

Rural Water Use in an Urbanizing Environment

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A. Introduction

This outline addresses some of the water law and policy issues raised when formerly surface-water-irrigated farmland is converted to residential subdivisions or other urban uses. The outline was developed with experience primarily from the Treasure Valley in Southwest Idaho, a fast-growing region where this phenomenon is occurring rapidly.¹ But the analysis applies equally to other areas of the State where irrigated agricultural land is being converted to other uses.

Many of the Treasure Valley's new residential subdivisions are irrigated under the same surface water rights that were used to irrigate crops on the agricultural land on which the subdivisions were established. In the typical situation, the canal company or irrigation district serving the agricultural area has continued to use its canal, ditch, and lateral system to deliver the full amount of water historically delivered to the entire tract, even though substantial portions of it may be converted, through subdivision and commercial development, to impervious or non-irrigated areas. This continued full water diversion and delivery provides the developed land substantially more water per irrigated acre for urban lawns and landscaping than the irrigated farm land received. Overall, the

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¹ The Treasure Valley includes, among others, the cities of Nampa, Caldwell, Boise, Meridian, Eagle, Kuna, Star, Middleton, Notus, and Parma. It is Idaho's fastest-growing area, with a 2007 population of approximately 600,000. Kootenai County in North Idaho also is rapidly developing, although it has less dependence on agricultural irrigation and may be seeing proportionately less conversion of agricultural irrigation to subdivision and commercial uses.

consumptive use from the urban irrigation is proportionately less than that which occurred on the parcel when it was entirely devoted to an irrigated crop.

This discussion presents information about water law and hydrology that is intended to help inform the ongoing discussion about how we are to maximize our water resources for the well-being of our citizens, for economic growth, and for the benefit of future generations of Idahoans. Efficiency serves these interests; waste, non-use, and a failure to allow water markets to work undercuts them.

B. Legal principles

1. The basics from Idaho’s Constitution. “The right to divert and appropriate the unappropriated waters of any natural stream to beneficial uses shall never be denied, except that the state may regulate and limit the use thereof for power purposes.” Idaho Const. art. 15, § 3. “Priority of appropriation shall give the better right as between those using the water.” *Id.*

- (a) It is a “constitutional requirement that priority over water be extended only to those using the water.” *American Falls Reservoir District No. 2 v. Idaho Department of Water Resources* (“*American Falls*”), 143 Idaho 862, 154 P.3d 433, 447-48 (2007). This is a disarmingly simple point often is overlooked. Before one may seek to have her priority enforced, she must be in a position actually to beneficially use all the water sought. Someone who is seeking to divert to a non-use has no enforceable priority for the un-used portion.
- (b) The State is responsible for regulating the “just apportionment to, and economical use by, those making a beneficial application” of the “waters of the state,” and “in providing for its use, [the state] shall equally guard all the various interests involved.” I.C. § 42-101.
- (c) In a delivery call for water—that is, a situation where priorities are being asserted and senior users are asking the State to shut off juniors—the Idaho Department of Water Resources (“IDWR” or “Department”) must consider not just priority, but also whether the senior has a need for the full amount of water being sought. The “Director ‘has the duty and authority’ to consider circumstances when the water user is not irrigating the full number of acres decreed under the water right.” *American Falls* at 447-48.

2. Duty of water. Irrigation water rights are limited to diversions of no more “than one second foot of water for each fifty (50) acres of land so irrigated,” unless more is shown to be necessary, and, in any event, no one shall “use ... more water than can be beneficially applied on the lands” I.C. § 42-220.

- (a) A “second foot” is another way of saying a cubic foot per second (“cfs”), which is 448.8 gallons per minute. The “one second foot per 50 acres”

rule expressed in section 42-220 means that the irrigator may divert from the source no more than .02 cfs per acre unless there is special justification for more. This rate of flow (.02 cfs, or 9 gallons per minute) is also known as a “miner’s inch.” There are fifty miner’s inches in a cfs. Accordingly, the permissible irrigation diversion rule is sometimes stated as one miner’s inch per acre.

- (b) “I.C. § 42-220 prohibits the senior appropriators, regardless of the amount of their decreed right, from ‘the use of more water than can be beneficially applied on the lands for the benefit of which such right may have been confirmed....’” *Briggs v. Golden Valley Land & Cattle Co.*, 97 Idaho 427, 435 n. 5 (1976).
- (c) This is the concept of “duty of water”: the amount the beneficial use needs, and no more. “It is a cardinal principle established by law and the adjudications of this court that the highest and greatest duty of water be required.” *Munn v. Twin Falls Canal Co.*, 43 Idaho 198, 207 (1926). Thus, the greatest number of acres for the least water.
- (d) Season-long diversions of one inch per acre is a sufficient amount of water for any irrigation application. Even the most consumptive irrigated crop in Idaho (alfalfa) consumes about 3 acre-feet of applied irrigation water per acre during an irrigation season. Diverting one inch fulltime for a 200 day irrigation season results in about 8 acre-feet of diversions—that is, such a diversion would be only about 38% efficient. Indeed, many irrigation water rights have been decreed to allow a river diversion of less than an inch per acre; 5/8 inch (0.0125 cfs) per acre is a commonly decreed amount.
 - i. Canals need water that may not be used on crops but is necessary to carry sufficient amounts to users, so it is understood that more is diverted than actually is needed for the crop’s consumptive needs.
 - ii. Soil types and irrigation practices also can affect the amount of water deliveries needed. But generally speaking, improvements in efficiency over time—from canal lining to the use of more pipelines, pumps, and sprinklers instead of flood irrigation techniques—have reduced the amount of water that actually needs to be diverted to grow a given crop. In any event, the inch-per-acre rule should be more than enough in nearly all cases to provide both for carriage water and the approved beneficial use.
- (e) The question of water duty also should be understood in the context of water rights administration. Even though a water user may have water rights to a certain rate of flow or a specified annual diversion volume, he or she cannot “call for”—seek curtailment of junior rights to deliver—any more than can be beneficially used. This point, already noted above, is

founded in Idaho's Constitution and expressly declared in the *American Falls* decision described above ("priority over water [is] extended only to those using the water.") 154 P.3d at 447-48 (2007). A senior appropriator's priority will be enforced against others only to supply the senior's actual beneficial use. "Paper" water rights, no matter how senior, lack this privilege.

- i. An example of this is a recent decision in the years-long delivery call controversy involving surface water users seeking to shut off pumping by thousands of ground water wells on the Eastern Snake Plain Aquifer ("ESPA"). In that case, the Twin Falls Canal Company ("TFCC") sought curtailment of junior ground water rights to deliver water sufficient to produce a diversion rate of $\frac{3}{4}$ miner's inch (0.015 cfs) per acre to TFCC's headgate on the Snake River. However, hearing officer Gerald Schroeder ruled that, though TFCC's water right decrees added up to river diversions of $\frac{3}{4}$ inch per acre for its approximately 198,000-acre place of use, it could obtain curtailment of juniors only to the level necessary to deliver $\frac{5}{8}$ inch. TFCC had called for the larger number, and there was no dispute that its water right decrees added up to this amount. As a result, the Department's emergency, pre-hearing order in the case calculated presumed injury on the basis of the higher number.
- ii. However, TFCC had failed to explain that an earlier judicial determination, TFCC's internal memoranda, its normal irrigation practice, and the capacity of its facilities all indicated that the smaller number was what TFCC needed for a full water supply. Consequently, after hearing, the hearing officer ruled that the $\frac{5}{8}$ inch diversion rate is all TFCC could call for. *In the Matter of Distribution of Water to Various Water Rights Held by or for the Benefit of A&B Irrigation District, et al.*, Idaho Department of Water Resources at 55 (April 29, 2008) (the "*ESPA Delivery Call*").
- iii. This does not mean the TFCC cannot divert the larger amount when it is available, can be accommodated in its system, and will be put to beneficial use without waste. It does mean that it cannot curtail others to deliver the larger amount.

3. Continuing obligation to place water to beneficial use. As should be clear from the above discussion, the requirement of beneficial use is the foundation for all water rights, and is a continuing obligation while in the irrigation entity's control. "[T]he legislature has and does exercise a certain control over all the waters of the state while they are flowing in the natural channel of the stream, and the law follows the water, after it is diverted therefrom, to see that it is applied to a beneficial use." *Boise Irrig. & Land Co. v. Stewart*, 10 Idaho 38, 48 (1904).

- (a) “Waters of the state belong to the public, and the private right which the individual acquires by appropriation or purchase is usufructuary only, and . . . at any given time the extent of his reasonable need is the measure of the maximum amount he is entitled for the time being to divert from the stream or to receive and use.” *Caldwell v. Twin Falls Salmon River Land & Water Co.*, 225 F.584, 595 (D. Idaho 1915).
- (b) “Concurrent with the right to use water in Idaho ‘first in time’ is the obligation to put that water to beneficial use. *Id.* “[T]he extent of beneficial use [i]s an inherent and necessary limitation upon the right to appropriate.” *Schodde v. Twin Falls Land & Water Co.*, 224 U.S. 107 (1912). “Neither the Idaho Constitution, nor statutes, permit irrigation districts and individual water right holders to waste water or unnecessarily hoard it without putting it to some beneficial use.” *American Falls* at 451.
- (c) “[I]t is the duty of a prior appropriator to allow the water, which he has the right to use, to flow down the channel for the benefit of junior appropriators at times when he has no immediate need for the use thereof.” *Mountain Home Irrig. Dist. v. Duffy*, 79 Idaho 435, 442 (1957). Again, the concept of first in time—the priority element—cannot be used except between those beneficially “using the water.” Idaho Const. Art. 15 § 3; *American Falls* at 447-48.
- (d) An Idaho statute addresses this directly.

No person entitled to the use of water from any such ditch or canal, must, under any circumstances, use more water than good husbandry requires for the crop or crops that he cultivates; and any person using an excess of water, is liable to the owner of such ditch or canal for the value of such excess; and in addition thereto, is liable for all damages sustained by any other person, who would have been entitled to the use of such excess water, as fixed by this section.

Idaho Code § 42-916. Construing this statute in *State v. Twin Falls Canal Co.*, 21 Idaho 410, 121 P. 1039, 1051 (1912), the Idaho Supreme Court found that the canal company in that case was not entitled to provide “a continuous flow” to its shareholders, and instead “is bound to employ the most economical method possible in the distribution of water from its canal and system, and if necessary adopt a system of rotation. . . .” And this despite the arguments of the canal company “that rotation means trouble, expense, and annoyance, and ought not to be forced without necessity. . . .” *Id.* at 1049.

4. The Federal Reclamation Act of 1902. The Reclamation Act comes into play in the Treasure Valley because approximately 1 million acre-feet of Boise River storage water is held under Bureau of Reclamation contracts for irrigation here. While the Act was adopted primarily to provide agricultural irrigation water to farms and

ranches—mainly by means of federal storage projects—increasing amounts of this storage now are being held or delivered by irrigation entities to irrigate suburban lawns and similar non-agricultural areas.

- (a) The United States, in carrying out the mandates of the Reclamation Act, must proceed pursuant to state water law, at least so long as such law does not frustrate the purposes of the federal act.²
- (b) The Reclamation Act also provides: “The right to the use of water acquired under the provisions of this Act shall be appurtenant to the land irrigated, and beneficial use shall be the basis, the measure, and the limit of the right.” 43 U.S.C. § 372. The second clause of this statement succinctly describes the essence of western water law.
- (c) The Bureau has recognized the beneficial use requirement in relation to whether, or to what extent, to renew storage water contracts with irrigation entities (e.g., contracts, involving Lucky Peak Reservoir storage on the Boise River):
 - A 1998 Bureau Memo contains no mention of beneficial use as an element to consider in water service contract renewals. *Memorandum from Commissioner to Regional Directors Re: Policy for Guidance on Interpretation of the Act of July 2, 1956, “Administration of Contracts Under Section 9, Reclamation Project Act of 1939”* (September 18, 1998).
 - In contrast, a 2000 Bureau Memo states that “[u]se of Reclamation project water is subject to state and Federal laws requiring beneficial use. An opportunity for a determination of beneficial use is the performance of a water needs assessment prior to entering contract renewals, amendments, or new contract initiatives. If a non-beneficial use of water is found to exist, the contracting process shall be used, as appropriate, to eliminate such use.” *Memorandum from Commissioner to Regional Directors Re: Water-Related Contracts and Repayment Policy* at 1 (March 20, 2000).
 - This policy appears not to have been implemented. For example, with regard to Lucky Peak storage contract renewals in recent years, no assessments were performed to determine the extent of beneficial use of Bureau storage water in the Treasure Valley.

² “Nothing in this Act shall be construed as affecting or intended to affect or to in any way interfere with the laws of any State or Territory relating to the control, appropriation, use, or distribution of water used in irrigation, or in any vested right acquired thereunder, and the Secretary of the Interior, in carrying out the provisions of this Act, shall proceed in conformity with such law, and nothing herein shall in any way affect any right of any State or of the Federal Government or of any landowner, appropriator, or user of water in, to or from any interstate stream or waters thereof.” Section 8 of the Reclamation Act of 1902, 43 U.S.C. §§ 372 and 383.

- A footnote in the definition of “transfer of project water” in the Bureau’s *Reclamation Manual* states that when Reclamation Project water “is converted from the irrigation of commercial crops to the irrigation of other vegetation (including, but not limited to, lawns and ornamental shrubbery used in residential and commercial landscaping...), then such a conversion is not a ‘change in the type of use’ of project water and is, therefore, not a ‘transfer of project water’” U.S. Bureau of Reclamation, *Reclamation Manual, Policy*, (130) 1/10/01 at p. 4, n. 6. Again, this Manual entry does not address what happens to project water that is not being beneficially used to irrigate vegetation.

C. Urbanization and Surface Water Irrigation in Idaho

1. Rapid urbanization of agricultural lands in some areas. In recent years in Idaho’s Treasure Valley, an average of about 3,000 acres transitioned annually from irrigated agriculture to urban or suburban land uses such as residential subdivisions, roads, and commercial areas. Other areas are experiencing similar growth onto formerly agricultural lands, particularly Twin Falls, Idaho Falls, Kootenai County, and parts of Blaine County

2. Irrigation accounts for the largest share of water diversion and use in the Treasure Valley. Approximately 95% of the water diverted in the Treasure Valley goes to irrigation for cropland, parks, lawns, landscaping and similar areas. Similar percentages apply in many other parts of the Intermountain West.

3. Local government ordinances require that suburban lawns be irrigated with surface water from canal companies and irrigation districts. Irrigation water from ditches and canals is supplied to most new subdivisions in Treasure Valley. City ordinances strongly encourage, or require, use of canal-delivered water for residential lawns and common areas where it is available—typically in pressurized systems that can supply standard in-ground sprinkler systems. Rationales for this policy include the argument that ground water should be preserved for domestic and culinary purposes, and that it is overly costly to supply treated water to irrigation uses.

(a) For example, the Boise City Code provides:

No subdivision plat shall be approved for residential development unless the developer has provided for the design, construction, and installation of a pressurized individual lot irrigation system. Irrigation system maintenance and operation shall be provided by the irrigation district or canal company within which the development lies, by a municipal irrigation district, or by the formation of another entity capable of operating and maintaining a pressurized irrigation system.

Boise City Ord. No. 5819 as amended 10/28/1997.

- (b) The City of Meridian’s pressurized irrigation ordinance requires constant surface water flow of 15 gallons per minute per user (21,600 gallons per day), delivered at the point of use. Note that this is substantially above the 13,000 gpd of diversions per household allowed under Idaho law for domestic use (including up to a half-acre of irrigation). Idaho Code § 42-111.
- (c) Eagle’s “Pressure Irrigation Standards” employ a “probability factor” to account for the possibility that all homeowners will sprinkle their lawns at the same time. This could lead to the situation where, for example, all 40 acres of subdivision irrigation in an 80-acre tract are irrigated at the same time, and water diversions and deliveries are required to provide this. In contrast, the farmer originally irrigated the tract at no more than about 9 acres at a time (see discussion and illustration in sections C.5 and 6, below.)
- (d) Blaine County has adopted an ordinance to the effect that existing on-site surface and ground water irrigation rights should be used before allowing new water rights to be established for housing developments. Blaine County Code §§ 9-21B-15.B.8.d; and 10-5-3.F. The effect of this in the Treasure Valley typically is to require a “dual” system, with the existing surface or ground water irrigation rights supplying the irrigation component, leaving the in-house culinary uses to be supplied by a new municipal water right.
- (e) These requirements come with no directive or comment about principles such as duty of water, the rotation of deliveries among users, or the sizing of facilities to avoid diverting more than reasonably can be put to beneficial use. They do not address the issue, or the opportunity, of transferring unneeded portions of water rights to other uses.

4. State law. A recently enacted Idaho statute also addresses this subject and essentially mandates the use of surface irrigation water from existing canal systems in most cases:

(1) The intent of this section is to encourage the use of surface water for irrigation. All applicants proposing to make land use changes shall be required to use surface water, where reasonably available, as the primary water source for irrigation. Surface water shall be deemed reasonably available if:

- (a) A surface water right is, or reasonably can be made, appurtenant to the land;
- (b) The land is entitled to distribution of surface water from an irrigation district, canal company, ditch

- users associations, or other irrigation delivery entity, and the entity's distribution system is capable of delivering the water to the land; or
- (c) An irrigation district, canal company, or other irrigation delivery entity has sufficient available surface water rights to apportion or allocate to the land and has a distribution system capable of delivering the water to the land.

I.C. § 67-6537. In a 2005 draft memorandum to staff, IDWR's former director David Tuthill stated that this new statute means that "it is no longer satisfactory to determine if surface water is *currently* appurtenant to the land," and that the question the agency must answer is whether "surface water *reasonably can be made* appurtenant" to the developed property. D.R. Tuthill, Memorandum to Water Management Division Staff re: *New Legislation Requiring the Use of Surface Water for Irrigation* (draft of July 13, 2005) ("IDWR Draft Memorandum") (emphasis in original). The memorandum states that this may involve IDWR mandating that the developer enter the market to purchase water rights: "This criterion requires an analysis of whether there are surface rights reasonably available for acquisition" from other water users or the Idaho Water Bank. IDWR Draft Memorandum at 3.

A separate statute, I.C. § 31-3805, requires subdivision developers of former agricultural land to either: 1) transfer the water rights to uses off the parcel; 2) install an irrigation system, approved by the local government with advice from the irrigation entity, for the subdivision that will use water provided by the irrigation entity; or 3) inform the lot buyers that neither of the above has been done and that the owner will remain obligated to pay any legal assessments the irrigation entity may impose on the lot owners. It is unclear how these two statutes operate together.³

As is the case with the local ordinances, neither of these state statutes addresses the question of duty of water, irrigation rotation or scheduling, system sizing, nor the issue of beneficial use.

5. Limits to local government action in the area of water rights. Cities and counties in Idaho have broad police powers to enact ordinances to protect health, safety and welfare. However, as implied by section 67-6537, there are limits to this power when it comes to water rights or water policy issues that may be seen as assigned to IDWR. Two recent cases illustrate this.

- (a) *Ralph Naylor Farms v. Latah County* ("Naylor Farms"), 144 Idaho 806, 172 P.3d 1081 (2007), involved an ordinance adopted by Latah County

³ The district court in *Eagle Creek Partners, LLC v. Blaine County*, Case No. CR-2007-670 at 9 (ID Fifth Judicial Dist, May 6, 2008) (an opinion discussed further below), agreed with plaintiff's characterization that Idaho Code § 31-3805 is a "consumer protection statute designed to ensure that a buyer of land in an irrigation district (in a proposed subdivision) either gets the water he is entitled to from the water provider, or receives notice that he is still liable for assessments for that water."

creating the “Moscow Sub-basin Groundwater Management Overlay Zone.” The ordinance prohibited the County from accepting applications for specified new land uses that were found to consume large quantities of water (mineral extraction and processing, large CAFOs, and golf courses). The ordinance was enacted as a direct response to the County’s failed protest of Naylor Farms’ application to IDWR for a ground water right for clay processing.

- i. The district court in *Naylor Farms* invalidated the ordinance on the basis that it was preempted by the authority granted to IDWR to regulate water resources. The County did not appeal. Instead, the prevailing applicant appealed the district court’s denial of its attorney fee request. While the appeal dealt with attorney fees, the Idaho Supreme Court found it necessary to discuss the merits of the preemption issue, essentially upholding the district court’s preemption analysis.⁴
 - ii. Neither the parties nor the Court discussed Idaho Code § 42-201(4), which was enacted in 2006, the year after the County adopted the ordinance in question. Instead, the district court applied a common law implied preemption analysis under *Envirosafe Services of Idaho, Inc. v. County of Owyhee*, 112 Idaho 687, 689, 735 P.2d 998, 1000 (1987).
- (b) On May 6, 2008, Judge Elgee issued a decision in *Eagle Creek Partners, LLC v. Blaine County*, Case No. CR-2007-670 (ID Fifth Judicial Dist, May 6, 2008), invalidating the county’s requirement that the developer not employ a series of ponds as part of its irrigation water delivery system. The County believed the pond system to be wasteful. The district court ruled that the county’s authority to require more efficient irrigation is preempted by IDWR’s authority to grant or administer water rights.
- (e) The message from *Naylor Farms* and *Eagle Creek* appears to be that cities and counties may not employ zoning laws to engage in what is really water resource management. That is exclusively IDWR’s domain. Thus, counties may not prohibit golf courses or aesthetic ponds on the ground that, in the county’s opinion, they use too much water. This is not to say, of course, that local governments are obligated to grant every zoning or plat approval request simply because the applicant has obtained a water right for it. But it is to say that the reason for restricting or prohibiting the development had better be something other than “it is good water resource

⁴ Since the county did not appeal, the Idaho Supreme Court accepted the district court’s determination as a given. On the other hand, the court did not appear troubled by the district court’s ruling on the merits, saying at one point “we respect the district court’s analysis.” *Naylor Farms* at 813, 172 P.3d at 1986. Ultimately, however, the appeal court upheld the district court’s decision not to award attorney fees against the county.

management.” Just where the line is between legitimate local regulation and improper intrusions into IDWR’s authority remains to be worked out. It bears emphasis that we do not yet have a definitive ruling from the Idaho Supreme Court.

6. Reduced irrigation water use after development of farmland. About 30,000 acres of pressurized systems exist in the Treasure Valley. These have been constructed, for the most part, on formerly irrigated agricultural land. Not surprisingly, IDWR has found evidence that “less surface water is used for irrigation after the conversion of irrigated agriculture to suburban/urban land uses.” *Final Report, Urban/Suburban Outdoor Water Use, Lower Boise River Valley* (August 2006) at 11. Subdivision of former agricultural land usually results in 40% to 65% reduction in irrigated area; the reduction of irrigated area is particularly acute where development involves substantial transportation infrastructure, shopping centers, apartment buildings, industries and similar land uses.⁵

7. In a delivery call, the Department can be expected to remove non-irrigated lands from its injury or curtailment calculation. It seems elementary that when an irrigation entity, such as an irrigation district or canal company, makes a delivery call, it should expect the State to curtail juniors only to the extent necessary to supply diversions to actually irrigated acres.

- (a) However, in the 2005 delivery calls carried out under the Department’s Conjunctive Management Rules and directed at wells affecting the ESPA (discussed above), the senior irrigation organizations, some of which have experienced significant urbanization, did not describe the number of acres that actually are irrigated within their boundaries, relying instead on their more generally described boundaries in their decrees. As noted above, this approach was rejected by the Hearing Officer, who found, in his Recommended Order, that some 14,500 acres in three of the seven irrigation entities “are not irrigated” and cannot be considered in calculating their necessary water supply.⁶ *ESPA Delivery Call* decision at 53 (April 29, 2008).

⁵ See, e.g., SPF Water Engineering, LLC, *Estimate of Non-Irrigated Acres in the Twin Falls Canal Company Service Area*, (draft of November 25, 2006). This SPF analysis formed the basis for testimony and other evidence supporting the Hearing Officer’s 2008 decision in the *ESPA Delivery Call* litigation, discussed above, that not all acres within irrigation entities making delivery calls are actually irrigated and therefore cannot form the basis for curtailing junior water rights. SPF’s study employing aerial photographs, IDWR information, canal company maps, and on-the-ground inspections, estimated that the non-irrigated portions of subdivisions served by TFCC are 62 percent within “urban subdivisions,” 24 percent within “rural subdivisions,” and 40 percent within what SPF describes as “miscellaneous” developed areas. Of course, it does not take an engineering study to conclude that converting an irrigated farm field to a subdivision results in reduced irrigated area. SPF’s findings are useful nonetheless in estimating percentages of reduction and for providing a basis for distinguishing between different housing densities within subdivisions.

⁶ The group of irrigation entities (together calling themselves the Surface Water Coalition) that brought the *ESPA Delivery Call* is comprised of seven members. It is likely that the other four entities not

- (b) With reference to diversions into a mutual canal company (in which water users' entitlements are evidenced by shares of stock), the Hearing Officer concluded that the "calculation of a water budget in determining if there will be curtailment should be based on acres, not shares." *Id.*

8. Historical rates of diversion usually not reduced when farmland converted to subdivisions. As noted above, irrigation district and canal company policy in the Treasure Valley and elsewhere in Idaho is not to reduce their river diversions to these subdivided, former agriculture areas, despite decreases in irrigated area.⁷

- (a) For example, consider an 80-acre alfalfa field for which 80 miner's inches (1.6 cfs) is diverted from the source. When it is subdivided into a 200-lot subdivision, the 80-acre parcel now has only, say, 40 irrigable acres. However, the irrigation entity continues to divert and deliver the full 80 inches for the development.
- (b) The transition from an 80-acre farm field to a subdivision with lawns is complicated by this fact: in the farmer's hands, the 80 acres would be irrigated at a maximum rate of about 16 acres per day, with the sprinklers rotating to the next 16 acres the following day, and so on. In fact, it is common for turf farms to irrigate only once every seven days (i.e., 11 acres per day), even on 100-degree days.⁸ However, if the subdivision built on the parcel has 40 acres of irrigated area, but with no rotation schedule in place, the result will be more instantaneous peak flow demand than the farmer needed. The overall amount of water put to beneficial use on the parcel, and its consumptive use, will be half as much. Accordingly, the per-acre amounts of both constant flow rate and annual volume will increase. Efficiency will have been halved.
- (c) Several rationales have been advanced for such over-diversions. It provides a peaking capability for the irrigation system during periods of extreme irrigation demand, particularly systems that are not on a rotation

mentioned by the Hearing Officer in this context also have acres that are not irrigated but for which curtailments are sought. At the hearing, the ground water users offered evidence only on the three noted by the Hearing Officer in the Recommended Order (Twin Falls Canal Co., Minidoka Irrigation District, and Burley Irrigation District).

⁷ Officials with the Twin Falls Canal Company, for example, have confirmed that they do not attempt to reduce diversions as lands are taken out of production for subdivisions and similar non-irrigation uses. *See, e.g.,* Deposition of Vince Alberdi, *In the Matter of Distribution of Water to Various Water Rights Held by or for A & B Irrig. Dist, et al. Idaho Department of Water Resources* (September 22, 2005).

⁸ Turf, such as bluegrass in most suburban lawns, needs water every 4 to 7 days during the heat of the summer, the variation depending on soil type and other factors. Personal communication with Todd Moon, Stonecreek Turf Co., Meridian Idaho (October 24, 2007). Mr. Moon explained that he irrigates any given parcel of turf only once every seven days, even when temperatures are in the triple digits, Fahrenheit.

or other watering schedule. It also minimizes both complaints from homeowners (concerned about low water pressure during peak irrigation times) and labor and management costs for the delivery entity. But it also raises legal and policy issues for water management.

- (d) The following photograph illustrates the situation. This turf farmer is using a quarter-mile-long side roll sprinkler to irrigate an 80-acre field. The device puts water down on only about 1.8 acres at any given time, and then is moved after sets of 8-12 hours to cover a new area. Typically, in a turf farm like this, the irrigator would use 4 or 5 such wheel lines, thus allowing about 9 acres to be irrigated at any one time—that is, about 11% of the total irrigated field. Under no circumstances does the farmer irrigate as much as half of the 80 acres at once, or pump into the sprinkler system the amount of water that would be required to irrigate even a third of the parcel at one time. Indeed, doing so likely would over-water the crop, resulting in poor yield and other problems. The irrigator expects to irrigate every piece of turf once every 4-7 days. This is what is needed for full beneficial use of water.



9. Duty of water for suburban lawns and landscape. Delivery of 80 acres-worth of water to 40 acres of use also makes the delivery rate outstrip the permissible duty of water. In the above example, the amount delivered per acre would increase from one inch per acre to two inches per acre as portions of the irrigation water right now are appurtenant to a house footprint, street, parking lot, highway interchange, commercial building, or similar use.

- (a) This is inconsistent with the mandate not to waste water, the decreed duty of water for the delivered right, and Idaho law imposing a standard duty of water allowing diversion flow rates of no more than one miner's inch (0.02 cfs) per acre.
- (b) More fundamentally, such a failure to reduce diversions in response to reduced irrigated area also assures that water is being diverted that is not being put to beneficial use. Such non-use cannot be protected, much less enforced, as a water right.
- (c) By using rotation, pond storage for peaking, and other techniques (including even shallow ground water wells), suburban lawn irrigation

could be carried out within the same per-acre diversions the farmer used before the conversion from agricultural field to residential subdivision—in other words, with diversions that have been reduced commensurate with the reduction in irrigated acres. This would retain the parcel’s duty of water. Such an approach requires water management.

- (d) To date, there has been little or no interest among irrigation entities or subdivision developers or many homeowners’ associations to live by the same water management practices that were employed by the farmer who owned the land previously.
- (e) The over-diversion of surface water for urbanized irrigation entities is consistent with some past practices in the Treasure Valley. A 2003 study for the Idaho Department of Environmental Quality commented on the application of “excessive water” to crops in past decades, a practice that was accompanied by the construction of drains to remove the resulting shallow ground water that was drowning roots. Due to this, according to the study, water “is not necessarily efficiently used.” Hill, et al., Ecosystem Sciences Foundation, “Lower Boise River—Designs to Improve Water Quality” (2003) at 30.

10. Infrastructure sizing. The current practice also can result in construction of pressure irrigation delivery infrastructure that, to operate properly, requires the full historical head of water in the system, including amounts that are beyond the legal duty of water or are not being put to beneficial use. Typically, pumps and other water delivery facilities are sized to accommodate the full rate of flow formerly delivered to the overall site; they usually are not sized to deliver at a rate proportional to the part of the area that will remain in irrigation post-development. Therefore, changing to a lesser amount of flow after this equipment is in place could be expensive. This situation can make it difficult to change to conform to a reasonable duty of water, to market the unneeded portions of the water right, or commit it to alternative uses.

11. Water use management. Irrigation districts and canal companies usually do an excellent job of measuring water into their headworks and main laterals, but they usually do not measure deliveries to the end users, such as a subdivision. Many subdivisions fail to impose rotation or other water use arrangement requirements, and the irrigation entities supplying the water (and controlling the water rights) do not see this as their responsibility.

12. Little conservation incentive. Pressurized irrigation water also is inexpensive; fees and assessments paid to irrigation districts and canal companies are not based on the amount used, and deliveries to individual homes usually are not metered. Annual fees or assessments for this water typically range from \$30 to \$90 per household. Non-metering and low rates are disincentives to conservation of water.

13. Changes in ground water recharge. Conversion of significant areas of agricultural land to subdivisions, shopping malls and roadways also usually reduces both natural and incidental ground water recharge, particularly to shallow aquifers.

- (a) Lands that formerly were flood irrigated to grow row crops are giving way to development. Even though urban developments often retain significant areas of irrigated lawn and open space, typically more than half of the land in urbanized areas consists of impervious, non-irrigated surfaces.⁹ These impervious surfaces increase surface runoff and preclude infiltration of precipitation.
- (b) Moreover, urban landscaped acres usually are served by sprinklers or drip systems that are more efficient than the gravity flood irrigation systems they may have replaced. In these cases, the result is less incidental recharge to ground water.¹⁰ In the Treasure Valley, these pressurized irrigation systems receive the same surface irrigation water through the same canal system that served the cropland on which the urban development occurred, and the canal systems themselves continue to contribute to ground water recharge.
- (c) But the net effect of urbanization on formerly agricultural areas still appears to be a decline in both the amount of beneficial use of surface water for irrigation and declines in natural and incidental ground water recharge.¹¹

14. Bureau of Reclamation's waste water remark in partial decrees. The Bureau has taken the position that it is entitled to reclaim water attributable to seepage from Boise Project canals and ditches that ends up in drains within the Project. It has sought and obtained a remark to this effect in many of the partial decrees held by water

⁹ Personal communication, Zena Cook, Idaho Dep't of Water Resources, October 28, 2002.

¹⁰ Recent studies have suggested that, for several reasons, suburban or commercial lawn and landscape irrigation likely provides little direct ground water recharge. Many recharge-inducing lateral ditches are abandoned, lined or piped to accommodate urban development; lawn irrigation systems typically use sprinklers; and there is evidence that lawn irrigation itself often results in reduced soil perviousness due to compaction of soils and effects of grading during home construction. *See e.g.*, NRDC, et al., *Paving Our Way to Water Shortages: How Sprawl Aggravates the Effects of Drought* at 5-6 (2002), citing EPA, *Clean Water Through Conservation*, EPA 841-B-95-002 (April 1995); Sakrison, R., *Water Use In Compact Communities: The Effect of New Urbanism, Growth Management and Conservation Measures on Residential Water Demands* (University of Washington, 1997); and Schueler, T., *The Peculiarities of Perviousness*, *Watershed Protection Techniques*, Vol. 2, Issue 1, 1995.

¹¹ A news story from Twin Falls describes how reductions in farm irrigation due to urbanization is reducing water seeping into underground drains that in turn supply water to fish farms on Rock Creek. Among other problems (such as developers blocking the drains in places), the story reported that "much farmland in the area has been sold for housing developments, . . . meaning even less irrigation. . . ." Nate Poppino, *Water Storage Could Harm Fish Facilities*, *Twin Falls Times News* (May 11, 2008).

users in the Treasure Valley.¹² The concept of recapturing and re-using waste water before it leaves the place of use is well established in Idaho law, so the Bureau’s position does not increase its water right. However, the re-use must not result in an enlargement, such as adding acres. Given that most of the Bureau’s areas are shrinking in irrigated acreage, the remark underscoring the ability to recapture wastewater and make a non-enlarging use of it appears to be of little practical import. Some irrigation districts, making a similar point, have asserted that they own the drains and the water in them, and that third parties cannot legally establish water rights in drains. However, such a position is not the law. *See Janicek* opinion, cited in footnote 12.

15. Sustainability of large flow rate deliveries per acre. The Idaho irrigation entities that supply suburban areas with high per-acre flow rates may find it difficult to continue doing so at some point as more farmland gives way to suburban development. Presumably, there is enough water now to supply current subdivisions with per acre flow rates in excess of those that the farmland required. However, it seems only a matter of time until such higher flow rates eventually overtake the district’s water right, or at least place an inordinate draw upon their storage.

16. The Idaho approach contrasts with that taken in Oregon. An irrigation district in an urbanizing area in Oregon has noted that “[a] water right gives you permission and an obligation to beneficially irrigate a very specific area (generally measured in acres)” and has recognized that “[c]onverting land to another use (road, parking lot, building, etc.) can also result in the forfeiture of a water right.” Central Oregon Irrigation District (“COID”), “Operations” section of its website. <http://www.coid.org/operations/>

a. This Oregon irrigation district, which is in an area that is urbanizing in ways similar to the Treasure Valley, also describes one of its “challenges” as the “[p]ersistence of patrons failing to beneficially use their water either due to economics, absentee ownership, or mismanagement resulting in potential confiscation by the District as the only viable option to prevent forfeiture.” <http://www.coid.org/about-us/managers-report/>

b. One of the ways COID deals with this situation is to insist that the surface irrigation water right be transferred off subdivided parcels and the water used elsewhere, including use through a collaboratively managed water bank that provides supplies for municipal uses, other irrigation, and even instream values in the Deschutes River. Indeed, an Oregon statute requires that when farmland is

¹² The waste water remark, which appears to do no more than restate settled law on the subject, is: “The source of this water right includes waste water. The right remains subject to the right of the original appropriator, in good faith and in compliance with state law governing changes in use and/or expansion of water rights, to cease wasting water, to change the place or manner of wasting it, or to recapture it.” *See, e.g., Order of Partial Decree for Water Right 63-27475 (Janicek LLC)*, In Re SRBA, Case No. 39576, District Court for the Fifth Judicial District for the County of Twin Falls (October 6, 2008). “Waste water” in this context generally is understood to be tail water, field runoff, or seepage—that is, water that has been diverted within the duty of water but was not taken up by the plant or evaporated.

subdivided within irrigation districts, “the subdivision shall be excluded and taken from the district...” ORS 545.101. A subdivision can be retained in the district and served with irrigation water if the district agrees to serve it. However, in these cases the subdivision must install a delivery and measurement system “for *only* the area that will be irrigable. The remainder will be transferred off in accordance with law.” COID Development Handbook (2/8/10) at p. 14. Accordingly, in Oregon urbanization proceeds within irrigation entities with the recognition that the portion of the water right appurtenant to non-irrigable land must be moved to where it can continue to be placed to beneficial use.

D. Data gaps and questions concerning surface water use in the Treasure Valley

1. No studies or published data. There is no published data on the amount of water canal entities supply to lawns and similar areas in Treasure Valley. Nor is such data available anywhere else in Idaho. As noted, these deliveries are not metered, and there are limited evaluations of pressurized systems. The Bureau has observed that even irrigation “drain flow data in the Boise Valley is relatively sparse.” *A Distributed Parameter Water Budget Data Base for the Boise Valley* (Jan. 2007) at 12. As part of its CAMP process, IDWR has begun to collect some drain flow information in the Treasure Valley.

a. The CAMP process is evaluating the Valley’s water supply, and its future water needs, including the question whether a new storage reservoir might be necessary to provide municipal water.

b. The CAMP process does not appear to be evaluating the water supply implications of the transition in many areas of the Valley from irrigated agriculture to urban uses. However, a presentation by Dr. Christian Petrich to the CAMP on June 10, 2010 made the point that irrigated area in subdivisions is substantially less than the cropland on which the subdivision was constructed.¹³

2. Bureau policy unclear. A significant amount of Bureau storage on the Boise River system now is being supplied to suburban lawns from the Bureau reservoirs. The Bureau has not yet decided how to treat the use of federal storage for small tract irrigation (i.e., suburban lawns and landscaping). However, a Bureau study now underway is evaluating certain aspects of the shallow ground water recharge that has occurred through leakage from canals, ditches, and application of irrigation water to fields. One purpose of this study is to place a value on the external benefit bestowed on ground water and drain water users. It is unclear what the Bureau’s aim is with this approach other than to get a better handle on the amount of seepage, runoff and tail water the Boise Project might be generating. The right of an appropriator to reclaim waste water was discussed above.

¹³ Christian R. Petrich, PhD, SPF Water Engineering, LLC, *Treasure Valley Water* powerpoint presentation and lecture (June 10, 2010), at pp. 25-26.

3. What we know about irrigation water use in the Treasure Valley. Annual maximum consumptive irrigation use in the Valley is about 3.2 af/acre per year. It would be slightly less for most landscape shrubs.

- (a) To meet this duty of water, the standard permissible river diversion of one miner's inch (9 gpm or 0.02 cfs) per acre results in a volume diverted from the river over the course of an irrigation season of up to 8 acre-feet per acre per year (e.g., .02 x 1.98 x 200 days = diversions of 7.92 af/acre). A "5/8 inch" right = diversion of 4.95 af/acre/year.
- (b) Amount supplied from the ditch into a pressure system could be close to consumptive use amount. Some pressurized systems use a pond for storage to meet peak demands. Ponds are usually seen as evaporating about as much as an irrigated field of comparable surface area.

4. The implications of relative water abundance in the Treasure Valley.

- 1. River flows below Star Bridge are not fully appropriated, and Boise River surface water right administration is not imposed below that point.
 - 2. Increases in these flows, including increased drain flows to the river, can be expected as more irrigated agricultural land is changed to non-irrigated uses.
5. Needed data. The follow are the types of information it would be useful to have from irrigation entities. Some of this information is available, some has not been collected:
- a. Diversions into main canal (natural flow and storage).
 - b. Re-diversions into laterals.
 - c. Diversions from wells.
 - d. Diversions from drains.
 - e. Discharges into drains.
 - f. Drain discharges to river, streams, or canals
 - g. Water quality of drain discharges.
 - h. Records of use by patrons or shareholders, including those shareholders who pay assessments but do not use the water (or use less than their full entitlement).
 - i. Names and locations of patrons or shareholders.
 - j. Gross area within each entity—i.e., area within the district boundary, company service area, or area owned by shareholders to which the entity's water rights are appurtenant. That is, the originally irrigated area.
 - i. Comparison of the gross area with place of use in the entity's SRBA decree.
 - ii. Amount of the service area actually irrigated with the entity's water.

- k. Locations of patron or shareholder lands that cannot receive the entity's water (name, location, size of area, number of shares or district entitlements).
 - i. List of former patrons or shareholders who have withdrawn from the district or company (name, location, size of area, number of shares or district entitlements).
 - ii. List of patrons or shareholders who do not receive or use entity water.
- l. Lands added to service area since water right acquired.
- m. Describe miles of:
 - i. Main canal(s)
 - ii. Laterals
 - iii. Ditches or other conveyances smaller than laterals
- n. Description of miles of the canals, laterals, and ditches that:
 - i. Are lined with concrete
 - ii. Are piped
 - iii. Have been removed
- o. Identify supplemental irrigation wells used by patrons or shareholders, and describe the amount of ground water used in each case.
- p. Identify domestic wells in the service area.
- q. Identify amounts of water supplied by the irrigation entity that is used for non-irrigation purposes (e.g., aesthetic, wildlife).
- r. Identify amount of water rights transferred out of the irrigation entity to some other use (e.g., municipal, commercial, aesthetic).

6. IDWR's current reluctance to grant new water rights.

- a. The ESPA experience appears to have made IDWR reluctant to grant new ground water rights.
- b. A negative signal to businesses who might want to locate here.
- c. Implications for economic development in Treasure Valley

E. Potential downstream pressures for Idaho water.

1. Endangered Species Act. There is always the possibility that there will be calls for Idaho to release additional water for salmon passage or in furtherance of habitat needs of other species. This situation, and other "regulatory droughts" based on environmental concerns, could make it more difficult for Idaho to meet new demands for water use in the Treasure Valley.

2. Interstate allocation. *Washington v. Oregon*, 297 U.S. 517, 527 (1936) ("there must be no waste...of the treasure of a river.... Only diligence and good faith will keep the privilege alive."); *Colorado v. New Mexico*, 459 U.S. 176 (1982) ("Wasteful and inefficient uses will not be protected.") It is worth noting that Idaho, virtually alone

among the western prior appropriation states, has no significant downstream water delivery obligations arising from compacts or Supreme Court decrees.

- a. Indeed, to focus just on the Treasure Valley, the Boise River downstream from Star is not even fully appropriated due to the prodigious flows from drains, ditches and ground water that return to the River in this lowest reach. In contrast, in other western states we see protracted litigation, sometimes harsh penalties, and constraints on economic development due to their obligation to deliver surface (and ground) water to a downstream sovereign.
- b. This problem, to varying degrees, affects Colorado, Nebraska, Wyoming, New Mexico, Arizona, Nevada, Utah, and California. It is a rare circumstance that Idaho finds itself not among this group, with the possible, and so far relatively minor, exception of salmon flows mandated by the Endangered Species Act.
- c. However, by failing to place some of its water to beneficial use—which is happening as Treasure Valley agriculture gives way to development—Idaho seemingly is sending water downstream and out of state willingly, if not wittingly. The State may be placing itself in a position where it will not be able to retrieve that water for the use of its citizens in the future.

3. In-basin delivery calls. River diverters who supply pressure irrigation systems may seek to shut off junior ground water users to supply these flow rates and volumes to subdivisions. This could precipitate a defense from the ground water users (or other juniors) based on lack of beneficial use, waste, or similar grounds.

F. Options for irrigation districts and canal companies.

1. Irrigation districts.
 - d. Irrigation districts could adopt programs and policies to serve non-agricultural irrigation uses while maintaining reasonable efficiencies and duty of water. Doing so could make water available for new users, either through lease, conveyance or annexation of new areas into the district. Such programs would help to maximize the use of water in Idaho for the long term.
 - e. Irrigation districts are governed primarily by statute and may feel they lack authority to engage in some of these initiatives. While they have some flexibility to lease water, meter water to subdivisions, annex new land, and exclude lands, they may need statutory changes to provide additional powers.
2. Canal companies.

- a. Most canal companies in Idaho, known as mutual canal companies, are non-profit corporations operating on behalf of their shareholders with only minimal statutory controls. Rather, they are governed primarily by their by-laws and the common law of water rights.
- b. State law provides that no water right transfer (including any change in the place of use, type of use, or point of diversion) may be made without consent of the canal company. I.C. § 42-108.
- c. While the majority rule is that shareholders in a mutual canal company are the beneficial title holders of the water rights the company delivers, most companies operate in a manner that assumes that the water rights delivered through the canal facilities are held solely by the corporation. In this way, most canal companies operate much like an irrigation district, if only primarily by custom. This places the board of directors in charge of all water right policy, such as whether the company will allow water use changes and transfers. Often, such transfers are not allowed or are burdened with conditions.
- d. Canal companies also could adopt bylaw changes or resolutions that would address the issues raised by urbanization and maximize water usage. However, to date there is not much evidence that this is happening.

G. Conclusions

There appear to be more irrigation diversions than can be put to beneficial use in subdivision systems in Idaho.

The physical implications likely include:

- Excess water diverted but unused; foregone opportunities for new uses of this water.
- More water in drains.
- More water for some junior surface users with established water rights, but not necessarily for new businesses or new municipal uses.
- Some irrigators also may be short of water, particularly storage, due to failure to make full use of natural flows that could be available to them.
- In some areas, this may mean more water flows out of state unused as urbanization occurs.

It is in everyone's interest to obtain the data and understand what water use actually is going on with the irrigation water that serves parts of our State that are changing from agricultural to suburban uses. All interests are served when water is put to beneficial use without waste.

