DOCKET
08-AFC-5
DATE JUL 26 2010
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DECLARATION OF SERVICE

I, Tom Budlong, declare that on July 26, 2010, I served and filed copies of the attached, Exhibits 567, 592, 599, 599A. The original documents, filed with the Docket Unit, are accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/solartwo/index.html]

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CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-5
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Tom Budlong

*indicates change

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
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APPLICATION FOR CERTIFICATION FOR THE
IMPERIAL VALLEY SOLAR PROJECT
(formerly known as SES Solar Two Project)
IMPERIAL VALLEY SOLAR, LLC

Docket No. 08-AFC-5
PROOF OF SERVICE
(Revised 6/8/10)

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STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

In the matter of:	)	
	)	DOCKET NO. 08-AFC-5
APPLICATION FOR CERTIFICATION FOR	)	
THE IMPERIAL VALLEY SOLAR PROJECT0	)	
(FORMERLY SES SOLAR TWO)	)	
_____	)	

TESTIMONY ON ALTERNATIVE WATER SUPPLY OF WITNESS EDIE HARMON FOR INTERVENOR TOM BUDLONG

May 17, 2010

Re: Tessera/SES Solar Two/Imperial Valley Solar/Solar 2 **Project**

Testimony for Evidentiary Hearing re Alternative Water Supply May 24, 2010

"Imperial Valley Solar (formerly Solar Two) (08-AFC-5) Supplement to the Application for Certification URS Project No. 27657106.00806" (SAC) proposed to use groundwater from well 16S/9E-36G4 in the Ocotillo/Coyote Wells Groundwater Basin, a US EPA designated Sole Source Aquifer.

1. These comments will include additional Exhibits mentioned but not yet scanned for the May 10, 2010 submission. Numbering of exhibits includes numbers for exhibits also attached to comments on the project submitted to the US ACE.

2. The SAC states that "In the event that the Seeley Waste Water Treatment Facility (SWWTF) improvements have not been completed at the start of construction of the Imperial Valley Solar Project, the Applicant proposes to use a **temporary,** alternative water supply originating in Ocotillo, California until the time SWWTF water is available." (emphasis added. SAC Supplemental Project Description Sec. 1.4 Alternative Water Supply p.1-2)

3. In the SAC Sec. 1.4.2 Ocotillo Water Supply Overview, the test states that:

    4. "If the SWWTF water supply is not available at the start of construction of the Imperial Valley Solar Project, water would be available through the Dan Boyer Water Company in Ocotillo, California. The Dan Boyer Water Company is a private water purveyor located at 1108 Imperial Avenue, Ocotillo, California 92259, approximately 3.5 miles southwest of the Project site and seven miles by road (Figures 1-3 and 1-4). The company operates State well #16S/9E-36G4 with a **current permitted pumping rate of 40 acre-feet per year** (afy). The water source is potable and permitted for use by construction or personal consumption. **Historically**, the well has typically extracted **over 100 afy** for uses such as construction, dust control, and personal use. Tessera Solar is currently involved in negotiations for a purchase agreement with the water company. Appendix A provides a will serve letter stating Dan Boyer Water Company's intent to temporarily furnish well water to the Project. It is expected that the Imperial Valley Solar Project would require water from the Dan Boyer Water Company for approximately **six months to three years**. The water would be transported to the Project site by 7,000 gallon water trucks. Based on the **expected construction demand of approximately 50 acre-feet per-year (afy) on average**, it is anticipated that up to 13 truck trips would be required per day. If the water supply would be used during Project operations, a maximum of seven truck trips per day would be required to supply the approximate 33 afy demand. Once onsite, the water would be stored for construction and/or operations use." (Emphasis added. SAC at pp 1-2, 1-3.)

5. URS Appendix D includes the Boyer will serve letter which provides additional contradictory information when it states that "The project would be expected to require the alternate water source for approximately **six to 11 months**." ..."Historically the well typically extracted between 120 and 132 afy for uses such as construction, dust control, and personal use." (Emphasis added.)

6. RESPONSES: Please note the contradictions in the terms "temporary" vs "6 months to three years" (Applicant) vs 6 to 11 months (well owner). Note that it states that the "current permitted pumping rate is 40 AF/Y", but fails to disclose how much is being supplied to other users for "personal use". How many residences/individuals are getting water from Boyer and how many gallons are being provided for residential use? What would happen to the water supply for those residences if the well exports water to IV Solar? Can domestic uses for homes that have been permitted to be built by the County in locations where it has long been known that there is no potable water be cut off from the source of water they have been using? Surely continued residential use of groundwater is a higher priority than

industrial use.

7. Applicant states a demand for 50 AF/Y for construction (SAC 1-3) which is 10 AF/Y or 3,268,850 gallons more than the permitted total that can be pumped, and 90,000 gallons/day is almost double the the gallons/day permitted in the Specific Terms for the Well.

8. The Applicant failed to provide any documentation either in terms of gallons pumped, number of tank trucks filled or electrical consumption for pumping to support the assertion that the well historically pumped over 100 AF/Y. Indeed, Appendix D the URS Groundwater Evaluation Report with a 6 page listing of Westwind Water Sales History, provides information only from 3 months in 1990 through June 2004. Those figures cannot be used to substantiate any amount of pumping such as asserted. A summary of the water sales that the applicant and/or well owner was able to document indicate no evidence of anything approaching 100 AF/Y. Surely if there was a business records had to be kept for tax purposes if nothing else. (See Table summarizing the data in Exhibit 555)

9. A table including the information from the URS Appendix with information from USGS water level and water quality monitoring and information from the 2006 USG DEIR/S reveals some interesting information about the potential for well interference and the influence of increased pumping on rate of decline in static water levels in feet above mean sea level (AMSL) which eliminated water levels related to surface topography. Or at least the numbers raise a lot of questions for me.

10. The nearest downgradient wells from the Boyer well are the wells that supply the USG wallboard factory at Plaster City, wells 16S/9E-36G3 (USG #4) and 16S/9E-36H1 (USG #5). Estimating the distance on URS Fig 1-4 "Well location map, Ocotillo-Coyote wells groundwater basin" it appears that 36G3 is less than 1000 ft to the east and 16S/9E-36H1 is about 2000 ft. By combining the amount of pumping from all three USG wells and providing a figure for combined pumpage, USG is successfully able to hide the true nature of amount pumped and therefore the potential impacts of pumping at each well, and therefore the potential for well interference or contribution to localized impacts.. The table "Westwind Water Sales History & water levels well 16S/9E-36G4 vs 16S/9E-36H1 is follows these comments and is appended as Exhibit 555. It also includes information about well 36G1 for TDS.

11. What is interesting about this table is that estimated for the year 1975 and measured for 1995, 2001 and 2010 the static water level AMSL in the Boyer well 16S/9E-36G4, was lower than in the downgradient assumed much higher volume pumping USG well 12S/9E-36H1. (AMSL refers to water level in feet above mean sea level to eliminate the distracting factors of surface topography.) Of those years, only in 2001 did the Boyer well pump more than 30 AF/Y. The volume of pumping at the US Gypsum well 12S/9E-36H1 is not currently publicly available, but must be revealed if one is to understand the relationship between pumping and water levels and water quality in these wells so close together. Note the 6.7 ft decline in the USG well from 2004 to 2005 and then recovery/rising static water level which is assumed to be related in changed sales related to housing market reduced demand for wallboard thereafter. Data for USG wells provided in the 2006 USG DEIR is for the three USG wells combined. Data in that document was not updated to 2006 for the USG DEIR or subsequently for this Alternative Water Supply assessment by URS. (See 524, BE 2004 Table 4-2 Historic Groundwater Pumping in 2006 USG DEIR/S previously submitted.)

12. From 1996 to 2005 the water level in the USG well 16S/9E-36H1 dropped 14.73 feet or an average of more than one foot/year. Without knowing for certain how much water either USG or Boyer wells pumped it is not possible to be certain of the cause of decline in water level. Was the pumping here greater for both the USG and Boyer wells. To what extent to the activities of each well influence the other? And what are the cumulative impacts related to water quality and water levels for downgradient owners water wells used to provide domestic water from private wells at each residence in Nomirage?

13. Adding the information form the table on historical pumping rates for the USG wells from the 2006

USG DEIR it seems obvious that as the pumping levels of the USG wells (total for all three wells) that this corresponded to a water level decline of more than 1 foot per year. But how much is being pumped and from which wells? Missing data must be made available for public review so that a real site specific analysis can be made and decision-makers understand the consequences of their decisions..

14. This table (Exhibit 555) and review of USGS monitoring data raise questions about possible well interference. Without additional data, it is not possible to reach the conclusion that increased pumping at the Boyer well will not have a significant impact on either water quality or water levels when considered in light of the historic changes in water quality in another well on the Boyer property and the changes in water elevations AMSL for wells in close proximity. Of course, the real question is what are the potential impacts on downgradient domestic wells in Nomirage?

15. It is now 2010. From the table providing information about the Westwind/Boyer well and USG well 12S/9E-36H1 (in Exhibit 555 included at the end of these comments) it seems obvious that there are such large gaps in information that it is not possible to draw any conclusions about no potential well interference impacts that might result from larger volumes of pumping from either the Boyer or any combination of the USG wells. This is especially true if as the SAC Environmental Information states that:

16. "The results of aquifer testing conducted in April 2010 demonstrate that State Well No. 16S/9E-36G4 can support the water demands for the Imperial Valley Solar Project during construction and **the lifespan of operations (if needed)**. Detailed results of the aquifer testing are provided in Appendix D of this report."

17. "In order to achieve the peak construction water demand (such as prior to large amounts of concrete mixing/pouring during construction), the Project would temporarily store water onsite. The projected average annual construction water use is approximately 50 afy, and operational water use is estimated to average 33 afy. Maximum peak demand is estimated to be 90,000 gallons per day (gpd)" (Emphasis added) (SAC Sec. 2.5.2.3.1 at p. 2.5-3)

18. "**Lifespan of operations (if needed)**" for the "Alternative Groundwater supply source??? Without any detailed consideration of the long term impacts of the cumulative effects of this well so close to the USG wells, given the questions raised by information in Exhibit 555. Without any detailed hydrogeology review, without any discussion of the cumulative impacts of all the other existing, approved, and proposed or reasonably foreseeable projects which have draft documents in progress, all of which are proposing to use groundwater from this same Sole Source Aquifer?

19. It is of interest to note that the purported "aquifer testing" referenced in Appendix D was for this well only, with no monitoring of the nearest well 500 ft away, (SAC 2.5-4) and only conducted for only one day for what appears to be about 8 hours, and after about 9-10 hours of recovery the well still had not recovered to the level prior to pumping . The well that is 500 ft away was not monitored to see if it's water level was affected by the continuous pumping of 36G4, even though that well is most likely well 16S/9E-36G1 which is also on the Boyer property. Why? How can one conclude there would be no significant impact on another nearby well is no monitoring of water levels of that well are also made?

20. At the end of the test the static water level was 2.98 feet below the starting level. According to the URS Appendix D. The monitoring data from USGS and the water sales data from the applicant reveal that no matter what the pumping test may suggest that well 16S/9E-36G4 at least historically has been extremely sensitive to even small quantities of pumping, or that there is considerable well interference from pumping at the USG wells.

21. The Westwind table reveals that between 1994 and 1995 when only 7.5 AF was pumped in 1994, that the static **water level in the well** 16S/9E-36G4 **declined by 16.25 ft. in one year**. Why?

22. When USGS field staff come to do the monitoring of static water levels in wells, in the past they chalk a steel tape and lower it into the well taking it up and recording the level on the chalked steel tape that is wet to determine depth to water. The measurement is taken three times to be sure that the water level is static rather than recovering from recent pumping. If the level is believed to be recovery following pumping that information is noted with the water level and so indicated on the USGS website for well monitoring.

23. During the same time the static water level in the downgradient USG well 16S/9E-36H1 increased by 1.07 ft. There appears to have been a more than 10 ft recovery in Boyer well 16S/9E-36G4 the following year when pumping declined to only 4.7 AF/y for 1995. Comparing the amount of pumping and the static water levels AMSL, it seems clear that the Boyer well is far more sensitive to pumping and/or well interference than the downgradient USG well. This may be related to well construction and screening, different transmissivities at the locations where the wells are drilled and depths of screening or some kind of well interference not discernable because of the paucity of data and unknown pumping from each of the two USG wells.

24. There is no water level data or pumping data for the majority of the time that the USG well 16S/9E-36H1 revealed a period when USG combined pumping increased causing decline in well 16S/9E-36H1 from an AMSL level of 253.18 in 2000 to 240.58 in 2005. Additionally, there is no indication of quantity of water pumped by USG in 2004, the year when there was the most significant water level decline of 6.7 ft in one year. . However, without additional information it is not possible to really understand a cause and effect relationship. However, it is safe to conclude that there is not enough data do not really support the URS assertion in its Appendix D 4/26/2010 letter that pumping up to 40.3 AF/Y from the Boyer well "will not have a significant effect on water quality or effect [sic] water supply in the surrounding wells" Land surface elevation for calculating AMSL for the USG well is based on the measurement provided by the USG consultant in the Bookman-Edmonston report for USG.

25. Reviewing the tables I prepared for the Sierra Club comments on the 2008 USG FEIR/S, I realize that I did indeed succeed in ferreting pout some historic well information related to the USG water levels in the 3 USG pumping wells. (See Exhibits 559, 560 and 561) For several years there was about a 9 foot difference in static water levels AMSL between well 16S/9E-36B1to the north of the Interstate and the 2 wells to the south. There was only about 1700 foot distance between 36B1 and 36H1. Water levels were provided, but no indication of how much each well was pumping. It is not the responsibility of the public to ferret out information to try to understand the relationships between well usage and measured water levels and well interference creating a large cone of depression.

26. What is really interesting about the information now available is that the static water level reported by URS in 2010 for well 16S/9E-36G4 was 3.27 feet lower than in the nearby USG well 16S/9E-36H1 (USGS monitoring) which was expected to have pumped far more water than the Boyer well. Is an appropriate interpretation of the data in the table that the Boyer well is actually at the center of the cone of depression ? If so, is that the response of current pumping or past pumping? In any event it raises many questions about the responses of different portions of the aquifer where wells are pumping more water than is used for single residence domestic purposes in close proximity to each other, and for which there is no publicly available data and for which the well owners and County apparently refuse to provide pumping information which is up to date to 2010.

27. Past brief analysis by Zipp in 1980 (Exhibit 554) and Huntley 1979, 1993 (Exhibits 548 and 549) note the concerns about the changes in water quality and water levels associated with pumping of 100-140 est AF/Y in Ocotillo and Yuha, both locations with much lower quantities of pumping than centered at the Boyer and USG wells. The information related to the possible Boyer/USG well interference issues in 2010 point out the need for additional analysis of groundwater uses, just as required by the language

of the 1994 Ocotillo/Nomirage Community Area Plan (ONCAP) which as a part of the Land Use Element of the Imperial County General Plan. (See Exhibit 517 for text of ONCAP)

28. It was for a presentation at a hearing conducted before the Regional Water Quality Control Board that in 1980 that Richard Zipp of the Division of Planning and Research at the State Water Resources Control Board submitted a report which in effect describes all water used at the US Gypsum Plaster City factory as export from the groundwater basin, acknowledges problems that have been created in the groundwater basin by the County's use of political rather than geologic boundaries, and clearly defines the problems of well interference caused by the cones of depression created by the concentration of wells pumping the largest quantities of water. He recommended restricting additional pumping in areas with well interference and the need to look for options to redistribute pumping away from the cones of depression. (Zipp. 1980 Ocotillo-Coyote Wells Groundwater quality-quality study, Imperial County at pp. 7, 8, 19, 201) (Exhibit 554)

29. "It is necessary to note that over 80 percent of pumpage is exported from the groundwater basin. This figure is based on different boundaries than the political boundaries which are currently accepted. The northern and eastern edges should be redefined to terminate at the Elsinore Fault as the water east of the fault is generally of an unusable quality." (Zipp 1980 at p.7)

30. "With this new definition of the basin, all extractions by U.S. Gypsum must be considered as exports, because the water is taken across the fault into poor quality, unusable area. Any percolation of process east of the fault should not be considered recharge to the Ocotillo-Coyote Wells basin" (Zipp 1980 at p.7, 8)

31. "Conclusions: 3. Cones of depression in Ocotillo, Coyote Wells, and Yuha have resulted in well interference. .... 10. Additional export of water from the areas affected by well interference will only intensify the problem. ....11. Deepening of the pumping cones may induce poor quality water upward from the deeper zones." (Zipp 1980 at p.19)

32. "Recommendations . 6. Use geologic rather than political boundaries for the groundwater basin. .... 8. Look into options to redistribute pumpage away from pumping cones of depression. 9. Restrict additional pumping in areas showing well interference." (Zipp 1980 at p.21) (Zipp. 1980 Ocotillo-Coyote Wells Groundwater quality-quality study, Imperial County)

33. Zipp later served as a consultant for McDougal in Imperial County litigation to stop the export of water to Mexico from wells in Ocotillo and Yuha.

34. Since that 1980 report and recommendations, the County has ignored both the conclusions and recommendations. This is especially true with respect to the County's actions related to the export pumpage by US Gypsum. Over the objections of residents and the Sierra Club, and contrary to the recommendations of the County's own consulting hydrogeologist Huntley (Exhibit 548), in 1998, the Board of Supervisors authorized US Gypsum to almost double its export pumping without preparation of any site specific geohydrology study which is required for any proposed groundwater use in the Ocotillo Coyote Wells Basin as spelled out in the Ocotillo/Nomirage Community Area Plan of 1994. It was this action by the county that triggered the litigation described in the Court of Appeals decision in Exhibit 538.

35. In 1979 Imperial County sought the consulting services of David Huntley, PhD as a consultant in hydrology. Dr. Huntley is now Professor Emeritus from San Diego State University, having taught groundwater geology courses and done consulting work for various local and federal government agencies. His report "The Magnitude and potential effects of declining water elevations in the Ocotillo-Coyote Wells Basin.." is included as Exhibit 549. The County had sought Huntley's evaluation because it was involved in litigation with one of the owners of export wells with the greatest water

level declines.

36. With respect to the proposed IV Solar Project well 16S/9E-36G4, relevant portions of Huntley analysis in 1979 stated that:

    a. "Wells 16/S/9E-36H1 [US Gypsum well] and 16S/9E-36G4 [WestWind or Boyer well] show large fluctuations in water levels, which may be understood when these are compared to rates of withdrawal from the Clifford well, the second largest well user in the Ocotillo area. It can be seen that the fluctuations in water levels in wells 16/S/9E-36H1 and 16S/9E-36G4 correspond one for one with changes in pumpage rates of the Clifford well. The period from 1976 to 1979 is characterized by below-average withdrawal, above average recharge, and relatively steady declining water levels. Periods of average recharge and average withdrawal will result in greater rates of decline than seen in 1976-1979." (Huntley 1979 at p.11)

37. Thus, Huntley saw well interference and the impacts of the largest pumping wells on each other. Without any accurate assessment of how much was pumped from each of the wells, the contributions of each of the major pumping wells to the growing cone of depression in 1979. But now the Clifford-McDougal well no longer pumps for export, so the relationship of current water levels and pumping responses cannot be seen any longer as related to activities of well 25K2. Today both the Clifford Well 16S/9E 25K2 (later called McDougal-Ocotillo well) and the Boyer well 16S/9E-36G4 are no longer pumping any significant quantities of water. However, based on the past analyses of Zipp and Huntley in addition to concerns raised in the documents prepared for the court ordered EIR/EIS for the USG expansion, without more information, it is questionable to conclude that the "Zone of Influence is considerably less than the distance to the closest well, approximately 500 feet away." as does URS SAC at p. 2.5-2.

38. Today the largest amount of pumping in the groundwater basin is from the three closely spaced wells operated by US Gypsum USG #6 or 16S/9E-36B1, USG #4 or 16S/9E-36G3 and USG #5 or 16S/9E-36H1. The well closest to these would be the Boyer well from which the IV Solar Project applicant proposes to haul groundwater by truck for export (Zipp's definition) to the solar project site near Plaster City.

39. According to a 1977 (?) Computer print out provided by USGS for all the original wells for the 1977 study, the many wells drilled by US Gypsum are 16S/9E-36B1 drilled in 1974, 16S/9E-36F2 drilled in 1925, 16S/9E-36F3 drilled in 1947; 16S/9E-36G3 drilled in 1952, 16S/9E-36H1 drilled in 1954, 16S/9E-36L1 drilled in 1950 and 16S/11E-8K1 drilled in 1925 at the site of the Plaster City factory. The three wells on the Elfring (now Boyer) property include 16S/9E-36G1 drilled in 1957,16S/9E-36G2 unknown drilling date, and 16S/9E-36G4 drilled in 1962. (See exhibit 553)

40. This information is included because it reveals that at one of the wells on the Boyer property (16S/9E-36G1) there was a marked change in water quality when the quality was monitored between 1958 to 1975. The amount of total dissolved solids (TDS) steadily increased from 341 mg/l to 635 mg/l during that 17 year period. No explanation is provided in any reports that I can recall. This would be of concern to any domestic well owner. (See information for well 16S/9E-36G1 in Exhibit 516m, the table of USGS data for the Ocotillo-Coyote Wells Groundwater basin.)

41. Based on the Monitoring date available from USGS and the conclusions of Zipp and Huntley earlier, there are grounds for concern that require full disclosure about the water quantities pumped, water levels, and water quality of all the USG and Boyer property wells. Absent such information it is not possible to make a finding that exporting groundwater from the Boyer well would not have an adverse impact either locally or downgradient, in terms of water levels or water quality.

42. Similarly well 16S/9E-25K1 was the original Clifford (later McDougal) well drilled in 1958 and used

for export to Mexico. Monitoring information from USGS indicated that the water quality deteriorated markedly with large volume pumping of about 100 AF/Y from this property. From 1959 to 1974, the TDS increased from 279 mg/l to 2250 mg/l, becoming non-potable. The nearby well 16S/9E-25K1 "experienced a rapid increase in chloride from 1980 through 1982 or beyond" though there was no data from 1983-1988. "..declining chloride levels since 1988 suggest chloride concentrations rose to levels in excess of 100 mg/l at the peak of McDougal's water production." (Exhibit 548, Huntley 1993 p.1) Huntley also noted that once the export pumping stopped sometime around 1986, that the chloride levels declined. Information on chloride levels can be obtained from http://nwis.waterdata.usgs.gov/ca/nwis/qwdata by searching for Imperial County and then linking to the data for each well.

43. Although groundwater reports repeatedly discuss recharge, is likely very insignificant if water levels continued to decline during and in the three decades following the heavy rainfalls and flooding of 1976, 1977, and 1981, even though the amount of pumping in the groundwater basin has declines, because there is no longer any export to Mexico, and USG reportedly is not producing wallboard at the rate it was previously.

44. With conditions of local overdraft because pumping is confined to the distribution of private property, there can be no surplus water at any of the wells near the center of the cone of depression,. This includes the Boyer well. Text in Appendix D referring to the use of groundwater for the life of the project (if needed) raises additional concerns about the potential for long-term cumulative impacts.

45. The Information provided here is to support a request that additional analysis and study must be made prior to any consideration of using additional water from near the center of the largest cone of depression in the Ocotillo-Coyote Wells Groundwater Basin, an EPA designated Sola Source Aquifer.

46. **Evidentiary hearings on hydrology issues should be rescheduled to allow public and agency review of groundwater issues which are not publicly available on the CEC project site until May 10, 2010**

47. There should be no evidentiary hearings until the review of the whole of the project and all of its components is complete and the public and hydrology experts from responsible agencies such as US EPA and USGS have an opportunity to review the changed proposed source of water for the project and have had an opportunity to compare information and analyses from one section to another and from other recent and past EIR/EIS documents related to groundwater uses from the Ocotillo-Coyote Wells Groundwater Basin. There simply has not been enough time to analyze the potential impacts of the pumping of the well sought for use in addition to the issue of cumulative impacts because the Applicant has failed to provide the necessary facts and bring data up to date. I have done my best, but time is too short.

Applicants Alternative Water Supply from well 16S/9E-36G4

References cited

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2010 available online at http://www.icpds.com/?pid=2308 .

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515 US EPA 1996 designated Ocotillo-Coyote Wells Groundwater Basin as a "Sole Source Aquifer" 61 FR 47752, Sept 10, 1996)

516 "EH Table 10 Water well information, water quality, and groundwater elevations Ocotillo/Coyote Wells Groundwater Basin, a Sole Source Aquifer, Imperial County CA" Updated March 2010 from Sierra Club comments on USG FEIR/EIS 2008 and included in CWSP Scoping comments found at 28appa-nop-initial-study-a at pp 7-17 (USG EIR/EIS Appendix B-1 USGS Hydrologic Data, USGS NWIS water level and quality data & Bookman-Edmonston 3/96 (BE96), BE 1/2004 (BE04). 11pages.

517 Ocotillo/Nomirage Community Area Plan (ONCAP) a part of the Land Use Element of the Imperial County General Plan 1994 with groundwater basin map

518 US EPA 2010-04-11 letter re Final EIS for US Gypsum project

519 USGS 2008-12-24 letter to Cong. Filner re Final EIS for US Gypsum Project

520 US EPA 2009-02-25 comments re NOI for Coyote Wells Specific Plan Area

521 USG FEIR/S 4.0 Collective Responses Table 4.0-1 Water quality info from USGS

522 USG FEIR/S 4.0 Collective Responses Fig. 4 Wells with Water Quality Data

523 USG FEIR/S 4.0 Collective Responses Fig 7. Wells with Recent Water Level data

524 BE 2004 Table 4-2 Historic Groundwater Pumping in 2006 USG DEIR/S

525 Ocotillo Express Wind Draft Plan of Development 2009

526 SES Applicant's Submittal of Opening Testimony re Van Patten re well 16S/9E-36G4

527 Terms for Well 16S/9E-436G4

528 Moore in SES Applicant's submittal of Opening Testimony re well 16S/9E-36G4

529 Ocotillo Express Wind Facility 4 pgs

530 USG FEIR/S Mitigation & Monitoring re Hydrology ES 9-11 submitted as an exhibit for the CWSP DEIR comments 20210

531 USG DEIR/S Mitigation & Monitoring re Hydrology See Applicant's Appendix C for hydrology and USG DEIR/S Impacts and Mitigation in Summary Table at pp S-7 through S-11

532 Powers, Bill. 2007 San Diego Smart Energy 2020 158 pgs, PP 69-74 includes conclusions and recommendations
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533 Berkeley Law. 2009." In Our Backyard: How to increase renewable energy production on buildings and other local spaces"

534 URS/BLM color brochure "Imperial Valley Solar Project Frequently asked Questions May 2010"

535 Tessera Solar, SES "Imperial Valley Project Fact Sheet (Formerly SES Solar Two)" undated color brochure.

536 "Impacts of Avoidance or partial avoidance of Drainage Areas I, K, C, E, and G" identified as "Preliminary Layout" by RMT in BLM documents provided at workshop on May 4, 2010, possibly dated 4/12/2010.

537 Skrivan, James. USGS 1977 "Digital - Model Evaluation of the Ground-Water Resources in the

Ocotillo-Coyote Wells Basin, Imperial County, California"

538 Sierra Club v. County of Imperial, United States Gypsum Company, Real Party in Interest, Court of Appeal Case D034281 Decision 10/26/00, Court of Appeal file recalled from storage and reviewed in January 2008

539 US EPS re 2006 USG DEIS

540 USGS re 2006 USG DEIS

541 Powers 2010-05-13 email 4 pgs "best comparative solar costs info I have" & FW other docs

542 San Diego solar panels cost less with 1 BOG

543 16-apr-10 Renewable Energy World US Solar sees 38% growth in PV capacity in 2009

544 7-apr-10 RETI Phase 2B Draft Report pp 4-6 to 4-8 Thin film PV lower cost than solar thermal

545 Mar 2010 SNL "SoCalEd orders 200 MW of solar panels, plans solicitation for 250 MW more"

546 Powers 2010-05-13 email 1Q 2010 CSI capital cost numbers

547 01-may-10 CPUC SunCentric Study in pictures through March 2010 costs trends (52 pages)

548 Huntley, D. 1993. Letter re changes in chloride concentration in water quality from a well in Ocotillo-Coyote Wells basin

549 Huntley, David 1979. Magnitude and potential effects of declining water elevations in the Ocotillo-Coyote Wells groundwater basin.

550 RMT 2010 Impacts of avoidance of drainages Fig. From BLM handout for May 4, 2010 workshop.

551 Harmon 2010 values for static water level in feet above mean sea level including most recent USGS data (compiled from Exhibit 516 EH Table 10, a compilation of USGS monitoring data.

552 Tisdale 2006 comments on the USG DEIR includes information on the IID source of supply for industrial use at Plaster City/USG factory

553 USGS 1977 computer printout of well ownership and drilling dates for Ocotillo-Coyote Wells Groundwater Basin

554 Zipp R. 1980. Ocotillo-Coyote Wells Groundwater quality-quality study, Imperial County

555 Table Westwind Water Sales History & water levels well 16S/9E-36G4 vs USG 16S/9E-36H1

556 Hamilton 16S/9E-34B1 well location and water level graph from USGS website

557 Hamilton 16S/9E-34B1 well water level table '98-09 from USGS website

558 Discrepancies in groundwater pumping (AF/Y) by USG wells in Ocotillo-Nomirage area as submitted by Bookman-Edmonston's Richard Rhone in January and September 2003 (Table 16-17 of Sierra Club comments on 2008 USG FEIR/S)

559 USG Annual Pumping and water levels in 3 USG wells in Ocotillo area (Table 14 of Sierra Club comments on 2008 USG FEIR/S) source of orriginal information is in Exhibits 560 and 561.

560 USG Annual Reports 1993-2002 (originally Sierra Club Exhibit 242 for 2008 USG FEIR/S)

561 Rhone 2003 email re USG Annual pumpage for three wells combined (originally Sierra Club Exhibit 236 for 2008 USG FEIR/S)

Declaration of Edie Harmon

Re: Testimony on groundwater issues related to the proposed Alternative Water Supply for the Imperial Valley Solar Project/Solar 2 DOCKET NO. 08-AFC-5

I, Edie Harmon, declare as follows:

I prepared the testimony submitted herein. These comments have also incorporated and/or included comments and analysis I have prepared and previously submitted as comments on Draft and Final EIR/EIS documents for the US Gypsum Expansion and Modernization Project in 2006 and 2008, and comments and analysis related to groundwater issues for the 2010 DEIR for the proposed Wind Zero/Coyote Wells Specific Plan Project. The Wind Zero project overlies the Ocotillo Coyote Wells Groundwater Basin with proposed wells just a few miles downgradient to the east of the Applicant's well and west of the Imperial Valley Solar Project. The tables that are submitted as exhibits were prepared by me either as exhibits for the Sierra Club 2008 comments on the USG FEIR/S or for the Imperial Vaqlley Solar Project..

My relevant experience and qualifications are set forth in the Resume which was submitted earlier. I believe that this testimony is true and correct. I am personally familiar with the facts and conclusions included in the attached testimony. If called as a witness, I could testify competently thereto.

I declare under penalty of perjury, under the laws of the State of California, that the foegoing is true and correct to the best of my knowledge.

Dated: May 17, 2010 ____s/ EdieHarmon_____

At: San Diego California Edie Harmon

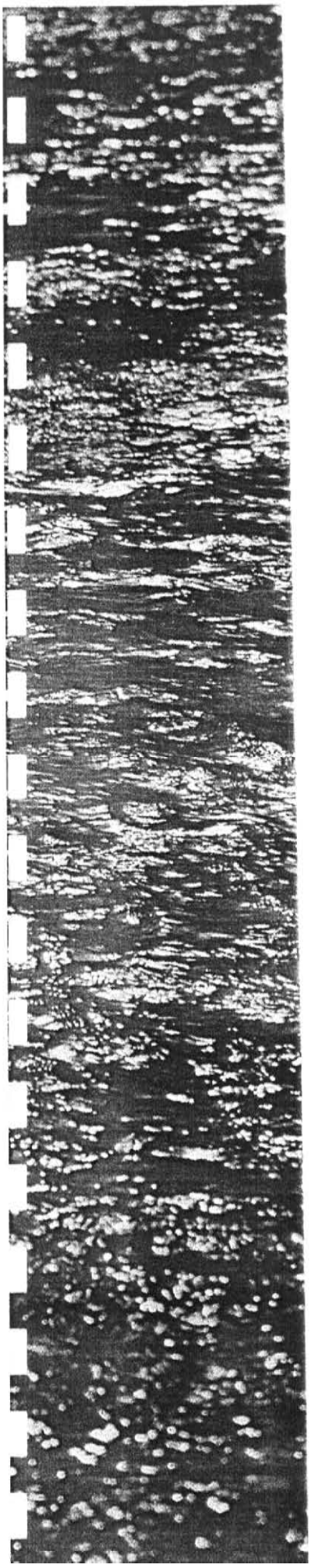
OCOTILLO/COYOTE WELLS HYDROLOGY AND GROUNDWATER MODELING STUDY

Prepared for

U.S. GYPSUM COMPANY

Prepared by

Bookman-Edmonston
A Division of GEI Consultants, Inc.



OCOTILLO/COYOTE WELLS HYDROLOGY AND GROUNDWATER MODELING STUDY

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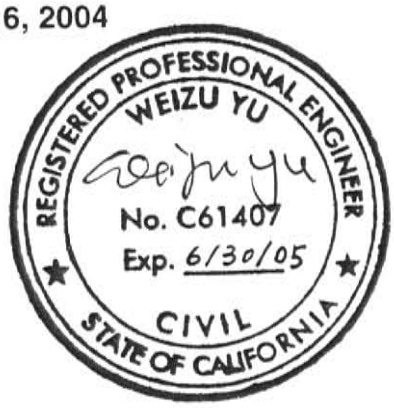


SECTION 4 LAND AND WATER USE

With the exception of the town of Ocotillo and communities of Nomirage, Yuha Estates, West Texas, and Painted Gorge, the basin is an undeveloped desert. The U. S. Bureau of Land Management owns a great deal of the land over the Ocotillo/Coyote Wells Groundwater Basin. Below is a description of both land and water use within the study area.

4.1 LAND USE

The Department of Water Resources conducted a land use survey in 1989. Data from this survey was plotted on USGS 7 1/2 minute quadrangle mapping based upon aerial photographs and field inspection. The entire basin is native vegetation excepting the town of Ocotillo and the communities of Nomirage, West Texas, and Yuha Estates. The communities of Painted Gorge and Coyote Wells were not shown on this land use map. Coyote Wells consists of a motorhome and a trailer located behind an abandoned service station-grocery store. Presented in Table 6-1 is a summary of the 1989 land use in the area.

Table 4-1
1989 Land Use

Community	Acres
Ocotillo	
Commercial	8
Residential	115
Suburban Residential	2
Flowers or Nursery	1
Total	126
Nomirage	
Suburban Residential	139
West Texas	
Suburban Residential	3
Yuha Estates	
Suburban Residential	2

Table 4-3
Population and Applied Water Use
Population

Community	Year					
	1975 [b]	1980 [b]	1990 [a]	1995 [b]	2010 [b]	2025 [b]
Painted Gorge	31	33	38	41	50	62
Ocotillo [c]	258	277	319	342	421	519
West Texas	8	9	10	11	13	16
Nomirage	67	72	83	89	110	135
Yuha Estates	8	9	10	11	13	16
Total	372	400	460	494	607	748

(a) - Population based on 1990 census

(b) - Population based upon annual population growth of 1.4% from 1980 to 1990

(c) Population of Ocotillo in summer months (population estimated to more than double during winter months).

APPLIED WATER USE
(Acre-Feet per Year)

Community	Year					
	1975	1980	1990	1995	2010	2025
Painted Gorge [a]	2.1	2.2	2.6	2.7	3.4	4.2
Ocotillo [b]	72.3	77.6	89.3	95.8	118.0	145.3
West Texas [a]	0.5	0.6	0.7	0.7	0.9	1.1
Nomirage [c]	7.5	8.1	9.3	10.0	12.3	15.1
Yuha Estates [c]	0.9	1.0	1.1	1.2	1.5	1.8
Total	83.3	89.5	103.0	110.4	136.1	167.5

(a) - Water use rate of 60 gpd/capita

(b) - Water use rate of 200 gpd/capita

(c) - Water use rate of 100 gpd/capita

Urban Water Use

The Ocotillo/Nomirage community area encompasses approximately 108,000 acres which includes the townsite of Ocotillo, and the communities of Nomirage, Painted Gorge, West Texas and Yuha Estates. The locations of each of these communities is presented in Figure 3-1. According to the ONCAP, the Ocotillo/Nomirage community area has 366 dwelling units and a population of 460. The entire planning area is dependent upon groundwater and is not served by a sanitation or sewer treatment facility.

The communities of Nomirage and Yuha Estates rely exclusively upon individual water wells for their water supply. Coyote Valley Mutual Water Company (CVMWC), Ocotillo Mutual Water Company (OMWC), and Shell Canyon Water Company (SCWC) are located in Ocotillo and serve most of Ocotillo. CVMWC serves 125 connections, OMWC serves 80 connections, and SCWC serves 16 connections. The remainder of Ocotillo relies upon individual water wells for their water supply. Westwind Water Company is also located in Ocotillo and provides water by privately owned trucks to Painted Gorge, West Texas, and construction sites in the area. Groundwater underlying Painted Gorge is unsuitable for drinking and all water must be trucked in. Groundwater underlying West Texas is suitable for bathing and landscape irrigation, but drinking water must be trucked in.

From population data available in the literature, and from the 1980, 1990 and 2000 population census information, estimates of population in each community within the study area were made for years 1980 and 1990. During the 1980 to 1990 period, the population increased by approximately 1.4 percent annually, but from 1990 to 2000 the population decreased by 1.1 percent totally (from 460 to 455). However, for water use estimates an assumption of a 1.4 percent constant annual population increase was computed. Table 4-3 provides a summary of population estimated for selected years from 1975 through 2025. With the exception of Ocotillo, the population of each of these communities is relatively constant throughout the year. The population of Ocotillo is estimated to more than double during winter months.

A water use rate of 200 gallons per day per capita was computed for Ocotillo based upon population and water use records from CVMWC and OMWC. The residences in Ocotillo are typically landscaped with trees, shrubs and desert vegetation which use drip (or other low volume) irrigation. Residences which are vacated during the summer still require landscape irrigation which causes the per capita water use rate to increase. A water use rate of 100 gpd/capita was assumed for Nomirage and Yuha Estates. These communities have a lower per capita water use rate because they have less irrigated landscaping than in Ocotillo and less seasonal population variation. A

water use rate of 60 gpd/capita was assumed for Painted Gorge and West Texas based upon estimated Westwind Water Company water use. Water use rates in these areas are expected to be lower than other areas because water must be trucked in and there is little or no irrigated landscape. Water use was computed for each community based upon estimated population and water use rates. Computed water use estimates for selected years during the 1975 through 2025 period are presented in Table 4-3.

Agricultural Water Use

It is a goal of ONCAP to eliminate commercial agriculture from the area. In field inspections of the project area in February 2003, no commercial agricultural land use was observed. This is consistent with the DWR 1989 land use, which indicated only one acre of flowers or nursery in the study area.

Estimates of historical agricultural use for this area was not found in the literature, however, Imperial County Health Department records indicate that the SCWC provided an average water use of 29,000 gallons per day (32 af/yr) to agriculture in 1981.

Export to Mexico

Water has historically been pumped from wells in Ocotillo and Yuha Estates for export to Mexico. The largest and most recent exporter of water to Mexico was the McDougal Water Company. The McDougal Water Company operated one well in Ocotillo and one in Yuha Estates.

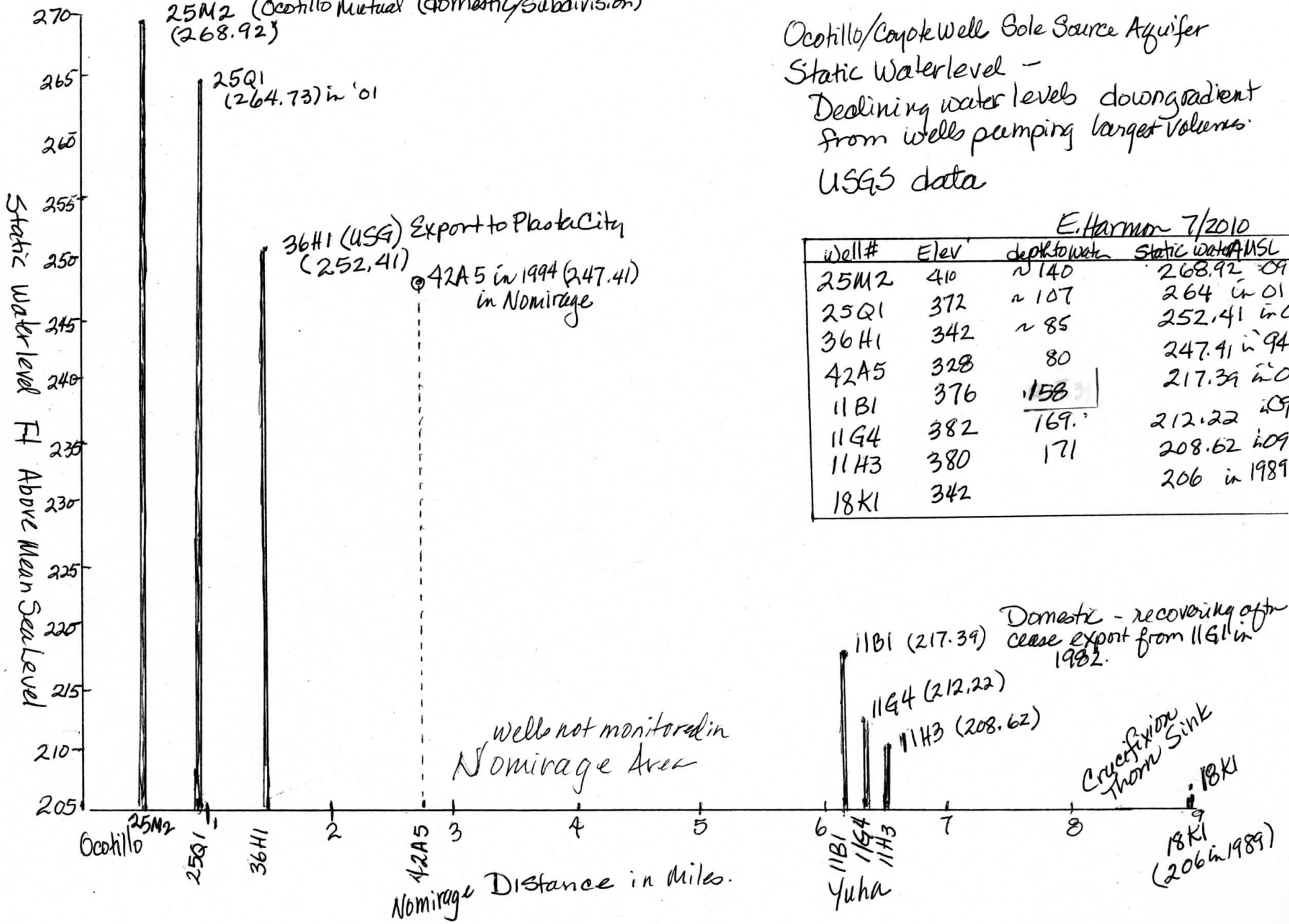
The McDougal Ocotillo well (well no. 16S/9E-25K2) was drilled by Thomas Clifford in 1958. This well originally served approximately 10 residents in Ocotillo. In 1967 Mr. Clifford began selling water to Mexico, as well as serving Ocotillo Unit No. 3. On December 1, 1977, McDougal Water Company took over the operation and installed a new 50-horsepower motor and second loading spout. A fleet of over 20 trucks made multiple trips daily, sometimes resulting in over 50 trips per day. The pumpage varied according to time of year and other factors, with the heaviest pumpage during the summer. Exports to Mexico from this well were ceased sometime near 1984. Export from this well can be estimated from energy use. Energy use records were available from IID for years 1974 through 1978. Table 4-4 presents a summary of energy use, total well production and water exported to Mexico from McDougal's Ocotillo well.

Table 4-4
Well Production and Export to Mexico
Well No. 16S/9E-25K2

Year	Energy Use (Kwh)	Total Pumped (af)	Exported to Mexico (af)
1974	55,460	141	138
1975	83,760	214	211
1976	84,580	216	213
1977	88,280	225	222
1978	54,940	140	137

In the above table, the total amount of water pumped is computed based upon 2.55 acre-feet per MWh, (from the 1979 Copley International Corporation Study). The amount of water exported to Mexico assumes that 3 acre-feet per year was used to serve residents in Ocotillo Unit No. 3.

McDougal Water Company had a similar operation in Yuha Estates (Well No. 17S/10E-11G4), which began in September 1977. Commercial export was ceased from this well on September 1, 1982. A 1979 report by David Huntley, estimated that 143 acre-feet per year was pumped from this well.

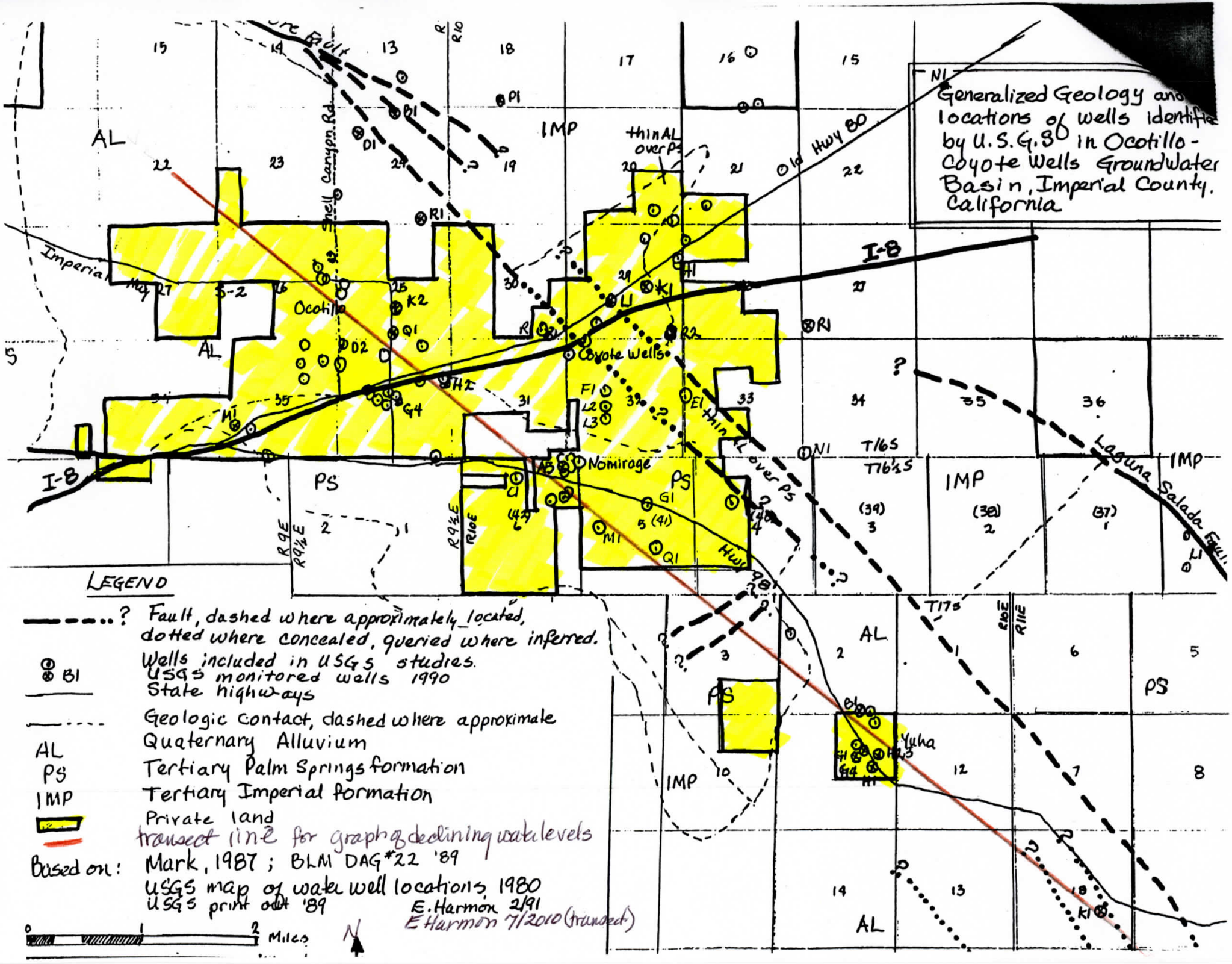


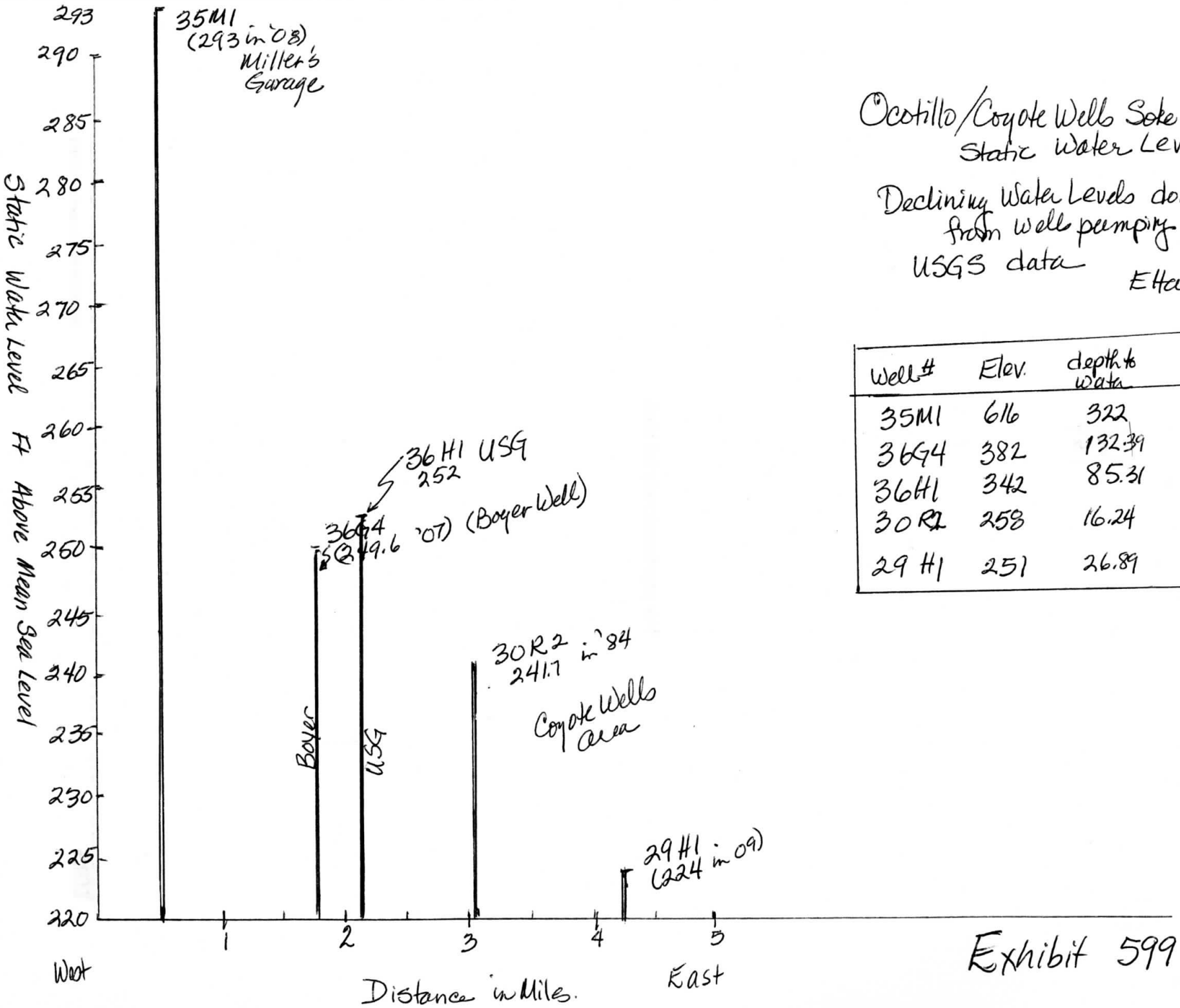
Ocotillo/Coyote Well Sole Source Aquifer
Static Waterlevel –
Declining water levels downgradient from wells pumping largest volumes.
USGS data

E. Harmon 7/2010

Well#	Elev'	depth to water	Static water AMSL
25M2	410	~140	268.92 '09
25Q1	372	~107	264 in 01
36H1	342	~85	252.41 in 09
42A5	328	80	247.41 in '94
11B1	376	158	217.39 in 09
11G4	382	169.'	212.22 in 09
11H3	380	171	208.62 in 09
18K1	342		206 in 1989

Exhibit 599


Generalized Geology and locations of wells identified by U.S.G.S. in Ocotillo-Coyote Wells Groundwater Basin, Imperial County, California
AL
IMP
PS
thin AL over PS
Hwy 80
I-8
Imperial Hwy
Shell Canyon Rd.
Ocotillo
Coyote Wells
Nomirage
Laguna Salada Fault
Yuha
T16S
T16½S
T17S
R9E
R9½E
R10E
R11E
LEGEND
Fault, dashed where approximately located, dotted where concealed, queried where inferred.
Wells included in USGS studies.
USGS monitored wells 1990
State highways
Geologic contact, dashed where approximate
Quaternary Alluvium
Tertiary Palm Springs formation
Tertiary Imperial formation
Private land
transect line for graph of declining water levels
Based on: Mark, 1987; BLM DAG #22 '89
USGS map of water well locations, 1980
USGS print out '89
E. Harmon 2/91
E Harmon 7/2010 (transect)
0 1 2 Miles
N



Ocotillo/Coyote Wells Sole Source Aquifer
Static Water Level

Declining Water Levels down gradient from well pumping largest volume

USGS data

Ettarmon 7-2010

Well #	Elev.	depth to water	static level AMSL
35M1	616	322	293 in '08
36G4	382	132.39	249.61 '07
36H1	342	85.31	252 in 09
30R2	258	16.24	241.76 in 84
29H1	251	26.89	224.25 '09

Exhibit 599 A