

*Rush*

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8 IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

9 IN AND FOR THE COUNTY OF MARICOPA

10 IN THE GENERAL ADJUDICATION )  
11 OF ALL RIGHTS TO USE WATER IN )  
12 THE GILA RIVER SYSTEM AND )  
13 SOURCE )

W-1-11-605

(Special Master George A.  
Schade, Jr.)

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**ARIZONA DEPARTMENT OF  
WATER RESOURCES'  
COMMENTS CONCERNING  
LEGAL ISSUES AND PROCEDURES  
RELATING TO THE  
AMENDED CLAIMS FOR  
FORT HUACHUCA**

CONTESTED CASE: *In re Fort Huachuca.*

HSR INVOLVED: San Pedro River Watershed Hydrographic Survey Report.

DESCRIPTIVE SUMMARY: The Arizona Department of Water Resources hereby files its comments concerning legal issues and procedures relating to the amended claims for Fort Huachuca.

NUMBER OF PAGES: Eight.

DATE OF FILING: May 2, 2002.

Pursuant to the Special Master's Order of December 4, 2001, on March 18, 2002 the Arizona Department of Water Resources (Department) submitted a status report concerning the amended water rights claims filed on January 14, 2002 by the United States on behalf of the

1 U.S. Army Intelligence Center and Fort Huachuca (the Fort).<sup>1</sup> Since the filing of that report,  
2 the Department has continued its review of the Fort's amended claims toward the preparation  
3 of a hydrographic survey report (HSR) that supplements the HSR for the San Pedro River  
4 Watershed (San Pedro HSR) related to the Fort's contested case. The San Pedro HSR was  
5 completed in 1991, more than 10 years ago, and by Minute Entry of October 26, 2000, Special  
6 Master Thorson resumed proceedings in the contested case for the Fort. In the supplemental  
7 contested case HSR, the Department intends to update the data included in the San Pedro HSR,  
8 and to include a watershed file report that describes the Department's proposed water rights  
9 attributes for the Fort's amended claims.  
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11 As further requested by the Special Master's Order of December 4, 2001, the  
12 Department hereby files comments on proposed deadlines for filing objections to the  
13 Department's supplemental contested case HSR for the Fort, procedures to determine  
14 objections, a timeline for disclosures and scheduling of hearings, and legal issues relating to the  
15 Fort's claims. The Department presents its comments on the legal issues first.

#### 16 **Legal Issues**

17 The Department believes that there are several legal issues that need to be resolved prior  
18 to the Department's completion of the supplemental contested case HSR for the Fort. These  
19 issues are primarily a result of changes in the law that occurred after the San Pedro HSR was  
20 finalized in 1991. These issues are discussed below.

21 In 1995, the statute which governs the preparation of HSRs was amended. Under  
22 A.R.S. § 45-256, as amended, the Department must propose water rights attributes for each  
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25 <sup>1</sup> The Department's report also included the status of the hydrographic survey report for the Gila River Indian  
Reservation.

1 claim or use investigated by the Department for the HSR. However, the statute does not  
2 specify which water rights attributes should be addressed.

3 On behalf of the Fort, the United States is claiming rights to both surface water and  
4 groundwater in its statements of claimant nos. 39-10774 and 39-10775. On January 14, 2002,  
5 the United States reduced the amount of *groundwater* claimed under statement of claimant 39-  
6 10774 from 10,087 acre-feet per year to 7,549 acre-feet of *groundwater* per year.<sup>2</sup> The United  
7 States did not amend statement of claimant 39-10775.

8  
9 **Issue 1.** Which water rights attributes should be used for the Fort's claimed federal  
10 reserved water rights? The Department suggests that the following be considered: the basis of  
11 the water right claimed, the source of the water, the owner of the property on which the water is  
12 to be used, the location of the point of diversion, the location of the place of use, the quantity of  
13 water, the priority date, the period of use, the beneficial uses of the water, the area and capacity  
14 of ponds, flow rates for springs, and diversion and delivery capacities. Should the water rights  
15 attributes be the same for groundwater-based uses and surface water-based uses? If the claim  
16 involves groundwater use, should the water rights attributes include the date the well was  
17 completed and the flow rate/volume?

18 **Issue 2.** Is it necessary to establish the purpose of the federal reservation prior to  
19 determining the water rights attributes for the Fort's claims? The Arizona Supreme Court's  
20 decision in *Gila III* appears to have a bearing on this issue. See *In re the General Adjudication*  
21 *of all Rights to Use Water in the Gila River System and Source*, 195 Ariz. 411, 423, 989 P.2d  
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25 <sup>2</sup> The claimant stated: "In the Amendment filed today, the claimant incorporates all previous filings, and amends Claim No. 39-010774 solely for purposes of amending paragraph eleven above. Therefore, instead of claiming 10,087 acre-feet of *groundwater* per year, the claimant now claims 7,549 acre-feet of *groundwater* per year." (Emphasis added.)

1 739, 751 [¶ 43] (1999) in which the Court concluded that, "Federal reserved  
2 rights extend to groundwater to the extent groundwater is necessary to accomplish the *purpose*  
3 of a reservation" (emphasis added). Also relevant is the Arizona Supreme Court's decision in  
4 *Gila V* in which the Court held that a federal reserved water right must be tailored to a  
5 reservation's "minimal need." *In re the General Adjudication of all Rights to Use Water in the*  
6 *Gila River System and Source*, 201 Ariz. 307, 35 P.3d 68, 73 [¶ 11] (2001). How should the  
7 minimal needs of the Fort be determined? Should the availability of effluent be considered?  
8 How should future uses be quantified?

9  
10 **Issue 3.** Should the federal reserved water rights claims for the Fort be quantified  
11 separately for groundwater and surface water? The Arizona Supreme Court's decision in *Gila*  
12 *III* may be instructive on this issue. In that case, the Court held that, "A reserved right to  
13 groundwater may only be found where *other waters* are inadequate to accomplish the purpose  
14 of a reservation." 195 Ariz. at 420, 989 P. 2d at 748 [¶ 31] (emphasis added). Is it necessary to  
15 quantify the "other waters?" Do the "other waters" include subflow? Is it necessary to conduct  
16 cone of depression tests for the Fort's wells in order to determine whether the wells are  
17 pumping subflow or groundwater? Is this an enforcement issue or a decree issue?

18 **Issue 4.** Should the supplemental contested case HSR for the Fort's amended claim  
19 include a "significant diminishment" analysis? By Order dated September 9, 1988, the  
20 adjudication court (Judge Goodfarb) instructed the Department to "determine all stream users  
21 or diversion of either surface water or groundwater which significantly affect these sources  
22 reasonably available on, at, or near the federal parcel..." In the San Pedro HSR, the  
23 Department concluded that surface water users did not have an impact on the Fort's water  
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1 supplies, and instead focused its attention on quantifying the potential impacts of off-  
2 reservation groundwater pumping.

3 Due to language in *Gila III* and the Arizona Supreme Court's recent order concerning  
4 Issue No. 6 in the Gila River adjudication, the Department questions whether it is appropriate  
5 to determine "significant diminishment" issues at this stage of the adjudication. In *Gila III*, the  
6 Court stated that, "once a federal reservation establishes a reserved right to groundwater, it may  
7 invoke federal law to protect its groundwater from *subsequent* diversion to the extent such  
8 protection is necessary to fulfill its reserved right." 195 Ariz. at 422, 989 P. 2d at 750 [¶ 37]  
9 (emphasis added). The Court further stated that, "If injunctions should *ultimately* prove  
10 necessary in this case, they shall likewise be appropriately tailored to minimal need." *Id.* [¶  
11 38] (emphasis added). A recent order of the Arizona Supreme Court concerning Issue No. 6 is  
12 also noteworthy. Issue No. 6 was phrased as, "Must claims of conflicting water use or  
13 interference with water rights be resolved as part of the general adjudication?" 195 Ariz. at  
14 414, 989 P. 2d. at 742, fn. 2 [¶ 4]. Based on statements from several of the parties in the Gila  
15 River adjudication, the Court vacated its prior order granting interlocutory review of Issue No.  
16 6 as well as the adjudication court's 1989 order relating to Issue No. 6. *In re the General*  
17 *Adjudication of all Rights to Use Water in the Gila River System and Source*, Ariz. Sup. Ct. No.  
18 WC-90-0001-IR (April 2, 2002).

19  
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21 **Issue 5.** How should the priority date for the Fort's federal reserved rights claims be  
22 determined? Related thereto, should the date of the Executive Order establishing the Fort be  
23 used as the priority date for the Fort's federal reserved right? Should subsequent expansions of  
24 the reservation affect the priority date? Should the fact that the post was deactivated from 1947  
25

1 to 1951 and for a few months thereafter affect the priority date? Should the same priority date  
2 be used for both groundwater-based uses and surface water-based uses?

3 **Issue 6.** Is it necessary to await a ruling on the *de minimis* uses before completion of  
4 the supplemental contested case HSR for the Fort? By Minute Entry dated September 28,  
5 2000, the adjudication court (Judge Bolton) concluded that, "before the Department is ordered  
6 to do any additional work in [the] San Pedro, this Court should rule on the Special Master's  
7 report on *de minimis* uses." The Department questions whether a decision on *de minimis* uses  
8 is relevant to the federal reserved water rights claims filed for the Fort.  
9

10 **Proposed Deadlines for Filing Objections to the Department's Supplemental Contested**  
11 **Case HSR for the Fort.**

12 Pursuant to the September 28, 2000 Minute Entry of the adjudication court (Judge  
13 Bolton), the Department was directed as follows concerning the San Pedro HSR:

14 As contested cases are scheduled, the Department will be ordered to update and  
15 supplement the watershed file reports to include recommendations of water right  
16 attributes and also to advise the Court concerning new uses and any new or amended  
17 statement of claimants. Objections will be allowed as the updates are published.

18 Although this order provides general guidance, it does not provide any specific timelines.

19 The Department recommends that a shorter time frame be used for filing objections to  
20 the supplemental contested case HSR for the Fort than was used for the final San Pedro HSR.  
21 The objection period for the final San Pedro HSR was 180 days, preceded by a 120-day notice  
22 of filing, as required by A.R.S. § 45-256. The Department does not believe that these  
23 procedures should apply to the supplemental contested case HSR for the Fort. The Department  
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1 suggests that objections be filed no later than 90 days after the Department files notice of filing  
2 of the supplemental report.<sup>3</sup>

3 **Procedures to Determine Objections**

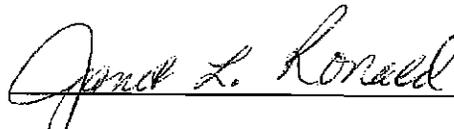
4 Because the San Pedro HSR has already been finalized, and because the Fort's claims  
5 are already part of a contested case, the Department suggests that the procedures for addressing,  
6 as well as filing, objections be more streamlined than those used for final HSRs.<sup>4</sup> As part of  
7 that streamlined process, the Department and the objectors should be provided with the  
8 opportunity to resolve objections prior to the contested case hearing.  
9

10 **Timeline for Disclosures and Scheduling of Hearings**

11 The Department believes that it is premature to comment on the timeline for disclosures  
12 and scheduling of hearings. The resolution of the legal issues described above will affect the  
13 proceedings in this case.

14 Respectfully submitted this 2<sup>nd</sup> day of May, 2002.

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16 ARIZONA DEPARTMENT OF WATER  
RESOURCES

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24 <sup>3</sup> A related issue concerns who should be provided with notice of the filing of the supplemental contested case  
25 HSR. As a contested case matter, will it be sufficient to provide notice to the court-approved mailing list for the  
contested case?

<sup>4</sup> Procedures for filing objections to final HSRs are described in the Rules of Proceeding before the Special Master,  
§ 6.00 (Nov. 1, 1991).

1 ORIGINAL of the foregoing  
2 mailed on the 2<sup>nd</sup> day of  
3 May, 2002 to:

4 Clerk of the Superior Court  
5 Maricopa County  
6 Attention: Water Case  
7 601 W. Jackson Street  
8 Phoenix, AZ 85003

9 COPIES of the foregoing  
10 hand-delivered on the 2<sup>nd</sup> day of  
11 May, 2002 to:

12 Honorable Eddward Ballinger, Jr.  
13 Judge of the Superior Court  
14 201 West Jefferson  
15 Phoenix, AZ 85003-2212

16 Special Master George A. Schade, Jr.  
17 Arizona General Stream Adjudication  
18 Arizona State Court Building  
19 1501 West Washington, St., Suite 228  
20 Phoenix, AZ 85007

21 COPIES of the foregoing  
22 mailed on the 2<sup>nd</sup> day of  
23 May, 2002 to all parties on the  
24 court-approved Ft. Huachuca mailing list.  
25



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IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION ) W-1-11-605  
OF ALL RIGHTS TO USE WATER IN )  
THE GILA RIVER SYSTEM AND ) UNITED STATES' COMMENTS TO  
SOURCE ) ADWR'S REPORT, RE: *In re FORT*  
 ) *HUACHUCA*  
 )  
 )

CONTESTED CASE NAME: *In re Fort Huachuca.*

HSR INVOLVED: San Pedro River Watershed Hydrographic Survey Report.

DESCRIPTIVE SUMMARY: This is the United States' response to ADWR's remarks on the amended claims to water rights filed on behalf of United States Army Post Fort Huachuca.

NUMBER OF PAGES: 4

DATE OF FILING: Original mailed to the Clerk of Court on May 1, 2002

The Court's December 2, 2001 Order asks for comments regarding the following:

- (1) The contents or omissions of ADWR's report.
- (2) Deadlines for filing objections to the amended watershed file reports to be prepared by ADWR.
- (3) Any procedures desired for determining the objections to the amended watershed file reports.
- (4) A timeline for disclosures and scheduling of hearings on the objections to the amended watershed file reports.
- (5) Any legal or procedural issues that the parties wish to be addressed relating to the determination of Fort Huachuca's amended statements of claimant and other amendments.

*Id.* at 3. Accordingly, the United States addresses the Court's request for comments as follows.

The Arizona Department of Water Resources' Status Report Concerning the Gila River Indian Community Hydrographic Survey Report and the Watershed File Report for Fort

1 *Huachuca ("Report")* explains that due to other demands placed on ADWR the Department is  
2 unable to recommend the attributes of the Fort's water rights at this time. Nevertheless, the  
3 Department discusses certain unique requirements related to the Fort's claims. Foremost is the  
4 requirement that ADWR study and determine the likelihood of significant diminishment of the  
5 Fort's reserved water rights by groundwater and surface water users in the vicinity of the federal  
6 reservation. *Report* at 3. ADWR notes that such an analysis will require the accumulation and  
7 incorporation of additional data. *Id.* The United States agrees with ADWR that additional data  
8 is required to update the 1991 Hydrographic Survey Report analysis quantifying the impacts of  
9 off-reservation pumping. Due to the demands placed on ADWR in other aspects of the  
10 adjudication, time and the Department's resources may be conserved by using an independent  
11 expert(s) for the analysis. A possible candidate for the task is the U.S. Geological Survey.

12 The Geological Survey's Modflow model was used by ADWR for its determination of  
13 significant diminishment in the 1991 HSR. *Report* at 3. Currently, the Geological Survey is  
14 conducting a detailed study of the subsurface and hydrogeology in the Sierra Vista Subwatershed  
15 and will be using the new information to create the most comprehensive groundwater model to  
16 date. Therefore, the Geological Survey may be an ideal entity to study the effect of off-  
17 reservation pumping on the Fort's water rights.<sup>1/</sup>

18 While the Department's production of a technical recommendation for the Fort's water  
19 rights is delayed, the United States believes there are certain legal or procedural issues that  
20 should be addressed before adjudication of Fort Huachuca's amended statements of claimant.  
21 One threshold issue is whether new objections should be allowed following the filing of  
22 ADWR's amended watershed file report. On January 14, 2002, the Fort amended its water rights  
23 to claim less water from the same places of use and points of diversion with the same priority as  
24 previously claimed. Parties had ample opportunity to object to the Fort's original claims when  
25 those claims were filed. No party, therefore, is prejudiced by the Fort's amended claims to a  
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27 <sup>1/</sup> The Fort reserves the right to challenge the significant diminishment study result should  
28 the underlying aquifer conditions change in the future.

1 substantially smaller amount of water. The Court therefore may wish to proceed with briefing on  
2 whether new objections to the amended water right claims are legally and equitably justified.

3 A second threshold issue is whether new or existing parties have standing to object. The  
4 Special Master ruled in an Order, dated August 17, 2001, that the City of Sierra Vista may  
5 intervene in the *In re Fort Huachuca* contested case because, *inter alia*, it has not been  
6 determined whether the City's claims fall within the adjudication of this proceeding. The Order  
7 further notes that the jurisdictional question will depend upon ADWR's determination of the  
8 specific parameters of the subflow zone. *Id* at 3. ADWR issued just such a determination for the  
9 Sierra Vista Subwatershed on March 29, 2002. Following appropriate proceedings, the Court  
10 will rule on ADWR's subflow determination.

11 Thus, the issue of whether the existing (or potentially new) objectors to Fort Huachuca's  
12 water rights are claiming subflow or intercepting subflow and have standing in this adjudication  
13 is likely to be ripe for judicial review in a matter of months. ADWR's amended recommendation  
14 and significant diminishment determination for Fort Huachuca, on the other hand, is likely to be  
15 delayed for many months. Therefore, the fundamental issue of the jurisdictional standing of a  
16 party, particularly one who does not even claim to be pumping or intercepting subflow, should be  
17 determined before that party may be allowed to object to the Fort's water rights.

18 Once these threshold legal issues are resolved and ADWR issues its technical  
19 recommendation it may be appropriate to revisit the setting of time lines and procedures for  
20 adjudicating the Fort's amended claims. At that time, however, and until a ruling on the scope of  
21 objections and the standing of objectors, a trial schedule is premature.

22 RESPECTFULLY SUBMITTED this 15<sup>th</sup> day of May, 2002.

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26 R. LEE LEININGER,  
27 Trial Attorney  
28 U.S. Department of Justice

1  
2 Certificate of Service

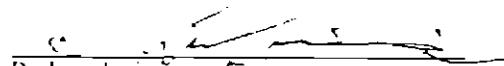
3 The original and one copy of the foregoing sent via Federal Express this 1<sup>st</sup> day of May, 2002,  
4 to:

5 Clerk of the Arizona Superior Court  
6 Attn: Water Case  
7 3345 W. Durango Street  
8 Phoenix, AZ 85009

9 A copy of the foregoing sent via Federal Express this 1<sup>st</sup> day of May, 2002, to:

10 Special Master  
11 Arizona General Stream Adjudication  
12 George A. Schade, Jr.  
13 1501 W. Washington, Suite 228  
14 Phoenix, AZ 85007

15 A copy of the foregoing mailed this 1<sup>st</sup> day of May, 2002, to all parties on the Court-approved  
16 W1-11-605 mailing list dated August 17, 2001

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R. Lee Leininger

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5 IN THE SUPERIOR COURT OF THE STATE OF ARIZONA

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Civil No. W1-11-605  
(Special Master George A. Schade, Jr.)  
**ARIZONA DEPARTMENT OF  
WATER RESOURCES'  
STATUS REPORT CONCERNING  
THE PREPARATION OF A  
SUPPLEMENTAL CONTESTED  
CASE HYDROGRAPHIC SURVEY  
REPORT FOR FORT  
HUACHUCA**

16 CONTESTED CASE: *In re Fort Huachuca.*

17 HSR INVOLVED: San Pedro River Watershed Hydrographic Survey Report.

18 DESCRIPTIVE SUMMARY: The Arizona Department of Water Resources hereby files its  
19 status report concerning the preparation of a supplemental contested case hydrographic survey  
report for Fort Huachuca.

20 NUMBER OF PAGES: Six.

21 DATE OF FILING: March 7, 2003.

22 **INTRODUCTION**

23 By order dated August 13, 2002, the Special Master requested that the Arizona  
24 Department of Water Resources (Department) submit a status report on the progress of  
25 completing a supplemental contested case hydrographic survey report (HSR) for Fort

1 Huachuca (the Fort). Since the Department's last status report of March 18, 2002, the  
2 Department has met with Fort personnel and has collected additional water level data within  
3 the Upper San Pedro River groundwater basin. The Department limited its activities,  
4 however, while awaiting direction from the Adjudication Court regarding priorities.

5 On June 16, 2002, the Adjudication Court indicated that it would issue a separate  
6 order setting forth priorities for the Department's completion of tasks in the Gila River  
7 adjudication as well as in the Little Colorado River adjudication. On February 21, 2003,  
8 Judge Ballinger entered an order that included a suggested schedule for the Department's  
9 technical work. Technical assistance related to the claims filed for the Fort was listed second  
10 in priority after completion of subflow determinations, cone of depression tests, and  
11 determinations of *de minimis* water rights in the San Pedro River Watershed (subflow issues).  
12 The Adjudication Court referred the subflow issues to the Special Master, who set a  
13 conference on this matter for April 10, 2003.

14 On August 2, 2002, the Department filed a report in the Little Colorado River  
15 adjudication that described the extent of the Department's resources that would be available to  
16 provide technical assistance for the Little Colorado River and Gila River adjudications  
17 (Resources Report). The resources described in that report have been reduced further due to  
18 subsequent budget cuts.

19 In its August 2002 Resources Report, the Department estimated that four to six  
20 months for each watershed would be necessary to implement the steps outlined in the  
21 Department's subflow report of March 29, 2002. This estimate did not include time to  
22 conduct cone of depression tests or to make *de minimis* determinations. Also, this estimate  
23 did not take into account the comments filed to the Department's report by the parties. These  
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1 comments reflect a wide range of disagreement regarding the Department's recommendations  
2 and the amount of resources that would be required. The resolution of these comments is  
3 before the Special Master whose recommendations will be submitted to the Adjudication  
4 Court for review. Whether additional technical assistance from the Department will be  
5 required in this process is not yet determined.

6 In its Resources Report, the Department also estimated the amount of time that would  
7 be required to complete a supplemental contested case HSR for the Fort. At that time, the  
8 Department estimated that approximately two months would be required to update land and  
9 water use data. However, the Department raised several issues concerning the content of the  
10 Fort's supplemental contested case HSR that could significantly increase the resources  
11 required.  
12

13 In the Special Master's order of August 13, 2002, the Special Master addressed the  
14 issues raised by the Department. The Special Master ruled that federal reserved water rights  
15 claims for the Fort should be quantified separately for groundwater and surface water, and  
16 that it would be necessary for the Department to conduct cone of depression tests for the  
17 Fort's wells. The methodology for conducting cone of depression tests is a matter that is  
18 currently before the Special Master for recommendations to the Adjudication Court. Absent  
19 direction from the Court, the Department will not be able to proceed with cone of depression  
20 tests on the 25 wells included in the Fort's claims. Also, until a court-approved methodology  
21 has been established, the Department will not be able to estimate the amount of time required  
22 to complete that task.  
23

24 In his order of August 13, 2002, the Special Master also ruled that the Fort's  
25 supplemental contested case HSR should include an update of the significant diminishment

1 analysis included in the 1991 San Pedro River Watershed HSR (San Pedro HSR). This  
2 analysis was included in the San Pedro HSR pursuant to the Adjudication Court's September  
3 9, 1988 order (1988 order). However, as noted by the Special Master, in the trial court's 1988  
4 order Judge Goodfarb indicated that the purpose of the significant diminishment analysis was  
5 to provide a basis for **later enforcement**, not as a basis for the decree. With respect to the  
6 holding in *Gila III*, the Special Master also stated: "The Court was addressing the  
7 **enforcement** of a reserved water right and not the initial determination of that right." Order,  
8 p. 6, August 13, 2002 (emphasis added). See *In re the General Adjudication of all Rights to*  
9 *Use Water in the Gila River System and Source*, 195 Ariz. 411, 422, 989 P.2d 739, 750  
10 (1999), cert. denied, 550 U.S. 1250 (2000). Nonetheless, the Special Master believed that  
11 information regarding water availability in the vicinity of the Fort would be beneficial, and  
12 that in any event the trial court's order of 1988 must be followed. The Department  
13 respectfully suggests that the trial court's order of 1988 be revisited in light of recent rulings  
14 by the Arizona Supreme Court, not only in *Gila III*, but also in *In re the General Adjudication*  
15 *of all Rights to Use Water in the Gila River System and Source*, Ariz. Sup. Ct. No. WC-90-  
16 0001-1R (April 2, 2002) (interlocutory review vacated on issue of whether claims of  
17 conflicting water use or **interference** with water rights must be resolved as part of the general  
18 adjudication).

19  
20  
21 Although the Department understands the Special Master's desire to obtain as much  
22 information as possible regarding the availability of water resources for the Fort, a significant  
23 diminishment analysis at this time would delay the preparation of a supplemental contested  
24 case HSR. In order to update the significant diminishment analysis included in the 1991 San  
25 Pedro HSR, the Department would need to update its Sierra Vista groundwater model with

1 more recent data that has been collected by both the Department and the United States  
2 Geological Survey (USGS). This modeling effort would require an adjustment in the  
3 Department's priorities, and at least one year to complete, assuming one modeling specialist  
4 working full time. The USGS has been developing its own groundwater model for the Sierra  
5 Vista subbasin that is expected to be released to the public in 2004. Regardless of whether the  
6 Department or the USGS were to do the work, the earliest that modeling results could be  
7 expected would be some time in 2004.

8  
9 The Department awaits further direction from the Special Master regarding how to  
10 proceed with the preparation of the Fort's supplemental contested case HSR. At this point the  
11 Department could update the land and water use data for the Fort included in the 1991 San  
12 Pedro HSR, but the Department is concerned that the updated information could become stale  
13 once again before the other Fort related issues are resolved concerning subflow and  
14 groundwater modeling.

15 Respectfully submitted this 7<sup>th</sup> day of March 2003.

16 ARIZONA DEPARTMENT OF WATER  
17 RESOURCES

18 

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20 Janet L. Ronald, Deputy Counsel  
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22 ORIGINAL of the foregoing  
23 mailed on the 7<sup>th</sup> day of  
24 March 2003 to:  
25

FMC001037

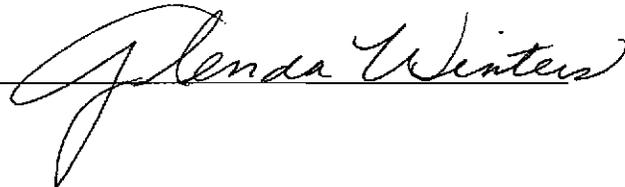
1 Clerk of the Superior Court  
2 Maricopa County  
3 Attention: Water Case  
4 601 W. Jackson Street  
5 Phoenix, AZ 85003

6 COPIES of the foregoing  
7 mailed on the 7<sup>th</sup> day of  
8 March 2003 to:

9 Honorable Eddward Ballinger, Jr.  
10 Judge of the Superior Court  
11 201 West Jefferson  
12 Phoenix, AZ 85003-2212

13 Special Master George A. Schade, Jr.  
14 Arizona General Stream Adjudication  
15 Arizona State Court Building  
16 1501 West Washington, St., Suite 228  
17 Phoenix, AZ 85007

18 All parties on the court-approved mailing list for  
19 contested case W1-11-605.

20   
21  
22  
23  
24  
25

LAND OWNER	WATERSHED FILE
-----	REPORT NUMBER
FORT HUACHUCA	111-23-073
U.S. ARMY INTELLIGENCE	
CENTER	
% OFFICE OF STAFF JUDGE	

A P P L I C A B L E F I L I N G S A N D D E C R E E S

CLEARLY STATED INFORMATION FROM FILINGS AND DECREES

FILING NUMBER	FILING STATUS	USES	QUANTITY IN AFA	USE LOCATION SECTION	TWNP RNGE	CLAIM DATE	DIVERSION SECTION	LOCATION TWNP RNGE
39-0010774	AMENDED	OTHER	10087.00			1881	SENWNW22	210S 200E
39-0010775	AMENDED	OTHER	435.00			1881	SWSENW16	210S 190E
							NENESW29	210S 190E
							SENWSE10	210S 200E

D W R A N A L Y S I S O F F I L I N G S A N D D E C R E E S

FILING NUMBER	USES CLAIMED OR REFERENCED	USES FOUND BY DWR	APPLIES TO DIVERSIONS	APPLIES TO PWR NUMBERS
39-0010774	OTHER	OTHER		
39-0010775	OTHER	OTHER		

P W R S U M M A R Y

PWR #	APPLICABLE ADJ FILINGS	APPLICABLE PRE FILINGS	*APPARENT FIRST USE DATE* DATE BASIS FOR DATE	WATER SOURCES AND CLASSIFICATIONS
NONE	39-0010774	NONE		
	39-0010775			

E X P L A N A T I O N

FILINGS AND DECREES

FILINGS 39-10774 & 39-10775 - CLAIM FEDERAL RESERVED WATER RIGHTS FOR MILITARY INSTALLATION PURPOSES AT FORT HUACHUCA. FOR MORE INFORMATION ON THE CLAIMS MADE BY FORT HUACHUCA, SEE CHAPTER 5, SECTION 5.4 IN VOLUME 1.

Statement of claimant 39-8034 claims a total current annual use of 0.49 acre-feet for domestic and stockwatering uses. Statement of claimant 39-8321 claims a current total annual use of 0.56 acre-feet. This total includes the claimed irrigation use. The irrigation was not field verified due to the inaccessibility of the area, and the aerial photographic evidence was inconclusive.

## **FORT HUACHUCA MILITARY RESERVATION (WFR #111-23-73)**

### **Location**

Fort Huachuca, currently the headquarters of the United States Army Intelligence Center, is located approximately sixty miles southeast of Tucson, and about fifteen miles north of the International Border with Mexico as shown in Figure 5-19. The installation is situated along the northern range of the Huachuca Mountains in Cochise County, just west of the City of Sierra Vista, and south of Huachuca City along state highway 90.

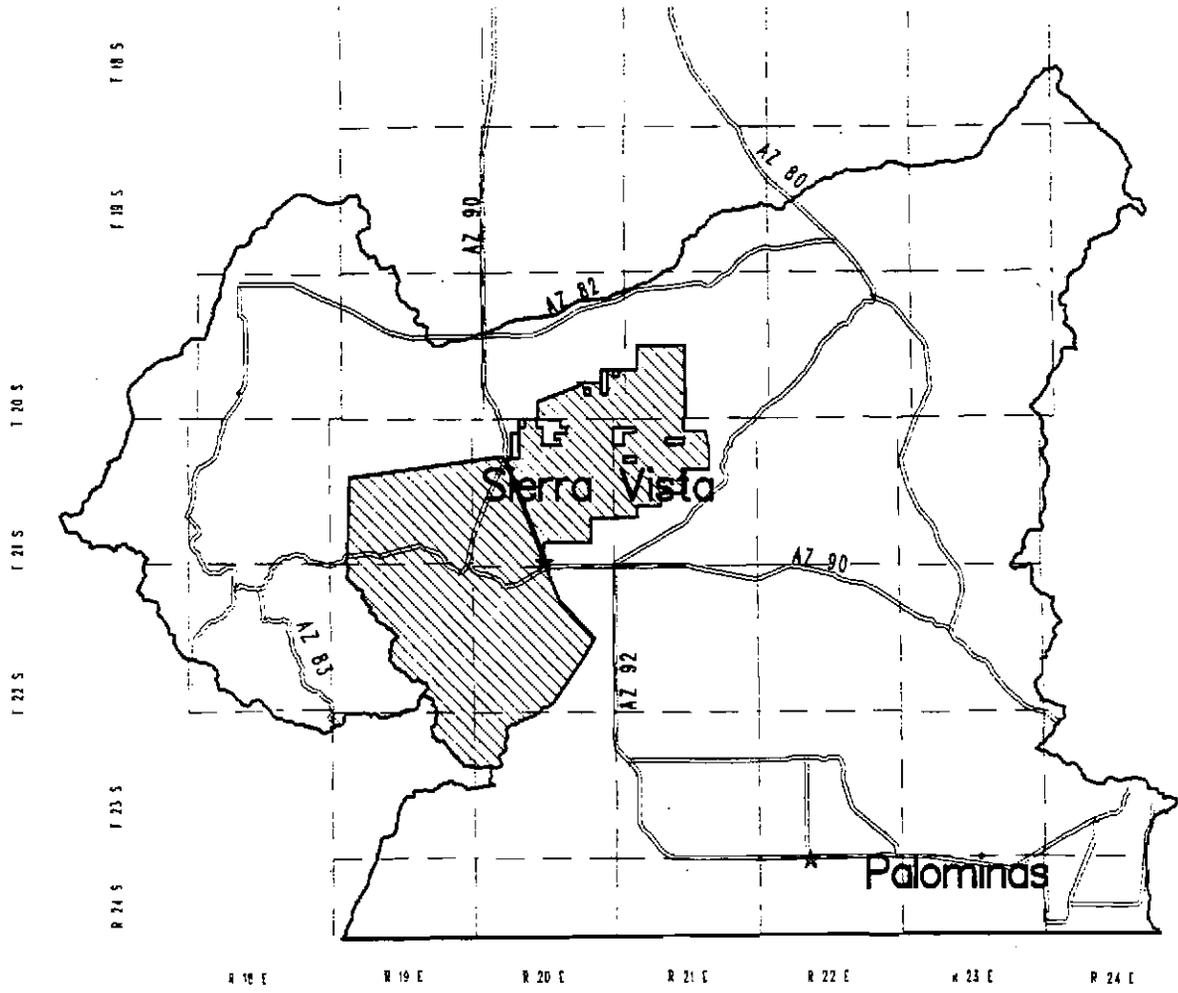
### **Climate**

The climate in the vicinity of Fort Huachuca is characterized by mild temperatures and moderate amounts of rainfall. The average annual temperature is 61.7°F, although temperature extremes of 1°F to 107°F have been recorded. Rainfall from summer monsoon thunderstorms accounts for approximately 50 percent of the annual precipitation, with winter snows accounting for an additional 10 percent. The mean annual precipitation is 16.45 inches at Fort Huachuca with a high of twenty-five inches in the Huachuca Mountains.

### **Geography**

Fort Huachuca falls within Arizona's basin and range lowlands region. The Huachuca Mountains form the western geographical boundary of the Fort, with the Babocomari River providing the northern boundary (Figure 5-20). The Huachuca Mountains provide the most rugged terrain of the military reservation. However, the majority of the Fort lies in the gently sloping foothills of this range.

The Fort has claimed an on-post land area of 73,272 acres. When the post was established by Executive Order #35 on October 28, 1881, the size of the



-  Fort Huachuca
-  Road or Highway
-  Subwatershed Boundary
-  Township / Range
-  City or Town

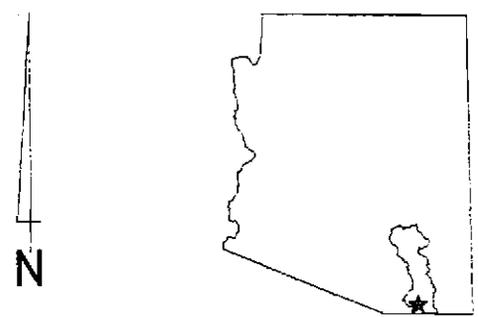


Figure 5-19. Location of Fort Huachuca within the San Pedro River watershed

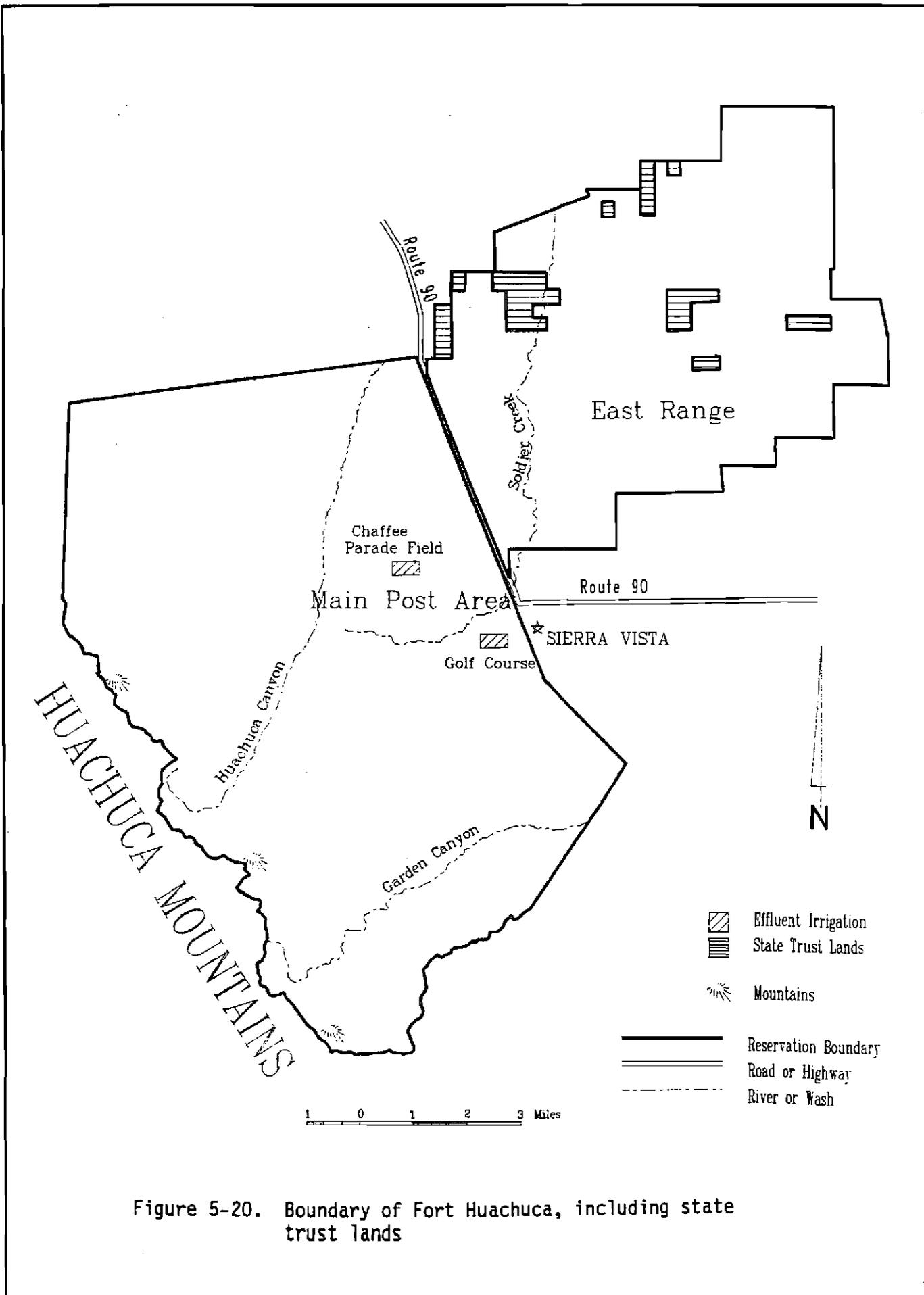


Figure 5-20. Boundary of Fort Huachuca, including state trust lands

Fort was 41,760 acres. On May 14, 1883, the Fort boundaries were expanded by Executive Order #36 to 44,800 acres (Figure 5-21). In the 1940s, Fort Huachuca was expanded again to include lands east of the original boundaries. This area is known as the East Range and encompasses approximately 13,545 acres (Figure 5-22). This brought the total area of Fort Huachuca to about 58,345 acres. In August 1957, 13,463 acres of BLM land were removed from the public domain and transferred to Fort Huachuca, bringing the Fort's total acreage to 71,808 acres. The remaining acreage claimed by the Fort (1,536 acres) is currently state trust land that is utilized by the Fort pending exchange between the State of Arizona and the United States Government. By deeds in 1982 and 1989, seventy-two acres were quit-claimed to the City of Sierra Vista for airport purposes.

### Population

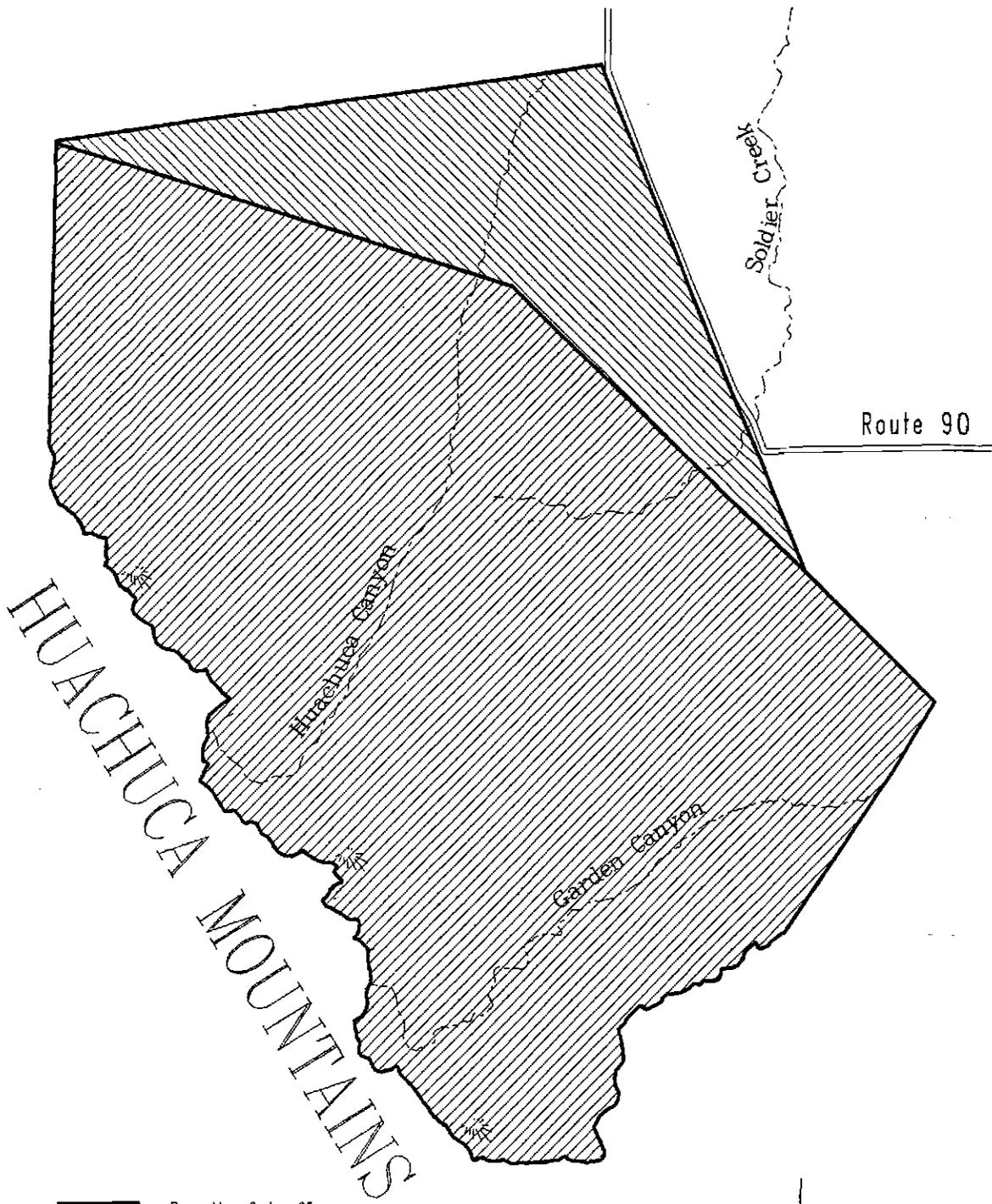
Fort Huachuca was incorporated into the city limits of Sierra Vista on February 17, 1971. In 1970, the post population was 6,659, and in 1980, the population was 9,301. Post population for 1990 is estimated at 9,200. Current population of Sierra Vista (excluding Fort Huachuca) is nearly 36,000. It should be noted that the population growth in the Sierra Vista area has increased markedly in the last decade from 24,937 to 35,868, an increase of 44 percent. Table 5-53 shows the Fort's population since 1980.

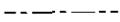
TABLE 5-53

FORT HUACHUCA  
MILITARY POPULATION

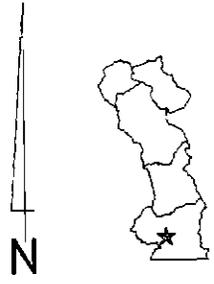
<u>YEAR</u>	<u>POPULATION</u>
1980	9,301
1981	8,602
1982	9,433
1983	9,996
1984	10,127
1985	10,502
1986	8,890
1987	9,667
1988	9,142
1989	9,204
1990	9,210

Source: Fort Huachuca



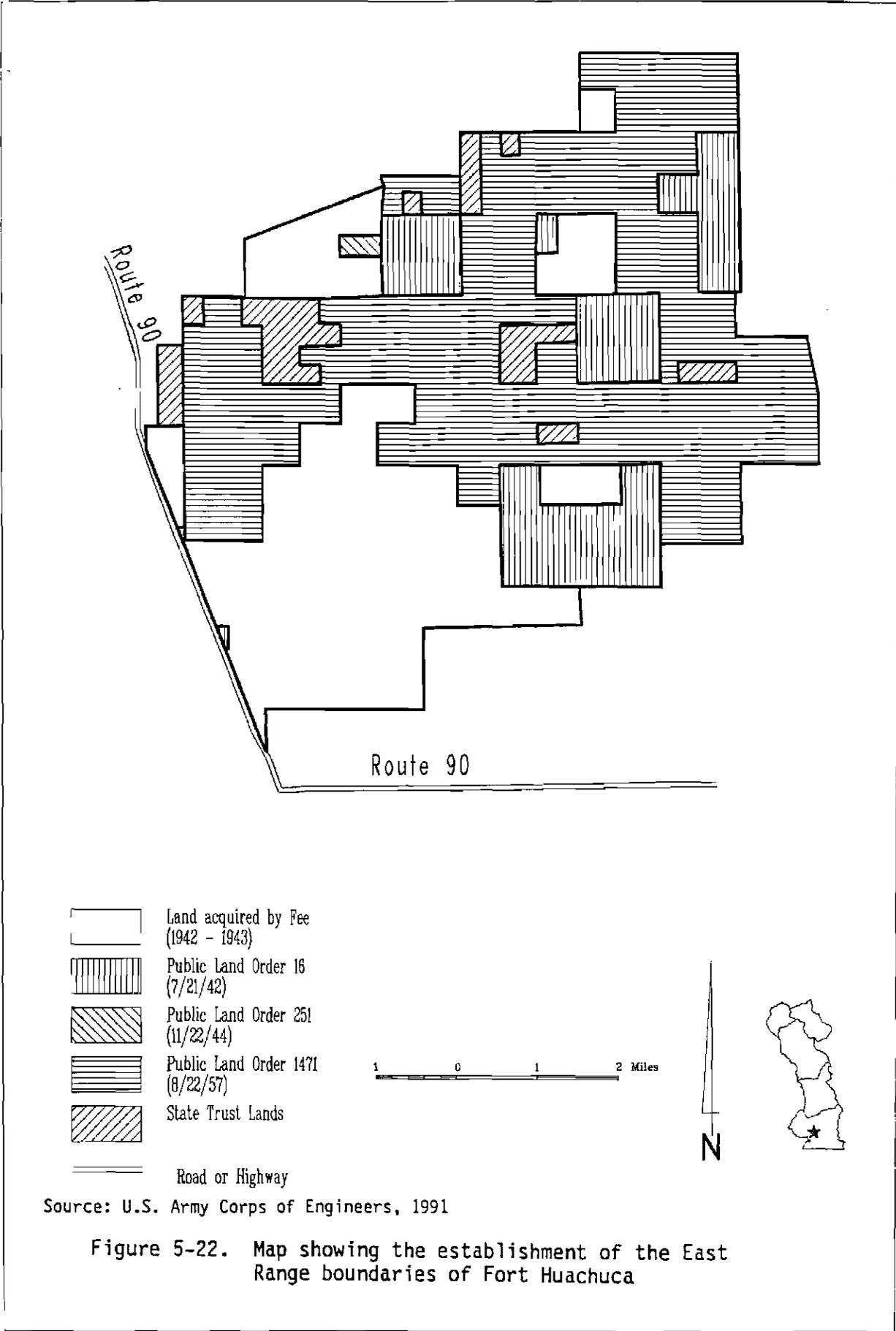
-  Executive Order 35 (11/28/81)
-  Executive Order 36 (5/14/83)
-  River or Wash
-  Road or Highway
-  Mountains

1 0 1 2 Miles



Source: U.S. Army Corps of Engineers, 1991

Figure 5-21. Map showing the original boundaries of Fort Huachuca



From a hydrologic standpoint, the population growth is important because Fort Huachuca and Sierra Vista utilize the same aquifer as their primary source of supply. There is a direct correlation between population growth and water usage as seen by the declining groundwater levels in the Sierra Vista area. This situation is discussed in more detail later in this section.

## History

In the Treaty of Guadalupe Hidalgo (1848) Mexico ceded its northern provinces (present day New Mexico and Arizona) to the United States. Article XI of the treaty provided that the United States would stop Indian raids into Mexico and could cross the International Border to pursue the Apaches. Although the Mexican Government rescinded Article XI in the Gadsden Purchase of 1853, they unofficially held the United States responsible for protecting them against Apache raids and war parties. The United States complied with Mexico's wishes by building eleven posts south of the Gila River from 1856 until 1876 to protect Anglo settlers from growing Indian unrest. Discontent among the Indian tribes had reached such proportions by 1877 that United States Army Headquarters, Department of Arizona ordered two troops of cavalry at Fort Lowell into the vicinity of the Huachuca Mountains to establish a temporary camp. Captain Samuel Marmaduke Whitside headed the detachment and decided on a location at the mouth of Huachuca Canyon because of its commanding view of the San Pedro Valley and its abundant water supply from natural springs running through the canyon. Thus, on March 3, 1877, the Cavalry set up Camp Huachuca to protect the settlers residing in southeastern Arizona (Whitside, Statement of Service; 31 March 1877). The U.S. War Department declared the camp a permanent installation on January 21, 1878 (Whitside; Letter to Adjutant General, U.S.A.; April 6, 1878).

After twenty-five years, the Indian wars were finally ended in 1886 with the surrender of Geronimo. The Army decided to keep Fort Huachuca as a permanent post because of its close proximity to Mexico, the general good health enjoyed by those stationed at the Fort, and its abundant water supply. Fort Huachuca, the only permanent military post along the International Border west of El Paso, formed the nucleus of patrolling operations along the International Border from 1902 until 1917. During this time Pancho Villa began his attacks on United States border towns in defiance of President Woodrow Wilson's recognition of Mexico's new government under



Figure 5-23. A photograph of Fort Huachuca taken circa 1885. The site chosen for the Fort, located at the northeast flank of the Huachuca Mountains, utilized the springs in Garden and Huachuca Canyons to supply the main post, and for pasture of cavalry horses.

General Venustiano Carranza. The United States responded with an extensive mounted expedition into Mexico to capture Villa. Within months, Carranza decided he no longer needed the help of this government to pursue Villa. President Wilson ordered the formal withdrawal of United States troops in 1917 as the country prepared to enter World War I against Germany. The American Government perceived a threat of German espionage against this country via Mexico during this conflict. This threat proved to be more than mere perception and, because it is located twenty-five miles from the Mexico-United States border, troops at Fort Huachuca patrolled the border to assure national security.

During World War II (1941-1945), the Army utilized the Fort as an infantry training ground. This mission ended with the war and in 1949 the Army turned the post over to the State of Arizona for use by the Arizona Game and Fish Commission as a wildlife reserve and to the Arizona National Guard for military use. From 1949 to 1951, the Arizona National Guard and the

Arizona Game and Fish Commission had use of the post for their respective missions. The Defense Department reactivated the Fort to train Aviation Engineers in 1951 at the onset of the Korean War.

At the end of the Korean conflict, the Fort experienced a brief inactive period until 1954 when it became the United States Army Electronic Proving Ground. In 1967, the Strategic Communications Command (redesignated the United States Army Information Systems Command in 1984) moved to Fort Huachuca continuing a communications history which began in 1886 with the heliograph (a system of reflective mirrors using Morse code). At present, the post is home to these commands as well as the United States Army Intelligence Center as well as the Department of Defense Joint Element of the Joint Tactical Command, Control, and Communications Agency, the 11th Signal Brigade, and the United States Army Communications Security Logistics Activity.

## **Applicable Filings and Decrees**

### **Previous Filings**

The claim filed by Fort Huachuca does not include previous water rights filings (33s, 36s, or 38s), in the form of applications, permits, or certificates.

### **Statement of Claimants**

Fort Huachuca has filed two statements of claimant, 39-10774 and 39-10775, which claim twenty-five wells, thirty-nine springs, and seventy-four ponds. Statement of Claimant 39-10774 was amended on August 5, 1991. Statement of Claimant 39-10775 was amended on August 21, 1989 and August 5, 1991. These facilities are summarized in Table 5-54 and in Tables 5-69 and 5-70 at the end of this section.

Total amount of annual water use claimed by the Fort is 10,522 acre-feet per year (10,087 acre-feet per year claimed on 39-10774 and 435 acre-feet per year on 39-10775). The Fort based these claims on federal water rights, and legitimate and authorized federal activities.

TABLE 5-54  
FORT HUACHUCA  
SUMMARY OF CLAIMED FACILITIES

<u>CLAIMED FACILITIES</u>	<u>NUMBER CLAIMED</u>	<u>CLAIMED QUANTITY (ACRE-FEET PER YEAR)</u>
<u>Wells</u>		
Potable (Domestic)	8	3,793.1
Nonpotable	8	73.9
Test	<u>9</u>	<u>-----</u>
TOTAL	25	3,867.0
<u>Springs</u>		
Potable	13	122.5
Nonpotable	<u>26</u>	<u>54.2</u>
TOTAL	39	176.7
<u>Ponds</u>		
Effluent evaporation	10	41.8
Game management	5	3.3
Wildlife, recreation	14	82.9
Erosion control	<u>45</u>	<u>74.4</u>
TOTAL	74	201.6
<u>Other Facilities<sup>1</sup></u>		
Check Dams	200 each	8.0
Water Bars	1,200 each	24.0
Water Terraces	8.7 miles	<u>17.4</u>
TOTAL		49.4

<sup>1</sup>From Fort Huachuca comments dated May 22, 1987 on the 1987 preliminary HSR.

For the claimed facilities, the Fort has approximated dates of first use. These dates are shown in Table 5-55.

TABLE 5-55  
FORT HUACHUCA  
CLAIMED DATES OF FIRST USE

CLAIMED FACILITIES	CLAIMED LOCATION	CLAIMED DATE OF FIRST USE
<u>Wells</u>		
Windmill #2	SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 27, T.20S., R.20E.	1905
Windmill #1	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 34, T.20S., R.20E.	1910
Garden Canyon	NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 29, T.22S., R.20E.	1930
Garden Windmill	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 32, T.22S., R.20E.	1930
Well #1	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 03, T.22S., R.20E.	1940
Well #2	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 03, T.22S., R.20E.	1941
Well #3	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.	1943
Well #4	NE $\frac{1}{4}$ , NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.	1943
Well #5	SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 28, T.21S., R.20E.	1943
East Range Bunker	NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 07, T.21S., R.21E.	1958
Well #6	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.	1959
Spatial Resolution Well	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 22, T.21S., R.20E.	1964
Test Well #1	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 20, T.21S., R.20E.	1971/1972 <sup>1</sup>
Test Well #2	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 30, T.21S., R.20E.	1971/1972 <sup>1</sup>
Test Well #3	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.21S., R.20E.	1971/1972 <sup>1</sup>
Test Well #4	SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 15, T.21S., R.20E.	1971/1972 <sup>1</sup>
Well #9	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 10, T.21S., R.20E.	1973 <sup>1</sup>
Test Well #6	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 35, T.20S., R.20E.	1973 <sup>1</sup>
Test Well #7	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 11, T.21S., R.20E.	1973 <sup>1</sup>
Test Well #8	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 13, T.21S., R.20E.	1973 <sup>1</sup>
Test Well #9	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 17, T.21S., R.21E.	1973 <sup>1</sup>
Rembass Well #1	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 26, T.21S., R.20E.	1978
Rembass Well #2	SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 14, T.21S., R.20E.	1978
Well #7	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 22, T.21S., R.20E.	1982
Well #8	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.21S., R.20E.	1982
<u>Springs</u>		
Potable	Various locations (see Table 5-66)	1877
Nonpotable	Various locations (see Table 5-66)	1954
<u>Ponds</u>		
All, except as shown below (see Table 5-66)		1954
Lower Antelope	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 16, T.21S., R.19E.	1975
Sycamore II	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 29, T.21S., R.19E.	1975
West Huachuca #2	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 21, T.22S., R.19E.	1975
Gate 5 Pond	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 16, T.21S., R.20E.	1975

<sup>1</sup>From Fort Huachuca comments dated November 13, 1990, on the 1990 preliminary HSR.

TABLE 5-55 (cont'd)

CLAIMED FACILITIES	CLAIMED LOCATION	CLAIMED DATE OF FIRST USE
45 Pond	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 10, T.21S., R.20E.	1975
#3 Sewage Pond	SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	1975
#2 Sewage Pond	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	1975
Horse Pasture Pond	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 06, T.22S., R.20E.	1975
Golf Course Fairway	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 04, T.22S., R.20E.	1975
51	SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 10, T.21S., R.21E.	1975
Middle Garden Canyon Pond	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 28, T.22S., R.20E.	1975
r Dam	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 21, T.20S., R.21E.	1976
b Dam	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 18, T.21S., R.21E.	1977
c Dam	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 17, T.21S., R.21E.	1977
g Dam	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 17, T.21S., R.21E.	1977
f Dam	SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 20, T.21S., R.21E.	1977
d Dam	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 20, T.21S., R.21E.	1977
h Dam	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 10, T.21S., R.20E.	1977
i Dam	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 10, T.21S., R.20E.	1977
j Dam	SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 10, T.21S., R.20E.	1977
k Dam	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 03, T.21S., R.20E.	1977
l Dam	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 09, T.21S., R.20E.	1977
Sediment 34a	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	1978
Sediment 34b	SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	1978
Sediment 34c	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	1978
Sediment 34d	SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 15, T.21S., R.20E.	1978
m Dam	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 36, T.21S., R.19E.	1979
n Dam	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 28, T.22S., R.20E.	1979
Woodcutters 1a	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 16, T.22S., R.20E.	1979
Woodcutters 1b	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.22S., R.20E.	1979
Woodcutters 1c	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 10, T.22S., R.20E.	1979
Sediment #1b	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.	1984

Analysis of Claims

DWR visited Fort Huachuca on several occasions. The purpose of these field trips was to investigate claimed water uses by the Fort, determine points of diversion, and gather other pertinent data as necessary.

DWR verified the use of wells #1 through #8 shown in Table 5-56, the spatial resolution well, East Range Bunker well, and the Garden Canyon well (nonpotable). The Garden Canyon well (no number is given in the claim) is used to fill ponds and can no longer be connected to the potable system.

TABLE 5-56

FORT HUACHUCA  
LOCATION OF THE EIGHT POTABLE WELLS

WELL NUMBERS	LOCATION
1	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 03, T.22S., R.20E.
2	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 03, T.22S., R.20E.
3	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.
4	NE $\frac{1}{4}$ , NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.
5	SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 28, T.21S., R.20E.
6	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.21S., R.20E.
7	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 22, T.21S., R.20E.
8	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.21S., R.20E.

All potable springs were visited and are shown in Table 5-57. DWR did not visit any nonpotable springs.

TABLE 5-57

FORT HUACHUCA  
POTABLE SPRING LOCATIONS IN GARDEN AND HUACHUCA CANYONS

SPRING NAME	CLAIMED LOCATION	WATERCOURSE
Spring #1	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 14, T.22S., R.19E.	Huachuca Canyon
Spring #2	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 14, T.22S., R.19E.	Huachuca Canyon
Spring #3	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 22, T.22S., R.19E.	Huachuca Canyon
Spring #3a	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 22, T.22S., R.19E.	Huachuca Canyon
Spring #4	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 22, T.22S., R.19E.	Huachuca Canyon
Chain Spring	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 31, T.22S., R.20E.	Garden Canyon
Picnic Spring	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 31, T.22S., R.20E.	Garden Canyon
Spring #1	SE $\frac{1}{4}$ , SE $\frac{1}{4}$ Sec. 36, T.22S., R.19E.	Garden Canyon
Spring #1a	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ Sec. 01, T.23S., R.19E.	Garden Canyon
Spring #1b	SE $\frac{1}{4}$ , SE $\frac{1}{4}$ Sec. 36, T.22S., R.19E.	Garden Canyon
Spring #2	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 01, T.23S., R.19E.	Garden Canyon
Spring #3	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 01, T.23S., R.19E.	Garden Canyon
Spring #4	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ Sec. 01, T.23S., R.19E.	Garden Canyon

As stated previously, Fort Huachuca claimed seventy-four ponds. DWR was able to verify all of these impoundments by aerial photography or field investigations. Of this total, sixteen impoundments were surveyed and are shown in Table 5-58.

TABLE 5-58

**FORT HUACHUCA  
SUMMARY OF SURVEYED IMPOUNDMENTS**

WATER USE NUMBER	FACILITY NAME	CLAIMED LOCATION	AREA (ACRES)	CAPACITY (ACRE-FEET)
PS1	Antelope	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 16, T.21S., R.19E.	2.6	26.4
PS2	Sycamore	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 20, T.21S., R.19E.	3.9	38.8
PS3	Hidden	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 28, T.21S., R.19E.	2.1	22.5
PS4	Golf Course	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 09, T.22S., R.20E.	7.6	59.7
PS5	Gravel Pit	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 17, T.22S., R.20E.	7.0	57.4
SP4	Lower Antelope	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 16, T.21S., R.19E.	2.2	14.9
SP5	Sycamore II	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 29, T.21S., R.19E.	1.5	10.5
SP12	Sediment (34d)	SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 15, T.21S., R.20E.	9.5	29.6
SP15	Sediment (34c)	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	2.5	6.0
SP16	#3 Sewage	SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	3.5	11.0
SP18	Sediment (34a)	NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	2.8	12.0
SP19	#2 Sewage	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 21, T.21S., R.20E.	3.3	5.5
SP29	Lower Woodcutters	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 10, T.22S., R.20E.	2.5	20.7
SP31	Woodcutters	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.22S., R.20E.	1.8	8.4
SP40	n Dam	NE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 28, T.22S., R.20E.	2.4	16.9
SP41	M. Garden Canyon	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 28, T.22S., R.20E.	4.1	27.1
TOTAL			59.3	367.4

### Water Resources

This section will discuss the water resources that are available to meet the current and projected water requirements of the Fort. The existing water resources are surface water, groundwater, and effluent.

#### Surface Water

Surface water on the Fort Huachuca military reservation occurs as storm runoff, snowmelt runoff, and discharge from springs into the stream channels of Garden and Huachuca Canyons (Brown, 1966). Other canyons located within the boundaries of the Fort yield little water except for short durations after precipitation events.

The primary source of surface water available to the Fort are springs, which can be classified as potable and nonpotable. The nonpotable springs are located in the many canyons of the Huachuca Mountains. These springs are used as water sources for wildlife and game. There are a total of twenty-six nonpotable springs which are listed on Table 5-59. The potable springs are located in Garden and Huachuca Canyons and are summarized in Table 5-60.

**TABLE 5-59**  
**FORT HUACHUCA**  
**NONPOTABLE SPRINGS**

<u>SPRING NAME</u>	<u>CLAIMED LOCATION</u>	<u>CLAIMED WATER COURSE</u>
Spring #2	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.22S., R.20E.	Tinker Canyon
Spring #3	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 33, T.22S., R.20E.	Tinker Canyon
Spring #4	SW $\frac{1}{2}$ , SW $\frac{1}{4}$ , Sec. 07, T.23S., R.20E.	Sawmill Canyon
Spring #5	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 35, T.22S., R.19E.	McClure Canyon
Spring #6	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 36, T.22S., R.19E.	McClure Canyon
Spring #7	SW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 36, T.22S., R.19E.	McClure Canyon
Cabin Spring	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 01, T.23S., R.19E.	Garden Canyon
Spring #8	SW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 25, T.22S., R.19E.	Garden Canyon
Spring #9	NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 25, T.22S., R.19E.	Woodcutters Canyon
Spring #10	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 19, T.22S., R.20E.	Woodcutters Canyon
Spring #11	NE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 20, T.22S., R.20E.	Woodcutters Canyon
Spring #12	NE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 07, T.22S., R.20E.	Soldier Creek
Spring #13	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 13, T.22S., R.19E.	Soldier Creek
Spring #14	SW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 27, T.22S., R.19E.	Huachuca Canyon
Spring #15a	NW $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 22, T.22S., R.19E.	Huachuca Canyon
Spring #15b	SE $\frac{1}{4}$ , SE $\frac{1}{4}$ , Sec. 22, T.22S., R.19E.	Huachuca Canyon
Spring #16	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 14, T.22S., R.19E.	Huachuca Canyon
Spring #17	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 15, T.22S., R.19E.	Huachuca Canyon
Spring #18	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 16, T.22S., R.19E.	Blacktail Canyon
Spring #19	SE $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 08, T.22S., R.19E.	Blacktail Canyon
Spring #20	NW $\frac{1}{4}$ , NE $\frac{1}{4}$ , Sec. 04, T.22S., R.19E.	Slaughterhouse Canyon
Spring #21	SW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 26, T.21S., R.19E.	Slaughterhouse Canyon
Spring #22	NW $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 32, T.21S., R.19E.	Sycamore Canyon
Spring #23	SE $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 21, T.22S., R.20E.	Tributary of Garden Wash
Spring #24	NW $\frac{1}{4}$ , NW $\frac{1}{4}$ , Sec. 07, T.23S., R.20E.	Scheelite Canyon
Spring #25	SE $\frac{1}{4}$ , SW $\frac{1}{4}$ , Sec. 36, T.22S., R.19E.	Tributary of McClure Canyon

TABLE 5-60

FORT HUACHUCA  
POTABLE SPRINGFLOW MEASUREMENTS FOR GARDEN AND HUACHUCA CANYONS

<u>SYSTEM</u>	<u>SPRING NUMBER</u>	<u>PERIOD</u>	<u>NUMBER OF MEASUREMENTS</u>	<u>AVERAGE DISCHARGE (GPM)</u>
Garden Canyon	1	Jan. 1962-Jun. 1963	46	194
Garden Canyon	1a	Winter, 1960-1961	Not Listed	400 (1)
Garden Canyon	2	Jan. 1960-Aug. 1961	47	176
Garden Canyon	3	Mar. 1960-Nov. 1962	43	32.9
Garden Canyon	4	Mar. 1960-Nov. 1962	43	32.9
Garden Canyon	Chain	Not Listed	Not Listed	150-250 (2)
Garden Canyon	Picnic	Not Listed	Not Listed	540 (1)
Huachuca Canyon	2	Feb. 1960-Sep. 1962	47	16.5
Huachuca Canyon	3	Apr. 1961-Jan. 1962	47	28.3

Source: USGS Report No. 1819-D.

- (1) Maximum flow measured (data not listed).  
 (2) Based on flow during wet weather; does not flow during the remainder of the year.

These springs were at one time the sole source of water for the Fort. In 1939, the first well was drilled to provide a more reliable supply of water. In 1983, the Fort no longer used the springs as a source of potable water. In the early 1960s, the USGS undertook a survey of the water resources of the reservation. As part of the survey, the USGS measured springflow from Garden and Huachuca Canyons. These measurements are shown in Table 5-60. During the years 1958 through 1963, springflow averaged 665 acre-feet per year in Garden Canyon and 171 acre-feet per year in Huachuca Canyon. Prior to 1983, Fort Huachuca used approximately 144 acre-feet of springflow as part of its water supply.

### Groundwater

The main source of groundwater for Fort Huachuca is the regional aquifer of the Upper San Pedro River Basin. The regional aquifer consists of upper and lower basin fill deposits. The upper basin fill deposits consist of clays, gravels, sand, and silt; the lower basin fill deposits consist of interbedded sand stones and gravels. Groundwater generally occurs under

unconfined or water table conditions in most of the regional aquifer. Groundwater may occur under confined (artesian) conditions where permeable and saturated material is overlain by impervious silt or clay lenses. No confined conditions exist in the regional aquifer in the vicinity of the Fort Huachuca aquifer.

Groundwater flow in the unconfined portion of the regional aquifer is generally from the valley margins near the mountains toward the San Pedro River. Centers of groundwater pumping and local flow barriers cause exceptions to the general flow regime. The flow direction is generally north eastward from the east face of the Huachuca Mountains toward the San Pedro River, except in the vicinity of the cone of depression in the Sierra Vista and Main Post area.

The sources of recharge for the regional aquifer are from mountain front recharge, streamflow infiltration, and direct infiltration of precipitation. Mountain front recharge to the regional aquifer occurs along the mountain fronts where surface runoff leaves the hard rock formations of the mountains and flows onto the permeable basin fill. Recharge occurs along the stream channels as filtration through the alluvial materials underlying the channel. Recharge also occurs as precipitation and is directly infiltrated into the aquifer through the land surface. The water recharged to the regional aquifer is later discharged to the San Pedro River, withdrawn by pumping within the basin, or withdrawn by natural vegetation. Mountain front recharge occurs along the east face of the Huachuca Mountains; streamflow infiltration occurs along the many water courses that pass through the reservation boundaries, primarily from Garden and Huachuca Canyons.

The USGS has made a preliminary estimate of the water in storage of the regional aquifer along the west side of the San Pedro River from the International Boundary to the Babocomari River to a depth of 1,200 feet. The USGS estimated that 13,400,000 acre-feet of the water was in storage in this portion of the aquifer. DWR estimates that there is approximately 11,350,000 acre-feet in storage in this portion of the aquifer to a depth of 800 feet.

Although the amount of water in underground storage in the vicinity of Fort Huachuca is quite large, a problem in the water supply for the Fort may occur due to the creation of a cone of depression from pumpage by the Fort and Sierra Vista. The cone is expanding and deepening which is resulting in

greater pump lifts and increased energy costs. This situation is discussed in more detail in the "Quantification of Significant Diminishment to Fort Huachuca" section of this report.

A local "perched aquifer" is believed to exist along the pediment of the Huachuca Mountains, in a zone where the alluvium of the basin fill is underlain at shallow depths by bedrock. The perched aquifer extends from the area of Carr Canyon toward the Fort Huachuca military reservation boundary and extends northeasterly toward the San Pedro River (Harshbarger and Associates, 1974)

Well pumpage from 1963 to 1984 has averaged 2,900 acre-feet per fiscal year. From 1982 to 1990, well production has averaged 2,889 acre-feet per calendar year. Table 5-61 shows well production for fiscal years 1963 to 1984 and calendar year 1982 to 1990.

TABLE 5-61  
FORT HUACHUCA  
WELL PRODUCTION  
(ACRE-FEET)

FISCAL YEAR				CALENDAR YEAR	
1963	2,887	1974	3,351	1982	2,736
1964	2,471	1975	2,597	1983	2,876
1965	2,636	1976	2,766	1984	3,071
1966	2,703	1977	2,871	1985	2,986
1967	3,021	1978	2,327	1986	2,898
1968	2,909	1979	2,802	1987	2,273 (excludes December)
1969	3,262	1980	3,011	1988	3,201
1970	3,319	1981	3,146	1989	3,209
1971	3,174	1982	2,597	1990	2,748
1972	3,148	1983	2,928		
1973	2,781	1984	3,105		

Source: Fort Huachuca letters concerning statements of claimant 39-10774 and 39-10775, December 28, 1981, Tab F, revised fiscal year figures, October 17, 1989, enclosure 6, revised calendar year figures, and September 13, 1991.

Currently, the Fort has eight production wells for the potable water supply. Table 5-62 lists these wells, their depth, and discharge capacity.

TABLE 5-62

FORT HUACHUCA  
DEPTH AND DISCHARGE OF THE EIGHT POTABLE WELLS

WELL NUMBER	DEPTH (FEET) (1)	DISCHARGE (GALLONS PER MINUTE) (2)
1	701 (823) (3)	500/500
2	710	700/900
3	802	700/700
4	912	700/700
5	800	700/700
6	1,230	700/310
7	762	800/ND
8	807	800/ND

(1) Figures from USGS Report (#1819-D).

(2) Figures shown are claimed data by Fort/data reported by USGS. ND means no data.

(3) Figure revised by Fort per letter dated November 13, 1990, comments on preliminary HSR.

### Potential Wells

The Fort undertook a test well drilling program in the early 1970s to identify areas for future production wells to meet projected water needs. The East Range area of the Fort was determined to have the most promising aquifer characteristics and location for the new wells. The East Range is an area of forty-four square miles, which is mostly isolated from private developments that might compete with the Fort for water. The areal extent of the East Range would also permit sufficient spacing between production wells to minimize interference between wells. Seven test wells were drilled in the East Range. Four of the test wells were determined to be good producers and three were determined to be poor to moderate producers based on an analysis of the specific capacity of the wells (specific capacity is a measure of well productivity expressed in gallons per minute per foot of drawdown).

Table 5-63 lists the test wells and their specific capacities. Specific capacities for the Fort's production wells are also shown for comparison purposes. The test wells that are good producers are generally located in the north and west portions of the East Range.

TABLE 5-63

FORT HUACHUCA  
EAST RANGE TEST WELL SPECIFIC CAPACITIES  
COMPARED WITH PRODUCTION WELL SPECIFIC CAPACITIES

<u>EAST RANGE TEST WELL DESIGNATION</u>	<u>SPECIFIC CAPACITY</u>
Test Well 3	22 gpm/ft.
Test Well 4	7 gpm/ft.
Test Well 5 (1)	29 gpm/ft.
Test Well 6	21 gpm/ft.
Test Well 7	23 gpm/ft.
Test Well 8	10 gpm/ft.
Test Well 9	8.6 gpm/ft.

<u>POST PRODUCTION WELL DESIGNATION</u>	<u>SPECIFIC CAPACITY</u>
Spatial Resolution Well	16 gpm/ft.
Post Well 1	15.4 gpm/ft. at 593 gpm
Post Well 2	17.1 gpm/ft. at 615 gpm
Post Well 3	17.7 gpm/ft. at 760 gpm
Post Well 4	40.7 gpm/ft. at 611 gpm
Post Well 5	6.2 gpm/ft. at 450 gpm
Post Well 6	37.5 gpm/ft. at 601 gpm

Source: U.S. Army Corps of Engineers, 1974.

(1) Test Well 5 has become Post Well 8.

### Effluent

Another source of water supply for Fort Huachuca is effluent. As stated earlier, the Fort uses some of the effluent to irrigate the Chaffee parade field and the Fort's golf course. The remaining effluent is placed in evaporation ponds. During 1990, the Fort produced effluent at the rate of about 1,720,000 gallons per day or about 1,923 acre-feet per year.

DWR has made a projection of effluent production to the year 2025 based on a per capita production rate of 202 gallons per capita per day (gpcd) based on the average gpcd rate for 1989 and 1990 and for population increases on the Fort of 0, 1, 3, and 6 percent. This projection is displayed in Figure 5-24.

# Fort Huachuca

## Projected Effluent Production

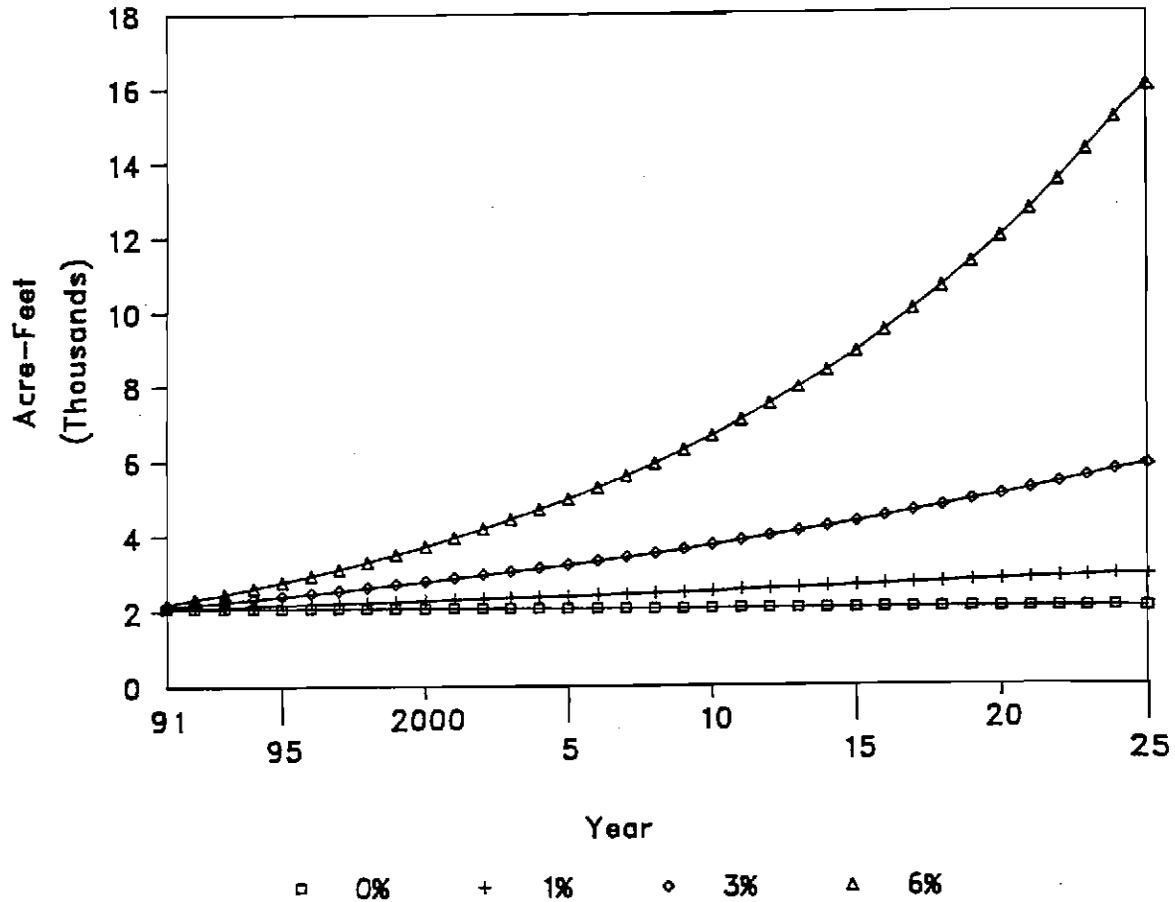


Figure 5-24. Fort Huachuca - projected effluent production using a 139 gpcd effluent production rate and for 0, 1, 3, and 6 percent rate of population increases

Table 5-64 shows the projected effluent production in acre-feet per year for selected years at 0, 1, 3, and 6 percent population growth rates.

### Water Uses

This section will discuss the historical water uses and sources as well as current water uses found at Fort Huachuca.

TABLE 5-64

FORT HUACHUCA  
EFFLUENT PRODUCTION  
(ACRE-FEET PER YEAR)

<u>YEAR</u>	<u>0%</u>	<u>1%</u>	<u>3%</u>	<u>6%</u>
1995	2,084	2,190	2,416	2,789
2000	2,084	2,302	2,801	3,732
2005	2,084	2,419	3,247	4,994
2010	2,084	2,543	3,746	6,683
2015	2,084	2,673	4,363	8,944
2020	2,084	2,809	5,058	11,969
2025	2,084	2,952	5,864	16,017

### Historical Water Uses And Sources

Captain Whitside chose the Fort Huachuca site primarily for its abundant water supply, however, the area regularly experienced torrential rains followed by drought. Whitside reported on September 7, 1878, that there was "water, water everywhere from July to September and drought for the remainder of the year." All adobe buildings on post were either washed away or damaged beyond repair as a result of the continuous rain. In 1880, Whitside wrote to the Regional Commander that the reservation needed to be formally surveyed to discourage civilians from settling in Tanner's Canyon (now Garden Canyon) thereby depleting the post water supply. In 1883, the Secretary of War enlarged the Fort to include the area under dispute. (General Orders, No. 36; May 24, 1883).

Water came from Sawmill Spring approximately three miles away from the post at an elevation of about 500 feet above the reservoirs which were 250 feet above the hospital, the lowest point in the camp. Iron pipes transported water from the springs to the reservoirs and then on to the points of distribution on post. Excavated in rock and cemented to inhibit seepage, each of the two reservoirs had a 220,000 gallon capacity. Overflow from these reservoirs watered the parade ground. Flood waters were carried away from post housing by deep open ditches; in front of the enlisted men's barracks and behind officer's quarters. Huachuca Creek flowed at the bottom of the slope behind the barracks and reportedly became a raging river during rain storms.

As early as 1887, the post commander restricted garden irrigation. Post Surgeon Leonard Wood wrote to the Commanding Officer that while there was a plentiful supply of water, its quality was not good. Wood based his assumption on the large number of soldiers being treated in the post hospital for stomach malfunctions a few days after the heavy rains. Apparently, the rains flooded the reservoir so that it became little more than a pool within the stream.

In 1906, plans were considered to abandon Fort Huachuca due to an acute water shortage. However, no actions were taken to move Fort Huachuca. In 1911, with an increase in troop strength, plans were made to complete a pipeline from Garden Canyon to the main post. This pipeline was completed in October 1911. Subsequently, the Army built collection works near the junction of Garden and McClure Canyons with small pipelines going up these canyons to several springs. The water was conveyed some seven miles from the collecting works to the post's 250,000 gallon masonry storage reservoir and a small 4,000 gallon capacity tank located near Carnahan Hill.

Shortages were severe during the summer of 1918. Beginning June 5, the Quartermaster began turning off the water supply during the night. One week later, water flow was restricted to six hours a day, with no water running in the irrigation ditches. By 1932, the Fort had insufficient water. All of it came from springs in Huachuca and Garden Canyons. A well was drilled in Garden Canyon to supplement the main Huachuca Canyon source, but it was never successful. Restrictions on water usage again plagued the Fort during the summers of 1934 and 1935.

In 1936, a large well was installed which tapped into the regional groundwater aquifer. This successfully supplemented the above-ground springs to insure an adequate future supply. Figures for 1940 indicate that the post population of 5,500 used 740 acre-feet of water from the well that year. The amount of water used fluctuated with the Fort population. In 1942, it was utilized as a training ground and housed 40,500 troops. Water pumpage for that year reached a high of 5,400 acre-feet.

The post was deactivated from 1947 until 1951. During this four year period, the reservation was used as a wildlife preserve by the Arizona Game and Fish Commission and for military training by the Arizona National Guard. The Fort was reactivated in 1951 for two years during the Korean War with a

population of 10,300 and water use of 1,380 acre-feet. It was closed again for a brief time from May 1953 until February 1954 at which time it was designated the U.S. Army Electronic Proving Ground. It has remained active since that date. Water use steadily increased from 2,580 acre-feet in 1954 to 3,300 acre-feet by 1973.

### Current Water Uses

#### 1. Municipal Use

Potable water utilized in meeting the municipal demands of Fort Huachuca is supplied by eight production wells. Of this total, six are located in the main post area, the remaining two are located on the East Range. Total current water consumption (1990), not including effluent use, is estimated at 2,748 acre-feet. The pumping capacity of six wells operating sixteen hours per day is 3,500,000 gallons a day or 4,000 acre-feet per year. Fort Huachuca has claimed a total water storage capacity of 5,630,000 gallons per day and a potable water distribution system totaling 1,795,866 lineal feet.

Potable water from springs in Garden and Huachuca Canyons is available to supplement the main municipal supply. At one time, both of these springs provided good quality water part of the time to the post. Turbidity problems during rains as well as chlorination problems resulted in disconnection of these sources from the main distribution system in 1983.

Water from the springs in Garden Canyon, while no longer part of the main municipal supply, is used to fill concrete tanks at the leadership reaction course, and for sustaining water levels at the golf course pond and gravel pit pond.

Currently unused, the Huachuca Canyon source consisted of a gravity feed through a pipeline from the spring. The pipeline is still in place, but the water is rerouted to Huachuca Canyon. As a result, a greater quantity of water is retained in the area for enhanced plant growth and wildlife usage.

Domestic use accounts for a significant amount of the total municipal water demand. An additional quantity of water is needed to maintain turf and landscaped areas. Turf areas currently watered by sprinkler irrigation include the Fort cemetery, Brown Parade field, Henry Circle, as well as turf areas surrounding base residences, the Fort headquarters, and Greely Hall.

## 2. Irrigation

The Fort currently irrigates two areas that utilize nonpotable water. This water is in the form of effluent produced at the two wastewater treatment plants located within the Fort boundaries shown in Figure 5-25. Fort Huachuca uses the effluent to irrigate Chaffee parade field and the post golf course. These uses are summarized in Table 5-65. Both locations are sprinkler irrigated. Any surplus effluent not used at these locations is disposed of in evaporation ponds. Fort Huachuca has claimed a total of 104,560 (211,420 per letter dated November 13, 1990) lineal feet of nonpotable water lines.

TABLE 5-65

FORT HUACHUCA  
IRRIGATION SUMMARY

<u>USE</u>	<u>LOCATION</u>	<u>SOURCE</u>	<u>ACRES</u>
Parade Field	Sec. 31, T.21S., R.20E. Sec. 32, T.21S., R.20E.	E2	10.25
Golf Course	Sec. 04, T.22S., R.20E. Sec. 09, T.22S., R.20E.	E1, E2	84.80

DWR has estimated the annual water requirements for the Chaffee parade field and the post golf course which is described below.

### A. Chaffee Parade Field

The parade field consists primarily of pasture grasses and is irrigated by a sprinkler system. Consumptive use for pasture grasses is estimated at 3.2 acre-feet per acre. Total acres irrigated equals 10.25 acres. The sprinkler system was assigned an efficiency of 72 percent. An estimate of water required to meet these needs is calculated as shown in the following equation.

$$\frac{3.2 \text{ acre-feet per acre} \times 10.25 \text{ acres}}{72 \text{ percent}} = 45.6 \text{ acre-feet}$$

### B. Golf Course

The turf irrigated at the post golf course has a consumptive use value of 2.5 acre-feet per acre. The golf course is sprinkler irrigated. This

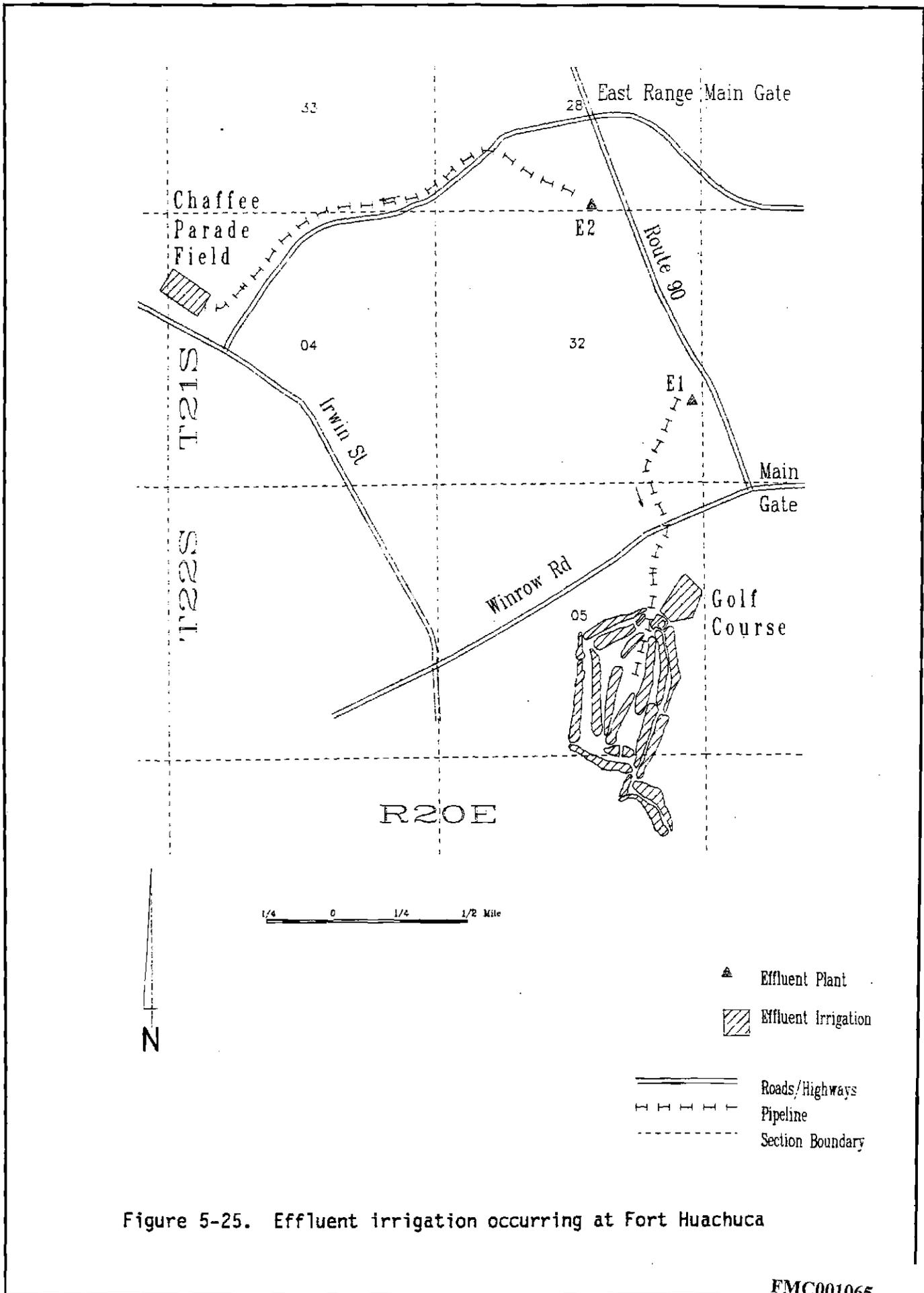


Figure 5-25. Effluent irrigation occurring at Fort Huachuca

FMC001065

irrigation system was also assigned an efficiency of 72 percent. Total irrigated area equals 84.8 acres.

$$\frac{2.5 \text{ acre-feet per acre} \times 84.8 \text{ acres}}{72 \text{ percent}} = 294.4 \text{ acre-feet}$$

The total quantity of effluent needed to satisfy the irrigation needs of the Chaffee parade field and golf course is equal to 340.0 acre-feet.

In 1986, Fort Huachuca was irrigating two additional areas (listening device-sensor fields) with nonpotable water as shown on Figure 5-26. These areas were sprinkler irrigated with groundwater from Rembass wells #1 and #2. Claimed acreage for these two areas was 47.87 acres. As of March 1990, these locations have been allowed to revert back to natural vegetation. (DWR estimates that irrigation requirement for the sensor fields is 212.8 acre-feet per year based on consumptive use of pasture grasses of 3.2 acre-feet per acre and an efficiency for sprinkler irrigation of 72 percent.)

### 3. Impoundments

The Fort has claimed a total of seventy-four impoundments for various uses such as game management, recreation, erosion control, and sewage evaporation. DWR surveyed sixteen of these impoundments and the remaining fifty-eight impoundments were determined to be less than two surface acres in area at maximum capacity. DWR estimates that total surface area subject to evaporation and seepage losses from these impoundments is eighty-eight surface acres.

The total seepage and evaporation loss is estimated to be 602 acre-feet per year.

### 4. Recreation Uses

Fort Huachuca has claimed fourteen ponds specifically for recreation and wildlife uses. An additional five ponds are designated for game management purposes.

Despite operating as a military installation, Fort Huachuca does offer a variety of public activities on post. Bird watching, hiking, and picnicking are popular past times. Firearm enthusiasts can enjoy sanctioned trap and skeet shooting competitions as well as bird dog field trials.

-  Irrigated fields
-  Section lines
-  Owner Boundary
-  Road or Highway
-  Wells

1/4 0 1/4 1/2 Mile

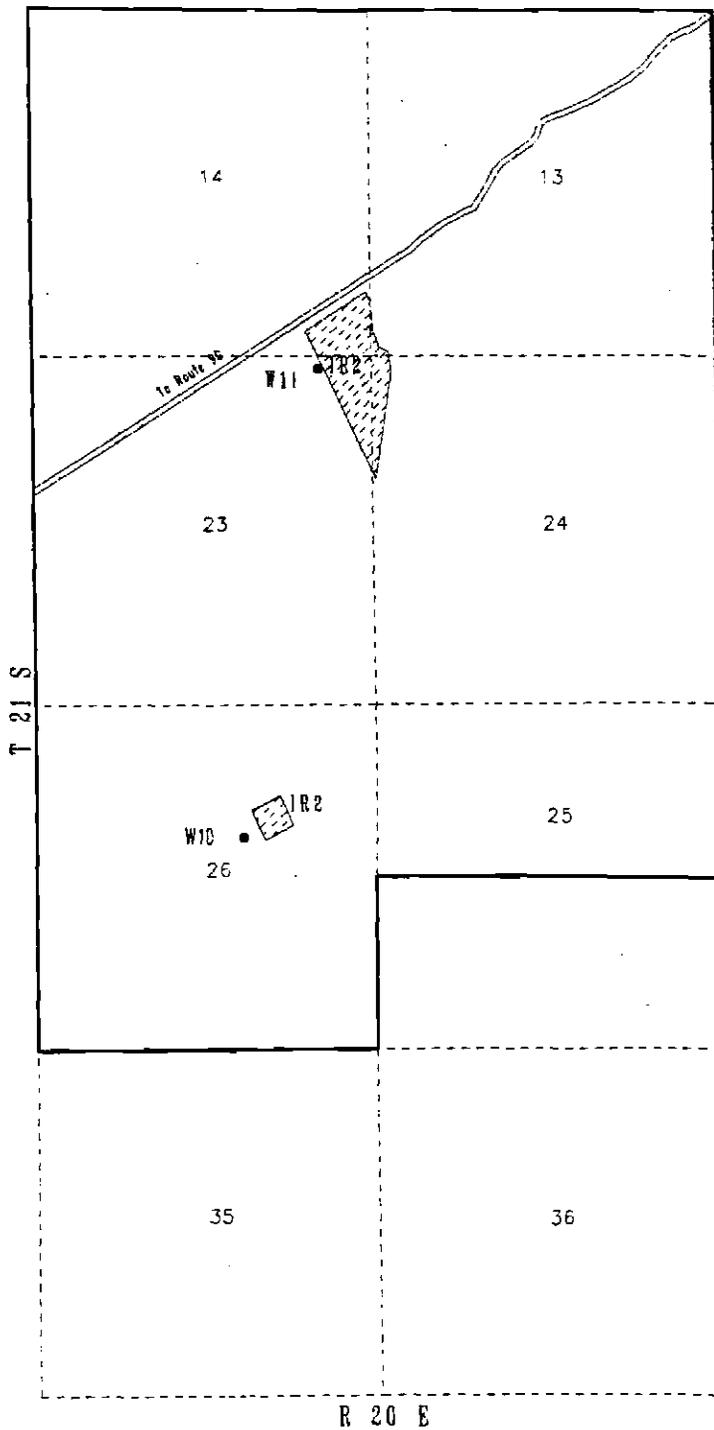


Figure 5-26. Listening device-sensor field irrigation occurring at Fort Huachuca

Water based recreation on post is limited to swimming and fishing. A semi-annual Tag Fishing Derby is held on post. The Fort's fisheries biologist tags trout which are then released into the golf course pond for the fishing competition. Rainbow trout and catfish, in addition to other fish, are released into Lower Garden Canyon pond as part of the Derby Day fishing activities.

## 5. Wildlife Uses

Fort Huachuca has adopted a multifaceted recreational approach to managing its wildlife resources. Highlights of their endeavors include establishment of warm water fisheries, wildlife habitat improvement, and protection of rare, threatened, and endangered Arizona and federal species. Many of those species are plants. Water conservation involved several projects. Spillways and dams were repaired to reduce erosion damage. Stream banks were stabilized using riprap stones. Renovation, relocation, and new construction of water catchment areas were completed in an effort to increase water availability for wildlife. It has been estimated that nearly one-fourth of all the bird species known to breed in North America have nesting sites in the Huachuca Mountains. The Fort is also home to big game species which include: whitetail deer, desert mule deer, pronghorn antelope, mountain lion, javelina, and black bear. The Fort has claimed a total of 54.2 acre-feet for wildlife in the form of wildlife springs.

## 6. Other Uses

Additional water uses claimed by the Fort include eight nonpotable wells and nine test wells. The test wells, two windmills, and one well (well #9) are currently capped. Fort Huachuca has stated that these sources have the potential for use during emergencies, mobilization, and to accommodate a change in mission. A majority of claimed nonpotable water is used for general military purposes, washing of vehicles, and dust control during construction.

Other water uses on the Fort include those at Libby Army Airfield. This facility is located on property owned by Fort Huachuca, but is jointly utilized by the Army, Air National Guard, and the City of Sierra Vista. Water uses at the airbase consist of domestic use, washing of equipment, limited irrigation, and fire prevention.

### Summary of Current Uses

The estimate of current water use for Fort Huachuca is 3,744 acre-feet as shown in Table 5-66.

TABLE 5-66  
FORT HUACHUCA  
ESTIMATED CURRENT WATER USE

<u>WATER USE</u>	<u>ESTIMATED WATER USE (ACRE-FEET)</u>
Municipal	2,748
Effluent irrigation	340
Impoundments	602
Recreation and wildlife	<u>54</u>
TOTAL	3,744

### Future Water Uses

#### 1. Municipal Use

Figure 5-27 shows DWR's projected future municipal water requirements based on pumpage figures and population estimates for Fort Huachuca supplied by the Fort for the years 1982 to 1990. DWR projected the future municipal requirements based on annual population increases of 0, 1, 3, and 6 percent to provide a representative range of water requirements. Water usage rates were determined by averaging the reported information from the years 1982 to 1990. This rate was determined to be 270 gpcd. This rate is used in DWR's projection which was converted to acre-feet per year. Table 5-67 displays DWR's projection for selected years to the year 2025.

#### 2. Irrigation

Effluent is used on the Fort's Chaffee parade field and golf course. The estimated annual water requirements for these fields is 340 acre-feet per year.

# Fort Huachuca

## Projected Municipal Water Usage

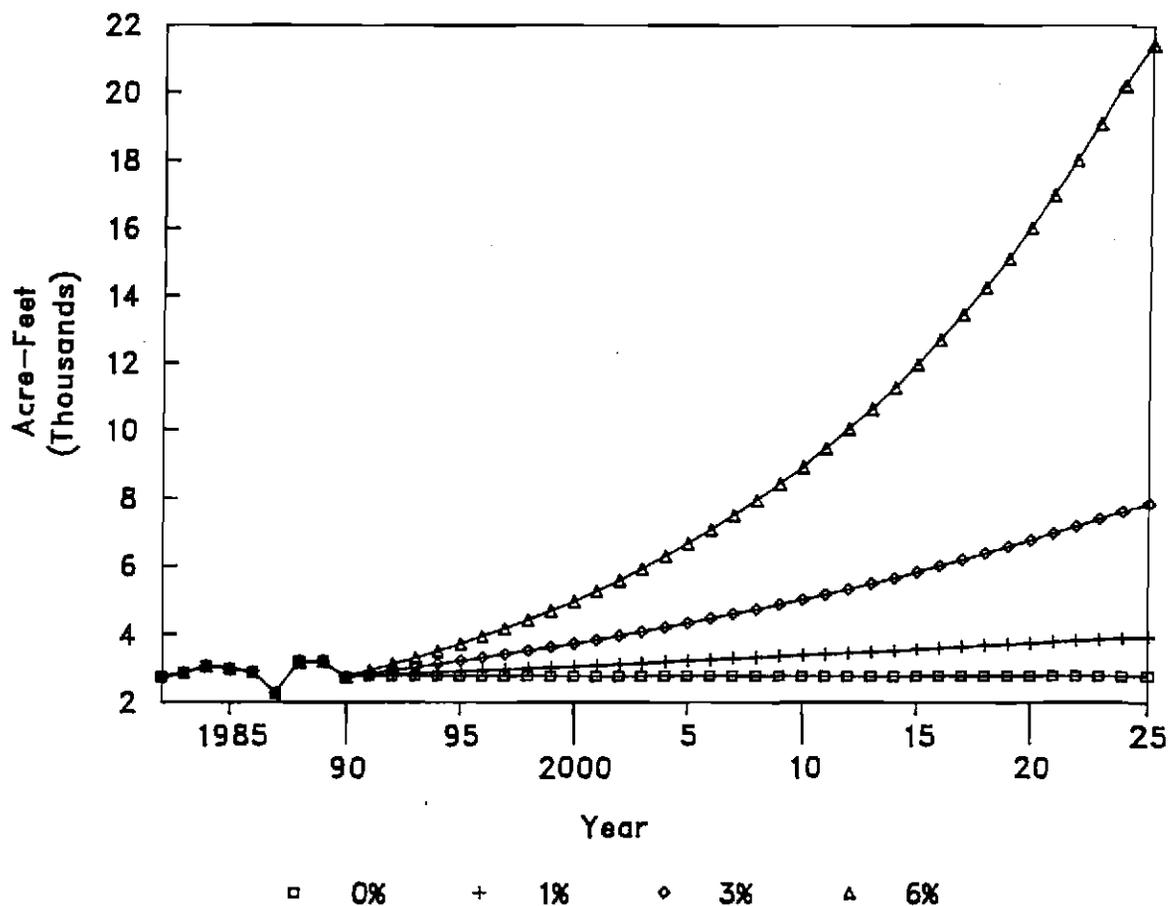


Figure 5-27. Fort Huachuca - projected municipal water use for 0, 1, 3, and 6 percent rates of population increases.

TABLE 5-67

### FORT HUACHUCA PROJECTED MUNICIPAL USE (ACRE-FEET PER YEAR)

<u>YEAR</u>	<u>0%</u>	<u>1%</u>	<u>3%</u>	<u>6%</u>
1995	2,787	2,929	3,231	3,730
2000	2,787	3,079	3,746	4,991
2005	2,787	3,236	4,342	6,680
2010	2,787	3,401	5,034	8,939
2015	2,787	3,574	5,836	11,962
2020	2,787	3,757	6,785	16,008
2025	2,787	3,948	7,843	21,422

### 3. Impoundments

The seepage and evaporation losses for the seventy-four impoundments is estimated to be 602 acre-feet per year.

### 4. Recreation and Wildlife

The estimated water requirements for recreation and wildlife uses is 54 acre-feet per year.

### Summary of Total Projected Water Requirements

Table 5-68 shows DWR's estimate of total projected water requirements for Fort Huachuca. The projection is shown for Fort population increases of 0, 1, 3, and 6 percent. The projection includes future municipal water requirements and total other water requirements of 996 acre-feet per year broken down into irrigation uses, impoundments, and recreation and wildlife usage equalling 340, 602, and 54 acre-feet per year.

TABLE 5-68

FORT HUACHUCA  
PROJECTED WATER REQUIREMENTS (1)  
(ACRE-FEET PER YEAR)

YEAR	0%	1%	3%	6%
1995	3,783	3,925	4,227	4,726
2000	3,783	4,075	4,742	5,987
2005	3,783	4,232	5,338	7,676
2010	3,783	4,397	6,030	9,935
2015	3,783	4,570	6,832	12,958
2020	3,783	4,753	7,781	17,004
2025	3,783	4,944	8,839	22,418

(1) The projection is based on the average Fort population for the years 1982 to 1990 and 270 gpcd rate.

It should be noted that increased or decreased mission requirements at Fort Huachuca cannot be forecasted with accuracy due to political events, funding, technological development, or other aspects of military operations. The projections made by DWR do not take these factors into account and are being presented to provide a basis of comparison to what the Fort has claimed. The projected amounts may not be sufficient to meet all the Fort's water requirements. The amount of water required to fulfill future military

requirements at Fort Huachuca will be totally dependent on the level of future increases (or decreases) in its military operations. An example of this mission change is the recent Department of Defense reorganization which resulted in Fort Huachuca potentially receiving many of the activities and personnel from Fort Devon, Massachusetts, which is being closed.

#### **Quantification of Significant Diminishment to Fort Huachuca**

The problem of special interest is, per the instructions of the Court's order of September 9, 1988, to: ". . . determine all stream users or diversions of either surface water or groundwater which significantly affect those sources reasonably available on, at, or near the federal parcel . . . ." (Emphasis added).

The quantification of significant diminishment to Fort Huachuca was conducted with the use of a numerical groundwater flow model developed by the USGS. APPENDIX G provides a detailed description of the methodology that was used to conduct this analysis.

The USGS Modflow model (Freethey, 1982) defined the hydrologic system of the Upper San Pedro Basin. Freethey developed a numerical model based on a conceptualization of the hydrologic system within the basin. The numerical model employed a three-dimensional, block centered, finite difference grid to simulate groundwater flow, stream/aquifer connection, and evapotranspiration. Information on hydraulic properties of the basin fill, recharge from bordering mountain ranges, discharge from evapotranspiration, and exchange of water between aquifer and stream was available from previous work or estimates. The advantages of using the model were that: 1) it is well documented, 2) it can be used to solve complex spatial and temporal relationships in a dynamic hydrologic system, and 3) the model can simulate different scenarios by changing input parameters.

In order to isolate the impacts that off-reservation pumpage has on the Fort's groundwater supply, the model compared two scenarios. The first incorporated groundwater withdrawals due only to the Fort's pumpage. The second incorporated groundwater pumpage for Fort Huachuca and the eight surrounding municipal water companies (including Huachuca City and Sierra Vista). Water level drawdown maps were constructed for the time periods 1940 through 1988 and for 1940 through 2038. These are shown in Figures 5-28 and

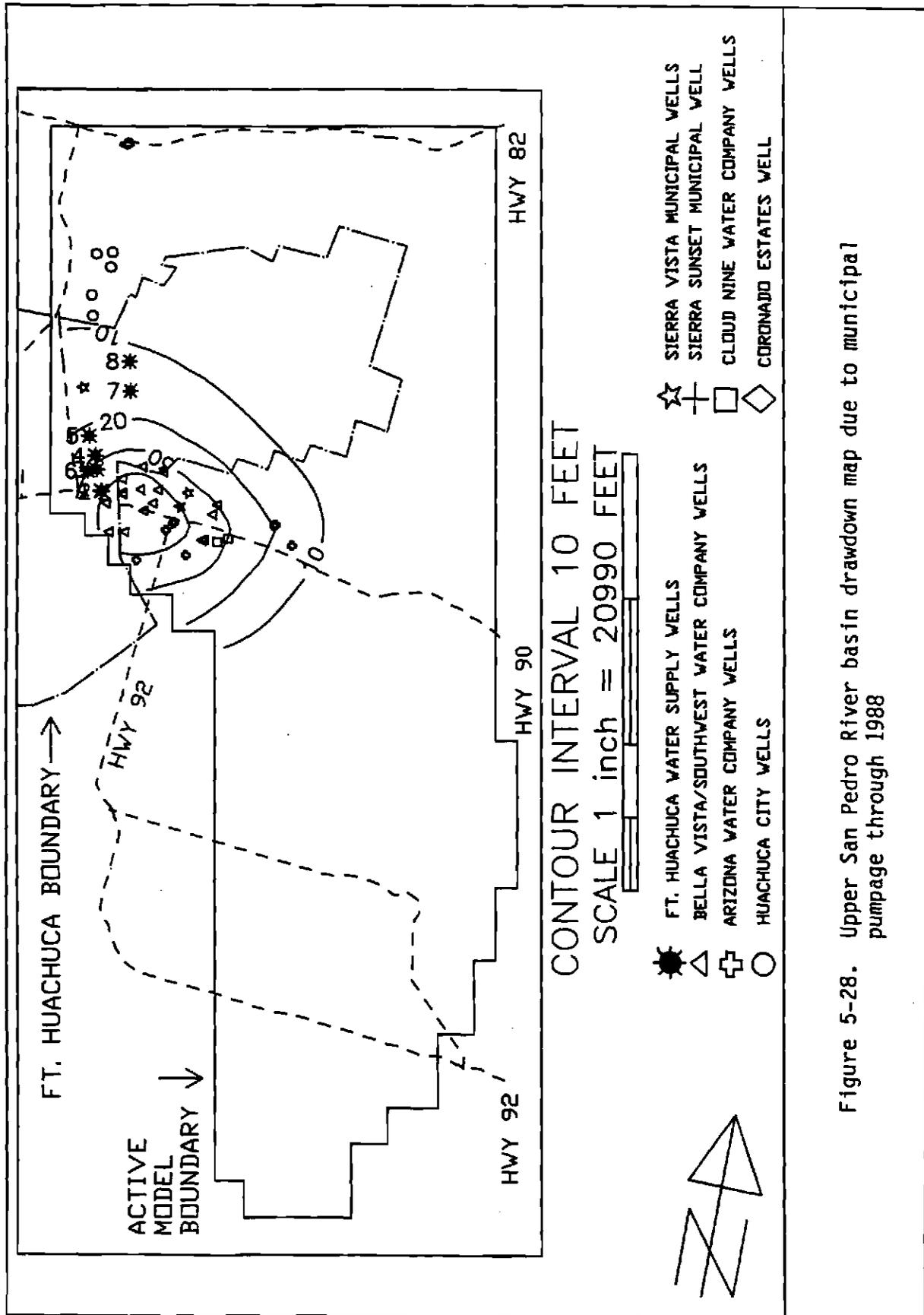


Figure 5-28. Upper San Pedro River basin drawdown map due to municipal pumpage through 1988

5-29. These drawdown maps illustrate the additional lowering of water levels solely from the municipal pumpage over the noted time periods. These drawdown maps do not reflect the total drawdown in the vicinity due to the municipal pumpage and Fort Huachuca pumpage.

The results of the model runs demonstrate that the additional drawdown to Fort Huachuca's wells because of the additional pumpage from the eight surrounding water companies from 1940 through 1988 ranges from thirteen feet at Fort Huachuca well #8 in the East Range, which is furthest from the pumping center, to forty-one feet at wells #1 and #2 nearest to the pumping center. The projected cost to the Fort over the forty-eight year period (1940-1988) could be between \$75,000 to \$125,000. Table G-4 in APPENDIX G shows this analysis. An explanation and description of the calculations used to derive these numbers are included in the table. The table is an attempt to quantify the economic impact that surrounding pumpage has had and might possibly have on Fort Huachuca's water supply costs. Table G-4 does not reflect actual costs incurred to the Fort by surrounding municipal pumpage. It is only an estimate, using data available to DWR at the time of the analysis.

A pumpage scenario (see Tables G-2 and G-3 in APPENDIX G for details) based on projected increases in population from 1989 through 2038 resulted in additional drawdown of seventy-two feet at well #8 to 223 feet at well #1 and #2. The projected cost from 1989-2038 could be between \$500,000 and \$1,880,000 over the next fifty years. This calculation was made in present dollars; energy, well deepening, and maintenance costs are not adjusted for inflation, as illustrated in Table G-4 in APPENDIX G. It cannot be overstated that such a fifty year prediction into the future is only one simulation scenario and only one approximation of many possible future growth projections. This particular scenario assumed that the pumpage rates fifty years from now would be 2.2 times the current rates. Such rates may or may not be reached by the year 2038. Future population growth might demand better water conservation techniques that would reflect in less per capita pumpage and subsequently less drawdown than the model results reflect in the Sierra Vista - Fort Huachuca area. Fort Huachuca's response to a lowering of water levels might also result in more pumpage being shifted away from the pumping center to the East Range wells (United States Army Corps of Engineers, 1987). This would result in fewer well deepening costs, repair costs, and a reduction in lift costs.

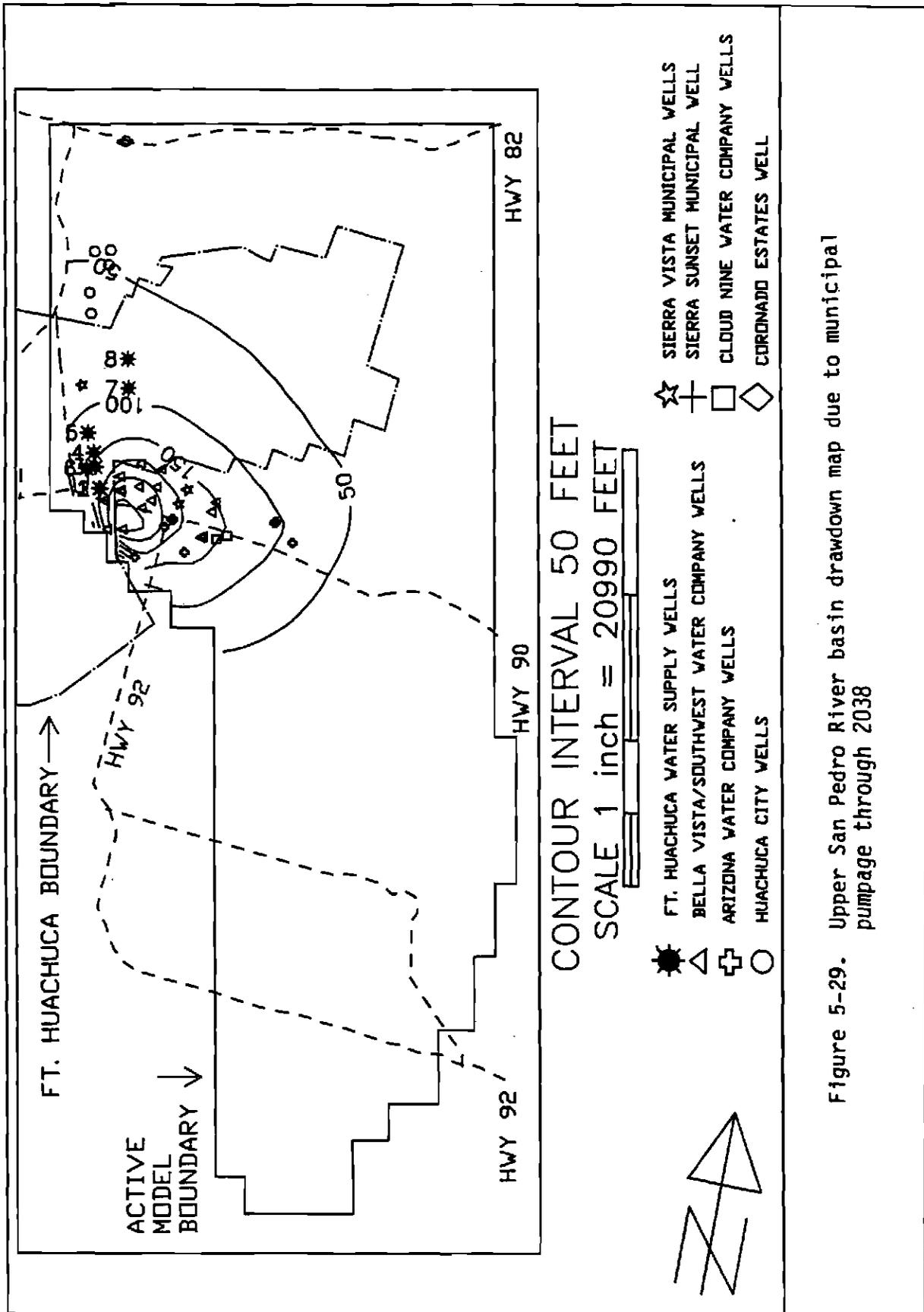


Figure 5-29. Upper San Pedro River basin drawdown map due to municipal pumpage through 2038

TABLE 5-69

UNITED STATES ARMY COMMUNICATIONS COMMAND  
 FORT HUACHUCA  
 III-23-73  
 COMPARISON OF CLAIMANT INFORMATION WITH DMR FINDINGS  
 STATEMENT OF CLAIMANT 39-10774

CLAIMED SOURCE	CLAIMED LOCATION		CLAIMED USE	CLAIMED NAME (FORT IDENTIFICATION)	CLAIMED WATERCOURSE	CLAIMED DATE OF ANNUAL USE (AC-FT)		WATER USE NO.	FOOD NO.	WATER USE TYPE	USE STATUS	WATER LOCATION	POINT OF DIVERGENCE LOCATION	ACREAGE OR CAPACITY (AC-FT)	MAP NUMBER
	16 21S 20E	22 21S 20E				FIRST USE	LAST USE								
Well	NESENE	16 21S 20E	DM, ML	Well #8 (W8)	Soldier Creek	412.9 <sup>1</sup>	1982	MU1	H1	MU	Verified		NESENE 16 21S 20E		111-20
Well	NNNNW	22 21S 20E	DM, ML	Well #7 (W7)	Soldier Creek	412.7 <sup>1</sup>	1982	MU1	H2	MU	Verified		NNNNW 22 21S 20E		111-20
Well	SNESW	28 21S 20E	DM, ML	Well #5 (W5)	Soldier Creek	628.2 <sup>1</sup>	1943	MU1	H3	MU, ML	Verified		SNESW 28 21S 20E		111-20
Well	NENNE	33 21S 20E	DM, ML	Well #4 (W4)	Soldier Creek	276.5 <sup>1</sup>	1943	MU1	H4	MU, ML	Verified		NENNE 33 21S 20E		111-20
Well	NNNSE	33 21S 20E	DM, ML	Well #6 (W6)	Soldier Creek	802.4 <sup>1</sup>	1959	MU1	H5	MU, ML	Verified		NNNSE 33 21S 20E		111-20
Well	NNNSE	33 21S 20E	DM, ML	Well #3 (W3)	Soldier Creek	919.6 <sup>1</sup>	1943	MU1	H6	MU, ML	Verified		NNNSE 33 21S 20E		111-20
Well	NNNNW	03 22S 20E	DM, ML	Well #1 (W1)	Soldier Creek	214.9 <sup>1</sup>	1940	MU1	H7	MU, ML	Verified		NNNNW 03 22S 20E		111-23
Well	NNNNW	03 22S 20E	DM, ML	Well #2 (W2)	Soldier Creek	125.9 <sup>1</sup>	1941	MU1	H8	MU, ML	Verified		NNNNW 03 22S 20E		111-23
Well	NNNSE	29 22S 20E	ML, ML <sup>1</sup>	Well (GH)	Garden Canyon	4.4 <sup>1</sup>	1930		H9	Capped	Unused		NNNSE 29 22S 20E		111-23
Well	NESENE	26 21S 20E	ML	Rambass Well #1 (WR1)	Graveyard Gulch	0.8 <sup>1</sup>	1978	IR2	H10	ML, IR	Verified	See Text/map	NESENE 26 21S 20E	47.9	See Text
Well	SNESW	14 21S 20E <sup>1</sup>	ML, IR	Rambass Well #2 (WR2)	Graveyard Gulch	1.3 <sup>1</sup>	1978	IR2	H11	ML, IR	Verified	See Text/map	NENNE 23 21S 20E		See Text
Well	NNNSE	20 21S 20E	Test	Test Well #1 (TW1)	N/A	0.0			H12	Capped	Unused		NNNSE 20 21S 20E		111-20
Well	NNNSE	30 21S 20E <sup>1</sup>	Test	Test Well #2 (TW2)	N/A	0.0			H13	Capped	Unused		NNNSE 30 21S 20E		111-20
Well	NENNE	16 21S 20E	Test	Test Well #3 (TW3)	N/A	0.0			H14	Capped	Unused		NENNE 16 21S 20E		111-20
Well	SNESW	15 21S 20E	Test	Test Well #4 (TW4)	N/A	0.0			H15	Capped	Unused		SNESW 15 21S 20E		111-20
Well	SNESW	35 20S 20E	Test	Test Well #6 (TW6)	N/A	0.0			H16	Capped	Unused		SNESW 35 20S 20E		111-20
Well	SESNW	11 21S 20E	Test	Test Well #7 (TW7)	N/A	0.0			H17	Capped	Unused		SESNW 11 21S 20E		111-20
Well	NNNSW	13 21S 20E	Test	Test Well #8 (TW8)	N/A	0.0			H18	Capped	Unused		NNNSW 13 21S 20E		111-20
Well	SNNSW	17 21S 21E	Test	Test Well #9 (TW9)	N/A	0.0			H19	Capped	Unused		SNNSW 17 21S 21E		111-20
Well	NNSEW	07 21S 21E	ML	East Range Bunker Well (ERB)	Graveyard Gulch	0.5 <sup>1</sup>	1958		H20	ML	Source a		NNSEW 07 21S 21E		111-20
Well	NNNNW	10 21S 20E <sup>1</sup>	Test	Well #9 (W9)	Soldier Creek	0.0			H21	Capped	Unused		NNNNW 10 21S 20E		111-20
Well	SENNW	22 21S 20E <sup>1</sup>	ML	Spatial Resolution Well (SP)	Soldier Creek	66.9	1964		H22	ML	Source a		SENNW 22 21S 20E		111-20
Well	NESEW	34 20S 20E	ML	Windmill #1 (WM1)	Soldier Creek	0.0	1910		H23	Capped	Unused		NESEW 34 20S 20E		111-20
Well	SNESW	27 20S 20E	ML	Windmill #2 (WM2)	Soldier Creek	0.0	1905		H24	Capped	Unused		SNESW 27 20S 20E		111-20
Well <sup>2</sup>	NENNW	32 22S 20E	ML	Garden Windmill (GM)	Garden Canyon	0.0	1930		H25	Capped	Unused		NENNW 32 22S 20E		111-23

CLAIMED INFORMATION

DMR FINDINGS

<sup>1</sup>Amended on August 5, 1991.

<sup>2</sup>Added or amended by amendment dated August 21, 1989.

TABLE 5-69 (cont'd)

CLAIMED INFORMATION		DMR FINDINGS												
CLAIMED SOURCE	CLAIMED LOCATION	CLAIMED USE NAME (FORT IDENTIFICATION)	CLAIMED WATERCOURSE	CLAIMED ANNUAL USE (AC-FT)	CLAIMED DATE OF FIRST USE	USE NO.	POD NO.	WATER USE TYPE	USE STATUS	WATER USE LOCATION	DIVERSION LOCATION	POINT OF DIVERSION	ACREAGE OR CAPACITY (AC-FT)	MAP NUMBER
Spring	NMSW 14 22S 19E MU	Spring #1 (SPP1)	Huachuca Canyon	5.3 <sup>1</sup>	1877	MU1	S1 MU	Verified	Verified		MMSW 14 22S 19E		111-23	
Spring	NMSW 14 22S 19E MU	Spring #2 (SPP2)	Huachuca Canyon	5.3 <sup>1</sup>	1877	MU1	S2 MU	Verified	Verified		MMSW 14 22S 19E		111-23	
Spring	NENE 22 22S 19E MU	Spring #3 (SPP3)	Huachuca Canyon	5.3 <sup>1</sup>	1877	MU1	S3 MU	Verified	Verified		NENE 22 22S 19E		111-22	
Spring	NENE 22 22S 19E MU	Spring #3a (SPP3a)	Huachuca Canyon	5.3 <sup>1</sup>	1877	MU1	S4 MU	Verified	Verified		NENE 22 22S 19E		111-22	
Spring	NENE 22 22S 19E MU	Spring #4 (SPP4)	Huachuca Canyon	5.3 <sup>1</sup>	1877	MU1	S5 MU	Verified	Verified		NENE 22 22S 19E		111-22	
Spring	NESW 31 22S 20E MU	Picnic Spring (PICHIC)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S7 MU	Verified	Verified		NESW 31 22S 20E		111-23	
Spring	SWSW 31 22S 20E MU	Chain Spring (CHAIN)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S8 MU	Verified	Verified		SWSW 31 22S 20E		111-23	
Spring	SESE 36 22S 19E MU	Spring #1 (SPP1)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S9 MU	Verified	Verified		SESE 36 22S 19E		111-23	
Spring	NENE 01 23S 19E MU	Spring #1a (SPP1a)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S10 MU	Verified	Verified		NENE 01 23S 19E		111-23	
Spring	NENE 01 23S 19E MU	Spring #1b (SPP1b)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S11 MU	Verified	Verified		NENE 01 23S 19E		111-23	
Spring	NESW 01 23S 19E MU	Spring #3 (SPP3)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S12 MU	Verified	Verified		NESW 01 23S 19E		111-23	
Spring	NESW 01 23S 19E MU	Spring #2 (SPP2)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S13 MU	Verified	Verified		NESW 01 23S 19E		111-23	
Spring	SWSW 01 23S 19E MU	Spring #4 (SPP4)	Garden Canyon	12.0 <sup>1</sup>	1877	MU1	S14 MU	Verified	Verified		SWSW 01 23S 19E		111-23	

KEY: DM = Domestic; E = Effluent (POD); EC = Erosion Control; FC = Flood Control; IR = Irrigation; ML = Military; MU = Municipal; POD = Point of Diversion; PS = Primary Storage Reservoir; RC = Recreation; SE = Sewage Evaporation; SP = Small Reservoir; SR = Small Reservoir; W = Well (POD); WL = Wildlife

<sup>1</sup>Amended on August 5, 1991.

TABLE 5-70

UNITED STATES ARMY COMMUNICATIONS COMMAND  
 FORT HUACHUCA  
 111-23-73  
 COMPARISON OF CLAIMANT INFORMATION WITH DMR FINDINGS  
 STATEMENT OF CLAIMANT 39-10775

CLAIMED INFORMATION		DMR FINDINGS										
CLAIMED SOURCE	CLAIMED LOCATION	CLAIMED USE NAME (FORT IDENTIFICATION)	CLAIMED WATERCOURSE	CLAIMED ANNUAL DATE OF USE (AC-FT)	USE NO.	FOOD NO.	WATER USE TYPE	USE STATUS	WATER USE LOCATION	POINT OF DIVERSION LOCATION	AOBEAGE OR CAPACITY (AC-FT)	MAP NUMBER
Effluent <sup>2</sup>	SENESE 31 215 20E	IR	Golf Course (Z-1/32a)	N/A	631.3	1954	RC	Verified See text	SENESE 33 215 20E	84.8	See text	
Effluent <sup>2</sup>	SENESE 31 215 20E	IR	Golf Course (Z-1/32b)	N/A	631.2	1954	E1 RC	Verified See text				
Effluent <sup>2</sup>	SENESE 28 215 20E	IR	Chaffee Parade Field (Z-2)	N/A	499.0	1954	E2 IR	Verified See text	SWSWSE 28 215 20E	10.3	See text	
Spring	SWSW 26 215 19E	WL	Spring #21 (SP21)	Slaughterhouse Canyon	1.0	1954	WL1	Spring	SWSW 26 215 19E			111-20
Spring	NMSW 32 215 19E	WL	Spring #22 (SP22)	Sycamore Canyon	2.6	1954	WL2	Spring	NMSW 32 215 19E			111-19
Spring	NMNE 04 225 19E	WL	Spring #20 (SP20)	Slaughterhouse Canyon	1.0	1954	WL3	Spring	NMNE 04 225 19E			111-22
Spring	SENE 08 225 19E	WL	Spring #19 (SP19)	Blacktail Canyon	2.6	1954	WL4	Spring	SENE 08 225 19E			111-22
Spring	NMNE 16 225 19E	WL	Spring #18 (SP18)	Blacktail Canyon	2.6	1954	WL5	Spring	NMNE 16 225 19E			111-22
Spring	SENM 15 225 19E	WL	Spring #17 (SP17)	Huachuca Canyon	2.6	1954	WL6	Spring	SENM 15 225 19E			111-23
Spring	NMSW 14 225 19E	WL	Spring #16 (SP16)	Huachuca Canyon	1.0	1954	WL7	Spring	NMSW 14 225 19E			111-23
Spring	NMSE 22 225 19E	WL	Spring #15a (SP15a)	Huachuca Canyon	1.0	1954	WL8	Spring	NMSE 22 225 19E			111-23
Spring	NESE 07 225 20E	WL	Spring #12 (SP12)	Soldier Creek	1.0	1954	WL9	Spring	NESE 07 225 20E			111-23
Spring	SMSW 13 225 19E	WL	Spring #13 (SP13)	Soldier Creek	2.6	1954	WL10	Spring	SMSW 13 225 19E			111-23
Spring	NESW 20 225 20E	WL	Spring #11 (SP11)	Woodcutters Canyon	1.0	1954	WL11	Spring	NESW 20 225 20E			111-23
Spring	SENM 21 225 20E	WL	Spring #23 (SP23)	Trib. to Garden Wash	1.0	1954	WL12	Spring	SENM 21 225 20E			111-23
Spring	SME 27 225 19E	WL	Spring #14 (SP14)	Huachuca Canyon	2.6	1954	WL13	Spring	SME 27 225 19E			111-23
Spring	NESE 35 225 19E	WL	Spring #5 (SP5)	McClure Canyon	4.2	1954	WL14	Spring	NESE 35 225 19E			111-23
Spring	SMSW 19 225 20E	WL	Spring #10 (SP10)	Woodcutters Canyon	2.6	1954	WL15	Spring	SMSW 19 225 20E			111-23
Spring	NMSE 25 225 19E	WL	Spring #9 (SP9)	Woodcutters Canyon	4.2	1954	WL16	Spring	NMSE 25 225 19E			111-23
Spring	SNNW 36 225 19E	WL	Spring #7 (SP7)	McClure Canyon	2.6	1954	WL17	Spring	SNNW 36 225 19E			111-23
Spring	SMSW 31 225 19E	WL	Spring #8 (SP8)	Garden Canyon	2.6	1954	WL18	Spring	SMSW 31 225 19E			111-23
Spring	NESE 33 225 20E	WL	Spring #2 (SP2)	Tinker Canyon	2.6	1954	WL19	Spring	NESE 33 225 20E			111-23
Spring	SESW 36 225 19E	WL	Spring #6 (SP6)	McClure Canyon	2.6	1954	WL20	Spring	SESW 36 225 19E			111-23
Spring	SESW 36 225 19E	WL	Spring #25 (SP25)	Trib. to McClure Canyon	1.4	1954	WL21	Spring	SESW 36 225 19E			111-23
Spring	NESE 33 225 20E	WL	Spring #3 (SP3)	Tinker Canyon	1.0	1954	WL22	Spring	NESE 33 225 20E			111-23
Spring	NMNM 07 235 20E	WL	Spring #24 (SP24)	Scheelite Canyon	1.0	1954	WL23	Spring	NMNM 07 235 20E			111-23
Spring	SMSW 07 235 20E	WL	Spring #4 (SP4)	Sawmill Canyon	4.2	1954	WL24	Spring	SMSW 07 235 20E			111-23
Spring	SMSW 01 235 19E	WL	Cabin Spring (CABIN)	Garden Canyon	2.6 <sup>1</sup>	1877	WL25	Spring	SMSW 01 235 19E			111-23

<sup>1</sup>Amended on August 5, 1991.

<sup>2</sup>Added or amended by amendment dated August 21, 1989.

TABLE 5-70 (cont'd)

CLAIMED SOURCE		CLAIMED LOCATION		CLAIMED USE NAME (FORT IDENTIFICATION)		CLAIMED WATERCOURSE		CLAIMED INFORMATION		DNR FINDINGS						
CL	SR	CL	LR	CL	LR	CL	LR	CL	IR	USE NO.	WATER USE TYPE	USE STATUS	WATER USE LOCATION	POINT OF DIVERSION LOCATION	ACREAGE OR CAPACITY (AC-FT)	MAP NUMBER
Spring <sup>2</sup>		SESE 22 22S 19E	WL	Moss Falls (SP15b)	Huachuca Canyon	0.0	1877	WL26	Spring		Verified	SESE 22 22S 19E		111-22		
Dam		NMSW 16 21S 19E	RC,WL	Antelope (19)	Trib. to Babocomari	4.8	1954	PS1	Verified		Verified	NMSW 16 21S 19E		111-19	26.4	
Dam		SESW 20 21S 19E	RC,WL	Sycamore (9)	Sycamore Canyon	6.0	1954	PS2	Verified		Verified	SESW 20 21S 19E		111-19	38.8	
Dam		SENN 28 21S 19E	RC,WL	Hidden (5)	Blacktail Canyon	5.6	1954	PS3	Verified		Verified	SENN 28 21S 19E		111-19	22.5	
Dam		NMNE 09 22S 20E	RC,WL	Golf Course (2)	Trib. to Soldier Creek	14.4	1954	PS4	Verified		Verified	NMNE 09 22S 20E		111-23	59.7	
Dam		NESE 17 22S 20E	RC,WL	Gravel Pit (1)	Trib. to Woodcutters Canyon	11.5	1954	PS5	Verified		Verified	NESE 17 22S 20E		111-23	57.4	
Dam		NENE 03 21S 20E <sup>1</sup>	EC,FC	(k)	Trib. to Soldier Creek	0.5	1977	SP1	Verified		Verified	NENE 03 21S 20E		111-20		
Dam		NENE 09 21S 20E	EC,FC	(l)	Trib. to Soldier Creek	0.5	1977	SP2	Verified		Verified	NENE 09 21S 20E		111-20		
Dam		SENN 21 20S 21E	WL	(r)	Trib. to San Pedro River	0.3	1976	SP3	Verified		Verified	SENN 21 20S 21E		111-20		
Dam <sup>2</sup>		SENN 16 21S 19E	WL	Lower Antelope (41)	Sycamore Canyon	6.0	1975 <sup>1</sup>	SP4	Verified		Verified	SENN 16 21S 19E		111-19	14.9	
Dam <sup>2</sup>		NESW 29 21S 19E	RC <sup>1</sup>	Sycamore (1) (42)	Sycamore Canyon	7.0	1975 <sup>1</sup>	SP5	Verified		Verified	NESW 29 21S 19E		111-19	10.5	
Dam		SWNE 26 21S 19E	EC,FC	Buffalo Corral (12)	Sycamore Canyon <sup>1</sup>	0.5 <sup>1</sup>	1954	SP6	Verified		Verified	SWNE 26 21S 19E		111-20		
Dam		SWNE 31 21S 19E <sup>1</sup>	EC,FC	(39a)	Trib. to Sycamore Canyon	0.5	1954	SP7	Verified		Verified	SWNE 31 21S 19E		111-19		
Dam <sup>2</sup>		NMSE 21 22S 19E <sup>1</sup>	EC,FC	West Huachuca (14)	Huachuca Canyon	0.7	1954	SP8	Verified		Verified	NMSE 21 22S 19E		111-22		
Dam		SESE 07 21S 20E	EC,FC	Lower Huachuca (23)	Huachuca Canyon	4.8	1954	SP9	Verified		Verified	SESE 07 21S 20E		111-20		
Dam		NMSE 18 21S 20E	WL	(q)	Trib. to Huachuca Canyon	0.5	1954	SP10	Verified		Verified	NMSE 18 21S 20E		111-20		
Dam		SENE 10 21S 20E	EC,FC	(r)	Trib. to Soldier Creek	0.5	1977	SP11	Verified		Verified	SENE 10 21S 20E		111-20		
Dam		SWNW 15 21S 20E <sup>1</sup>	SE	Sediment (34d)	Soldier Creek	4.0	1978	SP12	Verified		Verified	SWNW 15 21S 20E		111-20		
Dam		SENE 14 21S 20E	EC,FC	East #3 (37)	Trib. to San Pedro River	3.2	1954	SP13	Verified		Verified	SENE 14 21S 20E		111-20	29.6	
Dam <sup>2</sup>		SMSW 16 21S 20E	EC,WL	Gate #5 Pond (44)	Huachuca Canyon	0.4	1975 <sup>1</sup>	SP14	Verified		Verified	SMSW 16 21S 20E		111-20		
Dam <sup>2</sup>		NMSE 21 21S 20E	SE	Sediment (34c)	Soldier Creek	1.0	1978	SP15	Verified		Verified	NMSE 21 21S 20E		111-20		
Dam <sup>2</sup>		SESE 21 21S 20E	SE	#3 Sewage (46)	Soldier Creek	2.2	1975 <sup>1</sup>	SP16	Verified		Verified	SESE 21 21S 20E		111-20	6.0	
Dam <sup>2</sup>		NMSE 10 21S 20E	WL	Pond (45)	Soldier Creek	0.4	1975 <sup>1</sup>	SP17	Verified		Verified	NMSE 10 21S 20E		111-20	11.0	
Dam		NMSE 21 21S 20E <sup>1</sup>	SE	Sediment (34a)	Soldier Creek	1.7	1978	SP18	Verified		Verified	NMSE 21 21S 20E		111-20		
Dam <sup>2</sup>		SESE 21 21S 20E	SE,WL	#2 Sewage (47)	Soldier Creek	0.9	1975 <sup>1</sup>	SP19	Verified		Verified	SESE 21 21S 20E		111-20	12.0	
Dam		SESE 21 21S 20E	SE	Sediment #3 (34)	Soldier Creek	16.5	1954	SP20	Verified		Verified	SESE 21 21S 20E		111-20	5.5	
Dam		NMNE 36 21S 19E	EC,FC,RC	(m)	Huachuca Mesh	2.8	1979	SP21	Verified		Verified	NMNE 36 21S 19E		111-20		
Dam		NESW 27 21S 20E <sup>1</sup>	EC,FC	East #4 (38)	Soldier Creek	4.1	1954	SP22	Verified		Verified	NESW 27 21S 20E		111-20		
Dam		SESW 06 22S 20E <sup>1</sup>	EC,FC	Lower Fly (27)	Soldier Creek	6.0	1954	SP23	Verified		Verified	SESW 06 22S 20E		111-23		
Dam		SMSW 06 22S 19E <sup>1</sup>	WL	Fly (8)	Soldier Creek	0.9	1954	SP24	Verified		Verified	SMSW 06 22S 19E		111-23		
Dam <sup>2</sup>		SESW 06 22S 20E	EC <sup>1</sup>	Horse Pasture (48)	Soldier Creek	0.6	1975 <sup>1</sup>	SP25	Verified		Verified	SESW 06 22S 20E		111-23		
Dam		SESW 06 22S 20E	EC,FC <sup>1</sup>	Lower Horse Pasture (29)	Soldier Creek	0.8 <sup>1</sup>	1954	SP26	Verified		Verified	SESW 06 22S 20E		111-23		
Dam		NMNM 10 22S 20E	EC,FC	Woodcutters (18)	Woodcutters Canyon	4.5 <sup>1</sup>	1954	SP29	Verified		Verified	NMNM 10 22S 20E		111-23	20.7	
Dam		SENE 13 22S 19E	EC,FC	Upper Soldier Creek (7)	Rock Spring Creek	1.6	1954	SP30	Verified		Verified	SENE 13 22S 19E		111-23		

<sup>1</sup>Amended on August 5, 1991.

<sup>2</sup>Added or amended by amendment dated August 21, 1989.



TABLE 5-70 (cont'd)

CLAIMED INFORMATION			DMR FINDINGS										
CLAIMED SOURCE	CLAIMED LOCATION	CLAIMED USE NAME (FORT IDENTIFICATION)	CLAIMED WATERCOURSE	CLAIMED ANNUAL USE (AC-FT)	CLAIMED DATE OF FIRST USE	WATER USE NO.	POD NO.	WATER USE TYPE	USE STATUS	WATER USE LOCATION	POINT OF DIVERSION LOCATION (AC-FT)	ACREAGE OR CAPACITY	MAP NUMBER
Dam	NENE 07 22S 20E	RC,ML,EC,FC Lower Soldier Creek (6)	Rock Spring Creek	0.6	1954	SR6		RC,ML,EC,FC	Verified	SENE 07 22S 20E		111-23	
Dam	SWSE 02 23S 19E	RC,ML Upper Garden (30)	Garden Canyon	0.4	1954	SR7		RC,ML	Verified	SWSE 02 23S 19E		111-23	
Dam	NWSE 04 22S 20E	EC,FC Fairway (31)	Soldier Creek	0.4	1954	SR9		RC,ML	Verified	MNSE 04 22S 20E		111-23	
Dam <sup>2</sup>	NWNE 04 22S 20E	RC Golf Course Fairway (50)	Soldier Creek	0.2	1975 <sup>1</sup>	SR10		RC,ML	Verified	SWSE 04 22S 20E		111-23	
E012	SENESE 33 21S 20E	SE Sediment #1a (32a)	Soldier Creek	2.2	1954				See text	SENESE 33 21S 20E		See text	
E012	SENESE 33 21S 20E	SE Sediment #1b (32b)	Soldier Creek	2.2	1984				See text	SENESE 33 21S 20E		See text	
E022	SWSWSE 28 21S 20E	SE Sediment #2 (33)	Soldier Creek	5.5	1954				See text	SWSWSE 28 21S 20E		See text	
Dam <sup>3</sup>	SESW 24 21S 19E	RC,ML Pan Am (4)	Huachuca Canyon	3.2	1954				See text	SESW 24 21S 19E		See text	
Dam <sup>3</sup>	SKSW 05 22S 20E	EC Upper Horse Pasture (28)	Soldier Creek	0.9	1954				Destroyed by Libby Air Field Expansion in 1985.				
Dam <sup>3</sup>	NENE 04 21S 20E	EC East #2 (36)	Tri-b. to Babocomari River	0.9	1954				Not found by Fort Huachuca.				
									Not found by DMR or Fort Huachuca.				

KEY: DM = Domestic; E = Effluent (POD); EC = Erosion Control; FC = Flood Control; IR = Irrigation; ML = Military; MU = Municipal; POD = Point of Diversion; PS = Primary Storage Reservoir; RC = Recreation; SE = Sewage Evaporation; SP = Wildlife Pond; SR = Small Reservoir; W = Well (POD); WL = Wildlife

<sup>1</sup> Amended on August 5, 1991.

<sup>2</sup> Added or Amended by amendment dated August 21, 1989.

<sup>3</sup> No longer claimed by Fort Huachuca, but no amendment received.

## APPENDIX G: METHODOLOGY USED IN THE DETERMINATION OF SIGNIFICANT DIMINISHMENT TO FEDERAL RESERVED RIGHTS

This appendix describes the procedure and methodology used in determining impacts to the groundwater supply on Fort Huachuca. The basis of this determination was the United States Geological Survey (USGS) model that has been reported in the USGS Open-File Report 82-752, by Freethey, 1982.

### PROBLEM IDENTIFICATION

Increased groundwater withdrawal rates due to the growing population of the Sierra Vista, Fort Huachuca, and Huachuca City areas has and will continue to result in water being extracted from aquifer storage. Water levels in this region are declining despite the apparently large water supply of the aquifer(s). Further population growth, and subsequent pumpage from the aquifer(s) in this area will accelerate the decline of the water table threatening the operability of the existing wells in the vicinity (U.S. Army Corps of Engineers, 1987). The problem of special interest is, per the instructions of the court's order of September 9, 1988: "determine all stream users or diversions of either surface water or groundwater which significantly affect those sources reasonably available on, at, or near the federal parcel . . ." (emphasis added).

### SCOPE OF WORK

An initial review of stream users or diversions of surface water in the area around Fort Huachuca resulted in the conclusion that no surface water users existed that would have a "significant" impact on the military reservation's water supplies. Subsequently, the scope of work concentrated on a four step process. The first step was identifying groundwater users that might significantly impact Fort Huachuca's groundwater supply. The second step was updating and refining the pumpage data in the area of Sierra Vista, Huachuca City, and Fort Huachuca for the time period 1986 through 1988. These data sets were used in conjunction with a groundwater flow model previously developed by Freethey (1982) and revised by Putman et al., (1988). The third

step was estimating future pumpage by using the Department of Economic Security (DES) projected population figures (1989). The fourth step was to evaluate the accumulative impact of eight nearby municipal water companies pumping groundwater by running the updated model through 2038 in lieu of the projected increased pumpage.

#### **PREVIOUS WORK**

A numerical groundwater flow model for the Upper San Pedro River basin was developed by Freethey (1982). This model incorporated the area north from the International Boundary to the Babocomari River and east from the Huachuca Mountains to the San Pedro River. The hydrologic system for this area was defined by Freethey from previous work on the basin.

The Arizona Department of Water Resources (DWR) updated and revised the model for the time period 1977 through 1985 as reported in Putman et al., (1988). The U.S. Army Corps of Engineers study (Los Angeles District, 1987) incorporated the USGS Modflow model of the Upper San Pedro Basin to analyze the outcome of increased pumpage resulting from the municipal growth surrounding the military reservation. The analysis demonstrated results similar to this investigation by DWR, namely that water levels in Fort Huachuca's Well Nos. 1 and 2 will drop below the wells drilled depth within the next 30 years unless corrective measures are taken.

#### **VERIFICATION OF THE UPPER SAN PEDRO NUMERICAL GROUNDWATER FLOW MODEL FOR SITE SPECIFIC USE**

Several past investigations including Freethey (1982), the U.S. Army Corps of Engineers (1987), and Putman et al., (1988), have evaluated the Upper San Pedro using a numerical model. Freethey stated in the USGS open file report 82-752: "The numerical model developed for the Upper San Pedro basin simulates the hydrologic system to an acceptable degree of accuracy on the basis of current knowledge and definition of the system." However, Freethey goes on to say in the report that "The purpose of the model was not to analyze site specific groundwater conditions or to predict water level changes in wells." Near the summary of the report he also states "Although the model as developed is not designed for use in site specific studies, generalized

planning for the future of the groundwater is possible." Therefore, realizing the model's limitations in analyzing site specific conditions, it was used to assess regional impacts to the aquifer near the military reservation and natural conservation area boundaries.

Table G-1 lists wells, the respective modflow cell that contains the well, and the column that compares actual measured head to calculated modeled head (model minus actual). In most of the cases, the modeled heads are within twenty feet of measured heads for approximately the same time frame. In the few cases that the difference was greater than thirty feet; either the model simulates actual head much better in other stress periods (time frames) for the same cell or that adjacent modeled cells are much more accurately approximating actual measured water levels. Table G-1 demonstrates that the parameters used in the model generally result in calculated water levels that are reasonably close to actual measured water level for the purposes of this study. Therefore, the evaluation of the area's future growth and its impact on the Fort Huachuca concentrated primarily on increased pumpage scenarios with few modifications to other data sets. The ending 1988 Water Level Map including Fort Huachuca, Sierra Vista and Huachuca City municipal well locations is shown in Figure G-1.

#### **IDENTIFICATION OF GROUNDWATER USERS AND QUANTIFICATION OF PUMPAGE OFF THE MILITARY RESERVATION THROUGH 1988**

Eight water companies were identified as having a possible impact on Fort Huachuca within the model domain. Each well within the water company's service area boundary was converted to its respective model cell using the adjudication file maps. Pumpage figures from 1986 through 1988 were obtained from records from the Arizona Corporation Commission (ACC) and USGS. Total sales amount (in million gallons) by private water companies are reported to the ACC on an annual basis per service area rather than on a per well basis. The conversion of sales per year to pumpage per cell was prorated according to how many service area wells were located in each pumping cell. It was assumed that all wells pumped equal amounts of water per year for any given water company because of the lack of well specific pumpage data. The number of wells in each water company's service area and the three year average for pumpage from 1986 through 1988 in acre-feet is given below in Table G-2.

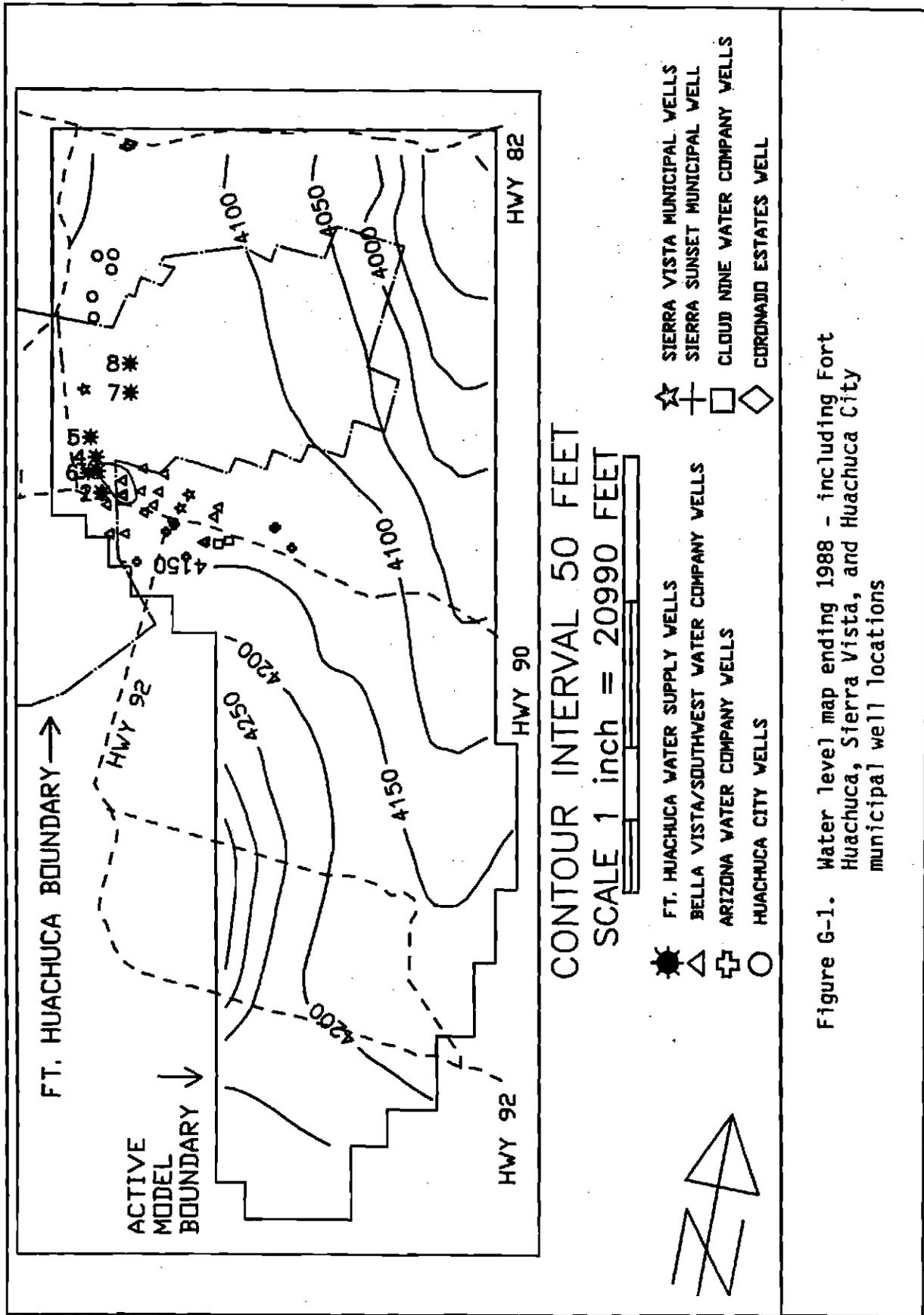


Figure G-1. Water level map ending 1988 - including Fort Huachuca, Sierra Vista, and Huachuca City municipal well locations

TABLE G-1

COMPARISON OF MODELED WATER LEVELS VERSUS MEASURED WATER LEVELS  
(RUN - INCLUDES FORT HUACHUCA AND SURROUNDING MUNICIPAL PUMPAGE)

WELL NO.	CADASTRAL	CELL	DATE COMPLETE	ALT. (MSL)	DEPTH		DATE MEAS.	MODEL W.L.	DATE	MEAS. W.L. - STRESS	
					OF WELL (MSL)	WATER LEVEL				MODL. W.L.	PERIOD
<u>Arizona Water Co.</u>											
2	D-21-21 33dcd	11,20		4,330	4,020	4,152.1	12\85	4,137.2	12\85	14.9	11
				4,330		4,158.9	4\78	4,150.4	12\77	8.5	10
3	D-21-21 33cbb2	11,21	1972	4,327	3,827	4,148.4	12\85	4,126.5	12\85	21.9	11
6	D-22-20 1bca1	7,21	1959	4,530	3,820	4,141.8	12\85	4,127	12\85	14.8	11
				4,530		4,151	4\78	4,155.2	12\77	-4.2	10
				4,530		4,139.2	3\69	4,171.6	12\68	-32.4	7
				4,530		4,171	3\68	4,173.5	12\67	-2.5	6
7	D-22-20 1bcc	7,21	1965	4,550	3,945	4,147.9	12\85	4,127	12\85	20.9	11
				4,550		4,149.4	3\68	4,173.5	12\67	-24.1	6
8	D-22-20 1bca2	7,21		4,530	4,026	4,141.8	12\85	4,127	12\85	14.8	11
9	D-22-20 12aab	7,20	1978	4,515	3,465	4,164	12\85	4,143.9	12\85	20.1	11
<u>Bella Vista/Southwest Wells</u>											
1	D-21-20 35cdd	6,22	1956	4,560	3,920	4,131.2	12\85	4,113.9	12\85	17.3	11
2	D-21-20 35cbc	5,23	1958	4,580	3,930	4,128.8	12\85	4,107.2	12\85	21.6	11
				4,580		4,130.8	4\78	4,126.2	12\77	4.6	10
3	D-21-20 35dbb	6,23	1968	4,545	3,920	4,128.7	12\85	4,111.7	12\85	17	11
				4,545		4,134.9	4\78	4,130.7	12\77	4.2	10
				4,545		4,154.1	3\69	4,150.7	12\68	3.4	7
4	D-22-20 2bac	6,22	1956	4,585	3,885	4,134.7	12\85	4,113.9	12\85	20.8	11
5	D-21-21 31bdc	9,22	1972	4,440	3,820	4,152.3	12\89	4,122.7	12\89	29.6	12
				4,440		4,154.9	12\85	4,122.7	12\85	32.2	12
7	D-21-20 34aaa	5,24	1968	4,566	3,866	4,130.5	12\85	4,113	12\85	17.5	11
9	D-21-20 34dcc1	5,22	1956	4,615	3,960	4,120.8	7\77	4,131.7	12\77	*	10
				4,615		4,123.5	7\76	4,134.2	12\76	*	9
10	D-21-20 34dcc2	5,22		4,615	3,915	4,107.4	12\85	4,107.8	12\85	-0.4	11
				4,615		4,041.3	3\68	4,150.4	12\67	-109.1	6
12	D-22-20 10abb	4,21		4,677		4,135.5	12\85	4,125.4	12\85	10.1	11
				4,677		4,101.9	2\89	4,115.7	12\88	-13.8	12

TABLE G-1 (cont'd)

WELL NO.	CADASTRAL	CELL	DATE COMPLETE	ALT. (MSL)	DEPTH		WATER LEVEL	DATE		MEAS. W.L. - STRESS			
					OF WELL (MSL)			MEAS.	MODEL W.L.	DATE	MODL. W.L.	PERIOD	
<u>Bella Vista/Southwest Wells (cont'd)</u>													
13	D-22-20	3ddd	5,21	1978	4,640	3,773	4,029	12\85	4,113.4	12\85	-84.4	11	
14	D-22-21	6bcc	8,20	1972	4,480	3,880	4,079.1	2\89	4,137.7	12\88	-58.6	12	
					4,480		4,145.8	12\85	4,142.3	12\85	3.5	11	
15	D-22-21	6bcd	8,20	1972	4,476	3,774	4,163.3	12\85	4,142.3	12\85	21	11	
16	D-21-21	31cac	9,21	1960	4,440	3,939	4,143.16	12\85	4,132.8	12\85	10.36	11	
					4,440		4,163.7	3\68	4,167.1	12\67	-3.4	6	
<u>Cloud 9 Water Co. wells</u>													
2	D-22-21	6acc	9,20	1969	4,425	3,825	4,154.6	7\77	4,153.5	12\77	*	10	
					4,425		4,157.4	7\67	4,166.6	12\76	*	9	
<u>Coronado Estates wells</u>													
1	D-2-20	18cad	5,36		4,360		4,145.9	4\69	4,138.6	12\68	7.3	7	
<u>Fort Huachuca wells</u>													
1	D-22-20	3bbb2	4,23	1939	4,641	4,571	4,124	12\67	4,132.7	12\67	-8.7	6	
					4,619.3		4,121.3	12\67	4,149.9	12\67	-28.6	6	
					4,619.3		4,128.3	3\67	4,145.8	12\68	-17.5	7	
					4,619.3		4,130.3	11\77	4,138.2	12\77	-7.9	10	
7	D-21-20	22bbb2	5,27	1976	4,476	3,714	4,144.7	12\85	4,126	12\85	18.7	11	
							4,141.9	2\89	4,120.3	12\88	21.6	12	
	D-21-20	22bbb1	5,27	1963	4,477	3,727	4,144.2	12\85	4,126	12\85	18.2	11	
							4,142	12\76	4,137.7	12\76	4.3	9	
							4,152.1	2\73	4,141.1	12\72	11	8	
							4,156.5	3\69	4,145.9	12\68	10.6	7	
8	D-21-20	16ada2	5,28	1971	4,426	3,619	4,137.1	12\85	4,127.5	12\85	9.6	11	
							4,115	2\89	4,122.4	12\88	-7.4	12	
	D-21-20	16ada1	5,28	1971	4,400	3,593	4,113.7	11\88	4,122.4	12\88	-8.7	12	
							4,400	4,117.5	2\86	4,127.5	12\85	-10	11
							4,400	4,117.1	12\85	4,127.5	12\85	-10.4	11

TABLE G-1 (cont'd)

WELL NO.	CADASTRAL	CELL	DATE COMPLETE	ALT. (MSL)	DEPTH		WATER LEVEL	DATE MEAS.	MODEL W.L. DATE	MEAS. W.L. - MODL. W.L.	STRESS PERIOD
					OF WELL (MSL)						
<u>Huachuca City Municipal wells</u>											
1	D-21-20 5cdc	3,32	1957	4,375	4,075	4,162.6	7\77	4,143.1	12\76	*	9
3	D-20-20 31dda	4,33	1957	4,250	3,950	4,162.8	3\68	4,143.2	12\67	19.6	6
4	D-21-20 5abc	4,32	1971	4,331	3,929	4,131.1	1\86	4,133.2	12\85	-2.1	11
				4,331		4,132	11\72	4,141.5	12\72	-9.5	8
5	D-21-20 8bdd	3,31	1974	4,431	3,929	4,140.5	1\86	4,137.7	12\85	2.8	11
<u>Sierra Vista Water Co. wells</u>											
3	D-21-20 20dcd	3,28	1971	4,600	3,799	4,168.6	7\76	4,149.2	12\76	*	9

\* = More than a four month span between simulated water level and measured water level.

TABLE G-2

AVERAGE WATER COMPANY PUMPAGE DATA FOR 1986 THROUGH 1988

<u>WATER COMPANY</u>	<u>NUMBER OF WELLS</u>	<u>PUMPAGE (AF/YR)</u>
Arizona	9	833
Bella Vista/Southwest	16	2,932
Cloud 9	2	43
Coronado Estates	1	22
Sierra Sunset	1	22
Crystal	1	7
Huachuca City	5	253
Sierra Vista Municipal	3	130
TOTAL	38 wells	4,241

Table G-3 lists these water companies along with the cell layer, row and column, followed by the 1986-1988 average pumping rates per cell [depicting well(s)] and the projected pumping rates through 2038.

#### **QUANTIFICATION OF PUMPAGE ON FORT HUACHUCA**

Well locations and pumpage on Fort Huachuca were also converted to model cells. Pumpage figures for the period from 1986 through 1988 were supplied by Fort Huachuca on a well by well basis. Currently, Fort Huachuca operates eight water supply wells that withdraw approximately 2,787 acre-feet per year for the 1986 through 1988 base period. Table G-3 also lists the reservation's cell locations, pumpage from 1986 through 1988 and projected pumpage through 2038. The average pumpage for Fort Huachuca from 1951 through 1988 was 2,666 acre-feet per year.

#### **EFFECTS OF OFF-RESERVATION GROUNDWATER PUMPAGE TO RESERVATION GROUNDWATER SUPPLIES THROUGH 1988**

To evaluate the impact of the municipal pumpage on Fort Huachuca's water supply wells, a model run was produced where all of the municipal pumpage was excluded. This base run reflects only the impact that Fort Huachuca's pumpage has on the aquifer storage in the vicinity. Such a scenario reflects a no impact condition on local aquifer storage by nearby groundwater users. This run was then compared to the model run that included the municipal pumpage. Referring to Chapter 5, Section 5.4, Figure 5-27 entitled Upper San Pedro River Basin Drawdown Map Due to Municipal Pumpage Through 1988, illustrates the difference in water levels between the projected drawdown due solely to Fort Huachuca pumpage (1940 through 1988) compared to modeled water levels that also include the surrounding municipal pumpage. Table G-4 estimates the additional lift costs and maintenance costs to Fort Huachuca due to the increased projected drawdown from the municipal pumpage surrounding Fort Huachuca for the time period 1940 through 2038. See Table G-4 "Explanation of Columns" for a description of calculations and assumptions. Also see Table G-5 for a listing of quantities of water lifted (acre-feet per year) from 1951 through 1988 and projected quantities from 1989 through 2038.

TABLE G-3

PUMPAGE VALUES USED FOR NUMERICAL MODEL 1986-2038 FOR FORT HUACHUCA AND SURROUNDING MUNICIPAL WATER COMPANIES (UNITS ARE CUBIC FEET PER SECOND)

GROUNDWATER USER	LAYER	ROW	COLUMN	STRESS PERIOD												
				1986-1988	1989-1993	1994-1998	1999-2003	2004-2008	2009-2013	2014-2018	2019-2023	2024-2028	2029-2033	2034-2038		
SIERRA VISTA MUN.	1	7	23	0.06	0.06	0.08	0.10	0.10	0.11	0.12	0.14	0.14	0.15	0.16	0.17	0.19
"	1	8	23	0.06	0.06	0.08	0.10	0.10	0.11	0.12	0.14	0.14	0.15	0.16	0.17	0.19
"	1	3	28	0.06	0.06	0.08	0.10	0.10	0.11	0.12	0.14	0.14	0.15	0.16	0.17	0.19
ARIZONA WATER COMPANY	1	5	20	0.13	0.13	0.18	0.21	0.23	0.23	0.26	0.29	0.29	0.32	0.35	0.38	0.40
"	1	11	20	0.13	0.13	0.18	0.21	0.23	0.23	0.26	0.29	0.29	0.32	0.35	0.38	0.40
"	1	7	21	0.5	0.5	0.68	0.80	0.90	0.90	1.01	1.13	1.13	1.24	1.35	1.45	1.56
"	1	7	20	0.13	0.13	0.18	0.21	0.23	0.23	0.26	0.29	0.29	0.32	0.35	0.38	0.40
CLOUD 9 WATER COMPANY	1	9	20	0.06	0.06	0.08	0.10	0.10	0.11	0.12	0.14	0.14	0.15	0.16	0.17	0.19
ARIZONA WATER COMPANY	1	11	21	0.26	0.26	0.35	0.41	0.47	0.47	0.52	0.59	0.59	0.64	0.70	0.76	0.81
HUACHUCA CITY	1	4	33	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16
"	1	4	32	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16
"	1	3	31	0.07	0.07	0.10	0.11	0.13	0.13	0.14	0.16	0.16	0.17	0.19	0.20	0.22
BELLA VISTA/SOUTHWEST	1	6	22	0.21	0.21	0.29	0.33	0.38	0.38	0.42	0.47	0.47	0.52	0.57	0.61	0.65
"	1	9	21	0.25	0.25	0.34	0.40	0.45	0.45	0.50	0.56	0.56	0.62	0.67	0.73	0.78
"	1	9	22	0.15	0.15	0.20	0.24	0.27	0.30	0.30	0.34	0.34	0.37	0.40	0.44	0.47
"	1	5	23	0.51	0.51	0.70	0.81	0.92	0.92	1.03	1.15	1.15	1.26	1.37	1.48	1.59
"	1	4	22	0.25	0.25	0.34	0.40	0.45	0.45	0.50	0.56	0.56	0.62	0.67	0.73	0.78
"	1	4	21	0.25	0.25	0.34	0.40	0.45	0.45	0.50	0.56	0.56	0.62	0.67	0.73	0.78
"	1	8	20	0.51	0.51	0.70	0.81	0.92	0.92	1.03	1.15	1.15	1.26	1.37	1.48	1.59
"	1	5	24	0.25	0.25	0.34	0.40	0.45	0.45	0.50	0.56	0.56	0.62	0.67	0.73	0.78
"	1	6	23	0.51	0.51	0.70	0.81	0.92	0.92	1.03	1.15	1.15	1.26	1.37	1.48	1.59
"	1	5	22	0.71	0.71	0.97	1.13	1.27	1.27	1.43	1.60	1.60	1.76	1.91	2.06	2.21
"	1	5	21	0.45	0.45	0.61	0.72	0.81	0.81	0.91	1.01	1.01	1.11	1.21	1.31	1.40
HUACHUCA CITY	1	3	33	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16
"	1	3	32	0.07	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.12	0.13	0.14	0.15	0.16
CRYSTAL WATER CO.	1	2	36	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02
CORONADO EST./SIERRA SUNST	1	5	36	0.06	0.06	0.07	0.08	0.08	0.08	0.09	0.10	0.10	0.11	0.12	0.13	0.13
FORT HUACHUCA	1	3	24	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15	2.15
"	1	4	23	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
"	1	3	25	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19	0.19
"	1	5	27	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
"	1	5	28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
TOTALS				9.71	9.71	11.76	13.08	14.23	15.50	16.84	18.14	19.37	20.60	21.77		



TABLE G-5

ACRE-FEET OF WATER LIFTED PER STRESS PERIOD OF NUMERICAL MODEL  
(CONVERTED FROM CFS TO ACRE-FEET PER STRESS PERIOD)

FT. HUACHUCA WELL(S)	MODFLOW CELL	STRESS PERIOD 4 1951-63 AF LIFTED	STRESS PERIOD 5 1964-66 AF LIFTED	STRESS PERIOD 6 1967 AF LIFTED	STRESS PERIOD 7 1968 AF LIFTED	STRESS PERIOD 8 1969-72 AF LIFTED	STRESS PERIOD 9 1973-76 AF LIFTED	STRESS PERIOD 10 1977 AF LIFTED	STRESS PERIOD 11 1978-85 AF LIFTED	STRESS PERIOD 12 1986-88 AF LIFTED
NO. 1 & 2	4,23	17,411	4,604	1,788	1,860	7,413	6,602	1,390	10,365	2,063
NO. 3, 4 & 6	3,24	3,858	1,238	485	507	1,795	897	224	7,875	4,669
NO. 5	3,25	0	1,411	550	571	2,227	1,158	246	3,936	412
NO. 7	5,27	2,070	629	246	253	521	463	94	753	608
NO. 8	5,28	0	0	0	0	521	463	94	753	608
TOTAL ACRE-FEET LIFTED FOR STRESS PERIOD		23,339	7,882	3,069	3,191	12,477	9,583	2,048	23,682	8,360
TOTAL ACRE-FEET LIFTED PER YEAR		1,795	2,627	3,069	3,191	3,119	2,396	2,048	2,960	2,787
AVERAGE ACRE-FEET LIFTED PER YEARS (1951-1988)										2,666

-----PROJECTED-----

FT. HUACHUCA WELL(S)	MODFLOW CELL	STRESS PERIOD 13 1989-93 AF LIFTED	STRESS PERIOD 14 1994-98 AF LIFTED	STRESS PERIOD 15 1999-2003 AF LIFTED	STRESS PERIOD 16 2004-08 AF LIFTED	STRESS PERIOD 17 2009-13 AF LIFTED	STRESS PERIOD 18 2014-18 AF LIFTED	STRESS PERIOD 19 2019-23 AF LIFTED	STRESS PERIOD 20 2024-28 AF LIFTED	STRESS PERIOD 21 2029-33 AF LIFTED	STRESS PERIOD 22 2034-38 AF LIFTED
NO. 1 & 2	4,23	3,438	3,438	3,438	3,438	3,438	3,438	3,438	3,438	3,438	3,438
NO. 3, 4 & 6	3,24	7,782	7,782	7,782	7,782	7,782	7,782	7,782	7,782	7,782	7,782
NO. 5	3,25	687	687	687	687	687	687	687	687	687	687
NO. 7	5,27	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013
NO. 8	5,28	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013	1,013
TOTAL ACRE-FEET LIFTED PER STRESS PERIOD		13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933	13,933
TOTAL ACRE-FEET LIFTED PER YEAR		2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787	2,787

TOTAL ACRE FEET LIFTED PER WELL FROM 1940 THROUGH 1988

PROJECTED TOTAL ACRE-FEET LIFTED PER WELL FROM 1989 THROUGH 2038

WELL	ACRE FEET
NO. 1	26,748
NO. 2	26,748
NO. 3	7,183
NO. 4	7,183
NO. 5	10,511
NO. 6	7,183
NO. 7	5,637
NO. 8	2,439

WELL	ACRE-FEET
NO. 1	17,190
NO. 2	17,190
NO. 3	25,940
NO. 4	25,940
NO. 5	6,870
NO. 6	25,940
NO. 7	10,130
NO. 8	10,130

## PROJECTED GROUNDWATER PUMPAGE 1989 THROUGH 2088

The results of the analysis through 1988 demonstrates that the impact to the water levels at Fort Huachuca's water supply wells ranges from approximately thirteen feet at Well No. 8 to forty-one feet at Wells No. 1 and 2. The estimated cost due to the additional lift and repair costs could range from \$75,000 to \$125,000 from 1940 through 1988 (refer to Table G-4). Table G-4 is only an estimate and does not reflect actual costs.

Future pumpage rates were calculated using population projections supplied by DES (Arizona Department of Economic Security, 1990), the projections were available to 2040. The methodology used in determining future pumpage rates through 2038 compared past population with past pumpage (Arizona Department of Economic Security, 1986), Table G-6. Population figures were supplied for Sierra Vista, Huachuca City, and Fort Huachuca from 1960 to 1985 by DES. Pumpage figures for the same time periods were supplied by ACC and USGS and incorporated into the numerical model. Table G-6 compares pumpage with population by establishing a ratio of pumpage/population for several different time periods from 1960 to 1985. For Fort Huachuca, Sierra Vista and Huachuca City several of the more recent ratios were averaged to project future pumpage/population ratios through 2038. These ratios were then multiplied by the DES projected populations for Sierra Vista and Huachuca City to arrive at projected groundwater pumpage through 2038. Fort Huachuca has been incorporated by Sierra Vista since 1971, subsequently when arriving at Sierra Vista's population figures Fort Huachuca's projected population was subtracted out of the value supplied by DES. A no growth scenario for Fort Huachuca was used, or a constant pumping rate of about 2,787 acre-feet per year. The average pumpage for Fort Huachuca from 1951 through 1988 was 2,666 acre-feet per year.

## PROJECTED CUMULATIVE IMPACT TO FORT HUACHUCA 1988 THROUGH 2088: FORT HUACHUCA PUMPAGE

A projected water level map to the year 2038 including Fort Huachuca, Sierra Vista and Huachuca City municipal well locations is shown in Figure G-2. Figure 5-28 entitled: Upper San Pedro River Basin Drawdown Map Due to Municipal Pumpage Through 2038, which is located in Section 5.4, shows the calculated drawdown from the projected groundwater withdrawals for the eight

TABLE G-6

RELATION BETWEEN POPULATION AND PUMPAGE (1960-1988) AND FUTURE PUMPAGE PROJECTIONS  
INFERRED FROM POPULATION PROJECTIONS (1989-2040)

YEAR	1960	1965	1970	1975	1980	1985	1990	1995	2000	2005	2010	2015	2020	2025	2030	2035	2040
FT. HUACHUCA POPULATION			6,659	8,067	9,475	9,238	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
FT. HUACHUCA PUMPAGE (CFS)			4.24	3.31	4.09	4.09	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85	3.85
FT. HUACHUCA PUMPAGE/POPULATION			0.00063	0.00041	0.00043	0.00044	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043	0.00043
FT. HUACHUCA GPCD			411.502	265.174	278.971	286.128	276.460	276.460	276.460	276.460	276.460	276.460	276.460	276.460	276.460	276.460	276.460
SIERRA VISTA POPULATION	2854	4635	6689	12054	15462	19550	25000	31345	36730	41370	45460	51865	57070	62032	66995	71695	76395
SIERRA VISTA PUMPAGE (CFS)	0.32	0.96	1.61	2.39	4.55	4.55	5.44	7.41982	8.66828	9.76332	10.9645	12.2401	13.4685	14.6395	15.8108	16.9200	18.0292
SIERRA VISTA PUMPAGE/POPULATION	0.00011	0.00020	0.00024	0.00019	0.00029	0.00023	0.00021	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023	0.00023
SIERRA VISTA GPCD	72.4621	133.855	155.553	128.139	190.178	150.411	140.628	152.982	152.520	152.520	152.520	152.520	152.520	152.520	152.520	152.520	152.520
HUACHUCA CITY POPULATION	1131	1186	1241	1691	1661	1978	2295	2595	2930	3225	3550	3900	4230	4547	4865	5168	5470
HUACHUCA CITY PUMPAGE (CFS)	0.1	0.18	0.29	0.37	0.28	0.28	0.40463	0.45496	0.51568	0.5676	0.6248	0.6864	0.74448	0.80027	0.85624	0.90956	0.96272
HUACHUCA CITY PUMPAGE/POPULATION	0.00008	0.00015	0.00023	0.00021	0.00016	0.00014	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017	0.00017
HUACHUCA CITY GPCD	57.1416	98.0851	151.022	141.407	108.944	91.4844	113.945	113.743	113.743	113.743	113.743	113.743	113.743	113.743	113.743	113.743	113.743

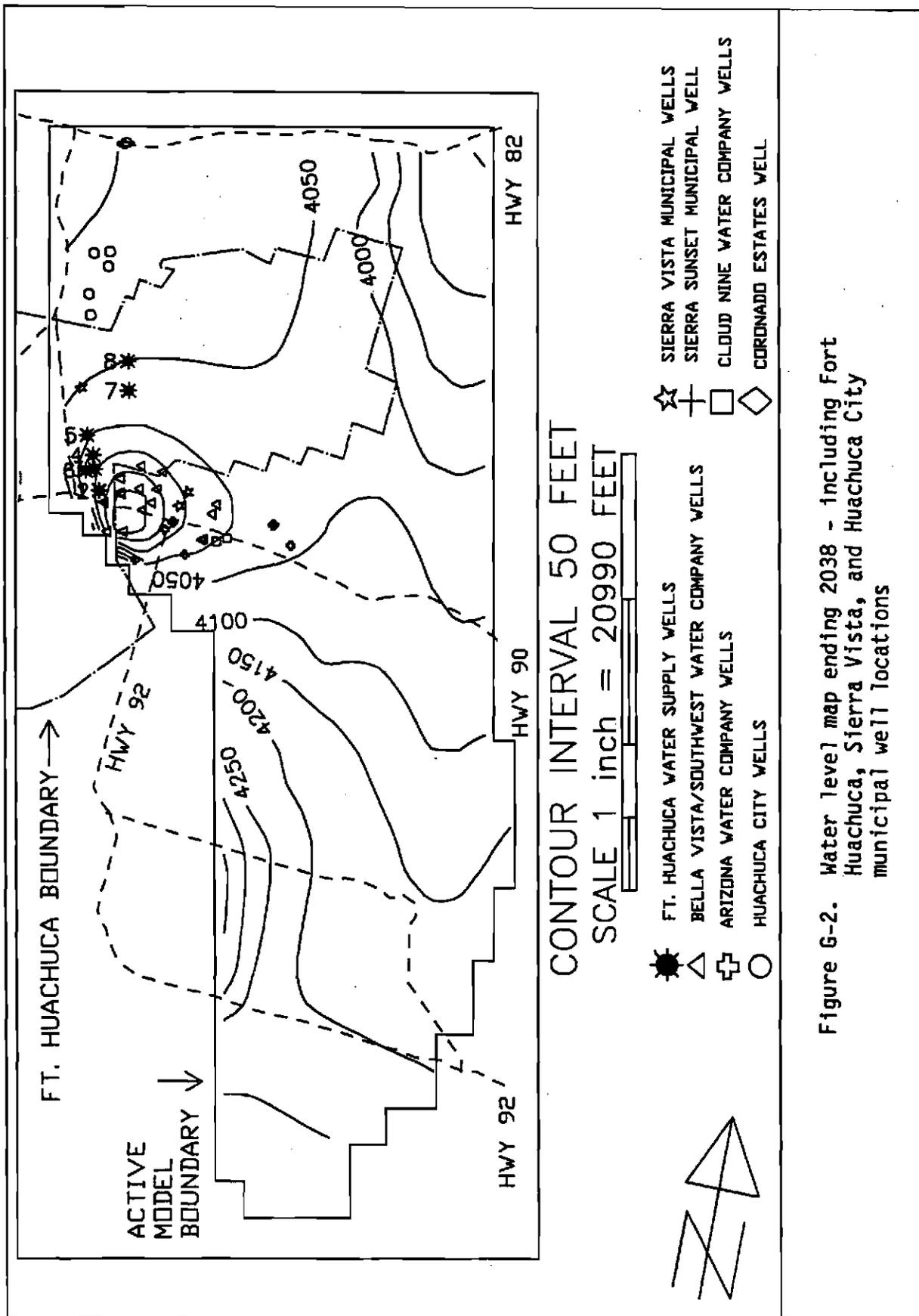


Figure G-2. Water level map ending 2038 - including Fort Huachuca, Sierra Vista, and Huachuca City municipal well locations

identified municipal water companies from 1940 through 2038. Drawdowns in the pumping center exceed 200 feet over the 98 year period. Projected costs to Fort Huachuca could range from \$500,000 to \$1,000,000 over the 98 year period. DWR believes that projecting fifty years into the future is an extremely difficult task. Many "best guesses" are assumed (i.e. population projections, pumpage projections, population/pumpage ratios, constant per capita usage, using only existing well locations, etc) utilizing existing trends and figures. Therefore, DWR cannot put a great amount of confidence in a fifty year projection.

#### **METHODOLOGY USED IN THE DETERMINATION OF SIGNIFICANT DIMINISHMENT TO THE SAN PEDRO RIPARIAN NATIONAL CONSERVATION AREA**

The methodology used to determine the significant diminishment to the San Pedro Riparian National Conservation Area (SPRNCA) was based on the same modeling analysis used to determine the significant diminishment to Fort Huachuca. For determining the significant diminishment to the SPRNCA, the model incorporated both the present day and projected pumpage rates. The model incorporates the affects of groundwater users in the Sierra Vista - Fort Huachuca area in addition to other major users in the basin. Although other minor groundwater users outside the Sierra Vista - Fort Huachuca area could impact or diminish groundwater supplies to the SPRNCA, the Sierra Vista - Fort Huachuca area consists of the most concentrated area of groundwater withdrawals within the Sierra Vista subwatershed. Therefore, this shows the potential effects that the major groundwater users would have on the SPRNCA. Refer to the previous sections for specific information regarding projected pumpage rates, use of the model, verification of the model and results.

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE  
WATER IN THE GILA RIVER SYSTEM AND SOURCE

No. W1, W2, W3 & W4  
W1-11-605  
Major User No. 1283

**MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for  
The San Pedro River Watershed**

Please file a separate objection for each Watershed File Report, Zone 2 Well Report or Catalogued Well Report. Objections to information contained in Volume 1 of the HSR can be stated on one objection form. Objections must be written. Use of this form, or a computer facsimile, is required. Objections must be received on or before May 18, 1992.

This objection is directed to Watershed  
File Report or Zone 2 Well Report No.

111-23-073

or Catalogued Well No.

**OBJECTOR INFORMATION**

Objector's Name: Bella Vista Ltd. Partnership; Nicksville Water Company; Bella Vista Water Company;  
Bella Vista Ranches Ltd. Partnership; Dan Cracchiolo; Pueblo Del Sol Water Company  
c/o William P. Sullivan, Martinez & Curtis, P.C.  
Objector's Address: 2712 North Seventh Street  
Phoenix, Arizona 85006-1003  
Objector's Telephone No.: (602) 248-0372

Objector's Watershed File Report or Zone 2 Well Report No. (if the Objector's claimed water rights are within the San Pedro River Watershed):

112-16-002; 111-20-007; 111-23-030; 111-20-062; 111-20-030; 111-23-017; 111-23-064; 111-23-017; 111-23-034

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 8 of the HSR):

Or Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro River Watershed):

STATE OF ARIZONA

**VERIFICATION** (must be completed by objector)

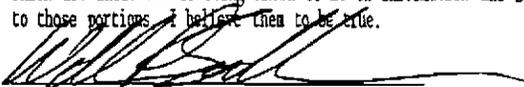
COUNTY OF MARICOPA

I hereby make this Objection. I certify that, if required, a copy of the forgoing Objection was served upon the following Claimant(s) by mailing true and correct copies thereof on the 14th day of May, 1992, postage prepaid and addressed as follows:

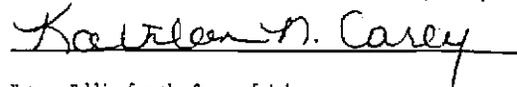
Name: FT HUACHUCA & U.S. ARMY INTELLIGENCE & CTR  
Address: C/O OFFICE OF STAFF JUDGE FT HUACHUCA  
FT HUACHUCA AZ 856135

(The above section must be completed if you object to another claimant's Watershed File Report, Zone 2 Well Report, or Catalogued Well Report. It does not need to be completed if you file an objection to your own Watershed File Report, Zone 2 Well Report, Catalogued Well Report; or to information contained in Volume 1 of the Hydrographic Survey Report.)

I declare under penalty of perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; and that the information contained in the Objection is true based on my own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and, as to those portions, I believe them to be true.

  
Signature of Objector or Objector's Representative

SUBSCRIBED AND SWORN to before me this 14th day of May, 1992.



Notary Public for the State of Arizona

Residing at Phoenix, Maricopa County, Arizona.

My commission expires January 16, 1996.

Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex,  
3345 W. Durango Street, Phoenix, AZ 85009, on or before May 18, 1991.

FMC001097

W1-11-605  
111-23-073  
FT HUACHUCA & U.S. ARMY INTELLIGENCE & CTR  
C/O OFFICE OF STAFF JUDGE FT HUACHUCA  
FT HUACHUCA AZ 856135

Category  
Number

The objectors protest the WFR for the following reasons:

- 11 Pursuant to Section 6.08 of the Rules for Proceedings before the Special Master, Objectors wish to preserve all objections which may arise from or otherwise are related to the five remaining issues on Interlocutory Appeal before the Arizona Supreme Court and in particular the following:
- (a) Whether the trial court erred in adopting its 50/90-day test for determining whether underground water is "appropriable" under § 45-141, Arizona Revised Statutes (1132);
  - (b) What is the appropriate standard to be applied determining the amount of water reserved for federal land (1133);
  - (c) Whether nonappropriable groundwater is subject to federal reserved rights (1134);
  - (d) Whether federal reserve water right holders enjoy greater protection from groundwater pumping than holders of state law rights (1135); and
  - (e) Whether claims conflicting with use or interference with water rights must be resolved as part of the general adjudication (1136).
- 11 Objectors reserve the right to amend or supplement this objection following the issuance of an opinion and mandate by the Supreme Court dealing with any of the issues pending before it (1130, 1132, 1133, 1134, 1135, and 1136).
- 11 The procedures imposed by the trial court and Master to preserve an objection to this claim are inconsistent with A.R.S. § 45-256(B). The Legislature did not intend each party to be required to review each and every claim and file all potential objections within the 180 day period or be foreclosed from participating in a contested case. The Statute clearly permits a party who has filed an objection "to make objections to any other claims" (100).
- 11 Zone 1 and Zone 2 wells, and the uses related thereto, are beyond the jurisdiction of the general adjudication and should not be included in the WFR. (510, 520, 1121)

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE  
WATER IN THE GILA RIVER SYSTEM AND SOURCE

MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for  
The San Pedro River Watershed

No. W111000605

Please file a separate objection for each Watershed File Report, Zone 2 Well Report or Catalogued Well Report. Objections to information contained in Volume 1 of the HSR can be stated on one objection form. Objections must be written. Use of this form, or a computer facsimile, is required. Objections must be received on or before May 18, 1992.

This objection is directed to Watershed  
File Report or Zone 2 Well Report No. 11123 073  
(please insert no.) or Catalogued Well No.  
(please insert no.)

OBJECTOR INFORMATION

Objector's Name: Gila River Indian Community San Carlos Apache Tribe; Tonto Apache Tribe; Yavapai-Apache Indian Community, Camp Verde Reservation  
C/O Cox & Cox C/O Sparks & Siler, P.C.  
Objector's Address: Suite 300 Luhrs Tower, P.O. Box 4245 7503 First Street  
Phoenix, AZ 85030 Scottsdale, AZ 85251  
Objector's Telephone: (602) 254-7207 (602) 949-1988

Objector's Watershed File Report or Zone 2 Well Report No. (if the Objector's claimed water rights are within the San Pedro River Watershed):

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 6 of the HSR):

Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro River Watershed):

39-11-05478 39-05-41142 39-07-12652 39-07-12676 39-05-50058 39-07-12169  
39-U8-60083 39-L8-36340 39-L8-37360 39-U8-63614 39-07-12675 39-05-50059

STATE OF ARIZONA

VERIFICATION (must be completed by objector)

COUNTY OF MARICOPA

I hereby make this Objection. I certify that, if required, a copy of the foregoing Objection was served upon the following Claimant(s) by mailing true and correct copies thereof on the 10 day of May, 1992, postage prepaid and addressed as follows:

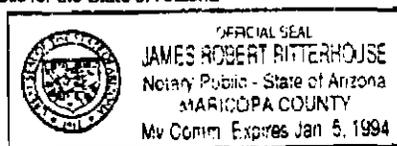
Name: FORT HUACHUCA  
Address: FORT HUACHUCA  
FORT HUACHUCA AZ 85613

I declare under perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; and that the information contained in the Objection is true based on my own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and, as to those portions, I believe them to be true.

Alfred S. Cox  
Signature of Objector or Objector's Representative

SUBSCRIBED AND SWORN to before me this 11 day of May 1992.

James R. Rutterhouse  
Notary Public for the State of Arizona



(The above section must be completed if you object to another claimant's Watershed File Report, Zone 2 Well Report, or Catalogued Well Report. It does not need to be completed if you file an objection to your own Watershed File Report, Zone 2 Well Report, Catalogued Well report; or to information contained in Volume 1 of the Hydrographic Survey Report.)

Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex, 3345 W. Durango Street, Phoenix, AZ 85009, on or before May 18, 1992.

FMC001099

Attachment to Objection re Fort Huachuca  
WFR# 111-23-073

2. HSR does not show Water Rights Registration for each Zone 1 Potential Water Right. (420)
2. HSR does not show location of POU for Statement of Claimant (478)
4. Use of the water claimed depletes water for senior federal and Indian water rights (1150)
9. HSR does not show claimed water use rate. (1000)

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE  
WATER IN THE GILA RIVER SYSTEM AND SOURCE

No. W1, W2, W3 & W4

MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for  
The San Pedro River Watershed

W1-11-000605

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File Report or Zone 2 Well Report No.

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(please insert no.)

or Catalogued Well No.

(please insert no.)

OBJECTOR INFORMATION

Objector's Name:

City of Mesa

Objector's Address:

P.O. Box 1466, Mesa, Arizona 85211-1466

Objector's Telephone No.:

602, 644-2343

Objector's Watershed File Report or Zone 2 Well Report No. (if the Objector's claimed water rights are within the San Pedro River Watershed):

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 8 of the HSR):

Or Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro River Watershed):

39-18-37263-37640,  
39-07-7828

STATE OF ARIZONA

COUNTY OF Maricopa

VERIFICATION (must be completed by objector)

I hereby make this Objection. I certify that, if required, a copy of the foregoing Objection was served upon the following Claimant(s) by mailing true and correct copies thereof on the 18th day of May, 199 2, postage prepaid and addressed as follows:

Name: Fort Huachuca

Address: Fort Huachuca, AZ 85613

(The above section must be completed if you object to another claimant's Watershed File Report, Zone 2 Well Report, or Catalogued Well Report. It does not need to be completed if you file an objection to your own Watershed File Report, Zone 2 Well Report, Catalogued Well Report or to information contained in Volume 1 of the Hydrographic Survey Report.)

I declare under penalty of perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; and that the information contained in the Objection is true based on my own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and, as to those portions, I believe them to be true.

Stephen A. Burg  
Signature of Objector or Objector's Representative

SUBSCRIBED AND SWORN to before me this 15th day of May, 199 2.

Carla Wagner  
Notary Public for the State of Arizona

Residing at Mesa

My commission expires 10-25-95

Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex, 3345 W. Durango Street, Phoenix, AZ 85009, on or before May 18, 1992.

FMC001101

## STATEMENT OF THE OBJECTION

The following are the main categories of the typical Watershed File Report (Zone 2 Well Reports and some Watershed File Reports lack certain categories). Please check the category(ies) to which you object, and state the reason for the objection on the back of this form.

- 1. I object to the description of Land Ownership
- 2. I object to the description of Applicable Filings and Decrees
- 3. I object to the description of DWR's Analysis of Filings and Decrees
- 4. I object to the description of Diversions for the claimed water right(s)
- 5. I object to the description of Uses for the claimed water right(s)
- 6. I object to the description of Reservoirs used for the claimed water right(s)
- 7. I object to the description of Shared Uses & Diversions for the claimed water right(s)
- 8. I object to the PWR (Potential Water Right) Summary of the claimed water right(s)
- 9. I object to the description of Quantities of Use for the claimed water right(s)
- 10. I object to the Explanation provided for the claimed water right(s)
- 11. Other Objections (please state volume, page and line number for each objection)

### REASON FOR OBJECTION

The reason for my objection is as follows (please number your objections to correspond to the boxes checked above; please attach supporting information and additional pages as necessary):

CATEGORY  
NUMBER

11 Objector has objected to Volume 1, page 558,  
lines 1-10, of the San Pedro HSR for the reason  
that, although the Department of Water Resources  
has correctly concluded that effluent is neither  
appropriable surface water nor groundwater, see  
A.R.S. § 45-141 and Arizona Public Service  
Company v. Long, 160 Ariz. 429, 773 P.2d 988  
(1989), this matter has not been placed directly  
before the adjudication court. A number of  
representative claims, including the claim in  
this WFR, should be consolidated for a case of  
"broad legal importance." (534)

FMC001102

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO  
USE WATER IN THE GILA RIVER SYSTEM AND SOURCE

No. W1, W2, W3 & W4  
W111000605

MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for  
The San Pedro River Watershed

Please use a separate objection for each Watershed File Report, Zone 2 Well Report or Catalogued Well Report. Objections to information contained in Volume 1 of the HSR can be stated on one objection form. Objections must be written. Use of this form, or a computer facsimile, is required. Objections must be received on or before May 18, 1992.

This objection is directed to Watershed  
File Report or Zone 2 Well Report No.

111-23-073

or Catalogued Well No.

OBJECTOR INFORMATION

Objector's Name: City of Phoenix  
Objector's Address: Suite 800  
251 W. Washington St.  
Phoenix, AZ 85003

Objector's Telephone: (602)-262-6761

Objector's Watershed File Report or Zone 2 Well Report No. (if the Objector's claimed water rights are within the San Pedro River Watershed): N/A

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 8 or the HSR): N/A

Or Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro River Watershed):

39-07-7927; 39-05-50153 through 39-05-50155; 39-L8-37666 through 39-L8-37691

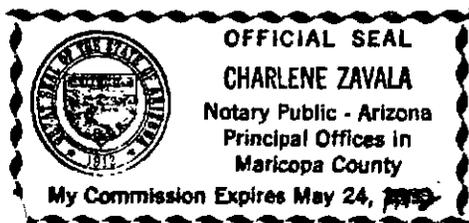
STATE OF ARIZONA  
COUNTY OF MARICOPA

VERIFICATION

I hereby make this Objection. I certify that, if required, a copy of the foregoing Objection was served upon the claimant(s) by mailing true and correct copies thereof on the 18th day of May, 1992, postage prepaid and addressed as follows:

FORT HUACHUCA  
& U.S. ARMY INTELLIGENCE  
FORT HUACHUCA

FORT HUACHUCA AZ 85613



I declare under penalty of perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; that the information contained in the Objection is true based on my own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and as to those portions, I believe them to be true.

*M. James Callahan*

Signature of Objector or Objector's Representative

SUBSCRIBED AND SWORN to before me this 18th day of May, 1992

*Charlene Zavala*

Notary Public for the State of Arizona  
Residing at: Phoenix, Maricopa County, Arizona  
My commission expires: MAY 24, 1992

Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex, 3345 W. Durango Street, Phoenix, AZ 85009, on or before May 18, 1992.

FMC001103

**Attachment to Watershed File Report: 111-23-073**

PHOENIX OBJECTS TO CATEGORY 11 FOR THE REASON THAT: THE METHOD USED BY DWR TO DETERMINE SIGNIFICANT DIMINISHMENT FOR FT. HUACHUCA (MAJOR USER CODE 1283) HAS BEEN IMPROPERLY APPLIED IN THAT ALL OF THE GROUNDWATER TABLE DECLINE FOR FT. HUACHUCA HAS BEEN ARBITRARILY ATTRIBUTED TO ONLY 38 OF THE ZONE 2 WELLS NEAR SIERRA VISTA. (180)  
A SIMILAR OBJECTION IS MADE BY PHOENIX TO VOLUME 1, APPENDIX G. (180)

**Attachment to Watershed File Report: 111-23-073**

PHOENIX OBJECTS TO CATEGORY 11 FOR THE REASON THAT: DWR'S METHOD FOR DETERMINING IMPACTS TO FT. HUACHUCA'S (MAJOR USER CODE 1283) WELLS COMPARES OFF-RESERVATION PUMPING TO ON-RESERVATION PUMPING, BUT FAILS TO INCLUDED 8 NON-POTABLE WELLS ON FT. HUACHUCA IN ITS ASSESSMENT OF ON-RESERVATION PUMPING. (180)  
A SIMILAR OBJECTION IS MADE BY PHOENIX TO VOLUME 1, PAGE G-8. (180)

**Attachment to Watershed File Report: 111-23-073**

PHOENIX OBJECTS TO CATEGORY 4 FOR THE REASON THAT: DWR FAILS TO IDENTIFY AS ZONE 2 WELLS THOSE WELLS ON FT. HUACHUCA (MAJOR USER CODE 1283), WHICH MAY IMPACT OTHER FEDERAL RESERVATIONS. (560)  
PHOENIX OBJECTS TO CATEGORY 11 FOR THE REASON THAT: A SIMILAR OBJECTION IS MADE BY PHOENIX TO VOLUME 1, PAGE 419. (119)

**Attachment to Watershed File Report: 111-23-073**

PHOENIX OBJECTS TO CATEGORY 8 FOR THE REASON THAT: DWR HAS IMPROPERLY INTERJECTED AN ECONOMIC ANALYSIS INTO THE STANDARD OF SIGNIFICANT DIMINISHMENT WHEN IT CALCULATES THE ECONOMIC IMPACT NEIGHBORING WELLS HAVE ON FORT HUACHUCA'S (MAJOR USER CODE 1283) BY PROJECTING ADDITIONAL FUTURE COSTS THE FORT MAY INCUR IF THE GROUNDWATER TABLE IS LOWERED AS A RESULT OF PUMPING FROM NEIGHBORING WELLS. (180)  
PHOENIX OBJECTS TO CATEGORY 11 FOR THE REASON THAT: A SIMILAR OBJECTION IS MADE BY PHOENIX TO VOLUME 1, PAGES G-14 AND G-17. (180)  
THE WATERSHED FILE REPORT RELATES TO THE FORT HUACHUCA MILITARY RESERVATION (MAJOR USER CODE 1283).

**Attachment to Watershed File Report: 111-23-073**

PHOENIX OBJECTS TO CATEGORY 8 FOR THE REASON THAT: DWR IS INCONSISTENT AND INEFFECTUAL IN REPORTING INFORMATION RELATING TO FEDERAL RESERVED RIGHTS CLAIMS IN THAT THE LEVEL OF INFORMATION VARIES WITHOUT APPARENT REASON. (200)

PHOENIX OBJECTS TO CATEGORY 11 FOR THE REASON THAT: A SIMILAR OBJECTION IS MADE BY PHOENIX TO VOLUME 1, PAGE 571. (146)  
THE WATERSHED FILE REPORT RELATES TO THE FORT HUACHUCA MILITARY RESERVATION (MAJOR USER CODE 1283).

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE  
WATER IN THE GILA RIVER SYSTEM AND SOURCE

No. W1, W2, W3 & W4  
Contested Case No. W1-11-000605

COPY

MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for the  
San Pedro River Watershed

Please file a separate objection for each Watershed File Report, Zone 2 Well Report or Catalogued Well Report. Objections to information contained in Volume 1 of the HSR can be stated on one objection form. Objections must be written. Use of this form, or a computer facsimile, is required. Objections must be received on or before May 18, 1992.

This objection is directed to Watershed File Report or Zone 2 Well Report No. 111-23- -073 (please insert no.) or Catalogued Well No. \_\_\_\_\_ (please insert no.)

OBJECTOR INFORMATION

Objector's Name: Salt River Project  
Objector's Address: Post Office Box 52025  
Phoenix, Arizona 85072-2025  
Objector's Telephone No: (602) 236-2210

Objector's Watershed File Report or Zone 2 Well Report No. (If the Objector's claimed water rights are within the San Pedro River Watershed): \_\_\_\_\_

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 8 of the HSR): \_\_\_\_\_

Or Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro Watershed):  
39-07 01040, 01041, 01206, 01207, 01998  
39-05 50053, 50054, 50055  
39-L8 35212, 35213

STATE OF Arizona

VERIFICATION (must be completed by objector)

COUNTY OF Maricopa

I hereby make this Objection. I certify that, if required, copy of the foregoing Objection was served upon the following Claimant(s) by mailing true and correct copies thereof on the 14th day of May, 1992, postage prepaid and addressed as follows:

Name: FORT HUACHUCA  
Address: FORT HUACHUCA  
FORT HUACHUCA, AZ 85613

I declare under penalty of perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; and that the information contained in the Objection is true based on by own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and, as to those portions, I believe them to be true.

David C. Roberts  
Signature of Objector or Objector's Representative

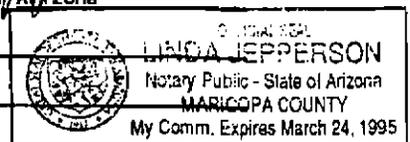
(The above section must be completed if you object to another claimant's Watershed File Report, Zone 2 Well Report, or Catalogued Well Report. It does not need to be completed if you file an objection to your own Watershed File Report, Zone 2 Well Report, Catalogued Well Report, or to information contained in Volume 1 of the Hydrographic Survey Report.)

SUBSCRIBED AND SWORN to before me this 1st day of May, 1992.

Linda Jepperson  
Notary Public for the State of Arizona

Residing at Maricopa County

My commission expires \_\_\_\_\_



Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex, 3345 W. Durango Street, Phoenix Az 85009, on or before May 18, 1992.

**EXCERPT FROM  
SALT RIVER PROJECT OBJECTIONS TO  
VOLUME 1 OF THE SAN PEDRO RIVER HSR**

**GROUNDWATER IMPACT EVALUATION**

**(page numbers refer to Volume 1)**

**Impacts on Groundwater Under Federal Reservations**

**pp. 414-417, G-1 - G-17**

The Salt River Project objects to the legal distinctions for nonappropriable groundwater underlying federal reservations created by the Gila River Adjudication Court's Order of September 9, 1988. The Superior Court's Order, which is currently on appeal to the Arizona Supreme Court, provides for federal reserved rights to groundwater and, apparently, would protect those rights from "significant diminishment" by off-reservation pumping. In contrast, pumpers of nonappropriable groundwater under state law are afforded no unique protections from interference by other state law pumpers or from federal rights.

The Superior Court's creation of federal reserved water rights to nonappropriable groundwater and "double standard" for protection from interference is contrary to law and, further, would result in an administrative nightmare once the decree was entered. All water rights recognized by the decree should be entitled to the same degree of protection from interference by other water rights, irrespective of the underlying basis for those rights.

The Salt River Project also objects to DWR's quantification of significant diminishment of groundwater available to Fort Huachuca. DWR has inappropriately expanded the scope of the information that it is required to provide on the impact of surrounding pumping on a federal reservation's groundwater resources. DWR was not directed to evaluate the impact of historic or future pumping. Likewise, there is no authority to estimate the economic impacts of past and future off-reservation pumping. The Court simply directed DWR to identify groundwater users that may affect groundwater under federal reservations.

The Court's September 9, 1988 order on groundwater and surface water contains the following pertinent statements at page 24, lines 24-28; and page 25, lines 1-12 and 21-26:

"Having ruled on the legal issues before it from the motion and the eight questions before the Court, the Court will now move to the area of its instruction to the Department of Water Resources for its Hydrographic Survey Reports.

First, these reports should include all claims of surface rights and claims where the water being used is sub-surface flow under the criteria previously described. These rights are to be catalogued, prioritized and entitlements assigned thereto by indicating the nature, extent and relative priority thereto, all as required by A.R.S. § 45-256. All other groundwater sources, not involving federal claims, shall be catalogued and their data determined as previously indicated.

When dealing with a claim made under federal law, the same procedure should be followed for those claims where the federal claim is for a diversion and use which is in physical use at this time. Where the claim is for a federal reserved right and there is no present physical use D.W.R. shall also:

- . . . d. In determining a prioritization of such claimed federal reserved rights, it will be necessary to determine all stream users or diversions of either surface water or groundwater which significantly affect those sources reasonably available on, at or near the federal parcel which would be available to fulfill the determined entitlement." (emphasis supplied)

Nowhere in the Court's order are drawdown calculations or an economic impact analysis requested of the Department.

The Salt River Project objects to DWR's analysis of significant diminishment on other grounds as well. First, DWR fails to specify the historical municipal pumping amounts that it used in the model. Second, the analysis fails to discuss the impact of the Fort's own pumping on the groundwater supply in the area. This is particularly important in relation to the possible impacts of Fort Huachuca-Sierra Vista pumping on surface water supplies for another federal reservation, the San Pedro Riparian National Conservation Area. Third, the economic analysis fails to convert streams of costs over time to the net present value of those costs. Fourth, annual rather than average changes in lift are required for an appropriate economic analysis. Fifth, it is particularly inappropriate to speculate on the impact of future pumping since many of the variables may change; e.g., pumping amounts by off-reservation users or the reservation's own withdrawals. For example, Fort Huachuca was closed in the late 1940s and may be closed again in the future. Sixth, a model that is intended only to assess regional impacts cannot be used to quantify hydrologic or economic impacts on specific federal wells.

RECEIVED MAY 7 1992

IN THE SUPERIOR COURT OF THE STATE OF ARIZONA  
IN AND FOR THE COUNTY OF MARICOPA

IN RE THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE  
WATER IN THE GILA RIVER SYSTEM AND SOURCE

W1-11-000605  
No. W1,W2,W3 & W4

MANDATORY FORM FOR OBJECTIONS TO  
The Hydrographic Survey Report for  
The San Pedro River Watershed

Please file a separate objection for each Watershed File Report, Zone 2 Well Report or Catalogued Well Report. Objections to information contained in Volume 1 of the HSR can be stated on one objection form. Objections must be written. Use of this form, or a computer facsimile, is required. Objections must be received on or before May 18, 1992.

This objection is directed to Watershed  
File Report or Zone 2 Well Report No.

111 - 23 - 073  
(please insert no.)

or Catalogued Well No.

(please insert no.)

OBJECTOR INFORMATION

Objector's Name: United States of America  
Objector's Address: Mr. Gary Randall, Department of Justice, General Litigation  
Section, P.O. Box 663, Washington, DC  
Objector's Telephone No.: 202 272-6978 20044-0663

Objector's Watershed File Report or Zone 2 Well Report No. (if the Objector's claimed water rights are within the San Pedro River Watershed):  
111 23 073

Or Objector's Catalogued Well Number (if the Objector's claimed water rights appear only in Volume 8 of the HSR):  
\_\_\_\_\_

Or Objector's Statement of Claimant No. (if the Objector's claimed water rights are located outside the San Pedro River Watershed):  
39 - \_\_\_\_\_

STATE OF \_\_\_\_\_  
COUNTY OF \_\_\_\_\_

VERIFICATION (must be completed by objector)

I hereby make this Objection. I certify that, if required, a copy of the foregoing Objection was served upon the following Claimant(s) by mailing true and correct copies thereof on the \_\_\_\_\_ day of \_\_\_\_\_, 199\_\_\_\_, postage prepaid and addressed as follows:

Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
\_\_\_\_\_

(The above section must be completed if you object to another claimant's Watershed File Report, Zone 2 Well Report, or Catalogued Well Report. It does not need to be completed if you file an objection to your own Watershed File Report, Zone 2 Well Report, Catalogued Well Report; or to information contained in Volume 1 of the Hydrographic Survey Report.)

I declare under penalty of perjury that I am a claimant in this proceeding or the duly-authorized representative of a claimant; that I have read the contents of this Objection (both sides and any attachments) and know the contents thereof; and that the information contained in the Objection is true based on my own personal knowledge, except those portions of the Objection which are indicated as being known to me on information and belief and, as to those portions, I believe them to be true.

Gary B. Randall  
Signature of Objector or Objector's Representative

FOR THE UNITED STATES  
SUBSCRIBED AND SWORN to before me this 7 day of May 1992

Pamela L. Sparks  
Notary Public for the State of \_\_\_\_\_  
Residing at \_\_\_\_\_  
My commission expires \_\_\_\_\_  
**PAMELA L. SPARKS**  
Notary Public - State of Arizona  
MARICOPA COUNTY  
My Comm. Expires 05-25-1995

Objections must be filed with the Clerk of the Superior Court in and for Maricopa County, Maricopa County Courthouse Annex, 3345 W. Durango Street, Phoenix, AZ 85009, on or before May 18, 1992.

FMC001112



ATTACHMENT TO OBJECTION RE UNITED STATES OF AMERICA AND FORT HUACHUCA

WFR No. 111-23-073  
CONTESTED CASE NUMBER  
VOLUME 3, W1-11-000605

8. Volume 3, page 117. No potential water right numbers, apparent first use dates or water sources and classifications are assigned or determined for Fort Huachuca. The United States of America realizes that no abbreviation for military uses appears in Volume 3's List of Abbreviations, at page 7 and that the Watershed File Report in the Explanation refers to Fort Huachuca's Major User Report in Volume 1, Chapter 5, Section 5.4. Nevertheless, the United States objects in order to preserve its opportunity to establish the nature, extent, and priority of its claims to surface water and ground water at Fort Huachuca. (220) (820) (920) (1283)
11. Volume 3, page 7, TABLE 1, entitled "LIST OF ABBREVIATIONS." The HSR omitted an abbreviation for military use. (220) (1283)

In an order dated December 11, 1990, the Arizona Supreme Court granted review by way of interlocutory appeal of the following six issues:

1. Do the procedures for filing and service of pleadings adopted by the trial court in its Pre-trial Order Number 1 comport with due process under the United States and Arizona Constitutions?
2. Did the trial court err in adopting its 50% / 90 day test for determining whether underground water is "appropriable" under A.R.S. Section 45-141?
3. What is the appropriate standard to be applied in determining the amount of water reserved for federal lands?
4. Is non-appropriable groundwater subject to federal reserved rights?
5. Do federal reserved rights holders enjoy greater protection from groundwater pumping than holders of state law rights?
6. Must claims of conflicting water use or interference with water rights be resolved as part of the general adjudication?

ATTACHMENT TO OBJECTION RE UNITED STATES OF AMERICA AND FORT HUACHUCA

WFR No. 111-23-073  
CONTESTED CASE NUMBER  
VOLUME 3. W1-11-000605

The six issues which are on interlocutory appeal before the Arizona Supreme Court, when resolved, may affect the content of the Arizona Department of Water Resources' Hydrographic Survey Report (HSR) and the Watershed File Reports. The United States of America, on behalf of the Department of the Army and Fort Huachuca, objects to any portion of the San Pedro River HSR or Watershed File Report whose contents are changed or affected by a future Arizona Supreme Court ruling on any of the six issues on interlocutory appeal. In other words, once the Arizona Supreme Court rules on any of the six issues, the United States of America reserves the right to object to any HSR or Watershed File Report that is changed or affected by the Supreme Court's ruling, especially in light of the fact that at least three of the issues in appeal directly concern federal reserved rights. (200) (220) (1130) (1283)

FMC001115

## FORT HUACHUCA BIOLOGICAL OPINION ANNUAL REPORT FOR 2002

This report fulfills the annual reporting requirement specified in Fort Huachuca's Programmatic Biological Opinion (BO), 2-21-02-F-229, dated August 23, 2002. This report summarizes the actions taken to implement mitigation measures identified in the BO and to address reasonable and prudent measures, with their implementing terms and conditions, to minimize incidental take that might otherwise result from the proposed action and implementation of conservation recommendations.

This report includes commitments identified in the PBO under the heading of Conservation Measures from pages 43 – 66.

### 1. Water Related Conservation Measures

1.1 The Fort Huachuca water pumpage for 2002 was 496,567,000 gallons or 1,523 acre feet, which is 8% less than that pumped in 2001 (1,655 acre feet). During 2002 the Fort completed its Army Water Resources Management Plan (AWRMP) as scheduled. Implementation of the plan will be an ongoing process that includes individual project development, budgeting cycles, and project installation.

1.1.a In the BO, Fort Huachuca proposed conservation measures to reduce its contribution to the ground water overdraft in the Sierra Vista Subwatershed by a total of 3,077 acre feet by the year 2011. During 2002 the Fort estimates water reductions as described below. These figures are estimates and can be refined over time with more data and experience.

Reduced Pumpage (metered water well readings)	132 acre feet
Conservation Easements Clinton Ranch (formally approved by USFWS)	630.8 acre feet
Storm Water Recharge (estimated East Range Phase I)	60 acre feet
<b>TOTAL:</b>	<b>822.8 acre feet</b>

### 1.2 Water conservation measures that occurred on Fort during 2002 include:

1.2.a Installation of 20 additional waterless urinals in facilities on the Fort during 2002 will save an estimated 900,000 gallons or approximately 2.8 acre feet of water per year. Although not specifically identified in the Biological Opinion (Table 5, page 45), the use of waterless urinals to conserve water is consistent with the Fort's commitment to use all reasonably available conservation measures. (Biological Assessment at 286)

1.2.b Sewer line cleaning and video inspection was accomplished on 30,000 linear feet of sewer piping. Repairs to the system continued in 2002 through the operations and maintenance contractor. Also during 2002, the Corps of Engineers awarded a contract to provide spot repair and or whole pipe section replacement of the existing sewer line on Fort. This contract was developed based on prior year sewer line cleaning and video inspections. This will result in as yet unquantified improvements to our effluent recharge program.

1.2.c The installation of 139 additional horizontal axis washers in facilities used for billeting, childcare development and fire stations occurred in 2002. Water savings for this project is estimated to be 26.6 gallons per cycle. Assuming four cycles per day, this results in a savings of approximately 16.6 acre feet per year. (Currently the Fort doesn't have counters on washers but we will survey utilization rates during 2003 in billeting so water savings can be better estimated and adjusted accordingly.) Where possible, new horizontal axis washers installed in the future will have counters to help determine water savings.

1.2.d During 2002, the Fort removed 56 evaporative coolers in the family housing area through the closing and demolition of old family housing units. These housing units were replaced with 28 new housing units that have air conditioning instead of the traditional evaporative cooling. Water savings for this project is estimated to be 840,000 gallons or 2.6 acre feet per year.

1.2.e During 2002, three sites were converted to xeriscape type landscaping. These sites were the Military Intelligence Academic Complex Courtyard, Reenlistment Building #52208 and the Chapel Complex building #81402. These sites totaled 105,000 square feet or approximately 2.4 acres. We assume a savings of one acre foot per acre of irrigated turf converted to xeriscaping. Because these acres were not entirely covered with turf, we estimate a water savings of from one to one and one-half acre feet.

1.2.f During 2002, facilities demolition on Fort Huachuca was accomplished on 50,758 square feet of old family housing buildings. This demolition is part of the ongoing family housing replacement program. The demolition includes the replacement of old sewer lines and water pipes in housing areas when new houses are constructed to replace the old housing. In addition to new utility systems for new houses, the houses also have water saving devices built in such as low flow toilets, low flow shower heads, and air conditioning instead of the old evaporative cooling systems. This will result in an as yet unquantified reduction in water use.

1.2.g At a funding level of \$36,250, the Fort continued to operate the Fort Huachuca Water Wise conservation education program with a personnel-staffing level equal to one man-year dedicated to the program. The program provided educational programs directed at water conservation training to over 5,200 students, military, civilian and dependents on Fort Huachuca.

### 1.3 Effluent Reuse

1.3.a. The Fort irrigated with a total of 424 acre feet of effluent water during 2002.

1.3.b. The Fort used 53.1 acre feet for Chaffee Parade Grounds and athletic fields. During 2002 the Corps of Engineers awarded the Phase II Effluent Recharge and Reuse Project on Fort Huachuca. This project will extend the Fort's existing effluent piping system to irrigate the athletic fields that are currently watered with groundwater.

1.3.b. During 2002 the Fort Huachuca Mountain View Golf Course continued maintenance of the existing irrigation system and use of the meteorological and soil moisture measurement telemetry system in an effort to reduce their use of treated effluent for irrigation of fairways and greens. The golf course used 370.9 acre feet of effluent for irrigation during 2002. The golf course irrigation system upgrade is scheduled to begin in Fiscal Year 2003.

1.4 Effluent Recharge. The Fort operated and maintained the East Range recharge basins during 2002 with 185.5 acre feet of treated effluent being sent to the basins for recharge from June through December 2002.

1.5 Conservation Easements - The Fort continued its cooperative agreement with The Nature Conservancy (TNC) to pursue the purchase of conservation easements along the San Pedro River in the GAP area. Two properties (Drijver and Stoner) were worked in 2002 by TNC to establish conservation easements aimed at reducing groundwater pumping adjacent to the San Pedro Riparian National Conservation Area (SPRNCA). TNC actions will continue into 2003 with plans to finalize these conservation easements. The Fort funded \$389,216 during 2002 in support of the cost of conservation easements.

1.6 Storm Water Recharge – Fort Huachuca made considerable progress in recharge efforts for storm water during 2002.

1.6.a The East Range Phase I storm water recharge basin is expected to recharge 150 acre-feet in an average year of rainfall. Based on actual rainfall in July and August of 2002, we conservatively estimate that 60 acre-feet were recharged in the reporting period.

1.6.b The Graveyard Gulch basin was constructed on the east range and the Greely Hall basin was constructed within the cantonment area. The design plans and drawings were completed for a basin within the Hatfield Road drainage area in 2002 with construction programmed in 2003. The Graveyard Gulch construction cost was \$351,434, the Hatfield design cost was \$17,075 and the Greely Hall design was \$25,311 with the Greely Hall construction being \$92,000. The Fort is working with the U.S. Geological Survey (USGS) to install metering devices to calculate recharge at these sites. The USGS will complete work during 2003 on the project, which will allow the Fort to report recharge in the future.

1.7 Water Mitigation Policy – The Fort’s population baseline is 12,305 based on the September 2001 Post Population Report. The Fort estimated growth in the BO in the amount of 500 persons, for an increased population of 12,805 to support future operations. The September 2002 Post Population report indicates a total post population of 11,112 that is a decrease of 1,193 under the baseline and 1,693 under the overall projected growth. The major changes in population during 2002, seem to be decreases in the number of student and permanent fulltime military and civilian employees on Fort. There were also increases in a few organizations such as the Western Civilian Personnel Operations Center and an increase in the number of contract personnel working on the Fort. The contractor personnel figures include temporary construction workers building new facilities throughout the Fort’s cantonment area. These numbers will fluctuate depending on the Army’s Military Construction program for any given year. During 2002, mitigation fees in the amount of \$125,000 were received from tenant organizations that saw or anticipate an increase in strength. These funds are used for the purchase of conservation easements along the GAP area of the San Pedro River and for low water use equipment such as waterless urinals and horizontal axis washers. A post population report for September 2002 is included in this annual report as an attachment.

1.8 Upper San Pedro Partnership (USPP) – Fort Huachuca was an active participant in the USPP during 2002 cooperating with local, state, and federal entities on workgroups and technical information sharing. The Fort provided funding in the amount of \$309,849 to the USPP in 2002. During 2002 the Fort and Huachuca City have partnered to develop effluent recharge capabilities from their sanitary sewage operation. This project will continue in 2003 with the development of recharge plans and seeking funding sources.

## 2. Erosion Control

### 2.1 East Range

2.1.a Erosion control on the Fort’s east range included completing the installation of signs to close 81 miles of roads. The Fort is partnering with the Natural Resources Conservation Service (NRCS) to implement land restoration to these closed roads. A meeting and site visit with the NRCS was held prior to NRCS starting field surveys and developing restoration plans for each segment of closed road. Other erosion control actions included issuing a contract for the development of erosion control requirements within planning unit 6 of the east range. This work would include identifying a site for a stormwater retention basin, re-vegetation planning for disturbed areas and developing a fire rotation burn plan for the unit.

2.1.b The Graveyard Gulch urban stormwater control and retention basin was constructed during 2002 at a cost of \$351,434. Based on the watershed area, this project is expected to recharge up to 110 acre feet of urban runoff during an average rainfall year.

2.2 Cantonment Area – As identified in the BO the Greely Hall retention basin was completed in 2002 at a design and construction cost of \$117,311. This basin will reduce

drainage impacts caused by the large paved parking lots near Greely Hall. The design was also completed for the Hatfield retention basin at a cost of \$17,075. This basin will provide an estimated 10 acre feet of recharge for urban runoff generated from pavement within the Forts cantonment area.

2.3 West Range – At this time a retention basin on the Fort's west range is in the long-range planning stage.

3. Monitoring and Surveying of Listed and Candidate Species – During 2002, Fort Huachuca completed monitoring and surveys on Fort for Mexican spotted owl, Lesser long-nosed bat, Huachuca water umbel, Sonora tiger salamander, the Ramsey Canyon leopard frog and Huachuca springsnail. The Fort also surveyed for Southwestern willow flycatcher and the Yellow-billed cuckoo within the SPRNCA.

#### 4. Protection of Listed and Candidate Species

4.1 During 2002 the Fort continued the training area restriction for off-road travel and for the use of pyrotechnics within agave management areas.

4.2 The Fort continued its ban of off-road travel on the Fort during 2002. The Range Control Office informs range and training area users of this requirement routinely as part of their environmental training briefings.

4.3 Warning signs and physical protection measures such as boulders were maintained and increased around Huachuca water umbel populations in Garden and McClure Canyons. Silt fencing was installed or replaced along Garden Canyon stream as part of routine road maintenance and repair in upper Garden Canyon.

4.4 The Fort and Service met during November 2002 to jointly develop a 2003 work plan for implementation of the BO.

#### 3. Fire Management

5.1 The protection of agave, lesser long-nosed bat, Huachuca water umbel, Mexican spotted owl and Sonora tiger salamander populations and habitat was an objective of all prescribed fire and fire suppression activities in 2002.

5.1.a Fort Huachuca continued to have resource advisors within the Environmental and Natural Resources Division present on all fire activities. Resource advisors were incorporated into the fire emergency response protocol for the installation, to include being on call 24 hours a day.

5.1.b All off-road vehicle and human disturbance activities were minimized during prescribed fire and fire suppression activities in 2002. Disturbed areas from suppression activities on the Ryan Fire on the Fort's west range were reclaimed naturally.

5.1.c No listed species were adversely affected by prescribed fire or fuels treatment activities in 2002; therefore, no mitigation or monitoring plans were needed.

5.1.d Fort Huachuca is scheduled to complete its Fire Management Plan in 2003. The plan will include a schedule for fuel management as well as prescribed fire activities. In 2002, the Fort conducted approximately 40 acres of fuel load reduction work in Garden, Huachuca and Blacktail Canyons.

5.1.e The Fort did not burn a black line around live fire ranges 6 – 10 in 2002. Since this area was burned in the fall of 2001, it was not necessary to burn it again because the vegetation was sparse and green.

5.1.f The Fort Huachuca Fire Department was present on the firing ranges during tracer firing and under high fire danger conditions. On several occasions, fires started by live fire rounds were confined and contained in front of Alpha Break. Several fires, including a 108 acre fire in November of 2002, started beyond Alpha Break by live firing exercises and were managed as suppression actions.

6. Recreation Management - Recreation management measures were maintained in 2002 for the protection of endangered species and their habitat. Boulder placement and warning signs around known populations of Huachuca water umbel were maintained as well as signs in other riparian areas including Upper Garden Canyon Pond and Tinker Canyon Pond. The Fort maintained signage for Scheelite Canyon to inform hikers and birdwatchers of the sensitive species and recreation restrictions that apply to their use of the canyon. Closure of caves and mines used for recreational spelunking, that are also lesser long-nosed bat roost sites, were closed to recreation activities during the presence of the LLNB on the Fort. The Fort continued to maintain the closure of Gate 7 to all vehicles during 2002 as well as restricting off-road-vehicle use on the installation. The live bait restriction for use of salamanders (waterdogs) while fishing on Fort was enforced in 2002 and was reflected in the Fort's fishing fact sheet.

7. Environmental Awareness Education - Through Fort Huachuca's Water Wise and Energy Smart Program, 178 educational programs were conducted that reached over 2,236 students. The Fort provided water conservation training to over 3,000 military and civilian personnel through professional development seminars and organizational briefings. The Fort sponsored a poster contest, developed nine desert landscape demonstration areas, conducted 32 water audits, developed four self-guided tours, completed 3 landscape projects and developed numerous brochures to promote water and energy conservation and desert landscaping. The Fort also worked with local schools to develop habitat gardens that provide a learning lab for students. The Range Control Office provided unit training on environmental policies and operational requirements for personnel training on Fort Huachuca. The Environmental and Natural Resources Division provided environmental awareness training for area youth, local schools and civic organizations, and military personnel.

8. Integrated Natural Resources Management Plan (INRMP) - During 2002, the Fort continued to implement the conservation agreement and management practices for the Ramsey Canyon leopard frog located in the Tinker Canyon Pond on Fort Huachuca. Two cooperative projects with the University of Arizona (UofA) were conducted in 2002. This included survey and inventory work for the Huachuca springsnail as well as a grassland fire research project. The grassland fire research project is looking at the fire effects on Lehmann lovegrass and impacts to agave, which is a food source for the LLNB. Both projects are scheduled to continue in 2003.

9. Agave Management Plan - The Fort implemented the Agave Management Plan in 2002, with requested changes to management actions as outlined in the BO. The Agave Management Plan is scheduled for revision in 2003. In addition, the Fort continued its grassland fire research project that should prove beneficial for the long-term management of agave in southeastern Arizona.

#### 10. Species Specific Conservation Measures

##### 10.A. Huachuca water umbel

10.A.1. In 2002, an inventory of all potential Huachuca water umbel habitat was completed on Fort Huachuca. All previously known umbel populations were found during the inventory. Three new populations were found during the inventory that were not previously identified during the 1999 inventory or during the 2000 and 2001 monitoring surveys. Results of 2002 inventory efforts were summarized in a 2002 inventory report and forwarded to the Service.

10.A.2. All potential umbel habitat in the SPRNCA was last inventoried in 2001. Umbel habitat in the SPRNCA is scheduled to be inventoried in the fall of 2004. Therefore, no umbel inventory was conducted on the SPRNCA in 2002.

10.A.3. During 2002, Fort Huachuca maintained the rock barriers that were installed in 1999 around Huachuca water umbel populations in Garden and McClure Canyons.

10.A.4. The Fort continued fuel management activities in high-use recreational areas in Garden, Huachuca and Blacktail Canyons. Approximately 40 acres were treated in 2002 to reduce fire spread and to reduce potential for a stand-replacing fire. Fuel load management activities had no adverse effects on umbel populations or their habitat; therefore no mitigation/monitoring plans were required.

10.A.5. Gate 7 was closed in 1999 and has remained closed since that time to minimize erosion in areas potentially affecting downstream umbel populations.

10.A.6. Fort Huachuca continued conservation easement actions for properties along the SPRNCA that would help restore and/or protect cienega conditions on the SPRNCA. As stated in section 1.5, the Fort continued working with TNC during 2002 to purchase conservation easements in the GAP area of the San Pedro River. This work is aimed at

reducing agricultural irrigation adjacent to the river, which impacts the river flow. On post, the Fort maintained boulders throughout the installation to protect umbel populations and habitat and improve recreational access management. Locations of boulders include Tinker and Upper, Middle, and Lower Garden Canyon Ponds, Garden, McClure, Huachuca, Split Rock and Blacktail Canyons, Wren Bridge and picnic areas in Garden and Huachuca Canyons.

10.A.7. Disturbance of umbel habitat at Upper Garden Canyon Picnic area was observed in May of 2002. Unauthorized mowing was discovered in the picnic area and was addressed with the appropriate personnel. No umbel plants were disturbed as a result of the mowing.

10.A.8. The Endangered Species Management Plan for Huachuca water umbel is scheduled for completion in 2003.

10.A.9. All Garden Canyon road maintenance activities in 2002 (i.e. waterbar maintenance and road grading) adhered to the PBO. Silt fencing that was installed in 2001 was removed in some areas with additional silt fencing being installed in certain areas to minimize sediment entering the creek. No water was taken from Garden Canyon Creek in 2002.

10.A.10. Fort Huachuca's water conservation efforts continued into 2002 with the Fort reducing groundwater pumpage during the year from 2001's pumpage level by 132 acre feet. The Fort's groundwater pumpage during 2002 was 1,523 acre feet. The meter system for the Fort's East Range effluent recharge basins was completed and came on-line during 2002. The Fort sent 185.5 acre feet of treated effluent to the East Range basins for recharge from June through December of 2002. The Fort continued working with TNC on the purchase of conservation easements aimed at reducing groundwater pumping for agricultural irrigation along the San Pedro river in the GAP area. Two properties are currently under consideration for establishing conservation easements to reduce groundwater pumping along the river. The Fort was able to construct two urban runoff stormwater recharge basins during 2002 and complete the design for a third basin that is planned for construction in 2003.

10.B. Lesser long-nosed bat (LLNB)

10.B.1. In 2002, there was no road construction or maintenance that would facilitate public access to LLNB day roosts.

10.B.2. In 2002, the presence of LLNBs at day roosts was documented from July 22 – November 21. Management actions implemented in 2002 include the closure of day roosts from April 15 – December 5 to protect the LLNB and other sensitive bat species, and the closure of access routes to roosts during this same time period. A new video surveillance system was installed and operational by July 2002. The new system was operational during the majority of the time LLNBs were present. When the system was not functioning properly due to technical difficulties (i.e. battery and solar panel

problems, etc.), Fort personnel conducted weekly site visits to day roosts. The Fort is currently addressing the problems experienced in 2002 and expects the new surveillance system to be fully functional for 2003. Signs and surveillance cameras at roost entrances were maintained along with fencing around the perimeter of day roosts. No illegal entries into LLNB day roosts were detected in 2002.

10.B.3. In 2002, monitoring for LLNB was conducted from mid June through late November. In late August, a record number of LLNBs were counted from Fort Huachuca with nearly 7,500 bats being present. A summary of 2002 monitoring efforts is currently being summarized in a report and that report will be forwarded to the Service upon completion.

10.B.4. The Fort prohibited low-level helicopter flights within 350 feet of all roosts while the lesser long-nosed bat was present on the installation.

10.B.5. The Fort conducted surveys for *Agave palmeri* (agave) prior to any ground disturbing activities and implemented actions identified in the PBO, page 58, 5.a – c, on an as needed basis.

10.B.6. The Fort prohibited the seeding or planting of nonnative grasses or other plants that have the potential to alter fire regime.

10.B.7. No managed natural fires occurred on the installation in 2002, but Fort Huachuca did conduct several prescribed fires. These included pile burns in Huachuca and Garden Canyons to reduce woody debris, but neither burn affected agaves. The grassland fire research project was continued in 2002, and did affect agaves, but it was formally consulted on in 2001 to minimize potential adverse effects to agave. A wildland fire (Ryan Fire) occurred on Fort Huachuca in 2002 and burned approximately 5,300 acres of the west range. From post-fire assessments of the Ryan Fire, it appears that most agave in the burn area should survive. A resource advisor was present on all of the above mentioned fires to ensure that potential adverse effect to the LLNB and agaves were minimized.

10.B.7e. A schedule for prescribed burns in Fort Huachuca grasslands and woodlands was not established in 2002, but is planned for completion as part of the Fort Huachuca Fire Management Plan in 2003.

10.B.7f. The Fort restricted nighttime training in agave management areas from July 1 – November 21, 2002.

10.B.8. Restrictions of no nighttime use or tracer fire on live fire ranges 2,3, and 4 were adhered to from July 1 – November 21, 2002.

10.B.9. The Fort adhered to all nocturnal UAV operational restrictions to include a minimum of 500 feet above ground level for all flights, confining take-off and landing

approaches away from Agave Management Areas (AMAs) and no use of rocket-assisted take-offs from July 1 – November 21, 2002.

10.B.10. Fort Huachuca continued to enforce the installation's off-highway vehicle policy that prohibits any off-road vehicle travel, especially in AMAs.

10.B.11. The Fort prohibited the use of pyrotechnics within 0.25 mile of AMAs and restricted live fire exercises during periods of high fire danger.

10.B.12. The Endangered Species Management Plan for the LLNB is scheduled for completion in 2003.

10.B.13. The Fort completed agave monitoring on the installation in 2002. A total of 72 agave-monitoring plots were installed to collect information on agaves and determine long-term trends. Results of the monitoring are being summarized in an agave monitoring report and will be forwarded to the Service upon completion.

10.B.14. Fort personnel conducted monitoring and no dead LLNB were detected in 2002.

10.B.15. Fort Huachuca did not detect any take of LLNBs or any LLNB day roost disturbance in 2002. As mentioned previously, approximately 5,300 acres of the west range burned in May of 2002, as a result of the Ryan Fire. The fire burned through several AMAs with the effects of the fire on agaves being assessed during agave monitoring efforts in 2002. In general, the fire appears to have moved quickly through most AMAs with little damage being done to most agaves.

#### 10.C. Sonora tiger salamander

10.C.1. Upper Garden Canyon Pond (UGCP) dried by late March 2002, and remained dry until at least early July, so successful reproduction did not occur this year.

10.C.2. No wildland fire or fuel reduction activities occurred in the UGCP drainage or in other watersheds upstream of high-potential salamander habitat. Pond basins on post within the Ryan Fire have not been perennial enough in the last decade or so to support salamander populations, if any ever occurred there. UGCP was identified as a sensitive site and drainage in fire suppression planning meetings on the 2002 Merrit Fire on the southwest side of the Huachuca Mountains near Garden Canyon.

10.C.3. Objectives for monitoring and habitat protection identified in the draft salamander ESMP were met in 2002. The Sonora tiger salamander ESMP will be completed in 2003.

10.C.4. Boulders and an erosion control gabion remained in place as a barrier to vehicle access to the pond basin of UGCP.

10.C.5. The closure to vehicle travel for Gate 7 was maintained, and no reports of violation were observed or reported.

10.C.6. Prohibition against transport or release of any live aquatic wildlife on post has been maintained in the Fort's annual fishing fact sheet. Many ponds have dried during the persistent drought, and fishing activity on post has decreased considerably, so the opportunity and likelihood for such transport is much reduced.

10.C.7. The signs at UGCP have been maintained, with little vandalism.

10.C.8. No take of salamanders or their habitat was observed or reported in 2002.

10.C.9. A schedule for prescribed burns or fuels reduction was not established in 2002, but is planned for completion as part of the Fort Huachuca Fire Management Plan in 2003. Forty acres of fuel load reduction work was completed in 2002 in lower Garden, Huachuca and Blacktail Canyon.

10.D. Southwestern willow flycatcher (WIFL)

10.D.1. The Fort maintained the main firebreaks on the East Range.

10.D.2. There were no fires on the eastern third of the East Range in 2002. Therefore, no fire suppression actions were implemented.

10.D.3. Currently, there is no suitable breeding habitat present on Fort Huachuca and therefore no fire related actions were taken.

10.D.4. WIFL habitat suitability was assessed at RDTE survey points in 2001 and no suitable WIFL habitat was observed. Therefore, no habitat suitability assessment was performed in 2002.

10.D.5. There is currently no suitable WIFL breeding habitat on Fort Huachuca; therefore, no WIFL surveys were conducted on Fort Huachuca in 2002. The Fort completed annual status surveys for WIFL throughout the SPRNCA, per Service protocol, and no breeding flycatchers were detected (although 3 apparent migrant WIFLs were detected). Permission to conduct WIFL survey work on private land in the SPRNCA and Babocomari Cienega was not obtained; therefore, no surveys were conducted on private lands in 2002. In addition to WIFL surveys, incidental detections of yellow-billed cuckoo (YBCU) were noted. A total of 81 YBCUs were recorded within established WIFL transects in the SPRNCA. A report summarizing 2002 survey results for WIFL and YBCU was provided to the Service.

10.D.6. Aerial photos were taken in November 2000 and vegetation mapping was completed in 2001. Vegetation maps (nine totals) and a final vegetation report was disseminated to cooperating agencies in the fall of 2001. Since vegetation mapping is required every four years, no mapping was conducted in 2002. Aerial photos are

scheduled for 2004 and 2008 with vegetation mapping being completed in 2005 and 2009.

10.D.7. The Fort continued conservation easement efforts for properties along the SPRNCA to help restore and/or protect WIFL habitat on the SPRNCA. The Fort's cooperative agreement with TNC continued during 2002 for the establishment of conservation agreements to reduce groundwater pumping for agricultural irrigation adjacent to the San Pedro river.

10.D.8. Fort Huachuca's water conservation efforts continued into 2002 with the Fort reducing groundwater pumpage during the year from 2001's pumpage level by 132 acre feet. The Fort's groundwater pumpage during 2002 was 1,523 acre feet. The meter system for the Fort's East Range effluent recharge basins was completed and came on-line during 2002. The Fort sent 185.5 acre feet of treated effluent to the East Range basins for recharge from June through December of 2002. The Fort continued working with TNC on the purchase of conservation easements aimed at reducing groundwater pumping for agricultural irrigation along the San Pedro river in the GAP area. Two properties are currently under consideration for establishing conservation easements to reduce groundwater pumping along the river. The Fort was able to construct two urban runoff stormwater recharge basins during 2002 and complete the design for a third basin that is planned for construction in 2003.

#### 10.E. Mexican spotted owl (MSO)

10.E.1. Monitoring of half the Protected Activity Centers (PACs) occurred in 2002. No survey of other owl habitat was conducted this year. The 2002 monitoring report was provided to the Service.

10.E.2. A comprehensive draft of the MSO ESMP was completed in 2002. The MSO ESMP will be completed in 2003.

10.E.3. No fires or fuel treatments in MSO PACs or owl critical habitat occurred in 2002.

10.E.4. No low-level flights occurred over owl PACs or other habitat in 2002.

10.E.5. No owls nested in Garden Canyon within .25 miles of the rappelling cliffs in 2002.

10.E.6. The sign at Scheelite Canyon trailhead was maintained without damage in 2002.

10.E.7. Garden Canyon road maintenance activity was conducted only during daylight hours and within the existing roadbed. Minor fuel load reduction work occurred in lower Garden Canyon, but not within a MSO PAC or owl critical habitat.

10.E.8. No take of owls or owl critical habitat was known to occur in 2002. Potential harassment may have occurred in 2002, although undocumented, by the large number of birders in Scheelite Canyon, or the greatly increased numbers of undocumented immigrants using canyons on post. However, the observed increase in immigrants coming through Fort canyons occurred after the breeding season.

11. Reporting Requirements – The FY02 funding to support the BO requirements was as follows:

<u>Project Name</u>	<u>Funded Program</u>
Comply W/BO (Water Mgt. Plan)	\$50,000
Comply W/BO (USPP)	\$500,000
Comply W/BO (Monitor Umbel & Flycatcher in SPRNCA)	\$50,000
Comply W/BO (Agave Mgt.)	\$50,000
Comply W/BO (Aquatic Species Mgt.)	\$30,000
Comply W/BO (Protect SWWF Critical Habitat)	\$300,000
Comply W/BO (Monitor MSO)	\$20,000
Comply W/BO (Water Cons. Program)	\$300,000
Comply W/BO (Fire Mgt.)	\$120,000
Comply W/BO (MOA W/Forest Service)	\$25,000
Comply W/BO (LLNB Mgt.)	<u>\$35,000</u>
TOTAL:	\$1,480,000