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Transcript Exhibit(s)

Docket #(s): L-00000NN-09-0541-00151

Exhibit # : See attached Exhibit List for the status of each Exhibit.

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To: Docket Control

Date: January 20, 2010

Re: Hualapai Valley Solar
L-00000NN-09-0541-00151, LS Case No. 151
Volumes I and II, Concluded
January 12 and 13, 2010

STATUS OF ORIGINAL EXHIBITS

FILED WITH DOCKET CONTROL

Hualapai Valley Solar (HVS Exhibits)

1 – 22	Admitted
23	Not moved by design or oversight
24 – 25	Admitted

Committee (Committee Exhibits)

1	Not moved by design or oversight

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Arizona Building and Construction Trades Council (BTC Exhibits)

1	Admitted
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Susan A. Bayer (BAY Exhibits)

1	Not moved by design or oversight
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Denise Bensusan (BEN Exhibits)

1	Not moved by design or oversight

Copy to:

John Foreman, Chairman
Ernest Johnson, Executive Director
Thomas Campbell, Esq. – Hualapai Valley Solar

10

EXHIBIT
HVS-10
ADMITTED

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No. L-00000NN-09-0541-00151 Case No. 151 DIRECT TESTIMONY OF KENDA POLLIO

PREFILED DIRECT TESTIMONY OF KENDA POLLIO

Question 1. Please state your name and business address.

Answer 1. My name is Kenda Pollio, and my business address is 2387 Montgomery Ave, Cardiff, CA 92007.

Question 2. By whom are you employed and in what capacity?

Answer 2. I am employed by kp environmental as a Principal.

Question 3. Please describe your role with respect to the Hualapai Valley Solar Project.

Answer 3. In my capacity as an American Institute of Certified Planner (AICP) and Environmental Consultant I served as the Project Planner and public process coordinator on the Hualapai Valley Solar Project (the "Project').

Question 4. Please describe your educational and professional background and experience.

Answer 4. I have a Bachelors Degree from Florida State University in Urban and Regional Planning and a Masters Degree from University of South Florida in Environmental Policy. I am a Certified planner with over 19 years of environmental consulting experience. I have worked on numerous solar projects and other power plant projects totaling over 100 transmission line and utility projects. I have recently testified before the Siting Committee on the following projects:

- <u>Solar Cases</u>
  - Case 145 Agua Caliente Solar Project
  - Case 139 Solana Solar Generating Station

- Generation Cases
  - Case 141 Coolidge Generating Station
  - Case 114 Wellton Mohawk Generating Facility-
- Transmission Line and Substation Cases
  - Case 140 Solana Gen-Tie
  - Case 146 Q43 Substation
  - Case 124 Palo Verde to Pinal West 500 kV Transmission Line
  - Case 126 Pinal West to Southeast Valley 500 kV Transmission Line
  - Case 132 Desert Basin 230 kV Transmission Line
  - Case 136 Sundance to Pinal South 230 kV Transmission Line

Question 5. Please provide an overview of your testimony.

Answer 5. I am going to walk through in chronological order the public process that was undertaken for this Project. As a certified land use planner, I will walk through the CEC Application's environmental exhibits for which I was responsible including Exhibit A, Land Use; Exhibit F, Recreation; Exhibit H, Planned Uses; Exhibit I, Noise and Communication; and Exhibit J, Special Factors. I will also discuss the Mohave County General Plan Amendment that was recently approved by the County Board of Supervisors.

Question 6. Can you start by describing what you did for the public process?

Answer 6. Hualapai Valley Solar ("HVS") conducted an extensive public process for the Project that included extensive outreach efforts intent on distributing information and soliciting input from the public and interested stakeholders. Additionally, the public process was conducted in association with the

Mohave County Major Plan Amendment Process and the NEPA Scoping Process.

This public process included a number of different meeting types and venues that were held in order to gain public input and to respond to questions and comments throughout the process.

Briefing meetings were held with jurisdictional, planning entities, and elected officials to identify issues and concerns associated with the Project. These meetings laid the foundation for working together with the public and stakeholders on the Project. Additionally, Project representatives met with civic organizations and local groups. Over the past year, the Project has had over 50 briefing meetings in and around Kingman.

A Stakeholder Workshop was held to introduce the Project to key individual and organizational Stakeholders in the community, and designed to encourage stakeholders to provide input on the site development and Project issues.

Three Open Houses were held in the community. These Open Houses allowed the public at large to have informal, one-on-one discussions with Project representatives and express concerns, provide input, and receive answers to their questions. Additionally, comment forms were available. Notice of the Open Houses was provided through the local newspaper and individual mailings.

A joint Western Area Power Administration ("Western")/Bureau of Land Management ("BLM") Scoping meeting was held as part of the Project's NEPA process.

Question 7. Did you have ways or tools to engage and inform the public about the Project?

Answer 7. Yes, one of the primary goals of the public process was to identify Stakeholder and general public issues and concerns. To complete this effort, a number of tools and venues were implemented.

- A Project website was developed in order for the general public and Stakeholders to obtain information and provide comment via the website. In addition, Western has a webpage for the Project.
- The Project maintains a 1-800 number that is used to respond to questions and obtain comments from the general public.
- Artist renderings using a 3-Dimensional (3D) model of the Project was developed to provide Stakeholders and the general public a sense of the size and scale of the Project. Comment forms were utilized at meetings to take written comments.
- Project email.

Question 8. Can you walk us through the Applicant-initiated public process, in chronological order?

Answer 8. A Stakeholder Meeting was held on June 30, 2008, from 11:00 a.m. to 1:00 p.m. at the Hampton Inn in Kingman. This meeting included the city, county, state and federal agencies, utilities, school districts, regional planning agencies, and civic, educational and professional organizations.

This purpose of this meeting was to provide Project information and provide an opportunity to obtain comments from Stakeholders. A list of the invitees, the meeting invitation, the agenda, the meeting handouts, meeting sign-in sheets, the presentation, and comment forms received are included in Exhibit J-1 to the Application. Fifty-five people attended this meeting, which included a presentation followed by a question and answer exchange. Although there was a large turnout, we modified the agenda and did not break into small groups, instead staying in the larger group as the attendees preferred to continue the Q&A.

There were three Open Houses conducted in July 2009. Over 190 people attended the three Open Houses, which were held from 5:00 p.m. to 7:00 p.m. in Valle Vista, Kingman and Dolan Springs. These Open Houses allowed the general public to have informal, one-on-one discussions with Project representatives and express concerns, provide input, and receive answers to their questions. Additionally, comment forms were distributed.

The full Public Process Report for the meetings held prior to the start of the NEPA process includes notices of meetings, presentation materials and handouts, and public comment forms. This Report can be found in Exhibit J-1 to the Application.

Question 9. Were there other public meetings associated with the Project?

Answer 9. Yes, there was the County General Plan Amendment Process, which I will discuss in later testimony. This process included several public meetings

where the general public was able to learn about the Project and provide public comments.

Additionally, there was the joint Western/BLM Scoping process. A Scoping meeting was held in both open house and presentation formats on October 1, 2009, from 6 p.m. to 8 p.m. at the Kingman High School Auditorium. Thirty-five people attended this meeting. Exhibit J-2 to the Application includes the Draft Scoping Report for the NEPA process.

The Applicant co-sponsored an event with the Kingman Chamber of Commerce on August 13, 2009 hoping to reach an even wider audience. HVS had a booth with information and had Project representatives available to discuss the Project. Over 300 people attended this event.

Question 10. How were these meetings noticed?

Answer 10. The Applicant used a number of methods to ensure the general public knew about the meetings where they could learn about the Project and provide comments. The Open Houses and Scoping meeting were advertised in the following manner:

- Mailer notices were sent to property owners within one mile of the Project and to the zip code within a 10-mile radius of the Project.
- Project flyers/posters were put up throughout Kingman and the Project area (e.g. Dolan Springs, Meadview, Peach Springs, Hackberry, and Valle Vista).
- The Applicant advertised in the Kingman Daily Miner and The Standard newspapers.

- Additionally, the newspapers ran multiple stories throughout this process about the Project and the meetings.
- The Scoping meeting had radio announcements and a press release.

Question 11. Describe how this hearing was noticed.

Answer 11. The hearing was noticed by publication in the *Kingman Daily Miner* on December 1, 2009, and *The Standard* on December 2, 2009. The Affidavits of Publication are marked as Exhibit HVS-2. HVS also put up a sign on the Project Site that provided information about this Committee hearing.

Question 12. Which other parts of the process were your responsibility?

Answer 12. I was the land use planner for the Project and conducted the land use studies as well as a noise study for the Project. Specifically, I prepared Exhibits A, F, H, and I to the Application.

Question 13. Let's start with Land Use and Exhibit A.

Answer 13. The Project site is under the jurisdiction of Mohave County and is entirely on private land. The access road and Gen-Tie crosses some BLM parcels. Existing land use was analyzed for the Project by conducting site visits and working with the Mohave County Planning Department. The existing land use of the Project site is vacant. The Gen-Tie will interconnect within the BLM designated utility corridor.

The Project's planned land use is under the jurisdiction of Mohave County. The Project was under a Rural Development Area (RDA) land use designation (*see* Figure A-3 in the Application). In September 2009, the

Mohave County Planning and Zoning Commission unanimously recommended approval of a Major Amendment to the Mohave County General Plan and Area Plan to change the land use designation for the Project site from a RDA land use designation to an RDA, Rural Industrial (RDA, RI) land use designation. This designation would provide compatible land use for the Project.

The Major Plan Amendment was approved by a unanimous vote of the Mohave County Board of Supervisors on November 16, 2009.

Question 14. What about Planned Land Use?

Answer 14. The Applicant analyzed planned uses within the area by reviewing Mohave County and BLM land use plans. The majority of the Project site is under option by the Applicant. This land was originally intended to be developed as a Planned Area Development (PAD). The PAD for the Red Lake Master Planned Community was approved by the County for residential development. Because of the Project, this Planned Community will not be built on the Project lands.

Other than the Red Lake Master Planned Community, there are no planned local, state, or federal developments in the vicinity of the Project and, therefore, no direct impacts to planned developments.

Question 15. What about Recreational Uses in the area?

Answer 15. The larger Mohave County region is visited by a substantial number of recreational users. However, in the area of the HVS Project there is very

little recreational use. There are no Mohave County designated recreational facilities in the area of the Project. The closest recreational area is on BLM land over 13 miles away.

Question 16. Can you also summarize the noise and communication analysis for the project?

Answer 16. Noise impacts were assessed for the CSP Project because this presents the maximum noise impact. Noise generated during the construction phase of the Project would result from the operation of construction equipment and vehicles.

The nearest noise receptors, which are sparsely populated residences, are over one mile from the Project site and property boundary; and over 2.5 miles from the Power Block, which is the main source of noise during construction and operation. The impact from the Project on the sound levels in the area would be minimal. All of the operational noise sources are located within the Power Block. The Power Block will be surrounded by the Project's solar field, which will provide a buffer from the noise source to any potential receptor.

This Project is not expected to generate interference with communication signals due to its remote location. The short Gen-Tie will be one of many transmission lines in the area and will not be sited near any residences.

Question 17. Would your analysis be the same if the Project were constructed as a PV project rather than as a CSP project?

Answer 17. Yes, the impacts are similar or less.

Question 18. Would your conclusions be the same if this Project were constructed in phases?

Answer 18. Yes.

Question 19. Does this conclude your testimony?

Answer 19. Yes.

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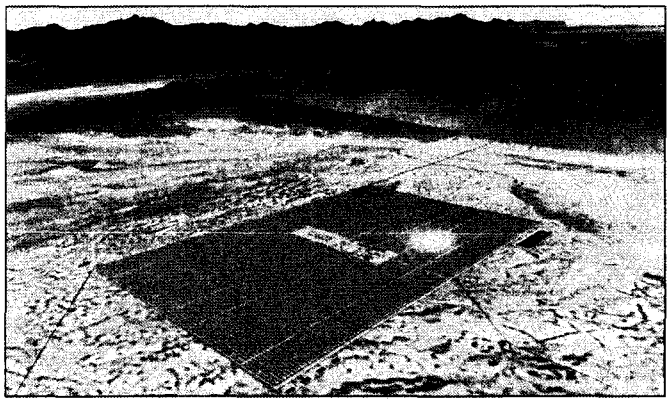
EXHIBIT
HVS-11
ADMITTED

hualapai valley solar™
a mohave sun power project



Hualapai Valley Solar Project
January 2010 | LSC Hearing | Kenda Pollio

Kenda Pollio - Experience

- Bachelors Degree Urban and Regional Planning, Florida State University
- Masters Degree Environmental Planning, University of South Florida
- American Institute of Certified Planner (AICP)
- 19 Years Experience
- Several Solar Generation Projects
- Over 100 Generation and Transmission Line and Utility Projects

Kenda Pollio – Recent Cases

- Testified Before the Siting Committee

  Solar Cases
  - Case 145 Agua Caliente Solar Project
  - Case 139 Solana Generating Station

  Generation Cases
  - Case 141 Coolidge Generating Station
  - Case 114 Wellton-Mohawk Generating Facility

  Transmission Line and Substation Cases
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  - Case 146 Q43 Substation
  - Case 124 Palo-Verde to Pinal West 500 kV Transmission Line
  - Case 126 Pinal West to Southeast Valley 500 kV Transmission Line
  - Case 132 Desert Basin 230 kV Transmission line
  - Case 136 Sundance to Pinal South 230 kV Transmission Line

Summary of Testimony

- Public Process
- Environmental Factors Considered
  - Exhibit A, Land Use
  - Exhibit F, Recreation
  - Exhibit H, Existing Plans
  - Exhibit I, Noise and Communication

Public Process

- Venues
  - Briefing Meetings
  - Stakeholder Workshop
  - Open House Meetings
  - Scoping Meetings
- Tools
  - Websites
  - 1-800 Number
  - Simulations of Project
  - Project Emails

Meetings

- Stakeholder Workshop
  - Held in Kingman on June 30, 2009
  - Over 55 Stakeholders Attended
  - Modified Format Based on Comments
- Open House Meetings
  - Three held in Valle Vista, Kingman, and Dolan Springs in July 2009
  - Over 190 people attended
- Mohave County General Plan Amendment Public Meetings
- Scoping Meeting
  - Held in Kingman in October 2009
  - Over 35 people attended

Public Process Notice

- Mailer Notices
  - Property Owners
  - Zip Code within 10 miles of Project Site
- Posters Throughout Region
- Advertisements in Newspapers
- Public Radio Announcements
- Press Release
- Newspaper Articles

Notice of Hearing Sign

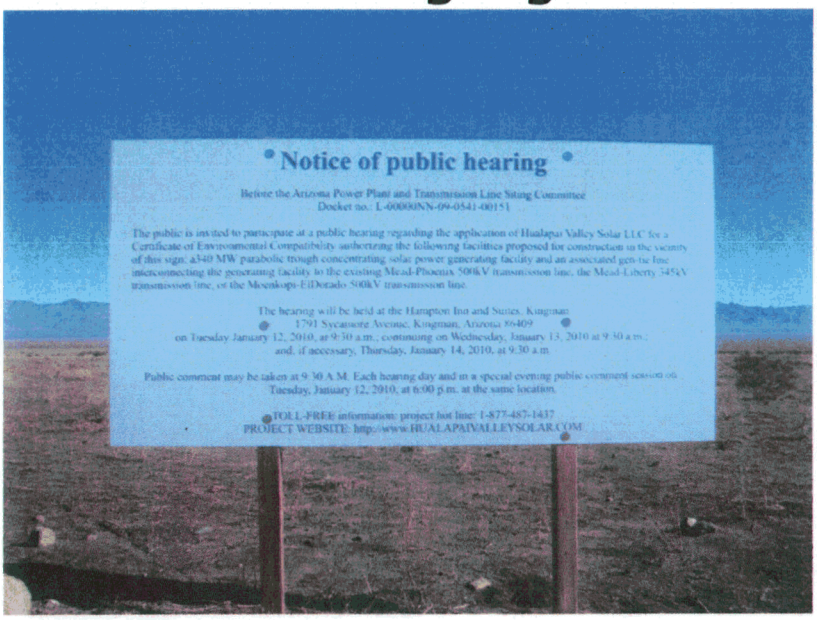

Exhibit A: Land Use

- Jurisdiction and Ownership
- Existing land use
  - Vacant land
- Planned Land Use
  - Mohave County General Plan Amendment and Area Plan approved unanimously by Board of Supervisors
- Compatible Land Use

BLM Corridor Aerial View

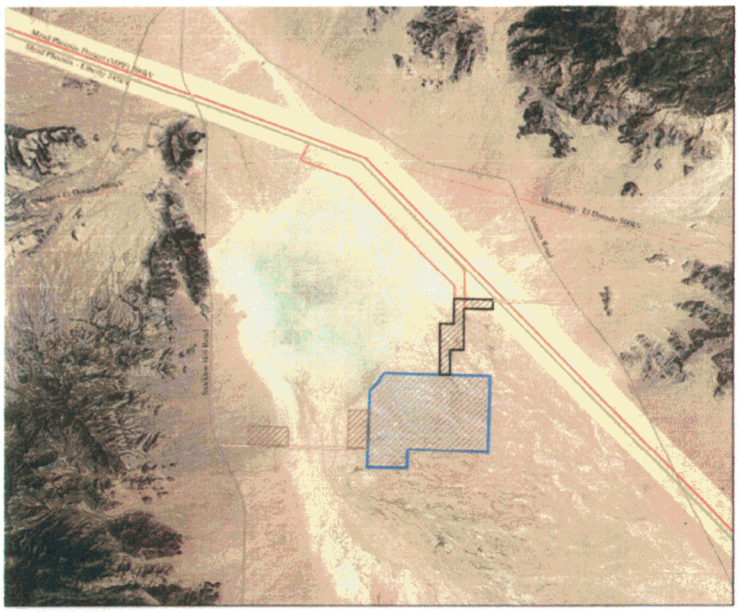

Exhibit H: Planned Uses
Exhibit F: Recreation

- Local, State and Federal Plans
  - No plans in the Project area
- Planned Private Development
  - Site was originally a PAD
  - The PAD would not be built on the Site
- No Direct Impacts to Planned Uses
- No On-site Recreation
- Closest Recreation
  - Closest Designated Recreation is over 13 miles away on BLM land
- No Recreational Impacts

Exhibit I: Noise and Communication

- Noise Impacts Assessed for CSP
- A Few Scattered Residences are Over 2.5 Miles Away from Power Block (primary noise source)
- No Discernible Noise from Project to Residences
- No Impacts to Communication Signals

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EXHIBIT
HVS-12
ADMITTED

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No. L-00000NN-09-0541-00151 Case No. 151 DIRECT TESTIMONY OF MICHAEL WARNER

PREFILED DIRECT TESTIMONY OF MICHAEL WARNER

Question 1. Mr. Warner, please state your name and business address.

Answer 1. My name is Michael Lloyd Warner. My business headquarters are located at 3740 East Southern Avenue, Suite 218, Mesa, Arizona.

Question 2. Mr. Warner, please describe your education and professional background and experience.

Answer 2. I have a Master's Degree in Landscape Architecture with emphasis in Environmental Planning from Utah State University, and a Bachelor's Degree in Agronomy with an emphasis in Plants and Soils from Brigham Young University. I am a member of the American Institute of Certified Planners. I have twenty years of experience working with utilities as an environmental planner, and have broad experience with permitting utility infrastructure with federal and state agencies. I have worked on permitting for more than thirty transmission lines ranging from 60 kV to 500 kV. I have testified before this Committee previously in five cases: the Sandario Transmission Line, Case 125; Carrel Interconnection, Case 129; Vail Area, Case 137; Vail to Valencia, Case 144; and Abel Moody, Case 148.

Question 3. Mr. Warner, by whom are you employed and in what capacity?

Answer 3. I am the founder and president of Transcon Environmental, Inc. I am environmental planner and project manager for the company, working mainly on utility siting and permitting projects.

Question 4. What is your role with respect to the Hualapai Valley Solar Project?

Answer 4. I am the project manager involved in preparing some of the resource studies for the CEC application. Specifically I am the sponsor of exhibits involved

with the biology, cultural resources and visual resources. In addition, I am the project manager and third party contractor currently conducting the Environmental Impact Study for the Department of Energy, Western Area Power Administration (Western or WAPA) and Bureau of Land Management (BLM).

Question 5. Mr. Warner, please provide an overview of your testimony.

Answer 5. My testimony will to provide a summary explaining that the Project is compatible with various environmental resources required for examination by Arizona statute, A.R.S. § 40-360.06. Specifically, I will summarize our findings contained in Exhibits C and D to the Application, which examined sensitive and protected biological species along with common vegetation and biological species. I will explain that the Project impacts we found were relatively minor and were compatible.

I will also discuss the findings contained in Exhibit E to the Application, which examined visual and cultural resources, and similarly will present our conclusions that the Gen-Tie and Generating Facility are compatible. I will also review visual simulations prepared as part of Exhibit G to the Application, which depict views identified by federal agency staff and Hualapai Tribal representatives.

Finally, I will review part of Exhibits B and J and include a summary of analysis currently underway by federal agencies as part of compliance with the National Environmental Policy Act (NEPA)

Question 6. Mr. Warner, please describe your analysis of biological resources.

Answer 6. The Project site is within an area dominated by Mohave Desert scrub and semi-desert grassland, and is just outside of the Red Lake Playa. There are no water sources to support fish or aquatic species.

Exhibits C and D to the Application contain a summary of sensitive or special-status species and common species, respectively. There is one endangered species that has the potential to be found in the Project area. The California Condor may forage in this area. Its current known locations, however, are distant (Grand Canyon), and it is a scavenger so the lack of consistent carrion in the area wold make it an unlikely visitor.

In regards to sensitive or special-status species impacts, one BLM sensitive plant, Parish's phacelia, a low-growing annual herb, could occur near the edge or within the Red Lake Playa. However, it was not observed during onsite biological reviews. Potential impacts are considered minimal because the species was not found and would likely occur closer to the Playa, outside of the Project's planned area of disturbance. In addition, we will conduct preconstruction surveys and individuals will be avoided if possible.

BLM sensitive species observed or likely found within the Project area are the Burrowing Owl, Swanson Hawk and bats. Some Burrowing Owls may be displaced by the power plant, but the impacts will be minor because a pre-construction survey will be performed and any owls found will relocated to suitable offsite locations. Swanson Hawks use the area for foraging, but nesting and roosting sites were not observed. Bats are found in the area and

likely use the area to forage. Nesting and roosting sites were not found in the area for bats.

The Project's mirrors will not have an impact on wildlife because there purpose is to direct the light and concentrate it in an area unlikely to be occupied by wildlife. The cooling ponds will not substantially impact wildlife because little supporting habitat is present and, therefore, animal frequency is expected to be low.

The two Gen-Tie interconnection sites have similarly low biological impacts. The Generating Facility and Gen-Tie are compatible with biological resources in the area because sensitive or protected species are not likely affected and resource protection measures, such as preconstruction surveys, and avoidance of sensitive areas, will help to reduce these impacts. In addition, common vegetation and biological species are widespread and dispersed. Impacts to common species are minor within the context of the setting.

Question 7. Mr. Warner, how did you evaluate cultural resources?

Answer 7. A Class I report summarizing the previous studies performed in the area was prepared. A summary of those findings are included in Exhibit E to the Application. A Class III pedestrian survey of the Project area is being completed by the Hualapai Tribe for all Project components.

We have worked closely with the Hualapai Tribe to evaluate impacts to areas or cultural resources considered important to the Tribe. Consultation

with the Tribe is being performed pursuant to Section 106 of the National Historic Preservation Act.

The two Gen-Tie interconnections have similar low impacts on cultural resources. Corridors are planned sufficiently wide to allow placement and construction that avoids typical cultural resources found in the area. Cultural resources found at the Generating Facility site will be examined, recorded, collected, and archived according to consultation and a Programmatic Agreement between agencies and the Tribe.

Based on current findings and previous surveys, the impacts to cultural and historic resources will be low. Therefore, Project components are compatible with cultural resources.

Question 8. Mr. Warner, please describe your evaluation of visual resources.

Answer 8. A summary of the evaluation is included in Exhibit E to the Application. BLM land in the area is managed as Class IV, which allows the maximum level of modification of any management class in the BLM's Visual Resources Management program. The area is open and the nearest resident is about 2.5 miles away. Scenic areas and resources are distant; for example, Mount Tipton Wilderness Area and U.S. Highway 66, seven and fifteen miles away, respectively. Simulations were prepared for 10 Key Observation Points identified in consultation with the BLM, Western, and the Hualapai Tribe. Simulations are contained in Exhibit G to the Application.

Question 9. Mr. Warner, please describe the visual simulations.

Answer 9. The federal agencies, Hualapai Tribe, and HVS chose the locations from which these views are simulated. These observation points are places from which the Tribe is concerned about the views to the surrounding area and, in some cases, the view is considered sensitive for the Tribe. Application Exhibits G-10 through G-19 provide representative views of the Project.

Question 10. What impact will the Project have on visual resources?

Answer 10. The visual impact of the Generating Facility is low. The mirrors are designed to capture the sunlight and direct it to an area where the energy can be used. Reflection of light off-site is inefficient and therefore is avoided. The effect is that the mirror array appears from a distance like a body of water that also absorbs light. In regards to the other apparatus and power plant features, the scale of the setting and the adjacent existing transmission lines are consistent with the planned facilities in scale and texture. Finally the BLM, through its public process, has designated this area as a Class IV visual management area, which will allow the maximum level of modification to the setting. Therefore, one can expect future uses to be compatible with the planned use of the Project.

The two Gen-Tie interconnections have similar impacts. The Gen-Tie is visually compatible with the visual management objectives for the area and does not contrast with the existing setting or with the three existing extra-high voltage transmission lines that cross the valley. The Project is compatible with the visual setting.

Question 11 Mr. Warner, please identify the other environmental analyses that are being conducted for this Project.

Answer 11. Exhibit B to the Application includes reports prepared for hydrology and water quality, and air quality. In addition, although the Generating Facility and much of the Gen-Tie route will be on private land, the Project triggers the NEPA process because the Project will interconnect into the electrical transmission system managed by WAPA. BLM is considered a cooperating agency because the Gen-Tie and access roads will require a grant of right-of-way to cross some BLM land. The NEPA process commenced in September 2009 with the publication of the Notice of Intent in the Federal Register. The scoping process concluded on October 23, 2009. Exhibit J to the Application includes the draft scoping report, which provides a summary of the process used to notify agencies, tribes, organizations, and individuals about the Project. It also identifies the issues raised for further study as part of the Environmental Impact Study. The NEPA process is expected to be complete in September 2010.

Question 12. Mr. Warner, in your professional opinion, is this Project environmentally compatible?

Answer 12. Yes

Question 13. Would your conclusion be the same if the Project were constructed as a PV project rather than as a CSP project?

Answer 13. Yes, the impacts are similar or less.

Question 14. Would your conclusion be the same if this Project were constructed in phases?

Answer 14. Yes.

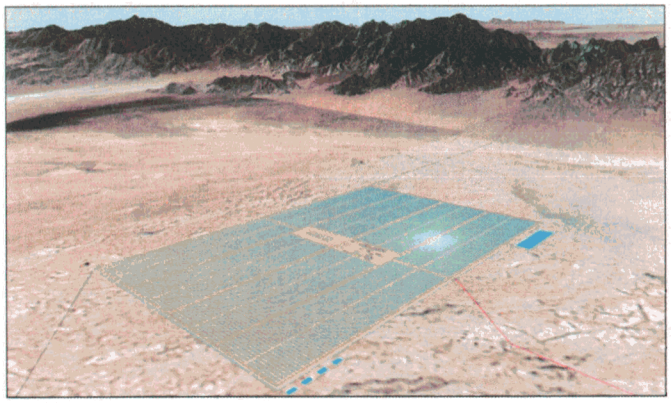
Question 15: Does this conclude your testimony?

Answer 15. Yes

13

EXHIBIT
HVS-13
ADMITTED

hualapai valley solar™
a mohave sun power project



Hualapai Valley Solar Project
January 2010 | LSC Hearing | Michael Warner

MICHAEL L. WARNER, AICP, ASLA

- MLA Landscape Architecture/Environmental Planning, Utah State University
- BS Agronomy, Brigham Young University
- Member, American Institute of Certified Planners
- Member, American Society of Landscape Architects
- 20 years experience consulting for utilities
- Managed resource, permitting, or siting activities on more than 30 transmission lines from 60 kV to 500 kV
- Managed permitting activities on thousands of miles of utility infrastructure
- Testified before the Committee five previous times
- President of Transcon Environmental, Inc.

SUMMARY OF ANALYSIS

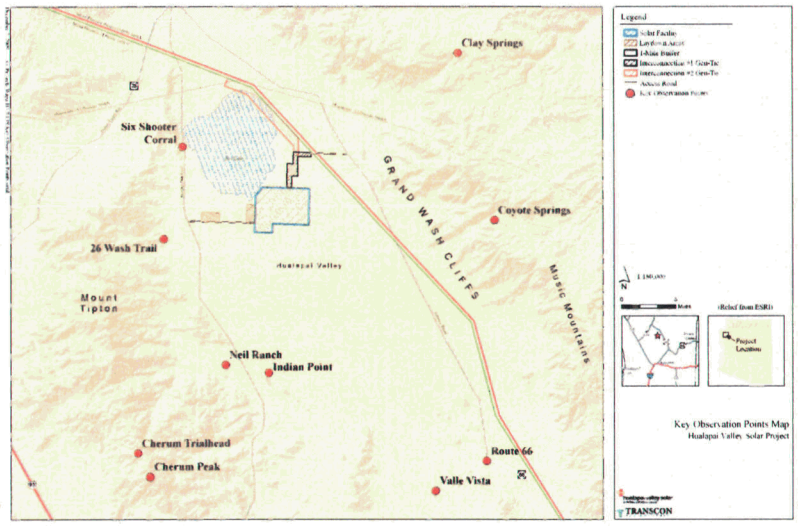
- Examined Biological and Cultural Resources
- Examined Visual Resources
- Determined Environmental Compatibility

BIOLOGICAL AND CULTURAL RESOURCES

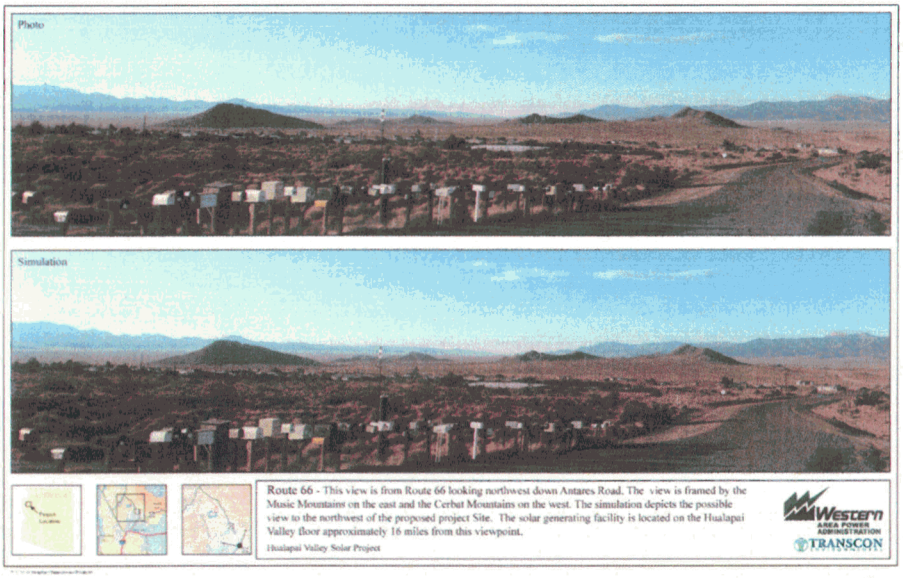
- Red Lake Playa

- No significant biological impacts
- Class I survey conducted
- Class III pedestrian survey underway prepared by Hualapai Tribe

SCENIC AREAS AND KEY OBSERVATION POINTS



ROUTE 66



VALLE VISTA

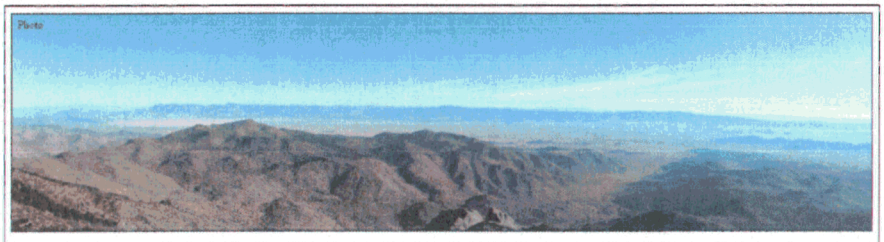
Valle Vista - This view is from E Concho Rd in the Valle Vista subdivision looking northwest. The view is framed by the Music Mountains to the east and the Cerbat mountains to the west. The simulation depicts the possible view to the northwest of the proposed project site. The solar generating facility is located on the Hualapai Valley floor approximately 16 miles from this viewpoint.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

MOUNT CHERUM SUMMIT



Summit of Mount Cherum - This is a view from the top of Mount Cherum in the Cerbat Range. This view is looking northeast. The view extends from the foothills of the Cerbat Range across the Hualapai Valley floor to the Music Mountains. This simulation illustrates the possible view of the solar generating facility at a distance of approximately 14.5 miles.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

MOUNT CHERUM TRAILHEAD

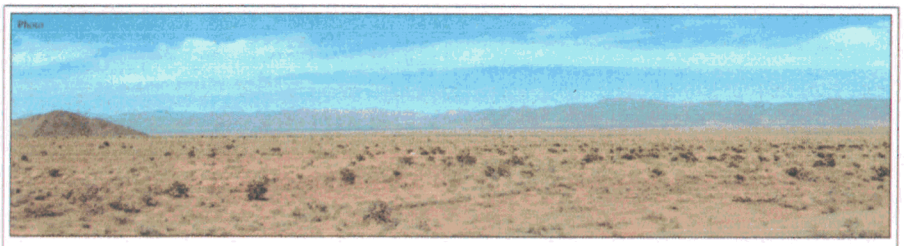
Cherum Peak Trailhead - The trailhead is located in the Cerbat Mountains, approximately 13 miles southwest of the proposed project site. The simulation depicts a possible view to the northeast of the solar generating facility, with the Music Mountains in the background.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

NEAL RANCH



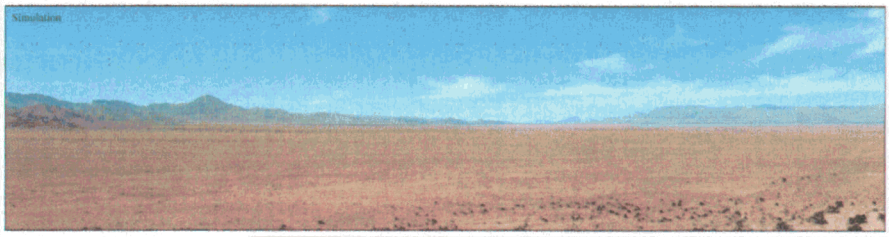
Neil Ranch - This viewpoint at the base of the Cerbat Mountains looks northeast across the Hualapai Valley floor toward the Music Mountains. The simulation depicts a possible view of the solar generating facility from approximately 7 miles away.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

INDIAN POINT



Indian Point - This view looks northeast from the south end of the Hualapai Valley floor toward the solar generating facility. This simulation depicts a possible view of the solar generating facility from approximately 7.5 miles away.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

26 WASH TRAIL

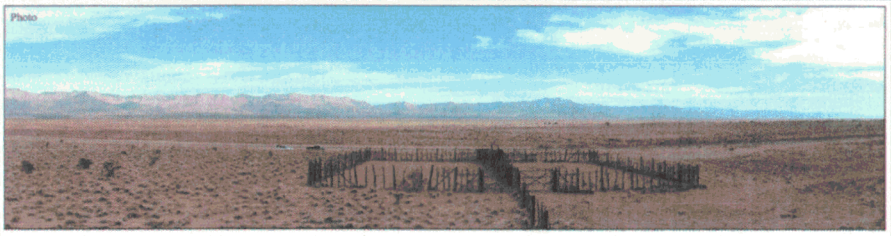
26 Mile Wash Trailhead - This viewpoint is located at the base of the Cerbat Mountains, 7 miles southwest of the proposed project site. The simulation depicts a possible view to the northeast of the solar generating facility, with the Music Mountains in the background.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

SIX SHOOTER CORRAL



Six Shooter Corral - This viewpoint located at the base of the Cerbat Mountains, 5 miles northwest of the proposed project site. The simulation depicts a possible view to the southeast of the solar generating facility, with the Music Mountains in the background.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

CLAY SPRINGS

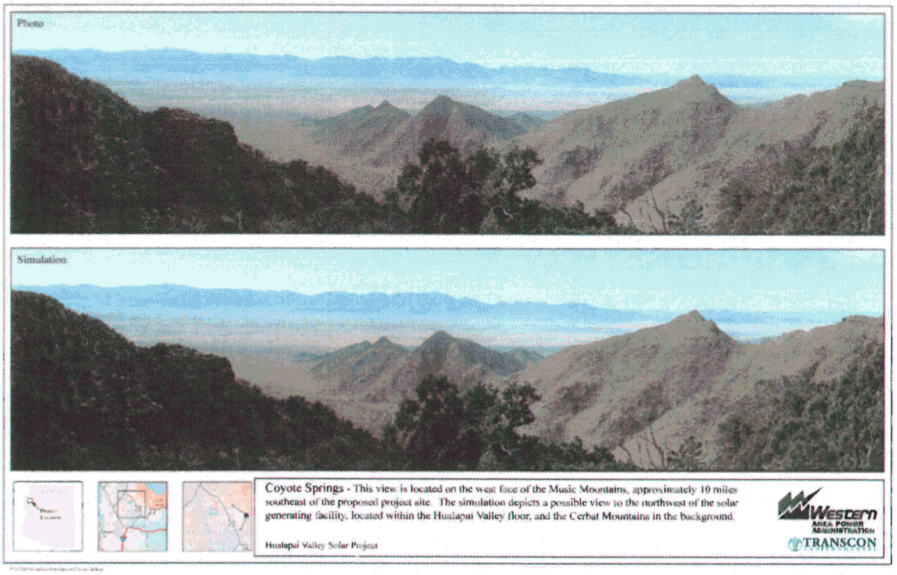
Clay Springs - This viewpoint is located near the west face of the Music Mountains, approximately 11 miles northeast of the proposed project site The simulation depicts a possible view to the southwest of the solar generating facility, located within the Hualapai Valley, and the Cerbat mountains in the background.

Hualapai Valley Solar Project

Western Area Power Administration

TRANSCON

COYOTE SPRINGS



SUMMARY OF COMPATIBILITY

For the Generating Facility and Gen-Tie Alignment

- The Project is consistent with existing plans of the state, local government, and public entities.
- There are no significant detrimental effects to fish, wildlife, plant life, and associated forms of life upon which they are dependent.
- There are no significant detrimental effects associated with noise emission levels and interference with communication signals.
- The Project could be constructed safely and in accordance with all applicable regulations.
- The Project would not result in significant detrimental effects to existing scenic areas, historic sites or structures, or archeological sites.
- The Project is environmentally compatible with the total environment of the Project study area.

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EXHIBIT
HVS-14
ADMITTED

CITY OF KINGMAN, ARIZONA
June 26, 2009

HUALAPAI VALLEY SOLAR LLC
Attention: Greg Bartlett, Managing Director
2701 East Andy Devine Avenue – Suite 300
Kingman AZ 86401
T: 206.349.6068 F: 309.407.1598 / greg@hualapaivalleysolar.com

RE: LETTER OF INTENT FOR THE USE OF EFFLUENT FROM THE HILLTOP WASTEWATER TREATMENT PLANT

Dear Mr. Bartlett:

Hualapai Valley Solar LLC ("HVS") and the City of Kingman ("City") share a common goal: to reuse the effluent created by the City's new Hilltop Wastewater Treatment Plant ("Hilltop").

The purpose of this non-binding Letter of Intent ("LOI") is to summarize our discussions to date and to confirm our respective intentions with respect to future collaborative investigations that may result in a possible future transaction.

1. HVS intends to build and operate a solar thermal power plant ("Power Plant") on private land it has acquired approximately 27 miles north of Kingman. The Power Plant is subject to obtaining required permits and approvals at the federal, state and local level.
2. The Power Plant requires water for both construction and normal operation. Rather than rely on on-site, treated groundwater from the Hualapai Valley Aquifer, HVS could possibly use effluent (treated wastewater) from Hilltop.
3. The City would like to find a productive use of the effluent produced by the new Hilltop Wastewater Treatment Plant (5925 E. Highway 66).
4. HVS has been considering the use of Hilltop effluent for its project. Investigative meetings and discussions have been conducted with the City water department, independent power plant consultants and wastewater experts, and the engineering firm designing the Power Plant.
5. This document is a Letter of Intent to only. It is not intended to be, and shall not constitute in any way, a binding or legal agreement, or impose any legal obligation or duty on either party, until a final, definitive Agreement is negotiated and executed.
6. In no event does this LOI restrict the City from exploring options with other entities or other uses.

Based on the foregoing intentions and expectations, the parties agree as to work together in a collaborative arrangement to further investigate the technical and financial feasibility of delivering Hilltop's effluent (or a portion thereof) to HVS for use in its Power Plant project.

Very truly yours,

MAYOR JOHN SALEM
CITY OF KINGMAN, ARIZONA

City of Kingman

John Salem, Mayor of Kingman

Hualapai Valley Solar LLC

Greg Bartlett, Managing Director

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EXHIBIT
HVS-15
ADMITTED

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding is made and entered into on this 5th day of January, 2010, between the City of Kingman (a municipal corporation located entirely in Mohave County, Arizona) and Hualapai Valley Solar LLC (a Delaware Limited Liability Company) for the express purpose of defining and delineating the City's and Hualapai's intent to negotiate in good faith the terms listed in this memorandum.

It is the Parties' mutual intent and desire to promote and effectuate an efficient and cooperative working relationship between themselves with the understanding of the practical, administrative and political considerations involved. Neither facility has been completed nor have all permits, inspections, and other rules and regulations been fully complied with in accordance with the applicable standards.

It is the Parties' mutual understanding that the City of Kingman is in the process of updating and expanding the Hilltop Wastewater Treatment Plant (HTWWTP). This process is ongoing and substantial completion is currently scheduled for January 4, 2011. Final completion is scheduled for March 5, 2011. The City of Kingman cannot guarantee any amount of effluent or quality of effluent to Hualapai. All discussion points contained in this memorandum are conditional upon the following non-exhaustive conditions:

1. The completion of the HTWWTP.
2. The ability of the City to store and pump the effluent to the edge of the City's west property line in section 11.
3. The approval of all necessary federal, state, and local rules, regulations, and permits for the construction of the HTWWTP.
4. The approval of all necessary federal, state, and local agencies regarding the operation of the HTWWTP, the sale of effluent, and the transmission of effluent.
5. The construction of the Hualapai Solar Plant.
6. The approval of all necessary federal, state, and local rules, regulations, and permits for the construction of the Hualapai Solar Plant.
7. The approval of all necessary federal, state, and local rules, regulations, and permits necessary for the operation of the proposed Hualapai Solar Plant.
8. The approval of a final binding agreement between the Kingman City Council and Hualapai.

The Parties understand that the City desires to have a means of disposing of effluent to be produced by the HTWWTP as a byproduct in order to comply with applicable environmental laws.

It is the Parties' mutual understanding that Hualapai is desirous of a long-term commitment by the City to provide effluent. Hualapai is requesting a term in excess of 20 (twenty) years.

It is the Parties' mutual understanding that Hualapai is desirous of 100% (one-hundred percent) capacity of the effluent treated by the City. When the new plant is built, the City will have an expected capacity for 1 MGD. If Hualapai Valley Solar is desirous of more than 1 MGD, they will need to obtain additional permitting and build additional treatment capacity. Both Parties understand that the City may only provide a surplus amount of effluent. The City has determined that it must reserve an undetermined amount of effluent for compliance with federal, state, and local regulations and may declare the remaining effluent as surplus for disposal according to mutual agreement.

It is the Parties' mutual understanding that both Parties are in need of additional infrastructure to facilitate this agreement. Hualapai agrees to negotiate in good faith the design, construction, and payment of the infrastructure necessary to store and pump the effluent to the City's west property line, in section 11, if required to facilitate the terms of this memorandum of understanding.

The amount of effluent needed by Hualapai will depend upon the ultimate size of the Hualapai Solar Plant and the extent to which water cooling is used. Whether a final binding agreement is reached will depend upon whether the Parties agree upon price, term, reimbursement provisions, infrastructure obligations and all other material terms.

The Parties of this memorandum of understanding agree to sign this memorandum, to negotiate the terms in good faith that will allow the Parties to reach a mutual understanding for a final binding agreement. This memorandum is binding only in so as far as it requires good faith on both Parties to negotiate for a final agreement. If the Parties fail to reach a final binding agreement by December 31st, 2010, this memorandum of understanding will terminate.

IN WITNESS WHEREOF, the Parties have signed this memorandum of understanding on the dates set forth below.

CITY OF KINGMAN, a municipal corporation of the State of Arizona

JAN 4, 2010
Date Signed

By John Salem
John Salem, Mayor, Kingman Common Council

HUALAPAI VALLEY SOLAR LLC, a limited liability company of the State of Delaware

JAN. 4, 2010
Date Signed

By Guy Bartlett
Its Managing Director

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EXHIBIT
HVS-16
ADMITTED

CITY OF KINGMAN
RESOLUTION NO. 4631

A RESOLUTION IN SUPPORT OF GREEN ENERGY

WHEREAS, the rapid decrease in the supply of conventional energy sources such as those that come from fossil fuels has caused the world to concentrate on the development of green (renewable) energy sources; and

WHEREAS, green (renewable) energy is the term used to describe sources of energy that are considered to be environmentally friendly and non-polluting, as well as constantly replenishing; and

WHEREAS, these energy sources include natural energetic processes that can be harnessed with little pollution such as anaerobic digestion, geothermal power, wind power, small-scale hydropower, solar energy, biomass power, tidal power, and wave power; and

WHEREAS, consumers, businesses, and organizations such as the City of Kingman may purchase and support green (renewable) energy in order to support further development, help reduce the environmental impacts of conventional electricity generation, and increase energy independence; and

WHEREAS, if developed further, green (renewable) energy systems can easily supplement all the energy needs of our area today and into the future, which will eliminate dependence on fossil fuels, lower costs of providing power and energy, and help in saving the environment; now therefore,

BE IT RESOLVED that Kingman stands in support of the development of local green (renewable) energy endeavors.

PASSED AND ADOPTED by the Mayor and Common Council of the City of Kingman, Arizona, the 8th day of September, 2009

ATTEST:

Deborah Francis

Deborah Francis, City Clerk

APPROVED:

John Salem

John Salem, Mayor

APPROVED AS TO FORM:

Carl Cooper, City Attorney

CITY OF KINGMAN
INCORPORATED
1952
ARIZONA

17

EXHIBIT
HVS-17
ADMITTED

PAGE: 1 of 7 FEE # 2009070631
B: 7634 P: 508
OFFICIAL RECORDS
OF MOHAVE COUNTY
CAROL MEIER,
COUNTY RECORDER
11/18/2009 04:10 PM Fee: $0.00
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PAID BY:MOHAVE CTY BD OF SUPERVISORS

RESOLUTION NO. 2009-274

A RESOLUTION SETTING FORTH THE APPROVAL OF A MAJOR AMENDMENT TO THE MOHAVE COUNTY GENERAL PLAN FOR SECTIONS 19, 20, 28, 29, 30, AND N 1/2 OF SECTION 31, AND SECTION 21 EXCLUDING N 1/2 N 1/2 AND SE 1/4 NW 1/4 AND SW 1/4 NE 1/4 THEREOF, IN TOWNSHIP 26 NORTH, RANGE 16 WEST TO CHANGE THE LAND USE DESIGNATION FROM A RDA (RURAL DEVELOPMENT AREA) LAND USE DESIGNATION TO AN RDA, RI (RURAL DEVELOPMENT AREA, RURAL INDUSTRIAL) LAND USE DESIGNATION AND AMENDING EXHIBITS VI.4 AND VI.6 OF THE GENERAL PLAN TO MATCH, CONSISTING OF APPROXIMATELY 6.3 SQUARE MILES IN THE MOHAVE COUNTY GENERAL AREA, MOHAVE COUNTY, ARIZONA.

WHEREAS, at the regular meeting of the Mohave County Board of Supervisors held on November 16, 2009, a public hearing was conducted to determine whether approval should be granted for a major amendment to the Mohave County Plan consisting of the above-described property as requested by Hualapai Valley Solar, LLC., of Tempe, Arizona, representing, Canberra Holdings, LLC, of Las Vegas, Nevada, and

WHEREAS, the area to be amended covers some 4,160 acres of contiguous, private land surrounded by Bureau of Land Management (BLM) holdings and other private parcels. The site lies 25 miles north of the City of Kingman, between Antares and Stockton Hill Roads. The planning area is comprised of generally flat land gradually inclined toward the Truxton Wash to the southwest and the Red Lake Playa to the northwest. The surrounding land uses consist of vacant land with limited single-family dwellings on large parcels, with six homes located within six miles of the project area, and

WHEREAS, the applicant requests the major General Plan amendment to Rural Industrial to allow for the construction of a 340 mW concentrating solar power generation facility. The Mohave County General Plan currently designates the land use as a Rural Development Area, and

WHEREAS, the site is not within a fire district. The site is not served by a water system or a sewer system. The site has access to the Western Area Power Administration electric transmission grid. Access to the site will be from Highway 66, via Anatares Road and an unnamed local road to the east, and from Stockton Hill Road and an unnamed local road from the west , and

WHEREAS, the General Plan requires the Department to evaluate a) the proposal's effect on the character of the neighborhood surrounding the site, b) the proposal's compatibility with adjacent land uses, and c) the capacity of planned services and facilities to accommodate the proposed use. This site is near the Liberty-Mead high voltage transmission line allowing electricity to be delivered to the Western Area Power Administration (WAPA) power grid. Policy 10.5 states Mohave County shall use its planning and development regulations to protect residential neighborhoods from encroachment of incompatible activities or land uses which may have a negative impact on the residential living environment. Conversely, Policy 21.8 requires Mohave County to protect industrially designated areas from encroachment by incompatible uses, such as residential neighborhoods. These two policies are also designed to protect property values and discourage disinvestment, and

WHEREAS, this proposal should generate minimal traffic, create little additional noise or other emissions from the site and be buffered to the northwest by the Red Lake Playa and various sections of BLM and ranch land, and

WHEREAS, Policy 3.5 of the General Plan states that Mohave County will only approve power plants using 'dry cooling' technology when the aquifer is threatened by depletion or subsidence. Added to the General Plan under the auspices of Growing Smarter Plus (ARS 11-823.C.3), this policy is designed to ensure that projected populations, based on land uses shown in the General Plan, are served by an adequate water supply. The applicant is taking measures to reduce demand on the aquifer, and

WHEREAS, Policy 5.2 of the General Plan asks that the County should limit development impacts on environmentally sensitive areas by encouraging innovative designs and mitigation. Natural resource and biological studies are anticipated to be required as a part environmental review. Mitigation measures will be provided as required and based on the findings of these reviews, and

WHEREAS, Policy 6.4 of the General Plan asks that the County should support and encourage solar and wind energy. The amendment will allow renewable energy opportunities and opportunities for reduced carbon emissions in the generation of energy. The amendment is also in keeping the Arizona Corporation Commision's Renewable Energy Standard and Tariff rules, passed in 2006, that requires 15% of the state's energy use be derived from renewable sources, and

WHEREAS, Policy 11.7 of the General Plan states that Mohave County shall only approve requests for rezoning, special permits, the division of land, other new development proposals or public projects that are consistent with the Land Use Diagrams, the policies contained in the Land Use Element and the other Elements of this General Plan, as further set forth in the County's Development Regulations, and

WHEREAS, Policy 13.8 of the General Plan states the County shall consider proposals for rural industrial uses, if such proposed uses provide significant employment opportunities for County residents, do not require the extension of public urban services, do not require a "major source" pollution permit from Arizona Department of Environmental Quality (A.A.C. Title 18, Chapter 2, Article 101(64)), do not mine ground water and are not appropriate for location in a planned industrial area. The solar energy project may provide a maximum of approximately 1,500 jobs during the 2 to 3 year construction period and approximately 100 full-time jobs for the operational phase of the project, and

WHEREAS, Policy 21.4 of the General Plan states that Mohave County should encourage design of commercial and industrial projects that incorporate natural features of the site that use native vegetation and design themes, recycle gray-water and/or harvest rainwater, and that support use of alternative energy sources, as set forth in the Development Regulations, and

WHEREAS, Policy 36.2 of the General Plan states Mohave County should encourage the establishment and/or relocation of diverse industrial and commercial developme, and nts in identified areas of the County consistent with these uses, and

WHEREAS, Policy 36.12 of the General Plan asks Mohave County to pursue and support industries that have smaller environmental footprints as measured by their use of less water and energy resources as well as their creation of fewer emissions when compared to traditional industry. The development of the proposed solar project is anticipated to utilize waters originally planned or anticipated to be used as a part of the Red Lake development proposed American Land Management, et.al. An Analysis of Water Adequacy (File No. 43-402285), dated November 7, 2007, concluded there was sufficient water to a depth of 1,200 feet below the land surface available on a physical, continuos and legal basis to support 223,580 homes per the Arizona Department of Water Resources (ADWR) 100-year water adequacy requirements (ARS §45-108). The Arizona Department of Water Resources analysis assumes 43,432 acre-feet of ground water and 26,161 acre-feet of effluent will be required to support this number of homes each year. Of the 59 square miles evaluated in the northern Hualapai Valley, the analysis included six of the seven sections in this proposal. Assuming an even distribution of residentail building density, the 6.3 square mile project area could support 24,635 homes with 4,785 acre-feet of ground water and 2,882 acre-feet of effluent. On July 6, 2009, the City of Kingman Common Council passed a Letter of Intent which informs the applicant that effluent will be available from the City's soon-to-be upgraded Hilltop Wastewater Treatment Plant. The letter of Intent shows the City's willingness to work with the applicant in a collaborative arrangement to further investigate the technical and financial feasibility of delivering effluent to the site. The solar power plant's estimated use of water is 2,500 to 3,000 acre-feet per year, and

WHEREAS, Policy 37.1 of the General Plan notes the Land Use Element and Area Plans should identify areas designated for future commercial and industrial development, including sites for renewable energy development. Mohave County's solar resources (approximate insolation value of 7.0 kWhrs per square meter per day at the site) allows the efficient deployment of both residential and commercial-scale solar projects, and

WHEREAS, Policy 43.4 of the General Plan asks that water systems should be designed to provide for emergency water needs for fire protection, and

WHEREAS, Policy 49.4 of the General Plan states that developments should not increase runoff from the site where downstream properties will be adversely impacted by the rate of runoff. Mitigation will be provided as required to insure that site runoff meets predeveloped conditions, and

WHEREAS, Policy 50.4 of the General Plan states that the County shall require that flood control/ drainage facilities be designed and constructed to minimize the intrusion of pollutants and excess sediments into sensitive areas and onto adjoining properties, and

WHEREAS, in addition to the above policies, Policy 27.9 of the General Plan states that proposed major amendments will be analyzed for suitability and feasibility. The Board will consider the following in determining the suitability of an application as a major amendment, and

a.) The applicant must demonstrate a perceived benefit or need to the area affected by the major amendment.

b.) The applicant will need to demonstrate sufficient water availability to support at least a 100-year supply to the area as a result of any future development resulting from the amendment, and which will neither pollute nor deplete the aquifer nor drop the water table below the natural recharge coefficient.

c.) The result of the proposed major amendment should provide reasonable continuous support, access, and service, to the location of the amendment so it can be reasonably accessed. The location of development as a result of the amendment should not be so remote that stated goals and policies within predicted time development increments cannot be attained.

d.) The purpose and implementation of the amendment should be in character with the region's current land uses or any previously devised natural balance of open space and current land uses.

e.) Proposed future uses as the result of a major amendment will be expected to be environmentally compatible with their surroundings. These include ensuring that changes and development that result from the amendment will not deplete water resources, particularly from downstream uses, and that protected habitats, riparian areas, and endangered species will not be disturbed or will have approved mitigation measures, and that water and air quality shall be maintained in perpetuity using established standards and requirements.

f.) For proposed major amendments to or in all Development Areas, it will be necessary to demonstrate how future land uses and proposed development as a result of the amendment will provide a cohesive self-supporting community.

g.) For amendments in or to Urban or Suburban Development Areas, the amendment will need to describe future land use development with full infrastructure in a logical development pattern with prescribed time frames for completion or the preliminary development steps to be taken leading toward incorporation.

WHEREAS, comments from the Arizona Department of Commerce regarding the implementation of Growing Smarter law (ARS 11-821) are pending, and

WHEREAS, a review of various FEMA FIRM Panels indicates that the area contains various flood hazard areas, including the Big Sandy Wash and its tributaries, and

WHEREAS, the following described Findings of Fact are for the above-captioned item:

a. All notices have been advertised and posted according to regulations.
b. The Hualapai Valley Solar development team held three public meetings as follows:
   i. July 15, 2009, at Valle Vista Country Club, where 91 people attended.
   ii. July 16, 2009, at Kingman High School, north campus, where 65 people.
   iii. August 7, 2009, at Dolan Springs Community Center, where 42 people attended.
c. Notification for these meetings were done, via mailed invitation, based on the Mohave County Tax Assessor's data records. Mailings were sent to those living in the surrounding area.
d. In addition, a stakeholder meeting was held on June 30, 2009 at the Hampton Inn, Kingman, where 55 people attended
e. The area has multiple forms of legal access.
f. The proposed land uses will be consistent with the planned and the existing, surrounding land uses and the Mohave County General Plan pending the finding of an adequate water supply to support the project and limited grading of site to avoid impeding existing named washes and drainages.
g. Significant environmental features affecting the planning area include the adjacent washes.

WHEREAS, at the public hearing before the Mohave County Planning and Zoning Commission on September 9, 2009 and September 16, 2009 the Commission recommended APPROVAL for a Major Amendment subject to the following:

1. Sections 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW 1/4 NE 1/4 thereof, in Township 26 North, Range 16 West shall change from a RDA (Rural Development Area) land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation with Exhibits VI.4 and VI.6 of the General Plan amended to match as shown on Exhibit "A".

2. The applicant will provide an evaluation showing that a sufficient water supply exists in the underlying aquifers for the proposed use.

3. The Arizona Corporation Commission (ACC) Power Plant and Line Siting Committee must issue a Certificate of Environmental Compatibility for the proposed electrical generation facility at this site.

4. The applicant shall obtain Aquifer Protection Permit and Air Pollution Permit, if required by state law, from the Arizona Department of Environmental Quality (ADEQ) prior to construction.

5. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared outlining methods for control of sediment and runoff during construction in accordance with National Pollutant Discharge Elimination System (NPDES) requirements.

6. The power plant will connect to the Western Area Power Administration (WAPA) transmission line or other service provider.

7. The proposed development will comply with all Federal, State and local requirements.

WHEREAS, the notice of hearing was published in The Kingman Daily Miner, a newspaper of general circulation in Kingman, Mohave County, Arizona, on November 1, 2009, and was posted on October 30, 2009, as required by Arizona Revised Statutes and the Mohave County Zoning Regulations.

NOW THEREFORE BE IT RESOLVED, that the Board of Supervisors, at their regular meeting on Monday, November 16, 2009, APPROVED this Major Amendment as recommended by the Mohave County Planning and Zoning Commission and outlined herein.

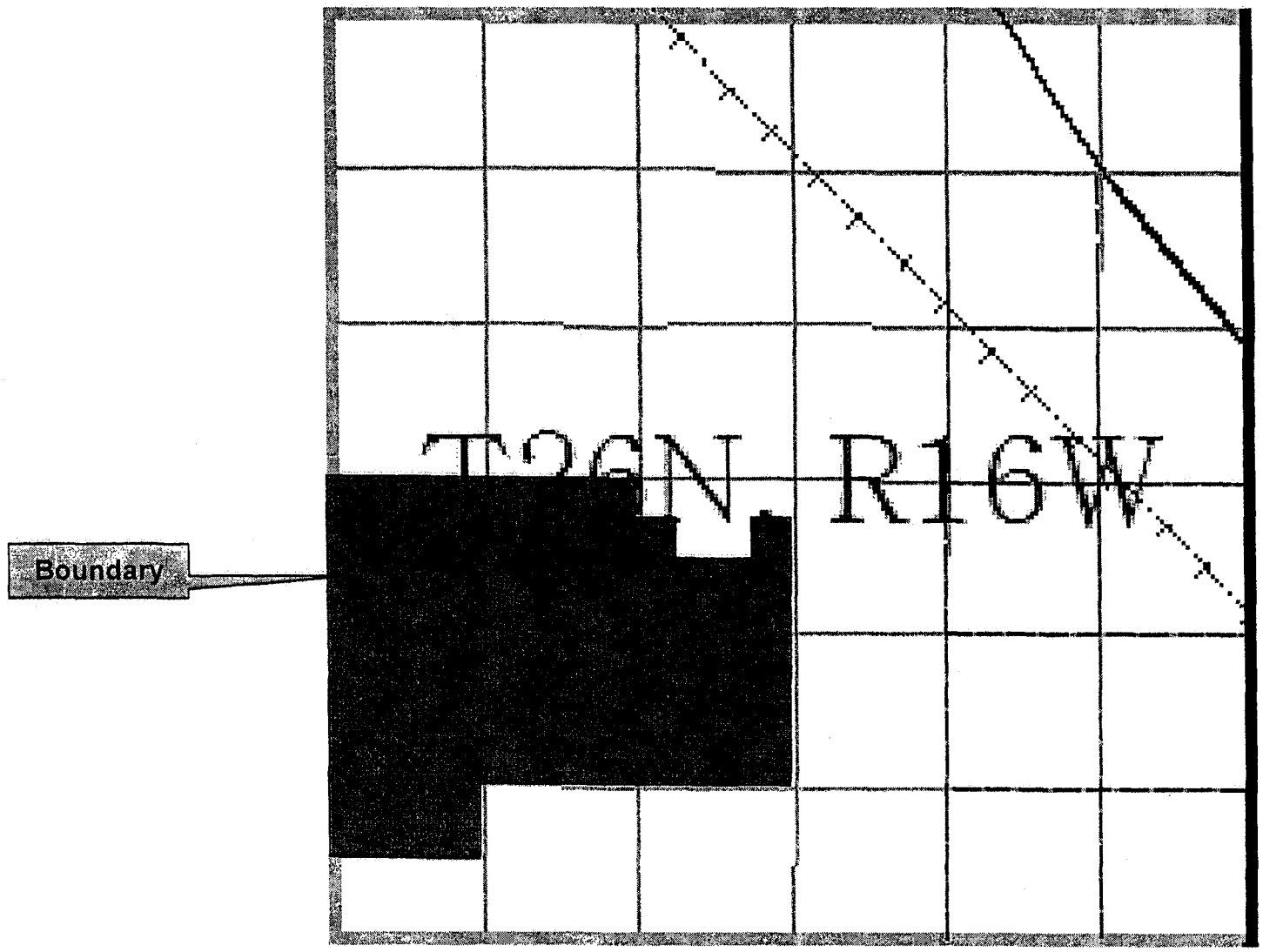
MOHAVE COUNTY BOARD OF SUPERVISORS

ATTEST

Tom Sockwell, Chairman

Barbara Bracken, Clerk

Exhibit "A"



Evaluation of a request for the approval of a **MAJOR AMENDMENT TO THE MOHAVE COUNTY GENERAL PLAN** for Sections 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW 1/4 NE 1/4 thereof, in Township 26 North, Range 16 West to change the land use designation from a RDA (Rural Development Area) land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation and amending Exhibits VI.4 and VI.6 of the General Plan to match, consisting of approximately 6.3 square miles in the Mohave County General Area, Mohave County, Arizona.

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OF MOHAVE COUNTY
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11/18/2009 04:10 PM Fee: $0.00
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RESOLUTION NO. 2009- 275

A RESOLUTION SETTING FORTH FOR THE APPROVAL OF THE HUALAPAI VALLEY SOLAR AREA PLAN CONSISTING OF PROPERTIES LOCATED IN SECTIONS 19, 20, 28, 29, AND N 1/2 OF SECTION 31, AND SECTION 21 EXCLUDING N 1/2 N 1/2 AND SE 1/4 NW 1/4 AND SW 1/4 NE 1/4 THEREOF, IN TOWNSHIP 26 NORTH, RANGE 16 WEST FOR A CONCENTRATING SOLAR POWER PLANT ON APPROXIMATELY 6.3 SQUARE MILES IN THE MOHAVE COUNTY GENERAL AREA, MOHAVE COUNTY, ARIZONA.

WHEREAS, at the regular meeting of the Mohave County Board of Supervisors held on November 16, 2009, a public hearing was conducted to determine whether approval should be granted for the adoption of the Hualapai Valley Solar Area Plan consisting of the above-described property as requested by Hualapai Valley Solar, LLC., of Tempe, Arizona, representing, Canberra Holdings, LLC, of Las Vegas, Nevada, and

WHEREAS, the area to be amended covers some 4,160 acres of contiguous, private land surrounded by Bureau of Land Management (BLM) holdings and other private parcels. The site lies 25 miles north of the City of Kingman, between Antares and Stockton Hill Roads. The planning area is comprised of generally flat land gradually inclined toward the Truxton Wash to the southwest and the Red Lake Playa to the northwest. The surrounding land uses consist of vacant land with limited single-family dwellings on large parcels, with six homes located within six miles of the project area, and

WHEREAS, the applicant requests the adoption of a new Area Plan to allow for the construction of a 340 mW concentrating solar power generation facility. The Mohave County General Plan currently designates the land use as a Rural Development Area, and

WHEREAS, the site is not within a fire district. The site is not served by a water system or a sewer system. The site has access to the Western Area Power Adminstration electric transmission grid. Access to the site will be from Highway 66, via Anatares Road and an unnamed local road to the east, and from Stockton Hill Road and an unnamed local road from the west , and

WHEREAS, the General Plan requires the Department to evaluate a) the proposal's effect on the character of the neighborhood surrounding the site, b) the proposal's compatibility with adjacent land uses, and c) the capacity of planned services and facilities to accommodate the proposed use. This site is near the Liberty-Mead high voltage transmission line allowing electricity to be delivered to the Western Area Power Administration (WAPA) power grid. Policy 10.5 states Mohave County shall use its planning and development regulations to protect residential neighborhoods from encroachment of

incompatible activities or land uses which may have a negative impact on the residential living environment. Conversely, Policy 21.8 requires Mohave County to protect industrially designated areas from encroachment by incompatible uses, such as residential neighborhoods. These two policies are also designed to protect property values and discourage disinvestment, and

WHEREAS, this proposal should generate minimal traffic, create little additional noise or other emissions from the site and be buffered to the northwest by the Red Lake Playa and various sections of BLM and ranch land, and

WHEREAS, Policy 3.5 of the General Plan states that Mohave County will only approve power plants using 'dry cooling' technology when the aquifer is threatened by depletion or subsidence. Added to the General Plan under the auspices of Growing Smarter Plus (ARS 11-823.C.3), this policy is designed to ensure that projected populations, based on land uses shown in the General Plan, are served by an adequate water supply. The applicant is taking measures to reduce demand on the aquifer, and

WHEREAS, Policy 5.2 of the General Plan asks that the County should limit development impacts on environmentally sensitive areas by encouraging innovative designs and mitigation. Natural resource and biological studies are anticipated to be required as a part environmental review. Mitigation measures will be provided as required and based on the findings of these reviews, and

WHEREAS, Policy 6.4 of the General Plan asks that the County should support and encourage solar and wind energy. The amendment will allow renewable energy opportunities and opportunities for reduced carbon emissions in the generation of energy. The amendment is also in keeping the Arizona Corporation Commision's Renewable Energy Standard and Tariff rules, passed in 2006, that requires 15% of the state's energy use be derived from renewable sources, and

WHEREAS, Policy 11.7 of the General Plan states that Mohave County shall only approve requests for rezoning, special permits, the division of land, other new development proposals or public projects that are consistent with the Land Use Diagrams, the policies contained in the Land Use Element and the other Elements of this General Plan, as further set forth in the County's Development Regulations, and

WHEREAS, Policy 13.8 of the General Plan states the County shall consider proposals for rural industrial uses, if such proposed uses provide significant employment opportunities for County residents, do not require the extension of public urban services, do not require a "major source" pollution permit from Arizona Department of Environmental Quality (A.A.C. Title 18, Chapter 2, Article 101(64)), do not mine ground water and are not appropriate for location in a planned industrial area. The solar energy project may provide a maximum of approximately 1,500 jobs during the 2 to 3 year construction period and approximately 100 full-time jobs for the operational phase of the project, and

WHEREAS, Policy 21.4 of the General Plan states that Mohave County should encourage design of commercial and industrial projects that incorporate natural features of the site that use native vegetation and design themes, recycle gray-water and/or harvest rainwater, and that support use of alternative energy sources, as set forth in the Development Regulations, and

WHEREAS, Policy 36.2 of the General Plan states Mohave County should encourage the establishment and/or relocation of diverse industrial and commercial developments in identified areas of the County consistent with these uses, and

WHEREAS, Policy 36.12 of the General Plan asks Mohave County to pursue and support industries that have smaller environmental footprints as measured by their use of less water and energy resources as well as their creation of fewer emissions when compared to traditional industry. The development of the proposed solar project is anticipated to utilize waters originally planned or anticipated to be used as a part of the Red Lake development proposed American Land Management, et.al. An Analysis of Water Adequacy (File No. 43-402285), dated November 7, 2007, concluded there was sufficient water to a depth of 1,200 feet below the land surface available on a physical, continuos and legal basis to support 223,580 homes per the Arizona Department of Water Resources (ADWR) 100-year water adequacy requirements (ARS §45-108). The Arizona Department of Water Resources analysis assumes 43,432 acre-feet of ground water and 26,161 acre-feet of effluent will be required to support this number of homes each year. Of the 59 square miles evaluated in the northern Hualapai Valley, the analysis included six of the seven sections in this proposal. Assuming an even distribution of residentail building density, the 6.3 square mile project area could support 24,635 homes with 4,785 acre-feet of ground water and 2,882 acre-feet of effluent. On July 6, 2009, the City of Kingman Common Council passed a Letter of Intent which informs the applicant that effluent will be available from the City's soon-to-be upgraded Hilltop Wastewater Treatment Plant. The letter of Intent shows the City's willingness to work with the applicant in a collaborative arrangement to further investigate the technical and financial feasibility of delivering effluent to the site. The solar power plant's estimated use of water is 2,500 to 3,000 acre-feet per year, and

WHEREAS, Policy 37.1 of the General Plan notes the Land Use Element and Area Plans should identify areas designated for future commercial and industrial development, including sites for renewable energy development. Mohave County's solar resources (approximate insolation value of 7.0 kWhrs per square meter per day at the site) allows the efficient deployment of both residential and commercial-scale solar projects, and

WHEREAS, Policy 43.4 of the General Plan asks that water systems should be designed to provide for emergency water needs for fire protection, and

WHEREAS, Policy 49.4 of the General Plan states that developments should not increase runoff from the site where downstream properties will be adversely impacted by the rate of runoff. Mitigation will be provided as required to insure that site runoff meets predeveloped conditions, and

WHEREAS, Policy 50.4 of the General Plan states that the County shall require that flood control/ drainage facilities be designed and constructed to minimize the intrusion of pollutants and excess sediments into sensitive areas and onto adjoining properties, and

WHEREAS, comments from the Arizona Department of Commerce regarding the implementation of Growing Smarter law (ARS 11-821) are pending, and

WHEREAS, a review of various FEMA FIRM Panels indicates that the Area Plan contains various flood hazard areas, including the Big Sandy Wash and its tributaries, and

WHEREAS, the following described Findings of Fact are for the above-captioned item:

a. All notices have been advertised and posted according to regulations.
b. The Hualapai Valley Solar development team held three public meetings as follows:
   i. July 15, 2009, at Valle Vista Country Club, where 91 people attended.
   ii. July 16, 2009, at Kingman High School, north campus, where 65 people.
   iii. August 7, 2009, at Dolan Springs Community Center, where 42 people attended.
c. Notification for these meetings were done, via mailed invitation, based on the Mohave County Tax Assessor's data records. Mailings were sent to those living in the surrounding area.
d. In addition, a stakeholder meeting was held on June 30, 2009 at the Hampton Inn, Kingman, where 55 people attended
e. The area has multiple forms of legal access.
f. The proposed land uses will be consistent with the planned and the existing, surrounding land uses and the Mohave County General Plan pending the finding of an adequate water supply to support the project and limited grading of site to avoid impeding existing named washes and drainages.
g. Significant environmental features affecting the planning area include the adjacent washes.

WHEREAS, at the public hearing before the Mohave County Planning and Zoning Commission on September 9, 2009 and September 16, 2009 the Commission recommended APPROVAL for the adoption of the Hualapai Valley Solar Area Plan subject to the following:

1. The applicant will provide an evaluation showing that a sufficient water supply exists in the underlying aquifers for the proposed use.

2. The Arizona Corporation Commission (ACC) Power Plant and Line Siting Committee must issue a Certificate of Environmental Compatibility for the proposed electrical generation facility at this site.

3. The applicant shall obtain Aquifer Protection Permit and Air Pollution Permit, if required by state law, from the Arizona Department of Environmental Quality (ADEQ) prior to construction.

4. A Storm Water Pollution Prevention Plan (SWPPP) will be prepared outlining methods for control of sediment and runoff during construction in accordance with National Pollutant Discharge Elimination System (NPDES) requirements.

5. The power plant will connect to the Western Area Power Administration (WAPA) transmission line or other service provider.

6. The proposed development will comply with all Federal, State and local requirements.

7. Development of the Area Plan shall show sufficient progress in five (5) years. Sufficient progress is the development of the solar power generation plant. Without such progress, the solar power generation plant portion of the Area Plan will be recommended for reduction in scope or rescission.

WHEREAS, the notice of hearing was published in The Kingman Daily Miner, a newspaper of general circulation in Kingman, Mohave County, Arizona, on November 1, 2009, and was posted on October 30, 2009, as required by Arizona Revised Statutes and the Mohave County Zoning Regulations.

NOW THEREFORE BE IT RESOLVED, that the Board of Supervisors, at their regular meeting on Monday, November 16, 2009, APPROVED this adoption of the Hualapai Valley Solar Area Plan as recommended by the Mohave County Planning and Zoning Commission and outlined herein.

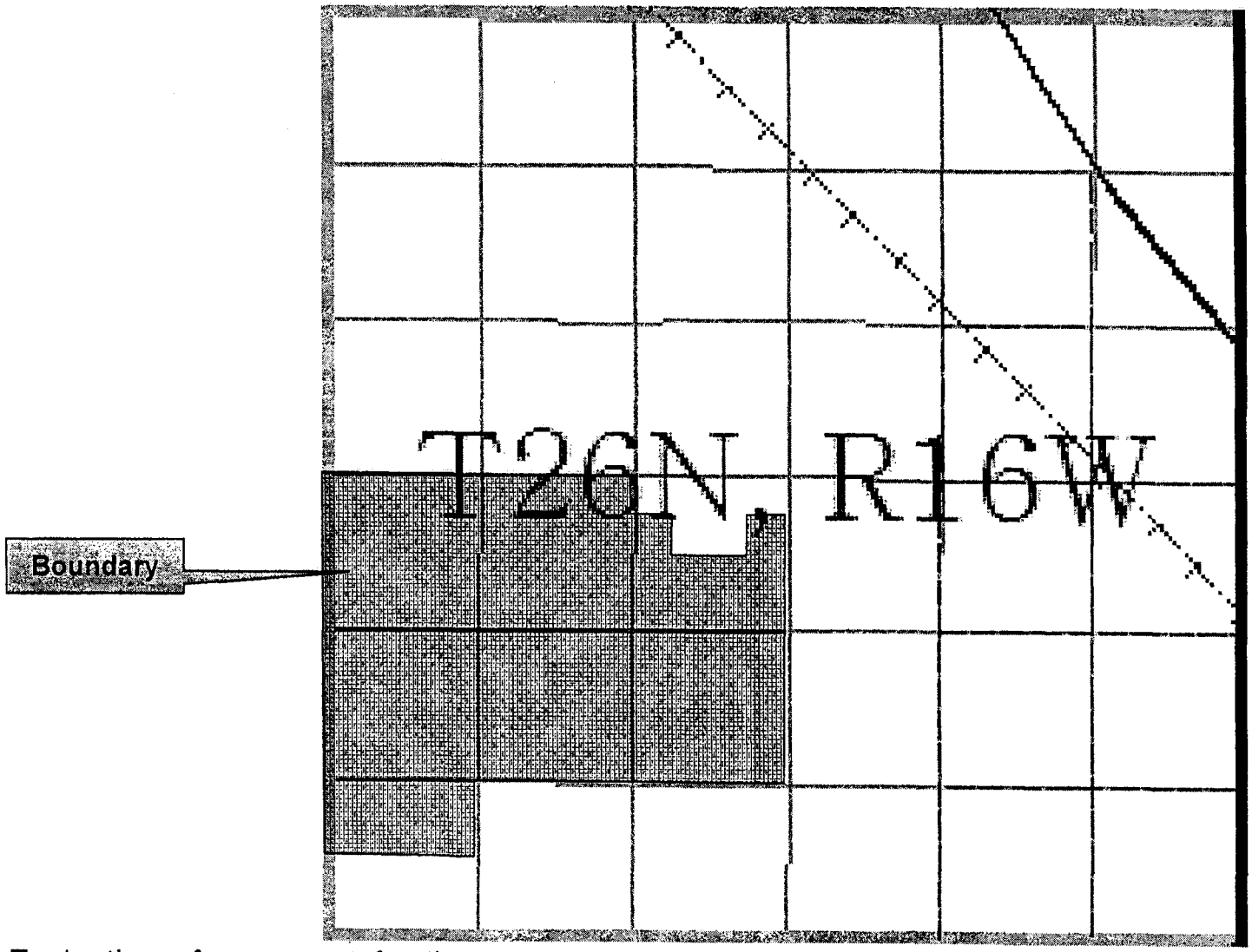
MOHAVE COUNTY BOARD OF SUPERVISORS

ATTEST

Tom Sockwell, Chairman

Barbara Bracken, Clerk

Exhibit "A"



Evaluation of a request for the approval of the **HUALAPAI VALLEY SOLAR AREA PLAN** consisting of properties located in Sections 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW 1/4 NE 1/4 thereof, in Township 26 North, Range 16 for a concentrating solar power plant, consisting on approximately 6.3 square miles in the Mohave County General Area, Mohave County, Arizona.

18

"Managing and conserving Arizona's natural, cultural and recreational resources"

Arizona State Parks

December 30, 2009

L-00000NN-09-0541-00151

PAD / CPA

JAN 05 2010

RECEIVED

EXHIBIT HVS-18 ADMITTED

John Foreman, Chairman
Arizona Power Plant and Transmission Line Siting Committee
Office of Attorney General
1275 West Washington Street
Phoenix, AZ 85007

RE: Docket No. L-00000NN-09-0541-00151
Hualapai Valley Solar Project
State Act Consultation
SHPO-2009-1388 (75718)

Mr. Foreman:

Thank you for initiating consultation with the State Historic Preservation Office (SHPO) pursuant to A.R.S. § 41-864 regarding the application by Hualapai Valley Solar LLC for a Certificate of Environmental Compatibility for the construction of the Hualapai Valley Solar Project and an associated Gen-Tie line interconnecting the generating facility to the existing Mead-Phoenix 500kV transmission line, the Mead-Liberty 345kV transmission line, or the Moenkopi-El Dorado 500kV transmission line in Mohave County, Arizona. We have reviewed the submitted materials and offer the following comments.

The submitted documents include a map indicating the proposed transmission line alternatives will require easements across lands managed by a federal agency, the Bureau of Land Management [BLM] and permits from the federal agency Western Area Power Administration [WAPA], Department of Energy. These will trigger reviews of the undertaking by our office pursuant to the National Historic Preservation Act [Section 106 of 36 CFR Part 800]. The applicant should also be reminded that Arizona State Law requires that if human remains or burial goods are encountered during any ground-disturbing activities, even on private lands [i.e., A.R.S. § 41-865], work in the immediate vicinity must cease and the Director of the Arizona State Museum promptly notified.

We appreciate your cooperation with this office in considering the potential impacts of development on cultural resources situated in Arizona. If you have any questions or comments, please contact me at (602) 542-7140 or electronically at djacobs@azstateparks.gov.

Sincerely,

David Jacobs
Compliance Specialist/Archaeologist
State Historic Preservation Office

CC: Mike Johnson, BLM
Mary Barger, WAPA

Janice K. Brewer
Governor

State Parks Board Members

Chair
Reese Woodling
Tucson

Tracey Westerhausen
Phoenix

Larry Landry
Phoenix

Walter D. Armer, Jr.
Vail

Arlan Colton
Tucson

William C. Scalzo
Phoenix

Maria Baier
State Land Commissioner

Renée E. Bahl
Executive Director

Arizona State Parks
1300 W. Washington
Phoenix, AZ 85007

Tel & TTY: 602.542.4174
AZStateParks.com

800.285.3703 from (520 & 928) area codes

General Fax: 602.542.4180

Director's Office Fax: 602.542.4188

From: Greg Bartlett <greg@mohavesun.com>
Subject: **Fwd: Red Lake Analysis**
Date: September 12, 2009 2:12:41 PM PDT

From: Sandra A. Fabritz <safabritz@azwater.gov>
To: Stephens, Chris
Cc: johnrgall@gmail.com <johnrgall@gmail.com>; Christine Ballard <Christine.Ballard@co.mohave.az.us>
Sent: Wed Sep 09 11:58:15 2009
Subject: Red Lake Analysis

Chris -

I am writing to confirm our discussions regarding the status of the Analysis of Adequate Water Supply No. **43-402285.0000**, issued to American Land Mgt. LLC, a South Dakota limited liability company; Desert Communities, Inc. a Nevada corp; South Dakota Conservancy, LLC a South Dakota limited liability company; Meridian Land, LLC, a Nevada limited liability company (**Red Lake**). The volume of groundwater that was demonstrated to be available for this project is 43,432.33 acre-feet per year. The actual demand of the development was assumed to be 69,593.26 acre-feet per year, with 26,160.93 acre-feet per year of effluent assumed to be available for the 100 year period.

The AAWS was issued on November 2, 2007 and is valid for 10 years from the date of issuance. The AAWS can be extended for two consecutive five year periods thereafter, if progress is being made on the development. During the term of the AAWS, the Department will consider the groundwater volume to be committed demands for all subsequent applications for adequate water supply – meaning subsequent applications must take this volume into account and demonstrate that they will not impact this volume before the Department will issue a determination of adequate water supply. This assumption will remain in place even if the property changes ownership during the term of the AAWS, unless the landowner requests that the AAWS be terminated.

If you have any questions, please feel free to contact me at 602-771-8589.

Sandra Fabritz-Whitney
Assistant Director
Water Management Division
Arizona Department of Water Resources
3550 North Central Avenue
Phoenix, AZ 85012
(602) 771-8589

GREATER PHOENIX
ECONOMIC COUNCIL

September 8, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

To whom it may concern,

I would like to express my support for the Hualapai Valley Solar project near Red Lake in Mohave County.

Solar and renewable energy industries will play a large role in determining Arizona's economic future. The county and state will see an economic benefit from this project, as well as from subsequent projects it is likely to draw.

I encourage the Mohave County Planning and Zoning Commissioners to vote in favor of the general plan amendment and area plan.

Sincerely,

Barry Broome

Barry Broome
President and CEO

From: "Brown Drilling" <info@browndrilling.com>
Subject: **SUPPORTING HUALAPAI VALLEY SOLAR LLC**
Date: September 8, 2009 11:09:29 AM PDT
To: <greg@mohavesun.com>

September 8, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

We, Brown Drilling, a commercial business of Mohave County, are in **SUPPORT** of the general plan amendment and area plan for Hualapai Valley Solar LLC. We ask that the County Planning and Zoning Commissioners vote in **FAVOR** of the general plan amendment and area plan.

Sincerely,

Brown Drilling
3375 N Bank St
Kingman, AZ 86401
928-757-1920
info@browndrilling.com

From: "John Salem" <jsalem@cityofkingman.gov>
Subject: **Letter**
Date: September 8, 2009 9:26:23 AM PDT
To: "Greg Bartlett" <greg@mohavesun.com>
4 Attachments, 241 KB (Save) (Slideshow)

I, John Salem, a resident of Mohave County, am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I ask that the County Planning and Zoning Commissioners vote in FAVOR of the general plan amendment and area plan. Mohave County and Kingman has the opportunity to reap the rewards of green technology and the proceeds and jobs that come with it. It appears Mohave Sun has done their homework and is working within the guidelines the community requests for smart, planned growth. Please don't let our county lose out on another valuable project! We need the planned growth, revenue and the jobs! Thank you!

City of Kingman

310 N Fourth Street | Kingman, AZ 86401 | (928) 753-5561

John Salem
Mayor - City of Kingman
310 N Fourth St - Kingman, AZ 86401
Office: (928) 753-8102
Email: jsalem@cityofkingman.gov
Web: http://www.cityofkingman.gov

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From: Timothy J Troy <TTroy@cbi.com>
Subject: **Support for Hualapai Valley**
Date: September 8, 2009 7:26:27 AM PDT
To: greg@mohavesun.com

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

I, Timothy Troy, believe in the economic benefits to the state of Arizona of the Hualapai Valley Solar project near Red Lake in Mohave County. I am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

The project will generate construction, operating, and maintenance jobs in the area while providing a source of clean and economic energy.

Regards,

Tim Troy
Business Development Manager
CB&I
3600 Mansell Road, Suite 230
Alpharetta, GA 30022
678-935-3665
ttroy@cbi.com

Stanley Consultants INC.

A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

September 8, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

I, George Ira Wallace, believe in the economic benefits to the Southwest US in the construction and operation of the Hualapai Valley Solar project near Red Lake in Mohave County, Arizona. The southwest is an incredible source for solar energy and the proposed location for this project meets all the requirements for such a project. I am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

Sincerely,

G. Ira Wallace, P.E.
Stanley Consultants

5820 South Eastern Avenue
Las Vegas, NV 89119
(702) 765-6345
wallaceira@stanleygroup.com

Land Planning | Civil Engineering | Water Resources | Storm Water Engineering
Landscape Architecture | Land Surveying | Construction Services

September 8, 2009

Mohave County Planning and Zoning
3675 East Hwy 66
Suite A
Kingman, AZ 86402-7000

I, Ryan Weed, believe in the economic benefits to the state of Arizona of the Hualapai Valley Solar project near Red Lake in Mohave County. I am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

Sincerely,

COE & VAN LOO
Consultants, Inc.

Ryan Weed, P.E.
Associate, Project Manager

4550 North 12th Street
Phoenix, AZ 85014
602-285-4730
rweed@cvlci.com

RW:cal

From: Philip Wisely <philipwisely@hotmail.com>
Subject: **Support of Amendment to General Plan**
Date: September 8, 2009 10:30:05 AM PDT
To: Greg Bartlet <greg@mohavesun.com>

September 7, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

I Philip Wisely, a resident of Mohave County, am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I ask that the County Planning and Zoning Commissioners vote in FAVOR of the general plan amendment and area plan.

I believe that the use of the treated City of Kingman waste water for cooling this plant is a win-win solution for this community. It not only provides a means of cooling the plant without using groundwater, it potentially improves the future water quality of the Hualapai Valley aquifer.

Sincerely,

Philip G. Wisely, P.E.
Wisely Engineering, P.L.L.C.
6173 N. Hwy 66
Kingman, AZ 86401
email: philipwisely@hotmail.com
cell: 928-715-8246

Hotmail® is up to 70% faster. Now good news travels really fast. Try it now.

Subject: Red Lake Solar Complex
From: "David E. Hollingsworth" <landman@citlink.net>
Date: Fri, 4 Sep 2009 08:56:46 -0700
To: <HVS@eraz.us>

To whom it may concern;
I am in total agreement with the proposed solar use on this property near Red lake. All of the infrastructure that we can possibly add into the mix at this crossroads called Kingman, AZ is extremely important for our future. When this infrastructure is green, re-uses the effulent from the City of Kingman and provides jobs it is even more critical that we support it.
David E. Hollingsworth
Broker/Owner
Hollingsworth Properties Inc.

David E. Hollingsworth <landman@citlink.net>
Owner/Broker
Hollingsworth Properties

Prudential
Northern Arizona
Real Estate

2813 E. Andy Devine, Kingman, AZ 86401

Office: 928-718-5800 Cell: 928-412-3445
E-Mail: garydlott@hotmail.com

September 4,, 2009

Mohave County Development Services
3675 E. Andy Devine Avenue
Kingman, AZ 86401

Re: Hualapai Valley Solar Plant

Dear Mr. Chairman and Members of the Planning & Zoning Commission,

As a resident and business owner in Mohave County, this letter is to serve as a letter of support of the general plan amendment for the Hualapai Valley Solar Plant. I live and work in this community and am in support of responsible, planned growth in our area. I ask that you vote in favor of it.

The proposed facility will produce a renewable resource, increase the tax base, and increase employment opportunities for our County. This is the type of industry that our County so desperately needs.

Sincerely,

Gary D. Lott, Realtor
Prudential Northern Arizona Real Estate

Since 1934

ARIZONA CHAPTER ASSOCIATED GENERAL CONTRACTORS
1825 West Adams • Phoenix, Arizona 85007 • (602) 252-3926 • Fax (602) 252-5870

September 3, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

The Arizona Chapter of the Associated General Contractors believes in the economic benefits to the state of Arizona of the Hualapai Valley Solar project near Red Lake in Mohave County. I, along with our membership of approximately 200 member firms in the heavy civil construction field, am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

Sincerely,

David M. Martin
President

Arizona Chapter Associated General Contractors
1825 W. Adams St
Phoenix, AZ 85005

602-252-3926
Email - dmartin@azagc.org

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September 3, 2009

Greg Bartlett
Project Director
Hualapai Valley Solar Project
2701 E. Andy Devine Ave., Suite 300
Kingman, AZ 86401

RE: Letter of support Hualapai Valley Solar Project

Dear Mr. Bartlett:

Our Board of Directors wishes to support the Hualapai Valley Solar Project and believe it is a viable and a much needed project for Mohave County, as it brings renewable energy to the region, jobs and tax revenue to the county. The Pro's far outweigh the Con's for this project.

After hearing the presentation to our board, the board unanimously agreed to support the project in any way we can.

Board of Directors:
Greg Bishop, President
Mike Fahey, President-elect
Jennifer Deschacht, Past President
Betty Moir, Vice President
Gabe Corral, Secretary
Sandy Port, Treasurer
Chris Deschacht, Director
Diane Komaneck, Director
Dave Rich, Director
DeeDee Schwab, Director
Tamra Sprague, Director
John Sullivan, Director

Sincerely,

Greg Bishop
President, On behalf of the Board of Directors

From: "mchasse@strategicassetsgroup.com" <mchasse@strategicassetsgroup.com>
Subject: General Amendment Support
Date: September 7, 2009 10:35:03 AM PDT
To: "greg@mohavesun.com" <greg@mohavesun.com>

September 3, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

I, Michael Chasse, believe in the economic benefits to the state of Arizona of the Hualapai Valley Solar project near Red Lake in Mohave County. I have seen numerous solar project presentations for Arizona and find the Hualapai Valley Solar project to be one of the most encouraging for power generation and job creation. I am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

Sincerely,

Michael Chasse

Michael Chasse
President, Designated Broker
Strategic Assets Group, LLC
10401 E. McDowell Mt. Ranch Rd, Suite 2-112
Scottsdale, Arizona 85255
480-664-8833 Office
480-664-8808 Fax
602-300-8202 Cell
mchasse@strategicassetsgroup.com

KELLER WILLIAMS®
REALTY

Sept. 3, 2009

This letter is to let you know that I am in support of the Hualapai Valley Solar project. I feel the project is a healthy project for us to bring to Mohave County. It should bring new jobs as well as substantial tax revenues to our county, just to name a few of the benefits.

Mohave Sun Power has been working diligently and responsibly, developing the project near Red Lake for nearly a year. I would like to see our county leaders come out in support of this worthwhile project and make the recommendation that the Mohave County Planning and Zoning commission approve to move forward.

Sincerely,

Betty Moir

Betty Moir, Realtor

River Cities Specialists
BETTY MOIR
2440Adobe Rd. Ste 106, Bullhead City, AZ 86442
Direct 928-716-4361 Office 928-704-2568 Fax 928-704-2579
bettymoir@realtor.com www.bullhead-homes.com

Richard Zepeda
Commercial Real Estate

Presidio Pointe Group

September 3, 2009

Mohave County Planning and Zoning
3675 E Hwy 66, Suite A
Kingman, AZ 86402-7000

I, Richard Zepeda, believe in the economic benefits to the state of Arizona of the Hualapai Valley Solar project near Red Lake in Mohave County. I am in SUPPORT of the general plan amendment and area plan for Hualapai Valley Solar LLC. I encourage the County Planning and Zoning Commissioners to vote in FAVOR of the general plan amendment and area plan.

With your support, Hualapai Valley Solar can become the first solar plant in Arizona to come on line. Being the first and Worlds largest Solar / Thermal power plant will bring immeasurable benefits to Arizona, the City of Kingman and Mohave County.

Sincerely,

Richard Zepeda
President
PRESIDIO POINTE GROUP
R.ZEPEDA@COX.NET
520-603-7330
14685 S. Avenida Cucana
Sahuarita, Arizona 85629

SUN WEST BIOFUELS LLC

August 31, 2009

Mohave County Development Services
3675 East Andy Devine Avenue
Kingman, AZ 86401

ATTN: Nicholas S. Hont P.E.

RE: HUALAPAI VALLEY SOLAR

Mr. Hont:

This letter is to serve as a LETTER OF SUPPORT for the proposed 340MW solar power plant (Hualapai Valley Solar project) to be located 27 miles north of Kingman at the Red Lake area.

As I am sure you are aware, this proposed solar plant is a potential customer of ours. Our industry will be the first of hopefully many support industries for this solar plant to locate in Mohave County.

Sun West Biofuels and Hualapai Valley Solar are both dedicated to renewable energy and the future economic growth of Mohave County. We feel this proposed facility and renewable industry as a whole are positive for Mohave County.

We feel that the proactive steps that Hualapai Valley Solar has taken to address public concern and protect natural resources, such as using effluent vs. groundwater and biodiesel vs. fossil fuel are reflective of the types of businesses we want in this county.

Sincerely,

Rick Neal
Managing Director
Sun West Biofuels

City of Kingman
310 NORTH FOURTH STREET • KINGMAN • ARIZONA • 86401 • (928)753-5561
www.cityofkingman.gov

August 12, 2009

The Honorable Steven Chu
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585

Dear Mr. Secretary,

I am writing in support of the Section 1703 loan guarantee program application of Hualapai Valley Solar LLC ("Hualapai Solar"), a project of Mohave Sun Power LLC, under the Innovative Energy Efficiency, Renewable Energy and Advanced Transmission and Distribution Technologies solicitation. The company submitted their application to the Department of Energy ("DOE") on February 26, 2009.

Given the Hualapai Solar project's potential impact on the economy of the U.S. Southwest – including a significant number of new, green jobs created during construction and operation of the plant – I am requesting that this application be evaluated as quickly as possible.

Hualapai Solar is developing what today would be the world's largest solar power plant, in the Hualapai Valley in northwest Arizona. They are using solar thermal parabolic trough technology that has been in use for over twenty years. The $2.1 billion, 340 MW solar thermal plant will supply enough clean, green electricity to power more than 120,000 homes. Hualapai Solar has already applied for county and state permits, and has held a number of public open houses in the community.

Hualapai Solar has also been taking action to accommodate community concerns over the use of groundwater at the plant. The Kingman City Council recently approved a Letter of Intent with the company to investigate the use of effluent from a new City wastewater treatment plant in lieu of groundwater. The treatment plant could provide as much as 80% of the company's water needs. The company is also investigating the feasibility of using biofuels from a proposed biofuels plant in Mohave County as a backup fuel source, eliminating fossil fuels from the plant altogether.

With the support of the DOE loan guarantee program funds, this project will generate more than 1,500 jobs at its peak during the 3-year construction phase, and provide more than 100 permanent jobs for the operation and maintenance of the plant. These jobs do not include the secondary jobs created by the firms supplying services to the company. An independent study has concluded that the project will result in an annual economic impact of more than $20 million annually to Mohave County and the state of Arizona.

By receiving the requested loan amounts, Hualapai Solar will be able to accelerate the start date of the project and begin impacting the local economy immediately.

Sincerely,

John Salem

Mayor John Salem

19

Hualapai Valley Solar

L-00000NN-09-0541-00151
LS Case No. 151

January 12 and 13, 2010

Exhibit HVS-19 Hualapai Valley Solar Exhibit No. 19 DVD with video

Compact Disc

-Application for Certificate of Environmental Compatibility

Hualapai Valley Solar LLC

TO REVIEW SEE DOCKET SUPERVISOR

DOCKET
L-00000NN-09-0541-00151

IKON Document Efficiency At Work.®

A RICOH COMPANY

EXHIBIT

HVS-19

ADMITTED

Hualapai Valley Solar Project

L-00000NN - [redacted] - 0541 - 00151

20

ARIZONA DEPARTMENT OF WATER RESOURCES
Office of Assured and Adequate Water Supply
3550 North Central Ave., Phoenix, Arizona 85012
Telephone (602) 771-8585
Fax (602) 771-8689

RECEIVED
NOV 9 2007
MONTGOMERY & ASSOC. INC.
SCOTTSDALE, ARIZONA

EXHIBIT
HVS-20
ADMITTED

Janet Napolitano
Governor

Herbert R. Guenther
Director

ANALYSIS OF ADEQUATE WATER SUPPLY

November 9, 2007

File Number:	43-402285.0000
Development:	Red Lake
Location:	Township 25 North, Range 17 West, Sections 1, 3, 5, 7, 9, 15, 17, 18, 19, 21, 28, 29, 30, 31 Township 26 North, Range 16 West, Sections 5, 7, 17, 18, 19, 20, 28, 29, 30, 31 Township 26 North, Range 17 West, Sections 3, 5, 7, 9, 13, 14, 16, 17, 19, 21, 23, 24, 25, 26, 27, 29, 31, 33 Township 26 North, Range 18 West, Sections 13, 23, 25, 31, 35 Township 27 North, Range 16 West, Section 31 Township 27 North, Range 17 West, Sections 1, 3, 13, 17, 19, 21, 23, 25, 29, 31, 35 Township 28 North, Range 17 West, Sections 23, 25, 27, 35 Mohave County, Arizona
Land Owner:	American Land Management, L.L.C., a South Dakota limited liability company; Desert Communities, Inc., a Nevada corporation; South Dakota Conservancy, L.L.C., a South Dakota limited liability company and Meridian Land, L.L.C., a Nevada limited liability company

The Arizona Department of Water Resources has evaluated the Analysis of Adequate Water Supply application for Red Lake pursuant to A.A.C. R12-15-712. The proposed development includes 210,700 single-family residential lots and 12,880 multi-family housing units. There are approximately 4,416 acres of non-residential uses such as elementary schools, high schools, 2 golf courses, common areas and parks. The applicant is going to rely on effluent water for the exterior water demand. Conclusions of the review are indicated below based on the adequate water supply criteria referenced in A.R.S. § 45-108 and A.A.C. R12-15-712.

- **Physical, Continuous, and Legal Availability of Water for 100 Years**
  On the basis of the Department's review, the Department has determined that 43,432.33 acre-feet per year of groundwater and 26,160.93 acre-feet per year of effluent will be **physically and continuously available**, which is equivalent to the annual estimated water demand for the development of 69,593.26 acre-feet per year. The application did not include a Notice of Intent to Serve form with the application. Therefore, **legal availability** of the water is not considered proven. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. Individual Notices of Intent to Serve will be required for each application for a Water Report.

- **Adequate Water Quality**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-719 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report, the Office of Assured Water Supply may be contacted for further guidance.

- **Financial Capability of the Owner to Construct the Necessary Distribution System**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-720 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report for an individual subdivision plat, the Office of Assured Water Supply may be contacted for further guidance.

The term of this Analysis of Adequate Water Supply is ten years from the date of this letter and may be renewed upon request, subject to approval by the Department. Throughout the term of this determination, the Department, when reviewing other requests for adequate water supply in the area, will consider the projected demand of this development. The demand projected for this development assumes that the conservation measures the applicant has identified to the Department will be required for the homes in this development, including the effluent use requirements for public parks, large turf areas and golf courses and low water use landscaping on the property. Additionally, it must be noted that based upon the limited hydrogeologic data available for the proposed development area, the amount of groundwater that may be physically available to 1,200 feet below land surface for this project may be limited. As additional hydrogeologic data becomes available, applications for Water Reports and the determination of physical availability in this analysis may be affected by that additional data.

Prior to obtaining plat approval by the local platting authority and approval of the public report by the Department of Real Estate, a Water Report must be obtained for each subdivision plat. The findings of this Analysis of Adequate Water Supply may be used to demonstrate that groundwater and treated effluent supplies are physically available for at least 100 years for purposes of an application for Water Report, unless new hydrogeologic data indicates otherwise. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. This determination may be invalidated if the development plan or other conditions change materially prior to filing for a Water Report.

Questions may be directed to the Office of Assured/Adequate Water Supply at (602) 771-8585.

Sandra Fabritz-Whitney, Assistant Director
Water Management Division

cc: Greg Wallace, Errol L. Montgomery & Associates, Inc.
Office of Assured and Adequate Water Supply
Nicole Swindle, Legal Division
Joan Card, Assistant Director, Arizona Department of Environmental Quality
Steve Olea, Assistant Director, Arizona Corporation Commission
Roy Tanney, Assistant Director, Arizona Department of Real Estate
Karl Taylor, Director, Subdivisions Division, Mohave County Planning and Zoning

21

EXHIBIT
HVS-21
ADMITTED

Concentrating Solar Power Commercial Application Study:
Reducing Water Consumption of Concentrating Solar Power Electricity Generation

Report to Congress

U.S. Department of Energy

This report is being disseminated by the Department of Energy. As such, the document was prepared in compliance with Section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Public Law 106-554) and information quality guidelines issued by the Department of Energy. Though this report does not constitute "influential" information, as that term is defined in DOE's information quality guidelines or the Office of Management and Budget's Information Quality Bulletin for Peer Review (Bulletin), the study was reviewed internally prior to publication.

Executive Summary

This report has been prepared in response to section 603(b) of the Energy Independence and Security Act of 2007, (Pub. L. No. 110-140), which states that *"...the Secretary of Energy shall transmit to Congress a report on the results of a study on methods to reduce the amount of water consumed by concentrating solar power systems."*

Because of the huge solar resource available in the Southwest United States, utilities are showing increasing interest in the deployment of concentrating solar power (CSP) plants to meet the requirements of state renewable portfolio standards. The Federal government is also encouraging the development of CSP plants through a 30% investment tax credit.

This report discusses potential methods to reduce water consumption associated with CSP. Four main concentrating solar power technologies are described in this report: parabolic troughs, linear Fresnel, power towers, and dish/engine. Parabolic troughs are the most commercially available technology. Linear Fresnel and power tower technologies are presently being planned as commercial plants, but none have yet been built in the U.S. The first three of these technologies use the heat collected from the sun to power conventional Rankine steam cycles, similar to those used for coal and nuclear plants. Steam cycle power plants require cooling to function (cooling is needed to condense the steam and complete the cycle). This cooling can be provided via water cooling, air cooling or a combination. Dish/engine systems use sunlight to power a small engine at the focal point. Stirling cycle engines using hydrogen as the working fluid are typically employed in dish/engine systems. These are air-cooled and only require water for mirror washing.

Water cooling for thermoelectric power plants is accomplished using two methods: once-through cooling and recirculating evaporative cooling. Once-through cooling withdraws large volumes (23,000 to 27,000 gal/MWh) from a body of water and returns it to that source at an elevated temperature, which causes additional evaporative loss from that body of water. Recirculating evaporative cooling withdraws a lesser amount (500 to 650 gal/MWh for an equivalent plant) but consumes most of the water directly through evaporation.[1] It should be noted that once-through cooling may be restricted in use for new thermoelectric power plants based on concerns with the potential aquatic environmental impact of such systems.[2]

Air cooling rejects the heat of the steam cycle directly to the air. A fossil power plant using this technology withdraws water only for the steam cycle blowdown and domestic water uses, which amount to less than 10% of the consumption of an evaporative cooled plant.[3]

To address water limitations and environmental regulations, air cooling can be used for new thermoelectric power plants, which eliminates over 90% of the water usage.[6] The typical dry-cooled plant routes turbine exhaust steam directly to finned tubes on air-cooled condensers. A study of a dry-cooled parabolic trough plant located in the Mojave Desert concluded that dry cooling would provide 5% less electric energy on an annual basis and increase the cost of the produced electricity by 7 to 9%.[7] However, the results are location-specific. For example, air cooling at a site in New Mexico would increase the cost of electricity by only 2% because maximum daytime temperatures are considerably lower there than in the Mojave Desert.[8]

The performance penalty of using air cooling also varies by technology. One study projected the annual electric output of a trough plant to drop by 4.6%, whereas that of a power tower to drop by only 1.3%. A simple model analysis estimates the differences between trough and tower technology using dry cooling will only differ by 0.5%.[9] The economic consequences will vary with climate which impacts the cooling system performance, water conditions which affects the cost of water treatment for an evaporative cooling tower, and depend on the premium value of delivered electricity during peak demand consequent with high ambient temperatures. One study showed that the net present value of an air-cooled CSP plant can be improved by using a larger collector field which offsets the lower steam cycle efficiency resulting in higher power output during peak summer hours.[10]

Hybrid wet/dry cooling systems use some combination of wet and dry cooling to reduce water consumption. Several recent plants built to conserve water have used a parallel cooling system (PCS), which uses both an air cooler (typically smaller than that use for air-cooled-only plant) and a small wet cooling tower operating in parallel for use during the summer.[11] In hot weather, the steam exiting the turbine is split with one portion routed to the air-cooled condenser and the other stream routed to the water cooled condenser with heat rejection to an evaporative cooling tower. A model study for a parabolic trough CSP power plant, showed this reduces water consumption 50% with only a 1% drop in annual electrical energy output, or 85% with only a 3% drop in output. For the latter case, the levelized electricity cost would increase about 5% compared to a water-cooled plant, or somewhat less than the cost penalty estimated for a direct dry cooling plant.[12]

Air cooling and wet/dry hybrid cooling systems offer highly viable alternatives that could reduce the total water usage of steam-generating CSP plants by 80 to 90% at a penalty in electricity cost in the neighborhood of 2 to 10%, depending on plant location and other assumptions.[13] The penalty for linear Fresnel designs has not yet been analyzed, but is expected to be somewhat higher than for troughs because of its lower operating temperature. Conversely, power towers would have a lower cost penalty because of their higher operating temperature. Additional research and development (R&D) and field experience should further decrease the need for water and help achieve cost penalties closer to the lower ends of these ranges.

Figure 3: State Renewable Portfolio Standard requirements (Union of Concerned Scientists)

CSP power plants employing parabolic trough technology have been performing reliably on a commercial scale in the Southwestern United States for more than 15 years.[16] Currently there are over 400 MW of generating capacity installed that are producing electricity on a utility scale, and there are power purchase agreements signed to construct an additional 4,000 MW over the next decade. Some of the benefits of CSP technology is that it can provide power during peak demand periods. Problems of solar intermittency can be overcome with thermal storage or hybridization with natural gas, allowing plants to dispatch power to the grid into the evening hours.

All of the existing commercial CSP power plants in the U.S. are parabolic trough systems that use a Rankine steam cycle to convert their thermal energy to electricity. This part of the solar plant, referred to as the power block, is similar to that used by coal, natural gas, and nuclear power plants. These power plants achieve the highest efficiencies when they are water-cooled. All operating CSP plants in the U.S. employ evaporative water cooling. The use of water for power plants is becoming constrained.[17] For the CSP industry, there is a strong incentive to investigate alternative cooling approaches that minimize the use of water. The most promising of those approaches will be discussed later in this report.

Concentrating Solar Power Technologies

There are four primary CSP plant designs – solar trough, linear Fresnel, power tower, and dish/engine. All designs use a small amount of water for mirror washing.[18] The first three of these technologies operate a steam cycle and require some water for steam makeup and, when they are water-cooled, require a substantial amount of water for heat rejection in a similar way as do water-cooled fossil and nuclear plants.[19] The Rankine steam cycle is typical of what is employed in a fossil fueled power plant. Utility managers are thus familiar with the power-generating portion of these plants. Thermal

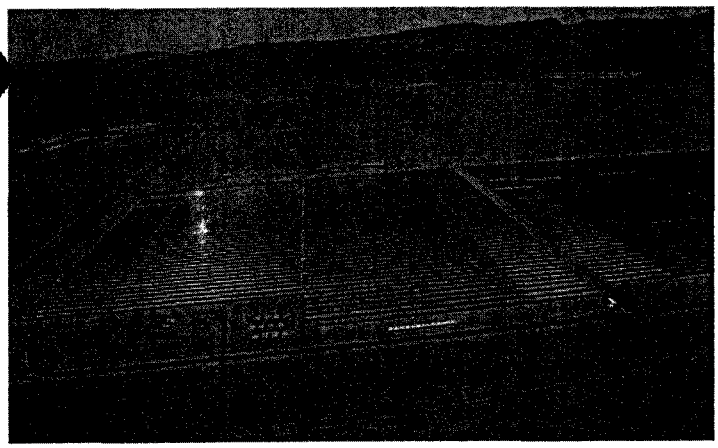

Figure 5: 64 MW Nevada Solar 1 Solar Plant

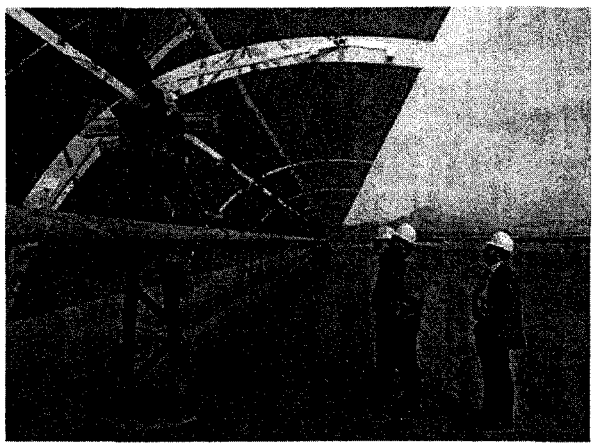

Figure 6, Nevada Solar 1 solar collector

Linear Fresnel

This technology (see Figure 7) is a line-focus technology similar to troughs in that it consists of reflectors that track the sun in one axis and focus the beam radiation onto fluid-carrying receiver tubes. The difference is that it uses a series of ground-mounted mirrors, and the receiver tube is elevated above the mirrors and fixed. The optical efficiency is lower than that of troughs, but this technology offers the promise of cost savings and reduced land use, associated with the tight spacing and ground location of the mirrors and a fixed receiver. A current design being marketed employs water directly in the receiver tubes where it is boiled at about 50 bars of pressure (50 times atmospheric pressure) to produce saturated steam at 535°F, which powers a steam cycle. Another proposes to use molten salt in the receiver tube. As of yet, there are no commercially operating power-generating systems employing this technology, but some are planned.

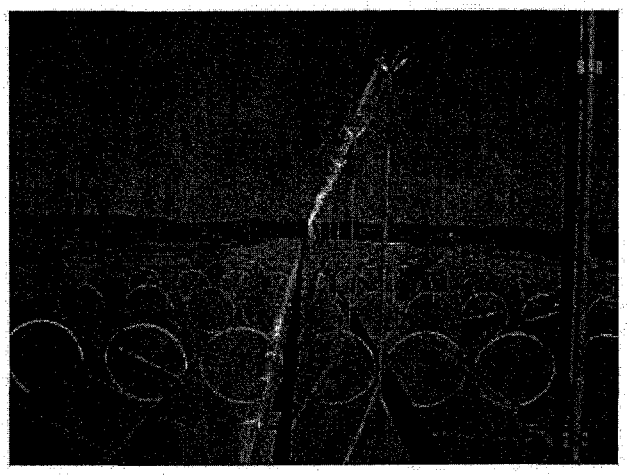

Figure 7: Linear Fresnel collector (Ausra)

Power Towers

Power towers utilize a field of tracking mirrors, called heliostats, which reflect the sun's rays to a receiver located on top of a tall, centrally located tower (see Figure 8). The solar energy is absorbed by pressurized water or molten salt working fluid flowing through the receiver.

reliability of the Stirling engines. The engines are air-cooled. Their high operating temperatures allow high efficiencies without water cooling, and no water is needed other than for mirror cleaning. From a water use perspective, dishes are well suited for operation in regions with minimal available water.

However, unlike the other CSP technologies discussed here, this technology does not easily lend itself to thermal storage, and so these systems are designed to provide electricity only when the sun is shining. This is a disadvantage to utility scale production in markets where firm generation is required and when the peak load period extends into the evening hours.[21]

Comparison of Water Usage for Different CSP Cooling Options

Because of water limitations, dry cooling and hybrid wet/dry cooling systems are being implemented and considered for both fossil and CSP generating plants. The technical challenges and performance limitations facing CSP are comparable to those of new fossil and nuclear power generating plants.

Dry cooling methods are increasingly common for thermal power plants. The disadvantages of dry cooling are higher capital costs, higher auxiliary operating power requirements, fan noise, and an overall lower plant performance, especially on hot days, when the peak power is needed most.[22] The relative cost impact to CSP is similar to that of fossil power plants.

In a Rankine steam cycle, heat is input at a high temperature (the source temperature) and rejected at a low temperature (the sink temperature). The difference between the heat input and the heat rejected is the work done by the turbine. The efficiency of the cycle (the ratio of the turbine work done to the heat input) is a function of the difference between the source and sink temperatures. Lowering the sink temperature will in general increase the cycle efficiency.

An air-cooled plant will operate at a lower efficiency than a water-cooled plant. Plants that heat the steam to a higher temperature will be less susceptible to changes in the sink temperature. Thus the performance of power tower which operates at a higher steam temperature will be penalized less by air cooling than current trough plants or linear Fresnel designs. Dry cooling when employed for any of these plants will reduce water consumption to zero for the heat rejection system of a Rankine power system, requiring only a minimal amount of water for boiler blowdown, mirror washing and miscellaneous domestic plant uses. A dry-cooled trough plant requires about 80 gal/MWh for cycle makeup and mirror washing.[23] This compares to a wet-cooled plant that requires 800 gal/MWh.[5]

Based on thermodynamic principles, a water-cooled linear Fresnel reflector plant which generates steam directly in the heat collection tube, is estimated to require somewhat more water than a trough plant owing to its lower operating temperature and reduced cycle efficiency (greater heat rejection per MWh of electricity). Conversely, a power

Dry Cooling

Dry cooling is becoming more prevalent in new power plants because of various state and federal water limitations. Dry cooling uses very little water. All of the waste heat from the power plant is rejected to the air. However, a significant temperature difference is needed to provide adequate heat exchange, and so the condenser temperature is about 30-50 F higher than the ambient air temperature. This results in a higher condensate temperature on hotter days which, in turn, raises the condenser pressure causing the steam turbine to be less efficient, see Figure 10. Dry cooling systems are more expensive and result in lower plant thermal efficiency, especially in hot climates and on hot days—typically when and where peak power is most in need.[27]

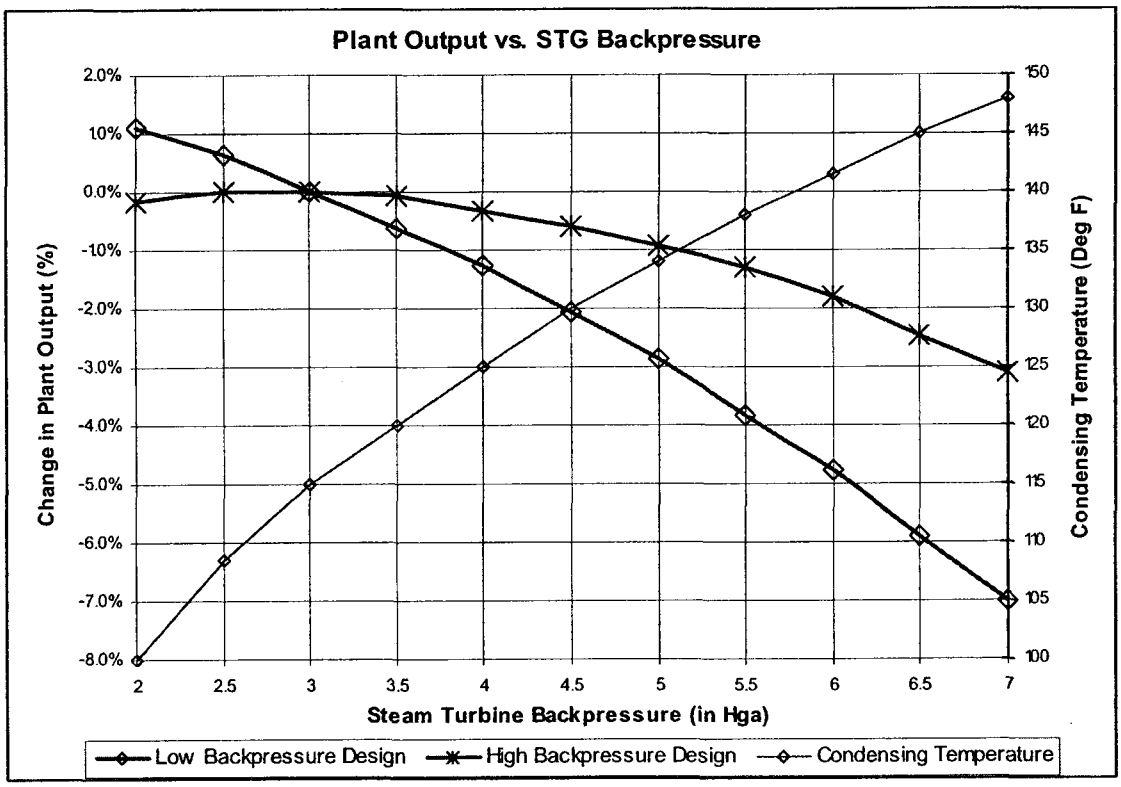

Figure 10: Plant output as a function of condensing temperature and turbine back pressure for a dry cooled plant optimized for low and high back pressure conditions

With dry cooling, the most straightforward way to minimize water use is to route exhaust steam directly to air-cooled condensers (ACCs). Typically the steam passes through an array of tubes and air is blown by a fan across the array. These systems can require considerable fan power.

A comparison of the performance and economics of a water-cooled trough plant located in Daggett, California to an air-cooled one showed that the performance of the air-cooled

are hybrid designs that reduce water consumption compared to wet cooled plants and enhance performance in warm weather compared to dry-cooled plants. Hybrid systems typically either involve separate dry and wet units that operate in parallel or use water to evaporatively cool the air going to the air-cooled condenser.

The parallel cooling system is shown in Figure 11. Here a dry cooling system is the primary heat rejection system, and it consumes no water. The dry cooling system is used exclusively for the majority of the time. On hot days, its performance is enhanced by routing a portion of the steam leaving the turbine to a separate wet cooling system which is only rejecting a portion of the total waste heat. By reducing the load on the air-cooled condenser, the dry unit can bring the condensing steam temperature closer to the design condenser temperature on hotter days. A hybrid system uses a fraction of the water that a traditional wet cooling system would use, and the turbine performance can be maintained at or close to design conditions. Such a system would have a small wet cooling tower and would typically have a smaller air-cooled condenser than an air-cooled plant. Although it is more expensive than a water-cooled plant, it should be less expensive than an air-cooled plant.[10]

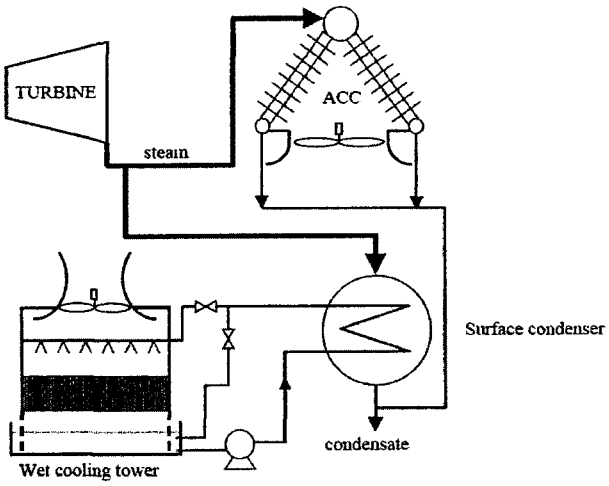

Figure 11: Hybrid wet/dry parallel cooling system (PCS)

An analysis was performed to compare the parallel cooling system design to simple dry and wet cooling for a parabolic trough plant in the Southwestern United States.[31] For the wet-cooled runs, plant performance was found to be relatively independent of ambient temperature. For the dry-cooled cases, performance dropped off at temperatures above 100°F. For various hybrid cases over 97% of the performance can be obtained with only 10% of the water usage and 99% of the performance can be obtained at half the water usage. Figure 12 provides a graphical summary of performance of the PCS plant as a function of how much water is used. The data points are labeled by the operating pressure of the condenser that the cooling system can maintain at design conditions. A larger wet section of the hybrid cooling system will consume more water, but can maintain a lower backpressure and hence higher annual power output. The design operating condenser pressures of the various hybrid systems are expressed in inches of mercury absolute (in

c Wet Cooling water consumption compares at 865 gal/MWh. From Tables 6 and 7 of reference 32.
d LCOE adjusted by adding increased annual revenue over constant solar field size.

Table 1 gives a financial comparison of an air cooled condenser (dry), and (hybrid) ACC parallel with a wet cooling tower, relative to evaporative cooling tower (wet). Costs of each system including capital equipment, installation, water treatment, solar field, and operation and maintenance (O&M), were considered along with the estimated performance and revenue based on historical climatology data and current value for power generated in the southern California area.

If there is water available, the PCS is a water-saving alternative. On the other hand, both a wet and dry cooling system will have to be maintained and the wet system may be cycled in and out of operation These two facts will increase the maintenance costs of the cooling system.

Table 2 summarizes the amount of water presently consumed by power plants throughout the U.S. and the options available to CSP for reducing water consumption.

Table 2: Comparison of consumptive water use of various power plant technologies using various cooling methods

Technology	Cooling	Gallons / MWhr	Perform. Penalty*	Cost Penalty**	Reference
Coal / Nuclear	Once-Through	23,000 – 27,000***			1, 3
	Recirculating	400 - 750			1, 3
	Air Cooling	50 - 65			1, 3
Natural Gas					
	Recirculating	200			4
Power Tower	Recirculating	500 - 750			(estm.)
	Combination Hybrid Parallel	90-250	1-3%	5%	10, 11
	Air Cooling	90	1.3%		9
Parabolic Trough	Recirculating	800			5
	Combination Hybrid Parallel	100-450	1-4%	8%	7, Appx. A
	Air Cooling	78	4.5-5%	2-9%	6, 9
Dish / Engine					
	Mirror Washing	20			5
Fresnel	Recirculating	1000			(estm.)

For using a less water intensive cooling technique:
* = Annual energy output loss is relative to the most efficient cooling technique.
** = Added cost to produce the electricity.

minimize cost and maximize cycle efficiency. However, there are concerns about mounting water shortages and air pollution associated with evaporative cooling towers. Analyses indicate that the use of either direct or indirect dry cooling can eliminate over 90% of the water consumed in a water-cooled concentrating solar power plant. However, a combination of a reduction in power output and the added cost of the air cooling equipment is estimated to add roughly 2 to 10% to the cost of generating electricity, depending on the plant location and other assumptions. The use of hybrid parallel wet/dry coolers is estimated to reduce the energy cost penalty to below that of air cooling alone while still saving about 80% of the water compared to a water-cooled plant.

References

[1] National Energy Technology Laboratory (2006). Estimating Freshwater Needs to Meet Future Thermoelectric Generation Requirements. DOE/NETL-2006/1235. pp. D-1 and F-2. Note the values provided in this text are an approximation of the national averages for coal fired supercritical and subcritical with wet FGD. The ranges for water consumption of coal fired plants are estimated from the box plots on p F-1 and F-2 to be between 400 and 800 gal / MWh. The averaged surveyed values for power plants nationwide, listed by plant type, cooling method, and FGD method is on page D-1.

[2] The Resources Agency of California. (September 2, 2003). Background information and staff recommendation on power plant water use. Memorandum from CEC to Integrated Energy Policy Report Committee.

[3].U.S. Department of Energy (December, 2006). Energy Demands on Water Resources. Report to Congress on the Interdependency of Energy and Water. P. 38 Table V-1.

[7] WorleyParsons. (2008). FPLE - Beacon Solar Energy Project: Dry Cooling Evaluation. WorleyParsons Report No. FPLS-0-LI-450-0001. WorleyParsons Job No. 52002501.

[8] *New Mexico Central Station Solar Power: Summary Report.* EPRI, Palo Alto, CA, PNM Resources, Inc., Albuquerque, NM, El Paso Electric Co., El Paso, TX, San Diego Gas & Electric Co., San Diego, CA, Southern California Edison Co., Rosemead, CA, Tri-State Generation & Transmission Association, Inc., Westminster, CO, and Xcel Energy Services, Inc., Denver, CO: 2008. 1016342.. p. 5-7.

[9] WorleyParsons. *Wet and Dry Cooling Options for a 250 MW Thermal Plant.*

and

GateCycle models for parabolic trough and central receiver plants which use air cooled condensers compared the relative performance at 70 F and 108 F for the two plant designs as follows:

Parabolic Trough Plant: 1450 psig / 710 F / 710 F Rankine cycle

70	F ambient temperature	108	F ambient temperature
139.5	MWe gross plant output	119.9	MWe gross plant
0.374	gross cycle efficiency	0.321	gross cycle efficiency
0.082	bar condenser pressure	0.250	bar condenser pressure
	0.860	hot day output / design day output	
	0.860	hot day efficiency / design day efficiency	

Central Receiver Plant: 1850 psig / 950 F / 950 F Rankine cycle

70	F ambient temperature	108	F ambient temperature
139.9	MWe gross plant output	121.7	MWe gross plant
0.412	gross cycle efficiency	0.361	gross cycle efficiency
0.082	bar condenser pressure	0.252	bar condenser pressure
	0.870	hot day output / design day output	
	0.875	hot day efficiency / design day efficiency	

Nominally, both plants show a 5 percent reduction in gross output and gross efficiency if the ambient temperature increases from the design point of 70 F to a hot day temperature of 108 F.

This is not a completely representative set of annual performance analyses, and the auxiliary energy demands of the pumps and fans are not included here. However, the trends in the above figures indicate a performance penalty for a parabolic trough plant compared to a tower plant is not as significant as shown in the above reference.

[10] WorleyParsons. (2008). FPLE - Beacon Solar Energy Project: Dry Cooling Evaluation. WorleyParsons Report No. FPLS-0-LI-450-0001. WorleyParsons Job No. 52002501. Table 8.

[11] PAC SYSTEM® Installation List
GEA Power Cooling Systems, LLC
143 Union Blvd., suite 400
Lakewood, CO 80228
Telephone: (303) 987-0123

Station Owner (A/E)	Size (MWe)	Steam Flow (Lb/Hr)	Turbine BP (in HgA)	Design Temp (Deg F)	Year	Remarks
Exeter Energy L. P. Project	30	196,000	2.9	75	1989	(W-T-E)
Streeter Generating Station	40	246,000	3.5	50	1993	(Combined Cycle)
Tucuman Power Station	150	1150000	5	99	1997	(Combined Cycle)
Grumman	13	105700	5.4	59	1997	(Combined Cycle)
SEMASS WTE Facility	54	407500	3.5	59	1999	(W-T-E)

[22]. Kelly, B. (2006). *Nexant Parabolic Trough Solar Power Plant Systems Analysis; Task 2 Comparison of Wet and Dry Rankine Cycle Heat Rejection.* National Renewable Energy Laboratory, NREL/SR-550-40163

[23] WorleyParsons (2008). P 15 and 16 show the water requirements for a dry cooled plant of 79 acre-ft per year and the corresponding annual energy production of 557,365 MWh.

[24] California Energy Commission (2001), Environmental Performance Report of California's Electric Generation Facilities. P700-01-001, July 2001. P. 39

[25] Torcellini, P.; Long, N.; Judkoff, R. (2003). *Consumptive Water Use for U.S. Power Production.* NREL/TP-550-33905.

[26] USEPA. AP-42. Compilation of Air Pollutant Emission Factors. Ch 13. Retrieved from : http://www.epa.gov/ttn/chief/ap42/ch13/final/c13s04.pdf

[27] Maulbetsch, J. S., and M. N. DiFilippo. 2006. *Cost and Value of Water Use at Combined-Cycle Power Plants.* California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2006-034.

[28] Kelly, B. (2007). *Comparison of Wet and Dry Rankine Cycle Heat Rejection.* Nexant, Inc. A Bechtel-Affiliated Company. San Francisco, California.

[29] *New Mexico Central Station Solar Power: Summary Report.* EPRI, Palo Alto, CA, PNM Resources, Inc., Albuquerque, NM, El Paso Electric Co., El Paso, TX, San Diego Gas & Electric Co., San Diego, CA, Southern California Edison Co., Rosemead, CA, Tri-State Generation & Transmission Association, Inc., Westminster, CO, and Xcel Energy Services, Inc., Denver, CO: 2008. 1016342.. p. 5-7

[30] WorleyParsons. *Wet and Dry Cooling Options for a 250 MW Thermal Plant..*

and

Provided by Bruce Kelly (email correspondence):
GateCycle models for parabolic trough and central receiver plants which use air cooled condensers compared the relative performance at 70 F and 108 F for the two plant designs as follows:

Parabolic Trough Plant: 1450 psig / 710 F / 710 F Rankine cycle

70	F ambient temperature	108	F ambient temperature
139.5	MWe gross plant output	119.9	MWe gross plant
0.374	gross cycle efficiency	0.321	gross cycle efficiency
0.082	bar condenser pressure	0.250	bar condenser pressure
	0.860	hot day output / design day output	
	0.860	hot day efficiency / design day efficiency	

Central Receiver Plant: 1850 psig / 950 F / 950 F Rankine cycle

70	F ambient temperature	108	F ambient temperature
139.9	MWe gross plant output	121.7	MWe gross plant
0.412	gross cycle efficiency	0.361	gross cycle efficiency
0.082	bar condenser pressure	0.252	bar condenser pressure
	0.870	hot day output / design day output	
	0.875	hot day efficiency / design day efficiency	

Appendix A

Concentrating Solar Power Commercial Application Study:

Reducing Water Consumption of Concentrating Solar Power Electricity Generation

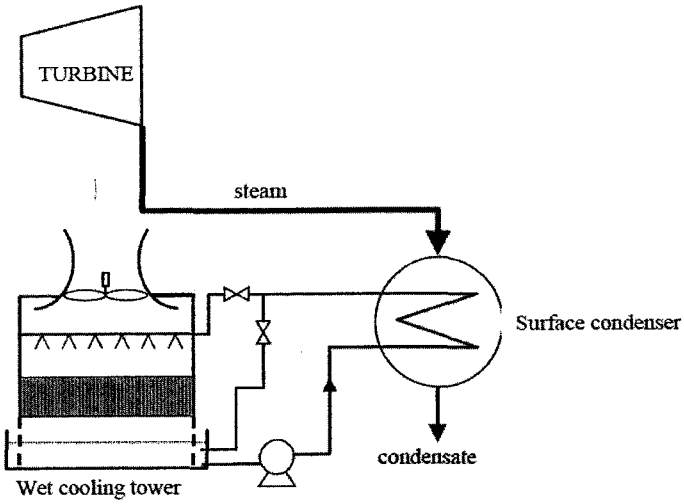

Figure 1 Schematic Diagram of Wet Heat Rejection System

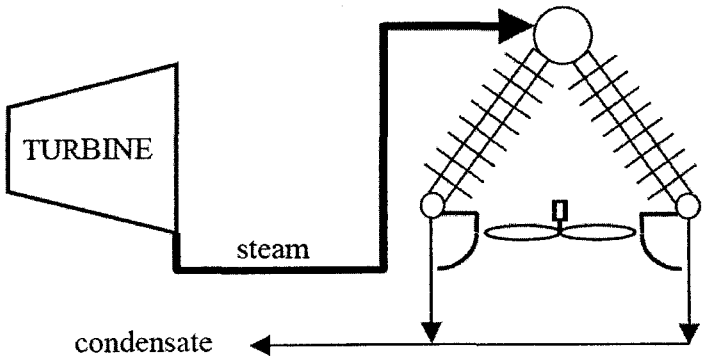

Figure 2 Schematic Diagram of Dry Heat Rejection System

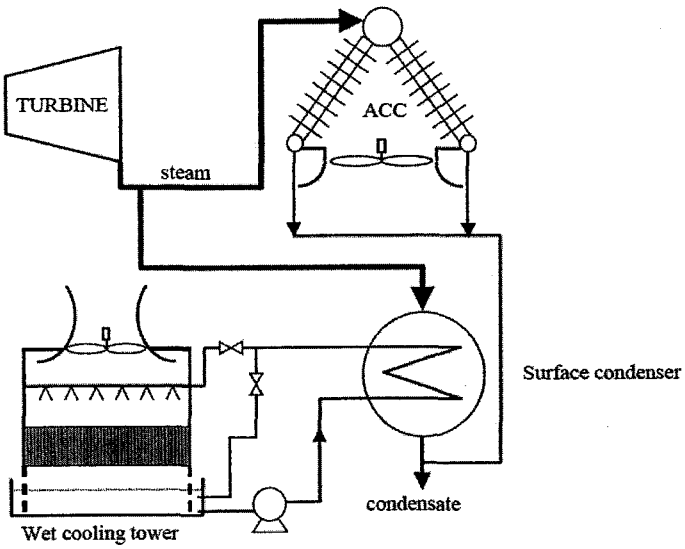

Figure 3 Schematic Diagram of Hybrid Heat Rejection System

2.2 Wet Heat Rejection

The wet heat rejection system is based on conventional, mechanical draft cooling towers. The principal design parameters include the following:

- 104 °F design dry bulb temperature; 10 percent relative humidity
- 10 °F cooling water approach to 64 °F wet bulb temperature
- 20 °F circulating water temperature range
- 224 MWt duty
- 6 cycles of concentration

The cooling tower consists of 10 cells, each with a 125 bhp fan. The circulating water flow rate is a nominal 76,000 gpm, and the makeup water flow rate is 1,930 gpm. Of the makeup water flow, 83 percent is to compensate for evaporation losses, 13 percent for blowdown, and 4 percent for drift losses.

The circulating water system includes the following:

- Two 50 percent capacity pumps, each rated at 38,000 gpm and driven by a 750 bhp electric motor
- A surface condenser, with a nominal area of 160,000 ft^2
- Supply and return circulating water pipes, with a diameter is 60 inches. The distance from the cooling towers to the surface condenser is assumed to be 200 feet.

2.3 Dry Heat Rejection

The dry heat rejection system is based on a mechanical draft, air cooled condenser. The principal design parameters include the following:

- 109 °F steam condensing temperature at 70 °F dry bulb temperature (39 °F initial temperature difference)
- 2 °F condensate subcooling at condenser outlet
- 224 MWt duty

2) For each hour of the year, the thermal output from the collector field was calculated by the Excelergy computer program, as discussed below.

3) The dry bulb temperature, the relative humidity, and the thermal input from the collector field were exported to the GateCycle program. The program calculated the steam turbine expansion efficiencies, exhaust losses, gross electric output, and the auxiliary electric loads for the cooling tower fans, the feedwater pump, the condensate pump, and if applicable, the circulating water pumps. For the wet and the hybrid heat rejection systems, the makeup water flow to the cooling tower was also calculated. The calculations were repeated for each of the 3,421 hours each year in which thermal energy was available from either the collector field or the thermal storage system.

4) Annual sums were developed for the following parameters: thermal energy supplied to the Rankine cycle; gross plant output; fan electric energy; pump electric energy; and net electric output. From these values, annual gross and net Rankine cycle efficiencies were developed.

The thermal output from the collector field is calculated using the Excelergy program. The program, under development by the National Renewable Energy Laboratory over the past 10 years, models the performance of parabolic trough collector fields and, if applicable, the associated Rankine cycle. The model calculates the following:

- Month of the year, day of the month, hour of the day, and time before noon

- Each of the following angles: solar declination; sun elevation; sun azimuth; and collector incidence. From the collector incidence angle, an incidence angle modifier was calculated to account for the reflected flux which misses the end of the heat collection element during the midday hours

- Each of the following optical efficiencies: solar field availability; structure tracking error and twist; mirror reflectivity; geometric accuracy; mirror reflectivity, mirror cleanliness factor; and the following factors for the heat collection elements: dust on glass envelope; bellows shading; envelope transmissivity; and absorber tube absorbtivity

- Heat collection element thermal losses, including emissivity as a function of fluid temperature, and allowances for lost vacuum and lost glass envelopes

- Gross field thermal output, by multiplying the following: collector area; collector optical efficiency; and heat collection element thermal efficiency

- Net field thermal output, by multiplying the gross output by 0.9805 to account for thermal losses from the field piping

3.2 Dry Heat Rejection

A plot of the net electric output as a function of the ambient temperature for the dry heat rejection system is shown in Figure 5. The annual net electric output for the complete 250 MWe plant is estimated to be 797,900 MWhe, and the net Rankine cycle efficiency is estimated to be 34.8 percent.

For ambient temperatures between 40 °F and 100 °F, the condenser pressure increases as the dry bulb increases, and the net plant output shows a gradual decrease. However, for ambient temperatures above 100 °F, the condenser cannot simultaneously condense the design point steam flow rate and provide a condenser pressure below 8 in. HgA. As a result, the steam flow rate must be reduced to ensure the condenser pressure remains with limits. During the one hour of the year with the highest temperature (113 °F), the plant output must be restricted to about 165 MWe.

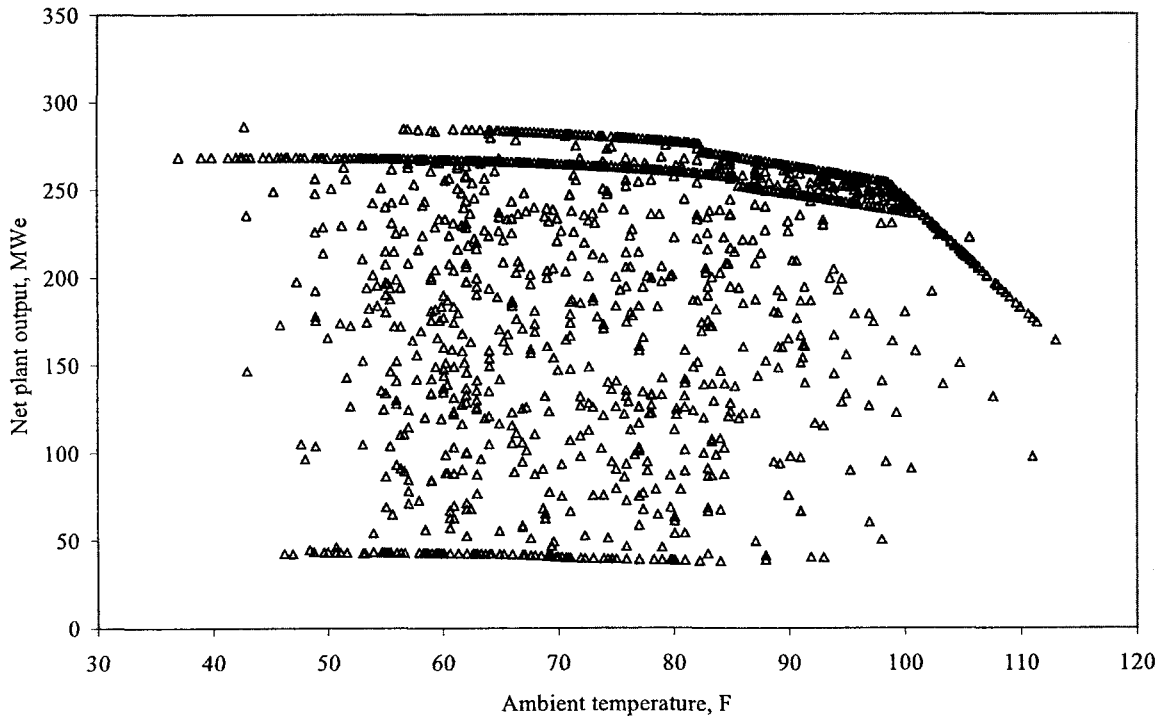

Figure 5 Net Plant Output as a Function of Ambient Temperature; Dry Heat Rejection

As with the wet cooling tower plot, data points in Figure 5 are not shown for net outputs below 40 MWe, the minimum turbine output which is 15 percent of the design output.

The annual plant performance for the 6 cooling tower options is summarized in Table 1. Three trends can be noted, as follows:

- The gross and the net plant outputs both increase as the water consumption increases
- The pump energy demand is the highest for the wet cooling tower, and lowest for the air cooled condenser, due to the demands of the circulating water pumps
- The hybrid cases use the same air cooled condenser as the dry cooling tower case; thus, the fan energies for the hybrid cases are the sum of the fan energies for the dry case plus a portion of the fan energies for the wet cooling tower.

Table 1 Summary of Annual Plant Performance

	Gross turbine, MWhe	Pump power, MWhe	Fan power, MWhe	Net turbine, MWhe	Gross efficiency	Net efficiency	Makeup water, tons
Wet	875,199	19,157	8,956	846,161	0.379	0.366	2,705,132
Hybrid: 2.5 in. HgA	871,459	15,468	24,082	839,099	0.377	0.363	1,207,521
Hybrid: 4 in. HgA	858,196	13,702	19,601	827,234	0.372	0.358	360,998
Hybrid: 6 in. HgA	848,014	13,045	19,477	815,626	0.367	0.353	25,020
Hybrid: 8 in. HgA	845,290	13,002	19,390	812,903	0.366	0.352	1,803
Dry	827,262	12,977	16,413	797,872	0.361	0.348	0

6. References

1) "Task 2 - Comparison of Wet and Dry Rankine Cycle Heat Rejection", Midwest Research Institute/ National Renewable Energy Laboratory Subcontract Number LDC-5-55014-01, Technical Support for Parabolic Trough Solar Technology, Nexant Inc. (San Francisco, California), July 2006

2) GateCycle Program, Version 5.34, GE Enter Software, Inc. and the Electric Power Research Institute

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EXHIBIT
HVS-22
ADMITTED

MONTGOMERY
& ASSOCIATES
Water Resource Consultants

Technical Memorandum

December 31, 2009

Prepared for:
Hualapai Valley Solar LLC

Addendum to Groundwater Flow Model for Hualapai Valley Solar Project

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MONTGOMERY
& ASSOCIATES

DECEMBER 2009
TECHNICAL MEMORANDUM

ADDENDUM TO GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

Prepared for:

HUALAPAI VALLEY SOLAR LLC

Prepared by:

MONTGOMERY & ASSOCIATES

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ILLUSTRATIONS (continued)

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LIST OF ABBREVIATIONS

ADWR	Arizona Department of Water Resources
AF	acre-feet
AF/yr	acre-feet per year
BLM	U.S. Bureau of Land Management
bls	below land surface
CSP	concentrating solar power
EIS	Environmental Impact Statement
feet msl	feet above mean sea level
gpm	gallons per minute
HVS	Hualapai Valley Solar LLC
M&A	Montgomery & Associates
NPS	National Park Service
USGS	U.S. Geological Survey
WAPA	Western Area Power Administration of the U.S. Department of Energy

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& ASSOCIATES

DECEMBER 2009
TECHNICAL MEMORANDUM

ADDENDUM TO GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

CONCLUSIONS

This technical memorandum is an Addendum to the Montgomery & Associates (M&A) technical memorandum dated November 16, 2009, and titled ***Groundwater Flow Model for Hualapai Valley Solar Project Mohave County, Arizona***. The principal conclusions from this investigation include:

1. Only a minute fraction of the groundwater stored in the Hualapai Valley groundwater basin is currently used. The volume of potentially recoverable groundwater calculated to be stored (15.8 million AF) in only the shallow part of the aquifer (above a depth of 1,200 feet below land surface) is equal to several hundred years of use at the current total rate (less than 20,000 AF/yr).

2. The projected impact on groundwater levels by the proposed HVS pumping would meet the stringent criteria for impacts on existing wells imposed by the State in Arizona Active Management Areas.

3. After 30 years of pumping, the projected incremental impact of HVS pumping is not substantial and is much less than 1 foot of water level change for wells in the City of Kingman, Dolan Springs, and Valle Vista areas.

4. The minimum pro rata amount of annually available groundwater already set aside by ADWR for the Rhodes Homes land on which the HVS plant is sited (4,416 AF/yr) would be nearly twice as much as HVS intends to use annually on average (2,400 AF/yr).

5. There is sufficient water available in the aquifer to meet the water needs for the life of the HVS Project without significantly impacting other existing groundwater users.

DECEMBER 2009
TECHNICAL MEMORANDUM

ADDENDUM TO GROUNDWATER FLOW MODEL FOR HUALAPAI VALLEY SOLAR PROJECT MOHAVE COUNTY, ARIZONA

INTRODUCTION

This technical memorandum is an Addendum to the Montgomery & Associates (M&A) technical memorandum dated November 16, 2009, and titled ***Groundwater Flow Model for Hualapai Valley Solar Project, Mohave County, Arizona*** (M&A, 2009). M&A prepared this Addendum under contract to Hualapai Valley Solar LLC (HVS) to address specific issues considered for the Hualapai Valley Solar Project Environmental Impact Statement (EIS). This EIS is being prepared by the U.S. Department of Energy (Western Area Power Administration or WAPA) with the U.S. Bureau of Land Management (BLM) participating as a cooperating agency. The proposed HVS thermal solar power plant is located southeast from Red Lake, Mohave County, Arizona.

The EIS is expected to address WAPA's proposed action of building a new substation and interconnecting the proposed HVS Project to WAPA's transmission system, as well as BLM's proposed actions of granting rights-of-way to HVS for the transmission line and associated access roads, and any other Project components crossing Federal lands, and to amend one of WAPA's existing rights-of-way to build a substation. It is anticipated that WAPA and BLM will also consider no-action alternatives along with other reasonable alternatives to the proposed Federal actions within the EIS, as appropriate. The potential environmental impacts of HVS constructing, operating, and maintaining a 340-megawatt solar-powered generating facility, consisting of a solar field, power block, thermal energy

storage system, transmission line, temporary lay-down areas, and other ancillary facilities are also expected to be considered within the EIS. Results from the groundwater flow modeling conducted by M&A are provided to assist decision makers in assessing the significance of potential impacts to groundwater levels in the Hualapai Valley groundwater basin due to planned pumping to supply the proposed HVS thermal solar power plant.

The groundwater modeling investigations reported by M&A (2009) were conducted in June and July 2009, and were focused on projecting the incremental impact due solely to the HVS Project pumping groundwater at the upper end of the range of possible demand rates. The EIS is considering HVS groundwater demands as well as cumulative impacts; therefore, the Addendum incorporates updated information from Arizona Department of Water Resources (ADWR) on other committed demands for the basin and contains simulations for a range of HVS pumping rates as well as maximum cumulative impacts as determined with the EIS advisory group, which includes representatives of BLM, WAPA, National Park Service (NPS), and ADWR. This Addendum provides a series of new tables and illustrations showing results from the additional model simulations. This effort also provided the opportunity to consider new results from additional gravity surveys conducted in Hualapai Valley that were reported by ADWR in September 2009 (ADWR, 2009b), after completion of the modeling for M&A (2009).

BACKGROUND ON MODEL

Beginning in 2005, M&A has conducted comprehensive groundwater studies in Hualapai Valley to evaluate the impacts of various groundwater uses. The basin-wide numerical groundwater flow model developed by M&A for Hualapai Valley was originally constructed and calibrated in 2006 and 2007, and included the latest geophysical data available for the basin at that time. After a several month period of critical review by ADWR, the model was approved in 2007 by ADWR for use in projecting groundwater impacts of proposed developments. Details of the model construction and previous use were reported by M&A (2006 and 2007).

Construction of the model was based on available hydrogeologic data for Hualapai Valley, including: pumping test results, lithologic logs, and other data for wells; geophysical data; results from previous investigations in the basin; and results from modeling studies conducted for similar alluvial basins in Arizona. The Hualapai model was constructed using MODFLOW (Harbaugh and McDonald, 1996) and Groundwater Vistas, a graphical modeling interface (Rumbaugh and Rumbaugh, 2004).

The proposed groundwater pumping for HVS was added to the existing model to simulate the impact of the proposed facility over its projected 30-year life. Maximum average pumping rate for HVS was assumed to be 3,000 acre-feet per year (AF/yr), which is equivalent to a constant pumping rate of about 1,869 gallons per minute (gpm). This rate was the upper end of the range of possible pumping rates estimated by HVS engineers. Based on further plant design evaluation, the current average groundwater use estimated by HVS for the wet-cooling alternative is 2,400 AF/yr, not taking into account potential reuse of treated effluent from the City of Kingman that may become available to the Project. Feasibility of using this distant source of treated effluent at the HVS site is being evaluated by HVS. Results from these modeling investigations were reported by M&A (2009). This

Addendum to M&A (2009) presented herein provides results from additional model simulations for three levels of HVS groundwater demand, updated other committed demands, and maximum cumulative demands.

The Hualapai Valley model is calibrated to simulate pre-development equilibrium conditions in the 1965 to 1970 timeframe and past transient groundwater conditions for the period from 1971 through 2005. Simulations for future transient conditions begin in year 2006 and extend to the desired future year. Past transient conditions for the 1971 through 2005 period were dominated by groundwater withdrawals for the City of Kingman. For this Addendum, future transient conditions are impacted by committed groundwater withdrawals for the City of Kingman, domestic wells, assumed other committed demands, and proposed groundwater withdrawals for the HVS plant during the 30-year period from 2013 through 2042.

COLORADO RIVER ACCOUNTING SURFACE

Wilson and Owen-Joyce (1994, p. v) define the "accounting surface" that is administered by the U.S. Bureau of Reclamation for the Colorado River corridor as follows:

> "The accounting surface represents the elevation and slope of the unconfined static water table in the river aquifer outside the flood plain and the reservoirs of the Colorado River that would exist if the river were the only source of water to the river aquifer. The accounting surface was generated by using profiles of the Colorado River and water-surface elevations of reservoirs, lakes, marshes, and drainage ditches."

Further, Wilson and Owen-Joyce (1994, p. 6) establishes the following criteria to determine if wells impact the Colorado River subflow:

> **Wells that impact the river subflow:** "Wells that have a static water-level elevation equal to or below the accounting surface are presumed to yield water that will be replaced by water from the river."
>
> **Wells that do not impact the river subflow:** "Wells that have a static water-level elevation above the accounting surface are presumed to yield water that will be replaced by water from precipitation and inflow from tributary valleys."

There are several factors that ensure none of the existing production wells or wells proposed by the HVS Project in the Hualapai basin will impact the river subflow using these criteria. Only the extreme northern limit of the basin lies inside the accounting surface for Hualapai Valley. In addition, altitude of the groundwater table at all of the wells listed in the well inventory given by M&A (2009; Appendix B) is several hundred feet above the accounting surface. The data given below are for one of the northernmost wells in the basin. These data demonstrate that the well is outside the accounting surface; therefore, all wells south of this well are also outside the accounting surface.

CADASTRAL LOCATION	WELL NAME	WELL DEPTH (feet, bls)	LAND SURFACE ALTITUDE (feet, msl)	GROUNDWATER LEVEL			ACCOUNT-ING SURFACE ALTITUDE (feet, msl)	FEET ABOVE ACCOUNT-ING SURFACE
				DATE MEASURED	DEPTH (feet, bls)	ALTITUDE (feet, msl)		
B(29-18) 01cca	TB-1	531	2,155	02/23/06	250	1,905	1205	695

Lastly, the accounting surface is deeper than the projected 30-year water level in the aquifer at any of the wells proposed by the HVS Project. Therefore, wells used to withdraw groundwater for the Project are not wells that would impact the Colorado River, according to criteria established by Wilson and Owen-Joyce (1994).

NEW INFORMATION

BEDROCK ALTITUDE AND SPECIFIC YIELD

In September 2009, ADWR published a report providing results of additional gravity survey data collected for the Hualapai Valley groundwater basin (ADWR, 2009b). The purpose of the ADWR report was to estimate groundwater in storage in Hualapai Valley by calculating the volume of saturated sediments between the groundwater level surface and the bedrock altitude surface, and selecting a range of specific yield values for the basin. Specific yield is the volume of water that would drain under gravity per unit volume of aquifer material and is dimensionless; this term is applied to unconfined or "water table" aquifers.

Bedrock Altitude

The M&A (2007 and 2009) modeled bedrock surface was approved by ADWR in 2007. Construction of this surface in the model was based on well logs and previously published data for gravity and seismic geophysical surveys conducted in Hualapai Valley, together with preliminary results from the new ADWR gravity survey provided to M&A in 2007 for the northern part of Hualapai Valley.

The ADWR (2009b) groundwater level surface and salt deposit extent are comparable to the 2005-2006 groundwater level surface and salt deposit extent from the M&A (2007 and 2009) groundwater model. The ADWR (2009b) bedrock altitude surface varies from the M&A (2007 and 2009) groundwater model as shown on **Figure 1**. The ADWR gravity survey

interpretation did not represent the Red Lake sub-basin salt deposit as bedrock, whereas the M&A (2007 and 2009) groundwater model simulates the salt deposit as a no-flow bedrock unit. Therefore, to provide an appropriate comparison on **Figure 1** with the M&A (2007 and 2009) modeled bedrock surface, the ADWR (2009b) bedrock surface was modified to include the top of the salt deposit as bedrock.

The differences between the two bedrock surfaces are color coded on **Figure 1**. Deep shades of blue indicate areas where the M&A bedrock is significantly deeper than the ADWR bedrock. Deep shades of red indicate areas where the M&A bedrock is significantly shallower than the ADWR bedrock. The white and lighter pastel shades of blue and red indicate areas where the differences are smaller.

It is important to note that projections of water level impact by the proposed HVS pumping are almost entirely controlled by the hydrogeologic conditions in the Red Lake sub-basin. The differences shown on **Figure 1** between the two bedrock surface interpretations in the Red Lake sub-basin are small; the calculated difference in volume of saturated sediments to a depth of 1,200 feet below land surface (bls) is only about 5 percent. The apparent differences shown on **Figure 1** in this sub-basin are caused chiefly by the fact that the M&A modeled surface of the salt deposit is tilted downward to the east based on data from four deep drill holes, whereas ADWR (2009) assumed a uniformly level surface of the salt deposit. Therefore, the east side of the sub-basin has blue shades and the west side has red shades.

The new bedrock data were not incorporated into the M&A model for this modeling Addendum because it would require fundamental, time-prohibitive, changes to the construction of the model, as well as recalibration and rerunning of all simulations.

Specific Yield

Published aquifer test data that can be used to estimate specific yield for this basin are not currently available. However, estimates from other comparable basins or previous investigations from this basin can be used to determine an appropriate range of specific yield values for Hualapai Valley. ADWR (2009b) provided a table of estimated volumes of groundwater in storage above depths of 1,200 feet, 1,500 feet, and 2,000 feet bls, while assuming average specific yield values of 3, 6, or 8 percent for the entire Hualapai Valley groundwater basin. This range of specific yield values is in the lower part of the range of values reported for the basin.

The specific yield of aquifer materials for the Basin and Range region is summarized in the literature to typically range from 10 to 15 percent, but may range from 3 to 25 percent in a specific basin (Anderson and others, 1990). In terms of general hydrostratigraphic units: 1) the estimated specific yield for lower basin fill (i.e., older alluvium) is 10 percent or less; and 2) the specific yield for upper basin fill (i.e., intermediate and younger alluvium) commonly ranges from 10 to 15 percent, but may range from 3 to 25 percent within a basin, depending on location (Anderson and others, 1992). In many alluvial basins, specific yield is estimated to be smaller in the center of the basin, where fine-grained deposits are abundant, and is estimated to be larger along the basin margins, where coarser sediments predominate. The average specific yield of various lithologic facies found in the Basin and Range region was summarized by Anderson (1995) as follows: coarse-grained facies (stream alluvium) range from 15 to 25 percent; intermediate-grained facies range from 5 to 25 percent; and fine-grained facies range from less than 1 percent to 10 percent. The intermediate-grained facies comprise the principal aquifer in most basins; both the fine-grained and intermediate-grained facies may be found in upper and lower basin-fill units. Freethey and Anderson (1986) reviewed modeling studies for alluvial groundwater basins in the region and concluded that transient groundwater models for basins with aerially extensive fine-

grained facies typically require a specific yield of between 5 and 13 percent for successful calibration.

The specific yield of sediments in the Hualapai Valley groundwater basin has been estimated by other investigators to range from 5 to 15 percent basin-wide, depending on aquifer lithology in the area considered. Gillespie and Bentley (1971) estimated the average specific yield of older alluvium to be between 5 and 10 percent for the entire basin; the specific yield of other aquifer materials in the basin was not estimated because older alluvium comprises the principal aquifer in the basin. However, lesser volumes of groundwater are stored in the volcanic rocks near Kingman, which were discussed in general terms as having a relatively low specific yield. Cella Barr Associates (1990) estimated the total volume of available groundwater in the Hualapai Valley by dividing the basin into three regions and assigning a specific yield value for each region based on review of available drillers logs: specific yield from Kingman to Long Mountain was estimated to be 10 percent; specific yield from Long Mountain to Red Lake was estimated to be 12 percent; and specific yield from Red Lake to Pierce Ferry Road was estimated to be 5 percent. Additional estimates for specific yield were incorporated into a numerical groundwater flow model, which was developed for the northern part of Hualapai Valley from Red Lake to the Gregg sub-basin, inclusive (Clear Creek Associates and Golder Associates, 2006). The conceptual basis for this model was a division of the aquifer into three sub-units: the Upper Basin Fill Unit, having an estimated specific yield of 15 percent; the Lacustrine Unit with an estimated specific yield of 8 percent; and the Lower Basin Fill Unit, also having an estimated specific yield of 15 percent. The Upper Basin Fill Unit corresponds to the "younger and intermediate" alluvium of Gillespie and Bentley (1971), and the Lower Basin Fill Unit is equivalent to older alluvium. The Lacustrine Unit is described as a "sequence of silts, fine sands, and limestones" having a maximum thickness of 150 feet that grades downward into Lower Basin Fill Unit south from Red Lake and pinches out north from Red Lake.

Specific yield values used in each area and layer of the calibrated M&A (2007 and 2009) groundwater flow model were selected based on a conceptual model of the basin that included available data and published estimates on: aquifer parameters; well logs; geophysical surveys; and dominant lithologies of basin-fill sediments. Specific yield was decreased from model layer 1 (upper layer) to model Layer 2 over most of the basin to account for aquifer compaction. In addition, the model calibration process itself was used to adjust the specific yield values, as reasonable and necessary, to match model output with measured groundwater levels in the basin, which is a primary criterion for calibration. Therefore, the model input values for specific yield are believed to be acceptable and appropriate for the basin. Model values for specific yield were 2 percent for the volcanic deposits, 8 percent for the playa deposits, and 10 and 12 percent for the remainder of the basin-fill deposits. Average model specific yield was 9.86 percent (M&A, 2009).

Based on the selection of specific yield values, different volumes of groundwater in storage in the Hualapai Valley groundwater basin were estimated by M&A (2007 and 2009) and ADWR (2009b). Using an average specific yield of 9.86 percent, the M&A model calculated about 15.8 million acre-feet (AF) of groundwater in storage above a depth of 1,200 feet bls in the entire basin. If the groundwater model had assumed an average specific yield of 8 percent, the calculated volume of groundwater in storage above 1,200 feet bls would be about 12.6 million AF. Using a specific yield of 8 percent, ADWR (2009b) calculated about 10.1 million AF of groundwater in storage above a depth of 1,200 feet bls, or about 20 percent less than the volume calculated by the M&A model for that specific yield. Most of this difference is due to the difference in depth to bedrock in the Kingman and Gregg sub-basins (**Figure 1**), which does not significantly affect the projection of impacts from proposed HVS pumping. These volumes compare with the range of 10.5 million to 21 million AF estimated by Gillespie and Bentley (1971) for the saturated sediments to depths of 1,000 feet bls in the Red Lake area and 1,500 feet bls in southern Hualapai Valley.

For the purpose of comparison, using an average specific yield of 8 percent in the Red Lake sub-basin, where the HVS Project is proposed, the M&A model calculated about 7.7 million AF of groundwater in storage above a depth of 1,200 feet bls. The corresponding volume calculated using the ADWR (2009b) bedrock surface in the Red Lake sub-basin is about 7.3 million AF, or about 5 percent less than the volumes calculated by the model.

PUMPING RATES

Pumping rates for simulations of the future transient conditions in this Addendum include: new information from ADWR on other committed groundwater demands in the basin; updating of assumptions for City of Kingman area groundwater demand; and a range of assumptions for HVS groundwater demand to address the estimated average and high-end demand for a concentrating solar power (CSP) facility with wet-cooling and the estimated average demand for a photovoltaic solar power facility.

Other Committed Demands

Pumping rates for simulations of the past transient groundwater conditions from 1971 through 2005 remain unchanged from the M&A (2007 and 2009) groundwater model approved by ADWR; these rates are given in **Table 1**. As part of ADWR requirements for the 2007 groundwater model submission, any analyses of adequate or inadequate water supply issued by ADWR were to be included as simulated pumping wells in the basin for all transient future (predictive) simulations. At that time, ADWR recommended that the pumping rate for the other committed demand should be a total of 3,893 AF/yr. This future demand was represented in the M&A model as seven wells identified and located in the application for

Mardian Ranch (Clear Creek Associates and Golder Associates, 2006) and seven additional wells each pumping 300 AF/yr. Locations for the seven additional wells were not specified by ADWR; therefore, model locations for these wells were selected in the Red Lake sub-basin, where the majority of the simulated pumping for the proposed Rhodes Homes developments occurs.

In October 2009, ADWR provided a new table giving the annual water demand for all of the other committed demands in the basin, located by the specific townships, ranges, and sections where the demands should simulated in the model. The total updated pumping for the other committed demand, excluding pumping for the City of Kingman, Mardian Ranch, and the five Rhodes Homes developments, is 9,763 AF/yr. For each committed demand, if the associated land comprised more than one section, the demand was divided equally among the sections listed. The locations and pumping rates for the simulated other committed demand wells are shown on **Figure 2** and given in **Table 2**. In many instances, the locations of the other committed demand provided by ADWR were outside the active model domain. Many of these wells are potentially completed in bedrock and are not pumping from the alluvial aquifer. However, to allow the demand to be simulated and provide a conservatively large estimate of total pumping from the alluvial aquifer, all of these well locations were moved into the active model domain. **Figure 2** shows the original locations of all wells and the adjusted locations used in the M&A groundwater model. The updated other committed demands are included in all of the simulations for this Addendum.

City of Kingman

Also as part of ADWR requirements for the 2007 groundwater model submission, the simulated City of Kingman demand for the predictive simulations was equal to the 2005 Designation of Adequate Water Supply for the City. The simulated City pumping increased from 9,297 AF/yr in 2006 to 12,076 AF/yr in 2014, and remained constant from 2014 through

2042. ADWR recently reported that the total City of Kingman pumping in 2008 was 8,720 AF (personal communication from R. Obenshain of ADWR, November 23, 2009). The M&A (2007 and 2009) groundwater model simulated a total demand of 9,992 AF for the City in 2008, or about 15 percent more than was reported.

To provide a more conservative projection of water demand in the City of Kingman area for this Addendum, estimates of population growth were reviewed and the future water demand for the City was simulated to increase at the rate of 3 percent per year to account for unplanned growth in the Kingman sub-basin. Projections reported by ADWR (2009a) indicate an average population growth rate in Hualapai Valley of about 1.9 percent through 2030. Data from the Arizona Department of Economic Security, reported by the Arizona Department of Commerce (2006), indicate an average population growth rate in Hualapai Valley of about 2.0 percent through 2042. Therefore, a 3 percent growth rate provides a large safety factor of 50 percent to account for unplanned growth.

For this Addendum, the City of Kingman pumping is simulated as 12,076 AF in 2014 and increasing thereafter at a rate of 3 percent per year until 2042, when pumping is simulated as 27,629 AF. Simulated pumping rates are given on **Table 2**. The updated City of Kingman well demands are included in all of the simulations for this Addendum.

Hualapai Valley Solar

The M&A (2009) model simulated HVS wells pumping at a total rate of 3,000 AF/yr from 2013 through 2042, which is the end of the projected 30-year life of the plant. This rate represents the high-end demand for a concentrating solar power (CSP) facility with wet-cooling. For this addendum, the EIS advisory group requested that HVS groundwater pumping also be simulated at an average annual rate of 2,400 AF/yr for a CSP facility with wet-cooling, and at an average annual rate of 30 AF/yr for a photovoltaic solar power facility. If City of

Kingman treated effluent becomes available and feasible for HVS use, it is estimated to reduce the groundwater demand of the plant by about 1,800 AF/yr. It should be noted that the minimum pro rata amount of annually available groundwater already set aside by ADWR for the Rhodes Homes land on which the HVS plant is sited (4,416 AF/yr) would be nearly twice as much as HVS intends to use annually on average (2,400 AF/yr).

UPDATED MODEL SIMULATIONS

BASE CASE SIMULATION

The Base Case groundwater model simulation for this Addendum is derived from the M&A (2009) groundwater model with updated simulated future pumping rates through the year 2042. The pumping rates are shown on **Tables 1 and 2**, and reflect the new information from ADWR on other committed groundwater demands in the basin and updated assumptions for City of Kingman area groundwater demand, as discussed in the previous sections, but exclude any pumping by HVS, Mardian Ranch, or Rhodes Homes. All other model parameters remain unchanged from the M&A (2009) model.

HVS SIMULATIONS

For these simulations, HVS pumping at four hypothetical onsite production wells is added to the Base Case at total rates of 3,000 AF/yr, 2,400 AF/yr, and 30 AF/yr for the 30-year period from 2013 through 2042. For each simulation, the HVS pumping is distributed equally among the four production wells. HVS pumping regimens for these simulations are given in **Table 3**.

MAXIMUM CUMULATIVE IMPACTS SIMULATION

The largest committed groundwater demands in Hualapai Valley are for the Mardian Ranch master planned community and the Rhodes Homes Peacock Highlands, Peacock Vistas, Hafley Ranch, Nugent Ranch, and Red Lake master planned communities. These proposed developments received letters of Analysis of Adequate Water Supply from ADWR in 2007 for a total of 81,373 AF/yr of groundwater for 100 years to supply 283,993 new single-family homes and 44,317 new multi-family homes. It is not known how or when these projects and the associated water use will be phased in, or how the current economic conditions may delay the projects. For perspective, the unused committed demand for these projects over the last two years since ADWR issued its analyses far exceeds the entire 30-year water demand for the HVS Project, yet no homes have been built. In any event, if the HVS facility is constructed and operated, ADWR has the ability to take the HVS committed demand into account when determining groundwater availability for future phases of these developments at such time as they are proposed.

In addition, similar letters of Analysis of Adequate Water Supply issued by ADWR from 2005 to 2007 to developers account for a total of 19,495 AF/yr of groundwater to build 40,495 single-family homes and 10,498 multi-family homes in Detrital Valley, and a total of 13,500 AF/yr of groundwater to build 31,202 single-family homes and 12,775 multi-family homes in northern Sacramento Valley. All these developments combined far exceed the projected population growth for Mohave County.

Based on the foregoing considerations, the EIS advisory group agreed to define the Maximum Cumulative Impacts simulation for Hualapai Valley as the Base Case with HVS pumping at 3,000 AF/yr and the Mardian and Rhodes Homes projects phasing in over a 50-year build out period. It is assumed that, even if they started immediately, none of the master planned communities could complete the permitting process and begin significant

groundwater use before 2012. Therefore, these communities are simulated to phase in at a constant rate over the 50-year period from 2012 through 2061. **Table 4** gives the simulated pumping regimens for the Maximum Cumulative Impacts simulation.

For Mardian Ranch, total simulated pumping increases from 229 AF/yr in 2012 to 7,104 AF/yr in 2042. For Peacock Highlands, total simulated pumping increases from 269 AF/yr in 2012 to 8,333 AF/yr in 2042. For Peacock Vistas, total simulated pumping increases from 64 AF/yr in 2012 to 1,991 AF/yr in 2042. For Hafley Ranch, total simulated pumping increases from 84 AF/yr in 2012 to 2,601 AF/yr in 2042. For Nugent Ranch, total simulated pumping increases from 113 AF/yr in 2012 to 3,501 AF/yr in 2042. For the Red Lake development, total simulated pumping increases from 869 AF/yr in 2012 to 26,928 AF/yr in 2042 **(Table 4)**.

To demonstrate how conservative the projected increase in Hualapai Valley groundwater use is for the Maximum Cumulative Impacts simulation, the values in **Table 4** were compared against the projections given on page 61 of the Water Resources Element of the Mohave County Development Services Department U.S. 93 Corridor Plans (Mohave County, 2009).

	Mohave County (2009) Projections for Hualapai Valley		M&A Model Projections		Ratio of Groundwater Use
Year	Population	Groundwater Use * (AF/yr)	Population *	Groundwater Use (AF/yr)	(M&A Model/County)
2008	---	8,720 **	---	19,788	2.3
2010	44,193	8,839	102,415	20,483	2.3
2020	67,973	13,595	209,325	41,865	3.1
2030	100,031	20,006	315,505	63,101	3.2
2040	138,843	27,769	430,215	86,043	3.1

* Based on 0.2 AF/yr per capita (Mohave County, 2009)

** From personal communication with R. Obenshain of ADWR, November 23, 2009; not from Mohave County

The projected groundwater use values in **Table 4** are more than three times the values projected by the County growth study for the basin after 30 years of HVS pumping and are, therefore, very conservative. For example, Mohave County (2009) projected total groundwater use in Hualapai Valley to be only 27,769 AF/yr in 2040, whereas the model uses 86,043 AF/yr.

GROUNDWATER MODEL RESULTS

Projected results of groundwater simulations are shown on **Figures 3a through 7d** and are summarized in **Table 5**. For these figures, the edge of the dark grey area of the basin represents the edge of the bedrock outcrop area. The tan-colored areas are inactive model cells where the underlying alluvial aquifer material was unsaturated in 1971 and throughout the simulation. The blue-colored area is the saturated part of the aquifer at the ending time of the simulation. Red-colored model cells are areas where the underlying alluvial aquifer material was unsaturated in 1971, but became dewatered, or "dry" cells sometime during the simulation period from 1971 through 2042.

BASE CASE SIMULATION

A contour map of projected groundwater level altitude for the Base Case simulation at the end of 2042 is shown on **Figure 3a**. A contour map of projected groundwater level decline (drawdown) for the Base Case at the end of 2042 is shown on **Figure 3b**. For the Base Case simulation, for the period from 2013 through 2042, the simulated model water balance projects a decrease in aquifer storage of 850,688 AF, based on a total simulated recharge volume of 113,990 AF, a total simulated pumped volume of 851,630 AF, and a total outflow volume via the Lake Mead constant head cells of 113,048 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2013 to 3,688 AF/yr in 2042.

HVS AT 3,000 AF/YR

Contour maps for projected groundwater level altitudes and projected drawdown at the end of 2042 for the simulation assuming HVS pumping at 3,000 AF/yr are shown on **Figures 4a and 4b**, respectively. Projected drawdown at the end of 2042 due solely to HVS pumping at 3,000 AF/yr is shown on **Figure 4c**. The drawdown shown on **Figure 4c** was calculated by subtracting the drawdown for the Base Case simulation from the total drawdown for this HVS simulation shown on **Figure 4b**. The maximum drawdown due to HVS pumping is 62 feet and occurs at the HVS plant site **(Table 5)**. Projected drawdown at the end of 2017 due solely to HVS pumping at 3,000 AF/yr is shown on **Figure 4d**. The purpose of **Figure 4d** is to show that the projected impacts by HVS would meet the well impact criteria on existing off-site wells imposed in Active Management Areas, which is less than 10 feet of drawdown in the first 5 years of pumping, if it were applicable in Mohave County.

For this simulation, for the period from 2013 through 2042, the simulated model water balance projects a decrease in aquifer storage of 940,702 AF, based on a total simulated recharge volume of 113,990 AF, a total simulated pumped volume of 941,621 AF, and a total outflow volume via the Lake Mead constant head cells of 113,071 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2013 to 3,688 AF/yr in 2042.

HVS AT 2,400 AF/YR

Contour maps for projected groundwater level altitudes and projected drawdown at the end of 2042 for the simulation assuming HVS pumping at 2,400 AF/yr are shown on **Figures 5a and 5b**, respectively. Projected drawdown at the end of 2042 due solely to HVS pumping at 2,400 AF/yr is shown on **Figure 5c**. The drawdown shown on **Figure 5c** was

calculated by subtracting the drawdown for the Base Case simulation from the total drawdown for this HVS simulation shown on **Figure 5b**. The maximum drawdown due to HVS pumping is 50 feet and occurs at the HVS plant site **(Table 5)**.

For this simulation, for the period from 2013 through 2042, the simulated model water balance projects a decrease in aquifer storage of 922,704 AF, based on a total simulated recharge volume of 113,990 AF, a total simulated pumped volume of 923,623 AF, and a total outflow volume via the Lake Mead constant head cells of 113,071 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2013 to 3,688 AF/yr in 2042.

HVS AT 30 AF/YR

Contour maps for projected groundwater level altitudes and projected drawdown at the end of 2042 for the simulation assuming HVS pumping at 30 AF/yr are shown on **Figures 6a and 6b**, respectively. Projected drawdown at the end of 2042 due solely to HVS pumping at 30 AF/yr is shown on **Figure 6c**. The drawdown shown on **Figure 6c** was calculated by subtracting the drawdown for the Base Case simulation from the total drawdown for this HVS simulation shown on **Figure 6b**. The maximum drawdown due to HVS pumping is 0.6 foot and occurs at the HVS plant site **(Table 5)**.

For this simulation, for the period from 2013 through 2042, the simulated model water balance projects a decrease in aquifer storage of 851,584 AF, based on a total simulated recharge volume of 113,990 AF, a total simulated pumped volume of 852,525 AF, and a total outflow volume via the Lake Mead constant head cells of 113,048 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2013 to 3,688 AF/yr in 2042.

MAXIMUM CUMULATIVE IMPACTS SIMULATION

Contour maps for projected groundwater level altitudes and projected drawdown at the end of 2042 for the Maximum Cumulative Impacts simulation are shown on **Figures 7a and 7b**, respectively. Projected drawdown at the end of 2042 due solely to HVS pumping at 3,000 AF/yr is shown on **Figure 7c**. The drawdown shown on **Figure 7c** was calculated by subtracting the drawdown for the Maximum Cumulative Impacts simulation without HVS pumping from the total drawdown shown on **Figure 7b**. The maximum drawdown due to HVS pumping is 63 feet and occurs at the HVS plant site **(Table 5)**. Projected drawdown at the end of 2017 due solely to HVS pumping at 3,000 AF/yr is shown on **Figure 7d**. The purpose of **Figure 7d** is to show that the projected impacts by HVS would meet the well impact criteria on existing off-site wells imposed in Active Management Areas, which is less than 10 feet of drawdown in the first 5 years of pumping, if it were applicable in Mohave County.

Results of the Maximum Cumulative Impacts simulation show that four model cells become dewatered along the edge of the groundwater model domain within the Red Lake sub-basin whether HVS is pumping or not. For this simulation, for the period from 2013 through 2042, the simulated model water balance projects a decrease in aquifer storage of 1,746,354 AF, based on a total simulated recharge volume of 113,990 AF, a total simulated pumped volume of 1,747,337 AF, and a total outflow volume via the Lake Mead constant head cells of 113,060 AF. Simulated discharge at the constant head cells decreases from 3,804 AF/yr in 2013 to 3,682 AF/yr in 2042.

BURRO SPRING

A concern raised by NPS is the potential impact to the quantity or quality of water that discharges from Burro Spring, located near the mouth of Spring Canyon which drains into Spring Cove on Lake Mead. NPS indicates that the spring may be used by wildlife and discharges continuously at an estimated rate of 15 to 35 gpm. Recent visits to this spring by NPS and the U.S. Geological Survey to obtain water samples for laboratory chemical and isotopic analyses indicate that the spring discharges from fractured bedrock, but could potentially be supported by groundwater in nearby alluvial deposits via interconnected fractures (personal communication from G. Karst of NPS, December 18, 2009). The spring lies in the transition zone between the Colorado Plateau and the Basin and Range Physiographic Provinces, where geologic and structural features are complex. Therefore, even though the spring is in the general area of discharge from the Hualapai Valley groundwater system to Lake Mead, the source of the small discharge from this spring is uncertain.

The Hualapai Valley groundwater model developed by M&A is designed to simulate basin-wide impacts in the alluvial aquifer and, therefore, is not designed to directly assess potential impacts to the small individual springs at Lake Mead, which are located in bedrock areas outside the model domain. Projecting impacts to springs discharging a few tens of gpm in a basin discharge area of 3,000 to 4,000 AF/yr (1,860 to 2,480 gpm) would require a model of high local resolution with the ability to analyze both porous media and fractured rock aquifer systems. Much more detailed information on the local hydrology and geology in the discharge area would be necessary to construct such a model, which is beyond the scope of this Addendum.

The present model can project water level change in the alluvial aquifer near Burro Spring due to groundwater pumping in the aquifer. For the alluvial aquifer in the active model cell nearest to Burro Spring, the M&A model projects 0.00 feet of groundwater level decline

due to proposed pumping by HVS after 30 years of pumping (year 2042) for any of the simulations described herein. The simulated impacts from proposed HVS pumping are not projected to reach that part of the groundwater basin after 30 years of pumping. Therefore, it can be concluded that the proposed pumping at HVS would not impact Burro Spring over the proposed life of the Project.

SUMMARY OF CONSERVATIVE ASSUMPTIONS

Assumptions made in this Addendum to provide conservative projections of potential impacts include:

1. In many instances, the locations of the other committed demand provided by ADWR were outside the active model domain. Many of these wells are potentially completed in bedrock and are not pumping from the alluvial aquifer. However, to allow the demand to be simulated and provide a conservatively large estimate of total pumping from the alluvial aquifer, all of these well locations were moved into the active model domain. **Figure 2** shows the original locations of all wells and the adjusted locations used in the M&A groundwater model. The updated other committed demands are included in all of the simulations for this Addendum.

2. As part of ADWR requirements for the M&A (2007) groundwater model, the simulated City of Kingman demand for the predictive simulations was equal to the 2005 Designation of Adequate Water Supply for the City. The simulated City pumping increased from 9,297 AF/yr in 2006 to 12,076 AF/yr in 2014. ADWR recently reported that the total City of Kingman pumping in 2008 was only 8,720 AF (personal communication from R. Obenshain of ADWR,

November 23, 2009). The M&A (2007 and 2009) groundwater model simulated a total demand of 9,992 AF for the City in 2008, or about 15 percent more than was reported.

3. To provide a more conservative projection of water demand after 2014 in the City of Kingman area for this Addendum, estimates of population growth were reviewed and the future water demand for the City was simulated to increase at the rate of 3 percent per year to account for unplanned growth in the Kingman sub-basin. Projections reported by ADWR (2009a) indicate an average population growth rate in Hualapai Valley of about 1.9 percent through 2030. Data from the Arizona Department of Economic Security, reported by the Arizona Department of Commerce (2006), indicate an average population growth rate in Hualapai Valley of about 2.0 percent through 2042. Therefore, a 3 percent growth rate provides a large safety factor of 50 percent to account for unplanned growth.

4. The projected groundwater use values for the Maximum Cumulative Impact simulation given in **Table 4** are more than three times the values projected by the Mohave County (2009) growth study for the basin after 30 years of HVS pumping and are, therefore, very conservative. For example, Mohave County (2009) projected total groundwater use in Hualapai Valley to be only 27,769 AF/yr in 2040, whereas the model uses 86,043 AF/yr.

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MONTGOMERY
& ASSOCIATES

TABLES

TABLE 1. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2005

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES*		SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET																																			
			EASTING (feet)	NORTHING (feet)	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Existing Kingman-Area Production Wells:																																								
B(22-16) 28BDA	55-504272	12/3/1982	429,681.93	1,551,625.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	119.9	239.8	359.8	479.5	599.4	719.2	839.1	959.	1,078.9	1,198.8	1,318.6	1,438.5	1,558.4	1,678.2	1,798.1	1,918.	2,037.9	2,157.8	2,277.6	2,397.5	2,517.4	2,637.2	2,757.1	2,877.
B(22-16) 29AAA	55-576713	2/6/1991	427,046.37	1,559,011.43	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	75.5	151.1	226.6	302.1	377.7	453.2	528.7	604.3	679.8	755.3	830.9	906.4	981.9	1,057.5	1,133.
B(22-16) 32DDD	55-591289	06/14/2002	427,107.05	1,542,867.93	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	414.	828.	1,242.	1,656.
B(22-16) 33CDC	55-612665	1/1/1971	428,915.42	1,542,832.77	0.	26.7	53.5	80.2	107.	133.7	160.5	187.2	213.9	240.7	267.4	294.2	320.9	347.7	374.4	401.1	427.9	454.6	481.4	508.1	534.8	561.6	588.3	615.1	641.8	668.6	695.3	722.1	748.8	775.5	802.3	829.	855.8	882.5	909.3	936.
B(22-16) 33BCD	55-612666	1/1/1968	428,423.19	1,545,561.39	0.	14.5	28.	43.5	58.1	72.6	87.1	101.6	116.1	130.6	145.1	159.7	174.2	188.7	203.2	217.7	232.2	246.7	261.3	275.8	290.3	304.8	319.3	333.8	348.3	362.9	377.4	391.9	406.4	420.9	435.4	449.9	464.5	479.	493.5	508.
B(22-16) 15CCC	55-612657	10/10/1974	433,097.36	1,558,693.87	0.	0.	0.	0.	16.1	32.1	48.2	64.3	80.3	96.4	112.4	128.5	144.6	160.6	176.7	192.8	208.8	224.9	240.9	257.	273.1	289.1	305.2	321.3	337.3	353.4	369.4	385.5	401.6	417.6	433.7	449.8	465.8	481.9	497.9	514.
B(22-16) 21BBD	55-612658	1/1/1972	417,388.83	1,558,090.68	0.	0.	37.7	75.4	113.1	150.8	188.5	226.2	263.9	301.6	339.3	377.1	414.8	452.5	490.2	527.9	565.6	603.3	641.	678.7	716.4	754.1	791.8	829.5	867.2	904.9	942.6	980.3	1,018.1	1,055.8	1,093.5	1,131.2	1,168.9	1,206.6	1,244.3	1,282.
B(22-16) 27DDD	55-612687	3/28/1968	437,966.65	1,547,764.62	0.	0.2	0.3	0.5	0.7	0.9	1.	1.2	1.4	1.5	1.7	1.9	2.1	2.2	2.4	2.6	2.7	2.9	3.1	3.3	3.4	3.6	3.8	3.9	4.1	4.3	4.5	4.6	4.8	5.	5.1	5.3	5.5	5.7	5.8	6.
B(22-16) 34CBC	55-612684	4/5/1978	433,103.11	1,544,172.84	0.	0.	0.	0.	0.	0.	0.	0.	1.4	2.7	4.1	5.4	6.8	8.1	9.5	10.9	12.2	13.6	14.9	16.3	17.6	19.	20.4	21.7	23.1	24.4	25.8	27.1	28.5	29.9	31.2	32.6	33.9	35.3	36.6	38.
Total Annual Pumping					0.	41.4	120.6	199.7	294.9	390.1	485.3	580.5	677.	773.6	870.1	966.7	1,183.1	1,399.6	1,616.	1,832.4	2,048.8	2,265.3	2,481.7	2,698.1	2,914.6	3,206.3	3,498.5	3,790.5	4,082.4	4,374.4	4,666.3	4,958.3	5,250.3	5,542.2	5,834.2	6,126.2	6,832.1	7,538.1	8,244.	8,950.
Existing Domestic Wells:																																								
B(21-15) 05BBB-R		9/20/2001	453,618.96	1,542,558.22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(21-16) 03CCA		4/5/2005	433,690.84	1,538,238.31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(21-16) 03BAB		3/26/2006	434,362.30	1,542,180.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-15) 09CAA		8/7/2002	461,394.12	1,565,882.48	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-15) 19CBB		1/1/1982	448,678.32	1,556,517.86	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 23CCD-R		1/1/1965	462,777.00	1,553,272.99	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33BBB		2/12/1957	459,537.57	1,547,194.93	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33DBD-R		9/12/2000	458,785.59	1,544,117.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33CCC-R		3/10/2002	454,954.75	1,542,710.36	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 02ABD		3/12/2005	441,889.65	1,573,181.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(22-16) 03CBA		12/11/1979	433,192.69	1,571,483.52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 03CBB		6/30/1980	433,103.49	1,571,234.44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 05DBA		1/1/1980	425,840.28	1,571,282.33	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 06DBA		11/26/2005	419,571.40	1,571,278.47	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(22-16) 07ADD		4/9/1974	421,925.07	1,566,607.26	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DAA		10/17/1987	422,008.92	1,566,304.53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DCC		8/4/2002	418,488.87	1,564,025.44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 07ABD		4/1/2005	419,554.71	1,567,981.44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(22-16) 10CAA		10/15/2005	435,070.71	1,585,852.59	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(22-16) 15CCC		10/4/1974	433,064.30	1,558,775.26	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15AAB		1/1/1980	437,046.87	1,563,300.73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCC		8/11/1983	433,097.36	1,558,693.87	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCA		11/30/1998	432,804.28	1,559,288.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/5/2002	427,046.37	1,559,011.43	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/12/2002	427,128.23	1,558,708.48	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 19BAA		6/1/1973	417,388.83	1,558,090.68	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20CBC		11/10/1997	422,509.85	1,554,755.79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20DAA		8/8/2002	427,128.38	1,555,418.54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 20CBC		5/10/2004	422,509.85	1,554,755.79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(22-16) 26BAC		6/1/1957	439,052.32	1,551,908.20	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 27DDD		11/15/1973	437,968.65	1,547,764.62	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BBA		11/30/1998	428,528.92	1,552,472.28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28CDA		11/21/2000	429,783.98	1,551,624.33	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BDA		2/2/2001	429,681.93	1,551,625.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		10/5/1990	427,127.56	1,552,774.73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		11/30/1996	417,706.93	1,558,016.86	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		9/8/2004	427,032.32	1,552,765.44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-16) 33BCD		6/15/1973	428,423.19	1,545,561.39	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CDC		10/7/1974	428,915.42	1,542,832.77	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CCD		9/10/2002	428,432.42	1,542,862.03	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(22-16) 34CBC		11/9/1990	433,103.11	1,544,172.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 34BCA		8/30/2000	433,711.43	1,546,134.44	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 03ADD		4/17/1998	500,771.52	1,603,443.78	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 05AAA-R		12/11/1989	490,496.24	1,605,974.78	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 14CCC-R		11/15/1973	464,080.39	1,588,907.91	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 30CBB		12/5/1979	448,789.88	1,581,966.99	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 35BAB-R		1/5/2004	470,715.84	1,579,426.29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(23-16) 03BBD		11/18/2005	433,813.76	1,604,912.95	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(23-16) 09ADA-R		6/1/1973	432,682.82	1,599,432.82	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 09DAB-R		12/5/1979	434,010.10	1,597,850.42	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 15BDB-R		2/2/1973	435,819.14	1,590,655.68	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25
B(23-16) 33CCC-R		1/25/2003	427,763.14	1,573,962.95	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25
B(24-14) 09CBB-R		10/9/2002	490,609.66	1,629,620.69	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(24-14) 19ABD-R		9/12/2002	487,897.17	1,620,524.38	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(24-14) 26DBC		4/6/1997	493,625.97	1,612,880.26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29AAB		1/1/1980	489,837.55	1,616,091.20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29BAD-R		2/2/1996	490,535.83	1,615,201.77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29AAA		1/16/1997	490,801.14	1,616,422.02	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29ABA		3/16/2005	489,375.94	1,616,248.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(24-14) 29BBA		1/12/2006	489,276.58	1,618,643.77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-14) 33AAD		2/1/1998	495,494.73	1,610,011.67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 01BCC		5/23/2004	475,325.46	1,635,586.68	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(24-15) 05CBD		11/30/1998	454,830.45	1,634,126.05	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05BBC		10/26/2004	454,176.26	1,637,115.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(24-15) 05DAC		4/19/2005	457,540.67	1,633,633.24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(24-15) 11CBB-R		1/1/1980	469,507.82	1,629,714.74	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BCA-R		1/12/1990	469,408.79	1,630,675.11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BAA-R		2/15/2006	469,368.49	1,631,954.58	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-15) 13ADA-R		1/1/1980	481,373.79	1,625,770.73	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 16BBB		11/30/1998	448,917.21	1,626,826.06	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 27CCC-R		1/3/2006	464,201.19	1,611,549.40	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-15) 28DDD-R		1/26/1978	464,099.20	1,611,470.53	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CCA		1/1/1980	460,111.85	1,612,117.28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CAC		4/13/2004	460,775.87	1,612,782.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(24-15) 32BBD		7/20/1981	454,979.40	1,608,710.87	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 32ACA		4/11/1982	457,710.14	1,609,836.82	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 33BBB		1/6/1975	459,159.94	1,610,946.70	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 07CAA-R		1/1/1980	415,445.13	1,629,398.81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08BDB-R		1/1/1978	423,469.17	1,631,010.34	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08DCA-R		1/1/1980	427,235.02	1,628,444.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08ACA		10/9/1989	425,924.90	1,630,692.41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 10CAA		9/1/2001	434,778.40	1,629,057.90	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(24-16) 10AAA		9/6/2001	437,937.46	1,632,357.60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(24-16) 11DDD		6/4/1985	442,830.53	1,627,231.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 19ADC		3/15/2001	421,375.18	1,621,012.62	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25

TABLE 1. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2005

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	LOCATION COORDINATES* NORTHING (feet)	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET 1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
B(24-16) 26ABA-R		8/30/2002	441,531.11	1,616,275.03	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25
B(24-16) 26CDB-R		12/8/2005	437,659.48	1,612,537.96	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(24-16) 34DDB-R		1/1/1980	435,082.10	1,606,829.26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34CAD		1/1/1980	435,134.26	1,607,557.52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34BDA		9/8/2001	435,141.41	1,609,539.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(25-16) 23BBB		3/23/2001	434,235.72	1,648,906.04	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(25-16) 30CCB		7/13/1995	413,479.26	1,644,629.72	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 31ACB		12/8/2005	415,927.62	1,641,953.28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(25-17) 13AAA		5/10/2001	412,901.88	1,659,375.50	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(25-17) 23BCA-R		2/2/1981	407,440.27	1,652,814.68	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-17) 23BDD-R		1/1/2006	407,566.39	1,651,757.29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-16) 16AA		5/12/2001	419,480.25	1,689,105.40	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25
B(26-16) 26C		3/7/2000	435,265.00	1,676,575.21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD		4/20/1995	400,403.18	1,679,477.52	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC		3/20/1993	427,993.74	1,675,479.60	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB		2/6/1991	418,627.70	1,680,298.27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB		1/27/1992	417,300.93	1,679,605.91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD		7/15/1992	423,296.65	1,675,604.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD		12/15/1992	423,238.87	1,676,462.20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD		8/31/1999	418,166.70	1,675,506.58	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC		2/1/1970	404,148.15	1,680,707.03	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CDD		9/20/1999	405,015.51	1,680,773.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CBB		11/4/1999	402,586.76	1,682,936.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB		2/16/1999	405,802.93	1,696,894.51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA		10/1/1956	401,088.27	1,679,401.21	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA		1/1/1959	409,756.10	1,670,152.84	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R		7/20/1990	377,549.70	1,703,827.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(26-18) 03BDB		1/1/1980	367,283.64	1,700,289.67	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD		12/19/2005	370,582.36	1,699,617.87	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25
B(26-18) 05DBB-R		11/2/1989	359,005.29	1,699,731.37	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DCB		6/25/2004	358,034.76	1,697,701.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25
B(26-18) 09CAD		1/1/1980	362,655.01	1,693,055.79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC		6/12/1981	363,317.67	1,693,051.39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC		6/25/1981	359,340.52	1,690,427.64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 28CBD		2/20/1995	424,467.87	1,708,683.65	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD		1/1/1993	419,166.43	1,707,352.53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC		1/1/1980	391,064.18	1,731,253.77	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC		10/20/1980	391,067.37	1,731,257.14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD		1/17/1994	410,230.32	1,721,601.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC		10/20/1977	403,317.86	1,714,251.10	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD		5/1/1968	389,154.88	1,749,712.73	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD		10/5/1957	386,463.26	1,733,906.05	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC		1/1/1963	382,470.05	1,734,343.00	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA		12/11/1979	386,481.23	1,738,521.56	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB		6/1/1957	379,200.74	1,750,387.40	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA		1/1/1980	378,705.30	1,760,393.15	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC		8/3/1979	375,607.77	1,792,432.26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping					0.	2.52	2.52	3.77	4.53	4.78	4.78	5.03	5.53	6.79	10.82	11.82	12.33	12.58	12.58	12.83	12.83	13.08	13.08	13.84	14.59	14.84	15.6	16.1	18.35	17.11	17.36	18.11	19.87	20.88	21.88	24.15	26.66	27.17	28.93	31.95
Simulated Other Committed Demand (OCD) Wells:																																								
B(23-16) 29-R	Amatista Acres, Sunward Ho! Rn	1/1/2007	442,853.62	1,575,898.89	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-15) 11-R	Arizona West Tract 1112	1/1/2007	461,908.63	1,592,656.82	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 11-R	Cedar Ridge Estates	1/1/2007	423,794.49	1,561,792.41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 14-R	Cedar Ridge Estates	1/1/2007	423,723.30	1,556,479.27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 12-R	Cerbat Ranches Unit 1	1/1/2007	429,082.69	1,561,771.85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 01-R	Cerbat Water Company	1/1/2007	429,051.91	1,567,101.64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 12-R	Cerbat Water Company	1/1/2007	429,082.69	1,561,771.85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 13-R	Cerbat Water Company	1/1/2007	429,039.87	1,556,472.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-17) 36-R	Cerbat Water Company	1/1/2007	429,149.97	1,572,363.64	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 31-R	Esmeralda Acres/Sunward Ho!	1/1/2007	435,989.22	1,570,642.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 13-R	Fountain Hills Estates	1/1/2007	429,039.87	1,556,472.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-15) 05	Greater Kingman Industrial Park	1/1/2007	456,442.34	1,571,495.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	456,439.75	1,560,933.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-15) 05	Greater Kingman Industrial Park	1/1/2007	456,442.34	1,571,495.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	456,439.75	1,560,933.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 07-R	Hillview Ranches	1/1/2007	436,272.15	1,594,647.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-16) 12	Hualapai Vista Estates, Tract 3811	1/1/2007	445,971.17	1,566,236.49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-16) 13	Hualapai Vista Estates, Tract 3811	1/1/2007	445,954.43	1,560,956.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-17) 09-R	Joshua Park Unit #1	1/1/2007	387,245.72	1,751,655.19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-17) 09-R	Joshua Park Unit 1	1/1/2007	382,288.66	1,756,811.21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-17) 09-R	Joshua Park Unit No. 1	1/1/2007	383,277.69	1,760,099.39	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-17) 09-R	Joshua Park Unit No. 1	1/1/2007	380,424.37	1,746,760.62	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 11-R	Lake Juniper	1/1/2007	423,794.49	1,561,792.41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 14-R	Lake Juniper	1/1/2007	423,723.30	1,556,479.27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 11-R	Lake Juniper Estates	1/1/2007	423,794.49	1,561,792.41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 14-R	Lake Juniper Estates	1/1/2007	423,723.30	1,556,479.27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-15) 03-R	Lake Mead Rancheros	1/1/2007	457,847.73	1,666,180.76	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 19	Lake Mead Rancheros	1/1/2007	447,311.50	1,651,448.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 21	Lake Mead Rancheros	1/1/2007	457,901.41	1,651,439.33	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 27	Lake Mead Rancheros #1-12	1/1/2007	463,162.22	1,646,121.18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 29	Lake Mead Rancheros #1-12	1/1/2007	452,598.20	1,646,153.47	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 31	Lake Mead Rancheros #1-12	1/1/2007	447,285.88	1,640,870.50	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 31	Lake Mead Rancheros Unit 10	1/1/2007	447,285.88	1,640,870.50	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 13-R	Lake Mead Rancheros, Unit 1	1/1/2007	466,935.35	1,653,113.34	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 05	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	452,638.42	1,667,278.65	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 09	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	457,892.29	1,661,994.51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

MONTGOMERY & ASSOCIATES

TABLE 1. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2005

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	LOCATION COORDINATES* NORTHING (feet)	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET 1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
B(25-15) 17	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	452,605.32	1,656,712.06	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-15) 27	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	463,162.22	1,646,121.18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 13	Lake Mead Ranchos Unit 2	1/1/2007	379,056.14	1,752,060.79	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 11-R	Lake Mead Ranchos Unit 3	1/1/2007	378,022.26	1,756,338.07	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,678.80	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,678.80	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,578.60	1,778,531.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,578.60	1,778,531.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 27-R	Lake Mead Ranchos, Unit 6	1/1/2007	371,227.57	1,773,403.29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 01-R	Lake Mohave Ranchos	1/1/2007	375,806.20	1,706,097.00	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 03	Lake Mohave Ranchos	1/1/2007	368,271.69	1,699,300.35	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 05-R	Lake Mohave Ranchos	1/1/2007	361,291.92	1,697,359.24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 07-R	Lake Mohave Ranchos	1/1/2007	359,122.53	1,694,357.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 09	Lake Mohave Ranchos	1/1/2007	362,984.35	1,694,046.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 11-R	Lake Mohave Ranchos	1/1/2007	370,527.10	1,700,838.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 13-R	Lake Mohave Ranchos	1/1/2007	373,984.00	1,701,187.90	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 15-R	Lake Mohave Ranchos	1/1/2007	365,237.30	1,695,559.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-19) 25-R	Lake Mohave Ranchos	1/1/2007	360,478.90	1,692,654.70	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-19) 25-R	Lake Mohave Ranchos, Unit 6	1/1/2007	361,537.00	1,692,056.40	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-19) 27-R	Mead-O-Rama #2	1/1/2007	376,972.11	1,774,424.25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-19) 35-R	Mead-O-Rama #3	1/1/2007	375,043.42	1,789,300.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-17) 31-R	Mead-O-Rama #4	1/1/2007	378,836.99	1,785,991.84	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-18) 35-R	Mead-O-Rama Unit No. 3	1/1/2007	375,663.08	1,788,134.85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(20-16) 06-R	Piñon Pines Estates #2	1/1/2007	452,972.94	1,541,717.19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-17) 12-R	Quail Valley Estates	1/1/2007	429,082.89	1,561,771.85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-16) 01	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,081.85	1,667,315.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-16) 11	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,792.73	1,652,037.17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-16) 23	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,764.28	1,651,482.12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-16) 28	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,027.75	1,646,184.85	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(25-16) 35	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,735.38	1,640,905.01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-15) 19-R	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	444,210.74	1,631,625.11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(26-15) 31	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	447,351.06	1,572,578.45	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-17) 23-R	Red Wing Canyon Estates	1/1/2007	446,736.73	1,588,165.02	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-14) 27-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	490,002.40	1,616,900.32	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-14) 35-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	495,278.11	1,611,016.53	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-14) 03-R	Sunny Highlands Estates, Tract 1132, Phase 1-20 Lots	1/1/2007	493,344.51	1,606,771.94	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 09-R	Sunnyvale Acres, Sunward Hol Ranches #2	1/1/2007	435,207.88	1,601,657.54	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 33-R	Sunrise Mountain Estates	1/1/2007	431,949.29	1,575,490.35	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 19-R	Sunward Hol Ranches	1/1/2007	436,210.53	1,584,157.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 30-R	Sunward Hol Ranches	1/1/2007	436,006.38	1,575,922.23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 31-R	Sunward Hol Ranches	1/1/2007	435,989.22	1,570,642.83	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 33-R	Sunward Hol Ranches	1/1/2007	438,213.59	1,579,201.89	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 30-R	Sunward Hol Ranches Turquesa Acres	1/1/2007	436,006.38	1,575,922.23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 18-R	Toro Acres, Sunward Hol #2	1/1/2007	438,213.12	1,589,428.29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-16) 19-R	Toro Acres, Sunward Hol #2	1/1/2007	438,210.53	1,584,157.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-15) 18-R	Valle Vista	1/1/2007	456,586.45	1,587,379.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-15) 10-R	Valle Vista #1A,3A	1/1/2007	456,612.41	1,592,653.10	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-15) 15-R	Valle Vista #1A,3A	1/1/2007	456,586.45	1,587,379.30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(23-15) 03-R	Valle Vista Unit 2 Tract 1200, Lots 860, 861, 996, 1078,1709, 1831, and 1907	1/1/2007	456,616.99	1,597,947.49	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(24-15) 34	Valle Vista Unit 3- Tract 1204	1/1/2007	435,485.93	1,608,549.29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(22-16) 05-R	Zafiro Acres-Sunward Ho Ranches	1/1/2007	425,495.38	1,567,541.86	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Total Annual Pumping					0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
Annual Grand Total					0.	43.8	133.1	205.5	299.4	394.9	490.1	595.5	692.8	790.4	881.	979.5	1,195.5	1,412.1	1,626.6	1,845.3	2,061.7	2,278.3	2,494.4	2,712.	2,929.2	3,221.4	3,514.1	3,806.8	4,098.8	4,391.5	4,683.7	4,976.4	5,270.1	5,563.1	5,856.1	6,150.3	6,858.8	7,565.2	8,273.	8,981.9

* = Location coordinates are State Plane, U.S. feet, Arizona West, North American Datum 1927
-R = Relocated Well. Well is located in the Hualapai Valley, but outside the active area for model. Well was relocated to the nearest active cell.

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MONTGOMERY & ASSOCIATES

TABLE 2. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 2006 THROUGH 2042, UPDATED BASE CASE

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES*		SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET																																				
			EASTING (feet)	NORTHING (feet)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Kingman-Area Production Wells:																																									
B(22-16) 28BDA	55-504272	12/3/1982	429,681.93	1,551,625.34	2,988.6	3,100.3	3,212.	3,323.6	3,435.3	3,546.9	3,658.6	3,770.2	3,881.9	3,993.3	4,118.3	4,241.6	4,369.1	4,500.1	4,635.1	4,774.2	4,917.4	5,064.9	5,216.9	5,373.4	5,534.6	5,700.6	5,871.7	6,047.8	6,229.2	6,416.1	6,608.6	6,806.9	7,011.1	7,221.4	7,438.	7,661.2	7,891.	8,127.8	8,371.6	8,622.7	8,881.4
B(22-16) 29AAA	55-576713	2/6/1991	427,046.37	1,559,011.43	1,177.	1,220.9	1,264.9	1,308.9	1,352.8	1,396.8	1,440.8	1,484.8	1,528.7	1,574.6	1,621.8	1,670.6	1,720.6	1,772.2	1,825.4	1,880.1	1,936.5	1,994.6	2,054.6	2,116.1	2,179.6	2,245.	2,312.3	2,381.7	2,453.2	2,526.7	2,602.5	2,680.6	2,761.	2,843.9	2,929.2	3,017.1	3,107.6	3,200.8	3,296.8	3,395.7	3,497.6
B(22-16) 32DDD	55-591289	08/14/2002	427,107.05	1,542,867.93	1,720.3	1,784.5	1,848.8	1,913.1	1,977.3	2,041.6	2,105.9	2,170.1	2,234.4	2,301.4	2,370.6	2,441.6	2,514.8	2,590.3	2,668.	2,748.	2,830.5	2,916.4	3,003.8	3,092.9	3,185.7	3,281.3	3,379.7	3,481.1	3,585.6	3,693.1	3,803.9	3,918.	4,035.6	4,156.6	4,281.3	4,409.8	4,542.1	4,678.3	4,818.7	4,963.3	5,112.1
B(22-16) 33CDC	55-612665	1/1/1971	428,915.42	1,542,832.77	972.3	1,008.8	1,045.	1,081.3	1,117.6	1,153.9	1,190.3	1,226.6	1,262.9	1,300.8	1,339.8	1,380.	1,421.4	1,464.1	1,508.	1,553.2	1,599.8	1,647.8	1,697.3	1,748.2	1,800.6	1,854.6	1,910.3	1,967.6	2,026.6	2,087.4	2,150.	2,214.5	2,281.	2,349.4	2,419.9	2,492.5	2,567.3	2,644.3	2,723.6	2,805.3	2,889.5
B(22-16) 33BCD	55-612666	1/1/1968	428,423.19	1,545,561.39	527.7	547.4	567.1	586.9	606.6	626.3	646.	665.7	685.4	706.	727.2	749.	771.5	794.6	818.4	843.	868.3	894.3	921.2	948.8	977.3	1,006.6	1,036.8	1,067.9	1,099.9	1,132.9	1,166.9	1,201.9	1,238.	1,275.1	1,313.3	1,352.7	1,393.3	1,435.1	1,478.2	1,522.5	1,568.2
B(22-16) 15CCC	55-612657	10/10/1974	433,097.36	1,558,693.87	533.9	553.9	573.8	593.8	613.7	633.7	653.6	673.6	693.5	714.3	735.8	757.8	780.6	804.	828.1	853.	878.5	904.9	932.	960.	988.8	1,018.5	1,049.	1,080.5	1,112.9	1,146.3	1,180.7	1,216.1	1,252.6	1,290.2	1,328.9	1,368.7	1,409.8	1,452.1	1,495.7	1,540.5	1,586.7
B(22-16) 21BBD	55-612656	1/1/1972	417,388.83	1,558,090.68	1,331.7	1,381.5	1,431.3	1,481.	1,530.8	1,580.6	1,630.3	1,680.	1,729.8	1,781.7	1,835.1	1,890.2	1,946.9	2,005.3	2,065.4	2,127.4	2,191.2	2,257.	2,324.7	2,394.4	2,466.2	2,540.2	2,616.4	2,694.9	2,775.8	2,859.	2,944.8	3,033.2	3,124.2	3,217.9	3,314.4	3,413.8	3,516.3	3,621.7	3,730.4	3,842.3	3,957.6
B(22-16) 27DDD	55-612667	3/28/1968	437,966.66	1,547,764.62	6.2	6.5	6.7	6.9	7.2	7.4	7.6	7.9	8.1	8.3	8.6	8.9	9.1	9.4	9.7	10.	10.3	10.6	10.9	11.2	11.6	11.9	12.3	12.6	13.	13.4	13.8	14.2	14.6	15.1	15.5	16.	16.5	17.	17.5	18.	18.5
B(22-16) 34CBC	55-612664	4/5/1978	433,103.11	1,544,172.84	39.6	41.	42.4	43.9	45.4	46.8	48.3	49.8	51.3	52.8	54.4	56.	57.7	59.4	61.2	63.1	65.	66.9	68.9	71.	73.1	75.3	77.6	79.9	82.3	84.7	87.3	89.9	92.6	95.4	98.2	101.2	104.2	107.4	110.6	113.9	117.3
Total Annual Pumping					9,297.3	9,644.7	9,992.	10,339.3	10,686.7	11,034.	11,381.3	11,728.7	12,076.	12,439.3	12,811.4	13,195.6	13,591.6	13,999.4	14,419.4	14,852.	15,297.5	15,756.4	16,229.1	16,716.	17,217.5	17,734.	18,266.	18,814.	19,378.4	19,959.8	20,558.6	21,175.3	21,810.6	22,464.9	23,138.9	23,833.	24,548.	25,284.5	26,043.	26,824.3	27,629.
Existing Domestic Wells:																																									
B(21-15) 05BBB-R		9/20/2001	453,618.98	1,542,658.22	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(21-16) 03CCA		4/5/2006	433,690.64	1,538,238.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(21-16) 03BAB		3/26/2006	434,362.30	1,542,180.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 09CAA		8/7/2002	461,394.12	1,566,882.48	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 19CBB		1/1/1982	448,678.32	1,566,517.66	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 23CCD-R		1/1/1965	462,777.00	1,563,272.99	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33BBB		2/12/1987	459,537.57	1,547,194.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33DBD-R		9/12/2000	458,765.59	1,544,117.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33CCC-R		3/10/2002	454,954.75	1,542,710.36	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 02ABD		3/12/2006	441,669.65	1,573,181.94	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 03CBA		12/11/1979	433,192.69	1,571,483.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 03CBB		6/30/1980	433,103.49	1,571,234.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 05DBA		1/1/1980	425,640.28	1,571,282.33	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 06DBA		11/28/2006	419,871.40	1,571,278.47	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07ADD		4/9/1974	421,926.07	1,566,607.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DAA		10/17/1987	422,006.92	1,566,304.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DCC		8/4/2002	419,488.97	1,564,028.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07ABD		4/1/2005	419,864.71	1,567,981.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 10CAA		10/19/2005	435,070.71	1,565,982.09	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCC		10/4/1974	433,064.30	1,558,775.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15AAB		1/1/1980	437,046.87	1,563,300.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCC		8/11/1983	433,097.36	1,558,693.87	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCA		11/30/1998	432,804.26	1,559,266.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/5/2002	427,046.37	1,559,011.43	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/12/2002	427,129.23	1,558,708.48	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 19BAA		8/1/1973	417,388.83	1,558,090.68	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20CBC		11/10/1997	422,509.85	1,554,765.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20DAA		8/8/2002	427,126.38	1,555,418.54	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20CBC		8/10/2004	422,509.85	1,554,765.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 26BAC		8/1/1957	439,052.32	1,551,908.20	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 27DDD		11/13/1973	437,966.66	1,547,764.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BBA		11/30/1998	428,828.92	1,552,472.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28CDA		11/21/2000	429,763.96	1,551,624.30	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BDA		2/2/2001	429,681.93	1,551,625.34	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		10/5/1990	427,127.56	1,552,774.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		11/30/1998	417,706.93	1,558,016.86	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		9/8/2004	427,032.32	1,552,765.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33BCD		8/15/1973	428,423.19	1,545,561.39	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CDC		10/7/1974	428,915.42	1,542,832.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CCD		8/10/2002	428,432.42	1,542,861.09	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 34CBC		11/9/1990	433,103.11	1,544,172.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 34BCA		8/30/2000	433,711.43	1,546,134.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 09ADD		4/17/1998	500,771.52	1,603,443.76	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 05AAA-R		12/11/1989	490,496.24	1,605,974.78	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 14CCC-R		11/15/1973	464,089.39	1,589,937.91	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 30CBB		12/8/1979	448,789.89	1,581,966.99	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 35BAB-R		1/5/2004	470,716.94	1,579,426.29	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 03BBD		11/16/2006	433,813.76	1,604,912.96	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 09ADA-R		6/1/1973	432,882.82	1,599,432.82	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 09DAB-R		12/6/1979	434,010.10	1,597,850.42	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 16BDB-R		2/2/1973	438,819.14	1,590,655.68	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 33CCC-R		1/25/2003	427,763.14	1,573,962.96	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 09CBB-R		10/9/2002	490,609.66	1,629,620.89	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 19ABD-R		9/12/2002	487,897.17	1,620,824.38	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 28DBC		4/6/1997	493,626.97	1,612,680.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29AAB		1/1/1980	489,837.55	1,616,091.20	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29BAD-R		2/2/1996	490,535.63	1,615,201.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29AAA		1/16/1997	490,801.14	1,616,427.02	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29ABA		3/16/2005	489,378.94	1,616,248.46	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29BBA		1/12/2006	489,276.58	1,616,643.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 33AAD		2/1/1998	495,494.73	1,610,011.67	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 01BCC		5/23/2004	475,325.46	1,635,686.68	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05CBD		11/30/1998	464,830.46	1,634,128.05	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 06BBC		10/26/2004	464,176.28	1,637,116.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05DAC		4/19/2005	467,640.67	1,633,633.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11CBB-R		1/1/1980	469,507.82	1,629,714.74	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BCA-R		1/12/1990	469,408.79	1,630,676.11	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BAA-R		2/15/2006	469,368.49	1,631,884.58	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 13ADA-R		1/1/1980	481,373.79	1,625,770.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 18BBB		11/30/1998	448,917.21	1,626,826.08	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 27CCC-R		1/3/2006	464,201.19	1,611,549.40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28DDD-R		1/26/1978	464,099.20	1,611,470.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CCA		1/1/1980	460,111.85	1,612,117.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CAC		4/13/2004	460,776.67	1,612,762.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 32BBD		7/20/1981	464,979.40	1,609,710.87	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 32ACA		4/11/1982	457,710.14	1,609,836.82	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 33BBB		1/6/1975	459,159.94	1,610,946.70	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 07CAA-R		1/1/1980	415,445.13	1,629,398.81	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08BDB-R		1/1/1978	423,489.17	1,631,010.34	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08DCA-R		1/1/1980	427,235.02	1,628,444.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08ACA		10/9/1989	426,924.90	1,630,692.41	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 10CAA		9/1/2001	434,778.40	1,629,057.90	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 10AAA		9/6/2001	437,937.48	1,632,357.60	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 11DDD		8/4/1986	442,830.63	1,627,231.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 19ADC		3/15/2001	421,375.18	1,621,012.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 26ABA-R		8/30/2002	441,831.11	1,616,275.03	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 26CDB-R		12/6/2005	437,859.48	1,612,537.96	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34DDB-R		1/1/1980	435,082.10	1,606,829.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34CAD		1/1/1980	436,134.26	1,607,557.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34BDA		9/6/2001	436,141.41	1,609,539.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 29BBB		3/23/2001	434,235.72	1,648,906.04	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 30CCB		7/13/1995	413,479.26	1,644,629.72	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 31ACB		12/8/2005	415,927.62	1,641,953.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-17) 13AAA		5/10/2001	412,901.88	1,659,375.50	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-17) 23BCA-R		2/2/1981	407,440.27	1,652,814.88	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-17) 23BDD-R		1/1/2006	407,586.39	1,651,757.29	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 16AA		5/12/2001	419,460.26	1,689,105.40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

TABLE 2. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 2006 THROUGH 2042, UPDATED BASE CASE

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	NORTHING (feet)
B(26-16) 26C		3/7/2000	435,265.00	1,676,578.21
B(26-16) 27ABD		4/20/1995	400,403.18	1,679,477.52
B(26-16) 28DDC		3/29/1993	427,993.74	1,675,479.60
B(26-16) 29BBB		2/6/1991	416,627.70	1,680,298.27
B(26-16) 29BBB		1/27/1992	417,300.93	1,679,805.91
B(26-16) 29DDD		7/15/1992	423,298.65	1,675,604.45
B(26-16) 29DDD		12/15/1992	423,236.87	1,676,462.20
B(26-16) 30DDD		8/31/1999	418,168.70	1,675,506.58
B(26-17) 23CCC		2/1/1970	404,148.15	1,680,707.03
B(26-17) 23DDD		9/20/1999	405,015.51	1,680,773.94
B(26-17) 25CBB		11/4/1999	402,556.76	1,682,936.45
B(26-17) 25BBB		2/18/1999	405,802.93	1,696,894.51
B(26-17) 27ACA		10/1/1956	401,088.27	1,679,401.21
B(26-17) 35AAA		1/1/1959	409,756.10	1,670,152.84
B(26-18) 01BDB-R		7/20/1990	377,549.70	1,703,827.30
B(26-18) 03BDB		1/1/1980	367,283.64	1,700,289.67
B(26-18) 03ADD		12/19/2006	370,582.36	1,699,617.67
B(26-18) 05DBB-R		11/2/1989	369,005.29	1,699,731.37
B(26-18) 05DCB		8/25/2004	358,034.76	1,697,701.84
B(26-18) 09CAD		1/1/1980	362,655.01	1,693,058.79
B(26-18) 09DBC		8/12/1981	363,317.67	1,693,051.39
B(26-18) 17AAC		8/26/1981	359,340.52	1,690,427.64
B(27-16) 28CBD		2/20/1995	424,467.87	1,706,883.65
B(27-16) 29CCD		1/1/1993	419,166.43	1,707,352.53
B(27-17) 05ADC		1/1/1980	391,064.18	1,731,253.77
B(27-17) 05ADC		10/20/1980	391,067.37	1,731,287.14
B(27-17) 13ABD		1/17/1994	410,230.32	1,721,601.94
B(27-17) 23CAC		10/20/1977	403,317.88	1,714,251.10
B(28-16) 07ADD		5/1/1968	389,154.86	1,749,712.73
B(28-17) 31DDD		10/5/1957	386,463.26	1,733,906.05
B(28-17) 31CCC		1/1/1963	382,470.05	1,734,343.00
B(28-17) 31AAA		12/11/1979	386,481.23	1,736,621.56
B(28-18) 13DCB		6/1/1957	379,200.74	1,750,387.40
B(28-18) 13CDA		1/1/1980	378,705.30	1,750,393.15
B(29-18) 01CCC		8/3/1979	375,607.77	1,792,432.26
Total Annual Pumping				
Simulated Other Committed Demand (OCD) Wells:				
B(23-16) 29-R	Amatista Acres, Sunward Hol Rn	1/1/2007	442,853.62	1,678,898.89
B(23-15) 11-R	Arizona West Tract 1112	1/1/2007	461,908.63	1,592,656.82
B(22-17) 11-R	Cedar Ridge Estates	1/1/2007	423,794.49	1,561,792.41
B(22-17) 14-R	Cedar Ridge Estates	1/1/2007	423,723.30	1,556,479.27
B(22-17) 12-R	Cerbat Ranches Unit 1	1/1/2007	429,082.69	1,561,771.86
B(22-17) 01-R	Cerbat Water Company	1/1/2007	429,051.91	1,567,101.84
B(22-17) 12-R	Cerbat Water Company	1/1/2007	429,082.69	1,561,771.86
B(22-17) 13-R	Cerbat Water Company	1/1/2007	429,039.87	1,556,472.83
B(23-17) 36-R	Cerbat Water Company	1/1/2007	429,149.97	1,572,363.64
B(23-16) 31-R	Esmeralda Acres/Sunward Hol	1/1/2007	435,959.22	1,570,642.63
B(22-17) 13-R	Fountain Hills Estates	1/1/2007	429,039.87	1,556,472.83
B(22-15) 05	Greater Kingman Industrial Park	1/1/2007	456,442.34	1,571,495.01
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	456,439.76	1,560,933.10
B(22-15) 05	Greater Kingman Industrial Park	1/1/2007	456,442.34	1,571,495.01
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	456,439.76	1,560,933.10
B(23-16) 07-R	Hillview Ranches	1/1/2007	436,272.15	1,594,647.84
B(22-16) 12	Hualapai Vista Estates, Tract 3811	1/1/2007	445,971.17	1,566,236.49
B(22-16) 13	Hualapai Vista Estates, Tract 3811	1/1/2007	445,954.43	1,560,956.45
B(28-17) 09-R	Joshua Park Unit #1	1/1/2007	387,245.72	1,761,655.19
B(28-17) 09-R	Joshua Park Unit 1	1/1/2007	382,256.66	1,756,811.21
B(28-17) 09-R	Joshua Park Unit No. 1	1/1/2007	383,277.69	1,750,099.39
B(28-17) 09-R	Joshua Park Unit No. 1	1/1/2007	380,424.37	1,746,760.62
B(22-17) 11-R	Lake Juniper	1/1/2007	423,794.49	1,561,792.41
B(22-17) 14-R	Lake Juniper	1/1/2007	423,723.30	1,556,479.27
B(22-17) 11-R	Lake Juniper Estates	1/1/2007	423,794.49	1,561,792.41
B(22-17) 14-R	Lake Juniper Estates	1/1/2007	423,723.30	1,556,479.27
B(25-15) 03-R	Lake Mead Rancheros	1/1/2007	457,647.73	1,665,180.76
B(25-15) 19	Lake Mead Rancheros	1/1/2007	447,311.50	1,651,448.34
B(25-15) 21	Lake Mead Rancheros	1/1/2007	457,901.41	1,651,439.33
B(25-15) 27	Lake Mead Rancheros #1-12	1/1/2007	463,182.22	1,646,121.18
B(25-15) 29	Lake Mead Rancheros #1-12	1/1/2007	452,698.20	1,646,153.47
B(25-16) 31	Lake Mead Rancheros #1-12	1/1/2007	447,265.88	1,640,870.80
B(25-15) 31	Lake Mead Rancheros Unit 10	1/1/2007	447,285.88	1,640,870.80
B(25-15) 13-R	Lake Mead Rancheros, Unit 1	1/1/2007	466,935.36	1,663,113.34
B(25-15) 05	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	452,638.42	1,667,278.65
B(25-15) 09	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	457,892.29	1,661,994.61
B(25-15) 17	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	452,605.32	1,656,712.06
B(25-15) 27	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	463,182.22	1,646,121.18
B(28-18) 13	Lake Mead Ranchos Unit 2	1/1/2007	379,056.14	1,752,060.79
B(28-18) 11-R	Lake Mead Ranchos Unit 3	1/1/2007	378,022.28	1,758,338.07
B(28-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,678.80
B(28-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,678.80
B(29-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,678.60	1,778,531.55
B(29-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,678.60	1,778,531.55
B(29-18) 27-R	Lake Mead Ranchos, Unit 8	1/1/2007	371,227.67	1,773,403.29
B(26-18) 01-R	Lake Mohave Ranchos	1/1/2007	375,808.20	1,706,097.00
B(26-18) 03	Lake Mohave Ranchos	1/1/2007	366,271.69	1,699,300.36
B(26-18) 05-R	Lake Mohave Ranchos	1/1/2007	361,291.93	1,697,359.24
B(26-18) 07-R	Lake Mohave Ranchos	1/1/2007	359,122.53	1,694,357.83
B(26-18) 09	Lake Mohave Ranchos	1/1/2007	362,954.35	1,694,046.01
B(26-18) 11-R	Lake Mohave Ranchos	1/1/2007	370,527.10	1,700,836.30

SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET

CADASTRAL LOCATION OR MODEL WELL NAME	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
B(26-16) 26C	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25CBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03BDB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DBB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09CAD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 28CBD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71
Simulated Other Committed Demand (OCD) Wells:																			
B(23-16) 29-R	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(23-15) 11-R	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7
B(22-17) 11-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 14-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 12-R	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
B(22-17) 01-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 12-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 13-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-17) 36-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-16) 31-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 13-R	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.
B(22-15) 05	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-15) 17	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-15) 05	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(22-15) 17	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(23-16) 07-R	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
B(22-16) 12	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
B(22-16) 13	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
B(28-17) 09-R	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(28-17) 09-R	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(28-17) 09-R	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
B(28-17) 09-R	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
B(22-17) 11-R	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 14-R	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 11-R	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(22-17) 14-R	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(25-15) 03-R	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5
B(25-15) 19	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(25-15) 21	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(25-15) 27	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 29	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-16) 31	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 31	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
B(25-15) 13-R	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
B(25-15) 05	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 09	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 17	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 27	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(28-18) 13	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
B(28-18) 11-R	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.
B(28-18) 01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-18) 01	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3
B(29-18) 23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(29-18) 23	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.
B(29-18) 27-R	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9
B(26-18) 01-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 03	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 05-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 07-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 09	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 11-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1

CADASTRAL LOCATION OR MODEL WELL NAME	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
B(26-16) 26C	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25CBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03BDB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DBB-R	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09CAD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 28CBD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71
Simulated Other Committed Demand (OCD) Wells:																		
B(23-16) 29-R	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(23-15) 11-R	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7
B(22-17) 11-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 14-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 12-R	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
B(22-17) 01-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 12-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 13-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-17) 36-R	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-16) 31-R	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 13-R	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.
B(22-15) 05	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-15) 17	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-15) 05	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(22-15) 17	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(23-16) 07-R	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
B(22-16) 12	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
B(22-16) 13	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.	8.
B(28-17) 09-R	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(28-17) 09-R	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(28-17) 09-R	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
B(28-17) 09-R	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
B(22-17) 11-R	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 14-R	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 11-R	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(22-17) 14-R	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(25-15) 03-R	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5
B(25-15) 19	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(25-15) 21	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(25-15) 27	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 29	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-16) 31	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 31	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
B(25-15) 13-R	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
B(25-15) 05	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 09	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 17	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 27	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(28-18) 13	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
B(28-18) 11-R	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.
B(28-18) 01	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-18) 01	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3
B(29-18) 23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(29-18) 23	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.
B(29-18) 27-R	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9
B(26-18) 01-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 03	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 05-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 07-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 09	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 11-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1

MONTGOMERY & ASSOCIATES

TABLE 2. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 2006 THROUGH 2042, UPDATED BASE CASE

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	LOCATION COORDINATES* NORTHING (feet)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
					SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET									
B(25-18) 13-R	Lake Mohave Ranches	1/1/2007	373,984.00	1,701,167.90	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 15-R	Lake Mohave Ranches	1/1/2007	365,237.30	1,695,589.10	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-19) 26-R	Lake Mohave Ranches	1/1/2007	360,476.90	1,692,654.70	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
B(26-19) 28-R	Lake Mohave Ranches, Unit 6	1/1/2007	361,537.90	1,692,056.40	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	Mead-O-Rama #2	1/1/2007	376,972.11	1,774,424.25	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(29-18) 35-R	Mead-O-Rama #3	1/1/2007	378,043.42	1,799,300.83	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(29-17) 31-R	Mead-O-Rama #4	1/1/2007	378,836.99	1,795,991.94	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(29-18) 36-R	Mead-O-Rama Unit No. 3	1/1/2007	375,683.09	1,795,134.85	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(26-18) 08-R	Pinion Pines Estates #2	1/1/2007	482,872.94	1,841,717.19	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	Quail Valley Estates	1/1/2007	429,052.69	1,861,771.85	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(25-16) 01	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,091.65	1,667,315.63	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 11	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,792.73	1,662,037.17	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 23	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,784.26	1,651,462.12	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 25	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,027.75	1,646,164.85	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 35	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,735.38	1,640,908.01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 19-R	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	444,210.74	1,681,625.11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 31	Reatiste Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	447,351.05	1,672,578.46	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	Red Wing Canyon Estates	1/1/2007	448,736.73	1,888,186.02	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	490,002.40	1,616,900.52	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 35-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	495,276.11	1,611,616.53	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	Sunny Highlands Estates, Tract 1132, Phase 1-20 Lots	1/1/2007	493,344.51	1,606,771.94	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-16) 09-R	Sunnyvale Acres, Sunward Hol Ranches #2	1/1/2007	436,207.88	1,601,657.54	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 33-R	Sundes Mountain Estates	1/1/2007	431,949.25	1,578,490.35	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-16) 19-R	Sunward Hol Ranches	1/1/2007	438,210.63	1,584,157.55	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	Sunward Hol Ranches	1/1/2007	436,006.36	1,575,922.23	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 31-R	Sunward Hol Ranches	1/1/2007	435,989.22	1,570,542.53	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 33-R	Sunward Hol Ranches	1/1/2007	438,213.89	1,579,201.89	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	Sunward Hol Ranches Tunuesa Acres	1/1/2007	436,006.36	1,575,922.23	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-16) 18-R	Toro Acres, Sunward Hol #2	1/1/2007	438,213.12	1,589,428.29	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-16) 19-R	Toro Acres, Sunward Hol #2	1/1/2007	438,210.63	1,584,157.55	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	Valle Vista	1/1/2007	456,585.45	1,567,379.30	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	Valle Vista #1A,3A	1/1/2007	456,612.41	1,562,653.10	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-15) 15-R	Valle Vista #1A,3A	1/1/2007	456,585.45	1,567,379.30	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 03-R	Valle Vista Unit 2 Tract 1200, Lots 860, 861, 999, 1078,1709, 1831, and 1907	1/1/2007	466,616.99	1,597,947.49	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-16) 34	Valle Vista Unit 3- Tract 1204	1/1/2007	458,468.93	1,608,549.29	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-18) 06-R	Zalfio Acres-Sunward Ho Ranches	1/1/2007	429,496.38	1,867,641.86	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping					9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Annual Grand Total					19,093.7	18,441.1	18,788.4	20,135.7	20,483.1	20,830.4	21,177.7	21,525.1	21,872.4	22,234.7

CADASTRAL LOCATION OR MODEL WELL NAME	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
B(25-18) 13-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 15-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-19) 26-R	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
B(26-19) 28-R	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(29-18) 35-R	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(29-17) 31-R	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(29-18) 36-R	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(26-18) 08-R	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(25-16) 01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 23	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 25	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 35	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 19-R	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 31	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 35-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-16) 09-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 33-R	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-16) 19-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 31-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 33-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-16) 18-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-16) 19-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-15) 15-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 03-R	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-16) 34	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-18) 06-R	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Annual Grand Total	22,607.8	22,992.3	23,386.	23,798.8	24,215.8	24,648.3	25,093.9	25,552.8	26,025.6	26,512.4

CADASTRAL LOCATION OR MODEL WELL NAME	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
B(25-18) 13-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 15-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-19) 26-R	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1
B(26-19) 28-R	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(29-18) 35-R	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(29-17) 31-R	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(29-18) 36-R	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(26-18) 08-R	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(25-16) 01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 23	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 25	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 35	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 19-R	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 31	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 35-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-16) 09-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 33-R	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-16) 19-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 31-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 33-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-16) 18-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-16) 19-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-15) 15-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 03-R	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-16) 34	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-18) 06-R	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Annual Grand Total	27,013.8	27,530.4	28,062.4	28,610.4	29,174.8	29,756.2	30,355.	30,971.7	31,607.	32,261.3

CADASTRAL LOCATION OR MODEL WELL NAME	2036	2037	2038	2039	2040	2041	2042
B(25-18) 13-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 15-R	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-19) 26-R	24.1	24.1	24.1	24.1	24.1	24.1	24.1
B(26-19) 28-R	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(29-18) 35-R	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(29-17) 31-R	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(29-18) 36-R	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(26-18) 08-R	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(25-16) 01	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 11	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 23	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 25	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-16) 35	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 19-R	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 31	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 35-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-16) 09-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 33-R	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-16) 19-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 31-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 33-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-16) 30-R	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-16) 18-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-16) 19-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-15) 15-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 03-R	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-16) 34	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-18) 06-R	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Annual Grand Total	32,935.3	33,629.4	34,344.4	35,080.9	35,839.4	36,620.7	37,425.4

* = Location coordinates are State Plane, U.S. feet, Arizona West, North American Datum 1927
-R = Relocated Well. Well is located in the Hualapai Valley, but outside the active area for model. Well was relocated to the nearest active cell.

MONTGOMERY & ASSOCIATES

TABLE 3. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, HUALAPAI VALLEY SOLAR PROJECT WELLS

SIMULATED PRODUCTION WELL NAME	LOCATION COORDINATES*		SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET				
	EASTING (feet)	NORTHING (feet)	1971-2012	2013-2042 BASE CASE	2013-2042 HVS@3,000	2013-2042 HVS@2,400	2013-2042 HVS@30
HVS-1	420,783.01	1,681,611.30	0.	0.	750.	600.	7.5
HVS-2	428,419.53	1,675,427.92	0.	0.	750.	600.	7.5
HVS-3	420,975.06	1,675,524.34	0.	0.	750.	600.	7.5
HVS-4	414,087.02	1,675,179.39	0.	0.	750.	600.	7.5
Total Annual Pumping			**0.**	**0.**	**3,000.**	**2,400.**	**30.**
TOTAL SIMULATED PUMPING IN BASIN IN 2042			**--**	**37,425.4**	**40,425.4**	**39,825.4**	**37,455.4**

* = Location coordinates are State Plane, U.S. feet, Arizona West, North American Datum 1927

TABLE 4. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, MAXIMUM CUMULATIVE IMPACTS

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	NORTHING (feet)	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
Existing Kingman-Area Production Wells:																																									
B(22-16) 28BDA	55-504272	12/3/1982	429,681.83	1,551,625.34	2,988.6	3,100.3	3,212.	3,323.6	3,435.3	3,546.9	3,658.6	3,770.2	3,881.9	3,998.3	4,118.3	4,241.8	4,369.1	4,500.1	4,636.1	4,774.2	4,917.4	5,064.9	5,216.9	5,373.4	5,534.6	5,700.6	5,871.7	6,047.8	6,229.2	6,416.1	6,608.6	6,806.9	7,011.1	7,221.4	7,438.	7,661.2	7,891.	8,127.8	8,371.6	8,622.7	8,881.4
B(22-16) 29AAA	55-576713	2/8/1991	427,046.37	1,559,011.43	1,177.	1,220.9	1,264.9	1,308.9	1,352.8	1,396.8	1,440.8	1,484.8	1,528.7	1,574.6	1,621.8	1,670.5	1,720.6	1,772.2	1,825.4	1,880.1	1,936.6	1,994.6	2,064.6	2,116.1	2,179.6	2,245.	2,312.3	2,381.7	2,453.2	2,526.7	2,602.5	2,680.6	2,761.	2,843.9	2,929.2	3,017.1	3,107.6	3,200.8	3,296.8	3,395.7	3,497.8
B(22-16) 32DDD	55-591289	6/14/2002	427,107.05	1,542,867.93	1,720.3	1,784.5	1,848.8	1,913.1	1,977.3	2,041.6	2,105.9	2,170.1	2,234.4	2,301.4	2,370.5	2,441.6	2,514.8	2,590.3	2,668.	2,748.	2,830.6	2,916.4	3,002.8	3,092.8	3,185.7	3,281.3	3,379.7	3,481.1	3,585.6	3,693.1	3,803.9	3,918.	4,035.6	4,156.6	4,281.3	4,409.8	4,542.1	4,678.3	4,818.7	4,963.3	5,112.1
B(22-16) 33CDC	55-612665	1/1/1971	428,916.42	1,542,832.77	972.3	1,008.6	1,045.	1,081.3	1,117.6	1,153.9	1,190.3	1,226.6	1,262.9	1,300.8	1,339.8	1,380.	1,421.4	1,464.1	1,508.	1,553.2	1,599.8	1,647.8	1,697.3	1,748.2	1,800.6	1,854.6	1,910.3	1,967.6	2,026.6	2,087.4	2,150.	2,214.5	2,281.	2,349.4	2,419.9	2,492.5	2,567.3	2,644.3	2,723.6	2,805.3	2,889.5
B(22-16) 33BCD	55-612666	1/1/1968	428,423.19	1,545,561.39	527.7	547.4	567.1	586.9	606.6	626.3	646.	665.7	685.4	706.	727.2	749.	771.5	794.6	818.4	843.	868.3	894.3	921.2	948.8	977.3	1,006.6	1,036.8	1,067.9	1,099.9	1,132.9	1,166.9	1,201.9	1,238.	1,275.1	1,313.3	1,352.7	1,393.3	1,435.1	1,478.2	1,522.5	1,568.2
B(22-16) 15CCC	55-612657	10/10/1974	433,097.36	1,558,693.87	533.9	553.9	573.8	593.8	613.7	633.7	653.6	673.6	693.5	714.3	735.8	757.8	780.6	804.	828.1	853.	878.5	904.9	932.	960.	988.8	1,018.5	1,049.	1,080.5	1,112.9	1,146.3	1,180.7	1,216.1	1,252.6	1,290.2	1,328.9	1,368.7	1,409.8	1,452.1	1,495.7	1,540.5	1,586.7
B(22-16) 21BBD	55-612658	1/1/1972	417,388.83	1,558,090.68	1,331.7	1,381.5	1,431.3	1,481.	1,530.8	1,580.6	1,630.3	1,680.	1,729.8	1,781.7	1,835.1	1,890.2	1,946.9	2,005.3	2,065.4	2,127.4	2,191.2	2,257.	2,324.7	2,394.4	2,466.2	2,540.2	2,616.4	2,694.9	2,775.8	2,859.	2,944.8	3,033.2	3,124.2	3,217.9	3,314.4	3,413.8	3,516.3	3,621.7	3,730.4	3,842.3	3,957.6
B(22-16) 27DDD	55-612667	3/28/1968	437,986.65	1,547,764.62	6.2	6.5	6.7	6.9	7.2	7.4	7.6	7.9	8.1	8.3	8.6	8.9	9.1	9.4	9.7	10.	10.3	10.6	10.9	11.2	11.6	11.9	12.3	12.6	13.	13.4	13.8	14.2	14.6	15.1	15.5	16.	16.5	17.	17.5	18.	18.5
B(22-16) 34CBC	55-612664	4/5/1978	433,103.11	1,544,172.84	39.5	41.	42.4	43.9	45.4	46.8	48.3	49.8	51.3	52.8	54.4	56.	57.7	59.4	61.2	63.1	65.	66.9	68.9	71.	73.1	75.3	77.6	79.9	82.3	84.7	87.3	89.9	92.6	95.4	98.2	101.2	104.2	107.4	110.6	113.9	117.3
Total Annual Pumping					9,297.3	9,644.7	9,992.	10,339.3	10,686.7	11,034.	11,381.3	11,728.7	12,076.	12,438.3	12,811.4	13,195.8	13,591.6	13,999.4	14,419.4	14,852.	15,297.5	15,756.4	16,229.1	16,716.	17,217.5	17,734.	18,266.	18,814.	19,378.4	19,959.8	20,558.6	21,175.3	21,810.6	22,464.9	23,138.9	23,833.	24,548.	25,284.5	26,043.	26,824.3	27,629.
Existing Domestic Wells:																																									
B(21-15) 05BBB-R		9/20/2001	453,618.96	1,642,558.22	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(21-16) 03CCA		4/5/2005	433,690.84	1,538,238.31	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(21-16) 03BAB		3/28/2006	434,362.30	1,542,180.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 09CAA		8/7/2002	461,394.12	1,565,882.48	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 19CBB		1/1/1982	448,678.32	1,555,517.86	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 23CCD-R		1/1/1965	462,777.00	1,553,272.99	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33BBB		2/12/1957	458,537.57	1,547,194.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33DBD-R		9/12/2000	458,785.69	1,544,117.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 33CCC-R		3/10/2002	454,954.75	1,542,710.36	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 02ABD		3/12/2005	441,689.66	1,573,161.94	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 03CBA		12/11/1979	433,192.69	1,571,483.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 03CBB		6/30/1980	433,163.49	1,571,234.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 05DBA		1/1/1980	425,840.28	1,571,262.33	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 06DBA		11/26/2005	419,671.40	1,571,278.47	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07ADD		4/9/1974	421,928.07	1,566,807.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DAA		10/17/1987	422,008.92	1,566,304.63	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07DCC		8/4/2002	418,486.97	1,564,028.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 07ABD		4/1/2006	419,554.71	1,567,981.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 10CAA		10/15/2006	435,070.71	1,568,982.09	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCC		10/4/1974	433,084.30	1,568,776.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15AAB		1/1/1980	437,048.87	1,583,300.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 15CCC		8/11/1993	433,097.36	1,558,693.87	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 16CCA		11/30/1998	432,804.28	1,559,288.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/5/2002	427,048.37	1,559,011.43	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 17DDD		7/12/2002	427,128.23	1,558,708.48	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 19BAA		8/1/1973	417,388.83	1,558,090.68	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20CBC		11/10/1997	422,609.86	1,554,765.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20DAA		8/8/2002	427,126.38	1,555,418.54	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 20CBC		5/10/2004	422,609.86	1,554,765.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-15) 26BAC		8/1/1967	439,052.32	1,551,908.20	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 27DDD		11/16/1973	437,986.65	1,547,764.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BBA		11/30/1998	428,628.92	1,552,472.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28CDA		11/21/2000	429,763.98	1,551,624.33	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 28BDA		2/2/2001	429,681.83	1,551,825.34	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		10/5/1990	427,127.56	1,552,774.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		11/30/1998	417,706.93	1,558,016.88	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 29AAA		9/8/2004	427,032.32	1,552,765.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 32DDD		1/1/2006	427,107.05	1,542,867.93	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33BCD		8/16/1973	428,423.19	1,545,561.39	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CDC		10/7/1974	428,916.42	1,542,832.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 33CCD		9/10/2002	428,432.42	1,542,862.03	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 34CBC		11/8/1990	433,103.11	1,544,172.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(22-16) 34BCA		8/30/2000	433,711.43	1,546,134.44	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 09ADD		4/17/1998	500,771.52	1,603,443.78	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-14) 06AAA-R		12/11/1989	490,498.24	1,605,974.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 14CCC-R		11/16/1973	464,099.39	1,588,937.91	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 30CBB		12/5/1979	448,789.88	1,581,988.99	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-15) 35BAB-R		1/5/2004	470,715.84	1,579,426.29	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 03BBD		11/18/2005	434,813.76	1,604,912.96	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 09ADA-R		8/1/1973	432,882.87	1,599,432.82	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 09DAB-R		12/5/1979	434,010.10	1,597,850.42	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 16BDB-R		2/2/1973	436,819.14	1,590,855.88	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(23-16) 33CCC-R		1/25/2003	427,763.14	1,573,962.95	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 09CBB-R		10/9/2002	490,609.66	1,629,620.69	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 19ABD-R		9/12/2002	487,897.17	1,620,524.38	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 28DBC		4/8/1997	493,625.97	1,612,880.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29AAB		1/1/1980	489,837.55	1,618,091.20	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29BAD-R		2/2/1996	490,536.89	1,615,201.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 28AAA		1/16/1997	490,801.14	1,616,422.07	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29ABA		3/18/2005	489,379.94	1,615,248.46	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 29BBA		1/12/2006	489,276.58	1,616,643.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-14) 33AAD		2/1/1998	495,494.73	1,610,011.67	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 01BCC		5/23/2004	475,325.48	1,635,586.68	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05CBD		11/30/1998	454,830.45	1,634,126.08	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05BBC		10/26/2004	454,176.28	1,637,115.94	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 05DAC		4/19/2005	457,540.87	1,633,633.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11CBB-R		1/1/1980	469,507.82	1,629,714.74	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BCA-R		1/12/1990	469,408.79	1,630,875.11	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 11BAA-R		2/15/2006	469,388.48	1,631,984.58	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 13ADA-R		1/1/1980	481,373.79	1,625,770.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 16BBB		11/30/1988	448,817.21	1,626,828.06	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 27CCC-R		1/3/2006	464,201.19	1,611,649.40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28DDD-R		1/26/1976	464,099.20	1,611,470.53	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CCA		1/1/1980	460,111.85	1,612,117.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 28CAC		4/13/2004	460,775.67	1,612,782.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 32BBD		7/20/1981	454,979.40	1,609,710.87	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 32ACA		4/11/1982	457,710.14	1,609,836.82	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-15) 33BBB		1/6/1976	459,169.94	1,610,946.70	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 07CAA-R		1/1/1980	418,446.13	1,629,398.81	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08BDB-R		1/1/1978	423,489.17	1,631,010.34	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08DCA-R		1/1/1980	427,235.02	1,628,444.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 08ACA		10/9/1989	425,924.90	1,630,892.41	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 10CAA		9/1/2001	434,778.40	1,629,067.90	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 10AAA		9/8/2001	437,837.48	1,632,357.80	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 11DDD		6/4/1986	442,830.63	1,627,231.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 19ADC		3/16/2001	421,376.18	1,621,012.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 26ABA-R		8/30/2002	441,531.11	1,616,276.03	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 26CDB-R		12/6/2005	437,859.48	1,612,637.96	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34DDB-R		1/1/1980	436,082.10	1,606,629.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34CAD		1/1/1980	436,134.26	1,607,557.62	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(24-16) 34BDA		9/6/2001	436,141.41	1,608,639.01	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 23BBB		3/23/2001	434,236.72	1,648,906.04	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 30CCB		7/13/1995	413,479.26	1,644,629.72	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-16) 31ACB		12/8/2005	415,927.62	1,641,953.28	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(25-17) 13AAA		5/10/2001	412,901.88	1,659,375.80	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23BCA-R		2/2/1981	407,440.27	1,652,814.88	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23BDD-R		1/1/2006	407,586.39	1,651,767.29	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 18AA		5/12/2001	419,480.26	1,669,105.40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 26C		3/7/2000	435,266.00	1,676,675.21	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 27ABD		4/20/1986	400,403.18	1,678,477.52	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 28DDC		3/20/1983	427,983.74	1,675,479.60	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25

MONTGOMERY & ASSOCIATES

TABLE 4. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, MAXIMUM CUMULATIVE IMPACTS

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	NORTHING (feet)	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET 2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
B(26-16) 29BBB		2/8/1991	418,627.70	1,686,298.27	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29BBB		1/27/1992	417,300.93	1,679,805.91	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD		7/16/1992	423,296.65	1,675,634.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 29DDD		12/15/1992	423,238.87	1,676,462.20	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-16) 30DDD		8/31/1999	418,166.70	1,678,506.58	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CCC		2/1/1970	404,148.15	1,680,707.03	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CDD		9/20/1999	408,015.51	1,680,773.94	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 23CBB		11/4/1999	402,586.76	1,682,636.45	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 25BBB		2/16/1999	405,602.83	1,696,894.51	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 27ACA		10/1/1956	401,088.27	1,679,401.21	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-17) 35AAA		1/1/1959	409,766.10	1,670,152.64	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 01BDB-R		7/20/1980	377,548.70	1,703,627.30	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03BDB		1/1/1980	367,283.64	1,700,289.67	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 03ADD		12/19/2005	370,682.36	1,699,617.87	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DBB-R		11/2/1989	359,006.29	1,699,731.37	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 05DCB		6/25/2004	358,034.76	1,697,701.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09CAD		1/1/1980	362,665.01	1,693,055.79	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 09DBC		6/12/1981	363,317.67	1,693,051.39	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(26-18) 17AAC		6/25/1981	356,340.52	1,690,427.64	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 28CBD		2/20/1985	424,467.87	1,708,683.65	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-16) 29CCD		1/1/1993	419,166.43	1,707,362.53	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 05ADC		1/1/1980	391,064.18	1,731,253.77	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 06ADC		10/20/1980	391,067.37	1,731,267.14	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 13ABD		1/17/1994	410,230.32	1,721,801.84	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(27-17) 23CAC		10/20/1977	403,317.88	1,714,251.10	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-16) 07ADD		5/1/1968	389,154.88	1,749,712.73	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31DDD		10/5/1957	386,483.26	1,733,606.06	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31CCC		1/1/1963	382,470.05	1,734,343.00	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-17) 31AAA		12/11/1979	386,481.23	1,738,521.56	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13DCB		6/1/1957	379,200.74	1,750,387.40	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(28-18) 13CDA		1/1/1980	378,705.30	1,750,393.15	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
B(29-18) 01CCC		8/3/1979	375,607.77	1,792,432.26	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Total Annual Pumping					33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71	33.71
Simulated Other Committed Demand (OCD) Wells:																																									
B(23-16) 29-R	Amellate Acres, Sunward Hol Rn	1/1/2007	442,853.62	1,575,898.69	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(23-15) 11-R	Arizona West Tract 1112	1/1/2007	461,808.83	1,592,658.82	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7	81.7
B(22-17) 11-R	Cedar Ridge Estates	1/1/2007	423,794.49	1,561,792.41	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 14-R	Cedar Ridge Estates	1/1/2007	423,723.30	1,558,479.27	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 12-R	Cerbat Ranches Unit 1	1/1/2007	429,032.99	1,561,771.85	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1	71.1
B(22-17) 01-R	Cerbat Water Company	1/1/2007	429,081.81	1,567,101.64	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 12-R	Cerbat Water Company	1/1/2007	429,032.69	1,561,771.85	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(22-17) 13-R	Cerbat Water Company	1/1/2007	429,039.87	1,556,472.83	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-17) 36-R	Cerbat Water Company	1/1/2007	429,149.97	1,572,363.64	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5	220.5
B(23-16) 31-R	Esmeralda Acres/Sunward Hol	1/1/2007	438,989.22	1,570,642.83	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
B(22-17) 13-R	Fountain Hills Estates	1/1/2007	429,039.87	1,556,472.83	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.	16.
B(22-16) 05	Greater Kingman Industrial Park	1/1/2007	458,442.34	1,571,495.01	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	458,439.76	1,560,933.10	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
B(22-16) 06	Greater Kingman Industrial Park	1/1/2007	458,442.34	1,571,495.01	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(22-15) 17	Greater Kingman Industrial Park	1/1/2007	458,439.76	1,560,933.10	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2	39.2
B(23-16) 07-R	Hillview Ranches	1/1/2007	436,272.15	1,594,647.84	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
B(22-16) 12	Hualapai Vista Estates, Tract 3811	1/1/2007	445,971.17	1,548,236.49	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
B(22-16) 13	Hualapai Vista Estates, Tract 3811	1/1/2007	446,964.49	1,550,956.45	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.	6.
B(28-17) 06-R	Joshua Park Unit #1	1/1/2007	387,248.72	1,751,655.19	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
B(28-17) 09-R	Joshua Park Unit 1	1/1/2007	392,298.66	1,756,411.21	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(28-17) 09-R	Joshua Park Unit No. 1	1/1/2007	389,277.69	1,760,099.39	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7
B(28-17) 08-R	Joshua Park Unit No. 1	1/1/2007	390,424.37	1,746,760.62	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
B(22-17) 11-R	Lake Juniper	1/1/2007	423,794.49	1,561,792.41	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 14-R	Lake Juniper	1/1/2007	423,723.30	1,558,479.27	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.	4.
B(22-17) 11-R	Lake Juniper Estates	1/1/2007	423,794.49	1,561,792.41	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(22-17) 14-R	Lake Juniper Estates	1/1/2007	423,723.30	1,558,479.27	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.3
B(25-15) 02-R	Lake Mead Rancheros	1/1/2007	467,647.73	1,865,180.76	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5	1,342.5
B(25-15) 19	Lake Mead Rancheros	1/1/2007	447,311.60	1,861,448.34	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(26-15) 21	Lake Mead Rancheros	1/1/2007	457,901.41	1,861,439.33	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5	63.5
B(25-15) 27	Lake Mead Rancheros #1-12	1/1/2007	463,162.22	1,846,121.18	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 29	Lake Mead Rancheros #1-12	1/1/2007	462,698.20	1,846,153.47	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 31	Lake Mead Rancheros #1-12	1/1/2007	447,286.88	1,840,870.90	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7	209.7
B(25-15) 31	Lake Mead Rancheros Unit 10	1/1/2007	447,286.88	1,840,870.90	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3
B(26-16) 13-R	Lake Mead Rancheros, Unit 1	1/1/2007	466,936.38	1,853,113.34	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3	48.3
B(26-16) 06	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	482,638.42	1,867,278.66	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 09	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	457,892.29	1,861,894.61	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-16) 17	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	482,606.32	1,856,712.06	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(25-15) 27	Lake Mead Rancheros, Units 3, 8, 14, 16	1/1/2007	463,162.22	1,846,121.18	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1	33.1
B(26-18) 13	Lake Mead Ranchos Unit 2	1/1/2007	379,056.14	1,762,060.79	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
B(28-18) 11-R	Lake Mead Ranchos Unit 3	1/1/2007	378,022.28	1,768,338.07	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.	35.
B(28-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,676.80	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(28-18) 01	Lake Mead Ranchos Unit 4	1/1/2007	379,110.22	1,762,678.80	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3	192.3
B(29-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,578.90	1,778,531.55	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
B(29-18) 23	Lake Mead Ranchos Unit 7	1/1/2007	371,578.90	1,778,531.55	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.	222.
B(29-18) 27-R	Lake Mead Ranchos, Unit 6	1/1/2007	371,227.57	1,773,403.29	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9	180.9
B(26-18) 01-R	Lake Mohave Ranchos	1/1/2007	375,606.20	1,706,097.00	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 03	Lake Mohave Ranchos	1/1/2007	368,271.69	1,699,300.35	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 05-R	Lake Mohave Ranchos	1/1/2007	361,291.93	1,697,369.24	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 07-R	Lake Mohave Ranchos	1/1/2007	359,122.53	1,694,357.83	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 09	Lake Mohave Ranchos	1/1/2007	362,984.35	1,694,046.01	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 11-R	Lake Mohave Ranchos	1/1/2007	370,527.10	1,700,836.30	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 13-R	Lake Mohave Ranchos	1/1/2007	373,984.00	1,701,167.80	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-18) 15-R	Lake Mohave Ranchos	1/1/2007	365,237.30	1,696,559.10	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1	18.1
B(26-19) 25-R	Lake Mohave Ranchos	1/1/2007	360,476.90	1,692,654.70	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1	24.1

MONTGOMERY & ASSOCIATES

TABLE 4. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, MAXIMUM CUMULATIVE IMPACTS

LOCATION COORDINATES*; SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	EASTING (feet)	NORTHING (feet)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
B(26-19) 26-R	Lake Mohave Ranchos, Unit 6	1/1/2007	381,537.00	1,882,056.40	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	Mead-O-Rama #2	1/1/2007	376,972.11	1,774,424.25	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(26-18) 35-R	Mead-O-Rama #3	1/1/2007	375,043.42	1,789,300.83	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(26-17) 31-R	Mead-O-Rama #4	1/1/2007	376,835.99	1,765,991.94	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(26-18) 36-R	Mead-O-Rama Unit No. 3	1/1/2007	375,663.06	1,766,134.85	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(20-15) 06-R	Pinion Pines Estates #2	1/1/2007	452,872.94	1,841,717.19	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	Quail Valley Estates	1/1/2007	429,082.68	1,561,771.85	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(26-18) 01	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,081.85	1,667,316.83	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 11	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,792.73	1,662,037.17	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 23	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,764.26	1,651,462.12	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-18) 26	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	442,027.75	1,646,164.85	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 35	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	436,736.38	1,640,905.01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 19-R	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	444,210.74	1,681,826.11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 31	Realsite Arizona Ranchettes Units 1,3,4,6,7,8, and 9	1/1/2007	447,361.05	1,672,678.46	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	Red Wing Canyon Estates	1/1/2007	445,736.73	1,586,185.02	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	490,002.40	1,619,900.52	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 36-R	Shadow Mountain Acres Unit Two & Three	1/1/2007	495,276.11	1,611,616.53	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	Sunny Highlands Estates, Tract 1132, Phase 1-20 Lots	1/1/2007	483,344.51	1,606,771.94	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-18) 09-R	Sunnyvale Acres, Sunward Hol Ranches #2	1/1/2007	435,207.88	1,601,657.64	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-18) 33-R	Sunrise Mountain Estates	1/1/2007	431,949.28	1,576,490.35	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-18) 19-R	Sunward Hol Ranches	1/1/2007	438,210.53	1,584,157.55	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	Sunward Hol Ranches	1/1/2007	438,008.38	1,576,922.23	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 31-R	Sunward Hol Ranches	1/1/2007	435,989.22	1,570,642.83	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 32-R	Sunward Hol Ranches	1/1/2007	438,213.59	1,579,201.89	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	Sunward Hol Ranches Turquoise Acres	1/1/2007	438,008.38	1,576,922.23	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-18) 18-R	Toro Acres, Sunward Hol #2	1/1/2007	438,213.12	1,589,426.29	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-18) 19-R	Toro Acres, Sunward Hol #2	1/1/2007	438,210.53	1,584,157.55	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	Valle Vista	1/1/2007	456,598.45	1,587,379.30	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	Valle Vista #1A,3A	1/1/2007	456,612.41	1,592,663.10	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 15-R	Valle Vista #1A,3A	1/1/2007	456,598.45	1,587,379.30	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
B(23-15) 03-R	Valle Vista Unit 2 Tract 1200, Lots 860, 861, 996, 1078, 1709, 1631, and 1907	1/1/2007	496,616.99	1,597,947.49	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-15) 34	Valle Vista Unit 3- Tract 1204	1/1/2007	436,465.93	1,608,549.29	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-16) 06-R	Zafiro Acres-Sunward Ho Ranches	1/1/2007	425,495.38	1,587,841.96	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping					9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Simulated Production Wells (Marden Ranch):																
Eno #1		1/1/2012	386,358.66	1,733,066.24	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
Stockton Well		1/2/2012	386,358.69	1,738,095.18	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
Pocket Well		1/3/2012	379,358.84	1,760,165.98	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-1		1/4/2012	375,358.06	1,763,361.58	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-2		1/5/2012	382,358.84	1,756,195.95	0.	0.	0.	0.	0.	0.	3.2	6.5	9.7	12.9	16.1	19.4
MR-3		1/6/2012	384,358.76	1,746,142.07	0.	0.	0.	0.	0.	0.	3.2	6.5	9.7	12.9	16.1	19.4
MR-4		1/7/2012	389,358.68	1,741,112.17	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-5		1/8/2012	387,358.70	1,741,112.15	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-6		1/9/2012	389,358.61	1,737,089.26	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-7		1/10/2012	393,358.61	1,736,083.26	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-8		1/11/2012	393,358.59	1,734,071.29	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-9		1/12/2012	428,358.46	1,685,788.86	0.	0.	0.	0.	0.	0.	54.9	109.7	164.6	219.5	274.3	329.2
MR-10		1/13/2012	426,358.51	1,684,780.85	0.	0.	0.	0.	0.	0.	54.9	109.7	164.6	219.5	274.3	329.2
MR-11		1/14/2012	380,358.86	1,754,189.94	0.	0.	0.	0.	0.	0.	3.2	6.5	9.7	12.9	16.1	19.4
MR-12		1/15/2012	382,358.80	1,748,154.03	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-13		1/16/2012	386,358.74	1,746,136.10	0.	0.	0.	0.	0.	0.	3.2	6.5	9.7	12.9	16.1	19.4
MR-14		1/17/2012	380,358.86	1,739,101.20	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-15		1/18/2012	384,358.70	1,736,077.20	0.	0.	0.	0.	0.	0.	8.1	16.1	24.2	32.3	40.3	48.4
MR-16		1/19/2012	383,358.77	1,745,136.07	0.	0.	0.	0.	0.	0.	3.2	6.5	9.7	12.9	16.1	19.4
MR-17		1/20/2012	382,358.78	1,746,142.05	0.	0.	0.	0.	0.	0.	6.5	12.9	19.4	25.8	32.3	38.7
Total Annual Pumping					0.	0.	0.	0.	0.	0.	229.2	458.3	687.5	916.7	1,145.8	1,375.
Simulated Production Wells (Rhodes Homes Development):																
M-PH1		1/1/2007	448,765.50	1,853,398.06	0.	0.	0.	0.	0.	0.	34.5	69.	103.5	138.	172.5	207.
M-PH2		1/1/2007	446,806.06	1,856,455.69	0.	0.	0.	0.	0.	0.	34.5	69.	103.5	138.	172.5	207.
M-PH3		1/1/2007	444,829.80	1,856,804.14	0.	0.	0.	0.	0.	0.	55.1	110.2	165.3	220.4	275.5	330.6
M-PH4		1/1/2007	459,317.10	1,873,906.57	0.	0.	0.	0.	0.	0.	55.1	110.2	165.3	220.4	275.5	330.6
M-PH5		1/1/2007	459,268.81	1,869,383.91	0.	0.	0.	0.	0.	0.	55.1	110.2	165.3	220.4	275.5	330.6
M-PH6		1/1/2007	459,330.73	1,865,238.00	0.	0.	0.	0.	0.	0.	34.5	69.	103.5	138.	172.5	207.
Total Annual Pumping					0.	0.	0.	0.	0.	0.	268.8	537.6	806.4	1,075.2	1,344.	1,612.8
M-PY1		1/1/2007	453,685.20	1,819,950.98	0.	0.	0.	0.	0.	0.	64.2	128.5	192.7	256.9	321.2	385.4
Total Annual Pumping					0.	0.	0.	0.	0.	0.	64.2	128.5	192.7	256.9	321.2	385.4
M-HR1		1/1/2007	449,111.25	1,821,529.99	0.	0.	0.	0.	0.	0.	42.	83.9	125.9	167.8	209.8	251.7
M-HR2		1/1/2007	453,519.95	1,821,427.57	0.	0.	0.	0.	0.	0.	42.	83.9	125.9	167.8	209.8	251.7
Total Annual Pumping					0.	0.	0.	0.	0.	0.	83.9	167.8	251.7	335.7	419.6	503.5
M-NR1		1/1/2007	437,596.10	1,841,020.23	0.	0.	0.	0.	0.	0.	56.5	112.9	169.4	225.9	282.3	338.8
M-NR2		1/1/2007	436,431.53	1,834,012.83	0.	0.	0.	0.	0.	0.	56.5	112.9	169.4	225.9	282.3	338.8
Total Annual Pumping					0.	0.	0.	0.	0.	0.	112.9	225.8	338.8	451.7	564.7	677.6
M-RL1		1/1/2012	407,181.27	1,881,353.33	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL2		1/2/2012	402,311.44	1,877,409.35	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL3		1/3/2012	417,871.36	1,895,887.75	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL4		1/4/2012	415,564.06	1,703,900.67	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL5		1/5/2012	405,944.28	1,890,490.13	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL6		1/6/2012	424,283.91	1,895,841.70	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL7		1/7/2012	413,616.84	1,674,781.24	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL9		1/8/2012	428,385.19	1,895,905.06	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7
M-RL10		1/9/2012	413,592.84	1,665,332.01	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7

CADASTRAL LOCATION OR MODEL WELL NAME	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
B(26-19) 26-R	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(26-18) 35-R	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(26-17) 31-R	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(26-18) 36-R	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(20-15) 06-R	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(26-18) 01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 23	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-18) 26	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 35	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 19-R	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 31	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 36-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-18) 09-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-18) 33-R	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-18) 19-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 31-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 32-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-18) 18-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-18) 19-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 15-R	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
B(23-15) 03-R	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-15) 34	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-16) 06-R	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Simulated Production Wells (Marden Ranch):												
Eno #1	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
Stockton Well	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
Pocket Well	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-1	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-2	22.6	25.8	29.	32.3	35.5	38.7	42.	45.2	48.4	51.6	54.9	58.1
MR-3	22.6	25.8	29.	32.3	35.5	38.7	42.	45.2	48.4	51.6	54.9	58.1
MR-4	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-5	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-6	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-7	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-8	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-9	384.1	439.	493.8	548.7	603.6	658.4	713.3	768.2	823.	877.9	932.8	987.7
MR-10	384.1	439.	493.8	548.7	603.6	658.4	713.3	768.2	823.	877.9	932.8	987.7
MR-11	22.6	25.8	29.	32.3	35.5	38.7	42.	45.2	48.4	51.6	54.9	58.1
MR-12	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-13	22.6	25.8	29.	32.3	35.5	38.7	42.	45.2	48.4	51.6	54.9	58.1
MR-14	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-15	56.5	64.6	72.6	80.7	88.8	96.8	104.9	113.	121.	129.1	137.2	145.2
MR-16	22.6	25.8	29.	32.3	35.5	38.7	42.	45.2	48.4	51.6	54.9	58.1
MR-17	45.2	51.6	58.1	64.6	71.	77.5	83.9	90.4	96.8	103.3	109.7	116.2
Total Annual Pumping	1,604.1	1,833.3	2,062.5	2,291.6	2,520.8	2,750.	2,979.1	3,208.3	3,437.5	3,666.6	3,895.8	4,124.9
Simulated Production Wells (Rhodes Homes Development):												
M-PH1	241.5	276.	310.5	345.	379.5	414.	448.5	483.	517.5	552.	586.5	621.
M-PH2	241.5	276.	310.5	345.	379.5	414.	448.5	483.	517.5	552.	586.5	621.
M-PH3	385.7	440.8	495.9	551.	606.1	661.2	716.3	771.4	826.5	881.6	936.7	991.8
M-PH4	385.7	440.8	495.9	551.	606.1	661.2	716.3	771.4	826.5	881.6	936.7	991.8
M-PH5	385.7	440.8	495.9	551.	606.1	661.2	716.3	771.4	826.5	881.6	936.7	991.8
M-PH6	241.5	276.	310.5	345.	379.5	414.	448.5	483.	517.5	552.	586.5	621.
Total Annual Pumping	1,881.6	2,150.4	2,419.2	2,688.	2,956.8	3,225.6	3,494.4	3,763.2	4,032.	4,300.8	4,569.6	4,838.4
M-PY1	449.6	513.9	578.1	642.4	706.6	770.8	835.1	899.3	963.5	1,027.8	1,092.	1,156.2
Total Annual Pumping	449.6	513.9	578.1	642.4	706.6	770.8	835.1	899.3	963.5	1,027.8	1,092.	1,156.2
M-HR1	293.7	335.7	377.6	419.6	461.5	503.5	545.4	587.4	629.4	671.3	713.3	755.2
M-HR2	293.7	335.7	377.6	419.6	461.5	503.5	545.4	587.4	629.4	671.3	713.3	755.2
Total Annual Pumping	587.4	671.3	755.2	839.1	923.1	1,007.	1,090.9	1,174.8	1,258.7	1,342.6	1,426.5	1,510.5
M-NR1	395.3	451.7	508.2	564.7	621.1	677.6	734.1	790.5	847.	903.5	960.	1,016.4
M-NR2	395.3	451.7	508.2	564.7	621.1	677.6	734.1	790.5	847.	903.5	960.	1,016.4
Total Annual Pumping	790.5	903.5	1,016.4	1,129.4	1,242.3	1,355.2	1,468.2	1,581.1	1,694.	1,807.	1,919.9	2,032.8
M-RL1	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL2	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL3	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL4	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL5	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL6	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL7	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL9	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.
M-RL10	348.4	398.2	448.	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.

CADASTRAL LOCATION OR MODEL WELL NAME	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042
B(26-19) 26-R	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
B(26-19) 27-R	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6	86.6
B(26-18) 35-R	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2	55.2
B(26-17) 31-R	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7	172.7
B(26-18) 36-R	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7	1,250.7
B(20-15) 06-R	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
B(22-17) 12-R	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7	15.7
B(26-18) 01	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 11	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-18) 23	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(25-18) 26	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 35	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 19-R	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(26-15) 31	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
B(23-17) 23-R	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8
B(24-14) 27-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(24-14) 36-R	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
B(23-14) 03-R	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
B(23-18) 09-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-18) 33-R	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8
B(23-18) 19-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 31-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 32-R	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1	42.1
B(23-18) 30-R	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
B(23-18) 18-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-18) 19-R	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
B(23-15) 15-R	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4	3,267.4
B(23-15) 10-R	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
B(23-16) 15-R	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
B(23-15) 03-R	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
B(24-15) 34	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
B(22-16) 06-R	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Total Annual Pumping	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7	9,762.7
Simulated Production Wells (Marden Ranch):													
Eno #1	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
Stockton Well	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
Pocket Well	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-1	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-2	61.3	64.6	67.8	71.	74.2	77.5	80.7	83.9	87.1	90.4	93.6	96.8	100.1
MR-3	61.3	64.6	67.8	71.	74.2	77.5	80.7	83.9	87.1	90.4	93.6	96.8	100.1
MR-4	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-5	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-6	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-7	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-8	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-9	1,042.6	1,097.4	1,152.3	1,207.1	1,262.	1,316.9	1,371.7	1,426.6	1,481.5	1,536.4	1,591.2	1,646.1	1,701.
MR-10	1,042.6	1,097.4	1,152.3	1,207.1	1,262.	1,316.9	1,371.7	1,426.6	1,481.5	1,536.4	1,591.2	1,646.1	1,701.
MR-11	61.3	64.6	67.8	71.	74.2	77.5	80.7	83.9	87.1	90.4	93.6	96.8	100.1
MR-12	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-13	61.3	64.6	67.8	71.	74.2	77.5	80.7	83.9	87.1	90.4	93.6	96.8	100.1
MR-14	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-15	153.3	161.4	169.5	177.5	185.6	193.7	201.7	209.8	217.9	225.9	234.	242.1	250.1
MR-16	61.3	64.6	67.8	71.	74.2	77.5	80.7	83.9	87.1	90.4	93.6	96.8	100.1
MR-17	122.7	129.1	135.6	142.	148.5	154.9	161.4	167.8	174.3	180.7	187.2	193.7	200.1
Total Annual Pumping	4,354.1	4,583.3	4,812.4	5,041.6	5,270.8	5,499.9	5,729.1	5,958.3	6,187.4	6,416.6	6,645.7	6,874.9	7,104.1
Simulated Production Wells (Rhodes Homes Development):													
M-PH1	655.5	690.	724.5	759.	793.5	828.	862.5	897.	931.5	966.	1,000.5	1,035.	1,069.5
M-PH2	655.5	690.	724.5	759.	793.5	828.	862.5	897.	931.5	966.	1,000.5	1,035.	1,069.5
M-PH3	1,046.9	1,102.	1,157.1	1,212.2	1,267.3	1,322.4	1,377.5	1,432.6	1,487.7	1,542.8	1,597.9	1,653.	1,708.1
M-PH4	1,046.9	1,102.	1,157.1	1,212.2	1,267.3	1,322.4	1,377.5	1,432.6	1,487.7	1,542.8	1,597.9	1,653.	1,708.1
M-PH5	1,046.9	1,102.	1,157.1	1,212.2	1,267.3	1,322.4	1,377.5	1,432.6	1,487.7	1,542.8	1,597.9	1,653.	1,708.1
M-PH6	655.5	690.	724.5	759.	793.5	828.	862.5	897.	931.5	966.	1,000.5	1,035.	1,069.5
Total Annual Pumping	5,107.2	5,376.	5,644.8	5,913.6	6,182.4	6,451.2	6,720.	6,988.8	7,257.6	7,526.4	7,795.2	8,064.	8,332.8
M-PY1	1,220.5	1,284.7	1,348.9	1,413.2	1,477.4	1,541.6	1,605.9	1,670.1	1,734.3	1,798.6	1,862.8	1,927.1	1,991.3
Total Annual Pumping	1,220.5	1,284.7	1,348.9	1,413.2	1,477.4	1,541.6	1,605.9	1,670.1	1,734.3	1,798.6	1,862.8	1,927.1	1,991.3
M-HR1	797.2	839.1	881.1	923.1	965.	1,007.	1,048.9	1,090.9	1,132.8	1,174.8	1,216.8	1,258.7	1,300.7
M-HR2	797.2	839.1	881.1	923.1	965.	1,007.	1,048.9	1,090.9	1,132.8	1,174.8	1,216.8	1,258.7	1,300.7
Total Annual Pumping	1,594.4	1,678.3	1,762.2	1,846.1	1,930.	2,013.9	2,097.9	2,181.8	2,265.7	2,349.6	2,433.5	2,517.4	2,601.3
M-NR1	1,072.9	1,129.4	1,185.8	1,242.3	1,298.8	1,355.2	1,411.7	1,468.2	1,524.6	1,581.1	1,637.6	1,694.	1,750.5
M-NR2	1,072.9	1,129.4	1,185.8	1,242.3	1,298.8	1,355.2	1,411.7	1,468.2	1,524.6	1,581.1	1,637.6	1,694.	1,750.5
Total Annual Pumping	2,145.8	2,258.7	2,371.6	2,484.6	2,597.5	2,710.5	2,823.4	2,936.3	3,049.3	3,162.2	3,275.1	3,388.1	3,501.
M-RL1	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL2	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL3	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL4	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL5	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL6	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL7	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL9	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
M-RL10	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.

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TABLE 4. SUMMARY OF SIMULATED GROUNDWATER PUMPING FOR 1971 THROUGH 2042, MAXIMUM CUMULATIVE IMPACTS

CADASTRAL LOCATION OR MODEL WELL NAME	REGISTRY NUMBER OR WELL OWNER	COMPLETION DATE	LOCATION COORDINATES* EASTING (feet)	LOCATION COORDINATES* NORTHING (feet)	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
					SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET														
N-RL11		1/10/2012	407,451.08	1,676,700.94	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7	348.4	398.2	448.
N-RL12		1/11/2012	408,652.83	1,711,676.16	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7	348.4	398.2	448.
N-RL13		1/12/2012	403,229.81	1,708,265.12	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7	348.4	398.2	448.
N-RL14		1/13/2012	407,349.23	1,717,249.32	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7	348.4	398.2	448.
N-RL15		1/14/2012	403,676.49	1,696,321.71	0.	0.	0.	0.	0.	0.	49.8	99.6	149.3	199.1	248.9	298.7	348.4	398.2	448.
N-RL16		1/15/2012	417,471.12	1,689,156.66	0.	0.	0.	0.	0.	0.	34.4	68.7	103.1	137.4	171.8	206.2	240.5	274.9	309.2
N-RL17		1/16/2012	412,508.67	1,679,722.97	0.	0.	0.	0.	0.	0.	34.4	68.7	103.1	137.4	171.8	206.2	240.5	274.9	309.2
N-RL18		1/17/2012	412,594.12	1,690,696.44	0.	0.	0.	0.	0.	0.	34.4	68.7	103.1	137.4	171.8	206.2	240.5	274.9	309.2
N-RL19		1/18/2012	400,784.77	1,721,474.87	0.	0.	0.	0.	0.	0.	34.4	68.7	103.1	137.4	171.8	206.2	240.5	274.9	309.2
N-RL20		1/19/2012	420,621.01	1,679,601.13	0.	0.	0.	0.	0.	0.	34.4	68.7	103.1	137.4	171.8	206.2	240.5	274.9	309.2
Total Annual Pumping					0.	0.	0.	0.	0.	0.	862.7	1,737.3	2,606.	3,474.6	4,343.3	5,212.	6,080.6	6,949.3	7,817.9
Simulated Production Wells (Hualapai Valley Solar Project):																			
HVS-1		1/1/2013	420,783.01	1,681,611.30	0.	0.	0.	0.	0.	0.	0.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-2		1/2/2013	428,419.53	1,678,427.92	0.	0.	0.	0.	0.	0.	0.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-3		1/3/2013	420,978.06	1,676,024.34	0.	0.	0.	0.	0.	0.	0.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-4		1/4/2013	414,087.02	1,676,179.39	0.	0.	0.	0.	0.	0.	0.	750.	750.	750.	750.	750.	750.	750.	750.
Total Annual Pumping					0.	0.	0.	0.	0.	0.	0.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.
Annual Grand Total					19,093.7	19,441.1	19,789.4	20,138.7	20,483.1	20,830.4	22,495.4	27,799.5	29,733.5	31,748.6	33,746.4	35,756.4	37,782.	39,817.4	41,848.1

CADASTRAL LOCATION OR MODEL WELL NAME	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET														
N-RL11	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6
N-RL12	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6
N-RL13	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6
N-RL14	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6
N-RL15	497.8	547.6	597.3	647.1	696.9	746.6	796.4	846.2	896.	945.7	995.5	1,045.3	1,095.1	1,144.8	1,194.6
N-RL16	343.6	378.	412.3	446.7	481.	515.4	549.8	584.1	618.5	652.8	687.2	721.6	755.9	790.3	824.6
N-RL17	343.6	378.	412.3	446.7	481.	515.4	549.8	584.1	618.5	652.8	687.2	721.6	755.9	790.3	824.6
N-RL18	343.6	378.	412.3	446.7	481.	515.4	549.8	584.1	618.5	652.8	687.2	721.6	755.9	790.3	824.6
N-RL19	343.6	378.	412.3	446.7	481.	515.4	549.8	584.1	618.5	652.8	687.2	721.6	755.9	790.3	824.6
N-RL20	343.6	378.	412.3	446.7	481.	515.4	549.8	584.1	618.5	652.8	687.2	721.6	755.9	790.3	824.6
Total Annual Pumping	8,586.8	9,445.3	10,423.9	11,292.8	12,161.2	13,029.9	13,898.6	14,767.2	15,635.9	16,504.6	17,373.2	18,241.8	19,110.5	19,979.1	20,847.8
Simulated Production Wells (Hualapai Valley Solar Project):															
HVS-1	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-2	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-3	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.
HVS-4	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.	750.
Total Annual Pumping	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.
Annual Grand Total	44,429.6	46,373.7	48,733.4	50,909.1	53,101.3	55,310.3	57,536.8	59,781.3	62,044.5	64,326.3	66,627.3	68,949.6	71,292.5	73,656.7	76,042.9

CADASTRAL LOCATION OR MODEL WELL NAME	2036	2037	2038	2039	2040	2041	2042
	SIMULATED ANNUAL PUMPING RATE, IN ACRE-FEET						
N-RL11	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
N-RL12	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
N-RL13	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
N-RL14	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
N-RL15	1,244.4	1,294.2	1,343.9	1,393.7	1,443.5	1,493.3	1,543.
N-RL16	859.	893.4	927.7	962.1	996.4	1,030.8	1,065.2
N-RL17	859.	893.4	927.7	962.1	996.4	1,030.8	1,065.2
N-RL18	859.	893.4	927.7	962.1	996.4	1,030.8	1,065.2
N-RL19	859.	893.4	927.7	962.1	996.4	1,030.8	1,065.2
N-RL20	859.	893.4	927.7	962.1	996.4	1,030.8	1,065.2
Total Annual Pumping	21,716.5	22,585.1	23,453.8	24,322.4	25,191.1	26,059.8	26,928.4
Simulated Production Wells (Hualapai Valley Solar Project):							
HVS-1	750.	750.	750.	750.	750.	750.	750.
HVS-2	750.	750.	750.	750.	750.	750.	750.
HVS-3	750.	750.	750.	750.	750.	750.	750.
HVS-4	750.	750.	750.	750.	750.	750.	750.
Total Annual Pumping	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.	3,000.
Annual Grand Total	79,449.6	81,292.5	83,096.7	84,843.9	86,451.9	90,884.3	

* = Location coordinates are State Plane, U.S. feet, Arizona West, North American Datum 1927
"R" = Relocated Well. Well is located in the Hualapai Valley, but outside the active area for model. Well was relocated to the nearest active cell.

TABLE 5. RESULTS OF SIMULATED IMPACT FROM HUALAPAI VALLEY SOLAR PUMPING

SIMULATION	AFTER 5 YEARS OF PUMPING AT HVS				AFTER 30 YEARS OF PUMPING AT HVS			
	MAXIMUM DRAWDOWN AT HVS SITE (ft)	MAXIMUM DRAWDOWN DUE TO HVS (ft)	AREA INSIDE 1 FOOT CONTOUR DUE TO HVS (mi^2)	AREA INSIDE 10 FOOT CONTOUR DUE TO HVS (mi^2)	MAXIMUM DRAWDOWN AT HVS SITE (ft)	MAXIMUM DRAWDOWN DUE TO HVS (ft)	AREA INSIDE 1 FOOT CONTOUR DUE TO HVS (mi^2)	AREA INSIDE 10 FOOT CONTOUR DUE TO HVS (mi^2)
Base Case	< 1	---	---	---	5	---	---	---
HVS at 3,000 AF/yr	47	47	60.5	6.3	66	62	202.5	56.7
HVS at 2,400 AF/yr	38	38	54.2	4.4	54	50	188.8	38.8
HVS at 30 AF/yr	< 1	0.5	0	0	6	0.6	0	0
Maximum Cumulative	50	47	59.2	6.3	158	63	194.3	55.5

Abbreviations:

AF/yr = Acre-feet per year
HVS = Hualapai Valley Solar
ft = feet
mi^2 = square miles

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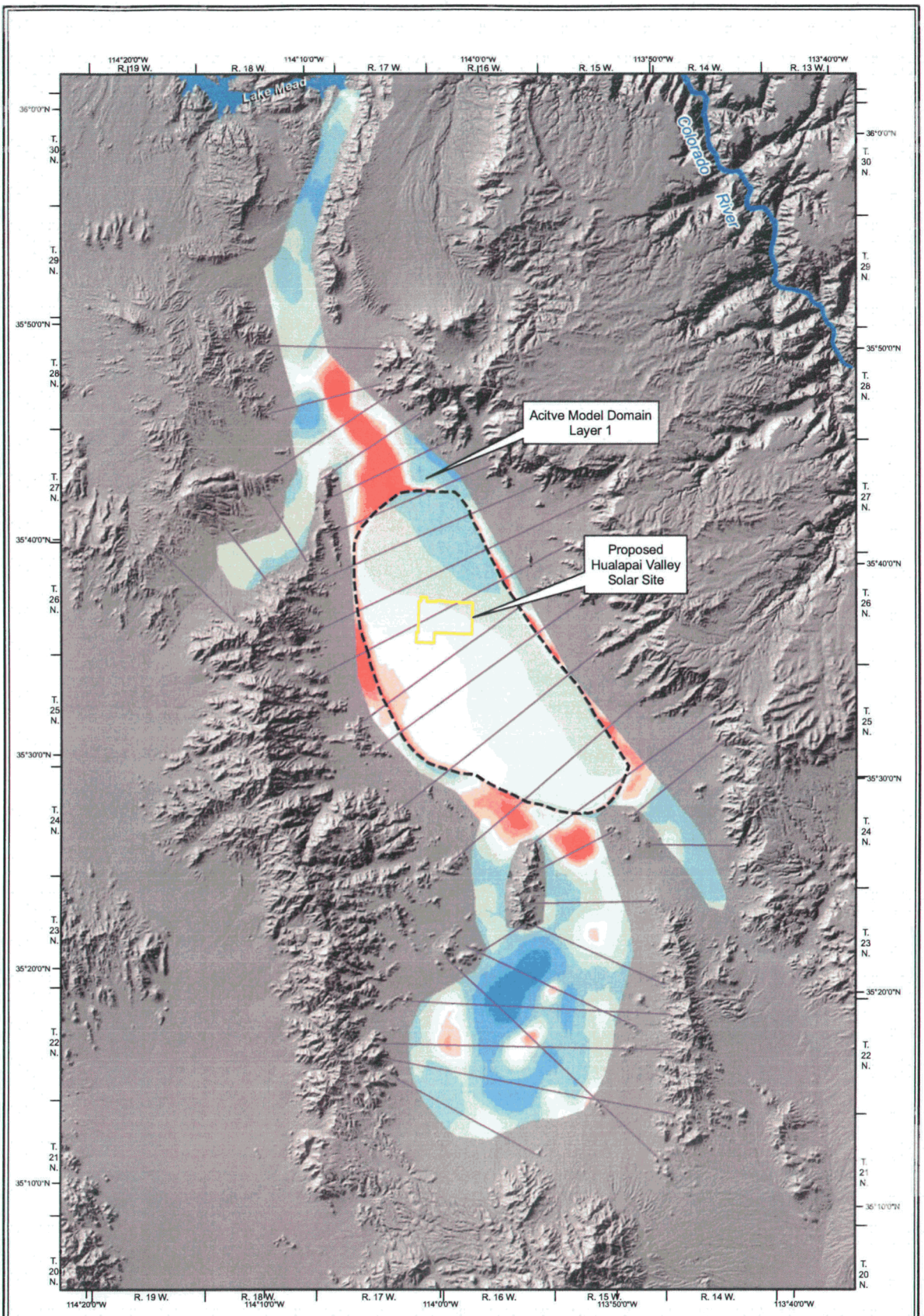
ILLUSTRATIONS



EXPLANATION

Bedrock Difference*

- -2,945 - -2,000
- -1,999 - -1,000
- -999 - -500
- -499 - -250
- -249 - -50
- -49 - 50
- 51 - 250
- 251 - 500
- 501 - 1,000
- 1,001 - 2,921

ADWR Gravity Profiles

HVS Site Boundary

Salt Formation Extent

*Difference values in feet.
Blues indicate M&A bedrock is lower than ADWR.
Reds indicate M&A bedrock is higher than ADWR

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

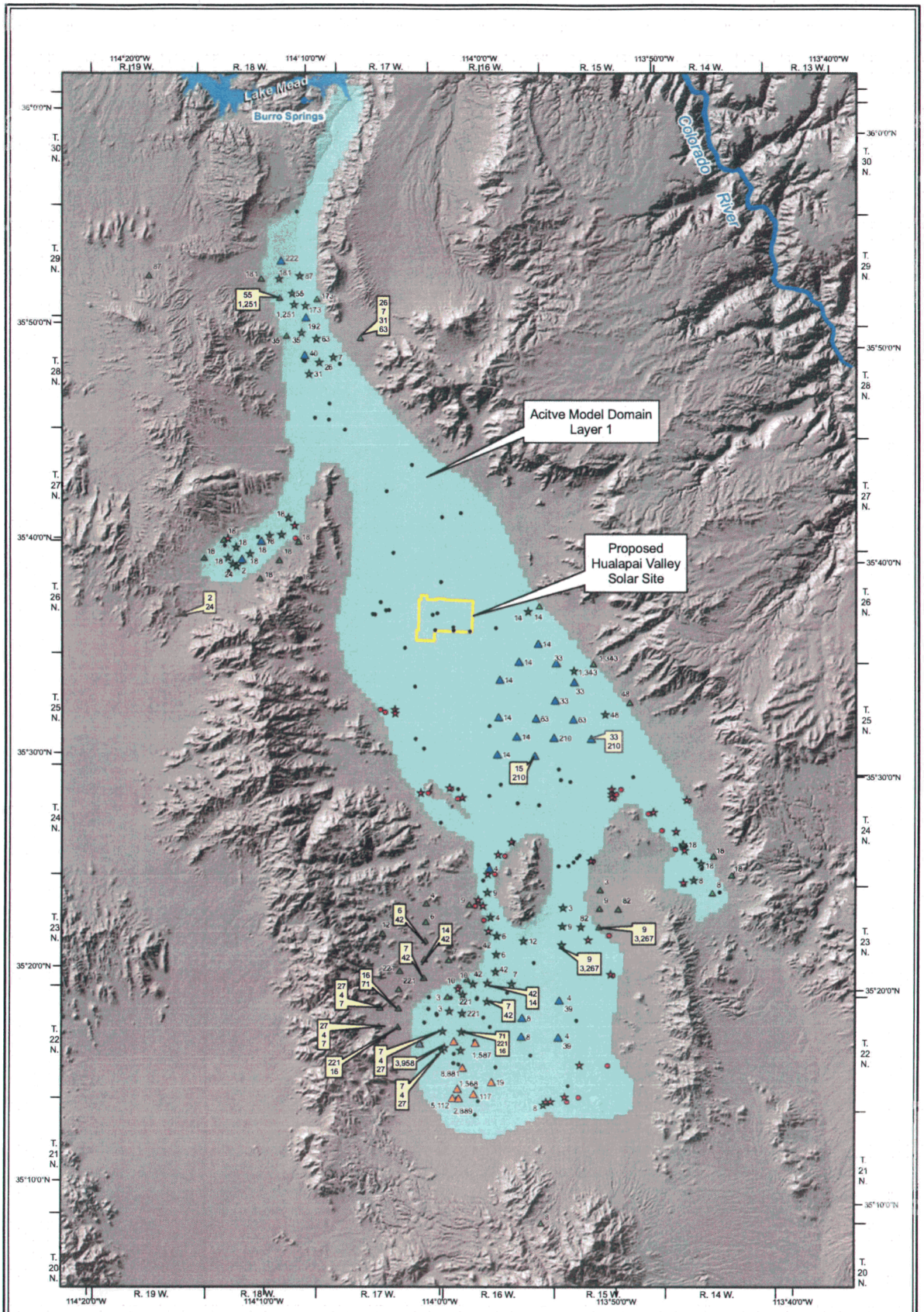
SIMULATED BEDROCK ALTITUDE COMPARED WITH ADWR GRAVITY SURVEY, 2009

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 1

GIS/1326/02/UpdatesDec09/BedrockComparison_Formatted.mxd/11Dec09



EXPLANATION

Simulated Wells in Groundwater Model and Maximum Pumping Rate, in AF/yr

- 5,112 City of Kingman
- 3,958 City of Kingman Relocated, Original Location
- 3,958 City of Kingman Relocated, New Location*
- 42 Other Committed Demand
- 221 Other Committed Demand Relocated, Original Location
- 221 Other Committed Demand Relocated, New Location*
- Domestic Well
- Domestic Well Relocated, Original Location
- Domestic Relocated, New Location*

*Well relocated within active model domain to ensure pumping is accounted for in model simulations

0 1 2 3 4 5
Miles

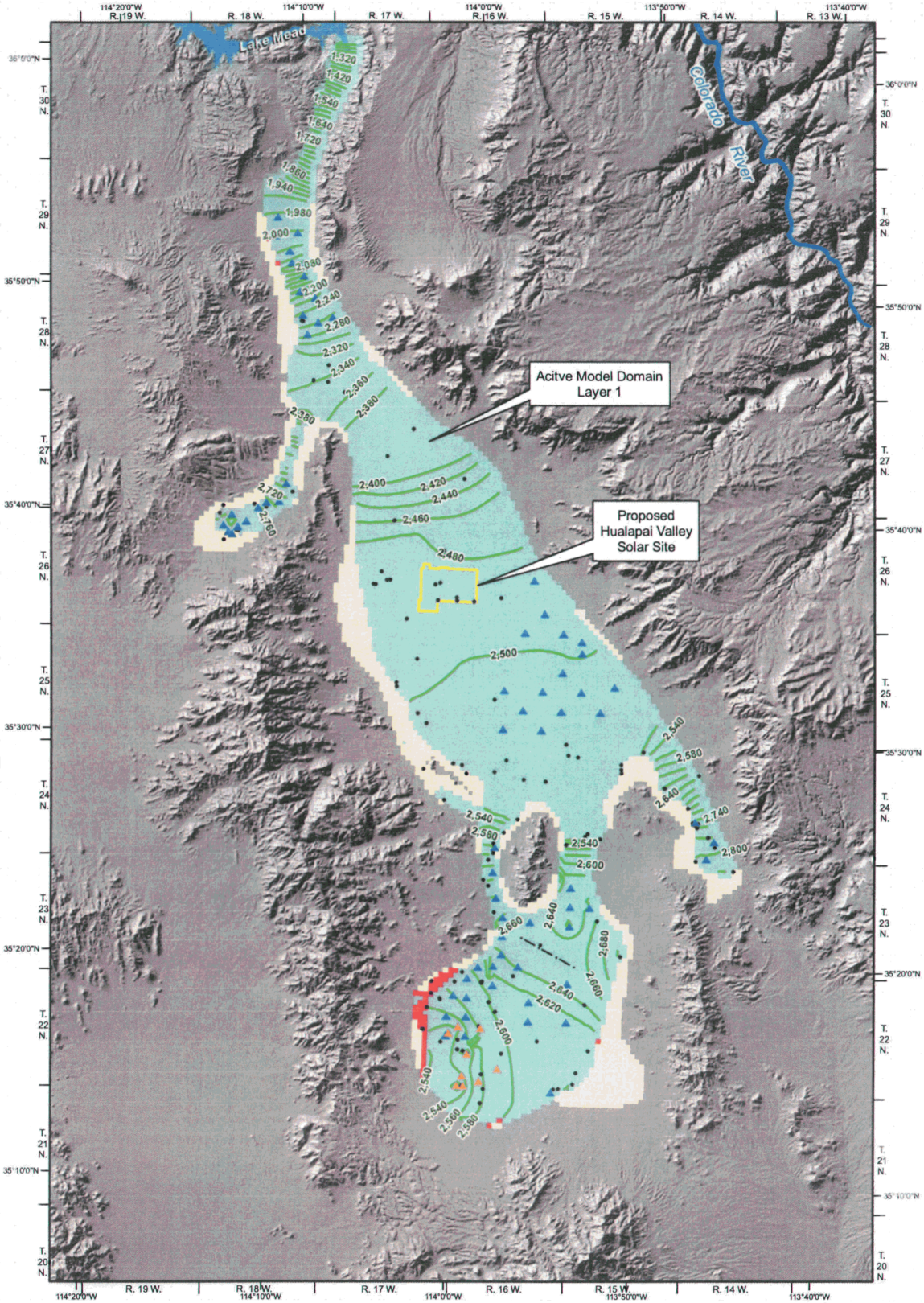
N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

SIMULATED PUMPING
FOR UPDATED BASE CASE

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009
FIGURE 2

GIS/1326/02/UpdatesDec09/WellLocation.mxd/14Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- City of Kingman
- Other Committed Demand
- Domestic

—2,600— Groundwater Level Altitude Contour in feet above mean sea level

-·-·- Approximate Location of Groundwater Divide

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

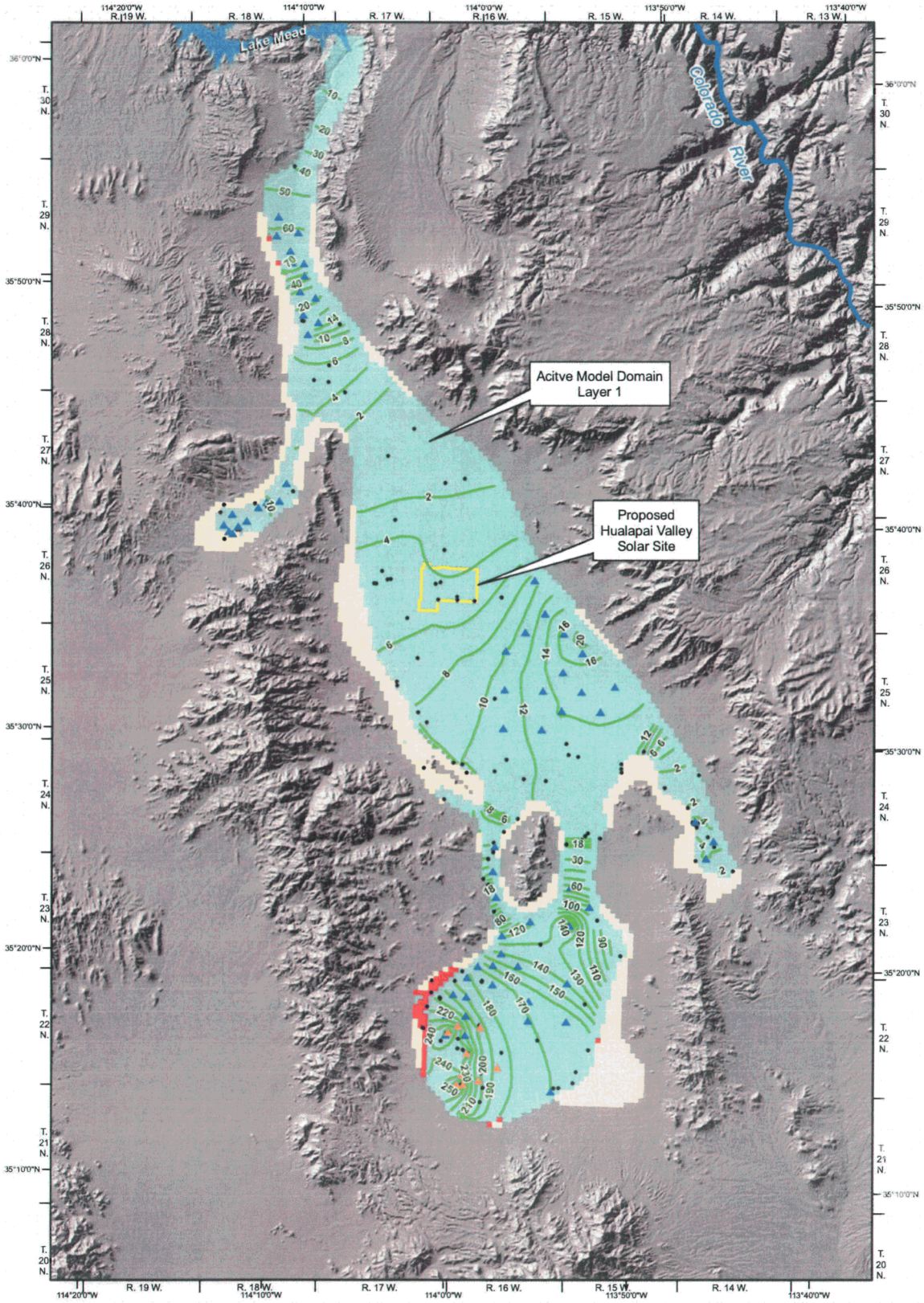
PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042, UPDATED BASE CASE

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 3a

GIS/1326/02/UpdatesDec09/BaseCase_a.mxd/14Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- City of Kingman
- Other Committed Demand
- Domestic

Groundwater Level Decline Contour in feet

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

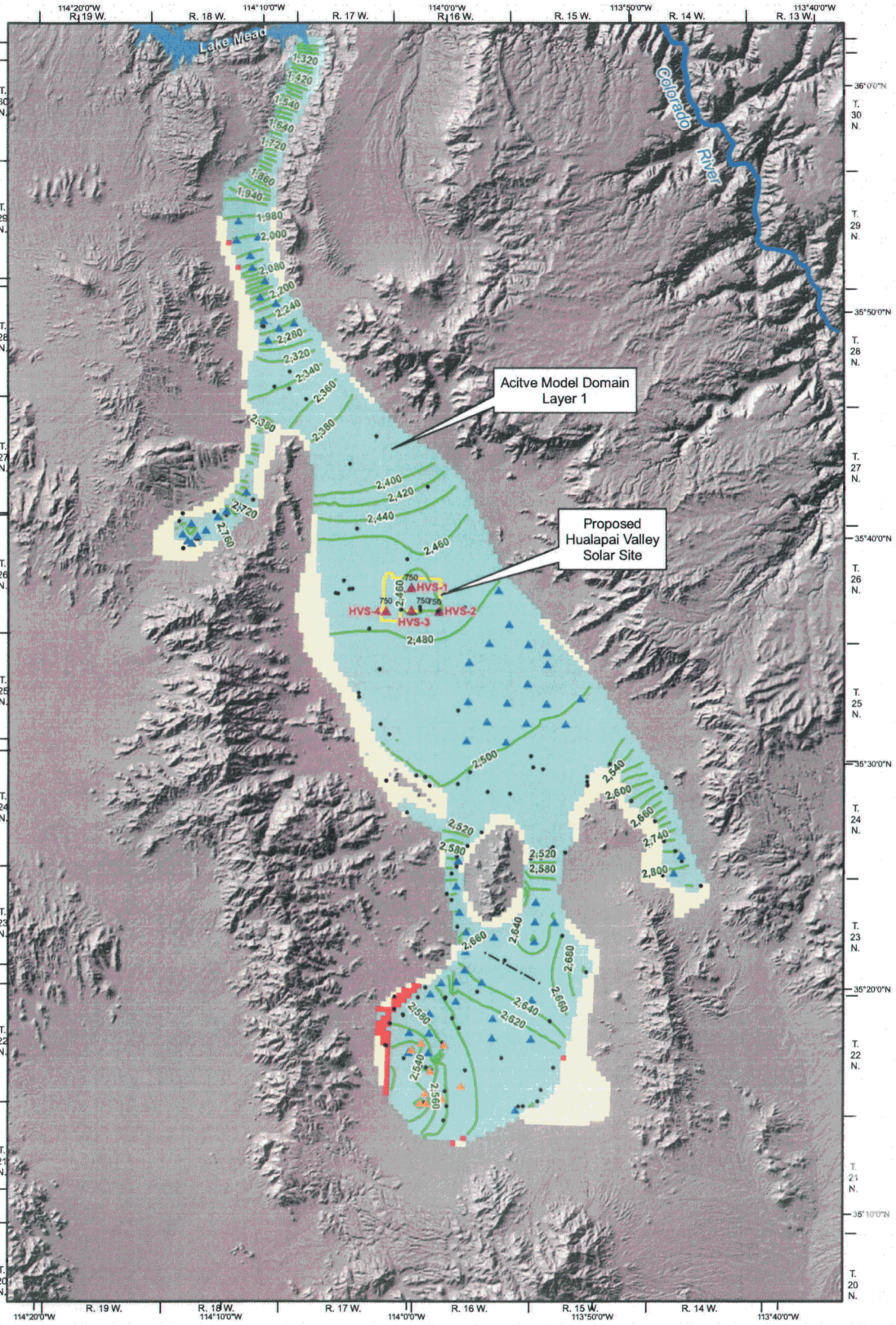
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042, UPDATED BASE CASE

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009

FIGURE 3b

GIS/1326/02/UpdatesDec09/BaseCase_b.mxd/14Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- 750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr
- City of Kingman
- Other Committed Demand
- Domestic

—2,600— Groundwater Level Altitude Contour in feet above mean sea level

Approximate Location of Groundwater Divide

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

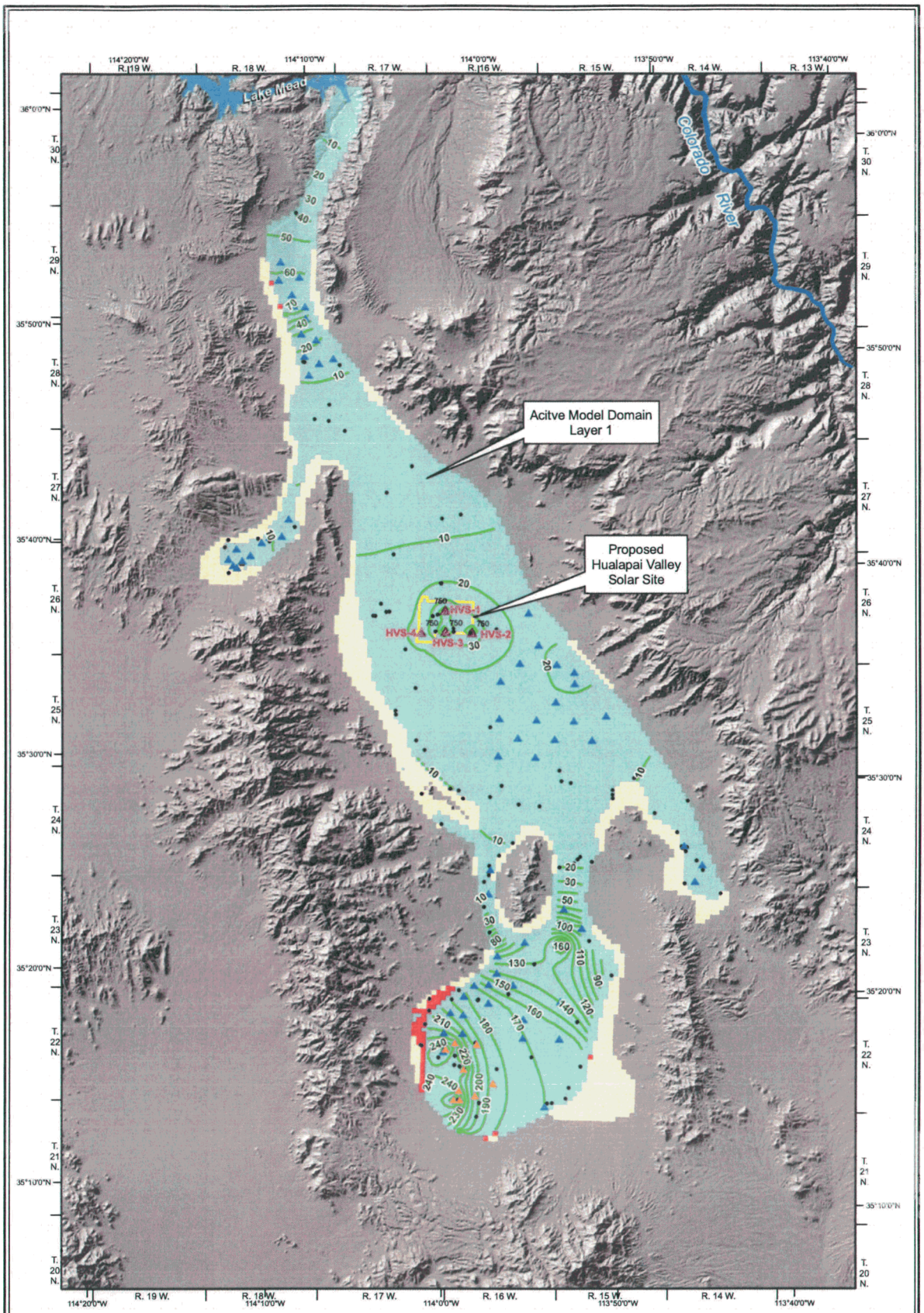
PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042, HVS AT 3,000 AF/yr

MONTGOMERY & ASSOCIATES

2009

FIGURE 4a

GIS/1326/02/UpdatesDec09/HVS3000_a.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—10— Groundwater Level Decline Contour in feet (maximum decline on HVS site = 66 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

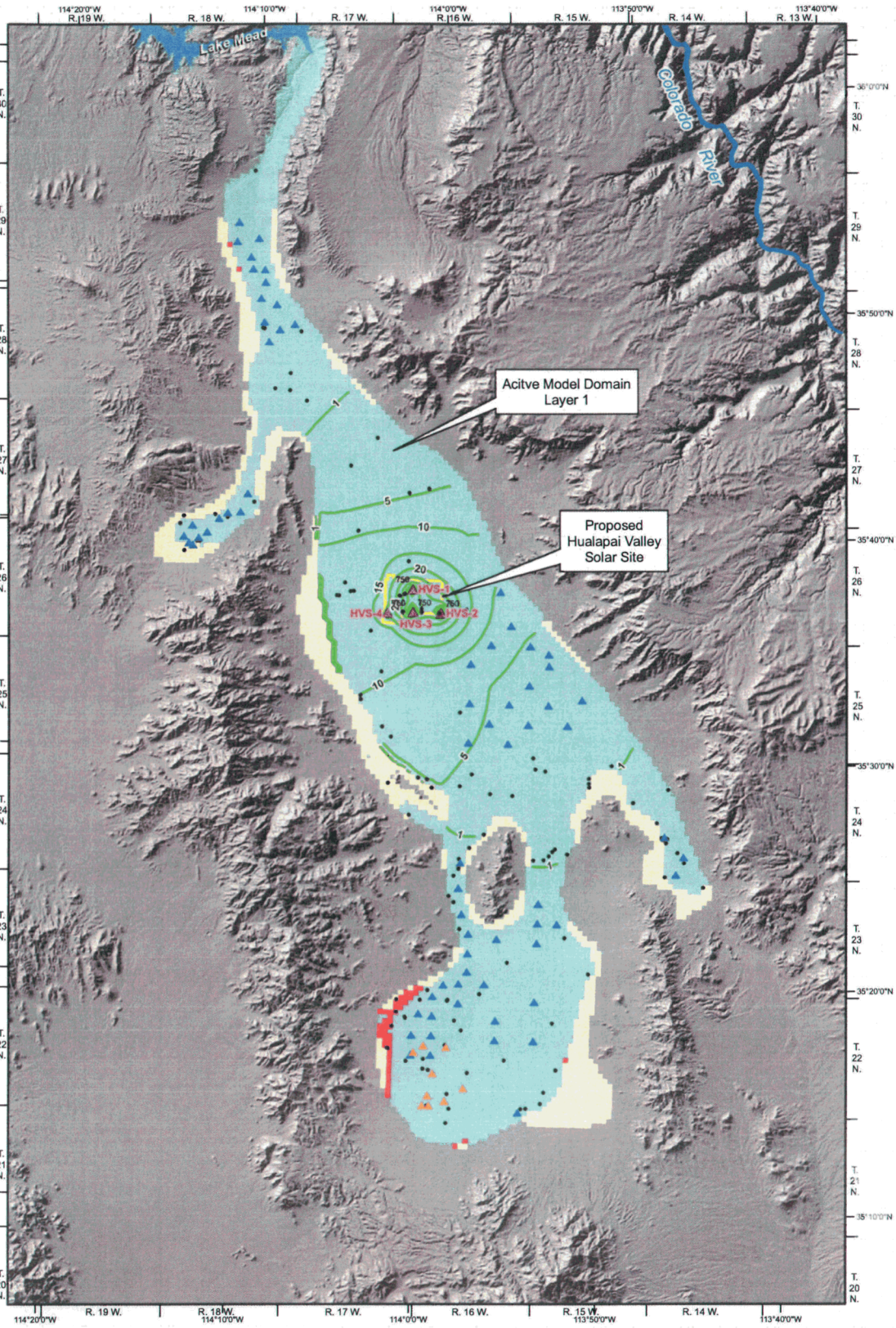
PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042, HVS AT 3,000 AF/yr

MONTGOMERY & ASSOCIATES

2009

FIGURE 4b

GIS/1326/02/UpdatesDec09/HVS3000_b.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—5— Groundwater Level Decline Contour Due Solely to HVS pumping, in feet (maximum decline = 62 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

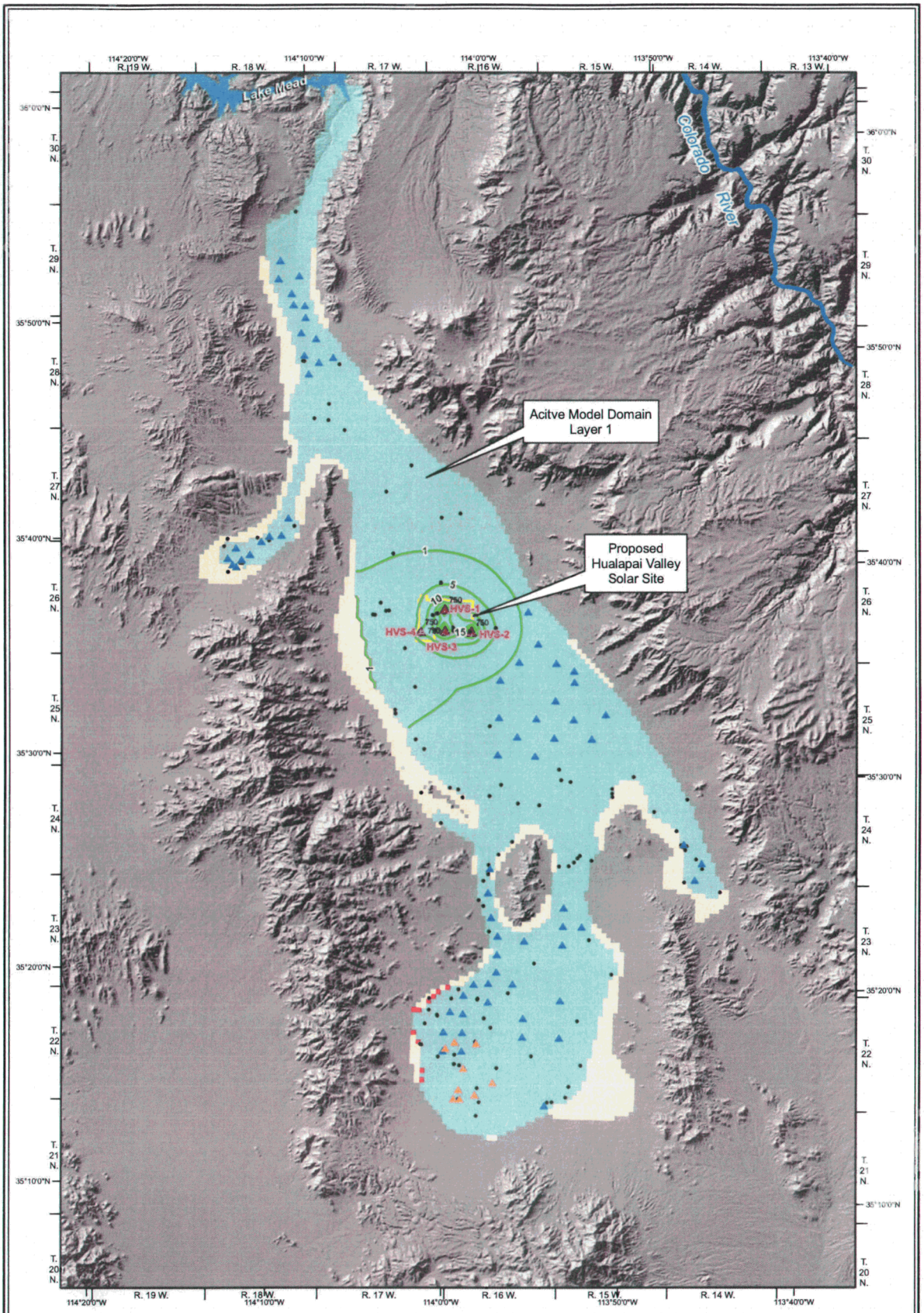
PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2042, HVS AT 3,000 AF/yr

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 4c

GIS/1326/02/UpdatesDec09/HVS3000_c.mxd/11Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—5— Groundwater Level Decline Contour Due Solely to HVS Pumping, in feet (maximum decline = 47 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

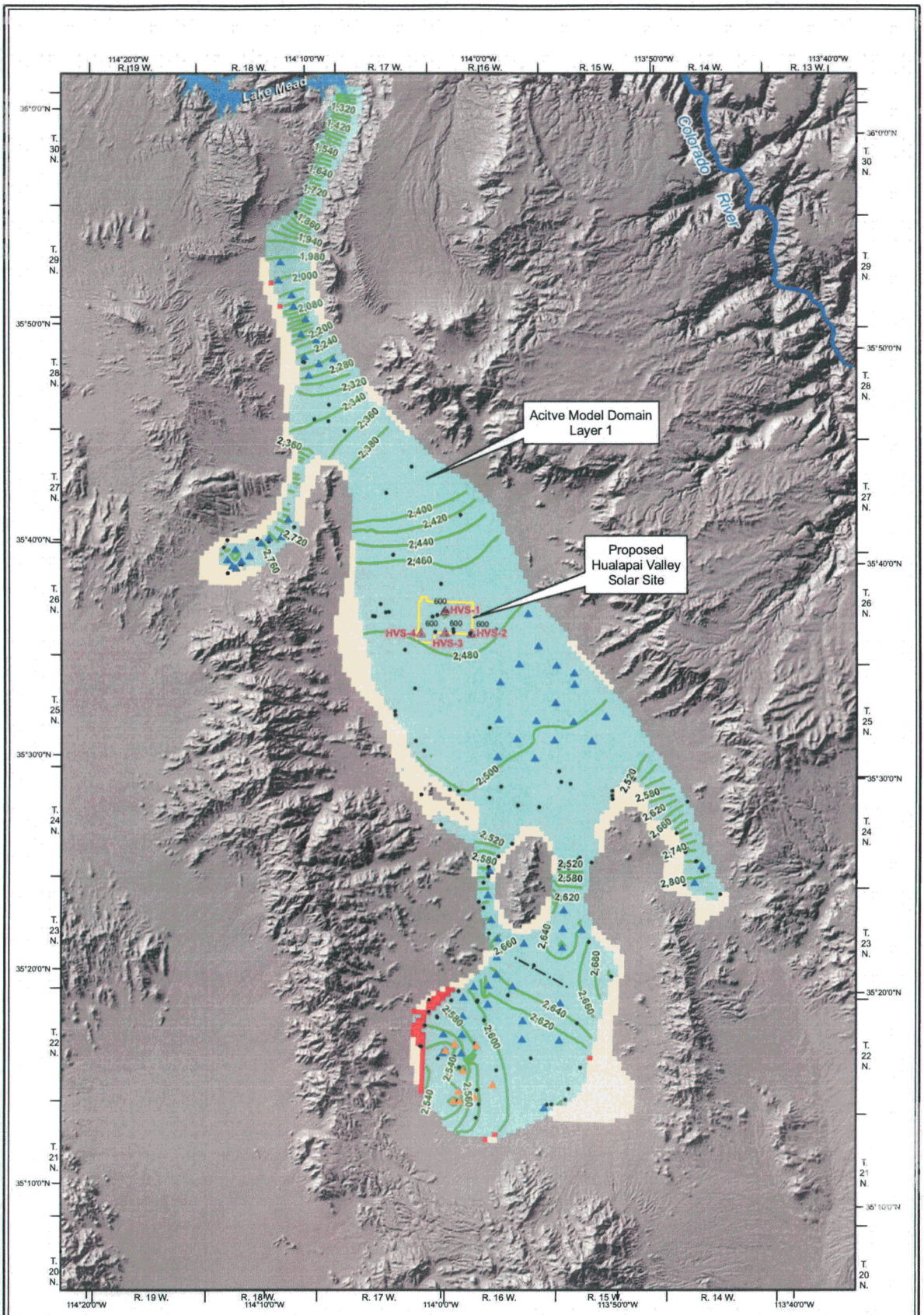
PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2017, HVS AT 3,000 AF/yr

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 4d

GIS/1326/02/UpdatesDec09/HVS3000_d.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

600 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—2,600— Groundwater Level Altitude Contour in feet above mean sea level

—·—·— Approximate Location of Groundwater Divide

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

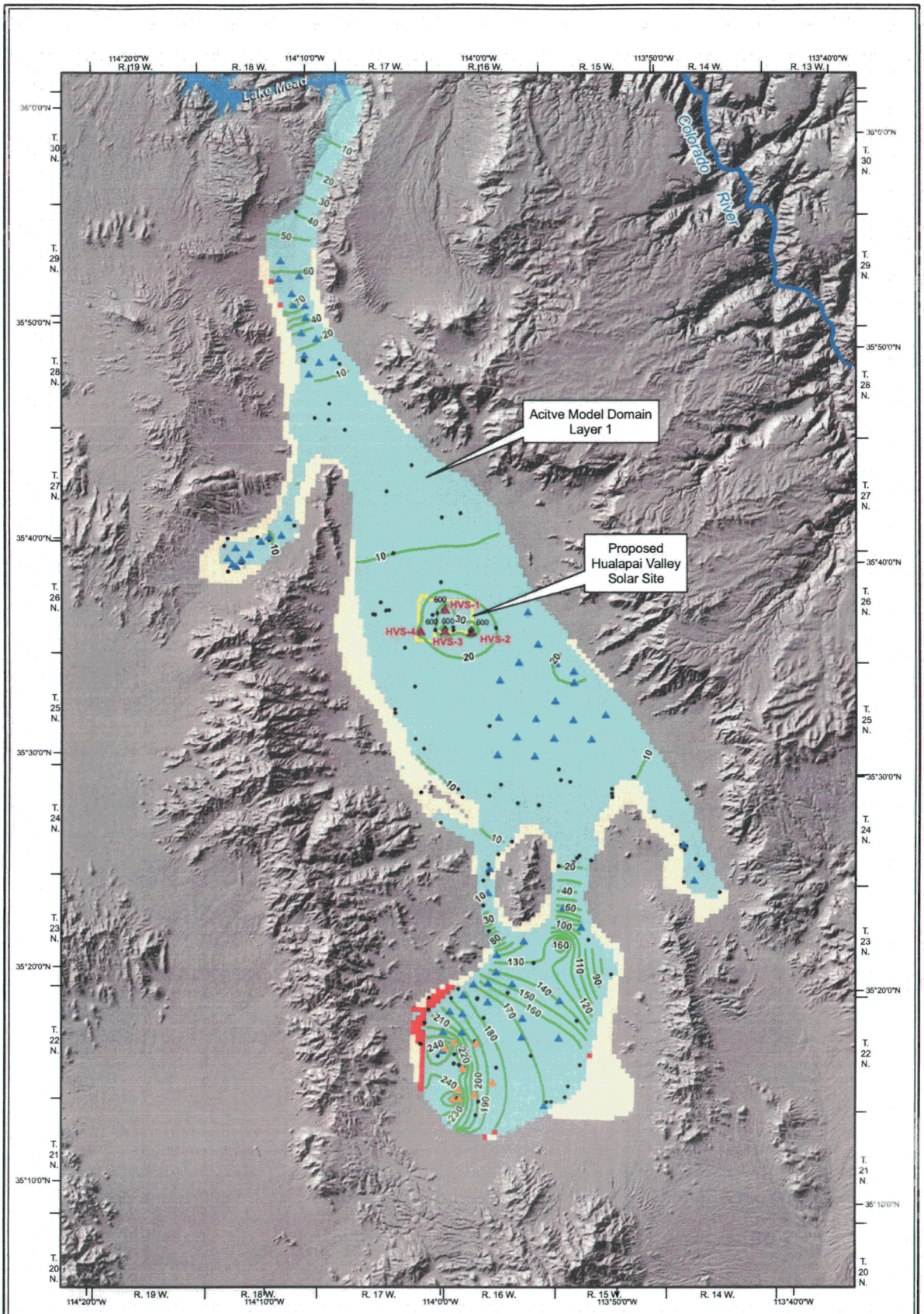
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042, HVS AT 2,400 AF/yr

MONTGOMERY & ASSOCIATES 2009

FIGURE 5a

GIS/1326/02/UpdatesDec09/HVS2400_a.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

600 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—10— Groundwater Level Decline Contour in feet (maximum decline on HVS site = 54 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

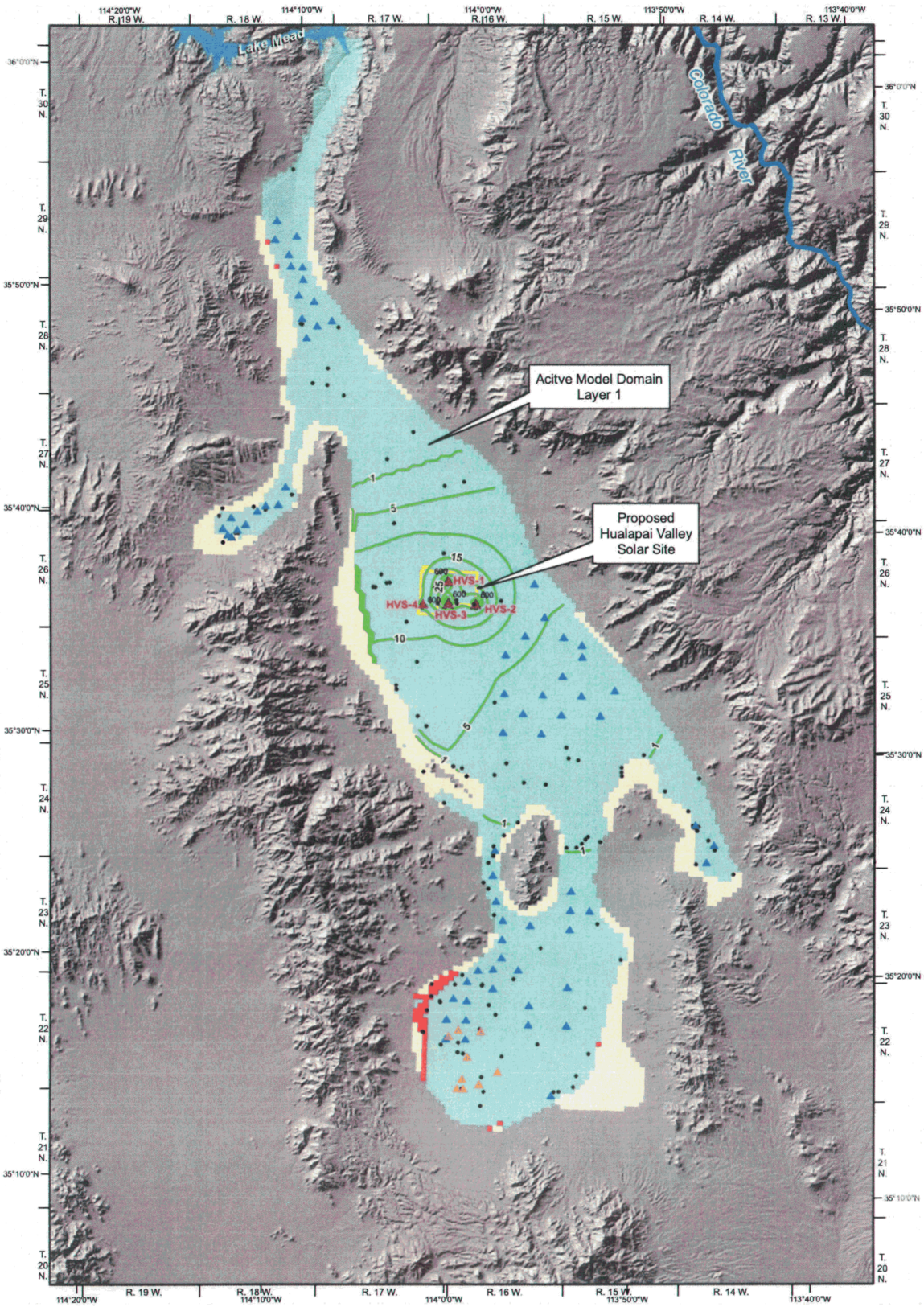
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042, HVS AT 2,400 AF/yr

MONTGOMERY & ASSOCIATES 2009

FIGURE 5b

GIS/1326/02/UpdatesDec09/HVS2400_b.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

600 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—5— Groundwater Level Decline Contour Due Solely to HVS Pumping, in feet (maximum decline = 50 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

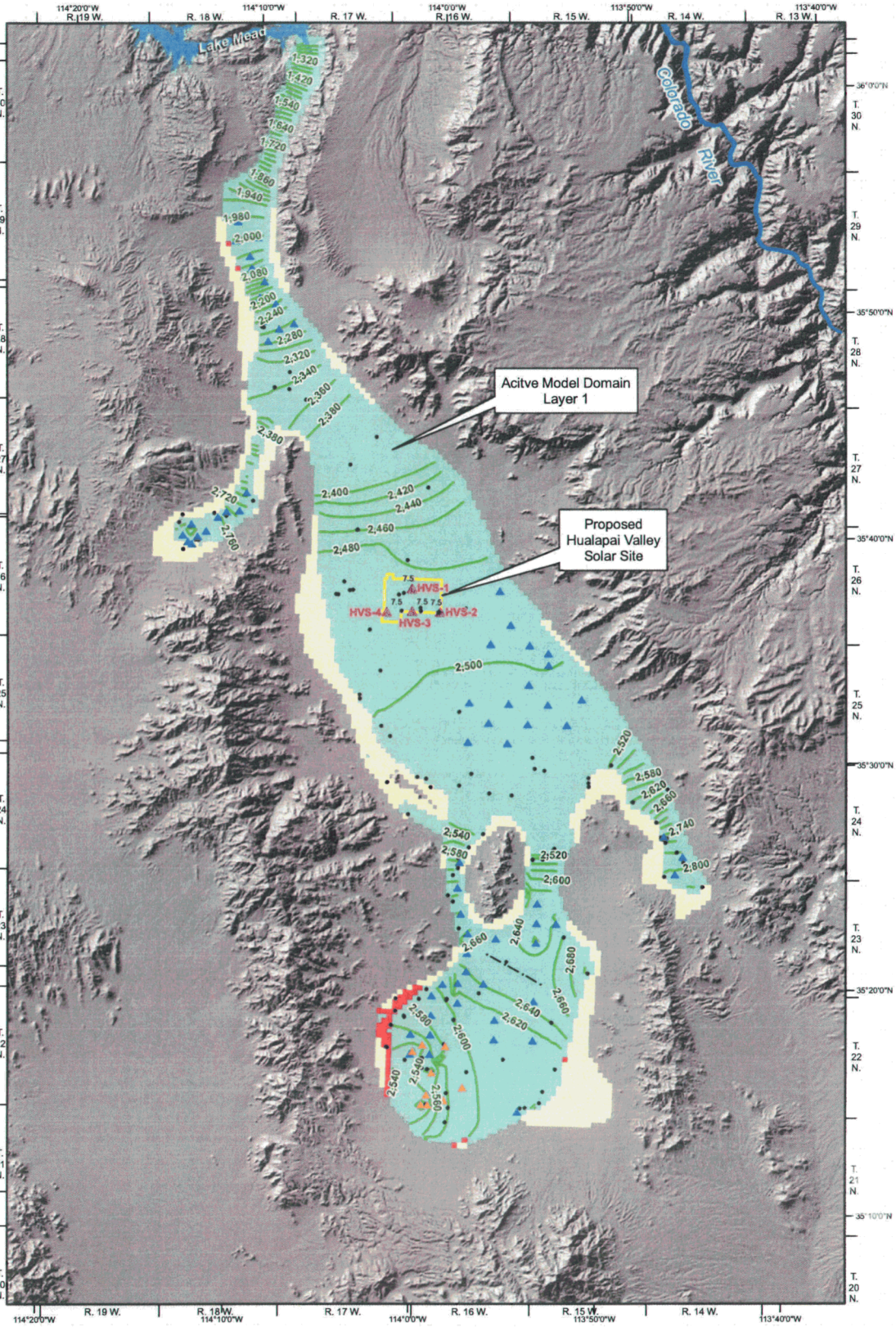
PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2042, HVS AT 2,400 AF/yr

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 5c

GIS/1326/02/Updates/Dec09/HVS2400_c.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- 7.5 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr
- City of Kingman
- Other Committed Demand
- Domestic

— 2,600 — Groundwater Level Altitude Contour in feet above mean sea level

-·-·- Approximate Location of Groundwater Divide

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

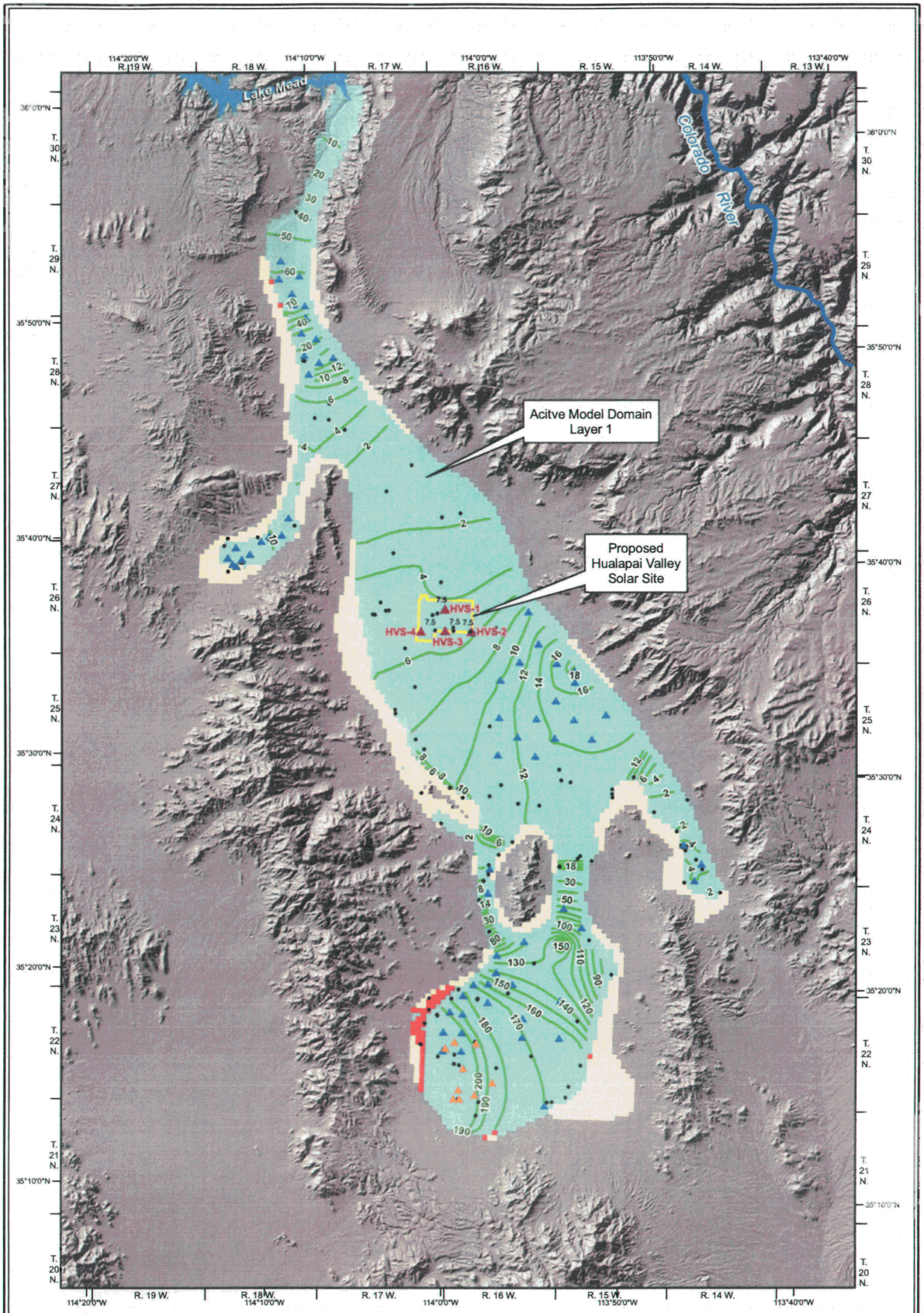
PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042, HVS AT 30 AF/yr

MONTGOMERY & ASSOCIATES Water Resource Consultants

2009

FIGURE 6a

GIS/1326/02/UpdatesDec09/HVS30_a.mxd/14Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- 7.5 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr
- ▲ City of Kingman
- ▲ Other Committed Demand
- • Domestic

—10— Groundwater Level Decline Contour in feet (maximum decline on HVS site = 6 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

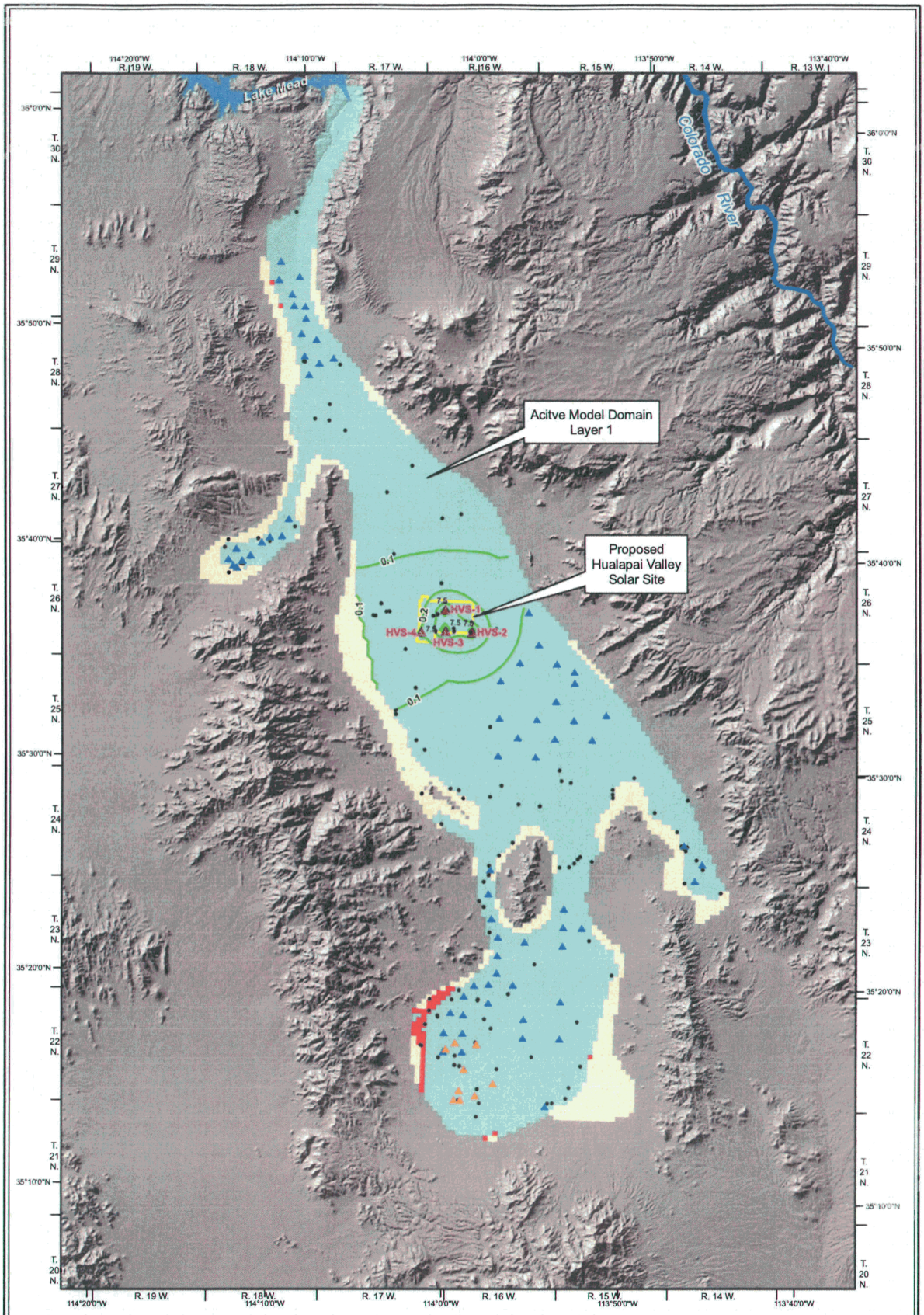
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042, HVS AT 30 AF/yr

MONTGOMERY & ASSOCIATES 2009

FIGURE 6b

GIS/1326/02/UpdatesDec09/HVS30_b.mxd/14Dec09



EXPLANATION

Simulated Wells in Groundwater Model

- 7.5 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr
- ▲ City of Kingman
- ▲ Other Committed Demand
- • Domestic

— 0.1 — Groundwater Level Decline Contour Due Solely to HVS Pumping, in feet (maximum decline = 0.6 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

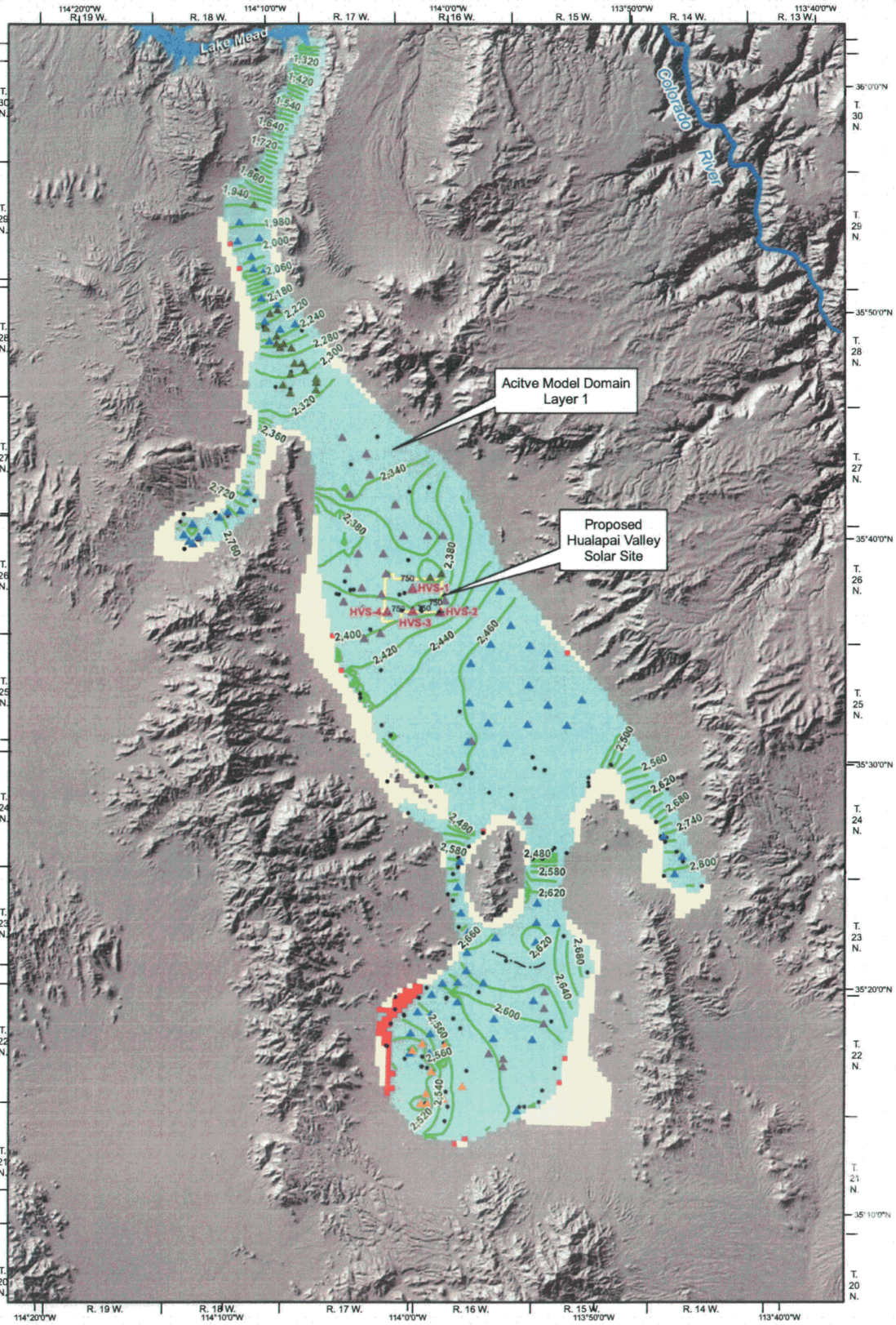
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2042, HVS AT 30 AF/yr

MONTGOMERY & ASSOCIATES
Water Resource Consultants
2009

FIGURE 6c

GIS/1326/02/UpdatesDec09/HVS30_c.mxd/15Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ Rhodes Homes at Red Lake

▲ Mardian Ranch

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—2,600— Groundwater Level Altitude Contour in feet above mean sea level

-·-·- Approximate Location of Groundwater Divide

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

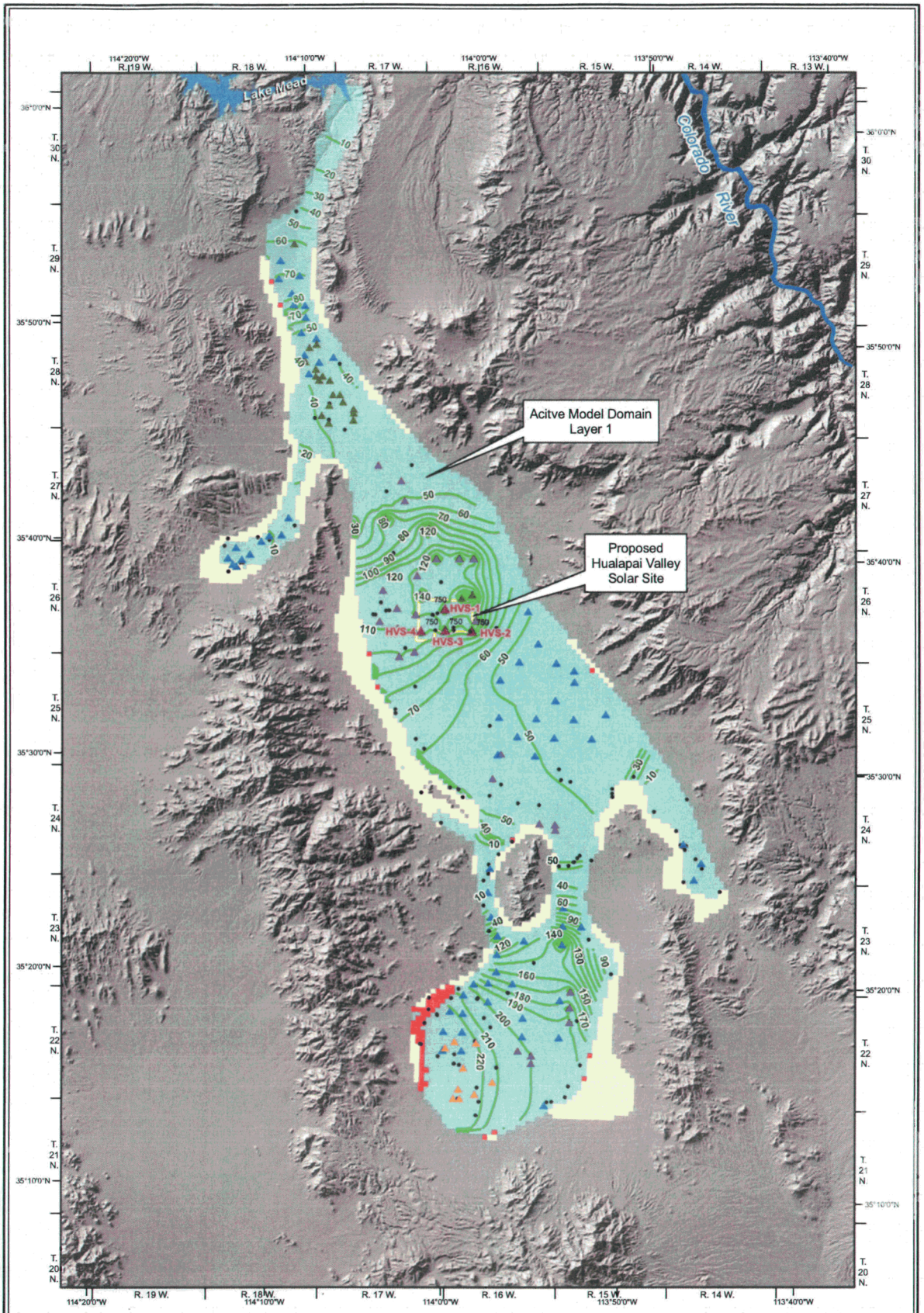
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL ALTITUDE AT END OF 2042, MAXIMUM CUMULATIVE IMPACTS

MONTGOMERY & ASSOCIATES 2009

FIGURE 7a

GIS/1326/02/UpdatesDec09/RM_HVS3000_a.mxd/23Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ Rhodes Homes at Red Lake

▲ Mardian Ranch

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—10— Groundwater Level Decline Contour in feet (maximum decline on HVS site = 158 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5 Miles

N

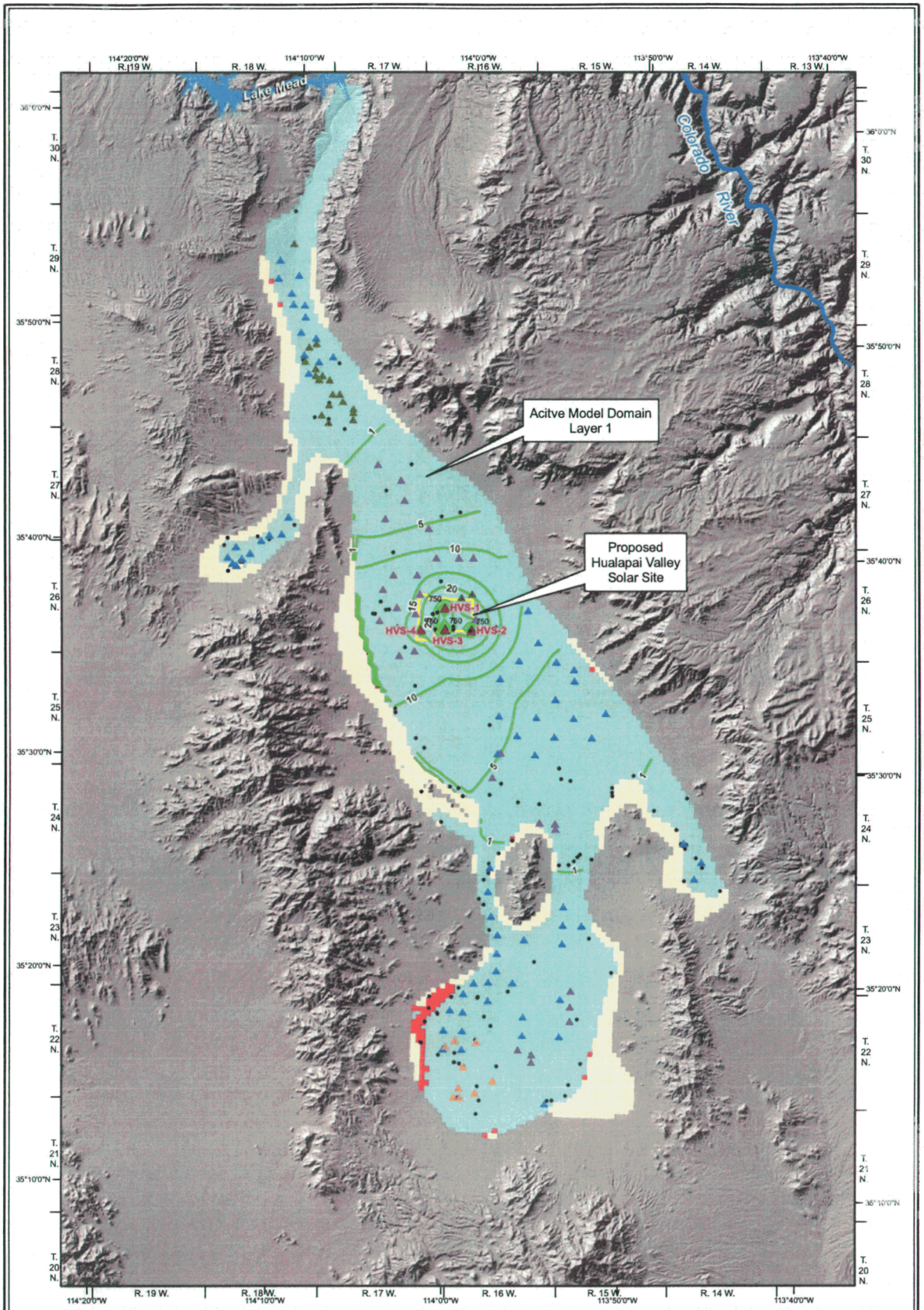
HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE AT END OF 2042, MAXIMUM CUMULATIVE IMPACTS

MONTGOMERY & ASSOCIATES 2009

FIGURE 7b

GIS/1328/02/UpdatesDec09/RM_HVS3000_b.mxd/23Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ Rhodes Homes at Red Lake

▲ Mardian Ranch

▲ City of Kingman

▲ Other Committed Demand

• Domestic

—5— Groundwater Level Decline Contour Due Solely to HVS pumping, in feet (maximum decline = 63 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

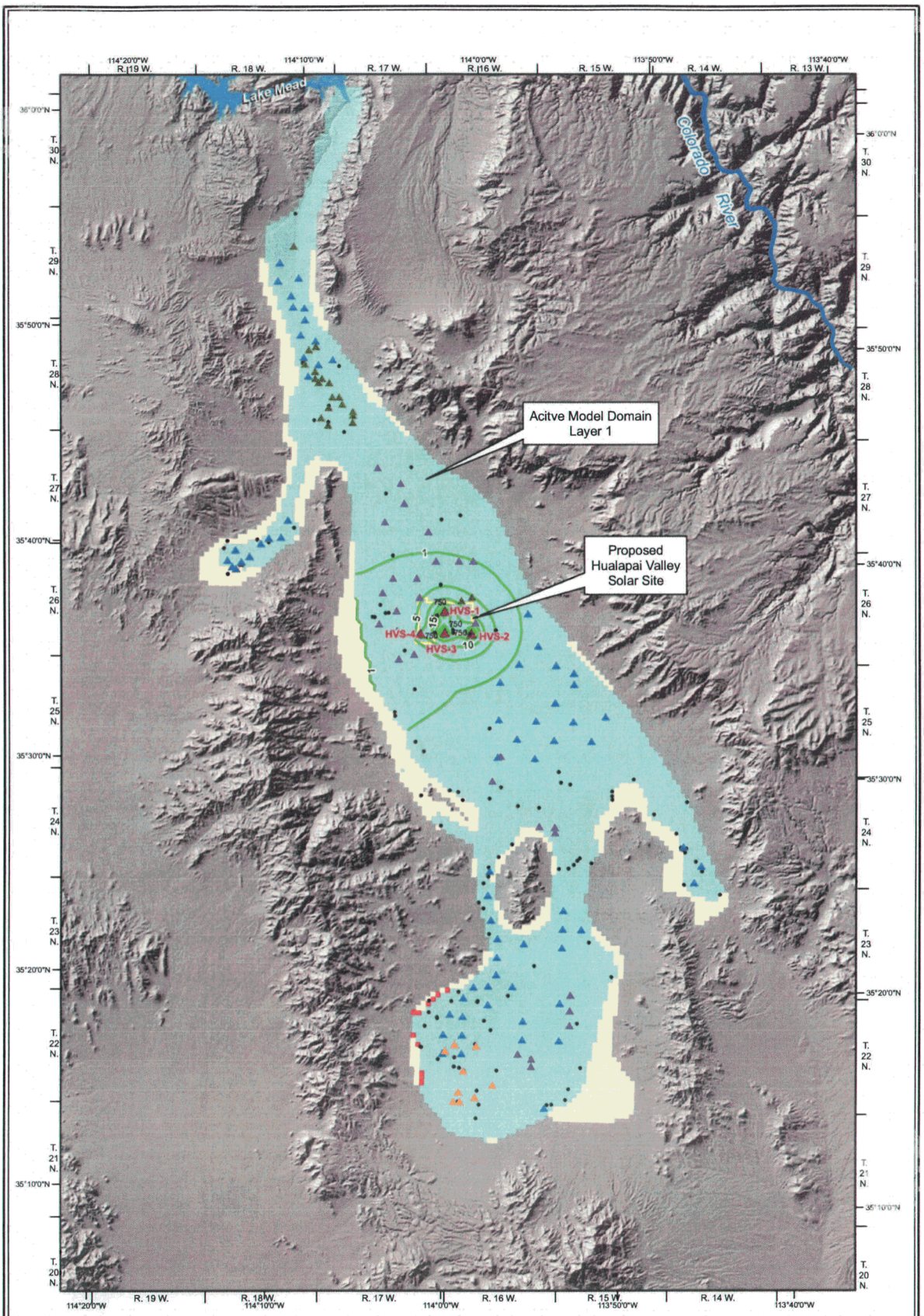
PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2042, MAXIMUM CUMULATIVE IMPACTS

MONTGOMERY & ASSOCIATES
Water Resource Consultants

2009

FIGURE 7c

GIS/1326/02/UpdatesDec09/RM_HVS3000_c.mxd/23Dec09



EXPLANATION

Simulated Wells in Groundwater Model

750 ▲ Hualapai Valley Solar Pumping Rate, in AF/yr

▲ Rhodes Homes at Red Lake

▲ Mardian Ranch

▲ City of Kingman

▲ Other Committed Demand

• Domestic

5 Groundwater Level Decline Contour Due Solely to HVS Pumping, in feet (maximum decline = 47 feet)

Inactive Model Cell

Dry Cells*

* Dry cells indicate groundwater level has been drawn down to top of simulated bedrock

0 1 2 3 4 5
Miles

N

HUALAPAI VALLEY
MOHAVE COUNTY, ARIZONA

PROJECTED GROUNDWATER LEVEL DECLINE DUE TO HVS AT END OF 2017, MAXIMUM CUMULATIVE IMPACTS

MONTGOMERY & ASSOCIATES 2009

FIGURE 7d

GIS/1326/02/UpdatesDec09/RM_HVS3000_d.mxd/23Dec09

23

EXHIBIT
HVS-23

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No.: L-00000NN-09-0541-00151 Case No. 151

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

Pursuant to notice given as provided by law, the Arizona Power Plant and Transmission Line Siting Committee (the "Committee") held a public hearing on January 12 through January 14, 2009, in Kingman, Arizona, in conformance with the requirements of Arizona Revised Statutes ("A.R.S.") §§40-360, *et seq.*, for the purpose of receiving evidence and deliberating on the Application of Hualapai Valley Solar LLC ("Applicant") for a Certificate of Environmental Compatibility ("Certificate") in the above-captioned case (the "Project").

The following members and designees of members of the Committee were present at one or more of the hearing days for the evidentiary presentations and for the deliberations:

John Foreman	Chairman, Designee for Arizona Attorney General, Terry Goddard
Paul Rasmussen	Designee for Director, Arizona Department of Environmental Quality

David Eberhart	Designee for Chairman, Arizona Corporation Commission
Jessica Youle	Designee for Director, Energy Office, Arizona Department of Commerce
Greg Houtz	Designee for Director, Arizona Department of Water Resources
Jeff McGuire	Appointed Member
William Mundell	Appointed Member
Patricia Noland	Appointed Member
Michael Palmer	Appointed Member
Michael Whalen	Appointed Member
Barry Wong	Appointed Member

The Applicant was represented by Thomas H. Campbell and Albert H. Acken, of the law firm of Lewis and Roca LLP. Denise Herring-Bensusan and Susan A. Moore-Bayer requested intervention in this proceeding.

At the conclusion of the hearings, the Committee, having received the Application, the appearances of the parties, the evidence, testimony and exhibits presented at the hearings, and being advised of the legal requirements of A.R.S. §§40-360 to 40-360.13, upon motion duly made and seconded, voted _____ to grant the Applicant this Certificate of Environmental Compatibility (Case No. 151) for the Project as set forth in the Application.

The Project consists of an up to 340 MW concentrated solar power ("CSP") generating facility, with biofuel, light fuel oil or natural gas co-firing, and a 345kV or 500kV transmission line (the "Gen-Tie"). The Project is located in Mohave County, approximately 27 miles north of Kingman, Arizona, and 80 miles southeast of Las Vegas, Nevada. The generating facility is located entirely on private land in Sections 19, 20, 21, 28, 29, 30, and the north half of Section 31 all within Township 26 North, Range 16 West, Gila and Salt River Baseline and Meridian.

The Gen-Tie will interconnect the CSP generating facility (and/or a photovoltaic generating facility built on the site approved for the CSP generating facility) to the regional transmission grid using one of two approved alignments:

Interconnection #1 Gen-Tie alignment, located entirely in Township 26 North, Range 16 West, runs from the generating facility's power block to the property boundary; then north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 and Section 08; then north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 and Section 09 until it reaches the north boundary of Section 09; then east for about 0.75 miles within a 1320-foot wide corridor along the north boundary of Section 09 until it reaches the termination in the northeast corner of Section 09. Interconnection #1 is approximately 2.75 miles in length from the generating facility property boundary.

Interconnection #2 Gen-Tie alignment runs from the generating facility's power block to the property boundary; then north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 and Section 08 ; then north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 and Section 09 until it reaches the north boundary of Section 09; then north for one mile within a 1320-foot wide corridor through Section 04 until it reaches the west boundary of the existing Mead-Liberty 345kV transmission line corridor, which it will parallel on a generally northwest heading; from there it will run within a 2640-foot wide corridor measured from the centerline of the Mead-Liberty 345kV transmission line west of and parallel to the existing transmission line for approximately 3.5 miles, going through the northeast corner of Section 05 in Township 26 North, Range 16 West; through Sections 32, 31, and 30 in Township 27 North, Range 16 West ; through Sections 25 and 24 in Township 27 North, Range 17 West; and terminate in Section 23 in Township 27 North, Range 17 West. Interconnection #2 is approximately 6.5 miles in length from the property boundary.

The transmission structure heights will not exceed 199 feet and will occupy a right of way ("ROW") width up to a maximum of 200 feet.

A general location map of the Project is set forth in **Exhibit A**.

CONDITIONS

This Certificate is granted upon the following conditions:

1. The conditions shall apply to the Applicant, its successor(s), and assignee(s).

2. The Applicant shall obtain all approvals and permits required by the United States, the State of Arizona, the County of Mohave, and any other governmental entities having jurisdiction necessary to construct the Project.

3. The Applicant shall comply with all existing applicable statutes, ordinances, master plans and regulations of the State of Arizona, the County of Mohave, the United States, and any other governmental entities having jurisdiction, including but not limited to the following:

   (a) all applicable land use regulations;

   (b) all applicable zoning stipulations and conditions, including but not limited to landscaping and dust control requirements;

   (c) all applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

   (d) all applicable noise control standards;

   (e) all applicable regulations and permits governing storage and handling of chemicals and petroleum products;

   (f) all other applicable federal and state regulations and standards.

4. Applicant may utilize groundwater for electrical generation and related uses associated with construction and commercial operation of the Project. The Applicant shall make good faith efforts to acquire effluent from the City of Kingman to meet a majority of the water needs for the Project.

5. If any archaeological, paleontological or historical site or object that is at least fifty years old is discovered on state, county or municipal land during the construction or operation of the solar generating facility and transmission line, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum, and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844.

6. If human remains and/or funerary objects are encountered on private land during the course of any ground-disturbing activities relating to the construction or operation of the solar generating facility and transmission line, the Applicant shall cease work on the affected area of the Project and notify the Director of the Arizona State Museum as required by A.R.S. § 41-865.

7. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the destruction of native plants during the construction and operation of the solar generating facility and transmission line.

8. This authorization to construct this Project (which may be constructed in two phases) shall expire unless the solar generating facility and transmission line is capable of operation within seven years from the date the Certificate is approved by the Commission. However, prior to expiration, the Applicant may request that the Commission extend this time limitation.

9. In the event that the Project requires an extension of the term of this Certificate prior to completion of construction, Applicant shall use reasonable means to notify all landowners and residents within one mile of the Project corridor as depicted on Exhibit A, all persons who made public comment at this proceeding, and all parties to this proceeding of the request and the date, time and place of the hearing in which the Commission will consider the request for extension.

10. The Applicant shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the transmission lines and related facilities addressed in this Certificate. The Applicant shall maintain written records for a period of five years of all complaints of radio or television interference attributable to operation, together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission.

11. Within 120 days of the Commission decision granting this Certificate, Applicant will post a sign at the plant site. The sign shall be no smaller than a normal roadway sign and shall advise:

(a) That the site has been approved for the construction of Project facilities;
(b) The expected date of completion of the Project facilities;
(c) A phone number for public information regarding the Project;
(d) The name of the Project;
(e) The name of the Applicant; and
(f) The website of the Project.

12. Applicant shall design the transmission line to incorporate reasonable measures to minimize impacts to raptors.

13. Applicant shall use non-specular conductor and non-reflective surfaces for transmission line structures.

14. Before construction on this Project may commence, the Applicant shall file a construction mitigation and restoration plan ("Plan") with ACC Docket Control. Where practicable, the Plan shall specify the Applicant's plans for construction access and methods to minimize impacts to wildlife and to minimize vegetation disturbance outside of the Project right-of-way particularly in drainage channels and along stream banks. Applicant shall re-vegetate, unless waived by the landowner, native areas of construction disturbance to its preconstruction state outside of the power-line right of way after construction has been completed. The Plan shall

specify the Applicant's plans for coordination with the Arizona Game and Fish Department and the State Historic Preservation Office. The Applicant shall use existing roads for construction and access where practicable and the Plan shall specify the manner in which the applicant makes use of existing roads.

15. Applicant shall follow regulatory requirements of the Arizona Game and Fish Department of the United States Fish and Wildlife Service for handling contacts during the construction and operation of the Project with any species designated as endangered. Applicant also shall follow regulatory requirements for handling contacts with any species of greatest conservation need as designated by the Arizona Game and Fish Department. If no regulatory requirements exist, the Applicant shall use reasonable care to avoid any harm to individuals of the designated species. If the avoidance of harm to individuals is not possible, the Applicant shall contact the Arizona Game and Fish Department and the United States Fish and Wildlife Service to obtain any appropriate permits and guidance for removing the individual members of the species contacted from the area of the Project.

16. With respect to the Project, Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner.

17. The Applicant shall provide copies of this Certificate to the Mohave County Planning Department, the City of Kingman, the Arizona State Land Department, the State Historic Preservation Office, and the Arizona Game and Fish Department.

18. Prior to the date construction commences on this Project, the Applicant shall provide known homebuilders and developers within one mile of the center line of the Certificated route and solar facility, the identify, location, and a pictorial depiction of the type of power line and solar facility being constructed, accompanies by a written description, and encourage the developers and homebuilders to include this information in the developers' and homebuilders' homeowners' disclosure statements.

19. Applicant will follow the most current Western Electricity Coordinating Council/North American Electric Reliability Corporation Planning standards as approved by the Federal Energy Regulatory Commission, and National Electrical Safety Code construction standards.

20. The Applicant shall submit a self-certification letter annually, identifying progress made with respect to each condition contained in the Certificate, including which conditions have been met. Each letter shall be submitted to the docket control of the Arizona Corporation Commission by December 1, 2010, and annually thereafter. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter along with the corresponding documentation shall be submitted to the Arizona Attorney General and Department of Commerce Energy Office. The requirement for the self-certification shall expire on the date the Project is placed into operation.

21. Within sixty (60) days of the Commission decision granting this Certificate, the Applicant shall make good faith efforts to commence discussions with private landowners, on whose property the Project corridor is located, to identify the specific location for the Project right-of-way and placement of poles.

22. The Applicant shall expeditiously pursue reasonable efforts to work with private landowners on whose property the Project right-of-way will be located, to mitigate the impacts of the location, construction, and operation of the Project on private land.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This Certificate incorporates the following findings of fact and conclusions of law:

1. The Project aids the state in meeting the need for an adequate, economical and reliable supply of renewable electric power.

2. The conditions placed on the Project in the Certificate by the Committee effectively minimize the impact of the Project on the environment and ecology of the state.

3. The Project is in the public interest because the Project's contribution to meeting the need for an adequate, economical and reliable supply of renewable electric power outweighs the minimized impact of the Project on the environment and ecology of the state.

DATED this ____ day of _____ 2010.

THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

_____
John Foreman, Chairman

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EXHIBIT
HVS-24
ADMITTED

September 12, 2009

Nicholas S. Hont, P.E., Director
Mohave County Department of Development Services
3675 E. Andy Devine Avenue
Kingman, AZ 86401

SUBJECT: WATER RESOURCES FOR HUALAPAI VALLEY SOLAR PROJECT PROPOSED MOHAVE COUNTY GENERAL PLAN AMENDMENT

Dear Mr. Hont:

My name is William R. Victor. I am a Principal in the Arizona-based hydrogeologic and water resources consulting firm of Montgomery & Associates (M&A). I am a professional geologist licensed in Arizona, California, and Kentucky. My address and phone are on this letterhead. My firm was retained by Hualapai Valley Solar (HVS) to characterize available water resources for use by the project and to evaluate potential impacts to the aquifer from groundwater pumping for the project via wells. Please consider this letter during your evaluation of the HVS proposed amendment to the Mohave County General Plan.

ARIZONA DEPARTMENT OF WATER RESOURCES ANALYSIS

Availability of groundwater resources for the HVS project was proven in 2007 through the process of Analysis of Adequate Water Supply by the Arizona Department of Water Resources (ADWR) for the Rhodes Homes application no. 23-402285.0000. Attached hereto are: 1) the ADWR Analysis of Adequate Water Supply, dated November 9, 2007, for the proposed Rhodes Homes Red Lake development; and 2) a communication dated September 9, 2009 from Sandra Fabritz-Whitney, Assistant Director of the ADWR Water Management Division, which confirms the current status of the ADWR analysis. These documents demonstrate that 43,432.33 acre-feet per year (AF/yr) of groundwater were determined to be physically and continuously available for a 100-year period.

Based on the total acreage given in the Rhodes Homes application for the Red Lake development (36,236 acres) and the total amount of groundwater determine to be physically available for those acres (43,432.33 AF/yr), the average pro rata amount of available

groundwater per acre is 1.20 AF/yr. The acreage to be acquired from Rhodes Homes by HVS within the ADWR analysis area is about 3,680 acres. Therefore, the minimum pro rata physically available groundwater for HVS based solely on acreage would be **4,416 AF/yr for 100 years** (3,680 acres x 1.20 AF/acre/yr). According to ADWR, the determination of physically available groundwater follows the property, so it is also available for any new owners of the property. For comparison, the water demand projected by HVS for its project is only **2,400 AF/yr for 30 years**.

MOHAVE COUNTY ANALYSIS AND APPROVALS

During the HVS open house meetings in the County, comments were received stating that the technology used for the HVS project should be restricted in accordance with General Plan Policy 3.5, which states that "Mohave County will only approve power plants using "dry cooling" technology when the aquifer is threatened by depletion or subsidence." Although we understand that HVS is still evaluating the merits and feasibility of dry, wet, and hybrid cooling technologies, we conclude that the conditions that would trigger Policy 3.5 do not occur at the HVS site.

To quote the ADWR website:

> "To address groundwater depletion in the state's most populous areas, the state legislature created the Groundwater Management Code in 1980 and directed ADWR to implement it. The goal of the Code is twofold: 1) to control severe groundwater depletion, and 2) to provide the means for allocating Arizona's limited groundwater resources to most effectively meet the state's changing water needs. This effort to manage Arizona's groundwater resources was so progressive that in 1986 the Code was named one of the ten most innovative programs in state and local government by the Ford Foundation and Harvard University. When granting the award, it was noted that no other state had attempted to manage its water resources so comprehensively. Accordingly, Arizona built consensus around its policy and then followed through to make it work in practice."

All of the areas of concern originally considered by ADWR are now Active Management Areas (AMAs) and had groundwater level declines of nearly 10 feet per year.

We believe the operative words in Policy 3.5 may be "when the aquifer is threatened". Without measured water level declines or land subsidence, there is no actual or perceived threat. The hydrographs shown on Figure 7 of the U.S. Geological Survey (USGS) Scientific Investigations Report 2007-5182 for well (B-27-16)33BAA (located about 4 miles north from the HVS plant site) and well (B-26-17)35AAA (located 1 mile west from the HVS plant site) indicate an **overall water level rise** in the proposed plant area during the period of record, which extends back to the 1950s and 1960s. These data demonstrate there is no current threat to the aquifer.

Another line of evidence can be made from the regulatory procedures to create a new AMA. ARS 45-412 states:

> "A. The director may designate an area which is not included within an initial active management area, pursuant to section 45-411, as a subsequent active management area if the director determines that any of the following exists:
>
> 1. Active management practices are necessary to preserve the existing supply of groundwater for future needs.
>
> 2. Land subsidence or fissuring is endangering property or potential groundwater storage capacity.
>
> 3. Use of groundwater is resulting in actual or threatened water quality degradation."

These conditions certainly do not exist in the proposed plant area. There have been no new AMAs established since the original basins.

PROJECTED IMPACTS FROM HVS GROUNDWATER PUMPING

Since 2005, M&A has conducted comprehensive groundwater studies in Hualapai Valley to evaluate the impacts of various groundwater uses. M&A characterized the hydrogeologic conditions based on well data, old and new geophysical surveys, and compilation and review of all available hydrogeologic data for the basin. For these studies, test wells were constructed and pumping tests were conducted for new and existing wells to characterize aquifer properties. Data were analyzed to prepare a map of the bottom of the aquifer so that volume of groundwater in storage could be properly estimated. M&A then constructed and used a complex basin-wide numerical groundwater flow model to estimate the quantity of groundwater in storage and to simulate the effects of groundwater wells on the aquifer. Through a several month period of critical review by ADWR staff hydrologists, including incorporation of the latest geophysical data for the basin, the model was approved by ADWR for use in projecting groundwater impacts. This body of work represents the most comprehensive investigative effort for the basin to date and a monetary investment in the science of the basin that very likely exceeds that of all previous studies for the basin by the USGS and ADWR combined.

Results of the M&A studies indicate the volume of groundwater in storage in the Hualapai Valley aquifer system is the largest component of the basin water budget, far exceeding either the annual volume of natural recharge to the basin or discharge of groundwater from the basin. Based on the information compiled for the area, depth, and specific yield of saturated sediments, total volume of potentially recoverable groundwater in

storage in the Hualapai basin is calculated to be about 27.7 million acre-feet (AF). Following a similar procedure, volume of potentially recoverable groundwater in storage above a depth of 1,200 feet below land surface was calculated to be about 15.8 million AF. This value is comparable to the volume of 21 million AF reported by the USGS (Gillespie and Bentley, 1971) for the saturated sediments to depths of 1,000 feet in the Red Lake area and 1,500 feet in southern Hualapai Valley. Records indicate current groundwater use in the basin, including the City of Kingman, is less than 15,000 AF/yr. Therefore, the volume of potentially recoverable groundwater calculated to be stored in only the shallow part of the aquifer (above a depth of 1,200 feet) is equal to more than 1,000 years of use at the current total rate.

Using the ADWR-approved model, M&A projected potential impacts of proposed HVS groundwater pumping on water levels and nearby wells of record. Although HVS engineering has progressed to the point where it projects a water demand of 2,400 AF/yr for its current project plan, the highest value considered during an earlier stage of engineering (3,000 AF/yr) was used in the model to be conservative and thereby overestimate the potential impacts of the final design.

Results of the HVS groundwater study indicate that projected incremental water level drawdown at the end of 30 years of continuous pumping at 3,000 AF/yr ranges from 38 feet at the HVS plant to less than 15 feet within 2 miles of the plant in any direction. Projected drawdown is less than 5 feet within about 5 miles north and 9 miles south from the plant, and rapidly decreases to less than 1 foot within about 10 miles north and 15 miles south from the plant. After 30 years of pumping, the projected incremental impact of HVS pumping is not substantial and, in fact, would be **much less than 1 foot of water level elevation change for wells in the City of Kingman, Dolan Springs, and Valle Vista areas**. For comparison, in any of the Arizona AMAs, projected drawdown in any neighboring well in the first 5 years of pumping the new well can not exceed 10 feet or the new well owner must obtain permission from the neighboring well owner. The HVS project meets this stringent AMA criterion (less than 10 feet in 5 years) at all off site wells of record.

CONCLUSIONS

Based on all this information, I conclude that:

1. Only a minute fraction of the groundwater stored in the Hualapai Valley groundwater basin is currently used. The volume of potentially recoverable groundwater calculated to be stored (15.8 million AF) in only the shallow part of the aquifer (above a depth of 1,200 feet below land surface) is equal to more than 1,000 years of use at the current total rate (less than 15,000 AF/yr).

2. The minimum pro rata amount of annually available groundwater already set aside by ADWR for the land on which the HVS plant is sited would be nearly twice as much as HVS intends to use annually.

3. The conditions that would trigger Mohave County General Plan Policy 3.5 do not occur at the HVS site.

4. The projected impact on groundwater levels by the proposed HVS pumping would meet the stringent criteria for well impacts imposed by the State in AMAs.

5. After 30 years of pumping, the projected incremental impact of HVS pumping is not substantial and, in fact, would be much less than 1 foot of elevation change for wells in the City of Kingman, Dolan Springs, and Valle Vista areas.

If you have any questions about the concepts or information provided herein, please do not hesitate to contact me.

Sincerely,

MONTGOMERY & ASSOCIATES, INC.

William R. Victor

William R. Victor, P.G.

Attachments (2)

ARIZONA DEPARTMENT OF WATER RESOURCES
Office of Assured and Adequate Water Supply
3550 North Central Ave., Phoenix, Arizona 85012
Telephone (602) 771-8585
Fax (602) 771-8689

RECEIVED
NOV 9 2007
MONTGOMERY & ASSOC. INC.
SCOTTSDALE, ARIZONA

Janet Napolitano
Governor

Herbert R. Guenther
Director

ANALYSIS OF ADEQUATE WATER SUPPLY

November 9, 2007

File Number:	43-402285.0000
Development:	Red Lake
Location:	Township 25 North, Range 17 West, Sections 1, 3, 5, 7, 9, 15, 17, 18, 19, 21, 28, 29, 30, 31 Township 26 North, Range 16 West, Sections 5, 7, 17, 18, 19, 20, 28, 29, 30, 31 Township 26 North, Range 17 West, Sections 3, 5, 7, 9, 13, 14, 16, 17, 19, 21, 23, 24, 25, 26, 27, 29, 31, 33 Township 26 North, Range 18 West, Sections 13, 23, 25, 31, 35 Township 27 North, Range 16 West, Section 31 Township 27 North, Range 17 West, Sections 1, 3, 13, 17, 19, 21, 23, 25, 29, 31, 35 Township 28 North, Range 17 West, Sections 23, 25, 27, 35 Mohave County, Arizona
Land Owner:	American Land Management, L.L.C., a South Dakota limited liability company; Desert Communities, Inc., a Nevada corporation; South Dakota Conservancy, L.L.C., a South Dakota limited liability company and Meridian Land, L.L.C., a Nevada limited liability company

The Arizona Department of Water Resources has evaluated the Analysis of Adequate Water Supply application for Red Lake pursuant to A.A.C. R12-15-712. The proposed development includes 210,700 single-family residential lots and 12,880 multi-family housing units. There are approximately 4,416 acres of non-residential uses such as elementary schools, high schools, 2 golf courses, common areas and parks. The applicant is going to rely on effluent water for the exterior water demand. Conclusions of the review are indicated below based on the adequate water supply criteria referenced in A.R.S. § 45-108 and A.A.C. R12-15-712.

- **Physical, Continuous, and Legal Availability of Water for 100 Years**
  On the basis of the Department's review, the Department has determined that 43,432.33 acre-feet per year of groundwater and 26,160.93 acre-feet per year of effluent will be **physically and continuously available**, which is equivalent to the annual estimated water demand for the development of 69,593.26 acre-feet per year. The application did not include a Notice of Intent to Serve form with the application. Therefore, **legal availability** of the water is not considered proven. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. Individual Notices of Intent to Serve will be required for each application for a Water Report.

- **Adequate Water Quality**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-719 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report, the Office of Assured Water Supply may be contacted for further guidance.

- **Financial Capability of the Owner to Construct the Necessary Distribution System**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-720 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report for an individual subdivision plat, the Office of Assured Water Supply may be contacted for further guidance.

The term of this Analysis of Adequate Water Supply is ten years from the date of this letter and may be renewed upon request, subject to approval by the Department. Throughout the term of this determination, the Department, when reviewing other requests for adequate water supply in the area, will consider the projected demand of this development. The demand projected for this development assumes that the conservation measures the applicant has identified to the Department will be required for the homes in this development, including the effluent use requirements for public parks, large turf areas and golf courses and low water use landscaping on the property. Additionally, it must be noted that based upon the limited hydrogeologic data available for the proposed development area, the amount of groundwater that may be physically available to 1,200 feet below land surface for this project may be limited. As additional hydrogeologic data becomes available, applications for Water Reports and the determination of physical availability in this analysis may be affected by that additional data.

Prior to obtaining plat approval by the local platting authority and approval of the public report by the Department of Real Estate, a Water Report must be obtained for each subdivision plat. The findings of this Analysis of Adequate Water Supply may be used to demonstrate that groundwater and treated effluent supplies are physically available for at least 100 years for purposes of an application for Water Report, unless new hydrogeologic data indicates otherwise. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. This determination may be invalidated if the development plan or other conditions change materially prior to filing for a Water Report.

Questions may be directed to the Office of Assured/Adequate Water Supply at (602) 771-8585.

Sandra Fabritz-Whitney, Assistant Director
Water Management Division

cc: Greg Wallace, Errol L. Montgomery & Associates, Inc.
Office of Assured and Adequate Water Supply
Nicole Swindle, Legal Division
Joan Card, Assistant Director, Arizona Department of Environmental Quality
Steve Olea, Assistant Director, Arizona Corporation Commission
Roy Tanney, Assistant Director, Arizona Department of Real Estate
Karl Taylor, Director, Subdivisions Division, Mohave County Planning and Zoning

From: "Stephens, Chris" <CStephens@BHFS.com>
Subject: **Fw: Red Lake Analysis**
Date: September 9, 2009 11:41:57 AM PDT
To: <greg@mohavesun.com>

Any federal tax advice contained in this communication (including any attachments) is not intended to be used, and cannot be used, for purposes of (i) avoiding penalties under the Internal Revenue Code, or (ii) promoting, marketing or recommending to another party any transaction or tax-related matter addressed herein.

This transmission and any attachment is attorney privileged and confidential. Any dissemination or copying of this communication is prohibited. If you are not the intended recipient, please notify us immediately by replying and delete the e-mail. Thank you.

From: Sandra A. Fabritz <safabritz@azwater.gov>
To: Stephens, Chris
Cc: johnrgall@gmail.com <johnrgall@gmail.com>; Christine Ballard <Christine.Ballard@co.mohave.az.us>
Sent: Wed Sep 09 11:58:15 2009
Subject: Red Lake Analysis

Chris -

I am writing to confirm our discussions regarding the status of the Analysis of Adequate Water Supply No. **43-402285.0000**, issued to American Land Mgt. LLC, a South Dakota limited liability company; Desert Communities, Inc. a Nevada corp; South Dakota Conservancy, LLC a South Dakota limited liability company; Meridian Land, LLC, a Nevada limited liability company **(Red Lake)**. The volume of groundwater that was demonstrated to be available for this project is 43,432.33 acre-feet per year. The actual demand of the development was assumed to be 69,593.26 acre-feet per year, with 26,160.93 acre-feet per year of effluent assumed to be available for the 100 year period.

The AAWS was issued on November 2, 2007 and is valid for 10 years from the date of issuance. The AAWS can be extended for two consecutive five year periods thereafter, if progress is being made on the development. During the term of the AAWS, the Department will consider the groundwater volume to be committed demands for all subsequent applications for adequate water supply – meaning subsequent applications must take this volume into account and demonstrate that they will not impact this volume before the Department will issue a determination of adequate water supply. This assumption will remain in place even if the property changes ownership during the term of the AAWS, unless the landowner requests that the AAWS be terminated.

If you have any questions, please feel free to contact me at 602-771-8589.

Sandra Fabritz-Whitney
Assistant Director
Water Management Division
Arizona Department of Water Resources
3550 North Central Avenue
Phoenix, AZ 85012
(602) 771-8589

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EXHIBIT
HVS-25
ADMITTED

Business Summit of the West
Western Business Roundtable

Tuesday, January 5, 2010

Remarks by Gov. Jan Brewer

Thank you, David, and thanks to the Western Business Roundtable, the Arizona Chamber, the Arizona Investment Council and the NextGen Energy Council for sponsoring this event.

Let me welcome all of you to the Great State of Arizona – especially those of you who may have left cold and ice and snow behind to be here today.

Now, I never try to intentionally disparage the states of my fellow Governors. Especially since the Governor of Montana, Brian Schweitzer, and his lovely wife, Nancy, are at the conference today.

But for those of you who traveled south to be here … including those of you from Montana … don't you think Arizona represents a welcome "climate change," if even for a few days?

And to those of you who are looking for places to expand your business operations in 2010, take a good hard look at Arizona while you are here.

I think what you'll find is that we have all of the beauty and grandeur of a state like Montana – but without all the ice scrapers.

And … our climate scientists are now predicting cooling in the evening and warming in the morning, so we will have the best of both worlds.

In all seriousness, I'm especially pleased that the Business Summit of the West is being held here in Arizona.

Our state is poised for robust growth and job creation in 2010 and beyond.

But I also see Arizona helping to lead the West in a robust economic revival that is long overdue.

Arizona is home to some of the world's top technology innovators in clean energy, manufacturing, health care, transportation, small business – the list goes on and on.

Their innovation – combined with the right public policies – can and will lead to a new job creation boom across our state and across the nation.

I want you all to know that I intend for Arizona to lead the West – and the nation – back to economic prosperity.

And we can show the world how to grow our economy and shrink our environmental footprint at the same time.

Let me elaborate on this a bit.

As many of you probably know, Governors – just like everyone else -- have pet projects.

When I'm home, in the backyard, my pet projects are my plants and flowers, and birds.

When I'm in the office, it's jobs.

Job creation is the path out of our economic downturn in Arizona, and I intend to lead the way.
Already, Arizona has a rapidly emerging national leadership role in climate friendly technologies.

But, the creation of good jobs – green jobs and jobs across the spectrum – requires a commitment to long-term planning, and the ability to sustain a vibrant economy. As Governor, I am committed to doing just that, putting into place the right path stones so that those who follow after us, will know the right way, and that right way will have been made much easier for them.

It is, really, a vision for Arizona's Second Century.

Since before statehood, Arizona has provided leadership in fostering solar energy research, development, manufacturing, and deployment.

This expertise continues today as we move into our Second Century.

It is experience and knowledge that will benefit the people and the economy of Arizona, as well as the nation and the world.

I am committed to making Arizona the Solar Capital of the World.

We are on our way toward that goal with a combination of regulatory and tax reforms.

We are re-thinking areas of our tax structure that unduly burden our employers, particularly those who require large capital investments, such as manufacturing.

We are examining how we treat them in property taxes – in business personal property taxes -- and in capital gains taxes.

While I will have a lot more to say about tax policy to spur job creation next week in my State of the State address, I wanted to give you a brief preview today. First, I will continue my call for a phased-in reduction in Arizona's corporate income tax rate to make it more competitive with our neighboring Western states. And second, I will be laying down the principles for additional tax incentives for job creation in our State.

Government must move aside, and let the creators of jobs and wealth, energize the market place.

That includes the hidden taxes of regulation.

This morning I am announcing the use of a significant portion of my remaining stimulus funds directly on bringing new jobs to Arizona.

I am devoting $10 million in one-time federal stimulus funds so our employees will be "work-force-ready" – the primary job training solution and what we need most to close the deals for business in Arizona, particularly in this new energy sector.

My first act as Governor included issuing a directive freezing all new agency rules and rulemaking, because we do not need new and burdensome regulations that only serve to strangle businesses and add needless costs and frustrations to people who are simply trying to make an honest living, or get into business for the very first time.

We cannot quash the next generation of entrepreneurs with petty rules and fines.

We must be sure we cut through the "green" tape as well as the red tape.

I can tell you how we are NOT going to do it.

We are NOT going to do it the California way, where, just recently, it was reported that visual impact and infrastructure regulations threaten construction of solar plants and wind farms planned for the region near the border of California and Nevada – those designed to generate electricity without carbon dioxide emissions.

In contrast, in Arizona, we are firing on all cylinders – distribution, line-siting, regulatory and tax reform – to ATTRACT renewable energy industries. We like them. We want them. We are prepared for them.

Memo to California solar industries: Arizona's door is open, we'll leave the light on for you.

With the start of the new year, Arizona has a new resource to advance its solar platform and reach into the area of renewable energy -- The Arizona Renewable Energy Tax Incentive Program.

Business leaders across the state rallied in support of this legislation last session.

I signed it into law last June.

This program will stimulate new investments in manufacturing and headquarter operations of renewable energy companies including solar, wind, geothermal, and other renewable technologies.

The formula is simple.

If you create quality jobs for Arizonans – the program offers two key benefits -- State income tax credit of up to 10 percent of the value of the investment, and, if the capital investment is over $25 million, then the renewable energy company is eligible for an approximate 77 percent reduction of the state property tax on both real and personal property for 10 to 15 years.

Already, one of the world's largest solar cell manufacturers has announced it will locate in the Phoenix-metro area and create jobs for Arizonans.

China-based Suntech Power Holdings is a multi-billion dollar corporation that makes photovoltaic solar cells and solar electric systems. Suntech is the first Chinese clean technology leader to bring manufacturing jobs to America.

In explaining why it chose the Metro Phoenix area, Suntech cited QUOTE "Arizona's leadership in research through Arizona State University, and statewide renewable energy policies, particularly its Renewable Energy Standard and distributed generation set-aside, as well as a supportive local business climate."

It will potentially be the first company eligible under the new Renewable Energy Tax Incentive Program.

I assure you it will not be that last one.

In recent weeks, I have met with several renewable energy companies interested in coming to Arizona.

In addition to our new solar energy businesses, I want to recognize First Solar's presence and leadership in Arizona. First Solar has its headquarters in the Metro Phoenix area. First Solar is one of the world's largest solar module makers and the first U.S. solar power company to join the flagship S&P 500 stock index.

I am committed to establishing Arizona as a leader in the renewable energy sector.

I am serious about creating quality, stable jobs that will help advance and diversify our state's economy.

Here's a recipe you'll only find in Arizona:

Take 300+ days of sunshine.

Add one of the fastest growing states in terms of population.

Stir in a large skilled workforce.

Add low payroll taxes.

Pour in a strategic location with the recently passed Renewable Energy Incentive Program.

Mix it all together ... and let it all rise ... and you get Arizona: arguably now the premier place in the United States to establish a business in the renewable arena.

Arizona's solar resource has the potential to provide enormous opportunity for economic growth.

It also has the potential to help Arizona become more energy independent.

While the Renewable Energy Incentive Program provides cash and tax incentives for virtually all non-generation companies in the renewable space, I want to see an incentive program targeted for renewable energy power generators.

Our Renewable Energy Standards require regulated utilities to generate 15% of their energy from renewable resources by 2025.

While these rules do not have a dedicated solar set-aside, they do have a specific set-aside for distributed generation.

The Standards allow utilities to use solar, wind, biomass, biogas, geothermal and other similar technologies to generate "clean" energy to power Arizona's future.

The rules package outlines what technologies qualify and allow for new and emerging technologies to be added as they become feasible. I am leading efforts to ensure that Arizona's $129-million in energy funds through the American Recovery and Reinvestment Act reap incredible benefit in the State.

We have launched a public buildings solar initiative with a goal to procure and deploy one megawatt of new solar installations on our state's public buildings in early 2010.

Arizona is also establishing a grant program to demonstrate commercially viable renewable energy and energy efficient products manufactured in Arizona.

An Energy Fund targets businesses wishing to retool or expand to meet the needs of the increasing renewable energy industry. These businesses can be in the supply chain as well as those developing the end product.

Arizona will grow green jobs and demonstrate the usefulness of renewable energies, like solar and wind, in diversifying and strengthening our state economy.

As a package, these incentives allow Arizona to compete globally, be more aggressive in attracting foreign direct investment, and secure quality jobs for Arizonans.

With a greater focus on renewable energy innovation, solar installation, and energy efficiency, Arizona will continue to lead the nation in the development and implementation of products that move the State of Arizona – and our country -- toward energy independence.

So today, I am announcing 3 new executive orders focused on renewable energy and climate change.

Executive Order No. 1
First, I am issuing an Executive Order creating the Governor's Solar Energy Advisory Task Force.

This group of 15 will evaluate incentives provided to solar energy producers and recommend their continuation, elimination, improvement and/or expansion.

They will identify impediments which have halted solar energy projects and have limited the distribution of solar and they will propose reforms to the public process and tax structures that advance the development of solar energy.

The Task Force will also advise me on any solar energy matters that it deems worthy. The Task Force will submit its written findings and recommendations about issues requiring legislative enactment to me.

Executive Order No. 2
Second, I am also issuing an Executive Order, directing that the Arizona Commerce Department, the Arizona State Land Department, and our three State Universities – along with the cooperation of the Arizona Bureau of Land Management and the Arizona Corporation Commission and non-profit associations with an expertise in advancing renewable energy development -- convene to frame the issues in renewable energy generation projects.

There should be:

-- Improved tribal, university and agency communication and coordination,

-- Timeline coordination and prioritization amongst the agencies,

-- Framing of issues related to the successful deployment of renewable energy projects,

-- And, the convening of a town-hall type meeting to discuss and develop strategies for increasing the success of renewable energy projects.

Executive Order No. 3

And third, I will be issuing an Executive Order governing Arizona's continued participation in the Western Climate Initiative and establishing a group to advise me on the WCI and federal climate change legislation.

I want to ensure that Arizona's unique perspective will be advanced and considered by the members of the WCI as they work to develop the Initiative and in any federal legislation.

While some have advised me to drop out of the WCI, I believe that if you are not at the table, you are on the menu!

Nuclear
Let there be no doubt; let there be no mistake, let there be no mischaracterization.

I am a strong advocate for the development of more nuclear energy in Arizona.

I have supported the Department of Environmental Quality when it issued controversial permits to a uranium mining company in northern Arizona and strongly objected to a proposal by the U.S. Bureau of Land Management to withdraw uranium mining claims on federal land in northern Arizona.

We have participated in meetings hosted by legislative leaders hoping to introduce legislation to create energy parks with a focus on nuclear power plants.

While we need to develop plans for the development of alternative sources of power for the Central Arizona Project, continued repayment of the Central Arizona Project, and ways to continue the employment and income generated from coal royalties on the Navajo and Hopi Reservations, nuclear power is at the cornerstone of our clean energy future.

Why nuclear?

Because nuclear power is clean-air energy.

It is the best source of power generation that does not produce greenhouse gas emissions. Nuclear is available 24-hours-a-day, seven days a week.

Nuclear's production costs are stable and are not subject to extreme market fluctuations as are natural gas and oil.

Each year, the average nuclear plant generates approximately $430 million in sales of goods and services in the local community and nearly $40 million in total labor income.

And every nuclear plant provides annual state and local tax revenue of almost $20 million to benefit schools, roads, and other state and local infrastructure. Each nuclear plant also pays roughly $75 million in federal taxes each year.

Need I say more?

A new nuclear plant has not been ordered in the U.S. since 1979. Yet, U.S. nuclear operators have been successful in improving safety and efficiency at the nation's existing nuclear facilities.

So, I do not for a moment shy from what nuclear energy offers Arizona's future.

COAL
But, let's be honest with each other.
We all know – as much as we love solar and nuclear energy -- we are still going to be using coal. According to U.S. government projections, world coal use could increase nearly 50% by 2030. Because of that, we do need to be aware of its environmental consequences as we pursue clean coal technologies.

But, it is also important that federal regulations do not hamper our ability to ensure the infrastructure we need.

We simply cannot allow excessive federal regulations to shut down our vital near-term supplies even as we forge a new path to our Second Century with viable alternative energy sources.

We cannot allow the federal government to make an orphan of common sense and our ability to make cost-benefit decisions based upon what is right and appropriate for Arizona and her future.

At this very moment, new federal rules under consideration by the EPA, threaten to close the Navajo Generating Station in northern Arizona, subsequently impacting jobs and water costs for businesses, governments, and citizens throughout Arizona.

Federal rules like these – those that do not even consider economic consequences -- only serve to defeat the very purpose for which the federal stimulus programs were proposed – in other words, they mindlessly threaten to eliminate important Arizona jobs.

In addition to the costly ramifications across Arizona, the proposed federal rules would have a particularly pernicious impact on the Hopi Tribe and the Navajo Nation. Almost 80% of the 545 NGS full-time employees are Navajo, and the Kayenta Mine that provides coal to NGS employs another 422 tribal members. The revenue received by the Hopi Tribe from coal sales account for the bulk of the Tribe's funds for governmental operations.

Frankly, we don't need the federal government telling the Grand Canyon State how to protect ... the Grand Canyon.

Today, I challenge the Western Business Roundtable members to work with me to develop an innovative clean coal solution for the Navajo Generating Station. I

believe this is a unique opportunity because any such solution will have the support of the Native Americans and the State of Arizona.

So, there you have it.

With common sense and prudence, let's assess – and pursue -- all of our options with regard to clean energy, utilizing the Arizona skills -- and a unique Arizona recipe -- for developing our future into the Second Century.

You will have no greater advocates than Jan Brewer and her team at the Department of Commerce.

You've seen what we've done in just one year. And, we've only just begun.

Thank you.

EXHIBIT
Committee - 1

Jim Kanelos

4402 W Oatman Rd
Golden Valley, AZ 86413
Tel: (928) 565-2453
Email: jkanelos@live.com

January 6, 2010

LINE SITE COMMITTEE

MESSRS.:

I am Jim Kanelos, resident of Mohave County, Arizona. I am also a voting member of the following organization:

ARIZONA HYDROLOGICAL SOCIETY
ARIZONA GEOLOGICAL SOCIETY
MOHAVE COUNTY LOCAL DROUGHT IMPACT GROUP
LOWER COLORADO RIVER RESOURCE CONSERVATION & DEVELOPMENT COUNCIL
ARIZONA WATER RESOURCE RESEARCH CENTER
NORTHWEST ARIZONA WATERSHED COUNCIL
HIGHWAY 93 NORTH AREA PLAN COMMITTEE, VICE CHAIRMAN
CENTRAL SACRAMENTO VALLEY AREA PLAN COMMITTEE
SACRAMENTO VALLEY SERVICES, INC., - DIRECTOR/VICE PRESIDENT

I am also an Arizona Master Watershed Steward.

My points to this esteemed council deals with matters of the "public good". I am not opposed to "solar energy", nor "alternative energy" projects. I do believe that it's this committees responsibility to address issues of "value vs cost", what is considered "re-enable resources" vs "finite resources", practical application of usage regulations, as opposed to unreasonable applications.

The proposed project is making use of, extraneous, unsubstantiated funding, to support their project, with NO definite data base that supports their financial availability claims. Further, the deceleration documents of "employment benefit" has also not been properly certified, nor the economic value to the community areas involved. The project is whole weighted on, thus far none excitant grants, and government support, to which NO applicants have thus far been submitted to any agency I am aware of... check the registry of USCCR's, this project has yet to request funding. In plain language, they are putting the cart before the horse.

Cost vs Benefit:

Benefit: Mohave County and Kingman area, may receive a $2 billion dollar solar energy distribution generation facility. According to the filed documents the major financial application and support come from U.S. Taxpayer dollars. During construction period, 12 to 18 months, employment, based on National average will be applied to 600 to 1200 workers. When completed actual employees would rage from 100 to 120 employees... NOT at National average, i.e. Arizona Right to Work laws.

Property taxes will increase on said lands, per industrial/manufacturing rates. Except that, under current Arizona State Statues, "alternative energy plants", will receive a minimum of 20% tax break on land taxes, and abatements from Mohave County for up to five, and maybe beyond years. Surrounding lands, which may become "industrially zoned" would also increase tax revenues, on a per acre basis.

Use of treated effluent water from the City of Kingman, would provide a direct financial revenue to the city, and

make use of most if not all of the available treated water, and offset costs associated with the city's project.

Cost:

The most immediate cost concern is the general draw down of the Hualapai Aquifer, which is NOT recharging at rate to maintain projected water usage for the area. There is NO cash or tax revenue from the "solar plant" to either the state or county governments. There is also NO current water usage monitoring system, nor applicable state statutes for this area, to insure that the plant does not exceed their allocated usage. This could potentially have an adverse effect on "residential" landowners of the area.

The proposed "solar generating plant", provides NO immediate electrical benefit to the local community.

The increased tax revenue base to the state and county governments by the project, would in fact, be negligible if any, as the project developers, are seeking "solar generating projects" tax relief, if compared to a residential development of the same size area. A housing development, which was the original proposed usage of the land area, would have provided infrastructure fees, water and utility taxes, far exceeding any reasonable expectations from the project.

The general increase in tax revenue from the project, would have a negative impact of existing "residential" property values in the surrounding area, lowering property values to such an extent that it would negate most, if not all of the potential "revenue increase" from land designation as "industrial/manufacturing". The current land valuation of "vacant" agricultural/residential lands are currently dropping due to general decline in the economy and housing development market. Within the area of the proposed project, are many high end valued houses, and developments that would be adversely affected immediately, creating a loss of tax revenue to the county and state. Further the "resale" value of these homes, already being depreciated by economic conditions, would face even greater devaluations. Federal Code requires that "residential property values", MUST be a primary consideration in the Cost vs Benefit, applications of Any project involving federal usage of said properties, making a financial impact, or any project the is making use "substantial federal funding" for said project. This project, according to the informational data provided by the project developers, is almost entirely based on federal funding.

In summation:

It would appear that the use of City of Kingman, treated water, would be cost prohibitive, as opposed to pumping ground water available at the project site. As there are NO restrictions on the use of ground water facing the project developers, it would be logical to use the ground water. NO actual binding agreement is in place between the City of Kingman and the project developers, at this time.

As the project developers will be receiving both state and county property tax incentives, for a considerable amount of time, the life expectancy of the project stated to be 30 years, would not seem beneficial to either the state nor the county governments.

The damage local area property values, the depletion of the water table, and minimal employment impact would seem greater cost than benefit.

Respectfully submitted for your consideration;

Jim Kanelos

EXHIBIT
BTC-1
ADMITTED

Arizona Building and Construction Trades Council

Quality Craftsmanship
You Can Trust

1

EXHIBIT
BTC-1
ADMITTED

Arizona Worker's Building Arizona

I. Introduction to the Arizona Building Trades Council (BTC)

II. Why use the Building Trades?

III. BTC Project Labor Agreement (PLA) & New Construction

IV. How the Building Trades Will Contribute to the Community

V. The Building Trades Difference

Introduction to the Arizona Building Trades Council (BTC)

- The BTC members have served Arizona's construction labor needs for more than 100 years.
- The BTC is comprised of 17 affiliate unions representing more than 10,000 members and their families.
- It is the mission of the BTC to work with its affiliates, labor partners and contractors to provide an exceptional construction labor force.

Building Trades Leadership

President:
Martin "Buzz" Murphy,
Ironworkers Local 75

Vice President:
Phil McNally,
UA Local 469

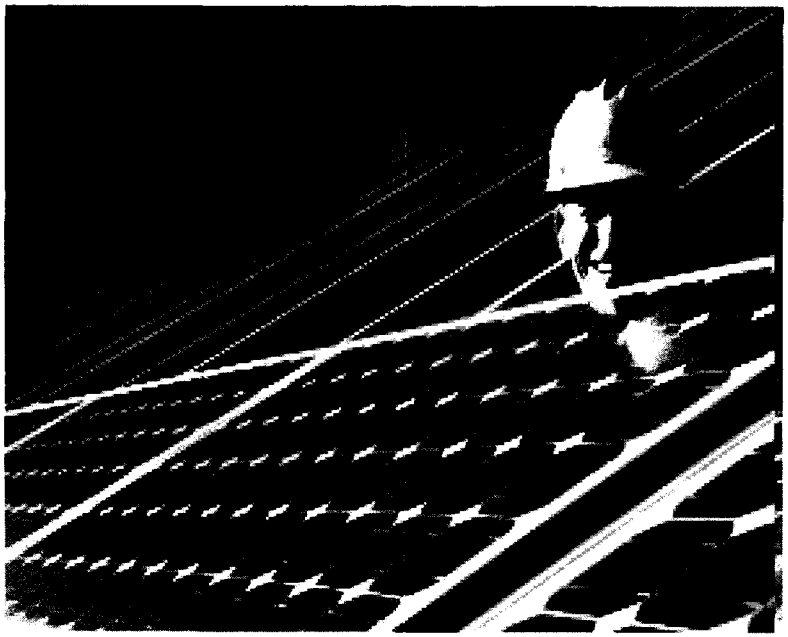
Secretary Treasurer:
Dean Wine, IBEW 640

Building Trades Affiliate Unions

- Boilermakers Local 627
- Bricklayers Local 3
- Carpenters Local 408
- Carpenters Local 1506
- Electricians Local 518
- Electricians Local 570
- Electricians Local 640
- Elevator Constructors Local 140
- Iron Workers Local 75
- Insulators & Asbestos Workers Local 73
- Laborers Local 383
- Operating Engineers Local 428
- Painters & Allied Crafts Local 86
- Plasterers & Cement Masons Local 394
- Plumbers Pipe Fitters and Steamfitters Local 469
- Regional Reinforcing Iron Workers Local 847
- Roofers, Waterproofers and Allied Workers Local 135
- Sheet Metal Workers Local 359
- Teamsters Local 104
- UA Sprinkler Fitters Local 669

Why use the Building Trades?

- Local Workers
- Apprenticeship Training
- Safety
- Assured workforce
- Trade collaboration
- Committed to Excellence
- Healthcare provided to workers and families
- Pension and retirement for local workers



Apprenticeship Training

- Apprentices receive state-of-the-art training in their craft as well as safety training which sets and often exceeds industry standards.
- Hands-on jobsite training is supplemented with classroom instruction to teach workers a life long skills.
- Apprenticeship training is paid for through contractor and member contributions—no cost to county or city.
- Apprentices receive college credit for time spent in the program, and many graduate with an Associate's degree.

Apprenticeship Investment

Building Trades workers take pride in providing well-trained, highly skilled labor.

To meet this need, local unions make a sizeable investment in apprenticeship training and facilities.

The Building Trades spends over **$4.3 million a year** on its apprenticeship programs with private money.

This is a sample of BTC members' investment in apprenticeship training:

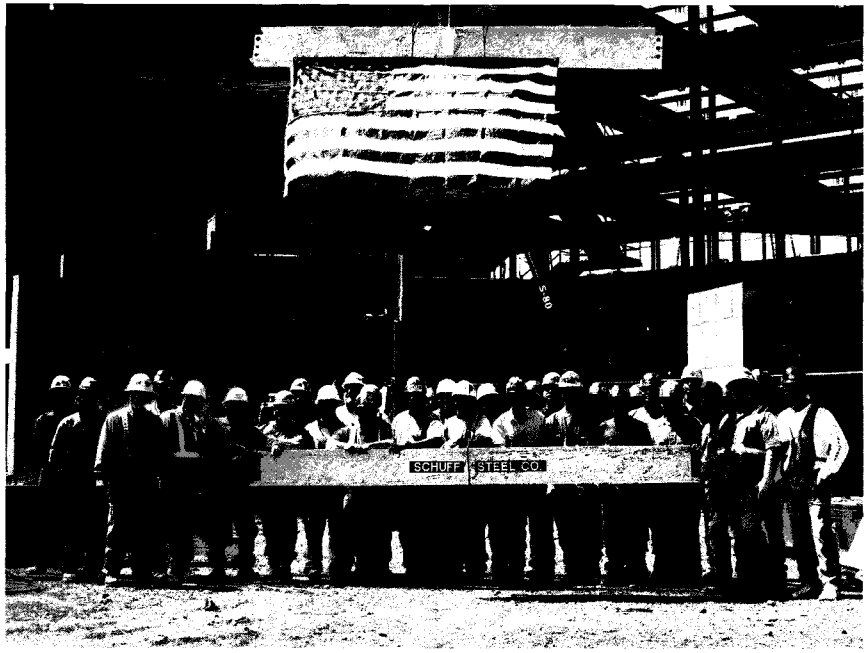
BTC Member Union:	Apprenticeship Investment / Year:
Insulators	$160,000
Bricklayers	$134,000
Cement Masons	$105,000
Electricians 640	$500,000
Ironworkers 75	$1,000,000
Pipe Fitters 469	$1,388,000
Sheet Metal Workers	$1,000,000

Jobsite Safety

- Building Trades workers take pride in their unparalleled safety record.
- Building Trades workers receive the most extensive safety training in the state.
- The BTC may coordinate an on-site safety director and on-site nurse.
- Each worker will be drug tested before being dispatched to the jobsite, and will comply with all owner drug-testing policies.

Projected Manpower Availability

- Working with the Building Trades allows project managers to accurately forecast craft availability and labor costs.



Projected Manpower Availability

BTC Member Union	In-State Manpower	In-State Apprentices
Asbestos Workers	205	75
Boilermakers	135	72
Bricklayers	275	28
Carpenters	5,000	400
Electricians	1,951	200
Iron Workers	1,330	132
Laborers	1,200	50
Operating Engineers	1,900	60
Painters & Allied Crafts	440	160
Pipe Fitters	2,644	400
Plasterers & Cement Masons	200	75
Sprinkler Fitters	158	40
Sheet Metal Workers	450	141

Committed to Excellence

- Not your grandfather's union.
- All Building Trades member unions have a Code of Excellence which must be signed by each union member.
- These codes spell out obligations for union members.

Examples of worker standards of conduct covered in a Code of Excellence:

- Tardiness or absenteeism
- Poor and unprofessional attitude and / or appearance
- Non-compliance with employer / customer work rules
- Poor workmanship or productivity
- Horseplay
- Harassment of co-workers
- Participating in or instigating any type of work slowdown or work stoppage
- Theft
- Jobsite violence

Building Trades Crafts Work Together

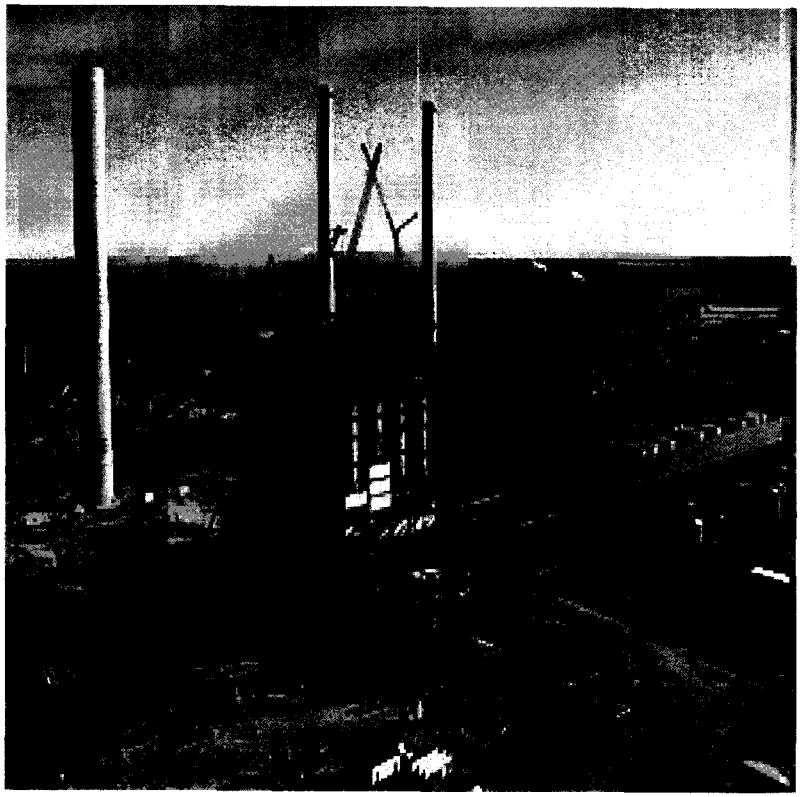
- The Building Trades are committed to building relationships with contractors and owners.
- Building Trades workers routinely work side-by-side on complex, highly technical projects.
- Collaboration saves time and money, creating a finished product of the highest quality possible.

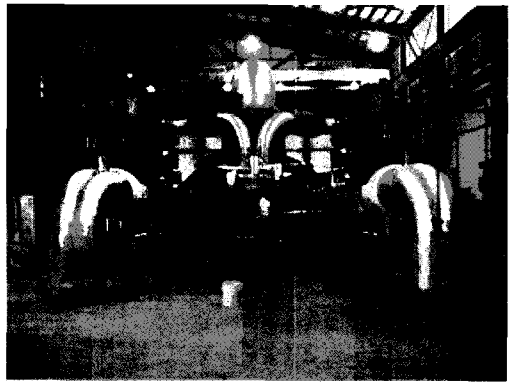
BTC Projects

- Generally, the BTC uses Project Labor Agreements to define and effectively manage costs for contractors and developers on projects

POWER magazine's
2006 Plant of the Year

Springerville Generating Station-Unit 3



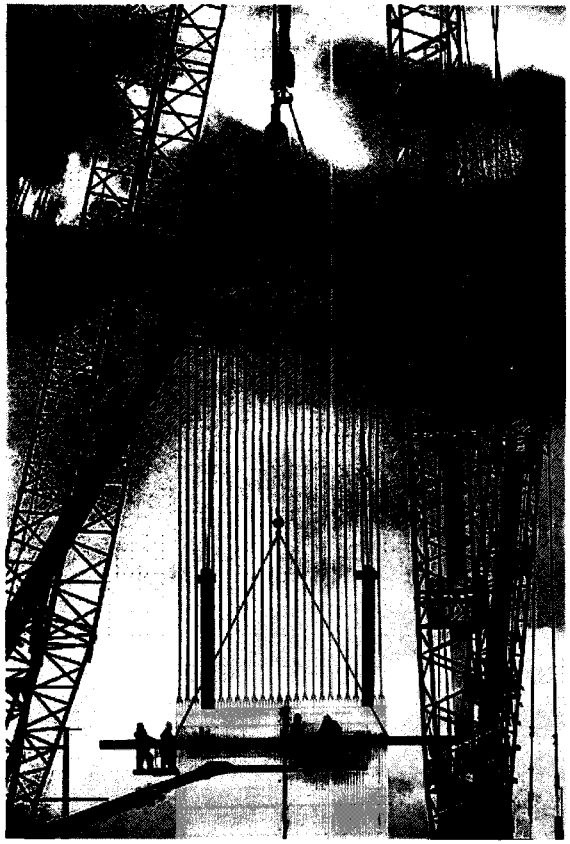


Springerville Generating Station-Unit 3

- Power Magazine's 2006 Plant of the Year
- State-of-the-art 400 MW coal-fired power plant
- First major pulverized coal-fired plant in 10 years
- Substantially complete in 33 months– 5 months ahead of schedule

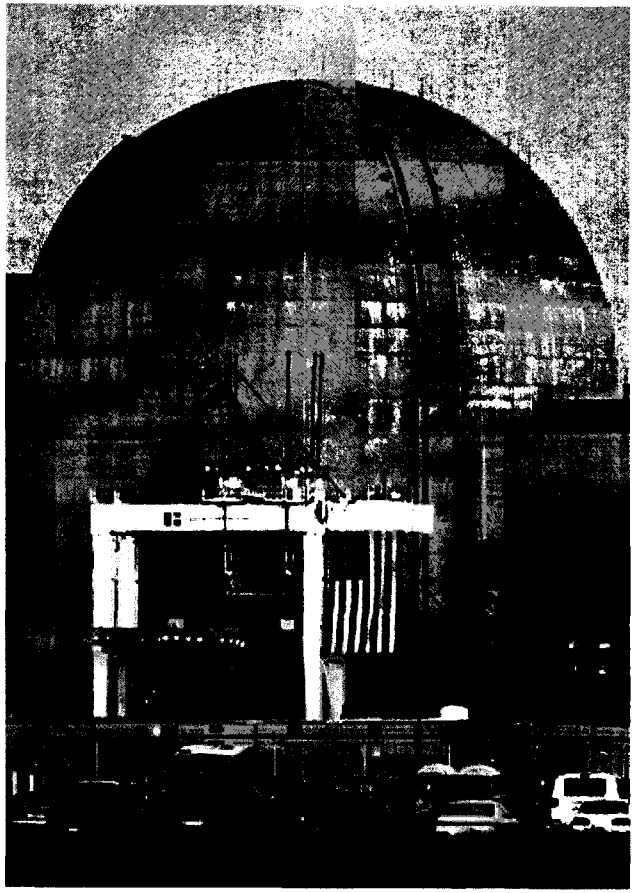
Springerville Generating Station-Unit 3

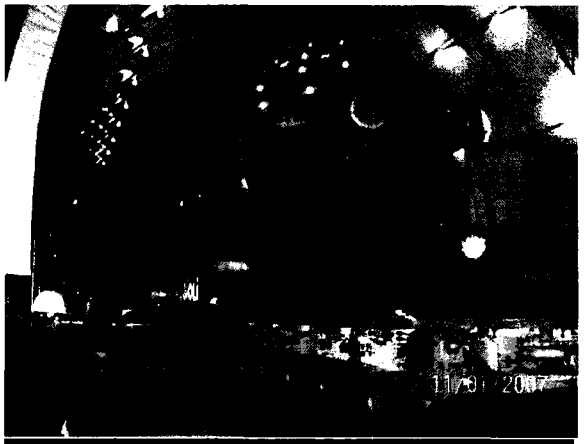
- 4.1 million man-hours without a single lost-time accident
- Healthcare provided to workers—not at taxpayer expense (ACCHS)
- Several Helmets-to-Hardhats apprentices and journeymen hired for the project



BTC-1-17

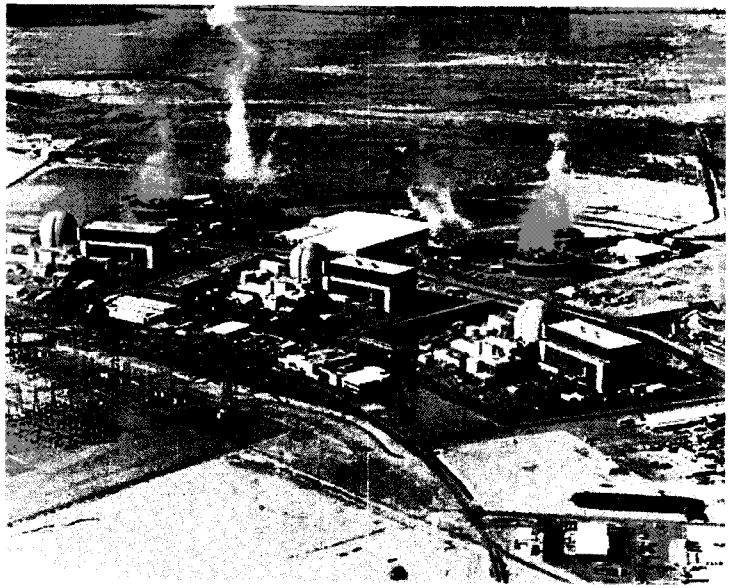
Palo Verde Nuclear Generating Station





BTC-1-18

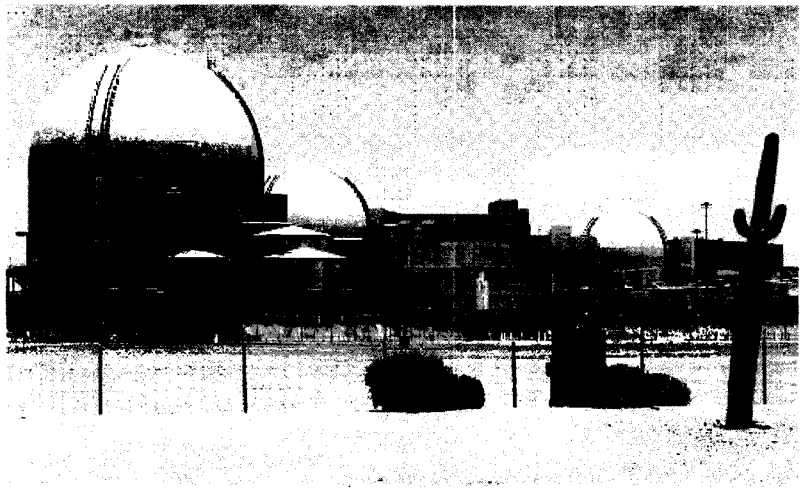
Palo Verde Nuclear Generating Station



- 3.2 GW multi-unit nuclear generating station
- Largest nuclear generating station in the United States
- Constructed over 12 years (1976 – 1988)

Palo Verde Nuclear Generating Station

- US Nuclear Regulation Commission updated Units 1 and 3 in 2005.
- Building Trades Workers completed update successfully.



How the Building Trades Will Contribute to the Community

- Local Arizona Work Force—<u>at least</u> 25% of workers will come from Mohave County
- Proposed Community Apprenticeship Programs
- Local Job Fairs

Local Arizona Workforce

- Over 53,000 construction jobs have been lost since July 2008 Arizona's unemployment rate in February 2007 was 3.8%
- Arizona has had a 28% drop in construction jobs this year. The largest year to year drop in in the United States.
- Arizona's unemployment rate in October 2009 was 9.3%
- Mohave's unemployment rate for October 2009 was **10.8%**

Local Arizona Workforce

- The Building Trades will work with partner signatory contractors or the owner directly to hire a local and Arizona work force.
- The BTC does not favor an out of state contractor hiring its own out of state workers.

Community Apprenticeship Program

The Building Trades Proposed Multi-Core Curriculum

- 120 hours training course
- Providing the local workforce with the skills necessary to work on upcoming solar projects
- Creating opportunities to learn a new skill set and begin a new life-long career

Local Job Fairs

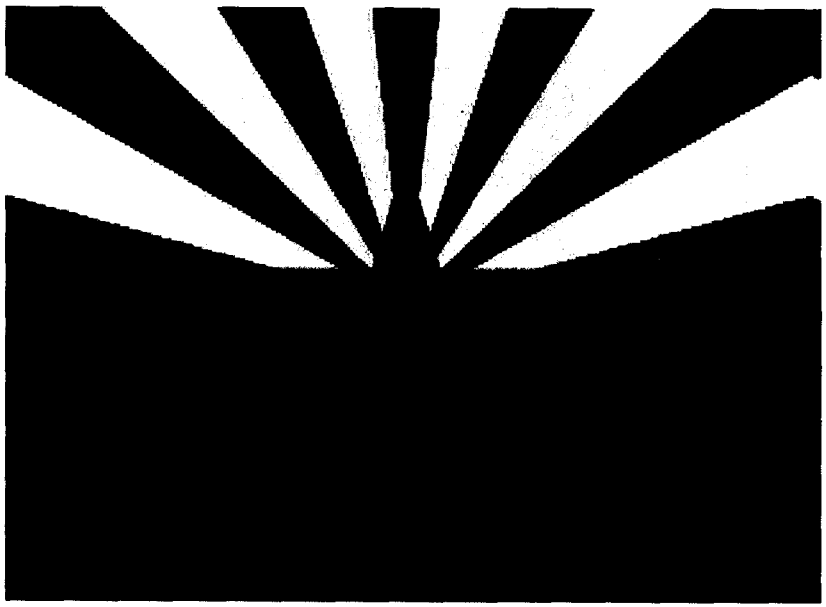
- February 10, 2010 the Building Trades will be hosting a Job Fair in Kingman, AZ at the Hampton Inn from 3 P.M. to 7 P.M.

- The Building Trades will be providing information to the local workforce on how to become prepared to work on the upcoming solar projects in Mohave County.

The Building Trades Difference

- Arizona's workforce building Arizona's future
- Proposed Community Apprenticeship Program Partnerships
- Growth for the Local Economy
- Superior Training and Safety
- A proven record of success
- An Assured Workforce
- Drug-free job site
- Healthcare and retirement plans for all workers at no cost to city, county, or state

Keep new construction jobs in Arizona!



- Arizona's working families need jobs!
- Choose the Building Trades to build Hualapai Valley Solar!
- This will ensure Arizonans benefit from new construction jobs.

EXHIBIT
BTC-2

Proposed additional language by the Arizona Building Trades Council

for

Hualapai Valley Solar, LLC Proposed Form of Certificate of Environmental Compatibility filed on January 4, 2010.

Page 2, Line 14
The Arizona Building Trades Council were represented by Israel Torres of the firm of Torres Consulting and Law Group, LLC, and provided a presentation pertaining to the Arizona construction trade unions and available manpower to build the proposed project with local construction workers.

Page 8, Line 20
23. Applicant, or its contractor of record, shall make good faith efforts to partner with Mohave County workforce development personnel to partner on job training and/or apprenticeship programs for Mohave County residents.

24. Applicant, or its contractor of record, shall make good faith efforts to utilize construction workers who are residents of Mohave County and/or the state of Arizona to construct the project.

25. Within ninety (90) days of the Commission decision granting this Certificate, the Applicant, or its contractor of record, shall make good faith efforts to commence discussions with the Arizona Building Trades Council on a model construction agreement that maximizes the utilization of Arizona and/or Mohave County residents for the construction of the project.

209 EAST BASELINE ROAD, SUITE E-102, TEMPE, AZ 85283
(602) 626-8805 OFFICE (602) 626-8889 FAX
WWW.THETORRESFIRM.COM

PENGAD 800-631-6989
EXHIBIT
BAY-1

I have a number of concerns with this applicant, Hualapai Solar, LLC. and their associations with others who don't respect the law or the taxpayers of the United States.
One of these individuals Is Don Van Brunt, in 1982 he pled guilty to the conspiracy to manufacture and possess counterfeit government obligations in other words pled guilty to counterfeiting, which is a felony and against the law. Even on his voter registration cards he signed that he had not been convicted of a felony. Supervisor Buster Johnson has praised Mr. Van Brunt for bringing in such companies as North Star Steel, which emitted so much pollution it liked to kill the residents, the state fined them 8.5 million and it ultimately shut down. Then Supervisor Johnson praised Mr. Van Brunt for bringing in Griffith and that plant is raising big water problems in Golden Valley. Contrary to Mr. Johnson opinion, M.C.E.D.A is not respected in Kingman. Mr. Van Brunt has also contributed to Supervisor Johnson campaign. Mohave County Manager Ron Walker publically stated, "Mohave County's open space, clean air and water are important, and fragile assets"..."The people who live here and the people who want to live here value these natural resources. But there are those who would take advantage of all of us and, in the process, destroy the very things that make life so good in our area. I want this county to take positive steps to protect and preserve our environment". Now Mr. Van Brunt has brought us Hualapai Solar LLC. The Executive Director, Mitchell Dong, ran a hedge fund that involved fraudulent market timing and late trading. It appears that he is one of the individuals who helped make our 401K worthless. He doesn't even own the property he plans to build on and they have falsified how much property they control in the area. These LLCs show questions as to **who** would be liable if things went wrong out there...his wife? Jim Rhodes? Mr. Dong?

My intervention against this project is broken down into 4 categories:

1.) Credibility issues of the applicant and associates;
2.) The lack of infrastructure in traffic routes;
3.) Our most necessary of species our bats, along with other sensitive species of wildlife;
4.) Lastly, I will be focusing on what concerns every living person, water.

Credibility:

Hualapai Solar has stated on its own web site that this company is applying for Federal stimulus money, and tax credits. The Executive Director, Mr. Mitchell Dong was sanctioned by the SEC, and paid 2.2 million dollars in fines for late trading. He has started a new corporation under the name of Hualapai Valley Solar, LLC and he believes he is entitled to qualify for Federal stimulus money. When Hualapai Valley Solar, LLC filled out its application with Mohave County, it was for a Concentrated Solar facility and with **no alternative**. Now they say to the Arizona Corporation Commission, "if this doesn't work, we

will just state, as an alternative, we can go photovoltaic". Hualapai Solar is trying to get approved for any solar operation they can get approved, so that they can qualify for the stimulus money.

Infrastructure:

Hualapai Solar has declared a site access route off Highway 93. This route directly takes you through the Dolan Springs which is on Route 25. Highway 93 has a dedicated speed limit of 65 miles per hour and is a 4 lane road, with turn off's. The road going into Dolan Springs is only a 2 lane road, starting out at a speed limit of 55 miles per hour and the speed limit goes down to a school zone of 15 miles per hour. These semi trucks will be transporting a minimum of 4 modular mirror units' and could be up to a maximum of possibly 8, the weight alone on an older road will cause dramatic damage. Route 25 has some sever cracking and deterioration on the route designated by Hualapai Solar. The amount of traffic generated just for the delivery of the modular mirrors is 2400 semi trucks. That figure did not include the balance of trucks necessary for the remaining construction needs.

Route 25 is a two lane road. This same road is the school bus route. There are signs posted that remind drivers not to pass a stopped school bus. Heavy semi trucks take longer to stop than a car because they are heavy. How are they going to stop in time if they must stop for a school bus? This same route designated by Hualapai Solar, goes directly past Mt. Tipton School. A heavily weighed down semi will have to slow down to make the turn in front of the school. To subject the school children to these road hazards is not safe. After leaving the school zone, the large trucks will pass through open range all the way to the project site. The live cattle will be placed at risk.

When asked, Supervisor Watson said "we have no plans to widen Stockton Hill Road". At the off ramp of i-40, Stockton Hill Road has one of the most dangerous intersections in Mohave County. Stockton Hill Road presents hazards today. To add semi truck traffic to that road would never be considered safe.

The only alternative route providing ingress and egress to the project site would be from Historic Route 66, west to Antares Road. Antares Road is a dirt road. Per Hualapai Solar they will not use this route, because the road is not paved. Antares Road also passes through open range lands.

Wildlife:

The Arizona Game & Fish have encouraged the use of **dry cooling** methods to significantly minimize water consumption. They also support the use of **hybrid parallel wet / dry cooling system** which reduces water consumption to a slightly lesser extent. However, they do not support the use of water cooling methods. Game and Fish's letter to Hualapai Solar they are concerned of the amount of water usage will exceed the natural recharge, which will place the aquifer under stress and more depletion. This will cause considerable affects on

wildlife. Arizona Game and Fish as determined that these two species of bats are "at risk, the Pale Townsend's big-eared bats, Allen's big eared bat, have been found within the vicinity of the area and they are considered "at risk". Bats fly by sonar. The intense heat from the Concentrated Solar reflector mirror's throw the bats sonar off and harm them. This could place these fragile bats into the endangered species category. The bats in Arizona are protected in a variety of ways by state and federal regulations. **State laws protect bats from being captured or killed!**

Water:

The state of Arizona is in a severe drought, and has been for at least 8 or more years. I make reference to the ADWR web site. Our President set standards in the area of renewable energy. The two main areas are wind and solar. My concern with Solar is that not all solar is considered GREEN. Photovoltaic uses no water, releases no carbon in the air, and very little particulate matter. The developers for Concentrated Solar state that it is GREEN, but yet these same companies use a non - renewable source of water to run its water cooled facility.

Montgomery & Assoc has stated that Hualapai Solar, LLC. Will be using water allocations that have been approved by the ADWR for the "Rhodes at Red Lake" subdivision, yet this subdivision and its golf courses have never been submitted in an application to Mohave County Development Services for a subdivision or land splits. The land was listed as Agriculture / Residential 36 Acre min. No requests for zoning changes have been made or reported to the public.

Mohave County spent 100,000 of taxpayer's dollars towards the USGS study on the Hualapai, Detrital, and Sacramento Aquifer's. This study was to determine if the Aquifers were in depletion, and how to budget growth based on the declines in water. In August 2007, a part of the study was completed. According to the USGS, the Sacramento Aquifer has declined 60 feet, and the Hualapai Aquifer has declined 55 feet. The Mohave County General Plan Policy 3.5 reads "Mohave County will only approve power plants using "dry cooling" technology when the aquifer is threatened by depletion or subsidence". This policy was put into the County General Plan as a result of the water in perpetuity as set forth in ARS # 45-108. The wording of the General plan is clearly written. The Hualapai Aquifer is in depletion based on the USGS and therefore 3.5 must and should be honored and followed.

I believe that we the citizens of Mohave County can have truly GREEN job's, building truly GREEN projects, but an outdated, Concentrated Solar that claims it is a renewable energy, is just all wet. Like the wet cooled turbines that release particles in the air, for our beloved bats, and animals, and human's to breathe. I plead that you, the line sitting committee, enforce the Mohave County General plan 3.5 and ask Hualapai Valley Solar, LLC to resubmit their application for a Dry Cooled or photovoltaic facility.

Susan A. Bayer
7656 West Abrigo Drive
Golden Valley, AZ. 86413

Outline for Docket # L-00000NN-09-0541-00151 By: Susan Bayer

1. Credibility of Applicant and Associates:
   (A) History of Advisors and Solicitors,
      1(A) - Donald W. Van Brunt, Executive Director of M.C.E.D.A.
         1-A-1 Exhibit –Court Report on judgment- United States District Court – Judge Joseph M. Levario
         1-A-2 Exhibit – Article on MCEDA, Executive Director Bill Goodale – North Star Steel cost the people a lot of money.
         1-A-3 Exhibit – Sworn Voter Registrations (2) VanBrunt
         1-A-4 Exhibit – Contributions of more than $25.00- Contributions to Johnson Campaign – Listed as "M.C.E.D.A Executive Director"
         1-A-5 Exhibit –Mohave County Manager, Ron Walker, slams cost to taxpayers for MCEDA projects
   (B) History of Applicants,
      1(B) – Mitchell Dong
         1-B-1 Exhibit – Advertisement - Mitchell Dong, Executive Director of Hualapai Valley Solar, LLC. – posted by the LLC
         1-B-2 Exhibit – Secretary of the Commonwealth, Massachusetts Chronos Asset Management, Inc. Ref: SEC
         1-B-3 Exhibit – SEC Order, findings, sanctions and cease and desist
         1-B-4 Exhibit Secretary of the Commonwealth, Massachusetts Mohave Sun Power, LLC
         1-B-5 Exhibit Arizona Corporation Commission (2) Hualapai Valley Solar, LLC & Hualapai Valley Solar Section 21, LLC
         1-B-6 Exhibit Harvard School of Public Health – Robin LaFoley Dong.
   (C) History of Land Developer,
      1(C) - James M. Rhodes
         1-C-1 Exhibit – Entitlement applications processing authorization –List of landowners -Truckee Springs Holdings, Inc. James M. Rhodes, President – maps (Lewis & Roca filing)
         1-C-2 Exhibit – Article- World's largest solar-thermal plant planned for Arizona Land sold by Rhodes – Hawkins – Land not sold yet – separate corporations/ land (to Dong?) & plant (to wife?)
         1-C-3 Exhibit – Article - Developer Rhodes seeks Chapter 11 bankruptcy- John G Edwards
         1-C-4 Exhibit – List of numerous companies related to The Rhodes Companies, LLC also bankrupt.- OMNI Management Group
         1-C-5 Exhibit – Article - Erin Kenny returning to Las Vegas after stays in prison – by Adrienne Packer – Rhodes paid Kenny

1-C-6 –Exhibit – County Supervisors go against all planning for smart growth and "spot zone" for Rhodes. Even MCEDA kept corridors for industry away from residential areas.

2. Lack of Infrastructure:
   (D) Proposed Traffic Routing
      1(D) –Proposed trucking route for heavy construction traffic
      1-D-1 Exhibit – Pictures of proposed route – Open range, school zone, high maintenance road, slow speed limits
3. Wildlife and Domestic Animals
   (E) Arizona Game and Fish
      1-E-1 Exhibit Letter to Davidson- AZ Fish and Game
      1-E-2 Exhibit Letter to LaRow- AZ Fish and Game
      1-E-2 Exhibit Pictures (2) Bats mentioned in letter.
4. Water
   (F) ADWR – Incomplete or unknown Reporting
      1-F-1 Exhibit - Mohave County Water Resources Investigation Fact Sheet - Internet site – Variances of 6.3 million ac.ft. in amount of water available, per ADWR.
      1-F-2 Exhibit – AZ Drought Program – Drought Status
   (G) USGS Reports
      1-G-1 Exhibit-Ground Water Occurrence shows aquifer depletion.
      1-G-2 Exhibit – Policy 3.5 – Mohave County General Plan, amended 2005
      1-G-3 Exhibit – US Dept. of Interior – USGS Report correct and final – Dave Anning
      1-G-4 Exhibit – USGS Power point recharge
      1-G-5 Exhibit – Mohave County Policy 36.12, Goal to encourage industries that use less water and energy resources.
      1-G-6 Exhibit – Mohave County Business Goals, see #9

A

ed States of America vs.

United States District Court

DEFENDANT: DONALD WHITMAN VAN BRUNT

CENTRAL DISTRICT OF CALIFORNIA

DOCKET NO. CR82-437-CBM

JUDGMENT AND PROBATION/COMMITMENT ORDER

AO 245 (8/7

COUNSEL

In the presence of the attorney for the government the defendant appeared in person on this date — MONTH August DAY 3 YEA 1982

[ ] WITHOUT COUNSEL However the court advised defendant of right to counsel and asked whether defendant desired have counsel appointed by the court and the defendant thereupon waived assistance of counsel.

[x] WITH COUNSEL William Hamilton, retained (Name of counsel)

PLEA

[x] GUILTY, and the court being satisfied that there is a factual basis for the plea, [ ] NOLO CONTENDERE, [ ] NOT GUILTY

FINDING & JUDGMENT

There being a finding/verdict of [ ] NOT GUILTY. Defendant is discharged [ ] GUILTY.

Defendant has been convicted as charged of the offense(s) of conspiracy to manufacture and possess counterfeit government obligations, in violation of Title 18, United States Code, Sections 371, 471 and 472, as charged in the one count indictment

SENTENCE OR PROBATION ORDER

The court asked whether defendant had anything to say why judgment should not be pronounced. Because no sufficient cause to the contr. was shown, or appeared to the court, the court adjudged the defendant guilty as charged and convicted and ordered that: The defendant hereby committed to the custody of the Attorney General or his authorized representative for imprisonment for a period of two (2) years.

IT IS ADJUDGED that the execution of sentence, as to imprisonment only, is suspended and the defendant is placed on probation for a period of three (3) years, upon the following terms and conditions: 1. comply with all of the rules and regulations of the probation officer; 2. obey all laws; and 3. perform 1,000 hours of community service, as may be determined by the probation officer, taking into account the physical condition of the defendant.

The bond of the defendant is ordered exonerated.

SPECIAL CONDITIONS OF PROBATION

ADDITIONAL CONDITIONS OF PROBATION

In addition to the special conditions of probation imposed above, it is hereby ordered that the general conditions of probation set out on reverse side of this judgment be imposed. The Court may change the conditions of probation, reduce or extend the period of probation, an any time during the probation period or within a maximum probation period of five years permitted by law, may issue a warrant and rev probation for a violation occurring during the probation period.

COMMITMENT RECOMMENDATION

FILED: AUGUST 3, 1982
EDWARD M. KRITZMAN, CLERK

by Joseph M. Levario
Joseph M. Levario, Deputy Clerk

It is ordered that the Clerk delivei a certified copy of this judgmen and commitment to the U.S. Mar shal or other qualified officer.

SIGNED BY

[x] U.S. District Judge

[ ] U.S. Magistrate

CONSUELO B. MARSHALL

Date AUGUST 4, 1982

BAY1-A-1

Press Release

JUNE 13, 2001 INFORMATION:
BILL GOODALE EXECUTIVE DIRECTOR
OFFICE: (520) 692-6970
FAX: (520) 692-6974

MCEDA, ITS ALL ABOUT JOBS AND TAXES

THE MOHAVE COUNTY ECONOMIC DEVELOPMENT AUTHORITY AFTER REVIEWING COUNTY TAX RECORDS AND EMPLOYMENT FIGURES FROM MCEDA ASSISTED BUSINESSES TO MOHAVE COUNTY IS RELEASING THEIR FINDINGS.

TO DATE EMPLOYMENT FIGURES TOTAL 907 JOBS

CREATED FROM MCEDA ASSISTED FIRMS LOCATING TO MOHAVE COUNTY. FROM THAT FIGURE A TOTAL OF $20,086,100.00 IN WAGES IN 2000 WERE PAID. MANY OF THESE EMPLOYEES HAVE PURCHASED HOMES, RAISING FAMILIES, AND PAYING PROPERTY TAXES TO THE COUNTY.

IN A TWO YEAR PERIOD OVER 4.3 MILLION DOLLARS IN PROPERTY TAXES WERE PAID BY MCEDA ASSISTED BUSINESSES. ACCORDING TO MCEDA EXECUTIVE DIRECTOR

BILL GOODALE, MCEDA'S GOAL IS TO PROVIDE THE COUNTY WITH BUSINESS THAT WILL HAVE GOOD PAYING JOBS, INCREASE THE COUNTY'S GENERAL FUND THROUGH PROPERTY TAXES, AND PROVIDE THE COUNTY WITH A LONG TERM VISION FOR BUSINESS AND INDUSTRIAL GROWTH.

IF YOU TAKE FOR INSTANCE THE NORTHSTAR STEEL PLANT AND ITS YEARLY PROPERTY TAX OF $714,569.00 FOR 1999, THIS FIGURE ALONE IS EQUIVALENT TO NEARLY 894 HOMES PAYING A PROPERTY TAX ESTIMATED AT $800.00 PER YEAR.

GOODALE SAYS, MCEDA IS DOING WHAT NO OTHER COUNTY AGENCY CAN DO, THAT IS TO SHIFT THE PROPERTY TAX BURDEN FROM THE MOHAVE COUNTY HOMEOWNER TO NEW BUSINESS AND INDUSTRY.

FINALLY GOODALE SAYS, LAST YEAR'S FUNDING TO MCEDA WAS $189,200.00. PROPERTY TAXES PAID BY MCEDA ASSISTED BUSINESS AND INDUSTRY TOTALED OVER 5 TIMES THAT.

IF THAT ISN'T BANG FOR THE BUCK, I DON'T KNOW WHAT IS.

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AFFIDAVIT OF REGISTRATION
MOHAVE COUNTY, ARIZONA

Registration Officer: TYPE or PRINT plainly with ink. FIRST and MIDDLE NAME must be shown in full using CAPITAL LETTERS.

OFFICE USE ONLY

ORIGINAL REG. DATE

(1) Full Name MR. MRS. MS. MISS — LAST NAME: VAN BRUNT — FIRST: DONALD — MIDDLE: W

(2) Residence Address: Box 325 O.S.R. (House Number, Direction, Street Name OR Subdivision, See Reverse, Type, Suite / Apt / Space) — RESIDENT CITY: Kingman — ZIP CODE: 86401

(3) Mailing Address If Different: Off Mohave Co. Prosecutor (House Number, Direction, Street Name (Rural Rt. or P.O.)) — MAILING CITY: — ZIP CODE:

MUST BE COMPLETED—ARS 16-152.7

(4) PARTY PREFERENCE IS: DEMOCRAT

(5) Telephone Number: 565-3927 (Unless Unlisted)

(6) Born in (Country) (STATE): Washington - Cowlitz — Birth Date: 10-3-27

(7) Occupation: Rancher — Indian Census Number: (Optional)

(8) Reason for inability to mark ballot:

(9) Father's Name: Oliver C. Van Brunt

(10) If registered to vote in another State, County, or Precinct, in County of: State of:

State of Arizona, County of Mohave | ss: I, the undersigned elector, do solemnly swear (or affirm) that I am a citizen of the United States, and a resident of the State of Arizona and the County of Mohave; that prior to the next General Election, I will be eighteen years of age or over; that I have not been convicted of treason or a felony (or if so, my civil rights have been restored); and that all the statements on both sides of this card are true to the best of my knowledge and belief.

(11) Precinct Name: [illegible]

OFFICE USE ONLY: 46-24000

(12) Use only if currently registered in Mohave County.

FORMER ADDRESS:
FORMER PARTY:
FORMER NAME:

(13) Subscribed and sworn to before me on this date: Month / Day / Year

(14) Signature of Registration Officer/Title: Dorothy Dwyer Dep. Reg.

(15) Signature of Applicant for Registration: Donald W. Van Brunt

APPLICATION OF REGISTRATION
MOHAVE COUNTY, ARIZONA

Registration Officer: TYPE or PRINT plainly with ink. FIRST and MIDDLE NAME must be shown in full using CAPITAL LETTERS.

OFFICE USE ONLY

ORIGINAL REG. DATE

(1) Full Name MR. MRS. MS. MISS — LAST NAME: VAN BRUNT — FIRST: Kathryn — MIDDLE: LEE

(2) Residence Address: Box 325 O.S.R. (House Number, Direction, Street Name OR Subdivision, See Reverse, Type, Suite / Apt / Space) — RESIDENT CITY: Kingman — ZIP CODE: 86401

(3) Mailing Address If Different: Off Mohave Co. Prosecutor (House Number, Direction, Street Name (Rural Rt. or P.O.)) — MAILING CITY: — ZIP CODE:

MUST BE COMPLETED—ARS 16-152.7

(4) PARTY PREFERENCE IS: Democrat

(5) Telephone Number: 565-3927 (Unless Unlisted)

(6) Born in (Country) (STATE): Washington — Birth Date: 7-24-36

(7) Occupation: Brand Teller — Indian Census Number: (Optional)

(8) Reason for inability to mark ballot:

(9) Father's Name: August Wilhelm Ferdinand Quimeyer

(10) If registered to vote in another State, County, or Precinct, in County of: State of:

State of Arizona, County of Mohave | ss: I, the undersigned elector, do solemnly swear (or affirm) that I am a citizen of the United States, and a resident of the State of Arizona and the County of Mohave; that prior to the next General Election, I will be eighteen years of age or over; that I have not been convicted of treason or a felony (or if so, my civil rights have been restored); and that all the statements on both sides of this card are true to the best of my knowledge and belief.

(11) Precinct Name: Salt Valley

OFFICE USE ONLY: 46-24000

(12) Use only if currently registered in Mohave County.

FORMER ADDRESS:
FORMER PARTY:
FORMER NAME:

(13) Subscribed and sworn to before me on this date: 3 / 24 / 88 (Month / Day / Year)

(14) Signature of Registration Officer/Title: Dorothy Dwyer Dep. Reg.

(15) Signature of Applicant for Registration: Kathryn L. Van Brunt

BAY1-A-3

FOR U.S. CITIZENS ONLY
PRINT CLEARLY IN BLACK INK
PRESS HARD TO MAKE COPY

VOTER REGISTRATION FORM
MOHAVE COUNTY, ARIZONA

OFFICE USE ONLY
45406 R5

8 142498

1 FULL NAME (CIRCLE ONE) MR. MRS. MS. MISS VAN BRUNT (LAST NAME) Donald (FIRST NAME) W (MIDDLE NAME) JR/SR/III

2 RESIDENCE ADDRESS 2486-W HIWAY 66 (HOUSE NUMBER, DIRECTION (N/S/E/W), STREET NAME (ST OR AVE, ETC)) APT./SP. NO. Kingman (CITY) 86401 (ZIP CODE)

(SEE INSTRUCTIONS) DRAW A MAP OF WHERE YOUR HOME IS LOCATED, IF RURAL

USE MILEAGE, NAMES OF ROADS AND LANDMARKS
MARK "X" WHERE YOUR HOME IS LOCATED

NORTH
WEST EAST
SOUTH

3 MAILING ADDRESS (IF DIFFERENT) R CITY ZIP CODE

4 POLITICAL PARTY Republican (DO NOT LEAVE BLANK. SEE INSTRUCTIONS.) TELEPHONE NUMBER 753 1717 (UNLESS UNLISTED)

5 BIRTH PLACE Wash (STATE OR COUNTRY) BIRTH DATE 10-3-29 (MONTH/DAY/YEAR) LAST 4 DIGITS OF SOC. SEC. NO. 4488 (OPTIONAL)

6 YOUR OCCUPATION Exec. INDIAN CENSUS NO. (OPTIONAL)

7 FATHER'S NAME OR MOTHER'S MAIDEN NAME VAN BRUNT (LAST) Dewey (FIRST) (MIDDLE)

8 ARE YOU CURRENTLY REGISTERED TO VOTE? ☒ YES ☐ NO
FORMER NAME
FORMER COUNTY
FORMER ADDRESS HC 36 Box 325 Kingman Az.
FORMER STATE

9 THIS FORM WAS COMPLETED ACCORDING TO MY INSTRUCTIONS BY: (SIGNATURE OF PERSON ASSISTING YOU IF YOU ARE UNABLE TO COMPLETE THE FORM YOURSELF.)

10 I WOULD BE WILLING TO WORK AT A POLLING PLACE ON ELECTION DAY. ☐ YES ☒ NO

READ THIS STATEMENT PRIOR TO SIGNING
I AM A CITIZEN OF THE UNITED STATES, A RESIDENT OF THE STATE OF ARIZONA AND THE ABOVE NAMED COUNTY AND WILL BE 18 YEARS OF AGE ON OR BEFORE THE TIME OF THE NEXT GENERAL ELECTION. I HAVE NOT BEEN CONVICTED OF TREASON OR A FELONY (OR, IF SO, MY CIVIL RIGHTS HAVE BEEN RESTORED). I CERTIFY UNDER PENALTY OF PERJURY UNDER THE LAWS OF THE STATE OF ARIZONA THAT THE INFORMATION ON THIS REGISTRATION FORM IS TRUE AND CORRECT. PERJURY IS A CLASS 6 FELONY.

11 DATE OF SIGNING 1-29-96 (MONTH/DAY/YEAR)

12 X Donald W. Van Brunt (YOUR SIGNATURE)

REMOVE TAPE AND FOLD TO MAIL

DESPEGUE LA CINTA ADHESIVA Y DOBLE PARA ENVIAR POR CORREO

JAN 29 1996

BAY1-A-3

Contributions more than $25 (from INDIVIDUALS)

JOHNSON FOR SUPERVISOR
NE 30 REPORT
January 1,2008 to May 31,2008

SCHEDULE A

ID#

100

Name, Address, Occupation and Employer of Contributor	Date	Amount	To Date
KUDEN, JIM P.O. BOX 462045 ESCONDIDO, CA 92046 REAL ESTATE DEVELOPER SELF	04/15/2008	$200.00	$200.00
LE GRAND, GEORGETTE 3845 SARATOGA AVE. LAKE HAVASU CITY, AZ 86406 BOOKKEEPER HAVASU HARDWARE	04/15/2008	$50.00	$50.00
LE GRAND, SCOTT 3845 SARATOGA AVE. LAKE HAVASU CITY, AZ 86406 MANAGER HAVASU HARDWARE	04/15/2008	$50.00	$50.00
MC CORMACK, KEITH 2235 ALPINE DR. LAKE HAVASU CITY, AZ 86403 RETIRED <<employer not specified>>	04/15/2008	$75.00	$75.00
PIANO, DAVID 2126 MC CULLOCH BLVD #2 KE HAVASU CITY, AZ 86403 AIR STYLIST SELF	04/15/2008	$250.00	$250.00
REYES, CYNTHIA HOLZER 3175 SADDLEBACK DRIVE LAKE HAVASU CITY, AZ 86406 RETIRED <<employer not specified>>	04/15/2008	$50.00	$50.00
REYES, IGNACIO 3175 SADDLEBACK DR. LAKE HAVASU CITY, AZ 86406 RETIRED <<employer not specified>>	04/15/2008	$50.00	$50.00
THOMAS, NOREEN C. 1295 AVALON AVE. LAKE HAVASU CITY, AZ 86404 RETIRED <<employer not specified>>	04/15/2008	$50.00	$150.00
VAN BRUNT, DONALD W. 2486 W. HI WAY + 66 KINGMAN, AZ 86401 EXECUTIVE DIRECTOR M.C.E.D.A.	04/15/2008	$300.00	$300.00
MOHR, WERNER 1026 GLENEAGLES DR. LAKE HAVASU CITY, AZ 86406 TIRED mployer not specified>>	04/17/2008	$150.00	$150.00

Mohave County manager proposes conservation, environmental action

KINGMAN – Mohave County Manager Ron Walker wants the Board of Supervisors to amend the county's Business Goals to include "natural resources planning and management."

"Mohave County's open space, clean air and water are important, and fragile, assets," he said. "The people who live here and the people who want to live here value these natural resources. But there are those who would take advantage of all of us and, in the process, destroy the very things that make life so good in our area. I want this county to take positive steps to protect and preserve our environment."

Walker has placed three items on the Board of Supervisors meeting agenda for Monday, April 16, that deal with environmental concerns.

He would like specific planning to take place regarding solid waste pollution.

"Illegal dumping has proliferated throughout or rural areas," he said. "Although our ERACE (Environmental Rural Area Cleanup Enforcement) program has been involved in many area-wide cleanups, we have been as effective against illegal dumping as battling an avalanche with a broom and dustpan. We need to map out specific objectives in dealing with this problem and take action."

Water availability and quality is the biggest problem rural Arizona has and will have in coming years, Walker said. "With growth, comes great thirst. Residential development and industrial corporate entities are competing for our water resources. Colorado River states continue to battle for river allocation,

Mohave County Manager Ron Walker

with Nevada being the most recent recipient of a greater share through the Arizona Water Banking Authority."

Pollution along the river is a serious concern, he said, as well as the contamination of ground water through the proliferation of septic tanks. "The Colorado River Regional Sewer Coalition has been working to bring federal funds to sewer river areas. Little major progress has been accomplished.

"Although Mohave County has set an example in building energy efficient facilities and pursuing a Green Building Certification for the new County Administration Building," he said, "we need to be more active in encouraging energy conservation for all new businesses, structures and services in our area."

Walker pointed out that Mohave County has signed agreements in prior years that have taken advantage of the governmental agency, the taxpayers and the future health of the environment.

The County Jail was "mortgaged" through Certificates of Participation to finance the project. Homeowners and other property taxpayers have the privilege of paying over $400,000 for each job created by economic development debacle. And this was called this Economic Development!

These project planners promised that Griffith locating to Mohave County would reduce local electric costs. Has anyone seen reduced electric costs? Merchant Plants, like Griffith, sell to the wholesale market, to the highest bidder. They are not a utility, and you cannot buy power from them for residential use. The project was sold to the public based upon a promised 5 year pay back period. Below is a summary of tax payments into the County General Fund and Expenses for the project by the General Fund. If 2003 is the first full payment, future payments will most likely decline through depreciation. To get closer to the pay back period, divide $10,000,000 by $252,888.14. That equates to 39.5 years payback not 5!

It should be noted that Griffith sued the State and Mohave County to reduce their taxable assessed value on personal property, which directly affects their tax obligation. They lost. They appealed. They lost. Now they have Senator Dean Martin, Republican District 6, introduce Senate Bill 2159 to change the law to cut them a tax break.

From the table below, the County has paid $2,668,097 on the debt, so far. Griffith will have paid with the 2003 Tax Bill, $264,300 and some change. For every $1 paid in taxes, the taxpayers have paid over $10 in debt payments.

County Loan Payments Payments/General Fund		Griffith Property Tax
1999		$47.68
2000		$900.32
2001	$760,269	$4044.47
2002	$813,276	$3421.70
2003	$779,526	$252, 888.14
2004	$315,026	
2005		

In the recent past, the MCEDA tried to lure industry with tax reductions and other government concessions. They targeted $10 per hour jobs. A $10 per hour job equates to $20,800 annual wage, almost $3,400 below average job wages. Every job at this level will reduce the average earnings measurement. This is not to condemn this wage; for one earning below a $10 per hour wage, that it is a nice raise. However, creating low end jobs does not contribute to improving average wage or per capita income. This shows the fallacy of measuring Economic Development by raw job numbers. Better measures revolve around Per Capita and Per Employee measures.

B

hualapai valley solar™
a mohave sun power project

about the project

The proposed Hualapai Valley Solar Project (HVS Project) is a 340MW concentrating solar power (CSP) plant in Mohave County, Arizona, approximately 27 miles north of Kingman and 100 miles south of Las Vegas on approximately 4,000 acres of private land. The HVS Project will use a proven technology that has been operational in the United States since the 1980's.

The HVS Project will use CSP technology to capture heat generated by sunlight and turn that heat into electricity using the standard Rankine cycle process. The HVS Project will also store excess heat using molten salts so that it can provide electricity when it is most needed during on-peak hours.

The HVS Project is in the early design and permitting stages, with a construction start anticipated in November 2010 and start of operations in June 2013. HVS is working with Fichtner Solar of Germany (www.fichtnersolar.com), the leading worldwide designer of concentrating solar trough projects, to design the project.

about the project site

The following characteristics associated with the HVS Project site make it ideal for a solar project:

1. High incoming solar radiation (insolation) value
2. Minimal slope
3. Proximity to electric grid
4. Water availability
5. Proximity to transportation corridors
6. Located on private land

hualapai valley team

Mitchell Dong, Executive Director
Greg Bartlett, Managing Director
Mike LaRow, Environmental Director
Rob Marsh, Financial Director

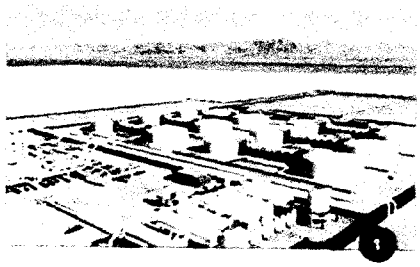
project status

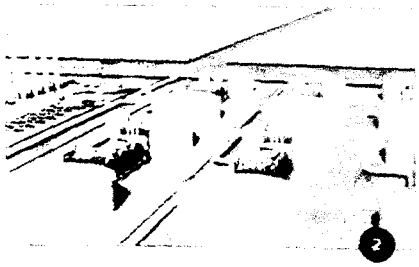
HVS has completed the preliminary design of the project and is using that now as a basis for discussions with the public and other stakeholders, county officials, state permitting agencies, and federal permitting agencies. HVS is moving to the next stage of project design, which will further define the project while taking into consideration the input and comments received from the public, other stakeholders, and permitting authorities. HVS anticipates this stage of design taking approximately one year.

Current View of Site

Project Overlaid on Site

rendered images from the site





view more pictures on flickr

BAY1-B-1

The Commonwealth of Massachusetts
William Francis Galvin

Secretary of the Commonwealth, Corporations Division
One Ashburton Place, 17th floor
Boston, MA 02108-1512
Telephone: (617) 727-9640

CHRONOS ASSET MANAGEMENT, INC. Summary Screen

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The exact name of the Foreign Corporation: CHRONOS ASSET MANAGEMENT, INC.

Entity Type: Foreign Corporation

Identification Number: 043292528

Old Federal Employer Identification Number (Old FEIN): 000517303

Date of Registration in Massachusetts: Nov 10 1995

The is organized under the laws of: State: DE Country: USA **on:** Oct 17 1995

Current Fiscal Month / Day: 12 / 31 **Previous Fiscal Month / Day:** 01 / 01

The location of its principal office:
No. and Street: 85 HAMILTON STREET
City or Town: CAMBRIDGE State: MA Zip: 02139 Country: USA

The location of its Massachusetts office, if any:
No. and Street: 85 HAMILTON STREET
City or Town: CAMBRIDGE State: MA Zip: 02139 Country: USA

Name and address of the Registered Agent:
Name: MITCHELL L. DONG
No. and Street: 85 HAMILTON ST.,
City or Town: CAMBRIDGE State: MA Zip: Country: USA

The officers and all of the directors of the corporation:

Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code
PRESIDENT	MITCHELL L. DONG	85 HAMILTON ST., CAMBRIDGE, MA USA
TREASURER	MITCHELL L. DONG	85 HAMILTON ST., CAMBRIDGE, MA USA

business entity stock is publicly traded: __

The total number of shares and par value, if any, of each class of stock which the business entity is authorized to issue:

	Par Value Per Share	Total Authorized by Articles	Total Issued

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Class of Stock	Enter 0 if no Par	of Organization or Amendments *Num of Shares* *Total Par Value*	and Outstanding *Num of Shares*
No Stock Information available online. Prior to August 27, 2001, records can be obtained on microfilm.			

__ Consent __ Manufacturer __ Confidential Data __ Does Not Require Annual Report
__ Partnership __ Resident Agent __ For Profit __ Merger Allowed

Select a type of filing from below to view this business entity filings:

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Annual Report
Annual Report - Professional
Application for Reinstatement

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UNITED STATES OF AMERICA
Before the
SECURITIES AND EXCHANGE COMMISSION

SECURITIES ACT OF 1933
Release No. 8883 / January 25, 2008

SECURITIES EXCHANGE ACT OF 1934
Release No. 57202 / January 25, 2008

INVESTMENT ADVISERS ACT OF 1940
Release No. 2696 / January 25, 2008

INVESTMENT COMPANY ACT OF 1940
Release No. 28135 / January 25, 2008

ADMINISTRATIVE PROCEEDING
File No. 3-12934

In the Matter of	:	**ORDER INSTITUTING ADMINISTRATIVE AND CEASE-AND-DESIST PROCEEDINGS, MAKING FINDINGS, AND IMPOSING REMEDIAL SANCTIONS AND A CEASE-AND-DESIST ORDER PURSUANT TO SECTION 8A OF THE SECURITIES ACT OF 1933, SECTION 21C OF THE SECURITIES EXCHANGE ACT OF 1934, SECTIONS 203(e) and 203(f) OF THE INVESTMENT ADVISERS ACT OF 1940, AND SECTIONS 9(b) AND 9(f) OF THE INVESTMENT COMPANY ACT OF 1940**
Chronos Asset Management, Inc. and Mitchell L. Dong,	:	
Respondents.	:	

I.

The Securities and Exchange Commission ("Commission") deems it appropriate and in the public interest that public administrative and cease-and-desist proceedings be, and hereby are, instituted pursuant to Section 8A of the Securities Act of 1933 ("Securities Act"), Section 21C of the Securities Exchange Act of 1934 ("Exchange Act"), Sections 203(e) and 203(f) of the Investment Advisers Act of 1940 ("Advisers Act") and Sections 9(b) and 9(f) of the Investment Company Act of 1940 ("Investment Company Act") against Chronos Asset Management, Inc. ("Chronos") and Mitchell L. Dong ("Dong") (collectively "Respondents").

II.

In anticipation of the institution of these proceedings, Respondents have submitted an Offer of Settlement (the "Offer"), which the Commission has determined to accept. Solely for the purpose of these proceedings and any other proceedings brought by or on behalf of the Commission, or to which the Commission is a party, and without admitting or denying the findings herein, except as to the Commission's jurisdiction over them and the subject matter of these proceedings, which are admitted, Respondents consent to the entry of this Order Instituting Administrative and Cease-and-Desist Proceedings, Making Findings, and Imposing Remedial Sanctions and a Cease-and-Desist Order Pursuant to Section 8A of the Securities Act of 1933, Section 21C of the Securities Exchange Act of 1934, Sections 203(e) and 203(f) of the Investment Advisers Act of 1940, and Sections 9(b) and 9(f) of the Investment Company Act of 1940 ("Order"), as set forth below.

III.

On the basis of this Order and Respondents' Offer, the Commission finds[1] that:

Respondents

1. Chronos Asset Management, Inc. is a Delaware corporation based in Cambridge, Massachusetts that has been owned and controlled by Dong since it was incorporated in 1995. At all relevant times, Chronos provided investment advisory services to two hedge funds: Chronos Fund I, LP ("Chronos Onshore Fund") and Chronos Offshore Fund, Inc. ("Chronos Offshore Fund") (collectively, the "Chronos Funds"). Chronos has never been registered with the Commission.

2. Mitchell L. Dong, age 54, is a resident of Boston, Massachusetts. Dong is Chronos's founder and at all relevant times owned Chronos and served as its president and chief executive officer. Dong also served as director of the Chronos Offshore Fund. As principal owner of Chronos, Dong had the ultimate decision-making authority for Chronos's investments.

Summary

3. This case involves a fraudulent market timing and late trading scheme by hedge fund adviser Chronos and its principal, Dong. From January 2001 to September 2003 (the "Relevant Period"), Chronos and Dong used deceptive means to continue market timing in mutual funds that had previously attempted to detect and restrict, or that otherwise would not have permitted, Chronos's trading. In addition, from May 2003 to September 2003, Chronos traded mutual fund shares after 4:00 p.m. Eastern Time ("ET") while receiving the same day's price. By virtue of their conduct, Respondents willfully

[1] The findings herein are made pursuant to Respondents' Offers of Settlement and are not binding on any other person or entity in this or any other proceeding.

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violated, and aided and abetted and caused violations of, the antifraud and mutual fund pricing provisions of the federal securities laws.

Facts

4. Dong owned and controlled Chronos, which controlled the Chronos Funds. He also oversaw Chronos's overall operations and investment strategies. During the Relevant Period, Chronos managed approximately $270 million for the Chronos Funds. Chronos used market timing as a primary investment strategy. It executed the strategy through the use of a proprietary statistical model that analyzed historical trading data and market trends and generated "signals" that determined whether and when Chronos should buy and sell mutual fund shares. Market timing includes: (i) frequent buying and selling of shares of the same mutual fund or (ii) buying or selling mutual fund shares in order to exploit inefficiencies in mutual fund pricing. Market timing, while not illegal *per se*, can harm other mutual fund shareholders because it can dilute the value of their shares, if the market timer is exploiting pricing inefficiencies, or disrupt the management of the mutual fund's investment portfolio and can cause the targeted mutual fund to incur costs borne by other shareholders to accommodate frequent buying and selling of shares by the market timer. From May to September 2003, Chronos also engaged in "late trading," whereby Chronos placed mutual funds trade orders after mutual fund companies calculated their daily net asset value ("NAV"), while obtaining the same day's NAV pricing.

Market Timing

5. During the Relevant Period, Respondents engaged in deceptive tactics by placing mutual fund trade orders with registered broker-dealer Prudential Securities, Inc. ("Prudential") that contained false and misleading information to hide Chronos's identity from mutual funds and otherwise facilitate Chronos' market timing strategies. Chronos disguised its identity and volume and frequency of its trading by using multiple customer account names (some of which were in the names of other corporate entities) and numbers.

6. Chronos's traders typically placed multiple mutual fund transactions per day with Prudential during the Relevant Period. Chronos opened its first account with registered representatives based in Prudential's Boston, Massachusetts branch office in January 2000. During the Relevant Period, Respondents were aware that mutual fund companies typically placed limits on the number of mutual fund trades that could be placed in a particular mutual fund and tracked mutual fund trades by customer name and customer account number. As a result, Respondents were aware that if they repeatedly placed short-term mutual fund trades using a single account name and number through one broker, the mutual fund companies would likely determine that Chronos's market timing was excessive and would block any further trades. Throughout the Relevant Period, through Prudential, Chronos was notified of "block notices" from mutual fund

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companies prohibiting Chronos from further trading in those fund families because of Chronos's previous market timing activity.[2]

7. Respondents opened a total of 21 additional accounts at Prudential (between 2000 and February 2003) after Chronos was prohibited from trading in certain mutual fund families. Respondents maintained, and market timed through, these accounts until Chronos ceased its market timing activities in September 2003. Many of Chronos's accounts at Prudential bore names that appeared unrelated to Chronos, such as the names of a Chronos trader's wife, hometown and dog. The primary purpose in opening these accounts was to conceal the accounts' connection to Chronos and thereby allow Chronos to continue to trade in mutual funds that had previously attempted to prohibit it from trading due to market timing.

8. Chronos used separate Prudential accounts as part of a "rotation strategy" to disguise its market timing activities from mutual fund companies. As part of its rotation strategy, Chronos made multiple purchases into a fund family using multiple accounts and traded in one fund until an account was blocked. Then Chronos rotated the blocked account out of the fund into another fund, and continued to use the remaining accounts to trade in the original fund, with the intent of deceiving mutual funds as to their identity. Using its various accounts, Chronos also divided large trades into smaller-sized trades in an effort to "fly under the radar" of mutual funds that detected market timers by monitoring trades with high dollar values.

Late Trading

9. Rule 22c-1(a) under the Investment Company Act requires registered open-end investment companies ("mutual funds"), persons designated in such funds' prospectuses as authorized to consummate transactions in any such security, their principal underwriters, and dealers in the funds' securities to sell and redeem fund shares at a price based on the current NAV next computed after receipt of an order to buy or redeem. Late trading refers to the act of executing trades in a mutual fund's shares after the time as of which the mutual fund has calculated its NAV in a manner that allows the trade to receive that day's net asset value per share, rather than the next day's net asset value per share. Most mutual funds, including the funds Chronos traded, calculate their daily net asset value as of the close of major United States securities exchanges and markets (normally 4:00 p.m. ET). Although Respondents were not themselves subject to Rule 22c-1, persons subject to that Rule must sell mutual fund shares at the NAV next computed after receipt of the trade order.

10. From May 2003 to September 2003, Chronos late traded through two broker-dealers (Broker-Dealer A and Broker-Dealer B) (which were unrelated to Prudential). Broker-Dealer A and Broker-Dealer B submitted Chronos' mutual fund trades through clearing brokers (Clearing Broker-Dealer A and Clearing Broker-Dealer

[2] Block notices restricted market timing trading by, among other things, prohibiting future trades in specific accounts, by particular registered representatives or by broker-dealer, and typically included a statement concerning the mutual fund's aversion to market timing.

B, respectively), each of which had dealer agreements with the relevant mutual funds. Broker-Dealer A and Broker-Dealer B routinely allowed Chronos to communicate orders to purchase and sell mutual fund shares after 4:00 p.m. ET at that day's NAV. During this period, between approximately 4:00 and 4:15 p.m. ET each day, Chronos traders analyzed both aftermarket news reports and the movement in the futures market (which continues to trade until 4:15 p.m. ET) to determine whether to buy or sell large cap mutual funds. Chronos' late trading arrangements thus allowed the traders to purchase or sell mutual fund shares at prices set as of the market close with the benefit of the aftermarket information. Chronos thereby obtained a competitive advantage by being able to capitalize on the aftermarket news and futures market trading, while obtaining the previously calculated NAV.

11. Respondents realized significant profits as a result of the conduct set forth in paragraphs 4-10, above.

Violations of the Federal Securities Laws

12. As a result of the conduct described in paragraphs 5-8 and 11 above, Respondents willfully violated Section 17(a) of the Securities Act, which prohibits fraudulent conduct in the offer or sale of securities.

13. As a result of the conduct described in paragraphs 5-8 and 11 above, Respondents willfully violated Section 10(b) of the Exchange Act and Rule 10b-5 thereunder, which prohibit fraudulent conduct in connection with the purchase or sale of securities.

14. As a result of the conduct described in paragraphs 9-11 above, Respondents willfully aided and abetted and caused Clearing Broker-Dealer A's and Clearing Broker-Dealer B's violations of Section 17(a) of the Securities Act and Section 10(b) of the Exchange Act and Rule 10b-5 thereunder.

15. As a result of the conduct described in paragraphs 9-11 above, Respondents willfully aided and abetted and caused violations of Rule 22c-1(a) of the Investment Company Act by Clearing Broker-Dealer A and Clearing Broker-Dealer B.

Undertakings

Respondent Dong undertakes to provide to the Commission, within 10 days after the end of the 12-month suspension period described below, an affidavit that he has complied fully with the sanctions described in Section IV below.

IV.

In view of the foregoing, the Commission deems it appropriate and in the public interest to impose the sanctions specified in Respondents' Offers.

Accordingly, pursuant to Section 8A of the Securities Act, Section 21C of the

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Exchange Act, Sections 203(e) and 203(f) of the Advisers Act and Sections 9(b) and 9(f) of the Investment Company Act, it is hereby ORDERED that:

A. Respondent Chronos is hereby censured;

B. Respondents Chronos and Dong shall cease and desist from committing or causing any violations and any future violations of Section 17(a) of the Securities Act, Section 10(b) of the Exchange Act and Rule 10b-5 thereunder, and Rule 22c-1 under the Investment Company Act;

C. Respondent Dong be, and hereby is, suspended from association with any investment adviser and is prohibited from serving or acting as an employee, officer, director, member of an advisory board, investment adviser or depositor of, or principal underwriter for, a registered investment company or affiliated person of such investment adviser, depositor, or principal underwriter for a period of 12 months, effective on the second Monday following entry of this Order; and

D. IT IS FURTHER ORDERED THAT Respondents shall together, on a joint and several basis, pay disgorgement in the amount of $303,000 plus prejudgment interest in the amount of $73,915.80, and pay a civil money penalty in the amount of $1,800,000. Respondents shall satisfy this obligation by making payment to the United States Treasury within 30 days of the entry of this Order. Such payment shall be: (i) made by United States postal money order, certified check, bank cashier's check or bank money order; (ii) made payable to the Securities and Exchange Commission; (iii) hand-delivered or mailed to the Office of Financial Management, Securities and Exchange Commission, Operations Center, 6432 General Green Way, Stop 0-3, Alexandria, VA 22312; and (iv) submitted under cover letter that identifies Chronos and Dong as Respondents in these proceedings, the file number of these proceedings, a copy of which cover letter and money order or check shall be sent to John T. Dugan, Associate Regional Director, Securities and Exchange Commission, Boston Regional Office, 33 Arch Street, 23rd Floor, Boston, Massachusetts 02110. Such disgorgement, prejudgment interest and civil money penalty may be distributed pursuant to Section 308(a) of the Sarbanes-Oxley Act of 2002 ("Fair Fund distribution"). Regardless of whether such Fair Fund distribution is made, amounts ordered to be paid as civil money penalties pursuant to this Order shall be treated as penalties paid to the government for all purposes, including all tax purposes. To preserve the deterrent effect of the civil penalty, Respondents agree that they shall not, after offset or reduction in any Related Investor Action based on Respondent's payment of disgorgement in this action, argue that they are entitled to, nor shall they further benefit by offset or reduction of any part of Respondents' payment of a civil penalty in this action ("Penalty Offset"). If the court in any Related Investor Action grants such a Penalty Offset, Respondents agree that they shall, within 30 days after entry of a final order granting the Penalty Offset, notify the Commission's counsel in this action and pay the amount of the Penalty Offset to the United States Treasury or to a Fair Fund, as the Commission directs. Such a payment shall not be deemed an additional civil penalty and shall not be deemed to change the amount of the civil penalty imposed in this proceeding.

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For purposes of this paragraph, a "Related Investor Action" means a private damages action brought against Respondents by or on behalf of one or more investors based on substantially the same facts as alleged in the Order instituted by the Commission in this proceeding.

By the Commission.

Nancy M. Morris
Secretary

The Commonwealth of Massachusetts
William Francis Galvin

Secretary of the Commonwealth, Corporations Division
One Ashburton Place, 17th floor
Boston, MA 02108-1512
Telephone: (617) 727-9640

MOHAVE SUN POWER LLC Summary Screen

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Request a Certificate

The exact name of the Foreign Limited Liability Company (LLC): MOHAVE SUN POWER LLC

Entity Type: Foreign Limited Liability Company (LLC)

Identification Number: 001006991

Date of Registration in Massachusetts: 06/25/2009

The is organized under the laws of: State: DE Country: USA **on:** 01/29/2009

The location of its principal office:
No. and Street: 85 HAMILTON ST.,
City or Town: CAMBRIDGE State: MA Zip: 02139 Country: USA

The location of its Massachusetts office, if any:
No. and Street:
City or Town: State: Zip: Country:

The name and address of the Resident Agent:
Name: ROBIN LAFOLEY
No. and Street: 85 HAMILTON ST.
City or Town: CAMBRIDGE State: MA Zip: 02139 Country: USA

The name and business address of each manager:

Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code
MANAGER	ROBIN LAFOLEY	85 HAMILTON ST,. CAMBRIDGE, MA 02139 USA
MANAGER	GREG BARTLETT	85 HAMILTON ST,. CAMBRIDGE, MA 02139 USA

The name and business address of the person in addition to the manager, who is authorized to execute documents to be filed with the Corporations Division.

Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code

The name and business address of the person(s) authorized to execute, acknowledge, deliver and record any recordable instrument purporting to affect an interest in real property

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Title	Individual Name First, Middle, Last, Suffix	Address (no PO Box) Address, City or Town, State, Zip Code
REAL PROPERTY	MITCHELL L. DONG	85 HAMILTON ST,. CAMBRIDGE, MA 02139 USA
REAL PROPERTY	ROBIN LAFOLEY	85 HAMILTON ST,. CAMBRIDGE, MA 02139 USA
REAL PROPERTY	GREG BARTLETT	85 HAMILTON ST,. CAMBRIDGE, MA 02139 USA

__ Consent __ Manufacturer __ Confidential Data __ Does Not Require Annual Report

__ Partnership __ Resident Agent __ For Profit __ Merger Allowed

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Annual Report
Application For Registration
Certificate of Amendment
Certificate of Cancellation

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Corporate Inquiry	
File Number: R-1531551-5	Check Corporate Status
Corp. Name: HUALAPAI VALLEY SOLAR LLC	

Domestic Address

%UNITED CORPORATE SERVICES INC
7226 E MAVERICK RD
SCOTTSDALE, AZ 85258

Foreign Address

%UNITED CORPORATE SERVICES INC
874 WALKER RD # C
DOVER, DE 19904

Statutory Agent Information

Agent Name: UNITED CORPORATE SERVICES INC
Agent Mailing/Physical Address:
7226 E MAVERICK RD
SCOTTSDALE, AZ 85258
Agent Status: APPOINTED 06/09/2009
Agent Last Updated: 06/12/2009

Additional Corporate Information

Corporation Type: FOREIGN L.L.C.	**Business Type:**
Incorporation Date: 06/09/2009	**Corporate Life Period:**
Domicile: DELAWARE	**County:** MARICOPA
Approval Date: 06/12/2009	**Original Publish Date:**

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Member Information

GREG BARTLETT MANAGER 85 HAMILTON ST CAMBRIDGE,MA 02139 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009	ROBIN LAFOLEY MANAGER 1 BERKELEY ST CAMBRIDGE,MA 02138 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009
MOHAVE SUN POWER LLC MEMBER 1 BERKELEY ST CAMBRIDGE,MA 02138 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009	

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Document Number	Description	Date Received
02812628	APPLICATION FOR REGISTRATION	06/09/2009

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Corporate Inquiry	
File Number: R-1531552-6	Check Corporate Status
Corp. Name: HUALAPAI VALLEY SOLAR SECTION 21 LLC	

Domestic Address

UNITED CORPORATE SERVICES INC
7226 E MAVERICK RD
SCOTTSDALE, AZ 85258

Foreign Address

%UNITED CORPORATE SERVICES INC
874 WALKER RD # C
DOVER, DE 19904

Statutory Agent Information

Agent Name: UNITED CORPORATE SERVICES INC
Agent Mailing/Physical Address:
7226 E MAVERICK RD
SCOTTSDALE, AZ 85258
Agent Status: APPOINTED 06/09/2009
Agent Last Updated: 06/12/2009

Additional Corporate Information

Corporation Type: FOREIGN L.L.C.	**Business Type:**
Incorporation Date: 06/09/2009	**Corporate Life Period:**
Domicile: DELAWARE	**County:** MARICOPA
Approval Date: 06/12/2009	**Original Publish Date:**

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Member Information

GREG BARTLETT MANAGER 85 HAMILTON ST CAMBRIDGE,MA 02139 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009	ROBIN LAFOLEY MANAGER 1 BERKELEY ST CAMBRIDGE,MA 02138 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009
MOHAVE SUN POWER LLC MEMBER 1 BERKELEY ST CAMBRIDGE,MA 02138 **Date of Taking Office:** 06/09/2009 **Last Updated:** 06/12/2009	

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Document Number	Description	Date Received
02812629	APPLICATION FOR REGISTRATION	06/09/2009

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Harvard School of Public Health

James Robins

Mitchell L. and Robin LaFoley Dong Professor of Epidemiology

Department of Epidemiology

Department of Biostatistics

677 Huntington Avenue
Kresge Building Room 823
Boston, Massachusetts 02115
617.432.0206
robins@hsph.harvard.edu

Research

The principal focus of Dr. Robins' research has been the development of analytic methods appropriate for drawing causal inferences from complex observational and randomized studies with time-varying exposures or treatments. The new methods are to a large extent based on the estimation of the parameters of a new class of causal models - the structural nested models - using a new class of estimators - the G estimators. The usual approach to the estimation of the effect of a time-varying treatment or exposure on time to disease is to model the hazard incidence of failure at time t as a function of past treatment history using a time-dependent Cox proportional hazards model. Dr. Robins has shown the usual approach may be biased whether or not further adjusts for past confounder history in the analysis when:

(A1) there exists a time-dependent risk factor for or predictor of the event of interest that also predicts subsequent treatment, and (A2) past treatment history predicts subsequent risk factor level.

Conditions (A1) and (A2) will be true whenever there are time-dependent covariates that are simultaneously confounders and intermediate variables.

In contrast to previously proposed methods, Dr. Robins' methods can:

1. be used to estimate the effect of a treatment (e.g., prophylaxis for PCP) or exposure on a disease outcome in the presence of time-varying covariates (e.g., number of episodes of PCP) that are simultaneously confounders and intermediate variables on the causal pathway from exposure disease;
2. allow an analyst to adjust appropriately for the effects of concurrent non-randomized treatments or non-random non-compliance in a randomized clinical trial. For example, in the AIDS Clinical Trial Group (ACTG) trial 002 of the effects of high-dose versus low-dose AZT on the survival of AIDS patients, patients in the low-dose arm had improved survival, but they also took more aerosolized pentamidine (a non-randomized concurrent treatment);
3. allow an analyst to adequately incorporate information on the surrogate markers (e.g., CD4 count) in order to stop at the earliest possible moment, randomized trials to the effect of the treatment (e.g., AZT) on survival.

Dr. Robins has applied his methods to analyze the effect of a non-randomized treatment aerosolized pentamidine on the survival of AIDS patients in ACTG Trial 002; the effect of

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arsenic exposure on the mortality experience of a cohort of Montana copper smelter workers; the effect of formaldehyde on the respiratory disease mortality of a cohort of U.S. chemical workers; and the effect of smoking cessation on subsequent myocardial infarction and death within the MRFIT randomized trial.

Education

M.D., 1976, Washington University School of Medicine

Harvard School of Public Health, 677 Huntington Avenue, Boston, MA 02115
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BAY1-B-6

C

March 6, 2009

Mohave County
Development Services Department
3675 E. Andy Devine Avenue
Kingman, AZ 86401

RE: Hualapai Valley Solar – Entitlement Applications Processing Authorization

To Whom It May Concern:

The purpose of this letter is to formally authorize the firms and individuals identified below to process all necessary applications, including but not limited to General Plan amendment, Area Plan, and Zoning applications, which may be related to securing entitlements for a solar energy generating plant on behalf of the respective property owner for the property legally described in the enclosed document.

- Hualapai Valley Solar, LLC;
- The law firm of Gammage & Burnham P.L.C., including but not limited to its representatives, Grady Gammage, Jr., Thomas J. McDonald, Stephen W. Anderson, and Rob Lane; and,
- Tierra Environmental Consultants, LLC, including but not limited to its representatives, Jason Ramsey

Canberra Holdings, LLC has the development rights for the parcels identified above, more fully described as the full legal description enclosed with this letter.

Sincerely,
Canberra Holdings, LLC
By: Truckee Springs Holdings, Inc.,
a Nevada corporation, its Manager

By _____
James M. Rhodes, President

Encl.: Legal Description

6707.1 434900.1

3/6/2009

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Map Key	APN	Owner	City	State
1	335-03-001	DESERT COMMUNITIES INC	PHOENIX	AZ
2	335-03-032	Beauvais Jo Ann Etal	HEEKONK	MA
3	341-01-082	PETTIFORD ROY L & SHIRLEY J JT	WEST ORANGE	NJ
4	341-01-081	FRESQUEZ ERNEST JR	LAS VEGAS	NV
5	341-01-088	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
6	341-01-079	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
7	341-01-074	TURCIOS RAFAEL & ROSALINDA JT	DOLAN SPRINGS	AZ
8	341-01-057	AZAM MISBAHUL CPWRS	PHOENIX	AZ
9	341-01-058	PONCE THOMAS M JR ETAL JT	LIVINGSTON	NJ
10	341-01-018	NEAL JOHN T ETAL	KINGMAN	AZ
11	341-01-069	GRAZIANO A J & JOAN	CENTENNIAL	CO
12	341-01-051	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
13	341-01-040	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
14	341-01-034	GRAZIANO EUGENE M	MELBOURNE	FL
15	341-01-037	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
16	341-01-038	TAFFARO VINCENT J & ANNA R ETAL JT	RIDGEFIELD PARK	NJ
17	341-01-023	NEAL JOHN T ETAL	KINGMAN	AZ
18	341-01-075	RL 40 S LLC	LAS VEGAS	NV
19	341-01-076	RL 40 S LLC	LAS VEGAS	NV
20	341-01-021	NEAL JOHN T ETAL	KINGMAN	AZ
21	341-01-028	GACH ANTHONY & MARY JT	WHITEHOUSE STATION	NJ
22	341-01-061	BOOZER HELEN E	BROOKLYN	NY
23	341-01-025	DODSON CAROLYN ETAL	KINGMAN	AZ
24	341-01-026	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
25	341-01-067	BLAKELY BRET A & DENISE L	HAPPY VALLEY	OR
26	341-01-027	TATARKA ROBERT F	WEST AMBOY	NJ
27	341-01-060	D'ALESSANDRO FIORETTO & MARY JT	SOMERSET	NJ
28	341-01-054	ARNOLD MEL	LONG BRANCH	NJ
29	341-01-063	WOOD ELIZABETH C	MADISON	NJ
30	341-01-062	KONELL JOHN C	CLACKAMAS	OR
31	341-01-064	NATH NEVADA LLC	LAS VEGAS	NV
32	341-01-072	RL 40 S LLC	LAS VEGAS	NV
33	341-01-059	LA MASTRA CHARLES & VIRGINIA E JT	LIMERICK	PA
34	341-01-066	JONES JOHN & LOIS TRUSTEES ETAL	LAS VEGAS	NV
35	341-01-065	NATH NEVADA LLC	LAS VEGAS	NV
36	341-01-009	Ulrich Richard	SPRING HILL	FL
37	341-01-010	Archer Investments LLC	LAS VEGAS	NV
38	341-01-011	Cocchiere Mae	TOMS RIVER	NJ
39	341-01-012	STAHL DENNIS & SHERYL	DANA POINT	CA
40	341-01-015	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
41	341-01-035	MUSSO GASPARE & MARY JT	LONG ISLAND CITY	NY
42	341-01-031	CHINIGO ANDREW M	SAN ANTONIO	TX
43	341-01-037	BROCKMAN KELLY	LAS VEGAS	NV
44	341-01-036	CARR TYREE & MARY TRUSTEES	LAS VEGAS	NV
45	341-01-030	CARR TYREE & MARY TRUSTEES	LAS VEGAS	NV
46	341-01-014	CARR TYREE & MARY TRUSTEES	LAS VEGAS	NV
47	341-01-070	JAMES GENE E JT	LYONS	KS
48	341-01-071	THORNBURG MICHAEL & CHRISTINE JT	BRIDGMAN	MI
49	341-01-016	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
50	341-01-033	RL 40 S LLC	LAS VEGAS	NV
51	341-01-039	COMPTON ERIC & JULIE	MUNSTER	IN
52	341-01-068	RL 40 S LLC	LAS VEGAS	NV
53	341-05-005	DESERT COMMUNITIES INC	PHOENIX	AZ
54	341-05-048	DESERT COMMUNITIES INC	PHOENIX	AZ
55	341-05-059	DESERT COMMUNITIES INC	PHOENIX	AZ
56	335-16-016	Vitello Anthony M & Loretta JT	PORT SAINT LUCIE	FL
57	335-16-015	Foley Bailey M	THOMASTON	ME
58	335-16-003	Tomin Richard D & Bonnie J Trustees	KINGMAN	AZ
59	335-16-004	Tiedeman Greg	HENDERSON	NV
60	335-16-001	Duca Frank	ROSELLE	NJ
61	335-16-006	Fleming Betty J	LAKE HAVASU CITY	AZ
62	335-16-005	Tomelevage Joseph M & Lois JT	DEERFIELD BEACH	FL
63	341-01-084	DESERT COMMUNITIES INC	PHOENIX	AZ
64	341-01-084	DESERT COMMUNITIES INC	PHOENIX	AZ
65	341-01-084	DESERT COMMUNITIES INC	PHOENIX	AZ
66	341-01-084	DESERT COMMUNITIES INC	PHOENIX	AZ
67	341-01-002	DESERT COMMUNITIES INC	PHOENIX	AZ
68	341-01-002	DESERT COMMUNITIES INC	PHOENIX	AZ
69	341-01-002	DESERT COMMUNITIES INC	PHOENIX	AZ
70	341-01-002	DESERT COMMUNITIES INC	PHOENIX	AZ
71	341-01-022	NEAL JOHN T	KINGMAN	AZ
72	341-01-024	NEAL JOHN T ETAL	KINGMAN	AZ
73	341-01-048	SPINA EMANUELE & GENEVIEVE JT	WARREN	NJ
74	341-01-047	SCOTTO-D'ABUSCO ANTHONY &	COLONIA	NJ
75	341-01-052	FERNICOLA CHARLES A JR	NEWARK	NJ
76	341-01-043	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
77	341-01-044	FARNWORTH TAMMY	JACKSONVILLE	FL
78	341-01-053	HARROWER DAVID B & ELLEN W JT	PHOENIX	AZ
79	341-01-045	BURLINGAME ANTOINETTE	STANHOPE	NJ
80	341-01-020	A B N MANAGEMENT	REDLANDS	CA
81	341-01-049	MARION FAMILY PARTNERSHIP LP	WAYNE	NJ
82	341-01-046	SOUTH DAKOTA CONSERVANCY LLC	LAS VEGAS	NV
83	341-01-050	DEVINE PAUL T	SAN DIEGO	CA

BAY1-C-1

LEWIS AND ROCA LLP LAWYERS

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 360 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No. L-00000NN-09-0541-00151 Case No. 151 APPLICANT'S NOTICE OF FILING PROPOSED TOUR MAP AND ITINERARY

Pursuant to Paragraph 15 of the Procedural Order dated November 25, 2009, Hualapai Valley Solar ("HVS") gives notice of filing the proposed tour map and itinerary.

Respectfully submitted this 4th day of January, 2010.

LEWIS AND ROCA LLP

Dan Campbell

Thomas H. Campbell
Albert H. Acken
40 N. Central Avenue
Phoenix, Arizona 85004
Attorneys for Hualapai Valley Solar LLC
(602) 262-5723 (Tel.)
(602) 734-3841

LEWIS AND ROCA LLP LAWYERS

ORIGINAL and twenty-five (25) copies of the foregoing filed this 4th day of January, 2010, with:

The Arizona Corporation Commission
Utilities Division – Docket Control
1200 W. Washington Street
Phoenix, Arizona 85007

COPY of the foregoing hand-delivered or served electronically this 4th day of January, 2010, to:

John Foreman, Chairman
Arizona Power Plant and Transmission Line Siting Committee
Office of the Attorney General
PAD/CPA
1275 W. Washington Street
Phoenix, Arizona 85007

Janice Alward, Chief Counsel
Arizona Corporation Commission
1200 W. Washington Street
Phoenix, Arizona 85007

Susan A. Moore-Bayer
7656 West Abrigo Drive
Golden Valley, Arizona 86413

Denise Herring-Bensusan
4811 E. Calle Bill
Kingman, Arizona 86409

Israel G. Torres
Torres Consulting and Law Group LLC
209 E. Baseline Road
Suite E-102
Tempe, Arizona 85283

Betty J. Griffin

BAY1-C-1

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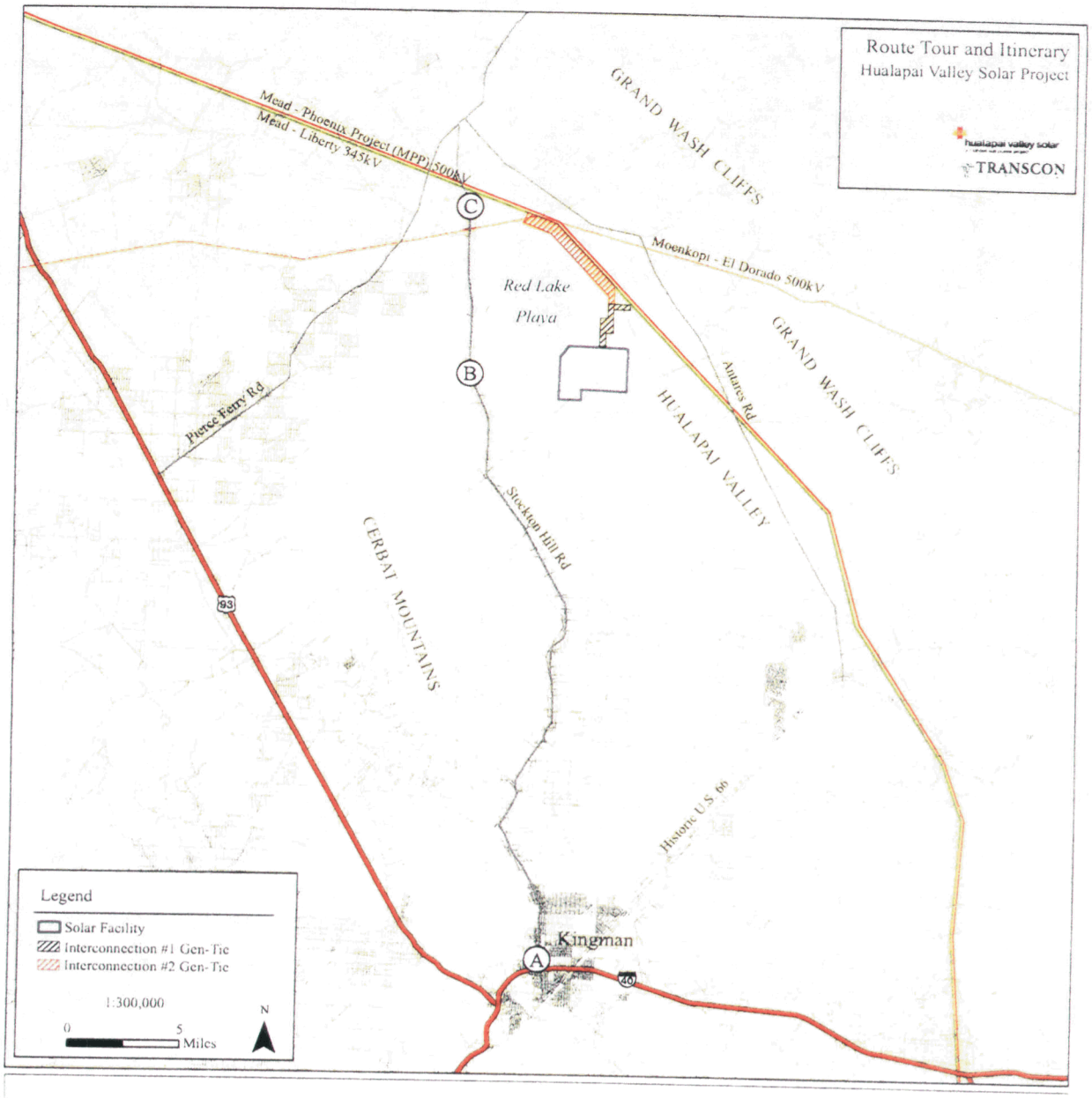


12/31/09

Route Tour Trip Itinerary Details

Start Location, Date, and Time: Hampton Inn (1791 Sycamore Avenue, Kingman, AZ 86409) parking lot at 8:00 a.m. on January 13, 2009

Estimated Length and Travel Time: 74 miles and approximately 2 to 2.5 hours of travel time

View Point Descriptions and Driving Directions

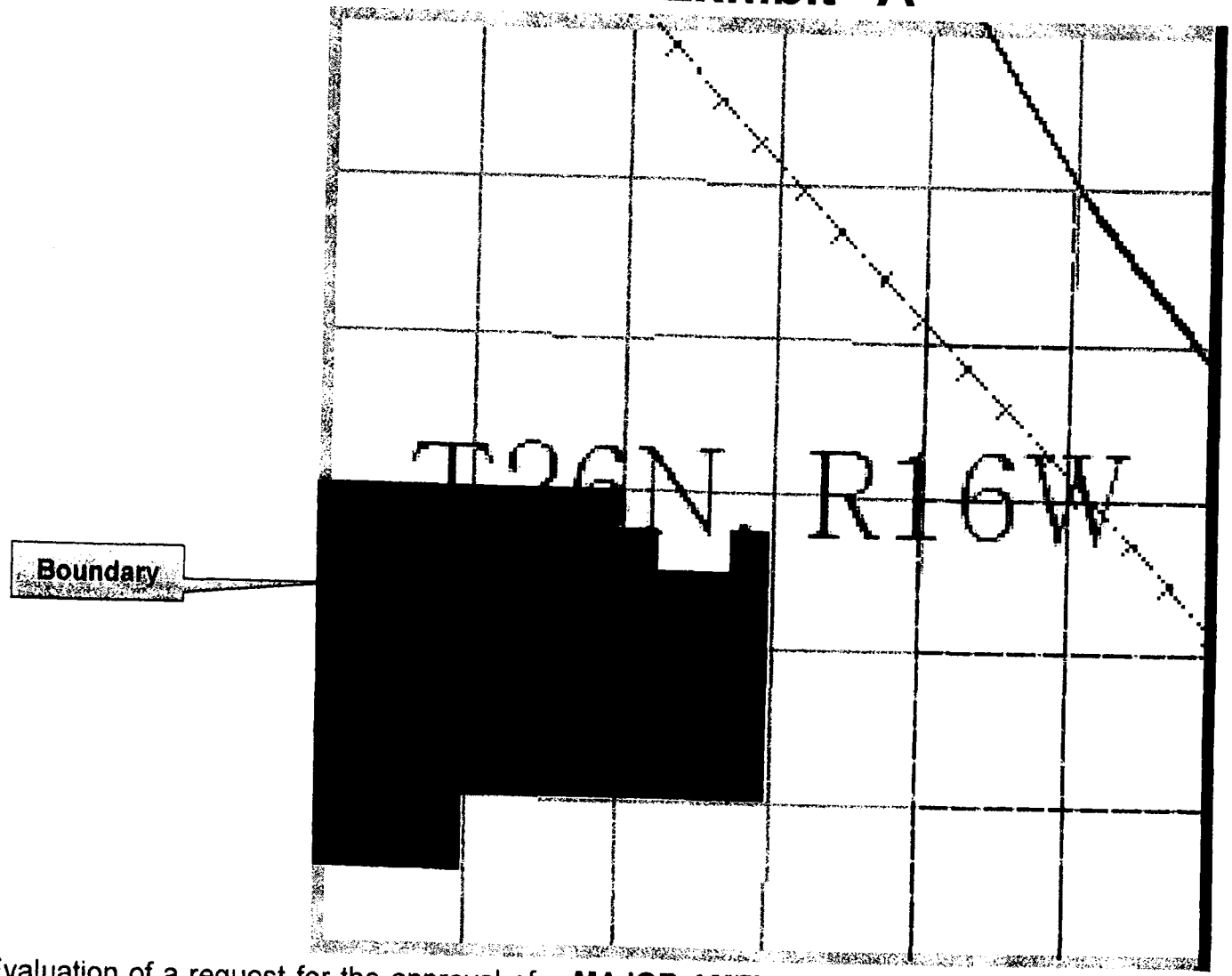
Note that the letters below correspond to the letters on the map.

A. Beginning and end point at Hampton Inn parking lot. To commence the route tour travel north on Stockton Hill Road 29.5 miles to stop B.

B. Stop and View. Location of public hearing notification sign. The proposed project access road would run east to the solar facility. The solar facility would be located approximately 3.5 miles to the east. Continue North on Stockton Hill Road for 7.7 miles to stop C.

C. Stop and View. This location offers a view from the north of Red Lake Playa southeast to the solar facility. Return to beginning (Stop A) by traveling south on Stockton Hill Road for 37.2.

Exhibit "A"



Evaluation of a request for the approval of a **MAJOR AMENDMENT TO THE MOHAVE COUNTY GENERAL PLAN** for Sections 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW 1/4 NE 1/4 thereof, in Township 26 North, Range 16 West to change the land use designation from a RDA (Rural Development Area) land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation and amending Exhibits VI.4 and VI.6 of the General Plan to match, consisting of approximately 6.3 square miles in the Mohave County General Area, Mohave County, Arizona.

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May. 12, 2009
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World's largest solar-thermal plant planned for Arizona land sold by Rhodes

By DAVE HAWKINS
SPECIAL TO THE LAS VEGAS REVIEW-JOURNAL

KINGMAN, Ariz. -- A Tempe-based firm intends to build and operate what it says will be the world's largest solar-thermal power plant on land in northwest Arizona that it has acquired from Las Vegas developer Jim Rhodes.

Mohave Sun Power LLC will later complete the purchase of the 4,160 acres 27 miles north of Kingman if it obtains the required permits and approval at the federal, state and local level, project director Greg Bartlett said.

Construction should begin late next year, providing up to 1,500 jobs, he said. More than 100 people would staff the plant during initial operation, forecast for late 2013.

Mohave Sun Power Executive Director Mitchell Dong said six square miles of parabolic mirrors will be built to harness the sun at a facility that will generate 340 megawatts of electricity.

The mirrors concentrate sunlight on long tubes of oil.

"It's a synthetic oil heated to 800 degrees by the sun's light," Dong said. "There are rows and rows of these collectors, and this 800-degree oil is pumped to a central power block, a central location where that hot oil goes to a boiler. It makes steam and drives a single steam turbine."

Dong said some of the generated heat will be stored in molten salt that will allow the plant to generate power at night when cloud cover diminishes solar radiation.

He also said the operation would require annual use of 1,500 to 3,000 acre-feet of groundwater. One acre-foot of water is enough to supply two Las Vegas Valley homes for one year.

Bartlett said company officials are well aware that use of groundwater is a sensitive subject. He noted, however, that the area had been targeted for residential development that would consume more water than the proposed solar facility.

Bartlett said water quality and quantity issues are the focus of ongoing hydrological study. The project will require zoning changes and plan amendments at the local level. He said company officials welcome public input and scrutiny.

"That's a very important part of the whole process," Bartlett said. "We embrace that."

Jack Ehrhardt, the leading environmental activist in northwest Arizona, guaranteed that scrutiny will be focused on water consumption issues as well as Dong himself, who was ordered to pay a

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penalty and interest sanction totaling nearly $2.2 million by the Securities and Exchange Commission.

A January 2008 order by the SEC found that Dong and the Chronos Asset Management company he founded in 1995 engaged in a fraudulent market timing and late trading scheme. Dong was suspended for 12 months from investment adviser or investment company activity.

Dong explained that Chronos was a hedge fund with nearly $500 million in assets under its management at its peak. He said he preferred to reach a settlement with the SEC rather than litigate allegations of improper trading.

"We chose to settle the matter, without admitting any wrongdoing, rather than to litigate," Dong said. "We were pleased to close this chapter and move on."

Find this article at:
http://www.lvrj.com/business/44775192.html

☐ Check the box to include the list of links referenced in the article.

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Apr. 01, 2009
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Developer Rhodes seeks Chapter 11 bankruptcy

By JOHN G. EDWARDS
LAS VEGAS REVIEW-JOURNAL

Developer James Rhodes on Tuesday night filed a petition for bankruptcy on behalf of many of his key businesses, including Rhodes Design and Development Corp., listing $100 million to $500 million in assets and liabilities in the same range.

The developer filed for bankruptcy under Chapter 11, which allows the companies to continue operating while their finances are restructured.

Rhodes has been one of Las Vegas' most successful and controversial developers and homebuilders. He developed Rhodes Ranch in southwest Las Vegas and Tuscany Village in Henderson. He provoked the ire of environmentalists with his development of the Red Rock Country Club community.

Rhodes drew news coverage again when Erin Kenny, the former Clark County commissioner, disclosed that Rhodes paid her $200,000 a year for consulting as part of an agreement in which she pleaded guilty to federal corruption charges. Kenny was sentenced to 30 months in prison in connection with a bribery case involving former strip club owner Michael Galardi.

The Arizona Corporation Commission questioned Rhodes about his business relationship with Kenny when he sought to establish a water utility for a master-planned community proposed in Golden Valley between Kingman and Bullhead City.

The Arizona panel also grilled Rhodes over $148,000 in fines he paid after admitting he illegally funneled campaign contributions in 2002 through employees and employees' spouses to Sen. Harry Reid, and then County Commissioner Dario Herrera. Herrera also was convicted in connection with the bribery case.

The Rhodes Companies filed the bankruptcy petition but an attachment notes that 31 affiliated companies also are seeking protection under Chapter 11 bankruptcy.

They include Rhodes Ranch General Partnership, Rhodes Ranch Golf and Country Club, Tuscany Golf Country Club, Tuscany Acquisitions and three similarly named companies, Rhodes Realty, Rhodes Homes Arizona, Rhodes Arizona Properties, Tribes Holdings, Six Feathers Holdings and Bravo.

Rhodes filed a statement explaining that he believed "it is in the best interests of the company, its creditors" and others to file for Chapter 11.

The Sunstate Companies of Las Vegas is the largest unsecured creditor and is owed $201,000, followed by G.C. Wallace of Las Vegas, which is owed about the same amount. The developer estimated that between 5,000 and 10,000 creditors will have claims in the bankruptcy case.

BAY1-C-3

He hired the law firm of Pachulski Stang Ziehl & Jones, which has offices in Los Angeles and other cities, but the petition was filed by Larson & Stephens of Las Vegas.

Contact reporter John G. Edwards at jedwards@reviewjournal.com or 702-383-0420.

Find this article at:
http://www.lvrj.com/news/42251777.html

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BAY1-C-3

OMNI Management Group

Corporate Bankruptcy Services

The Rhodes Companies, LLC

Related Debtors

Debtor	Case #	Filing Date	
Heritage Land Company, LLC	**09-14778**	**3/31/2009**	
The Rhodes Companies, LLC	**09-14814**	**3/31/2009**	*Primary Case*
Tribes Holdings, LLC	**09-14817**	**3/31/2009**	
Apache Framing, LLC	**09-14818**	**3/31/2009**	
Geronimo Plumbing, LLC	**09-14820**	**3/31/2009**	
Gung-Ho Concrete, LLC	**09-14822**	**3/31/2009**	
Bravo, Inc.	**09-14825**	**3/31/2009**	
Elkhorn Partners, a Nevada Limited Partnership	**09-14828**	**3/31/2009**	
Six Feathers Holdings, LLC	**09-14833**	**3/31/2009**	
Elkhorn Investments, Inc.	**09-14837**	**3/31/2009**	
Jarupa, LLC	**09-14839**	**3/31/2009**	
Rhodes Realty, Inc.	**09-14841**	**3/31/2009**	
C & J Holdings, Inc.	**09-14843**	**3/31/2009**	
Rhodes Ranch General Partnership	**09-14844**	**3/31/2009**	
Rhodes Design and Development Corp.	**09-14846**	**3/31/2009**	
Parcel 20, LLC	**09-14848**	**3/31/2009**	
Tuscany Acquisitions IV, LLC	**09-14849**	**3/31/2009**	
Tuscany Acquisitions III, LLC	**09-14850**	**3/31/2009**	
Tuscany Acquisitions II, LLC	**09-14852**	**3/31/2009**	
Tuscany Acquisitions, LLC	**09-14853**	**3/31/2009**	

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Rhodes Ranch Golf and Country Club	**09-14854**	**3/31/2009**
Overflow, LP	**09-14856**	**3/31/2009**
Wallboard, LP	**09-14858**	**3/31/2009**
Jackknife, LP	**09-14860**	**3/31/2009**
Batcave, LP	**09-14861**	**3/31/2009**
Chalkline, LP	**09-14862**	**3/31/2009**
Glynda, LP	**09-14865**	**3/31/2009**
Tick, LP	**09-14866**	**3/31/2009**
Rhodes Arizona Properties, LLC	**09-14868**	**3/31/2009**
Rhodes Homes Arizona, LLC	**09-14882**	**4/1/2009**
Tuscany Golf Country Club, LLC	**09-14884**	**4/1/2009**
Pinnacle Grading, LLC	**09-14887**	**4/1/2009**

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Jun. 17, 2009
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Dario Herrera, Erin Kenny returning to Las Vegas after stays in prison

By ADRIENNE PACKER
LAS VEGAS REVIEW-JOURNAL

Dario Herrera and Erin Kenny are being shipped back to Las Vegas from their respective federal prison camps, but their lives back home will bear little resemblance to their high-flying, high-living days as Clark County commissioners.

- Jane Ann Morrison blog

During his years in office, Herrera was accustomed to free passes into popular nightclubs, with complimentary lap dances, it was revealed during his 2006 trial.

He received sex on the house, and his golf came was spiced up with topless bar dancers at no additional cost.

The 35-year-old will come home Thursday a single man. His wife, Emily Herrera, who sat expressionless while detailed accounts of her husband's affairs were aired in the courtroom, filed and was granted a divorce a year ago.

Herrera has spent the last 45 months in a prison camp in Florence, Colo., after he was convicted of accepting bribes from strip club owner Michael Galardi.

Acquaintances said the once-rising Democratic star who earned his degree from the Boyd School of Law at the University of Nevada, Las Vegas, taught law classes at the facility.

Prior to Herrera's sentencing in late 2006, Jonathan Stern of ADG Capital, the company that employed Herrera and built the $80 million Loft 5 condominiums, said Herrera would have a job to come home to.

But the construction industry tanked while Herrera was locked up. The number at the company's New York headquarters has been disconnected.

Ashley Hall, director of public relations for the Church of Jesus Christ of Latter-day Saints, said he kept in contact with Herrera, who joined the church after he was indicted in 2003.

Hall wouldn't discuss Herrera's time in prison, other than to say he frequently sent Herrera books.

Kenny, who pleaded guilty to accepting bribes from Galardi, cooperated with the government and testified against Herrera and former colleague Mary Kincaid-Chauncey.

BAY1-C-5

Kenny and Herrera might spend the remaining days of incarceration at the same facility, the Las Vegas Corrections Center at 2901 Industrial Road. Kenny's return date couldn't be obtained today.

The facility is a halfway house that looks like a three-story office building with little security other than closed-circuit cameras.

The 124-bed institution allows inmates to find employment and re-establish ties to the community with the help of a case manager.

Visitation rules are liberal, and inmates are permitted to leave for the day to work, but are required to return at night.

It is unclear how long Herrera will remain at the center. But Kincaid-Chauncey was transferred to the Las Vegas halfway house on Dec. 16 and was released to home confinement just two weeks later, after she served all but six months of her 30-month sentence.

John Casale, the facility's director, did not return phone messages Tuesday and today.

Like Herrera, it is doubtful Kenny's cash flow will compare to her tenure as a commissioner.

Not only did Kenny collect her commission salary, which ranged from $54,000 to $70,000 over the years, but she also accepted $200,000 from real estate consultant Don Davidson, between $150,000 and $200,000 from Galardi and $3,000 a month from Triple Five Development.

After Kenny, 48, surrendered her commission seat to run for lieutenant governor in 2003, developer Jim Rhodes began paying her $15,000 a month for her advice on government services.

Kenny testified that Rhodes upped her salary to $201,600 a year after she was indicted.

Rhodes filed for bankruptcy earlier this year.

Rhodes, who also builds homes in Arizona, was questioned by the Arizona Cooperation Commission about his relationship with Kenny. He was never charged with any crime.

During her 30-month term at an Arizona prison camp, Kenny missed several of her children's milestones and accomplishments.

Her oldest son, Pat Kenny, recently graduated from Meadows High School, and his football team won the state championship. As a wrestler, he also won the regional championship for his weight class.

Kenny's daughter is in her 20s and attending college.

Herrera is scheduled to be released from the prison system on Dec. 14, and Kenny on Dec. 18, according to the Bureau of Prisons Web site.

The only player in the political corruption scheme who will remain incarcerated after Herrera and Kenny serve their final months in the system is Lance Malone, a one-time commissioner who served as a lobbyist for Galardi.

Malone, who received a six-year sentence for delivering cash bribes on behalf of Galardi, is scheduled to be released in July 2012.

Galardi, who pleaded guilty to the bribery charges and received a 30-month sentence, was

BAY1-C-5

MAY 13, 2001

THE MOHAVE COUNTY ECONOMIC DEVELOPMENT AUTHORITY, BETTER KNOWN AS MCEDA, IN ITS LAST BOARD MEETING, MAY 3, 2001, VOTED UNANIMOUSLY TO BEGIN WORKING WITH THE MOHAVE COUNTY PLANING AND ZONING DEPARTMENT TO

UPDATE THE MOHAVE COUNTY GENERAL PLAN. KEVIN DAVIDSON FROM THE MOHAVE COUNTY PLANNING AND ZONING DEPARTMENT ALSO PARTICIPATED IN THE DISCUSSION. MCEDA EXECUTIVE DIRECTOR BILL GOODALE WILL BRING THE AREA PLAN FOR THE I-40 INDUSTRIAL CORRIDOR, THE CORRIDOR THAT RUNS FROM JUST OUTSIDE THE CITY OF KINGMAN, FROM THE McCONNICO EXIT TO TOPOCK AT THE CALIFORNIA BORDER, ALONG THE WAY, A TWO-MILE STRETCH OF HIGHWAY 95 TOWARDS LAKE HAVASU CITY BEGINNING AT THE INTERSTATE 40, HIGHWAY 95 INTERCHANGE. MCEDA'S BOARD OF DIRECTORS HAVE DEVOTED SIGNIFICANTLY IN THE FORMATION OF A PLAN TO KEEP INDUSTRY CLOSE TO MAJOR TRANSPORTATION ROUTES AND REALIZE THE SPECIAL NEEDS OF INDUSTRY, TO DEVELOP THE INFRASTRUCTURE WITHIN THE CORRIDOR MAKING THE I-40 INDUSTRIAL CORRIDOR ATTRACTIVE TO BUSINESS AND INDUSTRY. MCEDA PRESIDENT HENRY VARGA SAYS, EMPHASIS ON THE I-40 CORRIDOR IS TO PROVIDE A PLACE THAT IS COMFORTABLE, COMPATIBLE AND EASY FOR INDUSTRY TO COME TO. THE I-40 INDUSTRIAL CORRIDOR AND OTHER CORRIDORS IN THE PLANNING STAGES ARE DESIGNED TO KEEP INDUSTRY OUT OF RESIDENTIAL AREAS, AND RESIDENTIAL AREAS SEPARATE FROM INDUSTRY.

ALONG WITH DAVIDSON AND OTHER PLANNING AND ZONING STAFF WILL BEGIN WORK ON ISSUES THE MODEL RAISES. ACCORDING TO DAVIDSON, THIS IS A MAJOR AMENDMENT TO THE COUNTY GENERAL PLAN, AFTER MCEDA AND THE COUNTY PLANING AND ZONING FINISH THE UPDATE, WE WILL SCHEDULE MEETINGS FOR PUBLIC INPUT AND FINALLY SUBMIT THE REVISED GENERAL PLAN TO THE COUNTY SUPERVISORS FOR THEIR APPROVAL. MCEDA EXECUTIVE DIRECTOR BILL GOODALE

BAY1-C-6

SAYS A LOT OF WORK IS STILL AHEAD AND LOOKS FORWARD TO WORKING WITH THE COUNTY PLANING AND ZONING DEPARTMENT.

MCEDA PRESIDENT HENRY VARGA NOTES THAT THE INCORPORATION OF THE I-40 INDUSTRIAL CORRIDOR PLAN IS IMPORTANT BECAUSE, MCEDA IS LOOKING FORTY TO FIFTY YEARS IN THE FUTURE, NOT NEXT WEEK OR NEXT YEAR, AND ALSO AT HISTORY. WE DO NOT NEED ANOTHER LAX, THERE INDUSTRY AND RESIDENTIAL AREAS ARE MIXED AND PROBLEMS EXIST.

FOR MORE INFORMATION CONTACT:
BILL GOODALE - EXECUTIVE DIRECTOR, MCEDA
(520) 692-6970

ACCORDING TO MCEDA PRESIDENT HENRY VARGA, BOARD MEMBERS, PAST AND PRESENT HAVE CONTRIBUTED THEIR TIME AND IDEAS IN THE FORMATION OF A COUNTYWIDE MODEL OF BUSINESS AND INDUSTRIAL GROWTH.

INTEREST IN THE MANAGED INDUSTRIAL AND ECONOMIC DEVELOPMENT FOR MOHAVE COUNTY BEGAN IN THE MIDDLE 1980'S. AS INDUSTRY, FROM OUTSIDE THE COUNTY, PURCHASED LAND AT THE KINGMAN AIRPORT, AT THAT TIME A COUNTY PROPERTY, QUESTIONS REGARDING WHAT TYPES OF INDUSTRY, AND WHERE THEY LOCATED MOVED A GROUP OF LOCAL BUSINESSMEN TO FORM CITIZENS FOR PROGRESS. LATER THIS LOCAL ORGANIZATION REQUESTED THE BOARD OF SUPERVISORS TO FORM A COUNTY WIDE DEPARTMENT FOR THE PURPOSE OF RECRUITING AND LOCATING FUTURE BUSINESS AND INDUSTRY WITHIN MANAGED AREAS OF THE COUNTY TO FIT THEIR PARTICULAR NEEDS.

IN 1992, THE MOHAVE COUNTY BOARD OF SUPERVISORS ASSISTED IN THE CREATION OF

MCEDA, AS A NON-PROFIT ORGANIZATION, WITH A BOARD OF DIRECTORS MADE UP OF MOHAVE COUNTY BUSINESS MEN AND WOMEN, AND CHARGED THEM WITH PLANNING INDUSTRIAL GROWTH TO INCREASE THE TAX BASE FOR THE COUNTY AND PROVIDE HIGH WAGE JOBS FOR THE CITIZENS OF MOHAVE COUNTY.

THE I-40 INDUSTRIAL CORRIDOR AND ITS

BAY1-C-6

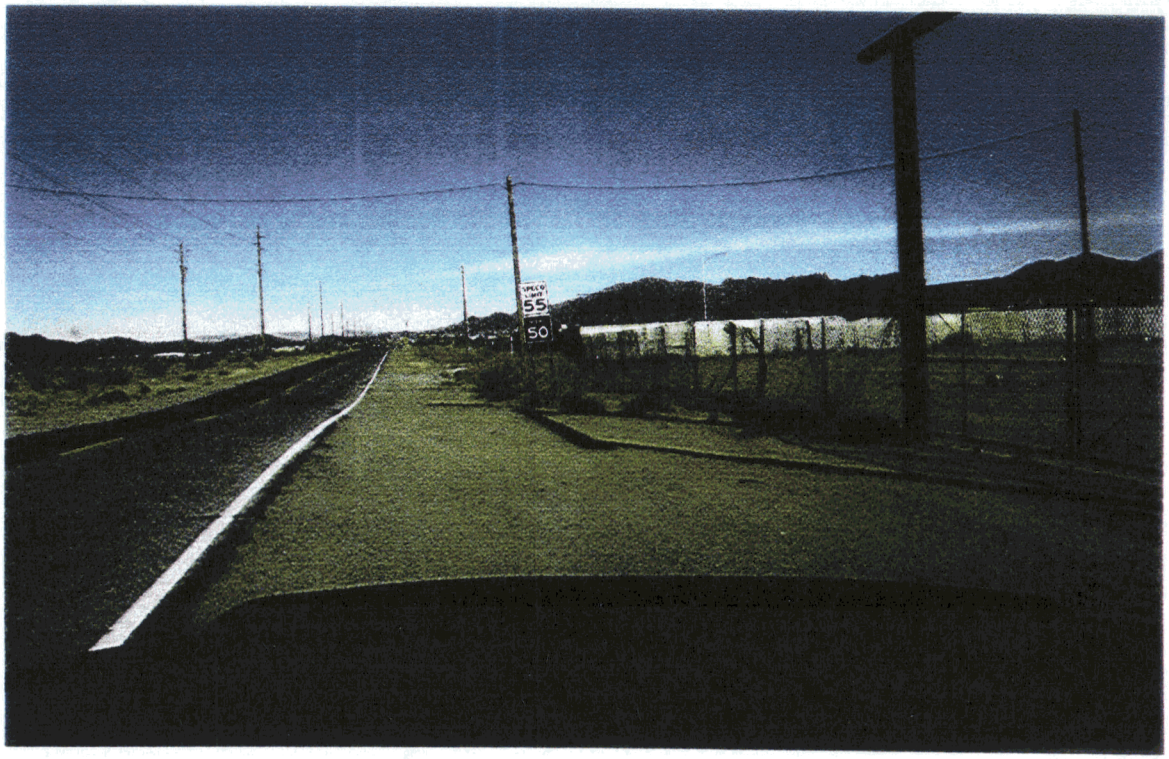
D

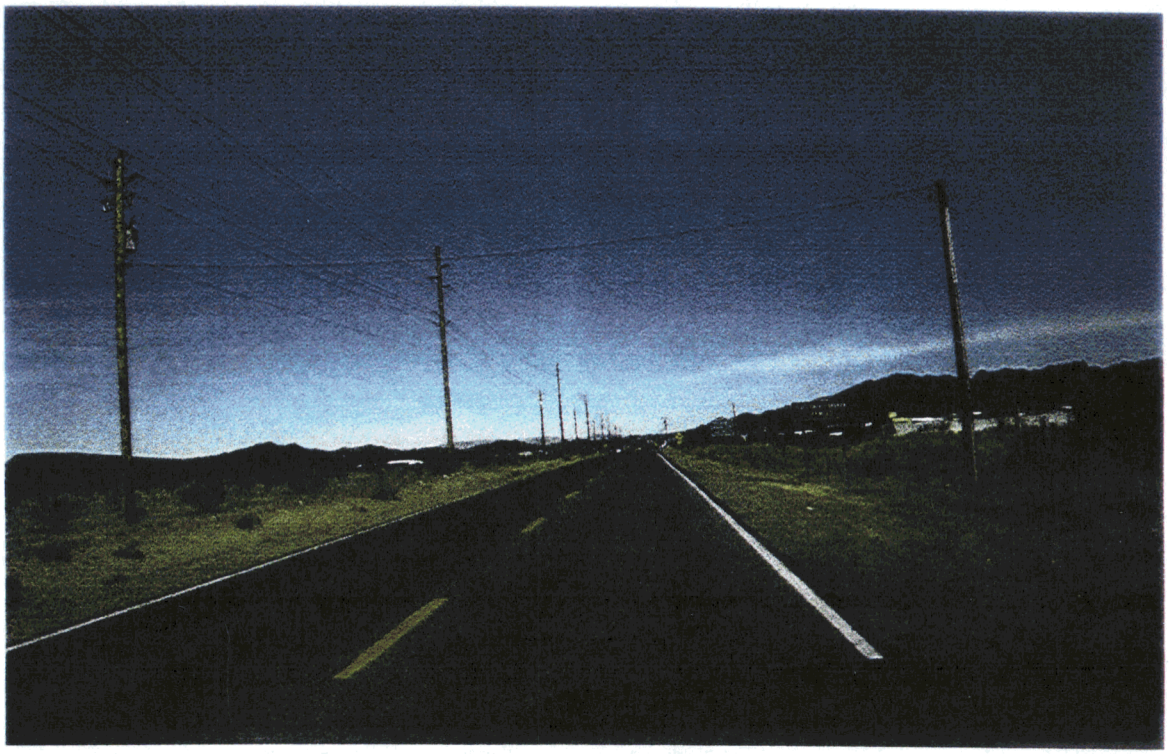
Pierce Ferry Rd
Dolan Springs
Meadview City
1/2 MILE

NORTH
NORTH
93
25
MILE
4
2

Dolan Springs 5
Meadview 39
South Cove 49

WATCH
FOR
ANIMALS





BAY1-D-1

SPEED
LIMIT
45

SPEED
LIMIT
45

UNLAWFUL
TO PASS
SCHOOL BUS
STOPPED FOR
CHILDREN

SPEED
LIMIT
25

SPEED
LIMIT
45

MOUNT TIPTON
15

SCHOOL
SPEED
LIMIT
15
MT. TIPTON
SCHOOL

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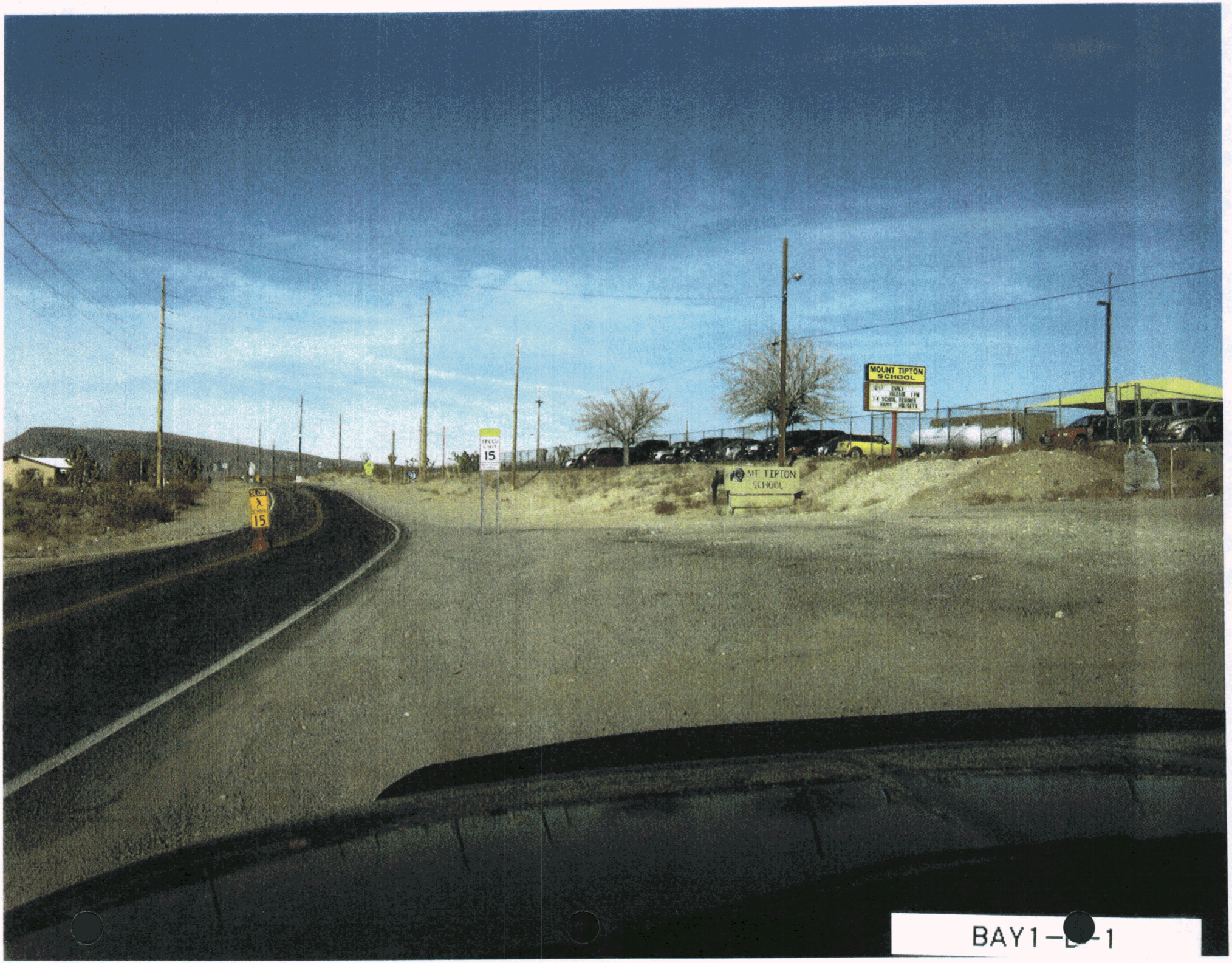

BAY1-[illegible]-1

BAY1-D-1

E

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

GOVERNOR
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NORMAN W. FREEMAN, CHINO VALLEY
JACK F. HUSTED, SPRINGERVILLE
DIRECTOR
LARRY D. VOYLES
DEPUTY DIRECTORS
GARY R. HOVATTER
ROBERT D. BROSCHEID

August 20, 2009

Mr. Kevin A. Davidson
Mohave County
Planning and Development Department
P.O. Box 7000
Kingman, AZ 86402-7000

Re: Hualapai Valley Solar Project

Dear Mr. Davidson:

The Arizona Game and Fish Department (Department) has reviewed the above-referenced Major General Plan amendment. The Department understands the amendment would allow construction and operation of a concentrating solar facility in Hualapai Valley. The Department has provided comments on this project to Mr. Mike LaRow, Hualapai Valley Solar, LLC. We have included a copy of these comments as an attachment.

The Department supports the use of solar technologies that minimize the amount of water and land needed to produce viable solar facilities. When CSP technology is used, we encourage the use of dry cooling methods to significantly minimize water consumption. We also support the use of hybrid parallel wet/dry cooling system which reduces water consumption to a slightly lesser extent. However, we do not support the use of water cooling methods. The process of water cooling consumes a great deal of water and is not suitable in a semi-desert environment where water resources are extremely limited.

Thank you for the opportunity to provide comments on the amendment. We look forward to continued communications with Hualapai Valley Solar LLC and Mohave County regarding the project development and implementation. Please contact me at 623-236-7606 if you have any questions, or would like to further discuss our concerns and recommendations.

Sincerely,

Ginger Ritter

Ginger Ritter
Project Evaluation Project Specialist, Habitat Branch

cc: Laura Canaca, Project Evaluation Program Supervisor, Habitat Branch
Trevor Buhr, Habitat Program Supervisor, Region III
Karl Taylor, Mohave County, Planning Manager

AGFD #M09-08195103

BAY1-E-1

THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT
5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

GOVERNOR
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LARRY D. VOYLES
DEPUTY DIRECTORS
GARY R. HOVATTER
ROBERT D. BROSCHEID

August 20, 2009

Mr. Mike LaRow
Hualapai Valley Solar LLC

Re: Hualapai Valley Solar Project

Dear Mr. LaRow:

The Arizona Game and Fish Department (Department) has reviewed the project information for Hualapai Valley Solar Project. We understand that the proposed project would construct a 340 MW generating station located on approximately 4,160 acres of semi-desert grassland habitat within sections 19-21 and 28-31 of Township 26 North, Range 16 West. The Department has the following comments for your consideration in preparation of an application for a Certificate of Environmental Compatibility for the Arizona Corporation Commission and other environmental analyses.

The Department is concerned about the amount of ground water that is required to operate the facility (3,000 acre feet/year). The Mohave County General Plan states that "estimated annual water use in Hualapai Valley will be over 14,000 acre-feet per year and exceed natural recharge placing the aquifer under stress from depletion." As a result, the lowered water table will indirectly affect Arizona's habitats in Hualapai Valley and may have considerable affects on wildlife which depend on small cienegas, springs, seeps, and marshes in the area. The Hualapai Valley Solar project will increase this affect if it is developed as a concentrated solar power facility. In the Mohave County General Plan there are goals and policies (e.g. Goal 3, Policy 3.5; Goal 36, Policy 36.12) that support industry and development that consume less water. The Department encourages Hualapai Valley Solar to consider other technologies which require less water to operate.

The Department is also concerned about the use of settling ponds to collect the highly saline wastewater in the evaporative cooling component of the proposed project. These ponds will likely attract birds, bats, and other wildlife which could then be inadvertently poisoned due to concentrated salt and other minerals. Therefore, the Department recommends the ponds be screened to prevent unsuitable and possibly fatal use.

BAY1-E-2

Lastly, the Department is concerned about the possible effects of facility lighting on nocturnal wildlife. Artificial night lighting, which may be intensified by the collection mirrors, may attract insects and the species that prey on them (e.g. bats). It could also impair the ability of nocturnal animals to navigate and may negatively affect reptile populations. The Department recommends using only the minimum amount of light needed for safety. Narrow spectrum bulbs should be used as often as possible to lower the range of species affected by lighting. All lighting should be shielded, cantered, or cut to ensure that light reaches only areas needing illumination.

In conclusion, the Department recognizes the purpose and need for alternative energy development but we also recognize that solar developments will negatively impact wildlife habitat. We believe project mitigations should focus on the following primary issues related to wildlife and their habitats:

- Wildlife habitat connectivity
- Depletion of water resources
- Wildlife impacts resulting from site development and facilities
- Project monitoring to evaluate project impacts and inform adaptive mitigation solutions

The Hualapai Valley Solar Project will substantially alter or eliminate approximately 4,160 acres of wildlife habitat. Impacts to Hualapai Valley's wildlife may also extend beyond the physical footprint of the project boundaries, potentially increasing the number of acres affected by the project. Attached you will find recommendations for the project. (**Note:** The Department is in the process of developing guidelines for solar enegy development which is expected to be completed by the end of 2009). Further, Department Policy I2.3 requires that we seek compensation for potential habitat losses resulting from land and water projects in accordance with State and Federal laws. The Department would like to recommend mitigating the project through:

- funding research on the effects of solar energy to surrounding wildlife.
- protecting/purchasing land equivalent to the amount being taken or relocating on unused agricultural lands.

The Department's Research Branch has developed a monitoring plan to elucidate whether the impact of this, and other utility-scale solar projects, stops at the project boundaries or if it extends beyond the project's physical footprint. This monitoring approach would inform planning, development, and mitigation on future projects by determining the true impacts from habitat loss, degradation and fragmentation. We would be interested in presenting this plan to representative from Hualapai Valley Solar for consideration as they strive to develop renewable energy projects while minimizing impacts to wildlife resources.

Thank you for the opportunity to provide comments on this proposed project. We look forward to continued communications with Hualapai Valley Solar, LLC regarding the project development and implementation. Please contact me at 623-236-7606 if you have any questions, or would like to further discuss our concerns and recommendations.

Sincerely,

Ginger Ritter

Ginger Ritter
Project Evaluation Project Specialist, Habitat Branch

cc: Laura Canaca, AGFD, Project Evaluation Program Supervisor, Habitat Branch
Trevor Buhr, AGFD, Habitat Program Manager, Region III
Janice Stroud, AGFD, Habitat Specialist, Region III
Kevin A. Davidson, Mohave County, AICP Planner II
Karl Taylor, Mohave County, Planning Manager

AGFD #M09-07132546

Department Recommendations for the Hualapai Valley Solar Project

To minimize the potential impacts to wildlife habitat and populations resulting from the development and operation of the Hualapai Valley Solar Project, the Department recommends implementing the following:

1. We strongly encourage Hualapai Valley Solar to meet with representatives of the Department to discuss a recently developed monitoring plan that will provide data to determine the extent of this project's impacts to wildlife habitat and connectivity. Our goal is to implement this monitoring plan on a landscape-scale by partnering with the solar industry, thereby allowing us to make accurate predictions regarding the impact that these projects will have on desert ecosystems. This data will greatly inform the appropriate planning and mitigation necessary to reduce impacts to wildlife and their habitat.
2. The Department recommends additional pre-construction studies be performed which provide sufficient detail to map the habitat for all special status species within the project vicinity (e.g. wetland/riparian habitat, contiguous tracts of undisturbed wildlife habitat, raptor nest sites) and to determine seasonal movement corridors for species (e.g. winter bird concentrations, raptor migration, nesting). These maps, as well as others, should be used to show the location of sensitive resources and to establish the layout of roads, fences, and other infrastructure in order to minimize habitat fragmentation and disturbance. Pre-construction surveys should also be performed for bats since several special status bat species (e.g. Pale Townsend's big-eared bat, Allen's big-eared bat) have been found within the vicinity of the facility.
3. If wildlife is encountered during construction of the facility, it should be moved outside the project area within 1 mile of its original location. A scientific collecting permit is required for this activity. A permit can be obtained by emailing Scpermit@azgfd.gov for more information. If wildlife will need to be removed from the facility once it is operational, annual renewal of the permit will be required.
4. Project analysis should include evaluation of the direct, indirect and cumulative effects of project development on wildlife, wildlife habitat and wildlife habitat connectivity resulting from the conversion of 4,160 acres of semi-desert grassland habitat to a solar generating plant. If negative impacts are anticipated, the Department recommends implementing activities that could mitigate these impacts. Such activities may include, but are not limited to, preserving land elsewhere, restoring degraded land, and/or relocating facility footprint.
5. Project analysis should also include a thorough evaluation of the anticipated impacts to water resources. The Department strongly encourages the use of technology that requires minimal amounts of water. In the desert, water is very scarce and reducing consumption will lessen impacts on wildlife as well as the public.
6. Current hydrology of the project site should be maintained. Any change in sheet flow will have detrimental effects to down slope vegetation. In addition, consult with the U.S. Army Corps of Engineers regarding Clean Water Act issues, best management practices, and guidelines for minimizing and mitigating impacts to riparian areas.

7. For any powerlines built:
   a. Proper design and construction of the transmission line is necessary to prevent or minimize risk of electrocution of raptors, owls, vultures, and golden or bald eagles, which are protected under state and federal laws.
   b. Limit project activities during the breeding season for birds, generally May through late August, depending on species in the local area (raptors breed in early February through May). Conduct avian surveys to determine bird species that may be utilizing the area and develop a plan to avoid disturbance during the nesting season.
   c. Coordinate plant salvage and revegetation efforts with the Arizona Department of Agriculture, in accordance with the Arizona Native Plant Law. A reclamation plan is recommended for disturbed sites, where appropriate, including planting native, weed-free seed and vegetation.

PALE TOWNSEND BIG EARED BAT

BAY1-E-3

http://www.azgfd.gov/w_c/edits/images/corytopa.jpg

ALLEN BIG EARED BAT

BAY1-E-3

http://www.azgfd.gov/w_c/edits/images/idiophyl.jpg

F

ARIZONA
DEPARTMENT
OF WATER
RESOURCES

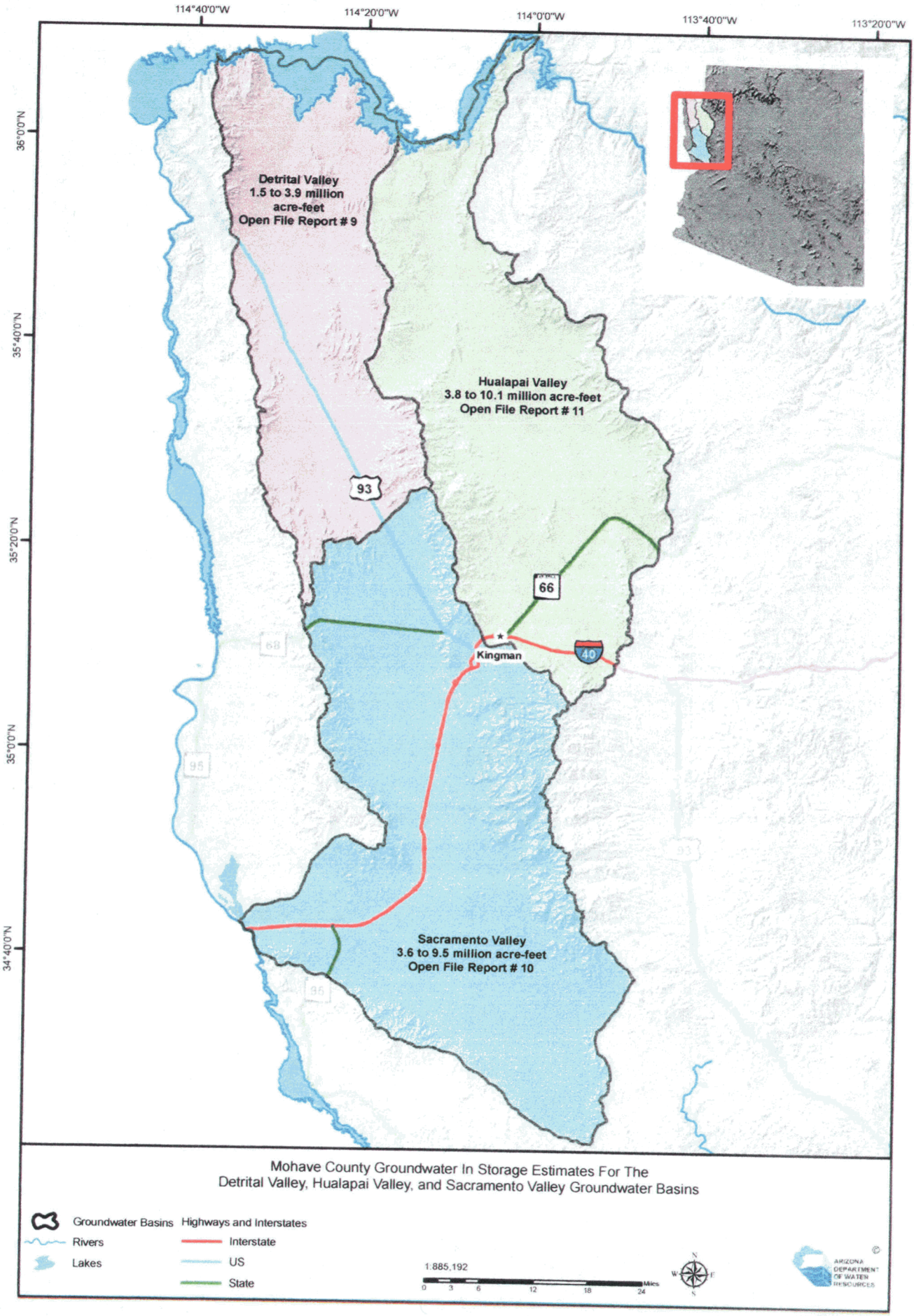
Mohave County Water Resources Investigation Fact Sheet
Estimating Groundwater Availability in the Detrital Valley, Hualapai Valley, and Sacramento Valley Groundwater Basins in Mohave County

The Arizona Department of Water Resources (ADWR) has performed a series of studies in Mohave County aimed at updating and improving estimates of the amount of groundwater available in three groundwater basins: the Detrital Valley, Sacramento Valley and Hualapai Valley. The studies are presented in three ADWR Open-File Reports: #9 – Detrital Valley, #10 – Sacramento Valley, and #11 – Hualapai Valley. Estimating the amount of groundwater in these groundwater basins is an important factor for evaluating the water resources available for the Assured and Adequate Water Supply Program (AWS). The results of these studies are summarized here.

The extent of the aquifer and the water level in a groundwater basin needs to be determined to calculate the amount of groundwater available in the basin aquifers. To determine the extent of the aquifers, ADWR collected over 1,100 gravity measurements throughout the three groundwater basins which were used in conjunction with other geologic data (i.e. well logs and geologic maps) to produce depth-to-bedrock maps. ADWR also collected over 300 water levels in the three groundwater basins to determine groundwater levels. These data were combined to calculate the volume of groundwater in the groundwater basins. However, it is important to note that not all of the estimated groundwater may be available for withdrawal, possibly due to localized geological conditions or due to poor water quality. The volumes of groundwater shown below are ranges which represent best estimates of groundwater available in each groundwater basin depending on a range of hydrogeologic conditions, which are described in the Open-File Reports, and to the AWS Program depth limit of 1,200 feet below the land surface.

Detrital Valley Groundwater Basin:	1.5 to 3.9 million acre-feet
Sacramento Valley Groundwater Basin:	3.6 to 9.5 million acre-feet
Hualapai Valley Groundwater Basin:	3.8 to 10.1 million acre-feet

ADWR Open-File Report No. 9: Preliminary Estimate of Groundwater in Storage for the Detrital Valley Groundwater Basin, Mohave County, Arizona, 2007.
ADWR Open-File Report No. 10: Preliminary Estimate of Groundwater in Storage for the Sacramento Valley Groundwater Basin, Mohave County, Arizona, 2008.
ADWR Open-File Report No. 11: Preliminary Estimate of Groundwater in Storage for the Hualapai Valley Groundwater Basin, Mohave County, Arizona, 2009.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Detrital Valley
1.5 to 3.9 million
acre-feet
Open File Report # 9
Hualapai Valley
3.8 to 10.1 million acre-feet
Open File Report # 11
Sacramento Valley
3.6 to 9.5 million acre-feet
Open File Report # 10
93
66
40
Kingman
Mohave County Groundwater In Storage Estimates For The
Detrital Valley, Hualapai Valley, and Sacramento Valley Groundwater Basins
Groundwater Basins
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Lakes
Highways and Interstates
Interstate
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ARIZONA DEPARTMENT OF WATER RESOURCES

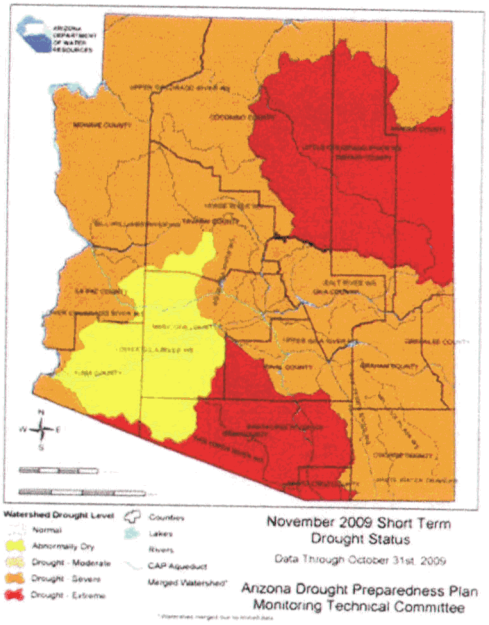
BAY1-F-1

Arizona Department of Water Resources
Drought Program

Drought Status

View Arizona's monthly drought status reports

How is drought status determined?



NOVEMBER 2009 DROUGHT STATUS UPDATE

Printable version

Short-term Drought Status Update

Fourteen of the fifteen watersheds are in severe or extreme drought, and the lower Gila watershed is abnormally dry. Three watersheds, the Little Colorado River, San Simon, and Santa Cruz River are in extreme drought. Precipitation over the past 12 months has been well below average, decimating forage, weakening forests, reducing streamflow, and leaving stockponds and small natural lakes dry. The northeast plateau and southern watersheds were especially hard hit as the monsoon was dry, followed by relatively dry conditions in October. A few storms moved across the state in October, but they brought very localized precipitation, which was well below average values for this time of year. Reservoir storage along the Salt River has dropped, but remains adequate due to significant runoff from the White Mountains last spring, and in 2008.

Help us characterize and monitor changes in drought conditions by reporting drought impacts to **AZDroughtWatch**.

AZ DroughtWatch
Arizona's Drought Impact Reporting System

Quick Links

Drought Status

- eCWS Online Annual Reporting
- Local Drought Impact Group Meetings and Info.
- Community Water System FAQs
- Arizona Drought Preparedness Plan
- USDA Disaster Designation
- Arizona Firewise Communities
- Conservation Home Page

BAY1-F-2

G

Ground-Water Occurrence and Movement, 2006, and Water-Level Changes for the Detrital, Hualapai, and Sacramento Valley Basins, Mohave County, Arizona

By David W. Anning, Margot Truini, Marilyn E. Flynn, and William H. Remick[1]

Abstract

Ground-water levels for water year 2006 and their change over time in Detrital, Hualapai, and Sacramento Valley Basins of northwestern Arizona were investigated to improve the understanding of current and past ground-water conditions in these basins. The potentiometric surface for ground water in the Basin-Fill aquifer of each basin is generally parallel to topography. Consequently, ground-water movement is generally from the mountain front toward the basin center and then along the basin axis toward the Colorado River or Lake Mead. Observed water levels in Detrital, Hualapai, and Sacramento Valley Basins have fluctuated during the period of historic water-level records (1943 through 2006). In Detrital Valley Basin, water levels in monitored areas have either remained the same, or have steadily increased as much as 3.5 feet since the 1980s. Similar steady conditions or water-level rises were observed for much of the northern and central parts of Hualapai Valley Basin. **During the period of historic record, steady water-level declines as large as 60 feet were found in wells penetrating the Basin-Fill aquifer in areas near Kingman, northwest of Hackberry, and northeast of Dolan Springs within the Hualapai Valley Basin.** Within the Sacramento Valley Basin, during the period of historic record, water-level declines as large as 55 feet were observed in wells penetrating the Basin-Fill aquifer in the Kingman and Golden Valley areas; whereas small, steady rises were observed in Yucca and in the Dutch Flat area.

Introduction

Detrital, Hualapai, and Sacramento Valley Basins are broad, intermountain desert basins in Mohave County, northwestern Arizona, and are home to residents in the City of Kingman and several rural communities (fig. 1). The spatial extent of these basins is defined by the Arizona Department of Water Resources (ADWR) ground-water basin boundaries. Ground water is the primary source of water in these basins and is essential for many economic and cultural activities. As in many parts of the western United States, population growth in these basins is substantial. From 2000 to 2005, the population of Kingman grew from 20,100 to 25,900—an increase of 29 percent (Arizona Department of Economic Security, 2006). During the same time period, the population of Mohave County increased by 21 percent. Management of the available ground-water resources in these basins, guided by a comprehensive scientific understanding of the area's natural resources, can help ground-water authorities to meet their water needs in a sustainable manner.

In 2005, the U.S. Geological Survey (USGS) began hydrogeologic investigations in the Detrital, Hualapai, and Sacramento Valley Basins in cooperation with ADWR as part of the Rural Watershed Initiative Program. The program, which was established by the State of Arizona and is managed by the ADWR, includes 17 areas throughout rural parts of the State. The overall objective of this investigation is to improve the understanding of the hydrogeologic systems of Detrital, Hualapai, and Sacramento Valley Basins. This investigation will be accomplished by

- Evaluating current and past conditions of ground-water levels and ground-water movement
- Evaluating ground-water quality for key water uses
- Developing a better understanding of the extent and lithology of geologic units and structures, and their relation to the storage and movement of ground water
- Developing improved estimates for ground-water budget terms, including recharge, discharge, and total water in storage
- Establishing a hydrologic-monitoring network to detect and characterize changes in aquifer conditions
- Informing the hydrologic community and the public at large about hydrologic conditions

[1]Hydrologist, Arizona Department of Water Resources

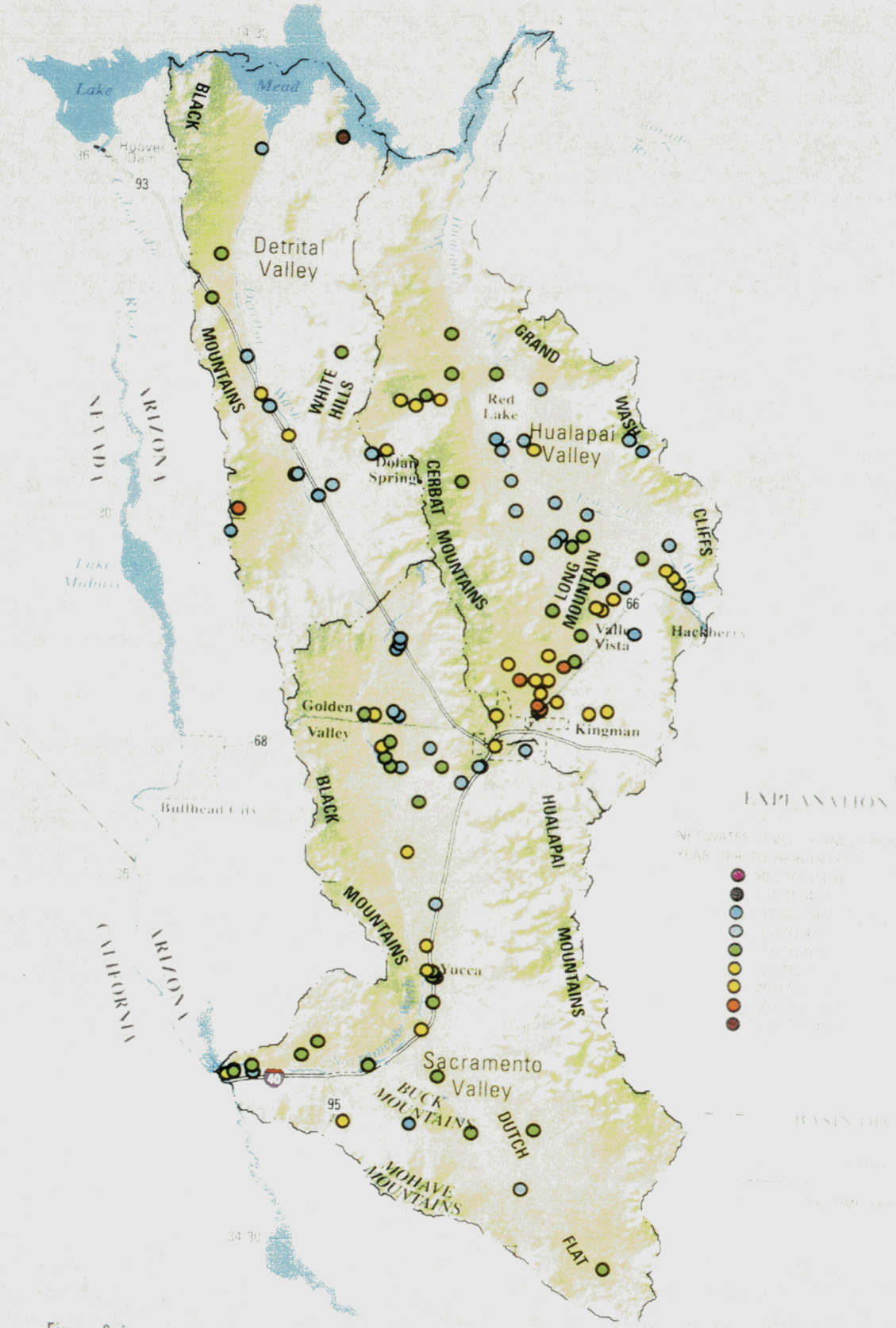


Figure 3. Net water-level change from water year 1996 to 2006 for selected wells, Detrital-Hualapai and Sacramento Valley Basins, Mohave County, Arizona.

BAY1-G-1

Figure 4. Net water-level change from water years 1979–80 to 2006 for selected wells, Detrital, Hualapai, and Sacramento Valley Basins, Mohave County, Arizona.

BAY1-G-1

Key Water Issues

Colorado River Water. The quality of water in Lakes Mead, Mohave and Havasu must be maintained to continue attracting tourists to the County. While many other jurisdictions have an impact on the Colorado River, Mohave County's economy and water supplies are so directly linked to the lakes and river that the County has a vital interest in preventing their contamination.

Groundwater Quality. To ensure the viability of its continued use, the quality of area groundwater should be monitored regularly. Key recharge areas in the mountains and bajadas should be protected from development activities that degrade water quality. The effects of urban runoff and septic systems effluent on groundwater quality should be minimized. Mohave County's updated Areawide Water Quality Management Plan ("208" Plan) is a tool to maintain watershed health.

Water Availability. Information on the use and availability of water should be monitored. While there appears to be enough water to meet anticipated demands in the rapidly urbanizing parts of the County for the next 40 to 50 years, long term water planning throughout the County will require better information than is currently available. Development of a Countywide water budget that identifies water supplies and demands for identified groundwater basin subareas will enable the County to use its water resources most efficiently.

Water Quantity and Quality Goals and Policies

Goal 3: To preserve the quantity and quality of water resources, in perpetuity, through out the County.

Policy 3.1 Mohave County should cooperate with ADEQ, local water suppliers, and other agencies to maintain a water budget that inventories the quantity and quality of the County's water resources, identifies how those resources are being used, and monitors commitments for future water use.

Policy 3.2 The County should support programs to monitor groundwater quality and well levels.

Policy 3.3 Mohave County should encourage the efficient use of water resources through educational efforts.

Policy 3.4 New water intensive uses such as golf courses and man-made lakes shall require the use of treated effluent where and when available.

Policy 3.5 Mohave County will only approve power plants using "dry cooling" technology when the aquifer is threatened by depletion or subsidence.

United States Department of the Interior

U.S. GEOLOGICAL SURVEY

Arizona Water Science Center
Flagstaff Programs Office
2255 North Gemini Drive
Flagstaff AZ 86001

September 1, 2009

Susan Bayer
7656 West Abrigo Drive
Golden Valley, AZ 86413

Dear Ms. Bayer,

The purpose of this letter is to provide clarification on some questions you conveyed on our phone conversation August 31 regarding U.S. Geological Survey Scientific Investigations Report 2007-5182 "Ground-water occurrence and movement, 2006, and water-level changes in the Detrital, Hualapai, and Sacramento Valley Basins, Mohave County, Arizona" by David W. Anning, Margot Truini, Marilyn E. Flynn, and William H. Remick. This report has gone through the peer review process and was approved by the USGS on Aug. 28, 2007. The report is available in hardcopy and in digital form on the World Wide Web at http://pubs.usgs.gov/sir/2007/5182. The report is considered final; however, in accordance with USGS report policy, any erratum or updates needed for this report will be incorporated into the online copy of the report. As of today, both the printed and electronic copies of the report are the same because there have not been any erratum or updates to the report.

Regarding your concerns of aquifer depletion, the section "Long-term water-level changes" (pages 6-12) discusses areas in the Detrital, Hualapai, and Sacramento Valleys where the groundwater levels have fluctuated over time in response to groundwater recharge or groundwater depletion. The report shows several areas in each of the three basins where water-level rises have occurred during the past several decades as a result of aquifer recharge, as well as other areas where significant water-level declines were observed, such as an area along Truxton Wash near Hackberry, an area northeast of Kingman, and an area in Golden Valley. These three areas of noted decline represent areas where ground-water pumpage has depleted the aquifer. The report, however, does not include a computation of the volume of such groundwater depletions from pumpage or additions from recharge, nor was any comparison made of these changes to the total volume of groundwater available in storage.

Sincerely,

David Anning
Hydrologist

BAY1-G-3

HYROGEOLOGIC INVESTIGATION OF THE DETRITAL, HUALAPAI, AND SACRAMENTO VALLEY BASINS

– Study Description –

Margot Truini,

U.S. Geological Survey

In Cooperation with

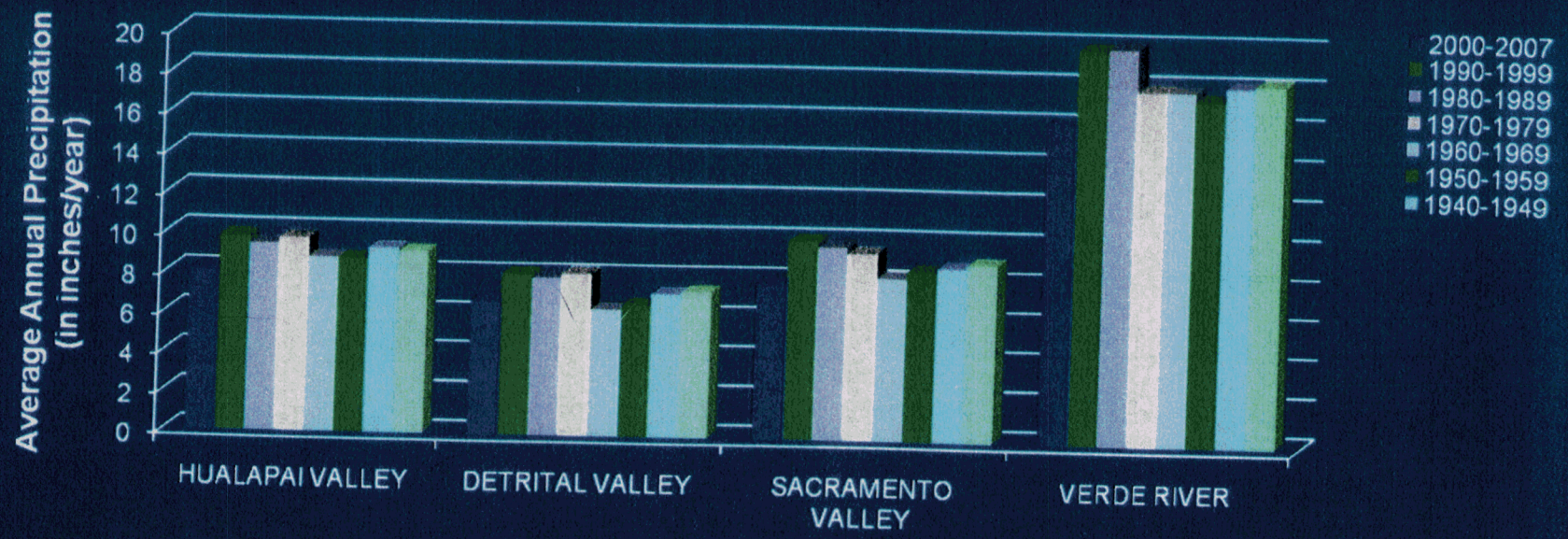
Arizona Department of Water Resources

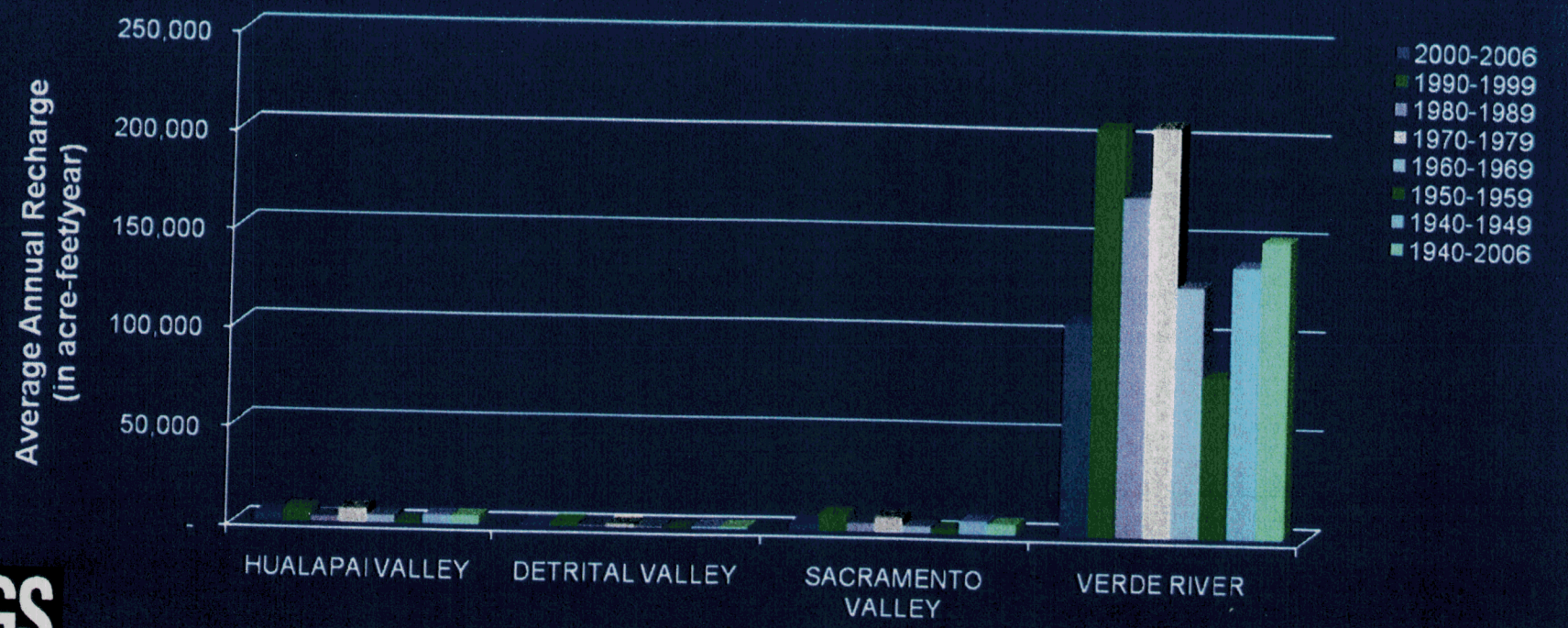
USGS
science for a chang[illegible]rld

November 16, 2009

BAY1-G[illegible]

Step 4. Water Budget - A look at Recharge





USGS
ience for a changi rld

to public and private entities.

Policy 36.8 Mohave County should support the location or relocation of businesses in Mohave County through the simplification of the development review process.

Policy 36.9 The County should cooperate with private and quasi-public entities, such as the Arizona Department of Commerce's North River Economic Region coordinator, the Chambers of Commerce and other economic development organizations to develop and update information on current and projected economic trends, labor force, land availability, development processes or other issues relevant to economic development efforts.

Policy 36.10 Mohave County should participate in efforts to obtain funding for economic development programs from State, Federal and other sources.

Policy 36.11 Mohave County should provide information and assistance to economic development projects interested in participating in State, Federal or other economic development programs.

Policy 36.12 Mohave County should pursue and support industries that have smaller environmental footprints as measured by their use of less water and energy resources as well as their creation of fewer emissions when compared to traditional industry.

Goal 37: To encourage economic development at appropriate locations throughout Mohave County and the North River Economic Development Region.

Policy 37.1 The Land Use Element and Area Plans should identify areas designated for future commercial and industrial development, including areas for renewable energy development. The Area Plans may include additional policies defining the appropriate types of non-residential development.

Policy 37.2 Development and redevelopment proposals in historic areas should further the preservation of these distinctive areas.

Policy 37.3 Mohave County should encourage the private sector to promote areas identified in the Land Use Element and Area Plans as primary locations for new industrial development. New locations for economic development activities should be considered where a need can be demonstrated. As a prerequisite, new locations must be able to be supplied by existing or developer-provided infrastructure.

Policy 37.4 Capital improvement planning and funding by Mohave County should consider economic development benefits as a criteria in reviewing improvement projects and in setting funding priorities.

Goal 38: To support economic development which provides employment opportunities for County residents at a variety of skill levels.

MOHAVE COUNTY
BUILDING BETTER SERVICES

Business Goals

Goal # 1: Financial Stability

Goal # 2: Create, Manage, and Improve the Most Effective Organization

Goal # 3: Continue to Advance our processes to Attract and Retain Quality Managers and Employees

Goal # 4: Create Formal Planning, Programming, and Budgeting System for Capital Asset Improvements and Infrastructure

Goal # 5: Enhance Public Health and Safety Process

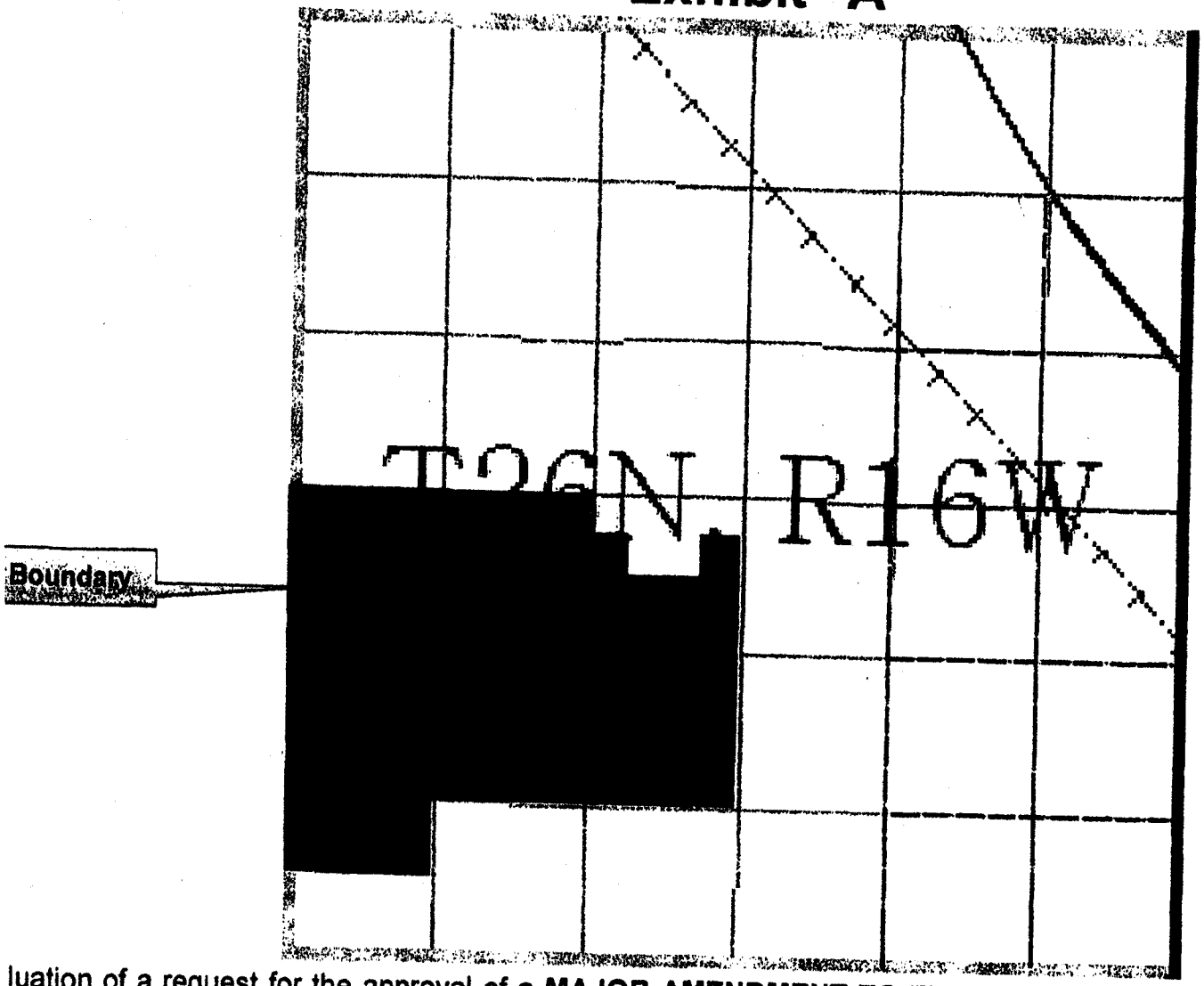
Goal # 6: Create Emergency Response Program

Goal # 7: Create and Institutionalize a Strategic Planning System

Goal # 8: Manage a Sustainable and Comprehensive Regional Economic Development Strategy and Plan

Goal # 9: Proactive in Preserving and Protecting Natural Resources

Exhibit "A"



SECTION 2
EXHIBIT
&
SECTION 17

luation of a request for the approval of a **MAJOR AMENDMENT TO THE MOHAVE COUNTY GENERAL PLAN** for tions 19, 20, 28, 29, 30, and N 1/2 of Section 31, and Section 21 excluding N 1/2 N 1/2 and SE 1/4 NW 1/4 and SW NE 1/4 thereof, in Township 26 North, Range 16 West to change the land use designation from a RDA (Rural elopment Area) land use designation to an RDA, RI (Rural Development Area, Rural Industrial) land use designation amending Exhibits VI.4 and VI.6 of the General Plan to match, consisting of approximately 6.3 square miles in the ıave County General Area, Mohave County, Arizona.

SECTION 6
PG 11
EXHIBIT

http://www.digitalstoryteller.com/BTV99/hartley/images/0303Solar_plant_fire_-1.jpg 1/10/2010

Amargosa Valley - Solar Millennium

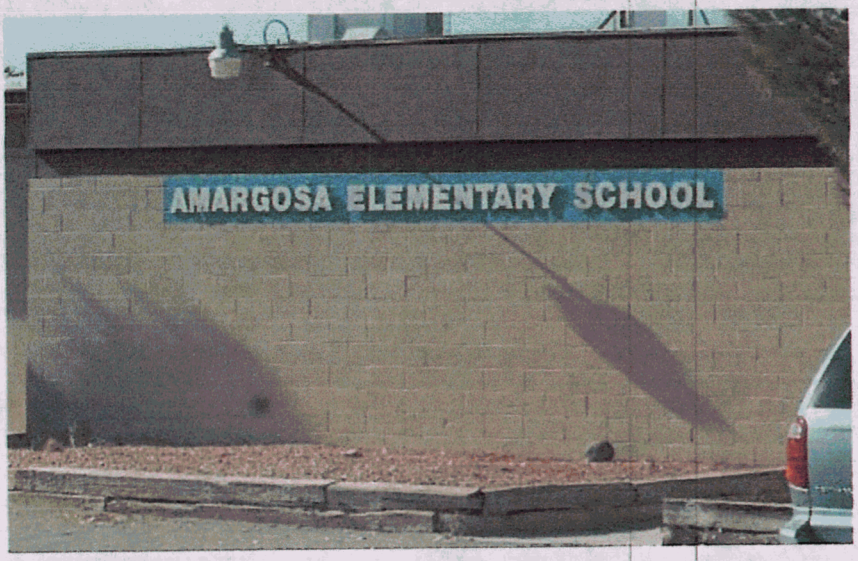
^(Left) Daggett solar thermal plant explosion, 1999; notice the mirrors at lower left (Photo by Lara Hartley). (Right) Kids at park in Amargosa Valley by elementary school which would be less than 1 and 1/4 miles from the proposed solar mirror field of Solar Millennium's plan.

Explosion Dangers: Solar Industrial Projects and Schools Do Not Mix!

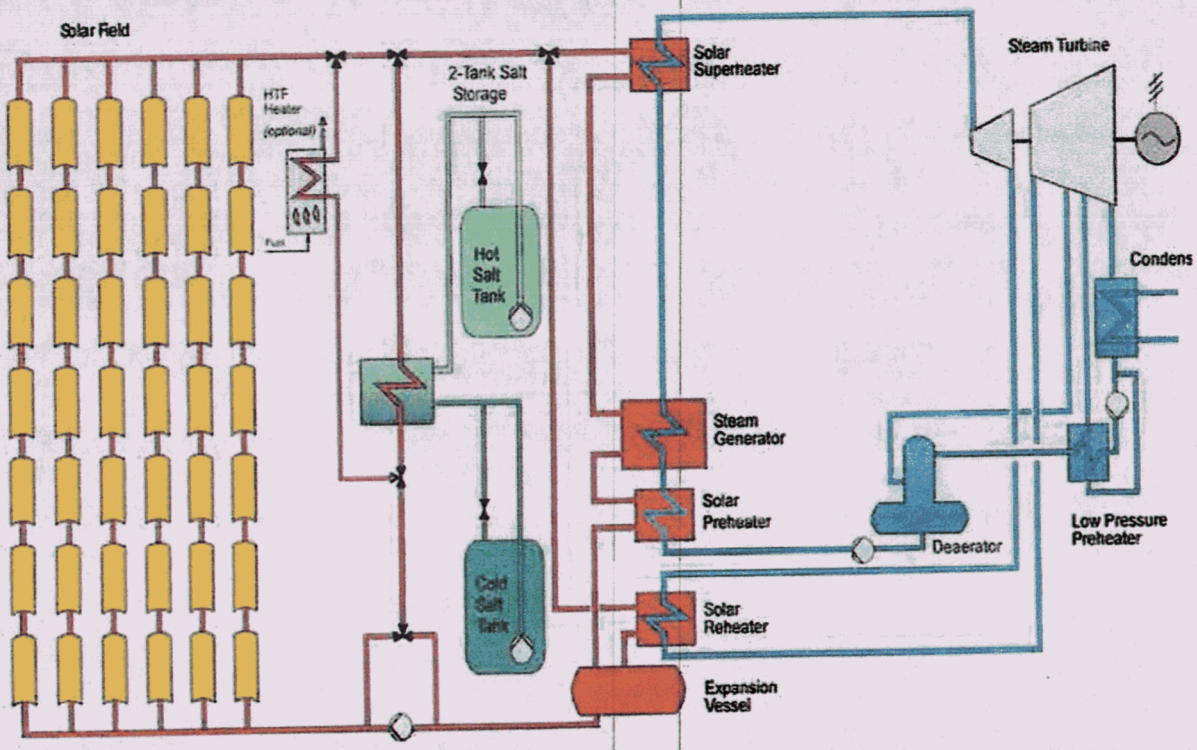
August 18, 2009 - Amargosa Valley, Nevada

That was the message of many residents at a Bureau of Land Management (BLM) scoping meeting in the town of Amargosa Valley, Nye County, Nevada. They were well organized and vocal about the dangers of having a huge industrial solar thermal project in the midst of their community on the flat desert along the Amargosa River, surrounded by public lands that are being increasingly snatched up for renewable development in a new land rush.

^Scoping meeting. The community center was crowded.



The German company Solar Millennium AG wants to lease 7,810 acres of BLM land that interfingers with the town, placing giant parabolic mirror fields with superheated oil (Therminol) on 4,350 acres, within a quarter mile of many homes, and less than a mile and a quarter from Amargosa Elementary School and a park. Two power blocks would also be within these fields, including two thermal storage tanks in each, containing molten salt - an experimental technology - as well as large steam turbine engines like those used in conventional fossil fuel plants.



Plant Schematic Diagram (with Thermal Storage)

(From Solar Millenium's Plan of Development pdf)

Many residents voiced concerns about explosion and fire dangers from such a power plant, citing the 1999 explosion at the Daggett SEGS Solar 1 plant . The SEGS 1 plant used new molten salt thermal storage technology developed in the 1980s, and initially had 3 hours of thermal energy storage that was used to dispatch to peak period. But the storage system was damaged by an explosion and was not replaced (source: National Renewable Energy Laboratory -http://www.nrel.gov/csp/troughnet/power_plant_data.html). (See below.)

This plant had a nameplate maximum capacity of only 13.8 megawatts (MW). Solar Millennium is seeking 242 MW. The heat transfer fluid **Therminol** will be used in Solar Millennium's design, similar to the Caloria oil that burned uncontrollably all night at SEGS 1. Pipe ruptures in the parabolic trough fields are a hazard.

Several residents stood up to speak about how the local volunteer fire department would not be able to handle an oil spill or fire involving specialized chemicals. Who will supply the needed equipment to cope with this industry? One man said a quarter-mile buffer zone was needed between the plant and residences at least. Questions were raised about how to evacuate the school in the event of a fire at the solar plant. Someone commented that he doubted that the execs of Solar Millennium would live so close.

Also, some pointed out that the mirror construction area was right across the street from the school, and surrounding a park: how much truck traffic would be going on the school road? Will kids be hit? "Why here?" the person demanded to know.

"There is a political frenzy to rush these plants for the economy, but at what cost?" asked an audience participant. "We are not guinea pigs. Maybe BLM did not realize that homes were so close, we urge you to find a way to move this plant," the person said, addressing the BLM managers. "We need solar power, but just not in our yard!"

The **draft Environmental Impact Statement** will be out after January 1, 2010, according to Greg Helseth, BLM Renewable Energy Project Manager

A resident who told us she lived a mile from the proposed plant handed out sheets with photos of the explosion at Daggett, and had a color poster with comments, but she was not allowed to show the poster during the proceedings of the meeting.

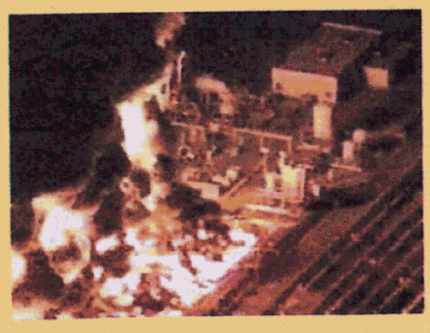
From the National Renewable Energy Laboratory:

SEGS I

Location: Mojave Desert, Daggett, San Bernardino County, California.
First Year of Operation: 1985
Type: Solar electric generating station (SEGS) with parabolic troughs; solar steam generation with natural gas superheating, including three hours of thermal energy storage.
Fossil fuel: Natural gas **Net Output:** 13.8 MW
Principals: Sunray Energy, Inc. (owner/operator), Luz (developer), Southern California Edison (utility PPA).
Solar Technology: Luz LS-1 and LS-2 collectors
Project Type: Public Utility Regulatory Policies Act (PURPA) Qualifying Facility IPP with special Standard Offer 2 (SO-2) type power purchase agreement to Southern California Edison.
Operational Dispatch: Solar operation during sunny hours. The plant initially had 3 hours of thermal energy storage that was used to dispatch to peak period. The storage system was damaged by fire in 1999 and was not replaced.
Special Incentives: Federal and state investment tax credits, solar property tax exclusion, accelerated depreciation.
Status: Daily operation. The two-tank thermal energy storage system used mineral oil (Caloria) heat transfer fluid to store energy for later use. It operated between 1985 and 1999.

SEGS II

Location: Mojave Desert, Daggett, California
First Year of Operation: 1986
Type: Solar electric generating station (SEGS) power tower; solar steam generation and solar superheating; auxiliary natural gas boiler to provide backup capability during low and non-solar hours.
Fossil fuel: Natural gas **Net Output:** 30 MW
Status: 2009 being dismantled and no longer in use (Barstow Daily Dispatch >>here).



<The SEGS 1 fire burning high temperature oil used to transport heat from the troughs to a thermal storage tank. There have apparently been TWO FIRES here. One fire was caused by a natural gas problem in the power block; an earlier fire was due to over-heating the oil (human error) and was caused by a trough tube leak (according to Red Rock Energy, http://www.redrok.com/helio.htm)

In February 1999 a massive explosion shook the plant and surrounding area. It was just a few miles from photographer Lara Hartley's place, and she drove over to take pictures (see http://www.digitalstoryteller.com/BTV99/hartley/0303.shtml). She reported that 900,000 gallons

Amargosa Valley - Solar Millennium

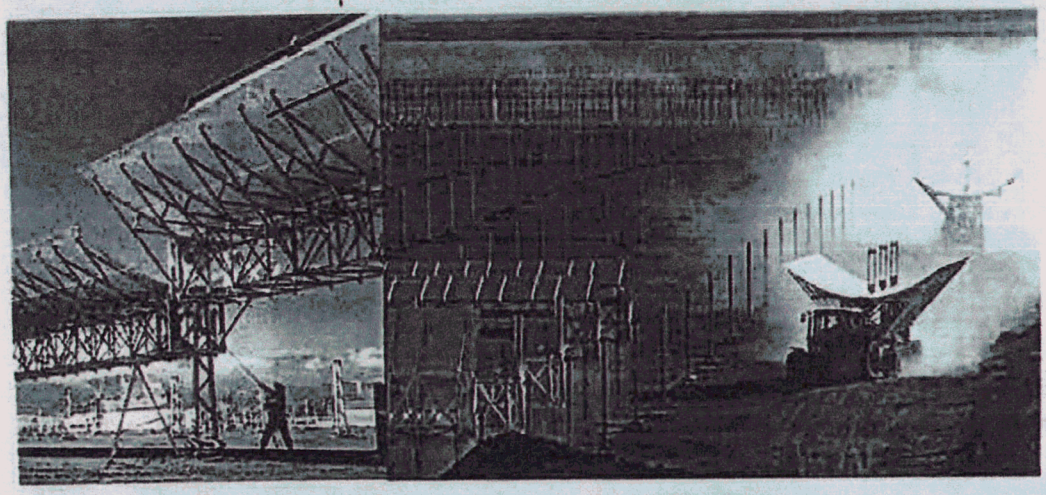
Explosion Dangers of Solar Thermal

At the Bureau of Land Management scoping meeting held August 18 in the town of Amargosa Valley, Nevada, we were handed these sheets by a local resident. She told us she lives a mile from the boundary of what would become a huge industrial solar thermal power plant using parabolic trough mirrors that collect heat from sunlight in tubes containg the synthetic oil Therminol. In 1999 a similar solar plant using a similar heat transfer oil exploded, causing a large fire. Residents of Amargosa Valley worry a similar accident could endanger their school, town, and residences. See our story on the BLM scoping meeting >>here.

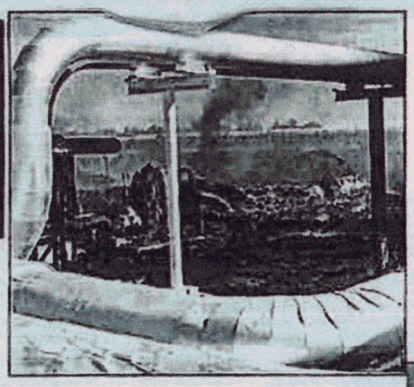
SOLAR POWER PLANT EXPLOSION

"Massive explosion shook the plant and surrounding area"

Photo from Solar Millennium's annual report. (Pg. 44)
Example of Solar Millennium's dust abatement.



A fire burns out of control at the Sunray Inc. solar plant in Daggett, CA after a massive explosion shook the plant and surrounding area.
This photo ran five columns on Saturday morning in both the Desert Dispatch and the Daily Press.



The fire still smolders and burns more than 14 hours after it started. Photo By Lara Hartley

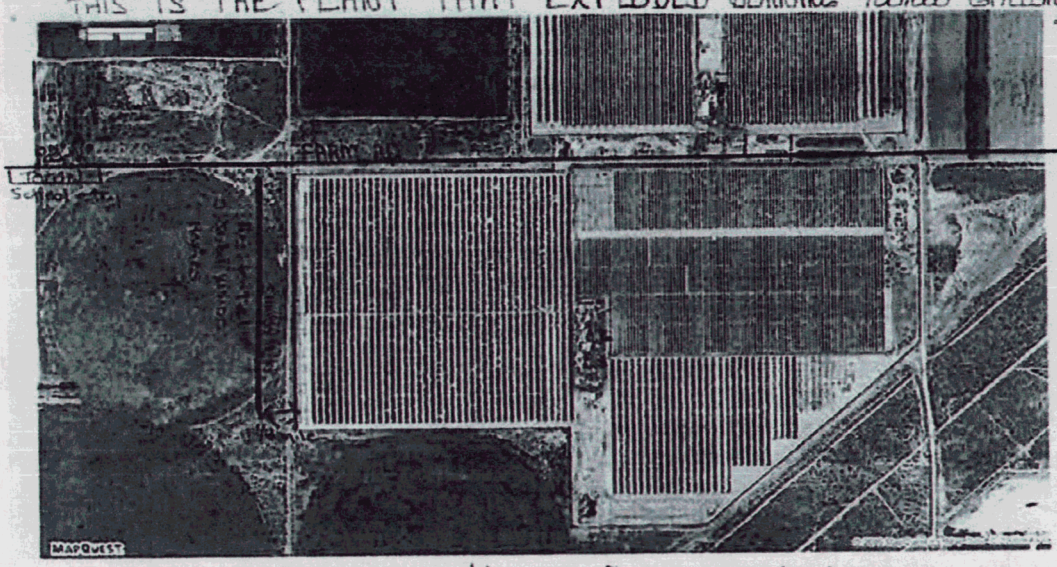
Firemen talk with company officials during the fire in which 900,000 gallons of a mineral oil burned.

Massive explosions - burning toxic oil fumes - fire spreading inevitable destruction and death's for surrounding residents and our town.

BLM allowing Solar Millennium to build this or any similar dangerous plant anywhere within 5 miles of our town or homes is insane!

A fire investigator looks over the burned out remains of the fuel tanks. Photo By Lara Hartley

THIS IS THE PLANT THAT EXPLODED BURNING 900,000 GALLONS OF TOXIC OIL



Above photo is a blow up of the solar plant below

1 mile

USING THIS SOLAR PLANT IN DAGGETT CA. AS AN OVERLAY TO THE AMARGOSA AREA WE CAN SHOW WHERE THE AMARGOSA TOWN AND SANDY LN. ARE LOCATED IN RELATION TO THE PLANNED SOLAR MILLENNIUM PLANT.

CLOSEST SMALL TOWN AND RESIDENTIAL AREA IS 3 TO 4 MILES FROM SOLAR PLANT IN DAGGETT CA.

THIS DOT IS WHERE AMARGOSA TOWN CENTER AND RESIDENTIAL AREA WOULD BE RELATIVE TO SOLAR MILLENNIUM PLANT

THIS IS THE PLANT THAT EXPLODED!

WE WOULD BE DEAD!

SANDY LN

HOME.....Solar Millennium Scoping Meeting 8-2009.....Solar Millennium Meeting 5-2009

BASIN AND RANGE WATCH

CITY OF KINGMAN
MEETING OF THE COMMON COUNCIL
Council Chambers
310 N. 4th Street

6:00 P.M. **AGENDA** **Monday, January 4, 2010**

REGULAR MEETING

CALL TO ORDER & ROLL CALL—ALL MEMBERS PRESENT
INVOCATION will be given by Chaplain Dave Patriquin of the Kingman Fire Department Honor Guard
PLEDGE OF ALLEGIANCE

THE COUNCIL MAY GO INTO EXECUTIVE SESSION FOR LEGAL COUNSEL IN ACCORDANCE WITH A.R.S.38-431.03(A) 3 TO DISCUSS ANY AGENDA ITEM. THE FOLLOWING ITEMS MAY BE DISCUSSED, CONSIDERED AND DECISIONS MADE RELATING THERETO:

1. **APPROVAL OF MINUTES**

The Regular Meeting minutes of December 21, 2009. MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

2. **APPOINTMENTS**

2010 Municipal Utility Commissioner Appointments
The Municipal Utility Commission met on December 17, 2009 to review its membership and applications for reappointment and replacement to the Commission. Stuart Anderson and Marvin Yarbrough's second terms both ended on December 31, 2009, with Stuart Anderson not seeking another term. Marvin Yarbrough was recommended for a third term. This will require a supermajority vote of the Council. David Amspoker's first term ends on December 31, 2009. He is willing to serve a second term and was recommended for reappointment by the Commission to serve such term. Craig Schritter indicated that he will be resigning to accept an appointment to the Planning and Zoning Commission, leaving a two year term unfilled. The Commission interviewed Kathleen Murray and Dustin Lewis and recommends they be appointed to fill the vacancy of Stuart Anderson for a three year term and fill the remaining two year term for Craig Schritter. **The Commission by a vote of 6-0 recommends reappointments and appointments of:**

1. **Marvin Yarbrough for reappointment by supermajority vote of Council**
2. **David Amspoker for reappointment**
3. **Kathleen Murray for appointment through December 2012**
4. **Dustin Lewis for appointment replacing Craig Schritter through December 2011**

MOTION TO REAPPOINT YARBROUGH WAS APPROVED BY A VOTE OF 7-0
MOTION TO REAPPOINT AMSPOKER WAS APPROVED BY A VOTE OF 7-0
MOTION TO APPOINT MURRAY WAS APPROVED BY A VOTE OF 7-0
MOTION TO APPOINT LEWIS WAS APPROVED BY A VOTE OF 7-0

SECTION
15

approving operations on the site. **Staff recommends scheduling a Public Auction of Parcels IV-U-B-E and IV-U-B-C-a at the Kingman Airport and Industrial Park for the January 18, 2010 regular City Council meeting.** MOTION TO APPROVE AFTER CHANGING THE DATE TO JANUARY 19, 2010 WAS PASSED BY A VOTE OF 7-0

i. **Property Management Agreement between the City of Kingman and the Kingman Area Chamber of Commerce**
The Property Management Agreement between the City of Kingman and the Kingman Area Chamber of Commerce is due for renewal. The agreement requires the Chamber to collect all rents and remit them to the City, maintain the property, assist the City in advertising vacant space and assist in screening applicants, and assist the City in enforcing rules and policies, as well as amending rules and policies as needed. If signed, the agreement will expire on December 31, 2012. **Staff recommends that Council allow the City Manager to sign the Property Management Contract with the Kingman Area Chamber of Commerce.** MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

6. OLD BUSINESS

Memorandum of Understand (MOU) For Sale of Effluent to Hualapai Valley Solar LLC
The City of Kingman has been approached by Hualapai Valley Solar regarding the sale of effluent produced by the upgraded Hilltop Wastewater Treatment Plant. The City of Kingman previously provided a non-binding letter indicating desire to provide the effluent. The City staff has met with a representative of HVS and negotiated an MOU for Council review and approval. **Staff requests that Council provide direction to staff for modifications or authorize the Mayor to sign the MOU.** MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

7. NEW BUSINESS

a. **Letter of Support for the Kingman Route 66 Association Grant Application**
Chris Durkin, of the Kingman Route 66 Association has requested a letter of support from the City of Kingman to submit along with a grant application. The grant they are applying for is through the Arizona Department of Commerce and will be used for their Historic Sign Restoration Project. **Staff requests direction from Council.** MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

b. **Resolution No. 4653 – Water Service To An Unsubdivided Parcel Identified as Tax Parcel 320-11-139 for a Carl's Junior Restaurant**
On December 17, 2009, the Municipal Utility Commission reviewed a request from Jeff Dietz for water service to an unsubdivided parcel identified as Tax Parcel 320-11-139. This water service request is for development of a Carl's Junior Restaurant on the 0.9 acre property at 3440 Stockton Hill Road, just north of Brake Masters. Resolution No. 4653 grants water service to parcel 320-11-139 for the subject restaurant. The Utility Commission voted 6-0 to recommend approval of water service to the subject unsubdivided parcel. The Commission voted 6-0 to recommend approval of water service to Tax Parcel 320-11-139. **Staff recommends approval of Resolution No. 4653.** MOTION TO APPROVE WAS PASSED BY A VOTE OF 7-0

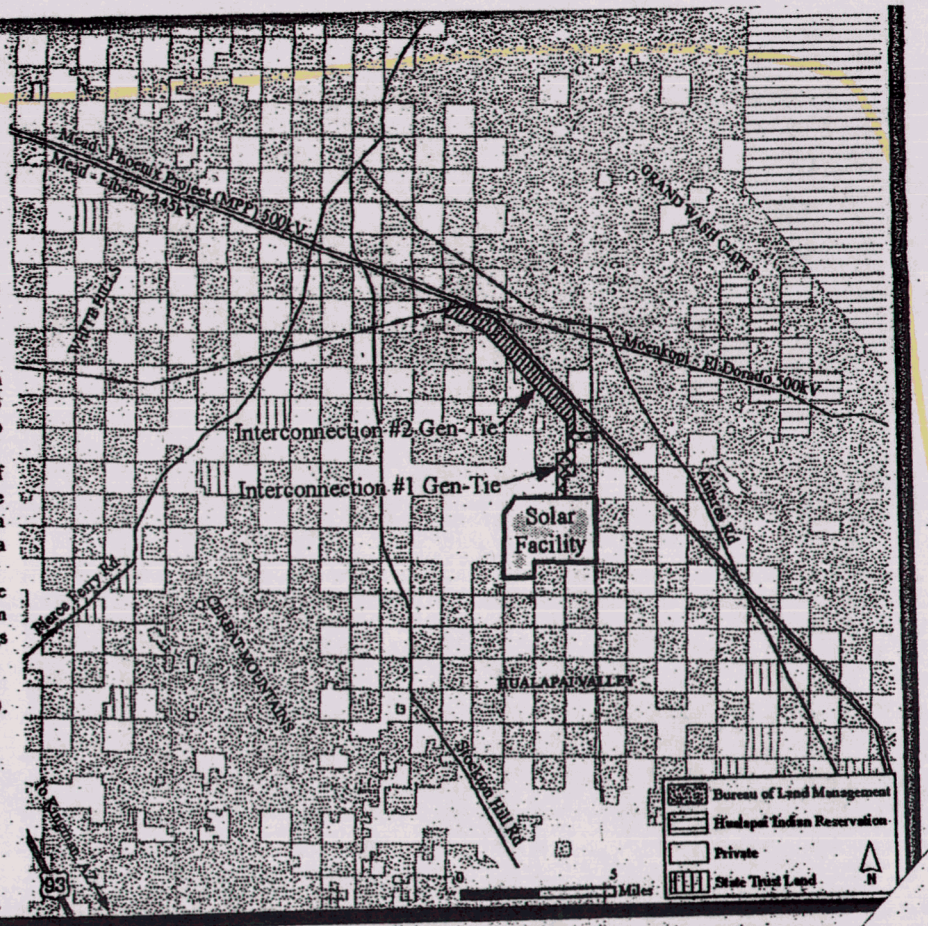
The Committee or its Chairman, at any time deemed appropriate, may make other persons parties to the proceeding.

Any person may make a limited appearance at a hearing by filing a statement in writing with Docket Control of the Arizona Corporation Commission, 1200 West Washington Street, Phoenix, Arizona 85007 and the Chairman of the Committee at 1275 West Washington Street, Phoenix Arizona 85007, not less than five days before the date set for hearing. A person making a limited appearance shall not be a party or have the right to present testimony or cross-examine witnesses.

This proceeding is governed by Arizona Revised Statutes Sections 40-360 to 40-360.13 and Arizona Administrative Code R14-3-201 to R14-3-220. No substantive communication not in the public record may be made to any member of the Committee. The written decision of the Committee will be submitted to the Arizona Corporation Commission pursuant to Arizona Revised Statutes Section 40-360.07. Any person intending to be a party to the proceedings on these matters before the Arizona Corporation Commission must be a party to the proceedings before the Committee.

ORDERED this 24th day of November, 2009.

/s/ John Foreman
John Foreman, CHAIRMAN
ARIZONA POWER PLANT AND TRANSMISSION
LINE SITING COMMITTEE
ASSISTANT ATTORNEY GENERAL



REFER TO SECTION 17

Re: Stakeholders Meetings

From: **Kevin Davidson** (Kevin.Davidson@co.mohave.az.us)
Sent: Tue 1/12/10 8:11 AM
To: Val Starr (svsinc@live.com)

Val:

I have seen numbers of about 0.85 gallons of water used for every kilowatt of energy produced. For a comprehensive analysis of a CSP being proposed just north of California City, see: http://www.energy.ca.gov/sitingcases/beacon/ The Final Staff Assessment is over 1,000 pages with water discussed around page 700.

Kevin D.

RE: Stakeholders Meetings

From: **Fred E. Breedlove** (febreedlove@azwater.gov)
Sent: Tue 1/12/10 9:08 AM
To: 'Val Starr' (svsinc@live.com)

We had met with stakeholders a few times last year and weren't able to get any kind of consensus or agreement but I think this time around folks recognize a little better just how dire the situation is. We last met on December 4. We've received comments on the plan and are going through all of them currently. The next stakeholder meeting will be held here at our office in Phoenix on Fri, Jan 29 at 10-noon. We will go over the comments we received and discuss our path for moving forward.

In answer to your question, I think you probably know that there is very little water regulation outside of the AMAs. So, a solar power generation facility that uses groundwater for cooling would basically only have to pay for the notice of intent (NOI) fee - currently $10 I believe - and pump all the groundwater they want.

There was a bill a couple years ago that gives counties and municipalities the ability to require new development to show that there is adequate water (100 yr availability) before any new development can proceed, but the county/municipality board/council must have a super-majority approve of such an ordinance. That's proven to be too high of a threshold to overcome for many jurisdictions. Of course, that bill doesn't deal with industrial pumpers or others (like solar plants).

Fred Breedlove
Deputy Counsel
Arizona Department of Water Resources
(602) 771-8472

From: Val Starr [mailto:svsinc@live.com]
Sent: Tuesday, January 12, 2010 7:51 AM
To: Fred E. Breedlove
Cc: Bob Corrigan; cyndi figg; Dennis Reid; Don Frey; Doris Goodale; Jack Ehrhardt; Ira Wallace; Jason Arnold; Jeff Thistle; JIM KANELOS; Kevin Davidson; Nancy Mclain; Ron Gould
Subject: Stakeholders Meetings

Hi Fred:

Thank you for the information... I will send it along to a number of others, including Trent Franks office. Very concerned about finishing up the studies. Looks like your staff has been thinking this budget problem through in a logical manner. I still like my ideas (of course) and they seem to fit in with yours in concept. We're on the same page.

When did you hold these "stakeholder meetings" and what were the comments?
I understand the budget issues better now... need sometime to crunch some numbers. I'm still not clear on "water users"... such as the "solar power generators", I haven't seen an annual useage report requirement for these entities. Many people and organizations are deeply concerned that they are getting FREE water, without actual accountability. Comments and info please. Most of the rural counties do not have Area Management... and at least in Mohave County it would be a very hot topic... is already.

I'll get our government/orgnizations liasion V.P. Jim Kanelos to sound the waters on your Power Points, for feed back. You will probably hear directly from him. It's a start, I wish we had gotten involved much earlier... but if wishes were fishes, etc. Let's see what we can get done.

I'll try not to take up too much of your time... and keep you advised what I'm doing and where we going.

Thank you again for putting us into the loop.

Val

Sacramento Valley Services, Inc.
"Quality water now and for the future"
Tel: (928) 565-3132

Hotmail: Trusted email with powerful SPAM protection. Sign up now.

EXHIBIT
BAY-2

Questions on Hualapai Solar Exhibits

Section : Applicants notice of filing:

1) Hualapai Valley Solar published their notice of filing: The page shows all of Section 21 is included, is this correct?
2) But the resolution passed by the Board of Supervisors states lots are excluded in Section 21.

3) It appears that Hualapai Valley Solar published the notice of filing incorrectly?

Section 4: Direct Testimony of Greg Bartlett

Page 2 You indicate your business address as: 85 Hamilton Street, Cambridge, MA

1) Is this correct?
2) Are there any other business / corporations that you are involved with at this location?

3) Can you provide the names of these Companies Mr. Bartlett.

4) You state that you are the Managing Director and Co Founder of Mohave Sun. LLC, the parent company of Hualapai Valley Solar? Is this correct?

Page 3 You indicate that you are a Hughes Scholar, published writer.

1) Can you tell us the name of the books you wrote?

Page 5 You indicate Mitchell Dong is Executive Director, of Mohave Sun LLC, and Hualapai Valley Solar, LLC. Is this correct?

Page 6

1) Is Mitchell Dong involved with other companies, other than what is indicated.

2) Is Mitchell Dong owner of Chronos Assest. Management Inc?

Page 12 Photo voltaic mentioned

1) Your application with Mohave County for this project was for a Concentrated Solar, is this correct?

2) Why are you indicating now Photo voltaic?

Page 13

1) No active residential development. Have you taken under consideration Rhodes at Red Lake?

Page 14: WWTP – Hilltop

1) The waste water treatment plant is 40% completed to date. How many gallons per day do they make right now?

2) Will their Federal Grant regulations prevent you from getting the water?

3) The water was granted for golf courses & recreation first was it not?

4) All of the waste water is evaporating?

Page 15

1) Have you reviewed the Grant application made to the government for the construction of the waste water treatment plant?

2) Are there water use restrictions on those grants?

Page 16

1) There are not enough sewers to provide the effluent needed to HVS. Many of the homes in the area are on septic, not sewer.

2) Also many of the homes in North Kingman are new, the grandfather clause would take over & preserve septic systems for years.

Page 19

1) Wouldn't the alternative connections prevent Arizona receiving the electricity?

Page 28

1) You indicate a Visitors Center. Which site route access do you plan on using to get to this center?

2) You have stated that this project will add the County in attracting and promoting projects that generate renewable energy. Breaking the county's mandate for 'No Water" cooled power plants sets a presidence for others to sue if not allowed.

SECTION 4

Section 7

Pg 31

1) How many letters of protest against the project were recieved?

Pg 32

1) [redacted] What is the name of the local water utility that [redacted]

2) Is this the [redacted]l Family?

3) These are the same water Companies that are under investigation by the ACC and also ADEQ

Pg 33

1) Photovoltaic confirms to Mohave County General Plan 3.5 Concentrate Solar Plants do not is this correct?

SECTION 5

Section 5
Refer to Labor Stats

Section 6 Mike LaRow
pg 2
1) What is Mitex Inc?

2) Who owns it?

pg 4 How long does it take these mirror's and oil tubes to cool?

SECTION 6

pg 5 Is it true where the water
* 1) droplets hit the hot pipes a
the TDS to particulate matter?

2) The TDS as of 12/30/2009 in
project area was 1559/772
parts per million.

3) Bats will sonar in on them

pg 6 Rhode @ Red Lake Housing
Development

1) ADWR states water available.
Are there any other water studies
that you refered to?

pg 6 Response

pg 8 DOE (Water to Dry Cooled)

1) Would the 5% loss not be off set by the .64¢ per 1000 gallons of effluent, and the 20-30 miles of pipline to be installed and the up keep of the pipes?

pg 10 Did the P&Z and BOS Consider water usage, and the mandate that states "No water" cooled plants. Why Not?

Pg 11 SEGS (Daggett CA)
Segis I exploded did it not?

2009 Segis II is closed & being dismantle

* And yet you are using the same proven technology on top of a salt bed

Pg 12
D ~~Is it true~~
If a Photovoltaic cost is less than a wet cooled CSP why not [redacted] make this Photovoltaic and the money saved can be used to pave Antares Rd as the alternative Rave?

SECTION 8

Section 8 William Victor

1) Who paid Montgomery and Associates?

pg 2 ① Are you not the same Co. that
• pg 3 worked on the "Provada" subdivision by Developer Jim Rhodes in Golden Valley located on the Sacramento Aquifer?

2) Did your Co. / firm work on Griffith Energy on the I-40 Corridor?

estimate ~~MM~~ 11

estimate ~~MM~~ 11

pg 5

1) The city of Kingman is located in the Hualapi Aquifer, is this correct?

will my reference

~~The Desert Community has will correct?~~

pg 6 to pg 7

IS the groundwater flows North into lake Mead. IS this contributing to Lake Meads Decline?

pg 7

2) If Kingman well fields are in depletion and water flows North, if ~~and~~ this sinks the proposed wells they require, will this also contribute to Lake Meads Decline

3) Mr Victor in your section you have used the word assumed 7 times. Do you have any facts to clarify your assumptions?

→ More pg 7

pg 1

4) Mr Victor you have also used the word estimated 7 times. Do you have facts to clarify your estimates.

pg 9 ~~Mr Victor is it not true that~~ ~~the USGS report on the~~ ~~[redacted]~~ ~~in the Hualapi, Sacramento~~ ~~and Detrital Aquifers is done.~~ water

1) Mr Victor you state that the Kingman wells increased at a 3% rate. Yet Kingman's growth has been at a higher %. Did you take this into consideration?

pg 10
1) You make reference to the Hwy 93 Corridor Area Plan? Are you aware this was tabled at the request of ADOT and another Concentrated Solar Facility

pg 11
1) ADWR has the ability to take HUS committed Demand into account. Did you take into consideration the Rhodes / Meraclen Subdivisions Completions?

2) Is it fair to say that it would be Hualapi Valley 1st, Rhodes 2nd and mandian 3rd in who

SECTION 10

TT cont.

gets water?

3) Then what happens to the individual parcel owners, they Cant [redacted] split their land because they dont have the water? [redacted]

Section 10 environmental

1) Mailer notices sent to property owners within one mile of the Project. About how many residents are within 1 mile of the project?

pg 8 RDA Designation - Yet Jim Rhodes is projecting an urban land use with small lots - Yet none of these land splits have occurred is this correct why?

pg 9 1) Has the infrastructure been planed by Mohave County within the next 5 years. - for proper infrastructure for Industrial Development?

* supervisor Gary Watson said NO! No plans now or in the future.

2) Or is the Mohave County tax payers picking up the tab yes or NO

Pg 9
#14
3 a) Does Mohave Sun own all of Section 21 in the proposed project area?

Pg 9 is this correct
4 a) You state that there is NO Local, State & Federal developments in the vicinity? ~~[illegible]~~
~~[illegible] miles to the North Please [illegible] of a proposed [illegible]~~
Yes or NO?

SECTION 12

5) Yet 6 miles to the North of the vicinity is Phase II of a proposed wind Farm.
Why did you not consider this

Section 12

pg 3
1) While you are working on this project - who signs your checks? (pay stubs?)
DOE?
WAPA?
BLM?

pg 4
1) Were you ever there at the proposed site at Dusk?
Like 6 pm or 7 pm
yes or No

→

pg 4

* 2) Did you complete your survey prior to this hearing?

3) How many bats did you see out at the proposed Hualapi Valley site?

pg 5 Cooling ponds

1) Do you understand that sitting water attracts the "Mohave Green" snake and other ground species? They will smell this water for miles

pg 7

1) Will there be much glare from these mirrors?

2) Your Demo shows a section of glare.
If this is glare, is the rest of the projects glare understated?

pg 8

1) The Nepa application is not done, and this hearing is premature and the finding are unstable - is this correct?

SECTION 15

Section 15

Signed Memorandum of Understanding

1) Mr Bartlett on Jan 4, 2010 were you at the Attorney Generals office for a pre-hearing
yes or NO

2) ~~The~~ The meeting lasted from approx 3:00 - 4:30
correct
yes or no

3) So when did you sign the memorandum of Understanding?

4) - The City of Kingman ~~@~~ City Council executive session @ 6:00 only approved the Memo of Understanding

see hearing on this

SECTION 17

Did the mayor sign then?

Section 17

- BOS resolution excludes parcels in Section 21 Why did you publish in 2 newspapers an inaccurate notice

- Resolution also uses ~~Smart Growth~~ (APS 11-823 C-3) Growing Smart as in the 3.5 of General Plan.

EXHIBIT
BEN-1

ORIGINAL SIGNATURE

BEFORE THE ARIZONA CORPORATION COMMISSION

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	**Docket No. L-00000NN-09-0541-00151** **ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE** **Case No. 151** **MOTION TO INTERVENE** **BY: DENISE HERRING-BENSUSAN (DENISE BENSUSAN)**

INT. D.B. 12-15-2009

I am a concerned local homeowner and one of the closest water users to proposed project. My personal water source and my neighbors' will be directly affected. I have lived in this area and have utilized my private well for 9 years.

I have extensive experience in our local water conservation and preservation planning efforts. I am currently the Chairman of the Northwest Arizona Watershed Council and have been affiliated with group for 9 years. I respectfully request to be a party in this matter.

THE FOLLOWING IS A LIST OF SERIOUS ISSUES AND CONCERNS (BUT NOT LIMITED TO THE SAME) THAT CAN ADVERSLY AFFECT OUR LOCAL COMMUNITY.

1) The long term negative and permanent impact on the Hualapai Aquifer which is in overdraft/depletion.
2) The proposed applicant has refused to use the best available current technology, in water conservation and

preservation. Dry cooling is recommended by the United states Department of Energy per the United States Congress.

3) Long range policies established by the state of Arizona in Smart Growth Practices are not being addressed.
4) Mohave Counties General Plan vilifies Smart Growth Practices. Policy 3.5 states that "Mohave County will only approve power plants using "dry cooling" technology when the aquifer is threatened by depletion or sustenance."
5) The Arizona Corporation Commission by laws requires them to follow the community's "master plan".
6) Impact on wildlife within Red Lake and surrounding areas.
7) Flood control and drainage pattern issues.

This filing has been mailed to all parties in the Service List below.

Respectfully Submitted on this 15th day of December 2009

Denise Herring-Bensusan

By _____

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The point really isn't whether or not we have just enough water to approve HVS the point is do we have a water plan that encourages, and has enough water to supply as MANY future industries and population growth ~~subdivisions~~ subdivisions - m master plan communities.

COMPARE SUB DIVISIONS TO MASSIVE

Will they support wet cooled or photovoltaic

withdraw!

NO ONE SAYS they don't want the plant they say dry cooled or photovoltaic these folks need JOBS! SO DO I!!!

Heard a lot of Words

Lots IMAGINE, POSSIBLY, ASSUME - I DONT KNOW

GOOD FAITH EFFORTS !!!

The Public Process was a joke!
Made formal complaints

All who drew from Aquifer were stakeholders.

CLARIFY

Kendra who has been so fine the last couple days

NWANC WAS NEVER directly contacted for participation in the process - individuals who were members attended and identified themselves as members

CERTIFICATE OF ENVIRONMENTAL COMPATIABILITY

of course wet cooled wind not
But dry cooled or photovoltaic
plant
IS
ENVIRONMENTAL
COMPATABLE

NOT APPLIED - concerning zoning

HVS has not applied for a rezone for the project. I believe that they have been waiting for the new Energy Zones to be adopted by the County which occurred in November. ,

we are also going through the General Plan as part of the 2010 formal review to streamline the document to allow the expeditious approval of new development activity in these difficult economic times.

ARS 11-802 is of particular interest:

"The Board of Supervisors of a county, in order to conserve and promote the public health, safety, convenience and general welfare, and in accordance with the provisions of this chapter, shall plan and provide for the future growth and improvement of its area of jurisdiction, and coordinate all public improvements in accordance therewith, form a planning and zoning commission to consult with and advise it regarding matters of planning, zoning, and subdivision platting and in the manner provided in this chapter, adopt and enforce such rules, regulations, ordinances and plans as may apply to the development of its area of jurisdiction."

This seems to be straight forward language, with the last sentence on "adopt and enforce such . . . plans as may apply" telling the BOS that once they have a set of goals and policies written down in the General Plan they adhere to them until they are altered or deleted by an official Board action, of course. So, when the HVS rezone comes before the P&ZC and the BOS how should the conditions be worded in light of the statute just mentioned when based upon findings from the USGS Three-Basin Study and certain extant policies in the General Plan that help it comply with ARS 11-821.C.3?

Hualapai aquifer. That's… 3 BILLION, 237 million, 300 thousand gallons of water per year being taken out of the aquifer and NOT being recharged back in.

The FACT is that we are emptying our water supply and not replenishing it. The Hualapai aquifer is in a state of DEPLETION! We WILL run out of water if we do not IMMEDIATELY start practicing intelligent growth and create a water plan to suit our emergency status!

If Mohave County ignores the health, well being and property values of the average citizen in favor of destructive industry then there will be recalls, referendums and law suits. The cost to the county will be extensive.

You have heard a lot of propaganda out there and this community is faced with elected officials and project developers who simply don't care about the FACTS and they don't care about you. If our elected officials cannot be creative enough to attract truly green industry that has a positive impact on this community then replace them with people that can actually handle the job!

If this project utilizes fresh water to produce energy then ~~there~~ it is not green

RESOURCES

A.D.W.R. main site: http://www.azwater.gov/dwr/default.htm
A.D.W.R. overview of the Arizona Groundwater management Code :
http://www.azwater.gov/dwr/Content/Publications/files/gwmgtovw.pdf
PHOENIX (Associated Press)
The World's Water 2008-2009 http://www.worldwater.org/
Mohave County General Plan:
http://resource.co.mohave.az.us/File/PlanningAndZoning/Mohave_County_General_Plan.pdf

A.D.W.R. WATER ATLAS
http://www.adwr.state.az.us/dwr/Content/Find_by_Program/Rural_Programs/content/water_atlas/default.htm
Laura Grignano, Industrial Planner for A.D.W.R.

Some Electric companies will NOT purchase energy from plants like this who utilize a finite resource such as water (when it is NOT necessary) will NOT purchase electricity from that plant - We are asking them NOT to

A WATER CRISIS IN MOHAVE COUNTY

"A State of Depletion"

"First of a Four Part Series on Water"

Denise Bensusan

Don't forget comments from Guenther - By the time we stop for to create an AMA it will be too late

The citizens of Mohave County Arizona are facing a major crisis concerning their water supply. No matter how you spin it the science tells us that this community is in trouble!

Most of us don't think much about where our clean (potable) drinking water comes from let alone how long it will be available to us. We have come to assume that water is an unlimited natural resource that will be there for us no matter how much is wasted. NOTHING COULD BE FURTHER FROM THE TRUTH!

The United States has the cheapest cleanest water in the world current day but our flippant attitude towards this vital resource is crashing in upon us faster than we can implement a real solution. "Americans are facing serious water shortages, especially in areas that rely on groundwater." The majority of Mohave County i.e. the City of Kingman, Golden Valley, Dolan Springs, Yucca, Meadview, Valentine, Hackberry, Truxton, Peach Springs etc. depends on groundwater (aquifers and tributaries underground) for their water supply.

The Arizona Department of Water Resources (A.D.W.R.) is extremely concerned for our water supply but we are outside of an Active Management Area (A.M.A.) and water laws are practically nonexistent. They see and understand the crisis plaguing our community but in truth they have very little control over water issues here. Herb Guenther, the director of the A.D.W.R. said that the State is in denial over water quantity. He went on to say that we must use our water in a sustainable way or that the uncertainty over water availability will slow economic growth.

A.D.W.R. was created legislatively in response to a serious condition called "overdraft" of Arizona's water supply. In the Mohave County General Plan "overdraft" is referred to as "depletion". Simply put overdraft or depletion is the act of pumping groundwater out of the aquifers faster than it is being replaced or recharged naturally. Just imagine drinking a glass of your favorite beverage through a straw and never refilling your glass. As you suck through the straw your beverage will disappear and your glass will become empty. Overdraft or depletion also increases the costs of drilling and pumping and of course the inevitable loss of our water supply will be both physically and financially devastating to the entire community.

Let's look at the recharge rate (or lack thereof) of the Hualapai Aqufure. This aquifer supplies water to the City of Kingman and private well owners north of Kingman. This is the Estimated Annual Natural Recharge (water replacing the water being drawn out of the aquifer) per A.D.W.R...

(a) 2000 - 2500 acre feet per year (per Remick 1981)
OR
(b) 3000 acre feet per year (per Freethey & Anderson 1986)

Let's give the benefit of the doubt and utilize the higher recharge rate of 3000 acre feet per year for this example. With Cultural Demand (water usage) in the period of 2001 - 2005 (it's is far higher now) of 8900 acre feet per year A.D.W.R.'s hydrology shows that the Hualapai Aquifer is being pumped into a state of decline at approximately 5900 acre feet per year. Now, let's add in the 4000+ acre feet that the proposed Mohave Sun Power "WET COOLED" power plant plans to withdraw. By the way, according to Laura Grignano, A.D.W.R.'s Industrial Planner there is no monitoring of the amount of water that Mohave Sun Power removes from the aquifer. Now we have 9900 acre feet per year of depletion within the

Mohave County manager proposes conservation, environmental action

KINGMAN – Mohave County Manager Ron Walker wants the Board of Supervisors to amend the county's Business Goals to include "natural resources planning and management."

"Mohave County's open space, clean air and water are important, and fragile, assets," he said. "The people who live here and the people who want to live here value these natural resources. But there are those who would take advantage of all of us and, in the process, destroy the very things that make life so good in our area. I want this county to take positive steps to protect and preserve our environment."

Walker has placed three items on the Board of Supervisors meeting agenda for Monday, April 16, that deal with environmental concerns.

He would like specific planning to take place regarding solid waste pollution.

"Illegal dumping has proliferated throughout our rural areas," he said. "Although our ERACE (Environmental Rural Area Cleanup Enforcement) program has been involved in many area-wide cleanups, we have been as effective against illegal dumping as battling an avalanche with a broom and dustpan. We need to map out specific objectives in dealing with this problem and take action."

Water availability and quality is the biggest problem rural Arizona has and will have in coming years, Walker said. "With growth, comes great thirst. Residential development and industrial corporate entities are competing for our water resources. Colorado River states continue to battle for river allocation.

Mohave County Manager Ron Walker

with Nevada being the most recent recipient of a greater share through the Arizona Water Banking Authority."

Pollution along the river is a serious concern, he said, as well as the contamination of ground water through the proliferation of septic tanks. "The Colorado River Regional Sewer Coalition has been working to bring federal funds to sewer river areas. Little major progress has been accomplished.

"Although Mohave County has set an example in building energy efficient facilities and pursuing a Green Building Certification for the new County Administration Building," he said, "we need to be more active in encouraging energy conservation for all new businesses, structures and services in our area."

Walker pointed out that Mohave County has signed agreements in prior years that have taken advantage of the governmental agency, the taxpayers and the future health of the environment.

B16657
PR08128

AN OVERVIEW OF MOHAVE COUNTY

POPULATION, EARNINGS, AND PERSONAL INCOME

[redacted]

Ron Walker, County Manager

March 2004

RON WALKER

Arizona's West Coast, Regional Tourism Profile, Compiled for the Arizona Department of Tourism

There are an estimated 32 million people within a 350 mile radius of Kingman and most of those are in Southern California. 2.2 million visitors come to the Arizona West Coast annually. 69% of those who travel here are from out of Arizona; that equals 1,518,000 out of state visitors. The Los Angeles area provided 37%, or 561,660 of these visitors.

Tourism Imports Real Dollars Into The Region

The average Arizona domestic overnight visitor spent $75 per person per day in 2002. Arizona's West Coast Domestic Overnight Leisure visitors stayed for an average of 3.1 nights. Using these figures, over $500,000,000 comes into the Arizona West Coast economy annually from tourism.

What Do They Spend It On?

The top spending areas for Overnight Leisure travel dollars in the region were: Transportation for 26%, food at 22%, shopping and entertainment for 17%. Participation rates for gambling, camping, boating/sailing and beach/waterfront activity in Arizona's West Coast region were the highest of all the regions.

Industry Groupings Contributions to Personal Income Were Addressed Above. The Next View is by Earnings and Jobs

From 1970 To 2000 Period, Average Earnings Per Job Dropped From $31,080 To $24,193 (In Real 2000 Dollars)

This measures wages and salaries for employees and proprietors, those who hold a job or operate a business. During the 1970 to 2000 period, earnings per job dropped from $31,080 to $24,193, below both national at $36,316 and Arizona at $33,050. Using the standard of 2080 hours annually that comes to: $11.63 per hour. In 1970 that wage amounts to: $17.45 per hour. From 1970-2000, 79% of new jobs have been Wage and Salary Employees. Proprietors contributed to 21% of growth in jobs. From 1970-2000, that portion decreased from 23%-21%.

How Much Should County Taxpayers Be Willing To Pay To Import Jobs Into The County?

Most Mohave County taxpayers have heard of the Griffith Energy project on I40 near Kingman. The project created approximately 25 jobs. The project was championed by the former Mohave County Economic Development Authority (MCDEA), using County Property Tax and Highway User Fund (HURF) dollars. The Property Taxpayers of Mohave County will pay over $8 million, with HURF paying over $2 million, for the project by the time all County debts are paid. (See Attachment for exact payment schedule.) The General Fund, your Primary Property Tax dollars, pays the annual principal and interest. Roads were built with Highway User Road Funds and not financed.

The County Jail was "mortgaged" through Certificates of Participation to finance the project. Homeowners and other property taxpayers have the privilege of paying over $400,000 for each job created by economic development debacle. And this was called this Economic Development!

These project planners promised that Griffith locating to Mohave County would reduce local electric costs. Has anyone seen reduced electric costs? Merchant Plants, like Griffith, sell to the wholesale market, to the highest bidder. They are not a utility, and you cannot buy power from them for residential use. The project was sold to the public based upon a promised 5 year pay back period. Below is a summary of tax payments into the County General Fund and Expenses for the project by the General Fund. If 2003 is the first full payment, future payments will most likely decline through depreciation. To get closer to the pay back period, divide $10,000,000 by $252,888.14. That equates to 39.5 years payback not 5!

It should be noted that Griffith sued the State and Mohave County to reduce their taxable assessed value on personal property, which directly affects their tax obligation. They lost. They appealed. They lost. Now they have Senator Dean Martin, Republican District 6, introduce Senate Bill 2159 to change the law to cut them a tax break.

From the table below, the County has paid $2,668,097 on the debt, so far. Griffith will have paid with the 2003 Tax Bill, $264,300 and some change. For every $1 paid in taxes, the taxpayers have paid over $10 in debt payments.

County Loan Payments Payments/General Fund		Griffith Property Tax
1999		$47.68
2000		$900.32
2001	$760,269	$4044.47
2002	$813,276	$3421.70
2003	$779,526	$252, 888.14
2004	$315,026	
2005		

In the recent past, the MCEDA tried to lure industry with tax reductions and other government concessions. They targeted $10 per hour jobs. A $10 per hour job equates to $20,800 annual wage, almost $3,400 below average job wages. Every job at this level will reduce the average earnings measurement. This is not to condemn this wage; for one earning below a $10 per hour wage, that it is a nice raise. However, creating low end jobs does not contribute to improving average wage or per capita income. This shows the fallacy of measuring Economic Development by raw job numbers. Better measures revolve around Per Capita and Per Employee measures.

Our county has the right to take water into account in zoning

Unlawful Exaction

One possible consideration, which I believe has been proposed by an opponent of one of the solar projects, would be to require the developer to conduct a hydrological study. That requirement could be subject to challenge as an unlawful exaction. ARS 11-811 requires the County to comply with certain Federal and Arizona court decisions. Those decisions require, among other things, that any exaction or condition for approval of land development have a nexus, or rational connection, to the impact caused by the development and that the extent of the exaction or condition be proportionate to the impact of the proposed development. The question here is whether the impact of the proposed development, the amount of projected water use, is intense enough to warrant a hydrological study of the entire aquifer.

ARS 11-821 E.1. provides that the water resource element of the comprehensive plan does not require new independent hydrological studies. I believe this provision was intended to prevent the water resource element from being interpreted to force counties to conduct new hydrological studies. A county may, but is not required to, conduct new hydrological studies in order to implement the water resources element. But it could be argued that it also does not force developers to conduct hydrological studies for development proposals. Regardless of the outcome of that argument, a county's requirement of a hydrological study from a developer would still be subject to the nexus/proportion test described above. ARS 11-821 H. provides that 11-821 does not authorize the imposition of dedications, exactions, fees or other requirements that are not otherwise authorized by law.

FROM BOB TAYLOR

Conclusion

The Planning and Zoning Commission and Board of Supervisors are authorized to consider the impact of proposed development on water supply when deciding a requested zoning change or plan amendment. The inquiry is justified by the Boards obligation to develop land use regulations that promote the public health, safety, convenience and general welfare and may be necessary in order to implement the water resources element incorporated into ARS11-821 through the Growing Smarter Plus Act. But the concern for water must be balanced against other goals and policies in the General Plan that are also vital to the health, safety and welfare of the community. Perhaps the most efficient and reliable way to address water use issues with respect to the proposed solar power facilities is to rely on the resources and expertise of the Line Siting Committee of the Arizona Corporation Commission.

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CIVIL DIVISION

MEMORANDUM

Confidential Attorney/Client Communication

TO: **Mohave County Board of Supervisors, Mohave County Planning and Zoning Commission**

CC: **Ron Walker, County Manager**
Michael Hendrix, Deputy County Manager, Development Services
Nick Hont, Director of Development Services
Christine Ballard, Director of Planning and Zoning

FROM: **Bob Taylor, Chief Civil Deputy County Attorney**

DATE: **September 4, 2009**

SUBJECT: **Water and Planning and Zoning –Solar Power Plants**

A question has been presented as to whether the Planning and Zoning Commission and Board of Supervisors are authorized to consider the impact of proposed development on water supply when deciding request for changes of zoning and plan amendments. This issue has arisen particularly in response requests for zoning and plan amendments to accommodate proposed solar power plants.

Under ARS Title 11 a county has authority to develop land use regulation in order to promote the health safety and welfare of the public. Under ARS 11-821 a county is specifically required to have a "water resources element" in its General Plan which is directed at linking land

planning with water availability. However, Title 11 authorizes and mandates other elements of land use planning which may often conflict with water conservation. For example, the General Plan requires the County to develop a diverse industrial base and promote jobs, encourage the development of renewable and alternate energy resources and promote affordable housing. Balancing conflicting goals is part of the legislative process. But the balancing process is particularly difficult with respect to groundwater use and availability outside of an Active Management Area where the county lacks sufficient information and expertise regarding the quantity of groundwater and the impact of proposed development on that quantity.

Statutory Framework

ARS 11-802 requires a county to adopt land use regulations in order to conserve and promote the public health, safety, convenience and general welfare of the county. ARS 11 -806 requires that a comprehensive plan be developed so as to conserve the natural resources of the county and to promote the health, safety, convenience and general welfare of the public. ARS 11-821 specifically requires a "water resources element" in the General Plan for all counties with a population of more than 125,000. Smaller counties are permitted but not required to have a water resources element. This water resources element requires a county's General Plan to include "Planning for water resources that addresses: (a) The Known and physically available surface water, groundwater and effluent supplies. (b) The demand for water that will result from future growth projected in the county plan. (c) An analysis of how the demand for water that will result from future growth projected in the plan will be served by supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies." ARS 11-806 and 11-821 provide that the General Plan shall serve as a guide and aid to the Planning and Zoning Commission it the performance of its duties. ARS 11-829 requires all zoning to be consistent with the general plan and for all proposed rezoning to be construed in a manner that will further the implementation of, and not be contrary to, the goals, policies and applicable elements of the general plan.

The authority to adopt zoning regulations and General Plan elements that promote the health, safety and general welfare of the public is a fairly broad grant of authority. Courts will not invalidate a zoning regulation which bears a rational relation to the health, safety or general welfare of the public provided that it allows for an economically viable use of the land. At the *17th Annual Arizona Water Law Conference* held in Phoenix on August 13-14, 2009, Speaker Robert Glennon, Professor of Constitutional Law and Water Law at the University of Arizona

School of Law, agreed that a county has authority under ARS Title 11 to consider the impact of a proposed use or density on water supply when confronted with a request for a change in zoning or plan amendment. According to Professor Glennon, the impact on water supply is one of the many factors affecting health, safety and welfare to be considered by the legislative body when considering a zoning or plan change.

General Plan – Goals, Policies, and Implementation Measures

Mohave County's General Plan contains several provisions directed at conserving and promoting the efficient use of water resources and assuring appropriate facilities for the delivery of water to development at given levels of density and intensity. Section II, which defines Mohave County's vision for the future, identifies the concept of "Water in Perpetuity" and states that "Mohave County's economic growth and well being of its residents is directly linked to a long term stable water supply. The County must encourage growth that is respectful of its water resources."

Several provisions of the General Plan specifically address water use in connection with proposed industrial development. Policy 3.5 provides that "Mohave County will only approve power plants using "dry cooling" technology when the aquifer is threatened by depletion or subsidence." Policy 3.4 provides that "New water intensive uses such a golf courses and man-made lakes shall require the use of treated effluent where and when available." Policy 27.9 (e) proscribes the depletion of water resources by future uses resulting from major plan amendments. Land Use Implementation Measure LU12 calls for the compilation of water use reports to assess the impact of various land uses and to project the future facility demands. Policy 36.12 states that "Mohave County should pursue and support industries that have smaller environmental footprints as measured by their use of less water and energy resources as well as their creation of fewer emissions when compared to traditional industry." Policy 43.9 provides that "The County should encourage developers to recycle grey water and rainwater onsite and/or use treated effluent for landscape irrigation and other non-potable uses including fountains, water features, commercial car and truck washes, and fire suppression systems to name a few." Policy 62.4 permits area plans to include more detailed goals and policies for issues addressed in the General Plan including water.

But as noted above, the General Plan also contains other goals and policies which may conflict or appear to conflict with the water conservation goals and policies. Policy 36.5 states that "Mohave County should support economic growth that keeps pace with population growth

and provides opportunities for the County's resident workers to work in the County. Policy 36.6 provides that "Mohave County should encourage non-residential development projects that may lead to significant long-term increases in County employment." Policy 8.4 states that "the County should support and encourage solar and wind energy." Implementation Measure E1 directs the County to "encourage developers and utilities to take advantage of solar energy opportunities in designing projects." Some policies contain conflicts within themselves. For example, in comparing the environmental footprint of a proposed solar energy plant against a facility that would use fossil fuel, the Commission and Board may determine that the emissions from a fossil fuel plant would be more harmful to the environment regardless of the solar plants water use.

There is no question that water, energy and industry are all vital to the health, safety and welfare of the residents of Mohave County. The weight to be given each factor in connection with a land use change is a legislative decision which should be carefully considered.

Growing Smarter

The water resources element required in the General Plan was enacted as part of the "Growing Smarter Plus Act during 2000. Its meaning and purpose has not yet been construed by a court. However, the Arizona Department of Commerce and the Governor's Growing Smarter Oversight Counsel have issued publications which give insight into the legislative intent. According to a publication by the Arizona Department of Commerce, "this element provides the opportunity for local governments to consider water demand in tandem with land use, anticipated growth areas, and infrastructure. Issue, concerns, or ideas may be raised throughout the public participation program, and the substance of this element may be closely connected to the policies included in the environmental planning, cost of development, or other elements." That publication identifies key questions that address reliability of water supply, sufficient infrastructure for delivery of water, impact of projected development on water supply, use of effluent, and water conservation measures.

During 2006, the Growing Smarter Oversight Counsel held public meeting around the state in order to develop strategies for implementing the elements of Growing Smarter Plus. Two of the recommendations generated were (1) Increase state efforts to develop reliable, independent, objective, information regarding the available supply of water for each hydrologic region of Arizona; and (2) Assure that the availability of clean, safe water is one criterion for evaluating all future Land use and development plans in all areas of Arizona.

The Growing Smarter Oversight Counsel as well as the participants at the 85th Arizona Town Hall, *Arizona's Water Future: Challenges and Opportunities*, Oct. 31- Nov. 3, 2004, recognized a key shortfall of the water resource element of the Growing Smarter Plus Act. Although the act appears to give counties authority in water resource planning, there are no resources to areas outside of Active Management Areas to develop sufficient data for planning. Counties within Active Management Areas have a great advantage due to the data and resources provided by ADWR. As a result the focus by counties outside of AMA's has been on looking for water resources to facilitate projected growth rather than considering the impact of growth on available supplies or developing a "carrying capacity" concept. Without reliable data land use decisions based on water availability may be reduced to speculation susceptible to political whim or alarmist demands. As a result some of the other goals of Smart Growth may be unnecessarily sacrificed.

ADWR Authority

Under the Groundwater Management Code, ARS 45-101 *et seq.*, the Arizona Department of Water Resources (ADWR) is given the authority to regulate the withdrawal, transportation, use, conservation and conveyance of rights to use the groundwater of the State. In an Active management Area the withdrawal and use of groundwater is closely monitored and regulated in accordance with Title 45. Outside of an Active Management Area there is not much regulation. Subject to certain well permit requirements and restrictions on transporting the groundwater outside of the basin from which it is extracted, a person may extract and use groundwater for any "reasonable and beneficial use". "Reasonable use" has been defined by the courts in Arizona to mean that a property owner has a right to capture and use underground water beneath their land for beneficial purpose on that land, but no landowner can transport water off the land from which it came if transfer injures the water supply of neighboring landowners. *Town of Chino Valley v. State Land Dept.* 119 Ariz. 243, 580 P.2d 704 (1978).

The ADWR does not have the authority to require a county to rezone property. The reasonable use doctrine does not require that a county re-zone a property in order to accommodate a use that may require more water than that which is normally expected in the property's present zoning classification. Re-zoning is a land use decision not a water use regulation. A refusal to rezone property does not prevent the owner's reasonable use of water for any purpose permitted within it present zoning classification. And refusal to grant a request for a change in zoning would not deprive a property owner of a compensable property interest in

ater. The Arizona Supreme Court has recently held that, outside of an Active Management Area, there is no right of ownership of groundwater prior to its capture and withdrawal from the common supply and a landowner does not have a real property interest in the potential future use of groundwater. *Davis v. Agua Sierra Resources L.L.C.*, 220 Ariz. 108, 203 P.3d 508 (2008).

A county's consideration of the impact of proposed development on water supply does not usurp ADWR's authority any more than a county's consideration of the impact of proposed development on air and water quality would usurp ADEQ's authority, or the county's consideration of the adequacy of traffic infrastructure for proposed development would usurp ADOT's authority. A county is specifically directed, under ARS Title 11, to address these factors in its general plan. Title 45 does not trump Title 11, nor vice versa. Both Titles should be interpreted and applied so that each has effect and meaning. It is not unusual that the regulatory impact of one agency or level of government would also impact an area regulated by another. In these instances the legislature often expects that the different agencies and levels of governments share resources and cooperate in order to achieve objectives that are common to their respective spheres of regulation. ADWR recognizes this concept on its webpage where it acknowledges that local governments can adopt water conservation ordinances and drought response measures.

ADWR also has a publication on its webpage entitled "*Water Management Requirements for Solar Power Plants in Arizona*". That publication indicates that ADWR requirements for groundwater use for solar power generation follows the regulations established under Title 45, which differ depending on whether the proposed facility is located within or outside of an active management area. There is not much regulation outside of an active management area other than a requirement that non-exempt wells be permitted and restriction on transfer from the basin. That publication also advises that the ACC and ADEQ may have additional water management requirements for proposed solar plants. Any requirements by the ADWR, ACC or ADEQ would apply regardless of the zoning issue. And none of the requirements or regulations of these agencies could be used to force a county to approve a requested change in zoning

ACC Authority

Under ARS Title 40, the Arizona Corporation Commission (ACC) is charged with the responsibility to balance the publics need for an adequate, economical and reliable supply of electric power with the need to minimize the effect thereof on the environment and ecology of

the State. The ACC, through the Arizona Power Plant and Line Siting Committee, has a process that should adequately address the concerns that the County may have regarding the impact of proposed solar power plants on the County's groundwater supply. The committee is comprised of (1) the State Attorney General or designee, (2) the Director of AWDR or designee, (3) the Director of ADEQ or designee, (4) Director of the energy office of the Arizona Department of Commerce or designee, and (5) Chairman of the Arizona Corporation Commission or designee. The Committee conducts an extensive vetting process which studies the need, viability, and environmental impact of the facility. The process involves public meetings with input from the applicant, committee, interested parties and members of the public. One of the requirements for approval by the ACC is a certificate of environmental compatibility. The availability of sufficient water and the impact of a proposed facility on the quantity and quality of water supply would be criteria to be considered in connection with both the viability and environmental compatibility of a proposed facility. The Line Siting Committee would have better resources and data available to it as well as stronger authority to require additional data, such as hydrological studies, from the applicant.

Liability Considerations

A refusal to grant a request change of zoning does not usually present a basis for liability in a subsequent lawsuit. In order to sustain an attack on a decision not to grant a requested rezone, the plaintiff must show that the existing zoning is invalid. An existing zoning classification will be presumed valid, and the plaintiff must show that is clearly arbitrary and unreasonable and that it does not have any substantial relation to public health, safety and welfare.

In some cases zoning ordinances that do bear a reasonable relation to the health safety and welfare of the public may subject the government to liability for compensation, if the ordinance leaves the property owner with no viable use of the property. There are a long line of U.S. Supreme Court cases which hold that hold that arbitrary and unreasonable restrictions which substantially deprive the owner of the economically viable use of his land may constitute a taking. These cases arose where there was an enactment of a regulation after the property owner acquired the property. It would be much more difficult for someone to buy property with a certain zoning classification and then sue for diminished value resulting from a refusal to re-zone. But someone may try, particularly if it appears that the county has exceeded its authority in denying or conditioning a requested re-zone.

County Authority

As discussed above, it is my opinion that a county has general authority under the zoning enabling statutes and specific authority under the "water resources element" required pursuant to "Growing Smarter Plus" (ARS11-821) to base zoning decisions on water availability. But there are obviously others who believe otherwise. These differing opinions may form the basis for litigation. And even assuming that the County does have authority, a refusal to rezone based on inadequate data may be challenged as arbitrary and capricious,

Proposition 207 Liability

The applicable provision of Proposition 207(ARS 12-1131-1138), ARS 12-1134 (A) provides that "if the existing rights to use, divide, sell or possess private real property are reduced by the enactment or applicability of any land use law enacted after the date the property is transferred to the owner and such action reduces the fair market value of the property the owner is entitled to just compensation from the state or political subdivision of this state that enacted the land use law."

A refusal to grant a requested re-zone would not give rise to a Prop 207 claim. The existing zoning was in place at the time the property was transferred to the owner. But, Prop 207 liability could be an issue if the county would attempt, without the owners consent, to change the zoning classification after a property owner acquired the property. A county could also face Prop 207 liability if it attempts to force a property owner into an area plan that did not exist when the property owner acquired the property.

Prop 207 would not impose liability for deprivation of groundwater rights outside of an Active Management Area. A refusal to grant a re-zone would not deprive the property owner of whatever rights to use water that he when he acquired the property. Moreover, as discussed above, the Arizona Supreme Court in *Davis v. Agua Sierra Resources LLC*, ruled that landowners outside of an Active Management Area have no right of ownership in groundwater prior to its capture and withdrawal from the common source and the landowner has no real property interest in the potential future use of groundwater. Prop. 207 only protects landowners against devaluation of real property interests.

Many times neighboring property owners who oppose a proposed re-zone threaten the County with a Prop 207 claim for the perceived devaluation of their property. ARS 12-1134 B. 6 provides that Prop 207 does not apply to land use laws that do not directly regulate the owners land. Although some plaintiff lawyers may disagree, I believe that this provision clearly precludes a property owner from bringing a Prop 207 claim based on a change of zoning for

neighboring property. And with respect to the proposed solar plants, 12-1134 B. 5. provides that Prop 207 does not apply to land use laws that establish locations for utility facilities.

Unlawful Moratorium

One of the opponents to one of the proposed solar energy facilities has circulated a petition requesting that the P&Z Commission table all rezoning request for the area at issue until a hydrology study has been completed. Such action may be challenged as an invalid moratorium. The authority for a county to enact a moratorium on construction or land development is strictly regulated by ARS 11-833. Before a moratorium can be declared there has to be an imminent threat to public health or safety caused by a shortage of essential public facilities. 30 days notice of intent to declare a moratorium must be provided and public hearings must be held. The length and conditions of the moratorium is closely regulated depending on the circumstances. And a moratorium may only be declared for shortage of facilities provided by the county. "Moratorium on construction or land development" is broadly defined under the statute as "engaging in a pattern or practice of delaying or stopping issuance of permits, authorization or approvals necessary for the subdivision and partitioning of, or construction on any land. It does not include denial or delay of permits or authorization because they are inconsistent with applicable statutes, rules, zoning or other ordinances." My interpretation is that the last part of that definition specifically precludes delay in processing an application to rezone from challenge as an invalid moratorium. But the definition is arguably broad enough to support a *prima facie* challenge.

Due Process

A property owner requesting a change of zoning does not have an automatic entitlement to the requested change. But the property owner has a due process right to have the request considered and decided in a timely manner in accordance with state statutes and the County's Zoning Ordinance. Section 40 of the Mohave County Zoning Ordinance governs the procedure for changing a zoning ordinance. Section 40 B. 2. provides that the Commission may have as many additional hearings or continued hearings on any initiated amendment as may be deemed necessary for public necessity, convenience, and general welfare. If it is fairly debatable that adequacy of water is rationally related to the public's health, safety and welfare, due process would not require that the Commission vote on a matter before it has a reasonable opportunity to receive and review sufficient information to address that concern. I do not believe that the continuances and requests for additional information to date have violated the developer's due process rights. But further delays without sufficient data to support a concern that the aquifer is threatened by a proposed development may form the basis for such a claim.

HVS IS MEANS NOTHING

MEMORANDUM OF UNDERSTANDING

This memorandum of understanding is made and entered into on this 5th day of January, 2010, between the City of Kingman (a municipal corporation located entirely in Mohave County, Arizona) and Hualapai Valley Solar LLC (a Delaware Limited Liability Company) for the express purpose of defining and delineating the City's and Hualapai's intent to negotiate in good faith the terms listed in this memorandum.

It is the Parties' mutual intent and desire to promote and effectuate an efficient and cooperative working relationship between themselves with the understanding of the practical, administrative and political considerations involved. Neither facility has been completed nor have all permits, inspections, and other rules and regulations been fully complied with in accordance with the applicable standards.

It is the Parties' mutual understanding that the City of Kingman is in the process of updating and expanding the Hilltop Wastewater Treatment Plant (HTWWTP). This process is ongoing and substantial completion is currently scheduled for January 4, 2011. Final completion is scheduled for March 5, 2011. The City of Kingman cannot guarantee any amount of effluent or quality of effluent to Hualapai. All discussion points contained in this memorandum are conditional upon the following non-exhaustive conditions:

Important cannot Guarantee ANY amount of effluent NORTH NOTHING

1. The completion of the HTWWTP.
2. The ability of the City to store and pump the effluent to the edge of the City's west property line in section 11.
3. The approval of all necessary federal, state, and local rules, regulations, and permits for the construction of the HTWWTP.
4. The approval of all necessary federal, state, and local agencies regarding the operation of the HTWWTP, the sale of effluent, and the transmission of effluent.
5. The construction of the Hualapai Solar Plant.
6. The approval of all necessary federal, state, and local rules, regulations, and permits for the construction of the Hualapai Solar Plant.
7. The approval of all necessary federal, state, and local rules, regulations, and permits necessary for the operation of the proposed Hualapai Solar Plant.
8. The approval of a final binding agreement between the Kingman City Council and Hualapai.

The Parties understand that the City desires to have a means of disposing of effluent to be produced by the HTWWTP as a byproduct in order to comply with applicable environmental laws.

It is the Parties' mutual understanding that Hualapai is desirous of a long-term commitment by the City to provide effluent. Hualapai is requesting a term in excess of 20 (twenty) years.

It is the Parties' mutual understanding that Hualapai is desirous of 100% (one-hundred percent) capacity of the effluent treated by the City. When the new plant is built, the City will have an expected capacity for 1 MGD. If Hualapai Valley Solar is desirous of more than 1 MGD, they will need to obtain additional permitting and build additional treatment capacity. Both Parties understand that the City may only provide a surplus amount of effluent. The City has determined that it must reserve an undetermined amount of effluent for compliance with federal, state, and local regulations and may declare the remaining effluent as surplus for disposal according to mutual agreement.

It is the Parties' mutual understanding that both Parties are in need of additional infrastructure to facilitate this agreement. Hualapai agrees to negotiate in good faith the design, construction, and payment of the infrastructure necessary to store and pump the effluent to the City's west property line, in section 11, if required to facilitate the terms of this memorandum of understanding.

The amount of effluent needed by Hualapai will depend upon the ultimate size of the Hualapai Solar Plant and the extent to which water cooling is used. Whether a final binding agreement is reached will depend upon whether the Parties agree upon price, term, reimbursement provisions, infrastructure obligations and all other material terms.

The Parties of this memorandum of understanding agree to sign this memorandum, to negotiate the terms in good faith that will allow the Parties to reach a mutual understanding for a final binding agreement. This memorandum is binding only in so as far as it requires good faith on both Parties to negotiate for a final agreement. If the Parties fail to reach a final binding agreement by December 31st, 2010, this memorandum of understanding will terminate.

IN WITNESS WHEREOF, the Parties have signed this memorandum of understanding on the dates set forth below.

CITY OF KINGMAN, a municipal corporation of the State of Arizona

JAN 4, 2010
Date Signed

By John Salem
John Salem, Mayor, Kingman Common Council

HUALAPAI VALLEY SOLAR LLC, a limited liability company of the State of Delaware

JAN. 4, 2010
Date Signed

By Guy Bartlett
Its Managing Director

Technologies exist to conserve water and reduce impacts

Dry cooling technologies currently available reduce water demand and, as a result, minimize many of the water-related impacts associated with power production. The low intake requirements of dry cooling systems allow for more flexibility in plant siting since the facilities can meet their relatively minor water requirements using a variety of sources, including treated sewage effluent discharges. This, in turn, frees facilities from having to locate next to ecologically-sensitive waters.

Worldwide, there are more than 600 power plants using a dry cooling technology, in hot and cold climates alike. One of the largest systems is located at a 1,200 MW gas-fired combined cycle plant in Saudi Arabia, where ambient air temperatures can reach 122°F. In the US, dry cooling systems are used in over 50 operating plants – about 6,000 MW of installed capacity – and market penetration is growing. The Arizona Corporation Commission came close to requiring two proposed plants to use dry cooling technology in 2002, but stopped short of actually imposing this condition.[78,79]

While estimates for both capital cost and operating and maintenance expenses vary, dry cooled plants are more expensive to build and operate than are wet cooled plants. EPA calculates the capital expense of wet cooling at a combined cycle plant as 3 percent of total capital cost compared to 6.5 percent for a dry cooling system. At a hypothetical 700 MW combined cycle plant, operating and maintenance costs are $1.8 million/year for wet cooling and $7.4 million/year for dry cooling. Total annualized costs for the 700 MW facilities are estimated at $3.1 million (.06¢/kWh) for the wet cooling tower system and $13.1 million (.25¢/kWh) for the dry cooling system.[80]

In between wet and dry cooling are hybrid designs and modifications to existing systems. Dry cooling systems can be fitted with water nozzles to be used in the hottest weather, when air-drying is less efficient.[81] Other hybrid systems rely on wet cooling when there are adequate supplies of water and dry cooling during a dry season or drought year.[82]

In addition, there are systems where the water is recycled and essentially distilled off, leaving a solid cake of salts. The water, which is fairly pure, is reused. The resulting solid discharges can be disposed of in regulated landfills. This can virtually eliminate the discharge issue associated with cooling towers.[83]

Technologies also exist to handle waste from power plants in a manner that protects ground and surface waters through lined and covered impoundments, leachate collection and even use of fully closed tanks where water is treated before discharge.

Plants saying that it WONT WORK HERE
35 applications in California & allowed only being COOLED DRY

+19
PG 18 (Department of Energy Report to Congress - Reducing Water Consumption of Consentrating Solar Power

***= Majority of this amount is returned to the source but at an elevated temperature.

Alternate and Future Technologies

Another type of hybrid system evaporatively cools the air-cooled condenser on those hot days when the air cooler cannot maintain low condenser pressures. This method currently has limited commercial use. The air approaching the air-cooled condenser is cooled by water spray nozzles or by passing the air through wetted media. It is also possible to directly deluge the finned heat transfer tubes in the air coolers with a flow of water.

Performance and economic modeling of a 30 MW air-cooled parabolic trough plant near Daggett, California was done to evaluate the impact of spray nozzles for pre-cooling the air.[33] The analysis showed that water cooling is more economical over a wide range of electricity prices and water costs. Water cooling is generally favored whenever water is available because of the high cost of electricity associated with trough plants. Compared to water cooling, the spray cooling decreased annual water consumption by 32% (from 856 gal/MWh to 584 gal/MWh) and decreased the annual electric output by 3.6%. With this performance imact, economic benefit would be realized only if the cost of water was over $13 per 1000 gal at an electricity price of $0.10 per kWh. Typical municipal water costs are around $4.00 per 1000 gallons, and may be lower if degraded water is used. The water-cooled system showed over 4% more cash flow than the air-cooled system.

Another option is to use an indirect air-cooling system called a Heller cycle. In this design, the air-cooled condensers are replaced by a combination of a direct contact condenser and an array of water-to-air heat exchangers. Condensate is cooled by passing the water through the air-to-water heat exchangers, and the cooled water is then used to condenser the steam in a direct contact condenser. (This direct contact condenser can be a conventional design or can be an advanced design using a structured packing approach patented by NREL.) The Heller cycle might provide LECa reduction in levelized electricity cost compared to an air-cooled plant, but the costs would depend on plant size and they are too uncertain to come to a conclusion at this time.[34]

Current research and development are exploring new technologies which, if realized, could improve efficiencies while reducing water use. Advanced high-temperature heat transfer fluids, for example, could eliminate the thermodynamic performance penalties of dry cooling on trough and linear Fresnel systems. Advanced power towers are being designed for higher operating temperatures that could allow the use of gas turbines instead of steam turbines, possibly eliminating the need for cooling water.[35]

Summary

Utilities are showing increasing interest in the deployment of concentrating solar power plants to meet the requirements of state renewable electricity standards. Dish systems which already use air cooled engines, need only water for mirror cleaning. Troughs, linear Fresnel, and power towers use the heat of the sun to power conventional Rankine steam cycles. As with fossil and nuclear-power plants, water cooling is preferred to

c Wet Cooling water consumption compares at 865 gal/MWh. From Tables 6 and 7 of reference 32.
d LCOE adjusted by adding increased annual revenue over constant solar field size.

Table 1 gives a financial comparison of an air cooled condenser (dry), and (hybrid) ACC parallel with a wet cooling tower, relative to evaporative cooling tower (wet). Costs of each system including capital equipment, installation, water treatment, solar field, and operation and maintenance (O&M), were considered along with the estimated performance and revenue based on historical climatology data and current value for power generated in the southern California area.

If there is water available, the PCS is a water-saving alternative. On the other hand, both a wet and dry cooling system will have to be maintained and the wet system may be cycled in and out of operation These two facts will increase the maintenance costs of the cooling system.

Table 2 summarizes the amount of water presently consumed by power plants throughout the U.S. and the options available to CSP for reducing water consumption.

Table 2: Comparison of consumptive water use of various power plant technologies using various cooling methods

Technology	Cooling	Gallons / MWhr	Perform. Penalty*	Cost Penalty**	Reference
Coal / Nuclear	Once-Through	23,000 – 27,000***			1, 3
	Recirculating	400 - 750			1, 3
	Air Cooling	50 - 65			1, 3
Natural Gas					
	Recirculating	200			4
Power Tower	Recirculating	500 - 750			(estm.)
	Combination Hybrid Parallel	90-250	1-3%	5%	10, 11
	Air Cooling	90	1.3%		9
Parabolic Trough	Recirculating	800			5
	Combination Hybrid Parallel	100-450	1-4%	8%	7, Appx. A
	Air Cooling	78	4.5-5%	2-9%	6, 9
Dish / Engine					
	Mirror Washing	20			5
Fresnel	Recirculating	1000			(estm.)

For using a less water intensive cooling technique:
* = Annual energy output loss is relative to the most efficient cooling technique.
** = Added cost to produce the electricity.

minimize cost and maximize cycle efficiency. However, there are concerns about mounting water shortages and air pollution associated with evaporative cooling towers. Analyses indicate that the use of either direct or indirect dry cooling can eliminate over 90% of the water consumed in a water-cooled concentrating solar power plant. However, a combination of a reduction in power output and the added cost of the air cooling equipment is estimated to add roughly 2 to 10% to the cost of generating electricity, depending on the plant location and other assumptions. The use of hybrid parallel wet/dry coolers is estimated to reduce the energy cost penalty to below that of air cooling alone while still saving about 80% of the water compared to a water-cooled plant.

References

[1] National Energy Technology Laboratory (2006). Estimating Freshwater Needs to Meet Future Thermoelectric Generation Requirements. DOE/NETL-2006/1235. pp. D-1 and F-2. Note the values provided in this text are an approximation of the national averages for coal fired supercritical and subcritical with wet FGD. The ranges for water consumption of coal fired plants are estimated from the box plots on p F-1 and F-2 to be between 400 and 800 gal / MWh. The averaged surveyed values for power plants nationwide, listed by plant type, cooling method, and FGD method is on page D-1.

[2] The Resources Agency of California. (September 2, 2003). Background information and staff recommendation on power plant water use. Memorandum from CEC to Integrated Energy Policy Report Committee.

[3].U.S. Department of Energy (December, 2006). Energy Demands on Water Resources. Report to Congress on the Interdependency of Energy and Water. P. 38 Table V-1.

		Water intensity (gal/MWh$_e$)			
Plant-type	Process	Steam Condensing		Other Use	
Steam		Withdrawal	Consumption	Withdrawal	Consumption
Coal	Mining				5–74
	Slurry			110–230	30–70
Fossil/ biomass/ waste	OL Cooling	20,000–50,000	~300	~30**	
	CL Tower	300–600	300–480		
	CL Pond	500–600	~480		
	Dry	0	0		
Nuclear	Mining and Processing				45–150
Nuclear	OL Cooling	25,000–60,000	~400	~30**	
Nuclear	CL Tower	500–1,100	400–720		
Nuclear	CL Pond	800–1,100	~720		
Nuclear	Dry	0	0		
Geothermal Steam	CL Tower	~2000	~1400	Not available	
Solar trough	CL Tower	760–920	760–920	8**	
Solar tower	CL Tower	~750	~750	8**	
Other					
Natural Gas	Supply				~11
Natural Gas CC	OL Cooling	7,500–20,000	100	7–10**	
	CL Tower	~230	~180		
	Dry	0	0		
Coal IGCC*	CL Tower	~250	~200	7–10 + 130 (process water)**	
Hydro-electric	Evaporation				4500 (ave)

Mining of coal consumes 0.07 to 0.26 billion gallons per day

Thermo-electric power generation withdraws 136 billion gallons per day and consumes 3.3 billion gallons per day

OL = Open loop cooling, CL = Closed Loop Cooling, CC = Combined Cycle
*IGCC = Integrated Gasification Combined-Cycle, includes gasification process water
Other Use includes water for other cooling loads such as gas turbines, equipment washing, emission treatment, restrooms, etc.
**References did not specify whether values are for withdrawal or consumption.

The general calculation for estimating water consumption of a typical thermal power plant is as follows. Given a steam turbine net efficiency of 37%, the heat rejection per MWh will be:

$$3.412 \times 10^6 \text{ btu/MWh} \times [(1/37\%)-1] = 5.81 \times 10^6 \text{ BTU/hr}$$

Assume 90% of heat is rejected by latent heat of evap, latent heat capacity of water to be 1000 BTU/lb, and water density of 8.33 lb/gal:

$$5.81 \times 10^6 \text{ BTU/hr} \times 90\% / (1000 \text{ BTU/lb} \times 8.33 \text{ lb/gal}) = 628 \text{ gal/MWh evaporation}$$

[4] DOE (2006). p. 38 Table V-1 and NETL (2006) p. D-1.
From the calculation above (Endnote 3), approximate water consumption rate for a combined cycle plant is 630 gal (170/500) = 255 gal / MWh plus aux loads.
In the table of NETL(2006) p. D-1, natural gas combined cycle (NGCC) plants with recirculating cooling consume on average 130 gal / MWh. The surveyed ranges of NGCC consumption rates are not provided.

[5] Cohen, G. E., Kearney, D. W., & Kolb, G. J. (1999). Final Report on the Operation and Maintenance Improvement Program for Concentrating Solar Power Plants. Usage listed is raw water usage and assumed to be withdrawal rate. Consumption rate approximated from 90% of the withdrawal rate. p. 30-31

[6] WorleyParsons. *Wet and Dry Cooling Options for a 250 MW Thermal Plant.*

2042. ADWR recently reported that the total City of Kingman pumping in 2008 was 8,720 AF (personal communication from R. Obenshain of ADWR, November 23, 2009). The M&A (2007 and 2009) groundwater model simulated a total demand of 9,992 AF for the City in 2008, or about 15 percent more than was reported.

To provide a more conservative projection of water demand in the City of Kingman area for this Addendum, estimates of population growth were reviewed and the future water demand for the City was simulated to increase at the rate of 3 percent per year to account for unplanned growth in the Kingman sub-basin. Projections reported by ADWR (2009a) indicate an average population growth rate in Hualapai Valley of about 1.9 percent through 2030. Data from the Arizona Department of Economic Security, reported by the Arizona Department of Commerce (2006), indicate an average population growth rate in Hualapai Valley of about 2.0 percent through 2042. Therefore, a 3 percent growth rate provides a large safety factor of 50 percent to account for unplanned growth.

For this Addendum, the City of Kingman pumping is simulated as 12,076 AF in 2014 and increasing thereafter at a rate of 3 percent per year until 2042, when pumping is simulated as 27,629 AF. Simulated pumping rates are given on **Table 2**. The updated City of Kingman well demands are included in all of the simulations for this Addendum.

PER Montgomery + Assc.

Hualapai Valley Solar

The M&A (2009) model simulated HVS wells pumping at a total rate of 3,000 AF/yr from 2013 through 2042, which is the end of the projected 30-year life of the plant. This rate represents the high-end demand for a concentrating solar power (CSP) facility with wet-cooling. For this addendum, the EIS advisory group requested that HVS groundwater pumping also be simulated at an average annual rate of 2,400 AF/yr for a CSP facility with wet-cooling, and at an average annual rate of 30 AF/yr for a photovoltaic solar power facility. If City of

Envir compatable
2,400 acre ft per year = wet cooled.
30 acre ft. per year photovoltaic

Kingman treated effluent becomes available and feasible for HVS use, it is estimated to reduce the groundwater demand of the plant by about 1,800 AF/yr. It should be noted that the minimum pro rata amount of annually available groundwater already set aside by ADWR for the Rhodes Homes land on which the HVS plant is sited (4,416 AF/yr) would be nearly twice as much as HVS intends to use annually on average (2,400 AF/yr).

talk about Subdivision
water uses vs -
usage (massive pumping immediately)
Cone of depression

NOT LEGALLY AVAILABLE RHODES

ARIZONA DEPARTMENT OF WA
Office of Assured and Adequate
3550 North Central Ave., Phoenix, A
Telephone (602) 771-85
Fax (602) 771-8689

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MONTGOMERY & ASSOC. INC.
SCOTTSDALE, ARIZONA

Janet Napolitano
Governor

Herbert R. Guenther
Director

ANALYSIS OF ADEQUATE WATER SUPPLY

November 9, 2007

File Number:	43-402285.0000
Development:	Red Lake
Location:	Township 25 North, Range 17 West, Sections 1, 3, 5, 7, 9, 15, 17, 18, 19, 21, 28, 29, 30, 31 Township 26 North, Range 16 West, Sections 5, 7, 17, 18, 19, 20, 28, 29, 30, 31 Township 26 North, Range 17 West, Sections 3, 5, 7, 9, 13, 14, 16, 17, 19, 21, 23, 24, 25, 26, 27, 29, 31, 33 Township 26 North, Range 18 West, Sections 13, 23, 25, 31, 35 Township 27 North, Range 16 West, Section 31 Township 27 North, Range 17 West, Sections 1, 3, 13, 17, 19, 21, 23, 25, 29, 31, 35 Township 28 North, Range 17 West, Sections 23, 25, 27, 35 Mohave County, Arizona
Land Owner:	American Land Management, L.L.C., a South Dakota limited liability company; Desert Communities, Inc., a Nevada corporation; South Dakota Conservancy, L.L.C., a South Dakota limited liability company and Meridian Land, L.L.C., a Nevada limited liability company

The Arizona Department of Water Resources has evaluated the Analysis of Adequate Water Supply application for Red Lake pursuant to A.A.C. R12-15-712. The proposed development includes 210,700 single-family residential lots and 12,880 multi-family housing units. There are approximately 4,416 acres of non-residential uses such as elementary schools, high schools, 2 golf courses, common areas and parks. The applicant is going to rely on effluent water for the exterior water demand. Conclusions of the review are indicated below based on the adequate water supply criteria referenced in A.R.S. § 45-108 and A.A.C. R12-15-712.

- **Physical, Continuous, and Legal Availability of Water for 100 Years**
  On the basis of the Department's review, the Department has determined that 43,432.33 acre-feet per year of groundwater and 26,160.93 acre-feet per year of effluent will be **physically and continuously available**, which is equivalent to the annual estimated water demand for the development of 69,593.26 acre-feet per year. The application did not include a Notice of Intent to Serve form with the application. Therefore, **legal availability** of the water is not considered proven. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. Individual Notices of Intent to Serve will be required for each application for a Water Report.

Legal availability of water is not considered proven.

- **Adequate Water Quality**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-719 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report, the Office of Assured Water Supply may be contacted for further guidance.

- **Financial Capability of the Owner to Construct the Necessary Distribution System**
  This requirement will be evaluated according to the criteria in A.A.C. R12-15-720 at the time an application for a Water Report is filed. Prior to preparing an application for a Water Report for an individual subdivision plat, the Office of Assured Water Supply may be contacted for further guidance.

The term of this Analysis of Adequate Water Supply is ten years from the date of this letter and may be renewed upon request, subject to approval by the Department. Throughout the term of this determination, the Department, when reviewing other requests for adequate water supply in the area, will consider the projected demand of this development. The demand projected for this development assumes that the conservation measures the applicant has identified to the Department will be required for the homes in this development, including the effluent use requirements for public parks, large turf areas and golf courses and low water use landscaping on the property. Additionally, it must be noted that based upon the limited hydrogeologic data available for the proposed development area, the amount of groundwater that may be physically available to 1,200 feet below land surface for this project may be limited. As additional hydrogeologic data becomes available, applications for Water Reports and the determination of physical availability in this analysis may be affected by that additional data.

Prior to obtaining plat approval by the local platting authority and approval of the public report by the Department of Real Estate, a Water Report must be obtained for each subdivision plat. The findings of this Analysis of Adequate Water Supply may be used to demonstrate that groundwater and treated effluent supplies are physically available for at least 100 years for purposes of an application for Water Report, unless new hydrogeologic data indicates otherwise. Applications for Water Reports that follow the Analysis of Adequate Supply will need to reference this letter. This determination may be invalidated if the development plan or other conditions change materially prior to filing for a Water Report.

Questions may be directed to the Office of Assured/Adequate Water Supply at (602) 771-8585.

Sandra Fabritz-Whitney, Assistant Director
Water Management Division

cc: Greg Wallace, Errol L. Montgomery & Associates, Inc.
Office of Assured and Adequate Water Supply
Nicole Swindle, Legal Division
Joan Card, Assistant Director, Arizona Department of Environmental Quality
Steve Olea, Assistant Director, Arizona Corporation Commission
Roy Tanney, Assistant Director, Arizona Department of Real Estate
Karl Taylor, Director, Subdivisions Division, Mohave County Planning and Zoning

GOES WITH CENSUS

Another approach is the number of jobs created per acre-feet of water consumed each year. With 100 full time jobs and 2,275 acre-feet of annual water use, each job requires 22.75 acre-feet of water. In 2000, the City of Kingman pumped around 8,000 acre feet of water and supported 8,228 jobs (see attached Census data) or about one job per acre-foot of water consumed each year.

Assuming a dry-coolling option, we would have one job per 2.3 acre-feet of water use per year and that would allow eight to nine more power plants to be located in the same valley with the same 2,275 acre-feet of water creating eight to nine times more jobs, more tax base and more local economic stimulus.

The downside to this development scenario is that there would be little open space left for scenic or recreational enjoyment. Now we are back to conserving and promoting the public health, safety, convenience and general welfare - planning.

JACK

Table DP-1. Profile of General Demographic Characteristics: 2000

Geographic area: Kingman city, Arizona

[For information on confidentiality protection, nonsampling error, and definitions, see text]

Subject	Number	Percent
Total population	**20,069**	**100.0**
SEX AND AGE		
Male	9,909	49.4
Female	10,160	50.6
Under 5 years	1,309	6.5
5 to 9 years	1,347	6.7
10 to 14 years	1,492	7.4
15 to 19 years	1,351	6.7
20 to 24 years	1,010	5.0
25 to 34 years	2,279	11.4
35 to 44 years	2,863	14.3
45 to 54 years	2,601	13.0
55 to 59 years	1,202	6.0
60 to 64 years	1,044	5.2
65 to 74 years	1,965	9.8
75 to 84 years	1,271	6.3
85 years and over	335	1.7
Median age (years)	39.6	(X)
18 years and over	15,048	75.0
Male	7,309	36.4
Female	7,739	38.6
21 years and over	14,349	71.5
62 years and over	4,196	20.9
65 years and over	3,571	17.8
Male	1,617	8.1
Female	1,954	9.7
RACE		
One race	19,561	97.5
White	18,051	89.9
Black or African American	111	0.6
American Indian and Alaska Native	398	2.0
Asian	288	1.4
Asian Indian	104	0.5
Chinese	36	0.2
Filipino	60	0.3
Japanese	14	0.1
Korean	15	0.1
Vietnamese	8	-
Other Asian [1]	51	0.3
Native Hawaiian and Other Pacific Islander	28	0.1
Native Hawaiian	14	0.1
Guamanian or Chamorro	6	-
Samoan	3	-
Other Pacific Islander [2]	5	-
Some other race	685	3.4
Two or more races	508	2.5
Race alone or in combination with one or more other races: [3]		
White	18,523	92.3
Black or African American	151	0.8
American Indian and Alaska Native	591	2.9
Asian	361	1.8
Native Hawaiian and Other Pacific Islander	56	0.3
Some other race	923	4.6

Subject	Number	Percent
HISPANIC OR LATINO AND RACE		
Total population	**20,069**	**100.0**
Hispanic or Latino (of any race)	1,856	9.2
Mexican	1,387	6.9
Puerto Rican	52	0.3
Cuban	14	0.1
Other Hispanic or Latino	403	2.0
Not Hispanic or Latino	18,213	90.8
White alone	17,119	85.3
RELATIONSHIP		
Total population	**20,069**	**100.0**
In households	19,411	96.7
Householder	7,854	39.1
Spouse	4,287	21.4
Child	5,346	26.6
Own child under 18 years	4,423	22.0
Other relatives	920	4.6
Under 18 years	388	1.9
Nonrelatives	1,004	5.0
Unmarried partner	412	2.1
In group quarters	658	3.3
Institutionalized population	645	3.2
Noninstitutionalized population	13	0.1
HOUSEHOLD BY TYPE		
Total households	**7,854**	**100.0**
Family households (families)	5,428	69.1
With own children under 18 years	2,365	30.1
Married-couple family	4,287	54.6
With own children under 18 years	1,642	20.9
Female householder, no husband present	794	10.1
With own children under 18 years	503	6.4
Nonfamily households	2,426	30.9
Householder living alone	2,001	25.5
Householder 65 years and over	919	11.7
Households with individuals under 18 years	2,615	33.3
Households with individuals 65 years and over	2,422	30.8
Average household size	2.47	(X)
Average family size	2.94	(X)
HOUSING OCCUPANCY		
Total housing units	**8,604**	**100.0**
Occupied housing units	7,854	91.3
Vacant housing units	750	8.7
For seasonal, recreational, or occasional use	63	0.7
Homeowner vacancy rate (percent)	2.9	(X)
Rental vacancy rate (percent)	9.1	(X)
HOUSING TENURE		
Occupied housing units	**7,854**	**100.0**
Owner-occupied housing units	5,604	71.4
Renter-occupied housing units	2,250	28.6
Average household size of owner-occupied units	2.54	(X)
Average household size of renter-occupied units	2.30	(X)

- Represents zero or rounds to zero. (X) Not applicable.

[1] Other Asian alone, or two or more Asian categories.

[2] Other Pacific Islander alone, or two or more Native Hawaiian and Other Pacific Islander categories.

[3] In combination with one or more of the other races listed. The six numbers may add to more than the total population and the six percentages may add to more than 100 percent because individuals may report more than one race.

Source: U.S. Census Bureau, Census 2000.

Table DP-2. Profile of Selected Social Characteristics: 2000

Geographic area: Kingman city, Arizona

[Data based on a sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see text]

Subject	Number	Percent
SCHOOL ENROLLMENT		
Population 3 years and over enrolled in school	**4,845**	**100.0**
Nursery school, preschool	274	5.7
Kindergarten	245	5.1
Elementary school (grades 1-8)	2,273	46.9
High school (grades 9-12)	986	20.4
College or graduate school	1,067	22.0
EDUCATIONAL ATTAINMENT		
Population 25 years and over	**13,355**	**100.0**
Less than 9th grade	429	3.2
9th to 12th grade, no diploma	1,957	14.7
High school graduate (includes equivalency)	4,448	33.3
Some college, no degree	3,736	28.0
Associate degree	933	7.0
Bachelor's degree	1,122	8.4
Graduate or professional degree	730	5.5
Percent high school graduate or higher	82.1	(X)
Percent bachelor's degree or higher	13.9	(X)
MARITAL STATUS		
Population 15 years and over	**15,721**	**100.0**
Never married	2,855	18.2
Now married, except separated	9,144	58.2
Separated	389	2.5
Widowed	1,289	8.2
Female	977	6.2
Divorced	2,044	13.0
Female	1,060	6.7
GRANDPARENTS AS CAREGIVERS		
Grandparent living in household with one or more own grandchildren under 18 years	**425**	**100.0**
Grandparent responsible for grandchildren	240	56.5
VETERAN STATUS		
Civilian population 18 years and over	**14,870**	**100.0**
Civilian veterans	2,750	18.5
DISABILITY STATUS OF THE CIVILIAN NONINSTITUTIONALIZED POPULATION		
Population 5 to 20 years	**4,212**	**100.0**
With a disability	364	8.6
Population 21 to 64 years	**10,413**	**100.0**
With a disability	2,569	24.7
Percent employed	55.3	(X)
No disability	7,844	75.3
Percent employed	76.6	(X)
Population 65 years and over	**3,149**	**100.0**
With a disability	1,510	48.0
RESIDENCE IN 1995		
Population 5 years and over	**18,438**	**100.0**
Same house in 1995	7,678	41.6
Different house in the U.S. in 1995	10,564	57.3
Same county	5,415	29.4
Different county	5,149	27.9
Same state	1,092	5.9
Different state	4,057	22.0
Elsewhere in 1995	196	1.1

Subject	Number	Percent
NATIVITY AND PLACE OF BIRTH		
Total population	**19,755**	**100.0**
Native	19,002	96.2
Born in United States	18,891	95.6
State of residence	5,569	28.2
Different state	13,322	67.4
Born outside United States	111	0.6
Foreign born	753	3.8
Entered 1990 to March 2000	175	0.9
Naturalized citizen	474	2.4
Not a citizen	279	1.4
REGION OF BIRTH OF FOREIGN BORN		
Total (excluding born at sea)	**753**	**100.0**
Europe	316	42.0
Asia	99	13.1
Africa	-	-
Oceania	-	-
Latin America	230	30.5
Northern America	108	14.3
LANGUAGE SPOKEN AT HOME		
Population 5 years and over	**18,438**	**100.0**
English only	16,834	91.3
Language other than English	1,604	8.7
Speak English less than "very well"	437	2.4
Spanish	888	4.8
Speak English less than "very well"	235	1.3
Other Indo-European languages	527	2.9
Speak English less than "very well"	124	0.7
Asian and Pacific Island languages	33	0.2
Speak English less than "very well"	-	-
ANCESTRY (single or multiple)		
Total population	**19,755**	**100.0**
Total ancestries reported	*21,380*	*108.2*
Arab	91	0.5
Czech[1]	91	0.5
Danish	170	0.9
Dutch	515	2.6
English	2,821	14.3
French (except Basque)[1]	889	4.5
French Canadian[1]	200	1.0
German	4,019	20.3
Greek	28	0.1
Hungarian	116	0.6
Irish[1]	2,961	15.0
Italian	691	3.5
Lithuanian	98	0.5
Norwegian	535	2.7
Polish	663	3.4
Portuguese	-	-
Russian	95	0.5
Scotch-Irish	358	1.8
Scottish	416	2.1
Slovak	39	0.2
Subsaharan African	-	-
Swedish	394	2.0
Swiss	75	0.4
Ukrainian	29	0.1
United States or American	1,543	7.8
Welsh	189	1.0
West Indian (excluding Hispanic groups)	8	-
Other ancestries	4,346	22.0

-Represents zero or rounds to zero. (X) Not applicable.

[1]The data represent a combination of two ancestries shown separately in Summary File 3. Czech includes Czechoslovakian. French includes Alsatian. French Canadian includes Acadian/Cajun. Irish includes Celtic.

Source: U.S. Bureau of the Census, Census 2000.

Table DP-3. Profile of Selected Economic Characteristics: 2000

Geographic area: Kingman city, Arizona

[Data based on a sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see text]

Subject	Number	Percent
EMPLOYMENT STATUS		
Population 16 years and over	**15,368**	**100.0**
In labor force	8,771	57.1
Civilian labor force	8,766	57.0
Employed	8,228	53.5
Unemployed	538	3.5
Percent of civilian labor force	6.1	(X)
Armed Forces	5	-
Not in labor force	6,597	42.9
Females 16 years and over	**7,841**	**100.0**
In labor force	4,031	51.4
Civilian labor force	4,031	51.4
Employed	3,777	48.2
Own children under 6 years	**1,527**	**100.0**
All parents in family in labor force	951	62.3
COMMUTING TO WORK		
Workers 16 years and over	**8,056**	**100.0**
Car, truck, or van - - drove alone	6,146	76.3
Car, truck, or van - - carpooled	1,360	16.9
Public transportation (including taxicab)	14	0.2
Walked	228	2.8
Other means	70	0.9
Worked at home	238	3.0
Mean travel time to work (minutes)[1]	16.7	(X)
Employed civilian population 16 years and over	**8,228**	**100.0**
OCCUPATION		
Management, professional, and related occupations	2,348	28.5
Service occupations	1,290	15.7
Sales and office occupations	2,202	26.8
Farming, fishing, and forestry occupations	26	0.3
Construction, extraction, and maintenance occupations	925	11.2
Production, transportation, and material moving occupations	1,437	17.5
INDUSTRY		
Agriculture, forestry, fishing and hunting, and mining	45	0.5
Construction	680	8.3
Manufacturing	1,004	12.2
Wholesale trade	266	3.2
Retail trade	1,086	13.2
Transportation and warehousing, and utilities	625	7.6
Information	172	2.1
Finance, insurance, real estate, and rental and leasing	241	2.9
Professional, scientific, management, administrative, and waste management services	544	6.6
Educational, health and social services	1,770	21.5
Arts, entertainment, recreation, accommodation and food services	782	9.5
Other services (except public administration)	420	5.1
Public administration	593	7.2
CLASS OF WORKER		
Private wage and salary workers	6,103	74.2
Government workers	1,525	18.5
Self-employed workers in own not incorporated business	577	7.0
Unpaid family workers	23	0.3

Subject	Number	Percent
INCOME IN 1999		
Households	**7,773**	**100.0**
Less than $10,000	783	10.1
$10,000 to $14,999	678	8.7
$15,000 to $24,999	1,276	16.4
$25,000 to $34,999	1,246	16.0
$35,000 to $49,999	1,274	16.4
$50,000 to $74,999	1,483	19.1
$75,000 to $99,999	615	7.9
$100,000 to $149,999	292	3.8
$150,000 to $199,999	55	0.7
$200,000 or more	71	0.9
Median household income (dollars)	34,086	(X)
With earnings	5,520	71.0
Mean earnings (dollars)[1]	44,374	(X)
With Social Security income	2,684	34.5
Mean Social Security income (dollars)[1]	11,740	(X)
With Supplemental Security Income	386	5.0
Mean Supplemental Security Income (dollars)[1]	6,422	(X)
With public assistance income	241	3.1
Mean public assistance income (dollars)[1]	2,985	(X)
With retirement income	1,704	21.9
Mean retirement income (dollars)[1]	15,296	(X)
Families	**5,448**	**100.0**
Less than $10,000	273	5.0
$10,000 to $14,999	281	5.2
$15,000 to $24,999	728	13.4
$25,000 to $34,999	1,009	18.5
$35,000 to $49,999	1,025	18.8
$50,000 to $74,999	1,274	23.4
$75,000 to $99,999	506	9.3
$100,000 to $149,999	252	4.6
$150,000 to $199,999	55	1.0
$200,000 or more	45	0.8
Median family income (dollars)	41,327	(X)
Per capita income (dollars)[1]	17,181	(X)
Median earnings (dollars):		
Male full-time, year-round workers	32,036	(X)
Female full-time, year-round workers	21,134	(X)

Subject	Number below poverty level	Percent below poverty level
POVERTY STATUS IN 1999		
Families	**446**	**8.2**
With related children under 18 years	338	12.8
With related children under 5 years	188	16.4
Families with female householder, no husband present	**247**	**32.6**
With related children under 18 years	210	37.2
With related children under 5 years	99	39.6
Individuals	**2,207**	**11.6**
18 years and over	1,439	10.1
65 years and over	248	7.9
Related children under 18 years	725	15.3
Related children 5 to 17 years	472	13.8
Unrelated individuals 15 years and over	800	24.7

-Represents zero or rounds to zero. (X) Not applicable.

[1]If the denominator of a mean value or per capita value is less than 30, then that value is calculated using a rounded aggregate in the numerator. See text.

Source: U.S. Bureau of the Census, Census 2000.

Table DP-4. Profile of Selected Housing Characteristics: 2000

Geographic area: Kingman city, Arizona

[Data based on a sample. For information on confidentiality protection, sampling error, nonsampling error, and definitions, see text]

Subject	Number	Percent
Total housing units	**8,564**	**100.0**
UNITS IN STRUCTURE		
1-unit, detached	6,168	72.0
1-unit, attached	258	3.0
2 units	118	1.4
3 or 4 units	297	3.5
5 to 9 units	257	3.0
10 to 19 units	271	3.2
20 or more units	335	3.9
Mobile home	671	7.8
Boat, RV, van, etc	189	2.2
YEAR STRUCTURE BUILT		
1999 to March 2000	494	5.8
1995 to 1998	1,437	16.8
1990 to 1994	1,540	18.0
1980 to 1989	1,912	22.3
1970 to 1979	1,411	16.5
1960 to 1969	702	8.2
1940 to 1959	578	6.7
1939 or earlier	490	5.7
ROOMS		
1 room	243	2.8
2 rooms	312	3.6
3 rooms	855	10.0
4 rooms	1,429	16.7
5 rooms	2,058	24.0
6 rooms	2,085	24.3
7 rooms	928	10.8
8 rooms	409	4.8
9 or more rooms	245	2.9
Median (rooms)	5.2	(X)
Occupied housing units	**7,768**	**100.0**
YEAR HOUSEHOLDER MOVED INTO UNIT		
1999 to March 2000	2,313	29.8
1995 to 1998	2,321	29.9
1990 to 1994	1,384	17.8
1980 to 1989	1,068	13.7
1970 to 1979	369	4.8
1969 or earlier	313	4.0
VEHICLES AVAILABLE		
None	459	5.9
1	2,977	38.3
2	2,939	37.8
3 or more	1,393	17.9
HOUSE HEATING FUEL		
Utility gas	6,072	78.2
Bottled, tank, or LP gas	287	3.7
Electricity	1,339	17.2
Fuel oil, kerosene, etc	-	-
Coal or coke	-	-
Wood	66	0.8
Solar energy	4	0.1
Other fuel	-	-
No fuel used	-	-
SELECTED CHARACTERISTICS		
Lacking complete plumbing facilities	45	0.6
Lacking complete kitchen facilities	18	0.2
No telephone service	244	3.1

Subject	Number	Percent
OCCUPANTS PER ROOM		
Occupied housing units	**7,768**	**100.0**
1.00 or less	7,446	95.9
1.01 to 1.50	157	2.0
1.51 or more	165	2.1
Specified owner-occupied units	**4,687**	**100.0**
VALUE		
Less than $50,000	282	6.0
$50,000 to $99,999	2,771	59.1
$100,000 to $149,999	901	19.2
$150,000 to $199,999	532	11.4
$200,000 to $299,999	156	3.3
$300,000 to $499,999	32	0.7
$500,000 to $999,999	13	0.3
$1,000,000 or more	-	-
Median (dollars)	87,500	(X)
MORTGAGE STATUS AND SELECTED MONTHLY OWNER COSTS		
With a mortgage	3,333	71.1
Less than $300	32	0.7
$300 to $499	282	6.0
$500 to $699	914	19.5
$700 to $999	1,236	26.4
$1,000 to $1,499	701	15.0
$1,500 to $1,999	128	2.7
$2,000 or more	40	0.9
Median (dollars)	781	(X)
Not mortgaged	1,354	28.9
Median (dollars)	215	(X)
SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1999		
Less than 15.0 percent	1,707	36.4
15.0 to 19.9 percent	768	16.4
20.0 to 24.9 percent	730	15.6
25.0 to 29.9 percent	425	9.1
30.0 to 34.9 percent	318	6.8
35.0 percent or more	692	14.8
Not computed	47	1.0
Specified renter-occupied units	**2,269**	**100.0**
GROSS RENT		
Less than $200	71	3.1
$200 to $299	176	7.8
$300 to $499	786	34.6
$500 to $749	730	32.2
$750 to $999	340	15.0
$1,000 to $1,499	59	2.6
$1,500 or more	-	-
No cash rent	107	4.7
Median (dollars)	510	(X)
GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME IN 1999		
Less than 15.0 percent	452	19.9
15.0 to 19.9 percent	439	19.3
20.0 to 24.9 percent	328	14.5
25.0 to 29.9 percent	194	8.6
30.0 to 34.9 percent	184	8.1
35.0 percent or more	517	22.8
Not computed	155	6.8

-Represents zero or rounds to zero. (X) Not applicable.

Source: U.S. Bureau of the Census, Census 2000.

M.C is already going to have to ha-l in water for the industry now – we have AMA – feel about what

By the time we force intervention on AMA it will be too late

– Herb Guenther told me.

State in denial over water quantity, official says

PHOENIX (AP) – The director of the Arizona Department of Water Resources says the state has to stop its denial when it comes to water.

"We're spoiled by cheap, easily available water and have been for a long time," Herb Guenther said. "We have a lot of water compared to other Western states. But we need to use it in a sustainable way."

Otherwise, scarcer supplies could push rates up and create uncertainty about water availability, slowing economic growth, he said.

State lawmakers have adopted water protection laws, but excluded rural areas and allowed changes that let cities and subdivisions drill wells. The Legislature has rejected proposals to better link growth to water availability.

Some rural communities are drilling new wells without knowing how much water is needed or how much remains, and cities and towns are preparing to tap underground reserves set aside for the future.

Surface water from runoff from mountain snows – a renewable resource intended to replace groundwater – cannot meet demands of urban areas away from delivery canals.

An effort to allocate water rights and sift through competing claims in the Gila River system has been in court more than 30 years. The Central Arizona Project took decades to get through the approval and construction process for its 336-mile canal.

The Arizona Legislature in 1980 imposed rules on parts of Maricopa, Pinal, Pima and Santa Cruz counties and the Prescott area, restricting their groundwater use and requiring new homes to prove a 100-year supply of renewable water.

"It wasn't the answer to all the problems, but it was intended to reduce reliance on groundwater. And it's doing that," said Sandra Fabritz, assistant director of the state Water Resources Department.

Communities in the areas rely on water from rivers, such as the Salt and Verde for Maricopa County; Colorado River water delivered through the Central Arizona Project; and a smaller mix of groundwater and treated effluent.

The supply rule forced cities to develop long-term water portfolios, but they've also been tapping aquifers.

The Central Arizona Groundwater Replenishment District was meant to help a few outlying communities and subdivisions meet the 100-year rule until pipelines or smaller canals could deliver renewable supplies.

Homes in the district use local groundwater and pay monthly charges to a water utility. Once a year, they also pay a replenishment fee that buys surface water equal to the groundwater used. That water goes into recharge basins.

Terri Sue Rossi, a Central Arizona Project analyst, said the district is a way for infrastructure and water to be paid for by users.

"To figure out how to do that is a major success story," she said.

As of March 31, nearly 265,000 homes, about a third of which are already built, were eligible to use groundwater through the district.

But before 1995, those homes could not have been built because they would have lacked a renewable water source. And although their builders were required to prove groundwater reserves would last at least 100 years, the wells could lower water tables enough to cause sinkholes or subsidence.

Liberians fret about

LaHood: 'Clunkers' dead unless Senate acts

Officials won't rule out middle class tax hikes

WASHINGTON (AP) – The Obama administration will suspend the

WASHINGTON (AP) – mers both sidester

Obama officials scrambled last week to add

IMPORTANT

ARIZONA DEPARTMENT OF WATER RESOURCES

Mohave County Water Resources Investigation Fact Sheet
Estimating Groundwater Availability in the Detrital Valley, Hualapai Valley, and Sacramento Valley Groundwater Basins in Mohave County

The Arizona Department of Water Resources (ADWR) has performed a series of studies in Mohave County aimed at updating and improving estimates of the amount of groundwater available in three groundwater basins: the Detrital Valley, Sacramento Valley and Hualapai Valley. The studies are presented in three ADWR Open-File Reports: #9 – Detrital Valley, #10 – Sacramento Valley, and #11 – Hualapai Valley. Estimating the amount of groundwater in these groundwater basins is an important factor for evaluating the water resources available for the Assured and Adequate Water Supply Program (AWS). The results of these studies are summarized here.

The extent of the aquifer and the water level in a groundwater basin needs to be determined to calculate the amount of groundwater available in the basin aquifers. To determine the extent of the aquifers, ADWR collected over 1,100 gravity measurements throughout the three groundwater basins which were used in conjunction with other geologic data (i.e. well logs and geologic maps) to produce depth-to-bedrock maps. ADWR also collected over 300 water levels in the three groundwater basins to determine groundwater levels. These data were combined to calculate the volume of groundwater in the groundwater basins. However, it is important to note that not all of the estimated groundwater may be available for withdrawal, possibly due to localized geological conditions or due to poor water quality. The volumes of groundwater shown below are ranges which represent best estimates of groundwater available in each groundwater basin depending on a range of hydrogeologic conditions, which are described in the Open-File Reports, and to the AWS Program depth limit of 1,200 feet below the land surface.

Detrital Valley Groundwater Basin:	1.5 to 3.9 million acre-feet
Sacramento Valley Groundwater Basin:	3.6 to 9.5 million acre-feet
Hualapai Valley Groundwater Basin:	8.0 to 10.1 million acre-feet

The deeper you go the water becomes salty! (also concerned about large block salt

ADWR Open-File Report No. 9: Preliminary Estimate of Groundwater in Storage for the Detrital Valley Groundwater Basin, Mohave County, Arizona, 2007.

ADWR Open-File Report No. 10: Preliminary Estimate of Groundwater in Storage for the Sacramento Valley Groundwater Basin, Mohave County, Arizona, 2008.

ADWR Open-File Report No. 11: Preliminary Estimate of Groundwater in Storage for the Hualapai Valley Groundwater Basin, Mohave County, Arizona, 2009.

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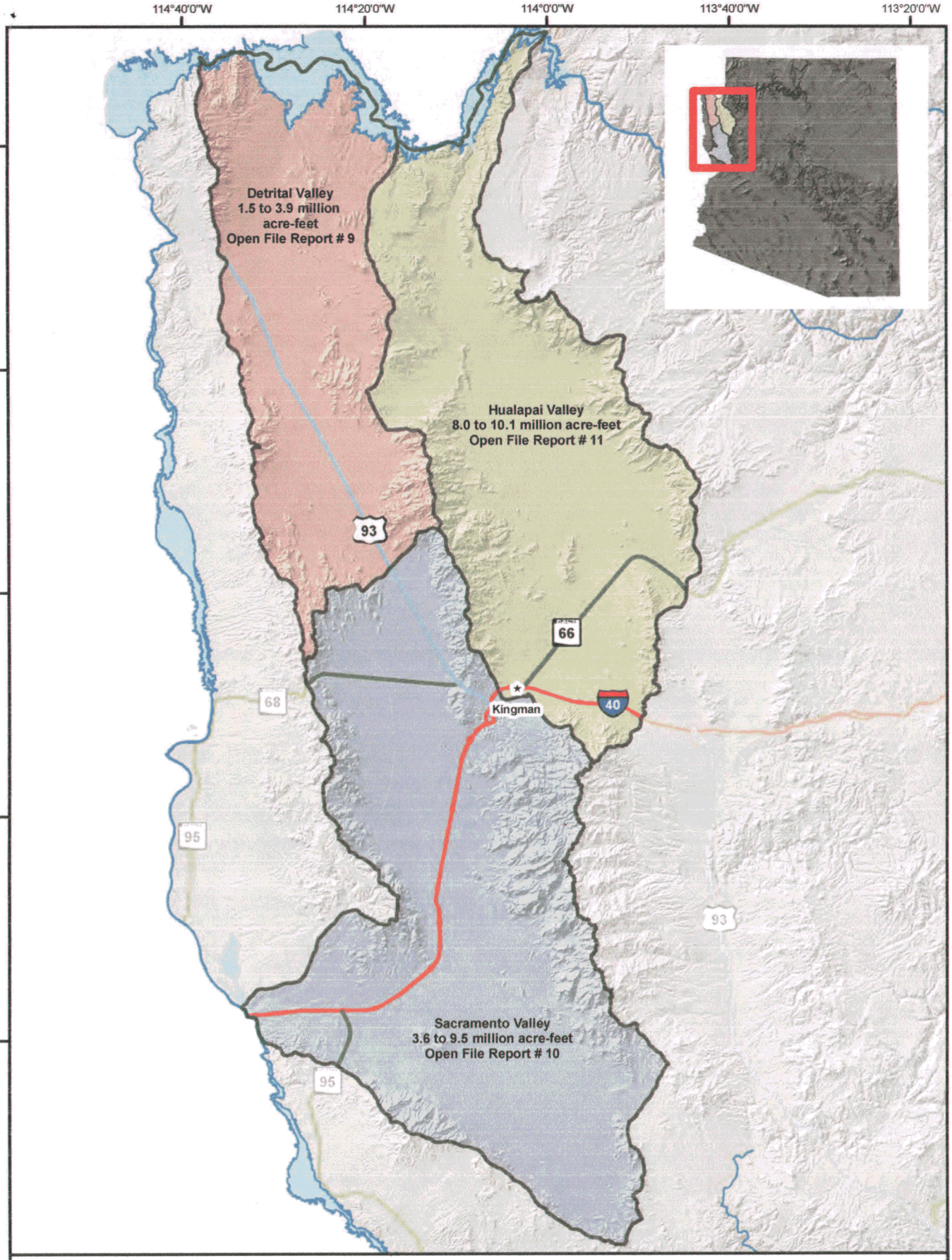

Mohave County Groundwater In Storage Estimates For The
Detrital Valley, Hualapai Valley, and Sacramento Valley Groundwater Basins

Groundwater Basins
Rivers
Lakes

Highways and Interstates
Interstate
US
State

1:885,192

0 3 6 12 18 24 Miles

N W E S

ARIZONA DEPARTMENT OF WATER RESOURCES

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...ll sic...

ADWR

...R. was created legislatively in response to a serious condition called "overdraft" of Arizona's water supply. In the Mohave County General Plan "overdraft" is referred to as "depletion". Simply put overdraft or depletion is the act of pumping groundwater out of the aquifers faster than it is being replaced or recharged naturally. ~~Just imagine drinking a glass of your favorite beverage through a straw and never refilling your glass. As you suck through the straw your beverage will disappear and your glass will become empty.~~ Overdraft or depletion also increases the costs of drilling and pumping and of course the inevitable loss of our water supply will be both physically and financially devastating to the entire community.

1

Let's look at the recharge rate (or lack thereof) of the Hualapai Aqufure. This aquifer supplies water to the City of Kingman and private well owners north of Kingman. ~~This is the Estimated Annual Natural Recharge (water replacing the water being drawn out of the aquifer) per A.D.W.R.:~~

~~(a) 2000 - 2500 acre feet per year (per Remick 1981)~~

~~OR~~

~~(b) 3000 acre feet per year (per Freethey & Anderson 1986)~~

applicant Refused to Monitor

~~Let's give the benefit of the doubt and utilize the higher recharge rate of 3000 acre feet per year for this example.~~ With Cultural Demand (water usage) in the period of 2001 - 2005 (it's is far higher now) of 8900 acre feet per year A.D.W.R.'s hydrology shows that the Hualapai Aquifer is being pumped into a state of decline at approximately 5900 acre feet per year. Now, let's add in the ~~4000~~ 4000 acre feet that the proposed Mohave Sun Power "WET COOLED" power plant plans to withdraw. By the way, according to Laura Grignano, A.D.W.R.'s Industrial Planner there is no monitoring of the amount of water that Mohave Sun Power removes from the aquifer. ~~[illegible]~~ we have 9900 acre feet per year of depletion within the Hualapai aquifer. That's... 3 BILLION, 237 million, 300 thousand gallons of water per year being taken out of the aquifer and NOT being recharged back in.

Since has been requested

Here is NO MONITORING

The FACT is that we are emptying our water supply and not replenishing it. The Hualapai aquifer is in a state of DEPLETION! We WILL run out of water if we do not IMMEDIATELY start practicing intelligent growth and create a water plan to suit our emergency status! ONLY APPROVING A DRY COOLED POWER PLANT IS APPROPRIATE!

...Mo... ...nt... ~~the health, well being and property values of the~~ average citizen in favor of

INTENT OF 3.5

Denise Bensusan@hughes.net

From: [redacted]
To: <denisebensusan@hughes.net>
Sent: Monday, January 11, 2010 8:37 PM
Attach: Morrison_ExecSum.pdf; MostlyDry_Forecast.doc; Warm_Earth.doc; WaterOrPower.doc
Subject: Re: Haulapai Valley Solar

Can speak with some credibility on this!

Denise:

MR WALKE DID NOT PARTICIPATE AT PUBLIC

Relax, you have plenty of public speaking skills and certainly have had chances to practice them over the years thanks to Mohave County P&Z! However, if you have a copy of Henry V, read Act IV to rouse your spirit and put noble luster in your eyes!

JACK ETAL was present as was NWAWC

For the genesis of Goal Three and Policy 3.5 of the General Plan, these originate from the 2001 update of the General Plan (see Section IV.B, p. 30) to conform to Growing Smarter Plus legislation, namely ARS 11-823.C.3, which reads as follows:

Planning for water resources that addresses: NWAWCD

(a) The known legally and physically available surface water, groundwater and effluent supplies.

(b) The demand for water that will result from future growth projected in the county plan, added to existing uses.

(c) An analysis of how the demand for water that will result from future growth projected in the comprehensive plan will be served by the water supplies identified in subdivision (a) of this paragraph or a plan to obtain additional necessary water supplies.

The Arizona experts on this include Grady Gammage, Steven Betts and Arlan Colton to name three.

How to meet this ambitious state requirement was discussed among staff at the time, and with a little input from the Northwest Arizona Watershed Council, "Water in Perpetuity" was coined. I should also note that this seeking out of a citizen group for help in creating the plan is the keystone of the Growing Smarter mantra of getting the public involved "early and continuously" in the planning process.

Policy 3.5 came from the aftermath of the Caithness/Big Sandy 720 MW power plant, also heard by the ACC in 2001. Part of our plan to achieve water in perpetuity is to address discretionary actions by the County, i.e. legislative actions such as rezones with conditions for water conserving technology. So our "plan to obtain additional necessary water supplies" is one of demand side-management through conservation vs. the supply-side option of building a pipeline (see attached Exec Summary from Lake Powell Pipeline Study). As I noted, the Board can choose to take another approach to make sure the growth projected in the General Plan is adequately served by water, for example rainwater harvesting and recharge of run-off, or to buy out the California farmers(!), but they really shouldn't through their hands up in the air and say we have no authority over land use decisions that have a water conservation component. Land use decisions of of local electd officials andhas been for four-score years since Euclid vs. Ambler (which see) and the Standard State Zoning Enabling Act, as well as the Standard State Planing Enabling Act, all from the 1920s.

Ron Walker uses mud and army general plan as the public meeting concerns

Final Staff Report

If you are curious about the California Energy Commission's approach to CSPs, take a look at this site for Beacon Energy http://www.energy.ca.gov/sitingcases/beacon/ and look at the Final Staff report from 10/22/2009 beginning around page 701. This is a new 250 MW CSP proposed about 15 mile north of Mojave at 2,300 feet of elevation in an equally dry and drought challenged environment.

[redacted]

P.S. I have also attached a few news articles from my archive on warmer and drier days ahead that might be of use.

Beacon Solar energy project.

Per Andy Whitefield Unintended consequences

[redacted] and told him that the siting of wet-cooled power plants in the Southwest will have the unintended consequence of stopping sprawl, at least within a five mile radius of each facility for fear of having to compete with an industrial well-field. With the County approval having been reduced from 11-12 months down to three or four months, there really is no surety of investment for rural land owners who want to have forty-acres and mule or a "new city." In the final analysis, the unintended consequences of such growth control may limit our leadership's vision of manifest destiny in the long-run.

As always, discretion is the better part of valor.

[redacted]

P.S. You have seen this video, but I thought I would pass it along:
http://www.slideshare.net/MitchellDong/mohave-sun-power-340-mw-hualapai-valley-solar-project-September-2009

Denise
Denise Bensusan

CONTACT INFO:
denisebensusan@hughes.net
http://speakoutarizona.com/
Main: 928-692-6933
Cell: 928-727-6933
Fax: 928-692-6993

"The world is not dangerous because of those who do harm, but because of those who look at it without doing anything." Albert Einstein

-----Original Message-----
From: Denise Bensusan@hughes.net <denisebensusan@hughes.net>
To: davidkevart@aol.com
Sent: Mon, Jan 11, 2010 6:49 pm
Subject: Re: Haulapai Valley Solar

I am on the phone with jack E. He said..... can you give me a timeline and intent on the when and how the general plan was created...in particular 3.5. What was the intention of that part of the plan. He said for me to reference it in my testimony and to mention his name NOT yours!

Do you think you might be bale to do that for me? Its a SECRET...he also told me to tell you that you can trust me! LOL. I need to have something to fight Ron Walker with.....

----- Original Message -----
From: [redacted]
To: denisebensusan@hughes.net
Sent: Monday, January 11, 2010 4:45 PM
Subject: Haulapai Valley Solar

Denise:

How are you today? I have the day off to use some of that remaining 900-hour PTO balance; however, the office has a way of finding me. At 2:15 PM I talked to Nick Hont about the testimony planned for tomorrow's ACC Line Siting Committee hearing for HVS and how I should respond to a possible subpoena to appear before the Committee. Ron Walker is representing the County which has effectively put a gag order on other staff input according to Nick and also Ray Osuna, Personnel Director. Mr. Osuna told Nick the cautionary tale about the employees who went to a County Supervisor (possibly Pete Byers) and lobbied him not approve the County's request (possibly from Mike Hendrix and Ron Walker) for the BOS to place GPS in their work vehicles in order to keep track of their mileage and whereabouts. They were disciplined for such disloyalty. Because this bit of advice was offered to me as an analog, I understand its meaning and the intended effect on mid-level bureaucrats. This also applies to my testifying as a private citizen. I appreciate Nick's candor and concern for my welfare; we have known each other for nine years now and I can call him a friend. We are also facing another difficult budget year, and I would hate to see the Development Services Department's budget cut. Given all that back-story, my circumstances seem to be a bit different from the subterfuge of a handful of underachievers, for lack of a better word, in that there is no personal gain on my part nor I'm I trying to cover up something, and that my testimony is solicited from a bona-fide state agency/governing body versus an active lobbying effort on part. What do you think? I wonder what the ACC thinks?

Another resource you may find at the hearings is Grady Gammage Jr. Although he is the attorney for the proponent, his knowledge of land use and water law in Arizona is first rate. The approvals required by the County - General Plan Amendment and Rezone - are legislative first and foremost, requiring a vote of the Board and are subject to referendum. These differ from quasi-judicial actions, the process used by the plating authority, which in our case is also the BOS, to approve a subdivision. So, without the adoption of the ARS rules laid about in SB 1575, the County really cannot deny a preliminary or final plat based upon water shortage, but we are not talking about a subdivision plat. This is where Grady's knowledge can be put to best use. The County cannot deny a well permit either, because they have no authority in their issuance. Well permits are the purview of ADWR. But then again that is not the question. The question is can the County approve or deny a rezone using any rational basis or maybe even an attempt to achieve a goal or policy in a county-adopted plan? Combine that with the recent USGS findings on water use in the Hualapai Valley (over 10,000 acre per year) and estimated recharge (less than 5,000 acre feet and our persistent drought) and groundwater flow (1 mile per thousand years) and you can make a pretty good case for rational basis. But then again when acting in its legislative capacity, the Board does not need detailed findings such as these, just looking out for the "welfare" of the constituents which has been defined by the Supreme Court, Thank you William O. Douglas, as "broad and inclusive." This means the Board can still go ahead and approve the General Plan amendment and rezone if they see the approval providing more jobs and tax base, they just can't say they have no authority, abrogating their responsibility as men and ethical beings, to avoid voter wrath in 2012.

The Great Spirit created Man and Woman in his own image. In doing so both were created as equal. Both depending on each other in order to survive. Great respect was shown for each other; in doing so, happiness and contentment was achieved then, as it should be now.

The connecting of the Hair makes them one person: for happiness or contentment cannot be achieved without each other

The Canyons are represented by the purples in the middle ground, where the people were created. These canyons are Sacred, and should be so treated at all times

The Reservation is pictured to represent the land that is ours, treat it well.

The Reservation is our heritage and the heritage of our children yet unborn. Be good to our land and it will continue to be good to us.

The Sun is the symbol of life, without it nothing is possible - plants don't grow - there will be no life - nothing. The Sun also represents the dawn of the Hualapai people. Through hard work, determination and education, everything is possible and we are assured bigger and brighter days ahead.

The Tracks in the middle represent the coyote and other animals which were here before us.

The Green around the symbol are pine trees, representing our name Hualapai - PEOPLE OF THE TALL PINES -

Hualapai Tribal Nation

Department of Planning & Economic Development

P.O. Box 179/941 Hualapai Way, Peach Springs, Arizona 86434

Phone (928) 769-2216 Ext. 104 Fax (928) 769-1063

hualapaiplanning@citlink.net

Comments; Department of Energy-Western Area Power Administration-Phoenix Arizona, August 24-09

Re: Hualapai Solar-340 megawatt –concentrated solar-wet cooled- Kingman Arizona area

Traditionally the Tribe has always been conscientious environmental stewards of their ancestral land and this includes the whole Hualapai Valley that this project is proposed in. The impacts and Cultural Concerns of the Power Plant are described by the Hualapai Tribe T.H.P.O.

Environmental and long term impacts to this style of project are also a concern. While solar energy is the absolute best energy source for meeting Federal mandates and State Renewable Energy Portfolio Standards, the water consumption required in this full wet cooled power plant is irresponsible to approve when dry cooled or hybrid technology is available to use with minimal energy production loss. All Federal Agencies including the Hualapai Tribe are required to use B.A.C.T., Best Available Current Technology including L.E.E.D., Leadership Energy Environmental Design, in deploying new capital projects. The Hualapai Tribe has exceeded L.E.E.D.in many cases and continues to excel in complying with responsible Environment Design and local Environmental stewardship.

The United States Congress requested of U.S. Department of Energy a, "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation". Please reference this whole 24 page report , page 5 last paragraph "Air cooling [dry] and wet/dry hybrid cooling systems offer highly viable alternatives that could reduce the total water usage of steam-generating CSP Plants by 80 to 90% at a penalty in electricity cost in the neighborhood of 2 to 10% ,depending on plant location and other assumptions." The document is designed to enlighten and empower agencies to understand that we can embrace the new solar technology and still be responsible stewards to our Natural Resources, including the protection of the unnecessary waste of our valuable

underground water resources .Please require this applicant to use the Department of Energy's recommendations in Air cooling technology that are part of current water conservation measures. By not requiring them to be dry cooled is like allowing a new car to be built without a catalytic converter because it will get better gas mileage. We simply do not do that anymore. Please recognize that in the Mohave County General Plan, policy requires dry cooling for power plants within its County and it violates some Arizona State law to give approval action against a County Plan. All energy projects when looked at from and especially from a N.E.P.A. perspective have this responsibility.

The Hualapai Tribe has asked the applicant to participate in a regional area transmission interconnect meeting to consider best benefits for all new planned projects in the area, including and especially renewable projects. Four new projects are proposed in the immediate area including the Hualapai Tribes proposed 150 megawatt wind farm. We have not heard back from them on this and believe it is significantly important to have this regional collaborative planning to consider joint cost saving and good regional long range energy development planning. We request these meeting for this planning be part of the approval process and be administered by W.A.P.A with reasonable accountability and benefits marked.

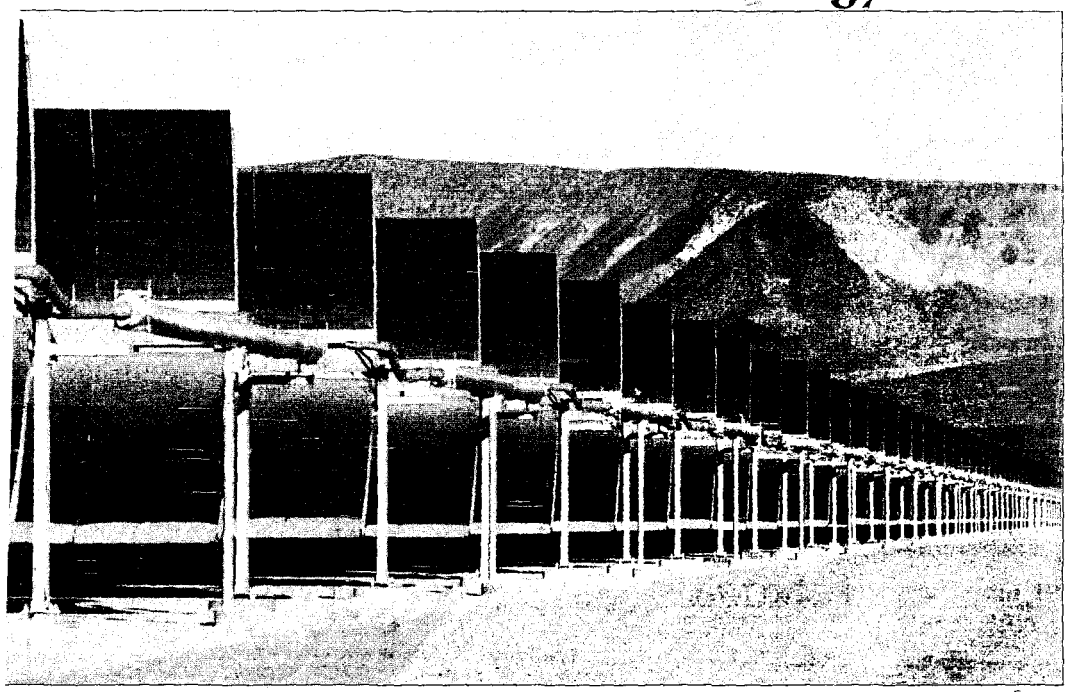
We thank you for the opportunity to give this input and look forward to the exciting new times in this paradigm shift to new clean renewable energy development .

Respectfully Submitted

Jack Ehrhardt

Jack Ehrhardt Director

The Green Behind Green Energy



Courtesy

Mohave County's landscape could soon be dotted with solar power plants similar to this one in Nevada.

Tax incentives fuel solar boom

Companies with Mohave County plans cashing in on 30-percent federal tax credit for construction

By Suzanne Adams
Miner Staff Writer

KINGMAN – Recent incentives by Congress have caused a flood of interest in and a scurry to build solar plants, especially in Mohave County.

Last year, Congress continued an incentive program that grants companies a 30-percent federal tax credit for building a solar or alternative energy plant.

Congress modified that incentive for 2009/2010 as part of the stimulus package that was passed earlier this year. The stimulus package modification turns the tax credit into a one-time 30-percent grant to businesses that start building solar plants in 2009 and finish before 2016.

In the last year, the county has seen a spike in the number of zoning and General Plan amendments for solar plants. There are currently four zoning requests and one completed solar plant in the county.

The most frequently stated reason for building a solar plant in the county is the generous amount of sun, cheap land and the rural nature of the county.

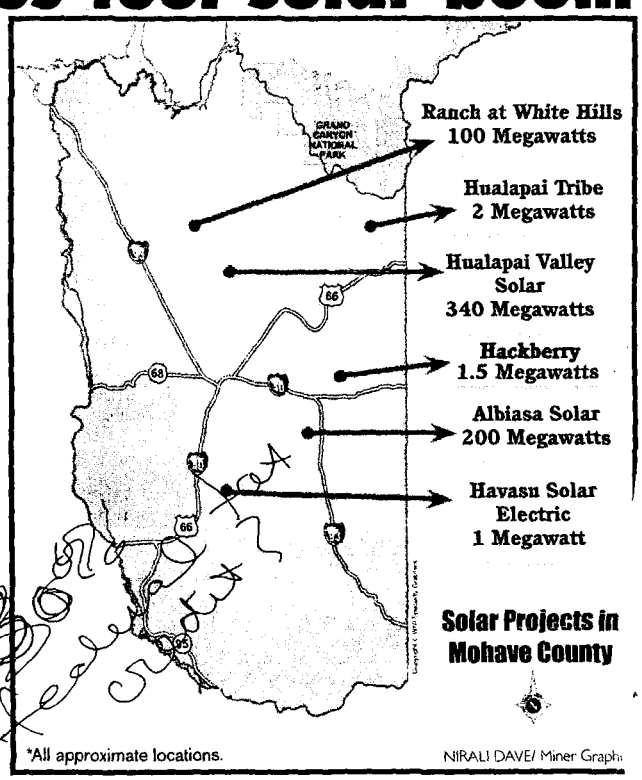
The Hualapai Tribe was the first to build a solar plant in the county. It owns a 2-megawatt solar plant on its land that helps supply the community with power. The tribe was able to build the plant with a grant from the federal government.

Developer Leonard Mardian is also working on a 100-megawatt photovoltaic plant for his Ranch at White Hills development near Dolan Springs. The plant will use solar panels to provide electricity to the community.

There are also two smaller photovoltaic plants proposed for the Yucca and the Hackberry areas.

The Yucca plant is proposed by Havasu Solar Electric and would include a 1-megawatt photovoltaic solar farm on nearly 46 acres of land east of Interstate 40 and north of Boriana Mine Road near Yucca. Th solar panels for the farr

See SOLAR, 5



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Martin Swanty Penske • 753-5151
2610 E Andy Devine

199 FT.

The transmission structure heights will not exceed 199 feet and will occupy a right of way ("ROW") width up to a maximum of 200 feet.

A general location map of the Project is set forth in **Exhibit A**.

CONDITIONS

This Certificate is granted upon the following conditions:

1. The conditions shall apply to the Applicant, its successor(s), and assignee(s).

2. The Applicant shall obtain all approvals and permits required by the United States, the State of Arizona, the County of Mohave, and any other governmental entities having jurisdiction necessary to construct the Project.

3. The Applicant shall comply with all existing applicable statutes, ordinances, master plans and regulations of the State of Arizona, the County of Mohave, the United States, and any other governmental entities having jurisdiction, including but not limited to the following:

(a) all applicable land use regulations;

(b) all applicable zoning stipulations and conditions, including but not limited to landscaping and dust control requirements;

(c) all applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

(d) all applicable noise control standards;

(e) all applicable regulations and permits governing storage and handling of chemicals and petroleum products;

(f) all other applicable federal and state regulations and standards.

4. Applicant may utilize groundwater for electrical generation and related uses associated with construction and commercial operation of the Project. The Applicant shall make good faith efforts to acquire effluent from the City of Kingman to meet a majority of the water needs for the Project.

Applicant shall make good faith efforts to acquire effluent from the city of Kingman

NOT GOOD ENOUGH

Hualapai Tribal Burial Grounds

5. If any archaeological, paleontological or historical site or object that is at least fifty years old is discovered on state, county or municipal land during the construction or operation of the solar generating facility and transmission line, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum, and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844.

6. If human remains and/or funerary objects are encountered on private land during the course of any ground-disturbing activities relating to the construction or operation of the solar generating facility and transmission line, the Applicant shall cease work on the affected area of the Project and notify the Director of the Arizona State Museum as required by A.R.S. § 41-865.

7. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the destruction of native plants during the construction and operation of the solar generating facility and transmission line.

8. This authorization to construct this Project (which may be constructed in two phases) shall expire unless the solar generating facility and transmission line is capable of operation within seven years from the date the Certificate is approved by the Commission. However, prior to expiration, the Applicant may request that the Commission extend this time limitation. May ask for extention

9. In the event that the Project requires an extension of the term of this Certificate prior to completion of construction, Applicant shall use reasonable means to notify all landowners and residents within one mile of the Project corridor as depicted on Exhibit A, all persons who made public comment at this proceeding, and all parties to this proceeding of the request and the date, time and place of the hearing in which the Commission will consider the request for extension. (Consider the request)

10. The Applicant shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the transmission lines and related facilities addressed in this Certificate. The Applicant shall maintain written records for a period of five years of all complaints of radio or television interference attributable to operation, together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission.

11. Within 120 days of the Commission decision granting this Certificate, Applicant will post a sign at the plant site. The sign shall be no smaller than a normal roadway sign and shall advise:

(a) That the site has been approved for the construction of Project facilities;
(b) The expected date of completion of the Project facilities;
(c) A phone number for public information regarding the Project;
(d) The name of the Project;
(e) The name of the Applicant; and
(f) The website of the Project.

12. Applicant shall design the transmission line to incorporate reasonable measures to minimize impacts to raptors.

13. Applicant shall use non-specular conductor and non-reflective surfaces for transmission line structures.

14. Before construction on this Project may commence, the Applicant shall file a construction mitigation and restoration plan ("Plan") with ACC Docket Control. Where practicable, the Plan shall specify the Applicant's plans for construction access and methods to minimize impacts to wildlife and to minimize vegetation disturbance outside of the Project right-of-way particularly in drainage channels and along stream banks. Applicant shall re-vegetate, unless waived by the landowner, native areas of construction disturbance to its preconstruction state outside of the power-line right of way after construction has been completed. The Plan shall

specify the Applicant's plans for coordination with the Arizona Game and Fish Department and the State Historic Preservation Office. The Applicant shall use existing roads for construction and access where practicable and the Plan shall specify the manner in which the applicant makes use of existing roads.

15. Applicant shall follow regulatory requirements of the Arizona Game and Fish Department of the United States Fish and Wildlife Service for handling contacts during the construction and operation of the Project with any species designated as endangered. Applicant also shall follow regulatory requirements for handling contacts with any species of greatest conservation need as designated by the Arizona Game and Fish Department. If no regulatory requirements exist, the Applicant shall use reasonable care to avoid any harm to individuals of the designated species. If the avoidance of harm to individuals is not possible, the Applicant shall contact the Arizona Game and Fish Department and the United States Fish and Wildlife Service to obtain any appropriate permits and guidance for removing the individual members of the species contacted from the area of the Project.

16. With respect to the Project, Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner.

17. The Applicant shall provide copies of this Certificate to the Mohave County Planning Department, the City of Kingman, the Arizona State Land Department, the State Historic Preservation Office, and the Arizona Game and Fish Department.

18. Prior to the date construction commences on this Project, the Applicant shall provide known homebuilders and developers within one mile of the center line of the Certificated route and solar facility, the identify, location, and a pictorial depiction of the type of power line and solar facility being constructed, accompanies by a written description, and encourage the developers and homebuilders to include this information in the developers' and homebuilders' homeowners' disclosure statements.

19. Applicant will follow the most current Western Electricity Coordinating Council/North American Electric Reliability Corporation Planning standards as approved by the Federal Energy Regulatory Commission, and National Electrical Safety Code construction standards.

20. The Applicant shall submit a self-certification letter annually, identifying progress made with respect to each condition contained in the Certificate, including which conditions have been met. Each letter shall be submitted to the docket control of the Arizona Corporation Commission by December 1, 2010, and annually thereafter. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter along with the corresponding documentation shall be submitted to the Arizona Attorney General and Department of Commerce Energy Office. The requirement for the self-certification shall expire on the date the Project is placed into operation.

21. Within sixty (60) days of the Commission decision granting this Certificate, the Applicant shall make good faith efforts to commence discussions with private landowners, on whose property the Project corridor is located, to identify the specific location for the Project right-of-way and placement of poles.

22. The Applicant shall expeditiously pursue reasonable efforts to work with private landowners on whose property the Project right-of-way will be located, to mitigate the impacts of the location, construction, and operation of the Project on private land.

FINDINGS OF FACT AND CONCLUSIONS OF LAW

This Certificate incorporates the following findings of fact and conclusions of law:

1. The Project aids the state in meeting the need for an adequate, economical and reliable supply of renewable electric power. WHICH STATE? Electric is shipped out of AZ

2. The conditions placed on the Project in the Certificate by the Committee effectively minimize the impact of the Project on the environment and ecology of the state.

3. The Project is in the public interest because the Project's contribution to meeting the need for an adequate, economical and reliable supply of renewable electric power outweighs the minimized impact of the Project on the environment and ecology of the state.

DATED this ____ day of _____ 2010.

THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

_____
John Foreman, Chairman

Which State?

EXHIBIT B

CONDITIONS (Case 15~~0~~1)

This Certificate is granted upon the following conditions:

~~1.~~ 1. The conditions shall apply to the Applicant, its successor(s), and assignee(s).

2. The Applicant shall obtain all approvals and permits required by the United States, the State of Arizona, the County of ~~Maricopa~~Mohave, and any other governmental entities having jurisdiction necessary to construct the Project.

3. The Applicant shall comply with all existing applicable statutes, ordinances, master plans and regulations of the State of Arizona, the County of ~~Maricopa~~Mohave, the United States, and any other governmental entities having jurisdiction, including but not limited to the following:

(a) all applicable land use regulations;

(b) all applicable zoning stipulations and conditions, including but not limited to landscaping and dust control requirements;

(c) all applicable water use, discharge and/or disposal requirements of the Arizona Department of Water Resources and the Arizona Department of Environmental Quality;

(d) all applicable noise control standards;

(e) all applicable regulations and permits governing storage and handling of chemicals and petroleum products;

(f) all other applicable federal and state regulations and standards.

4. ~~During commercial operation~~ Applicant may utilize groundwater for ~~solar~~ electrical generation and related uses associated with construction and commercial operation of the Project ~~pursuant to an application to the Arizona Department of Water Resources under ARS § 45-440. The total water use from groundwater and other sources shall not exceed 3000 acre feet per year for a 290 MW plant, and proportionally less for a smaller plant or phase. Prior to the commencement of commercial operation, Applicant will file with Commission Docket control, with the Department of Environmental quality, and with the~~

Removed

~~Department of Water Resources, a letter confirming that Applicant has secured both an adequate supply of water to produce the rated power of the plant or phase being placed in operation using CSP parabolic trough technology with thermal storage, and a legal right to use the water needed for the purpose of construction and commercial operation of the Project. This provision applies only to the use of groundwater for non-agricultural purposes, and only becomes applicable to each segment of subject property as land is retired from agriculture upon commencement of construction of each phase of the project. This provision does not limit use of groundwater for agricultural purposes prior to commencement of construction or following decommissioning.~~. The Applicant shall make good faith efforts to acquire effluent from the City of Kingman to meet a majority of the water needs for the Project. GOOD FAITH EFFORT

MONITORING REMOVED WITH

5. ~~Applicant shall enter into a land subsidence monitoring agreement with the Arizona Department of Water Resources.6.~~ If any archaeological, paleontological or historical site or object that is at least fifty years old is discovered on state, county or municipal land during the construction or operation of the solar generating facility and transmission line, the Applicant or its representative in charge shall promptly report the discovery to the Director of the Arizona State Museum, and in consultation with the Director, shall immediately take all reasonable steps to secure and maintain the preservation of the discovery as required by A.R.S. § 41-844.

~~7~~6. If human remains and/or funerary objects are encountered on private land during the course of any ground-disturbing activities relating to the construction or operation of the solar generating facility and transmission line, the Applicant shall cease work on the affected area of the Project and notify the Director of the Arizona State Museum as required by A.R.S. § 41-865.

~~8~~7. The Applicant shall comply with the notice and salvage requirements of the Arizona Native Plant Law (A.R.S. §§ 3-901 *et seq.*) and shall, to the extent feasible, minimize the

destruction of native plants during the construction and operation of the solar generating facility and transmission line.

~~9~~8. This authorization to construct this Project (which may be constructed in two phases) shall expire unless the solar generating facility and transmission line is capable of operation within seven years from the date the Certificate is approved by the Commission. However, prior to expiration, the Applicant may request that the Commission extend this time limitation.

~~10~~9. In the event that the Project requires an extension of the term of this Certificate prior to completion of construction, Applicant shall use reasonable means to notify all landowners and residents within one mile of the Project corridor as depicted on Exhibit A, all persons who made public comment at this proceeding, and all parties to this proceeding of the request and the date, time and place of the hearing in which the Commission will consider the request for extension.

1~~1~~0. The Applicant shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the transmission lines and related facilities addressed in this Certificate. The Applicant shall maintain written records for a period of five years of all complaints of radio or television interference attributable to operation, together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution shall be noted and explained. Upon request, the written records shall be provided to the Staff of the Commission.

1~~2~~1. Within 120 days of the Commission decision granting this Certificate, Applicant will post ~~signs in public rights-of-way giving notice of the Project corridor to the extent authorized by law. The Applicant shall place signs in prominent locations at reasonable intervals such that the public is notified along the full length of the transmission line until~~

~~the transmission structures are constructed. To the extent practicable, within 45 days of securing easement or right-of-way for the Project, the Applicant shall erect and maintain signs providing public notice that the property is the site of a future transmission line. Such signage~~a sign at the plant site. The sign shall be no smaller than a normal roadway sign~~.~~ ~~The signs~~ and shall advise:

(a) That the site has been approved for the construction of Project facilities;
(b) The expected date of completion of the Project facilities;
(c) A phone number for public information regarding the Project;
(d) The name of the Project;
(e) The name of the Applicant; and
(f) The website of the Project.

~~13.~~ 12. Applicant shall design the transmission ~~lines~~line to incorporate reasonable measures to minimize impacts to raptors.

~~14.~~ 13. Applicant shall use non-specular conductor and non-reflective surfaces for transmission line structures.

1~~5~~4. Before construction on this Project may commence, the Applicant shall file a construction mitigation and restoration plan ("Plan") with ACC Docket Control. Where practicable, the Plan shall specify the Applicant's plans for construction access and methods to minimize impacts to wildlife and to minimize vegetation disturbance outside of the Project right-of-way particularly in drainage channels and along stream banks~~, and~~. Applicant shall re-vegetate, unless waived by the landowner, native areas of construction disturbance to its preconstruction state outside of the power-line right of way after construction has been completed. The Plan shall specify the Applicant's plans for coordination with the Arizona Game and Fish Department and the State Historic Preservation Office. The Applicant shall use existing roads for construction and access where practicable and the Plan shall specify the manner in which the applicant makes use of existing roads.

1~~6~~5. Applicant shall follow ~~any published guidelines adopted by~~regulatory requirements of the Arizona Game and Fish Department of the United States Fish and Wildlife Service for handling contacts during the construction and operation of the Project with any species designated as endangered. Applicant also shall follow ~~any published and adopted guidelines~~regulatory requirements for handling contacts with any species of greatest conservation need as designated by the Arizona Game and Fish Department. If no ~~published and adopted guidelines~~regulatory requirements exist, the Applicant shall use reasonable care to avoid any harm to individuals of the designated species. If the avoidance of harm to individuals is not possible, the Applicant shall contact the Arizona Game and Fish Department and the United States Fish and Wildlife Service to obtain any appropriate permits and guidance for removing the individual members of the species contacted from the area of the Project.

1~~7~~6. With respect to the Project, Applicant shall participate in good faith in state and regional transmission study forums to coordinate transmission expansion plans related to the Project and to resolve transmission constraints in a timely manner.

~~18.~~ 17. The Applicant shall provide copies of this Certificate to ~~appropriate city, town and county planning agencies, mayors and town councils, W Harquahala, LLC~~the Mohave County Planning Department, the City of Kingman, the Arizona State Land Department, the State Historic Preservation Office, and the Arizona Game and Fish Department.

~~19.~~ 18. Prior to the date construction commences on this Project, the Applicant shall provide known homebuilders and developers within one mile of the center line of the Certificated route and solar facility, the identify, location, and a pictorial depiction of the type of power line and solar facility being constructed, accompanies by a written description, and encourage the developers and homebuilders to include this information in the developers' and homebuilders' homeowners' disclosure statements.

~~20.~~ 19. Applicant will follow the most current Western Electricity Coordinating Council/North American Electric Reliability Corporation Planning standards as approved by the Federal Energy Regulatory Commission, and National Electrical Safety Code construction standards.

~~21.~~ 20. The Applicant shall submit a self-certification letter annually, identifying progress made with respect to each condition contained in the Certificate, including which conditions have been met. Each letter shall be submitted to the docket control of the Arizona Corporation Commission by ~~May~~December 1, 2010, and annually thereafter. Attached to each certification letter shall be documentation explaining how compliance with each condition was achieved. Copies of each letter along with the corresponding documentation shall be submitted to the Arizona Attorney General and Department of Commerce Energy Office. The requirement for the self-certification shall expire on the date the Project is placed into operation.

~~22.~~ 21. Within sixty (60) days of the Commission decision granting this Certificate, the Applicant shall make good faith efforts to commence discussions with private landowners, on whose property the Project corridor is located, to identify the specific location for the ~~project's~~Project right-of-way and placement of poles.

~~23.~~ 22. The Applicant shall expeditiously pursue reasonable efforts to work with private landowners on whose property the Project right-of-way will be located, to mitigate the impacts of the location, construction, and operation of the Project on private land.

A 1-4-2010

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No.: L-00000NN-09-0541-00151 Case No. 151 **HUALAPAI VALEY SOLAR LLC'S NOTICE OF FILING PROPOSED FORM OF CERTIFICATE OF ENVIRONMENTAL COMPATIBLITY**

Pursuant to Paragraph 18 of Chairman Foreman's November 25, 2009 Procedural Order, HUALAPAI VALLEY SOLAR LLC ("HVS"), files a proposed form of Certificate of Environmental Compatibility, findings of fact, and conclusions of law. (Exhibit 1). Consistent with Paragraph 20 of the Procedural Order, HVS also files a document showing the previous case upon which the proposed conditions in Case 151 are based. (Exhibit 2).

Respectfully submitted this 4th day of January, 2010.

LEWIS AND ROCA LLP

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Albert H. Acken
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Phoenix, Arizona 85004
Attorneys for Hualapai Valley Solar LLC
(602) 262-5723 (Tel.)
(602) 734-3841

ORIGINAL and twenty-five (25) copies
of the foregoing filed this 4th day
of January, 2010, with:

The Arizona Corporation Commission
Utilities Division – Docket Control
1200 W. Washington Street
Phoenix, Arizona 85007

COPY of the foregoing hand delivered
or served electronically
this 4th day of January, 2010, to:

John Foreman, Chairman
Arizona Power Plant and Transmission Line Siting Committee
Office of the Attorney General
PAD/CPA
1275 W. Washington Street
Phoenix, Arizona 85007

Janice Alward, Chief Counsel
Arizona Corporation Commission
1200 W. Washington Street
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Tempe, Arizona 85283

Betty J. Griffin

EXHIBIT A

BEFORE THE ARIZONA POWER PLANT AND TRANSMISSION LINE SITING COMMITTEE

IN THE MATTER OF THE APPLICATION OF HUALAPAI VALLEY SOLAR LLC, IN CONFORMANCE WITH THE REQUIREMENTS OF ARIZONA REVISED STATUTES §§ 40-360.03 AND 40-360.06, FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AUTHORIZING CONSTRUCTION OF THE HVS PROJECT, A 340 MW PARABOLIC TROUGH CONCENTRATING SOLAR THERMAL GENERATING FACILITY AND AN ASSOCIATED GEN-TIE LINE INTERCONNECTING THE GENERATING FACILITY TO THE EXISTING MEAD-PHOENIX 500kV TRANSMISSION LINE, THE MEAD-LIBERTY 345kV TRANSMISSION LINE OR THE MOENKOPI-EL DORADO 500kV TRANSMISSION LINE.	Docket No.: L-00000NN-09-0541-00151 Case No. 151

CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY

Pursuant to notice given as provided by law, the Arizona Power Plant and Transmission Line Siting Committee (the "Committee") held a public hearing on January 12 through January 14, 2009, in Kingman, Arizona, in conformance with the requirements of Arizona Revised Statutes ("A.R.S.") §§40-360, *et seq.*, for the purpose of receiving evidence and deliberating on the Application of Hualapai Valley Solar LLC ("Applicant") for a Certificate of Environmental Compatibility ("Certificate") in the above-captioned case (the "Project").

The following members and designees of members of the Committee were present at one or more of the hearing days for the evidentiary presentations and for the deliberations:

John Foreman	Chairman, Designee for Arizona Attorney General, Terry Goddard
Paul Rasmussen	Designee for Director, Arizona Department of Environmental Quality

David Eberhart	Designee for Chairman, Arizona Corporation Commission
Jessica Youle	Designee for Director, Energy Office, Arizona Department of Commerce
Greg Houtz	Designee for Director, Arizona Department of Water Resources
Jeff McGuire	Appointed Member
William Mundell	Appointed Member
Patricia Noland	Appointed Member
Michael Palmer	Appointed Member
Michael Whalen	Appointed Member
Barry Wong	Appointed Member

The Applicant was represented by Thomas H. Campbell and Albert H. Acken, of the law firm of Lewis and Roca LLP. Denise Herring-Bensusan and Susan A. Moore-Bayer requested intervention in this proceeding.

At the conclusion of the hearings, the Committee, having received the Application, the appearances of the parties, the evidence, testimony and exhibits presented at the hearings, and being advised of the legal requirements of A.R.S. §§40-360 to 40-360.13, upon motion duly made and seconded, voted _____ to grant the Applicant this Certificate of Environmental Compatibility (Case No. 151) for the Project as set forth in the Application.

The Project consists of an up to 340 MW concentrated solar power ("CSP") generating facility, with biofuel, light fuel oil or natural gas co-firing, and a 345kV or 500kV transmission line (the "Gen-Tie"). The Project is located in Mohave County, approximately 27 miles north of Kingman, Arizona, and 80 miles southeast of Las Vegas, Nevada. The generating facility is located entirely on private land in Sections 19, 20, 21, 28, 29, 30, and the north half of Section 31 all within Township 26 North, Range 16 West, Gila and Salt River Baseline and Meridian.

Sections 19, 20, 21, 28, 29, 30
N ½ of Sec. 31
T 26 N, R 16 W
Gila + Salt River

The Gen-Tie will interconnect the CSP generating facility (and/or a photovoltaic generating facility built on the site approved for the CSP generating facility) to the regional transmission grid using one of two approved alignments:

Interconnection #1 Gen-Tie alignment, located entirely in Township 26 North, Range 16 West, runs from the generating facility's power block to the property boundary; then north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 and Section 08; then north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 and Section 09 until it reaches the north boundary of Section 09; then east for about 0.75 miles within a 1320-foot wide corridor along the north boundary of Section 09 until it reaches the termination in the northeast corner of Section 09. Interconnection #1 is approximately 2.75 miles in length from the generating facility property boundary.

Interconnection #2 Gen-Tie alignment runs from the generating facility's power block to the property boundary; then north for 1.25 miles within a 1320-foot wide corridor from the property boundary along the east boundary of Section 17 and Section 08 ; then north for 1.25 miles within a 1320-foot wide corridor along the west boundary of Section 16 and Section 09 until it reaches the north boundary of Section 09; then north for one mile within a 1320-foot wide corridor through Section 04 until it reaches the west boundary of the existing Mead-Liberty 345kV transmission line corridor, which it will parallel on a generally northwest heading; from there it will run within a 2640-foot wide corridor measured from the centerline of the Mead-Liberty 345kV transmission line west of and parallel to the existing transmission line for approximately 3.5 miles, going through the northeast corner of Section 05 in Township 26 North, Range 16 West; through Sections 32, 31, and 30 in Township 27 North, Range 16 West ; through Sections 25 and 24 in Township 27 North, Range 17 West; and terminate in Section 23 in Township 27 North, Range 17 West. Interconnection #2 is approximately 6.5 miles in length from the property boundary.

Efficient = more profitable

Question 8. Why did you not use dry cooling or hybrid dry and wet cooling?

Answer 8. Wet or evaporative cooling is a more efficient cooling method than dry or hybrid cooling. It typically has a moderate capital cost, including water supply and treatment costs, and relies on the energy lost when liquid water is converted to gas (evaporated), similar to the process used by the human body when it sweats. As proposed in this Project, evaporative cooling works by using fans to create an updraft of air inside the cooling tower. The heated water from the steam condenser is sprayed down against this updraft and the falling water is cooled in two ways; first by relatively cooler air flowing by it and second by the evaporation of a small amount of water from each falling droplet. As currently designed, the Project will use approximately 2,200 acre-feet per year in this cooling process.

As further described below, dry cooling generally has a lower energy efficiency, and higher capital and operating cost, but consumes no water. It works by blowing a very large amount of air over a radiator-like heat exchanger in order to condense the steam then cool the water. There is no direct contact between the steam or water and the air, and therefore, no evaporation. This method limits the lowest temperature that the steam can be cooled to the air temperature.

Hybrid cooling uses a combination of wet and dry cooling, with the relative amount of each cooling technology used 'tuned' to the desired outcome. It generally has the highest capital costs, due to the fact that it uses both wet and dry technologies, but depending on how it is 'tuned,' it consumes between 10 and 90 percent of the water used by evaporative cooling alone. Generally, in a water constrained situation, a hybrid system would be biased

(THIS IS ENVIR. COMPATABLE)

THIS IS ENV. COMPATABLE important

towards wet cooling during high heat periods and dry cooling during cooler periods to minimize energy and efficiency losses.

For most thermal power projects, especially solar projects in the desert southwest, dry or hybrid cooling imposes cost and performance penalties when compared to wet or evaporative cooling. In the recent Report to Congress from the U.S. Department of Energy ("DOE") titled "Concentrating Solar Power Commercial Application Study: Reducing Water Consumption of Concentrating Solar Power Electricity Generation" (the "DOE Report") the DOE states (pg 13 and 14):

> A comparison of the performance and economics of a water-cooled trough plant located in Daggett, California to an air-cooled one showed that the performance of the air-cooled system dropped off significantly at ambient air temperatures above 100°F. The air-cooled plant provided about 5% less electric energy on an annual basis than the water-cooled plant, because of reduced performance on hot summer days. The electricity cost for the air-cooled plant was 7 to 9% higher than for the water-cooled plant. Thus air cooling of a trough plant can be used to minimize water use, but at a 7 to 9% cost penalty.

NOT SIGNIFICANT

While the DOE Report notes that dry cooling methods are becoming more common for thermal power plants, it states (pg 11) "[t]he disadvantages of dry cooling are higher capital costs, higher auxiliary operating power requirements, fan noise, and an overall lower plant performance, especially on hot days, when the peak power is needed most." The full report is marked as Exhibit HVS-21.

this value natural Resource Conservation

The higher capital costs of the dry or hybrid cooling primarily result from the very large volume of air and therefore number and size of fans needed to

condense the steam back to water. It is important to note that this analysis includes the savings, on the dry cooling side, from not having to supply and treat water for the wet cooling towers.

The higher auxiliary operating power requirements or parasitic loads result from the increased amount of electricity consumed within the Project to operate the dry cooling system when compared to that needed to pump and treat the cooling water for a wet-cooled system.

The lower plant performance, especially on hot days, results from the fact that the amount of electric energy that can be extracted from the steam is a function of the difference in steam temperature and pressure between the input to the turbine and the output at the condenser, where the steam has been cooled and condensed back to water. This temperature and pressure at the condenser is a function of the cooling method. Dry cooling can only reduce the temperature to approach the 'dry-bulb temperature', which is what a normal thermometer measures. This means that when it is 105°F, the lowest temperature at the outlet of the turbine is 105°F. Wet cooling works like the human body which, when it sweats, and can approach much lower levels as measured by the 'wet-bulb temperature'. On hot days at the Project site, this 'wet-bulb temperature' can easily be 20-30 degrees cooler than the dry-bulb temperature.

The DOE Report (pg 12) goes on to say "[t]he most common cooling method for new power plants is evaporative cooling. This is an economical and high performing power plant cooling technique."

In day of drought, we are interested in Common.

In order to be competitive in the current market for renewable energy, HVS, like all of the other proposed parabolic trough plants in Arizona, are proposed as wet cooled projects. HVS believes that the 7-9% levelized cost of energy penalty associated with dry cooling would prevent the Project from being competitive.

PROFIT VS RESOURCES

Question 9. What is the status of the other necessary regulatory approvals?

Answer 9. At the county level, the primary regulatory approvals are the amendment to the General Plan and approval of the Area Plan, both of which the Project received on November 16, 2009. As the Project progresses, it will apply for other county approvals, such as zoning, stormwater management, and building permits.

At the state level, in addition to the CEC, the Project will require an aquifer protection permit and an air quality permit, both issued by the Department of Environmental Quality (DEQ). HVS has prepared a draft of its Minor Source air quality permit application based on the conceptual design for the Project. HVS will prepare the aquifer protection permit application during the next stage of design. The Project will also require a well permit from the Department of Water Resources (DWR).

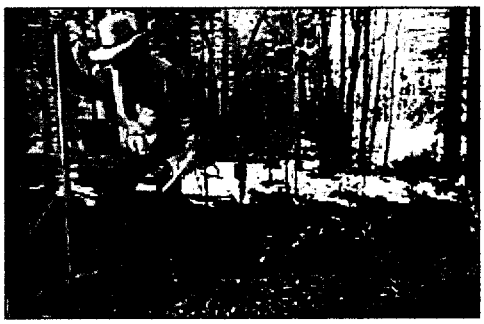
At the federal level, HVS is in the process of preparing an Environmental Impact Statement (EIS) with the Western Area Power Administration (Western) as the lead agency and the Bureau of Land Management (BLM) as a cooperating agency. This work is being done in coordination with the DWR, Department of Game and Fish, and State Historic Preservation Office. Other state and federal agencies, such as DEQ, Arizona Department of

THE CHRISTIAN SCIENCE MONITOR csmonitor.com
from the April 05, 2007 edition - http://www.csmonitor.com/2007/0405/p01s02-wogi.html

Surviving a warmer world: Global forecast is 'mostly dry'

Climate change is already being blamed for altered rainfall patterns and shrinking glaciers that provide water for drinking and agriculture. Part 1 of an occasional series.

By Peter N. Spotts | Staff writer of The Christian Science Monitor



Where'd it go? Richard Armijo measures snowpack on a mountain near Santa Fe, N.M. In past decades, a foot of snow would have been on the ground.

Andy Nelson - Staff

SANTA FE, N.M. It's a late March morning, and a light breeze tousles the tops of aspens and Ponderosa pines at Elk Cabin, one of the oldest spots in New Mexico for recording the depth of winter snow. Richard Armijo, a measuring stick in hand, is there to gauge this spring's snowpack.

The site, in the Sangre de Cristo Mountains, sits just upstream from two reservoirs that serve the city of Santa Fe. In late March, Elk Cabin should have a foot of snow on the ground, but it's nearly bare.

Like much of the West, New Mexico has endured a long drought.

According to the latest scientific evidence, such dry spells are likely to grow more severe – as they will around the world. Global warming, climate scientists say, is changing climates from the Himalayan Mountains to the Euphrates-Tigris River Basin. Patterns of rain and snowfall are shifting significantly.

The question now becomes: How will nations and individuals adapt as Earth's climate warms? Glaciers from the Andes to the Alps are shrinking at an accelerating pace. Countries are already haggling over river rights. From 400 million to as many as 3.2 billion people face serious water shortages over the next 20 to 50 years. New Mexico, an already dry region that is getting drier, is on the front lines.

Mr. Armijo, a snow surveyor for the US Department of Agriculture, knows something is going on. Like much of the American West, the state has been in the grip of drought for years.

"We've set record lows for snowpack a couple of times in the last five or six years," he says. "For the most part, the snowpack's gone. In the last three to four weeks, we've experienced some really warm temperatures."

In early February, the UN released a report on the science behind global warming. In it, researchers expressed "very high confidence" that greenhouse-gas emissions – mostly carbon dioxide from burning coal, oil, and natural gas – have been warming the climate.

If these emissions continue to grow at their current rates, the report estimates, global average temperatures could top their 1980-2000 average by 2.3 to 4.1 degrees C. (4.1 to 7.4 degrees F.) by the end of the century. Among the warming's effects: Arid regions will dry out further. And some of the water that they do receive will come in the wrong form (rain instead of snow) or at the wrong time.

On April 6 the UN-sponsored Intergovernmental Panel on Climate Change (IPCC) will release the second of its four major global-warming reports due this year. The focus: the challenges that vulnerable regions are likely to face and their options for adapting.

'We've set record lows for snow pack a couple of times in the last five or six years.'
– Richard Armijo, snow surveyor

Andy Nelson - Staff

The new IPCC report is expected to pay close attention to warming's impact on water resources – and for good reason, says James McCarthy, professor of biological oceanography at Harvard University and past co-chairman of the 2001 IPCC working group. In the last five years, scientists have seen "a consistent record" showing a pattern of droughts alternating with strong downpours "with less opportunity for that moisture to be absorbed or retained," Dr. McCarthy says.

A city slakes its thirst

How will humans cope with a drier climate? The city of Albuquerque has shown how much water can be saved through a concerted effort – if resources are available. But its experience also highlights the complex demands made on water resources.

The state's major river, the Rio Grande, cuts through Albuquerque. But it's only a dry riverbed part of the year. The city draws virtually all of its water from an underground aquifer, says John Stomp III, water resources manager for the city. By some accounts, Albuquerque once was thought to be sitting atop an aquifer with enough fresh water to fill Lake Michigan.

But in 1993, a closer look reversed that verdict: The city's underground lake was far smaller than previously estimated – and it was disappearing fast.

In 1994, the city set a goal to cut water consumption by 30 percent over 10 years. By 2004, it had cut consumption by 33 percent. By 2014, it aims to reduce that to 40 percent below 1994 levels.

To meet its goals, the city tightened its building code to improve efficient use of water. It gave tax rebates to residents and businesses for each low-flow toilet or shower head installed in

existing buildings. It offered a $100 credit for installing water-efficient washing machines. It gave rebates for xeriscaping – replacing water-hungry lawns and plants with drought-tolerant species – and it changed landscaping codes to require this approach in new developments. The city also irrigates its parks and other public lands with treated municipal wastewater and has been hunting down and repairing leaky water mains.

Sending water back underground

Albuquerque also has built a diversion dam across the Rio Grande and is completing an enormous water-distribution facility nearby. Both open for business next year.

When they do, the city will rely on river water for 70 percent of its needs and use the underground aquifer to make up for shortfalls during dry years. During wet years, it plans to use some of the Rio Grande water to recharge the aquifer.

While the new IPCC reports may begin to add new urgency to water planning, up until now it's been difficult to factor global warming into water-resource plans, Mr. Stomp says.

The earlier models he's relied upon have given conflicting answers to questions surrounding local precipitation.

"One says there's going to be more snow; one says there's going to be less snow," he says. But planning for severe, prolonged droughts has always been part of the planning process, he says.

Over the long term, population growth is likely to push other water-saving approaches to the fore, such as desalination of brackish underground water and reuse of municipal wastewater for drinking. At least six cities in the state are considering wastewater-to-drinking-water conversions either through a direct treatment and recycling system or by using treated wastewater to recharge aquifers.

Ironically, such efforts could make it more difficult for the state to balance the competing demands of its urban and rural interests. It will also be harder to meet its obligations to send some of its river water on to Texas, says John D'Antonio, New Mexico's state engineer.

In the West, agriculture consumes most of the water. Many farmers here are installing more-efficient irrigation systems that lose less water to seepage as it moves along irrigation ditches. But that "leaking" water also contributes to groundwater reserves. Now less water is finding its way back into aquifers.

Water is a finite resource, Mr. D'Antonio notes. If rivers are full subscribed, the only way for the state to grow is to transfer water rights in an orderly way from agriculture to urban uses.

A thirsty world responds to scarcity

How issues like these will play out around the world will depend on many factors, including whether countries can work out disputes over water resources.

So far, the record is patchy. In the Philippines, researchers from Columbia University are trying to help the city of Manila set up a water-leasing deal with nearby farmers. The city and farmers share a small reservoir – and recurring drought.

But in dry years, the city typically has just taken all the water it needed, leading to "massive agricultural losses," says Casey Brown, a member of the group working on the water-lease project. The hope is to set up a plan under which the

city would pay the farmers for the water it takes during droughts – providing, among other things, an added economic incentive for the city to conserve during dry years.

Political instability can get in the way, too.

Iraq, Syria, and Turkey have formed a joint commission on water issues, but it hasn't met since the first Gulf War in 1992, says Olcay Unver, a visiting scholar at the Water Resources Research Institute at Kent State University in Kent, Ohio.

Ironically, global warming may provide a catalyst by forcing countries to work together to solve their mutual problem, he suggests. "All parties see it as a common threat – which it is," Mr. Unver says. "So it could provide the basis for common solutions to water management."

High glaciers retreating fast

Hundreds of millions of people around the world draw their water from major river systems whose sources are mountain glaciers and seasonal snowpack. From the Andes and Himalayas to the Alps, scientists are gathering data that tell a sobering tale of rapidly retreating tongues of ice.

RICH CLABAUGH – STAFF

The World Glacier Monitoring Service tracks 27 glaciers in nine mountain ranges around the world. The service's data show that these glaciers have been steadily losing mass since 1980.

This comes as no surprise to Lonnie Thompson. Since 1983 he has studied ice cores from mountain glaciers and ice caps in the Andes, Himalayas, and from Mt. Kilimanjaro in Tanzania. Last July, the Ohio State University professor and his colleagues published a paper suggesting

that the current warming at high elevations is unprecedented in the last 2,000 years; in some areas, warming and the pace of glacial retreat is unprecedented for the past 5,200 years.

For example, the Qori Kalis glacier, the largest outlet for the Quelccaya ice cap in Peru, retreated 10 times faster during the 1990s than it did from 1963 to 1978, Dr. Thompson says. "The changes are overwhelming."

If global warming has shifted climate conditions closer to those that existed prior to 5,200 years ago, high-altitude glaciers may be under wholesale retreat and may disappear altogether "in the near future," Thompson says.

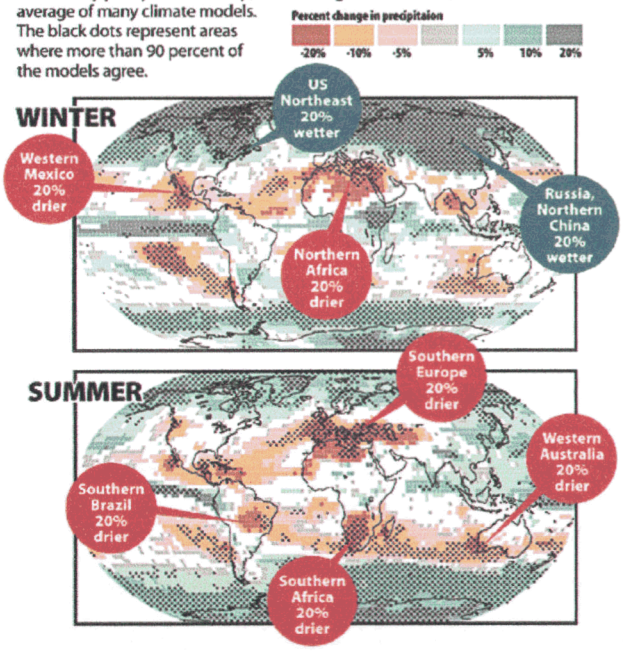
Already, some cities relying on these natural water towers are struggling to adapt. But these efforts are at their early stages, according to Walter Vergara, a civil engineer with the World Bank. In Quito, Ecuador, for example, the city of 2 million relies on water from the fast-retreating Antizana glacier. Quito has laid out pipeline and reservoir projects to expand its water supplies to keep pace with the city's growth through 2040. But the plans haven't factored in global warming, Mr. Vergara says.

Quito is now trying to anticipate the glacier's retreat and changing patterns of precipitation. This means extending water pipelines farther up the mountain and around the back of the glacier to tap its eastern, Amazon Basin side. The changes will add $100 million to the $300 million project, Vergara estimates.

Managing water supplies in a warmer, more variable climate "is a challenge developing countries face right now," notes Casey Brown, a climate scientist at Columbia University. "If they can meet this challenge, they'll be in much better shape to meet [the] other challenges [that] climate change brings."

By century's end, a mostly drier planet

Climate models suggest many populous regions of the world will become drier as a result of global warming by 2090-99, while areas near the poles, such as Siberia and parts of Canada, may see more precipitation. The maps (December to February precipitation on top, June to August on bottom) are based on an average of many climate models. The black dots represent areas where more than 90 percent of the models agree.



SOURCE: IPCC REPORT FEBRUARY 2007/RICH CLABAUGH – STAFF

EXECUTIVE SUMMARY

(Morrison Institute of Public Policy)

PURPOSE OF STUDY

Morrison Institute for Public Policy was asked by the Arizona Department of Water Resources to study potential growth impacts of a proposed new water pipeline for the Coconino Plateau Watershed in north-central Arizona, an area that is projected to nearly double in population over the next 50 years. The area of study extends from Page and Grand Canyon in the north, to Flagstaff and Williams in the south. (See Map 1, page 10.) It includes three cities, portions of two Indian reservations, one national park, two nationals forests, and roughly 1.5 million acres of mixed private and state lands primarily arranged in an alternating, one-square mile checkerboard pattern. The great majority of residents in the region currently rely on groundwater to meet their water needs.

PIPELINE PROPOSAL

In 1999, a water pipeline from Lake Powell was proposed to meet regional water demand up to the year 2050. This proposal grew out of regional efforts to plan future water resources, a water demand and resource analysis published by Arizona Department of Water Resources, and concerns over the effects of increased groundwater pumping on seeps and springs at Grand Canyon, the Havasupai Reservation, and elsewhere. The pipeline as proposed would draw water from Lake Powell and deliver it to a number of communities and entities across the region. From north to south, they are:

- City of Page
- Six western Navajo communities
  - LeChee
  - Coppermine
  - Bitter Springs
  - Cedar Ridge
  - Bodaway/Gap
  - Cameron
- Grand Canyon National Park
- Tusayan
- Valle
- Red Lake
- Kaibab National Forest (Kaibab Lake)
- City of Williams
- City of Flagstaff

The proposed pipeline would be designed to supply some or all of the anticipated new water demand for these areas until 2050, a volume that currently ranges from less than 10,000 acre-feet per year if new groundwater development is allowed in the future, to over 20,000 acre-feet per year if it is not.

To determine the growth effects of a potential regional pipeline, both quantitative and qualitative data sets were gathered. Research included interviews with key stakeholders in the region, field trips, consultation with experts, case studies, demographic analysis, appraisal of growth-related plans of governing bodies and agencies in the region, and evaluation of statewide growth management laws and their effects on regional planning.

SUMMARY OF RESULTS

Key observations of stakeholders:

- **Groundwater is the most relied-upon source of water in the study area, but resources and needs vary tremendously.** While Flagstaff and Page have enough water to meet near-term demand, Williams and most Navajo communities in the study area face critical water shortages. Most areas could see their water sources or systems affected by acts of nature, policy decisions, or legal action.
- **Expectations differ regarding local impacts of a water pipeline.** Flagstaff is expected to grow regardless of new water sources, while Navajo communities hope pipeline water will stimulate economic development. Growth prospects in the western portion of the study area are widely debated.
- **Substandard rural development is feared in the western portion of the study area.** Stakeholders worry that new water could accelerate "wildcat" and strip-type development along the gateway to Grand Canyon National Park. While some development there is inevitable, they want to preserve the sense of open space.
- **Regional infrastructure has limited capacity to accommodate growth.** Highways, streets, schools, and phones need upgrades to keep pace with regional growth, though some stakeholders want to preserve the highway approach to Grand Canyon as it is. Some also noted the need for water distribution lines to serve low density areas, and increased sewage treatment capacity.
- **A water pipeline could be used to manage growth in conjunction with other measures.** Among the collateral measures: 1) state legislation prohibiting any new groundwater uses in the study area, 2) legislation providing counties with greater power to regulate subdivisions, and 3) some type of management authority that could limit access to pipeline water in unincorporated areas.
- **Strong water conservation efforts could enhance existing water supplies.** Some believe that water conservation has been discouraged, rather than encouraged, by outdated county and local ordinances. Nevertheless, Tusayan currently reclaims a substantial portion of its water.

Critical issues regarding state land dynamics:

- **State trust lands in the region could be developed in the future, with the market deciding where.** Current law requires that state trust lands be managed for maximum public benefit, therefore, the real estate market

will effectively determine which lands are reclassified for development.

- **Development "hot spots" will be along the north-south highways.** Commercial development of state land in the region has been historically slow. But if conditions change, the action will likely follow major road corridors along which the proposed water pipeline might run – particularly State Highway 64 north from Williams, and U.S. Highway 89 north of Flagstaff.
- **Conservation efforts could preserve key state lands.** Existing and pending land preservation efforts could limit development in sensitive areas, but they will require substantial funding. Potential changes in state law may also alter Land Department mandates and allow no-cost conservation set-asides.

Lessons learned from other regions with water supply projects:

- **Water tends to flow toward economic growth, but does not, alone, create growth.** Where economic performance has led to population growth that strains water resources, an augmented water supply tends to facilitate further growth. But water has little growth effect in economically depressed areas unless combined with some other factor that triggers economic improvement.
- **Infrastructure and the decision on who gets water affects where and how a region grows.** If water access is tightly controlled by, or restricted to, urban areas, the region will tend to grow through urban infill or contiguous development on the fringe. If water is readily available across a region, development may leapfrog to more remote and unincorporated areas where land and development fees are less expensive.
- **Water projects can produce long-term economic benefits, and they can protect regional aquifers.** Reservoirs and other uses of project water can attract a recreation industry that contributes to the region's overall economy. Projects that use renewable water sources to meet demand can also reduce pressure on local groundwater sources, at least in the short term.
- **Surface water projects can damage downstream resources and undercut water conservation efforts.** Projects that divert streams or reduce stream flows can substantially alter natural resources. New water supplies also tend to reduce immediate resource concerns so that conservation efforts lose their impetus.

Key points regarding the region's growth prospects:

- **Coconino County has experienced high growth rates – and this is expected to continue.** Arizona Department of Economic Security (DES) projections rely on historical patterns to forecast future results, therefore population growth is projected to persist into the future, albeit at a somewhat reduced rate.
- **Coconino County has an unusually youthful profile.** With a high proportion of residents less than 25 years old and a low proportion over 50, the area is not considered a retirement haven.
- **Growth projections assume that current economic and demographic forces will continue.** But if growth drivers change, the regional growth trajectory will follow.
- **Tourism is the most important economic factor affecting growth in the region.** Because tourism leads all economic activity in north-central Arizona, it is likely to create the most jobs – and growth – in the future.
- **Pipeline water will have little impact on total projected population growth for the region.** DES projections tacitly assume that the region's ability to meet water demand in the future will not differ substantially from its ability to meet demand now, so overall growth figures should not be affected by the source of water.
- **Pipeline water and tourism expansion will have greatest effect in the western portion of the study area.** The western portion of the study area currently faces economic constraints that are influenced by a lack of available water. An improvement in either tourism visitation or water supply would stimulate growth in the area; an improvement in both would produce substantial gains.

Key characteristics of the region's growth-related plans:

- **Many plans are getting old.** Almost half were adopted more than 10 years ago, but some are scheduled for update. Analysis of the Flagstaff update-in-progress suggests a future trend toward greater specificity regarding growth management.
- **Water availability, adequacy of infrastructure, and transportation are addressed in nearly every plan, while other growth management tools appear in only a few.** Among the plans, Flagstaff, Page, Grand Canyon, and two county areas – Tusayan and Valle – tend to contain the most detailed growth management policies.
- **The verdict is out on the region's readiness to manage growth.** Due to the conflicting missions of some planning entities, and the age of some plans, it is difficult to predict how the region will collectively manage future growth. Moves toward cooperative planning efforts, the wide-spread use of county area plans, and anticipated updates to county and municipal plans promise reasonable preparation for the future.

Main impacts of the Growing Smarter acts:

- **City and county governments must update their general/comprehensive plans every 10 years, and then they must conform to them.** New plans must be ratified by voters, and changes can be made only with approval of a supermajority of the governing body.
- **The cities of Flagstaff and Page must address new elements in their future general plans, while Williams and Coconino County probably don't.** Based on population and growth rate factors, future Flagstaff plans must include five new growth-related elements (open space, growth areas, environmental planning, cost of development, and water resources), while Page plans must include just the first four. Williams and Coconino County appear to be exempt from the five elements at this time, but the county may have to add a water element if its Census 2000 population exceeds 125,000.

- **Some state and private lands regarded as "open space" may be preserved for conservation purposes.** New state funding sources will be able to grant monies to governments and other organizations to help them obtain development rights from state and private lands.

Conclusions: The Water-Growth Equation

The Coconino Plateau region is projected to nearly double in population over the next 50 years, and water demand will increase accordingly. Because population projections assume that additional water supplies will be available to meet that demand, a water pipeline designed to accommodate projected growth should have little effect on what is projected. The fact is, economic and demographic factors, not water per se, are the most significant drivers of population.

But the water-growth equation is not simple. State population projections do not consider potential changes in economic or demographic growth factors that might be supported by an assured water supply, nor do they consider any effects that might accrue if the region is unable to develop water unconditionally. Either could affect actual growth. Moreover, while growth number may hit projections, the pattern of growth could vary depending on the water's source and distribution.

Increased development of groundwater would favor growth in established communities. These places tend to have more growth management tools at their disposal and better, more comprehensive infrastructure to accommodate that growth – positive circumstances from a regional planning perspective. But future groundwater supplies are not assured due to uncertainties regarding the nature of local aquifers and the complexity of groundwater rights in the region. Already, national parks, Indian tribes, and even downstream water users are questioning whether deep wells on the Coconino Plateau impinge on their surface water rights, and well permits on national forest land are being scrutinized more carefully to determine their impacts on other water resources.

The beauty of a water pipeline is that it might sidestep most of the difficult groundwater issues. It would also be welcomed in parts of the region where water is especially short. But a regional pipeline could alter ***how*** growth occurs – and where. One area likely to grow with a pipeline is the western portion of the Coconino Plateau between Williams and Grand Canyon. This is a landscape of wide open spaces, but it is comprised of a mix of private land and state trust land, both of which are potentially developable. Weak economic factors combined with a lack of available water in this area have constrained growth in the area, but that could change dramatically with a rebound in tourism and an assured pipeline supply of water. Those who want to preserve a scenic approach corridor to the Grand Canyon, may demand some type of protective action for this area.

Policy Choices: Moving the Growth Debate Forward

Throughout Arizona, growth and its impact on natural resources has become the centerpiece of public policy debate. While much of the discussion has focused on the state's major metropolises, rural areas such as the Coconino Plateau region face many of the same policy choices. Most prominent among these choices is how best to balance the perceived value of development against its impact on the environment. As the only regional governing body in a regionwide decision-making process, Coconino County is in the best position to lead consensus building on a number of growth-related matters.

Among the most critical growth-related issues that must be decided regarding a regional pipeline:

- **Who will get pipeline water and how will it be treated and distributed?** The time to determine access to pipeline water, as well as its distribution and treatment, is before construction begins. That decision will strongly affect future growth patterns in the region. A more restrictive policy will channel growth toward places where infrastructure and growth management tools are at their most robust, thereby discouraging sprawl.
- **How much protection will the aquifer receive?** One major selling point for an outside water source for the region is the potential protection it affords regional aquifers. But if groundwater production increases regardless of the pipeline, political support for the proposal could be undermined. To keep all stakeholders on board, some type of restriction on groundwater use or development may be necessary as a corollary to pipeline construction.
- **How big should the pipe be?** The diameter of the pipe will determine the maximum number of people that can be served, therefore decision-makers need to decide early on how much growth they want to accommodate.
- **What growth management powers will the county wield?** Counties currently possess relatively few tools to manage growth in their unincorporated areas, particularly when it comes to regulating small and/or low density wildcat subdivisions. Because timing could be critical when it comes to protecting lands considered sensitive to development in the study area, concerned stakeholders may want to push for faster action in the state capitol, and/or develop a regional plan for protecting sensitive lands through purchase, lease, or regulation.
- **Who will manage the pipeline?** The legal and management structure for administering the water pipeline will play a significant role in determining how water is allocated. Whoever controls those allocations – particularly for any unencumbered water – will have power to regulate new subdivisions in unincorporated areas of the county, thereby influencing how much population growth can occur there.

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A cautionary picture of water supplies as Earth warms

New studies forecast declines for rivers in the US and elsewhere.

By Peter N. Spotts | Staff writer of The Christian Science Monitor

Mountain snows and alpine glaciers represent key reservoirs of fresh water for some 1.6 billion people worldwide. In 50 years, however, a warming planet is likely to disrupt many of these sources, leaving millions of people scrambling for additional supplies.

While conservation, additional reservoirs, and repairs to leaky water mains can help blunt the effects of these changes, efforts to adapt to shrinking snowpacks and vanishing glaciers are expected to require other changes in farming techniques, industrial practices, and lifestyles.

That's the warning a team of US scientists is issuing after reviewing field measurements and modeling studies that deal with the impact of global warming on alpine environments. Combined with a second, independent look at stream flows in key parts of the world, the studies are helping scientists fill in a picture of future freshwater supplies as the planet warms. (Both studies appear Thursday in the journal Nature.)

Efforts to anticipate the potential effects of global warming on water supplies have been under way for years. In the Western US, for example, some researchers have been saying for at least five years that despite uncertainties in model projections, the results are solid enough to be useful to regional water managers as they lay out long-term water-management plans.

But the US West is not the only region of the world that relies on winter snows to water crops, generate electricity at hydroelectric dams, or fill soup pots. So a team led by Timothy Barnett at the Scripps Institution of Oceanography looked at other regions that rely on snowmelt for at least 50 percent of their water and lack the ability to store a year's worth of runoff.

The principles involved are "exceedingly simple and uncontroversial," he says. "When it's warmer, you may have the same amount of precipitation, but more will be in the form of rain than snow. That's 'duh.' And if you have any snowpack in a warmer world, it's going to melt earlier." This can translate into less water in summer and fall.

The team looked at the effect of a shrinking snowpack on Europe's Rhine River and the Canadian prairie, as well as the Western US. They found a range of effects, from reduced freight shipments along the Rhine to increased farm vulnerability to drought.

As for glaciers, "they are fossil water," Dr. Barnett says. "They may melt right up to the end, and you don't think you have a problem. Then, hey, they're gone."

One of the areas the team sees as most crucial is the region whose thirst is slaked by glaciers in the Himalayas and Hindu Kush mountains. Collectively, these mountain ranges hold the third largest mass of ice after Antarctica and Greenland. The rivers they feed provide much of the water for 50 to 60 percent of the world's population. Yet China's latest survey of the mountains show that over the past 25 years, the glaciers are in wholesale retreat.

"These results are really robust," says Christopher Milly, a researcher with the US Geological Survey working at the National Oceanic and Atmospheric Administration's Geophysical Fluid Dynamics Laboratory. Dr. Milly and two colleagues produced the second study, which compares the results of 12 climate models used to project future annual stream flows worldwide.

By 2050, the models projected a 10 to 40 percent increase in annual stream flows in eastern equatorial Africa, South America's La Plata basin, and the near-polar regions of North America and Eurasia. Southern Africa, southern Europe, the Middle East, and western North America saw 10 percent to 30 percent declines.

The impact on regions with more water coursing through rivers each year could be positive, Milly says. Earlier studies, however, suggest that in several regions showing an increase, precipitation is more likely to come in sudden bursts, making it more difficult to capture and store.

"It's critical we start thinking about this now," says Lara Binder, an outreach specialist with the University of Washington's Climate Impacts Group. "We can't be in a position where we're trying to play catch-up."

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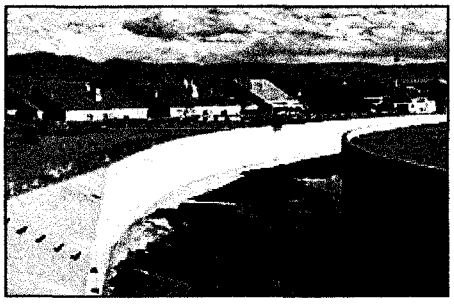
Trade-off looms for arid US regions: water or power?

Water consumed by electric utilities could account for up to 60 percent of all nonfarm water used in the US by 2030.

By Peter N. Spotts | Staff writer of The Christian Science Monitor



Squeezed dry? Fast-growing arid cities like Albuquerque, N.M., will need new electric power plants, they will need to find more water to run them.
Andy Nelson – Staff

Albuquerque, N.M. The drive to build more power plants for a growing nation – as well as the push to use biofuels – is running smack into the limits of a fundamental resource: water.

Already, a power plant uses three times as much water to provide electricity to the average household than the household itself uses through showers, toilets, and the tap. The total water consumed by electric utilities accounts for 20 percent of all the nonfarm water consumed in the United States. By 2030, utilities could account for up to 60 percent of the nonfarm water, because they use water for cooling and to scrub pollutants.

This water-versus-energy challenge is likely to be most acute in fast-growing regions of the US, such as the Southeast and the arid Southwest. Assuming current climate conditions, continued growth in these regions could eventually require tighter restrictions on water use, on electricity use, or both during the hottest months, when demand for both skyrockets, researchers say. Factor in climate change and the projections look worse. This is prompting utilities to find ways to alleviate the squeeze.

Here in New Mexico, scientists and water managers are already wrestling with the issue. One of the state's main sources of electricity is the San Juan generating station. Its main source of cooling water is the Navajo Reservoir, which straddles the state's border with Colorado. Under today's climate conditions, a three-year drought might require users of the reservoir to cut their water consumption by 18 percent, according to preliminary research at the Los Alamos National Laboratory. But a three-year drought with an average temperature rise of 1 degree C (1.8 degrees F.) could mean a 65 percent reduction by the end of the third year.

"This isn't just the San Juan River basin we're talking about," says Andrew Wolfsberg, a hydrologist at the lab. If the US decides to develop oil shale deposits in southern Colorado, which is likely to be water-intensive, it will be difficult to keep oil shale development going, he adds.

A large-scale move to biofuels would be even more water-intensive, says Ronald Pate, a researcher at Sandia National Laboratory in Albuquerque.

Over the past five years, water availability and quality have become rallying points for opponents of new plants around the country, according to a December 2006 Department of Energy report on the issue. By some estimates, electric utilities plan to build 150 coal-fired generating stations in the US over the next 30 years.

"Utilities are beginning to recognize that water is becoming a greater permitting issue than air quality," says Thomas Feeley III, a technology manager at the US Department of Energy's National Energy Technology Laboratory in Pittsburgh.

The potential collision of water, energy, and climate is not limited to the US. "This is a big issue in other arid and semi-arid parts of the world," says Christopher Flavin, president of the Worldwatch Institute, a nonprofit environmental think tank in Washington. The challenge is especially acute in China and India. India already faces serious water shortages around the country, he says. And in China, he says, the central government is losing control over energy planning as local governments drive the push for more power plants. In the future, if climate forecasts are correct, the demand for thermoelectric power could continue to grow as mountain glaciers melt, reducing the amount of electricity hydroelectric dams downstream can generate.

In the US, utilities are exploring ways to cut water consumption at power plants or are looking for alternative water sources.

In West Virginia, for example, construction began in February on a 600-megawatt coal-fired plant that will pull its water from pools in the same mine that it's tapping for coal. Although the plant is a commercial facility, it also is a test bed for approaches to tapping mine pools, which are found throughout the region, notes Joseph Donovan, who heads the Hydrological Research Center at West Virginia University in Morgantown.

And at the San Juan generating station outside Farmington, N.M., the Public Service Company of New Mexico has been exploring a range of approaches to reducing the plant's water consumption, notes Timothy Jones, the utility's water resources manager. In June, the plant will test a new design for cooling towers that attempts to capture and recycle the cloud of condensation that towers give off. The plant already recycles water from 20 to 50 times before it's evaporated off or becomes so tainted that it needs to be hauled off for disposal. The plant also has looked into using water produced as a byproduct of oil and gas extraction in the region.

"It has a fabulous potential for power plants," he says. But today's water-treatment technologies are too expensive and don't have enough capacity to fit the need.

The plant also is using a hybrid cooling tower that uses water only when air temperatures rise too high; otherwise the plant uses air for cooling.

In the end, "there is no single silver bullet" for coping with the projected effects of global warming, Mr. Jones says. "Renewables will play an important role, but energy efficiency is the only way you can deal with it without environmental impacts."