

SECONDARY WATER SUPPLY MANAGEMENT FOR IRRIGATION DISTRICTS AND CANAL COMPANIES

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ABSTRACT

One of the more important business practices over the years in larger multipurpose water districts has been the delivery of untreated water for lawns and gardens. This is generally in addition to traditional irrigation water deliveries. With rapid urbanization occurring in many rural agricultural counties, even smaller irrigation districts and canal companies are beginning to provide such service to small acreage subdivisions and a variety of other non-agricultural water users (golf courses, parks, etc.). It is a business innovation stemming from urbanization in traditional and, for the most part, prime irrigated lands throughout the West. This paper presents two case studies of untreated water delivery for lawns and gardens by such enterprises. It discusses some of the issues surrounding the development of this practice, the costs and benefits of engaging in this kind of water service, and what opportunities and constraints lay ahead for this business practice in the future.

SECONDARY WATER SUPPLY SYSTEMS

Secondary water supply management, or raw water delivery through open ditches or small pipelines for non-potable domestic use, such as for lawns and gardens, is an old tradition in the West. Irrigation

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districts and canal companies in California and Utah were providing lawn and garden water on a limited basis as early as the turn-of-the-century, in addition to their normal service of supplying water for irrigated agriculture (Hutchins, 1936).

In the face of declining irrigated farm income in many areas, this type of water service has the potential to prolong the viability of prime irrigated lands in areas experiencing virtually uncontrolled urban growth. This will be shown in the two case studies. At the same time, secondary water supply management provides much needed revenue to improve current irrigation facilities (canals, headgates, etc.), and water conservation through better record keeping, computerized water accounts, billing and other day-to-day business practices. Secondary water supply management appears to enhance the business operation of these traditional enterprises.

Local municipalities are greatly benefitted by secondary water supplies of this nature, by not having to build as many expensive water treatment facilities to meet what are generally brief peak demands for urban outdoor needs during the relatively short summer growing season, particularly in the Rocky Mountain region. Some community education in the use of untreated water for outdoor use is implied. However, it is often a win-win situation if irrigation enterprises and municipalities can cooperate with each other to develop such systems, if start-up capital can be secured, and there is an appreciation among municipal and county leaders about how this kind of water delivery helps maintain diverse land uses in urban corridors.

At the same time, interviews with canal company and irrigation district representatives indicate some mixed feelings about this secondary supply concept (Wilkins-Wells, 1999). Some argue that it may promote even faster urban sprawl onto irrigated lands. Yet, urban growth onto irrigated lands may have more to do with county and municipal land use policies and codes than it does with any kind of innovative raw water service provided by traditional irrigation enterprises. Let us briefly review the issue of urban sprawl before examining our two case studies of secondary supply systems. It has a bearing on the value of these systems.

IRRIGATION ENTERPRISES AND URBAN SPRAWL

Urban sprawl has importance to the two case studies because it is believed to be contributing significantly to the cost of operating an irrigation enterprise today (Wilkins-Wells and Coulter, 1999). Control of urban sprawl continues to be a major issue for county and municipal governments throughout the nation (American Farmland Trust, 1999). Although long an issue for the more populous West Coast states, many prime irrigation counties in the Rocky Mountain region are now facing rapid urbanization onto priceless irrigated lands. Nelson (1990), in an important theoretical discussion of farmland preservation techniques and their effectiveness in slowing urban sprawl, concluded that such practices as tax incentives, right-to-farm legislation, acquisition and/or transfer of development rights, agricultural zoning and various combinations of such policies, although suggestive, still lacked real empirical evidence as to their effectiveness. More recently, Geisler (1999) argues that urban sprawl may be more a function of who owns agricultural land than anything else. Transfer of farm ownership out of the hands of farmers and into the hands of corporate (non-agricultural) owners can lead to more rapid urban sprawl.

One of the issues that links urban sprawl not only to the loss of prime irrigated land, but to the increased costs of operating irrigation districts and canal companies, is the amount of farm income that is believed to be subsidizing urban sprawl. Although rarely researched, we may examine for a moment how this works with irrigated agriculture. It is a troubling trend for irrigated farm income and the preservation of prime irrigated lands in the West.

Irrigation enterprises can be said to have four kinds of operating costs today. We may refer to these as: 1) bond, loan or federal repayment contracts for infrastructure development and/or major improvements; 2) annual costs borne by these enterprises on their own account, which generally includes direct administrative, operation and maintenance costs associated with delivering water to farms; 3) pass-through costs represented by costs imposed on irrigation enterprises as a result of urbanizing trends

in the vicinity of these enterprises, but for which these enterprises are effectively reimbursed through one-time service fees and special water rates they charge for provisioning subdivisions and other non-agricultural water users, and; 4) non-pass-through costs that are imposed on these enterprises by urbanization, but for which they are generally not reimbursed.

Examples of the third category of costs, pass-through costs, are typically represented by what secondary supply systems do for irrigation enterprises in their adaptation to urbanization. More on this in a moment.

Examples of the fourth category of costs, non-pass-through costs, and where farm income is actually drained off to subsidize urban sprawl, include those for increased irrigation enterprise liability associated with subdivision development, and problems of maintaining, protecting and ensuring routine access to canal rights-of-way. Other costs in this fourth category include removing urban trash from canals, damage to canal systems from urban storm runoff, urban-related vandalism to irrigation enterprise equipment and facilities, and demands to bury open ditches in pipeline to accommodate subdivision needs.

Still other examples of these non-pass-through costs include a growing percentage of irrigation enterprise employee time (and therefore salaries) going to address problems and complaints from subdivision dwellers, and city and county requests for special action such as maintaining vegetation along canals at some specific height to accommodate urban dwellers, or requiring these enterprises to assess potential drainage and crossing issues affecting subdivision development; generally with little or no compensation for the time spent by enterprise employees in assessing these issues.

These and a host of other costs--by and large absent from irrigation enterprise budgets twenty years ago--are now routinely borne by irrigators, in whole or in part, through the water assessments, or in the case of irrigation districts, district land taxes, that these irrigators annually pay to operate and maintain their irrigation facilities. In short, farm income is

subsidizing urban sprawl.²

Non-pass-through costs borne by these traditional irrigation enterprises are growing at an alarming rate.³ Valuable farm income is lost to these urbanizing influences. One of the principal causes of this trend appears to be county and municipal land use codes that provide little protection to irrigation district and canal company lands and rights-of-way. Development plans submitted to county planning offices frequently affect irrigation enterprises very negatively, and without any real means of compensating irrigation enterprises for impacts associated with subdivision development and other externalities created by urban sprawl onto previously established irrigated lands.

Urban sprawl is a complex social, economic and political issue (Daniels and Bowers, 1997). However, when it comes to irrigation districts and canal companies, urban sprawl is clearly subsidized by farm income through these non-pass-through costs. It is true that urbanization around irrigated lands can clearly improve the equity of farms in many instances through increased land values, and this is desirable to many farmers. However, lowered farm income due to the many subtle affects of urbanization on the farm operation, such as increased non-pass-through costs associated with water allocation, may encourage somewhat more land speculation on the part of irrigators, to the exclusion of capital improvements to farms. Current research is underway to assess these relationships. However, what is important here is that this process may be, in part, ameliorated by these traditional irrigation enterprises entering into secondary water supply management.

² A current follow-up study to the Irrigation Enterprise Management Practice Study recently completed for the U.S. Bureau of Reclamation by Colorado State University is examining this cost in more detail. This cost to farmers is estimated to be in the tens of millions of dollars in lost farm income annually in the Rocky Mountain region alone.

³ Why the irrigation community has not reacted to this trend more assertively, demanding compensation for lost farm income, is puzzling, although many enterprises are now beginning to assert their concerns to local county commissioners and municipalities.

Two enterprises are informative in this regard. Both are predominately agricultural in the traditional sense of the word, but they are attempting to accommodate urban sprawl in the best way possible. They do so, in effect, by ensuring that costs associated with urban sprawl are pass-through costs (category three above), rather than non-pass through costs (category four). This will become apparent in discussing how these secondary supply systems are set up, financed, and operated. The first is the Davis and Weber Counties Canal Company of Sunset, Utah. The second is the Kennewick Irrigation District of Yakima, Washington. Again, both of these are predominately agriculture water providers.

THE DAVIS AND WEBER COUNTIES CANAL COMPANY⁴

The Davis and Weber Counties Canal Company (D&WCC) was officially established in 1894. A predecessor organization goes back to the early 1870s. The company was conceived and constructed with one purpose in mind, to provide reliable water supplies to farmers. It has been fulfilling this goal for over 100 years. Approximately 18,000 of the original 40,000 acres of prime irrigated land under the canal company still continues to be served, despite rapid urbanization in Davis and Weber counties.

Davis and Weber counties have always been important dairy, fruit and grain producing counties in the intermountain region. However, things have been changing in recent years. Since the late 1970s, these counties have become largely urbanized. Yet, there is still important agriculture in the area, as well as a highly valued rural life style on the outskirts of Ogden and Salt Lake City.

Prior to 1940, almost 100% of D&WCC water supplies were used for irrigation purposes. However, the transition from agricultural land to residential subdivisions began after the war. In 1985 the canal company's board of directors and management began to investigate the potential for alternative uses of irrigation water in its service area. This was partly driven by the need

⁴ Adapted in part from Davis and Weber Counties Canal Company annual reports.

to find additional sources of revenue to improve the agricultural water delivery system.

Special water rates for residential areas would be developed to finance a secondary water supply system, while at the same time financing the upgrade of the larger irrigation system that served both agricultural and residential water users. Clearly, first and foremost in the minds of farmers was to keep water attached to the canal company service area. However, providing raw water delivery for lawns and gardens could produce valuable new sources of revenue for the canal company to upgrade its aging irrigation system.

In April of 1985, a local firm that provided D&WCC engineering services for many years was hired to prepare a feasibility study on raw water delivery for lawns and gardens within the canal company's service area. After this study was completed, a series of meetings were held with local cities. These meetings were designed to acquaint cities with possible new options in coping with their growing demand for expensive treated water.

To place lawn and garden watering under non-potable sources would greatly relieve the cities of the increasing cost of using treated water for the same purpose. Municipal water treatment systems were often designed to accommodate the peak demand for outdoor water use during the summer months, and at a great cost to the cities. The idea of a canal company providing raw water to alleviate the need to design potable water systems for this peak summer usage looked like a win-win situation for everyone.

During 1986 and 1987, the D&WCC Board of Directors and its management staff continued to investigate avenues available to the canal company. Interest from the cities continued to grow. In February 1988, a special canal company stockholder's meeting was held in which 66% of the total voting shares of stock were represented. At this meeting, 65% of the company stock voted in favor of D&WCC entering into a loan with the Utah Division of Water Resources to a maximum amount of \$35,000,000. This loan was needed by the canal company to finance the up front basic infrastructure required to begin providing secondary supply service to local municipalities. This included building small, one acre, reservoir storage facilities to pressurize

portions of the secondary system. In return, D&WCC pledged up to one-half acre foot of water per share of company stock for use in developing the secondary water system. Only one percent (1%) of those present voted against this 1988 board resolution. It was a very popular idea.

In April 1988, D&WCC officially applied to the Division of Water Resources for funding. In August of the same year, the agency approved funding for the D&WCC secondary water project in the amount of \$38,000,000, including the first phase of the project that would serve Kaysville City, Utah. An agreement was signed with Kaysville City, and contracts were awarded in September of 1989 for a small reservoir east of Highway 89, along with the secondary supply pipelines to serve Kaysville City.

In December 1989, land was purchased in Layton, Utah for another small reservoir site, and in May 1990 D&WCC purchased property in the City of Sunset to construct another small one acre reservoir. Additional construction was completed through 1992. In summary, three surrounding communities now receive some secondary water supply service from D&WCC.

An agreement was entered into by D&WCC with each of these cities spelling out ordinances, mutual covenants, canal company maintenance procedures, city obligations, fees and assessments, and rate adjustments for future users. Presently, the city collects and remits fees to the canal company by first billing the secondary supply water user (homeowner) an initial connection fee, then the annual water fee. The city also collects a nominal fee per homeowner account for administrative costs. The canal company does not have to bill the secondary supply water users. It just receives a check for the annual fees collected by the City for the service.

These secondary water supply fees are used not only to pay back the loan from the state agency, but also to continually upgrade the canal company's agricultural water supply system. In the process of developing this new service, and to relieve the burden of local municipalities expanding their own domestic water service for lawn and garden water, the canal company has fallen upon a new source of revenue to help finance a much needed rehabilitation of its irrigation system.

Again, Davis and Weber still provides agricultural water service to more than 17,000 acres of prime irrigated land. This land is being kept in production despite considerable urban sprawl in the county. Farmers continue to farm and the irrigated lands are much valued for their production, open space qualities, and the mixed economy they provide to the counties.

SECONDARY SERVICE CONNECTIONS

A typical secondary supply service connection consists of a pipeline being constructed down the middle of the residential street serving a small housing subdivision. An extension is then tapped into this street pipeline from the planter strip along the curb. One-inch pipelines are then extended from this planter strip water connection to individual households. A $\frac{3}{4}$ -inch riser, painted red and tagged as non-potable water, is the service connection for the household. Education programs in the use of outdoor raw water connections are organized by the cities.

Cities cooperating with D&WCC have passed local ordinances governing the overall management of the secondary water supply system. These ordinances protect the canal company from liability. The developers of subdivisions receiving secondary water supply are largely responsible for acquiring the water to develop their subdivision. Developers convey to the Davis and Weber County Canal Company, upon payment of fair market value for such water rights, a minimum of three (3) acre feet of water per gross acre of newly developed land to be served by the secondary supply system (e.g., the total area of the subdivision lot prior to any improvements or development).

New service must be pre-approved in writing by the canal company prior to a city issuing a building permit to the developer. All construction and drawings of the secondary supply system must be in accordance with the canal company's standards and approval. Finally, the pressure irrigation facilities constructed for delivery of raw water to new subdivisions or developments are transferred to the canal company with a twelve (12) month warranty by the developer.

Rules and regulations, and a community education program in the use of raw untreated water, have been

developed in cooperation with the canal company and the cities now being served. Guidelines for property owners have been carefully designed to protect the water user as well as the property of the canal company and irrigated farms from non-pass-through costs (category four costs).

THE KENNEWICK IRRIGATION DISTRICT⁵

Irrigation in the area now served by the Kennewick Irrigation District (KID), Yakima, Washington began in the late 1800s. The district was officially organized in 1917. Farmers are still the primary customers in the irrigation district operations plan.

The district has 88 miles of canal, four ditch riders, and a maintenance crew of 6. There are 19,171 water accounts in the district. Household water is normally from wells, and some water is pumped directly from the Columbia River. However, KID draws its main water supply from the Yakima River, as do 7 other neighboring districts. Like a typical irrigation district, KID delivers only raw water. It is not involved in managing a potable domestic water supply system for anyone in its service area.

Water users who have been managing small amounts of raw water for lawns and gardens at an old irrigation turnout or lateral, approach the Kennewick Irrigation District about forming a Local Improvement District. These are referred to locally as "LIDS." A local improvement district is like a small incorporated lateral or homeowners association, but in this case it is organized for the purpose of obtaining a reliable raw water supply for irrigating lawns and gardens. In reality, it is a subdivision that is organized into a LID.

Upon a subdivision or homeowner's request to consider the organization of a LID, a determination is made by the Kennewick Irrigation District (the "mother" district if you will) as to the feasibility and desirability of such a small improvement district within its service area. A vote is then taken of the people affected by the proposed improvement district.

⁵ Adapted in part from Kennewick Irrigation District reports and newsletters.

The "voting public" in this case might consist of a small subdivision of 50 households.

If the resolution passes among the water users affected (e.g., homeowners), Kennewick Irrigation District then assists the small improvement district in finalizing its membership. However, the newly proposed LID must be approved by the Kennewick Irrigation District board of directors for the cost, because the mother district (Kennewick, that is) finances the cost of developing the LID. In one example, the Kennewick Irrigation District lent \$100,000 to a new local improvement district to develop its secondary supply system, amortizing the cost for the LID homeowners and charging some interest.

The development costs and annual operation costs of the secondary supply system for the local improvement district is obviously tied to the number of members in the LID. These operation costs are prorated across all members. Generally, the more people there are in a LID, the cheaper the raw water for each homeowner. Thus, the cost of untreated water service varies from one LID to the next.

The Kennewick Irrigation District system comes right into the local improvement district with a $\frac{3}{4}$ -inch valve from the mother district's main line. The local improvement district can have this connection installed above or below the ground. Changes or breakage are billed back to the local improvement district, not to the individuals within the improvement district. Again, these local improvement districts are like small affiliated homeowners associations, or incorporated laterals in irrigated areas. The Kennewick Irrigation District only interacts with the LID as an association, not with single individuals in the association. The LID also pays for its own street cutting and road repairs. If a line breaks in the road, the local improvement district pays for those repairs too.

CONCLUSION

In summary, canal companies and irrigation districts are entering into many new forms of agreements with cities to make more efficient use of water and to accommodate urban growth in innovative ways. Farmers express a strong desire to remain in business as long

as their water supply can be guaranteed, and as long as their irrigation district or canal company can effectively work with county planners, developers and new homeowners. Pressurized secondary water supply systems represent a major new form of business venture for traditional irrigation enterprises that can be used to address these challenges. In addition, these systems are capable of generating new revenue to upgrade existing irrigation facilities for agricultural water use and to meet new environmental concerns.

The entry of traditional irrigation districts and canal companies into secondary water supply management has been a revenue generator in most instances. It is financing the upgrading of irrigation systems in a way that could not be achieved otherwise. It often allows the agricultural water district or canal company to have more control over its water rights too. However, it also raises new concerns and new demands for water service which are not common in irrigation districts and canal companies. It is certain that secondary water delivery to subdivisions and other fractional water users for non-agricultural purposes is not possible for all irrigation enterprises. However, it is clear that the potential is there for additional revenue sources to meet future agricultural water delivery needs for some time to come.

Most of all, secondary water supply management provides a means of formalizing the responsibilities county and municipal government have toward the irrigation facilities, and in a way that allows the irrigation enterprise to be reimbursed for most non-pass-through costs. In fact, the process really converts or upgrades non-pass-through costs into pass-through costs, as well as improving the liability protection of these enterprises. The down side to this practice is the continued urbanization of the irrigated area, an almost inevitable process today. However, at least in these instances, the irrigation enterprise is a role-player and stakeholder in the urbanization process, rather than a bystander. To the degree that control over the enterprise's destiny is minimally guaranteed, secondary water supply management has its distinct benefits to irrigated agriculture in the face of the urbanization juggernaut.

AFTERWORD

In July of 1999, a major break occurred in the main canal of the Davis and Weber Counties Canal Company system, seriously damaging seventy residential homes under the canal. Contrary to the advice of the canal company, and despite the service it provided in meeting the costs of inexpensive municipal supplies for lawn and garden use, and thereby saving county and municipal taxpayers the cost of building more extensive water treatment facilities, the canal company was facing a lawsuit for its supposed negligence in managing the canal.

Like mud slides, earthquakes and other natural disasters, nature can take its toll on aging infrastructure. The problem is exacerbated by inadequate and often short-sighted county and municipal land use codes that place homeowners in harms' way through unrestricted urban sprawl into flood plains and under or near man-made water ways. A recently passed county land use code in a neighboring state, and one designed with all of the current state-of-the art practices of conservation easements, development transfer credits, and the like, showed only one sentence in a 258 page document pertaining to the business needs, liability concerns and interests of irrigation districts and canal systems. It is a testament of the times.

Meanwhile farm income continues to decline, and water supplies to the farm represent a major crop production cost leading to this decline in farm income. Not only does farm income subsidize urban sprawl through a growing number of non-pass-through costs not addressed by county and municipal land use codes, but the overall process leads to an impermanency syndrome on the part of farmers to sell when the price is right, rather than face continued costs and liability concerns.

Secondary water supply management can certainly lead to the strengthening of partnerships between traditional irrigation enterprises, and counties and municipalities, and in a way that allows continued multi-purpose land use and open agricultural space. However, counties and municipalities must be committed to protecting the economic interests of farmers and the traditional irrigation enterprises that serve them.

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