Attachment A

Division: Water Resource Management
Rules: 62-555.330.330, Engineering References for Public Water Systems, F.A.C.
62-555.360, Cross-Connection Control for Public Water Systems, F.A.C.
62-555.900, Forms and Instructions, F.A.C.

IV. Information on Potential Savings

a. Potential Savings to Community Water Systems (CWSs) and Their Residential Customers Resulting from the Department of Environmental Protection (DEP) Allowing a Dual Check Device (DuC) to Be Used as Backflow Protection at Service Connections from CWSs to Residential Premises Where There Is Any Type of Auxiliary or Reclaimed Water System

The current cross-connection control rules for public water systems allow a DuC to be provided as backflow protection only at service connections from CWSs to residential premises where there is a reclaimed water system—i.e., an auxiliary water system using reclaimed water. These current rules require that a reduced-pressure principle assembly (RP) or a double check valve assembly (DCVA) be provided at service connections to residential premises where there is an auxiliary water system using a source of water other than reclaimed water. (An RP is required if the source of water is a health hazard, and a DCVA is required if the source of water is not a health hazard.) Under this rulemaking, the DEP is amending Rule 62-555.360 to allow a DuC to be used as backflow protection at service connections to residential premises where there is any type of auxiliary or reclaimed water system.

To estimate the potential savings resulting from this rule amendment, the DEP estimates the following:

- There are approximately 1.84 million residential premises in Florida that are served by a CWS, that have an auxiliary water system using a source of water other than reclaimed water, and that, therefore, are potentially affected by this rule amendment; see Exhibits A-1 and A-2.
- The equivalent uniform annual cost (EUAC) for installing, testing, and maintaining an RP or a DCVA at a service connection to a residential premises is approximately $114 or $102, respectively; see Exhibits A-3 and A-4.
- The EUAC for installing and maintaining a DuC at a service connection to a residential premises is approximately $19; see Exhibit A-5.

Furthermore, the DEP assumes about 50% of the estimated 1.84 million residential premises in Florida that are served by a CWS and that have an auxiliary water system using a source of water other than reclaimed water will use a DuC, instead of an RP or a DCVA, at the service connection to the premises. Therefore, the DEP estimates that the potential statewide savings from this rule amendment will be about…

{(1.84 million service connections)(0.50)} x {($102 to $114, say $108, per year per service connection) – ($19 per year per service connection)} = $81.9 million per year.

b. Potential Savings to CWSs and Their Residential Customers Resulting from the DEP Allowing Biennial Instead of Annual Testing of Backflow Preventer Assemblies Required at Service Connections from CWSs to Residential Premises

The current cross-connection control rules for public water systems require annual testing of all backflow preventer assemblies required at all service connections from CWSs. Under this rulemaking, the DEP is amending Rule 62-555.360 to allow biennial instead of annual testing of those backflow preventer assemblies required at service connections from CWSs to residential premises.

To estimate the potential savings resulting from this rule amendment, the DEP estimates the following:

- There are approximately 2.15 million residential premises in Florida that are served by a CWS, that have an auxiliary water system using either reclaimed water or a source of water other than reclaimed water, and that, therefore, are potentially affected by this rule amendment; see exhibits A-1 and A-2.
- There are approximately 0.13 million dedicated irrigation service connections to residential premises in Florida that are potentially affected by this rule amendment; see Exhibits A-1 and A-6.
- The EUAC for annually testing a backflow preventer assembly at a service connection to a residential premises is approximately $50; see Exhibit A-7.
- The EUAC for biennially testing a backflow preventer assembly at a service connection to a residential premises is approximately $24; see Exhibit A-7.

Furthermore, the DEP assumes the following:

- As a result of the rule amendment described under IV.a. above, only about 50% of the estimated 2.15 million residential premises in Florida that are served by a CWS and that have an auxiliary water system using either reclaimed water or a source of water other than reclaimed water will use an RP or a DCVA, instead of a DuC, at the service connection to the premises.
- About 50% of the RPs and DCVAs at service connections to residential premises in Florida that have an auxiliary water system will be tested biennially instead of annually.
- About 50% of the backflow preventer assemblies—i.e., RPs, DCVAs, and pressure vacuum-breaker assemblies—at the estimated 0.13 million dedicated irrigation service connections to residential premises in Florida will be tested biennially instead of annually.

Therefore, the DEP estimates that the potential statewide savings from this rule amendment will be about…

{[(2.15 million service connections)(0.50)(0.50)] + [(0.13 million service connections)(0.50)]} x {($50 per year per service connection) – ($24 per year per service connection)} = $15.6 million per year.

c. Potential Savings to DEP* Resulting from DEP Requiring Large CWSs to Submit Annual Cross-Connection Control Program Reports

Under this rulemaking, the DEP is amending Rule 62-555.360 to require large CWSs—i.e., CWSs serving more than 10,000 persons—to submit annual cross-connection control program reports. In addition to enabling the DEP* to better ascertain the operational adequacy of large CWSs, these annual reports will enable the DEP* to more efficiently conduct sanitary surveys of large CWSs. DEP* staff will be able to spend less time reviewing cross-connection control information during triennial sanitary surveys of large CWSs.

To estimate the potential savings to DEP* resulting from this rule amendment, the DEP estimates the following:

- There are 241 large CWSs (FDEP, Public Water System Database).
- The annual cross-connection control program reports required from large CWSs will enable DEP* staff to spend one to three person-hours less reviewing cross-connection control information during each triennial sanitary survey of a large CWS.
- The average total compensation for all state and local government personnel is approximately $42 per hour (USDL, Bureau of Labor Statistics, National Compensation Survey).

Furthermore, the DEP assumes that DEP* staff will spread out triennial sanitary surveys of large CWSs so that about 33% of these surveys are conducted each year. Therefore, the DEP estimates that the potential savings to the DEP* from this rule amendment will be about…

{(241 sanitary surveys) / (3 years)} x {1 to 3 person-hours per sanitary survey, say 2 person-hours per sanitary survey} x {$42 per person-hour} = $6,700 per year.

d. References

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* As used here, DEP means the DEP and the eight county health departments approved to implement the public water system supervision program.

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Exhibit A-1: Total Number of Residential Premises Served by a Community Water System (CWS) in Florida

Method A-1.1

- There are approximately 6,207,200 total active service connections from active CWSs in Florida (FDEP, Public Water System Database).
- Approximately 86% of service connections from CWSs are residential domestic service connections (Lee, p. 15).
- The total number of residential premises served by a CWS in Florida ≈ 6, 207,200 x 0.86 ≈ 5,338,200.

Method A-1.2

- There are approximately 4,848,100 detached one-family dwelling units in Florida + 556,000 attached one-family dwelling units in Florida + 199,100 two-family dwelling units in Florida + 850,100 mobile homes in Florida ≈ 6,453,300 one- or two-family dwelling units in Florida (USDC, Census Bureau).
- Approximately 90% of Florida's residents obtain their drinking water from a CWS (Marella, p. 13).
- The total number of residential premises served by a CWS in Florida ≈ 6,453,300 x 0.90 ≈ 5,808,000.

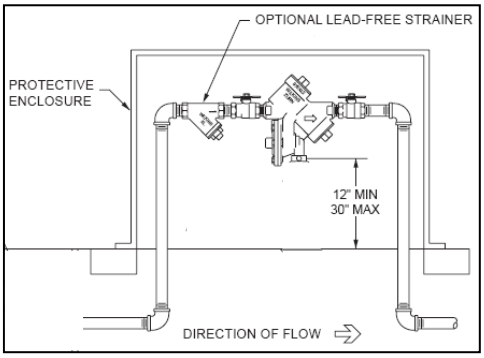
Use (5,338,200 + 5,808,000) / 2 = 5,573,100 total residential premises served by a CWS in Florida.

Exhibit A-2: Total Number of Residential Premises That Are Served by a Community Water System (CWS) in Florida and That Have an Auxiliary Water System Using Either Reclaimed Water or a Source of Water Other Than Reclaimed Water

- There are approximately 5,573,100 total residential premises served by a CWS in Florida; see Exhibit A-1.
- Approximately 3% (5,573,100 x 0.03 ≈ 167,193) of residential premises served by a CWS in Florida have a reclaimed water system—i.e., an auxiliary water system using reclaimed water (Whitcomb, p. 80). Or, approximately 311,100 (311,100 / 5,573,100 ≈ 0.06 or 6%) of residential premises served by a CWS in Florida have a reclaimed water system (FDEP, *2011 Water Reuse Inventory*, p. 4).
- Approximately 28% of residential premises served by a CWS in Florida have an auxiliary water system using well water, approximately 4% of residential premises served by a CWS in Florida have an auxiliary water system using surface water, and approximately 1% of residential premises served by a CWS in Florida have an auxiliary water system using a source of water other than well water, surface water, and reclaimed water (Whitcomb, p. 80). Thus, approximately 33% of residential premises served by a CWS in Florida have an auxiliary water system using a source of water other than reclaimed water.
- The total number of residential premises that are served by a CWS in Florida and that have an auxiliary water system using a source of water other than reclaimed water ≈ 5,573,100 x 0.33 ≈ 1,839,100.

Exhibit A-3: Equivalent Uniform Annual Cost (EUAC) for Installing, Testing, and Maintaining a Reduced-Pressure Principle Assembly (RP) at a Service Connection from a Community Water System (CWS) to a Residential Premises

- An RP has a useful life of about 40 years (USEPA, p. 9).
- The cost for initial installation and testing of a ¾- or 1-inch, lead-free RP meeting NSF Standard 61 is approximately $615[†] to $725[†], say $670[†] average, based on the following:
  - Approximately $265 or $280 for a ¾- or 1-inch, lead-free RP meeting NSF Standard 61 (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 36) + $35 for a lead-free thermal expansion pressure relief valve (DrillSpot.com; Watts Regulator Company, p. 33; and W.W. Grainger, Inc.) + $20 or $30 for ¾- or 1-inch Schedule 80 PVC pipe and fittings that meet NSF Standard 61 and that are painted or wrapped where exposed to sunlight (CompletePlumbingSource.com; PVCFittingsOnline.com; and W.W. Grainger, Inc.) or $75 or $115 for ¾- or 1-inch Type K hard copper pipe, and lead-free copper fittings, meeting NSF Standard 61 (CompletePlumbingSource.com and W.W. Grainger, Inc.).



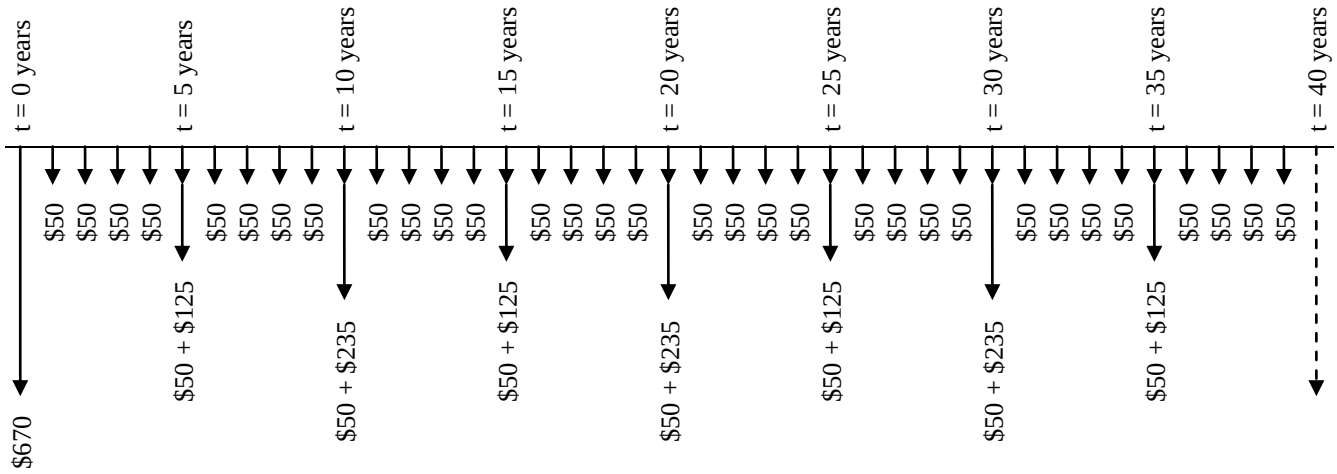
  - Approximately 2.5 person-hours of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
  - Approximately $55 for a building/plumbing permit (City of Tallahassee and Miami-Dade County Building Department)
- An RP should be tested annually (AWWA, 1990, p. 80; AWWA, 2004, pp. 17 & 59), and the cost for testing a ¾- or 1-inch RP is approximately $50 (Jim Bennett's Plumbing, Inc., et al).
- The internal rubber parts of an RP will need to be replaced about every five years (Inman); and the cost for this repair, plus follow-up testing, of a ¾- or 1-inch RP is approximately $125 based on the following:
  - Approximately $30 for rubber parts (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 83).
  - Approximately one person-hour of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).

Exhibit A-3 continued on next page.

[†] This cost excludes the cost of any freeze protection, concrete pad, enclosure, or test cock locks. Some or all of these additional items might be necessary, required, or desired in some locations.

Exhibit A-3 continued from previous page.

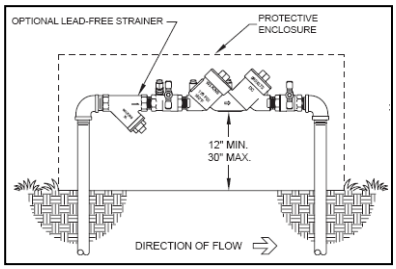
- An RP will need to be totally refurbished (by replacement of all internal parts, including rubber parts) about every 10 years (Inman); and the cost for this repair, plus follow-up testing, of a ¾- or 1-inch RP is approximately $235 based on the following:
  - Approximately $90 for parts (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 83).
  - Approximately 1.5 person-hours of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
- Cash flow diagram:



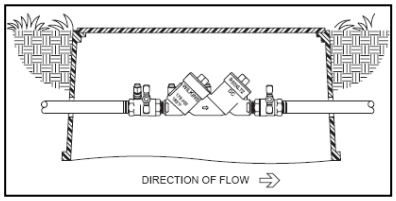
- The U.S. Environmental Protection Agency discount rate for fiscal year 2013 is 4.125 percent (Yee).
- The EUAC for installing, testing, and maintaining a ¾- or 1-inch, lead-free RP meeting NSF Standard 61 at a service connection from a CWS to a residential premises ≈ {$670 + ($50)(P/A,4.125%,39) + ($125)(P/F,4.125%,5) + ($235)(P/F,4.125%,10) + ($125)(P/F,4.125%,15) + ($235)(P/F,4.125%,20) + ($125)(P/F,4.125%,25) + ($235)(P/F,4.125%,30) + ($125)(P/F,4.125%,35)} x {A/P,4.125%,40} ≈ {$670 + ($50)(19.23) + ($125)(0.8170) + ($235)(0.6675) + ($125)(0.5453) + ($235)(0.4456) + ($125)(0.3640) + ($235)(0.2974) + ($125)(0.2430)} x {0.0515} ≈ {$670 + $962 + $102 + $157 + $68 +$105 + $46 +$70 + $30} x {0.0515} ≈ {$2,210} x {0.0515} ≈ $114.

Exhibit A-4: Equivalent Uniform Annual Cost (EUAC) for Installing, Testing, and Maintaining a <u>Double Check Valve Assembly (DCVA)</u> at a Service Connection from a Community Water System (CWS) to a Residential Premises

- A DCVA has a useful life of about 40 years (USEPA, p. 9).
- The cost for initial installation and testing of a ¾- or 1-inch, lead-free DCVA meeting NSF Standard 61 is approximately $470‡ to $580‡, say $525‡ average, based on the following:
  - <u>If the DCVA is installed above ground</u>, approximately $120 or $135 for a ¾- or 1-inch, lead-free DCVA meeting NSF Standard 61 (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 22) + $35 for a lead-free thermal expansion pressure relief valve (DrillSpot.com; Watts Regulator Company, p. 33; and W.W. Grainger, Inc.) + $20 or $30 for ¾- or 1-inch Schedule 80 PVC pipe and fittings that meet NSF Standard 61 and that are painted or wrapped where exposed to sunlight (CompletePlumbingSource.com; PVCFittingsOnline.com; and W.W. Grainger, Inc.) or $75 or $115 for ¾- or 1-inch Type K hard copper pipe, and lead-free copper fittings, meeting NSF Standard 61 (CompletePlumbingSource.com and W.W. Grainger, Inc.).



  - <u>If the DCVA is installed below ground</u>, approximately $120 or $135 for a ¾- or 1-inch, lead-free DCVA meeting NSF Standard 61 + $10 or $15 for ¾- or 1-inch Schedule 80 PVC fittings meeting NSF Standard 61 or $25 or $45 for ¾- or 1-inch lead-free copper fittings meeting NSF Standard 61 + $35 for a valve box (Lowe's) + $55 for a lead-free thermal expansion tank meeting NSF Standard 61 (Air Delights, Inc.; Lowe's; Watts Regulator Company, p. 37; and Zurn Wilkins, p. 74).



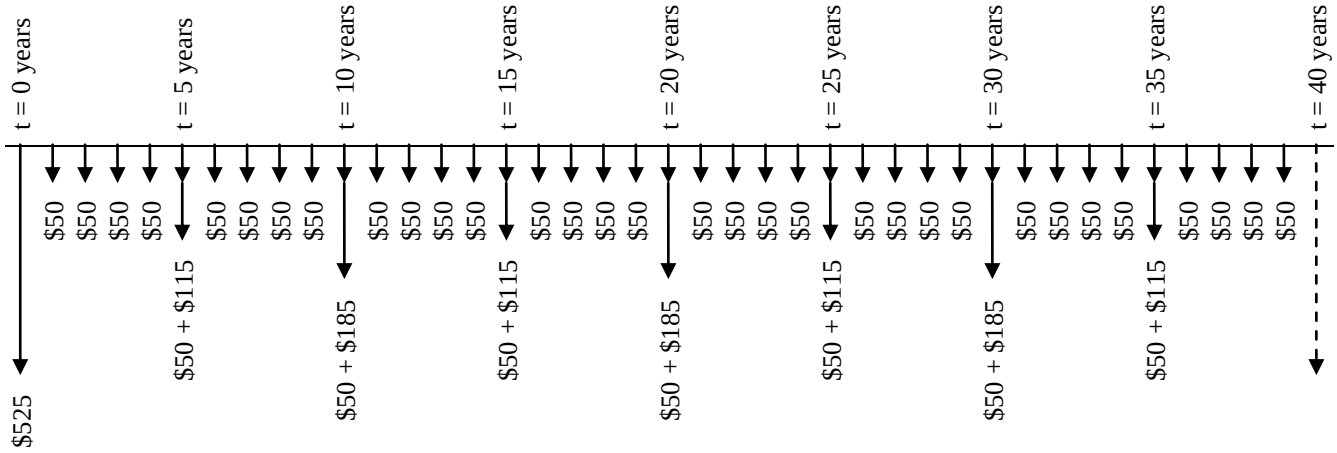
  - Approximately 2.5 person-hours of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
  - Approximately $55 for a building/plumbing permit (City of Tallahassee and Miami-Dade County Building Department).
- A DCVA should be tested annually (AWWA, 1990, p. 80; AWWA, 2004, pp. 17 & 59), and the cost for testing a ¾- or 1-inch DCVA is approximately $50 (Jim Bennett's Plumbing, Inc., et al).

Exhibit A-4 continued on next page.

‡ This cost excludes the cost of any freeze protection, concrete pad, or enclosure for aboveground installations and excludes the cost of any test cock locks. Some or all of these additional items might be necessary, required, or desired in some locations.

Exhibit A-4 continued from previous page.

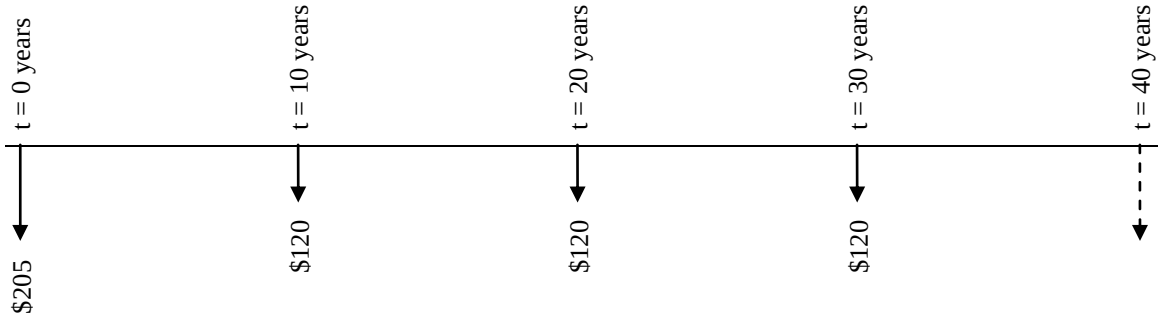
- The internal rubber parts of a DCVA will need to be replaced about every five years (Inman); and the cost for this repair, plus follow-up testing, of a ¾- or 1-inch DCVA is approximately $115 based on the following:
  - Approximately $20 for rubber parts (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 83).
  - Approximately one person-hour of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
- A DCVA will need to be totally refurbished (by replacement of all internal parts, including rubber parts) about every 10 years (Inman); and the cost for this repair plus, follow-up testing, of a ¾- or 1-inch DCVA is approximately $185 based on the following:
  - Approximately $40 for parts (Backflow Parts Connection; Backflow Parts USA; CompletePlumbingSource.com; Inman; Water Specialties Company; and Zurn Wilkins, p. 83).
  - Approximately 1.5 person-hours of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
- Cash flow diagram:



- The U.S. Environmental Protection Agency discount rate for fiscal year 2013 is 4.125 percent (Yee).
- The EUAC for installing, testing, and maintaining a ¾- or 1-inch, lead-free DCVA meeting NSF Standard 61 at a service connection from a CWS to a residential premises ≈ {$525 + ($50)(P/A, 4.125%,39) + ($115)(P/F,4.125%,5) + ($185)(P/F,4.125%,10) + ($115)(P/F,4.125%,15) + ($185)(P/F,4.125%,20) + ($115)(P/F,4.125%,25) + ($185)(P/F,4.125%,30) + ($115)(P/F,4.125%,35)} x {A/P,4.125%,40} ≈ {$525+ ($50)(19.23) + ($115)(0.8170) + ($185)(0.6675) + ($115)(0.5453) + ($185)(0.4456) + ($115)(0.3640) + ($185)(0.2974) + ($115)(0.2430)} x {0.0515} ≈ {$525 + 962 + $94 + $123 + $63 + $82 +$42 + $55 +$28} x {0.0515} ≈ {$1,974} x {0.0515} ≈ $102.

Exhibit A-5: Equivalent Uniform Annual Cost (EUAC) for Installing, Testing, and Maintaining a Dual Check Device (DuC) at a Service Connection from a Community Water System (CWS) to a Residential Premises

- A DuC has a useful life of about 40 years (USEPA, p. 9).
- The cost for initial installation of a ¾- or 1-inch, lead-free DuC meeting NSF Standard 61 is approximately $200 to $205, say $205 average, based on the following:
  - Approximately $30 for a ¾- or 1-inch, lead-free DuC meeting NSF Standard 61 (CompletePlumbingSource.com; Inman; and Zurn Wilkins, p. 56) + $5 for ¾- or 1-inch Schedule 80 PVC fittings meeting NSF Standard 61 (CompletePlumbingSource.com; PVCFittingsOnline.com; and W.W. Grainger, Inc.) or $5 or $10 for ¾- or 1-inch, lead-free copper fittings meeting NSF Standard 61 (CompletePlumbingSource.com and W.W. Grainger, Inc.) + $15 for a valve box if the DuC is not placed in the meter box (Lowe's) + $55 for a lead-free thermal expansion tank meeting NSF Standard 61 (Air Delights, Inc.; Lowe's; Watts Regulator Company, p. 37; and Zurn Wilkins, p. 74).
  - Approximately one person-hour of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
- A DuC will need to be totally refurbished (by replacement of all internal parts) about every 10 years at a cost of approximately $120 based on the following:
  - Approximately $25 for parts (Backflow Parts Connection; Inman; Water Specialties Company; and Zurn Wilkins, p. 84).
  - Approximately one person-hour of labor by a plumbing contractor at $95/hour (Jim Bennett's Plumbing, Inc., et al).
- Cash flow diagram:



- The U.S. Environmental Protection Agency discount rate for fiscal year 2013 is 4.125 percent (Yee).
- The EUAC for installing and maintaining a ¾- or 1-inch, lead-free DuC meeting NSF Standard 61 at a service connection from a CWS to a residential premises ≈ {$205 + ($120)(P/F,4.125%,10) + ($120)(P/F,4.125%,20) + ($120)(P/F,4.125%,30)} x { A/P,4.125%,40} ≈ {$205 + ($120)(0.6675) + ($120)(0.4456) + ($120)(0.2974)} x {0.0515} ≈ {$205 + $80 + $53 + $36}x {0.0515} ≈ {$374} x {0.0515} ≈ $19.

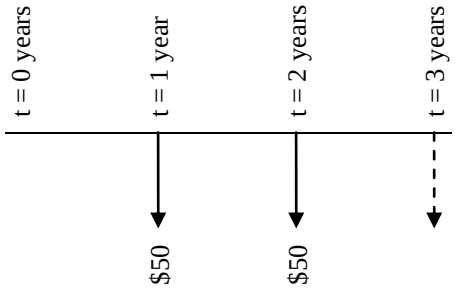
Exhibit A-6: Total Number of Dedicated Irrigation Service Connections from Community Water Systems (CWSs) in Florida to Residential Premises

- There are approximately 6,207,200 total active service connections from active CWSs in Florida (FDEP, Public Water System Database).
- Approximately 2% of service connections from CWSs are dedicated irrigation service connections (Lee, p. 15).
- Approximately 86% of service connections from CWSs are residential domestic service connections (Lee, p. 15).
- Approximately 9% of service connections from CWSs are commercial/industrial domestic service connections (Lee, p. 15).
- Assume the ratio of residential dedicated irrigation service connections to commercial/industrial dedicated irrigation service connections is approximately the same as the ratio of residential domestic service connections to commercial/industrial domestic service connections.
- The total number of dedicated irrigation service connections from CWSs in Florida to residential premises ≈ 6, 207,200 x 0.02 x {0.86 / (0.86 + 0.09)} ≈ 6, 207,200 x 0.02 x 0.91 ≈ 113,000.

Exhibit A-7: Equivalent Uniform Annual Cost (EUAC) for Annually or Biennially Testing a Backflow Preventer Assembly at a Service Connection from a Community Water System (CWS) to a Residential Premises

Annual Testing

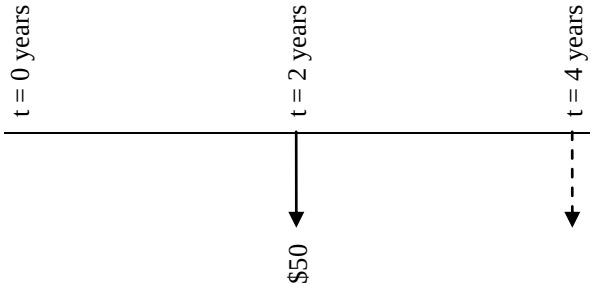
- The cost for testing a ¾- or 1-inch backflow preventer assembly is approximately $50 (Jim Bennett's Plumbing, Inc., et al).
- Cash flow diagram:



- The EUAC for annually testing a ¾- or 1-inch backflow preventer assembly at a service connection from a CWS to a residential premises = $50.

Biennial Testing

- The cost for testing a ¾- or 1-inch backflow preventer assembly is approximately $50 (Jim Bennett's Plumbing, Inc., et al).
- Cash flow diagram:



- The U.S. Environmental Protection Agency discount rate for fiscal year 2013 is 4.125 percent (Yee).
- The EUAC for biennially testing a ¾- or 1-inch backflow preventer assembly at a service connection from a CWS to a residential premises ≈ ($50)(A/F,4.125%,2) ≈ ($50)(0.4899) ≈ $24.