

Supplemental TABLE S1 Summary of sampling sites, online survey, and sanitary survey

| Sample No. | Sampling date         | Access point  | Connection status  | Spigot distance (inches) | Gutter/Downspout material | Roof material                  | Overhanging trees | Age of barrel (years)                           | % roof connected to barrel | % time shade | Barrel cleaning frequency    | Gutter cleaning frequency | Gutter covers | Wildlife evidence | Size of barrel (gallons) | Time to last rainfall (days)* | Sum of rainfall on 7 days prior to and including sampling day (inches) |
|------------|-----------------------|---|--|--------------------------|---------------------------|--------------------------------|-------------------|---|----------------------------|--------------|------------------------------|---------------------------|---------------|-------------------|--------------------------|-------------------------------|--|
| 1          | 11/17/14              | Hose  | Re-connected   |                          |                           | Tar                            |                   | 3   |                            |              |                              |                           |               |                   | 50-100                   | 0                             | 22.3   |
| 2 and 24   | 11/18/2014, 6/23/2016 | Spigot  | Connected  | 12                       | aluminum                  | unknown                        | yes               | 1 month first sampling, 2 years second sampling |                            |              | never cleaned                |                           |               |                   | 50-100                   | 0 (11/18), 3 (6/23)           | 47.7, 0.8  |
| 3          | 12/12/2014            | Spigot  |  |                          |                           |                                |                   |   |                            |              |                              |                           |               |                   | 50-100                   | 0                             | 45.5   |
| 4          | 11/23/14              | Spigot  | Connected  |                          |                           |                                |                   | 4   |                            |              |                              |                           |               |                   | 50-100                   | 5                             | 38.1   |
| 5 and 23   | 12/2/2014 and 7/13/16 | Hose for first sampling, spigot for second sampling | Connected  | 12                       | aluminum                  | asphalt shingle, tar           | yes               | 3 at first sampling, 5 at second sampling       |                            |              | tank has been cleaned before |                           |               |                   | 50-100                   | 0 (both sampling events)      | 36.4, 29.4   |
| 6          | 12/3/14               | Spigot  | Disconnected   |                          |                           | Unknown                        |                   | new (<1 month)                                  |                            |              |                              |                           |               |                   | 50-100                   | 0                             | 35.7   |
| 7 and 25   | 12/6/2014 and 7/14/16 | Spigot  | Disconnected during first sampling, connected during second sampling | 5.5                      | aluminum                  | Asphalt shingle (11 years old) | yes               | 3   | 75                         | 100          | never cleaned                | yearly                    | No            | No                | 50-100                   | 1 (12/6), 0 (7/14)            | 13.1, 16.8   |
| 8          | 12/6/14               | Spigot  | Disconnected   |                          |                           | Painted flat roof              |                   | 1   |                            |              |                              |                           |               |                   | 50-100                   | 1                             | 13.1   |
| 9          | 12/7/14               | Spigot  | Connected  |                          |                           | slate                          |                   | 3 weeks   |                            |              |                              |                           |               | Yes               | 50-100                   | 1                             | 36.2   |
| 10 and 27  | 12/7/2014, 7/15/16    | Spigot  | Disconnected during first sampling, connected during second sampling | 2.5                      | aluminum                  | unknown                        | no                | 2-3 at first sampling, 4-5 at second sampling   | 75                         |              | never cleaned                | yearly                    |               | Yes               | 50-100                   | 0 (both events)               | 29.1, 16.8   |
| 11         | 12/8/14               | Hose  | Connected  |                          |                           | Plastic greenhouse             |                   | 7 to 8  |                            |              |                              | Gutters cleaned day       |               |                   | >100                     | 1                             | 29.1   |

|    |          |                  |                  |                |                       |  |     |          |     |     |                              |   |   |     |        |        |      |      |
|----|----------|------------------|------------------|----------------|-----------------------|--|-----|----------|-----|-----|------------------------------|---|---|-----|--------|--------|------|------|
|    |          |                  |                  |                |                       |  |     |          |     |     |                              | before<br>sampling                      |   |     |        |        |      |      |
| 12 | 12/12/14 | Spigot           | Connected        |                |                       |  |     |          |     |     |                              |   |   |     |        | 50-100 | 0    | 44.5 |
| 13 | 6/29/16  | Spigot           | Connected        | 4.5            | aluminum              | slate                                  | yes | 3        | 50  | 50  | never<br>cleaned             | never                                   | Yes   | Yes | 50-100 | 1      | 22.9 |      |
| 14 | 6/29/16  | Spigot           | Connected        | 4.5            | steel                 | unknown                                | yes | 2        | 25  | 75  | never<br>cleaned             | Semi-<br>yearly or<br>more as<br>needed | No  | Yes | 50-100 | 1      | 22.9 |      |
| 15 | 6/29/16  | Spigot           | Connected        | < 6            | aluminum              | asphalt<br>shingle                     | yes | 10       | 50  | 100 | once (>1-<br>2 years<br>ago) | Yearly                                  | No  | Yes | 50-100 | 1      | 22.9 |      |
| 16 | 7/7/16   | Spigot           | Connected        | 12             | aluminum              | slate                                  | no  | 1        | 50  | 100 | never<br>cleaned             | never                                   | No  | Yes | 50-100 | 2      | 16.1 |      |
| 17 | 7/7/16   | Spigot           | Connected        | 1.5            | aluminum              | asphalt<br>shingle- 4<br>year old roof | no  | 8        | 75  | 25  | >3 years                     | never                                   | Yes   | Yes | 50-100 | 2      | 16.1 |      |
| 18 | 7/7/16   | Spigot           | Connected        | 0 at<br>bottom | aluminum              | asphalt<br>shingle                     | yes | 3        | 50  | 50  | never<br>cleaned             | yearly                                  | Yes   | Yes | 50-100 | 2      | 16.1 |      |
| 19 | 7/7/16   | Spigot           | Connected        | 5              | aluminum              | asphalt<br>shingle                     | no  |          |     | 50  | never<br>cleaned             |   |   |     | 50-100 | 2      | 16.1 |      |
| 20 | 7/11/16  | Top of<br>barrel | Not<br>connected |                | aluminum              | plastic<br>sheeting                    | no  | >1       | 100 | 50  | never<br>cleaned             | never                                   | No<br>but<br>screen<br>over<br>top of<br>barrel | No  | 50-100 | 1      | 14.8 |      |
| 21 | 7/12/16  | Spigot           | Connected        | 16             | aluminum              | unknown                                | yes | 4        | 33  | 50  | never<br>cleaned             | never                                   | No  |     | 50-100 | 3      | 10.4 |      |
| 22 | 7/12/16  | Spigot           | Connected        | 0              | Aluminium,<br>plastic | plastic<br>sheeting                    | no  | 5        | 75  | 25  | never<br>cleaned             | Never                                   | No  | Yes | 250    | 1      | 14.8 |      |
| 26 | 7/14/16  | Spigot           | Connected        | 4              | aluminum              | asphalt<br>shingle                     | yes | 2-3, 5-6 |     | 75  | never<br>cleaned             | yearly                                  | No  | Yes | 50-100 | 0      | 16.8 |      |
| 28 | 7/14/16  | Spigot           | Connected        | 0 at<br>bottom | aluminum              | asphalt<br>shingle                     | no  |          |     |     | never<br>cleaned             |   |   |     | 50-100 | 0      | 16.8 |      |
| 29 | 7/14/16  | Spigot           | Connected        | 2.5            | aluminum              | unknown                                | no  |          |     |     | never<br>cleaned             |   |   |     | 50-100 | 0      | 16.8 |      |
| 30 | 7/14/16  | Spigot           | Connected        | 3              | aluminum              | unknown                                | no  |          |     |     | never<br>cleaned             |   |   |     | 50-100 | 0      | 16.8 |      |
| 31 | 8/14/16  | Spigot           | Connected        | <6             | aluminum              | unknown                                | Yes |          |     |     | never<br>cleaned             | never                                   | no  |     | 50-100 | 2      | 1.3  |      |
| 32 | 7/14/16  | Spigot           | Connected        | <6             | aluminum              | unknown                                | No  |          |     |     | never<br>cleaned             | never                                   | no  |     | 50-100 | 0      | 16.8 |      |

|    |          |             |           |     |          |  |         |              |       |     |               |  |     |    |         |   |      |
|----|----------|-------------|-----------|-----|----------|--|---------|--------------|-------|-----|---------------|--|-----|----|---------|---|------|
| 33 | 7/21/16  | Spigot      | Connected | 16  | aluminum | tar and polyethylene sheeting-redone in March 2015 | no      | 1            |       |     | never cleaned | never                                  |     |    | 50-100  | 2 | 43.7 |
| 34 | 7/21/16  | Spigot      | Connected | 4   | unknown  | asphalt shingle, multi-layer                       | unknown |              |       |     | never cleaned | twice yearly                           | No  |    | unknown | 3 | 10.2 |
| 36 | 7/21/16  | Spigot      | Connected | 7.5 | aluminum | asphalt shingle                                    | yes     | 10-11 months |       | 100 | never cleaned |  | Yes |    | >100    | 2 | 43.7 |
| 37 | 7/21/16  | Garden hose | Connected | 3   | aluminum | asphalt shingle                                    | yes     |              |       |     | never cleaned |  |     |    | 50-100  | 2 | 43.7 |
| 38 | 8/3/2016 | Spigot      | Connected | <6  | aluminum | Rubber flat, asphalt shingle                       | no      |              | 25-50 |     | >6-12 months  | Cleaned before gutter guards installed | Yes | No |         | 1 | 40.9 |
| 39 | 8/4/2016 | Spigot      | Connected | 1.5 | aluminum | Rubber roof with white/silver coating              | No      | <1           |       |     | never         | never                                  |     |    | 50-100  | 2 | 40.9 |

\*For time = 0, rainfall occurred on sampling day

**Supplemental TABLE S2** Results of Kendall's Tau correlations between contaminants and meteorological (2014 and 2016 data) or survey parameters for 2016 data. Microbiological parameters with fewer than 5 positive detections were excluded. Significant values are bold-faced with  $\alpha_{\text{corrected}} = 0.05/4 = 0.0125$ .

| Parameter                | Spigot distance<br>(Continuous) | Barrel age<br>(Continuous) | Sum of rainfall<br>during 7 antecedent<br>days to sampling<br>event (Continuous) | Time to last rainfall<br>(Continuous) |
|--------------------------|---------------------------------|----------------------------|--|---------------------------------------|
| <i>E. coli</i>           | 0.037 (0.802)                   | -0.044 (0.861)             | 0.145 (0.282)  | -0.203 (0.115)                        |
| <i>Enterococcus</i> spp. | -0.087 (0.546)                  | -0.044 (0.861)             | 0.139 (0.320)  | -0.292 (0.028)                        |
| <i>Acanthamoeba</i> spp. | -0.03 (0.724)                   | -0.047 (0.575)             | 0.014 (0.853)  | -0.027 (0.672)                        |
| <i>Legionella</i> spp.   | -0.007 (0.981)                  | -0.145 (0.248)             | -0.087 (0.425)   | 0.115 (0.263)                         |
| <i>M. avium</i>          | 0.063 (0.560)                   | -0.062 (0.353)             | 0.073 (0.337)  | -0.061 (0.365)                        |
| <i>M. intracellulare</i> | -0.047 (0.724)                  | 0.170 (0.198)              | 0.038 (0.712)  | 0.003 (0.988)                         |
| Lead                     | -0.053 (0.718)                  | -0.275 (0.174)             | 0.009 (0.964)  | -0.019 (0.908)                        |
| Zinc                     | -0.080 (0.582)                  | 0.022 (0.955)              | -0.092 (0.516)   | 0.009 (0.963)                         |

## Philadelphia rainwater barrel contact information.

Please provide the details for the owner or person responsible for the rainwater barrel whom we should contact directly about water sampling. All information will be kept confidential and will not be shared. This information is used to plan our sampling program only.

1. Last name

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2. First name

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3. Preferred email address

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4. Preferred phone number

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5. Street address of rainwater barrel location  
(Example: 123 Walnut Street)

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6. Zip code:

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7. Please indicate your preferred sampling date (Month/Day). Choose a weekday between Wednesday June 29th through Tuesday, July 19th, 2016.

Kerry and a sampling assistant will visit your barrel location during normal business hours (9am-5pm) and it should take <10 minutes. Please contact Kerry ([kahamilton17@gmail.com](mailto:kahamilton17@gmail.com)) if additional days/ weekend days are needed.

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8. Please indicate your preferred sampling time.

Please indicate a time between 9am and 5pm if possible. If additional times are needed please contact Kerry ([kahamilton17@gmail.com](mailto:kahamilton17@gmail.com))

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9. How many tanks are on your property would like us to sample?

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## System materials and characteristics

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10. I got my barrel from:

Please indicate the source of your rainwater barrel.

Mark only one oval.

- The Philadelphia Water Department "Rain Check Program"
- A private vendor
- Other: \_\_\_\_\_

11. Size of rainwater barrel

Please indicate the size of your rainwater barrel

Mark only one oval.

- <50 gallons
- 50-100 gallons
- >100 gallons
- Not sure

12. Age of barrel (years)

Please provide the approximate age of your rainwater barrel in years.

\_\_\_\_\_

13. Barrel material

Mark only one oval.

- Polyethylene (Plastic)
- Galvanized/ Metal
- Concrete
- Fiberglass
- Wood
- Not sure
- Other: \_\_\_\_\_

**14. Gutter material**

*Mark only one oval.*

- Aluminum
- PVC
- Steel
- Not sure
- Other: \_\_\_\_\_

**15. Type of roof material?**

*Mark only one oval.*

- Asphalt shingle
- Modified bitumen
- Metal
- Rubber (EPDM or TPO)
- Clay/concrete tile
- Slate
- Green roof
- Cool roof
- Not sure
- Other: \_\_\_\_\_

**16. What proportion of the roof is connected to the barrel?**

*Mark only one oval.*

- 1/4
- 1/2
- 3/4
- All
- Other: \_\_\_\_\_

**17. Presence of overhanging trees on the roof?**

*Mark only one oval.*

- Yes
- No (5% or less)

**18. Is the rainwater barrel connected to a pump?**

*Mark only one oval.*

- Yes
- No
- Not sure

**19. TV aerial or antenna on the roof?**

*Mark only one oval.*

- Yes
- No

**20. % of time that the barrel is in the shade morning/afternoon**

*Mark only one oval.*

- 0%
- 25%
- 50%
- 75%
- 100%

## Maintenance

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**21. How frequently is the barrel cleaned?**

*Mark only one oval.*

- 1-3 months
- >3-6 months
- >6-12 months
- >1-2 years
- >2-3 years
- >3 years
- Never cleaned

**22. How frequently are the gutters cleaned?**

*Mark only one oval.*

- weekly
- monthly
- yearly
- never been cleaned
- Other: \_\_\_\_\_

**23. Do you use gutter covers or screens (gutter guards)?**

Gutter covers or screens are meshes that fit over gutters to prevent leaves or debris from building up.

*Mark only one oval.*

- Yes
- No

## Uses and treatment of rainwater

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**24. How is the rainwater from the barrel used?**

Please check all that apply.  
*Check all that apply.*

- Drinking
- Cooking
- Car washing
- Clothes laundering
- Bathing
- Showering
- Gardening
- Toilet flushing
- Filling a swimming pool
- Pets
- Other: \_\_\_\_\_

**25. Any previous testing done on rain barrel water quality?**

*Check all that apply.*

- Microbial quality
- Chemical quality
- Never been tested
- Other: \_\_\_\_\_

**26. Is rain barrel water treated before use?**

*Mark only one oval.*

- Yes
- No

**27. What treatment method is applied before use?**

*Mark only one oval.*

- No treatment method
- Chlorine
- Filtration
- Boiling
- UV
- Other: \_\_\_\_\_

**28. Is there a first flush diverter installed?**

First flush diverters remove the first wash of water that flows over the roof so that it does not enter the barrel.

*Mark only one oval.*

- Yes
- No

29. Is there evidence of wildlife or wildlife droppings on the roof? (birds, mice, rats, cats, etc.)

*Mark only one oval.*

Yes

No

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