

COLORADO WATER CONSERVATION BOARD

Authorization of Pilot Projects for the Beneficial Use of Captured Precipitation in New Real Estate Developments Criteria and Guidelines for the “Rainwater Harvesting” Pilot Project Program,

Approved by CWCB: January 28, 2010

Amended by CWCB: January 26, 2016, September 18, 2019

INTRODUCTION

Purpose

The purpose of this document is to describe the Colorado Water Conservation Board (“CWCB” or “Board”) process to implement the *Act Concerning an Authorization of Pilot Projects for the Beneficial Use of Captured Precipitation in New Real Estate Development, and Making an Appropriation in Connection Therewith*, as approved under House Bill (H.B.) 09-1129 and the *Act Concerning Incentives for Precipitation Harvesting, and, in Connection Therewith, Making an Appropriation*, as approved under H.B. 15-1016. House Bill 09-1129 calls for the Board to establish Criteria and Guidelines¹ for applications and the selection of pilot projects and for the Board, in consultation with the State Engineer, to select pilot project sponsors. CWCB staff developed Draft Criteria and Guidelines in consultation with the State Engineer and presented to the Board at its September 15, 2009 meeting, for informational purposes only. A technical advisory group provided comments on the draft, and updated Criteria and Guidelines were presented to and approved by the Board at its January 27, 2010 meeting. House Bill 15-1016 calls for the Board to update the Criteria and Guidelines² to allow for the establishment of Regional Factors that specify the amount of precipitation consumed through evapotranspiration of preexisting natural vegetative cover. The Division of Water Resources (DWR) staff and the CWCB staff presented the updated Criteria and Guidelines to the Board at its January 26, 2016 meeting and the Board approved the updated Criteria and Guidelines at that time. On July 17, 2019, DWR staff presented technical documentation for proposed Regional Factors to the Board. Revised Criteria and Guidelines incorporating the proposed Regional Factors were presented for Board approval at the September 18, 2019 meeting.

Background

Rainwater harvesting was not previously considered in Colorado primarily for two reasons: 1) historically relatively abundant and low-cost alternative water supplies have been available, and 2) prior to the passage of legislation in the 2008-2009 session, the law required 100% replacement of any precipitation captured out-of-priority, thereby requiring water users to find an equal amount of replacement water in like time and place. In 2007, a study entitled *Holistic Approach to Sustainable Water Management in Northwest Douglas County*³ was published under the CWCB Water Efficiency Grant Program. The study emphasized the importance of pairing outdoor water management with rainwater harvesting to maximize water conservation potential. The study concluded that five main factors influence outdoor water demands:

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- 1) amount of irrigated area,
- 2) landscaping material selection and corresponding water demand,
- 3) irrigation system performance, including sprinkler system efficiency and effects of installation, operations, and maintenance,
- 4) irrigation system technology such as rain gages and evapotranspiration controllers,
- 5) provider commitment and public acceptance.

Three outdoor water management strategies were considered, each based on an acceptable “look” of the landscaping to the public, as validated by the study advisory committee: (a) the traditional scenario included bluegrass with traditional plantings and spray irrigation; (b) the moderate scenario included fescue turf with a lower water demand than bluegrass, plantings classified as moderately consumptive, a portion of the potentially irrigated landscape was non-irrigated, and rotor irrigation; and (c) the water wise scenario included fescue turf with native plantings, an increase in non-irrigated areas, and subsurface drip irrigation.

Using historical hydrology data and commonly accepted quantification methods, the study concluded that with rainwater and snowmelt harvesting, outdoor water demand could be reduced by approximately 65% with “moderate conservation” and approximately 88% with “water wise conservation” as those scenarios were defined in the study. The study concluded that lawn and garden irrigation demands could be significantly reduced by using rainwater and snowmelt harvesting, particularly when paired with active water management techniques while maintaining a landscape appearance acceptable to Coloradans. The study recommended statutory law be crafted to allow precipitation capture and use with augmentation requirements based on maintaining the amount, timing, and location of historical return flows (overland runoff and deep percolation). It also recommended a pilot project to verify the study conclusions, which were based on modeling the pairing of rainwater harvesting with efficient landscaping and irrigation practices.

The CWCB developed these Criteria and Guidelines, in consultation with the State Engineer, based on Section 37-60-115(6) of the Colorado Revised Statutes (C.R.S.), with input from a technical advisory group, and considering examples of data collection and reporting requirements utilized in rainwater harvesting projects in other states.⁴ In 2016 and 2019, the CWCB, in consultation with the State Engineer, updated the Criteria and Guidelines with the goal of incentivizing Rainwater Harvesting Pilot Projects based on the revised language in Section 37- 60-115(6), C.R.S. that was adopted in H.B. 15-1016.⁵

RAINWATER HARVESTING PILOT PROJECT PROGRAM DEFINITION, GOALS, AND PURPOSES

H.B. 09-1129⁶ addressed one of the recommendations from the *Holistic Approach to Sustainable Water Management in Northwest Douglas County* study with the authorization of up to ten pilot projects for new residential or mixed-use developments, providing an opportunity to further evaluate implementation of rainwater and snowmelt harvesting in Colorado (collectively referred to as “rainwater harvesting”). The CWCB defines rainwater harvesting pilot projects as:

Rainwater harvesting pilot projects collect precipitation from rooftops and other impermeable surfaces and utilize the collected water for non-potable uses to evaluate water conservation potential. Pilot projects must be designed such that data collection

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supports the purposes identified in Section 37-60-115(6)(a), C.R.S. and further evaluates water conservation potential through pairing rainwater harvesting with advanced⁷ outdoor water demand management. Projects must be located in new residential or mixed-use development.⁸

Regional Factor is defined as one factor, or a set of factors, that specify the amount of precipitation consumed through evapotranspiration of preexisting natural vegetative cover in a specific region of the state.

The goal of the pilot project program is to gain additional field-verified information about the feasibility of rainwater harvesting as a water conservation measure in Colorado, through pairing it directly with advanced outdoor water demand management – particularly efficient landscaping and irrigation practices. The purpose of the pilot projects, as described in Section 37-60-115(6)(a), C.R.S. shall be to:

- (I) Evaluate the technical ability to reasonably quantify the site-specific amount of precipitation that, under preexisting, natural vegetation conditions, accrues to the natural stream system via surface and ground water return flows;
- (II) Create a baseline set of data and sound, transferable methodologies for measuring local weather and precipitation patterns that account for variation in hydrology and precipitation event intensity, frequency, and duration, quantifying preexisting, natural vegetation consumption, measuring precipitation return flow amounts, identifying surface versus ground water return flow splits, and identifying delayed ground water return flow timing to receiving streams;
- (III) Evaluate a variety of precipitation harvesting system designs;
- (IV) Measure precipitation capture efficiencies;
- (V) Quantify the amount of precipitation that must be augmented to prevent injury to decreed water rights;
- (VI) Compile and analyze the data collected; and
- (VII) Provide data to allow sponsors to adjudicate permanent augmentation plans as specified in paragraph (c) of this subsection (6).

The specific authorizing legislation for the pilot project program is attached. Specific data collection and reporting needed to meet the goal of the pilot project program are also provided under the Application Eligibility Requirements and Process and section below. The following Criteria and Guidelines have been developed pursuant to Section 37-60-115(6), C.R.S. and are adopted by the CWCB.

NOTE:

The Act limited the CWCB's ability to spend money to implement the Act. **As a result, only those applicants and the fees paid that fall within the Board's authorized spending authority shall be selected.** The CWCB indicated that the spending authority granted by H.B. 09-1129 would be a limiting factor in selecting and awarding projects. The Board will consider the need for the submission of a future budget Change Request if it determines such a request is needed.

APPLICATION ELIGIBILITY REQUIREMENTS AND PROCESS

These Criteria and Guidelines provide guidance for the pilot project application and approval process. As stated in the previous section, the goal of the pilot projects is to gain field-verified information about rainwater harvesting as a water conservation measure in Colorado, through pairing it directly with advanced outdoor water demand management. H.B. 09-1129 identified additional objectives toward advancing the understanding of potential water rights impacts from rainwater harvesting in Colorado. Rainwater harvesting pilot projects must operate according to a Substitute Water Supply Plan (SWSP) approved annually by the State Engineer pursuant to Section 37-92-308(4) or (5), C.R.S.

For the first two years of operation, sponsors of projects in areas where Regional Factors have not been adopted by the Board are required to replace an amount of water equal to the precipitation captured out-of-priority and measured from rooftops and impermeable surfaces. After a minimum of two years of implementation of rainwater harvesting applied to nonpotable uses with advanced outdoor water demand management and data collection, pilot project sponsors may apply to the appropriate water court for a permanent augmentation plan or file a plan with the State Engineer to permanently retire the rainwater collection system, which plan must be reviewed and approved prior to the cessation of augmentation. In the water court application for an augmentation plan, and in the associated SWSP, the sponsor may apply to reduce the augmentation obligation by an amount equal to the historical consumptive use from preexisting, natural vegetation cover. The minimum two year data collection period begins once water collected through rainwater harvesting, under an approved SWSP, is applied to nonpotable demands in combination with additional demand management.

Sponsors of projects in areas where Regional Factors have been adopted by the Board may propose to use the Regional Factor to claim an evapotranspiration credit for the preexisting vegetative cover that was made impermeable through development associated with the pilot project. The evapotranspiration credit may be used prior to the sponsor completing two years of data collection and/or the sponsor's application to the water court. Proposed use of the credit will be reviewed as a part of the State Engineer's SWSP approval process.

The CWCB, in consultation with the State Engineer, shall consider all Eligibility Requirements, as described below, in evaluating pilot project proposals. As required under Section 37-60-115(6)(b)(V), C.R.S., **priority shall be given to projects that a) are located in areas that face renewable water supply challenges and b) promote water conservation.** Approval for an SWSP⁹ and water court decree is a separate process and is not explicitly addressed in these Criteria and Guidelines.

Eligibility Requirements

For an applicant to be eligible for the pilot project program, it must meet the requirements described in this section. Only projects associated with new development are eligible; no applications for existing structures or development will be considered. Proposals for rainwater harvesting pilot projects must include:

1. Pilot project sponsor information including:
 - a. The name and contact information of the pilot project sponsor.
 - b. A description of how the pilot project sponsor qualifies as an applicant for a new development as defined in Section 29-20-103, C.R.S., for a new planned

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- unit development or new subdivision of residential housing or mixed uses.
- c. A list of the organizations and/or individuals including those hired or otherwise retained by the entity that will assist in development and implementation of the pilot project and analysis of data, including a written statement of their role and contributions and any applicable professional licensing/certifications (e.g. licensed professional engineer, plumber, landscape irrigation designer, etc.). Applicant must demonstrate its commitment to carrying out the goals of the pilot project through demonstrating adequate staffing (paid or volunteered, in-house or outsourced, consultants, advisors, etc.) and a commitment to make the applicant's resources available to carry out the pilot project.
2. An application fee of \$4,000 and demonstration of ability to provide an annual review fee of \$1,000 throughout the pilot project, per Section 37-60-115(6)(b)(I), C.R.S. H.B. 09- 1129 limited the CWCB's ability to spend money to implement the Act. **As a result, only those applicants and the fees paid that fall within the Board's authorized spending authority shall be selected.** The CWCB indicated that the spending authority granted by H.B. 09-1129 would be a limiting factor in selecting and awarding projects. The Board will consider the need for the submission of a future budget Change Request if it determines such a request is needed. The annual review fee will be due one year after acceptance as a pilot project.
 3. A description of the proposed new development, per Section 37-60-115(6)(b)(II), C.R.S., including:
 - a. Description of the current conditions of the project site and watershed. Aerial photo of pilot project site and at least 3 on-site photos showing extent of native vegetation.
 - b. Project location map, including identification of location within a Water Division as established in Section 37-92-201, C.R.S., watershed boundaries, location of rainwater catchment area and site where rainwater is applied to nonpotable uses, location of climate data measurements, and other pertinent geographic and hydrologic information, per Section 37-60-115(6)(b)(III), C.R.S. Map of hydrologic soil group map units in the pilot project catchment, including tabulated area of units named with "rock outcrop" (see Rainwater Harvesting Pilot Project Regional Factors Report (2019) for further details),
 4. A description of the proposed rainwater harvesting collection system, per Section 37-60-115(6)(b)(II), C.R.S., including:
 - a. Description of the collection system sizing, design, and maintenance plan.
 - b. Estimated average volume of water to be captured each month, based on historical precipitation data.
 - c. Method for metering inflow and measuring capture efficiencies.
 5. A description of how the proposed development meets any applicable local government water supply requirement through sources other than precipitation harvesting, per Section 37-60-115(6)(b)(IV), C.R.S.

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6. A description of renewable water supply challenges for the area, per Section 37-60-115(6)(b)(V)(A), C.R.S. Indicate how the proposed project addresses key water needs, for example, as identified in the Colorado Water Plan or associated documents and offers opportunity to collect information from a variety of geographic and hydrologic areas throughout the state. Preference may be given to projects that address larger water supply needs or in locations with critical water supply challenges.
7. A description of the pilot project implementation plan and how the project will promote and implement water conservation, per Section 37-60-115(6)(b)(V)(B), C.R.S., including:
 - a. Description of how rainwater harvesting will be utilized on-site and paired with advanced outdoor water demand management techniques to promote water conservation, including:
 - i. Landscape and irrigation design approach and specific advanced outdoor water demand management practices to be utilized.
 - ii. The implementation plan shall provide for metering of all on-site landscape water (harvested rainwater and any supplemental potable water supply) and address any potential cross-connection issues and backflow prevention if the rainwater harvesting system is connected to a backup potable water supply.
 - iii. Irrigation system technology to promote water conservation.
 - iv. Homeowner/community water conservation education approach.
 - b. Description of metrics that will be used to quantify water usage and an estimate of the projected water savings through rainwater harvesting paired with advanced outdoor water management techniques. These shall include but not be limited to:
 - i. Landscape plans and water budgets including square footage of irrigated and non-irrigated landscape for common areas and individual homes, description and quantification of landscape plantings, estimated average annual demand in gallons per square foot based on historical evapotranspiration rates (water budgets). Landscape plans should follow industry best practices.
 - ii. Design plans of irrigation systems including, but not limited to, emitter types, controller type, rain sensor and meter type for measuring use of water from the rainwater harvesting collection system and any supplemental potable water supply. A system-wide irrigation audit should be performed within the first season of operation and action taken to address findings. Irrigation design plans should be carried out by an irrigation designer and contractor certified through a program labeled by the U.S. Environmental Protection Agency's WaterSense program.
 - iii. Landscape management plan to include irrigation schedule, maintenance schedules, and other ongoing management aspects. Landscape management should be carried out by a contractor who is certified through

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- a program labeled by the U.S. Environmental Protection Agency's WaterSense program.
- iv. Connection(s) between the rainwater harvesting collection system and irrigation system should be fully metered. At a minimum, sponsors shall consider automated meter reading/data loggers with immediate feedback to pilot project sponsors on impacts from water management decisions.
 - v. Description of homeowner/community water conservation education campaign and training program (i.e. how will the pilot project sponsor support and assist homeowners, community members, and maintenance personnel to make the best water management decisions). These educational programs should be comprehensive to include indoor and outdoor water demand management, water supply, and water quality education.
- c. Estimated pilot project costs including:
- i. Estimated infrastructure and ongoing operations and maintenance costs associated with implementing the system, and
 - ii. Estimated cost to implement project per acre-foot of water saved. Considerations should include: institutional, legal, technical/design, infrastructure, and augmentation water supply. Potential cost savings and benefits associated with the project should also be quantified: reduced water rights acquisition, reduced storm water system sizing, water quality benefits, etc.
- d. Pilot project implementation schedule for all major project components and data collection. The minimum two year data collection period (without credit for historical natural depletion if not using Regional Factors) begins once water collected through rainwater harvesting, under an approved SWSP, is applied to nonpotable demands in combination with advanced outdoor demand management. A project sponsor must make a commitment to implement some level of data collection within the first year of receiving approval as a pilot project.
8. A description of how the rainwater harvesting pilot project will meet the purposes of the rainwater harvesting pilot program per Section 37-60-115(6)(a), C.R.S. Data collection, reporting, and analysis methods may include but not be limited to:
- a. Determining local weather and precipitation patterns that account for variations in hydrology and precipitation event intensity, frequency, and duration.
 - b. Quantifying preexisting, natural vegetation consumption.
 - c. Measuring precipitation return flow amounts.
 - d. Identifying surface water versus ground water return flow splits.
 - e. Identifying delayed ground water return flow timing to receiving streams.
 - f. Quantifying the amount of precipitation that must be augmented to prevent

- injury to decreed water rights.
- g. Utilization of a Regional Factor
9. A summary of an SWSP application that demonstrates the applicant can meet the requirements of the *General Guidelines for Substitute Water Supply Plans Submitted to the State Engineer Pursuant to Section 37-92-308, C.R.S. (2003)*.
- a. For pilot projects that are not using Regional Factors, the summary shall contain, at a minimum, an explanation of how the applicant will engage resources necessary to determine 1) the maximum amount of precipitation that will be captured during the year, 2) the timing with which that entire amount of precipitation would accrue to the stream system through overland flow and deep percolation, 3) the potential sources of replacement water that will be available to replace those depletions at the appropriate locations, and 4) how the plan will be operated.
 - b. For pilot projects that are using Regional Factors, the summary shall describe if the project will result in any out-of-priority depletions due to the storage of water in excess of the historic natural depletion, and if so describe the potential sources of replacement water that will be available to replace those depletions at the appropriate locations. The summary shall also describe how the replacement plan will be operated.
 - c. The CWCB will not consider a pilot project for selection if, in consultation with the State Engineer, it determines that the applicant does not have the resources to develop a viable SWSP for approval. The SWSP process for pilot projects and unique requirements for rainwater harvesting SWSPs are detailed in the State Engineer's Rainwater Harvesting Legal Framework memo (2019).

Process

Section 37-60-115(6), C.R.S. establishes certain processes and obligations for pilot project sponsors as well as the CWCB, in consultation with the State Engineer, as further described in this section. H.B. 09-1129 limited the CWCB's ability to spend money to implement the Act. **As a result, only those applicants and the fees paid that fall within the Board's authorized spending authority shall be selected.** The CWCB indicated that the spending authority granted by H.B. 09-1129 would be a limiting factor in selecting and awarding projects. The Board will consider the need for the submission of a future budget Change Request if it determines such a request is needed.

A. Pilot Project Sponsors

- i. Prospective pilot project sponsors shall submit proposals meeting the Eligibility Requirements described above, along with the application fee, to the CWCB. Per Section 37-60-115(6)(b)(III), an applicant that meets the Eligibility Requirements may apply to become a sponsor of one or more of the ten pilot projects, however no more than three pilot projects may be located within any single Water Division established in Section 37-92-201, C.R.S.
- ii. Pilot projects authorized by the Board may begin collecting rainwater upon approval of an SWSP. Pilot project sponsors must operate according to an

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SWSP¹⁰, if approved annually by the State Engineer pursuant to Section 37-92-308(4) or (5), C.R.S.

iii. Pilot project sponsors shall provide an annual preliminary report to the Board and State Engineer throughout the term of the pilot project, until a water court decree is obtained or a cessation plan is approved by the State Engineer, per Section 37-60-115(6)(d), C.R.S. Annual reports and review fees shall be due annually on July 1, unless otherwise authorized by the CWCB. Annual reports shall summarize the information set forth in Section 37-60-115(6)(a), C.R.S. and indicate how data and findings address the pilot project program goals, including:

a) Variances from original project as conceptualized at the time of the pilot project program application. Include information on any data quality issues that may be magnified if results are extrapolated to a larger scale project.

b) Rainwater harvesting system performance, including:

- Description of final collection system design with plans and specifications of all system components;
- Operations and maintenance plans and any issues encountered;
- Metered amount of water flowing into the rainwater collection device (hourly or daily with automated meter reading/data logger or equivalent) and estimated capture efficiency;

c) Pilot project implementation plan and estimated water conservation achieved through pairing rainwater harvesting with advanced outdoor water management, including:

- Description of method of applying captured rainwater and any supplemental potable water supply (e.g. drip system, sprinkler, etc). with plans and specifications for all system components including technology such as irrigation system programmers, evapotranspiration controllers, etc.;
- Landscaping plans including measured irrigated areas, plant descriptions, theoretical irrigation water requirement methods and results, and water budget reflecting application efficiencies;
- Metered water use diverted from the rainwater collection system (hourly or daily with automated meter reading/data logger or equivalent) and use by category if application varies (e.g. different irrigation systems);
- Metered water use from other potable water supply sources (hourly or daily with automated meter reading/data logger or equivalent) if rainwater is supplemented;
- Comparison of actual consumptive use by category of use to estimated water budgets and estimate of water conserved as a result of the rainwater harvesting;
- Landscape maintenance assessment (i.e. quality of landscape, maintenance issues, replacement plantings), and irrigation system

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audit results and corresponding actions.

- Costs including design, infrastructure, operations, and maintenance costs; estimated cost to implement rainwater harvesting system per acre-foot of water saved; and comparison of original projected and actual costs from implementing rainwater harvesting systems. Considerations should include: institutional, legal, technical/design, infrastructure, and augmentation water supply.
- d) A review of the project's hydrologic data collection and analysis plan including a discussion of how the plan addresses the pilot project program goals and a summary of the accomplished and planned tasks.
- Discuss how the project, as completed to date and planned going forward, creates a baseline data set and sound, transferable methodologies that meet the following objectives (at sites using Regional Factors some of the following items are estimated and not directly measured, but applicants should describe how they would be measured or identified to develop a permanent augmentation plan):
 - ♦ Measure local weather and precipitation patterns that account for variation in hydrology and precipitation event intensity, frequency, and duration to Quantify preexisting, natural vegetation consumption
 - ♦ Measure precipitation return flow amounts
 - ♦ Identify surface versus ground water return flow splits
 - ♦ Identify delayed ground water return flow timing to receiving streams
 - ♦ Quantify the amount of precipitation that must be augmented to prevent injury to decreed water rights.
 - ♦ Apply the data set toward the adjudication of a permanent augmentation plan
 - Provide an update of the collection and analysis of data, including a description of how the sponsor will quantify the site-specific amount of precipitation that accrues to the stream system, via surface water and ground water, under preexisting, natural conditions.
 - ♦ If the sponsor is using a Regional Factor for the purposes of the pilot project and associated SWSPs, describe how hydrologic data about preexisting natural conditions that is necessary for the purposes of adjudicating a permanent augmentation plan will be collected.
- iv. All program descriptions should include a description of the location and method of collecting daily or more frequent climate data measurements, with a summary of data including, at a minimum, temperature and precipitation.
- v. Pilot project sponsors shall submit a final report to the CWCB and State Engineer by January 15, 2025, or the appropriate date if extended, per Section 37-60-115(6)(d), C.R.S. Final reports shall include a compilation of annual reports and a

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summary of project findings and conclusions including variations from the pilot project as conceptualized at the time of application to the pilot project program.

B. Colorado Water Conservation Board

- i. Applications for rainwater harvesting pilot projects will be accepted on a rolling basis.
- ii. CWCB staff, in consultation with the State Engineer, shall have up to 120 days to review and evaluate pilot project proposals, according to the Eligibility Requirements previously described. Pilot project applications that meet the Eligibility Requirements will be placed on the agenda for the next available Board meeting following the 120 day review period.
- iii. CWCB staff shall present recommendations to the Board for consideration at the next available Board meeting following the 120 day review period, at which time the Board may approve, disapprove, or defer a decision to award a pilot project. Board approval will be contingent to SWSP approval, per Section 37-60-115(6)(c), C.R.S.
- iv. The CWCB and the State Engineer shall brief the Water Resources Review Committee created in Section 37-98-102, C.R.S., on the reported results of the pilot projects by July 1, 2014 and shall provide a final briefing to the Water Resources Review Committee by July 1, 2025, per Section 37-60-115(6)(d), C.R.S.

Regional Factors

Paragraph (b) of subsection (6) of Section 37-60-115, C.R.S. directs the Board to develop Regional Factors that sponsors may use in SWSPs obtained as a part of a pilot project.

A. Development of Regional Factors

- i. The Board need not adopt a Regional Factor until a sponsor has collected a minimum of two years of data and has submitted the data to the Board.¹¹¹² For the purposes of developing Regional Factors only, two years of data collection shall include, at a minimum, stream gage and evapotranspiration data from the development site; data collection may start before the rainwater is applied to non-potable demands.
- ii. Once the Board receives the sponsor's data, the State Engineer, in consultation with the CWCB, shall review the data and propose one factor, or a set of factors, for adoption by the Board and inclusion into these Criteria and Guidelines as the Regional Factor. All proposed Regional Factors submitted to the Board for inclusion to the Criteria and Guidelines shall include, at a minimum:
 - iii. A map of the region where the Regional Factor will be applied,
 - iv. A description of the data collected by the sponsor,

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- v. A description of the methodology used to develop the proposed Regional Factor,
- vi. A description of the proposed Regional Factor and any limitations of use,
- vii. Draft updated Criteria and Guidelines that incorporate the proposed Regional Factor into this section of the Criteria and Guidelines.

B. Use of Regional Factors

- i. If a sponsor submits an application in a region where Regional Factors have been adopted under these Criteria and Guidelines, the sponsor may propose the use of the Regional Factors in SWSPs applied for pursuant to section 37-92-308(4) or (5), C.R.S. and associated with the sponsor's pilot project. The State Engineer shall give the sponsor's use of the Regional Factors in said SWSP applications a presumptive effect, subject to rebuttal.¹²
- ii. One set of Factors was adopted by the Board in 2019. The complete documentation of those Factors and their use is included in Attachment A, the Regional Factors Report (2019). The following summarizes this set of Factors and their use:
- iii. **Concept.** Allowed rainwater harvesting volumes are estimated using three calculations that require NRCS Hydrologic Soil Group information for the catchment area. The infiltration factor is the percentage of a precipitation event that infiltrates, which varies from 25 to 90 percent based on the soil group and the precipitation depth and duration. The groundwater factor is the percentage of a precipitation event that is a groundwater return flow, which varies from 3 to 6 percent, depending on the soil group. The ET/Soil factor is a 30-day limit on the rainwater harvesting volume, which varies depending on the month of the year.
- iv. **Data.** Use of Factors requires quantification and documentation of area made impervious in the development, area of NRCS Hydrologic Soil Groups A, B, C, & D, and on-site precipitation monitoring with 15-minute resolution.
- v. **Accounting.** The Factors accounting process requires use of a daily accounting spreadsheet using the template provided by DWR. The template applies the three calculations described above. The user inputs the 15-minute precipitation record, which is processed into individual storms. The accounting sheet uses event depth and duration and soil group information to determine the volume of historic natural depletion. The sheet is also used to maintain storage accounting with all gains and losses to assure accurate tracking of the volume of runoff harvested and any out-of-priority depletions. Lastly, the accounting tracks any replacement water provided to the stream for out-of-priority depletions.

All approved applications and reporting under pilot projects will become public record and will be available to the public through the CWCB website. These Criteria and Guidelines do not attempt to provide guidance on the level of detail in data collection/analysis needed to

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successfully advance a pilot project through the SWSP process or water court. It is anticipated that such requirements may vary depending on the size and type of rainwater harvesting system, project location, and resulting impact on the stream system. It is the pilot project sponsor's responsibility to propose the appropriate level of detail, subject to review and approval by the State. Further, compliance with these Criteria and Guidelines does not ensure an SWSP or water court application will be approved. These Criteria and Guidelines shall be reviewed and updated as necessary.

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¹ Per Section 37-60-115(6)(b), C.R.S., the board shall establish criteria and guidelines for applications and the selection of pilot projects, including the following:

- (I) An application fee and, for pilot projects that are selected, an annual review fee;
- (II) The information to be included in the application, including a description of the proposed development and the proposed precipitation harvesting system;
- (III) Selection of pilot projects to represent a range of project sizes and geographic and hydrologic areas in the state, with no more than three pilot projects being located within any single water division established in section 37-92-201;
- (IV) The requirement that the proposed development meet any applicable local government water supply requirements through sources other than precipitation harvesting;
- (V) Giving priority to pilot projects that:
 - (A) Are located in areas that face renewable water supply challenges; and
 - (B) Promote water conservation.

² Per Section 37-60-115(6)(b), C.R.S., as amended by H.B. 15-1016, the board shall update the criteria and guidelines with the goal of incentivizing the submission of applications and applying lessons learned from previously approved pilot projects for applications and the selection of pilot projects, including the following:

- (VI) Regional Factors that sponsors can use for Substitute Water Supply Plans that specify the amount of precipitation consumed through evapotranspiration of preexisting natural vegetative cover. If an applicant uses the factors, the State Engineer shall give the factors presumptive effect, subject to rebuttal. The Board need not establish factors for a region until the sponsor of a project located within that region has submitted a minimum of two years of data pursuant to sub-subparagraph (B) of subparagraph (II) of paragraph (C) of this subsection (6). A sponsor that makes such a submission shall also submit the data to the Board.

³ *Holistic Approach to Sustainable Water Management in Northwest Douglas County*, Prepared by Leonard Rice Engineers, Inc., Meurer & Associates, and Ryley, Carlock & Applewhite for the Colorado Water Conservation Board, Dominion Water and Sanitation District, Castle Pines North Metropolitan District, Douglas County, Thunderbird Water and Sanitation District, and Plum Valley Heights HOA, January 2007.

⁴ *The Texas Manual on Rainwater Harvesting, Third Edition*, Texas Water Development Board, 2005. Dr. Hari J. Krishna, Contract Manager; *Rainwater Harvesting: Supply from the Sky*, City of Albuquerque, March 1995; *Approval of Rainwater Harvesting Systems as a Statewide Alternate Method of Providing Water for Non-Potable Uses*, State of Oregon Building Codes Division, Alternate Method Ruling No. OPSC 08-03; *Ordinance No. 10597 and Development Standard No. 10-03.0 Commercial Rainwater Harvesting*, City of Tucson, April 2009.

⁵ The rainwater harvesting pilot project program updated under H.B. 15-1016 requires the Board to update the Rainwater Harvesting Pilot Project Criteria and Guidelines by January 1, 2016 with the goal of incentivizing the submission of applications and applying lessons learned from previously approved pilot projects. The primary method of incentive identified by H.B. 15-1016 is the Board's adoption and of Regional Factors for the evapotranspiration of preexisting vegetative cover.

⁶ The rainwater harvesting pilot project program established under H.B. 09-1129 is separate from Senate Bill 09-80 which authorized limited exemptions for water collected from certain residential rooftops that are served by wells permitted for domestic uses according to Section 37-92-602, C.R.S., and meeting other criteria described under S.B. 09-80.

⁷ CWCB considers advanced outdoor water demand management to include concepts similar to those identified in the *Holistic Approach to Sustainable Water Management in Northwest Douglas County* that reduce outdoor water demands and improve application efficiency.

⁸ Per 37-60-115(6)(b), an applicant for a development permit, as that term is defined in Section 29-20-103, C.R.S., for a new planned unit development or new subdivision of residential housing or mixed uses may submit an application the Board to become a sponsor of one or more of the ten pilot projects. Section 29-20-103, C.R.S. indicates that a development permit is generally limited to an application regarding a specific project that includes new water use in an amount more than that used by fifty single-family equivalents, or fewer as determined by the local government.

⁹ For additional information, see Rainwater Harvesting Legal Framework Memo (2019), Division of Water Resources Policy 2003-2, Implementation of Section 37-92-308, *CRS (2003) Regarding Substitute Water Supply Plans, and the Attachment to Policy 2003-2, General Guidelines for Substitute Water Supply Plans Submitted to the State Engineer Pursuant to Section 37-92-308, C.R.S. (2003)*.

¹⁰ The following State Engineer approval is described in Section 37-60-115(6)(c), C.R.S.: Notwithstanding any limitations regarding phreatophytes or impermeable surfaces that would otherwise apply pursuant to Section 37-92-103 (9) OR 37-92-501(4) (b) (III), each of the ten pilot projects shall:

(I) During the term of the pilot project, operate according to a substitute water supply plan, if approved annually by the state engineer pursuant to section 37-92-308 (4) or (5). The pilot project shall be required to replace an amount of water equal to the amount of precipitation captured out of priority from rooftops and impermeable surfaces for nonpotable uses; except that, in determining the quantity of water required for the Substitute Water Supply Plan to replace out-of-priority stream depletions, there is no requirement to replace the amount of historic natural depletion to the waters of the state, if any, caused by the preexisting natural vegetative cover evapotranspiration for the surface areas made impermeable and associated with the pilot project. The applicant bears the burden of proving the historic natural depletion; except that the applicant may use the applicable regional factors established pursuant to subparagraph (V) of paragraph (b) of this section. (II)

(A) Apply to the appropriate water court for a permanent augmentation plan prior to completion of the pilot project or file with the state engineer to permanently retire the rainwater collection system, which plan shall be reviewed and approved prior to the cessation of augmentation. As a condition of approving retirement of a pilot project, the state engineer shall have the authority to require the project sponsor to replace any ongoing delayed depletions caused by the pilot project after the project has ceased. Any such permanent augmentation plan shall entitle the sponsor to consume without replacement only that portion of the precipitation that the sponsor proves by a preponderance of the evidence would not have accrued to the natural stream under preexisting, natural vegetation conditions. The sponsor shall be required to fully augment any precipitation captured out of priority that would otherwise have accrued to the natural stream.

(B) After a minimum of two years of data collection and upon application to the appropriate water court for a permanent augmentation plan, the pilot project sponsor shall file an application for approval of a substitute water supply plan pursuant to section 37-92-308 (4). For any substitute supply plan application filed under section 37-92-408(4), the sponsor shall fully augment an precipitation captured out of priority; except that, in determining the quantity of water required for the Substitute Water Supply Plan to replace out-of-priority stream depletions, there is no requirement to replace the amount of historic natural depletion to the waters of the state, if any, caused by the preexisting natural vegetative cover evapotranspiration for the surface areas made impermeable and associated with the pilot project. The applicant may use applicable regional factors established pursuant to subparagraph (V) of paragraph (b) of this subsection (6).

¹¹ Per Section 37-60-115(6)(b)(VI), C.R.S., the board shall update the criteria and guidelines to include Regional Factors that sponsors can use for Substitute Water Supply Plans that specify the amount of precipitation consumed through evapotranspiration of preexisting natural vegetative cover. If an applicant uses the factors, the State Engineer shall give the factors presumptive effect, subject to rebuttal. The Board need not establish factors for a

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region until the sponsor of a project located within that region has submitted a minimum of two years of data pursuant to sub-subparagraph (B) of subparagraph (II) of paragraph (C) of this subsection (6). A sponsor that makes such a submission shall also submit the data to the Board.

¹² Sections 37-92-308(4)(a)(IV)(B) and 37-92-308(5)(IV)(B), C.R.S., state that:

Notwithstanding any limitations regarding phreatophytes or impermeable surfaces that would otherwise apply pursuant to section 37-92-103(9) or 37-92-501(4)(b)(III), for any precipitation harvesting pilot project selected pursuant to section 37-60-115(6), the applicant shall fully augment any precipitation captured out of priority; except that, in determining the quantity of water required for the substitute water supply plan to replace out-of-priority stream depletions, there is no requirement to replace the amount of historic natural depletion to the waters of the state, if any, caused by preexisting natural vegetative cover evapotranspiration for the surface areas made impermeable and associated with the pilot project. The applicant may use regional factors established pursuant to section 37-60-115(6)(b)(VI).

In addition, Section 37-60-115(6)(b)(VI) states that:

If the applicant uses the [regionally applicable] factors, the State Engineer shall give the factors presumptive effect, subject to rebuttal.