

Meeting Minutes

CCN: 059120

SUBJECT GW/VZ INTEGRATION PROJECT WEEKLY MEETING - JUNE 1, 1998

TO Distribution

FROM Michael J. Graham, GW/VZ Project Manager

DATE June 3, 1998

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NEXT GW/VZ INTEGRATION PROJECT WEEKLY MEETING DATE:

Date: June 8, 1998

Location: 3350 George Washington Way, BHI Assembly Room, Badging Required

MEETING MINUTES FROM JUNE 1, 1998:

A Groundwater/Vadose Zone (GW/VZ) Integration Project Weekly Meeting was held on June 1, 1998 in Richland, Washington, at 3350 George Washington Way, BHI Assembly Room.

UPCOMING EVENTS: (Michael Graham)

- A Time Magazine Reporter will be here this week. His primary focus will be on the Tanks and K-Basin. The GW/VZ Project will be meeting with him on Thursday morning for approximately 20 minutes in the C-Reactor Building.
 - Gordon Rogers noted that he had been personally contacted for his perspective of the Hanford Site as a former employee.
- The ER-DWP Kick-Off Meeting will be held Wednesday, June 3. Our plan is to influence the planning process and activities, some in 1999 and certainly in 2000. We will keep driving our schedule to make good things happen for the Hanford Site. We will follow-up on this meeting in next week's Monday Project Meeting.
- We are on the HAB Agenda for late Friday afternoon. We are trying to determine what kind of support is needed from the GW/VZ Project.

PROJECT SPECIFICATION DISCUSSION: (Tony Knepp)

Remember that the Project Specification is a high level planning document that will determine the scope of the job, goals, and some of the drivers. Twenty people from PNNL, PHMC and BHI have been selected to participate in the writing of this document. The kick-off was May 14, 1998.

QUESTION: Does it include Appendix D?

ANSWER: It does not.

From the May 21, 1998, CRCIA Meeting there was an action to conduct a meeting to review high level details of the CRCIA document and determine where we are to date. On May 28, 1998, a meeting was held with Tom Woods, Lino Niccoli, Wade Riggsbee, Tom Wintczak, Tony Knepp and Bruce Ford to go through the planning process for the workshop on developing the conceptual model.

An internal White Paper on the current position on the CRCIA requirements will be completed sometime this week and will be distributed for review (attached). We would like to have a meeting soon to discuss this paper. This is a starting point to begin planning conceptualization. One of the key parts of the GW/VZ Integration Project's job is to create a plan for what is missing. What do you understand and what don't you understand? Once you know this, you can then determine where you want to go.

QUESTION: Will you be involving the stakeholders, Tribal Nations and regulators in this review.

ANSWER: Yes. The White Paper will give us a starting point. It will be distributed electronically and you can respond with what you agree or disagree with. We need to know who is interested and will be available in participating. We would like to have a quick turnaround on this, but if you can't respond this week, let us know and we will try to work around your schedules.

COMMENT: Be sure to include a date for when you need to have the feedback.

QUESTION: Will the Project Specification affect other project milestones?

ANSWER: No. It's more along how you conduct the work and how you plan for it.

PUBLIC & TRIBAL NATION PROJECT PARTICIPATION: (Dru Butler)

We would like to have a discussion on what kind of meeting notes would be best for our workshops and these meeting. At the beginning of the project we said that the meeting minutes would consist of key points and capture any action items that came out of the meeting discussions. We have had some requests for more detailed meeting minutes and would like your feedback on the type of meeting minutes we prepare.

DISCUSSION:

- The current meetings minutes don't capture the specifics. They aren't detailed notes. Some of the items that were key to the discussions have not been captured. Is there an advantage to that much detail, or can you lose some of the high level bullets in the details? Would like to see greater detail.
- What is the purpose of taking the notes? Is it to document the outcome of the meetings? If so, then what we have is sufficient. If the purpose is to provide a transcript of what was said, then we have something much different and it would require greater resources.
- One of the reasons that we went into detailed format for the CRCIA Meetings was that often we would walk away from the meetings thinking that everyone had agreed to an item, when in reality we each had different

ideas of what we had agreed to. More detailed minutes helped us work together as peers and helped us remove the “hat” that we wear to work towards solutions.

- It is important we have a common understanding. A solution to the problem of gaining consensus would be if we were to review at the end of the meeting any agreements that had been made. Another method would be to review agreements at the end of each section under discussion and record them at that time.
- Would you pause in the middle of the meeting and record what was being said? Yes.
- Sometimes the high points have a way of creeping up on you and the information leading up to it can be lost.
- We need to find a middle ground between a court reporter and editing on the spot.
- The CRCIA meeting minutes did not say the “Yakama Indian Nation said this,” they were more a capturing of ideas without ascribing them to a particular individual.
- If you don’t capture who said what you may have ordinary folks getting into areas they might not have much understanding of.
- Maybe if we were to include a notation of the participants in a particular discussion and not necessarily ascribe the discussion to who said what.
- When CRCIA began to really go somewhere was when the people around the table left their “hats” off the table, unless they had to make a particular statement. At that point, everyone began to act as if they were as much concerned with each others needs, as well as their own. Until we reached that plateau we had a problem. Everyone needs to be willing to take on each others needs and concerns.
- We all come to this table because we have an interest in the GW/VZ. We are here because of that interest, not because we wear a certain “hat” that requires us to be here. When we do have to say something wearing a particular hat (i.e., EPA) then we should designate so at that time.
- I want to commend the project for having meeting minutes out quickly. It helps to keep things fresh in the minds of those attending.

CONSENSUS: We will edit meeting minutes on the spot. At the end of each major topic we will identify issues, actions, or “jewels” of what was discussed. Unless otherwise requested, we will not ascribe who said what to the entire discussion process.

QUESTION: Are there any comments on the May 21, 1998, Public Involvement Workshop?

ANSWER: Having DOE-HQ represent themselves was a very positive aspect to the process.

Dru Butler and Bryan Foley are beginning work on an outline for the Public Involvement Plan. If there are interested individuals who would like to work with us on preparing a draft, please call Dru on (509) 375-4669 or Bryan on (509) 376-7087 by June 10.

EXPERT PANEL: (Tom Page)

We had originally planned on holding a June 23, 1998 Public Involvement Workshop with follow-on meeting every month. Our hope was to convene this meeting to coincide with Dr. Moniz’s trip to Hanford at that time and have the first Science and Technology Roadmapping Workshop the end of that week. Today we are not sure if Dr. Moniz is coming, and we aren’t sure if we have enough time to convene the Expert Panel at that time. We would like to have a discussion regarding the June 23 Workshop, should we go ahead or delay?

QUESTION: What would be the focus of the workshop?

ANSWER: What we are working on right now is the conceptual model.

QUESTION: What do you mean by conceptual model?

ANSWER: It is a description of the physical and biological system we are going to address in this project.

QUESTION: So the physical model is what will be discussed?

ANSWER: Correct.

COMMENT: If you are trying to coincide this with the Core Expert Panel Meeting, the time frame may not work. The higher qualified the candidates the less available they become in the time frame we need to use them. If you are going to talk about the physical system, postpone the meeting until you can pull together all the people.

COMMENT: There is grave concern among regulators and some stakeholders with the Expert Panel. When you look at the list of names that was sent out on May 28, the candidates are mostly geoscientists. A criticism of CRCIA was that we were more detailed on the front end and we had short shifted the toxicological components. Our concern is that we may do that again if the group of experts do not have a balance for the whole array of the entire perspective.

We need to have a panel member from each of the disciplines.

ANSWER: The Expert Panel is not responsible for developing the conceptual model. They are responsible for oversight, guidance and review. There will be sub-panels convened of experts to address the specific needs (i.e., toxicology). If we tried to bring in a member for each of the topic areas we would end up with a very large group of people.

QUESTION: Who determines who is on the panel? Does the GW/VZ Project determine who is on the panel?

ANSWER: The selection committee (University of Oregon and University of Washington) has been asked to give us a list of 12-13 candidates with a broad perspective. This list will then be given to DOE-HQ and Dr. Moniz for selecting 5-6 additional names.

COMMENT: If you are starting with Geohydrology folks, then they will start with a bias, and that will be where the focus will be. Your list of names is so narrow that you will lose credibility.

RESPONSE: At our April 14, 1998 meeting we asked for additional names. In our weekly meetings we have asked for additional names. We threw a wide net for a list of candidates. If we delay the process now, we jeopardize our timing.

COMMENT: The solution is to be sure that we get a distribution of skill expertise.

COMMENT: A decision has been made and it appears that you are going to stand by it. However, there is confusion on what the process is going to be. We were not sure what types of names you were

looking for. There are names that could be added. You need to minimize the concern that this has a bias toward geohydrology.

COMMENT: Trying to move forward -- what you are hearing now is not an argument of the names on the list. The problem is a lack of confidence in the process. It sounds like you are in a situation where you are damned if you do, and damned if you don't.

RESPONSE: If you have more names to be added to list of candidates, then get them to us and we will make sure they are added to the screening process. We will convey to the selection committee your concerns of diversity. If the list of twelve candidates don't meet our criteria, we will ask them to go through the process again. We will share the names of the 12 candidates when they are available to us.

COMMENT: On the assumption that there aren't any new names, rank the candidates on diversity.

COMMENT: Contact the state. The Department of Health and Fish & Wildlife will have a list of names that could be included. They will have some good candidates.

ON THE RECORD: The only part of this whole process which has been open to outside of DOE is that anyone could nominate names. DOE set the criteria. DOE will receive the list of candidates. DOE will select the Expert Panel members. The only part open to any of us is that we could throw names into the hat. At the same time we didn't receive the criteria and list of names until last week. (Larry Gadbois)

COMMENT: One solution would be to keep the SX Panel and add members to it.

COMMENT: What you are hearing around this table is that one of the fundamental differences that CRCIA responded to was the tradition of Hanford that the analysis stopped at the river and didn't carry through to the receptors. We must determine what the river does with the contaminants. We need people with expertise in that area and they are missing from the candidate list. We see subtle nuances of what Hanford has always done, and we don't see things changing.

COMMENT: Hanford has always had people evaluating the receptors. Many people have been employed in that for 20 years. The river analysis didn't compare to the airborne releases.

COMMENT: Look at the problem from the beginning. One of the things missing is eco-biological people.

COMMENT: The Core Panel is not going to determine everything the project will be doing. What has been said is an important comment. Involvement of others is for the better. We don't want to lose the momentum, but we want to verify that we have the right perspective. Maybe we should pick a smaller group and run through a smaller process later to add diversity.

COMMENT: Surely we can get a cross section of disciplines from the names on the current list.

COMMENT: Make sure that we have a subject matter expert in groundwater flow and transport.

COMMENT: Have an independent third party select the names who won't impose bias to the selection.

COMMENT: Make sure that we have someone on the panel the Tribal Nations will be comfortable with.

QUESTION: When we get the 12-13 names, how do we bring it to the group? What kind of input do you want? How do we manage?

QUESTION: Ecology and EPA, what do you do when you are the manager. Do you follow the process you have subscribed here when you select experts?

ANSWER: This project has a nuance that is different. The intent was to have stakeholders be a part of the process.

Hanford is unique because of its size.

Hanford is unique because it has a credibility problem the state doesn't have.

For a specific project that comes up, EPA would have an internal review from people away from the problem.

COMMENT: The more involvement we have as owners in the process, the better the chance of success. If you don't have involvement, you will have problems in the future. One concern is having people in the academic arena doing the selection. We want real people doing real work. We need a level of expertise that can look at the whole picture.

WRAP-UP: (Michael Graham)

Some good issues have been raised today. Let me restate -- If you have more names to be added to the list of candidates, get them to us as soon as possible and we will make sure they are added to the screening process. We will convey to the selection committee your concerns of diversity. If the list of twelve candidates don't meet our criteria we will ask them to go through the process again. We will share the names of the 12 candidates when they are available to us.

Regarding meeting minutes, we will edit meeting minutes on the spot. At the end of each major topic we will identify issues, actions, or "jewels" of what was discussed. Unless otherwise requested, we will not ascribe who said what to the entire discussion process.

NEW ACTION ITEMS:

- Continue to scope the type of workshop/meeting and notification process for mid-June. Discuss at next weeks meeting.
- Contact the Universities of Oregon and Washington to select candidates with diversity in disciplines.
- Share the list of 12-13 Expert Panel candidates with all interested parties.
- Follow-up on ER-DWP Kick-Off Meeting.

ATTACHMENT: CRCIA Requirements White Paper

Introduction

The GW/VZ project recognizes the need to immediately define the scope of the project in sufficient detail to allow discussion of what activities are currently included, identify activities that may need to be included, and activities that are excluded. The original plan commits to producing a Project Specification Document where scope and goals can be found. Additionally, DOE-RL has committed to use the CRCIA Phase II requirements report as a “starting point.” The material presented here is an approach to begin this process of using the CRCIA report as a “starting point” to help in the development of the Project’s definition and documentation of its scope.

All who participate should recognize a number of challenges exist that must be met and overcome. The first is that the GW/VZ is a complicated project, in the start up phase, and is in the process of defining itself and key interfaces. It is not easily described in short phrases or bulleted items. The project is also dynamic with scope expected to change as progress is made. The CRCIA report also provides a relatively complex and interrelated set of requirements that define what the supporting organizations believe a comprehensive impact assessment should include and how it should be managed. Defining differences and similarities in the two efforts is a major challenge. The precise meaning of CRCIA requirements and commentors opinions is often lost. The imprecise meaning of planning language make comparisons difficult and opens the door to misunderstandings.

Purpose and Approach

The purpose here is to provide a basis on which to initiate discussions, minimize misunderstandings, identify differences and similarities, and finally to resolve those areas where resolutions are possible. The approach is simple: start from the highest level of the Project and CRCIA detail and progress to the more detailed. This should be accomplished in three to four meetings of those interested parties who care to participate.

It is our belief that there are many similarities between the CRCIA requirements and the GW/VZ project and in these areas we should begin to make aggressive progress. It should also be recognized that there are differences. All parties should aggressively pursue resolution of these differences as they deem appropriate.

Presented below is a statement describing the central purpose and salient features of the GW/VZ project. It is hoped this statement will improve the understanding of what the Project is about and what it hopes to accomplish in relation to the CRCIA Part II Requirements document. This statement is followed by a discussion and an initial project position on the higher level requirements provided in the CRCIA documentation. Addressed here is the summary problem statement, principles and general requirements sections. For each problem statement, a position is advanced as to whether this project is expected to address it. Each principle and requirement is followed by a brief position on its relevancy and applicability to the GW/VZ project. Provided here will be an initial project position on each of these areas. Using the organization of the CRCIA report in this way hopefully will allow the discussion to move from the highest levels to the more detailed. A third step, to be initiated after the successful completion of the first two will be to apply what was learned in the first two steps in evaluating the more detailed information in the CRCIA Appendices A through C.

Statement on the GW/VZ Project

The statement provided below reflects information in the Planning document released April 13, 1998. It is slightly amended to promote an improved understanding to the high level purpose of the Project in relation to the CRCIA requirements.

The GW/VZ project will:

Integrate current activities on the Hanford Site, identify gaps and overlaps, and integrate the implementation of a resulting project plan.

Develop a system model (and sub system models) to evaluate the rate of movement of both radionuclides and other non radiological contaminants over a time period appropriate for decision making. This model will perform a basis for comprehensive risk assessments and be used with sensitivity and uncertainty analyses to guide work plans (e.g. characterization)

Include classical elements of water resources protection are included in the project (reducing the potential to contaminate, etc.)

Support DOE in making remediation and mitigation decisions according to the regulatory requirements governing the DOE. These regulations are found primarily the RCRA and CERCLA statutes.

Provide a sound scientific basis for decisions and actions related to the Hanford cleanup, protection of the Columbia River, and stewardship of the groundwater.

Provide for rigorous, independent technical review of the work.

The project will develop and implement an approach to conduct a cumulative assessment including both chemical and radiological contaminants that will allow an evaluation over a time commensurate with the needs of the analysis. Its areal scope includes primarily the Hanford Reservation and appropriate portions of the Columbia River. This scope can be modified, as conditions warrant, based on observed or reasonably expected impacts of Hanford. Information needed to make remedial and mitigative action decisions are expected to be related primarily to assessing the impacts of Hanford beginning at the present time and projected into the future. Impacts will be judged by use of a combination of: 1) comparison to accepted federal, state, DOE criteria, 2) Risk assessment. Detailed elements of a risk methodology are yet to be developed. Cultural impacts will be included as they are needed to determine the impacts of Hanford contamination. The development of new assessment criteria is not a goal of the Project.

Position statements on the CRCIA: Phase II problem statements.

CRCIA information is quoted verbatim from the narratives sections titled "Problem Statement" pg. II-3 of the CRCIA Phase II Requirements document. GW/VZ statements are intended to indicate if the problem identified by CRCIA would likely be addressed in the current study.

Problem Statement	GW/VZ Statement
<p>◆ The Hanford Site has not been addressed in its post-cleanup end state as a single, composite source of potential contamination in previous assessments. This is partly because the radioactivity and chemical data used were drawn from lists of known inventories of materials and wastes in their existing states. The planned end states of the wastes have not been reflected in the data used.</p>	<p>Agree with statement. This issue would be addressed in the scope of this project. End-states (e.g. final disposition of contaminants) will be defined by the respective projects having responsibility in the area.</p>
<p>◆ A composite source term that combines the effects of all chemical and nuclear materials and wastes within the geographical boundaries of the Hanford Site has not been used in previous assessments</p>	<p>Agree with statement. Development of a composite source terms will be addressed in scope of this project</p>
<p>◆ Predictive cumulative effects of Hanford's multiple contaminant sources have not been addressed.</p>	<p>Agree with statement. Development of a systems wide model to examine cumulative effects is in the scope of this project</p>
<p>◆ The time frame considered for potential effects to occur has been inconsistent with 1) the point at which planned waste containment devices can be expected to be breached, allowing contaminant migration to the Columbia River and 2) the period during which potential contaminants remain intrinsically dangerous</p>	<p>The project will emphasize a time frame that is important for remediation decisions recognizing the long half lives of certain isotopes, their daughter isotopes, and their mobility.</p>
<p>◆ Impacts on human health from river-borne contaminants have not considered the full suite of potential health effects or all human exposure scenarios. For example, previous assessments have only considered incremental cancer risk and hazard quotients.</p>	<p>The primary scope of this study is those health effects and environmental effects required by regulation and DOE order that must be considered in decision making. Developing new impact indicators and standards is beyond the scope of the project. However, the identification of areas where additional developmental work may be is needed is part of this study.</p>
<p>◆ The cultural impact on potentially affected people has not been evaluated.</p>	<p>Cultural impacts are within scope of the project as they relate to assessing the impacts of remediation or mitigative decisions. The approach to incorporate this element into the Project has not been determined at this time.</p>

Problem Statement	GW/VZ Statement
<p>◆ Ecological effects have not been adequately considered.</p>	<p>Agree. Ecological effects should be better considered than have been in the past. The level of detail the project expects in this area is currently undefined and will be developed as we proceed.</p>
<p>◆ Existing environmental regulations are, as the only guidance, inadequate because they generally are not site specific and do not adequately consider protection of the affected people and cultures. Only a site-specific assessment of risk can meet these needs.</p>	<p>Environmental regulations and guidance as defined and interpreted by EPA and other authorized agencies provide the basis/starting point for conducting risk assessments and in environmental decision making.</p>

Principles

The following paragraphs are verbatim quotes from the CRCIA requirement document followed by Project responses. The responses are phrased to both indicate areas of agreement, disagreement and our level of understanding of the statement

A. Dominance

◆ **Dominance.** This is the principle, which in virtually all things, a relatively small number of factors dominates the outcome. This assessment must not leave out any factors that dominate the results. Yet, the magnitude of work and cost of the analysis must be responsibly managed. Sensitivity analyses, parametric analyses, and related methods will be used to identify and rank the factors that dominate the outcome of this assessment. These factors may be physical attributes of the Hanford Site or waste disposal, or they may be technical characteristics and challenges within the study itself. Assumptions framed through expert judgment (in lieu of repeatable analyses) will not be used to identify dominant factors or discard smaller contributors. The resulting understanding of relative importance will be used to focus technical emphasis, management oversight, and assessment planning, as well as Hanford Site budget estimates and funding allocation for the CRCIA. This principle and its implementation while managing uncertainty are discussed in Appendix II-C.

Response: The project is in full agreement that dominant factors in each portion of the analysis will be identified in a rigorous way that allows for the process of selecting and refining factors to be evaluated by peer and other interested groups. The impact of assumptions on conclusions will be evaluated as they would always be in any credible project. The use of expert judgement will be documented and used in accordance with good scientific principles.

B. Uncertainty

◆ **Uncertainty.** The relative uncertainty inherent in assessment results will be quantified and used in the technical definition of the assessment as well as in the study’s management and allocation of resources. The level of uncertainty that can be tolerated in using the study results as a basis for cleanup decisions will be a guiding requirement. Uncertainty will be uniformly managed across the various study tasks. Methods such as “Value of Information” (from decision theory) will be used to determine the usefulness of spending more

effort to reduce uncertainty. It also will be recognized that uncertainty and the dominance principle are coupled. Technical attention will be focused accordingly. This principle is addressed further in Appendix II-C

Response: Uncertainty will be handled in both a qualitative and quantitative manner depending on the problem and available data. The quantitative handling of uncertainty is a difficult, data demanding and computer intensive task. Very often, the analyst must trade detail to allow for the efficient handling of uncertainty. At this point in the study, a commitment to quantitatively handle uncertainty in the technical definition, management and allocation of resources would severely misuse project resources and accomplish very little. Clearly, the evaluation of uncertainty will be conducted in all the above areas. The project must reserve the right to conduct a professional qualitative evaluation of uncertainty. As needed, quantitative evaluations will be combined with qualitative evaluations and used as the task or decision warrants.

C. Fidelity of Assessment Results

- ◆ Fidelity of Assessment Results. In the same sense that a high-fidelity sound system reproduces the original musical performance with clarity and discernible differences among instruments, this assessment must be able to detect an impact and resultant effect that is or will be significant to the receptors affected by the cleanup and waste disposal decisions made at Hanford (see Figure 2). In this context, fidelity includes the concepts of accuracy, resolution of information in both time and location, and statistical significance. Perhaps the primary consideration is that assessment results have enough fidelity to distinguish among cleanup and disposal alternatives in the Hanford Site decision making process. The analysts must be careful not to dismiss an effect that may be important from a cultural perspective simply because popular analytical approaches may discard such effects. This principle imposes a difficult challenge on those who do the technical design of the assessment.

Response: All analyses have as their goal the ability to distinguish among the effects of the alternatives under consideration. Sadly to say, this is often not possible. The project cannot be in a position to require a commitment of resources because of the need to distinguish between effects of every alternative that may be under consideration.

The potential to dismiss an effect that may be important from a cultural perspective is not an acceptable or desirable outcome. Hopefully, the various interested groups and cultures would be involved with the project as the study progresses to develop an approach to minimize the possibility of this happening.

D. Use of Expert Judgement

- ◆ Use of Expert Judgment. Experienced, knowledgeable analysts are expected to exercise their skills and judgment with the highest professionalism in planning and conducting this assessment. Substituting expert judgment for analytical quantification should, however, be avoided unless a convincing rationale is presented to the contrary. Clearly, time, available resources, and significance of the matter at hand must guide the analysts. The bases in making such choices are credibility and reproducibility. Pivotal activities in the assessment must be reproducible by qualified professionals outside of the Hanford community. The assessment must not be vulnerable to disrepute because results cannot be independently reproduced.

Response: The Project is in full agreement with this principle

E. Development and Use of Assumptions

- ◆ Development and Use of Assumptions. Adherence to the requirements in Part II should eliminate the need to make arbitrary assumptions to conduct the assessment. If, however, assumptions are needed, CRCIA Board approval must be obtained before the candidate assumptions are implemented. Those with merit will likely result in a revision to Part II of this document. The analyst must document all assumptions.

Response: The Project disagrees with the need of the “CRCIA Board” to approve assumptions. The Project will adhere to strong independent technical peer review and oversight. Again, independence will be achieved through an accepted scientific peer review process. It is currently planned to include appropriate portions of the Part II document as an Appendix to the Project Specification.

F. Integration of Tasks Within the Assessment

- ◆ Integration of Tasks Within the Assessment. As the assessment is subdivided into work tasks, care will be taken to ensure consistency and compatibility in the application of requirements, use of data, seamlessness of modeling, management of uncertainty, and treatment of related factors bearing on overall assessment quality.

Response: The Project is in full agreement with this principle

G. Integration with Other Site Efforts

- ◆ Integration With Other Site Efforts. Two primary areas require continuous management integration aside from the assessment tasks. First, the assessment must remain integrated with cleanup and waste disposal decisions, including related environmental impact statements, records of decision, conceptual design contract awards, planning bases for budget submittals, strategic planning, and Hanford Site project requirements documents. Second, integration must be achieved and maintained with other related analytical efforts, especially other studies involving the Columbia River. Any analyses involving the river or river corridor are expected to comply with the applicable portion of the requirements of Part II. Information from other studies may be used in this assessment only if those studies meet the requirements in Part II.

Response: We do not agree to establishing the pedigree or quality of work based on its compliance with “applicable portions of the requirements of Part II” in as much as the requirements interfere with standard professional evaluation of technical work. Technical work is evaluated by peers to gain acceptance. Other professional’s work that is used in this study is used at the discretion of the professional and management team conducting the work. To operate effectively the professional team must reserve the right to evaluate work on its own merits as judged by the professionals conducting the work.

H. Use of Other Study Results

- ◆ Use of Other Study Results. Data that do not meet the requirements in Part II are not acceptable without convincing justification. This assessment will, however, use the Hanford Site disposition baseline for defining disposal methods and, if available, estimates of containment performance. Composite source term information compiled elsewhere may be used if it meets CRCIA requirements.

Response: The use of data in any application must rely on the professionalism of the people involved. We philosophically disagree with the need to comply with Part II requirements in as much as the requirements interfere with standard process for professional evaluation of technical work. We agree that estimates made from source terms should come from the individual projects.

I. Research and Development (R&D) of Analysis Methods

- ◆ Research and Development (R&D) of Analysis Methods. Several of the important objectives of this assessment lie beyond conventional analytical practices. For example, in projecting mutagenic and cultural effects, existing methods will need to be modified and new techniques developed. Design and planning of the assessment must include preliminary R&D tasks to ensure that proper analytical tools and technical information will be available as needed.

Response: It is outside the scope to set as an objective to develop new analytical methods and techniques. Clearly, the need for improved methods will be identified and in some areas pursued. These areas will be determined through a combination of project needs, expert panel, existing conditions and project commitments.

J. CRCIA Phased Approach

- ◆ CRCIA Phased Approach. While the CRCIA Team strove to capture the requirements for this assessment independent of any given definition or sequence of work tasks, a phased pattern seems to emerge. Requirements for what may be thought of as the core set of calculations (such as contaminant inventory compilation, modeling, and exposure calculation) are described in Section 1.0. Developing the requirements for the elements of this core assessment process consumed a high percentage of the CRCIA Team's attention. The screening assessment (Part I) represents the first phase of work in performing CRCIA and used some elements of this core process in assessing the current state of the Columbia River.

The next phase consists of the tasks needed to complete an assessment. The assessment stands until DOE changes the Hanford disposal baseline. This phase is carried out in stages, beginning with designing and planning (including budget estimates and schedules) the work needed to respond to the comprehensive requirements in Part II. This planning stage also may include some of the preparatory tasks requisite to the core assessment process. Following the planning stage, the remaining preliminary tasks and analytical tools preparation will likely require a level of effort large enough to become recognized as an additional stage of the assessment. The next phase is completed by progressively refining rough assessments in stages. It is complete when the core assessment process has produced useable impact assessment results for each of the prescribed scenarios based upon the aggregate set of Hanford waste closure end states.

Subsequent assessment updates are performed in response to DOE changes to the Hanford disposal baseline. The updates are initiated by a planned or actual change in the Hanford post-cleanup end states. These subsequent assessment updates are aligned with the timetable for key cleanup decisions, annual updates of strategic planning products, Hanford Site budget submittals, and 5-10 year plan revisions.

Response: The project agrees that a phased approach will be necessary. The various phases described above are well within our own understanding of what might occur as the GW/VZ project begins.

Position Statements on the CRCIA "General Requirements"

The following initial bulleted statements are verbatim statements reprinted here the CRCIA Phase II: Requirements document. Each is followed a Project position.

- ◆ **Columbia River Area to be Assessed.** The geographic section of the Columbia River to be assessed begins at the Priest Rapids Dam and proceeds downstream to the river's mouth at Astoria, Oregon. It includes the riparian zone on either side of the Columbia River and both drinking water and irrigation water drawn from the river. It also includes the aquatic and terrestrial life that depends on the river for biological, social, or economic reasons. The water ingested from the Hanford Reach area includes undiluted, or only somewhat diluted, groundwater found in seeps and springs in the riparian zone as well as groundwater upwelling in the river bottom where aquatic habitat is found.

Response: The area to be assessed is dependent on the areas where impacts of Hanford are reasonably expected to be found or observed. A large body of information currently suggests that Hanford Site impacts (associated with groundwater and the vadose zone) are primarily observed on the Site. Clearly effects on the River's aquatic and terrestrial organisms have been detected – most notably during reactor operations. The initial emphasis in the Project is on the Hanford Site, its current impact on the River, mitigation and remediation. Current and projected impacts to the River is a priority activity in this Project. We agree that the riparian zone within the area to be assessed should be included. The elements of the assessment (“biological, social and economic”) will be included per an assessment approach whose elements are yet to be determined.

- ◆ **Time Period of Potential Impact.** The impact to and through the Columbia River is to be assessed beginning with the federal government's acquisition of Hanford lands in 1943. It continues through the period during which the radioactive and chemical materials remain intrinsically harmful, including radioactive decay daughter products and chemical reaction products. The generally recognized current regulatory horizon (about 30-50 years) is inconsistent with the long-term hazard from Hanford Site wastes and materials. The assessment must be guided by the materials' period of intrinsic hazard rather than the regulatory period.

It is beyond the scope of CRCIA to make estimates of past injury or damages. Nevertheless, to the extent that past Hanford events have resulted in present day cumulative effects or conditions that bear on future river related impact, these past events must be understood and taken into account in this assessment.

Response: It is outside the scope of this project to re-create the impacts of operations since the inception of Hanford. The analysis scope of the GW/VZ project is from the present day to as, of yet, and undetermined future date. The future date will be related to decision making (legal requirements), rate of contaminant movement, release rates etc. The scope only includes incidental work associated with estimating injury. Injury or damage assessments are not included in the scope.

- ◆ **Radioactive and Chemical Materials.** Calculations involving radioactive and hazardous materials data will include radioactive decay daughter products and chemical compounds/properties estimated to occur with time and after reaction with other chemicals, soils, and river chemistry.

Response: The Project includes this scope.

- ◆ **Impact Comparison Baseline.** “Impact” as used throughout this assessment means, and will be compared with, conditions that would exist if no Hanford contamination had ever occurred. Generally, this pre-

Hanford state will be equated with today's conditions, extending upstream from Hanford to the vicinity of the Priest Rapids Dam. It is recognized that Hanford contaminants are not entering a pristine ecosystem. Hanford impact is the fractional contribution of total impacts resulting from Hanford contaminants entering into the existing system. Total impact shall include the combined effects of Hanford contaminants and those originating elsewhere.

Response: The Project generally agrees with this requirement but provides the following clarification. We believe the definition of impacts is needlessly restrictive. The definition of an existing or background condition should not be limited to the Priest Rapids stretch of the River but include information from other river sections as the researchers on the project deem credible. The emphasis of the Project is Hanford's impact on the river. Total impacts will be addressed only in so much as needed to place the impacts of Hanford in perspective.

- ◆ **CRCIA Standards.** Contaminant concentrations and doses prescribed in regulations can be used in the assessment for general information and guidance. However, caution must be exercised to ensure that effects of interest in this assessment, but not adequately treated in current regulations, such as mutagenic effects, teratogenic effects, and cultural effects, are adequately considered. Elevated levels of contaminants will not be ignored because they lie below regulatory levels or because of a void in research linking such contaminant levels to adverse effects. The assessment analysts must develop criteria for elevated levels that should be of concern based on considerations such as naturally occurring reference levels of the contaminants, the presence of multiple contaminants and multiple exposure pathways, general environmental cleanup experience, the body of regulatory experience, and historical environmental events such as Chernobyl. Other considerations include health physics accepted practice; international standards such as those of the International Commission on Radiological Protection; cause and effect correlations from the medical community; and new developments in ecology, toxicology, and risk assessment. In addition to the need for criteria for elevated contaminant levels, criteria also must be developed for the aggregate tolerable contaminant load in groundwater and total plume size, both based on the presence of multiple contaminants.

Response: The project will use accepted standards as developed by agencies of the federal government or other reputable scientific bodies. It is not within the scope of the project to develop original standards applicable to Hanford. There is no intent on the part of the Project to ignore new developments in the field of impact assessment. Results of this work will be included as it becomes accepted in the literature. It is beyond the scope to commit to the develop new criteria as a Project commitment. Cultural impacts are also not intended to be excluded. It is within scope to evaluate and potentially develop methods to estimate cultural impacts as the need to make remediation and mitigative action decisions requires..

- ◆ **Required Results.** A primary result of the assessment is the actual or projected dose level from Hanford-derived contaminants for each receptor and each dominant contaminant as it varies with time throughout the time period of interest. The resultant impact to species will also be determined. These determinations must be made for individual dominant contaminants as well as multiple contaminants that, when assessed in combinations occurring at the same time, result in elevated toxicity levels above CRCIA standards criteria (see "Standards," above). Analysts might expect to find suspiciously high levels of some contaminants for which biological effects are not well established. Any such findings must be retained and reported. From the concerns expressed by CRCIA Team members, some potential effects have been defined (see Appendix II-A.9) and must be evaluated to determine the potential for their existence and their severity.

Response: Agree with the requirement with the exception of the concept of “CRCIA standards” as discussed previously. All findings will be retained and reported.

- ◆ **Assessment Control.** The aggregate of the requirements in Part II of this document makes indispensable a relentless, intense attention to control of the conduct of the assessment. Sensibly applying and maintaining the delicate balance among the principles of dominance, management of uncertainty, and fidelity require thoughtful conceptualization and planning of the assessment as well as continual reassessment and rebalancing of the on-going effort. The burden of this effort rests primarily on the performing contractor, particularly the assessment project manager. As described in Appendix II-D, final decision authority rests with the CRCIA Board, which will remain actively involved in managing the assessment. However, the DOE project manager, designated in Appendix II-D by the Board as the CRCIA Executive Administrator, shares the responsibility of ensuring the assessment meets the letter and intent of these requirements.

Response: Commitments related to the control of the study by agencies outside the federal government are outside the area of discussion of this paper. The Project is defining its management structure and its plans for public participation in a Project Management Plan and a Public Involvement Plan, respectively. Both of these documents are under development.

- ◆ **Assessment Frequency.** The description of recurring CRCIA assessments for each successive revision of DOE’s planned site end state is found in Section 1.0 and is illustrated in Figure 4. However, additional refinements of the assessment may be desirable in response to such developments as results from atmospheric studies that suggest new environmental scenarios, significant changes in data from Hanford studies, new information that causes changes in CRCIA models and related tools, and advances in ecology and toxicology.

Response: Agree with the requirement

- ◆ **Required Continuation of Columbia River Monitoring.** Much of the basis for detecting trends in changes to the river, which are very important to realistic assessment results, comes from monitoring current groundwater and river conditions. The monitoring program must be continued and periodically refocused to the findings and needs of this assessment.

Response: Agreed. All vadose zone, groundwater, and Columbia River monitoring is within the scope of the Project

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