



MEMORANDUM

To: Theresa Worsham, City of Golden
From: WaterNow and Western Resource Advocates
Date: September 2019
Project: Golden Graywater Ordinance and Program Development

Objective: To gain insight into existing greywater ordinances and programs in three Colorado communities, along with several others in surrounding states, in order to better understand the efficacy of each program, including the process of developing and implementing the program.

Research summary: WaterNow and Western Resource Advocates conducted interviews and research on communities in Colorado and around the West who have graywater ordinances and programs. The goals of this research and interviews were to better understand how these ordinances were developed and implemented, the status of implementation, challenges and barriers, and any potential modifications going forward. Additionally, an individual from the Colorado Department of Public Health and Environment who is responsible for overseeing Colorado’s graywater program was also interviewed to gain insight into the state’s perspective and provide some guidance for Golden moving forward. A general list of questions was prepared for the interviews, but additional questions tailored to their specific ordinance/program were asked. This memo provides a summary of these interviews and research.

Informational interview summaries:

Pitkin County

Date: August 9, 2019
Interviewee(s): Kurt Dahl, Pitkin County Environmental Health Manager

Program overview

Pitkin County’s [graywater ordinance](#) was adopted in 2018 and includes all categorical uses under Regulation (“Reg”) 86, and is enforced by the Environmental Health Department. The decision was made to include all categorical uses—as opposed to just a “laundry-to-landscape” (“L2L”) program—because they believe a whole house system is where the most water savings occur. The County commissioners are pretty “savvy” when it comes to water and wanted the most savings. To date, no projects have been implemented, and the County believes that is primarily due to the costs associated with implementing a project. The other possible reason for a lack of interest is the County has not been

promoting the program, as they wait for the state's stakeholder process to play out. Their hope is that revisions to the program will simplify processes and reduce costs. One potential change the County is already discussing is around Renewable Energy Mitigation Program (REMP) fees. REMP fees are assessed on mega-mansions with heated driveways, and there is discussion about giving homeowners credit on their fees if they install a graywater system.

The County does not currently have a design criteria manual as they are waiting for the first application, but they are not planning on providing any additional design criteria outside of Reg 86. One specific concern they have is in regards to water rights, and the County is planning on working with the Division of Water Rights to make sure any graywater projects are in compliance. If a project were to be permitted, there are multiple phases to the inspection process. Any indoor plumbing components would be handled by the Building Department, while any outdoor components (e.g., storage tank, treatment system) would be handled by the Environmental Health Department. The required site evaluation for subsurface irrigation systems is identical to their septic protocol. The inspection and permit fees are based on an hourly rate (currently \$162/hour), so the total cost will depend on the size of the system. In order to track graywater systems (as required by Reg 86) the County will utilize their existing septic permitting system. Their hope is down the road this tracking can be incorporated into their GIS system. In regards to an O&M manual, because those will be specific to each type of system, the County will rely on the manufacturer of each system to provide the manual to the homeowner.

In terms of the public process, the County did not hear any concerns while the ordinance was being developed and reviewed. In general, they perceive that the community would like to use graywater, but it is just not practical at this point (most likely due to the costs). As mentioned before, they have not been actively promoting the program as the state's stakeholder process is playing out, but do have outreach plans once any revisions are made. Potential outreach plans include utilizing the local media (e.g., the local TV station was utilized for education on radon), having the public information officer draft press releases, community meetings (especially if they pursue the REMP fee credit), and potentially some pilot projects. Open Space and Trails are building some new buildings, so that could be one option for a pilot project.

Successful elements & lessons learned

One suggestion the County had for Golden is to identify similar or relevant existing regulations/requirements, in order to avoid reinventing the wheel. The specific example given was in regards to concern about transferring the O&M manual when a property is sold. Instead of creating all new language for this requirement, Golden could look to Jefferson County, for example, in regards to their transfer of title and inspection requirements for septic systems when a property is sold. The language in that requirement could be modified for Golden's graywater program. Additionally, the County thought that large commercial structures probably provide the best opportunity for pilot projects, in terms of outreach and education.

Challenges & barriers

The County has been disappointed thus far that no one has applied to get a permit, especially because a lot of the community was excited when the ordinance was adopted. The County acknowledged that in hindsight, they might have pushed for better regulations if they knew how long it would take for someone to obtain a permit. Additionally, the County is concerned that there is still confusion about what homeowners can use graywater for, even though there are only two types of systems allowed (i.e., indoor toilet and urinal flushing and outdoor subsurface irrigation).

City and County of Denver

Date: August 13, 2019

Interviewee(s): Jon Novick, Environmental Administrator, Denver Department of Public Health and Environment

Program overview

In 2016, the City and County of Denver jointly adopted their [graywater ordinance](#) which includes all categorical uses in Reg 86. In general, Denver found Reg 86 to be somewhat confusing, so they wrote theirs to be more clear and straightforward. For example, and based on feedback from contractors, they modified the program so that people applying for an L2L system can do it all through an online permitting system. They acknowledge, however, that even though it is a quick process, there are still some challenges associated with it. The main challenge being that graywater systems require a licensed contractor, which includes a test through the Building Department. If homeowners want to install the system themselves, they must also take the test. Other challenges include that the online permitting process is not entirely intuitive, and there is not a lot of information or guidance. Further, there are some questions that do not seem applicable (e.g., how many gas lines come into the property). They do have an online tutorial, but that is not too helpful. The permit fee is still being discussed, but their goal is to have it be relatively affordable, most likely around \$25. The Community Planning and Development Department issues the permit, and the program is overseen by CDPHE. To date, no permits have been obtained. This has been to Denver's disappointment as they were hoping there would be interest with all the new development happening.

For larger graywater systems (hotels, dorms, MFR, etc.) the ordinance does require a certified operator (as opposed to L2L or SFR systems, which only require a licensed contractor). In the development of Reg 86, there were questions about what specific certifications would be required by the state certification board, so Denver decided to err on the side of safety for these larger systems. Inspections are a joint process between the Building Department and CDPHE. With L2L systems, though, there is some uncertainty with who exactly will be doing the inspections, as the Building Department does not do outside inspections. They will most likely clarify that process once they actually get a project permit application. Their hope, though, is it will be a relatively simple inspection. In terms of fees for the inspection, that will be covered by the building's permitting fee. Denver's current tracking mechanism is simply a Microsoft Access database hosted by the Building Department. This presents some concerns for CDPHE because as permits begin to come in to the Building Department, they are flagged for CDPHE. This requires, however, someone to actually see that notification. If someone does not see the notification, CDPHE might not hear about the permit. As for O&M manuals, Denver will rely on the contractors to develop those, but they will not be requiring them for L2L systems.

In developing the ordinance, Denver utilized their formal rulemaking process which included public notice. They did not do a lot of public outreach and did not receive much public comment. Now that the program is in place, they do not have specific outreach materials other than directing people to the website.

Successful elements & lessons learned

Denver believes that the online process with a relatively cheap permit fee for L2L systems is important for the program to be successful. One idea they have discussed for improving the program is to provide a rebate, but it is unclear where the funding for a rebate would come from. As for advice for Golden, Denver noted the most important thing is considering how to get the word out about the program and how to encourage people to install graywater systems. They also noted that only focusing

on L2L is nice because it does not require new construction and is relatively simple. The other thing Golden should consider is the type of soils present, as the city will need to make sure those do not present additional challenges.

Challenges & barriers

One of the biggest challenges has simply been getting the program to take off, as it has not generated as much interest as they had originally hoped for. Some of the challenges identified above (e.g., contractor requirement, confusion with the online process) are partially to blame for the lack of interest, but Denver also acknowledges they have not done a good job of education and outreach.

City of Castle Rock

Date: August 16, 2019

Interviewee(s): Mark Marlowe, Director of Castle Rock Water

Program overview

Castle Rock passed and adopted its [graywater ordinance](#) in early 2019 and it includes all categorical uses under Reg 86, but is only allowed in new construction. Castle Rock took a slightly different approach from the other communities by keeping their ordinance concise and simple (the whole document is three pages). This simplicity was deliberate after working with the Water Quality Control Division and CDPHE to design the ordinance. Castle Rock felt that Reg 86 had many components that were open to interpretation, and accordingly wanted to interpret it from a simplistic standpoint. The plan is to develop a more detailed review process as they begin to receive applications, but until then the ordinance has been kept simple. The ordinance was limited to new development as the city believed the cost was too high to review graywater system permits for existing homes. The city would allow a L2L system if someone applied, but are more focused on indoor graywater use such as toilet flushing systems in larger developments. They are not interested in approving 1-off systems and would much rather approve a system for a whole group of homes. The idea is a developer would incorporate a graywater system into an existing program (e.g., Water Efficiency Plan Program), which would ultimately be included in the development plan. At that point, it is not an individual permit for a homeowner, but rather part of the construction permit for an entire development. The ordinance is enforced by Castle Rock Water, with field inspections conducted by the Building Department. To date no projects have been permitted.

The city has not developed graywater design criteria documents as they are waiting for the first system application. They do not want to spend a lot of time developing those documents unless there is an interested applicant. Similarly, the current plan is there will not be any separate inspection fees for the graywater systems as it will be part of the plumbing inspection, but they anticipate that could change in the future. The tracking mechanism will simply be incorporated into Castle Rock Water's billing system, where they will note customers with graywater systems. O&M manuals will be reviewed and approved on a case-by-case basis, but the city is more concerned about ensuring the homeowner (and future homeowners) will be able to easily access those manuals. In addition to being able to access the manuals, the city is also concerned about ensuring the system design accounts for the fact that some customers may not maintain or operate the systems altogether. This will fall in part on the developer in educating the homeowner, but that does not account for future homeowners. One company who designs and install systems, and who has thought about this issue, Greyter, has developed

a way to monitor systems indefinitely to ensure they are functioning or not. In addition to what was discussed before, these concerns are part of the reason for keeping the ordinance so simple—to encourage someone to apply for a permit and install a pilot project, in order for the city to begin to work out the kinks.

During the development of the ordinance the city received minimal comments from the public. Now that the ordinance is in place, the city plans on doing some outreach to homebuilders and developers, but probably not to the general public as they are not the target audience for the program.

Successful elements & lessons learned

The city found the ordinance development successful, and a large part of that was keeping the ordinance simple. Overall the city feels there is potential for significant water savings with the whole house (or at least toilet) systems, especially considering how much new development is expected. They were less optimistic about water savings with existing homes. Overall the biggest advice provided was to keep the ordinance as simple as possible. They felt Reg 86 is complicated, but CDPHE was supportive in interpreting those regulations from a more practical and straight forward standpoint.

Challenges & barriers

As noted above, the city is concerned about homeowners having access to the O&M manuals indefinitely, and especially when properties are sold. Further, the city wants to ensure that these systems can be in place even if the homeowner does not maintain or utilize the system for a period of time. In other words, they need to ensure the plumbing is safe regardless if they are working or not. Those are challenges that will hopefully be worked out as developers apply for and install systems in the future. Another potential barrier is in relation to cost. Currently, the incentive structure for conservation will not cover the costs of a graywater system. Accordingly, additional incentives may be necessary, but several pilot projects would need to be installed before considering those additional incentives. The city is not confident in the long-term operations of these systems to feel that the conservation/savings are a long-term benefit. The Greyter system mentioned before claims a 20% savings on indoor consumption—which could be significant for the city, and the reason they adopted in the ordinance in the first place—but need pilot projects to confirm that’s actually what you get.

Colorado Department of Public Health and Environment (CDPHE)

Date: August 23, 2019

Interviewee(s): Bret Icenogle, Engineering Section Manager

Background information on Regulation 86 and program implementation

CDPHE modeled Reg 86 after the Onsite Wastewater Program in that they set up minimum criteria and the local government must meet those requirements. Once the local graywater ordinance is adopted, the state has minimal involvement with enforcement. If a local government is not in compliance, the state would not necessarily investigate right away, but rather talk with the local jurisdiction. If there was an egregious violation or a public health issue, then the state would put pressure on the local government to fix the issue.

When developing the ordinance, the local government must meet the minimum criteria in Reg 86, but there is no formal requirement to submit the ordinance to the state. If requested, the state

(through CDPHE) can provide feedback in the form of a “courtesy review”. The turnaround time for such a review is relatively quick and can usually fit within the timeframe needed by the local government. Once the ordinance is in place and the local government is tracking graywater systems, that information needs to be available upon request by the state, but there are no routine reporting requirements.

There is no requirement for the local government to opt-in to the entire program—in other words, a community could develop just a L2L ordinance. If the community includes any component of the program, the only requirement is to meet the minimum regulations of that component. When developing an ordinance within a municipal jurisdiction, there is no requirement for the county to also adopt a graywater ordinance. If the program extends beyond the municipal boundaries and into the county, then the county would also need to adopt the ordinance. A graywater ordinance can be adopted by a city, a county, and/or a city and county.

Existing graywater programs

All of the existing graywater programs are having difficulty getting people to actually apply for the permits. According to Bret, it is unclear at this point why that difficulty exists. For example, Bret believes that an L2L permit is not difficult to obtain, so anyone currently installing L2L systems without a permit should be able to do so.

Potential modifications to Reg 86

The state began a stakeholder process over a year ago to solicit input on Reg 86 for potential changes (e.g., additional graywater uses). In general, the state heard that people wanted less prescriptive and more descriptive regulations that the local government would review. In other words, people wanted the state regulation to be more open-ended. There was some discussion about the desire of including edible crops, but there are significant amounts of data required for health outcomes. This stakeholder process is an ongoing process, and the state is hoping to solicit additional input.

City of Santa Rosa, CA

Date: April 27, 2017 (phone interview); August 23rd, 2019 (follow-up questions via email)

Interviewee(s): Teresa Gudino, Water Resources Analyst

Program overview

The City of Santa Rosa began permitting graywater systems in 2010. Unlike Reg 86 in Colorado, in California a permit and landscape contractor are not required for installing laundry-to-landscape systems, other more complex systems do require permits. Santa Rosa offers three different financial incentive options to encourage graywater systems; these incentive programs were driven by community input and request. For laundry-to-landscape or single-fixture systems, participants can choose between a \$75 rebate per qualifying fixture or they can receive a free graywater parts kit. If they select the parts kit, a follow-up inspection is required to confirm that the system was installed per code. For more complex systems, participants can receive a \$200 rebate for every 1,000 gallons of sustained reduction in monthly water consumption. The rebate amount cannot exceed the cost of the system, excluding labor costs. As of 2017, the City had issued 45 graywater rebates, and the vast majority of those were laundry-to-landscape systems.

Santa Rosa's graywater rebate program is managed by the City's water efficiency department. The Building Department is responsible for permitting, including a pre-inspection to qualify for a rebate and a final inspection prior post permit issuance.

The City also works with a local non-profit, called Daily Acts, to offer free, hands-on graywater installation trainings for customers who want to install their own laundry-to-landscape programs. These trainings are popular and participants can receive parts-kit following the training. They also have used various outreach methods to get the word out about the program including social media, newspaper ads, radio ads, and bill inserts.

Successful elements & lessons learned

As noted above, the City of Santa Rosa has instituted a number of strategies to try to remove as many barriers as possible to graywater systems. They developed a rebate program in 2010 to incentivize graywater system installation, they've utilized different outreach strategies, offered free workshops, and streamlined the permitting and rebate process as much as possible for applicants. Many of these program elements were developed along the way as a response to applicants concerns. They're currently interested in expanding the workshop to include a "showers to flowers" component.

Challenges & barriers

Unfortunately, Santa Rosa's graywater rebate program still has a relatively low level of adoption and the City isn't sure why that might be since they've tried to make it as affordable and simple as possible. Another challenge the City has faced is difficulty in actually tracking water savings since conditions fluctuate so much. For example, the house might change ownership or a very hot summer could mean outdoor landscaping uses much more water than in other years.

City of Tucson, AZ

Date: January 17, 2017 (phone interview); August 23rd, 2019 (follow-up questions via email)
Interviewee(s): Candice Rupprecht, Water Conservation Program Manager

Program overview

The City of Tucson began its graywater rebate program in 2011 under the notion that the easiest way to bring about widespread adoption is to offer rebates, unless you choose to change local code to require systems. In Arizona, most residential systems – including laundry-to-landscape systems - don't require permits. In Tucson, currently participants can receive up to \$1,000 in rebates to cover materials and part of the labor costs for residential graywater systems. As a requirement of this rebate programs, participants must take a graywater training workshop with an approved training organization. Between 2011 and 2019, the City processed 167 graywater applications. There most common rebate is for laundry-to-landscape systems. Tucson has combined their graywater and rainwater programs in order to build momentum for using alternative water sources. The City tracks their graywater systems and one analyst who reviewed their data found that homes with graywater systems reduced their water savings by 17% compared to the control group.

Successful elements & lessons learned

The City of Tucson has received strong feedback from the public on the graywater workshops, which are a requirement to receive a rebate. Participants feel that these rebates are valuable for understanding how to install their graywater system and how graywater fits into the overall water resources solution.

Challenges & barriers

Although Tucson has issued 167 graywater rebates, this is a limited number when compared with their rainwater harvesting program that has issued over 2,000 rebates in 7 years. The City would like to be doing more outreach around the graywater rebate program and talking with different stakeholders. They think it would be valuable to connect with retailers, the plumbing community, and developers to encourage program expansion.

Summary:

The results of our interviews revealed a few key findings:

- The current proposal by Golden to adopt a “laundry-to-landscape” program is permissible under state regulations as long as all the specific requirements are adhered to.
- To date no greywater permits have been applied for in local jurisdictions in Colorado.
- A simple permitting process may be helpful in attracting more participants.
- Outreach and education may play a key role in attracting participants.
- A financial incentive such as a rebate program or parts kits may encourage more participants.
- Little to no public dissent or opposition has occurred in local Colorado jurisdictions related to graywater ordinance adoption.

At this time no additional research is recommended, though we may contact any of these individuals again, or new contacts, as needed in the future.