

**ADHS Ultra Low Range Total Residual Chlorine (ULR TRC) MDL and ADEQ Reporting Instructions:
02/2014**

1. MDL Determination:

- A. The measurement of ULR TRC on a colorimeter requires an MDL study, which would then become plant's reporting limit to ADEQ.
- B. In the most general terms, MDL is a measurement of how low a given method can practically detect.
- C. Spike the actual sample taken just before the chlorine contact chamber. The sample cannot have any dechlorinizer present or the MDL will be invalid.
- D. Spike with 100 ug/L chlorine standards. They can be purchased from NSI Solutions Chlorine Check Standard – Amperometric Titration - 0.100 mg/L = 100 ug/L QCI-148 (25 Tubes)

NOTE: The actual true value concentration must be used in the calculations.
- E. The MDL study will be run over 3 days. Generally 3 samples on one day and 2 samples each on 2 different days for a total of 7 sample spikes. This gives a more representative MDL value.
- F. On the first day, take 4 samples just before the chlorine contact chamber. One sample will be run without spiking and the other 3 samples will be spiked with 100 ug/L.
- G. If the blank sample shows any presence of chlorine, then that value will be subtracted from the spikes values. If the blank sample doesn't show any value, then the readings from the spiked samples are used in the spreadsheet.
- H. On the other 2 days, similarly take a blank sample and 2 samples for spiking and get values for all the 3 each day

The sample Excel MDL table is attached below.

- Enter the analyst name
- Enter the dates
- Raw amount would be the final value of spiked sample (or if you have to subtract the unspiked sample chlorine value)
- The next column is the True Value which is on the packets. Sometimes they are not written on the packets. There are a couple of ways the true value can be found:
 - 1) Call the NSI solutions, tech support will give the true value and will email the certificate if the lot number of the check sample is given.
 - 2) The bag in which the check standards are packed in will have the true value written on it.

- 3) When the order for the check standard is placed request the vendor to include the certificate with the check sample.
 - 4) When the order for the check standard is placed request the vendor to include the certificate with the check sample.
- The MDL value can be obtained in the ug/L or mg/L units. Change the units in the spreadsheet if needed and enter the values in the appropriate units.
 - If the raw values and the True value are entered, the spreadsheet will calculate rest of the values and the final MDL value is calculated.
 - This MDL value becomes the permittee's reporting limits.
 - Report any sample values at or above the MDL to ADEQ.
 - If the sample value is below the MDL, then report as "NODI B" or "< XX", where XX is the actual MDL (a.k.a LOD) value, depending on the reporting requirements specified in Part II.B of the permit.

Please see next page for the sample Excel MDL table.

2. ADEQ MDL Reporting Instructions (Contact Marnie Greenbie of the ADEQ Surface Water Section Permits Unit for more information):

The permittees should include a copy of the spreadsheet showing the MDL calculation with the first set of Discharge Monitoring Reports (DMRs) that reference the new MDL. The DMRs are submitted to the ADEQ Data Unit.

The permit (Part II.B) also requires the permittees to include with the DMRs the following information for all field test results (ADEQ do not have a form, so the permittees have to make one up):

1. The analytical result
2. The analytical method
3. The LOD (a.k.a. MDL) and LOQ for that method
4. Any applicable data qualifiers

If the information is not applicable, "N/A" should be entered. Please note that the LOD is the same as the MDL and is defined in the permit.

This is the language in ADEQ's current boilerplate permit (Part II.B):

8. For all field testing, or if the information below is not included on the laboratory reports required by Part II.B.2, the permittee shall attach a bench sheet or similar documentation to each DMR that includes, for all analytical results during the reporting period:
 - a. the analytical result,
 - b. the number or title of the approved analytical method, preparation and analytical procedure utilized by the field personnel or laboratory, and the LOD and LOQ for the analytical method for the parameter, and
 - c. any applicable data qualifiers using the most current revision of the Arizona Data Qualifiers (available on line at <http://www.azdhs.gov/lab/license/resources/resources.htm>).

Some older permits have this language instead, but the information is generally the same:

7. If the information below is not provided on the laboratory reports required in Part II.B.1, the permittee shall attach a report to each DMR that includes the following for all analytical results during the reporting period:
 - a. The analytical result.
 - b. The number or title of the approved analytical method, preparation and analytical procedure utilized by the laboratory and method-specific MDL or method-specific ML of the analytical method for the pollutant. When no method-specific ML exists, the laboratory derived ML shall be reported.
 - c. The levels at which any results are reported as either NODI(B) or NODI(Q).

- d. Any applicable data qualifiers using Arizona Data Qualifiers Revision 3.0 (9/20/2007).