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Steve Glomb
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NRDAR Program
Mail Stop MIB 4449
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Subject: Comments on FACA Committee Meeting

Dear Mr. Glomb:

I am pleased to submit written comments concerning the information presented at the NRDAR FACA meeting held in Washington, DC, on November 30, 2006. I appreciate the opportunity to speak as part of the public at the recent meeting, and to provide these comments as a supplement to my verbal observations.

As an overall comment, I recommend that Subcommittee 1 use the term “organism” rather than “individual” in describing this level of biological organization. Similarly, suborganism level would be the appropriate terminology for endpoints such as histopathology and enzyme activities. Although the term “individual level” is used by some practitioners, it is not a level of biological organization, and may lead to some confusion about what is meant by the term. The issues associated with the use and misuse of this terminology have been discussed by Suter et al. (2005).¹

On page 5, lines 64–68 of the November 27 draft of the Subcommittee 1 report, it is stated that *“We generally observe that there is a lack of strict adherence to the steps in 43 CFR Part 11 apparently because the regulations are deemed insufficiently flexible to allow practitioners to address the wide diversity of contaminants, potential injuries, habitats and resources present at CERCLA sites, or utilize newly emerging assessment and scaling methodologies.”* In my 20+ years experience in working on many NRD cases, I have not found this to be the case. It is true that, in many cases, trustees do not maintain a strict adherence to the DOI rule. However, I do not believe, and have not heard from trustees, that the lack of adherence is because of a lack of flexibility in the rule. The draft report also does not provide specific examples of inflexibility in the rule.

¹ Suter, G.W., S.B. Norton, and A. Fairbrother. 2005. Individuals versus organisms versus populations in the definition of ecological assessment endpoints. *Integr. Environ. Assess. Manage.* 1(4):397–400.

In its present form, the rule is actually very flexible, and is not highly prescriptive in nature. For example, in describing the injury quantification phase, the rule [43 CFR §11.71(f)] does not identify specific biological resources that should be assessed, but describes only broad criteria associated with their selection. Furthermore, in the discussion of measurement methods for injury quantification [43 CFR §11.71(l)], the rule states that “*When estimating population differences of animals, standard and widely accepted techniques, such as census, mark-recapture, density, and index methods, and other estimation techniques appropriate to the species and habitat shall be used.*” For wildlife, the rule recommends that methods should follow “*...standard and widely accepted techniques...*” The rule contains many such statements that contain the word “should,” which leaves injury quantification open to methods that meet certain general criteria, including new or emerging methods. I recommend that the subcommittee reconsider the conclusion that the DOI rule is inflexible. As currently stated, the report inappropriately implies that amending the rule may be necessary because of a relatively vague notion of inflexibility.

On page 6, lines 87–92 of the November 27 draft report, it is concluded that 43 CFR 11 does not define the terms population, habitat, or ecosystem, and that this omission has resulted in “*...confusion and uncertainty over the meaning of these terms in the NRDA process and has unnecessarily inflamed the controversy over what is the appropriate level of biological scale...for assessing injury and determining damages.*” I disagree with this conclusion. The terms population, habitat, and ecosystem are well understood by practitioners, including trustees, their consultants and industry consultants. These terms are taught in entry-level ecology courses, and are explored in detail in more advanced college courses. They are not “terms of art” specific to NRDA (e.g., as is “baseline”), and do not require a regulatory definition. Although there may be specific issues associated with the limits of a particular population at a site, those are site-specific scientific issues, and are not dependent on the general definition of these terms. The appropriate levels of biological scale for injury quantification are clearly, and understandably, stated in the rule as being the population, habitat, and ecosystem levels [43 CFR §11.71(l)(1)].

Although the community level is not explicitly included in the rule, in my experience this has not caused a problem. NRD practitioners realize that a community is composed of multiple populations, and is essentially an extension of that level of biological organization. Therefore, community-level assessments are frequently conducted in NRDA without any confusion or limitation imposed by the current rule. I recommend that the aforementioned conclusion in the report be reconsidered.

On page 6, lines 96–100 of the November 27 draft report, it is stated that: “*DOI should provide clarity, either through a revision in 43 CFR Part 11 or through new guidance, that makes clear injury determination and quantification should be performed at the level of habitat and/or at the appropriate level of biological scale (i.e., at the individual, population, community, or ecosystem level) that is practicable, reliable, and reasonable for the site in question.*” I have

two significant concerns with this recommendation. First, I think that this statement should be consistent with the “preferred option” as stated at the meeting (slide 7). I recommend that additional guidance might be appropriate, but the rule does not need to be amended in this regard. More importantly, the recommended inclusion of “individual” level measurements for injury quantification is not consistent with sound science. In general, we do not have reliable methods for extrapolating from organism-level effects to a determination that services provided by natural resources have been impaired. The concept of services is extremely important in the interpretation of quantified injuries to natural resources. Any biological scale used for injury quantification must be related to services.

Injury quantification at the population, community, or habitat levels provides scientifically meaningful assessments relative to potential service losses. There are available scientific methods that are consistent with the criteria in the rule, and may be used for such assessments. In some cases, information on survival, growth, and reproduction may also be measured at the organism level, and such measurements may be reliably extrapolated to the population level (e.g., using population models) and used to estimate service losses. However, suborganism level measurements are neither reliable nor appropriate for determination of service losses. Many suborganism level measurements are biomarkers of exposure, and do not reflect adverse effects in the tested species. The significant weaknesses and limitations of these methods for estimating adverse effects have been recently reviewed by Forbes et al. (2006).²

The significant limitations of organism and suborganism level measurements are clearly identified in Table 2-1 of the Subcommittee 1 draft report. As stated in Table 2-1, these weaknesses include “*little known ecological relevance, weak relationship with ecological effects, individuals may be relatively unimportant to the overall population demography, ... often not representative of ecological services.*” I agree with the identification of these weaknesses, and support the evaluation of relative strengths and weaknesses of various levels of organization as presented in Table 2-1. However, I believe that the information in Table 2-1 is inconsistent with recommendations concerning organism-level assessments presented in the body of the report. The stated weaknesses of organism and suborganism level assessments far outweigh any potential strengths associated with these methods in relation to injury quantification and determination of service losses. I recommend that the body of the report be re-written to reflect these significant limitations. I also believe that the report should reflect that organism- and suborganism-level measurements should not be used for conducting injury quantification, except for measurements of survival, growth, and reproduction for selected situations (i.e., when these measurements can be reliably extrapolated to population or higher level effects). In addition, I recommend that the last column (NRDA Specific Issues) of Table 2-1 be re-evaluated by the Subcommittee and re-written. This column in the table is generally

² Forbes, V.E., A. Palmqvist, and L. Bach. 2006. The use and misuse of biomarkers in ecotoxicology. Environ. Toxicol. Chem. 25(1):272–280.

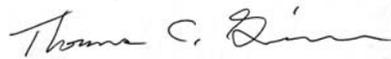
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inconsistent, and in some cases redundant, with the identified strengths and weaknesses in the preceding columns of the table.

Finally, I note that HEA, which is discussed on page 6 of the draft report, is not a technique for determining or quantifying injury. It is simply a mathematical construct for translating estimates of service losses into estimates of compensatory restoration. As such, it involves a step in the NRD process that follows injury quantification. I agree that consideration of possible restoration alternatives is important throughout the NRDA process, and that HEA may be a useful tool for estimation of compensatory restoration for some kinds of ecological services. However, the overall process of damage determination and/or restoration planning involves many regulatory considerations and scientific issues, and is not adequately described by the brief section that has been included in the draft report. For these reasons, I recommend that the discussion of HEA be deleted from the report.

In summary, I commend the Subcommittee for its work on this subject. I believe that the final report will provide important information to the Department of Interior concerning its planning associated with NRDA regulatory issues. Please consider my recommendations both in the final Subcommittee 1 report and the final report that is submitted to the Agency.

Sincerely,



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