Grand Canyon Chapter ● 202 E. McDowell Rd, Ste 277 ● Phoenix, AZ 85004
Phone: (602) 253-8633 Fax: (602) 258-6533 Email: grand.canyon.chapter@sierraclub.org

May 10, 2012

Mr. Thomas Buschatzke
Assistant Director
Arizona Department of Water Resources
3550 North Central Avenue, Second Floor
Phoenix, Arizona 85012

Re: Designation of Adequate Water Supply (File No. 40-700705), Pueblo del Sol Water Company) and Water Report (File No. 53-700704, the Oaks)

Dear Mr. Buschatszke:

I am writing on behalf of the Sierra Club's Grand Canyon Chapter and our 12,000 members in Arizona to express our strong objections to the issuance of a Designation of Adequate Water Supply for the Pueblo del Sol Water Company and the proposed Tribute master planned community in Sierra Vista, AZ (hereafter referred to as "Tribute"].

Standing to File an Objection

The Sierra Club is a national organization with chapters in every state, including Arizona. The Sierra Club mission is to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; and to educate and enlist humanity to protect and restore the quality of the natural and human environments. The Grand Chapter of the Sierra Club has many members who reside in the Sierra Vista area on lands within the groundwater basin affected by the proposed application for Designation of Adequate Water Supply. Members of the Grand Canyon Chapter of the Sierra Club use and enjoy the San Pedro River and its adjacent riparian areas for a variety of recreational purposes including bird watching, wildlife viewing, and hiking along its banks among others. Our Arizona Water Sentinels program conducts regular water quality monitoring on the San Pedro River and we help to monitor groundwater levels in the uplands within the San Pedro Riparian National Conservation Area ["San Pedro RNCA"].

While A.R.S. §45-108.01(B) states that objections to an application for a Designation of Adequate Water Supply may be filed by residents or landowners who live within the groundwater basin, we strongly believe that the Sierra Club – Grand Canyon Chapter has standing to file an objection on behalf of its members who are residents and property owners within the upper San Pedro groundwater basin. Our objections on their behalf are stated in the following comments.

Printed on recycled paper

Grounds for Objection

The grounds for objection to an application for a Designation of Adequate Water Supply are prescribed by A.R.S. §45-108(I). Under A.R.S. §45-108(I)(1), an applicant for a Designation of Adequate Water Supply must demonstrate that: "[s]ufficient groundwater, surface water, or effluent of adequate quality will be continuously, legally, and physically available to satisfy the water needs of the proposed use for at least one hundred years."[1] An applicant for a Designation of Adequate Water Supply also must demonstrate the financial capability "… to construct the water facilities necessary to make the supply of water available for the proposed use, including a delivery system and any storage facilities or treatment works."[2]

We object to the application for a Designation of Adequate Water Supply, File Number 40-700705 on the grounds that the applicant has failed to demonstrate that sufficient groundwater, surface water, or effluent of adequate quality will be continuously, legally, and physically available to satisfy the water needs of the proposed Tribute master planned community in Sierra Vista, Arizona for 100 years.

Sufficient groundwater, surface water, or effluent is not legally available to support the proposed Tribute development

Sufficient groundwater is not legally available because groundwater pumping for the proposed Tribute master-planned community will impair federal reserved water rights for the San Pedro Riparian National Conservation Area (RNCA). Congress established the San Pedro RNCA, the Nation's first National Riparian Conservation Area, in 1988.[3] Congress' purposes in establishing the San Pedro RNCA were "…to protect the riparian area and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the public lands surrounding the San Pedro River…."[4] The Secretary of the Interior, through the Bureau of Land Management (BLM), manages the San Pedro RNCA in a manner that conserves and protects the riparian area and its resources consistent with Congress's intent in establishing the San Pedro RNCA.

When Congress established the San Pedro RNCA in 1988, Congress explicitly reserved "…a quantity of water sufficient to fulfill the purposes of the San Pedro Riparian National Conservation Area….The priority date of such reserve rights shall be November 18, 1988."[5] Congress recognized that the preservation of surface water flows in the San Pedro River was crucially important to fulfilling Congress' purposes in establishing the San Pedro RNCA. As Senator Dale Bumpers, Chairman of the Senate Subcommittee on Public Lands, National Parks and Forests, put it when considering the legislation creating the San Pedro RNCA: "There is no point in having this legislation unless we are going to protect…the free flow of water year-round."[6]

---

[1] *See* A.R.S. §45-108(I)(1).
[2] *See* A.R.S. §45-108(I)(2).
[3] *See* United States Code, Title 16, Conservation, Chapter 1 – National Parks, Military Parks, Monuments, and Seashores, Subchapter CIX – San Pedro Riparian National Conservation Area, Section 460.
[4] *See* Title 16, Chapter 1, Section 460(a) of the United States Code.
[5] *See* Title 16, Chapter 1, Section 460(d) of the United States Code.
[6] Quoted in Glennon, Robert. 2002. *Water Follies, Groundwater Pumping and the Fate of America's Fresh Waters*, Island Press, 1718 Connecticut Avenue, N.W. Suite 300, Washington D.C., p. 54.

The San Pedro RNCA has a federal reserved water right that is senior to and supersedes water rights and uses created after November 18, 1988. Persons who seek to establish new water rights or water uses after November 18, 1988 cannot impair the federal reserved water right created expressly to protect Congress' purposes in establishing the San Pedro RNCA. Federal law protects this reserved water right against interference by subsequent water users, whether those users rely on surface water or ground water.[7] For this reason, the Arizona Department of Water Resources (ADWR) must consider the federal reserved water right for the San Pedro RNCA when deciding whether to issue a Designation of Adequate Water Supply for the proposed Tribute development. Ground water pumping and water uses associated with the proposed master-planned community cannot impair the federal reserved water right that has been expressly created to preserve the San Pedro RNCA. Moreover, ADWR must take a long-term view and consider the impacts of ground water pumping and the risk of impairing that right over the next 100 years. If future ground water mining to provide water for the proposed development will impair San Pedro RNCA reserved water rights over the next century, then ground water is not legally available and ADWR must deny the application for Designation of Adequate Water Supply.

The U.S. Supreme Court decision in Cappaert v. United States, 426 U.S. 128 (1976), provides the legal basis for an ADWR denial of the application for a Designation of Adequate Water Supply

In 1952, President Truman issued a proclamation under the American Antiquities Preservation Act, adding the Devil's Hole unit to Death Valley National Monument (now Death Valley National Park). The Devil's Hole National Monument protected the habitat for the only known naturally-occurring population of an endangered species, the Devils Hole Pupfish (*Cyprinodon diabolis*). In 1967, the same year that the Devil's Hole pupfish was listed as an endangered species under the Endangered Species Act, the Cappaerts, who owned a nearby ranch, began pumping ground water for agricultural irrigation from the same aquifer that was the source of ground water for Devil's Hole. The Cappaert's ground water pumping decreased the water level in an underground pool at Devil's Hole National Monument that provided the only known habitat for the endangered fish.

In 1968, the Cappaerts subsequently applied to the Nevada State Engineer for permits to change the use of ground water from several of their wells. The National Park Service filed a protest, seeking a denial of the application or a postponement of a decision until it could be determined whether the Cappaert's ground water pumping should be limited to prevent lowering of the water in the underground pool at Devil's Hole National Monument. The Nevada State Engineer granted the state permits to the Cappaerts and the United States filed suit in federal district court seeking to limit the Cappaerts' ground water pumping.

The District Court permanently enjoined ground water pumping that would lower the water in the underground pool below a level necessary to preserve the Desert Hole pupfish. The district court held that when President Truman created that Devil's Hole National Monument by presidential proclamation, the United States had reserved appurtenant, unappropriated waters necessary to the purpose of the reservation, including enough water to preserve the underground pool and the endangered Desert Hole pupfish. The District Court held that this federal reserved water right antedated the Cappaert's water rights and that the United States could seek appropriate injunctive relief. The Court of Appeals affirmed the District Court decision and the Cappaerts petitioned the United States Supreme Court for relief.

[7] See Cappaert v. United States, 426 U.S. 128 (1976).

In 1976, the U.S. Supreme Court decided the landmark *Cappaert v. United States* case. The U.S. Supreme Court held that when the United States established the Devil's Hole National Monument by presidential proclamation, it acquired, by reservation, water rights in unappropriated, appurtenant water sufficient to maintain the level of the underground pool in the monument to preserve its scientific value [*See* Cappaert v. United States, 426 U. S. at 138-147]. The U.S. Supreme Court explained that when the federal government reserves land from the public domain, by implication, *it reserves water rights sufficient to accomplish the purposes of the reservation*. In the 1952 presidential proclamation creating the Devil's Hole National Monument, the President expressed an intention to reserve unappropriated water to preserve the underground pool and its fish species [*See* Cappaert v. United States, 426 U. S. at pp. 138-141]. The U.S. Supreme Court held that the federal district court had appropriately tailored its injunctive relief to curtail the Cappaert's ground water pumping only to the extent necessary to preserve a water level adequate to protect the underground pool's scientific value as the natural habitat of the fish species sought to be preserved. [*See* Cappaert v. United States, 426 U. S. at p. 141]. Also, since the "implied reservation of water" doctrine was based on the necessity of water for the purpose of the federal reservation, the U.S. Supreme Court held that the United States could protect its reserved water from subsequent diversion, *whether the diversion is of surface water or groundwater*. *See* Cappaert v. United States, 426 U. S. at pp. 142-143.

The legal principles of federal reserved water rights articulated in Cappaert v. United States are relevant to the ADWR decision whether to grant or deny the application for a Designation of Adequate Water Supply (File No. 40-700705). The facts here and those in the *Cappaert* case are remarkably similar. In *Cappaert*, President Truman established a national monument by presidential proclamation. Here, the U.S. Congress established the San Pedro RNCA, the first riparian national conservation area in the nation, by federal law. In *Cappaert*, the federal reservation creating the Desert Hole National Monument predated the Cappaert's application to the Nevada State Engineer for a permit to pump ground water. The establishment of the San Pedro RNCA in 1988 predates the application for a Designation of Adequate Water Supply for the proposed development in Sierra Vista. When President Truman created the Devil's Hole National Monument, there also was an *implied* reservation of water sufficient for the purpose of establishing the Desert Hole National Monument (i.e. a federal reserved water right). When the U.S. Congress established the San Pedro RNCA, Congress *explicitly* reserved sufficient water to serve the purposes of the San Pedro RNCA. Both the *Cappaert* case and the San Pedro RNCA fact situations involve applications for a state permit or, in this case, for a Designation of Adequate Water Supply to authorize ground water pumping.

Like the National Park Service in the *Cappaert* case, it is clear that the BLM has a legitimate objection to proposed ground water mining to protect its federal reserved water rights for the San Pedro RNCA from impairment. Moreover, it is clear that the United States can seek appropriately tailored injunctive relief to prevent the impairment of reserved water rights to preserve sufficient flows in the river for the purposes of the San Pedro RNCA. ADWR finds itself in the same untenable position as the Nevada State Engineer in the *Cappaert* case. ADWR must decide whether to enable a century of unsustainable ground water pumping in a groundwater basin that is already in a severely overdrafted condition, is not achieving safe yield, and that threatens the very existence of the San Pedro RNCA. ADWR should take the lessons of Cappaert to heart, avoid litigation that it has little chance of prevailing, and do the right thing by denying the application for a Designation of Adequate Water Supply.

It is well-established in the scientific literature that surface water flow in the San Pedro River is affected by ground water pumping in the upper San Pedro River ground water basin

The hydrogeology of the upper San Pedro River basin has been extensively studied over the last 30 years. There is broad consensus among scientists and hydrologists that the regional and floodplain alluvial aquifers in the upper San Pedro groundwater basin and the surface water flows of the San Pedro River are connected. It also is well-established in the scientific literature that groundwater pumping in the upper San Pedro River sub-watershed negatively impacts surface flows of the San Pedro River.

In 1982, the U.S. Geological Survey developed and tested a ground-breaking numeric ground water model of the alluvial groundwater basins of the Southwest using data and information for the upper San Pedro River basin.[8] The USGS groundwater model adequately described ground water flows, stream-aquifer connections, and evapotranspiration in the upper San Pedro ground water basin. Water level contour maps derived from existing data and model simulations showed a pattern of ground water level declines in the Fort Huachuca – Sierra Vista area and the expansion of existing cones of depression.

In 1987, U.S. Army Corps of Engineers (COE) investigators used the USGS regional groundwater model developed by Freehey (1982) to further evaluate ground water conditions and model future water use scenarios to predict the impacts of ground water withdrawals on the regional aquifer in the upper San Pedro groundwater basin.[9] The COE confirmed the earlier finding that ground water pumping in the Fort Huachuca – Sierra Vista and Huachuca City areas had created large cones of depression in the upper San Pedro ground water basin.[10] COE investigators found that ground water pumping in the Fort Huachuca – Sierra Vista area had created a cone of depression estimated to be four miles long and 1½ miles wide. The COE also found that expansion of the cone was associated with new development in the Sierra Vista area. COE investigators determined that there also was a cone of depression in the Huachuca City area estimated to be three miles long and one mile wide. Finally, COE investigators determined that ground water flows along the Babocomari River had actually reversed direction and that some of the ground water that had flowed eastward towards the San Pedro River had been captured and was moving towards the Huachuca City cone of depression. COE investigators concluded that, despite the large amounts of ground water thought to be stored in the regional aquifer, ground water pumping far exceeded safe yield in the basin and threatened the water supply of the entire San Pedro basin "in the not too distant future."[11]

In 1988, the Arizona Department of Water Resources (ADWR) studied the hydrology and water uses in the upper San Pedro ground water basin to evaluate whether the basin should be designated as an Active Management Area.[12] ADWR reported the following conclusions in its 1988 study:

- Ground water withdrawals taking place in the regional aquifer around Sierra Vista resulted in an average ground water decline rate of 1.4 feet per year between 1968 and 1986. The maximum ground water decline rates were 3.7 to 3.9 feet per year for several wells in the area.

---

[8] *USGS Groundwater Modeling Study of Upper San Pedro Basin from Mexico to Fairbank, Arizona* (Freethey, 1982).
[9] See *U.S. Army Corps of Engineers Groundwater Modeling Study for Fort Huachuca* (COE, 1987) in Fort Huachuca Programmatic Biological Assessment, Appendix F, Summary of Hydrogeology, p. 2.
[10] Id.
[11] *See* U.S. Army Corps of Engineers 1987. *Groundwater Modeling Study for Fort Huachuca*, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-1.
[12] See Arizona Department of Water Resources. 1988. *ADWR Study of Water Resources of the Upper San Pedro* summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-3.

- A cone of depression approximately 7.5 square miles in area likely existed in the Sierra Vista area. The cone of depression had grown from an area of about five square miles in 1968 (i.e., an increase of an estimated 2.5 square miles over an 18-year period).

- Continued ground water pumping between 1986 and 2000 would mine an estimated 208,000 acre-feet of ground water from the regional aquifer resulting in a maximum ground water decline of about 80 feet and a maximum ground water level decline rate of six feet per year.

- The ground water model used to project water levels to the year 2000 showed that ground water levels in the regional aquifer several miles west of the San Pedro River would rise up to 20 feet at Hereford, decline about ten feet west of Lewis Springs, and decline by about ten feet west of Charleston. The decline in the water table was predicted to be about 0.7 feet per year based on estimated rates of ground water pumping.

- The artesian heads present in some portions of the regional aquifer underlying the flood plain alluvium of the San Pedro River had decreased somewhat over time due to ground water development.

In 1989, the BLM prepared a management plan and environmental impact statement (EIS) for the San Pedro RNCA.[13] The BLM conducted a hydrologic analysis of surface and ground water resources as part of its combined management plan and EIS. BLM scientists observed that there had been reductions in the base flow of the San Pedro River but they were uncertain as to the causes of the reductions. BLM scientists hypothesized that observed reductions in the base flow of the San Pedro River may have been caused by reduced recharge of the floodplain aquifer by the regional aquifer, reduced recharge of the floodplain aquifer by surface water runoff, increased ground water pumping from the floodplain aquifer, increased use of the floodplain aquifer by phreatophytes (e.g., trees), or the increased loss of groundwater in the floodplain aquifer to the regional aquifer.[14] However, the BLM scientists thought that several of these possible causes were unlikely, stating:

> It does not appear that the declines in base flows can be attributed to declines in overall runoff in the basin. Also, it is unlikely that changes in phreatophyte use or losses to the regional aquifer have significantly affected base flows. *Thus it can be deduced that either groundwater pumping in the floodplain aquifer, reduced recharge from the regional aquifer, or a combination of both have contributed to the lower base flows recorded at both [Charleston and Palominas] gauges* [emphasis added].[15]

In 1990, Schwartzman conducted an investigation of the lower Babocomari River, a tributary to the San Pedro River, to evaluate effects of ground water pumping on the river.[16] Schwartzman found that groundwater pumping affected ground water flow patterns in the northern Huachuca City and Fort Huachuca East Range areas and that a cone of depression had formed in the study area. Schwartzman concluded that continued ground water declines would adversely affect riparian habitats along the

---

[13] *See* Bureau of Land Management. 1989. *San Pedro River Riparian Management Plan and EIS,* summarized in Appendix F Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-5
[14] Id.
[15] Id.
[16] *See* Schwartzmann, 1990. Hydrological Resource Assessment of Lower Babocomari Watershed, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-6

Babocomari River and recommended that ground water levels near the Babocomari River be closely monitored to better manage riparian resources in the area.[17]

In 1991, ADWR conducted a Hydrographic Survey Report (HSR) for the San Pedro River watershed as part of the general adjudication of the Gila River system.[18] Chapter 4 of Volume 1 of the hydrographic survey report contained a hydrologic analysis of the San Pedro River. ADWR reached several relevant conclusions about the hydrology of the San Pedro River in the HSR, including the following:

- Cultural depletions impacted the hydrologic system by lowering groundwater levels in the regional and floodplain aquifers and/or by directly reducing stream flow in the channels. The removal of groundwater may directly or indirectly interfere with stream flow. Direct interference occurs when the cone of depression of a pumped well(s) intercepts the streambed and induces surface water to move away from the stream. Indirect interference occurs when the cone of depression does not intercept the stream, but reduces the amount of groundwater discharged to the stream by intercepting ground water flows.[19]

- ADWR concluded that a negative change in storage of -11,230 ac-ft was occurring in the Sierra Vista subwatershed as a result of municipal ground water pumping in the Sierra Vista-Fort Huachuca area and ground water pumping to supply irrigation uses located near the San Pedro River.[20]

As in previous hydrologic studies, ADWR found that there was a direct correlation between population growth, water usage, and declining ground water levels in the Sierra Vista area.

In 1992, Maddock and Vionnet conducted a study titled *Modeling of Groundwater Flow and Surface / Groundwater Interaction for the San Pedro River Basin.*[21] The purpose of the study was to improve existing ADWR groundwater models of the Upper San Pedro River basin. Maddock and Vionnet concluded that by 1988, the end of the model simulation period, an estimated 13, 680 acre feet/year of ground water was being extracted through pumping and that stream flow gains were drastically reduced over the 48-year simulation period. Maddock and Vionnet concluded that the subsurface geology in the Charleston vicinity initially inhibited the Sierra Vista cone of depression from intersecting the San Pedro River but that the model simulation indicated that the cone of depression will spread to the south and perhaps intersect the San Pedro River upstream of the inhibiting geologic formation near Charleston.

In 1993, the USGS and BLM conducted a comprehensive analysis of the geomorphic history and condition of the San Pedro River basin titled *Entrenchment and Widening of the Upper San Pedro River* (Hereford, 1993). The principal investigator in that study made the following observation:

---

[17] Id.

[18] See Arizona Department of Water Resources. 1991. ADWR Hydrographic Survey Report for the San Pedro River Watershed, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-6

[19] Ibid.

[20] Ibid.

[21] See Vionnet and Maddock. 1992. *Modeling of Groundwater Flow and Surface / Groundwater Interaction for the San Pedro River Basin*, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-8.

Impounding of sediment in reservoirs and upstream withdrawals of surface water for agriculture, mining, or domestic use will compromise the present flow regime [of the San Pedro River], degrading the recently developed riparian community. This community is closely linked with groundwater level; a drop in this level would probably have the same effect on the riparian community as upstream impoundments and withdrawals. The effect of lowering the water table is well illustrated by the extensive degradation of the riparian environment following the entrenchment of the San Pedro River channel between 1890 and 1908. *In short, extensive development and exploitation of groundwater resources will almost surely lower the water table, with predictable consequences for the riparian forest* [emphasis added].[22]

In 1996, Corell et al. published another groundwater modeling study of the Sierra Vista subwatershed and the upper San Pedro groundwater basin.[23] Corell (1996) issued a separate report containing simulations of future groundwater and surface water conditions. Corell simulated the period from 1990 to 2030 using different rates of groundwater pumping, agricultural pumping, effluent recharge, evapotranspiration rates, and rates of population increase. Under all of the scenarios and model results, groundwater levels in the Sierra Vista were projected to decline 45 to 90 feet in the Sierra Vista area. The model results also indicated varying effects on stream flows in the San Pedro River and the Babocomari River based on varying model inputs. Under most scenarios, stream flow in the Babocomari River was projected to decrease. Stream flow in various reaches of the San Pedro River increased in reaches of the river near Palominas and Hereford if controls on agricultural pumping were imposed. However, the flow of the San Pedro River in reaches north of Tombstone decreased under most model scenarios.[24]

Goode and Maddock (2000), in a study titled *Simulation of Groundwater Conditions in the Upper San Pedro Basin for the Evaluation of Alternative Futures*, identified three major trends from their model simulations for the years 1947 to 1997.[25] The three major trends were:

- Reduced stream flow in the San Pedro River (primarily downstream of Fairbank);
- Reduced riparian evapotranspiration along the San Pedro River; and
- Formation of significant cones of depression (and associated large losses of groundwater storage) near many communities in the upper San Pedro Basin.

Finally, Steinitz, et al. (2003) simulated the results of various groundwater pumping and management scenarios associated with selected alternative futures in *Alternative Futures for Changing Landscapes, The Upper San Pedro Basin in Arizona and Sonora.*[26] The researchers analyzed alternative futures based on different scenarios that could be grouped into three major categories: 1) scenarios that generally

---

[22] *See* Hereford. 1993. Entrenchment and Widening of the Upper San Pedro River, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-10.

[23] *See* Corell, et al, 1966), *A Groundwater Flow Model of the Sierra Vista Watershed of the Upper San Pedro Basin-Southeastern Arizona,* summarized in Appendix F, Fort Huachuca Programmatic Biological Assessment, p. F-11..

[24] *See* Corell, 1996. *Groundwater Flow Model Scenarios of Future Groundwater and Surface Water Conditions; Sierra Vista Subwatershed of the Upper San Pedro Basin – Southeastern Arizona*, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-13 .

[25] *See* Goode and Maddock. 2000. *Simulation of Groundwater Conditions in the Upper San Pedro Basin for the Evaluation of Alternative Futures*, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-18.

[26] *See* Steinitz, et al. 2003. *Alternative Futures for Changing Landscapes*, *The Upper San Pedro River Basin in Arizona and Sonora*, summarized in Appendix F, Summary of Hydrogeology, Literature Review - Fort Huachuca Programmatic Biological Assessment, p. F-21.

maintained the status quo; 2) scenarios based on slower growth and implementation of aggressive land conservation and habitat protection measures; and 3) scenarios based on rapid growth with a decrease in land conservation and habitat protection measures (the "open" scenarios). It is fair to say that the development of the Tribute master-planned community probably fits most appropriately into one of the "open" scenarios. The model simulations for the "open" scenarios resulted in the most severe groundwater impacts with groundwater storage continuing to decline, with losses increasing from 8 to 37% over 2000 conditions. Also under the "open" scenarios, the model predicted that the San Pedro River would lose approximately 20 miles of perennial or intermittent flows.

The points of this exposition of this long history of hydrological studies are these: The hydrological connection between the San Pedro River and the regional and floodplain aquifers of the Sierra Vista subwatershed is well-established and increasingly well documented after more than four decades of study. It is well-established that the regional aquifer is being depleted. The proposed Tribute development will cause even more groundwater depletion in the upper San Pedro subwatershed, ultimately threatening the future of the San Pedro River. ADWR should carefully consider this body of hydrological literature and do what needs to be done….deny the application for a Designation of Adequate Water Supply.

Sufficient groundwater, surface water, or effluent are not physically available for the proposed Tribute development for 100 years without impairing federal reserved water rights for the San Pedro RNCA.

The Tribute master planned community is proposed to be located within the City of Sierra Vista, Arizona. According to the City of Sierra Vista website, the Tribute master-planned community will include up to 6,959 homes on 1,916 acres and could house as many as 17,000 new residents at full build out.[27] The proposed development also will include commercial development, public school sites, public facilities, and open space (including a new golf course that will, at least initially, be irrigated with pumped ground water). The City of Sierra Vista publicly acknowledges that any new development will impact ground water and that all water use is of concern within the Sierra Vista sub-watershed because of its potential to impact the San Pedro RNCA. According to the City of Sierra Vista website, the master-planned community at full build out is projected to use 2,000 acre feet of ground water each year. One acre-foot of ground water equals 325,851 gallons. When you do the math, the proposed Tribute development at full build out will pump 651,702,000 gallons of groundwater from the regional aquifer each year (that's 651 **million** gallons / year!). Over a century of ground water pumping, that translates to the withdrawal of more than 65 **billion** gallons of groundwater out of the regional aquifer for the Tribute master-planned community alone. Given our current understandings of current overdraft and annual rates of ground water recharge, it is difficult to see how ADWR can make a finding that sufficient groundwater is physically available for the proposed development for 100 years.

Even if one accepts estimated mitigation figures for the proposed development of 1,325 to 1,625 acre-feet per year that are published on the Sierra Vista website, there will still be an immense amount of ground water mining in a regional aquifer that is already overdrafted. If the applicant is able to mitigate and return 1,625 acre-feet or 80 percent of the 2,000 acre-feet of groundwater they propose to pump each year, there still would be a net loss of 122,194,125 gallons of pumped groundwater each year. Even with this over-generous mitigation estimate, the proposed Tribute development will result in the mining of 12.2 billion gallons of groundwater from the regional aquifer over the next century. If the

[27] http://www.sierravistaaz.gov/egov/docs/1279125811529.html.

applicant is able to mitigate and return 1,325 acre/ feet per year, or 65% of the groundwater they propose to pump, the net loss to the regional aquifer increases to 220 million gallons per year, or 22 billion gallons of groundwater over 100 years. Does ADWR believe that the regional aquifer can sustain such net losses to justify issuance of a Designation of Adequate Water Supply?

Public Law 108-136, Section 321 requires the submittal of a report to Congress on the quantity of overdraft of the regional aquifer of the Sierra Vista subwatershed, progress towards reaching the goal of achieving reductions of the overdraft, and water use management and conservation measure undertaken to reduce the overdraft.[28] In the most recent Section 321 report, the USGS estimated the quantity of overdraft to be 4,300 acre feet per year (as of 2008). The USGS summarized the current overdraft situation in the Sierra Vista subwatershed as follows:

> *It is important to understand that the overall situation in the regional aquifer of the Sierra Vista Subwatershed today is not improving; rather, it is getting worse* at a rate slower than 2002 (and 2007). Though the annual overdraft of the aquifer has been greatly reduced from the 15,084 acre-ft anticipated for 2008 when first estimated… to 4,300 acre-ft today, this is still another 4,300 acre-ft of water that has been removed from storage in addition to the hundreds of thousands of acre-ft that have been removed from storage since groundwater pumping commenced in earnest in the first half of the 20th century [emphasis added].[29]

The important point here is that the groundwater mining situation in the San Pedro Subwatershed is getting worse, not better. Continued ground water mining on the scale contemplated in the proposed application for a Designation of Adequate Water Supply exacerbates groundwater depletion and threatens both the regional water supply and the San Pedro River in the long-term. If ADWR issues a Designation of Adequate Supply for the proposed development, it will be taking a step in the wrong direction, making a bad overdraft situation even worse. ADWR should not enable unsustainable growth and development in Sierra Vista or threaten continued flows of the San Pedro River, one of the Last Great Places in the nation. The long-term consequences to the region and the San Pedro River are simply unacceptable. ADWR should deny the application for a Designation of Adequate Water Supply.

Sincerely,

Steve Pawlowski
Water Sentinels Program Coordinator
Sierra Club – Grand Canyon Chapter

[28] Upper San Pedro Partnership, 2010. Water Management of the regional aquifer in the Sierra Vista Subwatershed, Arizona 2009 report to Congress: Washington, D.C. U.S. Department of Interior, 75 p.
[29] Ibid at p. 6.