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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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March 13, 1995

Mr. Ron Gerton
Tank Waste Remediation System Safety Manager
U. S. Department of Energy
P.O. Box 550
Richland, WA 99352

Dear Mr. Gerton:

The enclosed pages present the Washington State Department of Ecology's (Ecology) comments to the U. S. Department of Energy (USDOE) document, **Data Requirements for the Safety Screening Issue Developed through the Data Quality Objectives Process (Draft)**. Ecology would like to commend USDOE on producing a document which directly addresses the issues involved without a lot of unnecessary verbiage. This, however, does not mean there are not places where the document needs to be expanded, but the attempt to minimize the size of a document and focus on just the issues important for the problem is something Ecology would like to endorse. In addition, although Ecology in general understands the approached being proposed, there are a number of issues which still need to be addressed before the plan can be implemented.

If you have any questions concerning these comments, please give me a call at (509) 736-3018. Ecology looks forward to hearing your response to our concerns.

Sincerely,

A handwritten signature in black ink, appearing to read "Alex Stone", followed by a horizontal line.

Dr. Alex Stone
Tank Waste Remediation System Safety Team Leader
Nuclear Waste Program

AS:mf
Enclosures

cc: Susan Eberlein, WHC
Mike Payne, WHC
Todd Brown, WHC
Administrative Record



START

Ecology Comments on:

Data Requirements for the Safety Screening Issue Developed through the Data Quality Objectives Process

The comments which follow are divided into two sections. The first, Major Concerns, deals with more broad scope issues which are of primary concern. The second section, Other Concerns, are more specific examples of wording or content issues. The comments in the second section occasionally provide more detailed information on the points raised in the first section and are included for clarity.

Major Concerns:

- Control/Mitigation Definition: The document is too vague when it comes to dealing with how control and/or mitigation is to be effected. Statements are made throughout the document such as "implement appropriate controls AND/OR mitigate to reduce safe level" (page 3, 3.2 Decision Logic, 1A, final sentence) without clearly defining what actions are to take place. This information needs to be provided and each currently known safety hazard needs to be addressed.
- Long-term Screening: The document fails to include what actions are to be taken in the long term to continue safety screening. This document encompasses only what safety screening is to be done initially for all 177 tanks. It does not consider how it will address such issues as episodic releases and the potential manufacture of new safety issues. The sampling suggested in this document only provides a single value to determine the tank waste condition at a single point. It does not address the possibility the sample will be taken at a time (or place?) which is not representative of the true condition of the tank. A particular example would be the episodic release of gases. If the sample is taken on a day for which little gas was released, it may provide an unrealistic evaluation of the tank waste condition. Another example is some tanks will be screened and deemed not to present a hazard (i.e., no control and/or mitigation will be done on these tanks.) If this is the case, it is imperative that a screening schedule be established to confirm the status of these tanks on a regular basis. This document must address continued sampling on some periodic basis which resolves these issues.
- Interaction with the Interim Stabilization Program: This document fails to consider how the Interim Stabilization (IS) program will affect the safe storage of tank waste. One major premise of this document is the determination of water content. If sufficient moisture is available to prevent a reaction from occurring, the tank waste is stored safely. The IS program, however, removes moisture from the tanks in order to prevent leakage of waste into the surrounding environment. It would be necessary, therefore, 1) to work closely with the IS program to assure that sufficient moisture remains to prevent a safety



problem from occurring while minimizing potential leakage to the environment, and 2) to screen the tanks on some frequent basis to affirm the moisture content remains constant. This issue needs to be addressed in the DQO document.

- Unexpected Chemical Species: The document addresses a list of chemical species which have been identified as being potential safety hazards. What is not addressed is what effort is being made to evaluate the sampling results for unknown or unrealized hazards. A perfect example is the current problem with tank U-106. The vapor sample was analyzed for tentatively identified compounds (TICs) and values were obtained for compounds such as methyl isocyanate, which were both at a level of serious concern and completely unexpected. Although the compounds in U-106 may be either artifacts of the sampling effort or due to some chemical reaction in the sampling media, the important point is unexpected compounds were discovered and their potential presence addressed. The DQO document does not include information on what actions are to be taken to identify unexpected chemical species and how this information will affect the status of the various tanks.
- Monitoring Information: At several points in this document, the issue of monitoring is raised without presenting detailing information on what type of monitoring will be used for each potential safety problem. Information needs to be included on what type of monitoring will occur for each expected safety issue and how this information will be used to assure continued safe storage of the tank waste.
- Compatibility with other DQOs: There exists a vagueness in the document when other DQOs are reference. It is not clear from this document that, if a potential problem is identified, what responsibility is transferred from this document to other DQOs produced to address specific safety issues. For example, on page 3, 3.2 Decision Logic (sentence after 1C), the statement is made ". . . if step 1C is answered "yes" then go to the organic DQO . . . as well as proceeding with the safety screening DQO." It is unclear from this comment what the results of this statement are. What are the responsibilities of the Organic DQO and what are the responsibilities of the Safety Screening DQO? These issues need to be clearly defined.
- Confidence Limits: In Section 7.0 Acceptable Confidence Limits for Decision Errors, Table 7.1 provides information on what decision is being made, the decision threshold, and the confidence requirement for the sampling data. Ecology questions whether the confidence limits listed in this table and described through this section have any meaning for the sampling program provided in this DQO. In order to assign any confidence limits to a decision variable, multiple sampling is required to determine whether the data fall within the required confidence limit. The sampling described in this document only addresses a single data value taken at a specific sampling event. This comment relates somewhat to the earlier comment on long termed sampling to obtain a true representation of waste condition. The discrete sampling event provides information only on a specific

date. This limited information cannot be used to produce any defensible confidence limit. Therefore, if multiple sampling is not planned for each tank, then the use of any confidence requirements is inappropriate and a new method for evaluating the discrete samples needs to be established.

- DSTs: The issue has been raised that it may be unnecessary to subject the DST system to the Safety Screening DQO. The comment was made that due to both the level of knowledge concerning the waste in the DSTs and the high level of transfers which lead to tanks with frequently changing waste content, the Safety Screening DQO would not provide useful information. Ecology agrees some tanks within the DST system may not require a safety screening analysis (tanks which act as feed for the evaporator, for example, in which the waste fluctuates as the evaporator runs is a good example). However it has been proposed that many of the current safety problems were caused by both the inappropriate mixing of condensed waste from the evaporator and/or potentially over concentrating the waste by the evaporator. Therefore, Ecology feels many of the tanks in the DST system require safety screening on a regular basis to validate many of the assumptions used for the evaporator (level of concentration, appropriate mixing of waste types, etc.) and to provide proof that current actions are not leading to any potentially new safety problem. This issue needs to be addressed either in this DQO or in a DQO which addresses specifically the unique problems faced by the DST system.
- Non-sampling Data: At several points within this document, statements are made that sources of non-sampling data will be used as a basis for various decisions. These comments are extremely vague and details need to be provided on what type of non-sampling data will be used and how this data will provide a basis for the decision involved. Without such clear delineation of use and "appropriateness" of non-sampling data, use of it for decisional purposes cannot be justified. (See the following comment for a specific example.)
- Historical Data: One potential source of information from a non-sampling source is historical data as represented by the model produced by Steve Agnew at Los Alamos National Laboratories. Historical data as represented by the Agnew model, has very valuable uses such as directing sampling efforts and for other such general concerns at the TWRS EIS. Historical models, however, cannot be used to replacing sampling data without a detailed verification of the quality of the information the model provides. To date, there has been no verification of the Agnew model (although a Historical DQO is in process which addresses some of these concerns). Until this verification procedure has been completed, the Agnew model and any other historical sources cannot be used in lieu of sampling results. This document must reflect this limitation and users directed that historical information cannot be used in place of sampling results at this time.
- Referencing other documents: Throughout this DQO, references are made to external documents which are used for basis of several of the decisions made within. It is

important if one is to concur with these decision points that a summary of the important information be provided. Ecology does not want to see this document include all the information of the referenced item, but a very brief summary of the salient points is important.

- General Format: The draft would be more readable if a good technical writer proof read it. Some of the confusion is due to inconsistency and lack of order. Detailed information is addressed in the following comments.

Other Concerns:

- Executive Summary: Questionable statements are made in the first and second sentences under the Executive Summary. The Tank Safety Program has been working on tank safety issues for years. How could they claim that the potential for combustion of all tanks and the concentration of noxious vapors in all tank are unknown? It might be more reasonable to claim "unknown" for most, but not all tanks. The same statements are also made on the page 2 of this report.
- Executive Summary: The first sentence of the second paragraph under the Executive Summary states: ". . . bring the tank to safe operating conditions" should be changed to ". . . bring the tank to safe storage conditions."
- Page 3, 3.2 Decision Logic, 1C: The comment is made concerning a "miscible organic phase." Does the logic include the possibility of discovering a tank with an immiscible or partially miscible phase? Tank C-103, for example, has a floating organic layer and the possibility exists that other tanks which have not been identified may also have this problem.
- Page 3, 3.2 Decision Logic, Item 2: The comment is made ". . . monitor waste to ensure continued safe interim storage and the decision process ends here." What exactly is meant by "monitor," and how will each safety problem be monitored? See the comment in Major Concerns for more details.
- Page 4, 3.2 Decision Logic, final sentence: The comment is made that "The decision logic is given in a logic diagram on page 4." No logic diagram was found and, therefore, no comments could be provided on its content.
- Page 4, 4.0 Decision Inputs, second paragraph: The comments are made that "Decision inputs may consist of any piece of information or data that can help answer the decision. It does not necessarily need to be from sampling and analysis." These comments are vague and need to be clarified. What process will be used for evaluating the appropriateness of information used as a decision input and what information other than sampling and analysis can be used? See the comment in Major Concerns for more details.

- Page 4, Table 4.1 Summary of Decision Inputs: CO₂ is not an air pollutant under state and federal regulations, but it appears in Table 4.1 as one of the decision inputs for Decision 1B. The other decision inputs for Decision 1B are all air pollutants. Therefore, it is questionable that CO₂ should be listed in Table 4.1. Provide justification on why it was included.
- Page 4, Table 4.1 Summary of Decision Inputs: For the "Decision Input" butanal, no "Reason for Requesting Decision Input" given. This information should be provided.
- Page 6, Table 4.1 Summary of Decision Inputs: For the "Decision Inputs" [n-dodecane] and [n-tridecane], the "Reason for Requesting Decision Input" given was "Same as [n-undecane] justification." No species of [n-undecane] was found. Is this either an error or an abbreviation which needs to be described? Please clarify.
- Page 8, paragraph below Table 4.1: The statement is made that "Decision inputs . . . are referenced in (Meacham 1994)." In addition to any grammatical considerations, it is necessary to provide a short summary here of the major decision inputs in the referenced document. (See the Major Concerns for more details.)
- Page 9, 5.0 Study Boundaries: The bulleted items in the third paragraph include the statement "Tank layer (or specified thickness)." Where does this information come from, how is it determined, and how is its presence (or absence) verified?
- Page 9, 5.0 Study Boundaries: The bulleted items in the third paragraph which list the six physical boundaries are different from the physical boundaries listed on Table 5.1 in numbers and terms. This inconsistency needs to be addressed.
- Page 9, 5.0 Study Boundaries, fifth paragraph: The statement is made "To date, no time constraints have been specified for determining decisions and decision inputs." When will these very important inputs be determined and how will the decision be made?
- Page 9, 5.0 Study Boundaries, Table 5-1: Under the "Input" for [Hydrogen], the only "Physical Boundary" mentioned is "Vapor space." Does this completely exclude the waste itself which generates the hydrogen gas? What is the responsibility of other DQOs to address the waste issue? (See Major Concerns for more information.)
- Page 9, 5.0 Study Boundaries, Table 5-1: Under the "Input" for "Temperature," the only "Physical Boundary" mentioned is "Vapor Space." Does this completely exclude the issue of high heat tank waste and is this appropriate? What is the responsibility of other DQOs to address the high heat issue? (See Major Concerns for more information.)

- Page 11, Summary of Decision Rule, second paragraph: The comment is made that "inputs may be acquired from existing information and data sources . . ." This point needs to be clarified. See Major Concerns for a more detailed discussion of this issue.
- Page 11, Summary of Decision Rule, Table 6.1 Decision Rule: In Step #2, no decision threshold was provided for [Tributyl Phosphate] at the end of the column. Please provide this information.
- Page 14, 6.2 Justification of Decision Thresholds, third paragraph: The comment is made at the end of the paragraph that ". . . it will not characterize any type of transient behavior." This issue needs to be addressed. See Major Concerns for a more detailed discussion of this issue.
- Page 14, 6.2 Justification of Decision Thresholds, third paragraph: The statement is made that "Other flammable gases such as ammonia and methane are generated by the waste in some Hanford double-shell tanks." Why are ammonia and methane not listed with hydrogen on Decision 1A? This inconsistency needs to be addressed.
- Page 15, 6.2 Justification of Decision Thresholds, fourth paragraph: The statement is made that two sources were utilized to identify the CES concentration limits. A source which needs to be referenced and included is acceptable source impact levels as defined by WAC 173-460. The information included in this reference needs to be addressed.
- Page 19, Optimization of the DQO Process, second paragraph: The comment is made that "The characterization program has access to other sources of characterization information." This statement needs to be clarified. See Major Concerns for a more detailed discussion of this issue.
- Page 19, Optimization of the DQO Process, Table 8.1: Under the "Decision Inputs" of "% Water" and [Fuel], the comment is made in both for "Possible Input Sources" that "2 Tank grouping models" can be used. It needs to be made clear what type of models are to be used and how they can be used. Historical models without verification cannot be used in lieu of sampling data. See Major Concerns for a more detailed discussion of this issue.

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