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DMMP CLARIFICATION PAPER

CLARIFICATION OF THE ROLE OF DETECTION LIMITS AND REPORTING LIMITS IN THE DMMP

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INTRODUCTION

Appropriate sediment testing is essential when evaluating the potential impact of dredged material discharge upon the aquatic environment. The goals of the data collection are to generate sufficient data of known quality for the intended data usage; satisfy the needs of the customer and the regulators; and provide a historical record for potential future use.

Detection and reporting limits are currently described by the DMMP as: (a) the method detection limits provides qualitative estimates of low-level responses that are detected at the maximum sensitivity of a method and instrument[1]; and (b) the reporting limit, or practical quantification limit, is the minimum concentration of an analyte required to be measured and allowed to be reported without qualification as an estimated quantity for samples without substantial interferences[1]. The reporting limit is generally based on a value that is between 3 to 5 times that of the detection limit, considering the amount of sample typically analyzed and the final extract volume of that method. The reporting limit must be greater than the detection limit[1]. The differentiation between detection and reporting limits are of most concern when analyzing for organic compounds of concern where the method detection limits tend to be closer to the reporting limits that with inorganic compounds where the differences between detection and reporting limits are much greater.

Screening levels (SL) are chemical concentration guidelines below which there is little reason to believe that dredged material disposal would result in unacceptable adverse effects[2]. Additionally, the DMMP requires that method detection limits must be lower than screening levels[3]. Current DMMP guidelines, in cases where sample-specific detection limits exceed the SL for chemicals of concern, are that sample-specific detection limits will be used to determine biological testing requirements[2]. The Users Manual for the Puget Sound Dredged Disposal Analysis (PSDDA) Program states that when "one or more chemicals-of-concern (COC) have sample detection limits exceeding screening levels while all others COCs are quantitated or have sample detection limits at or below the screening levels; the requirement to conduct biological testing will be triggered solely by sample detection limits. In this case the analytical chemist should do everything possible to bring sample detection limits down to or below the screening levels, including additional cleanup steps, re-extraction, etc. This is the only way to prevent unnecessary biological testing".

It is acknowledged that achieving low method detection limits can be difficult; however, the consequence of not detecting a contaminant with the detection limits greater than screening levels is either rejection of the data set or direction to use biological testing to provide the quantification of effects. Best professional judgment is used in considering background information and exceptions to the general rule, however, current policy requires a positive hit to be assumed

unless it can be demonstrated otherwise.

PROBLEM IDENTIFICATION

It has come to the attention of DMMP staff that some local and regional laboratories are reporting only reporting limits, not method detection limits, and assigning a "U" qualifier code when a sediment contaminant is not detected at *or above* the reporting limit value. This appears to be especially true in reporting results for organic chemicals of concern, such as semivolatiles and PCBs. The practice does not assure DMMP sediment staff that estimated concentrations of contaminants measured below the reporting limit (and above the method detection limit) are being reported as estimated, e.g., qualified with a "J", when that is indeed what both programs require. The practice also fails to comply with the DMMP guideline stating that the highest Aroclor method *detection* limit "U" is assigned to Total PCB Aroclor mixture results when no individual Aroclor is detected. Ecology's SMS rule also cites this requirement.

Another reason for this clarification is that there appears to be some confusion about this DMMP guideline to report results relative to the method detection limit, not reporting limit, because of Ecology SMS program guidance that has evolved toward requiring reporting limits to be at or below the SQS[4].

PROPOSED CLARIFICATION

1. Clarify that laboratories ***must*** report estimated concentrations that fall between the MDL and RL

2. Require laboratories to report both the reporting limits and the method detection limits for any COC that is accompanied by a "U" qualifier code.

3. Continue to provide the project laboratories with the information required to meet the project data requirements.

4. Reaffirm the requirement to conduct biological testing when one or more COC have sample detection limits above the screening levels.

5. Specific to the reporting of Total Aroclor PCBs, reiterate that there is clear DMMP guidance stating that the detection limit is the basis for summing non-detected Aroclor mixtures. However, PCBs are not different than other compounds in terms of comparison to the screening level, biological trigger and the maximum level - reported values of detected mixtures will be used, including "J" values falling between the detection limit and the reporting limits.

CONCLUSION

The DMMP agencies recognize improvements in the analytical capabilities of laboratories, particularly in regards to technology and methods that make it reasonable to achieve reporting limits below both screening levels and SQS values for most, if not all, COCs. The agencies also recognize that the issue of detection and reporting limits, and how to report sediment quality data is also the subject of discussion in the Regional Sediment Evaluation Team. Thus we will track recommendations made by that forum during the next year and will consider future clarifications

as appropriate.

REFERENCES

[1] Puget Sound Estuary Program (Organics Chapter p 8)

[2] Dredged Material Evaluation and Disposal Procedures: A Users Manual for the Puget Sound Dredged Disposal Analysis (PSSDA) Program Users (Sections 5.7 to 5.9)

[3] Puget Sound Estuary Program (QA/QC Chapter, Section 2.4.2.2 and Organics Chapter Section, 5.2.2)

[4] Ecology, 2003. Sediment Cleanup User's Manual, Sampling and Analysis Plan Appendix (SAPA).