July 13, 2016
Memorandum of Understanding
Subject: Guidelines for monitoring and reporting Perfluoroalkyl substances (PFASs) in finished water samples

The release of the US Environmental Protection Agency (EPA) drinking water health advisories (HA) for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) on May 19, 2016 has stipulated that when both chemicals are found in drinking water, the combined and individual concentrations of PFOA and PFOS should be compared to the 70 parts per trillion (ppt), i.e., 0.07 ug/L, health advisory level.

A series of questions has arisen from the municipal water suppliers regarding what actions should be taken in the event that the individual or combined concentrations of PFOA and PFOS found in finished drinking water exceed the 70 parts per trillion health advisory level. Specifically: what actions should be taken in the event of an exceedance, and should the sample values be averaged, over what timeframe.

The Alabama Department of Environmental Management (ADEM) contacted the EPA on June 7, 2016, requesting guidance on how to interpret the testing results from the affected water systems. EPA Region 4 – Atlanta responded on June 8, 2016, with an email to ADEM [1/] describing the approach EPA took when assessing reported results from the third cycle of the Unregulated Contaminant Monitoring Rule (UCMR 3) against the new final health advisory.

EPA Region 4stated that since PFOA and PFOS are not regulated contaminants, EPA defers to states and water systems to decide how they want to interpret monitoring data. EPA Region 4 then proceeded to describe how the Technical Support Center in Cincinnati approached the question. The Technical Support Center treated results below the UCMR minimum reporting levels (MRLs) [0.02 ug/L or 20 ppt PFOA; 0.04 ug/L or 40 ppt PFOS] as "zero". EPA recommended looking at 141.131(b)(2)(iv) as precedent for treating "< MRL" as zero: *"[2] When adding the individual trihalomethane or haloacetic acid concentrations to calculate the TTHM or HAA5 concentrations, respectively, a zero is used for any analytical result that is less than the MRL concentration for that DBP, unless otherwise specified by the State."*

The Technical Support Center calculated the sum of the UCMR 3 PFOA and PFOS results and then rounded to the nearest 10 ppt (e.g., 70 ppt versus 74 ppt; 80 ppt versus 76 ppt). Additionally, EPA Region 4 recommended that "it is also instructive to look at the results for the *individual* sampling events in addition to looking at the average for the multiple events. The former is consistent with the UCMR approach, but this is certainly a judgement call that the state is free to make."

Based on this guidance from EPA Region 4, ADEM and the Alabama Department of Public Health (ADPH) have determined that a reasonable approach to interpreting any subsequent testing results from the affected water systems would be to average sample results over time, noting exceedances but not taking action unless the average of the previous four samples exceeds the 70 parts per trillion health advisory level[2/]. Sample results utilized in determining the average shall be those samples collected after completion of the UCMR 3 data collection efforts (i.e., December 31, 2015). It is important to understand and recognize that the EPA final health advisory for these chemicals is for a lifetime exposure, not short term or acute exposure.

In EPA's final health advisory document dated May 2016, the final health advisory level for PFOA and PFOS is expressed in units of µg/L (ppb) to two decimal places, one significant

figure, (i.e., 0.07 µg/L). In order to be consistent with the final health advisory, ADEM and ADPH will take the sample results data reported as ug/L (rounding the sum to two digits after the decimal place) or as ppt (rounding the sum to the nearest 10 ppt). This is consistent with EPA's approach under UCMR3 as previously discussed. Therefore, the format used will be x.xx µg/L or x0 ppt.

In assessing the UCMR 3 PFC results, the EPA used the MRL (not DL or detection limit) as their reference point because they did not have high confidence in values for results between the DL and the MRL. According to EPA, EPA set the UCMR MRLs such that they would have "high confidence that a capable analyst/lab could meet those levels". The MRLs were set to 20 parts per trillion for PFOA and 40 parts per trillion for PFOS. The EPA then treated results below these MRLs as "zero".

In consideration of EPA's application under UCMR 3 and the extremely low values being reported, ADEM and ADPH has determined that a sample result below the Method Detection Limit (MDL) will be treated as a "zero". This approach is more conservative than that utilized by EPA under UCMR 3.

There will be times when a system reports a total PFOA/PFOS value greater than the 70 parts per trillion health advisory level. If a system's reported level is above the final health advisory level, then four new samples, separated by at least three days but preferably seven, should be collected, unless an alternate schedule is deemed appropriate based on facility specific circumstances. If, based on the confirmatory sampling, the average (rounding will be used after calculation of the average) of the previous four samples does not exceed the 70 parts per trillion health advisory level, then the system's sampling frequency may be reduced from every three to seven days to an alternate frequency acceptable to both ADEM and ADPH. However, monitoring will be performed until such time the results indicate consistent levels below the final health advisory level.[2/]

In conclusion, the approach to establish and interpret the testing results from the affected water systems will be to:

- Average sample results over time, noting exceedances but not taking action unless the average of the previous four samples exceeds the 70 parts per trillion health advisory level [2/].
- In cases were the result is less than MDL, the decision to view that sample as a "zero" is acceptable.
- In the instances where a system has had prior exceedances but is taking actions to mitigate these exceedances, it is permissible for the affected system to present four samples, separated by at least three days but preferably seven, to show ADEM and ADPH that the finished water is averaging below the 70 parts per trillion health advisory level.
- ADEM and ADPH may accept an alternate sampling regime based on facility specific circumstances if it is determined to be appropriate.
- ADEM and ADPH should then review the sample data and ADPH will send a letter to the affected system acknowledging that they are below the EPA final health advisory level.
- The system will continue to monitor for PFOA and PFOS until such time the results indicate based on a case-by-case basis consistent levels below the final health advisory level.

[1/] EPA email dated June 8, 2016, from Ms. Becky B. Allenbach, Chief, Grants and Drinking Water Protection Branch, EPA Region 4 – Atlanta to Mr. Dennis Harrison, Chief, ADEM Drinking Water Branch.

[2/] ADEM and ADPH will also give consideration to individual sample results and based on the facility specific circumstances may require action and/or an alternate sampling regime to include averaging of data and monitoring frequency.

NOTE: This guidance is intended for finished water only.