

# Michigan 2013 Statewide Failed Sewage System Evaluation Summary Report



December 2014



## **Introduction**

Calendar Year (CY) 2013 represented the fifth year of failed system data collection by local health departments (LHD) in Michigan. For CY 2013, the process of data collection and data submission to the Department of Environmental Quality (DEQ) remained unchanged from the previous two years. As with 2012, during 2013 there were isolated discussions between a few LHDs and the DEQ regarding expanding the definition of “failure;” however, no changes were made to the definition. During summer 2014 a workgroup consisting of members of the Michigan Association of Local Environmental Health Administrators (MALEHA) and DEQ staff began meeting to review and discuss the “failure” definition, in preparation for Cycle 6 of the Local Public Health Accreditation Program (LPHAP). In mid-October 2014, the workgroup came to agreement with an expanded failure definition that LHDs will begin to use starting in January 2015. The new definition for failure is as follows:

**For the purpose of this guidance, a system consists of a tank or tanks, an absorption system, and associated appurtenances. A system is considered to have failed when sewage backs up into the home or structure, discharges to the ground surface, contaminates surface water or drinking water supplies, any part of the system is bypassed, the system is the source of an illicit connection, there is an absence of an absorption system, or there is a structural failure of a septic tank or other associated appurtenances.**

With this new definition for failure, the DEQ recognizes that the existing guidance for data collection will need to be expanded to include examples of failures under the new definition. It is anticipated that during 2015 the DEQ will be working with MALEHA to develop that guidance. It is further anticipated that the data collection process will be in a state of transition during Cycle 6, and as a result, the data reporting and the statewide failed sewage system evaluation summary reports will also be affected.

For CY 2013, LHD accreditation reviews determined that there was one instance where an LHD did not meet the essential elements of data collection and submission under Indicator 5.1 of Section VI – On-Site Wastewater Treatment Management of the LPHAP. For that LHD it was determined that a breakdown in communication between the LHD and DEQ resulted in the incorrect data collection forms being used.

## **Data Analysis and Summary**

The findings of the analysis of the data for the residential and non-residential failures are discussed in this report.

As with the previous two years, the 2013 data have been summarized in a similar manner. First, the total number of residential failures reported to the DEQ by each LHD in 2013 is shown in Table 1. Secondly, the data for both residential and non-residential failures are summarized in a graphical representation composed of histogram graphs reported in percentages.

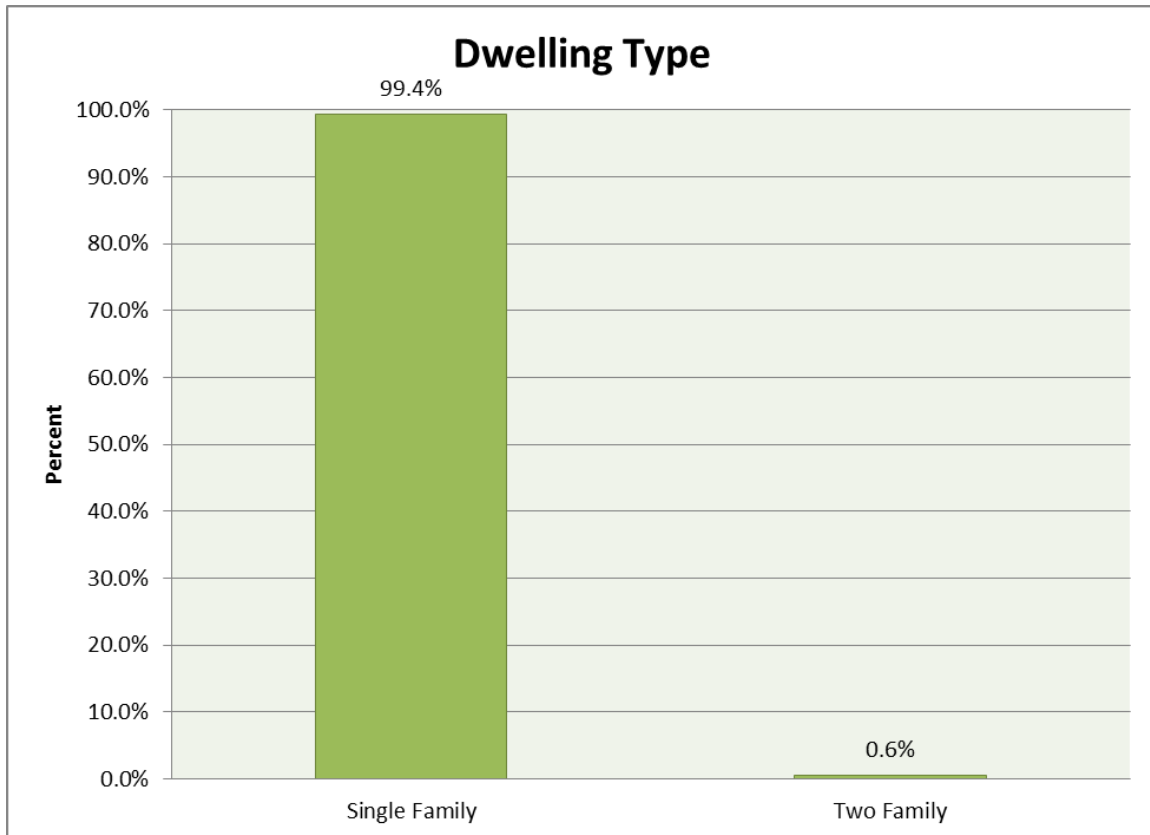
Table 1

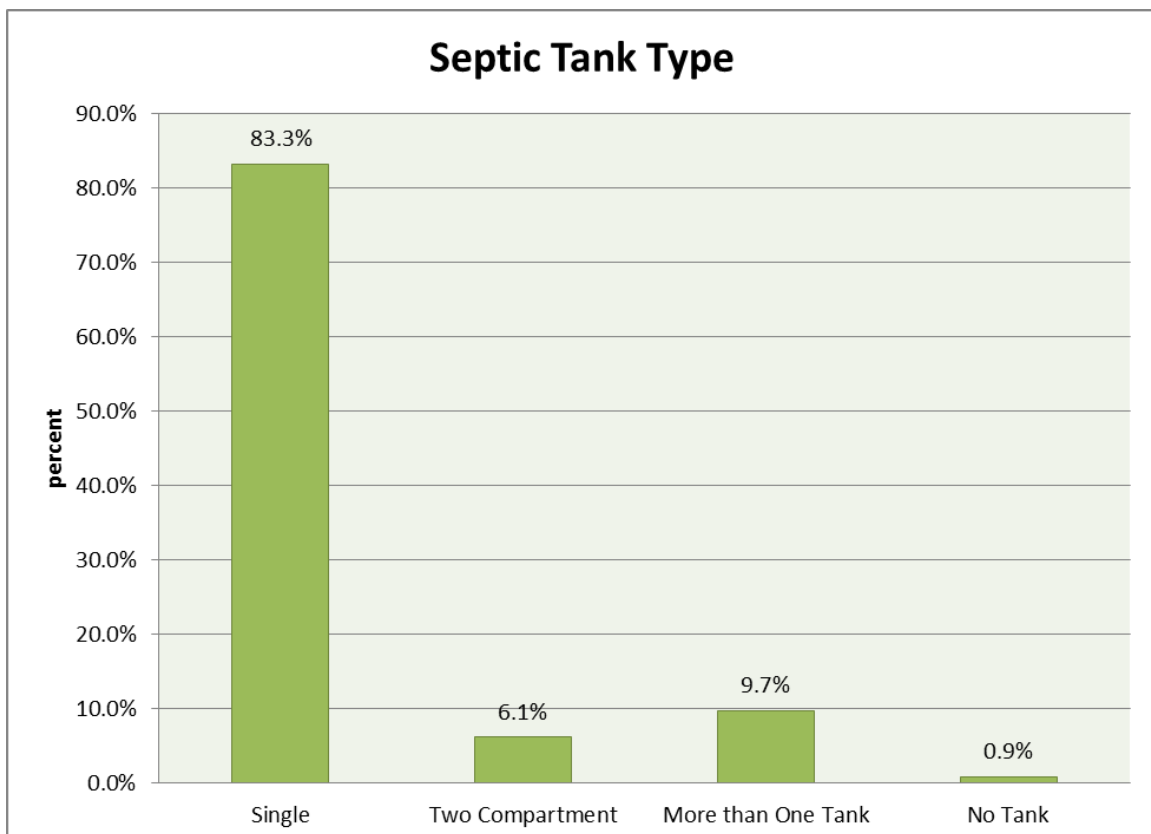
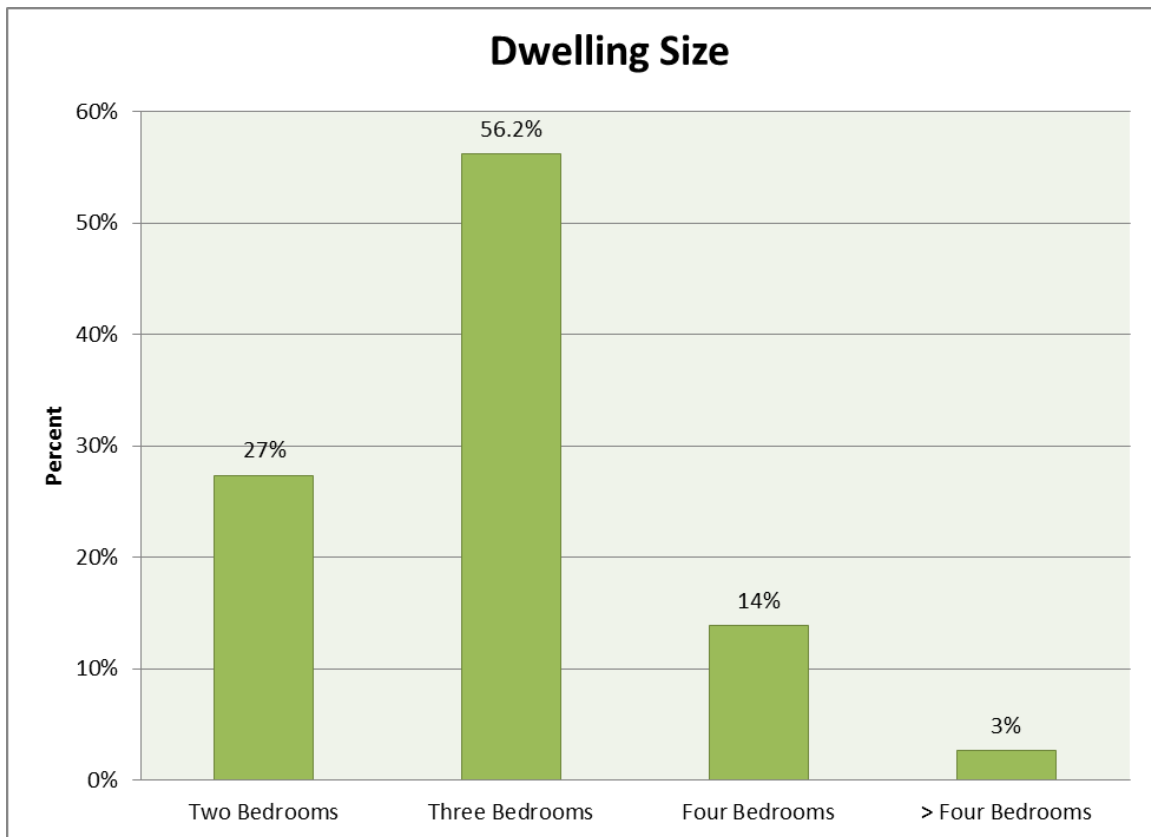
Total Residential Failures Reported by Local Health Departments in 2013

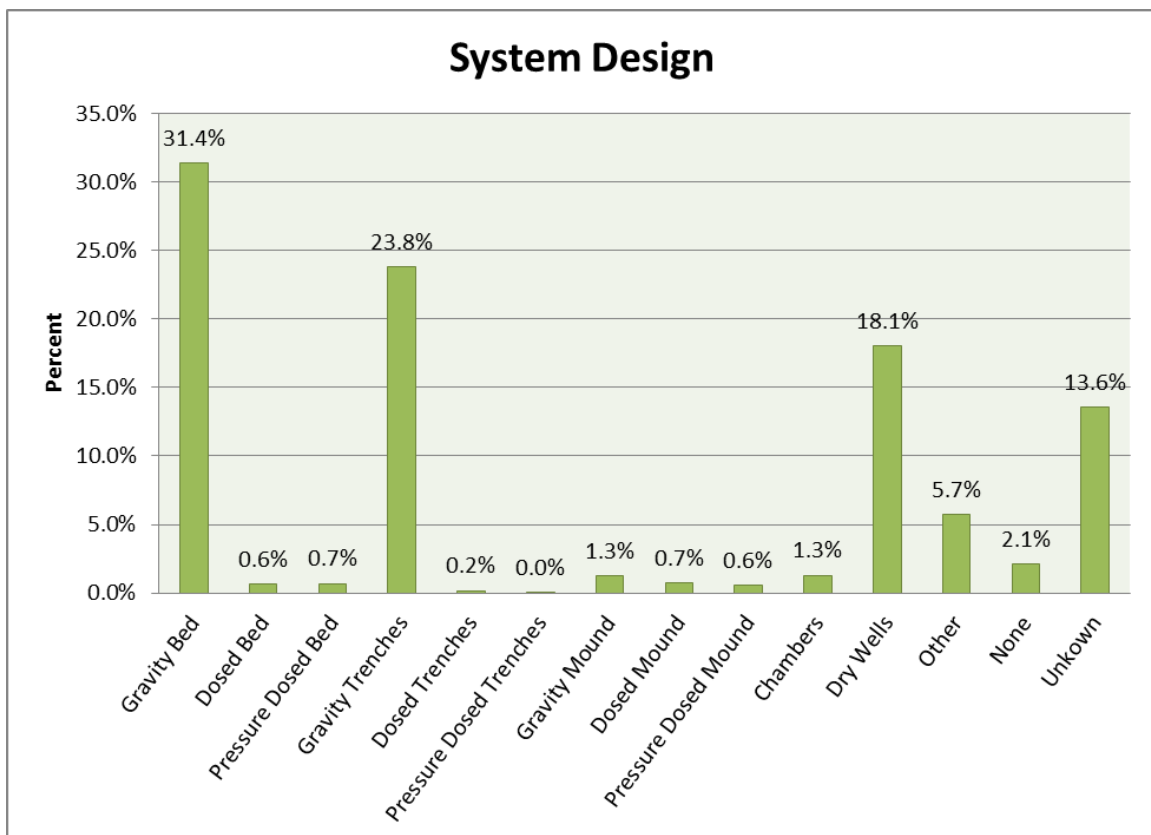
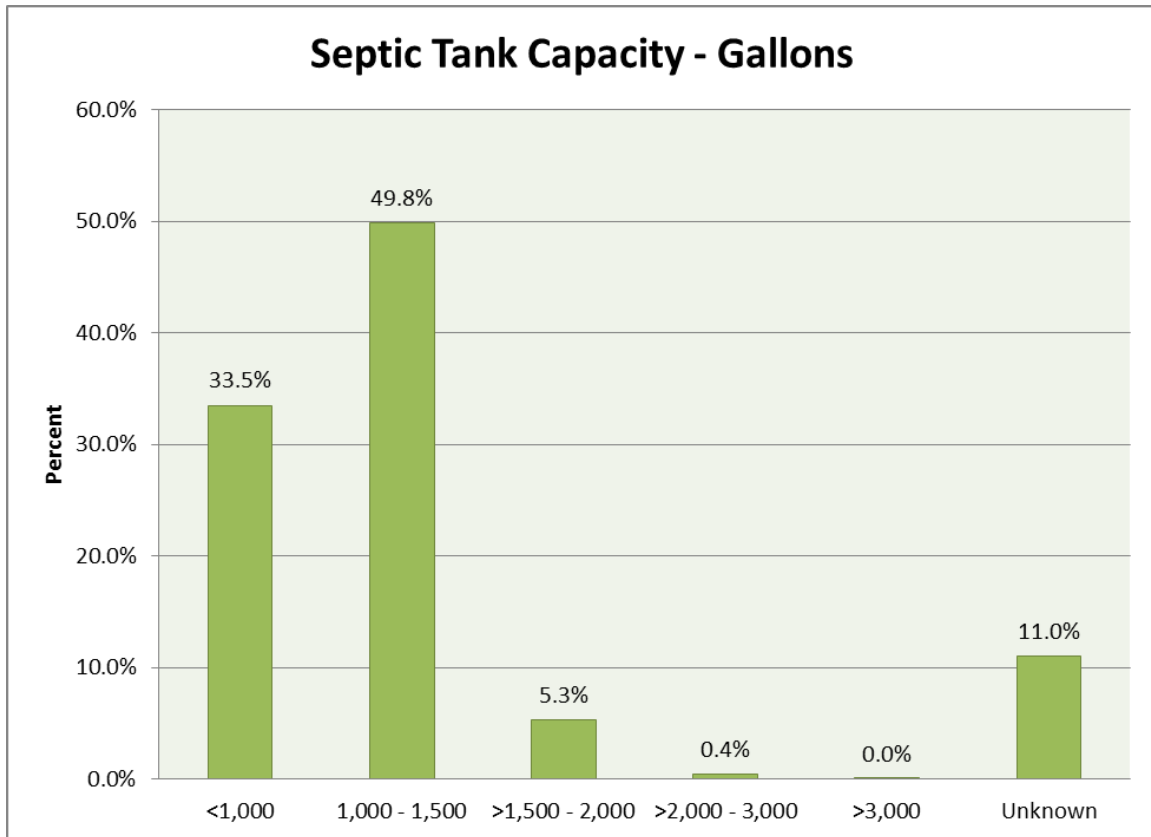
| County:            | Single Family | Two Family |
|--------------------|---------------|------------|
| Allegan            | 6             | 0          |
| Barry-Eaton        | 125           | 0          |
| Bay                | 28            | 0          |
| Benzie-Leelanau    | 63            | 1          |
| Berrien            | 111           | 1          |
| Branch-Hillsdale-S | 130           | 1          |
| Calhoun            | 71            | 0          |
| Central Mich.      | 463           | 0          |
| Chippewa           | 23            | 0          |
| Delta-Menominee    | 8             | 0          |
| Dickinson-Iron     | 41            | 0          |
| District # 2       | 35            | 0          |
| District # 4       | 4             | 0          |
| District #10       | 328           | 3          |
| Genesee            | 46            | 0          |
| Grand Traverse     | 65            | 2          |
| Huron              | 30            | 0          |
| Ingham             | 54            | 2          |
| Ionia              | 40            | 0          |
| Jackson            | 44            | 0          |
| Kalamazoo          | 203           | 1          |
| Kent               | 241           | 3          |
| Lapeer             | 49            | 1          |
| Lenawee            | 13            | 0          |
| Livingston         | 71            | 2          |
| LMAS               | 59            | 0          |
| Macomb             | 89            | 0          |
| Marquette          | 29            | 0          |
| Mid - Michigan     | 121           | 1          |
| Midland            | 95            | 0          |
| Monroe             | 42            | 0          |
| Muskegon           | 125           | 0          |
| Northwest Mich     | 217           | 2          |
| Oakland            | 426           | 0          |
| Ottawa             | 184           | 1          |
| Saginaw            | 103           | 0          |
| Sanilac            | 26            | 1          |
| Shiawassee         | 107           | 0          |
| St. Clair          | 65            | 3          |
| Tuscola            | 16            | 0          |
| VanBuren-Cass      | 71            | 0          |
| Washtenaw          | 20            | 1          |
| Wayne              | 8             | 0          |
| Western UP         | 43            | 0          |
| <b>Totals</b>      | <b>4138</b>   | <b>26</b>  |

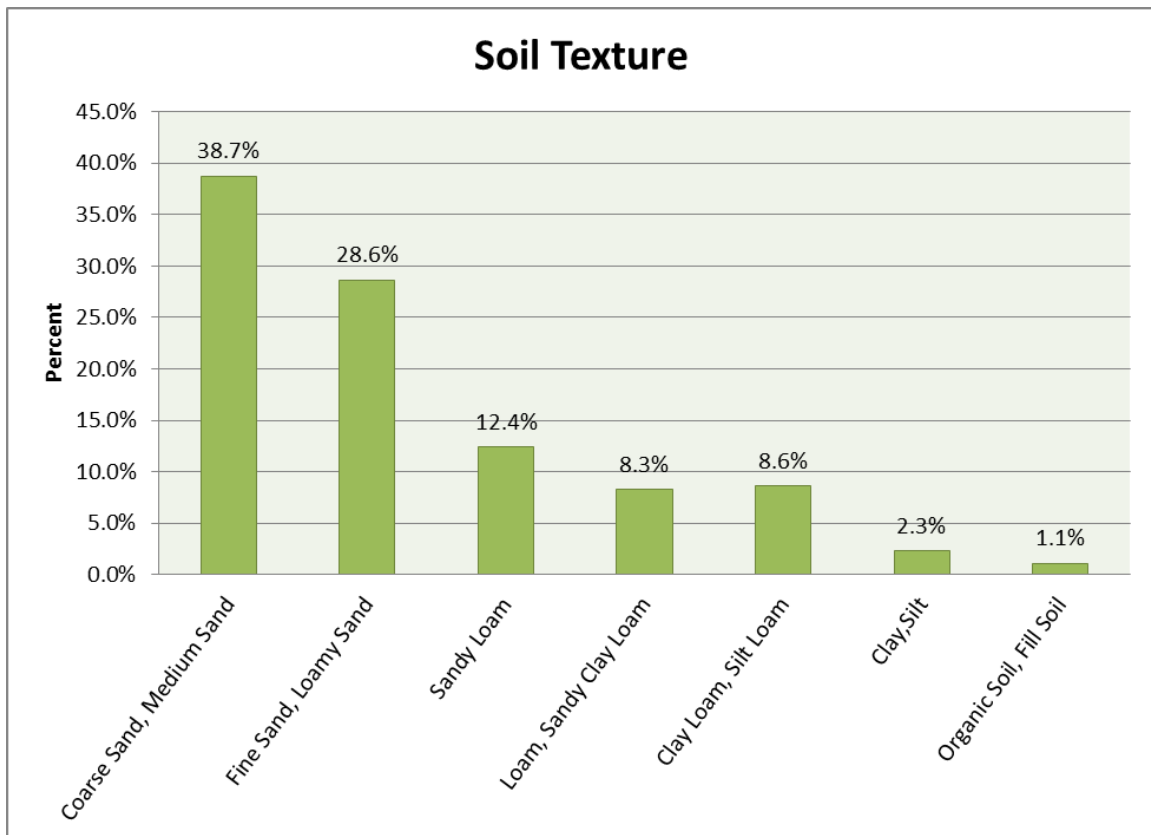
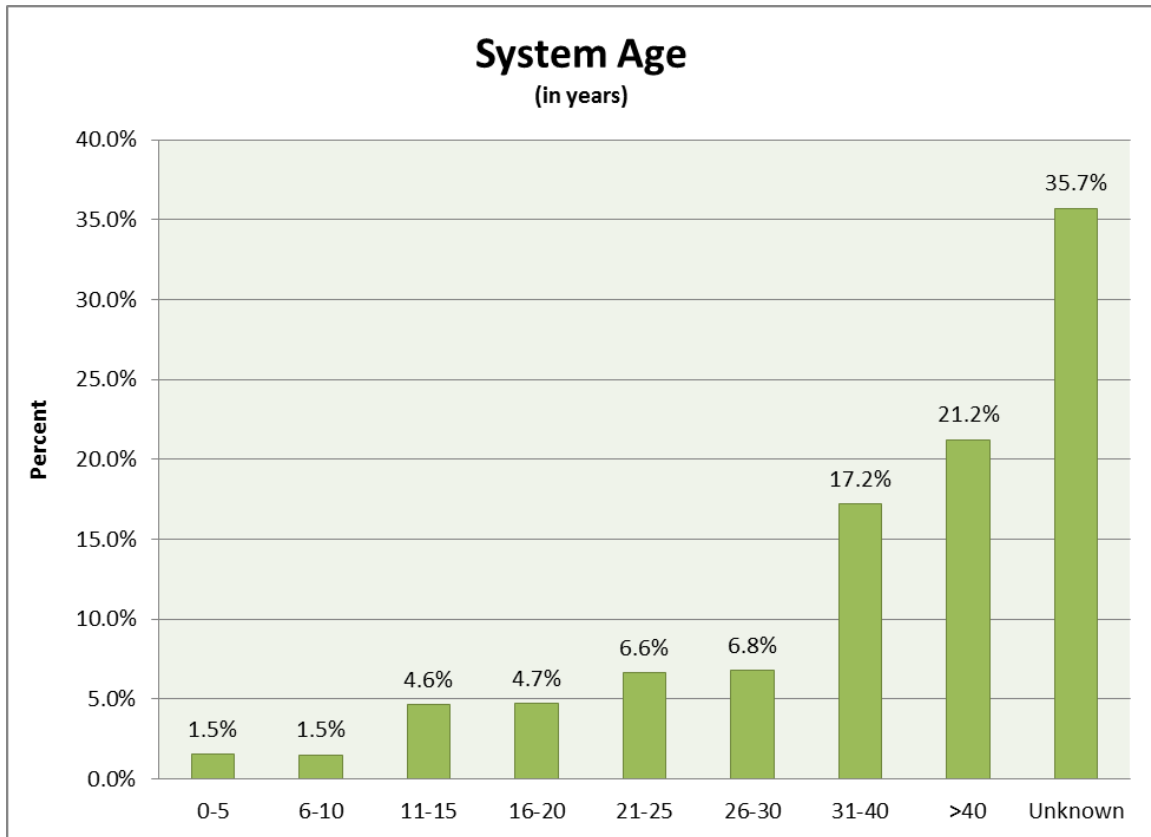
The analysis of the 2013 residential data continued to show similarity to the 2012 data, with the only notable changes being in the system sizing categories for “Unable to Determine.” More specifically, the “System Size – Bed ft2” (on page 8 of this report) showed a 7.7 percent decrease from 2012, while the “System Size – Trench ft2” (on page 9 of this report) showed a 6.1 percent increase from 2012.

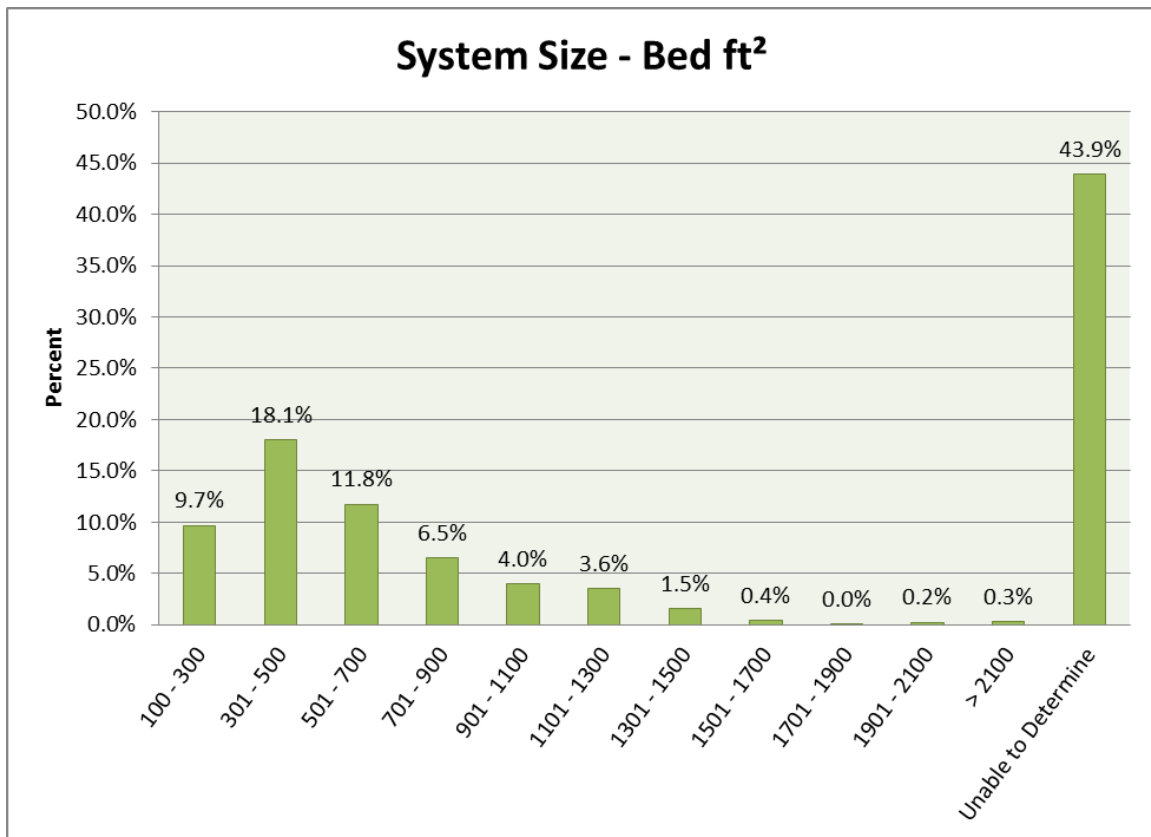
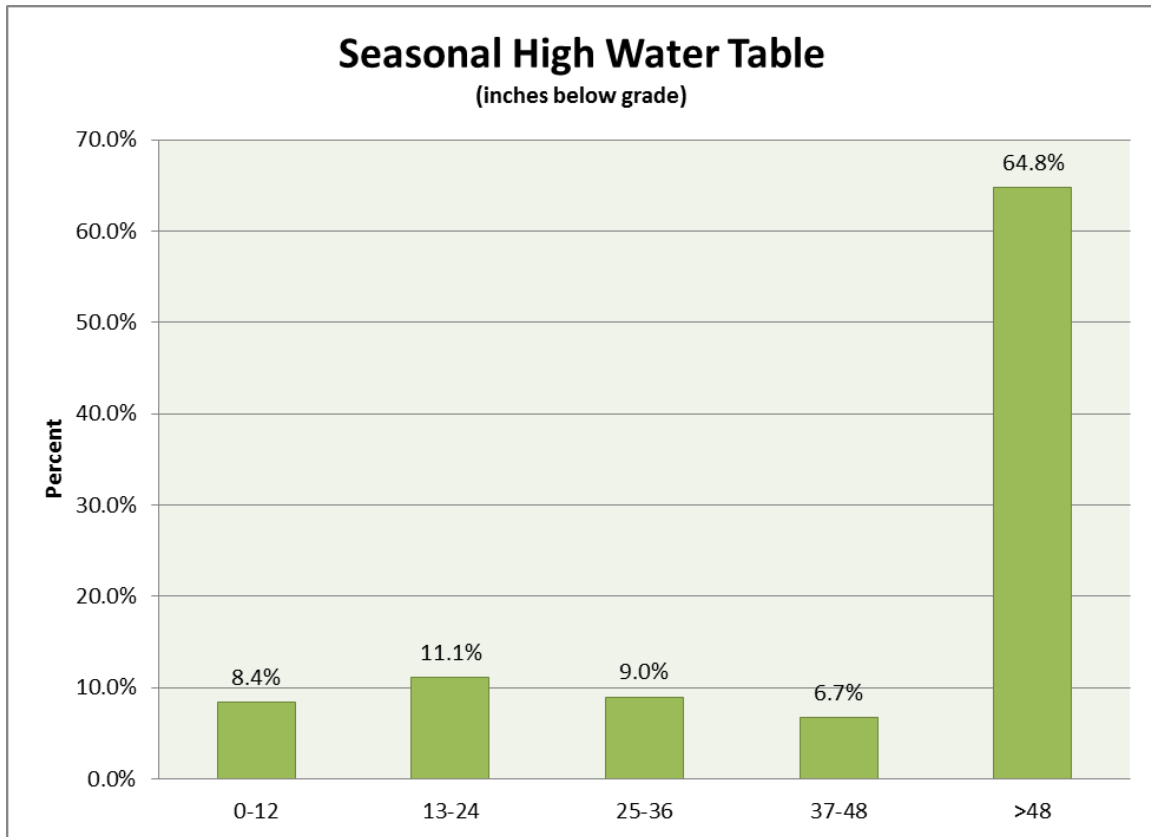
## Residential Data

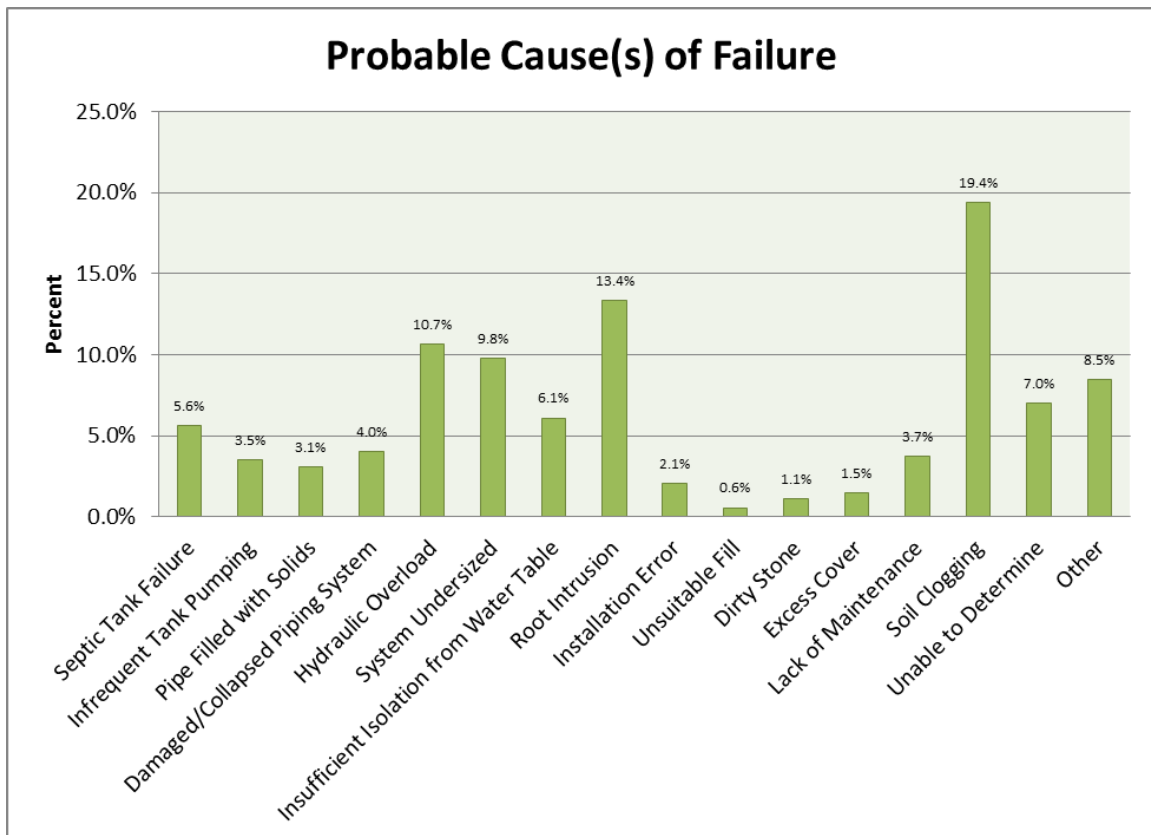
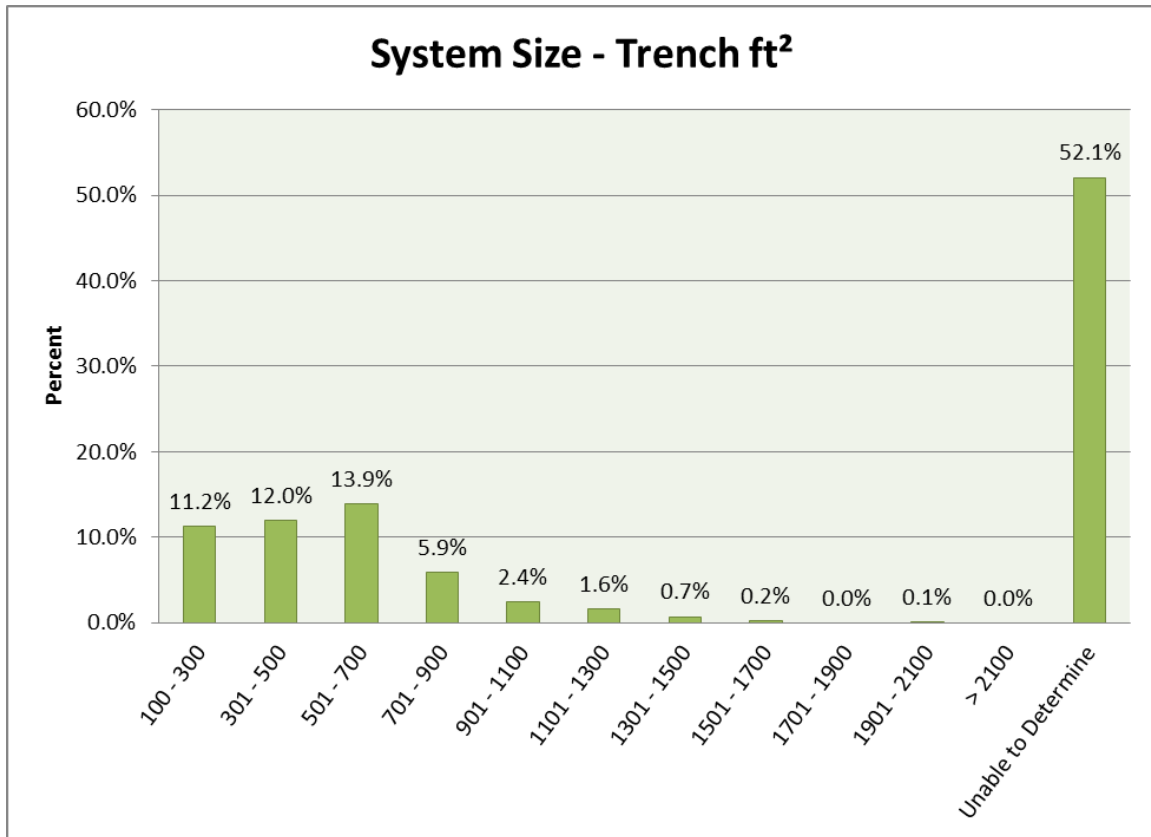












### **Non-Residential Data Analysis**

The analysis of the 2013 non-residential data identified some similarities to the 2012 non-residential data; however, the data showed some dramatic changes that are discussed below.

The most profound change for “Facility Type” (on page 11 of this report) was in the percent reported as nonspecific type of facility and identified as “Other.” For 2012, more than 41 percent of reported failures were identified as “Other,” whereas for 2013 the “Other” category was nearly 25 percent. This resulted in more than a 16 percent reduction from 2012 and is an indication of an increased effort by LHDs to categorize the facility type. Related to the percent reduction of the “Other” category for 2013, six of the remaining facility type categories showed an increase in percentages being reported. Most notable was the largest percentage increase for the “Industrial” type of facility that went from 4.7 percent in 2012 to 12.4 percent in 2013.

In comparing the 2012 and 2013 data, the “Estimated Flows” categories (on page 12 of this report) continued to show similarity, with greater than 70 percent of the reported failures being for systems with flows of less than 1,000 gallons per day. However, the “Septic Tank Type” category showed changes with an increase of 17.1 percent for “Single” and a decrease of 13.0 percent for “More than One Tank.”

Other notable changes in the percentages in the data between 2012 and 2013 for specific categories are identified below:

“Septic Tank Capacity - Gallons” – The “1,000 – 1,500” category increased by 12.3 percent, and with the exception of the “Unknown” category, all other categories showed a reduction.

“System Design” – The “Pressure Dosed Bed” category decreased by 10.9 percent, the “Drywells” category increased by 6.7 percent and the “Unable to Determine” category increased by 4.2 percent.

“System Age” – The percentage of failures reported for systems 20 years old or less decreased over the 2012 data. The 2012 data reported nearly 38 percent of the non-residential failures were for systems 20 years old or less; whereas for 2013, slightly over 30 percent were reported to have failed during this time period. The most notable change for 2013 was the “>40” category increase of 10.1 percent over 2012.

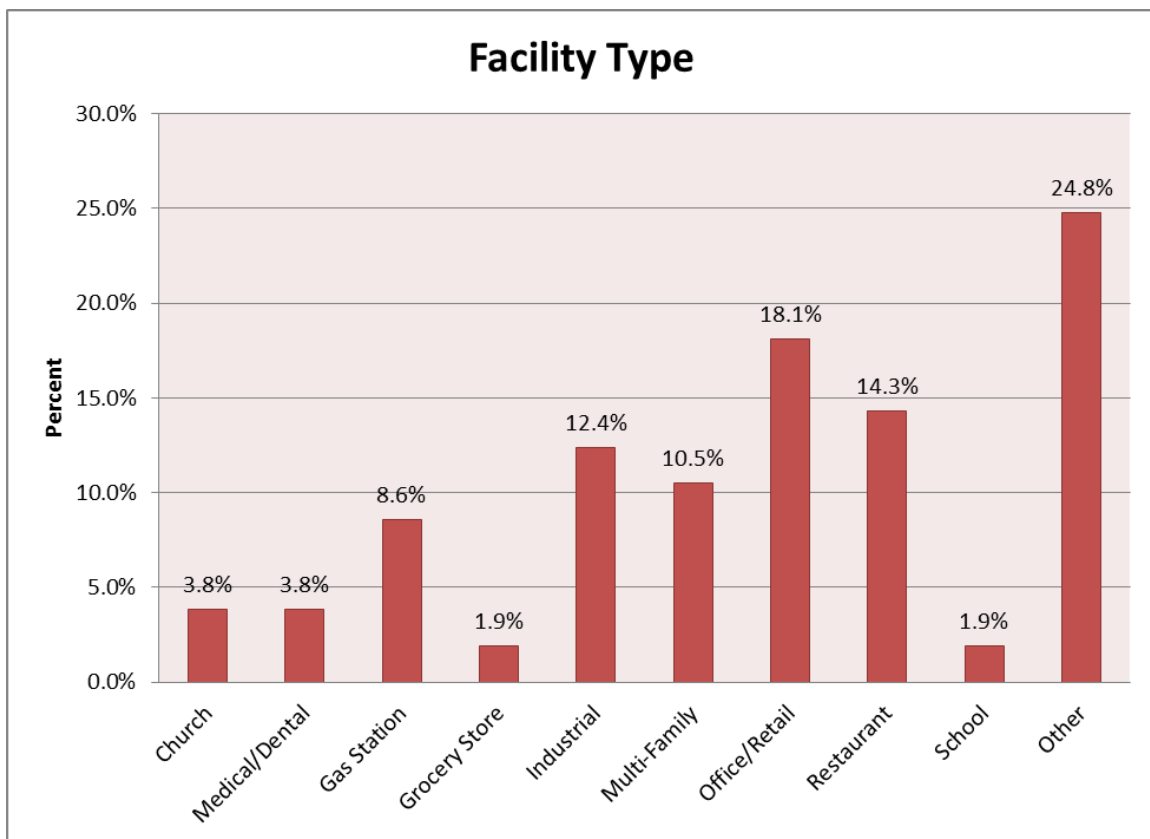
“Soil Texture” – The “Sandy Loam” category had the most notable change, with a decrease of 7.7 percent.

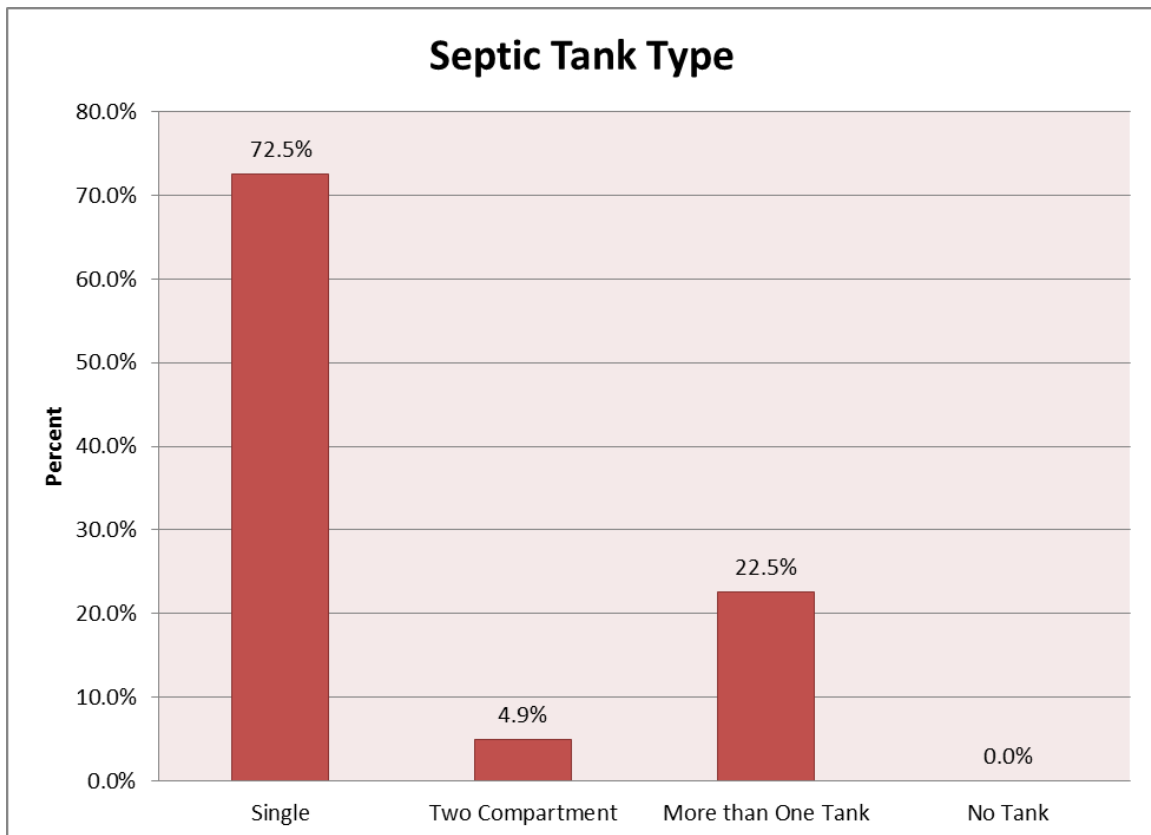
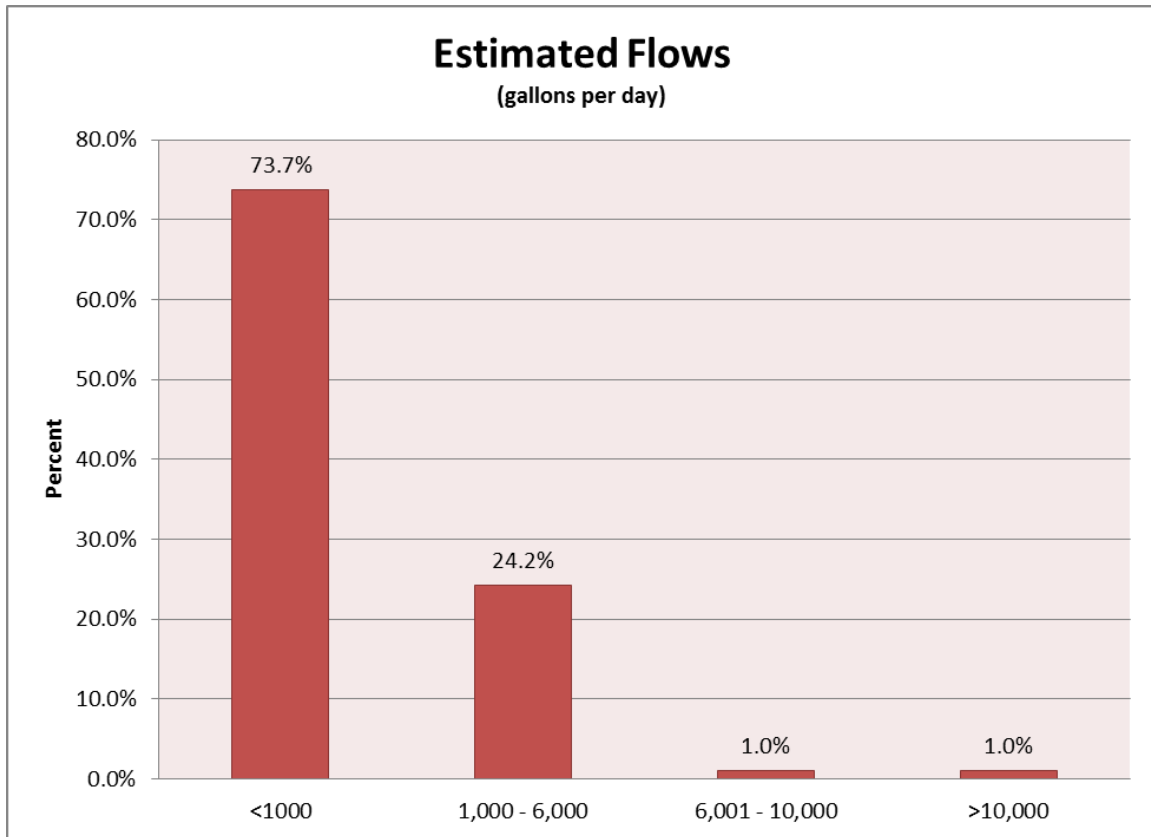
“System Size - Bed ft<sup>2</sup>” – The “301 – 500” category increased by 9.2 percent and the “>2100” category decreased by 12.2 percent.

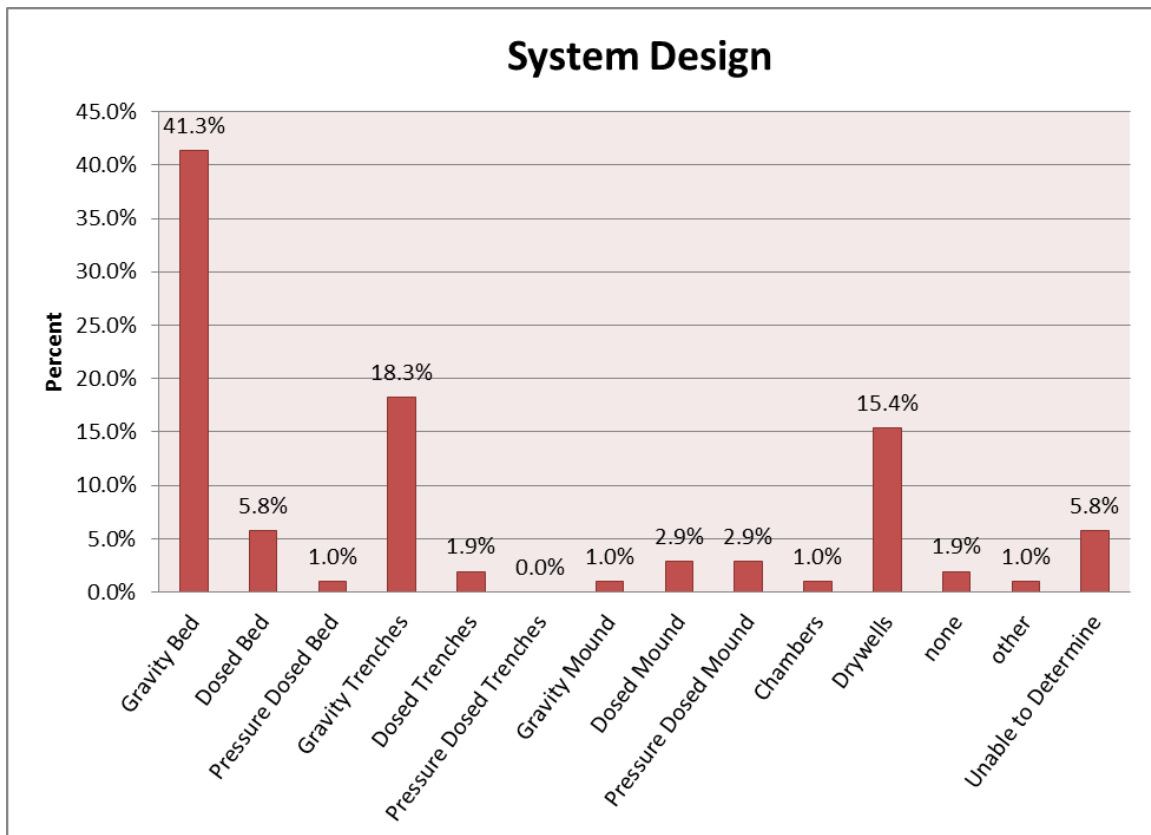
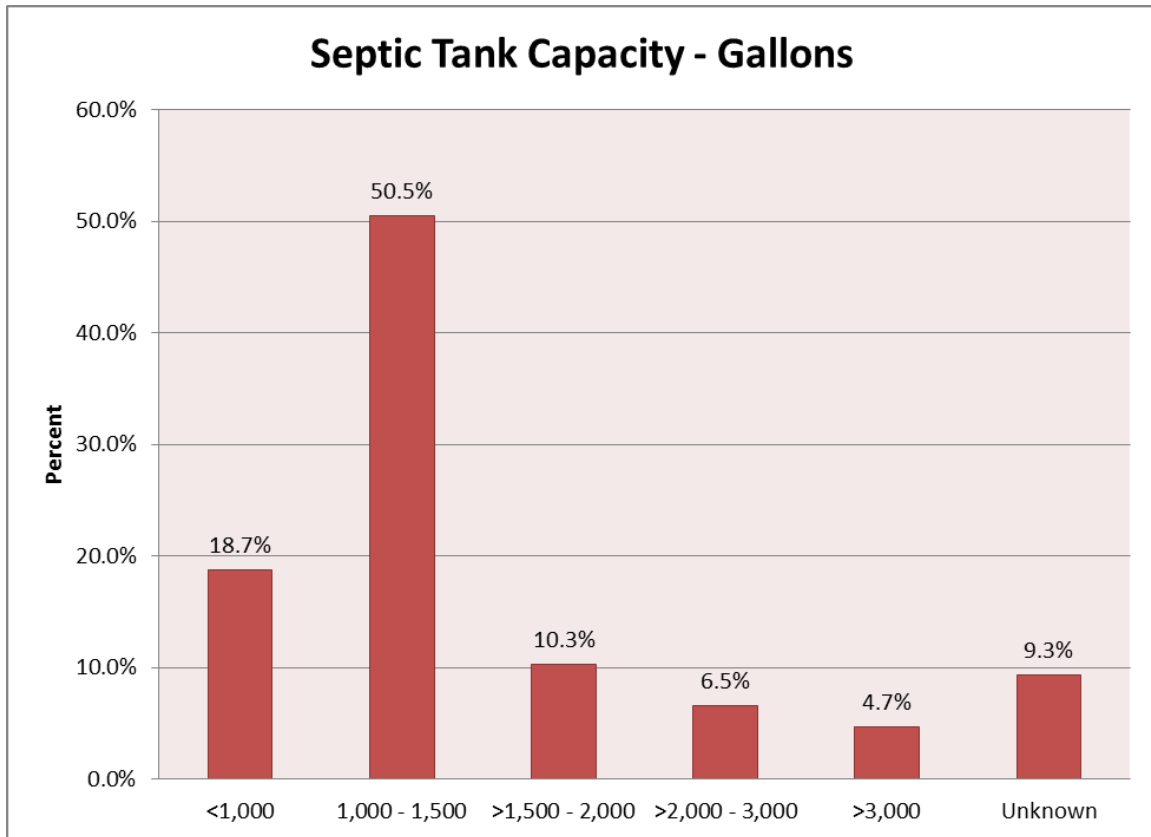
“System Size – Trench ft<sup>2</sup>” (on page 16 of this report) – The “100 – 300” category increased by 10.9 percent, the “301 – 500” category decreased by 18.1 percent and the “901 - 1100” category increased by 6.7 percent.

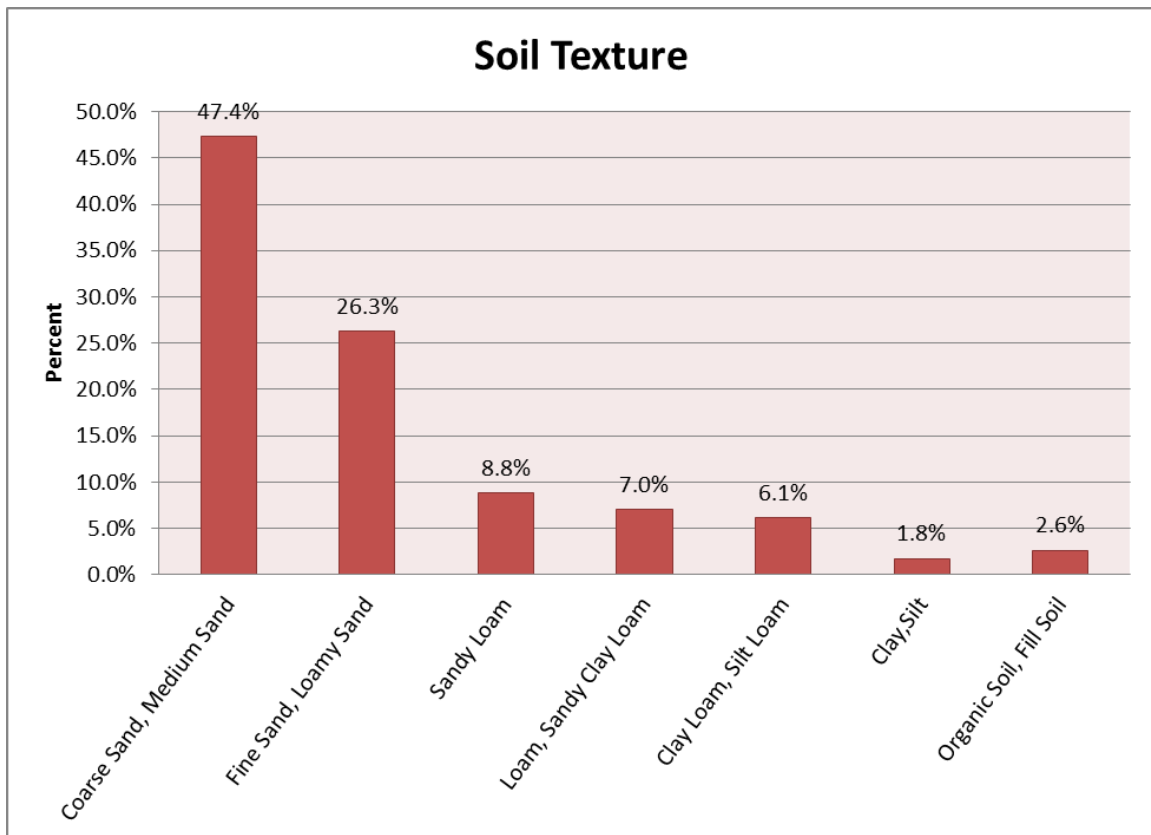
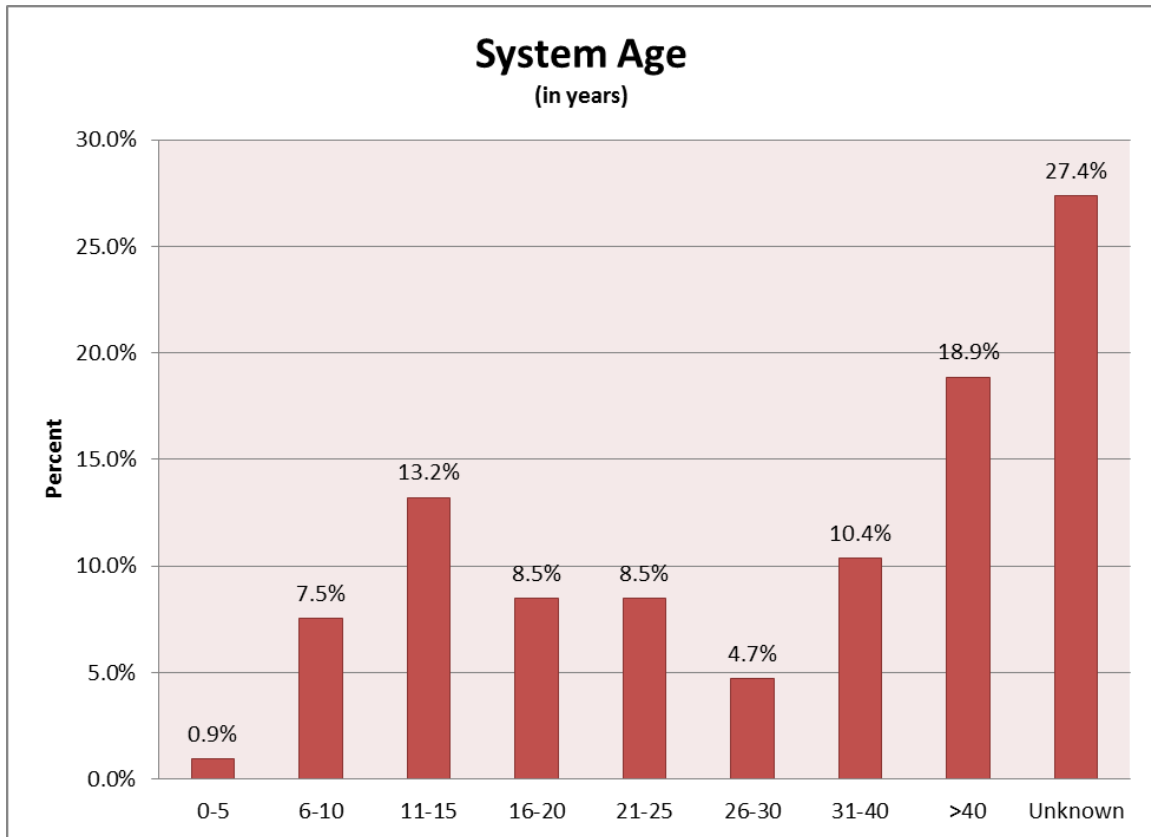
Lastly, as with the 2012 findings, the highest percentages for “Probable Cause(s) of Failure” for the 2013 non-residential failures were attributed to “Hydraulic Overload” at 18.0 percent and “Soil Clogging” at 17.4 percent. Other notable findings for 2013 were that the “Septic Tank Failure” category decreased by 5.1 percent, and the “Other” category decreased by 7.6 percent from 2012.

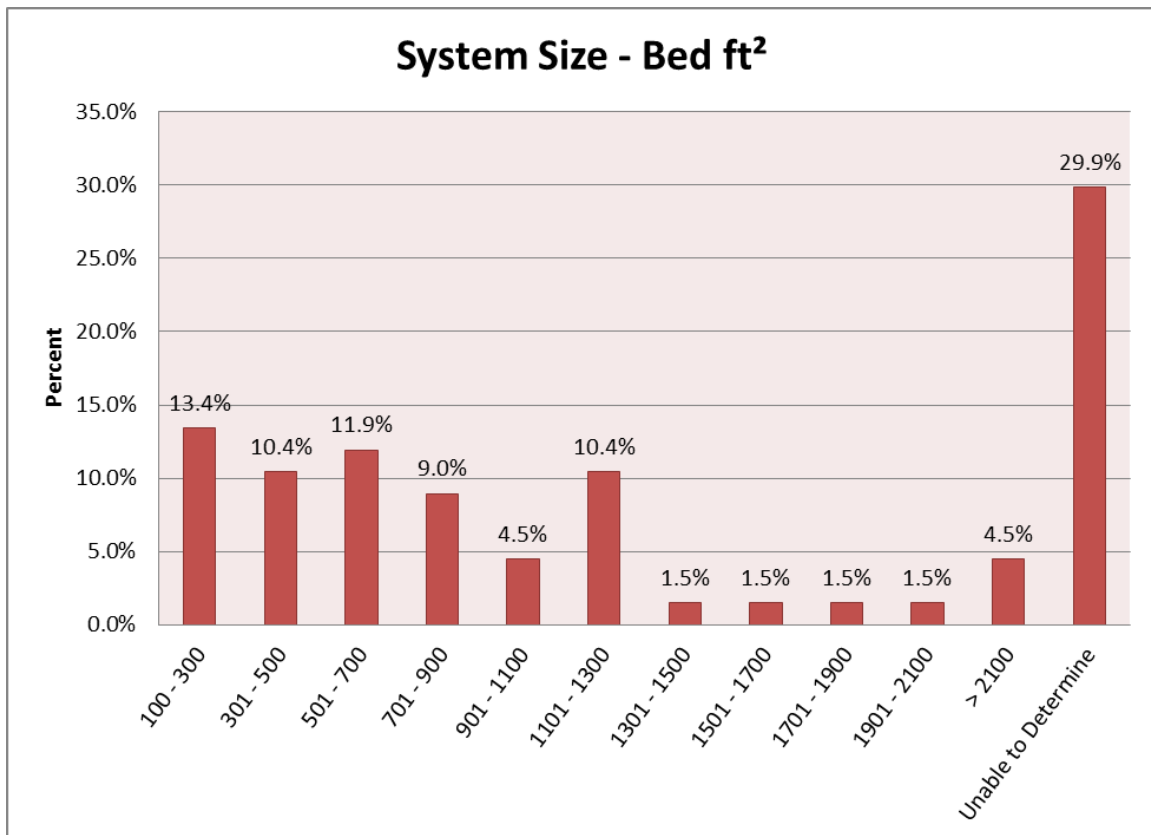
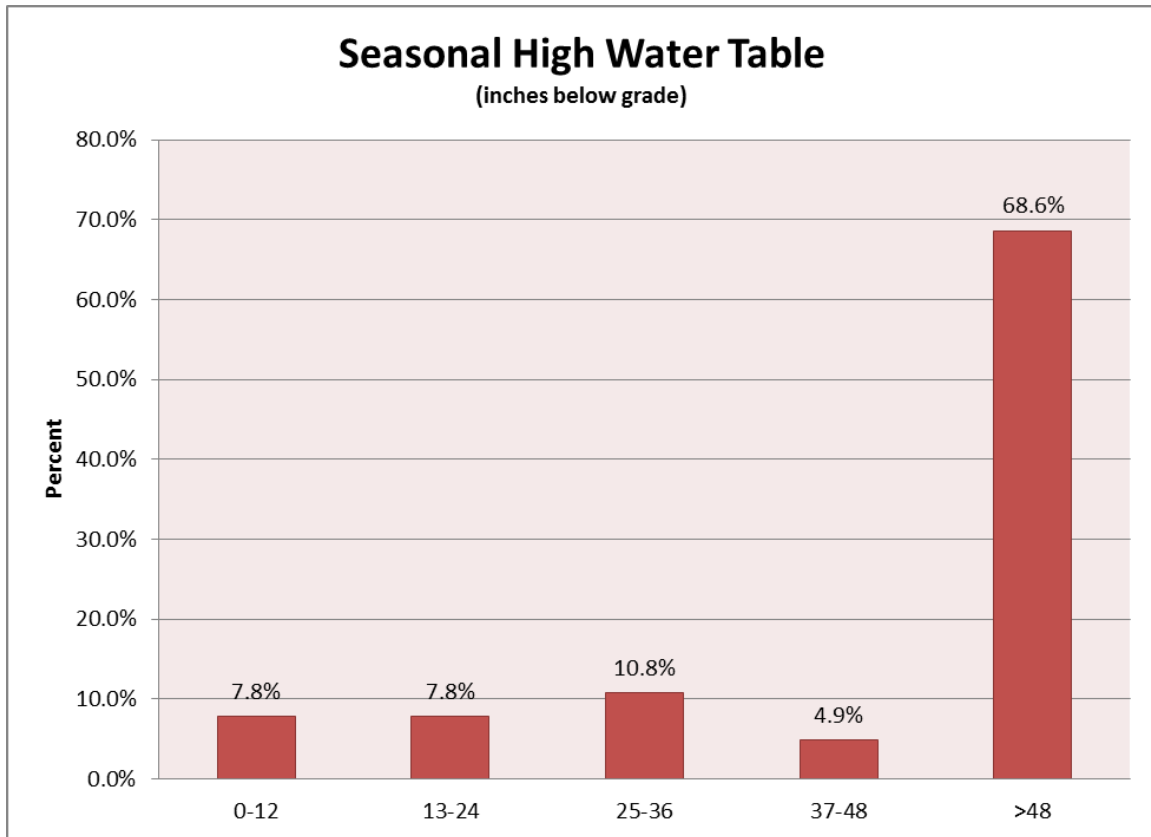
### Non-Residential Data

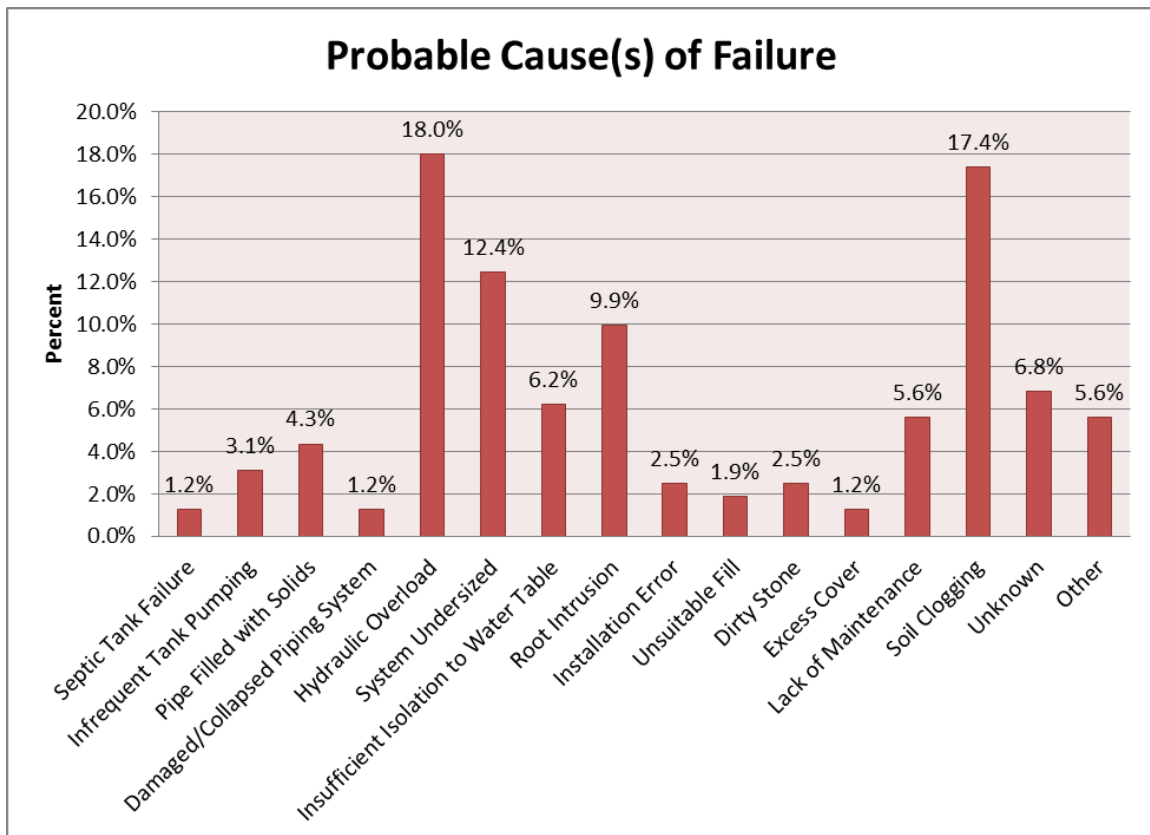
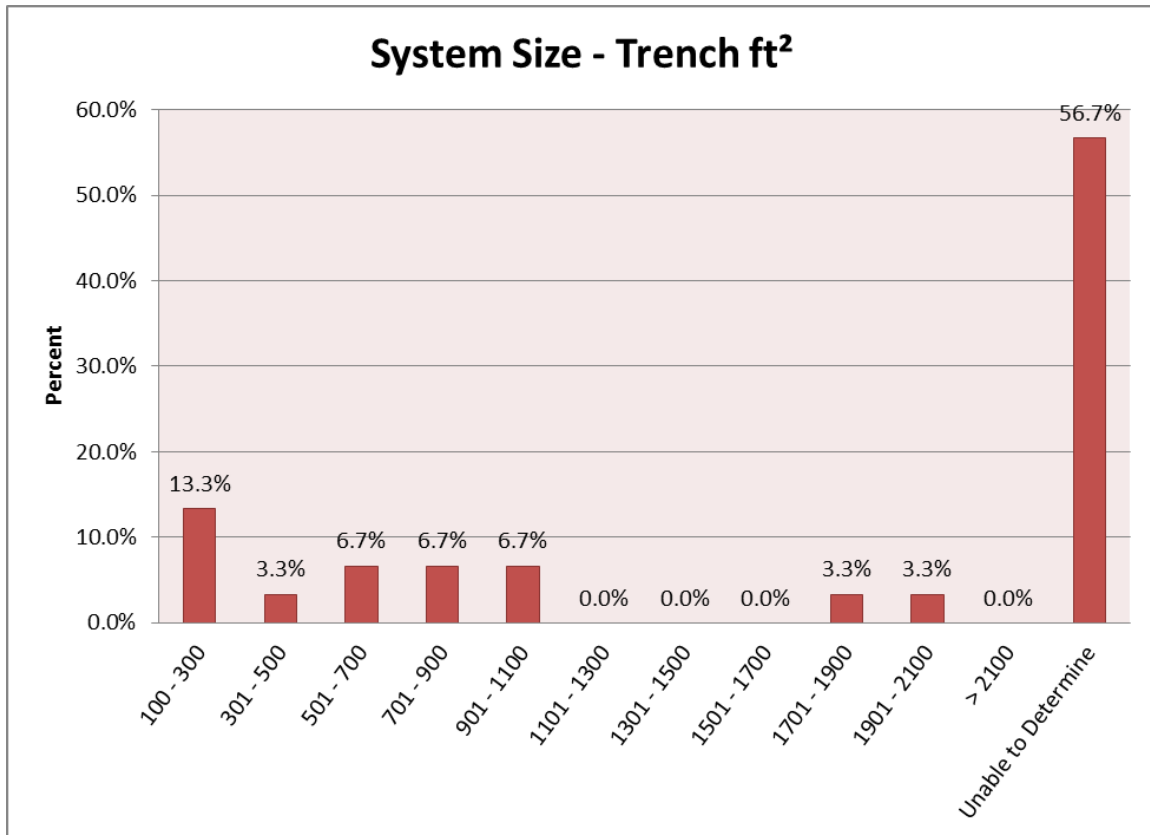












### **Expanded Analysis of Failed System Data**

During the analysis of the 2013 failed system data submitted to the DEQ by the LHDs, a review of the 2012 failed system data was conducted to determine if there were any noticeable changes in the numbers of reported residential failures over the past two years. In comparing the data, 12 of the 44 LHDs showed a greater than 30 percent change in the numbers of failures reported to DEQ. Of the 12 LHDs, seven showed a percentage increase with the remaining five showing a decrease.

Most interesting was that the percentage change in the failures reported ranged from an increase of 155 percent for one LHD to a decrease of 57 percent for another LHD. To further attempt to understand what may have impacted the changes in the reported failures, the DEQ reviewed the number of permits issued during 2012 and 2013 for these 12 LHDs. The review determined that seven LHDs incurred an increase in permits being issued and the remaining five showed a decrease. The LHDs with an increase in permit numbers ranged from 5 to 25 percent while the LHDs with a decrease in permit numbers ranging from <1 to 23 percent.

In the review of LHD permit numbers a comparison was made to the numbers of failures reported. To identify a means of comparing the percentage of failures for the 12 LHDs, the number of reported failures for 2013 was divided by the number of permits issued during 2013 for each of the 12 LHDs. The results of this effort identified a wide range in the percentage of failures, from a low of 1.2 percent for one LHD to a high of 74 percent for another LHD.

In an effort to better understand the factors influencing the changes observed the DEQ was able to provide the individual review findings to 11 of the 12 LHDs, and subsequently was able to engage in discussions with 10 of the 11 LHDs. Through the discussions it was learned that a number of factors influenced the changes in the LHD reporting of failures for 2012 and 2013. These factors are as follows:

#### **Decrease in failures reported.**

- Change in the person reviewing and/or submitting the failure data.
- Discontinuance of including non-failures in the failure reporting data.
- A decrease in the number of replacement permits issued.
- An improving economy leading to more individuals initiating system corrections prior to the point of system failure.

#### **Increase in failures reported.**

- Change in the person reviewing and/or submitting the failure data.
- Including non-failures in the failure reporting data.
- An increase in the number of replacement permits issued.
- Weather influences resulting in an extremely wet spring and early summer.
- A change from the use of paper documents to electronic means for data collection and/or reporting.

Based on the discussions with the LHDs, the DEQ attributes much of the changes in the numbers of failures being reported over the past two years to the changes in the LHD staff responsible for reviewing and submitting the data, changes to the method for data collection and reporting, and inconsistencies in reporting of failed system data under the previously established definition of failure. The DEQ views the new definition of failure for Cycle 6 of the LPHAP as the first step in establishing consistency. Additional steps to be taken will be to expand guidance for LHDs and provide training. In conclusion, the DEQ is looking at the upcoming Cycle 6 of the LPHAP as an opportunity to work with LHDs to establish the necessary consistency in the data collection and reporting process.