

**ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION  
DIVISION OF SPILL PREVENTION AND RESPONSE  
CONTAMINATED SITES REMEDIATION PROGRAM**

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Technical Memorandum

June 2012

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**GUIDELINES FOR DATA REPORTING, DATA AVERAGING  
AND TREATMENT OF NON-DETECT VALUES**

**PURPOSE:**

The Alaska Department of Environmental Conservation (DEC) has developed a state-specific Risk Assessment Procedures Manual that provides risk assessment procedures for use in preparing human health and ecological risk assessments under the Oil and Other Hazardous Substances Pollution Control site cleanup rules, 18 Alaska Administrative Code (AAC) 75 and the Underground Storage Tank regulations, 18 AAC 78. This memo provides clarification on several data reduction issues commonly encountered in risk assessments, but shall also apply to site investigation, characterization and remediation work performed under the above-referenced regulations.

**DATA REDUCTION ISSUES:**

**1. Reporting of multiple results for the same constituent in the same sample.**

In the event that more than one contaminant result is reported due to multiple analyses by a single method, the highest detected value will be used.

If more than one result is reported from alternate analytical methods for a single contaminant, the highest detected value **OR** the result from the confirmatory method shall be used. This determination is made on a compound-specific basis. Any method-specific reporting requirements should also be adhered to.

If results are reported as non-detect by multiple analyses or methods, the undetected result with the lowest detection limit (DL) may be selected for reporting.

**2. Data reduction from field duplicate samples.**

DEC regulates based on the maximum result or statistically valid 95% upper confidence limit (UCL) per 18 AAC 75.380(c)(1). Therefore, DEC requires that the most conservative detectable sample result of the primary and duplicate results be used for management decision-making purposes. Primary and duplicate results shall not be averaged.

If the primary and duplicate results are both reported as non-detect (ND), the minimum detection limit (DL) should be presented with the data qualification flag denoting the result as ND (U-qualified).

If one of the results is reported as non-detect and the other is a detectable concentration, the detected value should be used.

### **3. Handling of Non-Detects (NDs) in the calculation of exposure point concentrations.**

Until recently, the one-half of the method detection limit (MDL/2) substitution method has been the most commonly used method to compute the various statistics of interest for data sets with non-detect (ND) results. The primary reason for the common use of this method has been the lack of the availability of other defensible methods and associated programs that can be used to estimate the various environmental parameters of interest. Today, several other methods (e.g., Kaplan Meyer (KM) method, bootstrap methods) with better performance are available to compute the various upper limits of interest. Some of these parametric and nonparametric methods are available in ProUCL 4.0. DEC recommends the use of this U.S. Environmental Protection Agency-sponsored software application and the ProUCL 4.0 recommended method of evaluating NDs. The use of one-half the detection limit substitution (DL/2) method is not recommended as the default approach in statistical procedures that may be used in decision-making processes.

Pro UCL 4.0 information can be found online at the following EPA website:

<http://www.epa.gov/nerlesd1/tsc/software.htm>

Finally, it should be noted that the 95% UCL calculation for exposure point concentrations is only applicable to soil. The use of a 95% UCL for groundwater is not acceptable.

### **4. Handling of Non-Detects (NDs) in the summation of the Total Aromatic Hydrocarbons (TAH) and Total Aqueous Hydrocarbons (TAqH) Water Quality Standards for Contaminated Sites.**

Until recently, the department had recommended one-half the Practical Quantitation Limit (PQL) be used to substitute for non-detect (ND) results when calculating and reporting TAH and TAqH for contaminated sites. The Contaminated Sites Program now recommends the following revised requirements for calculating TAH and TAqH for contaminated sites management:

For contaminated site projects where these water quality parameters will be reported, all laboratory data reports must include reporting to the detection limit (DL) for each compound analyzed (BTEX and PAHs). TAH and TAqH summations should be calculated using the Limit of Detection (LOD) values for non-detects. If the laboratory data does not report a LOD, two times (2x) the Method Detection Limit (MDL) should be used for ND results. If a compound is reported as estimated, e.g., J-flagged, the estimated value should be used to calculate and report TAH and TAqH, instead of the LOD. If the laboratory data only reports a PQL, then one-half the PQL level should continue to be substituted for NDs for summation calculations of TAH and TAqH.