

## **Competition for America's Ground Water Resources - the Public Perception**

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### **INTRODUCTION**

Ground water has always been important for domestic and agricultural use in America. The last two hundred years have seen technical changes in our ability to pump and use ground water. By the year 2050 there will be an additional 100 million people in America. There will be competing pressures for access to ground water resources. Each market sector's ability to make the case for priority use will become increasingly important as demands escalate. While allocation decisions will largely be based on a combination of legal rights, technology and raw economics, it is ultimately political authority that will decide. Public opinion is a very potent force on political will. If the irrigation industry does not have an information/ communications strategy to favorably impact public opinion, it may lose out.

### **SUSTAINABLE DEVELOPMENT**

The concept of sustainable water resource development requires that we plan to meet the water needs of the present without compromising the ability of future generations to meet their needs. Provision of the required quantity of water needs to also take account of different user requirements for quality. For the next fifty years there will be an average additional two million people each and every year added to American society! The population of the US is expected to increase from its present 268 million to about 370 million by 2050!

There will be the certainty of more land-use pressures for homes and recreation, and the certainty of a need to increase food production. At the same time there is a high level of uncertainty about climatic trends (water resource availability). Right now there are immediate uncertainties about our ability to maintain the quality and equitable allocation of existing sources. Working under the generally accepted management paradigm of sustainable development, it is critical that the irrigation industry, and the users of the water it delivers, make good resource decisions now in order to accommodate the inevitable increase in demands. For those with a professional interest in irrigation or a financial interest in its benefits, there is a responsibility to become involved in water decisions. Wise heads and good information will be needed at local, regional, and state and national levels.

The historical record of America's water resources, particularly in the west, demonstrates that engineers have in the past usually provided solutions to water deficiency problems by creating structures to move water from where it occurs to where it is needed. However we can't expect to engineer our way to solutions that will provide extra water. There may be some locally undeveloped or underdeveloped groundwater resources, but there is no magic untapped source that will provide for our needs. One certainty is the uncertainty of climatic change. Our groundwater resources are part of the hydrologic system. We need to frame our ground water development plans on hydrologic reality.

### **GROUNDWATER**

There is no doubt that ground water will become even more important as a resource. There are opinions both

from government, and from a myriad of organizations, that demonstrate a strong attitude towards protecting groundwater, for example, by the former US EPA Director, William Reilly. "Ground Water resources are of vital importance to this country - to the health of our citizens, the integrity of many of our ecosystems, and the vigor of the economy." (US EPA, 1991).

While there is general recognition of the value of ground water, and its importance for development, there are also concerns about threats to the environment from our progressively industrial and commercially based lifestyle, for example Charles Reich, writing nearly thirty years ago at the time of great "green" consciousness, said, "Technology and production can be great benefactors of man, but they are mindless instruments: if undirected they roll along with a momentum of their own. In our country they pulverize everything on their path: the landscape, the natural environment, history and tradition, the amenities and civilities, the privacy and spaciousness of life, beauty and the fragile, slow-growing social structures which bind us together." (Reich, 1970).

People are concerned with lifestyle. There is an awareness of the fragility of water resources. There is "no-brainer" evidence that there will be increased competition for groundwater resources. How the allocations work out will depend largely on the public's (and hence the politicians) perception of value and need. Are the present users of irrigation threatened? With more people and a finite (although renewable) water resource base, how will irrigation users fare when questions are asked that may largely be decided on the basis of the public perception of priority?.

- The fundamental need for food - should keep food production irrigation on the list?
- Today's recreational lifestyles - should keep turf water requirements on the list?
- Civic and corporate pride - should keep landscaping irrigation requirements on the list?
- Increasing home-ownership, and the home lawn & garden as a symbol of independence - should keep the nursery business and garden irrigation on the list?

Is anything going to change? When the water availability crunch comes, who will take a hit?

**The old approach to water resources:                   How much is needed and how do we get it?**

**The changing paradigm is now:                           How much is there and how can it best be used?**

## **GROUND WATER USE**

The first water demand that society must satisfy is for basic supply needs for domestic use. Right now over 53% of all American drinking water is from wells. In addition to the 40 million people served by some 15 million private wells, another 100 million are served by ground water based public supplies. There are over 150,000 small water systems (each serving less than 3,300 persons), mostly in rural areas, that are totally dependent on ground water. While demographically, much of America's population growth will occur in cities, changing technologies will continue to add non-agricultural population to rural areas. There are

increasing demands for water supply infrastructure provision and improvement. EPA currently estimates a \$138.4 billion price tag for infrastructure needs (Hanson, 1998). There will be increasing public demand that

agricultural activities do not jeopardize the viability of home or utility ground water sources. In areas of irrigation farming, where water applications may (or may be believed to) transport chemicals to ground water, there is a great need for good public communication.

Big dollar numbers apply to irrigation; for example, California's annual \$24 billion value of farm crops, \$14 billion of which are from the Central Valley. There are great demographic pressures on California's water, and very real threats of urban encroachment on farm land. This vast private sector but federally subsidized agricultural enterprise is a target for those with a priority to satisfy urban water needs. A surprising ally for protecting California's irrigation agriculture comes from planners anxious to prevent loss of farmland. While there may still be some way to go in achieving the perfect balance between production benefits and environmental problems from the use of agricultural chemicals, California's farm land is a great environmental asset. There are now very real ecological benefits to promoting agriculture and protecting farmland in California. Marc Reisner points out that in the early 1940s Los Angeles County was the nation's leading county for farm income. Now it is virtually all paved over, gone forever is some of the state's finest agricultural land. In more recent times, Santa Clara's famous orchards have been lost to the relentless expansion of "Silicon Valley" (Reisner, 1997).

Reisner sees reliable, affordable irrigation as critical to protecting California's farmland. As management strategies become more sophisticated, for example, aquifer recharge, water banking, conjunctive use, water leasing etc.; ground water resources, and the storage potential of aquifers will be more important. To secure the water use savings from irrigation technology, farmers need to feel confident in their long term ability to profit from investment. As a nation we continue to vacillate between the sanctity of private property and the desire to protect resource assets in the public interest. The irrigation industry needs to be part of the debate, but should be mindful of the competing demographic pressures.

It is well known that certain food production (especially meat) requires more water than, for example, cereal products. Some areas of reliable rainfall can produce crops without irrigation. Replacing the production of an item which is not water efficient with a competitive import from elsewhere (regionally or internationally) will in theory free-up water for a more beneficial use. While the concept of "virtual" or "embedded" water (Allan, 1998), is a challenging economic concept, the present private sector reality of much of the irrigation water use in America is based on ownership "rights" and expected returns on investment. Right now we can't expect a Texas farmer not to irrigate his land just because a farmer in Ohio can grow the same crop without irrigation; unless of course selling his water for some other use provides more return. Agricultural communities have a huge social investment in maintaining production. Irrigation water means more to rural areas than just the bottom-line for local landowners.

## **IRRIGATION INDUSTRY**

As potential water wars loom, the irrigation industry has a vested interest in wooing the hearts and minds of the public. The industry has much to tell about the benefits that it brings to society. The biggest public

relations obstacle is the belief that irrigation is wasting water. Cheap federal water and easy availability did not provide early incentives for conservation. Today's industry is almost totally focused on maximizing growth productivity while minimizing resource use. The well known term "best management practices" could be a slogan for today's

irrigators. The industry is focused on efficiency, for example, weather station controlled computerized systems, low pressure drop tubes for center pivots, gated roll-out pipe, drip tape technology, and innovations such as new turf cultivars and plant-growth regulators. The industry's new arsenal of low volume drip and trickle products allow for irrigation that can provide precise delivery at a specific time to specific plants. The industry's research and technology in water management practices and products is striving to achieve maximum efficiency with minimum energy use and optimum water conservation.

A most obvious benefit to consumers from irrigation can be seen in every grocery store. How many people appreciate the low cost and year-round availability of goods that would be largely impossible without irrigation?

The turf and landscape industry represents about one billion dollars a year in installed components. For many people, golf courses, and green lawns around corporate headquarters may seem to be a profligate waste of water resources. However, changing social and recreational patterns and the value that many employees have for the quality of the workplace environment, is probably changing such negative perceptions. There may be some other important messages that also need to get to the public about turf irrigation. For example, there are probably few people that recognize that a healthy irrigated turf results in water conservation by maintaining a ground cover that provides maximum opportunity for infiltration of natural rainfall. Are many people aware of the ecological values of golf courses? Do they realize that grey-water use for irrigation may be leading to improved quality and availability of local ground water?

Manufacturing technology, especially the development of plastic fittings and couplings, has led to irrigation coming within the reach of home owners. Retail availability of efficient home irrigation systems provides the means for important recreational fulfillment for home gardeners; in many cases, with negligible impact on resources. However there are forces at work that could limit such irrigation; for example over zealous health departments, or revenue hungry utilities that will not allow private wells to be used for irrigation where a public supply system is installed. Consumers will be reluctant to invest in garden systems if the only supply is expensive municipal water, or if there is a risk of watering bans. The irrigation industry has much public education work ahead if it is to remove such unjustified road blocks.

## **RESOURCE ALLOCATION DECISION MAKING**

Ultimately, the competition for local groundwater resources come down to "who will get it?" The decision making process is often complicated by a plethora of competing jurisdictions and an increasing number of water resources stake-holders. Stakeholders may live, work, or have financial interests in the ground water of the area in question, or they may represent recreational or environmental interests. In the end, management or allocation decisions must enable resources to support present and future needs. In any decision-making there

is a need for an accurate assessment of resources, water-use trends, projections of use and appropriate protection strategies. Those who have "rights" to water have two problems to confront. First, that rights to water are no guarantee that the hydrologic system will deliver! and secondly, that there is plenty of legal precedent that "rights" may be taken if it is deemed to be in the broad interests of the community.

The first requirement for any intelligent consideration of resource allocation or management is that the resource characteristics must be understood before management can be effective. It is not feasible to manage a resource that has not been adequately quantified. However, in the absence of information, planners are often forced to adopt the "squeaky wheel" management strategy; (users that make the most noise will get the most water). Users that are politically connected, and/or who have done the best PR job, stand a better chance of favorable treatment. Control over water can create power, and water allocation decisions can influence the relative power accruing to the users, (Burrill, 1997). There is ample evidence of the power that results from control of water allocations, for example, as reported by Worster, in the book, *Control of the Waters*, (Worster, 1986).

## **EDUCATION STRATEGY**

For the most part, no water allocation or management policy can work without the support and cooperation of individuals and communities. The question then is, who does whose bidding? Do the authorities' know what is best and only need to inform the public, or does the public know what it wants its elected representatives and state officials to achieve? An informed public is better able to understand issues and can therefore voice support or opposition to decisions affecting ground water. Most issues related to protecting water quality are complex. Many are imperfectly understood. For that reason, the public's participation in discussion can serve an important role. There is now far more environmental awareness than in previous decades. An informed public is empowered to demand and ensure that communities, legislators and regulators do not believe, receive, or dispense, hydrobabble information, (Stone, 1997).

The entire community, including local government, is responsible for balancing the risks, the costs and the benefits involved in protecting the groundwater supply, (Rail, 1989). However the entire community, or at least some volunteer representatives, cannot be meaningfully engaged in the process until or unless they have the benefit of awareness of the hydrologic background and an understanding of the basic problems and possible solutions.

Faced with the challenge of honestly promoting self interest, what can the irrigation industry do to secure its position as a respected component of the decision making process about the development and management of America's water resources?

The familiar response is to get out there and "educate the public", but education is a process, not an end result. There is a lot more to public education than handing out a few pamphlets! There is a need for a public education strategy crafted to match what the industry wants to achieve. This strategy will include components such as communications outreach, creating consumer awareness, stimulating public interest, and providing

technical information in an easy to understand format. In addition to such a carefully researched and formulated overall public education strategy at the national level, there is much that can be achieved by immediate local industry involvement.

Irrigation professionals and irrigation users should be in the front line of educating the public about their industry and its

role in efficiently managing water resources. There is much positive information to be told

about the achievements of the irrigation industry. A key starting point is to identify, then work to dispel commonly held misconceptions.

The American Ground Water Trust is an independent authority on ground water. Over the last ten years the Trust has developed consumer awareness and public education strategies. The Trust's programs stimulate awareness and provide information on many different aspects of ground water. Our experience shows that there are few "one-size-fits-all" solutions to the public's concerns about ground water and wells. Our programs, usually carried out in partnership with other organizations or companies, are customized to serve specific consumer education needs.

To date, much of the Trust's program focus has been on drinking water supply. The time is long overdue for the Trust to expand its outreach to encompass the concerns of the irrigation industry, the largest user of the nation's ground water resources. We believe that much of our communications experience is directly relevant to irrigation issues. As a not for profit membership organization, the Trust has established credibility with federal and state agencies, private sector companies, environmental organizations and the media.

In public education, the messenger is often more important than the message. In the years ahead the Trust expects to become far more involved with providing consumer information and public education programs that are relevant to the needs of the irrigation industry and its user clients. We are interested in providing objective information to the public and decision makers where and when it is needed to help resolve water resources decisions. While we have no myopia about past practices that may not have been in the best interests of ground water resources; philosophically we believe the private sector is the key to water resources solutions. The irrigation industry has much to offer, we believe that there are education partnership opportunities that will achieve the Trust's broad ground water education mission while at the same time help to resolve specific local and regional issues relating to the use of irrigation technology.

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