Integrated Land and Water Planning in Colorado

By Anne Castle, John Sherman, and Larry MacDonnell

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Introduction and Purpose

The Colorado Water Plan (CWP) recognizes that the projected growth in the state's population over the next century must be supported more strategically than the growth in past century in order to reduce the amount of water needed.[2] The manner in which Colorado develops into the future will have a strong influence on Colorado's future water supply gap.[3] Not only does the CWP recognize that the connection between local land use decisions and water availability must be strengthened, it also supports more comprehensive incorporation of water conservation requirements or incentives into land use decisions to reduce demand.[4]

The CWP establishes as one of eight overall measurable objectives that by 2025, 75 percent of Coloradans will live in communities that have incorporated water-saving actions into land-use planning.[5] Chapter 6.3.3 contains an excellent overview of existing efforts to more closely bind land use decisions to water supply considerations, and recent legislation on this issue. Actions identified to accomplish the objective include the development of training programs by the Colorado Water Conservation Board (CWCB) and the Department of Local Affairs (DOLA) to encourage local governments to incorporate best management practices for water into land use decisions.[6] The proposed training topics include many valuable techniques for encouraging wiser and more sustainable water use.[7]

The majority of the Basin Implementation Plans developed by the Basin Roundtables recommend the development and improvement of land use policies requiring and promoting water conservation.[8] The South Platte and Metro Roundtables specifically pointed to opportunities for reduction of water use through updates to comprehensive plans, changes to zoning requirements, and revising subdivision regulations.[9] Six boards of county commissioners from two Front Range and four West Slope counties and elected officials from a Front Range city and county government emphasized the importance of integrating land use planning into the CWP and adopted a joint declaration stating that "every community can do better on water conservation and

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[2] Colorado's Water Plan, November 2015 (CWP), available at http://coloradowaterplan.com, at 10-5.
[3] CWP at 6-83.
[4] CWP at 6-88 to 6-90, 10-5, 10-9, 10-10.
[5] CWP at 10-5.
[6] CWP at 6-89.
[7] *Id.* Some of the training topics are techniques that are targeted at, and could only be implemented by, water supply entities; others could be incorporated by local government land use approval authorities.
[8] CWP at 6-86 to 6-88.
[9] CWP at 6-88; see South Platte Basin Implementation Plan, HDR and West Sage Water Consultants, April 17, 2015, at 5-5.

efficiency via locally determined measures such as . . . enhanced building codes and water sensitive land use planning."[10]

The Colorado General Assembly has also recognized the importance of engaging local government land use planners in efforts to create better and more widespread water management and conservation. Senate Bill 8, enacted in 2015, amended the Water Conservation Act of 2004 by specifying that the conservation plans required of water suppliers serving demand of 2,000 acre feet or more must include an evaluation of "best management practices for water demand management that could be implemented through land use planning efforts."[11] In order to assist water providers in performing this evaluation, the new law prescribes the development of training programs for local government officials by the CWCB and DOLA in best management practices for water demand management, efficiency, and conservation.[12] This legislation also requires the CWCB and DOLA to make recommendations for better integration of water demand management and conservation planning into land use planning, including legislative, regulatory, or policy changes.[13]

The CWCB and DOLA are working with the Land Use Law Center at Pace University to create training programs as required by Senate Bill 8. Various training modules and webinars are in development as of this writing. Initial modules will address overall integration of demand management and conservation into the zoning and development approval process and the use of comprehensive plans, site plans, and subdivision approvals to incorporate water conservation considerations. The initial programs are anticipated to be available in the fall of 2016.[14] No recommendations have yet been made to achieve better land use and water integration.

The CWP suggests that academic institutions can advance integrated land use and water planning through innovation and research.[15] The purpose of this report is to provide such research by documenting how Colorado's laws on water adequacy and conservation considerations were actually incorporated into the development approval

[10] Comments on draft CWP from Boulder County, City and County of Denver, City and County of Broomfield, Eagle County, Grand County, Pitkin County, and Summit County, available at https://www.colorado.gov/pacific/cowaterplan/record-input-received-date, input received between March 5 and May 1, 2016, Item #67.
[11] Senate Bill 15-008, codified at Colo. Rev. Stat. § 37-60-126(4)(f). The other required elements of a conservation plan include water saving measures, an evaluation of conservation in the supply planning process, estimates of water saved by conservation, a time period for reviewing and updating the plan, and the steps used to develop implement, and revise the conservation plan. Colo. Rev. Stat. § 37-60-126(4).
[12] Colo. Rev. Stat. § 37-60-126(4)(f).
[13] *Id.*
[14] Personal communication with Kevin Reidy, Water Conservation Technical Specialist, CWCB, April 20, 2016.
[15] CWP at 6-90.

processes for five different developments along the Front Range.[16] This report does not attempt to address the many local governmental requirements for water adequacy and conservation, independent of state law. The goal is to provide background for discussions about whether new programs or changes to state statutes would be beneficial and to suggest practical and prudent actions for improvement.

Brief Synopsis of Relevant Law

Colorado law attempts to ensure that new development throughout the state is supported by an adequate water supply, and integrates this consideration into the local government land use approval process. Water conservation concepts are less well integrated into the development permit process,[17] but detailed conservation plans are mandated for large water providers, and indoor water-saving fixtures will be statutorily required as of late 2016. A review of the relevant statutes is provided below.

Master and Comprehensive Plan Water Considerations

Colorado's Local Government Land Use Control Enabling Act of 1974[18] confirms the authority of local governments "to plan for and regulate the use of land within their respective jurisdictions."[19] Both municipalities and counties must adopt master (or comprehensive) plans governing the development of land within their jurisdictions that include consideration of "the general location and extent of an adequate and suitable supply of water."[20] If the master plan includes a water supply element, the entities that supply water for use within the municipality or county must be consulted to ensure coordination on water supply and facility planning.[21] A water supply element is not mandatory, however, in a master plan. Master plans are advisory documents to guide land development decisions, but can be made binding by the governing body for its development approval process.[22] If, however, a local government has adopted special procedures for planned unit developments (PUDs), those procedures must require a

[16] The authors intended to include a Colorado West Slope case study in this report, but were unable after multiple attempts to identify a development that provided a suitable comparison. Because the South Platte and Metro Basins are the locus of the majority of the gap between water supply and demand projected by the CWP, the Front Range focus is appropriate. *See* CWP, Table 6.2-2, Summary of Basin Implementation Plans Addressing the Municipal and Industrial No-and-Low Regrets and Gaps, at 6-20.
[17] "Development permit" as defined in the local government land use statutes includes "any preliminary or final approval of an application for rezoning, planned unit development, conditional or special use permit, subdivision, development or site plan, or similar application for new construction." Colo. Rev. Stat. § 29-20-103(1).
[18] Colo. Rev. Stat. §§ 29-20-101 to -109.
[19] Colo. Rev. Stat. § 29-20-102(1).
[20] Colo. Rev. Stat. §§ 30-28-106(1), (3)(a)(IV); 31-23-206(1)(d).
[21] *Id.*
[22] Colo. Rev. Stat. §§ 31-23-206(1), 30-28-106(3)(a). It is the authors' understanding that few local governments have made their master plans mandatory.

finding that the PUD is in general conformity with any applicable master or comprehensive plan.[23]

Both counties and municipalities are authorized to create zoning plans, but the authorizing statutes do not address water considerations.[24] Other types of land use approval processes, such as development plans and subdivisions are discussed further below.

Water Adequacy Determinations

Colorado's law on the consideration of the adequacy of the water supplies for new development has evolved considerably over the past decade. Because land use planning for counties and for other local governmental entities is found in different sections of the Colorado statutes, the water adequacy requirements for those different entities have evolved separately. Both sets of statutes are discussed below.

County Planning Statutes

Since 1972, counties have been subject to the requirement that a board of county commissioners may not approve a preliminary plan or final plat[25] unless the developer has provided evidence that there will be a sufficient water supply for the proposed subdivision in terms of quantity, dependability, and quality.[26]

When a county receives a preliminary plan submission as part of a subdivision application, it must refer the plan to the State Engineer for an opinion regarding likely material injury to other water rights and adequacy of proposed water supply to meet the requirements of the proposed subdivision.[27] If the water supply is to be provided by a public water supplier, the supplier must document the amount of water that can be

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[23] Colo. Rev. Stat. § 24-67-104(1)(f).

[24] Colo. Rev. Stat. §§ 31-23-211, 30-28-111.

[25] The term "final plat" appears to be universally understood in the land planning context as the document that must be recorded in the real property records before lots can be sold. "Preliminary plan" is less specific, however, and may have different meanings in different jurisdictions. Preliminary plan is defined in the county planning statutes as "the map of a proposed subdivision and specified supporting materials, drawn and submitted in accordance with the requirements of adopted regulations, to permit the evaluation of the proposal prior to detailed engineering and design." Colo. Rev. Stat. § 30-28-101(6).

[26] Colo. Rev. Stat. § 30-28-133(6)(a); see Colo. Sess. L. 1972 pp. 502-04. For the purposes of this county requirement, there is no minimum number of lots in the subdivision, unlike the 50-lot minimum in the local government statutes. Divisions of land into parcels of more than 35 acres are, however, exempt from these requirements. Colo. Rev. Stat. § 30-28-101(10). Such parcels are entitled to an exempt well permit for one single-family residence under a rebuttable presumption that no material injury will be caused and are not subject to administration of water rights in priority. Colo. Rev. Stat. §§ 37-92-602(1)(b), (3)(b)(II)(A). With an estimated 200,000 or more exempt wells in existence in Colorado, it can be legitimately argued that a critical component of addressing overall water sustainability is tightening this exemption.

[27] Colo. Rev. Stat. § 30-28-136(1)(h)(I).

provided without causing injury and the State Engineer must comment on the statements made.[28] If the State Engineer finds that there will be material injury or that the water supply is inadequate, the Board of County Commissioners (BOCC) may still approve the subdivision, but a copy of the State Engineer's opinion must be provided to all potential purchasers unless the developer has corrected the problem to the satisfaction of the BOCC.[29]

The Colorado State Engineer has issued Guidance for its staff regarding the subdivision review process that it undertakes when a water supply plan is referred.[30] This Guidance specifies that the State Engineer's Office (SEO) will respond only to water supply plans proposed for "subdivisions as defined in Colorado statute, and referred by a county."[31] If, however, a county refers a water supply plan outside of a "subdivision approval process," the SEO will perform a cursory review and provide informal comments to assist the county in evaluating the water supply.[32] The guidance provides the specific criteria the SEO will apply to its determination concerning the adequacy of water supply plans relying on various identified sources of water (municipal supply, Denver Basin ground water, other types of ground water, exempt wells).[33]

In order to be considered by the State Engineer in rendering the required opinion, water rights that are part of a proposed water supply plan must have final Water Court decrees or, for rights in designated ground water basins, final determinations from the Ground Water Commission.[34] The Guidance also states that water supply plans should not rely solely on non-renewable aquifers, but that alternative renewable water resources should be incorporated into the water supply.[35] No further clarification is provided on what a reasonable and prudent ratio between renewable and non-renewable sources might be.

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[28] Colo. Rev. Stat. § 30-28-136(1)(h)(II).
[29] Colo. Rev. Stat. § 30-28-136(1)(h)(I).
[30] Updated Memorandum Regarding Subdivisions dated March 16, 2005 from Dick Wolfe, Assistant State Engineer to All County Land Use Planning Directors ("Guidance"), available at http://water.state.co.us/DWRIPub/Documents/memo_subdivisions.pdf.
[31] *Id.;* see Colo. Rev. Stat. § 30-28-101(10)(a). The State Engineer's Guidance, *supra* note 30, does not designate the specific stages of the development approval process that will be considered as a "subdivision approval," but there is some indication that zoning changes and preliminary development plans would not be considered a "subdivision" for this purpose. Personal communication with Joanna Williams, Water Resources Engineer, SEO, March 29, 2016.
[32] Memorandum, *supra* note 30, at 2.
[33] *Id.* at 3-7.
[34] *Id.* at 7. The position taken in the Guidance that only decreed water rights are considered for the purpose of providing the required opinion suggests that the State Engineer is not making an independent determination regarding whether material injury to other water rights is likely to occur, but rather is deferring to and relying upon the injury determination in the water right decrees.
[35] *Id.* at 7.

Local Government Requirements

Until 2008, the requirements for county subdivision processes were the only water adequacy considerations in development approvals. The approval processes of cities and towns had no required water adequacy provisions. In that year, however, the General Assembly enacted House Bill 1141, finding that while land use approval decisions are matters of local concern, the adequacy of water for new developments is a statewide concern.[36] House Bill 1141 added a new water adequacy section to the Local Government Land Use Control Enabling Act of 1974, which governs all local governments, including counties, home rule or statutory cities, towns, territorial charter cities, or a city and county.[37]

Pursuant to the 2008 legislation, local governments must make a determination that an applicant for a development permit has satisfactorily demonstrated that the proposed water supply will be adequate before approving a development permit application.[38] Developments of 50 or more units are subject to this provision.[39] An adequate water supply is "sufficient for build-out of the proposed development in terms of quality, quantity, dependability, and availability to provide a supply of water for the type of development proposed."[40] The determination of adequacy is in the local government's "sole discretion."[41] The statute provides that it should not "be construed to require that the applicant own or have acquired the proposed water supply or constructed the related infrastructure at the time of the adequacy determination."[42] The statutes specify the information that must be submitted to demonstrate an adequate water supply, for both a developer-provided supply and one to be served by an independent water supply entity.[43] The required information includes a report prepared by a registered professional engineer or water supply expert acceptable to the local government describing the estimated water supply requirements for the proposed development.[44] The local government may, but is not required to, request comment

[36] Colo. House Bill 2008-1141, Section 2, codified at Colo. Rev. Stat. § 29-20-301(1)(b).
[37] *Id;* Colo. Rev. Stat. § 29-20-103(1.5).
[38] Colo. Rev. Stat. § 29-20-303(1). A "development permit" includes any preliminary or final approval of an application for rezoning, planned unit development, conditional or special use permit, subdivision, development or site plan, or similar application for new construction that include new water use in an amount more than that used by 50 single-family equivalent units. Colo. Rev. Stat. § 29-20-103(1).
[39] Colo. Rev. Stat. § 29-20-103(1). The language of the statute indicates that developments of less than 50 units that use more than the average amount of water could also be subject to these requirements.
[40] Colo. Rev. Stat. § 29-20-302(1).
[41] Colo. Rev. Stat. § 29-20-303(1).
[42] Colo. Rev. Stat. § 29-20-303(2). While it is understandable that the applicant may not have ownership of water rights at early stages of the development approval process, it would seem to be critical that ownership or some form of control of the water rights be demonstrated at some stage, at or before final plat approval. This is not addressed in the local government statutes.
[43] Colo. Rev. Stat. § 29-20-304.
[44] *Id.*

from the Colorado State Engineer on the water supply documentation provided by the developer.[45]

A highly publicized decision involving the proposed Sterling Ranch development in Douglas County prompted an amendment to this water adequacy statute in 2013. After the Douglas County Commissioners had approved an application for rezoning and approval of planned development, an appeal to the Douglas County District Court resulted in a reversal.[46] The Court held that the requirements on local governments did not allow the County Commissioners to defer their water adequacy determination until later stages of the development approval process.[47] While an appeal of that decision was pending, Senate Bill 2013-258 was enacted, clarifying that a local government has the flexibility to determine at which stage in the development approval process the water adequacy determination will be made.[48] This determination may occur at the preliminary or final approvals of rezoning, planned unit development, conditional or special use permit, subdivision, or site plan applications, but only once during the entire process.[49]

The required referral to the State Engineer and prohibition on approval of a preliminary plan or final plat unless water adequacy is demonstrated are specific to applications submitted to counties. The statutes do not reconcile the requirement applicable only to counties for an adequacy determination specifically at the preliminary plan or final plat stage with the discretion of all local governments including counties to decide for themselves when the water adequacy determination will be made. So, for example, a county could decide to defer its water adequacy determination until the final plat stage pursuant to Senate Bill 2013-258 and Colo. Rev. Stat. § 29-20-301(1)(c), but might then be in violation of the requirement in Colo. Rev. Stat. § 30-28-133 that no preliminary plan can be approved unless the developer has provided evidence that there will be a sufficient water supply for the proposed subdivision. This discrepancy is addressed in the Observations and Recommendations section below.

[45] Colo. Rev. Stat. § 29-20-305(1)(b).

[46] Order dated Aug. 22, 2012, Chatfield Community Assn. v. Board of County Commissioners of Douglas County, Case No. 11CV1437, Douglas County District Court.

[47] *Id.* at 10. The Court notes that the "planned development stage" of the Sterling Ranch process that was at issue in the decision preceded anticipated subsequent submittals of a sketch plan, preliminary plan, and final plat. *Id.* at 7.

[48] Colo. Senate Bill 2013-258, codified at Colo. Rev. Stat. §§ 29-20-301(1)(c), (d).

[49] Colo. Rev. Stat. §§ 29-20-103(1), -301, and -303(1). While the local government has complete discretion on the timing of the adequacy review, it seems likely that the water supply plans available at different stages of the land use approval process will have differing levels of detail and provide correspondingly different degrees of confidence regarding the accuracy of the water supply adequacy determination. This differential is not addressed in the statutes. See Observations and Recommendations section in this paper.

Activities of State Interest - 1041 Regulations

Colorado counties and municipalities are allowed and encouraged to designate "activities of state interest" and to administer such activities for the benefit of state citizens and protection of the environment.[50] Regulations promulgated pursuant to this authority are commonly referred to as "1041 regulations," based on the bill number of the enabling legislation (House Bill 1974-1041). Included in the activities of state interest that can be designated by a local government are major new domestic water treatment systems, development of new communities, and the efficient utilization of municipal and industrial water projects.[51]

If a local government designates an activity of state interest, a permit issued by the governing body is required in order to pursue the activity.[52] The purposes of the local government's administration and permitting of these activities are briefly addressed in the statutes and include proper utilization of existing water treatment plants, orderly development of such facilities in adjacent communities, and efficient use of water, including recycling and reuse.[53] Many counties and some cities have adopted 1041 regulations, particularly for water projects, and they can have quite detailed requirements governing water supplies and conservation.[54]

Water Conservation

The state laws governing county and local government land use authority do not specifically direct local governments to promote water-conserving methods of land development. The local government statutes addressing the determination on the adequacy of water supplies, discussed above, require an applicant for any development permit to provide a description of water conservation and demand management measures, if any, that may be implemented within the development.[55] The statutory language makes it clear that water conservation measures are not mandatory.

Water conservation requirements are, however, addressed in Colorado's consumer affairs statutes by prohibiting the sale of indoor plumbing fixtures that do not meet the standards of the Environmental Protection Agency's WaterSense program[56] beginning on September 1, 2016.[57] In addition to the requirement for WaterSense toilets, faucets, and showerheads, Colorado homebuilders are required to offer customers a "water-

[50] Colo. Rev. Stat. § 24-65.1-101.
[51] Colo. Rev. Stat. § 24-65.1-203.
[52] Colo. Rev. Stat. § 24-65.1-501.
[53] Colo. Rev. Stat. § 24-65.1-204.
[54] *See, e.g.,* Arapahoe County, Regulations Governing Areas and Activities of State Interest, at V.H.7, V.H.9, V.H.20; Douglas County, Areas and Activities Designated as Matters of State Interest, at 902.12.
[55] Colo. Rev. Stat. § 29-20-304(1) and (2).
[56] See WaterSense, An EPA Partnership Program, https://www3.epa.gov/watersense/about_us/what_is_ws.html
[57] Colo. Rev. Stat. § 6-7.5-101 to -103.

smart home option," which includes Energy Star[58] clothes washers and dishwashers.[59] If the homebuilder provides landscaping, landscape design following the "Green Industry Best Management Practices" must also be offered.[60] Common interest communities[61] are prohibited from adopting or enforcing restrictive covenants that prohibit xeriscape or drought tolerant vegetation or any requirement for whole or partial use of turf grass.[62]

As of August 2016, Colorado homeowners are authorized to install up to two barrels for rainwater collection on the rooftop with total capacity of up to 110 gallons, and to use the collected water for outdoor purposes on their property.[63] Homeowners associations may not prohibit rain barrels meeting the above requirements.[64]

The Colorado Water Quality Control Commission has adopted rules governing the use of graywater (untreated wastewater from bathroom sinks and showers) for non-drinking purposes to encourage its use and reduce the need for new supplies.[65] Graywater may be used only in municipalities or counties that have adopted an ordinance or regulation allowing such use.[66]

Water suppliers serving 600 or more taps are required to install meters on all new taps, and were required to retrofit all existing taps by 2009.[67] Larger suppliers with total water demand of at least 2,000 acre feet are also required to develop and implement water conservation plans.[68] Such plans are also required for any entity seeking funding from the Water Efficiency Grant Program of the Colorado Water Conservation Board

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[58] *See* https://www.energystar.gov/about.
[59] Colo. Rev. Stat. § 38-35.7-107(1)(a)(II).
[60] Colo. Rev. Stat. § 38-35.7-107(1)(a)(III); see also Green Industry Best Management Practices (BMPs) for the Conservation and Protection of Water Resources in Colorado: Moving Toward Sustainability, available at https://www.gcsaa.org/uploadedfiles/Environment/Get-Started/BMPs/Green-Industry-Best-Management-Practices-for-the-Conservation-and-Protection-of-Water-Resources-in-Colorado.pdf.
[61] "Common interest community" is defined in Colo. Rev. Stat. § 38-33.3-103(8) and has been interpreted as any community that levies assessments against its owners. *See* Evergreen Highlands Association v. West, 73 P.3d 1 (2003); J. Orten, Understanding Colorado Common Interest Communities, available at http://www.ochhoalaw.com/media/documents/Understanding_Common_Interest_Communities_(00565192).pdf.
[62] Colo. Rev. Stat. §§ 37-60-126(11), 38-33.3-106.5(i).
[63] House Bill 2016-1005, signed by the Governor on May 12, 2016, to be codified at Colo. Rev. Stat. §§ 37-96.5-101 to -105.
[64] House Bill 2016-1005, Section 3, to be codified at Colo. Rev. Stat. § 38-33.3-106.5(1)(j).
[65] Colo. Dep't of Public Health and Environment, Water Quality Control Commission, Regulation No. 86, 5 CCR 1002-86; Colo. Rev. Stat. § 25-8-205(1)(g).
[66] Colo. Rev. Stat. § 25-8-205(1)(g)(II). The City and County of Denver adopted such an ordinance in May 2016; *see* https://www.denvergov.org/content/denvergov/en/mayors-office/newsroom/2016/denver-city-council-passes-ordinance-to-allow-graywater-use.html. It is the authors' understanding that few other local governments have done so.
[67] Colo. Rev. Stat. §§ 37-97-102, -103(1).
[68] Colo. Rev. Stat. § 37-60-126.

(CWCB).[69] The detailed requirements for conservation plans include the evaluation of a wide range of water saving measures to be used by the supplier, such as low-flow fixtures, low water use landscapes, reuse, and rate structures.[70] These large suppliers are required to report water use and conservation data on an annual basis to the CWCB.[71] In addition, in order to obtain a new water right, a water supplier must address the implementation of reasonable conservation measures as part of its demonstration of the amount of available water necessary to serve its reasonably anticipated needs, over and above its current water supply.[72]

Recent legislation also requires the CWCB to provide training for local water and land use planners on best management practices for water demand management, water efficiency, and water conservation, and to make recommendations regarding how to better integrate water demand management and conservation planning into land use planning.[73]

Summary of Relevant Law

Colorado has enacted requirements to ensure that new development has an adequate water supply, based on evidence provided by the developer and verified by the Colorado State Engineer, a registered professional engineer, or a water supply expert. The local government has discretion to decide at what stage of the development approval process this water adequacy determination is made. The minimum level of development for which a water adequacy determination is required is different for cities (50 lots) and counties (2 lots). For developments at or above the minimum levels, the adequacy determination is required to obtain a final plat

Water conservation tools and programs are not required as part of Colorado's land use approval processes, but other statutes and programs address some of these measures. Large water suppliers must file detailed water conservation plans, evaluating water saving measures, and report water use data and information on metering, rate structures, water losses, and public education. The state has been progressively moving toward more water conservation requirements by mandating low-flow indoor fixtures, allowing rain barrels, and encouraging less water-intensive landscaping, and these trends are likely to continue. Local ordinances and regulations are sometimes much

[69] Colo. Rev. Stat. § 37-60-126(12)(b).
[70] Colo. Rev. Stat. § 37-60-126(4)(a).
[71] Colo. Rev. Stat. § 37-60-126(4.5); see also Guidelines Regarding the Reporting of Water Use and Conservation Data by Covered Entities, Nov. 16, 2011, available at http://cwcb.state.co.us/legal/Documents/Guidelines/HB1051Guidelines.pdf.
[72] *Pagosa Area Water and Sanitation District v. Trout Unlimited,* 170 P.3d 307, 309, 317-19 (2007); *Pagosa Area Water and Sanitation District v. Trout Unlimited,* 219 P.3d 774 (2009).
[73] Colo. Rev. Stat. § 37-60-126(4)(f)(II).

more prescriptive in their requirements for the adoption of water conservation techniques but, on the other hand, may also not address conservation at all.

Case Studies

This paper includes five case studies of recently approved residential developments in the Front Range area of the state. The case studies represent residential developments of a variety of sizes, located in both counties and municipalities, some proposing a developer-provided water supply, others receiving supplies from an established supplier. These studies focus on the manner in which the water adequacy and conservation requirements described above were actually implemented in the development approval process. They are intended to illustrate the manner in which existing statutes addressing water considerations are being interpreted by local land planning entities. This information can support additional examination into the efficacy and extent of the current land-planning framework, and generate further discussion about beneficial programs and potential legislative changes.

The five case studies are:

Sterling Ranch, approvals by Douglas County. Sterling Ranch is a proposed development of 12,050 single-family dwellings on 3,400 acres near Chatfield Reservoir in the southwest Denver area. This development has received approval from the County for rezoning and planned development. The consideration of water adequacy for Sterling Ranch has received statewide attention and resulted in legislative changes to the statutes governing water adequacy determinations by local governments, providing more flexibility in the timing of the decisions.

Iliff Commons, approvals by the City of Aurora. Iliff Commons is a small infill residential development of 115 homes, served by Aurora Water. It is included as an illustration of a type of water conservation incentive that can be offered by water suppliers to reduce overall and peak day demand.

Prosper, approvals by Arapahoe County. This is a large residential development in unincorporated Arapahoe County, east of Aurora. A total of 9,000 dwelling units are proposed, together with significant commercial development. The County approval process takes advantage of the flexibility in the timing of water adequacy determination provided by legislative changes in 2013. The water supply plan proposes use of non-renewable Denver Basin ground water and renewable supplies to be provided by the Arapahoe County Water and Wastewater Authority.

Stapleton, Filing No. 9, approvals by the City and County of Denver. Filing No. 9 is a subset of the 4,700-acre redevelopment of the former Stapleton airport site.

This unique, large infill development is governed by a specific Stapleton Redevelopment Plan, adopted by the City Council, and the Stapleton Design Review Criteria, imposed by private covenant. It is served by Denver Water.

Barefoot Lakes, approvals by Town of Firestone, previous approvals by Weld County. This development proposes 3,500 residential units on approximately 1,200 acres in what was previously unincorporated Weld County, now annexed into the Town of Firestone. Trail systems, parks, and a 120-acre lake are components in the development. Water for the development will come from the Little Thompson Water District, a distributor of water from the Colorado-Big Thompson Project.

The detailed case studies are provided in Appendix A.

Observations and Conclusions

Implementation of State Water Adequacy Requirements

The 2008 changes to the local government law requiring water adequacy considerations by all local government land use authorities represent a significant step forward in the effort to better integrate land use and water planning. Local land use agencies are continuing to refine their implementation of these water adequacy requirements.

The directives of Senate Bill 2015-008 and the CWP's recommendations for the development of educational programs for local land use officials on best practices for integrating water demand management, efficiency, and conservation into land use decisions are being implemented. The training modules being developed by the CWCB and DOLA will address the incorporation of best management practices for water demand management, efficiency, and conservation into the land use process.[74] The first of these training modules will be available in 2016. In addition, Western Resources Advocates is working with Pace University's Land Use Law Center to produce a comprehensive guidebook for land use planners in the interior West on integrating water efficiency into land use planning. The balancing of local control of land use decisions with wise water planning on a regional or statewide basis is a difficult one, and while there is a statewide interest in ensuring that demand management and conservation are incorporated into new developments, the precise water conservation strategies adopted may require different solutions in different locations.

The case studies included here provide a clear conclusion that better integration of land and water planning occurs when the planning function and water supply function are housed in the same governmental entity. There is more coordination in these cases,

[74] CWP at 10-10.

although it is still far from extensive. When the water supply entity is separate from the land use authority, little, if any, joint planning takes place. The land use authority makes the water adequacy determination, but the impacts of the proposed water use on neighboring development and on regional supplies or sustainability are not considered in the decision-making process.

Water conservation concepts and requirements are considered to be the responsibility of the water supplier, not the land use authority. In these cases, consistent and pro-active efforts by both entities will be necessary to better integrate land use and water planning, including joint consideration of the impacts of individual developments, the potential for reduction of demand, and the broader, regional water availability setting.

In many municipalities in Colorado, the municipal government is both the water provider and the land use authority, but this is not always the case and the applicable statutes should not assume that it is. Counties have the land use approval authority over unincorporated areas, but are not the water provider. In many areas in the state, special water districts[75] are the water providers but those districts have no land use approval authority. The laws governing water adequacy and conservation should be designed to sensibly address each of these different scenarios, and encourage and incentivize better coordination among the different decision-makers and a more regional approach to water sustainability.

Flexibility in Timing of Water Adequacy Determination

The case studies of subdivisions developing their own water supplies or receiving their supply from a separate entity (Prosper, Sterling Ranch) suggest that the land use authorities are availing themselves of the timing flexibility now provided in the local government statutes and determining at which point in the development process the water adequacy determination will be made. In one of the case studies, a preliminary plan was approved by a county without a final water adequacy determination, with the county commissioners explicitly deferring the determination until the time of final plat (Prosper).[76] This procedure is entirely consistent with the flexibility in the local government laws and the 2013 amendment. It is, however, directly at odds with the statutory directive to counties that a preliminary plan may not be approved without evidence of a sufficient water supply.[77] In addition, the term "preliminary plan" is not universally understood and may refer to different stages in the development process in different jurisdictions.

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[75] *See* Colo. Rev. Stat., Title 32, Articles 1 to 16.

[76] A water supply plan was submitted with the Prosper preliminary plan application and was reviewed in detail by Arapahoe County and its water resources consultant. *See infra* pp. 53-58. Nevertheless, the water adequacy determination was not made as part of the preliminary plan approval but was deferred until the consideration of the final plat. *Infra* note 238.

[77] Colo. Rev. Stat. § 30-28-133(6).

The timing flexibility on the water adequacy determination provided in 2013 appears to be welcomed by land use authorities in all types of local governments and by developers. It is widely recognized that it is unrealistic to expect developers to have 100 percent of their water supplies in hand and Water Court decrees issued at the early stages of a development plan that may take years to win approval and decades to build out. The total amount of indoor and outdoor water requirements may not be known with certainty at the earlier stages of the approval process. Water Court proceedings may be planned or in progress, but no decrees issued. Even "commitment" or "will serve" letters from established water providers may have conditions or limitations early in the development process that do not guarantee a future supply. For example, a conditional "will serve" commitment may state that the supplier will supply water to the project when homes are built if the supplier has adequate water at that time and a satisfactory agreement is reached with the developer. The type of information available about water need and proposed supplies at these early stages provides some level of confidence that adequate water supplies will be available when needed, but insufficient reliability to support a firm water adequacy determination.

As the development review process moves forward, the developer and the land use authority will have more detail about expected water demand such as fixture counts and types, landscaped area, and return flows, as well as more developed plans for water supply. As this evolution occurs, it would be beneficial to have information on the proposed water supplies provided to the land use authority in increasing levels of detail and reliability. The land use authority will then have increasing degrees of confidence that adequate water supplies will ultimately be provided, culminating in the final determination, whenever it is made. This progression of detail and confidence is not addressed in the statutes or in any existing guidance to land use authorities.

If the water adequacy determination is not made until the time of final plat, the development plans and approvals can be very advanced before any information about water supplies is provided. Considerable expense will have been incurred, and potentially, significant action taken by the developer in reliance upon the preliminary approvals. If at that stage, water adequacy cannot be determined, much time and expense has gone to waste. While protection in the form of denial of final approval is always theoretically available if the proposed water supplies are determined inadequate, it may prove very difficult in practice for an elected body to deny approval when development plans are far advanced.

In addition, the provision that an applicant need not own or have acquired the proposed water supply or constructed the related infrastructure to obtain a water adequacy determination[78] becomes problematic if the determination is made at a late stage in the development approval process. Clearly, a developer should be required to demonstrate

[78] Colo. Rev. Stat. § 29-20-303(2).

ownership or control of the water supply before lots or houses are sold. The statute provides that it should not be construed to require such a demonstration, but does not appear to prohibit local governments from requiring one at the point in the process they deem reasonable. Clarification is needed.

It would be useful for local governments to have additional guidance, a best practices template, and/or specified standards addressing the progressively detailed levels of information and certainty regarding water that should be obtained as the proposed development progresses through the various land use approval stages. This guidance should address when in the process it is necessary for the developer to demonstrate ownership or control of the water rights supporting the water supply plan. The possibility that developments may fail to acquire or develop water supplies for later stages of the development is also an issue to be covered. This is necessary to avoid a situation in which reliance has been placed on the provision of community facilities by the developer, such as parks or school sites, at later stages in the development process and a lack of water at those stages would deprive the community of the benefit of the initial development agreement.

Such a progression of water information required as the approval process moves forward would not undermine the flexibility in the timing of the definitive water adequacy determination provided to local governments. While the final determination regarding water adequacy would take place at whatever stage the land use authority designates, the local government would have confidence that a water supply plan was coming together in an appropriate manner, and would not be blindsided at a late stage in the development approval process with unexpected water issues.

Discrepancies in Water Adequacy Rules for Cities and Counties

The water adequacy statutes enacted in 2008 apply to all local governments, including cities, towns, and counties.[79] Counties are also subject to earlier enacted water adequacy provisions that are slightly different and sometimes conflicting.[80] The discrepancies are: (a) Required or optional review of the proposed water supply by the State Engineer; (b) timing of the water adequacy determination; and (c) the size of development for which an adequacy determination is required. Each of these areas is discussed below.

1. State Engineer Review

While counties are required to obtain an opinion from the State Engineer regarding the adequacy of proposed water supply and whether material injury is likely to occur,

[79] Colo. Rev. Stat. §§ 29-20-303, -103(1.5).
[80] *See* Colo. Rev. Stat. §§ 30-28-101(10)(a), -133, -136(1)(h).

municipalities are not required to do so.[81] Applicants for municipal land use approvals must supply a report on estimated water requirements prepared by a registered professional engineer or water supply expert, but review by the State Engineer is optional. There does not appear to be any particular rationale behind these differing requirements. While developments within municipalities have a greater likelihood of obtaining a water supply from the municipality itself, that is not always the case. In addition, counties are required to obtain a State Engineer opinion even on plans to receive water from a municipal water supplier to ensure that the water can be supplied without injury to existing water rights. The State Engineer's Guidance specifically addresses how supplies from a municipal water supplier will be evaluated.

Having a uniform review by the office of the top state water official would seem to be advantageous in terms of ensuring that developers in different parts of the state and under different jurisdictions are held to the same standards.[82] The State Engineer has provided guidance to county land use planning directors on how the review will be conducted including for situations in which the source of water is a municipality. In order to assure uniformity across the state in the assessment of the adequacy, consideration should be given to having all local governments obtain a water adequacy opinion from the State Engineer. It must be recognized, however, that increasing the number of land use decisions for which a State Engineer's opinion will be required puts additional burden on the State Engineer's Office. New resources will be required to support the goal of providing uniformity to water adequacy determinations across the state.

2. Timing of Determination

The 2013 legislation gives all local governments complete discretion to determine the stage of the development approval process at which the water adequacy determination will be made. The county planning statutes, however, expressly provide that a "preliminary plan" cannot be approved by a board of county commissioners without evidence to establish that "definite provision has been made for a water supply that is sufficient in terms of quantity, dependability, and quality to provide an appropriate supply of water for the type of subdivision proposed."[83] Because the local government statutes providing the flexibility in timing are the more recently enacted, counties may be using that flexibility and ignoring the older directive applicable to preliminary plans. Having this discrepancy in the statutes, however, could subject counties to claims of violation by opponents of a particular development. The county statute should be amended to incorporate the same flexibility as in the local government provisions.

[81] *Compare* Colo. Rev. Stat. § 30-28-136(1)(h) to § 29-20-305(1)(b).
[82] The requirement for review by the State Engineer for a county subdivision does not, however, ensure that a water adequacy determination will actually be made by that agency. *See infra* pp. 76-77.
[83] Colo. Rev. Stat. § 30-28-133(6)(a).

3. Minimum Size

The local government statutes require a water adequacy determination for projects that include new water use in an amount more than that used by fifty single-family equivalents.[84] The county statutes require the determination for all subdivisions, defined as divisions of land into two or more parcels.[85] At 50 units, Colorado's floor for water adequacy determinations by local governments is among the highest in the western states.[86] While different minimums may be appropriate for different types of areas or water supplies (e.g., rural, infill development, non-renewable ground water supplies, service provided by an established water supplier), a differential based on whether the land is in a city or a county does not appear to have a rational basis. As stated above, while it is more likely that a development in a municipality will receive water from the municipal water provider, that is not always the case, and there are situations in which county developments receive supplies from a nearby municipal entity. A uniform statewide floor would seem appropriate, as is done in other western states. All local governments should also be given the flexibility to lower the minimum in all or parts of their planning jurisdictions or to address different circumstances on the ground upon adoption of an appropriate ordinance or regulation.

Water Conservation

The CWP establishes a measurable objective that 75 percent of Coloradans will, by 2025, live in communities that have incorporated water-saving actions into land-use planning.[87] Several of the Basin Implementation Plans authored by the Basin Roundtables around the state call for incorporation of water conservation requirements into local land use approval processes.[88] But while some local governments mandate that water conservation techniques be incorporated into new development,[89] this is not

[84] Colo. Rev. Stat. § 29-20-103(1)(b). This requirement is commonly described as applicable to a minimum of 50 units, even though that is not precisely what the statute mandates.
[85] Colo. Rev. Stat. §§ 30-28-101(10)(a).
[86] Arizona – 6 units (Ariz. Rev. Stat. §§ 32-2101(56), 32-2181(E)); Montana – 1 unit (Mont. Code Ann. §§ 76-3-103(14), (15), -104, 76-4-102(16)); Nevada – 5 units (Nev. Rev. Stat. §§ 278.320(1), .330, .360); New Mexico – 5 units (N.M. Stat. Ann. §§ 47-6-11, 47-6-2(M), (P)-(T)); Oregon – 4 units (Or. Rev. Stat. §§ 92.010(16) – (17), 92.090(4)); Washington – 5 units (Wash. Rev. Code §§ 58.17.170, .060, .020(1)); Wyoming – 6 units (Wyo. Stat. Ann. § 18-5-306(a)); *but see* California - 500 units (Calif. Gov't Code § 66473.7(a)(1)).
[87] CWP at 10-5.
[88] *See, e.g.,* Colorado Basin Roundtable, Colorado Basin Implementation Plan, April 17, 2015, at 140, available at https://www.colorado.gov/pacific/sites/default/files/CBIP-April-17-2015.pdf; South Platte Basin Implementation Plan, HDR and West Sage Water Consultants, April 17, 2015, at 5-5, available at https://www.colorado.gov/pacific/sites/default/files/SouthPlatteBasinImplementationPlan-04172015.pdf.
[89] *See, e.g.,* City of Aurora, Colorado, Landscape Ordinance, Sec. 146-1426, available at https://www.auroragov.org/UserFiles/Servers/Server_1881137/File/Business%20Services/Development%20Center/Code%20&%20Rules/Design%20Standard/Planning%20Design%20Standard/009372.pdf (requiring xeric plant materials).

common, and there are no state laws connecting water conservation to land use decisions. Recent state enactments recognize that while "land use and development approval decisions are matters of local concern,"[90] availability of reliable supplies is a statewide concern and that reduction in per capita or per unit usage can be the most economic means of ensuring a sustainable water future.[91] Recent enactments concerning WaterSense fixtures, rain barrels, and Green Industry landscape design also indicate that there is a state role to play in the encouragement of water conservation measures and that the state has become increasingly active in this area.

The Colorado Water Plan recognizes that "every community can do better on water conservation and efficiency via locally determined measures such as . . . enhanced building codes and water sensitive land use planning."[92] While local control of land use decisions is a given, and there is likely no "one size fits all" conservation technique, the statewide interest in achieving sustainable water supplies suggests that a laissez faire approach to conservation is no longer realistic. A statewide enactment could be considered to require the incorporation of appropriate conservation practices into new development or require local governments to provide incentives for developers adopting such techniques. Arizona and New Mexico have such requirements.[93] The CWCB and DOLA, drawing on expertise from organizations like the Colorado Municipal League, Colorado Counties, Inc., and the Special District Association, could provide helpful guidance concerning the types of conservation measures that local land use approval agencies could and should consider requiring of new development, and which measures generate the most water savings.

Expansion of the requirement for WaterSense features to outdoor irrigation fixtures would seem a logical next step. Consideration could be given to decreasing the threshold for water supplier entities required to have water conservation plans and report water use, from 2,000 acre feet to a smaller volume so that more entities would be covered. Collection of information on the percentage of the state's population now served by entities required to submit conservation plans would be useful to determine whether such a modification would garner significant benefits. In addition, the requirement for having a water conservation plan as a condition precedent for CWCB grant funding could be extended to funding provided for water facilities by the Colorado Department of Public Health and Environment.[94]

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[90] Colo. Rev. Stat. § 29-20-301(1)(b).
[91] *Id.*; Colo. Sess. Laws 2004 Ch. 373, Sec. 1.
[92] CWP at 6-83; *see also*, Comments on draft Colorado Water Plan from Boulder County, City and County of Denver, City and County of Broomfield, Eagle County, Grand County, Pitkin County, and Summit County, available at https://www.colorado.gov/pacific/cowaterplan/record-input-received-date, input received between March 5 and May 1, 2016, Item #67.
[93] Ariz. Rev. Stat. §§ 45-563, -567, -567.01; Ariz. Admin. Code § R12-15-721; N.M. Stat. Ann. § 47-6-9(A)(4).
[94] *See, e.g.,* Colorado's State Revolving Fund Loan Program, available at https://www.colorado.gov/pacific/sites/default/files/WQ_GLU_SRFfactsheet.pdf

Consideration of Regional Supply Availability and Impacts

The type of determination required by the statutes about the adequacy of water supply is solely related to the particular development being proposed, and does not consider regional demand or availability. Analysis of future population projections, anticipated additional development in the water supplier's service area, depletion of regional surface and ground water resources, comparisons of per capita water use, and climate change impacts on available supplies are not factored into these water adequacy determinations. Ultimately, integrated land and water planning must consider these regional issues, not just the particular development in the approval process, in order to move toward a sustainable water future. This is difficult, but not impossible, to accomplish. Arizona established "safe yield" goals for several of its Active Management Areas as part of the 1980 Groundwater Management Act.[95] All development within the AMAs must be consistent with the management goals.[96] A good start for Colorado would focus on discussions between local land use authorities and relevant water suppliers, perhaps facilitated by the regional council of governments or DOLA, on the issues of the limits of the water supplies available and the implications of those limits for current and future land use approvals.

Integration of Water Considerations into Land Use and Development Approvals

As stated above, recent legislation calls for the development of training programs by the CWCB and DOLA on how to incorporate water demand management, efficiency, and conservation into the land use planning process.[97] CWCB and DOLA are also directed to make recommendations for better integration of water demand management and conservation planning into land use planning, including legislative, regulatory, or policy changes.[98] While the training programs are being developed, the recommendations have not yet been made.

While there is widespread agreement on the goal of better-integrated land and water planning, implementation is difficult and relatively rare. While some communication between the land use approval authority and the water supply authority takes place when they are part of the same governmental entity and these lines of communication are improving slowly, much new development is not served by the governmental entity with land use authority and coordination among separate entities is at best sporadic. There are no existing state law provisions that require this coordination, and little, if any, guidance about how to do it. Water supply entities have no control over or say in the land use approval process. Regional and cumulative impacts of development on water supplies are rarely considered. We can do better.

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[95] Ariz. Rev. Stat. §§ 45-562.
[96] ARIZ. ADMIN. CODE § R12-15-722.
[97] Colo. Rev. Stat. § 37-60-126(4)(f).
[98] *Id.*

Specific Recommendations

Following are the specific recommendations emanating from the observations and case studies in this paper. The first four recommendations below would require legislation; the last one could be accomplished administratively. These recommendations are aimed at achieving consistency in the consumer protection function of the water adequacy determination, incorporating some water conservation requirements into the land use approval process to reduce the overall demand expected from population growth, and providing needed guidance for local land use approval agencies on making meaningful water adequacy determinations. These are incremental steps geared toward improving the integration between the land use process and water supply availability that will ultimately provide a better foundation for meeting the gap between water supply and demand identified in the CWP. Actually meeting the water gap will require additional targeted measures.

1. A water supply element should be required in county and municipal master plans, not discretionary as provided by current law. This would appear to be the first step toward better integration of land and water planning, as called for in the CWP and several of the Basin Implementation Plans. The water supply element should call for the incorporation of best management practices for water demand management, water efficiency, and water conservation.

2. Clear up the discrepancy between the flexibility in timing of the water adequacy determination in the local government statutes and the requirement for such a determination before preliminary plan approval in the county statutes. This could be accomplished through a cross-reference in the county directives in Colo. Rev. Stat. § 30-28-133 to the local government water adequacy procedures in Colo. Rev. Stat. § 29-20-301 to -306 and elimination of the specific references to “preliminary plan” and “final plat” in the former statute.

3. Make the minimum number of units for which a water adequacy determination is required the same for both municipalities and counties, with flexibility for the local government land use authority to lower the minimum if desired.

4. Extend the requirement for a State Engineer opinion on water adequacy and material injury to all local governments, recognizing the additional state resources that will be required.

5. Consider a statewide enactment that requires incorporation of some water conservation measures into land use approval processes.

6. The requirement for having a water conservation plan as a condition precedent for CWCB grant funding should be extended to grant funding provided for water facilities through the Colorado Department of Public Health and Environment.

7. Through some combination of the expertise in the CWCB, DOLA, Colorado Municipal League, Colorado Counties, Inc., and the Special District Association, provide guidance, a best practices template, or defined standards for local governments addressing the progression of detail and information concerning proposed water supplies that developers must supply in order to obtain approvals at various stages of the development review process, concluding with the final determination concerning water adequacy. This guidance would provide a template for coordination between the land use planning agency and the proposed water supplier, including the consideration of the ability of the water supplier to serve anticipated population growth in the area. Mechanisms to ensure that essential components of the water supply plan are effectuated, regardless of whether or not full build-out is achieved, should be included. The timing of any required demonstration of ownership or control of the necessary water rights should also be considered. A mechanism should be established for dissemination of this information and training for local planning agencies.

APPENDIX A: Case Studies

Sterling Ranch

Sterling Ranch is a mixed-use development, planned for up to 12,050 single-family dwelling units on 3,400 acres of prairie landscape near the Chatfield Reservoir, within Douglas County. It aims to be a sustainable community employing innovative water conservation strategies. The general project concept is of a mixed-use community, with an amenity-rich town center surrounded by nine largely residential villages and roughly 1,000 acres of open space. Since Sterling Ranch was outside of any existing water district, the developers opted to create their own: the Dominion Water and Sanitation District.[99] This project provides an example of a large, long-term development, with an emphasis on water conservation resulting in a unique look at Douglas County's process for determining water supply adequacy. The maps below show the location of the proposed development in the general vicinity and the general layout of the development site.

[99] Nelson Harvey, Show Us the Water, HEADWATERS, Summer 2015, at 31.

STERLING RANCH VILLAGE MAP

Douglas County Development Approval Requirements

Douglas County has established a presumptive water supply demand standard for all types of land uses in its zoning and subdivision resolutions and has described its goals for land development and water supply in its comprehensive plan. The Douglas County Comprehensive Plan guides the county's land development policies and is "intended to provide decision makers with guidance on how to maintain and improve identified community values."[100] The plan identifies ten community values, including Water Supply, and describes goals, objectives, and policies relating to each. Motivating some of these values is the expectation that County's unincorporated areas will grow by nearly 93,000 people by the year 2040. Directly addressing this growth, the plan includes polices that aim to preserve open space and nonurban areas. These polices include "support[ing] development of renewable water resources while emphasizing conservation efforts and increase[ing] open space preservation activities."[101] In short, the plan aims to shape new growth in a way that will ensure that future development is well served while preserving natural resources and amenities enjoyed by current residents.[102]

Water Supply is an important community priority and commands its own section in the Comprehensive Plan.[103] The plan recognizes that past developments have relied too much on groundwater, and stresses the need for sustainable, renewable water sources. It also sets forth a number of policies that should minimize water consumption, maximize efficiency, and encourage developments to utilize sustainable, dependable, and quality water supplies. The following policies exemplify these objectives: "limit the size and location of irrigated landscapes; support development that conserves water; strongly encourage development to reuse and/or recycle water; and ensure that land use applications address water supply standards."[104] However, the county is not a water provider itself so these policies are vague in terms of how that reusable water supply is to be developed. For example, there is no discouragement of agricultural water transfers. But by being broad, the policies do not foreclose creative water supply solutions, such as sale and lease back approaches.

The plan does reaffirm the very important water supply standards adopted by Douglas County in 1999. These standards were integrated within the County's zoning resolution as a county-wide overlay district.[105] Applying as a supplemental regulation to all zoning districts in the county, the Overlay District establishes presumptive water demand standards for agricultural, residential, commercial, industrial, and domestic irrigation uses. The standards are summarized in the Table 1 below.

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[100] DOUGLAS CNTY. PLANNING COMM'N, COMPREHENSIVE MASTER PLAN 2035 1-1 (2014).
[101] *Id.* at 1-7.
[102] *Id.* at 1-9.
[103] *Id.* at 8-1.
[104] *Id.* at 8-3.
[105] DOUGLAS COUNTY, DOUGLAS COUNTY ZONING RESOLUTION § 18A WATER SUPPLY OVERLAY DISTRICT (2015), available at http://www.douglas.co.us/documents/section-18a.pdf.

Table 1. Douglas County Water Demand Standards[106]

Land Use	**Water Demand Standard**
Irrigated lawn	2.5 acre-feet/year/acre
Low Density Residential	1 acre-foot/year/residence
Medium and High Density Residential	0.75 acre-feet/year/residence
Commercial/Office/Industrial	0.75 acre-feet/year/6,695 square-feet of building space
Other	To be determined by County analysis

It is important to note that these standards are required minimums, and can be reduced through a water demand appeal process included in the regulations.[107] The County is willing to lower the demand standards, so long as a developer can justify it with water conservation measures and convincing data. Often, this means hiring consultants and producing detailed conservation and demand management plans. The primary incentive for going through the appeal process is the high cost of acquiring water rights. While this may not be a meaningful incentive for small developments, the scale tips in favor of rebutting the presumptive standards as the number of units increases.[108]
The Water Supply Overlay District also sets forth at which stage in the approval process a developer needs to provide proof of an adequate water supply. Pursuant to the flexibility in timing provided by state law,[109] Douglas County has decided that water supply adequacy "shall be determined … within a Preliminary Plan, Minor Development, Final Plat, or Use by Special Review application, as applicable."[110] 'Final Plat' refers to a map of specific lots or parcels created in compliance with subdivision regulations and recorded in the county's real estate records.[111]

The timing of the water supply determination has tremendous implications for developers. Long-term projects like Sterling Ranch develop in phases rather than all at once, with each phase being one piece of a larger pre-approved master plan. A phased approach helps to make sure product supply does not outpace demand, allows water supply acquisitions to be made incrementally, limits the cost of providing services and infrastructure, and lessens credit burdens by allowing earlier phases of development to help pay for future project costs. One of these costs is creating a Final Plat, so it is only done when a phase is ready for development. The Final Plat for Sterling Ranch's first

[106] *Id.* at § 1804A
[107] *Id.* at § 1810A
[108] Interview with Steven Koster, Assistant Director of Planning Services, Douglas County Department of Community Development, in Castle Rock, Colo. (Dec. 4, 2015).
[109] Colo. Rev. Stat. § 29-20-301(1)(c)
[110] Douglas County Zoning Resolution § 1802A.
[111] *See Id.* at § 3602

phase and its context within the larger Sterling Ranch Master Plan are shown below in Figures 1 and 2.

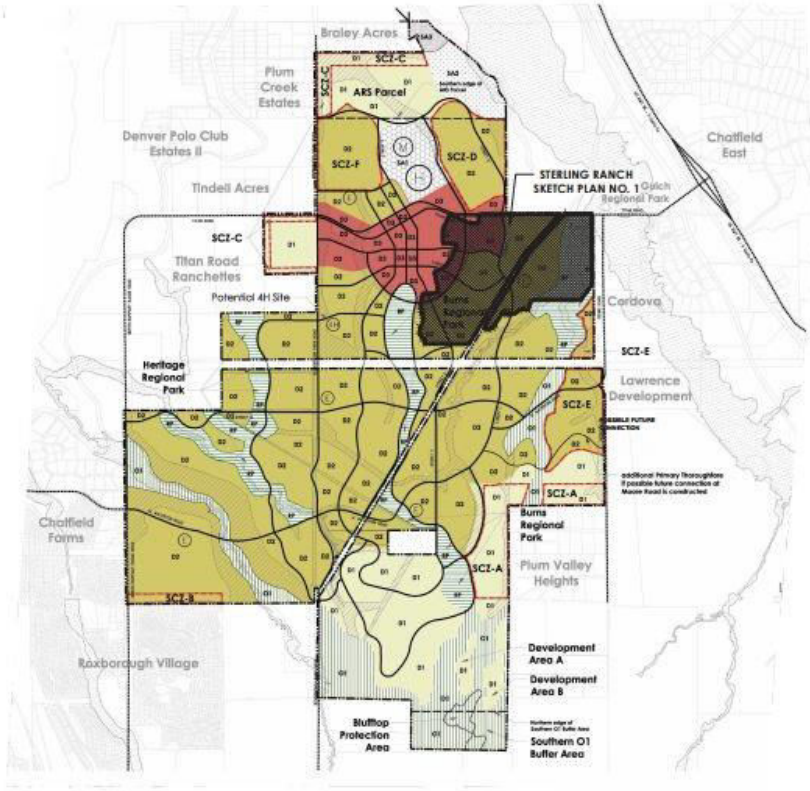
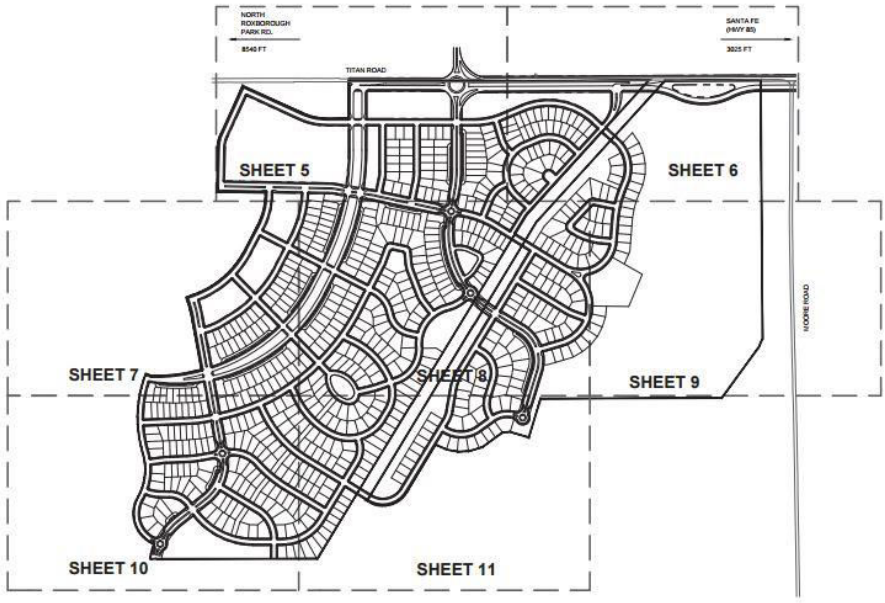


Figure 1. The Sterling Ranch Master Plan[112]



[112] Sterling Ranch Development Company, Sterling Ranch Sketch Plan No. 1, 3 (April 7, 2014), available at https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=17587750.

Figure 2. The Sterling Ranch Sketch Plan No. 1[113]

The consequences of making water supply determinations at the platting stage instead of at the development's master planning level are clear. Douglas County's approach allows for a phased approach to proving water supply rather than requiring it all at once. The all-at-once approach would force long-term developments, such as Sterling Ranch, to acquire water rights they might not need or be able use for over a decade. The financial burden of purchasing those rights and building out all the necessary infrastructure would simply be cost prohibitive.[114]

Douglas County also refers a development's water supply plan to the state engineer's office, as required by state law, for a review of whether any diversions of water to the development will injure existing water rights and whether the proposed supply is adequate in terms of volume and delivery to meet the needs of the development.[115] Findings are then expressed in a written referral letter to the Board of County Commissioners. This review does not analyze the proposed demand assumptions, and the Board of County Commissioners may approve the development notwithstanding the state engineer's opinion. Such an approval would be unlikely though, and opponents of a project might use the state engineer's referral letter as evidence of an abuse of the commissioners' discretion.[116] Additionally, to avoid a negative opinion, project developers can request a meeting with the state engineer's office before the referral letter is issued to improve understanding of the proposal and address any concerns that the state engineer may have.[117]

Sterling Ranch Application and Water Supply Proposal

The developers of Sterling Ranch filed for a variance, or water appeal, pursuant to the zoning resolution with Douglas County, aiming to get the water supply standard down to 0.286 acre-feet per year per residence. Typically, a developer will first look to see how much water supply he or she can afford to acquire, and then use the presumptive standard to decide how many units he or she can build. Conceptually, Sterling Ranch started by considering the demand management measures it could implement to support the number of units it wanted, and then sought to minimize the necessary supply by rebutting the presumptive demand standards.[118] When considering the proposed 12,050 single-family dwelling, establishing a lower demand standard would result in tremendous savings in both water and dollars.

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[113] *Id*. at 1.
[114] Interview with Beorn Courtney, President, Element Water Inc., in Denver, Colo. (Nov. 13, 2015).
[115] Colo. Rev. Stat. § 30-28-136(1)(h)
[116] Interview with Gilbert McNeish, Of Counsel, Spencer-Fane LLP, in Denver, Colo. (Dec. 16, 2015) (attorney for Sterling Ranch).
[117] *Id.*
[118] Courtney interview.

To justify this lower standard, the developers included a detailed water plan with their land development application. It described a number of measures that would minimize water demands and provided examples of the difference these measures have made in other developments.[119] For instance, the plan cited the impacts water conservation programs have made in Aurora (from 0.4 ac-ft/yr/unit to 0.33), Castle Rock (0.37 ac-ft/yr/unit to 0.3), and Denver (0.549 ac-ft/yr/unit to 0.385) since the 2002 drought.[120] Their overall approach relied "on proven technology and integrated water resources planning rather than significant behavioral changes."[121] The main target of these conservation measures is residential water use, which comprises the vast majority of expected water demand.

The first efficiency measure proposed is a Waterwise home certification program applying to every single family home in the development, comparable to the Environmental Protection Agency's WaterSense program.[122] This certification requires that high efficiency fixtures and appliances be installed prior to occupancy in every home. This includes toilets, faucets, showers, washing machines, and dishwashers. Based on a 2001 retrofit study, the plan estimates the installation of efficient fixtures and appliances will bring total indoor demand usage down to 0.14 ac-ft/yr/unit, where each unit has three people.[123]
To limit outdoor water use, the plan provides five sample landscape plans for single-family detached homes. They minimize water use by limiting the size of the irrigated landscape, the type of vegetation that can be planted, and the type of irrigation system employed. On average, every single-family home will have 1,500 square feet of irrigated landscape, and the plans differ in how that square footage is divided. For example, Plan 1 consists entirely of fescue turf watered by a sub-surface drip irrigation system while Plan 2 assumes 33% as bluegrass turf, 33% moderate water use plants, and 33% low water use or native plants. The water demands of each plan are calculated based on the plant's water demand, irrigation system efficiency, and square footage. All five landscape plans assume no precipitation and are expected to demand only 0.08 ac-ft/yr/unit.[124]

Putting indoor and outdoor uses together, the final conservation measure ties an individual's actual water use to the price they pay for water. The plan calls for the creation of individual water budgets and a tiered rate structure that gets more costly with increasing use. To help residents decide where they may need to cut back on

[119] STERLING RANCH, LLC, DOUGLAS COUNTY LAND USE APPLICATION 176 (2009), available at https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=12162124
[120] *Id.* at 191.
[121] *Id.* at 182.
[122] *Id.* at 199.
[123] *Id.* at 194.
[124] *Id.* at 196 (Vegetative water demands and irrigation efficiency data is from a 2008 Denver Water irrigation calculator, available at http://www.denverwater.org/cons_xeriscape/conservation/waterirrigationintro.html).

water use, every unit will have separate meters for indoor and outdoor use. "Customers' bills will show the actual measured indoor and outdoor water used and will compare that consumption to the water budget established for the property."[125] Outdoor water budgets are adjusted up or down from the average 1,500 square-foot irrigated area to reflect actual lot size, and indoor use budgets are to be tailored to the "specific characteristics of individual properties."[126] All of this data will be closely monitored by Dominion, which plans to have dedicated water conservation staff to provide education and technical assistance to residents.

Considering these measures, the developers expect an actual water use of 0.22 acre-feet per year per unit, with 0.14 coming from indoor use, and 0.08 from outdoor. Including a system loss factor of 10% and an additional 20% factor for demand irregularities, the total water demand comes to 0.286 acre-feet per year per unit.[127]

There were no water dedication requirements in the Douglas County review process, but the proposal takes the additional step of including a commitment as a condition of approval to serve the neighborhoods adjacent to Sterling Ranch with renewable water through Dominion.[128] These areas have historically been served by groundwater wells, which may lack long-term reliability.

Approved Development

The largest point of contention in the proposal was the proposed change to the water demand standard described above. After many hours of meetings, negotiations, and research, the developers and county planners settled on an initial 0.40 acre-feet/year/unit water demand standard with the ability to change it at later stages of development given statistically significant data on actual water use. The County believed there was not enough evidence concerning expected results from the proposed conservation measures in practice to justify the 0.286 standard, but was willing to reevaluate the demand standard over time.[129] (The water supply plan was only able to cite two studies for indoor water use, noting "Data for actual indoor use is sparse…few studies have examined actual indoor water use and savings generated by retrofitting older fixtures and appliances with water efficient models. The studies that do exist are extremely valuable and widely referenced."[130]) For residential units, the criterion for reevaluation is the collection of five years of metered water use data for at least one

[125] *Id.* at 203.
[126] *Id.* at 202.
[127] *Id.* at 211.
[128] *Id.* at 130, 215.
[129] Interview with Steven Koster, Assistant Director of Planning Services, Douglas County Department of Community Development, in Castle Rock, Colo. (Dec. 4, 2015).
[130] STERLING RANCH, LLC, DOUGLAS COUNTY LAND USE APPLICATION at 193.

hundred units.[131] Any future standard must account for expected water use, system inefficiencies, and potential demand variability and it will apply retroactively.[132]

Aside from the water demand standard, little was changed between the initial proposal and the approved application. The efficiency measures described in the water plan were incorporated into a Water Conservation Covenant, which binds homebuilders, homeowners, Dominion, and retail water districts.[133] Similarly, the commitment to provide water to certain adjacent neighborhoods was also approved and recorded, in what has been deemed the Chatfield Valley Water Supply Framework.[134] And finally the state engineer found that water supply for the first phase was adequate and can be provided without causing injury to other water rights.[135]
The state engineer's referral letter provides a good summary of the approved demand figures and the proposed water sources. The demand figures are reproduced in Table 2 below.[136]

Table 2. Phase 1 Water Demand Summary

Land Use	**Quantity**	**Initial Water Demands Standards from Sterling Ranch Water Appeal**	**Total (acre-feet/year)**
Residential -SFD	891 units	0.40 acre-feet/year/unit	356.4
School	1,000 students	0.01456 acre-feet/year/student	14.6
	6.3 irrigated acres	2.431 acre-feet/year/irrigated acre	15.2
Church	5,000 square-feet of building space	0.75 acre-feet/year/6,695 square-feet of building space	0.6
Recreation Center	5,000 square-feet of building space	0.75 acre-feet/year/6,695 square-feet of building space	0.6

[131] DOUGLAS COUNTY, BOARD OF COUNTY COMMISSIONERS RESOLUTION R-013-080 13 (2013), *available at* https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=16537643 (approving the water supply plan, included therein)
[132] *Id*. at 15
[133] DOUGLAS COUNTY CLERK AND RECORDER'S OFFICE, FILING NO. 2013095324, AGREEMENT AND DECLARATION OF WATER CONSERVATION COVENANTS FOR STERLING RANCH (2013).
[134] Dominion Water and Sanitation District, Chatfield Valley Water Supply Framework (2011), *available at* https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=13362482 (under the framework, 10% of the water supply for each phase of development will be made available to existing neighbors)
[135] JOANNA WILLIAMS, COLO. DIV. OF WATER RESOURCES, RE: STERLING RANCH FILING 4, SB2014-050 (2014), available at https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=18884011.
[136] JOANNA WILLIAMS, COLO. DIV. OF WATER RESOURCES, RE: STERLING RANCH FILING 1, SB2014-050 (2014)

	1 pool site	4.00 acre-feet/year fill, refill, and evaporation	4
Welcome Center	4,500 square-feet of building space	0.75 acre-feet/year/6,695 square-feet of building space	0.5
Pocket Parks	6.8 irrigated acres	2.431 acre-feet/year/irrigated acre	16.5
Roadway Medians	10.1 irrigated acres	2.431 acre-feet/year/irrigated acre	24.6
Multi-Functional Open Space	10.5 irrigated acres	2.431 acre-feet/year/irrigated acre	25.5
		Total Demand	**458.5**

Dominion will supply up to 480 acre-feet of water per year to serve the demands of the first phase. Of the 458.5 acre-feet demanded, 366.4 will be potable, and 92.1 will be non-potable grey-water recycled from indoor uses.[137] The estimated surplus of 113.6 acre feet of potable water leaves some supply available for the neighbors in the Chatfield neighborhood, which are being delivered 48 acre-feet in accordance with the Chatfield Valley Water Supply Framework. The City of Aurora, in two separate inter-governmental-agreements, has agreed to supply all 480 acre-feet to Dominion from renewable sources, with raw consumable water. The benefit of consumable water is that "Dominion shall have the right to use, reuse, make successive uses and use to extinction the water delivered," allowing it to have the grey-water recycling program.[138] Dominion, in turn, will supply the water to the retail water districts that will serve the end users.

The agreements deserve some inspection. In the first one, dated October 26, 2009, Dominion agreed to transfer certain water rights from ditches in Park County to Aurora for the delivery of 230 acre-feet of water from any source legally available to Aurora.[139] The water will be delivered to Dominion via the Roxborough Water and Sanitation District's treatment plant, already located within Sterling Ranch, with a maximum delivery rate of 40 acre-feet per month and at a cost of $3.77 per 1,000 gallons.

The second agreement is more complicated. Approved on December 11, 2013, it provides for only a temporary supply from Aurora. [140] Much like the first agreement, Aurora will supply 250 acre-feet to Dominion through the Roxborough plant with a maximum monthly delivery volume of 66.7 acre-feet at a rate of $3.77 per 1,000 gallons. The difference is that delivery of this water after December 31, 2020 is conditioned on

[137] *Id*. at 4.
[138] DOUGLAS COUNTY, COMPLETED WATER FILE, 184 (July 23, 2014), available at https://apps.douglas.co.us/planning/projects/download.aspx?PosseObjectId=18714806
[139] *See Id.* 157 – 181.
[140] *See Id.* 182 – 195.

Dominion either conveying its own 250 acre-feet of water to Aurora, cash in lieu at a cost of $76,932 per acre-foot, or a mixture of the two. If Dominion fails to meet this condition, Aurora may terminate the agreement.[141]

Current Status

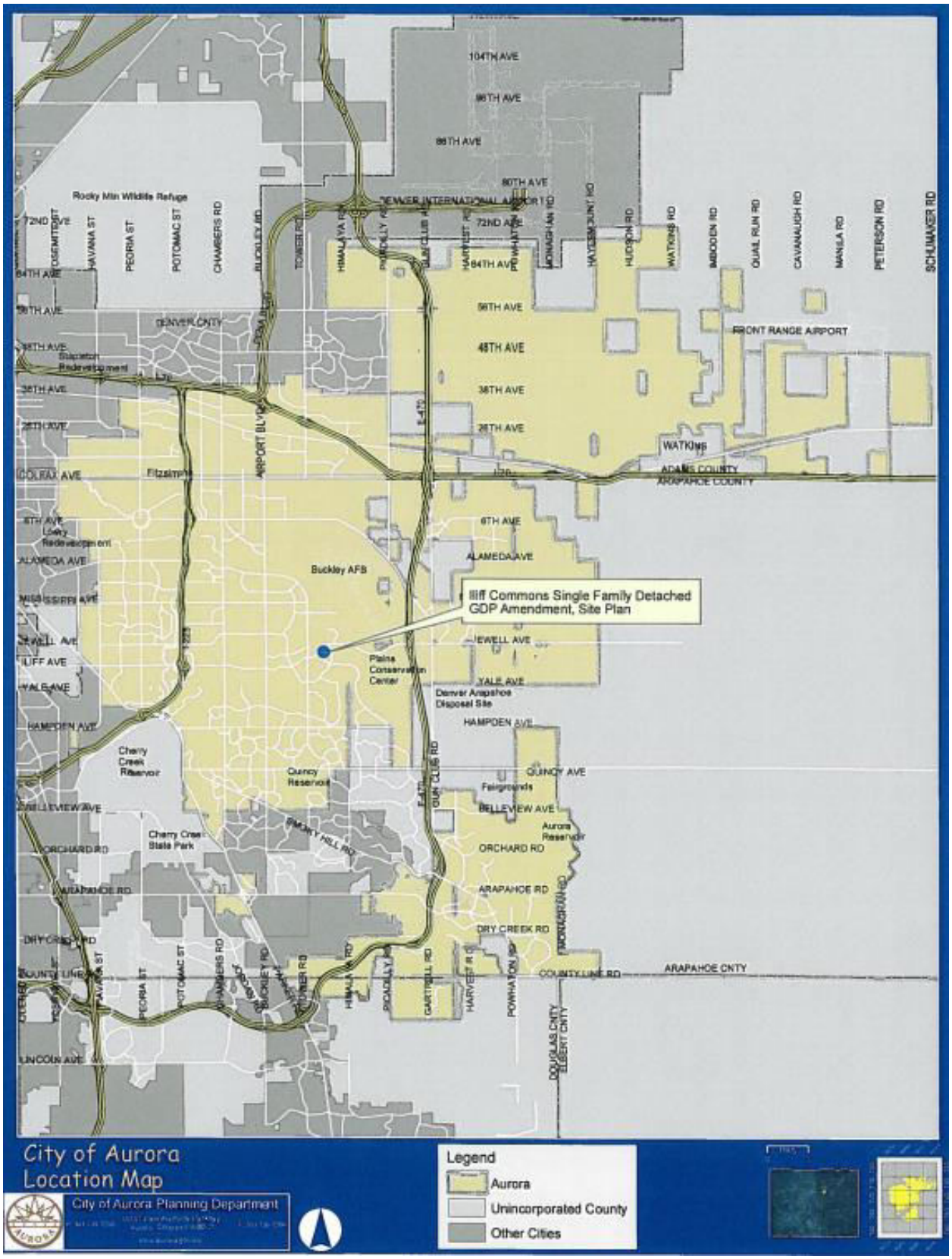
Today, development of Sterling Ranch's first phase, Providence Village, has begun. This first of nine phases will cover 320 acres of the 3,400-acre development and include 658 single-family homes as well as some civic buildings. [142] According to the Denver Business Journal, home construction has begun and models are expected to be completed in the third quarter of this year. [143] Additionally, the Roxborough Water and Sanitation District has begun reconstructing its water treatment and reclamation plant with Dominion's financial support to expand capacity in anticipation of the growing water demand.[144] In the meantime, wastewater services will be provided by Littleton at a cost of $200 per home per year.[145] Rather than set up a facility just to serve the first phase, Dominion's utilities director said "It is just more efficient to use [Littleton's] with so few homes."[146] When completed, the Roxborough plant will allow Dominion to treat and reuse wastewater directly for outdoor uses.[147]

[141] *Id.* at 186.
[142] Brian C. Hart, Redland, Re: Sterling Ranch Sketch Plan No. 1 Project Narrative, PS2014-100 (2014), available at https://apps.douglas.co.us/planning/projects/download.ASPX?PosseObjectId=17582069.
[143] Molly Armbrister, Sterling Ranch's First Wave of Homes: Here's What They'll Cost, THE DENVER BUSINESS JOURNAL, April 18, 2016, http://www.bizjournals.com/denver/blog/real_deals/2016/04/sterling-ranchs-1st-wave-of-homes-heres-what.html.
[144] Krysta Cossitt, RWSD's New Water Treatment Plant, ROXBOROUGH LIVING, November 3, 2015, http://roxboroughliving.com/tag/dominion-water-and-sanitation-district/
[145] Jennifer Smith, Sterling Ranch Asks for Wastewater Help, The Littleton Independent June, 28 2015, *available at* http://littletonindependent.net/stories/Sterling-Ranch-asks-for-wastewater-help,192454?.
[146] *Id*.
[147] E-mail from Beorn Courtney, President, Element Water Inc., to author (June 12, 2016) (on file with author).

Iliff Commons

Iliff Commons is a 119 single-family home infill development being erected on 65 acres in southeast Aurora by KB Home. The City of Aurora is both the land use approval entity and the water supplier.

Iliff Commons is examined in particular to provide information on the City of Aurora's Z-Zone irrigation program, which incentivizes low water intensive landscaping through credits to the otherwise applicable tap fee. Z-Zone reduces the developer's cost of connecting to the water system in exchange for installing xeric landscapes. Reduction of irrigation demand in the summer has a direct and beneficial impact on the sizing of water delivery systems required and the amount of water needed to address peak demand. Aurora provides an example of one component of integrated land and water planning, and Iliff Commons' outdoor areas are a direct result of that integration.
The maps below show the location of the Iliff Commons development in the general vicinity and the actual development site.


Iliff Commons Single Family Detached GDP Amendment, Site Plan
City of Aurora
Location Map
City of Aurora Planning Department
Legend
Aurora
Unincorporated County
Other Cities
104TH AVE
96TH AVE
88TH AVE
80TH AVE
72ND AVE
64TH AVE
56TH AVE
48TH AVE
38TH AVE
26TH AVE
COLFAX AVE
6TH AVE
ALAMEDA AVE
MISSISSIPPI AVE
ILIFF AVE
JEWELL AVE
YALE AVE
HAMPDEN AVE
QUINCY AVE
BELLEVIEW AVE
ORCHARD RD
ARAPAHOE RD
DRY CREEK RD
COUNTY LINE RD
ARAPAHOE CNTY
LINCOLN AVE
DENVER CNTY
ADAMS COUNTY
ARAPAHOE COUNTY
DOUGLAS CNTY
ELBERT CNTY
DENVER INTERNATIONAL AIRPORT
FRONT RANGE AIRPORT
WATKINS
Buckley AFB
Rocky Mtn Wildlife Refuge
Cherry Creek Reservoir
Quincy Reservoir
Aurora Reservoir
Cherry Creek State Park
Plains Conservation Center
Denver Arapahoe Disposal Site
Fairgrounds
Blucher Redevelopment
Lowry Redevelopment
AIRPORT BLVD
GUN CLUB RD
HIMALAYA RD
TOWER RD
BUCKLEY RD
CHAMBERS RD
PEORIA ST
POTOMAC ST
HAVANA ST
ROSEMARY ST
PICADILLY RD
HARVEST RD
POWHATON RD
MONAGHAN RD
HAVEN/MOUNT RD
HUDSON RD
WATKINS RD
BIBOOKEN RD
QUAIL RUN RD
CAVANAUGH RD
MANILA RD
PETERSON RD
SCHUMAKER RD
GARTRELL RD
PICADILLY RD
I-70
I-225
I-25
E-470
PARKER RD
PIKEY HILL RD

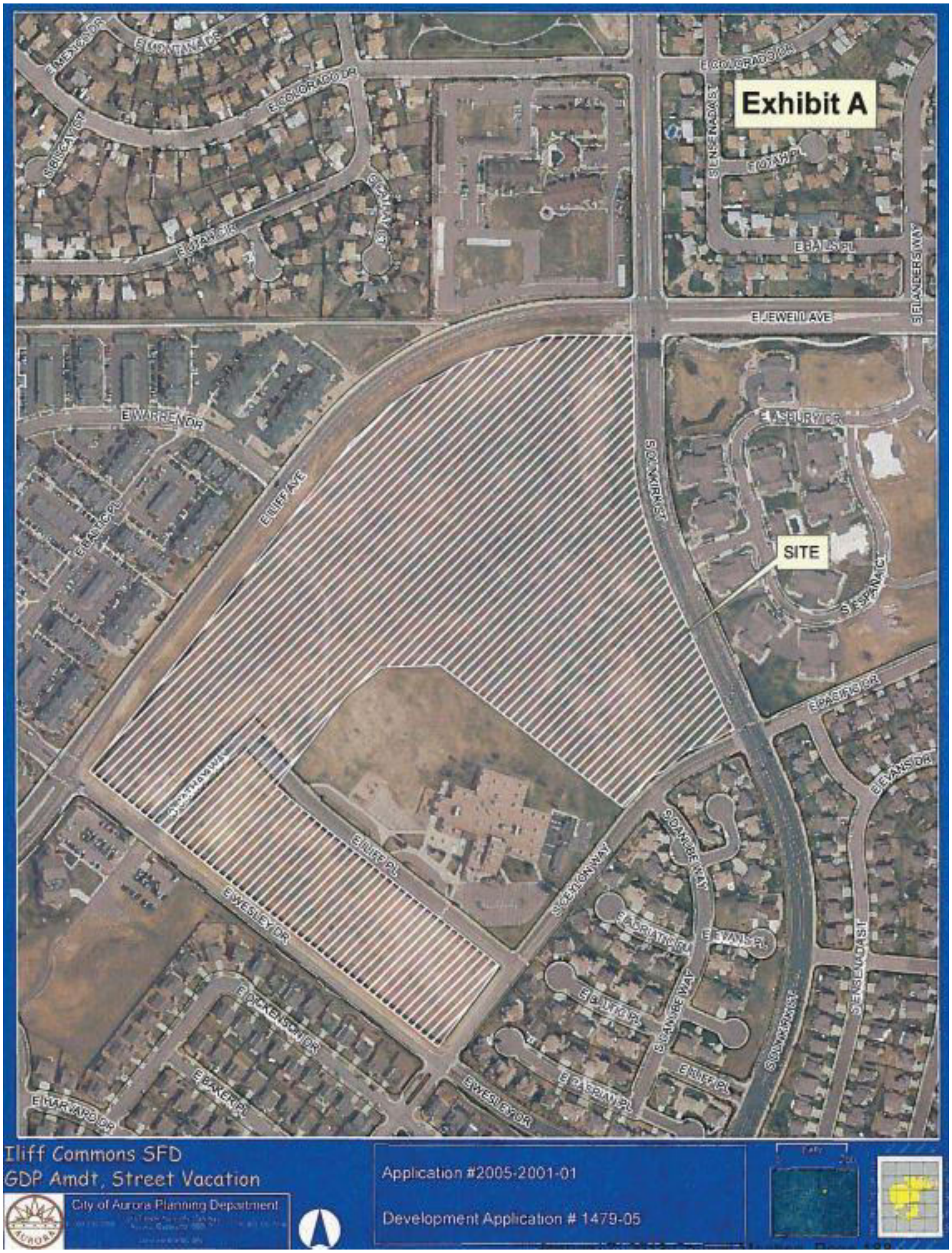


Exhibit A
E JEWELL AVE
E ILIFF AVE
E ILIFF PL
E WESLEY DR
E ASBURY DR
E EVANS DR
E EVANS PL
SITE
Iliff Commons SFD
GDP Amdt, Street Vacation
City of Aurora Planning Department
Application #2005-2001-01
Development Application # 1479-05

City of Aurora's Development Approval Requirements

As a home rule city and water provider, Aurora's development review process falls under the auspices of the Local Government Land Use Control Enabling Act of 1974 and the Water Conservation Act of 2004 which were described in the introduction. Within these constraints, Aurora has delegated its authority to regulate the use of land within its jurisdiction to the Aurora planning commission.[148] This power is not without limitation though. The City Council makes final approvals of zoning changes, hears any appeals of the commission's decisions, and adopts the city's Comprehensive Plan.[149][150]

In its latest Comprehensive Plan, Aurora included a water supply element.[151] The plan section, titled "Developing and Protecting Water and Other Natural Resources" describes the city's goals for water resources, population and demand forecasts, the impacts of conservation, supply projects, and strategies for reducing demand in times of drought. The forecasts are telling. Between 2010 and 2050, Aurora expects to grow by 200,000 people, increasing annual water demand by 35,000 acre feet.[152] The goals articulate some important principles that will guide the acquisition of new water supplies. One of the Comprehensive Plan's goals is to maintain a leadership role in the development of Colorado water policy. Aurora receives 95% of its water from renewable snowmelt runoff now, and envisions a continued reliance on renewable surface water sources, as well as an expanded water recapture program.

The Comprehensive Plan also describes Aurora's efforts to use water responsibly. In 2003, the city developed its first Water Management Plan and began work on rewriting the city's landscape ordinance "to ensure that future landscapes will be sustainable during dry periods and drought."[153] This effort has resulted in the development of a xeriscape plant list, an irrigation ordinance, and the Z-zone incentive program. A new Water Management Plan was published in 2012, which encourages the wise use of water and provides a series of responses to various water availability conditions.[154]

To meet the state law requirement for the development and implementation of a water conservation plan,[155] Aurora also has a Water Efficiency Plan.[156] This plan is required to

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[148] Colo. Rev. Stat. § 29-20-102(1); Aurora City Code § 106-27 ("The planning and zoning commission shall have and exercise all powers and privileges conferred by statute.")
[149] Aurora City Code § 147-18.
[150] *Id*. at § 146.206.
[151] CITY OF AURORA, 2009 COMPREHENSIVE PLAN, Ch. IV.G (2010), available at https://www.auroragov.org/DoingBusiness/CityPlanning/PlansandStudies/ComprehensivePlan/
[152] *Id.* at 2
[153] *Id.* at 7.
[154] CITY OF AURORA, 2012 WATER MANAGEMENT PLAN, 4, available at https://www.auroragov.org/cs/groups/public/documents/document/002342.pdf
[155] *See* Colo. Rev. Stat. § 37-60-126.
[156] 2015 Municipal Water Efficiency Plan, Aurora Water, City of Aurora, https://www.auroragov.org/cs/groups/public/documents/document/023624.pdf.

cover water saving measures, an evaluation of conservation in the supply planning process, estimates of water saved by conservation, and best management practices for water demand management that could be implemented through land use planning efforts.[157] Aurora's Efficiency Plan also profiles the city's supply system, existing use, and future demand.[158] In doing so, the plan doubles as a "water supply plan" for the purpose of showing adequacy of water supply in the development approval process.[159] In cities that have water supply plans, developers can avoid the burden of submitting "estimated water supply requirements for the proposed development in a report prepared by a registered professional engineer or water supply expert acceptable to the local government."[160] The Water Efficiency Plan effectively saves developers in Aurora the time and expense of estimating their own water demands and determining a source of water that will supply it.

Aurora has also developed an Integrated Water Master Plan to help project future supply needs. The meat of the plan is a twelve-factor demand model, which produced a range of future demands based on possible scenarios.[161] An important part of the model was input from the water and planning departments.

> In tandem with Aurora Water and Aurora Planning, BBC Consulting developed projections for the factors that will drive changes in future water use. This information included: projections regarding future growth and development; variables that define water use intensity by Aurora Water customers; and projections regarding treatment loss and non-revenue water use.[162]

Future growth and development projections came specifically from Aurora Planning's Land Use Allocation Model, a GIS model that distributes growth to developable land across the city. The model calculates population and employment capacity for every city parcel based on current zoning.[163] Then, historical Aurora Water demand data was used to predict the future demands of those uses.

The model's median forecast projected demand to increase from 16.4 billion gallons annually today to 20.4 billion by 2025, 24.0 billion by 2035, and 38.8

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[157] Colo. Rev. Stat. § 37-60-126(4).
[158] *Id*. at 5-21.
[159] Colo. Rev. Stat. § 29-20-304 (3) (describing the necessary elements of a water supply plan).
[160] Colo. Rev. Stat. § 29-20-304(1), -304(3) ("an applicant shall not be required to provide a letter or report identified pursuant to subsections (1) and (2) of this section if the water for the proposed development is to be provided by a water supply entity that has a water supply plan.")
[161] Interview with Sarah Young, Aurora Water Planning Services Manager, City of Aurora, in Aurora, Colo. (Feb. 10, 2016).
[162] BBC Research and Consulting, Water Demand Forecasts for Integrated Water Master Plan, Draft Final Report (Feb. 3, 2016).
[163] *Id*. at Appendix D.

billion by 2070.[164] In acre feet, the baseline was 50,445; which increases to 62,456 by 2025, then 73,734 by 2035, and finally 119,183 by 2070. Today, the average yield from Aurora's water rights is 85,274 acre feet annually.[165]

The 2070 projected demand is more than double Aurora's existing use, but there are some underlying variables that may change this figure. They include future weather, water rates, water use intensity, and magnitude of future growth.[166] To lower demand intensity, Aurora is focusing its efforts on outdoor water use, and has left the regulation of indoor plumbing fixtures largely up to the state.[167] Aurora's approach to indoor use for single-family homes is to charge a tap fee based on the number of bathrooms. A tap fee or connection charge is intended to recover the city's cost of acquiring and supplying water.[168] For outdoor use, Aurora's biggest accomplishment is the Z-Zone program.

The Z-Zone program is meant to combat what was described as Aurora's toughest issue: irrigation.[169] Irrigation is a major problem because of the way it creates large demand peaks in the summer months. The peak demand determines the required size of delivery facilities and the total supplies that must be available. The impacts of irrigation can be seen very starkly in the chart below:

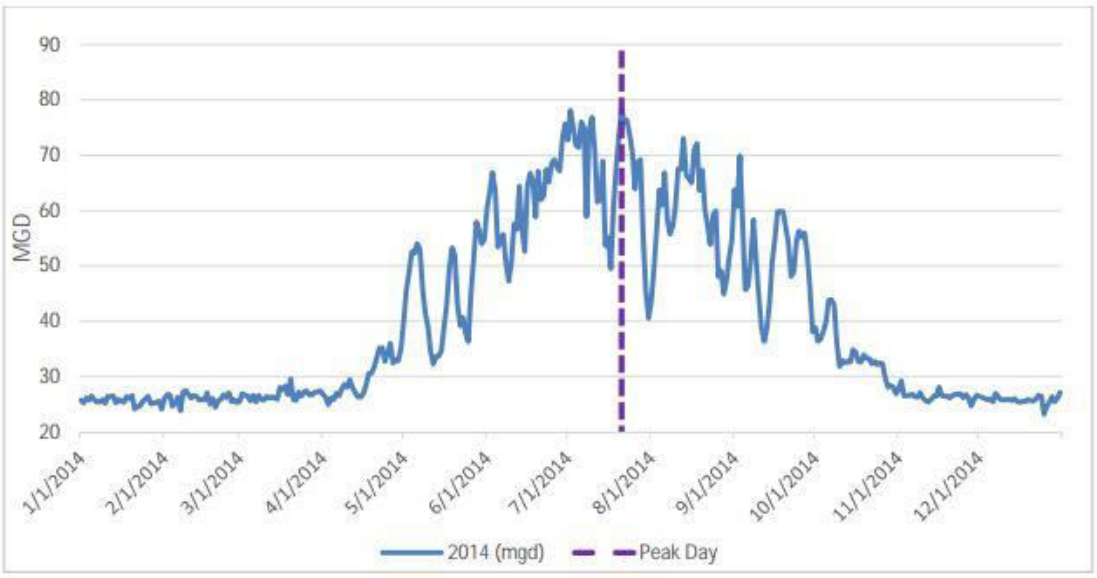

Figure 3. 2014 Daily and Peak Demand[170]

[164] *Id.* at § 3, p. 6.
[165] City of Aurora, 2015 Aurora Water Efficiency Plan, 5.
[166] *Id.* at § 3, p. 8.
[167] Interview with Sarah Young, *supra* note 161.
[168] Interview with Tim York, Senor Water Conservation Specialist, City of Aurora, in Aurora, Colo. (Feb. 3, 2016).
[169] Interview with Sarah Young, *supra* note 161.
[170] City of Aurora, 2015 Aurora Water Efficiency Plan, 14.

According to this data, Aurora residents frequently use more than three times as much water during the summer as they do during the winter, showing the impacts of irrigation on the supply system.

The Z-Zone program is an incentive to install xeric landscapes, aimed at reducing and even eliminating irrigation use of water. A xeric landscape, or xeriscape, is defined as "a sustainable and drought-tolerant landscape that uses low-water plants and specific techniques to maximize water efficiency."[171] Aurora Water's 2016 Fee Schedule describes the Z-Zone program as "a temporary water option for irrigation only that allows for establishment of low-water plant material."[172] Aurora's zoning code requires irrigation systems for all landscaped areas except for areas of native, dryland and restorative grasses.[173] The added cost on the system to supply water for irrigation is assessed as a connection (also known as tap) fee, in addition to the connection fee for indoor uses based on the number of bathrooms. For single-family homes, the irrigation connection fee is $0.941 per square feet of lot size. If a xeric front yard is installed however, a $1,000 credit is available to be applied toward this charge.[174]

For all other types of development, the fee is based on the square footage of the land and type of vegetation being irrigated. Aurora has three classes of landscape: non-water conserving, water conserving, and Z-Zone.[175] The tap fees per square foot of each are $2.75, $1.47, and $0 respectively. Because one acre equates to 43,560 square feet, this tap fee could be very expensive for large lots.

Obtaining a Z-Zone classification requires administrative review by city staff, provided for in the city's zoning code.[176] First, an applicant must submit a landscape plan describing the proposed method of irrigation, types and distribution of vegetation, and how it will be mulched. For single-family homes, once the plan is approved, the builder can begin installing the xeric yard. After that, the city will inspect it and if it satisfies the code's requirements, will remit the $1,000 credit. Aurora is considering removing the landscape plan submittal requirement to make it cheaper and easier for builders to take advantage of the program.[177]

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[171] City of Aurora, Xeriscape, https://www.auroragov.org/LivingHere/Water/Residential/Xeriscape/.
[172] City of Aurora, Development and Connection Fee Schedule (2016), *available at* https://www.auroragov.org/cs/groups/public/documents/document/025809.pdf
[173] City of Aurora Zoning Code § 146-1430 ("All applicants shall provide automatic irrigation systems for landscaped areas. Within areas of native, dryland, and restorative grasses, applicants shall provide an automatic irrigation system for only the trees and shrubs.")
[174] City of Aurora, Development and Connection Fee Schedule (2016)
[175] *Id.*
[176] City of Aurora Zoning Code at § 146-1437.
[177] Lyle Whitney, Aurora Water, Linking Land Use and Water, at the Rocky Mountain Land Use Institute Conference (Mar. 9, 2016).

For everything else, once the landscape plan is approved, the applicant puts down a $20,000 deposit to have a temporary irrigation tap installed on the property. The applicant is given three years to develop the landscape. If it is successful, the deposit is returned and the irrigation tap is removed. If the owner decides to install other vegetation, the applicable fee will be assessed and the deposit will be used as a credit. Over the course of these three years, Water Department staff visit the property to inspect the landscape and answer any of the owner's questions. This relationship building is an important part of how Aurora educates the end water user and can be very effective.[178] As a whole, the Z-Zone program incentivizes the installation and maintenance of landscapes that do not require irrigation. The intent is to shape how people use land and to drive down water demand.

Outside of the landscape code, the criteria for site plan review is very vague when it comes to considering water conservation and water supply implications. A possible source of authority is the criterion that "the proposed development does not result in undue or unnecessary burdens on the city's existing infrastructure and public improvements, or that arrangements are made to mitigate such impacts."[179] In application, however, this is limited to concerns over the physical infrastructure, such as roads and pipes, as water is provided to all development within Aurora's Planning Boundary regardless of water supply considerations.[180] Review "is not a yes or no question," rather, it becomes a question of the level of service and how much it will cost to provide it. Those costs are then passed back onto developers through an impact fee (separate from the connection charge but considered together as the tap fee[181]), updated every five years and based on the twenty-year average cost of supply infrastructure, storage, and water rights.[182]

Iliff Commons Application

Iliff Commons developer KB Homes sought to ensure that every home in the development would be water conserving. For indoor use, this meant including water efficient fixtures. "All KB homes include a number of water-saving features to help reduce usage and help save money … includ[ing] WaterSense® labeled faucets, toilets and showerheads."[183] For outdoor uses, this meant installing water-conserving landscapes.

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[178] Interview with Tim York, Senor Water Conservation Specialist, City of Aurora, in Aurora, Colo. (Feb. 3, 2016).
[179] City of Aurora Code Sec. 146-405(f)(2).
[180] Interview with Sarah Young, *supra* note 161.
[181] City of Aurora Municipal Code at § 138-224(a) ("all water development, connection, and service fees…shall be used for the construction, installation, operation, maintenance, replacement, extension, and improvement of the water system.")
[182] Interview with Sarah Young, *supra* note 161.
[183] KB Home, Energy Efficient Homes, http://www.kbhome.com/energy-efficient-homes

Iliff Commons was first conceived in 2006 as a 250 townhome project but the developer determined that a smaller number of detached residences would be more marketable, and proposed a new site plan and plat in 2012.[184] The 2012 application was aimed at meeting the Z-Zone requirements for the single-family homes.

In general terms, the proposed landscapes are one-third low-water turf, one-third mulch, and one-third trees and shrubs. The Figure below shows the composition of a typical lot at Iliff Commons.

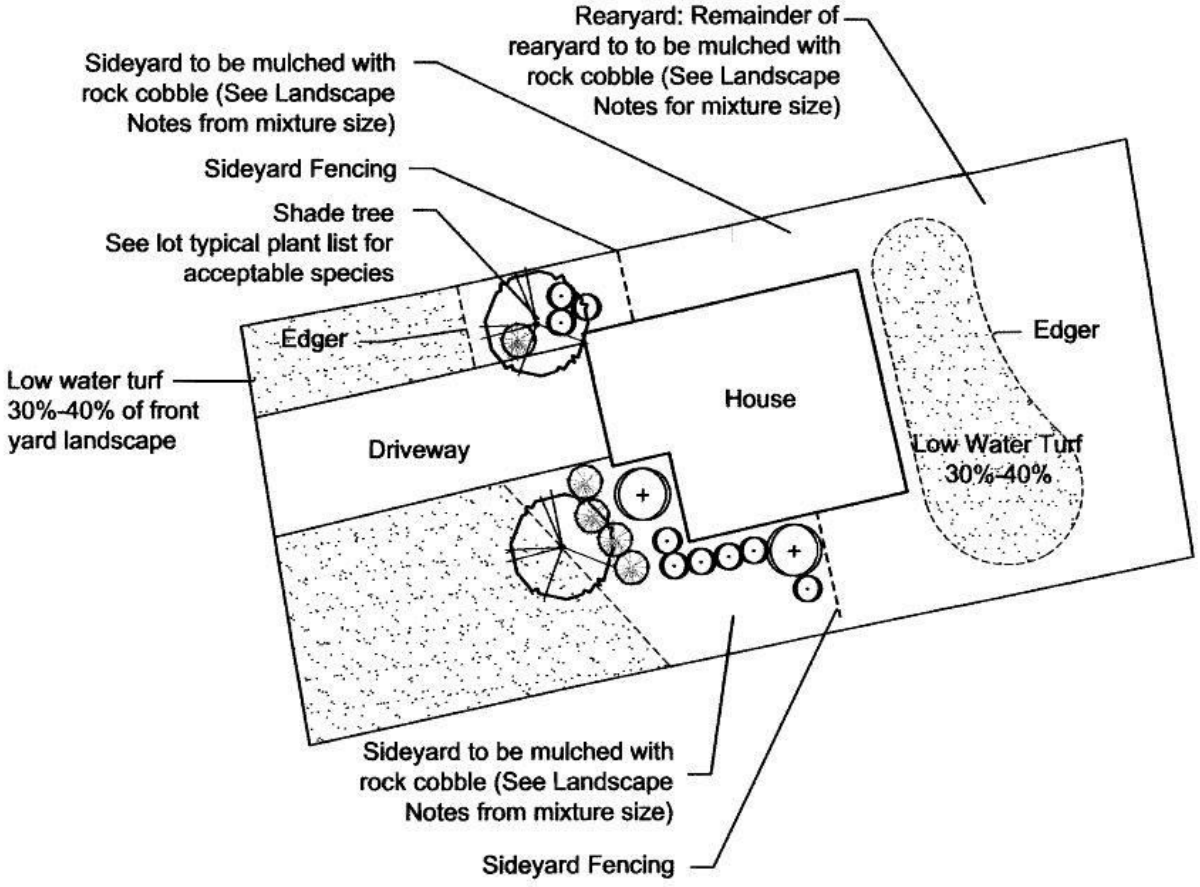


Figure 4. Standard Lot Landscape

As described in the prior section, the only relevant factor in determining the indoor water use and therefore connection charge is the number of bathrooms in a home. Of the ten floor plans for Iliff Commons, seven have 2 – 2.5 bathrooms, and two can have up to 3, and one can have up to 4 bathrooms.[185] The indoor use service connection fee

[184] City of Aurora, Planning Commission Case Reports, (Dec. 12, 2012), *available at* https://www.auroragov.org/cs/groups/public/documents/document/013274.pdf

[185] KB Homes, Home Designs in this Community (2016), *available at* http://www.kbhome.com/new-homes-denver/iliff-commons

will be $5,509 for the homes with 2 – 2.5 bathrooms or $8,901 for homes with 3 to 4 of them.

In August of 2014, KB Homes filed a minor amendment application to its previously approved landscape plan.[186] The amendment sought to take advantage of the Z-Zone program for the development's common areas. The main difference was a change from sod to native seed, supported by temporary spray irrigation. Much of the common areas remain sod however, so the tap fee will be reduced proportionally. The image below shows the planned landscape for a small pocket park within the development. In it, a small area of traditional sod is surrounded by native grasses.

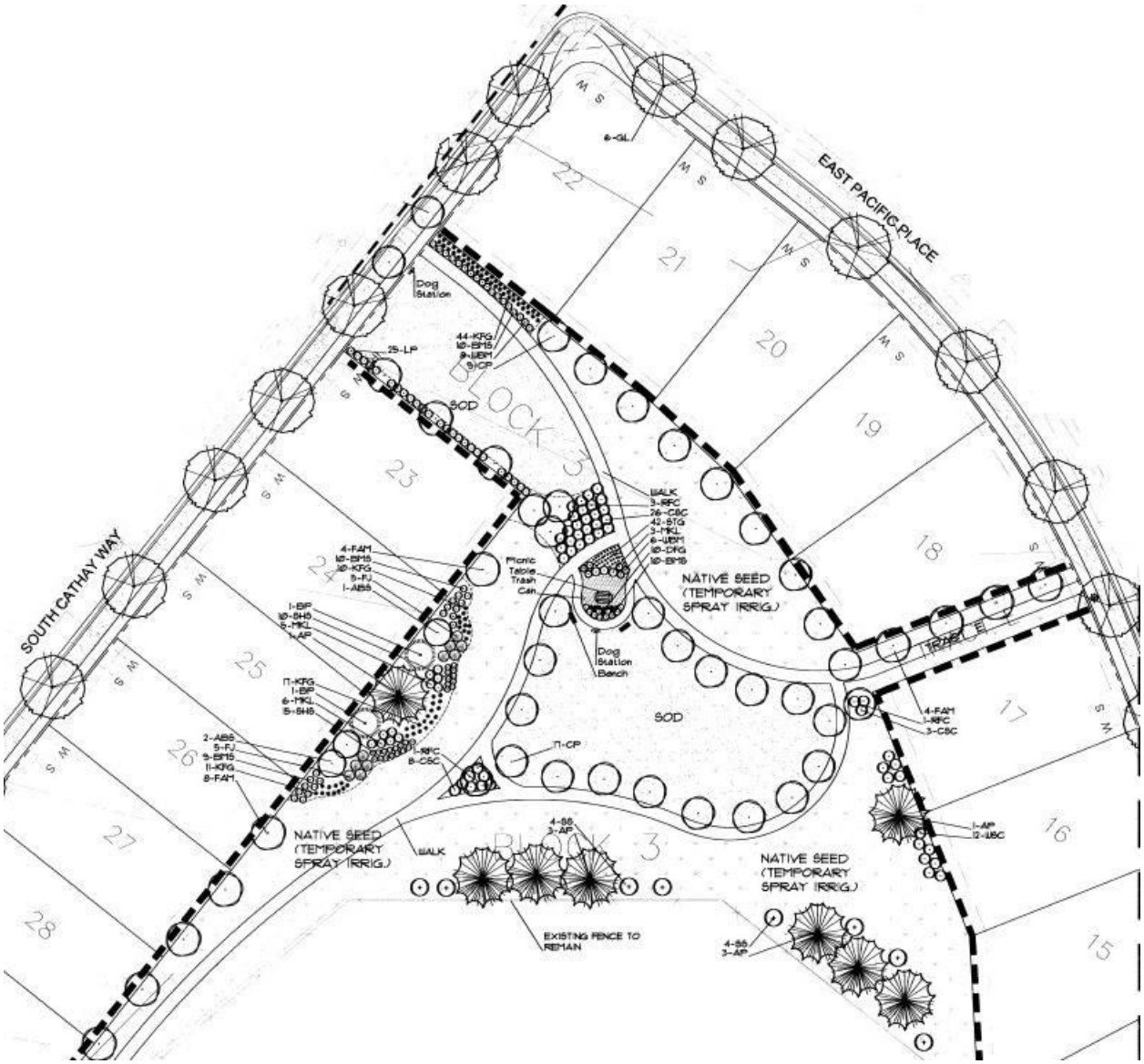


Figure 5. Landscape elements of the development's pocket park

[186] KB Home, Iliff Commons Landscape Plan, (Aug. 26, 2014).

City of Aurora Development Approval

The 2012 proposal underwent a number of reviews by planning staff and was approved by the city's planning commission, complete with the proposed xeric landscapes, in December of 2012.[187] But this approval was conditioned on resolving outstanding technical issues. The main technical issue was related to fencing, and in June of 2013, KB Home submitted its site plan for a third review.[188] The comments by the water department are telling of its focus. It was concerned with the location of irrigation meters, manhole spacing, and trees being planted over water line easements. There was no mention of the proposed vegetation and its water efficiency, presumably because those issues had been previously addressed. Because the site plan had already been approved by the planning commission, no further public review was necessary for these minor amendments and they were approved internally.[189] The 2014 minor amendment to the landscape plan underwent the same process and was approved after staff found that it met the Z-Zone requirements.[190]

Current Status

As of the middle of May 2016, construction of Iliff Commons is well underway. The project's 119 lots are in various stages of development: some are already occupied by homeowners, others are under construction, and still others are being prepared to be built on. The xeric landscapes are being installed on every lot during construction. The figure below shows a final landscape, with the gravel mulch, small areas of turf, and trees.

[187] City of Aurora, Minutes of the Regular Meeting of the Planning and Zoning Commission (Dec. 12, 2012).
[188] The Henry Design Group, Third Submission Review – Iliff Commons Single Family Detached GDP Amendment, Street Vacation, Site Plan and Replat (June 27,2013), *available at* https://www.auroragov.org/search/index.htm?ssUserText=iliff%20commons%20landscape&SearchType=record
[189] City of Aurora Code Sec. 146-405(H) "Any approved site plan may be amended administratively [and] the director of planning may approve administrative amendments to an approved site plan without notice or hearings."
[190] Telephone Interview with Kelly Bish, Senior Planner, City of Aurora (Jan. 26, 2016).

Figure 6. Completed home and landscape

Once the homes are all completed, city staff will inspect them and determine if they are eligible for the fee credit. The inspection is regarded as a valuable opportunity for City staff to educate homeowners on water conservation while enforcing the Z-Zone program. If the landscapes are approved, the credit will go to the developer that paid the fee up front.[191] With 119 homes in the development, this would result in a $119,000 credit for KB Home.

The outdoor common areas are also at varying stages of completion. The areas of sod and stone, and irrigation systems have been installed but much of the native grasses have not. The figures below show how various common areas are progressing. Figures 4 and 5 contain insets comparing the area shown to the landscape plan in Figure 2.

[191] Email from Timothy York, Water Conservation Specialist, Aurora Water, to author (April 20, 2016) (on file with author).

Figure 7. Area of sod within the pocket park

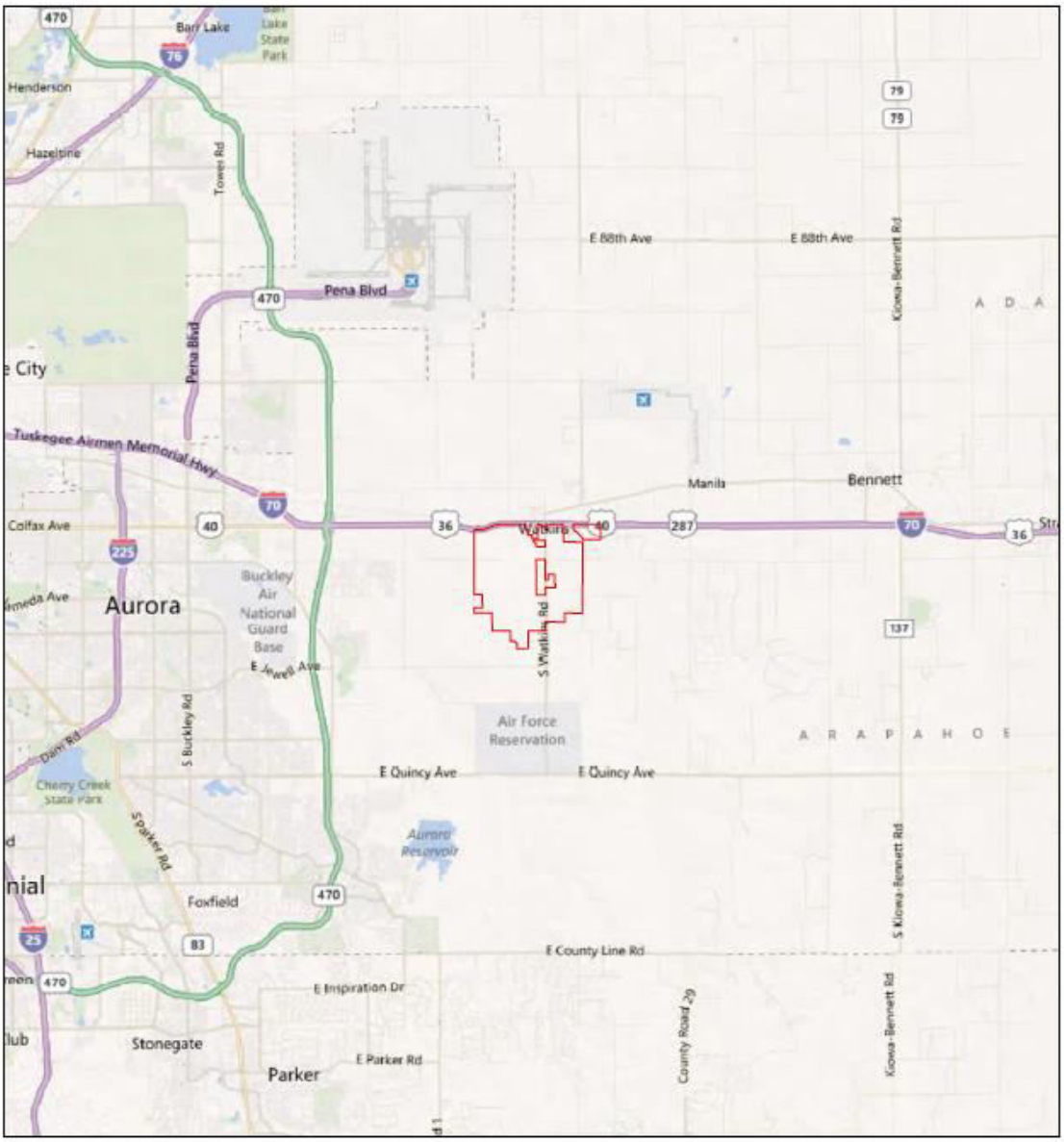
Figure 8. Area slated for native grasses witin the pocket park

Figure 9. East Warren Drive and Iliff Avenue

These images provide a sense of the size and scale of the land being landscaped with water conserving mulch and vegetation. These areas can provide meaningful savings to KB Home if they are successfully established over the next three years.

Prosper

Prosper is a proposed master planned community located in unincorporated Arapahoe County. The developer, Prosper Farms Investments, LLC, has proposed 9,000 residential units and 8 million square feet of commercial development. It is proposing to develop its own water supply. The maps below show the location of the proposed development in the County, and the location of residential, commercial, and open space areas.



Legend

Boundary April 2012

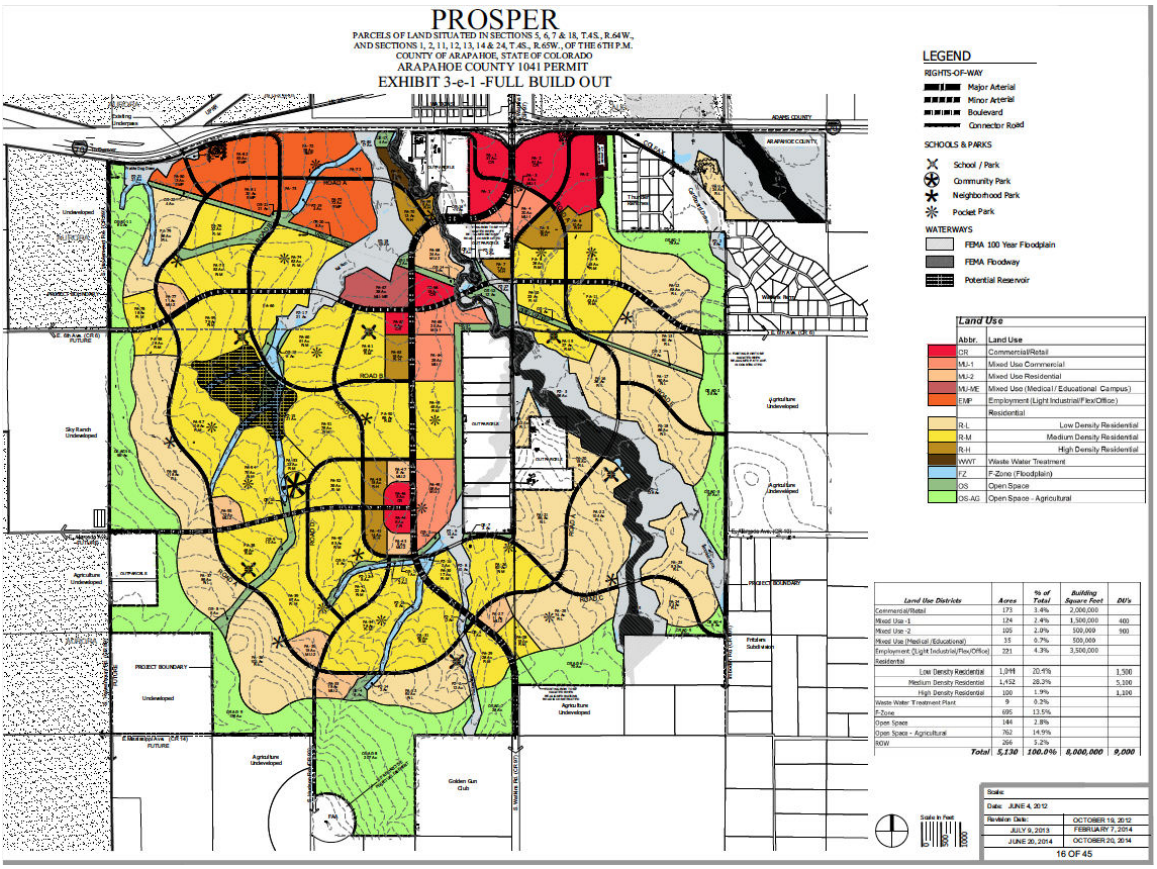
NORTH

0 2.5 5

Miles

Figure 1. Vicinity Map
Prosper Project

Date: April 2012



Arapahoe County Development Approval Requirements

Arapahoe County has adopted a Comprehensive Plan (Comp Plan) to guide its land use and growth and development decisions.[192] It provides the vision for development in the County, various goals, and an implementation strategy. In Arapahoe County, the Comp Plan is considered strong guidance to developers, but is not mandatory. The Comp Plan addresses water supplies first by stating that the County does not consider non-tributary groundwater to be an adequate long-term water supply for its communities and will encourage developers to consider options for obtaining renewable sources of water.[193] It states that in order "to allow time to obtain and secure a renewable source of water, the County will consider requiring water districts that serve development in areas east of Gun Club Road to prepare service plans using a conservative aquifer life assumption of a 100-Year supply, non-tributary groundwater classification only, assuming a 50 percent recovery factor."[194] This means that only one-half of the decreed amount of nontributary ground water will be considered as an adequate source of supply. The Comp Plan includes as an appendix a Water Resource Study prepared by a water

[192] Arapahoe County Comprehensive Plan, adopted June 19, 2001, most recently amended Jan. 7, 2014 (Comp Plan), available at https://www.arapahoegov.com/DocumentCenter/View/330.
[193] *Id.* at IV-16, Policy PFS 1.5.
[194] *Id.* at IV-16, Strategy PFS 1.5(a).

consultant engaged by the County, Jon Ford at Leonard Rice Consulting Water Engineers in 2001, which recommends the adoption of the above-described limits, together with other water-related recommendations.[195]

The Comp Plan also contains a policy aimed at conserving water resources by increasing public awareness of water conservation techniques and encouraging and rewarding water conservation efforts.[196] One strategy anticipates the amendment of zoning regulations to require water conserving landscape plans during the site plan review process for certain types of development. [197] This strategy was implemented in 2003 by adding a section to the Arapahoe County Land Development Code providing the landscaping standards applicable to all development included in Final Development Plans, Administrative Site Plans, Use By Special Review applications, or Subdivision Development Plan.[198] The Comp Plan also indicates that the County will require that new homeowners association covenants not preclude xeriscape landscaping or the incorporation of native plants and grasses.[199] Another strategy provides that the County will allow the use of recycled or reused water in new development projects, so long as State environmental standards are met.[200]

The County has adopted 1041 regulations that require a County permit for "new communities" and "major domestic water and sewage treatment systems", as well as for other areas and activities not general related to water resources.[201] Arapahoe County's 1041 regulations set forth the criteria used to determine approval of a requested permit. All activities covered by the 1041 regulations are required to "reflect principals [sic] of resource conservation, energy efficiency and recycling or reuse."[202] The permit approval criteria for new communities reflect the County's concern with "dependence on bedrock ground water, and the difficulty in supplying future surface sources."[203] Permit applicants are, therefore, required to provide a water supply plan "using an aquifer life assumption of 100-year supply, non-tributary groundwater classification only, assuming a 50 percent recovery factor."[204] A finding must be made

[195] *Id*. Appendix G, p. 4.
[196] *Id*. p. IV-38, Policy NCR 3.1.
[197] *Id.* p. IV-38, Strategy NCR 3.1(b).
[198] Arapahoe County Land Development Code, Section 12-1403, available at https://www.arapahoegov.com/DocumentCenter/View/1142
[199] Comp Plan, *supra* note 192, at IV-38, Strategy NCR 3.1(b).
[200] *Id.* p. IV-38, Strategy NCR 3.1(c).
[201] Regulations Governing Areas and Activities of State Interest in Arapahoe County (Arap. Co. 1041 Regs), available at https://www.arapahoegov.com/documentcenter/view/345. Both major new domestic water and sewage treatment systems and major extensions of existing water and sewage treatment systems are defined as "major water and sewer projects."
[202] *Id*. Section V.A.11.
[203] *Id.* Section V.H.20.
[204] *Id.* Arapahoe County's water consultant recommended the use of the 50% recovery factor based on an estimate of percentage of the legally available resource that was capable of being physically recovered from the Denver Basin aquifers. *See* Comp Plan, *supra* note 192 Exhibit G, pp. 22, 37.

that adequate water supplies are available for the new community's needs and that the applicant has obtained, or will obtain all water rights necessary for the proposed project.[205] Major water projects are further required to "emphasize the most efficient use of water, including, to the extent permissible under existing law, the recycling, reuse and conservation of water."[206]

Arapahoe County is not a water supplier, although there are existing suppliers in the County such as the Arapahoe County Water and Wastewater Authority (ACWWA).

Prosper Application and Water Supply Proposal

The Arapahoe County Comp Plan initially did not allow the type of development envisioned for Prosper at the project's location within unincorporated Arapahoe County. Ultimately a Comp Plan amendment was necessary. This was accomplished in 2012, and the changes addressed the entire I-70 corridor from E-470 to Strasburg, and areas farther east. This Comp Plan amendment process was not explicitly done for Prosper and had been initiated by the County prior to the submittal of the initial Prosper application. After the Comp Plan amendment, Arapahoe County's initial process includes a Planned Unit Development application (also called a preliminary development plan by Arapahoe County) and an application for a 1041 Permit for a new community.

Prosper submitted contemporaneous applications in 2012 for preliminary development plan approval and the 1041 Permit for a new community. The 1041 Permit application ultimately acted on by the Board of County Commissioners included a proposed water supply plan authored by Prosper's water consultant and dated January 2014 (Prosper WSP).[207] An earlier water supply plan had been submitted with the original applications in 2012 and updated in 2013, and both submittals had been reviewed and commented on by the County's water consultant.[208] The result of these discussions was a revised 2014 version of the water supply plan.[209]

The water supply plan calculates indoor and irrigation demand, maximum daily requirements, describes the expected sources of water supply, and addresses the adequacy of the proposed supply. It also comments on possible water conservation measures.[210]

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[205] Arap. Co. 1041 Regs., *supra* note 201, Section V.H.7(b).
[206] *Id.* Section V.B.5.
[207] *Prosper, Colorado, Water Supply Plan Report*, prepared by HRS Water Consultants, Jan. 2014 (Prosper WSP).
[208] Email dated March 25, 2016 from Sherman Feher, Arapahoe County Planner, to Anne Castle, on file with author.
[209] *Id.*
[210] Prosper WSP, *supra* note 207.

Indoor water demand is calculated at 0.2 acre feet (af)/year/Single Family Equivalent (SFE). Irrigation demand is also estimated at 0.2 af/year/SFE, for a total residential demand of 0.4 af/year/SFE. Irrigation on open space, schools, commercial areas, and other land outside of residential lots is estimated at 2.25 af/acre. Total demand, including reservoir evaporation and treatment plant losses, is estimated at 5,986 af/year.[211] The plan proposes a dual water system in which non-potable irrigation water will be delivered through facilities completely separated from the potable system.[212]

The sources of the proposed water supply include nontributary Denver Basin ground water (27%), renewable surface water supplies (33%), reclaimed wastewater (33%), and lawn irrigation return flows (7%).[213] Prosper owns decreed Denver Basin ground water in the amount of 5,424 af, a portion of which is nontributary. The Prosper WSP anticipates that the Denver Basin ground water will be withdrawn primarily from the nontributary Lower Arapahoe and Laramie-Fox Hills aquifers. The anticipated use of 1,595 af of Denver Basin ground water represents about 40% of the entire amount of Prosper's nontributary ground water, including the water from the Upper Arapahoe aquifer.[214] It is not clear from the County's 1041 Regulations whether the 50% recovery factor is intended to apply to the entirety of the nontributary ground water owned by the applicant or only to the aquifers to be utilized. The plan also states that nontributary Upper Arapahoe and not nontributary Denver aquifer water may be used as an auxiliary supply, if needed during extreme drought periods.[215]

The Prosper WSP states that the proposed renewable surface water supply of 1,903 af is currently anticipated to be delivered by ACWWA through the pipeline owned by East Cherry Creek Valley Water and Sanitation District, although the applicant is evaluating other renewable supply alternatives.[216] Prosper submitted a conditional "will serve" letter from ACWWA, which verifies discussions between Prosper and ACWWA for the provision of service and contemplates that ACWWA would expand one of its existing projects to provide potable water service of 1,662 af of renewable supplies to Prosper if specified conditions are met.[217] The Prosper WSP also states "no portion of the renewable surface water will be needed by the project until approximately ten years after development begins."[218] Prosper's land planning consultant states that Prosper is continuing to discuss the renewable component of the planned water supply with ACWWA and other providers in the area.[219]

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[211] *Id.* at 4-7.
[212] *Id.* at 7.
[213] *Id.* at 10.
[214] *Id.* at 11-12.
[215] *Id.* at 12.
[216] *Id.* at 13.
[217] *Id.* Exhibit H.
[218] *Id.* at 13.
[219] Email dated April 27, 2016 from Jeffrey Vogel, Vogel & Associates, to Anne Castle, on file with author.

Reclaimed wastewater in the amount of 1,913 af is an essential component of the Prosper WSP. Both the renewable surface water supply and the nontributary Denver Basin ground water are legally allowed to be recaptured and reused. An onsite treatment plan is proposed to treat wastewater flows from indoor use at the development (estimated at 95% of indoor deliveries) and these flows will be reused by exchange with alluvial wells or by direct delivery to a raw water irrigation system.[220] Lawn irrigation return flows are also proposed to be quantified and used by exchange to pump additional water from alluvial wells.[221] The use of both the reclaimed wastewater and lawn irrigation return flows will require future Water Court approvals.

Water conservation measures are contemplated to be addressed in a comprehensive water conservation plan to be established by Prosper.[222] The Prosper WSP indicates that this plan will require efficient technologies such as low-flow indoor fixtures, low water-use plants and turf blends, and efficient irrigation systems.[223] Prosper intends to implement a "waterwise certification program" for residential and non-residential development and a monitoring and evaluation program.[224] The conservation plan may also include dual metering on indoor and outdoor water use and outdoor water restrictions during drought periods.[225]

Arapahoe County employed an expert water consultant to examine and evaluate the proposed Prosper WSP. The consultant's review of the initial plan provided in 2012 resulted in an opinion that the plan was technically feasible, operationally complex, and expensive, with many unknowns and uncertainties.[226] Prosper's water consultant addressed the issues raised in the County consultant's letter in further correspondence[227] and additional discussions. The County's water consultant ultimately indicated that Prosper had responded to the concerns raised in an adequate manner.[228]

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[220] *Id.* at 16-18.
[221] *Id.* at 18-19.
[222] *Id.* at 25.
[223] *Id.* at 26-27.
[224] *Id.* at 27. The waterwise certification is described as requiring high efficiency fixtures and appliances, including toilets, washing machines, dishwashers, kitchen and bath faucets and showerheads. Homebuilders will be required to achieve minimum efficiency standards that will be prescribed for specific uses. *See* Prosper WSP, *supra* note 207, at 27.
[225] *Id*.
[226] Letter dated April 19, 2013 from Jon R. Ford of Leonard Rice Consulting Water Engineers, Inc. to Sherman Feher, Arapahoe County Public Works and Development, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489.
[227] Letter dated Mary 14, 2013 from Mark Palumbo of HRS Water Consultants, Inc. to Sherman Feher, Arapahoe County Public Works and Development, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489.
[228] Email dated March 4, 2013 from Jon Ford to Sherman Feher, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489; Interview of Sherman Feher, Arapahoe County Planner, April 13, 2016.

As required by the statutes governing county subdivision procedures, Arapahoe County referred the Prosper Preliminary Development Plan application and Prosper WSP to the Colorado State Engineer.[229] While the County understands that the State Engineer reviews WSPs at the "subdivision" stage, a referral was sent to the State Engineer at this time to obtain a preliminary opinion regarding Prosper's WSP. The State Engineer's Office found that the submitted material did not appear to qualify as a "subdivision" as defined in the applicable Colorado statutes, and thus performed only a "cursory review" of the water supply plan and did not address its adequacy.[230] No conceptual problems with the Prosper WSP were noted, except that Water Court decrees would be required for several of the plan components, and that the conditional "will serve" letter from ACWWA contemplates providing less than the total amount of renewable surface supply proposed.[231] The response notes that if a "subdivision" approval application is submitted in the future, the State Engineer would provide additional comments regarding the potential for injury to decreed water rights and the adequacy of the proposed water supply." The letter further notes that, in conformance with published procedures, the State Engineer would provide a final opinion only after proposed water court decrees are signed and the County has resubmitted the water supply plan for review.[232]

The referral to the City of Aurora resulted in a letter expressing concern that the proposed water supply plan did not address the possibility that renewable surface water supplies could not be acquired in the future.[233] Aurora urged that renewable supplies be decreed before the project is approved.[234] Prosper responded by referring to the flexibility of timing in demonstrating an adequate water supply and noting that as the land use process continues, it will be able to bring increased specificity to the water plan.[235]

In a later comment, the City of Aurora Planning Director stated that the City Council had directed planning staff to begin the process of expanding Aurora's annexation boundary to include the Prosper development, and suggested that Prosper begin discussions with

[229] Colo. Rev. Stat. § 30-28-136(1)(h)(I). The Water Supply Plan referred to the State Engineer was the original plan from 2012 as updated in 2013.
[230] Letter dated Aug. 22, 2013 from Joanna Williams, Water Resources Engineer, Division of Water Resources, to Sherman Feher, Arapahoe County Public Works and Development, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489.
[231] *Id.*
[232] *Id.*
[233] Letter dated Oct. 1, 2013 from Jim Sayre, Planning Manager, City of Aurora, to Sherman Feher, Arapahoe County Planning Division, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489.
[234] *Id.*
[235] Letter dated July 14, 2015 from Jeff Vogel of Vogel & Associates to Sherman Feher, Arapahoe County Public Works and Development, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Agenda/12162014-489.

Aurora about the possibility of annexation.[236] Prosper representatives informed Arapahoe County planning staff that they had no interest in annexing to the City.[237]

Prosper Development Approvals and Agreements

The Arapahoe County Board of County Commissioners (BOCC) approved the Preliminary Development Plan and 1041 Permit for a new community, with conditions, in February 2015.[238] The BOCC recognized that the applicant had submitted a water supply plan in conformance with the local government requirements, but deferred its determination as to the adequacy of the water supply "to the time of final plat approval."[239] Prosper is required to provide a water study demonstrating that there is sufficient water for each final plat of the development, and amendments to the 1041 Permit must be obtained if any changes are made to the water supply plan.[240] The BOCC made it clear that if there is insufficient water at the time of final plat, the application would be denied.[241]

In November 2015, a Development Plan and Agreement with Prosper Farms Investments, LLC was approved by the Arapahoe County Board of County Commissioners.[242] Because of the anticipated length of time required for buildout of this large development, the three-year statutory period for vested property rights provided insufficient protection to the developer to support the substantial required capital investment.[243] The Development Agreement addressed the various commitments for public improvements made by the developer.[244] It also provided the developer with vested rights for an initial term of 30 years, during which the County agreed not to enact any moratorium on development within the Prosper property or act inconsistently with the right to develop for the uses and densities provided in the preliminary development plan and 1041 permit. The County expressly retained the discretionary authority to deny or approve with conditions any further development

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[236] Email dated Jan. 13, 2015 from Bob Watkins, Director of Planning and Development Services, City of Aurora, to Sherman Feher and Jan Yeckes, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Item/1007?fileID=2019.

[237] Board Summary Report dated Jan. 15, 2015 from Sherman Feher, Senior Planner, at 9-10, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Item/1007?fileID=2019.

[238] Minutes of the Arapahoe County Board of County Commissioners, February 10, 2015. The various metropolitan service districts (Title 32 districts) proposed by the developer were also approved at this meeting.

[239] *Id.* at 4.

[240] *Id.*

[241] *Id.*

[242] Minutes of the Arapahoe County Board of County Commissioners, Nov. 10, 2015, available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Minutes/11102015-685; *see* Development Plan and Agreement between Prosper Farms Investments, LLC and Arapahoe County Board of County Commissioners, dated Nov. 10, 2015 (Development Agreement), available at https://www.arapahoegov.com/AgendaCenter/ViewFile/Item/2517?fileID=3811.

[243] Development Agreement, *supra* note 242, at 1; interview of Sherman Feher, Arapahoe County Senior Planner, April 13, 2016.

[244] Development Agreement, *supra* note 242, at 7-12.

plans and noted its deferral of the water supply adequacy determination to the time of final plat approval.[245] The County confirmed the responsibility of the developer to acquire renewable tributary water rights when necessary to supply the project after the available nontributary ground water has been allocated.[246]

Arapahoe County Senior Planner Sherman Feher, who was the case planner for the Prosper development, describes the County's process of examining the adequacy of the proposed water supply as one of moving along a continuum as the development process proceeds to greater specificity and greater degrees of confidence that the water proposed to be used will be there when needed.[247] When final platting occurs, the County will need to be fully confident that the water supply will be adequate, and must have a definitive opinion from the State Engineer. Prior to that time, however, a more general assurance is needed to show that the water supply need will ultimately be met.[248] As provided in the Development Agreement, the County has the ability to deny any final plat application if it is not fully satisfied with the adequacy of the water supply, despite the existence of vested rights. Mr. Feher also reports that Arapahoe County views the imposition of water conservation requirements as being primarily the responsibility of a water supplier, rather than a component of the land use approval process.[249]

Current Status

As of this writing, Prosper has submitted its application for a 1041 Permit for the wastewater treatment plant planned for the development, but that application has not yet been acted upon. Prosper will also need to eventually obtain a 1041 Permit for its water facilities, and will also go through the subdivision process, consisting of the preliminary and final plats, as well as the site plan (Final Development Plan) process.

[245] Development Agreement, *supra* note 242, at 14-15, 17.
[246] *Id.* at 17.
[247] Interview of Sherman Feher, Arapahoe County Senior Planner, April 13, 2016.
[248] *Id.*
[249] *Id.*

Stapleton Filing No. 9

Stapleton is a 4,700-acre urban infill redevelopment, turning the old Denver airport site into a mixed use urban community. Redevelopment has been a long term process. It started in the 1980s with plans to open a new airport northeast of Stapleton. [250] Once Denver's aviation future was secured, work began on crafting a vision and development plan for the old Stapleton Airport which closed in 1995. That vision became the Stapleton Development Plan, also known as the Green Book.[251] After site remediation and infrastructure improvements, construction began on the first homes in 2001.[252] Filing No. 9 is currently under construction, and is profiled in this case study. It contains a mix of single family detached homes, townhomes, and apartment buildings. The City of Denver reviews development proposals and Stapleton is served by Denver Water. Filing No. 9 is highlighted in the map below.

[250] Stapleton Development Corporation, About SDC, *available at* http://www.sdcdenver.org/about-sdc
[251] *Id.*
[252] Forest City, Stapleton Facts and Figures 2016, *available at* http://www.stapletondenver.com/wp-content/uploads/2016/04/Facts-and-Figures-Q1-2016.pdf

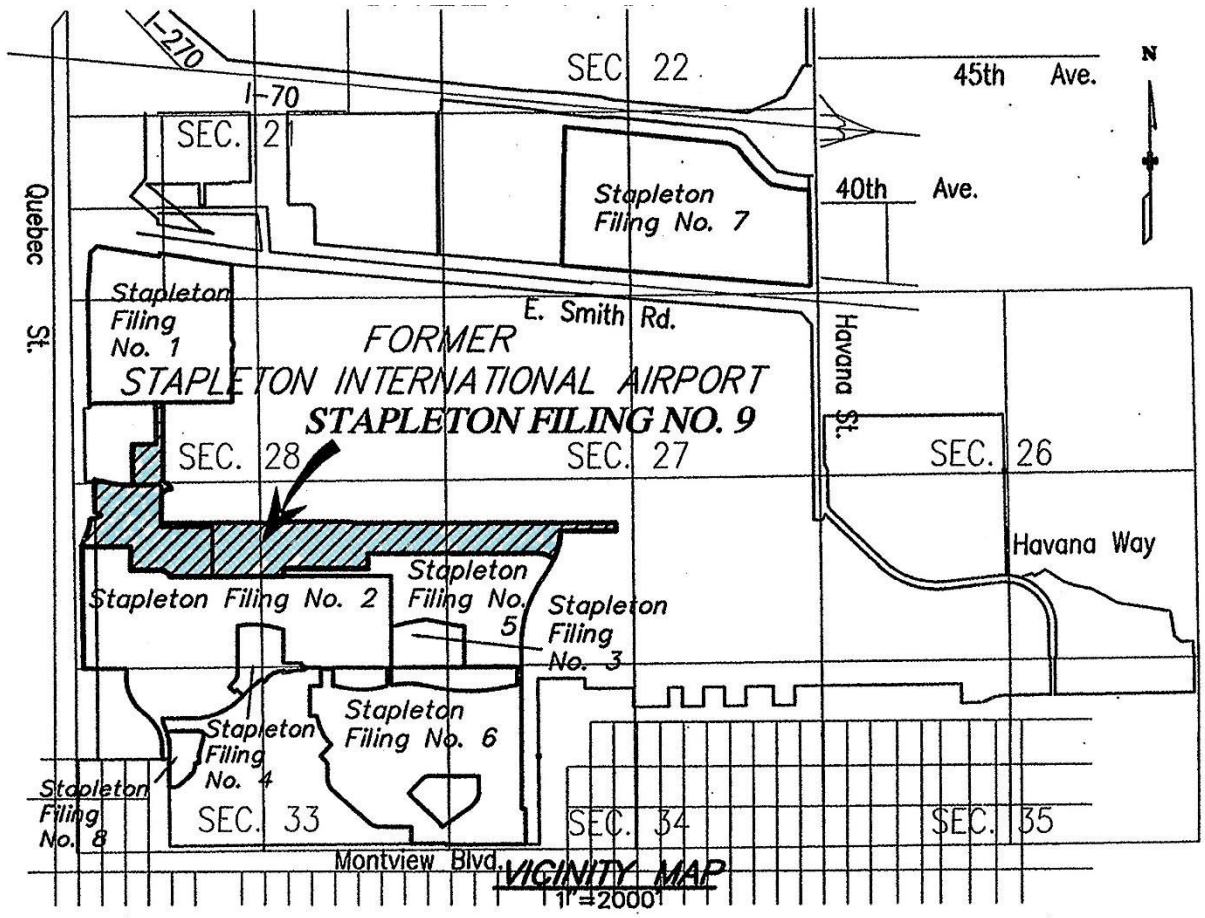

Figure 10. Filing No. 9 Vicinity Map[253]

City of Denver's Development Approval Requirements

Development, land use, and zoning decisions in Denver are guided by the city's Comprehensive Plan. Its explicit purpose is to "provide an expression of the city's vision for the future with a listing of goals and objectives."[254] The Denver Revised Code also provides a list of elements that the comprehensive plan may include, such as land use, capital and community facilities, housing, and environment.[255] It does not include water supply or any other water-related element. However, that did not stop Denver from factoring water into its most recent comprehensive plan, Plan 2000. The plan contains aspirations about conserving natural resources, reducing water demand, and working with Denver Water. Strategy 2-C aims to conserve water and improve water quality by:

[253] Forest City, Stapleton Filing No. 9, (2003) available at https://denvergov.org/subdivisionsurveys/Result?SubId=0&SubName=STAPLETON+FILING+NO+9&Quarter=&Section=&Township=&Range
[254] Denver Revised Code Sec. 12-61(a).
[255] *Id*. at Sec. 12-61(c).

> Achieving a steady per capita water-use reduction over the next 10 years,
> Encouraging the Denver Water Board to deny water service to areas where water conserving-landscape practices are not allowed,
> Reviewing, developing and amending city polices to allow and encourage water-conserving landscape practices, and
> Working to encourage water-conserving landscaping and building techniques in new development areas.[256]

On a broader level, the objective of the comprehensive plan is to achieve environmental sustainability.[257] It highlights Stapleton as a specific neighborhood development project that will incorporate principles of sustainable development.[258]

The Stapleton Redevelopment Plan was formally approved by the Denver Planning Board and adopted as an amendment to the comprehensive plan by the City Council.[259] It "describes a physical, social, environmental, economic, and regulatory framework" for the sustainable redevelopment of the Stapleton International Airport site.[260] One of its three fundamental goals is environmental responsibility and it incorporates the principle of minimizing on-site requirements for natural resources by eliminating need, reducing use, and reusing and recycling what is needed.[261]

On the subject of how water demands will be met, the Stapleton Redevelopment Plan states "current Denver water supplies are adequate to support the full buildout of Stapleton."[262] It does not, however, provide an estimate of how much water a completely built out Stapleton would demand. It states that "Stapleton represents an opportunity to demonstrate new approaches to water use, reuse and conservation."[263]

Implementing these ideas was left to the Stapleton Design Committee.[264] The power of the design committee is made possible by the way land at Stapleton is sold. First, all of the land was owned by Denver International Airport, which is an enterprise of the

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[256] City of Denver, Denver Comprehensive Plan 2000, 38, *available at* https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/planning/comprehensiveplan2000/CompPlan2000.pdf.
[257] *Id*. at 36.
[258] *Id*. at 33 and 41.
[259] City of Denver, Stapleton Development Plan, Introduction (1995) *available at* https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/planning/Plans/Stapleton_Development_Plan.pdf
[260] *Id.* at 1-2.
[261] *Id.* at 4-4.
[262] *Id.* at 5-30.
[263] *Id.* at 5-30, 5-31.
[264] Stapleton Development Corporation, Stapleton Design Criteria, 3, June 1, 1999 *available at* http://www.sdcdenver.org/design-review/process, ("The concepts and design criteria established herein are administered by the Stapleton Design Review Committee according to review procedures defined in this document.")

city[265]. Next, the land was leased to the Stapleton Development Corporation to find a master developer.[266] Only when a lot is ready to be developed does title actually transfer to the developer or builder. As a condition of any sale, the property is subject to a Design Declaration, which makes it subject to specific Stapleton Design Criteria, meant to implement the principles of the Development Plan.[267]

The Design Criteria document does just that, addressing water demand in two major ways: irrigation regulations and green building certification. On the topic of irrigation, the criteria include a number of provisions that aim to reduce water demand. For example, buildings must capture downspout and runoff water for use in the landscape. Additionally, a "significant portion" of the lot available for landscaping should be low water zones such as native grasses and wildflowers. "Significant portion" is defined, however, as 20% of a lot, excluding front yards. [268] Fully irrigated zones "should be designed to achieve a reduction in the water demand when compared to bluegrass law for the same area, by application of the latest water conserving species, irrigation technologies, and management."[269]

The Criteria also include "Special Criteria for Sustainable Development."[270] This section requires a Green Building certification from the Home Builders Association for all residential development and a LEED silver certification for all buildings of at least four stories.[271] These certification programs provide points for water and energy efficiency, transportation impacts, site development, indoor environmental quality and material sourcing. For water specifically, they reward the installation of water efficient fixtures, smart irrigation, and water re-use systems.[272] Each program requires a minimum level of water efficiency credits to be certified.[273] In this way, the Criteria address indoor and outdoor water use and efficiency.

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[265] Denver International Airport, Administration, (2016) *available at* http://www.flydenver.com/about/administration

[266] Stapleton Development Corporation, Amended and Restated Design and Architectural Declaration, (2009) *available at* http://www.sdcdenver.org/design-review/process, ("The City entered into a Master Lease and Disposition Agreement with [Stapleton Development Corporation] in order to dispose of property within the former Stapleton International Airport in accordance with the Stapleton Development Plan.")

[267] *Id.*

[268] Stapleton Design Criteria, *supra* note 264, at 21, Sec. 6.16.6.2

[269] *Id*. at 21, Sec. 6.16.6.3.

[270] *Id.* at 34, Sec. 9.0.

[271] *Id.* at 35, Sec. 9.3

[272] U.S. Green Building Council, LEED Credits, (2016) *available at* http://www.usgbc.org/credits (awarding points for outdoor water use reduction, indoor water use reduction, and water metering); National Association of Home Builders of the United States, ICC/ASHRAE 700-2015 National Green Building Standard, Ch. 8 (2016) *available at* https://builderbooks.com/book/green-building/icc-ashrae-700-2015-national-green-building-standard.html (awarding points for water efficient fixtures, smart controlled irrigation, and grey water systems).

[273] *Id*. at 14; U.S. Green Building Council, Scorecard for New Construction and Major Renovations, (2016) *available at* http://www.usgbc.org/credits

The Stapleton Design Committee's review is in addition to what is required by Denver's Zoning Code, Subdivision Regulations, and Department of Community Planning and Development.[274] The City's review focuses more on the efficient use of land and infrastructure rather than water conservation specifically.[275] Denver's subdivision regulations provide for "adequate water supply facilities,"[276] but the review procedure indicates that Denver Water's determination concerning availability of service is definitive on this point.[277] Denver Water also determines what on-site and off-site improvements and easements are required.[278]

A large part of Denver's subdivision approval process is a review by the Development Review Committee.[279] The Review Committee is comprised of representatives from the city's many departments, including Denver Water, and helps guide a proposed subdivision through each department's regulations. Important departments include Engineering, Transportation, Wastewater Management, Fire, and Parks and Recreation. Because each department or entity has many unique requirements, one of the primary functions of Denver's Community Planning and Development Department is to coordinate the review by all of these agencies.[280] Since the city has limited authority over Denver Water, the Community Planning and Development Department makes sure the developer can meet Denver Water's requirements, but the city council does not set the underlying policies.[281]

Denver's zoning code does not specifically address water conservation but contains some provisions that influence the amount of water required for outdoor use for development within the city. The zoning code "is intended to guide Denver's prosperous and sustainable future by . . . promoting sustainable building and site design practices."[282] The zoning code focuses on outdoor water use by requiring at least 50% of every yard to be landscaped with living plant material.[283] All landscaped areas are required to have irrigation systems with full coverage of all plant material areas.[284] Xeric

[274] Stapleton Development Corporation, Stapleton Design Criteria, 3 ("Development is also subject to City of Denver Zoning, Rules and Regulations, and other standards and codes").
[275] Interview with Chris Gleisner, Development and Planning Supervisor, City of Denver, in Denver, Colo. (April 1, 2016).
[276] City of Denver, Subdivision Rules and Regulations (1997) 3 *available at* *https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/Zoning/other_regulations/Subdivision_Regulations.pdf*.
[277] *Id*. at 11-12.
[278] *Id*.
[279] *Id.* at 9-10.
[280] Interview with Chris Gleisner, *supra* note 275.
[281] *Id*.
[282] City of Denver, Denver Zoning Code, (2016) § 1.1.2(L), *available at* https://www.denvergov.org/content/denvergov/en/community-planning-and-development/zoning/denver-zoning-code.html.
[283] *Id*. at § 10.5.4.2(B).
[284] *Id*. at § 10.5.2.2(D).

landscaping is not addressed. The zoning code allows water conserving landscapes to be installed but does not require them, and does require the installation of irrigation systems that may not be necessary for fully xeric plants.

Denver Water's Development Approval Requirements

Denver Water serves 1.4 million people across a number of cities in the Front Range of Colorado.[285] The figure below is a map of Denver Water's service area.

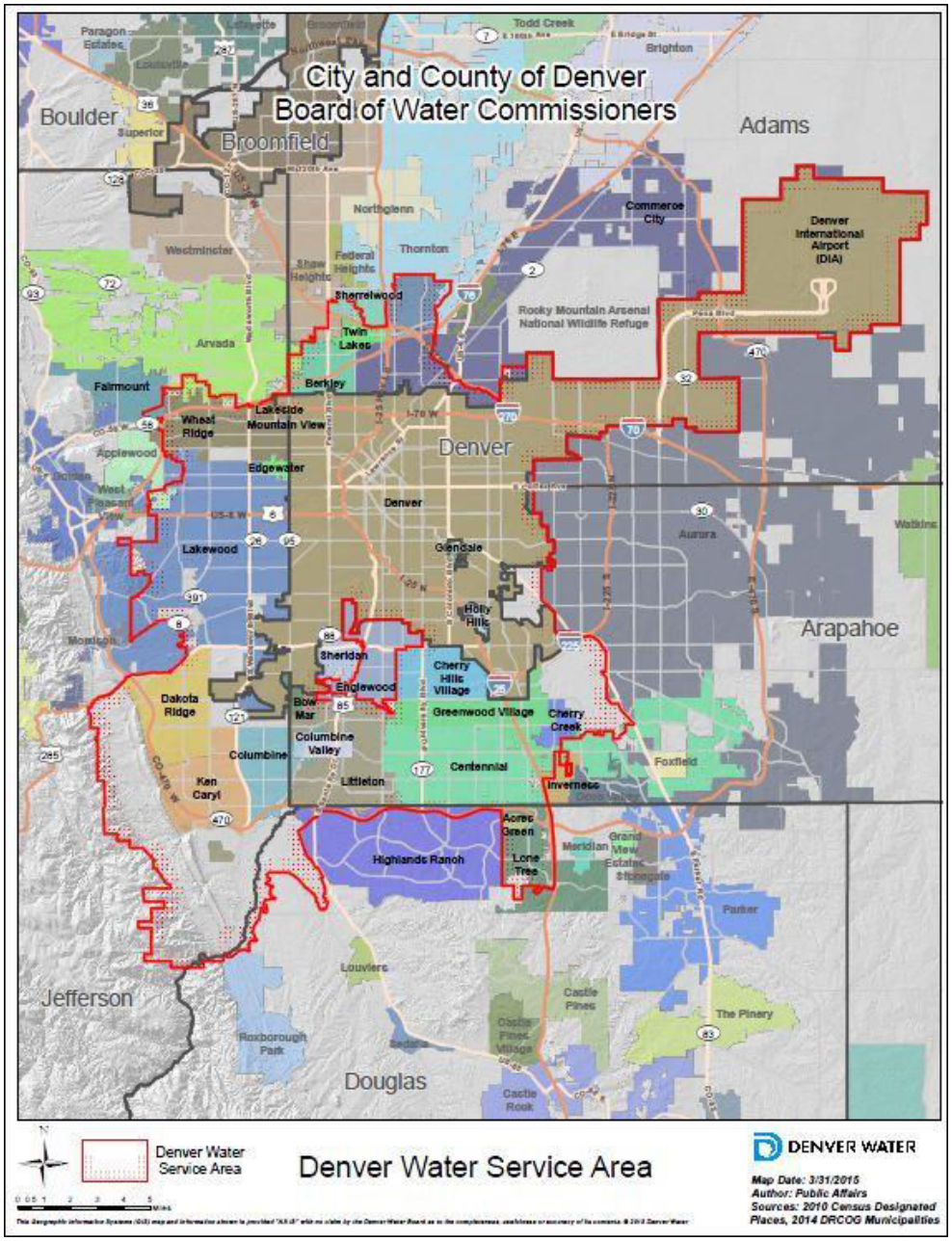

Figure 11. Denver Water's Service Area.

[285] Denver Water, Service Area (2016) *available at* http://www.denverwater.org/AboutUs/ServiceArea/.

Denver Water's Operating Rules set the eligibility requirements for water service (obtaining a Water Supply License). The Rules provide: "All property inside the corporate boundaries of the City and County of Denver as the same may exist from time to time shall be eligible to receive water service from Denver Water upon compliance with these rules and payment of such fees and charges as may be applicable and necessary to extend Denver Water's system to the property concerned."[286] Additional criteria for the License include a "statement of the purpose for which the water is to be used" and an agreement to comply with all of Denver Water's Operating Rules and Engineering Standards, as well as pay the applicable System Development Charge (SDC).[287] The SDC, similar to a tap fee, is assessed based on "one of the following methods, as determined by Denver Water: 1) the size of the licensed premises . . .; 2) the number of residential units on the licensed premise; 3) the size of the tap purchases; 4) the volume of water to be taken on an annual basis."[288]

Denver Water determines the SDC based on tap size,[289] and tap size is based "on the size of the licensed premises, the applicant's statement of projected water use, and the applicable Engineering Standards."[290] So while tap size, and the corresponding SDC, is related to actual water use, the connection is somewhat attenuated. The table below shows the charges for multifamily developments and single-family residences.

Multifamily Units	Charge	Single Family Residences	Charge
First two dwelling units	$10,040	Base Charge	$3,030
Next 6 dwelling units, $ per unit	$2,420	First 22,000 sq. ft., $ per sq. ft.	$0.70
Over 8 dwelling units, $ per unit	$1,940	Over 22,000 sq. ft., $ per sq. ft.	$0.35

Table 3. System Development Charges Inside Denver.[291]

Denver Water is working on using the SDC as an incentive to water conservation, by decreasing it for water efficient developments, but doing so would require an

[286] Denver Water, Operating Rules – Licenses and Conditions for Water Service § 2.01.2 (2016) *available at* http://www.denverwater.org/OperatingRules/OperRulesArticleX/ (there are separate eligibility requirements for areas outside of Denver).
[287] *Id*. at § 2.06.1(f).
[288] *Id*. at § 2.07.2(a).
[289] Interview with Jeff Tejral, Manager of Water Conservation, Denver Water (April 15, 2016)
[290] Denver Water, Operating Rules § 9.02.2(c).
[291] Denver Water, System Development Charges (2016) *available at* http://www.denverwater.org/BillingRates/RatesCharges/SystemDevelopmentCharges/

individualized assessment of water demand, which may be difficult to administer given the size of its service area.[292]

Paying the SDC is not the only condition for water service. The Operating Rules also require certain steps to conserve water during the development review stage and during operation.[293] The overarching policy is that "water shall be used only for beneficial purposes and not be wasted."[294] Prohibited water waste includes watering with spray irrigation between 10:00 a.m. and 6:00 p.m., watering areas during rain or high wind, watering more than three days per week, applying irrigation water to impervious surfaces, and failing to repair leaks.[295] Violators of these rules are subject to penalties.[296] They start with a written warning, progress to charges of $50 and $100 on the second and third violation respectively, and culminate with the temporary suspension of water service if there is continued willful waste of water.

Denver Water's development review criteria largely apply to outdoor water use. The irrigation of more than one acre may be subject to special review, and that acre does not need to be contiguous.[297] To be approved, there must be a finding that "the proposed landscape and irrigation design will use water efficiently in view of the intended uses of the open space," and Denver Water may require the use of recycled water if it is reasonably available.[298] There are also irrigation requirements for narrow strips of land to minimize water waste. For example, spray irrigation is prohibited on land less than 6 ft. in width.[299] Other items require Denver Water verification. These include the installation of soil amendments that help retain moisture, thereby reducing irrigation demands and improving drought tolerance[300], and the water recirculating system of decorative water features.[301] In these ways, Denver Water uses its limited authority to shape land use across its wide service area.

To lower demand generally, Denver Water relies on three approaches: policy, incentives, and education.[302] On the policy front, they advocated for Senate Bill 8 at the state legislature, described in the Introduction to this paper, and use their own operating rules. One aspirational operating rule is on xeriscapes. "It is Denver Water's policy to encourage xeriscape landscapes throughout the service area. Prohibitions on the use of Xeriscape are contrary to public policy."[303] This internal policy cannot

[292] Interview with Jeff Tejral, *supra* note 289.
[293] Denver Water, Operating Rules, § 14.
[294] *Id*. at § 14.01.
[295] *Id.* at § 14.01.1.
[296] *Id.* at § 14.07.
[297] *Id.* at § 14.02.2.
[298] *Id.* at § 14.02.2(c).
[299] *Id.* at § 14.02.3.
[300] *Id.* at § 14.02.4.
[301] *Id.* at § 14.04.
[302] Interview with Jeff Tejral, *supra* note 289.
[303] Denver Water, Operating Rules, § 14.02.1(b).

override city landscape code, but it may help shape the interpretation. For incentives, Denver Water uses cash rebates for replacing existing indoor fixtures and outdoor devices such as toilets and sprinklers, and public recognition for water conserving developments.[304] The education component is made up of use audits, the creation of water budgets, and talking to customers directly.[305] The goal for the whole system is to reduce water use to 165 gallons per capita per day (gpcd).[306] According to the 2012 Update to Denver Water's Integrated Resource Plan, they are on track to reach that goal, and because of that, have sufficient water supply to meet customer demands through approximately 2030.[307] Recent trends in gpcd can be seen in the figure below. The lower figures from 2009 and 2013 may also be reflective of cooler and wetter summers, not solely water conservation.[308]

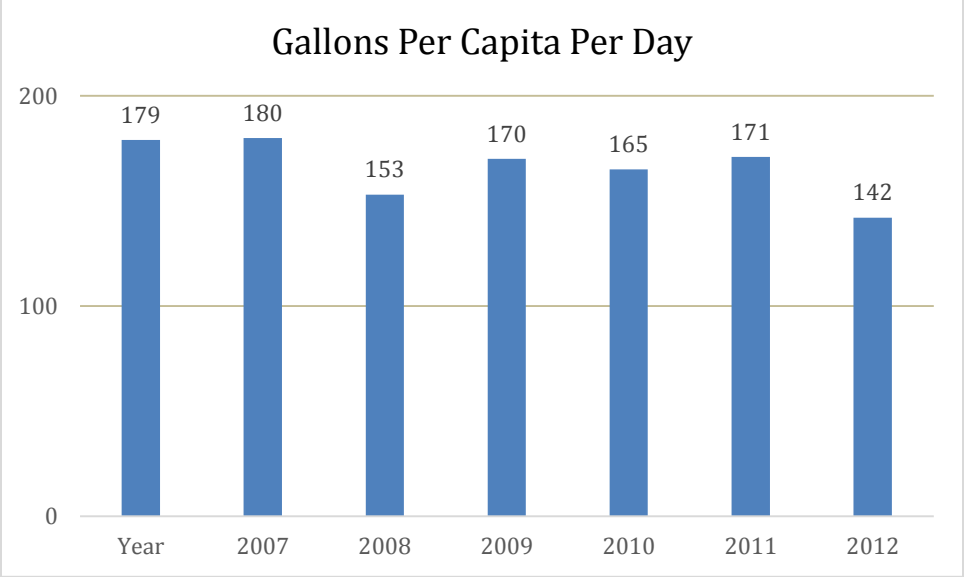

Figure 12. Denver Water Average Gallons Per Capita per Day[309]

[304] Interview with Jeff Tejral, *supra* note 289; *see* http://www.denverwater.org/Conservation/Rebates/.
[305] Denver Water, Commercial and Multifamily Services (2016) *available at* *http://www.denverwater.org/Conservation/commercial-multifamily-services/*
[306] Denver Water, Denver Water's Conservation Plan, *available at* http://www.denverwater.org/Conservation/ConservationPlan/.
[307] Denver Water, Update on the Integrated Resource Plan, 2 (2012) *available at* http://www.denverwater.org/docs/assets/0998A374-FFE0-B218-F8317976D2DD072E/IRPUpdateJune2012.pdf.
[308] Denver Water, Water Conservation Plan Update-Draft, 17 (2013) *available at* http://denverwater.org/docs/assets/A71A6797-CA8C-1371-9FD95F082563B2BB/DenverWaterConservationPlanUpdate.pdf
[309] *Id.* at 18.

Stapleton Filing No. 9 Application

Since nearly all of the review related to water conservation happens at design review stage rather than the platting stage, the Filing No. 9 plat application does not describe indoor or outdoor water use. The recorded plat itself includes the following note:

> Multi-family development within Filing No. 9 will require an additional review by the City and County of Denver to approve conditions not included in this Development Plan. That review will be conducted through the review by the SDC's Design Review Committee and a separate approval letter will be provided by the Community Planning and Development agency for those projects. This letter must be obtained prior to zoning approval required for a building permit.[310]

A copy of such a letter, however, was not made available to the authors.

Current Status

As of August 2016, nearly every site within Stapleton Filing No. 9 has been completed. There remain two vacant lots and one large apartment building under construction.

[310] Forest City, Stapleton Residential Development Plan for Filing No. 9, (2004) *available at* https://www.denvergov.org/denvermaps/documents/SDP_MAPS/2004029045.pdf.

Barefoot Lakes

Barefoot Lakes is a planned unit development of 1,300 acres that will include over 5,000 residential units, originally in unincorporated Weld County but now annexed into the Town of Firestone.[311] The developer is Brookfield Residential. Filing No. 1 of the PUD includes a total area of about 380 acres, with 212 of these acres in open space.[312] One of the project's main themes is Stewardship.[313] With respect to water, this principle is demonstrated by a density of 5.86 dwelling units per acre[314], the dedication of a large area of land to open space, and a commitment to using low-water demand vegetation[315]. At build out, this phase of the development is expected to include 293 single-family detached residential units and 3 non-single-family detached residential units. The property also includes several former gravel pits located adjacent to the St. Vrain River that were reclaimed as lakes. The development is investigating use of these

[311] Weld County, Hearing Certification Docket No. 2015-43. (2015) available at https://www.co.weld.co.us/assets/bDCd103C457892dBa02A.pdf.
[312] Barefoot Lakes Filing No. 1.
[313] Brookfield Residential, Final Development Plan, Barefoot Lakes Filing No. 1, (2015) *available at* http://www.firestoneco.gov/DocumentCenter/View/2817
[314] *Id.* at 2 ("Average Residential Lot Size is 7,433 square feet.")
[315] *Id.* at 22 ("the conservation of water and use of native or adaptive plants is important for stewardship of resources.")

lakes as both a recreational amenity and as a source of irrigation water. Construction of the development began in 2016. A map showing the layout for the initial filing is provided below. A general location map of the development follows.

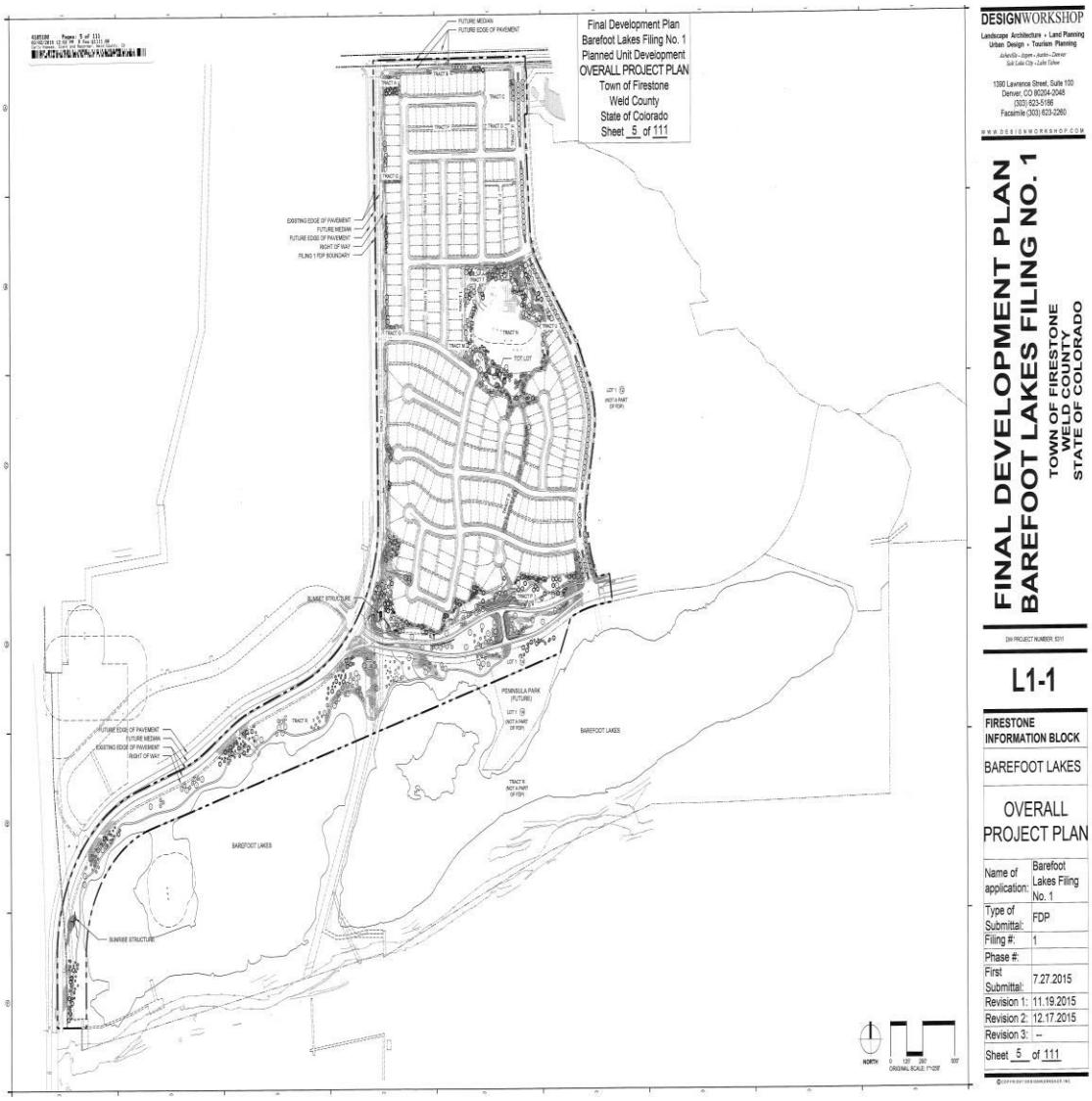

Figure 13. Final Development Plan for Barefoot Lakes Filing No. 1

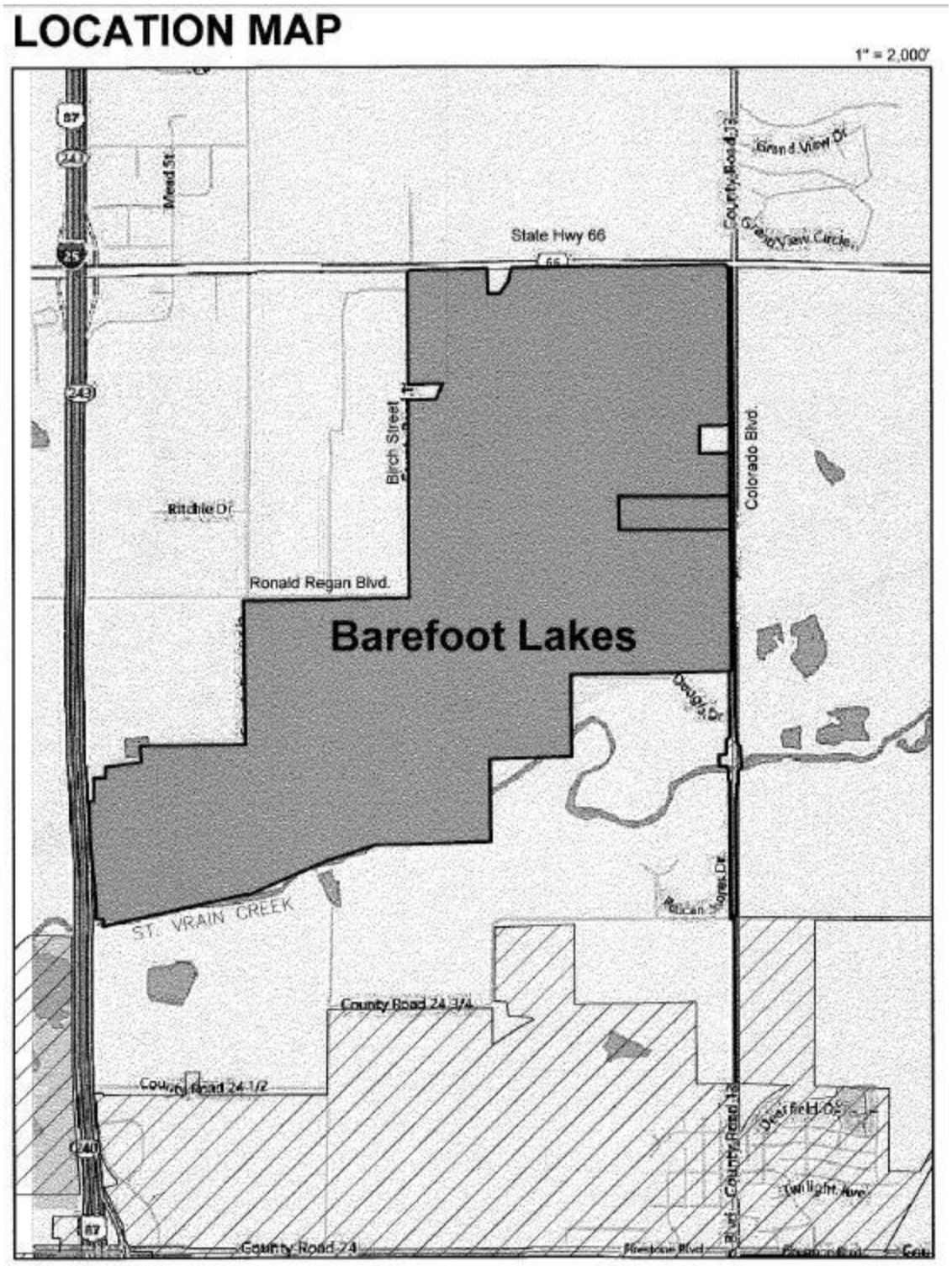

Figure 14. Location Map.

Weld County Review

Weld County is receiving much of the new urban growth in the Colorado Front Range. The number of planning cases filed with the County Planning Department increased from 310 in 2008 to 573 in 2015.[316] The County has a strong agricultural economy and has expressed special concern for maintaining that economy.[317] With the increase of urban development, the County in its Comprehensive Plan encourages careful use of land. It states:

> One (1) facet of urban development is the efficient use of land as a resource. Since urban development accommodates more density on each acre, the amount of land relative to the number of people who live on or use the land is less. Jurisdictions that can accommodate urban development should employ policies and regulations that facilitate urban development, while at the same time managing the quality of this development.[318]

The Weld County Comprehensive Plan calls for "regional urbanization areas" as a means of best managing new growth.[319]

The Comprehensive Plan includes a considerable discussion about water.[320] Included in its statement of goals respecting water is a preference to avoid dry up of agricultural land but a recognition that water rights are property rights that may be transferred and changed in use.[321] Another water goal encourages county residents to conserve water.[322] In particular, this goal "[e]ncourage[s] using low-water-use plants and water conservation techniques during landscaping" and "[e]ncourage[s] new development to consider water systems that incorporate separate potable and nonpotable water sources."[323]

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[316] Weld County, Department of Planning Services, Work Output 2015 at 3.
[317] Weld County Code, Sec. 22-2-10.
[318] Weld County Code, Sec. 22-2-30 (f).
[319] Weld County Code, Sec. 22-2-130. "Municipalities are best suited for most types of urban development, and other County policies encourage urban development within existing municipalities. The Regional Urbanization Areas (RUAs) are intended to provide a tool that facilitates opportunities that might not otherwise be available. As a land use tool, the RUA enables the County and its citizens to make decisions regarding future development within specified areas. Key factors in their creation are wise use of natural resources, development of quality communities, provision for regional services, employment opportunities and maintaining fiscal integrity."
[320] Weld County Code, Sec. 22-4-20 to 30.
[321] Weld County Code, Sec. 22-4-30 (1) & (5).
[322] Weld County Code, Sec. 22-4-30 (C).
[323] *Id.*

Weld County has created a special I-25 Regional Urbanization Area (RUA) that includes the lands of the Barefoot Lakes PUD.[324] New development within RUAs must follow the county's planned unit development (PUD) rules.[325] As stated in the Comprehensive Plan, "[a]ll Planned Unit Developments (PUDs) within the I-25 RUA shall preserve a portion of the site as common open space."[326] The Plan sets out desired characteristics of new residential development, including desired densities of residential dwellings.[327] It also includes requirements applying to landscaping.[328] PUDs are intended to encourage creative and flexible approaches to development.[329] The County Code states: "PUDs must be capable of meeting state drinking water regulations (Colorado Primary Drinking Water Regulations) and have adequate provisions for a three-hundred-year supply of water …."[330] In addition, "[a] PUD Zone District shall be serviced by an adequate water supply. All PUDs shall be served by a public water system as defined in this Chapter."[331]

Water Supply

Domestic water for the Barefoot Lakes development will be supplied by the Little Thompson Water District (LTWD), "a Colorado Special District [formed] in 1960 and [that] began serving domestic water to a 250 square-mile area in Larimer, Weld and Boulder counties, Colorado by 1962."[332] LTWD obtains its water from the Northern Colorado Water Conservancy District through the Colorado-Big Thompson and Windy Gap projects.[333] These projects take water from the headwaters of the Colorado River, convey it under the Continental Divide to storage facilities on the Front Range, including Carter Lake. LTWD takes water out of Carter Lake, runs it through its water treatment plants, and then delivers it to users within its service area. The LTWD provided water service to approximately 7,300 taps in 2012.[334]

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[324] Weld County Code, Sec. 26-1-20 (B): "The I-25 RUA covers approximately fifteen thousand (15,000) acres, with approximate boundaries at Weld County Road 1 on the west, Weld County Road 15 on the east, Weld County Road 32 on the north and Weld County Road 20 on the south. The planning area boundaries are shown on the I-25 Regional Urbanization Area 2.1 Land Use Map, reflected in Appendix 26-Q."

[325] Weld County Code, Sec. 26-1-50.

[326] Weld County Code, Sec. 26-2-30 (A).

[327] Weld County Code, Sec. 26-2-30 (D)(2): "Residential development within this RUA is clustered in such a way as to protect and preserve large contiguous areas of open space, prime irrigated agricultural land, important natural resources and scenic views. The intent is to include a mix of densities to create variation and options within the neighborhoods being created, ranging from low-density rural estate lots (one [1] dwelling unit per acre) up to medium-density areas (ten [10] dwelling units per acre) envisioned within and near the center or core area …."

[328] Weld County Code, Sec. 26-2-50. The landscaping section encourages use of native plants and suggests use of fescue and brome/fescue in lieu of bluegrass where appropriate.

[329] Weld County Code, Sec. 27-1-10 (A)(1).

[330] Weld County Code, Sec. 27-2-170.

[331] Weld County Code, Sec. 27-2-210.

[332] Little Thompson Water District, Water Efficiency Management Plan, May 2012 (LTWD Plan).

[333] *Id.*

[334] LTWD Plan, at 9.

Developers seeking water service from the LTWD must provide their own raw water supply, typically in the form of shares in the CBT or Windy Gap projects.[335] For residential customers, LTWD requires either 1.40 or 0.70 shares of CBT water for standard and urban customers respectively.[336] Urban customers are distinguished by smaller lot sizes and consequently smaller water demands.[337] Historically, one CBT share yields 0.7 acre-feet.[338] Therefore, LTWD expects urban customers to demand an average of 0.49 acre-feet per unit. Barefoot Lakes is considered an urban development. Alternatively, developers may pay cash in lieu of water shares.[339]

To meet this requirement, Brookfield elected to purchase 12 shares of Windy Gap water to serve the development. The current annual yield of each share of the Windy Gap Project is 40 acre-feet, but this amount is expected to increase to 100 acre-feet with the completion of the proposed Chimney Hollow Reservoir.[340] Windy Gap water is fully consumable, which means it can be recycled to extinction.[341]

The negotiated agreement between Brookfield and LTWD sets out a raw water requirement of 0.35 acre-feet per single-family residential unit.[342] The 12 shares of Windy Gap water are considered sufficient at present to provide 480 acre-feet of raw water annually, enough to support service for 1,371 single-family residential units.[343] Upon completion of the Windy Gap Firming Project, the raw water supply will increase to 1,200 acre-feet, sufficient to support 3,428 single-family units.[344] The agreement further provides for a "Water Quantity Study" to be prepared within three years after the development has established 250 water taps. Based on the results of the study, the raw water requirements for the development may then be adjusted according to the findings.[345]

LTWD also charges tap fees that include a basic investment cost, an installation cost, and a water right charge. The water right charge depends on the anticipated demand of

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[335] LTWD Plan, at 27.
[336] LTWD Plan, at 29-30. There is no express standard distinguishing standard and small lots but the appropriate category is determined at the time a service commitment is made. The "standard" tap requires the donation of 1.4 shares of CBT water and allows an annual allotment of 228,000 gallons of water. Use beyond this amount is charged at the highest rate
[337] Interview with Michael Cook, District Engineer, Little Thompson Water District, in Berthoud, Colo. (July 20, 2016). The "urban" or "conservation" category was developed specifically for the Barefoot Lakes development to acknowledge the markedly smaller lot sizes associated with this development.
[338] Northern Water, Water Conservation and Management Plan (2011), 18 *available at* http://www.northernwater.org/docs/WaterConservation/WaterConservationMngtPlan.pdf.
[339] Currently the District does not accept cash in lieu for new developments. Personal Communication, Michael Cook, LTWD, August 10, 2016.
[340] Interview with Michael Cook, *supra note 337.*
[341] *Id.*
[342] Addendum A to Amended and Restated Agreement for Water Extensions, Feb. 12, 2015, ¶3.
[343] *Id*. at ¶3.1.4.
[344] *Id.*
[345] *Id*. at ¶3.5.

the user. Since Brookfield had already acquired water for Barefoot Lakes, the tap fee does not contain a water right charge.[346]

The LTWD uses an increasing block rate structure for water uses shown in the table below. The fee rate accelerates quicker for the urban taps to ensure users are staying within their lower water right allocation. The urban rate is applicable to Barefoot Lakes.

Table 4. Monthly Charges for Water[347]

Tap	Gallons Used	Rate Per 1,000 Gallons
Urban Residential	0 - 6,000	$2.24
	6,001 - 15,000	$2.81
	> 15,000	$3.80
Standard Residential	0 – 6,000	$2.24
	6,001 – 25,000	$2.81
	25,001 – 50,000	$3.30
	> 50,000	$3.80

The LTWD has been preparing conservation plans as required by state law since 1996. In its 2012 Water Management Efficiency Plan, the LTWD stated:

> The District's objective is to implement a Water Efficiency Management Plan that will increase water use efficiency and thereby reduce water demands. The District will attempt to accomplish this without adversely affecting continued population and economic growth. The District's goals include reducing the loss and waste of water, improving efficiency in the use of water, extending the life of current water supplies, and identifying means to support water reuse.[348]

The LTWD staff relied on the Colorado WaterWise, "Guidebook of Best Practices for Municipal Water Conservation in Colorado," for evaluating its programs and practices. Its 2012 Plan sets out the following goals: "The District will continue to utilize existing and new programs and measures to increase its water efficiency with a goal of reducing system losses by 25%, residential demand by 5% and non-residential demand by 1% over the next seven years. The quantifiable goal for this water efficiency programs is to reduce the total projected water supply requirements by more than 480 AFT of water

[346] LTWD Plan at 29. This tap fee is called an urban fee and reflects the smaller lot size and consequently smaller water demand expected in the Barefoot Lakes development. It also reflects a lower charge because Barefoot has provided the District with the necessary water rights to supply its use. Thus there is no water right charge included in the tap fee. Traditional development in this area has been on one-acre lots. Lots sizes in the First Filing of the Barefoot development are 8,000 square feet, about 1/5 of an acre.
[347] *Id*. at 30, Table 2.5.
[348] *Id*. at 48.

annually."[349] To this end, the District has a couple of rebate programs it expects builders at Barefoot Lakes to take advantage of, but these are at the option of the builders, and are not required by Brookfield The first rebate, worth up to $500, is for soil amendments. The second is for installing water saving plants. This could credit the builder an additional $250.[350]

In addition, Barefoot Lakes' property includes several former gravel ponds located on the north bank of the St. Vrain River. Brookfield, working with the LTWD, is planning to reline these ponds (they were damaged in the 2013 flood) and to use the ponds as a recreational resource, as well as possibly a source of nonpotable water to irrigate landscaping in open space and common areas. The LTWD obtained a conditional storage right, plan for augmentation, and conditional right of exchange for these ponds in 2009.[351] The Decree conditionally authorizes the storage of 1,400 acre-feet of water in four ponds from the St.Vrain River under a plan for augmentation that will fully replace all out-of-priority diverted water in amount and timing through exchange of unconsumed water available from its transmountain Windy Gap supplies as discharged from the St.Vrain Sanitation District's Wastewater Treatment Plant.

The Colorado Division of Water Resources reviewed the development's final plat with its water supply plan for adequacy under Colorado law. In its 2014 response, DWR noted that it had not received any information on the estimated demand from the subdivision.[352] It noted that the LTWD was expected to supply potable water and that the District had a decree for the use of the ponds for irrigation uses. It concluded that the proposed water supply will not cause injury to existing water rights, but, because it had not been given an analysis of demands, declined to comment on the physical adequacy of the water supply.[353]

Weld County uses its own in-county process for determining the adequacy of the water supply.[354] For major subdivisions (more than 9 lots), the developer first submits a sketch plan with a description of the type of proposed water supply system.[355] At the preliminary plan stage the developer must supply a "water supply resource report."[356]

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[349] *Id*. at 62.
[350] Interview with Michael Cook, *supra* note 337.
[351] Decree, District Court, Water Division No. 1, Concerning the Application for Water Rights of: The Little Thompson Water District in Larimer and Weld Counties, 05CW263, Feb. 4, 2009.
[352] Colorado Division of Water Resources, Barefoot Lakes Filing No 1, Case No PUDF14 0009, Sec 35 T3N R68W 6th P M, Water Division 1 Water District 5, Nov. 12, 2014.
[353] *Id.*
[354] Interview with Kim Ogle, Weld County Planner, September 9, 2016.
[355] Weld County Code, Sec. 24-4-10 (B)(4).
[356] Weld County Code, Sec. 24-4-30 (4)(g). This report must include: "… written evidence that adequate water service in terms of quality, quantity and dependability is available for the type of subdivision proposed. Such evidence may include, but shall not be limited to the following: Evidence of ownership or use of existing and proposed water rights; historic use and estimated yield of claimed water rights; amenability of existing rights to a change in use; and evidence that public or private water supply is

This report is evaluated by the County Attorney's Office.[357] Next the planning commission must find "[t]hat definite provision has been made for a water supply that is sufficient in terms of quantity, dependability and quality to provide water for the subdivision, including fire protection."[358] Then the Board of County Commissioners must make the same finding.[359] The County's requirements were deemed satisfied by the Agreement for Water Extensions and its amendments between the LTWD and the developer.[360]

Annexation to Firestone

Barefoot Lakes petitioned the Town of Firestone for annexation in early 2015.[361] To be eligible for annexation, an urban style development must able to be efficiently served by Firestone's municipal services such as fire and police.[362] It must also be within the Firestone Master Plan Area, defined by an urban growth boundary pictured below and have adequate utility services available.[363]

available. The amount of water available for use within the subdivision and the feasibility of extending services shall be identified and evidence submitted concerning potability of the water supply for the proposed subdivision.

[357] Interview with Kim Ogle, September 9, 2016.

[358] Weld County Code, Sec. 24-4-30 (k)(4).

[359] Weld County Code, Sec. 24-4-30 (4)(d).

[360] Agreement for Water Extensions, April 7, 2005; Amended and Restated Agreement for Water Extensions, Feb. 12, 2015. Interview with Kim Ogle, September 9, 2016.

[361] John Fryar, Brookfield Residential submits Firestone annexation, development proposal, Longmont Times-Call, April 27, 2015, available online at http://www.timescall.com/longmont-local-news/ci_28000627/brookfield-residential-submits-firestone-annexation-development-proposal.

[362] Town of Firestone, Comprehensive Plan, (2013) Sec. 22 Annexation Policies, 39, *available at http://www.firestoneco.gov/DocumentCenter/View/45*

[363] Town of Firestone, Development Regulations (2010) Sec. 4.0, *available at* http://www.firestoneco.gov/DocumentCenter/View/161

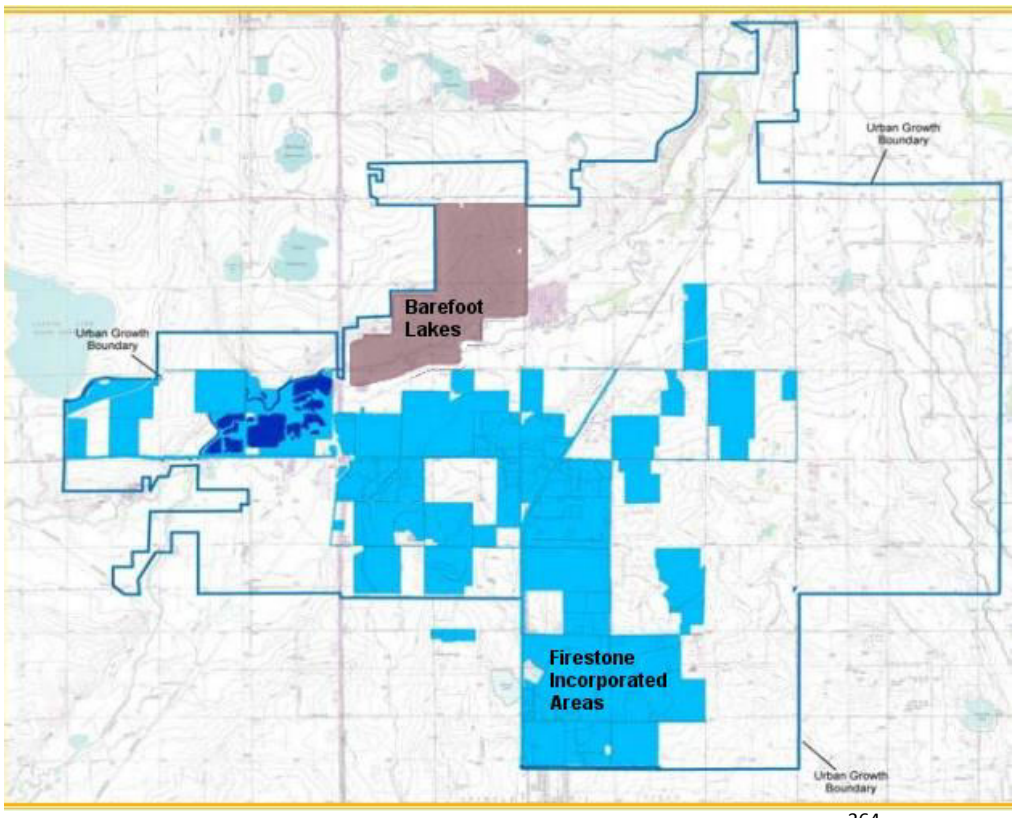

Figure 15. Firestone Annexed Areas and Urban Growth Boundary[364]

The Town's Board of Trustees approved the annexation in late May 2015 subject to the conditions of an annexation agreement.[365] The Annexation Agreement provides that Filing No. 1 will be governed by the subdivision plat approved by Weld County. Subsequent filings however must be subdivided according to Firestone's Code and Development Regulations.[366] As part of the annexation negotiation between Firestone and the developer, it was agreed that Barefoot Lakes would not be required to go through the Town's platting process.[367]

Firestone did not reconsider the adequacy of the proposed water supply.[368] However, the annexation agreement does provide a right of first refusal to the Town to acquire

[364] Firestone Comprehensive Plan, *supra* note 362, at Sec. 8 ("This Master Plan limits urban development within Firestone to the Master Plan Area."

[365] An Ordinance of the Board of Trustees of the Town of Firestone, Colorado Approving an Annexation Agreement for the Barefoot Lakes Annexation and a Development and Vested Rights Agreement for the Barefoot Lakes Property Pursuant to Article 68 of Title 24 C.R.S. and Authorizing Execution of Such Agreements, May 27, 2015.

[366] *Id* at 33.

[367] Interview with Rebecca Toberman, Planning Coordinator, City of Firestone, in Firestone, Colo. (July 20, 2016)

[368] *Id.* Because the project had already entered into a water supply agreement with the Little Thompson Water District when the annexation took place, it was not thought to be necessary to do an adequacy determination. Email from Rebecca Toberman to John Sherman, September 15, 2016.

much of the proposed water supply, including shares in eight ditches and reservoirs located in the vicinity of the development and owned by Barefoot Lakes.[369] It also provides a "right of first negotiation" regarding the 12 shares of Windy Gap water the developer has provided to the LTWD.[370]

Firestone normally has a policy of requiring new developments to dedicate to the Town the water rights necessary to meet their demand, which the Town then uses to provide water.[371] The Town uses the Central Weld Water District as a wholesale supplier of its potable water, which the Town then provides to individual users.[372] As a water provider, Firestone has a Water Conservation Plan to "conserve water in order to maximize the effectiveness of its currently owned water resources and infrastructure."[373] As of 2007, total water use in the town was 1,800 acre-feet per year, and average residential per capita demand was 159 gpcd, and the Town set a ten-year goal to reduce this by 5% to 151 gpcd.[374] To reduce demand, the plan calls for rebate programs, education programs, rate structure revisions, water audits, and requiring rain sensors for irrigation systems. Interestingly, the plan says xeriscapes for residences would be "difficult to implement due to individual HOA regulations [and] the Town cannot provide breaks in water dedication for residential xeriscape because there is no guarantee the subsequent homeowners will leave the low-water-use landscaping in place."[375]

These measures do not apply to Barefoot Lakes though, because it is being served by the LTWD. Being north of the St. Vrain River, the development falls outside of the Central Weld Water District's service area, shown below.[376] This means water will not be delivered by the town's delivery system, and the LTWD's conservation policies will be in effect instead.

[369] Annexation Agreement, attached to the Ordinance at 4.
[370] *Id*. at 4-5. The Town and LTWD have entered into an Intergovernmental Agreement regarding future use and ownership of these Windy Gap shares.
[371] Town of Firestone, 16.04.055 - Water rights dedication.
[372] Town of Firestone, Water Conservation Plan (2007), 1, *available at* http://www.firestoneco.gov/DocumentCenter/View/698.
[373] *Id.* at ES-1.
[374] *Id.* at ES-2.
[375] *Id.* at 35. Colo. Rev. Stat. § 37-60-126(11), which makes unenforceable any covenant or regulation of a common interest community that prohibits or limits xeriscape landscaping, may resolve the first hurdle.
[376] Firestone Comprehensive Plan, *supra* note 362, at Sec. 9.3.

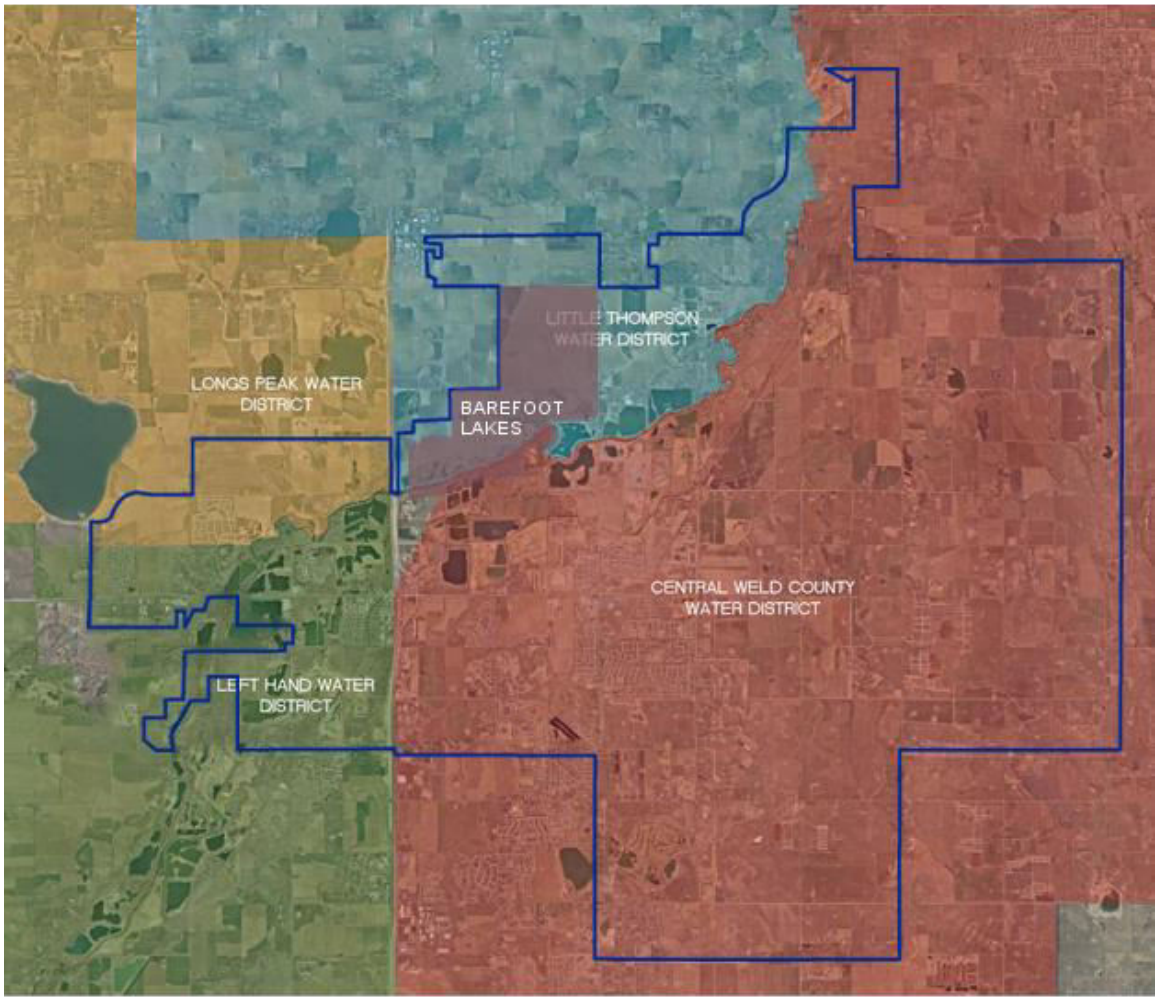

Figure 16. Water Districts serving the Firestone Master Planning Area.

Current Status

Construction and sale of the homes in Filing No. 1 have already begun, and the developers are in the process of getting a second filing approved. Still to be determined is exactly how nonpotable water will be reused and the role the lakes will play in augmenting water supplies.[377] According to the LTWD, the shares of Windy Gap water provide ample supply to serve these first two phases of development.

[377] Interview with Michael Cook, *supra* note 337.