MEMORANDUM

TO: Shirley Olinger

FROM: Stuart Harris, CTUIR Department of Science & Engineering

DATE: June 17, 2005

SUBJECT: CTUIR responses to Endstates notes

This memo responds to a request for clarification on the CTUIR endstate vision for Hanford as a whole and for individual areas. This memo draws from previous letters we have written and briefly restates our views on some of the major topics relating to endstates and stewardship. The summary statements for each area are fairly high-level, without much detail on individual issues. Please feel free to call me or Dr. Harper for further clarification.

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A. Summary Statement for each Area

General Hanford Summary Statement

The Hanford Site is alive with the heritage of Native people. Continuous use of the natural resources reaching back 10,000 years at Hanford is well documented. The goal of the Yakama, Umatilla, and Nez Perce Nations is to protect all native species and habitats still remaining at Hanford, and to restore particularly sensitive or significant habitats to their baseline conditions. The Big River, N'chi'wana, remains the lifeblood of tribal culture and traditions, as it has been for generations upon generations. The river sustains and nourishes many interlinked peoples and systems, including the salmon, the deer, the eagle, the human, the sagebrush, and so on. Recognition by native ancestors that all natural and cultural resources, as well as the lives of the native peoples, are linked within a single web has grown into a holistic environmental management science over many millenia of systematic observation and inductive reasoning.

The single Columbia Basin fabric that includes human livelihood, many cultures, environmental functions and services, and tangible resources and goods can be thought of as a single ethno-habitat (human beings living within and inseparable from the environment). The CTUIR is a Natural Resource Trustee of the entire Hanford area, no matter which federal agency has ownership or management responsibilities.

Our most basic value might be expressed as ensuring the continuity and well-being of tribal peoples and their homelands. The basis for this value is often cited as a combination of (1) legal documents (Treaties, the U.S. Constitution, environmental statutes), (2) court cases that uphold trusteeship, sovereignty, and treaties, (3) federal policies that recognize and affirm underlying principles and obligations of trusteeship, government-to-government relations, and environmental health protection, and (4) religious teachings that stress that in return for being given a planet that provides the resources needed for survival, health, and fulfillment there are proportional responsibilities to care for mother earth and fulfill sacred duties. Whether this is interpreted by the dominant society as common sense, a legal requirement, a philosophy of enlightened self-interest, an environmental religion, or a stewardship ethic, the result is the same - caring for mother earth and all her peoples now and in the future. Of fundamental importance is the fact that cultural identity and integrity depends on being able to protect ancestral, cultural, or heritage areas for hunting, gathering, fishing, ceremonies, teaching, religious observances, and social activities. Thus, the integrity of the overall cultural fabric depends on being able to conduct these activities in a clean and whole environment, and being able to fulfill sacred duties. It should therefore be recognized that, in addition to the sustenance (nutritional services) and everyday implements provided by sites and natural resources, they also provide cultural services.

Ethno-habitats can be defined as the set of cultural, religious, nutritional, educational, psychological, and other services provided by intact, functioning ecosystems and landscapes. An ethno-habitat refers to the cultural survival of a people within its traditional homeland. A healthy ethno-habitat is one that supports its natural plant and animal communities and sustains the biophysical and spiritual health of its native peoples through time. Ethno-habitats are also eco-cultural landscapes. Ethno-habitats are places defined and understood by groups of people within the context of their

culture. They are landscapes with culturally familiar features defined by cultural knowledge and experience.

These lands serve to help sustain modern Indian peoples' way of life, cultural integrity, social cohesion, and socio-economic well being. These lands encompass traditional Indian homelands, places, habitats, resources, ancestral remains, cultural symbols, and cultural heritage. The presence of and access for traditional use to healthy habitats is fundamental to useable and harvestable levels of resources significant to Indian peoples as well as to healthy ecosystems.

Those ethno-habitats that are places where useable quantities of culturally significant species may be obtained often overlap with ecologically-defined areas, although the species and their number and quality are often defined differently than Euro-American taxonomic systems would define them. Larger ethno-habitats can include multiple interconnected ecosystems, discrete geographic and seasonal use areas, and access corridors all within a collective set of significant places.

The Hanford landscape is a very important part of the Umatilla tribal homelands for several reasons. The basalt outcrops are important in tribal religious history and thus form a sacred landscape, social and cultural activities, and also provide unique food and medicinal plants. The upland portions of Hanford contain a series of interlinked habitats with an abundance of plants and animals important to tribes for many reasons (food, medicine, religion, ecological functionality). The river corridor is also of utmost importance for cultural, nutritional, religious, social, educational, and other reasons. The continuity between the river and the basalt outcrops form a single system that nourishes its native people spiritually, nutritionally, medicinally, socially, and so on.

The Treaty of 1855 between the Cayuse, Umatilla, and Walla Walla Tribes is the most important legal document governing our land use at Hanford. It supercedes all other documents, since treaties are referred to in the US Constitution as "the supreme law of the land." The Treaty granted the United States ownership of the land at Hanford, but reserved rights of access and use for all future generations of Tribal members. Treaties never expire or fade away unless formally rescinded by Congress. Later documents, including the Comprehensive Land Use Plan EIS, cannot take these Treaty rights away. Therefore, we consider the Treaty to be our land use plan and endstate vision. All of our technical work, including the development of the CTUIR exposure scenario, reflect the traditional uses and practices of our people, including living, praying, and teaching at Hanford. This includes many individual activities such as fishing, hunting, pasturing livestock, gatherin, gardening, sheltering, and other aspects of life.

100 Area Summary Statement

The River corridor is very important to CTUIR, including the riparian areas, the upland areas and the River itself. The River, river corridor, and adjacent lands are locations included in our Treaty as locations where we reserved rights of access and use. Additionally, the CTUIR is a Natural Resource Trustee of these areas. We consider the 100 Area and the River Corridor to be part of the same unit. We also consider groundwater and soil sites to be linked, and we believe that they cannot be closed independently even if, for practical reasons, they have been designated as separate operable units and are on separate schedules.

Our land use in the 100 Area is the same year-round lifestyle, with fishing, hunting/livestock, gathering/gardening, pasturing, and sweating that is described in our CTUIR exposure scenario. Our scenario should be used to evaluate risk and set cumulative (multi-pathway, multi-media, and multi-contaminant) health-based remedial goals. If the risks are reduced to acceptable levels as confirmed by the use of the CTUIR scenario, there will be no further lost or restricted use. Setting remedial goals for individual contaminants when multiple contaminants are present results in unprotective remedies due to additive risk. Any institutional controls that are required to reduce health risk are demonstration of lost use (a NRDA issue).

Baseline environmental conditions are defined as good-quality shrub-steppe and riparian habitat that has not been disturbed or contaminated. Regaining that level of habitat quality will support traditional tribal uses. For groundwater, the data for invertebrates in the hyporheic zone (what invertebrates are present, what is their abundance, what is the toxicity of contaminants, and what is the effect of anoxic conditions) is thin.

Criteria for closing the 100 Area as a complete unit have not been developed. Considering the amount of residual contamination that is being left beneath clean fill and the spatial extent of groundwater contamination, it is not clear what are appropriate closure criteria.

It makes sense to allow the entombed the reactor cores to remain where they are for several decades in order that radioactive decay can occur and make subsequent removal less risky and less ecological damaging. However, a bond must be posted to ensure that future removal will occur, or there will be an accumulation of lost use (NRDA damages) while we wait.

The pipe outfalls in the river must be removed, and studies should be done to determine the least damaging means of doing this. This may be most practical to do when the river is very low.

The N-Area groundwater plume must be addressed. The CTUIR exposure scenario includes access and use of groundwater. Whatever remedy is selected, the recovery time will be evaluated in the NRDA process. It is important to understand these recovery curves for each plume.

If the 100 Area is ever transferred to another federal agency, we prefer that it be transferred to BIA and USFWS jointly. In any event, federal and tribal national governments take precedence over local civic governments.

200 Area Summary Statement

The 200 Area and Central Plateau are very important to the CTUIR for natural resource and cultural reasons. The upland portions of Hanford are locations included in our Treaty as locations where we reserved rights of access and use. Additionally, the CTUIR is a Natural Resource Trustee of these areas. The mature late-successional sagebrush habitat of the 200 and 600 Areas, along with its wildlife and its cultural uses and history is of paramount importance to preserve both for its uniqueness as the last remnant of mature sagebrush and for its importance as part of the traditional cultural landscape. The upland areas at Hanford are a collection of interlocking habitats based

on soil and vegetation characteristics, and the variations in soils and plants results in different plant communities at different locations. Because any of these plant communities is likely to contain plant species of traditional importance, it cannot be assumed that there are local subsistutes of comparable quality. Therefore, the size of the impact footprint must be measured, and all types of impact (physical disturbance, airborne deposition, or soil or groundwater contamination) must be evaluated.

There are also unique plant communities on Gable Mountain due to its composition and elevation that, along with its identification as a sacred site, make it important to measure airborne deposition on the mountain. The eco-cultural systems associated with the ALE Reserve and Rattlesnake Mountain are also extremely important to evaluate due to their natural characteristics which made them important food, medicine, and cultural areas over many millennia. The water sources (various springs on ALE, West lake) in the upland areas are focal points for cultural resource preservation as well as individual species of high importance. Finally, unique geologic features (e.g. islands, dunes, and basalt outcrops) are important not only for their unique habitats but also for their traditional uses and place in the native historical culture.

Our endstate vision and land use in the Central Plateau, including the core zone, is full traditional use. We never agreed to a permanent disposal and sacrifice zone in this area, despite the CLUP. The CLUP cannot be used to deny Treaty rights, either in the core zone or outside of the core zone (or anywhere else on site).

Our land use in the 200 Area is the same year-round lifestyle, with fishing, hunting/ livestock, gathering/gardening, pasturing, and sweating that is described in our CTUIR exposure scenario. Our scenario should be used to evaluate risk and set cumulative (multi-pathway, multi-media, and multi-contaminant) health-based remedial goals. If the risks are reduced to acceptable levels as confirmed by the use of the CTUIR scenario, there will be no further lost or restricted use. Setting remedial goals for individual contaminants when multiple contaminants are present results in unprotective remedies due to additive risk. Any institutional controls that are required are demonstration of lost use (a NRDA issue).

Our baseline condition is good-quality (undisturbed and uncontaminated) shrub-steppe habitat. Our endstate vision is to consolidate waste as much as possible, which will minimize the size of the footprint for which restricted access and lost use (under NRDA) will need to be evaluated.

The best closure of the U-Plant (the first canyon building) is clearly full removal, which is one of the cheapest in short-term project costs, is by far the cheapest in terms of lifecycle costs (monitoring, barrier replacement), allows adjacent waste to be excavated, is most permanent, uses by far the least amount of clean fill (with its associated natural resource injury and associated costs), and protects the tribes and public the most. Since worker doses will not be allowed to exceed permissible limits, this is not a decision factor. The cost and risk data presented in the DOE documents make full removal by far the best remedy.

The tanks should not be filled with grout. We strongly support full removal so that the tanks and associated soil contamination can be removed. If they cannot be removed in the short term, then DOE should not take irreversible interim actions such as filling the tanks with grout. We strongly oppose the reclassification of residual high level waste as

low activity waste, which would result in leaving high level waste in near-surface disposal or storage sites, which is prohibited by law.

Contamination from tank leaks has clearly reached groundwater and is moving northwest toward the Columbia River. We may have only decades until it begins to affect the last salmon spawning area in the mainstem Columbia River. The contamination that is in the vadose zone should be excavated to a depth that needs to be negotiated. If residual soil uranium is fairly immobile for the present, this makes it easier to excavate; and immobility is not a valid reason to leave it in place, but fortuitously aids in removal. Associated pipes, trenches, cribs, ditches, electrical lines and other waste should be removed. Any residual contamination in the deep vadose zone may be part of the NRDA injury valuation, since deep soil is also a natural resource under the aegis of the Natural Resource Trustee Council.

300 Area Summary Statement

The 300 Area is very important to the CTUIR for natural resource and cultural reasons. The River, river corridor, and adjacent lands are locations included in our Treaty as locations where we reserved rights of access and use. Additionally, the CTUIR is a Natural Resource Trustee of these areas. Our land use in the 300 Area is the same year-round lifestyle, with fishing, hunting/livestock, gathering/gardening, pasturing, and sweating that is described in our CTUIR exposure scenario. Our scenario should be used to evaluate risk and set cumulative (multi-pathway, multi-media, and multi-contaminant) health-based remedial goals. If the risks are reduced to acceptable levels as confirmed by the use of the CTUIR scenario, there will be no further lost or restricted use. Setting remedial goals for individual contaminants when multiple contaminants are present results in unprotective remedies due to additive risk. Any institutional controls that are required are demonstration of lost use (a NRDA issue).

The 300 Area should remain under federal control, preferably jointly BIA and USFWS. Local civic entities such as towns should not get any further excess land from the 300 Area and northward; in fact, Richland already received Columbia Point and portions of the 1100 and 3000 Areas. The Tribes have received nothing.

In the 300 Area, there may be uncontaminated buildings that could be reused. This is to be encouraged, as long as there is not soil contamination beneath them, and as long as no irrigation or landscaping is added, since this could mobilize the uranium in the soil

The uranium in the soil and groundwater needs to be addressed. If a remedy such as soil flushing is proposed, it must be accompanied by catch-systems (such as a freeze barrier) so that the uranium does not simply get flushed into the river.

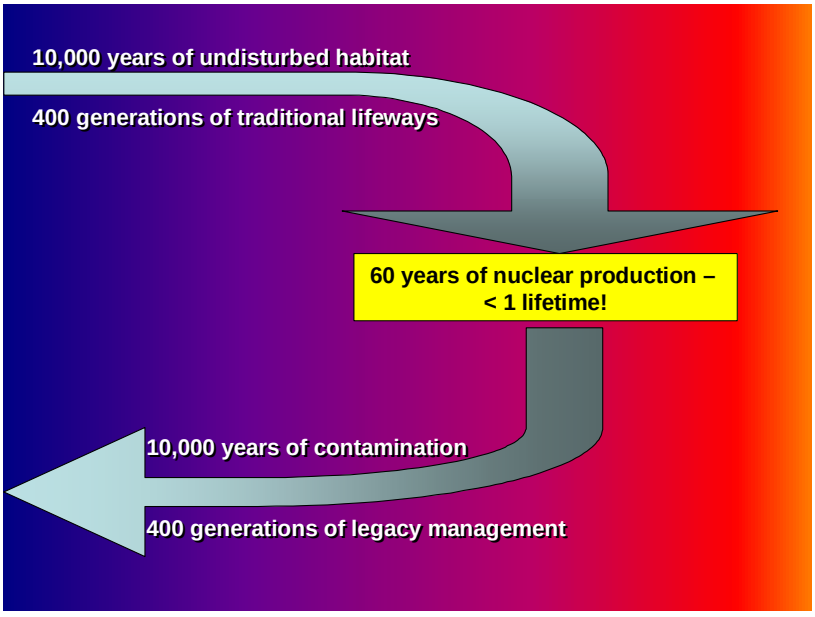
B. Summary of CTUIR Views on Endstates and Stewardship

The CTUIR has a vital interest in Hanford endstates. Under the Treaty of 1855, the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) ceded lands that included the eventual Hanford site to the federal government, but retained rights of access and use for the purpose of sustaining their lives, traditions, and culture. This Treaty is our land use plan and describes our risk-based endstate vision.

CTUIR members were using Hanford in a traditional residential manner when it was "borrowed." We were promised that Hanford would be returned to its original conditions and that we could re-occupy our usual and accustomed places and use the restored resources, including groundwater. The CTUIR exposure scenario reflects this use. If the CTUIR exposure scenario is also used to develop remedial goals and cleanup levels, then the site will be clean enough for us to safely regain our use.

The CTUIR sees its short-term and long-term role at Hanford as

1) Implementing Tribal goals: protecting the Treaty, people, the reservation, and ceded lands;
2) Trustee of natural resources, forever, no matter which federal agency controls the land (preferably jointly BIA and USFWS);
3) Legacy Manager of lands, resources, and contamination;
4) Science Center/Native Plant Experimental Field Station operation:
   a) Research and development in many scientific areas
   b) Setting cleanup goals for cumulative risk and environmental health, and working with regulators and contractors to ensure completion
   c) Sampling and monitoring long after DOE is gone
   d) Restoration of natural resources and resumption of tribal uses.

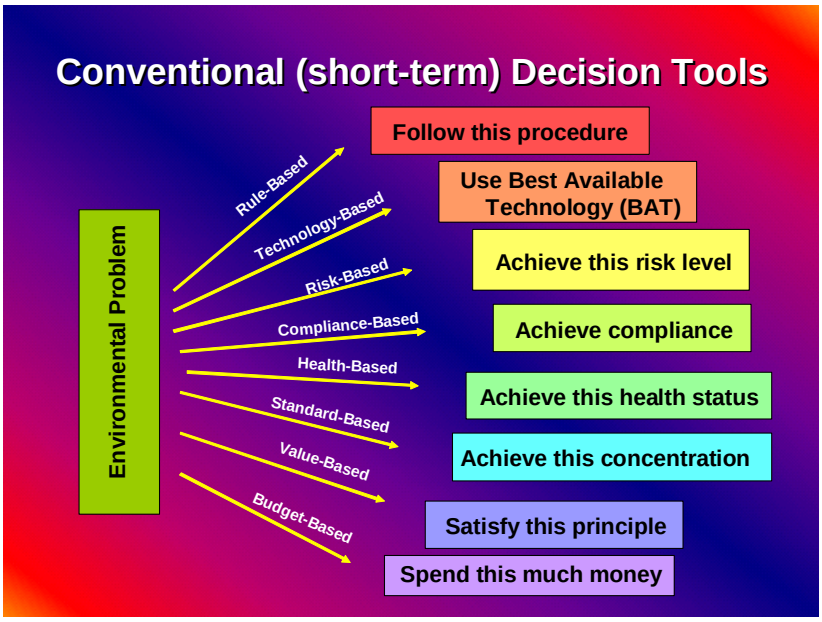


From a long-term perspective, we have been here for 10,000 years, using the resources and participating in the natural cycles. It has taken less than one lifetime to permanently

affect the ability to use Hanford and River resources for the next 10,000 years. We consider that we are at the half-way point in our presence here, so we are preparing for the new technical requirements for continuing on as Legacy Manager and Trustee of Hanford.

Risk-Based Endstates. As defined in the guidance for DOE Order 455.1, the RBE is a condition that "sustainably protects human health and the environment for the planned use of the property." This is a perfectly reasonable goal; in fact, it is the required regulatory approach. The difficulty is in determining *whose* health is to be protected (i.e., used to set the remedial goals), and *whose* land use is to be made safe.

The practice and application of risk analysis is prone to use of value-laden words that can mean very different things to different people. We recognize the problems resulting from use of indefinable terms such as "risk", "safe", "clean", "harm", "hazard", "danger", and degraded. These types of terms cannot have precise definitions any more than attributes such as beautiful, nice, or satisfying. These words will inevitably mean different things to different people. For example, when a regulator asserts that a resource is clean and safe, a tribal person may assume something quite different than what the regulator actually means. Compounding this is the technical and regulatory terminology, such as probability, severity, risk assessment, risk analysis, acceptable risk, risk characterization, and so on. In addition, risk assessors can disagree among themselves about definitions, for example whether lack of exposure is synonymous with no risk. Risk assessors often fail to define their own terminology in their own conversations. For this document, we simply recognize these inherent problems and describe some tribal risk principles.

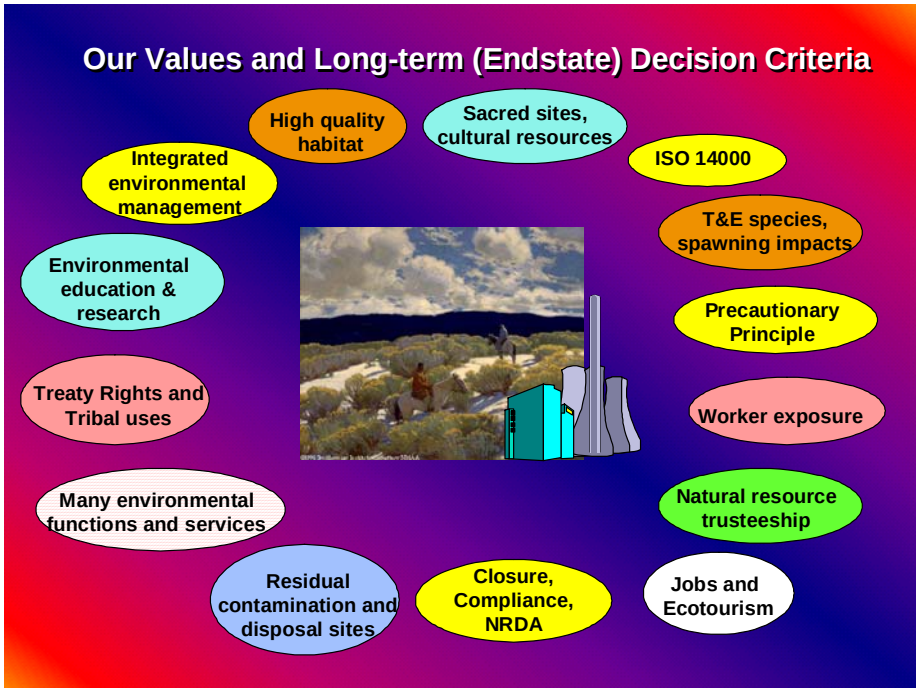


This figure illustrates various decision criteria. The decision criteria used at Hanford have been confused, resulting in different expectations resulting from undefined terminology. For example, meeting Safe Drinking Water Act MCLs for individual contaminants results in different cleanup goals than cumulative health-based goals.

This is a problem at every Superfund site, including Hanford, but it seldom dealt with in a way that the public understands.

The CTUIR definition of a sustainable RBE that protects human health and the environment is:

1. One that complies with all existing Treaties, ARARs, and Agreements;
2. One that protects natural and cultural resources and the human use of those resources, particularly Tribal health during the exercise of traditional lifestyles as described in our exposure scenario. This is a health-based cleanup, which is different from a standards-based cleanup.
3. One that assesses natural resource injuries, and minimizes, restores, mitigates, or compensates for past injury as well as future injury due to residual contamination. This includes ecological injury as well as lost human use as quantified through the use of our exposure scenario.
4. One that protects people and resources over thousands of years. Hanford will remain contaminated for a period of time as long as mankind has existed as a species.
5. One that is based on cumulative lifecycle risks and costs and Value-of-Information decision analysis. This includes a wider variety of risks, including cultural risk.
6. One that preserves all future uses, by cleaning, restoring and maintaining all Hanford lands in an original or baseline condition. We consider this to be the highest and best use of the land, and the most valuable status or condition.



This figure depicts our criteria for closure and endstate acceptability. We evaluate each of these, some quantitatively and some qualitatively but nevertheless systematically.

Specific metrics are not presented here; they have been transmitted to DOE on many previous occasions.

Natural Resource Trusteeship. This issue has not been adequately factored into DOE planning and closure. All of Hanford is under the oversight of natural resource Trustees. This trusteeship persists even after land ownership is transferred to another federal agency. Thus, the process for taking land away from Trustees and giving it to private owners (such as civic entities) has never been discussed. Can local land use controls honor Trusteeship if local governments are not Trustees? Do Counties have to honor Treaties in their Urban Growth Management Plans? Counties are notorious for ignoring Tribes and Trusteeship. Who bears the accountability or liability for making equitable decisions?

Reasonably Foreseeable Post-Reclamation Land Use. The Hanford Remedial Action EIS, which became the Hanford Comprehensive Land Use Plan (CLUP), set some land uses for 50 years. The CLUP did not abrogate Treaty Rights, and NEPA cannot "trump" a Treaty. Regardless of the CLUP, our land use is always traditional lifeways across all of Hanford throughout time.

Land uses always change. Today's land use plans do not necessarily reflect what future land use will actually be. All land use controls fail. Local zoning ordinances are easily undone.[1] Land uses that are inconceivable now *will* happen. There are many examples of decisions made less than one generation ago that are forgotten, resulting in schools and houses being built on landfills, and waste sites being inadvertently intruded into. The best solution is to clean up to the highest and best condition, which would allow any future use to be safe.

Time Frame. The time frame of evaluation is at least 10,000 years or as long as the material remains intrinsically hazardous, not 1,000 years, and especially not the mere 50 years discussed in the land use plan. The time frame for institutional control failure is 100, not 150 years. Intruder and residential scenarios must be evaluated starting with current conditions and continuing for 10,000 years or as long as the material remains intrinsically hazardous. The proper way to perform a risk assessment is to evaluate what the risks would be now, and then determine how to deal with access and land use, rather than to restrict access first and then decline to evaluate those risks at all.

Disposal and Waste Reclassification. We oppose the reclassification of waste, including tank waste, to lower designations that might result in near-surface disposal of highly radioactive materials. If reclassification occurs, then the RBE must assume that institutional controls fail within the prescribed time under CERCLA, and intruders intentionally or unintentionally penetrate the caps over the landfills, waste trenches and tanks. If DOE asserts that there will be 10,000 years of monitoring and effective DOE control, then the RBE must describe how this will occur and the likelihood that it will be adequately funded.

DOE claims that it needs to reclassify high level waste as low activity waste because DOE cannot afford to treat all the HLW waste as HLW. However, the vitrification plant was "sold" to Congress, regulators, Tribes, and the public as a way to comply with the

[1] MR English and RB Inerfeld, 1999. "Institutional Controls for Contaminated Sites: Help or Hazard?" Risk: Health, Safety & Environment 10: 121-138.

99% removal requirement, without the need for waste reclassification. These two statements contradict each other. DOE assures us that the "target" budget will still allow DOE to comply with the Tri-Party Agreement, so it seems that cost cannot be an argument for waste reclassification.

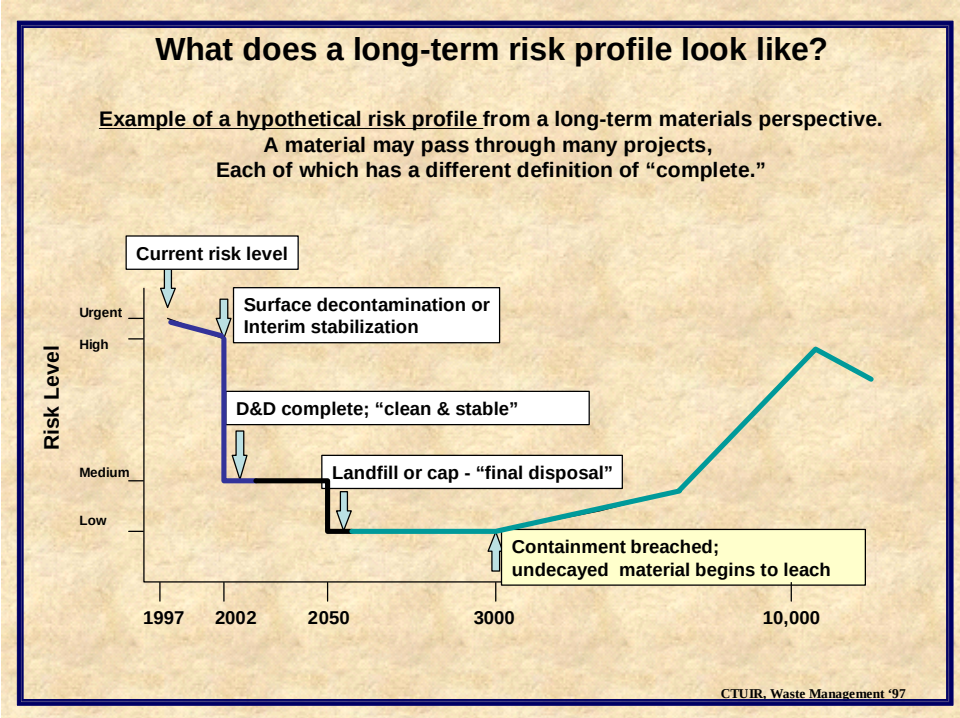
Life Cycle Cost-Benefit Analysis (CBA) and Life Cycle Risk Assessment. We believe that CBA is misunderstood. For example, DOE apparently will compare safety issues to dose-based risks. DOE should not assume that their nuclear transportation drivers have a certain number of accidents per mile based on national DOT highway statistics, nor should DOE assume a certain number of accidents per mile for trucks that are moving waste from one part of Hanford to another. As recognized in the RBE guidance, DOE is required to proceed with its cleanups safely, period. Therefore, the safety requirement is to train nuclear drivers to a much higher standard that the general public so that accidents do not happen at all, and to maintain its equipment at a much higher standard, to maintain road conditions safer, and so on. If DOE assumes a higher number of accidents for its nuclear drivers, then DOE is not meeting safety standards.

Comparative risk methods can and should be used as a part of life cycle risk, but only if done correctly. For example, it is acceptable to compare remediation worker doses to Tribal and public life-cycle (10,000-year) doses under various land use scenarios. However, doses received during remediation occur for only a few years, whereas the doses if Hanford remains unremediated persist for many millennia and potentially expose millions of people. Further, worker doses are always within acceptable limits (as ensured by dosimetry), so only those doses outside acceptable limits (above 5 rad/yr) should be used for comparison to public doses in excess of 15 mrem/yr. However, worker doses would exceed the occupational dose limit only rarely and accidentally. If worker doses exceed dose limits more frequently, then safety measures are being violated.

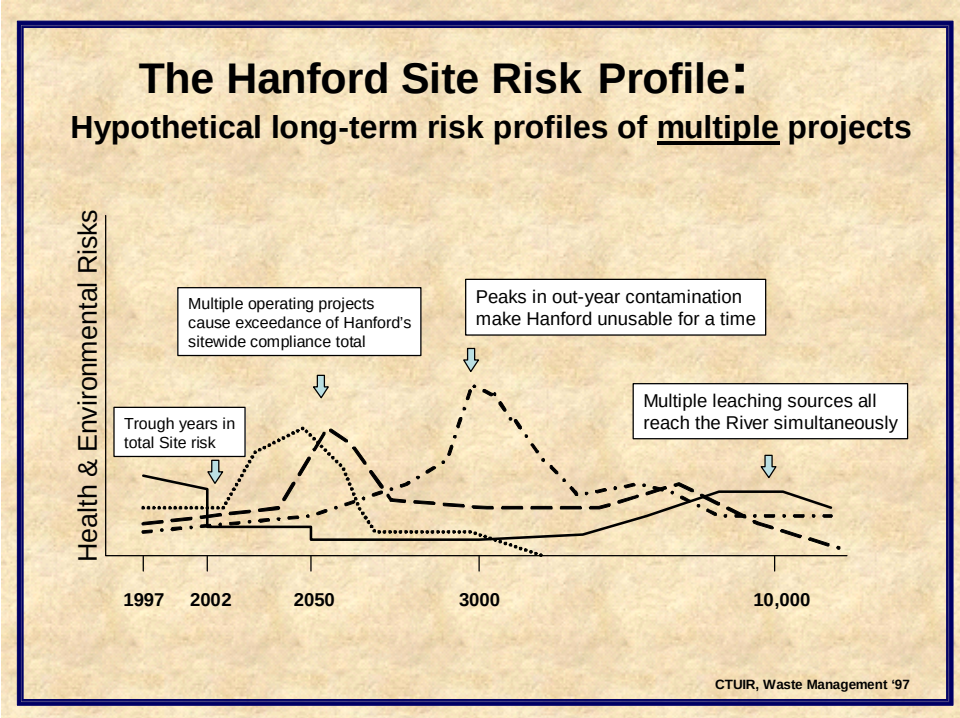
If life cycle cost/risk comparisons are made to endstates requiring institutional controls, then the life cycle cost must include NRDA damage costs for ecological injury and lost human use to account for the differential between full cleanup and partial cleanup.

The full breadth of risks (health, ecological, worker, cultural, economic, and so on) can be normalized on a single scale, as the National Academy of Sciences recommended. We have published such a scale (a "universal harm scale"). A test case at the Hanford K Basins demonstrated the "proof of principle." CTUIR would be glad to help DOE-HQ develop a more scholarly risk-normalization or risk-comparison process that incorporates a wider range of risks and concerns (and that has already been peer-reviewed and tested at Hanford).

We believe it is imperative to develop methods to evaluate lifecycle risks and lifecycle costs. The following figures illustrate some of the concepts and show how endstate and legacy planning would benefit from these types of discussions.



What does a long-term risk profile look like? At each stage of material processing, there is an associated risk profile (not shown in the figure above). There is a long-term risk profile if material is not stabilized, and a smaller risk profile associated with material after it has been stabilized. Even landfills and capped sites have risk profiles associated with future breach of containment. If the area under each risk curve is integrated and compared, the differences reflect how much risk is reduced. Sometimes this risk is merely delayed as containment delays release of contaminants. In other instances, containment allows decay before it escapes containment, which is true risk reduction. The magnitude of this risk reduction is what we are "buying" with Hanford cleanup, and if all risks (human, ecological, cultural, economic, and social) are properly evaluated, we can better justify the budgets and benefits of Hanford cleanup. We have presented ways to evaluate all the risks and impacts (dependency webs and risk metrics).



Risk integration and endstate planning would also benefit from evaluating the overlap between the long-term risk profiles of different projects. Even with a great deal of uncertainty about long-term contaminant migration and risks, a value-of-information approach to developing long-term risk information would likely show the cost-effectiveness of developing these risk profiles?

100 Area

Responses to Individual Questions

A final regulatory decision must be made for the 100 Area cleanup. Given the National Monument designation and the Department of Energy Record of Decision on land use, what post-cleanup activities do you see for the 100 Areas?

- Full traditional use, as reflected in the CTUIR exposure scenario, including year-round residence, gathering/gardening, fishing, hunting/livestock, pasturing, and sweating. Cumulative, health-based remedial goals should be used to select a remedy, including groundwater.
- If institutional controls are required because the CTUIR scenario shows excessive risk, this will be lost use under NRDA
- Neither the CLUP nor the HRNM designation can be used to break our Treaty or deny access.
- CTUIR could manage the land areas not in the National Monument and co-manage the land in the HRNM
- We would like excess land returned to us; Tribal governments take precedence over local civic governments. If the land is not returned directly to us, then we would prefer that it be turned over to BIA and USFWS jointly.
- Locations of cultural resources must be protected; adequate staff must be provided.
- Data on the hyporheic zone, including invertebrates, is weak.

Should the reactor blocks be moved to the Central Plateau? If so, now or at the end of an interim storage period?

- Comfortable with leaving for a while but strongly want ultimate removal. Do not implement irreversible remedies, such as monolithic concrete or grout in tanks. OK to wait a little longer if reactors can then be cut and completely removed without too much ecological damage. Post a bond now so those funds will be available in 75 years; otherwise, there will be additional NRDA lost use while we wait.

Are the remedies completed at waste sites in the 100 Area sufficient to be considered final remedies?

- Probably not, but we won't know until a truly cumulative, multi-pathway, multi-contaminant, integrated risk assessment is done.
- Since rad training and safety training is required to go anywhere on site, and additional training is required to walk around and do work in the operable units, they are clearly not safe now.
- Note on remedy selection: if the only criterion is to reduce human health risk, an institutional control would break an exposure pathway. If both human and ecological risk must be reduced, then an institutional control (which does nothing to reduce ecological risk) is not adequate. If human, ecological, and cultural risk must be reduced, then a more extensive but less intrusive remedy must be chosen.
- Note: there is no such thing as "unrestricted surface use." This is not CERCLA language – land use refers to a site, not just to layers of a site. A "site" extends from deep in the ground to high in the air, and site closure is not done a layer at a time, despite the designation of operable units as soil and water pieces (this is a merely practical measure since the engineering required to remediate soil and groundwater is so different).
- Note: worker dose is not a cleanup issue or a risk tradeoff – workers will not receive an excess dose, period. This is why there is such a strict dosimetry program. Further, rad workers today wear dosimetry badges so their doses can be ensured of remaining within acceptable limits. Tomorrow's workers may not. Tribal members will not be wearing

badges as they engage in traditional activities and lifestyles. No one except workers are carefully monitored for dose.

Should the pipelines from the reactors into and under the Columbia River be removed or should they be left in place?

They must be removed. Studies must be done to determine how to do this with minimal ecological damage.

Groundwater in the 100 Area is expected to meet applicable standards by the end of the cleanup mission with the exception of the strontium-90 (Sr-90) plume at 100 N. Is it acceptable to rely on radioactive decay to remediate this plume or are extensive efforts required to perform further treatment?

- No. "Applicable standards" are not cumulative, and were not developed with Tribal usage levels in mind, therefore MCLs or other numerical standards for individual contaminants do not protect tribal health or resources. A health-based remedial goal (as opposed to a standards-based PRG) would use the CTUIR exposure scenario to both estimate risks and set cleanup goals. Any cleanup less than this obviously means that tribal members cannot practice that lifestyle the way that the scenario describes, and restricts our use. This is not a seasonal or visitation scenario – it is a whole-lifestyle scenario, including fishing, sweating, gathering/gardening, pasturing, and hunting/livestock. .
- Natural attenuation comes with high costs of lost use and injured resources. Lifecycle cost estimates will reveal whether it is cheaper to spend more to clean a plume or pay more for the NRDA process and associated court costs.
- Concern about uranium in clam shells and contaminants in tules.
- Tribal staff and Tribal members indicated that the cost of remedy is not a consideration for Tribes (clean it up no matter what the cost). The full lifecycle cost or a remedy must be included (and the full life cycle risk profile), including the Natural Resource Damages for lost use and injured resources if the remedy leaves residual contamination.
- Note: Tribal members present pointed out that the Tribal members and staff present spoke for themselves and the government-to-government consultation was required to obtain a Tribal position.

200 Area

Responses to Individual Questions

Uses and Activities

What range of activities could workers and/or visitors be involved in within the core zone? Outside the core zone? Should other alternatives activities (beyond those consistent with the assumed land uses) be considered for comparison or other purposes?

- CTUIR never agreed to a sacrifice zone where permanent disposal is acceptable. As DOE has stated numerous times, the FSUWG and similar items are "not decision documents." The Land Use Plan EIS cannot be used to deny Treaty-reserved rights. This, again, is de facto evidence of lost use, restricted access and denial of treaty rights,

- These statements apply to the entire site, including the ALE-North Slope buffer areas and the core zone. The full CTUIR exposure scenario must be used to evaluate risks, and the degree to which it is used, or not used, to set remedial goals forms the basis for lost use claims.

- A single large landfill (ERDF) is preferable to many smaller landfills/closures, and reduces the areal extent of lost use (a NRDA issue).

Based on the desired land-use and exposure scenarios, what types of institutional controls are appropriate, and over what time frames?

None. Institutional controls are demonstration of restricted access and lost use, a NRDA issue. Restricted access in the 200 Core zone was never agreed (we cannot agree to give up Treaty-reserved rights for free). If it is not practical to regain full access for unrestricted use in the core zone, then there is room for negotiating how to mitigate that lost use.

Institutional controls do not work, especially over millennia. This is why LTS planning is so important now. The larger the anticipated legacy waste problem, the more money DOE should be sending to Hanford to plan for LTS. Since Hanford is the most contaminated, it should be getting more money for planning.

Does land revert to Tribes? Consultation under Cultural/Historical Resources law with Tribes ongoing for transfer of jurisdiction from DOE to Fish and Wildlife Service. There are many issues here. One solution would be to transfer it to BIA, as is being done in a number of cases across the country. Or, transfer it jointly to BIA and USFWS. In any event, federal and tribal governments take precedence in the government excess process over local civic entities such as towns.

Buried Waste and Contaminated Soils

When would you consider leaving waste in place under a barrier? When would you consider removal, treatment, and disposal of the waste? What other options would you consider and when would you consider them? How would these considerations change depending on location inside or outside the core zone and could these decisions affect how the core zone is defined? If data collection activities are purposely focused on defining the highest levels of contamination, how important is additional detailed characterization in making these decisions? How does this change for different end states or hazards?

CTUIR will be providing risk-based decision criteria and decision analysis rules. We have many comments on these topics and a high level of interest, and a short quick answer would not do this topic justice.

The short answer is that any remedy that leaves waste comes with a cost of perpetual barrier lifecycle costs, as well as lost use and ecological injury NRDA damage costs. There has never been an open and honest discussion of this (DOE lawyers prohibit these discussions).

Processing Facilities, Building, and Structures

What end-state do the stakeholders envision for the various classes of facilities (such as canyons, plutonium processing facilities, ancillary facilities? Waste storage/treatment facilities, etc.) on the Central Plateau? How do you feel about leaving facilities in place (i.e. fully standing) versus demolishing them? Under what situations would you think it appropriate to retrieve, treat and dispose of some or all of the waste within and/or under the facility or is consolidation and isolation of waste within the facility a viable option? If a canyon facility is left in place or is partially demolished, can additional waste be placed init? How would the potentially high does rates and hazards to workers encountered during cleanup activities affect these decisions? If data collection activities are purposefully focused on defining the highest levels of contamination, how important is additional detailed characterization information in making these decision? How does this change for different end states or hazards?

CTUIR will be providing risk-based decision criteria and decision analysis rules. We have many comments on these topics and a high level of interest, and a short quick answer would not do this topic justice.

Again, clean closure and/or complete removal is clearly the most cost-effective and health-protective remedy, according to the DOE U-Plant Closure Plan. The option is one of the cheapest remedies, and has no out-year costs (other than ERDF costs), no barrier replacement costs, less damage due to clean fill and barrier capping material needs, a smaller footprint, is permanent, is more acceptable to the community, and similarly meets the rest of the 9 CERCLA criteria better in every case. It is mystifying to us why that option is not being chosen.

300 Area

Responses to Individual Questions

Based on the possible post-cleanup land uses, the following end state related questions (primarily focused on the time frame of 20 years into the future and beyond) can be discussed:

- **What range of activities could the public, workers and/or visitors be involved in within the region now known as the (industrialized) 300 Area?**
- **Outside the industrialized 300 Area?**
- **Should other alternative activities (beyond those consistent with the assumed land uses) be considered for comparison or other purposes?**
- **Based on the desired land-use and exposure scenarios, what types of institutional controls are appropriate, and over what time frames?**

Tribal Nations will use the area for traditional fishing, hunting, gathering, and sweathouses, as described in our exposure scenario. This is not seasonal or visitational, but whole-life and cumulative. This statement applies everywhere on Hanford and for any time period (past, present and future).

The 300 Area should remain under federal control, preferably jointly BIA and USFWS. Local civic entities such as towns should not get any further excess land; in fact, Richland already received Columbia Point and portions of the 1100 and 3000 Areas.

No additional surface water use should be permitted since this will mobilize the residual uranium.

Groundwater Remediation Alternatives and Technologies

- **Are the alternatives we are considering for the groundwater feasibility study appropriate?**
- **Are you aware of any other potential groundwater technologies which should be considered?**
- **Are there other considerations that should be evaluated?**

Given the possible types of surface uses and the potential groundwater remediation alternatives, what considerations are important for groundwater remedy selection? For example,

- **What is an acceptable period of time to achieve groundwater goals?**
- **Under what surface end states would it make sense to continue with monitored natural attenuation?**
- **Under what surface end states would it make sense to pursue an alternative approach?**
- **Under what circumstances would alternatives that result in near-term increases in uranium contamination in the groundwater and/or increased discharge to the river be appropriate?**

Again, CTUIR has many detailed comments and a high level of interest in groundwater.

As with the other questions, the simple answer is that our resource uses and Treaty-reserved rights are reflected in our exposure scenario, across all of Hanford, and throughout time. This includes groundwater. Whatever remedy is applied to groundwater, including natural attenuation, simply determines what area-under-the-curve is used to estimated recovery times, lost use, and therefore NRDA damages.

Monitoring will be required until sites can be given a clean bill of health, which is why the CTUIR is planning a science center/field station as the future legacy managers of Hanford.

Again, there is no such thing as “surface endstates.” The endstate is simply whether the site is restricted or unrestricted (clean enough to allow multipathway subsistence use, and whole enough to support them).

If short-term uranium mobilization (to flush it out of the soil and groundwater) were proposed, it should be combined with a catch system that has a very high probability of success (possible freeze barriers). It should not simply be flushed into the river.