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DRAFT Meeting Highlights
Residential Graywater Advisory Committee
February 14, 2020 1:00 pm - 3:30 pm
MDE 1800 Washington Blvd. Baltimore, MD 21230
Patuxent Conference Room (6th floor)

This meeting highlights document includes an Attachment that lists topics of discussion raised by Committee member comments on the Version 1 draft regulation. In addition, issues raised during past Committee meetings are captured in a running list at the end of this document.

Attendees Present:

Dave Duree, Advanced Systems, Drip Irrigation
Ching Tien, MDE
Ellen Frketic CWEA and MES
Gary Anotonides, Ches. Env. Prot. Assn
Tom Buckley, WSSC Water
Jim George, MDE
Matt Rowe, MDE
Mike Harmer, WSSC Water
Mike Moulds, Kent County DPW/MACO
Nasser Kamazani, Montgomery County
Nony Howell, MDE
Saeid Kasraie, MDE
Suzanne Dorsey, MDE
Zohreh Movahed, CWEA Water Reuse Committee

Attendees on the Phone:

Barry Glotfelty – Frederick Co. Health Dept., MACHO
Evelyn Hoban, Prince George's County Health Dept., MACHO
Jenny Willoughby, City of Frederick, MML
Massoud Negahban-Azar, UMD

Meeting Highlights

1. Review Past Highlights, Announcements, Meeting Overview

Responses to Comments on the Version 1 Draft Regulation

MDE announced that it intends to provide written responses to the first set of comments provided by Advisory Committee members in mid-December. The comments will reflect preliminary views of MDE staff working on the regulations, which will be subject to change as the process and information evolves.

David Duree led a discussion on Drip Irrigation

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- He described drip irrigation hoses. The new technology is lined with Treflan coating that David said does not leach and prevents root intrusion clogging of the tube openings.
- Concern was raised about potential for PFAS-like pollutants; however, general agreement that this issue is beyond the scope of the Committee.
- Winter Performance: This tubing is used in Minnesota, though is typically 12” below the surface.
- Irrigation Rate: We discussed a distinction between an irrigation rate to support plant uptake (evapotranspiration) versus soil absorption (similar to septic system discharges).
- Installation of drip lines must account for slopes, and should be installed perpendicular to slope gradient.
- Do we need to specify drip tubing standards/criteria or is that covered in the 2018 International Plumbing Code (IPC)? {Editor’s Note: The IPC does not appear to specify drip tubing criteria}.
- David mentioned Hoot Treatment Systems
- David also mentioned that soil moisture sensor and irrigation control systems are becoming more common. A 4-zone system costs in the range of \$2,800.

Nasser Kamazani described Montgomery County’s involvement considering adoption of the International Green Construction Code

The International Green Construction Code includes on-site water reuse elements. This suggests the potential for the Advisory Committee to learn lessons from that process. Mr. Kamazani offered to share information about the Code with the group.

Subject Matter Expert Presentations to the Committee

The Committee was polled on whether they had any topics for which a briefing by a subject matter expert is warranted. The Committee had no suggestions; however, may reconsider in the future.

2. Identification of Key Topics for Discussion

The Committee reviewed a list of potential discussion topics gleaned from comments on the version 1 draft regulation (See Attachment to these Highlights). After brief consideration, the group agreed to discuss the topics in the order presented, starting with “Scope” issues.

Barry G. suggested that we address the definition of “sewage,” because it is a foundation of regulatory authority, particularly for the involvement of local health departments. Given the legal nature of this issue, and the viability of discussing other aspects of graywater management without resolving this important question, it was tabled for now.

Gary A. raised the role of Operations and Maintenance (O&M) Manuals. This led to a discussion that identified a distinction between O&M manuals for proprietary treatment

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systems versus the larger graywater system, which could include irrigation components, etc.

The topic of “sewage strength”, which is an item for discussion under the “Technical Issues” heading, came up. The topic is usually limited to impacts on septic systems; however, it was noted that, if large volumes of graywater are diverted, then impacts could be experienced by wastewater treatment plants and sewage collection pipe networks.

3. Discussion of Key Issues

Scope Issues:

1. Should sectors be expanded beyond the single residential setting? At least one commenter suggested expanding the scope to include commercial and institutional settings. The discussion touched on health risks in single-family setting versus settings in which many people are contributing graywater. Committee members reiterated that reusing rainwater, condensate water and even foundation dewatering water, would have been an easier place to start; however, it was acknowledged that this initiative is driven by legislation adopted in 2018.

The group considered whether focusing on only the narrow single-residence setting might make it harder to integrate other water uses later. That is, the group considered the “one water” concept. In particular, it considered the co-mingling of different sources, and recognized that graywater should not be stored with other water types, e.g., rainwater.

Eventually, the group felt that the complexity of taking on all sources at once would be too much, given the challenges we have on our plate for adopting graywater regulations. The Committee reached consensus that it would be wise to limit the scope to single residential graywater for now.

The discussion then shifted to the role of treated graywater quality. Gary A. suggested requiring NSF 350 level of quality, could be a possibility.

The topic of implementation was raised. This led Nony H. to suggest it be done through the onsite sewage disposal system regulations; however, these regulations do not address homes on sewer. This all relates to outdoor use for irrigation.

The use of graywater for toilet flushing was raised. Jim G. mentioned that the state of Oregon allows NSF 350 systems for single residential settings to be installed with solely a plumbing permit. No additional State or local oversight is required.

Saeid K. asked, what is the motivation for graywater reuse? What is the demand or rationale? Nasser suggested that it has to be economically feasible. David D. indicated that water and sewer savings could be a motivator. Barry G. noted that most cases he has observed were motivated by taking stress off of the OSDS.

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Bottom Line: Scope limited to single family residential setting. Irrigation vs indoor toilet flushing addressed below.

2. Should regulations allow surface drip irrigation? The statute calls for surface irrigation; however, the law does not reference “treatment,” which is widely acknowledged as necessary for allowing surface irrigation.

Barry G. said that surface irrigation would have to be in the county water and sewer plan (??)

Gary A. again suggested NSF 350 criteria should be OK.

Jim G. mentioned the consideration of NSF 350-1 with disinfection or with exclusion by fencing might be acceptable in single family residential setting. NSF 350 treatment of BOD and TSS to 10 mg/l (average) was judged excessive by the 2016 National Academies panel on graywater and stormwater. NSF 350-1 has a threshold of about 30 mg/l for BOD and TSS.

Nasser K. asked whether disinfection would be chlorine or UV and seemed to suggest that UV might not work well if TSS and BOD were at 30 mg/l.

Dave D. suggested a role for filtering at 150 microns. However, graywater BOD is characterized by being mostly in dissolved form for which filtering isn't effective.

Tien noted that NSF 350 has a fecal count of 14/100 ml

Bottom Line: The Committee opted for simplification and recommended no surface irrigation at this stage.

4. Use Categories & Types of Approval/Oversight

Based on the prior discussions about the scope of the regulation, this discussion topic was significantly narrowed. The remaining categories to consider are outlined as follows:

- Single Family Residential (including duplexes)
 - Low - Volume subsurface irrigation
 - Intermediate -Volume subsurface Irrigation
 - High - Volume subsurface Irrigation*
 - Toilet flushing*

* Not discussed, but proposals provided below.

The hand-edits, and small-font, notes on the low- and intermediate- flow use categories below reflect the outcome of discussion by the Advisory Committee.

The high-volume subsurface irrigation and toilet flushing are included in these highlights for completeness and have not been discussed by the Committee.

Subsurface Irrigation - Single Residential, Low Flow

Flow* < ~~60~~⁷⁵ gpd x two systems (~~120~~¹⁵⁰ gpd max)

Treatment - None

For Comparison:
Santa Barbara, CA allows registration
for systems up to 250 gpd.

Storage: None ~~or OK < 24hrs?~~ - This includes laundry water
- Climate is much more arid

Pumps: None

Oversight

- Registration – No review & approval, right of entry

* Assumes 25 gpd/capita based on 2018 IPC, no laundry

Subsurface Irrigation - Single Residential, Intermediate Flow

~~120~~¹⁵⁰ gpd < Flow* < 300 gpd

Treatment - None

Storage: No storage ~~or OK < 24hrs?~~

Pumps: OK In-line pumps, possibly with pre- and post- pump
filters (the later being finer).

Oversight

- GP - Design review & approval, right of entry
 - In-home plumbing permit
 - Irrigation installed by certified installer or DIY installation inspection by local authority

* Assumes 25 gpd/capita based on 2018 IPC, no laundry

Subsurface Irrigation - Single Residential, High Flow

Flow* > 300 gpd

Treatment – None or NSF 350

Storage: OK < 24hrs unless treated via NSF 350

Pumps: OK

Oversight

- Indiv Permit – PE Design, plan review & approval
- Plumbing Permit
- Site inspection at construction
- Certification of Maintenance & Annual Reporting
- Right of entry

* Assumes 25 gpd/capita based on 2018 IPC, no laundry

Toilet Flushing - Single Residential

Treatment – NSF 350

Oversight

- Registration – No review & approval by DPW or Health Department
- Plumbing Permit
- Land Record Agreement

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5. Meeting Conclusion

The meeting concluded at 3:30pm. MDE said it would take the guidance provided and produce a revised version of the regulation prior to the next meeting. The next meeting will be in Mid-March or Early April.

Attachment

Potential GWAC Discussion Topics Following Review of Ver 1 Draft Reg.

Scope Issues

1. Should regulations include additional settings/sectors/scales? (broader scope implies more time needed from the Advisory Committee)
 - a. Commercial
 - b. Multi-unit residential
 - c. Institutional
2. Should regulations allow surface drip irrigation (particularly settings with public access)? Other uses (equipment cleaning, sidewalk cleaning, dust suppression, etc? Allowed by NSF 350)? At issue is our confidence in the reliability of small treatment systems and operators to maintain quality, which by the numbers are similar to Class IV.

Approval & Oversight Issues

3. Use Categories & Type of Approval/Oversight:
 - Registration vs
 - General Permit vs
 - Individual Permit
 - Note: Distinction between construction & operating permits.
4. Enforceability: What are reasonable expectations for government oversight? What is the responsibility of the owner/operator? How to manage liability of government oversight bodies - Role of Reporting Maintenance Service?
5. Monitoring
 - a. Performance-Based Vs Technology-Based
 - b. Require for Installation quality verification only (Type 3 quality) in commercial, multi-unit residential and institutional?

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- c. Require for periodic permit renewal?
- d. Require at time of property transfer?

Approving Authority Issues

- 6. Who and what the approving authority is needs to be much more clearly defined. Do the regs need to indicate three interacting agencies are needed to govern the full range of graywater system options? (WSSC comment #F)
- 7. Should MDE regulations call for the adoption of local ordinances and regulations including changes to plumbing codes? (WSSC #G)
- 8. How best to reflect desired International Plumbing Code elements?

Technical Issues

- 9. Should we have Type 2 treated graywater?
 - a. Difference between NSF 350 and NSF 350-1
 - b. Can NSF 350-1 w/o disinfection be stored longer than 24-hours?
- 10. Graywater flow estimates
 - a. Residential: Are we OK with 25 gpd/resident in the 2018 IPC?
 - b. Commercial: IBC (I can't find flows in the IBC).
- 11. Rule of thumb for wastewater strength to avoid PE certification? Are dishwasher, kitchen sink and blackwater flows sufficient?
- 12. When to require PE design certification?
 - a. Commercial, institutional, multi-residential? (toilet flushing, irrigation?)
 - b. Volume threshold?
- 13. Clarification on 04.D & E "Avoid" and ponding.
- 14. Tank venting and odor control. How much detail to include in the Reg vs relying on plumbing code?
- 15. Can we presume that wastewater concentration will not be too strong for onsite wastewater treatment systems if laundry water is not included in the graywater that is diverted? How should the regulation ensure wastewater strength does not exceed a threshold?

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FOLLOW-UP ITEMS from past Advisory Committee Meetings:

A. Work Tasks:

1. Create version 2 draft regulations based on broad guidance of Feb 14, 2020 meeting.
2. Nasser Kamazani will share info. about on-site water reuse with the group, thru MDE, from the International Green Building Code process in which Montgomery County is involved.

B. Regulation-oriented Issues:

1. Clarification or removal of Sec. 2(2)(b).
2. How explicit to be on different levels of approval, e.g., One or two approvals? Plumbing approval for interior and health department approval for irrigation? Nature of the approval: Registration, general permit, individual permit, other?
3. How explicit to be in specifying what entities at the local level have an approval and oversight role.
4. What level of specificity about plumbing details should be included in the regulation?
5. Page 13, E7 - Suggested removal of gravity-only system element.
6. Definition of sewage as relates to graywater

C. Regulation Implementation Issues:

D. Possible Topics of Recommend by the Committee:

1. Consider adding laundry water in statute
2. Change the statute's distance to groundwater to be consistent with septic system rules

E. Questions for Review by Assistant Attorney General:

1. Can regulations be formulated to allow local authorities to opt-in to adopting a graywater program?
2. Can regulations be formulated to allow local authorities to opt-in to parts of a graywater program, e.g., adopting outdoor irrigation but not indoor toilet flushing?
3. Confirm that regulations can define different types of graywater, based on level of treatment, in addition to the definition in statute.
4. Would it be allowable to adopt regulations for irrigation apart from toilet flushing, to be done at a later time?
5. What liabilities to local governments are potentially created by their involvement in approving graywater systems? Can disclaimers help to mitigate this liability?

COMPLETED FOLLOW-UP ITEMS:

A. Work Tasks:

1. David Duree shared information on soil moisture sensors used to automate control of irrigation.

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2. Flow-chart or summary table to describe when certain approvals are needed. WSSC shared how its procedures work at the November 15, 2019 meeting (incorporated into November Meeting Highlights).
3. Nasser Kamazani (Montgomery County) shared guidance on procedures they have used for onsite water reuse pilot projects.
4. Invite graywater system vendors to brief the Committee. -As of 2/14/20 the Committee had no specific suggestions. The invitation remains open.