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NATURAL RESOURCES

Administration



CONFEDERATED TRIBES  
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10 April 1995

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RECEIVED  
APR 19 1995  
DOE-RL/DCC

Subject: CTUIR COMMENTS ON PROPOSED "REMEDIAL" PLAN FOR 200-BP-1 OPERABLE UNIT

Dear Paul:

Technical staff of the Confederated Tribes of the Umatilla Indian Reservation (CTUIR) submit the following comments on the proposed "remedial" work plan for the 200-BP-1 operable unit, in response to your formal written request for CTUIR technical review of the document, dated 4 January 1995. Implications of the ambiguous outcome of the so-called "Evaluation of Indian Values" workshop sponsored by EPA and held in Richland in December 1994 also are discussed.

INTRODUCTION

CTUIR staff review of the 200-BP-1 Proposed Plan has identified a number of significant flaws in the proposed "remedial" plan.

- Both general and specific tribal concerns associated with the overall approach defined in the Plan,
- Faulty assumptions,
- Complete failure to reasonably address long-term needs required to mitigate adverse impacts of long-lived contaminants,
- Complete failure to recognize and include true long-term costs,
- Too narrowly focused and prejudicial remedial objectives,
- Minimization of current risks and complete failure to characterize future, much greater risks,

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- A proposed "remedial" methodology that contains little meaningful action to "address" widespread contamination present beneath this series of cribs,
- A proposed "remedial" methodology that consumes vast quantities of resources without a concomitant guarantee of effectiveness, and
- A proposed "remedial" strategy that appears totally uncoordinated with, and which may adversely impact, directly related remedial actions at the adjoining 241-BY tank farm and in the underlying 200-BP-5 groundwater operable unit, of which 200-BP-1 is the principal source.

## SUMMARY OF OVERARCHING CONCERNS

Issues of tribal concern can be summarized into the following overarching issues, which are then discussed in more detail below.

- *What's the rush* to remediate this relatively low-priority 200 Areas site, when the principal driver, namely large-scale liquid waste discharges already has been stopped?
- Tribes, stakeholders, regulators, and even the Department of Energy *all* have agreed that Columbia River corridor sites are the highest and first priority for remediation. With all the across-the-board cutbacks coming, the available dollars and manpower for remediation must be most effectively and efficiently concentrated along the immediate river corridor *first*.
- Barrier construction has yet to be demonstrated, from either a technical or engineering standpoint, to fulfill its stated primary function of limiting or diverting infiltrating water and *preventing remobilization of vadose zone contamination* for short periods of time (years to decades), let alone for the thousands of years required to adequately mitigate the impacts of long-lived uranium contamination distributed throughout more than half a million cubic yards of vadose zone soils.
- Despite the availability of data to the contrary, *the Proposed Plan ignores the impact of time* on future migration of and changing exposure potential to widespread contamination that, as proposed, is not and will not *ever* be isolated from the environment--or the Columbia River. *Time simply cannot be ignored when "addressing" contaminants with half-lives measured in hundreds of millions of years--or in safeguarding Tribal rights and interests.*
- The risk assessment that justified selection of this remedial alternative is based on only a single potential exposure pathway, a single contaminant of concern, and current conditions. Future risks associated with much higher predicted uranium discharges to the Columbia River over thousands of years or from potential exposure of other highly radioactive contaminants at the surface have been ignored, greatly minimizing apparent

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- risk through time, and permitting selection of an ineffective long-term remedial option.
- *Barrier effectiveness is misrepresented* by overly simplistic or unrealistic assumptions of homogeneous subsurface conditions or that all infiltration is a vertical straight shot to groundwater. Discontinuous caliche layers or local sedimentary-facies aquitards in Hanford's subsurface introduce considerable lateral spreading, temporal variability, and other localized complexities into the generally downward path. *Lateral spreading of infiltrating water is a necessary result of Hanford's highly variable subsurface conditions.* Under such conditions, *no barrier of reasonable areal extent could prevent infiltration within a sufficiently large area that could not eventually migrate into and leach existing contamination.*
  - *Barrier construction consumes valuable land and resources.* Little appreciation is evident of the cumulative and indirect impacts, true costs, or large-scale environmental degradation associated with mining the vast quantities of basalt and top soil required to facilitate the more widespread application of barriers at Hanford. These unrecognized but directly connected actions will result in accumulating, areally extensive, adverse environmental impacts simply being displaced and actively encouraged elsewhere in the name of "remediation" at Hanford.
  - The Proposed Plan selects and attempts to justify a "remedial alternative" that is really a last-ditch measure to be employed only after other proactive remedial alternatives have been tried and failed.
  - There is *naive and excessive reliance on institutional controls*, of which barriers comprise but one example, to control either contaminated site access or exposure potential over *extremely long periods of time.* CTUIR staff believe it is unrealistic to rely so heavily on such controls, which in this case must last *thousands of years* longer than any other human endeavor in history or prehistory. The increasingly rapid pace of cultural change in modern society necessitates that the most effective means of true control (such as environmental isolation, containment, or contaminant removal) must be tried first. Institutional controls give the all-important appearance of doing something, but offer no substance or long-term protection.
  - Barriers are not a panacea, a cure-all to just cover up all the difficult problems that exist at Hanford. The true purpose of selecting this remedial alternative appears to be "so that these barriers can be used more extensively on the Hanford site as well as other semi-arid environments" (Proposed Plan), but such increased use will be at the expense of real remedial actions and the health of affected communities. Barriers have their place at Hanford, but a blind and widespread reliance on what is really a last-resort strategy with limited effectiveness and application *decidedly does not.*
  - CTUIR staff do not support the hurried completion of final remedial actions such as recent construction of a barrier over the B-57 crib without proper DOE and regulator consultation with affected tribes. Moreover, it is further unacceptable to refer to this

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*final remedial action* as an "experiment" or a "constructability test," when it is clear that neither DOE nor regulators will ever revisit actual *remediation* of the crib.

- Tribal treaty rights and the Federal government's trust responsibility to tribes exist *in perpetuity*. CTUIR staff do not believe that such rights and responsibilities are best fulfilled by this proposed short-sighted and short-term solution to a very long-term problem.

## BASIS OF TRIBAL CONCERNS

Two sentences in the proposed plan highlight a biased analysis of remedial alternatives that appears to be driven chiefly by cost and expedience, and resulted directly in development of a deficient, short-sighted, and environmentally unsound "remedial" plan:

"This proposed plan addresses soils contaminated at the 200-BP-1 Operable Unit." [emphasis added], and

"Since the contaminated soils must remain on the Hanford Site for the foreseeable future regardless of the alternative chosen, and the most significant contamination is located from 15 to 50 feet below the ground surface, it makes sense to leave the waste in place at this operable unit." [emphasis added]

Simply covering up a problem and saying that the associated future risks are "acceptable" does not "make sense" to the Tribes, nor does it *in any way* "address" contaminated soils. The proposed plan cynically offers to do as little as possible now and offers *no* substantive protection for the future. Wouldn't it both make much more "sense" and actually "address" the problem directly by reasonably *isolating from the environment, containing, or removing the most highly contaminated soils, which will remain hazardous and pose severe health and environmental threats for thousands of years?* The defined approach does not reflect DOE's and regulators' stated policy to practice environmentally sound waste management for the long-term at Hanford, and to develop remedial programs that would proactively fulfill DOE's trust responsibilities to effectively manage and restore land and natural resources.

## FIRST PRIORITIES FIRST

What's the rush to complete this proposed "remedial" plan for a central plateau, 200 Areas operable unit, especially because the principal driving force--namely large-scale liquid waste discharges--already has been eliminated? CTUIR staff understand from the recently

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completed TPA negotiations that *sites along the Columbia River corridor were to be the first priority for funding and completion of remedial actions*. Especially given the recent crisis over vastly reduced budgets at Hanford overall, but especially for Environmental Restoration activities, *all available dollars and manpower efforts should first be concentrated along the immediate Columbia River corridor*.

It is a difficult choice to agree to postpone equally important and even more challenging plateau remedial projects, as impacts from 200-BP-1 and other 200 Areas operable units will ultimately reach the river. *But we agree that near-river sites deserve first priority*. So far as CTUIR staff are aware, this is one of the few issues that tribes, regulators, stakeholders, and even the Department of Energy agree upon. *Put 200-BP-1 on the back burner until there is some meaningful progress in remediating more immediate threats along the river corridor*.

## BARRIERS AS A "REMEDIAL" STRATEGY

Barriers simply cover over contaminated sites. No real remediation, i.e., remedy, is involved. No contamination is removed. No toxicity or potential mobility is reduced. No threat to human health or the environment is truly "addressed" or reduced. No exposure pathways are controlled or eliminated, over the full period that contamination remains a hazard. No long-term effectiveness, protection, or permanence is provided.

*Waste remains uncontained forever--this is not compliant with ARARs--to behave as it will over a physically, chemically, and temporally complex and ever-changing environment. This is a particular concern with highly radioactive, very long-lived, and environmentally mobile contaminants such as uranium*. Only an *appearance* of controlling future migration potential is implied through the construction of a barrier, as a surface barrier is readily bypassed even in the shallow subsurface.

Nevertheless, barriers are a necessary strategy for controlling some waste sites at Hanford and elsewhere. Barriers are appropriately applied, for example, to old municipal landfill sites, where exhumation of complexly mixed and hazardous wastes of diverse media is impractical. Similar conditions at Hanford may require a similar approach. Conditions, however, must be objectively evaluated on a case-by-case basis, with barrier use reserved only for those truly intractable conditions or circumstances.

*The proper role for barriers is as a remedial approach of last resort, only to be considered after other reasonable attempts at real remediation have failed*. Barriers are *not* properly used *first* when other, more effective remedial approaches are available and practical. In the case

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of 200-BP-1, however, *no practical attempts at real remediation are even proposed to be tried*, and barriers are the first and preferred choice. *All alternatives that include real soil remediation in 200-BP-1 have been rejected from the beginning*, presumably because of overemphasized short-term, but unrecognized true long-term costs or impacts.

PERMANENCE OF INSTITUTIONAL CONTROLS

There is excessive and unsupported optimism about both the effectiveness and permanence of barriers or other institutional controls. To be fair, 200-BP-1 is far from the only project relying excessively on such blind-faith-in-the-future measures. The Proposed Plan notes that: "All of the [proposed remedial] alternatives would require some form of institutional control to provide *long-term effectiveness*" [emphasis added]. Naive and unfounded faith is repeatedly placed in the use of "institutional controls" for the protection of human health and, supposedly, the environment from *the real and very long-term risks* posed by simply leaving vast amounts of highly dangerous and long-lived contamination in place.

Modeling results provided by EPA staff during the Evaluation of Indian Values workshop in December 1994, *clearly indicate that the threats posed by the existing contamination at 200-BP-1 will persist--and in fact greatly increase--for thousands of years*. The proposed construction of barriers to simply cover it all up does NOTHING to remove or reduce this threat. *Failure to meaningfully control contamination now present in the vadose zone will preclude any possibility of success in remediating the contaminated groundwater originating from this source*. The current thinking (i.e., "discounting") appears to be that future human and Columbia River ecosystem generations--especially those far into the future--are not important, or not as important. In fact, our children and grandchildren must be far less valuable since it seems to be OK to leave them this permanently dangerous, uncontained, and possibly uncontrollable legacy.

Is it realistic to presume that institutional controls will remain in place *for the full period of many thousands of years during which a threat exists*? How will institutional controls protect the Columbia River long into the future as groundwater-transported contamination reaching the river gradually increases? Even the barrier itself is only being (optimistically) designed to last 1000 years--an engineering milestone in and of itself. But how long will a fence last--and how effective will it be in 1000 or 5000 years? How long will DOE's commitment to environmentally sound waste management, remediation, and restoration at Hanford last, given the rapidity and fickleness with which political winds and funding priorities change? How long do tribal treaty rights and the federal government's trust responsibility last?

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Blind faith in institutional controls presumes a depth of commitment, an ability, and a permanence that infinitely surpasses that of any human institution known to have existed. Moreover, given the increasingly rapid pace of cultural change in modern society, it is simply unwise (or worse) to depend on the presumed persistence of any such frail and fleeting human institutions. *Any assumptions of institutional controls should never be permitted to extend more than 100 years into the future--and even this may prove to be overly optimistic if we realistically assess the nature and magnitude of change occurring in our society during the past 100 years. Excessive reliance on institutional controls provides a false sense of security and a false impression of "doing something," with little actual substance to back it up.*

### PREJUDICING FUTURE OPTIONS

Barriers prejudice future options. Emplacement of expensive and complex engineered barriers greatly reduces or outright eliminates the likelihood that any more meaningful future remediation will ever occur. Why is there such a rush to move forward so quickly with the construction of barriers in this operable unit when the principal contaminant driving force has already been removed, when river-margin sites are the top priority, when many issues such as impacts to groundwater or tank farm remediation have not been thoroughly worked out, and when remediation in this operable unit probably could be best coordinated with tank farm closure? If there is a potential threat of affecting the integrity of the 241-BY tank farm by actively remediating the site now, then doesn't it make more sense to better plan and coordinate these adjoining remedial efforts now? In the interim, a simple plastic cover would save vast sums of money better spent on near-river remediation--*the first priority*, would serve to control some infiltration around 200-BP-1 in the interim, would prevent widespread adverse environmental impacts associated with large-scale basalt and top-soil mining, and would not prejudice future remedial options at either 200-BP-1, 200-BP-5, or the 241-BY tank farm. The construction of a Hanford soil/rock barrier would necessarily represent a *de facto* final remediation. It's just not being called that.

### BARRIER EFFECTIVENESS

The results of modeling contaminant discharge to groundwater through time shown to CTUIR staff in the above referenced package appear to be based on highly unrealistic assumptions as to be schematic at best for the intended purpose of assessing barrier effectiveness. For example, all modeling results assume that infiltration is purely vertical with no lateral movement occurring throughout an unchanging and uniformly homogeneous vadose zone. The common presence of discontinuous caliche layers or local-facies aquitards throughout the

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subsurface at Hanford demonstrates that infiltrating water will take a highly complex, generally unpredictable, and time variable path "downwards," but *this path will necessarily involve substantial lateral spreading*. As the Hanford Sitewide Groundwater Protection Management Plan (DOE/RL-89-12, Rev. 2, p. 5) notes:

". . . downward movement of moisture in the vadose zone is retarded by heterogeneities in soil composition (e.g., silt or cemented layers)," and

"Layers of silt or cemented layers generally slow the downward movement of water, *resulting in lateral spreading of water and localized saturated zones (i.e., "perched" water zones) above the top of the unconfined aquifer. This condition may expand a contaminant source area beyond the physical dimensions of a disposal facility.*" [emphasis added].

Over time--and with such long-lived contaminants there will be plenty of time--this lateral spreading will inevitably leach existing vadose zone contamination and transport it to groundwater and the Columbia River.

Hence, how can a barrier, even if constructed to substantially overlap the areal extent of a waste site at the surface, offer any truly long-term protection from the vastly greater amounts of water that will infiltrate in the general vicinity surrounding a waste site and then travel through the waste site vertically and laterally at multiple depths throughout the subsurface? Moreover, all runoff from the surface of the barrier itself is simply transferred to and concentrated along the margins of the cover, regardless of its areal extent. *All barrier discussion ignores these inherent drawbacks and critically important facts about the nature of water infiltrating into the highly complex and heterogeneous subsurface conditions that actually exist at Hanford.*

Furthermore, the defined approach ignores potential spatial and temporal variations in the subsurface hydrologic regime that may at least partly defeat any surface barrier's intended purpose. For example, the existing uranium groundwater plume has not only travelled through the entire thickness of the vadose zone but has already spread with the groundwater more than a mile downgradient of its source, all within 40 years. How does emplacement of a barrier control the further spread or support remediation of this actively spreading plume? How does a surface barrier remove or control the future threat to groundwater from continuously remobilized contamination below the barrier?

Moreover, future groundwater levels beneath the site will vary in response to either natural or human-induced changes. If (when) groundwater levels rise, contaminants now present in the

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lower vadose zone will become mobilized, resulting in further volume increases and plume migration through time. Remember, the extremely long-lived nature of 200-BP-1 contaminants, especially uranium isotopes, and the associated environmental and exposure threats they pose will remain for *thousands of years*. Contaminants will be left uncontained, free to move as changing conditions permit, forever. Significant if unpredictable geologic and hydrologic change will occur over the time spans involved. The nature and magnitude of natural changes recorded during Holocene time can be used as a direct measure of the types and magnitude of expectable future problems that are not now even being conceived of, let alone planned for, in these *proposed permanent uncontained subsurface nuclear waste repositories*.

## LONG-TERM IMPACTS ARE NOT BEING CONSIDERED

The failure to adequately and realistically consider long-term impacts of the proposed alternative is clearly driven home in modeling of contaminant "concentrations" (actually, radioactivity levels) in groundwater with time, given different postulated infiltration rates. Accepting for the moment the validity of the inherently faulty assumptions outlined above, then the figures clearly show that with low infiltration rates, comparable to modern conditions, uranium activity levels will *increase indefinitely* for at least 11,000 years. Higher infiltration rates result in much higher uranium levels that peak in 5000 to 8000 years, and then decline over the following several thousand years. Depending on infiltration rates, predicted uranium activity levels may range as high as *several thousands of picocuries per liter*, but at all modeled infiltration rates will *increasingly exceed* the proposed standard of 30 pCi/L for *thousands of years*.

Yet the Proposed Plan states: "[Uranium] concentrations [sic] currently entering groundwater from the soils at 200-BP-1 are *declining* and are generally near or below EPA's drinking water standards." [emphasis added] A subsequent statement then *totally contradicts* the first: "Modeling indicates that . . . natural precipitation (rain and snow) will transport uranium downward towards the groundwater. According to the modeling, uranium concentrations [sic] will exceed the proposed drinking water standard (30 pCi/L) in about 700 years." *How can both these statements possibly be true?*

In light of the modeling results, this mischaracterization is unacceptably simplistic, reflects incorrect interpretation of the available data, and gives a false impression that things are getting better. It is possible that *current* uranium levels in groundwater are actually declining slightly and "near" drinking water standards *in the short term* (over a few years). *But even with its faults, the modeling clearly emphasizes that uranium levels will greatly increase over*

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*the next several thousands of years--and possibly indefinitely--to levels that may exceed the proposed drinking water standard by up to two orders of magnitude and last for many thousands of years. A risk assessment focused only on current conditions ignores ever increasing future risks of exposure and both the health and environmental impacts of such increasing releases. Implementation of the proposed "remedial" alternative means that the Columbia River will suffer for many thousands of years hence from uranium-contaminated groundwater discharges that dwarf any current discharges and greatly exceed any current threat. The risk of time and to future generations is not accurately characterized.*

An even more unpredictable impact may be the effects of human-induced changes on the natural system, many of which we can hardly guess at now, given the long time spans involved and current pace of technological change. Hanford operations over the past half century alone resulted in major changes to the hydrologic regime--significantly increasing natural hydraulic gradients and even reversing the natural groundwater flow direction in some cases.

Although some past changes have been mitigated by the cessation or reduction of many Hanford discharges, future changes may have much broader, even larger scale, and other yet unknowable impacts on the natural hydrologic regime. For example, significant quantities of treated or partially treated groundwater from Hanford remediation activities are proposed to be discharged into new facilities surrounding the 200 Areas. Such large-scale discharges will impact future subsurface conditions by creating new contaminant plumes, groundwater mounds, flow directions, or gradients in new areas and may potentially, even if unintentionally, remobilize and further spread existing subsurface contamination. In addition, a minimum 4 to 5 foot future increase in groundwater levels sitewide has been estimated, along with corresponding gradient increases, owing to increased irrigation and artificial recharge in the upper Cold Creek Valley and other upgradient areas. Localized or sitewide rise in groundwater levels of this magnitude could play a significant--and currently underappreciated--role in continuously remobilizing lower vadose zone contamination across the site, including beneath 200-BP-1.

#### BARRIERS CONSUME RESOURCES

*Barriers require tremendous consumption of valuable land and natural resources and directly result in increased environmental degradation, whether at Hanford or elsewhere. The construction of Hanford, RCRA, or other proposed barriers requires a vast source of basalt (and why is consideration limited only to basalt?). CTUIR staff repeatedly have made it clear that the CTUIR will strongly oppose the mining and further degradation of any culturally*

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significant sites at Hanford such as Gable Butte or Gable Mountain. There would appear to be few other "readily available" basalt sources that would not involve huge transportation costs from offsite and/or result in adverse environmental impacts somewhere else.

But really, all this entire approach does is to transfer problems from one place or time to another. Is it really acceptable to totally devastate another, and likely more pristine or comparatively unaltered, site of substantial extent in the name of "remediation" at Hanford? This philosophy of disconnect, which appreciates neither cumulative impacts nor connected actions in other areas, only represents further piecemealing of remediation *and restoration* efforts at Hanford.

Furthermore, the soil cover for the proposed barrier would similarly involve the large-scale disruption and mining of yet another area for top soil. The currently designated sacrifice zone is the McGee Ranch area west of Hanford, an area known for the high quality and comparative uniqueness of its loamy soils. Should this valuable resource now be plundered and yet another vast tract unalterably destroyed to permit more widespread application of barriers in the name of "remediation" at Hanford?

#### EVALUATION OF INDIAN VALUES

In connection with development of the Proposed Plan for 200-BP-1, EPA staff convened a workshop in December 1994, in order to better understand American Indian values associated with remediating this operable unit. Unfortunately, CTUIR and other tribal staff all shared a lingering mutual concern that this workshop was simply an attempt to establish a set of "tribal criteria" which could then somehow be separated, quantified, and applied to the evaluation process. It appears to be simply an attempt to create a tribal "checklist," if you will, to satisfy "consultation" or advertise that "tribal values" have been fully incorporated into this or any other process.

Tribal staff do not employ any sort of "checklist" in our evaluation of DOE and regulator actions; such an approach is in fundamental conflict with tribal values and a holistic world view. Tribal staff evaluate all projects solely on their specific and individual merits and on their potential impacts to tribal rights, interests, and responsibilities. For your reference, CTUIR staff enclose a copy of our Criteria document, developed in July 1993, as an outreach to the Tri-Parties, outlining four basic criteria that tribal staff and policy makers would use in evaluating the impacts of then-proposed changes to the Tri-Party Agreement. But the Criteria are equally applicable to a wide range of other Hanford activities, including remedial planning for the 200-BP-1 operable unit.

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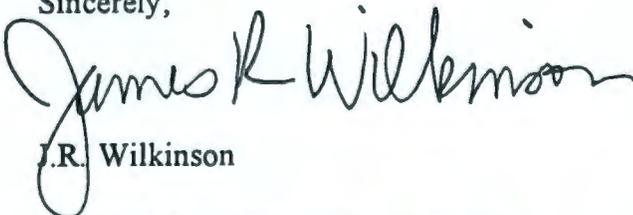
In conjunction with the integrated set of tribal values embedded within this document, review of the Criteria document will provide you with a basic overview of tribally important values that transcend persistent attempts by Hanford decision makers to subdivide and pigeonhole. Attempts to break apart a holistic world view into its individual components first assumes that *all* such components can be identified and quantified, and then that an accurate characterization of a "forest" can be built solely from individual descriptions of only some of its "trees." In fact the whole system is far more complicated, interrelated, and interdependent than simply the sum of a few of its parts.

CONCLUSION

The rush to finalize the proposed plan for 200-BP-1 is highly premature. As proposed, the plan represents but a cynical attempt to give an appearance of "doing something" while in fact conducting as little real remediation of an environmentally mobile and long-lived threat as is conceivably possible. Such an approach does not protect tribal rights and interests, now or in the future, nor does it fulfill DOE's trust responsibility to tribes or DOE's commitment to begin being an effective steward of land and natural resources. *Put the brakes on this deficient plan now and focus immediate efforts directly along the Columbia River corridor.*

Thank you for the opportunity to provide comments on the proposed "remedial" plan for the 200-BP-1 operable unit. CTUIR staff expect to receive detailed responses to the comments provided herein, including a description of how the proposed remedial plan will be modified in response to outlined tribal concerns. CTUIR staff will be available to meet with you for further discussions following your review of this letter owing to the significant nature and number of concerns raised herein. Owing to numerous other obligations that limited CTUIR staff review of this proposed plan, CTUIR staff also reserve the right to submit additional comments in the future. Please coordinate future efforts on this project with either myself or Tom Gilmore, Hanford Environmental Restoration Project Hydrogeologist, at 503-276-0105.

Sincerely,



J.R. Wilkinson

Hanford Projects/Program Manager  
CTUIR Department of Natural Resources

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