



WATER CONSERVATION/SAFE YIELD COMMITTEE A G E N D A

**WATER CONSERVATION/SAFE YIELD
GENERAL MEETING
THURSDAY, October 16, 2008
3:00 P.M.**

**PUBLIC WORKS CONFERENCE ROOM
433 N. VIRGINIA ST.
PRESCOTT, ARIZONA
(928) 777-1130**

The following Agenda will be considered by the **WATER CONSERVATION/SAFE YIELD COMMITTEE** at its **GENERAL MEETING** to be held on **THURSDAY, OCTOBER 16, 2008**, in the **PUBLIC WORKS CONFERENCE ROOM**, located at **433 N. VIRGINIA STREET**. Notice of this meeting is given pursuant to Arizona Revised Statutes, Section 38-431.02.

1. Call to order and roll call
2. Public comment (5 minutes)
3. Review and approve minutes (5 minutes)
4. Presentation on the success of water conservation efforts in the City of Prescott to Date (based on a Presentation to City Council in September) (Tucker and Rydell--20 minutes)
5. Plan to present WC & SY initiatives to Council (Crews--20 minutes)
6. Water Conservation to Safe Yield Task Force report and discussion of proposal to council (please review attached pfd before meeting) (1 hour)
7. Adjourn

THE CITY OF PRESCOTT ENDEAVORS TO MAKE ALL PUBLIC MEETINGS ACCESSIBLE TO PERSONS WITH DISABILITIES. WITH 48 HOURS ADVANCE NOTICE, SPECIAL ASSISTANCE CAN BE PROVIDED FOR SIGHT AND/OR HEARING IMPAIRED PERSONS AT PUBLIC MEETINGS. PLEASE CALL 777-1272 OR 777-1100 (TDD) TO REQUEST AN ACCOMMODATION TO PARTICIPATE IN THIS MEETING.

CERTIFICATION OF POSTING OF NOTICE

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Prescott City Hall and on the City's website on _____, at _____ .m. in accordance with the statement filed with the City Clerk's Office.

Teresa Ogle

Conservation Savings, New Commercial Accounts and Safe Yield

T. Crews
H. Mechanic
J. Zambrano
Draft 10-13-08

There is a phenomenon in resource management called Jeavons' paradox. Jeavons correctly predicted in 1865 that improvements in coal burning efficiency in Great Britain would result in an increase in coal consumption rather than a desired decrease. Jeavons' paradox describes how a successful conservation effort can backfire, resulting in equal or greater exploitation of a scarce resource. All too often, "conserved" resources end up being appropriated for different applications rather than being left alone-- the original intent of the conservation programs. Jeavons' paradox happens in part because, as social scientist Mario Giampietro explains, "the aspirations of individuals for a better standard of living generally have a stronger effect on decision makers than the requirement of ecological systems for lower human pressure..."

One of the first and most important tasks of Mayor Wilson's Water Conservation and Safe Yield Committee (WC & SY), has been to build public trust and accountability in City conservation efforts. In letters to the editor, at city council meetings, and in direct communications with Committee members, it is clear that many residents are reluctant to conserve water because they believe that any water they save through conservation efforts may not necessarily go towards safe yield. Rather than use conserved water to achieve a balance that will maintain Prescott's water supply, they believe it will be used to facilitate more development, and ultimately exacerbate rather than solve our current unsustainable overdraft.

Put another way, many citizens would be willing to make lifestyle sacrifices or invest personal income to help the community of Prescott reach a sustainable balance with its water supply if they had clear assurance that their actions were contributing to safe yield. However, if the fate of conserved water is at all ambiguous, then people are much less inclined to significantly change behavior or invest in conservation efforts. In raising this issue, the WC & SY Committee is not addressing the desirability of population growth in Prescott. Nor is it delving into what an appropriate population growth rate should be. The Committee's charge is simply to maximize conservation of water to help resolve Prescott's unsustainable aquifer overdraft.

A Task Force was designated within the WC & SY Committee to investigate whether conservation savings are already being applied to safe yield, and to make recommendations if they are not. The findings of the Task Force suggest that, to some degree, water conservation savings resulting from a reduction in consumption by Prescott citizens is in fact going to off-set groundwater over-draft. The primary reason the task force came to this conclusion is that the City's alternate water supply, which is currently

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the only source of water that can be used for new residential development, is in no way tied to current rates of water consumption by Prescott residents. The alternate water supply is fixed, regardless of whether current gallons per capita per day (GPCD) goes up or down. All subdivisions in the Prescott AMA platted after 1999 must use alternate water (other than AMA groundwater). So if existing residents reduce their water use through conservation efforts, the saved water cannot be used for new subdivisions.

While the Task Force did find that conservation savings may offset groundwater overdrafts, it also discovered that current allocation policy has the potential to allow conservation savings to be used for water-intensive commercial development. From what the Task Force can discern, it is possible that no conservation savings have actually been applied to water-intensive commercial development since the declaration of groundwater mining, and there is good reason to believe that it could be prevented in the future. However, by maintaining current policy which allows new commercial development the *potential* to use more water than is designated in the City's alternate water portfolio, it is currently impossible to guarantee to the citizens of Prescott that their conservation efforts will be directed at aquifer overdraft rather than support greater regional development.

At present, the City of Prescott is legally allowed to pump between 10-11,000 acre-feet (af) of AMA groundwater per year according to its ADWR designation (range depends on the pre-1999 plat build-out). We are currently pumping close to 8000 af/year, and this is expected to increase to approximately 9500 af/year as pre-1999 plats are completed. As of 2008, there are 759.6 af remaining in the City's 2006-2010 alternate water budget. As noted above, if a city resident were to save, for example, 20,000 gallons of water per year by replacing his or her lawn with low-water landscaping, the City's alternate water portfolio would *not* increase by 20,000 gallons. Thus the 20,000 gallons of conserved water could not be re-directed towards the construction of more homes. However, there is currently no mechanism in place that would subtract the 20,000 gallons of conserved water from the 10-11,000 af that the City can ultimately pump. Therefore, the conserved water is not securely dedicated to safe yield.

If water for residential development is tied to a fixed alternate water budget, then how can conserved water be tapped for growth? The Task Force found that the most important loophole lies in how water for commercial development is allocated. Current policy allows for commercial enterprises to receive up to 5 af per business per year. Any requests greater than 5 af per year have to be approved by Council and the allocation has to come out of the alternate water budget. Interestingly, while non-residential development below 5 af is not formally restricted by the alternate water budget, water is essentially allocated within the alternate water budgeting process to cover commercial and other non-residential needs.

When Council allocates alternate water for new residential development, they apply .35af per unit. However, it is well understood by city water administrators that homes only require .25 af. The remaining .10 af is added to each new house allocation to account for non-residential needs (i.e., commercial and government applications). What has been happening for some time, therefore, is that water for commercial applications *has* in fact

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been allocated from alternate water resources, but commercial applications have not been formally limited to the cumulative sum of .1 af / house allocations in a given year.

For example, in 2007, the City issued 74 new commercial permits and 533 residential permits¹. The alternate water supply that was allocated for the residential construction was $533 * .35 \text{ af/house} = 187 \text{ af}$. Of the .35 af/house, 0.25 af is dedicated to the house itself (133.5 af), and 0.1 is dedicated to non-residential applications (totaling 53.5 af). Work by WC & SY statistician Gene Schmidt has shown that water demands by Prescott businesses break down in the following categories:

| % of businesses | af used/year/business |
|-----------------|-----------------------|
| 30 | 0.06 |
| 30 | 0.20 |
| 30 | 0.86 |
| 5 | 3.29 |
| 5 | 10.1 |

(based on analysis of 1100 Prescott businesses)

The mean water use per business is 1.05 af/year whereas the median water use per business is 0.5 af/year. Using the mean, we estimate that the 74 new businesses in 2007 required ~78af. Seventy percent (53.5 af as above) of this commercial allocation was accounted for in the alternate water budget, with the balance of about 25 af coming from AMA groundwater. We do not know how much water the new business from 2007 actually required. However, according to this estimate, all water conservation gains made in the 2007 Prescott incentives program may have been effectively used for new commercial enterprises rather than safe yield. In other words, the conservation gains may not have resulted in a GPCD reduction, but instead simply shifted GPCD from residential to commercial applications.

Alternatively, if we carry out the above calculation using the median water use per business (.5af/year), then the 74 new businesses would have required 37 af which is well within the alternate water supply allocation for non-residential uses. The contrast in the median and mean analyses of new commercial account allocations underscores how, as with residential customers, a small number of business use the greatest amounts of water. In reality, whether the City of Prescott tapped conservation savings to support commercial growth in 2007 depends on how many new businesses fell into the top 10% water use categories. The City would have to go back and examine actual water use of the new businesses to determine which scenario was actually allowed.

In the future, it is likely that Prescott will look to conservation even more than today, to balance its share of aquifer overdraft. In order to avoid Jeavon's paradox, it is crucial that the City carefully craft a water allocation policy that guarantees the allocation of conservation savings to safe yield. Towards this end, the WC & SY Committee strongly recommends that the City Council formally tie commercial water allocations to its alternate water supply. If non-residential allocations exceed the sum of .1af/home

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allocations assigned in one (or multiple) years, then water-intensive, non-residential applications should be supplied strictly through further allocation of alternate water. By developing a program in which new businesses estimate their projected water usage, the City will be able to budget its non-residential water allocations and thus assure residents that conserved water is helping to create a sustainable water balance in the AMA. Moreover, and also important, the City will be able to see potential conservation savings before businesses are even built. For example, approximately 20% of commercial water use occurs as “summer excess”, much of which could be dedicated to water-intensive landscaping.

¹ This value for residential allocation needs to be checked. It was generated using the alternate water allocation of 2007—186af and divided it by .35 af/house