

**2019 ANNUAL METER TESTING REPORT**  
**FOR**  
**GRAYSON COUNTY WATER DISTRICT**  
**5/8- x 3/4-INCH BADGER MODEL 25 METERS**

**CASE NO. 2019-00115**

December 31, 2020

## **2019 ANNUAL METER TESTING REPORT**

### **SECTION 1.0 EXECUTIVE SUMMARY**

Grayson County Water District (“GCWD”) is filing this 2019 Annual Meter Testing Report as required by the Public Service Commission’s (“Commission”) Order dated April 28, 2020 in Case No. 2019-00115.

This 2019 Annual Meter Testing Report provides information for the following meter lots:

- 2006 Meters (meters which were installed during calendar year 2006), Year 13 Test Results

All meter lots passed at each flow rate using the relevant ANSI Standard.

### **SECTION 2.0 INTRODUCTION**

GCWD is a water utility located in Grayson County, Kentucky. On April 11, 2019, GCWD filed an application with the Commission requesting a deviation from the testing frequency requirements of 807 KAR 5:066, Section 16(1), in order to implement sample testing of 5/8- x 3/4-inch Badger Model 25 meters 13 years of age and older in accordance with its sample meter testing plan (“Plan”). The case was assigned Case No. 2019-00115.

As part of GCWD’s Plan, GCWD committed to submitting an annual report to the Commission detailing the test results. The report would include the sample test results for each year and detail whether each sample was accepted using approved statistical testing methods. The report would also include any abnormal meter results that were not used in determining the acceptability of the sample, along with an explanation of why the particular meter result was discarded.

On April 28, 2020, the Commission issued a final order in Case No. 2019-00115. The Commission approved GCWD’s Plan with limited modifications and granted GCWD a deviation from the testing frequency requirements of 807 KAR 5:066, Section 16(1). The Commission also required GCWD’s annual reports of its sample testing to include the following:

1. The serial number, manufacturer, and model/form/type of each meter tested;
2. The date that each meter was tested;
3. The total water flow through the meter from the date it was placed in service through the date of sample testing as recorded at the time of testing;
4. An excel spreadsheet, with formulas intact, containing the raw data collected from each meter tested and showing the calculations detailed in the ANSI/ASQ Standards on which GCWD relied in conducting or analyzing its sample testing;
5. The results of GCWD’s calculations and an explanation of whether each sample was passed at each flow rate using the relevant ANSI/ASQ Standards;
6. An explanation of any abnormal meter results that were excluded or otherwise not used in determining whether a sample passed;
7. A detailed explanation, as discussed above, of the basics of excluding a meter or a group of meters from a sample group or replacing them, including the test results at each flow level for the excluded meter;

8. The total number of meters in a particular lot in service at the time GCWD performed the sample testing; and
9. Any other information GCWD has deemed relevant and necessary to review the accuracy of the meters tested.

This 2019 Annual Meter Testing Report provides information for the following meter lots:

- 2006 Meters (meters which were installed during calendar year 2006), Year 13 Test Results

All meter lots passed at each flow rate using the relevant ANSI Standard.

**SECTION 3.0            2006 METERS, YEAR 13 TEST RESULTS**

GCWD performed the year 13 testing for meters it installed during calendar year 2006 (the “2006 meters”) in December 2019. At the time it performed the testing, GCWD had 12 13-year-old meters in service. GCWD followed the same procedure set forth in the ANSI Standard as it detailed in GCWD’s Plan filed April 11, 2019. Following the procedure set forth in the ANSI Standard, GCWD tested a sample size of 3 meters at maximum, intermediate, and minimum flow rates. All meters tested were Badger Model 25 meters. Pursuant to the Commission’s Order dated April 28, 2020 in Case No. 2019-00115, GCWD tested all meters pulled for maximum and intermediate flow rate testing at minimum flow rates.

**(A)    Meters Tested**

The following 2006 meters were tested in year 13:

<b>Test Results of 2006 Sample Meters - Year 13</b>					
<b>Serial No.</b>	<b>Maximum</b>	<b>Intermediate</b>	<b>Minimum</b>	<b>Total Water Flow</b>	<b>Testing Date</b>
32579088	99.13	100.14	99.00	178,183.2	12/17/2019
32579085	99.08	100.54	98.90	474,926.1	12/17/2019
32579090	98.82	99.84	98.90	362,197.4	12/17/2019

**(B) Maximum Flow Test Results**

Meters were tested at a maximum flow rate using the same procedure set forth in the ANSI Standard and detailed in GCWD’s Plan filed April 11, 2019. Following the procedure set forth in the ANSI Standard, GCWD tested a sample size of three meters at maximum flow rates. The sample was accepted.

<b>ANSI Standard for Maximum Flow</b>		
1	Sample Size: n	3
2	Sum of Measurements	297.0
3	Sum of Squared Measurements	29408.9957
4	Correction Factor (CF)	29408.9403
5	Corrected Sum of Squares (SS)	0.0554
6	Variance (V)	0.0277
7	Estimate of Lot Standard Deviation	0.16643317
8	Sample Mean	99.01
9	Upper Specification Limit	101.5
10	Lower Specification Limit	98.5
11	Quality Index: QU (upper)	14.96096003
12	Quality Index: QL (lower)	3.064293017
ANSI Standard Table B-5 used to derive values below		
13	Est. of Lot Percent NcF above Upper	0.000%
14	Est. of Lot Percent NcF below Lower	0.000%
15	Total Est. Percent NcF in Lot (p)	0.000%
16	Max. Allowable Percent NcF (M)	7.590%
17	Acceptability Criterion (to accept, P<M)	<b>Accepted</b>

**(C) Intermediate Flow Test Results**

Meters were tested at an intermediate flow rate using the same procedure set forth in the ANSI Standard and detailed in GCWD’s Plan filed April 11, 2019. Following the procedure set forth in the ANSI Standard, GCWD tested a sample size of three meters at intermediate flow rates. The sample was accepted.

<b>ANSI Standard for Intermediate Flow</b>		
1	Sample Size: n	3
2	Sum of Measurements	300.5
3	Sum of Squared Measurements	30104.3368
4	Correction Factor (CF)	30104.09013
5	Corrected Sum of Squares (SS)	0.246666667
6	Variance (V)	0.123333333
7	Estimate of Lot Standard Deviation	0.351188458
8	Sample Mean	100.1733333
9	Upper Specification Limit	101.5
10	Lower Specification Limit	98.5
11	Quality Index: QU (upper)	3.777648823
12	Quality Index: QL (lower)	4.764773139
ANSI Standard Table B-5 used to derive values below		
13	Est. of Lot Percent NcF above Upper	0.000%
14	Est. of Lot Percent NcF below Lower	0.000%
15	Total Est. Percent NcF in Lot (p)	0.000%
16	Max. Allowable Percent NcF (M)	7.590%
17	Acceptability Criterion (to accept, P<M)	<b>Accepted</b>

**(D) Minimum Flow Test Results**

Meters were tested at a minimum flow rate using the same procedure set forth in the ANSI Standard and detailed in GCWD’s Plan filed April 11, 2019. Following the procedure set forth in the ANSI Standard, GCWD tested a sample size of three meters at minimum flow rates. The sample was accepted.

1	Sample Size: n	3
2	Sum of Measurements	296.8
3	Sum of Squared Measurements	29363.42
4	Correction Factor (CF)	29363.41333
5	Corrected Sum of Squares (SS)	0.006666667
6	Variance (V)	0.003333333
7	Estimate of Lot Standard Deviation	0.057735027
8	Sample Mean	98.93333333
9	Lower Specification Limit	90
10	Quality Index: QL (lower)	154.7298722
ANSI Standard Table B-5 used to derive values below		
11	Est. of Lot Percent NcF	0.000%
12	Max. Allowable Percent NcF (M)	40.470%
13	Acceptability Criterion (to accept, P<M)	<b>Accepted</b>

**(E) Abnormal Meter Results**

There were no abnormal meter results with respect to the 2006 meters. None of the meters in the sample group had been damaged.

**SECTION 4.0 CONCLUSION**

As shown above, GCWD’s 2019 Annual Meter Testing Report shows that the following meter lots passed at each flow rate using the relevant ANSI Standard:

- 2006 Meters, Year 13 Test Results