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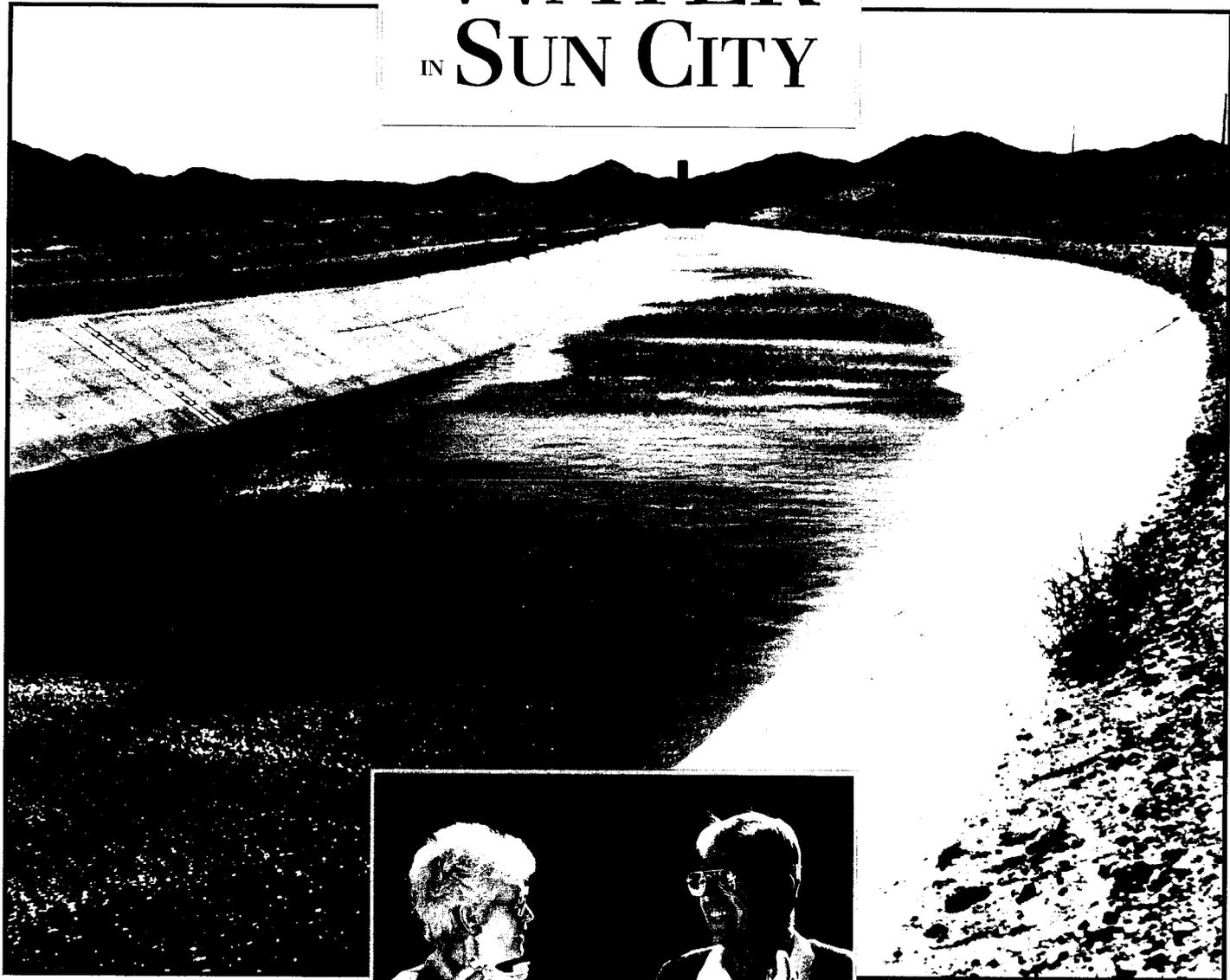
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# CAP WATER IN SUN CITY

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ARIZONA CORPORATION COMMISSION  
PHOENIX, ARIZONA



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**Sun City's Advocate Since 1963** DOCKETED BY 

SUN CITY HOME OWNERS ASSOCIATION

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“Land Subsidence and Earth Fissure Hazards near Luke AFB, Arizona”.  
 By Herbert H. Schumann in U.S. Geological Survey Open File  
 Report 94-532, p. 18-21

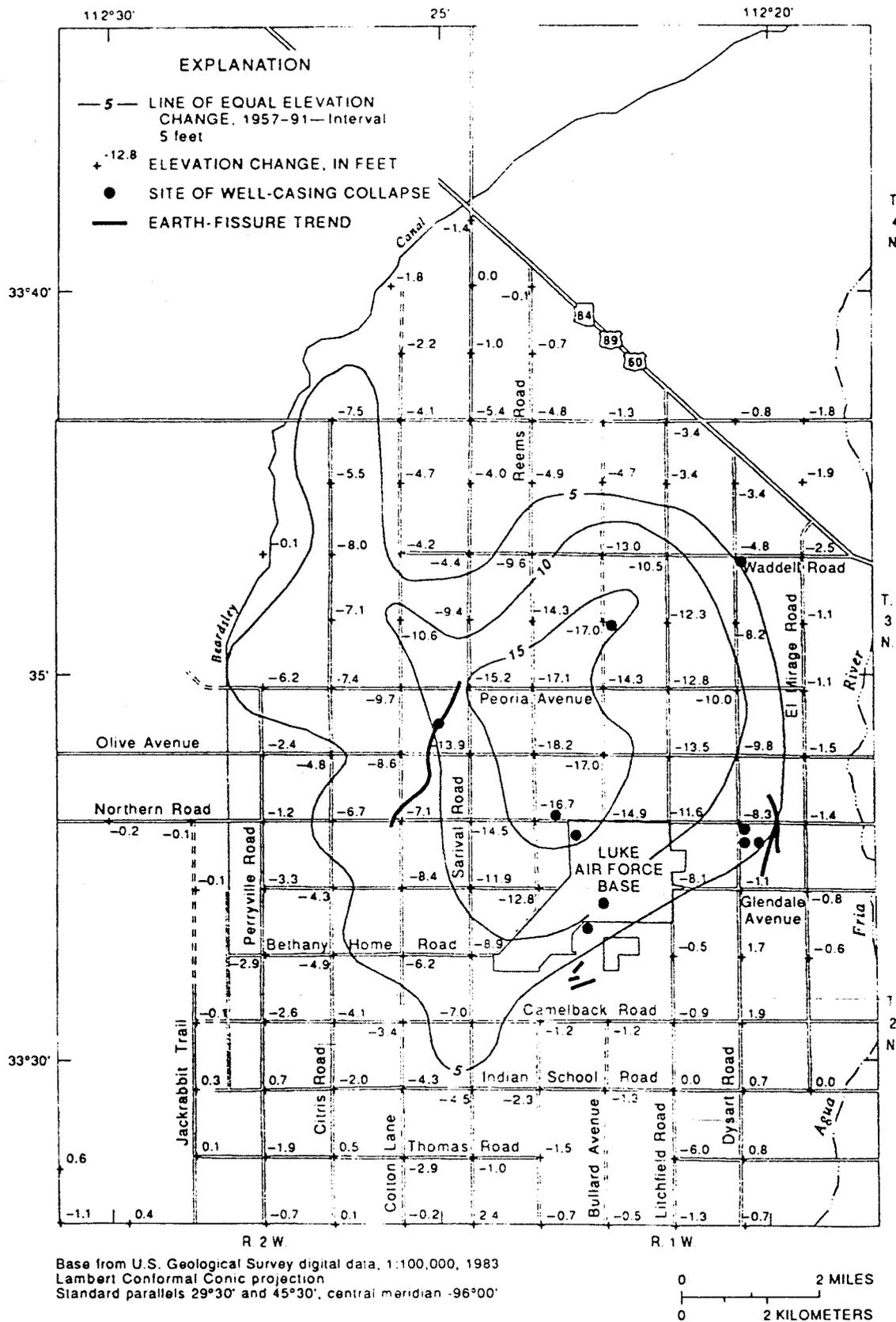


Figure 19. Land subsidence in part of western Salt River Valley, 1957-91.

## WHY ARE SUN CITY RESIDENTS CONCERNED ABOUT THEIR WATER?

For most residents of Sun City, the water we use in our homes is something we take for granted. In part, this casual attitude toward our water supply comes from our experience in living in communities in other states where the supply of good water is simply not an issue. An abundance of either rainfall or groundwater has been the rule in most parts of the United States, and cities and towns generally have had no problem in providing an adequate supply of water to their communities.

But we live in a desert.

Our average rainfall in the Valley doesn't come anywhere near matching the needs of our growing communities. Historically, there were two major sources of water for use in the Valley. The first is the Salt River Project (SRP), which supplies water from the Salt and Verde rivers to the area within the legal boundaries of the SRP. None of that water is available to Sun City.

The second major source of water for residential use is pumped groundwater. This is water drawn from the underground aquifer, which exists, at varying levels, beneath the Valley. That aquifer is, in part, replenished each year by natural recharge from rainfall and the streams from outlying areas that feed into the Valley.

But the major problem with the use of groundwater is that our population is increasing far faster than natural recharge can replenish it.

The result is what is called "overdrafting." The population of the Valley is using groundwater far faster than nature can restore it, and the result is a falling groundwater table.

The problem is particularly acute in the Northwest Valley, which includes the Sun City area. The water table in our area of the Valley has dropped hundreds of feet since records were first kept of groundwater levels, and it continues to drop. The reason for that drop is not hard to find. The rapid growth of homes in neighboring Glendale, Peoria, Surprise and Sun City West have all increased in population to levels that were undreamed of when Sun City was first created. These new residents get their water supplies from the same underground aquifer as Sun City does, so overdraft was inevitable.

The impacts of overdrafting and a dropping of groundwater table are threefold: (1) increased cost of pumping; (2) deterioration of water quality; and (3) land subsidence.

The deeper the wells from which you are pumping groundwater, the greater the cost in power and other operating costs. And that cost has to be borne by the residents of Sun City. And the deeper you go to draw up groundwater, the more the quality of the water becomes a problem. The deeper you go, the more heavily the water is mineralized, so it becomes much "harder." It has a bad taste and you experience an increase in the clogging of the pipes that make up the water distribution system.

But land subsidence is the most obvious impact of a falling groundwater table. Just to the south of Sun City, particularly in the area of Luke Air Force Base, one can see remarkable visual evidence of the fact that the level of the land has been dropping steadily. The extraordinary levels of land subsidence, which are clearly visible, are only part of the story, however. The most important evidence available to us is that the Luke area of land subsidence is slowly spreading. And the direction of that spread is moving inexorably closer to Sun City.

The only thing that will stop the spread of land subsidence in the direction of Sun City is to substantially reduce pumping groundwater from beneath our community.

How to go about solving the water problem facing Sun City is not a simple problem. In fact, it is one of the most complex and difficult problems any community can face. But one thing is indisputable -- water is a problem that cannot be ignored.

Residents of the Sun Cities and Youngtown with professional background in water resource management formed the "CAP Task Force" and studied the facts regarding water in the Northwest Valley, and their conclusions are an important part of these papers.

The papers in this booklet are provided by your Sun City Homeowners Association in an effort to educate the community about the water situation, and the measures, which will be essential to deal with it.

## **SUBSIDENCE: THE MOST OBVIOUS PROBLEM**

Subsidence in the surface of the land is the inevitable result of the overdrafting of the groundwater aquifer. As water is pumped out of the ground in amounts substantially in excess of natural replenishment, then over time the land above the groundwater table slowly subsides and land fissures develop.

The amount of land subsidence that will occur in a given area will depend upon the water table, the groundwater pumping rates, the types of soils and the rates of natural recharge. How all those factors will interact to create subsidence in a given area is very difficult to predict, and hence the best predictor of future subsidence is past experience in the particular area of concern. That is, when you have a situation of known groundwater overdrafting (such as we now have in the Northwest Valley), the best guide to use in predicting future subsidence is to look at the history of what is happening in that area.

The attached map shows the area of subsidence that has been occurring in the area just to the south of Sun City. This area is generally known as the "Luke cone of depression," since it is centered in an area adjacent to Luke Air Force Base. The historical records show that this area of subsidence is gradually spreading northward, and that the rate of spread is increasing. The Sun City Homeowners Association (HOA) obtained a photographic record of that subsidence and has posted those photos in its main office on Coggins Drive. Those photographs show a clear and indisputable record of land subsidence that is remarkable in its effect on the land surface immediately to the south of our community. Those pictures are worth examining for the view they give of upended and broken pavement and underground piping. And those views, of course, are a predictor of the damage that could occur in the Sun City community.

HOA has also commissioned two studies by an eminent geology expert (Herb Schumann) to show the scientific basis of the spread of subsidence now heading in the direction of Sun City. Dr. Schumann's studies clearly show the future danger of subsidence in the Sun Cities area.

In the Northwest Valley, the spread of subsidence also correlates with three other particularly nasty features. First, the underground complex surrounding Luke has an extremely high salt content. As water is withdrawn from beneath Sun City, and the underground water table drops, there is an increasing opportunity for very salty (i.e., highly mineralized) underground water to migrate northward toward Sun City. The potential result is an even greater amount of degradation in the quality of the water, which is used by Sun City for all its residential drinking water.

The second extremely serious impact of subsidence is that once it occurs, it is irreversible. As the surface of the land subsides, the sub-surface layers of land compact as water in the soils is squeezed out. And once the water that is normally a part of underground soils is removed, the sinking of the land compacts those soils in a manner, which precludes water from reentering. As a result, once subsidence occurs, the land becomes permanently sunken, and there is no way to correct the situation.

And third, the rate at which the Northwest Valley is overdrafting groundwater is steadily increasing. That is, as communities are being built up around Sun City, their increasing population places an increasing demand on the groundwater supplies. Neighboring communities recognize this problem, and are taking steps to make better use of CAP water themselves. However, their efforts, while laudable, are currently not enough to stop the steady drop in the water table. Thus, a combination of overdrafting by the Sun Cities, coupled with overdrafting by its surrounding communities, has led to a major problem.

Obviously, the time to deal with subsidence is before it occurs. And the only way to do that is to stop the overdrafting of the underground aquifer. Any reduction in groundwater pumping will help the situation. The use of CAP water by the residents of Sun City is probably not enough to completely resolve the threat of subsidence in our community. But it is an important step in the right direction.

## CAP WATER: WHAT IS IT?

"CAP" is the "Central Arizona Project." CAP is the broad acronym used to designate the canal system that is used to bring water from the Colorado River across Arizona to Phoenix and Tucson.

Going back four decades ago, the political leadership of Arizona recognized that in order for the major metropolitan centers of Arizona to be able to grow, we were going to have to find an additional source of water. The water available here in the desert was a very finite and limited quantity, and would be nowhere near enough to accommodate the growth that was clearly on its way. Not only was surface water limited and subject to drought cycles, but groundwater supplies were even less likely to be adequate for the long run.

Arizona fought a long and difficult legal battle with the states of Colorado, California and Nevada to get a fair share of the water available in the Colorado River. The result of that legal battle was a compact between those three states (and the U.S. Government) which guaranteed Arizona enough water to assure its economic future. But there was no way to take delivery of that water. That is, no natural channel exists which would get water from the Colorado River over into the Phoenix Valley.

Accordingly, the state of Arizona entered into an arrangement with the federal government to build the CAP canal system, which would deliver Arizona's share of Colorado River water to the Valley. That CAP canal is a marvel of modern engineering, and is now fully operational.

Colorado River water is basically good surface water. It is used by communities all up and down the Colorado basin, and is a mainstay of the water system, which serves Southern California. It can be used directly on agricultural crops, although it is often mixed with local water supplies to deal with its slightly higher mineral content. It is suitable for use on golf courses as turf irrigation, although most golf course users will do a minimal filtration in order to avoid clogging sprinklers.

Colorado River water is also used extensively for drinking water purposes, although treatment is required. Both Phoenix and Glendale, to cite two close-by examples, treat CAP water for use as part of their municipal water supply.

As you would expect, CAP water is not cheap. The future costs of CAP water are expected to continue to rise, and costs which could be as much as four times the present cost of pumped groundwater are possible. But unfortunately, it's the only alternative we have.

Firm subscription or contract speaks for almost all the currently available CAP water. As a result, you just cannot go out in the market and buy CAP water. However, Citizens Water Resources did, at the very inception of the CAP program, reserve a block of CAP water for use by Sun City. That amount of water (4,189 acre/feet) is a relatively small portion of Sun City's overall residential needs, but is a significant offset to the groundwater pumping now being done in the local area.

Unfortunately, that Sun City block of CAP water is now in a "use it or lose it" situation. If that CAP water is not put to productive use in the Sun City area, Citizens will not be in a position to charge for it, and hence will return it to the general state pool of CAP reserves. And once lost, it is gone forever to our community.

HOA leadership studied the possibility of getting other surface water supplies to enable it to deal with the subsidence problem (purchasing water from Indian tribes, for example), but no other possible water source could be made to work.

## HOW CAN CAP WATER BEST BE PUT TO USE IN SUN CITY?

In its deliberations on the use of CAP water, the CAP Task Force considered at least seven different plans for using CAP water in the Sun City community. Each of those plans had some merit and some disadvantages. Each of the plans was analyzed to bring out all the facts of what was involved in making use of CAP water. That research work very quickly revealed that the Task Force, in trying to decide what was the best way to make use of CAP water, would first have to agree on the objectives for putting CAP water to use, and then measure the various plans against those objectives.

In other words, an understanding of the goals, which the community had in making use of CAP water, had to be the driving force in deciding the best plan to make use of CAP water.

It didn't take long to recognize that one basic goal was of paramount importance to the Sun City community. Namely, if Sun City residents were going to pay for the CAP water, then it had to be put to use directly in Sun City. To deal with problems such as subsidence, Sun City needed the benefit of real water which could be put to use in restoring the effects of the over-pumping which impacted groundwater levels. There was no value, for example, to implementing groundwater recharge projects located some distance from Sun City. In addition, whatever plan was chosen had to be feasible from an engineering perspective, and had to be doable at a cost that could be borne by the water rate payers of Sun City. It was also felt that any water use plan, which didn't meet that one basic goal of being of direct use in our community, would not be acceptable to the people who would have to pay for CAP water.

For example, several persons thought initially that storing water in a recharge basin a considerable distance north of Sun City might be acceptable since, with time, that water would seep down underground and then likely migrate southward underground and ultimately benefit the water levels under Sun City. However, it was soon realized that underground migration rates took place, at best, in terms of feet per year. And as a result, water recharged miles north of Sun City would take many decades to even begin to affect our community. Because such a plan would not directly benefit the people who would be paying for the CAP water, it was judged unacceptable.

Unfortunately, there are no land areas available in Sun City, which could be put to use as a settling pond for recharge purposes.

What was realized early on in analyzing the possible uses of CAP water is that if you shut off the pumps that are presently pumping groundwater beneath Sun City, you bring about an immediate and direct relief to the pressure being put on the underground aquifer. That is, the best way to stop the effects of mining groundwater is to cut back on

existing pumping. And so the CAP Task Force looked for ways to use CAP water in a manner that would reduce the current level of pumping.

One possibility, of course, would be to build a CAP water treatment plant and use the water for drinking purposes as a replacement for the water currently being pumped for residential use. That idea was rejected because the costs of such treatment would have been prohibitive in light of the amount of water available. A second possibility was based on recognition that the Rec Centers' golf courses in Sun City currently have the right to pump groundwater for turf irrigation purposes. Since CAP water has been used for years for golf course watering with no ill effects, this made it an ideal solution to be considered.

After a great deal of study, a plan was evolved to bring CAP water from the CAP canal to the Sun City golf courses, and thus save groundwater pumping which would otherwise have been required to keep the courses green. This plan requires the construction of a pipeline to get the CAP water from the canal to Sun City, and some filtering of the water to remove solid materials that might otherwise clog the delivery system. Engineering studies were done to make sure the plan was feasible, and to carefully estimate the costs involved. Citizens hired independent engineers to make those studies, and then the Sun City Home Owner's Association, through it grant, hired its own engineer to verify that the costs were within the limits that had been estimated.

The more it was considered, the "golf course" plan only made common sense. If you stop pumping groundwater, you give the aquifer a chance to recover. The engineers on the CAP Task Force were quick to point out that the simplest plan is usually best, and the simple approach of using CAP water on the golf courses to reduce the present over-pumping represents the kind of common sense that the residents of Sun City would readily understand.

It was recognized that the "golf course" plan was more expensive than plans, which would recharge the water at some distance from Sun City. However, as the various possible alternative plans are considered, it becomes obvious that **only** the golf course plan meets the basic goal which was set to evaluate how to best make use of CAP water. And as a result, the CAP Task Force clearly and firmly recommended going forward with a plan to use CAP water to substitute for most of the current groundwater pumping on the golf courses.

This paper is only a very brief summary of all the analysis that went into the choice of the "golf course" plan as the best vehicle to put CAP water to use in Sun City. The serious student of water use planning should review the CAP Task Force report for further information on the subject.

## WHAT WILL BE THE COSTS TO SUN CITY RESIDENTS OF USING CAP WATER?

The cost of the Sun City/Youngtown CAP water allotment of 4,189 acre feet per year (325,851 gallons in an acre foot) will be divided equally among all of the unit owners in Sun City. Each unit will pay the same dollar amount for the CAP water. Commercial users will pay their share based on a 'total use formula.' Our CAP water allotment is equal to about 3,500 gallons per unit per month. It doesn't make any difference how much water we use, that is all that will be available! The option to reduce the use of groundwater (turning off the pumps on the Sun City Recreation Centers golf courses) saves approximately 3,500 gallons of water per unit per month to be used and paid for, equally, by each unit.

The CAP water costs will be incurred in two stages.

**Stage 1.** This is an interim plan to defray costs during construction. Recovery of CAP water holdings costs for the past years, spread over 60 months (about \$.27 per month per household). Citizens Water Resources (our water utility) would begin collecting revenues to pay the cost to deliver CAP water to the Maricopa Water District for recharge (about \$.94 per month). Total estimated cost per residential unit for Stage 1 for the 60 months, while the pipeline is being built, are thus estimated to be \$1.21 per month per household.

**Stage 2.** Stage 2 would be the long-term part of reducing groundwater pumping. This program will build a pipeline from the CAP canal (8.7 miles north of Sun City) to the distribution head-point of the Sun City Recreation Centers golf courses so that the total allotment of CAP water would be used on the golf courses, instead of pumping groundwater. The total cost for Stage 2 would be \$5.80 per month per residential unit, which includes the CAP water costs.

While these monthly increases are a substantial change, it should be recognized that our present water costs are one of the lowest in the Valley. For example, a single family home in Peoria, using 8,000 to 10,000 gallons of water per month would pay double what a single family home in Sun City would pay for the same amount of water! This is based on rates in effect today. The City of Peoria has scheduled additional rate increases of 13.2% in 2000, 12.5% in 2001 and 12.3% in 2002. Thus, even paying for CAP water would still leave our costs well below Peoria's. As has been discussed in these monographs, there is really no other choice to provide future water for the Sun City community.

## WHAT WILL BE THE BENEFITS TO SUN CITY FROM USING CAP WATER?

Using CAP water on the golf courses in Sun City will bring about an equivalent reduction in the pumping of groundwater from beneath our community. This reduction in groundwater pumping will, in part, allow the underground aquifer to recover from the present over-drafting. And the results of that effort will help accomplish the following:

1. Reduce the rate of decline in the groundwater table.
2. Reduce the spread of the Luke cone of subsidence, which currently is moving toward Sun City.
3. Help preserve the quality of the water available for residential use.
4. Lessen the cost of pumping groundwater from ever-deepening groundwater levels.
5. Help mitigate potential future regulatory actions by the Arizona Department of Water Resources which would impact Sun City residents based on their continuing over-drafting of the underground aquifer.

The first item above is the key to achieving the benefits of items one through four on the list. Anything that Sun City can do to reduce the decline of its groundwater level, will mean that the current expansion of subsidence in the ground above will be slowed. Similarly, not having to pump from deeper and deeper levels means that we will not be pumping up water with greater levels of dissolved minerals, since the deeper you pump from, the poorer the quality of the water. Anyone who has recently been to Mesa or Apache Junction and tasted the water will understand what a difference in the taste and quality of water results from pumping up mineral-laden water from deeper and deeper wells.

The Arizona Department of Water Resources has identified the Sun Cities' area as a "Critical Groundwater Area." This identification was made based on the recognition that declines in groundwater levels, incidences of land subsidence and earth fissures, and the likelihood of future groundwater quality problems is most serious in the Northwest Valley. This means that the Department will be considering more aggressive management approaches to deal with over-drafting in the Northwest Valley. By making the commitment to use CAP water in a manner which clearly and directly reduces groundwater pumping, Sun City sends a message to the Department that it is serious about addressing its groundwater mining problem. HOA believes that the Department will recognize the importance of that commitment and will take such action into account in evaluating future regulatory actions.

However, no one should expect that the CAP water to be used in Sun City would solve all the community's water problems. The amount of water involved is far too small to compensate for years of over-pumping and the explosive growth of neighboring cities and towns. There are no studies or scientific data available which rigorously quantify the amount of water that will be needed to bring the residential use of groundwater in Sun City into balance with the long-term rate of natural recharge of the aquifer. Many good technical people have made educated estimates of the size of our water shortfall, and all agree that it is substantial. But notwithstanding that there is still a lot to be learned about just how much future CAP water will be needed, the one fact that is the strongest indicator of the seriousness of the situation is that the water table has been declining at an increasing rate. And that's an untenable situation.

Perhaps one way to get a sense of the magnitude of the problem is to recognize that the amount of CAP water, which will be delivered to Sun City, is less than 27% of the groundwater being pumped to serve our consumer needs. So it's not too hard to see that until surface water (such as CAP) use becomes an appreciable part of the city's total water use, the problem of a declining water table will undoubtedly continue.

Notwithstanding the uncertainties about the amount of CAP water which will ultimately be needed to bring the Sun City area to a state of balance with regard to its water table. The really good news is that the projected use of CAP water on the golf courses is a healthy step in the right direction. It's like any major reform project, the magnitude of the first step isn't as important as the commitment by the community to move in the direction of preserving its groundwater and reversing the negative, over-pumping trends of prior years. The projected use of CAP water on the golf courses isn't a complete or final solution to the community's groundwater problem, but it's an essential first step in coming to grips with your future needs.

## **BUT WHAT HAPPENED TO OUR "ASSURED WATER SUPPLY?"**

At the time the original residents of Sun City bought their homes from Del Webb, they were assured that there was a more than adequate supply of water available for their future needs. Those people, as well as later residents, heard from sales people that the Sun City developments would never have a problem with the availability of water.

Later residents equated those earlier promises with the "Assured Water Supply" ("AWS") law enacted in the 1990's. That law required any developer of land in this state to obtain, as a prerequisite to proceeding with a development project, a certificate from the Department of Water Resources which certified that there was a one hundred year water supply available to the residents of the development. This certificate provided the buyer of a new home with his evidence of an "Assured Water Supply." No such certificates were ever issued in Sun City.

The concept of an "Assured Water Supply" is a very worthwhile effort at regulating the over-drafting of the underground aquifer. The concept also provides homebuyers the certainty they need regarding a long-term water supply.

Sun City is a part of what is generally described as the "Northwest Valley" basin (technically, the West Salt River Valley Sub-basin). That basin includes, for example, the towns of Peoria, El Mirage, Surprise, and Sun City West. At the time Sun City was built, those other towns and cities were very small communities. But just in the last ten years, we have seen Peoria, for example, go from a population of 15,000 to well over 50,000. Sun City West added 20,000 people to the basin almost overnight. And Surprise is now one of the fastest growing cities in Arizona. Each of those communities draws their water supply from the same underground aquifer as Sun City.

Thus, it's easy to see that while Sun City in the 1960's had the benefit of being on top of a more-than-adequate underground water supply, within thirty years it was sharing that same underground reservoir with a burgeoning population in neighboring communities. Not surprisingly, what was a plentiful supply thirty years ago is now inadequate to provide water for all the people who now live in the Northwest Valley. And, it explains why the Sun City underground water table is now slowly dropping, since natural recharge from both rain and drainage from the mountains to the North no longer replenishes what is being pumped out.

Sun City's neighbors have recognized the water resource problem, which all the Northwest Valley communities face, and are all taking steps to obtain surface water supplies such as CAP water so that they can ease off pumping groundwater. But the continued growth in the Northwest Valley means that the problem isn't going to get any better by itself. All the communities of the Northwest Valley are faced with the exact same problem, and all of them are taking steps to make use of CAP water.

The Department of Water Resources has identified the Northwest Valley water resource problem and has identified it as a "critical groundwater water management area." Since Sun City is all built out, this finding has no direct, immediate effect on the Sun City community other than to serve as a loud wake-up call. It says that if anyone's mind-set was still anchored in what was a comfortable water supply many years ago, that time is long past.

Pursuant to the Groundwater Management Act, the Phoenix AMA (Active Management Area) of the Department of Water Resources is looking at a goal of "safe yield." That is, the goal of managing the water resources of the Valley should focus on reaching a state where the amount of groundwater being pumped is matched by the amount of water being recharged. And to the extent that more water is needed than is provided by natural recharge, then surface water such as CAP must be put to use. Therefore, in order to meet the safe-yield goal, the Northwest Valley will have to provide CAP water for their needs in excess of what is added to the groundwater supply through natural recharge. Under such a concept, there would never be any further depletion of the groundwater table.

How to manage "Safe yield", or other possible water resource management concepts, are still in the process of being worked on. But what is beyond any argument at this point is that the concept of an "Assured Water Supply" does not apply to the Sun Cities' area.

## IS SUN CITY ALONE IN ADDRESSING THE WATER PROBLEM?

The challenge that Sun City faces in dealing with its water problem is by no means unique. Almost every city in the Valley has been facing the problem of having to curtail groundwater pumping and replacing that resource with surface water. And for all of them, CAP water is generally the best solution.

For example, Peoria and Glendale have reserved substantial blocks of CAP water, and have both moved to build treatment plants to use that water.

However, the Sun City situation is worse than most. Areas like the Northwest Valley and the Carefree/Cave Creek area have been identified by the Arizona Department of Water Resources (ADWR) as "Critical Water Management Areas." This designation means that overdrafting of the groundwater aquifer has reached serious levels, and long-term damage to the water supplies of the region will happen unless something is done. ADWR will work with the local community to plan what should be done.

It is also worth noting that Sun City West is facing the exact same problem as Sun City, and its leadership has coordinated its response with Sun City. That is, the plan being adopted by Sun City to use its CAP water allotment is being done in conjunction with Sun City West. By making this program a joint project between the two retirement communities, significant cost savings have resulted for Sun City residents.

Various public groups have worked to educate the Sun City community regarding the serious nature of its overdrafting of its groundwater and of the creeping cone of subsidence, which is moving toward the area. However, the one message that all the professionals who have worked in this area agree upon, is that time is running out.

The approach being taken by Sun City in using CAP water on the golf courses to offset some of its groundwater pumping is innovative. But it is one that fits the unique situation of a community, which is mature in the sense that its water and sewer infrastructure is already built and in place. Other communities for example, can integrate their use of CAP water as part of the construction of new facilities needed to accommodate their continuing population growth. For example, many are making use of treated effluent on golf courses for turf irrigation to replace groundwater pumping. Other communities, which have (or will have) their own water treatment facilities, use CAP water to augment their drinking water supplies. However, the concept being used by Sun City is comparatively low cost, since it does not involve the significant treatment costs being incurred by other cities.

Sun City leadership has participated in various regional working groups (WESTMARC, for example) so that it can track what other communities are doing to solve their water problems and to learn from their experience. Thus, Sun City, through its working partnership with Sun City West and its participation in regional planning entities, recognizes those elements of the problem which it has in common with other communities and has moved to take advantage of the experience of those other communities.

## ARE THERE OTHER SOLUTIONS TO THE WATER PROBLEM?

The work of the CAP Task Force included the process of evaluating a large number of possible alternative plans for dealing with the water situation facing Sun City. Many of those plans had a number of desirable features, but in the end, they were judged to be less attractive than the "golf course" plan which was ultimately adopted as the Task Force recommendation.

The purpose of this paper is to summarize all those various plans, and provide the pro's and con's of each of them.

1. **Conservation.** The Department of Water Resources required that the local water utility, Citizens Water Resources, conduct a strong and continuing campaign to encourage residential water conservation. This effort was in support of a "rate-of-use" requirement. Citizens has been actively engaged in a public education campaign to promote conservation for three years now to achieve their requirement. But despite ads in the newspapers, flyer materials, and other promotional aids, the results have not been significant. The Task Force concluded that although conservation should continue to be encouraged and the current public education efforts continued, conservation alone was simply not going to be effective in achieving the reduction in groundwater pumping which will be necessary to deal with our falling water table.

2. **Water Treatment.** In order to be satisfactory for residential use, CAP water must either be treated or mixed and diluted with better quality water. CAP water has a degree of mineral content and organic solids in it that most people would not find acceptable. The amount of treatment required is not all that difficult, but the capital costs necessary to build the treatment plant are a major investment. Clearly, the amount of CAP water allotted to Sun City didn't justify the cost of such a plant construction. Also considered was the idea of going into a joint plant with a neighboring city such as Peoria or Surprise. The timing for such a venture was wrong since our neighbors already had other plans well underway. But the idea was a good one, and perhaps at some future time when a greater investment in CAP water is required, it can be pursued.

3. **Remote Recharge.** A number of different schemes for putting water on the ground in settling basins to the north of Sun City were examined. Under any of those schemes, water would be ponded and allowed to sink down into the aquifer. The presumption was that the water, once it reached the underground aquifer, would migrate southward and thus shore up the existing Sun City water table. At least two potentially feasible sites for such recharge were identified and considered. But the flaw in any such plan was the time it would take for this recharge to move underground and become of any benefit to Sun City. Water moves underground at an extremely slow rate, feet per year, and it would have been many decades before an appreciable benefit

would be seen in Sun City from such plans. And waiting decades for a solution to problems as pressing as subsidence was just not acceptable.

Special mention should also be made of the water banking recharge program and its possible impact on Sun City. The State of Arizona has adopted a plan to take its share of Colorado River water and store it in underground reservoirs until it is needed at a future time such as a drought cycle. This program is not unlike the national petroleum storage program. One of the sites which will be developed for such storage is located to the Northwest of Sun City, just below the CAP canal. The significant thing about this program is that it will store a huge volume of water. Literally millions of gallons of CAP water are projected to be put into the aquifer. The huge amount of water being recharged into the ground appears likely to have a major impact on the water table in the Northwest Valley. However, just what the impact of that storage program will be is largely unknown at this point. How that water will travel underground, where it will go, how fast it will travel, and its specific effect on Sun City are, at best, a matter of educated guesswork at this juncture in the program. Still, it would be tempting to count on that program as having a very positive effect on Sun City's water table, except for one glaring fact: the water is really only being stored temporarily, and will, at some future date, be recaptured by pumping it back out. Thus, whatever positive effect it will have on our community can only be considered temporary, and does not represent a long-term solution.

4. **Do Nothing.** Although it may sound silly, the option to just do nothing is a strategic planning alternative that always has to be considered. And considering the cost of putting CAP water to use in Sun City (or any community), the "do nothing" alternative earned more than just a passing thought. But unfortunately, the pressures of subsidence, poor water quality, and regulatory demands were too strong to be ignored. Sun City had just plain run out of time, and it was recognized that water resource management was a problem that should have been dealt with years ago and could no longer be put off.

Sun City has a long and proud tradition of gathering together to solve community problems on a voluntary basis. Our present situation is one which needs the same kind of voluntary support we have been so good at in the past in order to work out water issues in our own way and do what's best for our community. The alternative is continuing and increasing regulatory pressure leading to state-defined programs instead of citizen-defined solutions.

## **WHAT DOES THE RECENT ARIZONA CORPORATION COMMISSION DECISION ON CAP WATER MEAN TO SUN CITY?**

In January of 2000, the Arizona Corporation Commission (ACC) came to a decision regarding the use of CAP water in Sun City. Although the case was framed in the form of a rate increase package brought by Citizens Water Resources which defined what the rate payers in Sun City would pay for CAP water, the real issue in the case was whether or not Citizens would be allowed to implement the "golf course" plan and charge the rate payers for the cost of that project.

Positive testimony in favor of the golf course plan had been presented by a coalition of the governing organizations of the retirement communities (HOA, the Condominium Homeowners Association, the Sun City Rec Centers, the Sun City West Rec Centers, PORA, and Youngtown). The Sun City Taxpayers opposed the plan, and did not want to pay anything for CAP water. The Commission staff favored the plan, subject to certain reservations and concerns. Various other parties weighed in on both sides of the issue, and the record made in the hearings was an extensive review of all the issues involved.

The ACC clearly struggled with the case, in part because it was dealing for the first time with a major state water resource management policy issue in the guise of a utility rate case. However, the Commission's Hearing Officer had sorted through all the issues and conflicting testimony, and had concluded that the golf course option was the best approach to using CAP water for Sun City. His draft order clearly showed that he had made a careful and logical analysis of all the issues in the case. His favorable recommendation to the Commission was presented forcefully, and appeared to carry a great deal of weight with the Commissioners.

The Corporation Commission, after a great deal of debate, finally voted unanimously to adopt the recommendation of the Hearing Officer, subject to certain conditions.

The decision of the ACC means that Citizens will move forward to implement the golf course plan. That plan will unfold in two distinct phases. There will be an interim phase wherein the CAP water will be exchanged with the Maricopa Water District. That temporary arrangement will help defray the costs of the CAP water, but will not be of any benefit to Sun City's underground water supply. The second phase will be the design and construction of the infrastructure needed to bring CAP to the golf courses. This is primarily a pipeline from the CAP canal and its associated pumping and distribution arrangements. The current estimates for this project indicate completion of the pipeline and commencement of water deliveries within four years.

Of special interest, however, are the special conditions, which the Commission attached to its order as safeguards for the Sun City ratepayers. These conditions included the following:

1. Submittal for review to the Corporation Commission of final engineering cost estimates by Citizens to ensure that the project remained within the budget previously submitted to the Commission. This condition was intended to insure that the costs of the project did not give rise to unacceptable future rate increases.
2. Development of contracts between the Rec Centers and Citizens for the delivery of the CAP water which would be satisfactory to both parties.
3. Investigation by Citizens of certain possible ways of achieving cost savings in the Project.
4. Completion of the project in a timely manner.

These and other conditions which were imposed on Citizens Utility were crafted to create a continuing regulatory oversight of the project, and have been designed to ensure that the promises made by Citizens Utility regarding the completion of the Golf Course Project would indeed be kept.

The technical details of the golf course project have now been worked out and a practical means to put CAP water to use in Sun City will soon be under construction. But the decision by the ACC was important in that it gave a green light to implementing a practical plan to start solving the community's long term water problems. But even more importantly, it also provided an independent review and endorsement of the choice of the golf course project as the best plan for the residents of Sun City.

## **WHAT YOUR SUN CITY HOME OWNERS ASSOCIATION (HOA) HAS BEEN DOING TO HELP**

Over eight years ago, the Sun City Home Owners Association (HOA) became concerned about potential water issues in our community and formed the first HOA Water Committee. That committee was made up of people from Sun City who were knowledgeable in water issues, and who volunteered to look into the situation which would be facing both Sun City and the entire Northwest Valley. Even back then, it was recognized that the problems facing Sun City were really part of an overall water situation, which was developing in the entire Northwest Valley. That original committee, which has continually added new volunteer members, is still active today. It forms the nucleus of HOA's efforts at community education on water matters.

That early HOA water committee gave rise to the WESTMARC water committee, and these two organizations worked closely together to develop an understanding of the groundwater situation in the Northwest Valley. These two groups soon attracted the interest of Sun City West, and that community formed a joint PORA/Recreation Centers water committee, which has continued to work closely with Sun City.

The early work of HOA was predictably focused just on trying to understand the facts of the water situation in Sun City. Even a few years ago, hard information on the state of the underground aquifer of the Sun City area was just not available. Even worse, there were activists who were circulating misinformation that was a serious disservice to the community's understanding of the real situation regarding water. Part of HOA's responsibility has been to develop a clear and unassailable record of the real facts of the water situation.

This part of the Valley had grown so fast that efforts to measure what was happening to our water supplies had simply not kept up with the changes taking place. But HOA and WESTMARC were able to persuade the Arizona Department of Water Resources (ADWR) to undertake a landmark study of the groundwater situation in the Northwest Valley. That study was a comprehensive survey of all the information then available to ADWR, and provided a clear picture of the present state of the groundwater table in relation to the hydrogeology of the entire West Valley, including Sun City. The study was comprehensive and also developed a computer model that could be used to predict possible future trends in the underground aquifer and what they would mean to Sun City.

The picture developed by that study was sobering. Not only was the groundwater table dropping, but there was every indication that it would continue to drop, with very unpleasant results in store for us as a result. At the same time, studies had been made of the Luke Air Force Base cone of depression, which showed

the alarming spread of ground subsidence in the West Valley. All those studies showed that some kind of corrective action was needed in the very near term.

HOA's management recognized the need for all the organizations of the retirement communities to work together on the water resource problem and continued to encourage all the groups within our community to cooperate on developing a community understanding of the problem. A continuing series of newspaper articles, speeches at service groups and churches, and the preparation of information fliers have been part of HOA's effort to educate all our Sun City residents as to the nature and seriousness of the water issues facing us. HOA's commitment to public education on water issues is continuing.

In 1998, Citizens proposed a water service rate increase which would require the rate payers of Sun City to pay for the CAP water allotment that had been reserved for Sun City. Unfortunately, Citizens had not developed a clear plan as to how it would put the CAP water to beneficial use in the Sun City area. HOA helped organize a strong resistance to that rate increase on the grounds that we had no assurance that the water we were being asked to pay for would be put to use for the benefit of Sun City rate payers. HOA's opposition to the rate increase was successful in that it led to having the Corporation Commission set aside the rate increase until Citizens Utility could come forward with a serious plan as to how CAP water would be used to benefit Sun City.

HOA then helped form the CAP Task Force, which was a group of citizens from the retirement communities who were tasked with looking at ways to make best use of CAP water for our communities. The work of that CAP Task Force ultimately resulted in the identification of the "golf course" plan as being the best approach for using CAP water, and that in turn led to the action of the Corporation Commission in adopting that plan.

Concurrently, HOA has worked with ADWR to obtain a grant to develop education materials which would be of value in informing Sun City residents as to the water issues facing the community and what remedial actions need to be taken. This series of papers is one part of the public communication materials developed as part of that grant program.

If additional information is needed on the water issues facing Sun City, you can contact the HOA general offices on 10401 West Coggins Drive in Sun City, or call 623-974-4718.

HOA continues to believe that educating our community on major issues facing it is an important part of our role. Your suggestions and ideas as to what other actions HOA can take to increase community awareness on water issues are sincerely invited.

A very special welcome to our guests who have agreed to be present today to answer your questions. Like you, each has an interest in the outcome of the Corporation Commission's decision, and each brings knowledge and experience to the table. Feel free to address any of them with your questions:

**Bill Beyer**  
*Water Law Attorney*

**Robert Jones**  
*PORA representative and professional engineer*

**Dess Chappellear**  
*Retired civil engineer from the US Bureau of Reclamation*

**Gene Zylstra**  
*Chair, Sun Cities Youngtown Water Committee*

**CAP/Groundwater  
Community Forum  
Thursday, July 26, 2001**

**Moderator:** .....**Jerry Swintek**  
*President, Recreation Centers of Sun City*

**Panel:**

*Each of the following will give a brief overview of their interests in the CAP/Groundwater plan. The panel will then receive questions from the audience.*

**Ray Jones**  
*Vice President & General Manager for Citizens Water Resources'*

**Mark Frank**  
*Area Director of the Phoenix Active Management Area*

**Herb Schumann**  
*Hydrologist and expert in the field of subsidence*

**WATER RATE COMPARISONS FOR RESIDENTIAL CUSTOMERS**  
**5/8" X 3/4" METERS**

	<b>7,000*</b>	<b>15,000*</b>
<b>COMPANY</b>		
<b>Sun City Water</b>	<b>\$ 10.11</b>	<b>\$ 17.28</b>
<b>Sun City West Water</b>	<b>\$ 11.51</b>	<b>\$ 20.28</b>
<b>GLENDALE (In)</b>	<b>\$ 17.10</b>	<b>\$ 27.26</b>
<b>PEORIA</b>	<b>\$ 20.96</b>	<b>\$ 40.89</b>
<b>SCOTTSDALE (In)</b>	<b>\$ 18.94</b>	<b>\$ 35.15</b>

\* Usage in thousands of gallons

Please answer the following questions, cut this out, and bring it or mail it to the Sun City Homeowners Association at 10401 West Coggins Drive, Sun City, Arizona 85351:

- 1. Do you favor keeping the CAP water allocation?  
YES  NO
- 2. Do you favor using the CAP water allocation on the area's golf courses to reduce the groundwater overdraft, as recommended by the Task Force?  
YES  NO
- 3. Are you willing to pay for the pipeline system needed to bring the CAP water into Sun City at a cost of approximately \$5.00 per month per household starting in the year 2003/4  
YES  NO

KEEP UP THE  
GOOD WORK.

Your opinion on the CAP water issue is of great importance to the future of Sun City. If you have a question, please call HOA at 974-4718 and a Task Force member will respond ASAP.

JOEL & ANNE JAGGIE 10710 W. GARNETTE DR SC, AZ  
 NAME ADDRESS PHONE 85373  
 623-875-3648  
 GREAT INFORMATIVE MEETINGS 7-27-01  
 FOR TWO ONLY IN AZ 3 WKS. DATE  
 THANKS FOR THE INFO AND HANDOUTS. ROCK ON!!

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Earlene Callahan 16652 Brewell Blvd 974-5227  
 NAME ADDRESS PHONE  
 7/26/01  
 DATE

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Robert T. Story 9908 W. Bright Angel Cir 623.977.1014  
 NAME ADDRESS PHONE  
 7/26/01  
 DATE