HLW & FD EIS PROJECT - AR PF
Control # DC-01

Rev1 EISreview

Comments on "Draft INEEL HLW EIS, Idaho High-Level Waste & Facilities Disposition"

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Thanks for asking for my opinions of your "Draft INEEL HLW EIS". It's nice to see that the effort I've put into my hobby (HLW management) during the past few years qualifies me to be one of the Site's "key stakeholders". Since the National Academy of Science's Board on Radioactive Waste Management seems to feel the same way (they've sent me a personal copy of their review of the Site's HLW program), I've decided to put my thoughts about both of these reports together into one note.

Here it is:

First of all, I feel that these documents have dealt INEEL's credibility as the "lead laboratory" another big blow. I also feel that its future viability as an applied engineering facility has been seriously threatened.

Since the NAS's report is more prestigious and apt to have greater impact on INEEL, I'll start off with it.

1-2 X1(3) I sympathize with the Panel's frustration with the management "symptoms" that make doing nothing seem more sensible than trying to implement any of the EIS alternatives consistent with today's HLW management paradigm. (These symptoms are identified in another recent NAS Report, *"Barriers to Science"*, 1996.) However, while I agree with the Panel's reservations about the "separations" approach championed by INEEL's decision-makers, I don't agree with its conclusion that it would be best to abrogate the two key HLW-related provisions of the "Batt agreement"; i.e., to not render existing calcines "road ready" by 2035 AD and to not calcine the remaining liquid waste by 2012 AD.

Since DOE could honor its promises if it were simply willing to eschew some of its "symptoms", a more constructive conclusion would have been to suggest that it do so and identify specific changes that need to be made.

I also disagree with two of the Panel's rationalizations for its conclusions: 1) it is *not* necessary to delay decision-making until we know more than we do already about the chemical composition of INTEC wastes: we know everything that's genuinely relevant to implementing any of several reasonable rock-making processes and "characterization" via the science of analytical chemistry cannot prove that there isn't a molecule of "listed" waste somewhere in the tanks/binsets (only God can know such things) - "characterization" done for its own sake[1] is simply another of DOE's fabulously expensive delaying tactics, and 2) it is *not* necessary to know every conceivable detail about the waste's ultimate resting place (repository) to get on with *our* job of converting it into road-ready waste forms - we can and should make materials suitable for disposal in any of several already sufficiently-characterized & technically competent potential candidate repository sites, the same assumption made by the people who designed the "historic waste" solidification system for BNFL's Sellafield facility (UK) and who decided to encapsulate everything with concrete.

[1] For example, a recent estimate of what the US taxpayer is now paying to "characterize" each of the barrels of RWMC waste being prepared for shipment from INEEL to WIPP is $60,000 (roughly the cost of a four-year degree at a good college.) The nominal purpose of this activity is to "assign codes" to the waste -- the numbers do not influence how the barrel is shipped or what will be done with it at the repository.

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1-40 III.D-1(4) What we genuinely don't know enough about yet are specific details of how to go about applying alternative treatment/solidification technologies to INEEL's wastes. The reason for this is that DOE-ID's M&O contractor refused to spend any of its "programmatic" money on actual R&D - virtually all the money spent on alternatives to its pet separation/vitrification scheme went to produce "group think" exercises similar to the Draft HLW EIS.

1-41 X(3)

1-3 V(6) There is an important factual error in the NAS report (it isn't the Panel's fault – it was pulled verbatim out of an INEEL technical publication.) Figure 11.1 (p 99) suggests that ICPP/INTEC calcines are about ten times more radioactive than they really are (i.e., that they possess a total radioactivity of about 60,000 curies/m^3.). In this case, the number is important because it suggests that it would take more than one hundred years for those calcines to decay down to a level now considered to be "low". The fact is that typical ICPP/INTEC calcines generate only about 40 watts worth of radioactive heat/m^3 (due primarily to ^{90}Sr & ^{137}Cs) which corresponds to a radioactivity of ~7,000 Ci/m^3 - which, in turn, means that they're about at "Class C" LLW limits now & definitely will be below them (fission-product-wise at least,) by the time that we've promised to have 'em ready to be shipped offsite.

1-4 V(9) Of course, in a rational world it really wouldn't make much difference exactly how "hot" these wastes are because any facility used to treat/dispose of them would certainly be "remoted" anyway - where it makes a difference is when decision-makers decide what they are going to do based solely upon arbitrary (and therefore subject to change) criteria such as the radwaste classification numbers listed in Table II of 10 CFR 61. The US Nuclear Establishment's infatuation with legalistic hair-splitting rather than common-sense implementation of the intent of laws/regulations (another of its "symptoms") is evidenced by INEEL's insistence that SBW is fundamentally different than the reprocessing waste that's already been calcined . If/when we ever screw up enough courage/resolve to calcine SBW, we'll discover that the resulting product is just as nasty as the other calcines (it'll have a higher percentage of plutonium, less of fission products, more mercury, less cadmium, etc., etc.). There is no good reason to treat them differently just because somebody decided to label one of them "high" and the other "incidental". Logically, they should be turned into one type of waste form and disposed of in one type of repository.

The NAS apparently wasn't told that there's enough room in the binsets (set #7) to accept any calcine made from SBW without having to mix it with existing calcines and thereby render it "high". That's important because one of its rationalizations for recommending that DOE-ID break its promise to calcine SBW (which wouldn't be good for the Site's credibility) is that so-causing it to become "high" would make it more difficult to deal with. It wouldn't, making any kind of durable "rock" out of SBW (concrete, HIPed glass-ceramic, or glass) would be facilitated by first burning out the volatile stuff.

1-5 III.C(2) As far as how to go about calcining this waste is concerned, the reason we haven't been able to succeed at it is that the Site's decision-makers deliberately decided to **not** use the only really efficient approach available to do it; i.e., add some sugar just before squirting the stuff into the calciner. It's an well-established and safe way to calcine SBW (the rest of the world (e.g. BNFL at Sellafield) routinely does it that way & we successfully tested the concept here at NRTS/INEL/INEEL thirty-five years ago and again ~ 3-4 years ago). If you refuse to calcine that way (today's excuse is "safety") then you either have to dilute SBW with massive amounts of easily-denitrated stuff such as aluminum nitrate - which makes calcination extremely slow, unnecessarily "NOx ous", and creates a lot more calcine than actually we need to - or run the calciner at a temperature that generates so much "fines" that the offgas system becomes plugged up with dust (the reason why the last "high temperature" calcination campaign had to be shut down).

1-6 III.C(2) The fact that the Site's decision-makers have also steadfastly refused to do things like recover/recycle mercury (electroplate it from the calciner's offgas scrub solution) and NO_x from NWCF offgas has made calcination a lot less attractive (& that mission less viable) than it ought to be. Some sorts of modifications to NWCF would indeed cost a lot of money but these two would be pretty cheap.

1-7 III.C(2) There are two reasons why sugar calcination would greatly reduce the amount of NO_x that's emitted by NWCF. First, much less aluminum nitrate would have to be added to the waste (we'd need an Al:Na ratio of ~1:1 instead of the ~3:1 required by the "basis approach" – each mole of Al so-added adds another three moles of nitrate). Second, sugar calcination reduces most of the nitrate in the calciner's feed to

elemental nitrogen instead of to NO_x. Since NO_x is the probably the most toxic gas emitted by NWCF (& certainly the most visible one), don't you think that an "EIS" ought to mention that there's a cheap fix available for it? [Cheap? @ 20 cents/pound, enough table-quality sugar to sugar-calcine all SBW would cost about $0.5 million – "running" NWCF costs ~$50 million/year & sugar-calcination of SBW would cut the required operational time by at least a factor of two.]

I-8 III.D.4(4) Why doesn't this EIS mention that STUDSVIK offered to sell INEEL a brand new, MACT-compatible calcination system (including a new building to put it in) for considerably less than what it's now spending every year to "run" NWCF?

I-9 III.D.4(7) Since the NAS Panel apparently agrees that homogenizing these wastes would be a good thing to do, why isn't the waste coprocessing option that I suggested six years ago (i.e., slurry SBW with existing calcines, add some sugar and then feed both phases into NWCF) and which was then subsequently deemed feasible by a Fluor Daniel report (1966) mentioned in the EIS? The University of North Dakota's fluidized bed combustion research facility ("EERC") offered to do a pilot plant scale demonstration of that process for ~$20,000. This offer was ignored.

I-10 VII.D(6) I-43 III.C(1) DOE promised to calcine **all** of INEEL's reprocessing waste (BATT agreement), doing that would make conversion of that waste into good-quality waste forms much easier, and *it can* be done both on time (by 2012 AD) for a reasonable number of dollars – why does this EIS devote so little attention to evaluating ways to actually accomplish it? I-42 III.C(1) I-44 III.C(2)

Incidentally, I've just heard through the company grapevine that most of BBWI's radwaste experts have been cloistered up in town for the last 3-4 weeks trying to decide upon a way of dealing with SBW consistent with all of today's customs/policies/assumptions – apparently someone's pushing for a decision on a "preferred alternative".

I-11 III.F.3(1) I've also heard that the SBW treatment alternative viewed with the most favor invokes running it through columns/contactors to separate it into streams called "non-contact handled TRU" and "Class C" LLW, grouting both of 'em, and then shipping both off to be buried in differently-labeled holes at WIPP. Apparently, somebody's decided that there's only so much "room" for one of these waste categories at WIPP (I forget which one) so it would, therefore, make good sense for us to spend a few tens (hundreds?) of million taxdollars separating the stuff before we ship it all off to the same place. (This kind of gov't spending/planning gives me a warm feeling when I send off my check to the IRS every year.)

I-12 III.D.4(7) Again, according to the grapevine, none of the NAS report's suggested SBW treatment options are being considered. Why not?

Here are some questions about how the processing alternatives are represented in the EIS Summary.

I-13 III.C(9) First, most of your process options invoke the grouting of one or more waste liquid streams – most of which would be strongly acidic. None of the figures you've shown depict that those streams will be calcined/incinerated prior to being solidified. Why not? Doing so simultaneously reduces the mass/volume of grout you'll have to make, destroys troublesome stuff like "listed" organics, and makes a much more durable concrete product.

I-14 III.D.2.a(1) Second, your Hot Isostatic Pressed (HIP) Waste option (Fig. S-9) invokes the HIPing of ion exchange resin. You can't put gas-forming materials into HIP cans. The figure needs to indicate some sort of heat-pretreatment step.

I-15 III.D.3(4) Third, your "Planning Basis" (Fig. S-7) and "Minimum INEEL Processing alternatives (S-12) suggest that Cs-loaded ion exchange resin will be "separated" along with the calcines. Would a process designed to dissolve/extract calcines work with ion exchange resins? Wouldn't it be better to burn the resins and treat the *ash*? If that's to be done, your figures should depict the necessary incinerator. Ditto that for all of the "separation" alternatives.

Next, let's discuss the management scenarios that I've had some hand in bringing to the Public's attention - all those that would convert stuff now considered to be "high" into concrete.

I-16 III.D.2.b(4) First, I'm disappointed that the folks you've hired to produce this Draft EIS managed to conclude that the "direct cement" option - turning a pile of sand-like calcine into cans full of "rock" by mixing it with cementing agents & water, injecting that grout into steel canisters, and then curing them in a pressure cooker (which step might not even be necessary - only some hands-on research can really tell) - would be as "dangerous" as your last M&O Contractor's pet separations-based "Planning Approach"- which of course, invokes far more unit operations, more time, more people, (a lot) more toxic chemicals, much higher (>2000 F) processing temperatures, multiple waste forms, an extra incinerator, transport to multiple repositories, etc., etc.. However, in view of the degree of "command influence" that goes into the production of official DOE-EM technical reports (often reflected by deliberate omission of uncomfortable facts), I'm not really surprised at this conclusion.

I-17 III.D.2.b(1) Here's why a properly implemented "direct cement" alternative would have low environmental impact. First of all, I've always advocated that "direct cement" be implemented in such a way that all of ICPP/INTEC's waste is converted to the same type of waste form and goes to the same repository.[2] [That's not the way the EIS interprets it – it proposes making a large separate LLW waste stream that's very apt to end being left in Idaho – an unnecessary assumption that makes this option much less attractive to stakeholders.] A one-process/one-waste form/one-repository scenario would be much simpler than any of the other alternatives which would actually keep the promises that have been made to stakeholders. Simplicity means less equipment, fewer personnel, less chemicals, less paperwork, less confusion, fewer lawyers, etc., etc., - all characteristics that tend to make doing things less "impactful" to both the environment and the taxpayer's pocketbook.

I-19 VII.D(3) Our mission is simply to make ICPP/INTEC reprocessing waste "road ready" for transport to an offsite repository that the Federal Government (DOE?) has promised to provide and then clean up the place, period. It's not to "make work" for thousands of DOE/Contractor/subcontractor personnel or to try to justify dumb decisions that have already been made elsewhere with respect to implementing/siting repositories, categorizing radwastes, and/or making them ready for transport. My assumptions are that,

I-20 III.F.2(6) 1) there's plenty of suitable "Federal Land" available (notably at the NTS) for a practical sort of repository for defense-type reprocessing wastes[3] (meaning one that doesn't assign today's phony premium to "volume reduction" – apparently our HLW experts are still being told that the incremental cost of 1 m^3 worth of YM is ~ a half-million dollars), 2) the politicians who can decide to implement such a repository will eventually do so when convinced that it's simultaneously possible, politically defensible and affordable, 3) cement-solidified calcine would meet the "letter of the law" (10CFR-60 & 40CFR-191) as a HLW disposal form, and 4) that until a suitable repository actually materializes, we should simply emulate the UK's approach to "historic" reprocessing waste management.

I-21 III.D.2.b(4) I-23 III.E(2)

[2] If reasonable attention is paid to minimizing the solids content of the liquids generated in cleaning up the place (termed NGLW in this EIS), the amount of radioactive "ash" that would be produced by drying/calcining those liquids will be small with respect to that represented by today's calcines and SBW. Consequently, I propose(d) that they be processed/disposed-of in exactly the same manner – no additional equipment, repositories, assumptions, or paperwork required.

[3] Its decision to confound disposal of its own waste with that produced by the commercial nuclear power industry constitutes another reason why the US Federal Government has failed to honor its promises to Idaho (the first official promise to prepare our waste for disposal said it'd be done by 1980). Due to DOD insistence that DOE's civilian waste management responsibilities not interfere with its own interests at NTS, the Federal government chose to "withdraw" another ~600 km^2 of land from Nevada for today's official HLW repository modeling exercise (YM). This plus the assumption that *all* commercially-produced HLW is to be sent there engenders enough litigation to indefinitely block implementation of that repository – which means that linking these problems causes total paralysis. The most reasonable place for the Federal Government to site a repository dedicated to cold-war defense-type waste is at its cold-war defense-type test range, the Nevada Test Site (NTS). The NTS makes good sense because, a) it's already "federal land" (no new "withdrawal" required) ,b) it receives less precipitation than do other DOE sites, c) it possesses the USA's deepest water table, d) it has already been the object of more than thirty years worth of immediately relevant hydrogeological research, e) it's already been irredeemably "crapped up" by ~950 nuclear "events", and, finally, f) a little-publicized **real** example of a practical (cheap) repository for this sort of waste has already been implemented and (then) exhaustively tested (the "GCD" in area 5). However, it is *not* necessary to wait for a repository siting decision to begin rendering INEEL waste road-ready (the UK didn't) - regardless of exactly where that waste might eventually end up, it is reasonable to assume that HC-type concrete would be at least as durable as glass due to the fact that its mineralogical similarity to natural soil minerals provides less thermodynamic driving force for alteration.

I-24 III.D.2.b(1) Concrete-making is intrinsically safer than either glass-making or HIPing (it's done "wet" - generates less dust - and requires much lower temperatures) and is much easier/cheaper to do on an appropriate (large) scale. The specific improvements that I and my colleagues have recommended over regular "grouts" (the use of "hydroceramic" rather than regular grout formulations and the calcination (incineration) of everything that would be rendered more suitable for cmentitious solidification that way) are to ensure the production of top-quality products – materials distinctly more durable than those which BNFL has recently made out of the UK's "historic waste" and probably also superior to typical radwaste-type glasses. The "Lead lab" should make the DOE Complex's best waste forms.

I-25 III.D.2.b(1) Hydroceramics make especially good sense at INEEL for the following reasons:

I-26 III.D.2.b(1) 1) INEEL has not yet officially committed to any particular way of dealing with its HLW.

I-27 III.D.2.b(1) 2) Because INEEL calcines do not contain excessive concentrations of soluble salts, it would be possible to satisfy the "sodalite formulation" rule-of-thumb with high (>25%) waste loadings.

I-28 III.D.2.b(1) 3) Since two of the three elements making up HC binder phases (Na & Al) are high-percentage constituents of INEEL calcines, there is no need to separate them (or anything else) prior to solidification. This means that everything would be prepared for offsite disposal – the wish of INEEL's local stakeholders. (A primary goal of the "volume reduction" activities practiced at WVDP and SRS is to transfer those elements to "low level" fractions that aren't vitrified.)

I-29 III.D.2.b(1) 4) Simple changes to the existing calcination facility would permit it to efficiently calcine the remaining liquid reprocessing waste – either by itself or (preferably) after it's been slurry-mixed with existing calcines. The latter scenario would consolidate all INEEL reprocessing wastes into a homogeneous feedstream suitable for HC solidification.

I-30 III.D.2.b(1) 5) It would also provide a good way to deal with other INEEL radwastes. For example, INEEL must find some way to dispose of ~1000 metric tons of radioactive NaOH generated by reacting metallic sodium reactor coolant with water. Since this just happens to be the same amount of "activator" that would be required to turn ICPP/INTEC's calcines into HC concrete, coprocessing these wastes would solve two problems. If the changes to the existing calcination facility I've alluded to were to be implemented, virtually any sort of liquid or particulate waste (e.g., contaminated soils) could be readily converted to HCs.

6) It is probable that a formal proposal to properly implement an HC-type solidification process would satisfy INEEL's stakeholders.

I-31 III.D.2.b(1) 7) Finally, if a future generation deems it to be both politically expedient and affordable, HC concrete monoliths could be hot-isostatically-pressed into "vitrified" monoliths without removing them from their original canisters.(this means that today's decision-makers would not have to make an irrevocable commitment to not "vitrifying" this waste).

Since this EIS is just a "draft", let me suggest some changes for your final version.

I-32 VII.D(2) First, make it very clear up front just exactly what it is you're trying to accomplish. If it's already been decided that it's OK to **not** honor commitments made in the "Batt Agreement", say so. (For instance, some of the scenarios in this Draft that propose that SBW will be calcined, assume a completion time of 2014 AD, not 2012 AD - does this two-year "slip" reflect a change in policy?)

I-33 IX.A(3) Second, when you present/discuss treatment scenarios that don't seem to make much sense[4], be sure that you explain the assumptions/conditions that would make them plausible.

[4]for instance, the "Minimum INEEL Processing Alternative" (the "driver" for which is the cost of building a DOE-type vitrification plant here at INEEL) suggests that we are to bundle up our calcines into some sort of transportable (you can't ship powders) temporary waste form (RTV-type rubber cement is being proposed for this purpose) & then ship it all off to Hanford where they will somehow undo our temporary solidification process, separate the stuff into various fractions, vitrify(?) all of them, and then ship it all back here for a few(?) decades worth of "interim" storage. This is too clever to make much sense to the casual reader unless additional background is provided.

I-34 III.D.1(6) Third, you might want to consider integrating some of this Site's other waste treatment/disposal problems into your final version (e.g. using ANLW's caustic as the activator for "hydroceramics" made out of INTEC calcines.) Doing so would prevent a lot of unnecessary duplication, cause a higher percentage of INEEL's radwaste to be prepared for offsite disposal (which would delight local stakeholders), and save taxpayers a lot of money. (The "stove piping" of EM projects to match existing organizational structures/definitions is another of the "symptoms" identified in "*Barriers to Science*").

I-35 III.D.4(6) Fourth, when you present/discuss treatment scenarios that have not received programmatic research support, e.g., "Direct Cement/Hydroceramics", make it clear to the reader that that's indeed been the case & also that information about them can be obtained from sources other than therefore non-existent official Government reports. (For example, I've co-authored/published a dozen research papers that anyone interested in why "direct cement" makes sense might want to see – the "Draft EIS" doesn't acknowledge that this sort of technical literature even exists).

I-36 III.D.4(6) Fifth, to ensure that your EIS-preparation subcontractors do a better job of representing alternatives like "Direct Cement" in the final version, insist that they actually contact the persons responsible for developing/championing them - the "draft" doesn't accurately represent what my colleagues & I have done or would recommend.

I-37 III.F.2(1) Sixth & finally, please don't characterize DOE's decision to tell its employees & contractors to assume that all waste forms made from it's reprocessing waste will have 0.5 MTHU/m^3 as being merely "controversial" (p. S-21). A policy that is inconsistent with both the intent and letter of the law (see 40 CFR 191) and is largely responsible for DOE's inability to deal efficiently with its own "high level" waste requires a more forceful adjective.

I-38 IX.A(2) Do not change your Publisher. The quality of the photography, printing, general layout, etc. of this EIS is the best I've ever seen in a large government-sponsored document.

I-39 III.D.2.b(1) If you would like to read some technical stuff that's not in a DOE-sponsored report, I've written up another research paper (at this point, it is also just a "draft") discussing why "Direct Cement" makes especially good sense for INEEL. It goes into a good bit of detail about vitrification's drawbacks (one of which is that its prohibitive cost encourages folks to do "separations") and compares leach test performance of radwaste type glasses with "hydroceramics. It's an "easy read" because it's written like the stuff you find in trade journals like *Radwaste Magazine*. Its literature references (35 of them) support the "controversial" contentions I've made in this review. Let me know if you would like to see it.

ACIdoc

WHY HYDROCERAMIC SOLIDIFICATION MAKES MORE SENSE THAN VITRIFICATION FOR *INEEL* HIGH LEVEL WASTE

Darryl D. Siemer

ABSTRACT

"Hydroceramics" (HC) are alkali aluminosilicate ("geopolymeric") concretes designed to match the leach test performance of radwaste-type glasses. They are made by curing grouts consisting of mixtures of calcined waste, calcined clay, water, and NaOH under hydrothermal conditions. This paper characterizes them and explains why this approach to radwaste treatment would be preferable to vitrification for the Idaho National Engineering and Environmental Laboratory's (INEEL) reprocessing waste.

INTRODUCTION

In 1970, Idaho's political leadership was told that the "high level waste" (HLW) generated by the Federal Government's nuclear fuel reprocessing facility at INEEL (then "NRTS") would be prepared for offsite disposal (i.e., rendered "road ready") by 1980[1]. Since then, billions of taxdollars have been spent on HLW management paperwork, no HLW repository has been provided, none of INEEL's reprocessing waste has been rendered road-ready, and today's official deadline for accomplishing it has slipped to 2035 AD[2]. A recent National Research Council (NRC) report identified the management "symptoms" responsible for this situation[3]. One of these is that DOE habitually blinders itself to any but predetermined "preferred alternatives" when deciding how to go about solving problems. This paper discusses one "preferred alternative", vitrification, and describes why a particular cementitious technology ought to be used instead.

VITRIFICATION'S DRAWBACKS

During the past three years DOE's contractors have managed to operate two full-scale glass melters long enough to establish that the cost of solidifying its HLW that way will be 2-4 $million per m^3 of glass produced[4]. Because DOE must eventually process ~60,000 m^3 of high-solids reprocessing waste (primarily the sludges at its Hanford & SRS facilities) and is unlikely to achieve >100% volumetric loading of those materials into glass, these costs suggest that vitrification will prove to be prohibitively expensive. This was predicted by another "controversial" NRC report published over twenty years ago[5].

Let's review some of the arguments employed by vitrification's champions.

One of these is, "glass is better because a glass melter can achieve greater volumetric waste loading than low temperature solidification technologies". This is both misleading and irrelevant. It's misleading because it presumes that the other technologies *must* be implemented without appropriate waste pretreatment and, also, as I'll demonstrate later, that only a fraction of the waste "counts". Raw reprocessing waste consists primarily of volatile materials such as water, mineral acid, nitrate/nitrite and, in some cases, organic materials which may include "listed" toxins (both real and imaginary), solvents, and chelating agents. Calcination (or "incineration")[6,7] is a well-developed, technically justifiable, and obvious way to eliminate those components while producing inorganic ash which can be converted to equally low-volume monoliths by other means. While it is true that glass melters may be (and sometimes are) used as "devolatilizers", it is much more efficient to do that operation with equipment optimized for that purpose[7].

The argument is irrelevant because the notion that the cost of managing this waste will be proportional to the geometric volume of waste forms made from it is invalid. First of all, history suggests that *any* facility run under DOE oversight will cost taxpayers a lot of money whether or not it actually ever produces anything - which, in turn, indicates that today's practice of judging hypothetical waste treatment scenarios based on an assumed proportionality between cost and volume is overly simplistic. [For example, the cost of producing one canister (~1 m^3) of any sort of "rock" will be >90% that of making ten canisters (~10 m^3)

of it with the same equipment - most of the total expenditure (research, development, design, licensing, administrative, construction, personnel training, testing, decommissioning, etc., etc.) will be independent of the amount of product made. Producing something adds only an *incremental* cost.] Similarly, the cost of disposing of waste forms produced from DOE HLW will *not* be proportional to their geometric volume. Why ? 1) Formal analyses have repeatedly concluded that transport of waste forms to a repository will represent a small fraction of total cost regardless of their volumes[8], 2) today's official hypothetical HLW repository site, Yucca Mountain (YM), is physically large enough (several cubic miles - several tens of billions of cubic meters) to accommodate any type of material(s) that DOE might choose to make from its reprocessing wastes, 3) YM's capacity is defined in units proportional to the amount of radionuclides to be buried there (the equivalent of that in 70,000 "metric tons of heavy metal"), not that waste's geometric volume[9], and, of course, 4) YM will cost US taxpayers billions of dollars whether or not any real waste is ever buried there. Again, the cost of using the facility for its intended purpose will add only a relatively small *incremental* cost attributable to mass/volume.

Today's tendency to assign undue weight to "volume" is harmful because doing so diverts both attention and resources from rendering waste road-ready to changing its classification via "volume reduction". Existing defense-type HLWs should be rendered road-ready because they are toxic, radioactive, corrosive, situated in places poorly suited to become permanent geological repository sites, and have already been neglected for far too long - not because they are "big" or "high". "Devolatilization" via calcination/incineration and physical compaction of compressible solids are the only volume reduction technologies that make much sense. In practice, most of the separation technologies used/proposed to effect reclassification decrease the physical size of "high activity" fractions that "must be vitrified" for offsite disposal by increasing those of "low level" fractions destined to be left on-site with little or no further treatment. The latter usually contain the bulk of the original waste's infinite half-life toxic components and, due to the process chemicals added to affect the separation(s), is generally larger (often much larger) in terms of total mass, solids content, and volume than the waste was before it was fractionated. Stratagems used/proposed to achieve enough "volume reduction" to make the vitrification of the "high" stuff in DOE's reprocessing waste more affordable range from the relatively straightforward sludge-washing done at WVDP & SRS to the "full separation" scheme championed by INEEL's decision-makers during most of the 1990s. History suggests that the "volume reduction" of existing reprocessing waste is attractive primarily to those who would be employed designing/building/operating the facilities required to do it – and equally unattractive to independent reviewers[10] and folks who live near the site in question but do not derive their incomes from it[11].

Another argument proffered for vitrification consists of a strained analogy; i.e., "because France and Great Britain vitrify their high-level reprocessing wastes, it must be 'best' for US HLW too". This is invalid because about the only characteristic that these wastes have in common is their name. European HLW consists of relatively "young", first-cycle, PUREX-type raffinates generated by the nitric acid dissolution of mechanically-declad commercial reactor fuel. Fission products typically comprise 20-60% of the non-volatile matter in them. On the other hand, today's DOE HLW is "old" (typically >30 years out-of-reactor) and consists primarily of non-radioactive materials derived from fuel cladding and involatile process reagents. Consequently, DOE's HLWs are typically 2 orders of magnitude less radioactive and much more heterogeneous than their European namesakes. The "technical" reason why vitrification of US HLW is prohibitively expensive is that a US melter capable of solidifying any given amount of "bad stuff" must be ~100 times larger and able to safely accommodate a much wider range of feedstocks than its European counterpart ("bad stuff" = the sum of RCRA metals +fission products + TRU).

A more fundamental weakness of glasses for this application is that they are "ineluctably metastable"[1]. Glasses are rare in Nature because they are unstable with respect to crystalline minerals/rocks and therefore inevitably decompose to form them; e.g, the "zeolitized tuff" that makes up much of today's official hypothetical HLW repository site was originally volcanic glass. Radwaste-type glasses (i.e., ones with relatively low percentages of silica and alumina & high percentages of alkalies and boron) are apt to be especially unstable. Furthermore, because both materials tend to enhance the corrosion rate of glasses under certain conditions[12], some of DOE's radwaste management experts are now suggesting that its proposed HLW repository must be implemented without the use of concretes for construction or clays for backfill –

which, of course, constitutes another hurdle to be overcome by the engineers responsible for implementing it. I do not mean to imply that HLW disposal via glass waste forms would necessarily "fail" (if the repository is properly sited, the waste form itself will have negligible effect upon overall system performance[9, 13,14]), only that glass is neither "best" nor necessary.

Let's look at a more constructive approach to rendering this sort of waste road-ready. Perhaps the best analogy to the US's present situation is Great Britain's "historic waste" problem circa 1980[13,16].

In 1982, the British government directed its prime nuclear contractor, British Nuclear Fuels, Limited (BNFL), to design an up-to-date commercial fuel recycling facility at Sellafield (aka Windscale). It mandated that the new facility must not only be able to immediately process all newly-generated reprocessing wastes to disposable waste forms, but also to similarly deal with a 30+ year backlog of "temporarily" stored reprocessing waste generated previously. Unlike the situation in the USA, the British government did not impose a "preferred technology" - only that the waste forms must satisfy performance-based standards; i.e., be suitable for disposal in any of the possible repository systems that it might choose to implement within the next 50 years or so. Five years worth of collaborative effort by technologists from BNFL and the British Government's Department of Environment led to a consensus that "inorganic cements" would be appropriate for all radwaste streams which generate less than ~500 watt/m^3 worth of radioactive heat; i.e., the choice of solidification technology would be determined by a measurable and technically relevant characteristic of the waste - its history and any arbitrary labels that may have been applied to it (e.g., "high-level", "low-level", "mixed", "incidental", "transuranic", etc.) didn't matter. This conclusion is consistent with sound technical and economic reasoning, IAEA guidelines, and the opinions of US technologists willing to assume the professional risks inherent in taking an unblindered look at the issue[5]. By 1991, BNFL had completed the new reprocessing plant and its cementitious solidification facilities started "hot" operation two years later - it has since rendered most of Sellafield's >15,000 m^3 accumulation of historic radwaste (~150 distinguishable "streams") road-ready in the form of 500-liter stainless steel canisters filled with concrete "encapsulated" wastes.

Since then BNFL has become a prominent player in the US radwaste technology marketplace - in effect leveraging its success at home to compete with US-owned firms (many of whose employees work at DOE sites) for US tax dollars. While this situation is rather galling to some US nuclear professionals (e.g., this writer), US taxpayers are relatively well-served by it because, unlike the situation with many of USDOE's contractors, BNFL generally accomplishes what it promises to do on time and on budget. Of course, this does not mean that it is in the *best* interests of US taxpayers for USDOE to promise BNFL several million dollars for every glass "log" it might be able to produce from US HLW[4] – those taxpayers would be much better served if USDOE would instead permit it to use an updated version of the same technology applied to similarly radioactive British reprocessing radwastes.

There are two reasons why INEEL is the logical place for DOE to initiate this change of policy. First, unlike the situation elsewhere, INEEL's decision makers have not yet officially committed themselves to any particular HLW management scenario. Second, INEEL's fuel reprocessing facility, the "Idaho Chemical Processing Plant" (ICPP, recently reacronymed "INTEC") calcined >90% of its raw liquid waste rather than converting it to a mix of water soluble salts and sludge via neutralization with NaOH. This plus the fact that those calcines generate only ~40 watts/m^3 of total radioactive heat make its waste intrinsically well suited for cementitious solidification.

THE HYDROCERAMIC ALTERNATIVE

There are three reasons why conventional "grouts" (including those employed by BNFL) usually don't perform as well as do glasses on radwaste leach tests. The first is that grouting is usually applied to the intrinsically soluble fraction of the waste (raw uncalcined salts) while glass-making is reserved for a "volume reduced" fraction from which readily soluble material has already been leached. While the pH buffering provided by conventional calcium silicate-based concretes makes them able to do an excellent job of immobilizing the intrinsically insoluble components of US radwastes (this "easy stuff" includes all multivalent cations - all TRU elements[17], the majority of fission products, and most RCRA metals[18]), they do not chemically fix the alkali metal (e.g., sodium and ^{137}Cs) salts that constitute the majority of the waste so-treated. (From a material science point of view, it would make more sense to consign the salts to the

glass melter and the sludges to the concrete mixer.] Second, the protocols imposed by those leach tests (small scale, short term, etc.) obviate the key advantages of cementitious solidification, i.e., that it would be relatively easy/cheap to make waste forms possessing low geometric surface areas relative to their volumes (in other words, large ones) and equally easy/cheap to then enhance their post-emplacement durability at the repository via in-situ grouting ("backfilling") with a chemically compatible grout ("grout" would destabilize glasses). Third, because concretes are intrinsically porous, the actual surface area exposed to the leachant is much greater than is the case with equal-sized chunks of glass.

Hydroceramic concrete[19,20] eliminates this "performance gap" because it consists of minerals (sodalites, cancrinites, zeolites, etc.) capable of chemically fixing both salts and "easy stuff". The process implements the chemistry of Hanford's circa-1970 "Clay Reaction Process"[21] via Oak Ridge National Laboratory's almost equally venerable "Fixed Under Elevated Temperature and Pressure" (FUETAP) autoclaved-concrete making technology[22]. HC "grout" consists primarily of calcined kaolinic clay ("metakaolin) and NaOH plus smaller amounts of powdered vermiculite (to enhance Cs fixation) and sodium sulfide (which serves both as a redox buffer and a precipitant for RCRA metals). The relative amounts of alkali metals, aluminum, silicon and all anions other than hydroxide, aluminate, and silicate in it are adjusted to approximate a "sodalite" composition; i.e., ratios of $(Na+K+Cs)_a:Al_b:Si_c:X_d$ are $b \geq a$, $c \geq a$, & $d<0.25a$. The physical characteristics (appearance, strength, porosity, density, etc., etc.) of the finished concretes are similar to those of conventional calcium silicate-based concretes.

The decision to confound disposal of its own waste with that produced by the commercial nuclear power industry constitutes another reason why the US Federal Government has failed to honor its promises to Idaho. Due to DOD insistence that DOE's civilian waste management responsibilities not interfere with its own interests at NTS[1, pp 251-252], the Federal government chose to "withdraw" another ~600 km^2 of land from Nevada for today's official HLW repository modeling exercise (YM). This plus the assumption that *all* commercially-produced HLW is to be sent there engenders enough litigation to indefinitely block implementation of that repository – which means that linking these problems causes total paralysis. The most reasonable place for the Federal Government to site a repository dedicated to cold-war defense-type waste is at its cold-war defense-type test range, the Nevada Test Site (NTS). The NTS makes good sense because, a) it's already "federal land" ,b) it receives less precipitation than do other DOE sites, c) it possesses the USA's deepest water table, d) it has already been the object of more than thirty years worth of immediately relevant hydrogelological research[13,14], e) it's already been irredeemably "crapped up" by ~950 nuclear "events", and, finally, f) a little-publicized real example of a practical (cheap) repository for this sort of waste has already been implemented and (then) exhaustively tested[23]. However, it is *not* necessary to wait for a repository siting decision to begin rendering INEEL waste road-ready (the UK didn't) - regardless of exactly where that waste might eventually end up, it is reasonable to assume that HC-type concrete would be at least as durable as glass due to the fact that its mineralogical similarity to natural soil minerals provides less thermodynamic driving force for alteration.

LEACH TESTS

In order to have a reasonable chance of breaking vitrification's lock on US HLW solidification, an alternative must not only be simpler, cheaper, and safer to implement, it must also produce products that satisfy performance criteria that have been established for glasses. Consequently, "good" HC concretes ought to possess the following characteristics: 1) gross matrix solubility less than that of DOE's HLW QC benchmark, "Environmental Assessment" (EA) glass as measured by the 7-day "Product Consistency Test"; 2) normalized 28-day MCC-1 leach test performance <1 g/day/m^2 for the toxic & radioactive materials in INEEL calcines; 3) satisfy "universal treatment standard" (UTS) criteria for RCRA metals via TCLP; and , 4) accommodate waste loadings ≥ 25%. In addition, they should also evince individual-constituent ANS/ANSI-16.1 leach indices much higher than the usual "waste acceptance criteria" (6.0) for radwaste grouts and possess similar physical strength (>500 psi compressive).

Figure 1 compares 28-day MCC-1 leach test performance of a typical HC with those of several radwaste-type glasses and a hot-isostatically-pressed ceramic material, "ANLW cer"[23]. This test exposes a monolithic specimen of known composition and geometric surface area to a relatively large volume (to discourage saturation) of 90°C distilled water for one month. The fractions of the specimen's components

found in the leachate are then used to calculate normalized leach rates in units of gram/m^2/day. (The data in figure 1 were not normalized with respect to time – to do so, divide by 28.) The HC contained 42 wt % of a representative INEEL "zirconia-type" pilot-plant calcine, a calcined clay pozzolan produced by the ASHGROVE Cement Co. ("Troy clay"), powdered raw vermiculite, a small amount of sodium sulfide, plus household lye (sodium hydroxide).

Figure 1: Comparison of HCs with glasses on the PCT

Table I lists detailed results of an ANS/ANSI 16.1 leach test of the same specimen. This protocol measures the mobility (bulk diffusion constant, D in units of cm^2/s: the "leach index" = $-(\Sigma \log_{10} D)/n)$] of individual components of a monolithic specimen immersed in water under conditions that discourage saturation (the leach water is periodically changed). The most readily-soluble bulk constituents of US radwaste (sodium and nitrate) evinced diffusivities ~four orders of magnitude lower (better) than the usual waste acceptance criterion for radwaste grouts (10^{-6} cm^2/sec) - those of the "easy" components were several orders of magnitude lower yet. The shift in nitrate diffusivity between the first and later leach intervals indicates that ~90% of it had been "microencapsulated" in sodalite/cancrinite crystalites – the remainder leached as fast as it would from a conventional grout.

Table I: ANS/ANSI 16.1 Leach Test Performance

Today's most popular HLW leach test is the "product consistency test" (PCT)[26]. By exposing a finely powdered specimen to a relatively small amount (10 x as much) of hot (90°C) water for one week, this test generates an estimate of its gross solubility under conditions apt to cause saturation. Compared to the older ANS/ANSI 16.1 and MCC-1 protocols, it is relatively simple and quick to do. Table II compares several "representative" radwaste-type glasses[27] with some HCs with respect to their most readily-leached common component (sodium). For "easy" components such as ^{90}Sr, HC's outperform the glasses by a greater margin.

Table II: Comparison of HCs with glasses on the PCT test

Most of the attention now being paid to INEEL's reprocessing wastes is focused upon the <10% which had not yet been calcined by the time (1991) ICPP/INTEC lost its original mission – and which still hasn't been. The reason for this is that because it contains a relatively high proportion of thermally-stable Na/K nitrate salts, "sodium bearing waste" (SBW) cannot be efficiently processed in the existing calciner unless a reducing agent (e.g., sugar) is mixed with it[5,7] - a option considered **not** be a "preferred alternative" (BNFL's new Sellafield facility routinely "sugar calcines" its SBW). Table III gives the results of a TCLP (EPA Method 1311, SWP 846) leach test applied to an HC made with a sugar-calcined SBW simulant that had been doped with unrealistically high levels of several RCRA metals. The simulant was calcined as follows: After 38 grams of sucrose per mole of nitrate had been dissolved in the liquid, it was then slowly added to a stainless steel beaker situated on a maximum-temperature hotplate. Then that beaker was placed into a muffle furnace preheated to NWCF's normal operating temperature (500°C) to burn out the residual elemental carbon. The HC formulation consisted of 30 wt % of this calcine, ~1% sodium sulfide, a small amount of household lye to provide some "free" hydroxide (the sodium in the calcine itself was present as a ~1:2 mix of sodium aluminate plus sodium carbonate), plus sufficient water to make a "stiff" (modeling clay-like) dough. This was rolled into a ball, wrapped with tin (not aluminum!) foil, and than autoclaved for two hours at ~200°C. Table III lists regulatory limits along with the concentrations of "characteristic" metals in both the original calcine and the TCLP leachate.

TABLE III: TCLP Results: Sugar-calcined "sodium bearing waste" specimen

HYDROCERAMICs vs GEOPOLYMERIC CONCRETES

Hydroceramics are "geopolymeric"[28] concretes designed to minimize solubility of the "aggregate". In order to achieve the quick-set characteristics needed for construction work, commercial geopolymeric cements are usually activated with alkali polysilicate(s), not alkali hydroxide(s) and often contain substantial proportions of CSH-forming components (e.g., granulated blast furnace slag) as well. Table 4 compares PCT leach results seen with three concretes (same formulation, different curing conditions) activated with sodium silicate and another activated with hydroxide alone. The waste simulant represented the soluble fraction of a caustic-neutralized liquid reprocessing waste present in one of the tanks at DOE's SRS site [~11.5 M sodium hydroxide, 1.5 M sodium nitrate, 1.13 M sodium nitrate, 0.4 M sodium aluminate, 0.2 M sodium carbonate, plus a trace of cesium chloride.] A 10:1 mix of "Troy clay" plus powdered vermiculite was used for all of them. 1.1 grams of a 37% NaOH was added to the "hydroceramic" formulation (10 grams of the clay mix plus 5 grams of the simulant). The "geopolymeric" formulation (11 grams of the clay mix plus 5.06 grams of the waste simulant) was activated with 2.5 grams of liquid sodium silicate ("water glass", ~38% solids, SiO_2:Na_2O wt. ratio of 3.22:1). While the physical characteristics of all of the concretes appeared to be similar, the leach results indicate that polysilicate did not reform the substrate clay into salt-fixing minerals as effectively as did hydroxide alone. Because of their excellent durability and compatibility with HCs, the best use for a conventional geopolymeric cement in this context would be as a construction and/or backfill material.

TABLE IV: PCT leachability of geopolymeric vs hydroceramic concretes

OTHER CONSIDERATIONS

The developers of the FUETAP process addressed the "radiolytic pressurization issue" by demonstrating that only the uncombined water in concrete serves as a source of radiolytic gases[22]. Consequently, the HC process would bake out porewater before the canister is sealed. (Sellafield's cementitious solidification facilities sidestep this issue by venting canisters through filters.) Due to stakeholder insistence that DOE-ID consider HLW management scenarios which would render all of it road-ready (not just a "volume-reduced" fraction), several engineering-feasibility "paper" studies of the HC process have been comissioned[29,30]. However, because no programmatic funding was allocated for laboratory or pilot plant studies, its primary technical liability is that only a limited amount of research and no scale-up work has been done. While its scientific basis is established and there is good reason to believe that it could be implemented in a straightforward fashion, there are a number of questions that/ need to be answered before a full-scale facility is designed. [For example, "would a few month's worth of curing at the ambient-pressure boiling point of water at INEEL (zero gauge pressure) make concretes comparable to those produced within two hours by a 200 psi autoclave?" If the answer to this is "yes", the process would be safer/simpler/cheaper to implement.]

CONCLUSIONS

The leach test results indicate both that the chemical durability of HCs is equivalent to that of vitrified materials and that the leaching of individual constituents from them is not determined by congruent matrix dissolution. Single-phase materials such as "WV-39-2" glass tend to release everything at the same rate – HCs do not. Like many natural rocks, HC concretes are assemblages of physically interlocked crystalline minerals possessing different intrinsic solubilities. Due to the rapid, batch-nature of the process used to make them, both their porosities (~15-25 %) and total (BET) surface areas (~15 m^2/g) are more like those of conventional concretes than natural rocks or glasses. HCs behave like glasses on leach tests because their lower intrinsic solubility compensates for their greater surface areas. Because conventional grouts tend to saturate their cation fixation sites with calcium ions (portland cement is ~65 wt% CaO), HC's generally outperform them with respect to the degree of immobilization of the polyvalent cation "easy stuff" (e.g., ^{90}Sr) too. This may also explain why the MCC-1 leachrate of Cs from HCs is about two orders of magnitude lower than it was from the original FUETAP concretes[22].

The "hydroceramic alternative" makes especially good sense at INEEL for the following reasons:

1) INEEL has not yet officially committed to vitrification.
2) Because INEEL calcines do not contain excessive concentrations of soluble salts, it would be possible to satisfy the "sodalite formulation" rule-of-thumb with high (>25%) waste loadings.
3) Since two of the three elements making up HC binder phases (Na & Al) are high-percentage constituents of INEEL calcines, there is no need to separate them (or anything else) prior to solidification. This means that everything would be prepared for offsite disposal – the wish of INEEL's stakeholders. {A primary goal of the "volume reduction" activities practiced at WVDP and SRS is to transfer those elements to "low level" fractions.}
4) Simple changes to the existing calcination facility would permit it to efficiently calcine the remaining liquid reprocessing waste[5,6] – either by itself or (preferably) after it's been slurry-mixed with existing calcines[30]. The latter scenario would consolidate all INEEL reprocessing wastes into a homogeneous feedstream suitable for HC solidification.
5) It would also provide a good way to deal with many of INEEL's other wastes. For example, INEEL must find a way to dispose of ~1000 metric tons of radioactive NaOH generated by reacting metallic sodium reactor coolant with water. Since this just happens to be the same amount of "activator" that would be required to turn ICPP/INTEC's calcines into HC concrete, coprocessing these wastes would solve two problems. If the changes to the existing calcination facility alluded to above were to be implemented, virtually any sort of liquid or particulate waste (e.g., contaminated soils) could be readily converted to HCs.
6) It is probable that a formal proposal to properly implement an HC-type solidification process would satisfy INEEL's stakeholders[31].
7) Finally, if a future generation deems it to be both politically expedient and affordable, HC concrete monoliths could be hot-isostatically-pressed into "vitrified" monoliths without removing them from their original canisters[32-34].

The National Research Council raised the same questions about INEEL's HLW management paradigm that have been addressed by this paper[35]. From a "pro nuke's" point of view, the most compelling reason to challenge that paradigm is that its cost provides the Federal Government with another excuse to perpetuate its tradition of waffleing on waste disposal. Because radionuclides have finite lifetimes and defense-type reprocessing wastes will never pose an *immediate* hazard to the public-at-large, it will **always** be possible to make a case for more "temporary delay". The viability of the US nuclear power industry requires tangible proof that its government's "nuclear establishment" can deal with its own waste.

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Figure 1

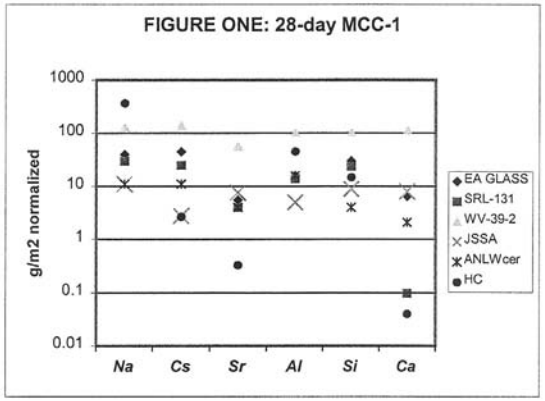

Table I: ANS/ANSI 16.1 Leach Performance*

Interval	Sodium		Cesium		Zirconium		Strontium		Chromium		NO_3^-	
(hrs)	ppm	-logD	ppb	-logD	ppb	-logD	ppb	-logD	ppm	-logD	ppm	-logD
2.83	32	9.55	<2	>13.8	33	15.3	3	14.1	0.28	10.6	23	8.3
5.7	20	9.7	<2	>13.5	68	14.4	2	14.1	0.21	10.6	5	9.3
15.3	28	9.8	<2	>13.9	140	14.1	7	13.5	0.076	11.8	2.3	10.4
19.5	13	10.3	<2	>13.7	<10	>16.3	1	15.0	0.05	11.1	0.9	11.1
22	22	9.8	<2	>13.9	100	14.2	6	13.4	0.03	12.4	1	10.9
35.8	21	10.1	<2	>13.5	<10	>16.4	1	15.2	0.02	13.0	1	11.1
25.5	15	9.9	<2	>13.7	<10	>16.0	3	14.2	0.02	12.6	0.4	11.5
36	14	10.2	<2	>13.7	<10	>16.2	1	14.9	0.01	13.4	0.9	11.0
LI	9.9		13.7		>15.4		14.3		12.0		10.4	
Total % Leached	8.26		<0.0099		<0.0025		0.015		1.2		10.5	

the <> figures in this table are based upon detection capabilities of the analytical instrumentation: ICPAES for all metals except Cs, graphite furnace AAS for Cs, and ion chromatography for nitrate

Table II: Comparison of HCs and glasses on the PCT test

MATERIAL	% Na_2O	mg/l Na in leachate	% Na dissolved
EA GLASS	16.9	1720	13.7
PUREX GLASS	12.1	941	10.4
SRL-131	12.9	931	9.7
HC#1 $NaAlO_2$/NaOH/TROY clay	16.7	718	5.8
HC#2 NaOH, $NaNO_3$ (25% of Na)/TROY clay	12.6	513	5.5 (2.6% of the NO_3 had also leached)
HC#3 38% alumina calcine/NaOH/DEA/TROY clay	13.1	554	5.7
HC#4 46% zirconia calcine/NaOH/TROY clay	12.4	558	6.1
HC#5 30% sugar-calcined SBW/TROY clay*	12.6	925	9.9
HC#6 NaOH/ Englehard Metakaolinite, 9-hr cure @ 200 °C	16.3	229	1.9 (ANSI 16.1 LI_{Na} = 11.6)

*This particular HC violated the "sodalite composition" rule of thumb - too much carbonate

TABLE III: TCLP Results: Sugar-calcined "sodium bearing waste" specimen

Analyte	Found(ug/g)	Limit (ug/g)	Calcine (ug/g)
As	<0.002	5	10.8
Ba	0.35	100	48
Cd	0.13	1	1372
Cr	0.023	5	950
Hg	<0.01	0.2	<0.01*
Pb	<0.1	5	1500
Se	<0.002	1	6.9
Ag	<0.1	5	1510

* Mercury was not added to the liquid simulant because it would have been lost during subsequent calcination. In a properly-implemented real radwaste calcination system, mercury would be recovered from the offgas.

TABLE IV: PCT* leachability of geopolymeric vs hydroceramic concretes

	Hydroceramic	Geopolymer	Geopolymer	Geopolymer
Cure Conditions	200°C, 2 hours	200°C, 2 hours	90°C, 4 days	~20°C, 4 days
pH of leachate	10.7	11.3	11.7	12.3
% Na leached	7.1	9.6	21	52
% Cs leached	0.086	0.060	0.18	2.0
% nitrite leached	26	36	51	71
% nitrate leached	14	46	57	71

*samples crushed to pass 100 mesh (150 micron- no lower size limit) screen, leached with 10x as much 90°C distilled water,

Document 2, Coalition 21 (Lowell A. Jobe), Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - AR PF
Control # DC-02

COALITION21
Supporting Tomorrow's Technologies With Facts ✦ Not Fears!
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COMMENTS RE THE IDAHO HIGH-LEVEL WASTE DEIS: DOE/EIS-0287D

2-1 X(2) 1. The purpose of an EIS doesn't have to include the effect of costs. However, cost effective comparisons of the various alternatives is (or should be) a major factor in the public's and DOE's evaluations and decisions. Environmental concerns are important, but are not the only important factors that determine the best interests of our United States. Therefore we, the public, need to know when the cost evaluation will be available to us. Such information could very possibly narrow down the alternatives worth considering.

2-2 X1(3) 2-6 V1(1) 2. We are not convinced that DOE supplied the National Research Council's (NRC) Committee on INEEL with sufficient data for them to arrive at a more definitive evaluation of the different alternatives for handling its High Level Waste (HLW) to the the Idaho Settlement's deadli.nes. It is easy to postpone decisions and actions while waiting for better information, but mere postponement does not get things done.

2-3 III.F.2(1) 3. We support the State of Idaho's view that DOE's current method of calculating Metric Tons of Heavy Metal (MTHM) should be changed to either of the State's proposed methods to allow DOE HLW to be within the proposed repository's space allotment.

2-4 III.F.2 (2) 4. DOE should freeze the waste acceptance criteria without waiting for details of the repository. This would allow expediting a decision on INEEL waste handling by eliminating bureaucratic procrastination.

2-5 VII.A(1) 5. Greater DOE emphasis on public comment input should be given to recommendations and comments from their Citizen Advisory Boards, who are selected to represent a real cross section of the public and who intensively study the issues before making consensus recommendations. Those of the public who make comments have an obligation to really study the issues and facts first, and base their comments on those rather than emotions.

Lowell A Jobe

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EXHIBIT #7
HLW&FD Draft EIS
Idaho Falls, ID
February 7, 2000
Name: Lowell Jobe

Visit our Internet site! www.coalition21.org Printed on Recycled Paper Send us E-mail! facts@coalition21.org

Document 3, Number Not Used
Left Blank Intentionally

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HLW & FD

EIS PROJECT - (AR) PF

Control # DC-04

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United States Senate

WASHINGTON, DC 20510

COMMITTEES:
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SUBCOMMITTEE ON SUPERFUND, WASTE CONTROL, AND RISK ASSESSMENT
BANKING, HOUSING, AND URBAN AFFAIRS
SUBCOMMITTEE ON INTERNATIONAL TRADE AND FINANCE, VICE CHAIR
SUBCOMMITTEE ON SECURITIES
SUBCOMMITTEE ON FINANCIAL INSTITUTIONS
SMALL BUSINESS

Comment on High-Level Waste and Facilities Disposition Draft EIS

I appreciate the opportunity to provide input on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (Draft EIS) and regret that I could not be here in person.

As a life-long Idahoan, I am a strong supporter of the people and programs at the Idaho National Engineering and Environmental Laboratory (INEEL). The INEEL has served the nation and contributed to the enhancement of Idaho for over fifty years, continues to do so today, and will continue to in the future.

Although the INEEL has been and continues to be an asset to the nation and Idaho, the environmental legacy of Cold War weapons production and the INEEL missions has left 4200 cubic meters of mixed high-level waste calcine and 1.4 million gallons of liquid mixed transuranic/sodium-bearing waste. This high-level waste must be safely disposed of so that future generations are not burdened by this legacy. The process established by the National Environmental Policy Act (NEPA) includes an Environmental Impact Statement as the method of ensuring that federal decisions that could significantly affect the quality of the environment are made considering all the facts. Paramount in this process are considerations of the environment and public and worker health and safety. This public comment period allows input to the decision making process prior to initiation of major federal actions.

As a step toward cleaning up the waste in Idaho, the 1995 Settlement Agreement between the State of Idaho and the Departments of Energy and Navy identifies milestones that must be met for treatment and removal of the waste from Idaho. I am a strong supporter of the 1995 Settlement Agreement and will do all that I can to ensure that the Department of Energy continues to meet its obligations to clean up the Cold War legacy at the INEEL. To date, all portions of the agreement have been met.

This Draft EIS discusses actions that feed directly into meeting the milestones to complete calcination of sodium-bearing liquid high-level waste by December 31, 2012, and to complete treatment of all high-level waste so it is ready to be moved out of Idaho by December 31, 2035.

The Draft EIS identifies nine waste processing alternatives and six different facility disposition alternatives that must be carefully evaluated to ensure that the final EIS and subsequent record of decision reflect the best interests of Idahoans, the nation, and the environment.

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Some of the waste processing alternatives, if chosen, would not meet all aspects of the Settlement Agreement. The Draft EIS states that two of the alternatives will not meet the 2035 milestone for having high-level waste ready for shipment out of Idaho. One of these two is the No Action Alternative, which is required to be investigated to provide a baseline for the NEPA process. In addition, the Draft EIS states that it may be difficult to have all liquid waste out of the underground storage tanks and cease using them by 2012 for seven of the alternatives.

4-1
VII.D(6)

I am a strong supporter of the Settlement Agreement and I urge the state and Department of Energy to choose an alternative that meets the milestones in the court-enforceable Agreement. I also want to encourage all Idahoans to review the Draft EIS and participate in the public comment period. Public comment is an important part of federal agency decision-making and is one of the factors that will be considered when choosing a course of action.

Sincerely,

Mike

Michael D. Crapo
United States Senator

Document 5, Congressman Mike Simpson, Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - (AR) PF
Control # DC-05

STATEMENT BY
Representative Mike Simpson
High-Level Waste and Facilities Disposition
Environmental Impact Statement
February 2000

The U.S. Department of Energy has some important decisions to make regarding management of high level waste and mixed transuranic waste now stored at the Idaho National Engineering and Environmental Laboratory. High-level waste management is a complex technical subject, but it's important for Idahoans to understand that these decisions will determine how DOE will treat large amounts of radioactive and hazardous material stored over the Snake River Plain Aquifer, and how it will close contaminated facilities when they are no longer needed.

The Idaho High-level Waste and Facilities Disposition Draft Environmental Impact Statement that DOE Idaho has just issued for public review and comment is the critical first step in this decision-making process. While it is not a decision document itself, it provides the scientific information about the potential impacts to the environment of various management alternatives that DOE is considering. The document gives Idahoans the opportunity to study these environmental issues, compare the impacts of different actions, and to make their voices heard under the National Environmental Policy Act process.

5-1
IX.A(2)

The DOE project staff have obviously worked hard to convey technical information in a manner that the general public can understand. I encourage all Idaho citizens to review the EIS and send their comments on to the Department of Energy. Public comment is an important part of federal agency decision making and is one of several factors that the Secretary of Energy will consider when choosing a course of action.

Document 6, Senator Larry E. Craig, Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - (AR) PF
Control #DC-06

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VETERANS' AFFAIRS

United States Senate
WASHINGTON, DC 20510-1203

February 7, 2000

STATEMENT ON TRANSMITTAL OF THE IDAHO HIGH-LEVEL WASTE & FACILITIES DISPOSITION DRAFT
By U.S. Senator Larry E. Craig

The Department of Energy in Idaho has managed dry granular calcined mixed high-level waste in above-ground storage tanks and liquid mixed transuranic waste in tanks below the ground according to regulatory requirements for many years.

With the agreement made between the State of Idaho and the Department of Energy, this waste will be treated for transportation in the highest and most safely effective way possible. This Draft Environmental Impact Statement analyzes five waste treatment alternatives that span the years between the years 2000 and 2035. It also analyzes six facilities disposition alternatives.

6-1
IX.A(2)

I am ~~very~~ impressed with the readability of this document. It is very unusual for a Draft Environmental Impact Statement to be a document that is "user-friendly". I must congratulate the project staff for their efforts to provide scientific information in a manner that the general public can understand. It is important to know that the decisions made from this document and the public input will determine how DOE will treat the great amount of radioactive and hazardous material for shipment out of Idaho.

I encourage all Idahoans to review this DEIS and send their comments to the DOE by the deadline of March 20, 2000.

Thank you!

Larry E. Craig
United States Senator

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EXHIBIT #3
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HLW & FD

EIS PROJECT - AR/PF
Control # DC-7

HLW EIS Web Comments

RECEIVED
FEB 10 2000

From: HLWFDEIS Web Site
Sent: Wednesday, February 09, 2000 3:40 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Auto-Assigned Comment Number: 2
Name: Dr Lee Plansky
Affiliation: INEEL
Address1: POB 1625
Address2:
City, State Zip: Idaho Falls, ID 83415
Telephone: 208.526.2788
Date Entered: 2000-01-28 08:39:48
Comment:

7-1 IX.A(1) 1 Need a dd.mm.for the general timeframe on page 3-2 at bottom for "Cease Introduction of NGLW...to the..., only YEAR is specified - 2005.

7-2 V(2) 2 Need a clear definition of NGLW in one or more places in the EIS, including glossary.

3.

HLW & FD

EIS PROJECT - AR/PF
Control # DC-8

HLW EIS Web Comments

RECEIVED
FEB 10 2000

From: HLWFDEIS Web Site
Sent: Wednesday, February 09, 2000 3:40 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Auto-Assigned Comment Number: 3
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Telephone: 208 785 3209
Date Entered: 2000-02-04 20:09:43
Comment:

8-1 III.B(1) I believe that the DEIS is lacking vital information necessary to allow informed decisions and discussion. The information needed is: What will the radiation level be in the calcine and liquid wastes as a function of years, eg. 100, 200 300, etc. and how will those levels compare with the average levels of natural radioactive isotopes in Idaho soil. Unless and until DOE begins to put that basic information in EIS documents dealing with options for handling radioactive wastes of any type, the "no action" option cannot be meaningfully addressed. A thorough discussion of the RBE (I think this is an old term now) comparisions between waste stored over a period of time and natural isotopes in the soil is not a job for the timid or uninformed, but there is a sore need for it because it directly speaks to the "environmental impact".

8-2 VIII.G(8)

Richard Lindsay

Document 9, Darryl D. Siemer, Idaho Falls, ID
Page 1 of 8

HLW & FD

EIS PROJECT - (AR) PF
Control # DC-09

1

Rev2 ElSreview

Comments on "Draft INEEL HLW EIS, Idaho High-Level Waste & Facilities Disposition"

To: T. L. Wichmann, US DOE-ID
MS 1108
and
Ann Dold, INEEL Oversight Program
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RECEIVED
FEB 14 2000

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What was said and done at the 7Feb00 Idaho Falls public hearing on the "Draft INEEL HLW EIS" has inspired a revision of my original review. Here it is:

9-1 IX.A(2) Thanks for asking for my opinions of your "Draft INEEL HLW EIS". It's nice to see that the effort I've put into my hobby (HLW management) qualifies me to be one of the Site's "key stakeholders". Since the National Academy of Science's (NAS's) Board on Radioactive Waste Management seems to feel the same way (they've sent me a personal copy of their review of the Site's HLW program), I've decided to put my thoughts about both of these reports together into one note.

Since the NAS's report is apt to have greater impact on INEEL's future, I'll start off with it.

9-2 XI(3) I sympathize with the NAS Panel's frustration with the DOE management "symptoms" that make doing nothing seem more sensible than trying to implement any of the EIS alternatives consistent with today's HLW management paradigm. (These symptoms are identified in another recent NAS Report, *"Barriers to Science"*, 1996.) However, while I agree with that Panel's reservations about the management approach championed by INEEL's decision-makers (separations/vitrification), I don't agree with its conclusion that it would be best to abrogate the two main provisions of the "Batt agreement"; i.e., to not render existing calcines "road ready" by 2035 AD and to not calcine the remaining liquid waste by 2012 AD.

Since DOE could honor its promises if it were simply willing to eschew some of its "symptoms", a more constructive conclusion would have been to suggest that it do so and identify specific changes that need to be made.

I also disagree with the Panel's rationalizations for its conclusions. First, it is *not* necessary to delay decision-making until we know more than we do already about the chemical composition of INTEC wastes[1] - today's uncertainties have to do with traces of materials of significance only to the waste's classification, not to implementing its solidification. Second, it is *not* necessary for INEEL to know every conceivable detail about the waste's ultimate resting place (repository) to keep its promise (convert its waste to transportable monoliths). It can and should make waste form materials suitable for disposal in any of the already sufficiently-characterized & technically competent potential repository sites available to the US Federal government - the same assumption made by the people who designed the "historic waste" solidification system at the UK's new fuel reprocessing facility at Sellafield, Cumbria[2].

9-65 III.E(2)

[1] Because the amount and chemical composition of the wastes put into the tanks/binsets was both known and recorded, we already know everything genuinely relevant to implementing any of several candidate rock-making processes.

[2] In 1982, the British government directed its prime nuclear contractor, British Nuclear Fuels, Limited (BNFL), to design an up-to-date commercial fuel recycling facility at Sellafield (aka Windscale). It mandated that the new facility must not only be able to immediately process all newly-generated reprocessing wastes to disposable waste forms, but also to similarly deal with a 30 year backlog of "temporarily" stored reprocessing waste generated before. Unlike the situation here in the USA, the British government did not impose a "preferred technology" - only that finished waste forms must satisfy performance based standards; i.e., be suitable for disposal in any of the possible repository systems that it might choose to implement within the next 50 years or so. Five years worth of collaborative effort

9-66 III.D.1(2)

EXHIBIT #1
HLW F&D EIS
Jackson, WY
February 9, 2000
Name: Darryl Siemer

(1)

Document 9, Darryl D. Siemer, Idaho Falls, ID
Page 2 of 8

2

9-3 V(3) In practice, much of the "characterization" now being done in the DOE complex is unnecessary. It's popular with decision-makers because it provides them with another excuse for putting off politically tough decisions and/or substantive actions while continuing to spend "programmatic" money[3]. A properly designed and implemented waste management system is "rugged" enough to work with a substantial degree of uncertainty in its feedstream[4].

9-4 XI(4)

9-5 X(3) What we genuinely don't know enough about yet are specific details of how to go about applying alternative treatment/solidification technologies to INEEL's wastes. The reason for this is that DOE-ID has refused to insist that its M&O contractor spend "programmatic" money on actual R&D - virtually all the money spent on alternatives to its pet separation/vitrification-based scheme went to produce "group think" exercises similar to today's Draft HLW EIS.

9-67 III.D.1(4)

9-6 V(6) There is an important factual error in the NAS report (it isn't the Panel's fault – it was pulled verbatim out of an INEEL technical publication.) Figure 11.1 (p 99) suggests that ICPP/INTEC calcines are about ten times more radioactive than they really are (i.e., that they possess a total radioactivity of about 60,000 curies/m^3.). In this case, the number is important because it suggests that it would take more than one hundred years for those calcines to decay down to a level now considered to be "low". The fact is that typical ICPP/INTEC calcines generate only about 40 watts worth of radioactive heat/m^3 (due primarily to ^{90}Sr & ^{137}Cs) which corresponds to a radioactivity of ~7,000 Ci/m^3 - which, in turn, means that they're about at "Class C" LLW limits now & definitely will be below them (fission-product-wise at least,) by the time that we've promised to have 'em ready to be shipped offsite.

9-7 V(9) Of course, in a more rational environment it really wouldn't make much difference exactly how "hot" these wastes are because any facility built to treat/dispose of them would certainly be "remoted" anyway - where specific numbers make a difference is when decision-makers decide what they are going to do based solely upon arbitrary (and therefore subject to change) criteria such as the radwaste classification numbers listed in Table II of 10 CFR 61. DOE's infatuation with legalistic hair-splitting ("classification") rather than common-sense implementation of the intent of regulations (another of its "symptoms") is evinced by INEEL's insistence that SBW is fundamentally different than the reprocessing waste that's already been calcined . If/when we ever screw up enough resolve to calcine SBW, we'll discover that the product is just as nasty as the other calcines - it'll have a higher percentage of plutonium, less fission products, more mercury, less cadmium, etc., etc.. The fact that somebody decided to label one of them "high" and the other "incidental" does not constitute a valid reason to treat them differently. They should be turned into one type of waste form and disposed of in one repository.

The NAS apparently wasn't told that there's enough room in the binsets (set #7) to accept any calcine made from SBW without having to mix it with existing calcines and thereby render it "high". That's

9-66 III.D.1(2) (cont'd) by technologists from BNFL and the British Government's Department of Environment led to a consensus that "inorganic cements" would be appropriate for all radwaste streams generating less than ~500 watt/m^3 worth of radioactive heat; i.e., in England the choice of solidification technology is determined by a measurable and technically relevant characteristic of the waste - its history and any arbitrary labels that may have been applied to it in the past (e.g., "high-level", "low-level", "mixed", "incidental", "transuranic", etc.) don't matter. This conclusion is consistent with sound technical and economic reasoning, IAEA guidelines, and the opinions of US technologists willing to assume the professional risks inherent in taking an unblindered look at the issue. By 1991, BNFL had completed the new reprocessing plant and its cementitious solidification facilities started "hot" operation two years later - it has since converted Sellafield's >15,000 m^3 accumulation of historic reprocessing waste (~150 distinguishable "streams") to 500-liter stainless steel canisters filled with concrete.

[3] US taxpayers are now paying their government ~$60,000 (roughly the cost of a four-year degree at a good college) to "characterize" individual barrels of waste being prepared for shipment from INEEL's RWMC to WIPP. The nominal purpose of this activity is to "assign codes" to the waste – the actual analyte concentrations so-determined do not determine how the barrel is shipped or what will be done with it at the repository.

[4] For instance, a "rugged" grout-based solidification system for liquid waste would assume that the waste was "mixed", not over-emphasize waste loading, and incorporate a calcination/incineration pretreatment step. The reason for the latter is that "devolatilization" (which includes denitration) of liquid waste reduces the mass/volume of grout that will have to be made/stored/transported, destroys organics (including things like "listed" wastes and chelating agents), and invariably produces a final product with superior leach resistance. (Unfortunately, most DOE grout is made from uncalcined wastes).

(2)

important because one of its rationalizations for recommending that DOE-ID break its promise to calcine SBW (which wouldn't be good for INEEL's credibility) is that so-causing it to become "high" would make it more difficult to deal with. It wouldn't, making any kind of durable "rock" out of SBW (concrete, HIPed glass-ceramic, or glass) would be facilitated by first burning out the volatile stuff.

Now, let's turn to the EIS itself.

9-8 VII.D(6) 9-9 III.C(1) 9-10 III.C(1) DOE has promised to calcine **all** of INEEL's reprocessing waste, doing so would simplify its conversion to good-quality waste forms, and it *can* be done on time (by 2012 AD) for a reasonable number of axdollars – why does this EIS devote so little attention to ways of actually accomplishing it?

9-11 III.C(2)

9-12 III.C(2) The "technical" reason that INEEL has managed to calcine only about 10% of its SBW during the last eight years is that its decision-makers deliberately decided to **not** use the only efficient approach available to do it; i.e., add some sugar to the waste just before squirting it into the calciner. This is a well-established and safe way to calcine SBW.[5] If you arbitrarily reject it (today's excuse is "safety") then you either have to dilute the SBW with massive amounts of easily-denitrated stuff such as aluminum nitrate - which makes the calcination process extremely slow, unnecessarily "NOx ous", and creates a lot more calcine than we need to – and/or run the calciner at a temperature that generates so much "fines" that its offgas system eventually plugs up with dust (the reason why the last "high temperature" calcination campaign had to be terminated). The fact that our decision-makers have also refused to do such things as recover/recycle mercury (electroplate it from the offgas scrub solution) and NO_x (via water-scrubing) from the calciner's offgas has made calcination much less attractive to INEEL's stakeholders (& that mission less viable) than it ought to be. Some modifications to NWCF would cost a lot of money but these ought to be cheap.

9-13 III.C(2)

9-14 III.C(2) Since NO_x is the probably the most toxic gas emitted by NWCF (& certainly the most visible one), don't you think that an EIS ought to mention that there's a cheap way to ameliorate the situation? [Cheap? @ 20 cents/pound, enough table-quality sugar to sugar-calcine all SBW would cost about $0.5 million – "running" NWCF costs ~$50 million/year & sugar-calcination would cut the required operational time by at least a factor of two.]

9-15 III.C(2) There are two reasons why sugar calcination would significantly reduce (probably by a factor of more than ten) the amount of NO_x emitted by NWCF. First, much less "cold" aluminum nitrate would have to be added to the waste (we'd need an Al:Na ratio of ~1:1 instead of the ~3:1 required by the "basis approach" – each mole of Al so-added adds another three moles of nitrate). Second, sugar calcination reduces most of the nitrate in the feed to harmless elemental nitrogen, not NO_x.

9-16 III.D.4(7) Since the NAS Panel apparently agrees with me that homogenizing INEEL's radwastes would facilitate the implementation of any subsequent waste form-making process, why isn't the waste coprocessing alternative that I suggested six years ago (i.e., slurry SBW with existing calcines, add some sugar, and then feed both phases into NWCF – immediately "grout" the new calcine) seriously considered in this EIS? It was certainly deemed feasible by Fluor Daniel (1996). The University of North Dakota's fluidized bed combustion research facility (*"Energy & Environmental Research Center"*) offered to do a pilot plant scale demonstration for us for a nominal sum. So did *STUDSVIK*. Why didn't we look into it?

9-17 III.D.4(4) Why doesn't this EIS mention that *STUDSVIK* also offered to sell INEEL a brand new, already MACT-compatible SBW calcination system (including a building to put it in) for considerably less than what it's now spending every year trying to "run" NWCF?

[5] The rest of the world (e.g. BNFL at Sellafield) routinely sugar calcines SBW & we successfully tested it in our own fluidized bed calcination pilot plants here at NRTS/INEL/INEEL thirty-five years ago and again ~ 3-4 years ago. In 1995, a Hanford contractor, VECTRA, had one of its subcontractors, Procedyne, "reinvent" fluidized-bed sugar calcination of SBW. For some reason, none of those "pro-sugar" reports were cited in INEEL's recent review of SBW calcination options (H. J. Welland, LMITCO INTERNAL REPORT, "NWCF Process Modification for Sodium Bearing Waste Project Conceptual Design.", INEL/INT-97-00075, dated April 1997.)

(3)

Incidentally, I've just heard through the company grapevine that most of BBWI's radwaste experts have been cloistered up in town for the last 3-4 weeks trying to decide upon a way of dealing with SBW consistent with all of DOE's customs/policies/assumptions – apparently someone's pushing for a decision on a "preferred alternative".

9-19 III.F.3(1) I've also heard that the SBW treatment being viewed with the most favor invokes running it through centrifugal contactors to separate it into streams labeled called "non-contact handled TRU" and "Class C" LLW, grouting both of 'em, and then shipping both off to be buried in differently-labeled holes at WIPP. Apparently, somebody's decided that there's only so much "room" for one of these waste categories at WIPP (I forget which one) so it would, therefore, make good sense for us to spend a few tens (hundreds?) of million taxdollars separating the stuff before we ship it all off to the same place.

9-20 III.D.4(7) Again, according to the grapevine, none of the NAS report's suggested SBW treatment options are being considered. Why not?

Here are some questions/comments about how the alternatives are represented in the EIS.

9-21 III.C(9) First, most of your process options invoke the grouting of one or more liquid waste streams – most of which would be strongly acidic. None of the figures you've shown depict that those streams will be calcined/incinerated prior to being solidified[6]. Why not? Are you hoping that "declassification" will make the manufacture of top-quality concrete unnecessary?

9-22 III.D.2.a(1) Second, your Hot Isostatic Pressed (HIP) Waste option (Fig. S-9) invokes the HIPing of ion exchange resin. You can't put gas-forming materials into HIP cans. The figure needs to indicate some sort of heat-pretreatment step.

9-23 III.D.3(4) Third, your "Planning Basis" (Fig. S-7) and "Minimum INEEL Processing alternatives (S-12) suggest that Cs-loaded ion exchange resin will be "separated" along with the calcines. Would a process designed to dissolve/extract calcines work with ion exchange resins? Wouldn't it be better to burn those resins and treat the *ash*? If that's to be done, your figures should depict the required incinerator. Ditto that for all of the "separation" alternatives.

9-24 IX.A(8) In general, it would appear that all of the figures depicting the various separations-based treatment alternatives are greatly simplified relative to that representing "direct cement"; i.e., a considerably higher fraction of the unit operations required to implement them have been left out.

Next, let's discuss the management scenarios that I've had some hand in bringing to the Public's attention - all those that would convert stuff now considered "high" into concrete.

9-25 III.D.2.b(4) First, I'm disappointed that the folks you've hired to produce this EIS have somehow managed to conclude that the "direct cement" option - turning a pile of sand-like calcine into cans full of "rock" by mixing it with cementing agents & water, injecting that grout into steel canisters, and then curing it/them in a pressure cooker (which step might not even be necessary - only some hands-on research can really tell) - would be as "dangerous" as your M&O Contractor's pet separations-based "Planning Approach"- which of course, would require far more unit operations, more time, more people, (a lot) more toxic chemicals, much higher (>2000 F) processing temperatures, multiple waste forms, an extra incinerator, transport to multiple repositories, etc., etc..

9-26 X(4) Second, I was also disappointed to discover at last night's (7Feb00) Public Hearing that DOE and its contractors have persisted in artificially inflating the cost of the "direct cement alternative" by saddling it with a ridiculously high volumetric disposal cost - a figure which has risen from the ~$300,000/$m^3$ assumed five years ago to today's even more fantastic $850,000/$m^3$. Here's why this is both irrelevant

[6] A description of one alternative did suggest that its LLW would be "denitrated" before grouting. No indication of how that might be accomplished was given.

(4)

Document 9, Darryl D. Siemer, Idaho Falls, ID
Page 5 of 8

Q-27 I(3) Q-28 III.D.2.b(3) Q-29 X(4) Q-30 X(4) Q-31 III.F.2(1) Q-32 III.F.2(1) Q-33 X(4) Q-34 III.F.2(1) Q-35 X(4) + Q-36 III.F.2(3)

and wrong.] [First, INEEL's mission is to make waste forms, not to dispose of them.] [Second, the EIS suggests that INEEL's ~5,000 m^3 of HLW (today's calcines plus the additional 500-800 m^3 that could be made from SBW if it were to be efficiently calcined) will create 13,000 m^3 of "grout". Based upon my experience in grouting INEEL calcines, that figure is probably ~30% high.] [Third, and much more important, the "supplementary information" in the booklet on the table last night (the necessary figures weren't in the *EIS* itself) indicates that DOE is still unable to grasp the fact that disposal will be an incremental cost[7] in other words, that the cost of disposal will *not* be directly proportional to the geometric volume of waste forms.] [Why? 1) Formal analyses have repeatedly concluded that the transport of waste forms to a repository will represent a small fraction of total management cost irrespective of their volumes; 2) today's official hypothetical HLW repository site, Yucca Mountain (YM), is large enough (several cubic miles - several tens of billions of cubic meters) to accommodate any type of material(s) that DOE might choose to make from its reprocessing wastes; 3) YM's "size" is defined in units proportional to the amount of radionuclides to be buried there (the equivalent of that in 70,000 "metric tons of heavy metal"), not the waste's geometric volume; 4) the drilling/boring equipment necessary to create storage volume in it is already paid for; 5) SANDIA's "1994 Performance Assessment" indicates that all of INEEL's reprocessing waste adds up to only 320 "metric tons of heavy metal" - 0.46% of YM's capacity; and, of course, 6) YM is going to cost US taxpayers billions of dollars whether or not any real waste is ever buried there – like all DOE facilities, the cost of actually using YM for its intended purpose will add only a relatively small *incremental* cost.]

Q-37 III.E(2) + Q-68 III.D.3(2) Q-38 III.D.3(2)

[Third, and finally, the same supplementary information also indicated that the actual processing of ICPP/INTEC waste into finished waste forms via "Direct Cement" would be about as expensive as the "planning approach" (separation/vitrification). That's just plain hogwash – the NAS has produced several reports that point out the relative cost effectiveness of cementitious solidification and cost is one of the main reasons why the UK chose to treat its "historic" reprocessing waste that way.] [Also, let's not forget that one of the primary goals of "separations" is to reclassify waste so that a higher fraction of can be grouted instead of vitrified ('cause it's cheaper).]

Q-39 III.D.2.b(2)

[Considering the degree of "command influence" that goes into the production of DOE-EM technical reports (often reflected by the deliberate omission of data, literature citations, etc., inconsistent with a desired conclusion, see footnote 5), I'm not really surprised how the EIS characterizes "direct cement".]

Q-40 III.D.2.b(1)

[Here's why a properly implemented "Direct Cement" alternative would have low environmental impact. First, let's define "properly". I've consistently advocated that it be implemented in such a way that **all** of ICPP/INTEC's waste regardless of "classification" is converted to the same type of waste form and goes to the same repository.[8] That's not the way the EIS interprets it; its authors propose making a large separate LLW waste stream that's apt to end being left in Idaho – an unnecessary assumption that makes this option much less attractive to stakeholders.] A one-process/one-waste form/one-repository management scenario would be much simpler than any of the other alternatives that would keep the promises made to stakeholders. Simplicity means less equipment, fewer personnel, less chemicals, less paperwork, less confusion, fewer lawyers, etc., etc., - all characteristics that tend to make doing things less "impactful" to both the environment and the taxpayer's pocketbook.

Q-42 VII.D(3)

[Our mission is simply to render ICPP/INTEC reprocessing waste ready for transport to a repository that the Federal Government has promised to provide and to then clean up the place, period. It is not to "make work" for another couple of generations of DOE/contractor/subcontractor/regulatory personnel or to justify poor decisions made elsewhere with respect to implementing repositories, categorizing radwastes, or rendering them ready for transport.] [My assumptions are that, 1) there's plenty of suitable "Federal

Q-43 III.F.2(6)

[7] The NAS Panel also pointed this out – and then went on to suggest that it's unwise to base a choice of HLW solidification technology on guesses about what it might cost to dispose of waste forms several decades off in the future.

[8] If reasonable attention is paid to minimizing the solids content of the liquids generated in cleaning up the place (termed NGLW in this EIS), the amount of radioactive "ash" that would be produced by drying/calcining those liquids will be very small with respect to that represented by today's calcines and SBW. Consequently, I propose(d) that these liquids be processed/disposed-of in exactly the same manner – no additional equipment, repositories, assumptions, or paperwork would be required.

5

Document 9, Darryl D. Siemer, Idaho Falls, ID
Page 6 of 8

Land" available (notably at the NTS) for a practical repository for defense-type reprocessing waste[9] (meaning one that is not situated over a huge aquifer (INEEL) and which doesn't assign a phony premium to "volume reduction" (YM)), 2) the politicians who can decide to implement such a repository will eventually do so, 3) cement-solidified calcine would meet the "letter of the law" (10CFR-60 & 40CFR-191) as a HLW disposal form, and, 4), that until a suitable repository actually materializes, we should simply emulate the UK's approach to "historic" reprocessing waste management.

Q-44 III.E(1) Q-45 III.D.2.b(6) Q-46 III.E(2)

[Concrete-making is intrinsically safer than is either glass-making or HIPing (it's done "wet" - generates less dust - and requires much lower temperatures) and is much easier/cheaper to do on an appropriate (large) scale. The improvements that I and my academic colleagues at PSU have recommended ("hydroceramic" (HC) rather than Portland cement–based grout formulations and the calcination (incineration) of everything that would be rendered more suitable for cementitious solidification by doing so) are to ensure production of top-quality products – materials distinctly more durable than those which BNFL has made out of the UK's "historic" waste and probably also superior to typical radwaste-type glasses. The "Lead lab" should make the DOE Complex's best waste forms.]

Q-47 III.D.2.b(1)

BNFL has recently become a prominent player in the US radwaste technology marketplace because it has been able to leverage its tangible successes at home to successfully compete with US-owned firms (many of whose employees work at DOE sites) for US tax dollars. A cornerstone of its reputation is that it devised a practical way to make the UK's "historic reprocessing "waste" road-ready and then saw the project through to completion – all done via "direct cement". US taxpayers would be well-served if USDOE would permit its contractors to apply a version of the same technology to its wastes.

Q-48 III.D.2.b(1)

Q-49 III.D.2.b(1)

"Direct Cement" makes especially good sense at INEEL for the following reasons:

Q-50 III.D.2.b(1) 1) INEEL has not yet formally committed itself to any particular "preferred alternative".

Q-51 III.D.2.b(1) 2) Because INEEL calcines do not contain excessive concentrations of soluble salts, it would be possible to satisfy the HC "sodalite formulation" rule-of-thumb with high waste loadings.

Q-52 III.D.2.b(1) 3) Since two of the three elements making up HC binder phases (Na & Al) are high-percentage constituents of INEEL calcines, there is no need to separate them (or anything else) prior to solidification. This means that everything would be prepared for offsite disposal – the expressed wish of local stakeholders. (A primary goal of the "volume reduction" practiced at WVDP and SRS is to transfer those elements to "low level" fractions that aren't vitrified.)

Q-53 III.C(2) 4) Simple changes to the existing calcination facility would permit it to efficiently calcine the remaining liquid reprocessing waste – either by itself or (preferably) after it's been slurry-mixed with existing calcines.

Q-54 III.D.2.b(1) 5) It would also provide a good way to deal with other INEEL radwastes. For example, INEEL must find some way to dispose of ~1000 metric tons of radioactive NaOH generated by reacting metallic sodium reactor coolant with water. Since this just happens to be the same amount of "activator" that would be required to turn ICPP/INTEC's calcines into HC concrete,

[9] Its decision to confound disposal of its own waste with that produced by the commercial nuclear power industry constitutes another reason why the US Federal Government has failed to honor its promises to Idaho (the first official promise to prepare our waste for disposal said it'd be done by 1980). Due to DOD insistence that DOE's civilian waste management responsibilities not interfere with its own interests at NTS, the Federal government chose to "withdraw" another ~600 km^2 of land from Nevada for today's official HLW repository modeling exercise (YM). This plus the assumption that *all* commercially-produced HLW is to be sent there engenders enough litigation to indefinitely block implementation of that repository – which means that linking these problems causes total paralysis. The most reasonable place for the Federal Government to site a repository dedicated to cold-war defense-type waste is at its cold-war defense-type test range, the Nevada Test Site (NTS). The NTS makes good sense because, a) it's already "federal land" (no new "withdrawal" required) ,b) it receives less precipitation than do other DOE sites, c) it possesses the USA's deepest water table, d) it has already been the object of more than thirty years worth of immediately relevant hydrogeological research, e) it's already been irredeemably "crapped up" by ~950 nuclear "events", and, finally, f) a little-publicized **real** example of a practical (cheap) repository for this sort of waste has already been implemented and (then) exhaustively tested (the "GCD" in area 5). However, it is *not* necessary to wait for a repository siting decision to begin rendering INEEL waste road-ready (the UK didn't) - regardless of exactly where that waste might eventually end up, it is reasonable to assume that HC-type concrete would be at least as durable as glass due to the fact that its mineralogical similarity to natural soil minerals provides less thermodynamic driving force for alteration.

6

coprocessing these wastes would solve two problems. If the changes to the existing calcination facility I've alluded to were to be implemented, virtually any sort of liquid or particulate waste (e.g., contaminated soils) could be readily converted to HCs.

6) It is probable that a formal proposal to properly implement an HC-type solidification process would satisfy INEEL's stakeholders.

9-55 III.D.2.b(1) 7) If a future generation deems it to be both politically expedient and affordable, HC-type concrete monoliths could be hot-isostatically-pressed into "vitrified" ceramic monoliths without removing them from their original canisters. (In other words, today's decision-makers would not have to make an irrevocable commitment to not "vitrify" this waste).

9-56 III.D.2.b(1) 8) To retain its "lead lab" status, INEEL needs to succeed at doing something. "Direct Cement" would permit it to be the first DOE reprocessing site to render its waste road-ready.

Since this EIS is just a draft, let me suggest the following changes for the final version.

9-57 VII.D(2) First, make it very clear up front just exactly what it is you're trying to accomplish. If it's already been decided that it's OK to **not** honor the commitments made in the "Batt Agreement", say so. (For instance, some of the scenarios in the Draft that still propose that SBW will be calcined, assume a completion time of 2014 AD, not 2012 AD - does this two-year "slip" reflect a change in policy?

9-58 IX.A(3) Second, when you present/discuss treatment scenarios that don't make much sense[10], be sure that you explain the assumptions/conditions that would make them plausible.

9-59 III.D.1(6) Third, you might want to consider integrating some of INEEL's other waste treatment/disposal problems into your final version (e.g. using ANLW's waste caustic as the activator for "hydroceramics" made out of INTEC calcines.) Doing so would prevent a lot of unnecessary duplication, cause a higher percentage of INEEL's radwaste to be prepared for offsite disposal (which would delight local stakeholders), and save taxpayers a lot of money. (The "stove piping" of EM projects to match existing organizational structures/definitions is another of the "symptoms" identified in "*Barriers to Science*").

9-60 III.D.4(6) Fourth, when you present/discuss treatment scenarios that have not received programmatic research support, e.g., "Direct Cement/Hydroceramics", make it clear to the reader that that's indeed been the case & also that information about them can be obtained from sources other than therefore non-existent official Government reports. (For example, I've co-authored/published a dozen open-literature research papers that anyone interested in why "direct cement" makes sense might want to see – the "Draft EIS" doesn't acknowledge that non-government report-type technical literature even exists).

9-61 III.D.4(6) Fifth, to ensure that your EIS-preparation subcontractors do a fairer job of representing alternatives such as "Direct Cement" in the final version, insist that they actually contact the persons responsible for developing/championing them - the "draft" doesn't accurately represent what my colleagues & I have done or would recommend.

9-62 III.F.2(1) Sixth & finally, please don't characterize DOE's decision to tell its employees/contractors to assume that all waste forms made from its reprocessing waste will have 0.5 MTHU per m^3 as being merely "controversial" (p. S-21). A policy that is inconsistent with both the intent and letter of the law (see 40 CFR 191) and which is largely responsible for DOE's inability to deal efficiently with its own "high level" waste requires a more forceful adjective.

9-63 IX.A(2) Do not change your Publisher. The quality of the photography, printing, general layout, etc. of this EIS is the best I've ever seen in a large government-sponsored document.

[10]For instance, the "Minimum INEEL Processing Alternative") suggests that we are to bundle up our calcines into some sort of transportable (you can't ship powders) temporary waste form (RTV-type rubber cement is being studied for this purpose) & then ship it all off to Hanford where they will somehow undo our solidification process, separate the stuff into various fractions, vitrify(?) all of them, and then ship it all back here for a few(?) more decades worth of "interim" storage. This is too clever to make much sense to the casual reader unless considerable additional background information is provided

7

9-64 III.D.2.b(1) If you would like to read some technical literature that's not in a DOE-sponsored report, I've written up another research paper (at this point, it's also just a "draft") discussing why "Direct Cement" makes especially good sense for INEEL. It goes into some detail about vitrification's drawbacks (one of which is that its prohibitive cost encourages folks to do "separations") and compares the leach test performance of radwaste type glasses and hydroceramic-type concretes. It's an "easy read" because it's written like the stuff you find in trade journals like *Radwaste Magazine*. Its literature references (35 of them) support the "controversial" contentions I've made in this review. I'll be happy to send you a copy. Want more? I'll also be happy to send you another copy of the report I wrote up for the M&O contractor's HLW department in 1997.

8

Document 5, Congressman Mike Simpson, Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - (AR) PF
Control # DC-05

STATEMENT BY
Representative Mike Simpson
High-Level Waste and Facilities Disposition
Environmental Impact Statement
February 2000

The U.S. Department of Energy has some important decisions to make regarding management of high level waste and mixed transuranic waste now stored at the Idaho National Engineering and Environmental Laboratory. High-level waste management is a complex technical subject, but it's important for Idahoans to understand that these decisions will determine how DOE will treat large amounts of radioactive and hazardous material stored over the Snake River Plain Aquifer, and how it will close contaminated facilities when they are no longer needed.

The Idaho High-level Waste and Facilities Disposition Draft Environmental Impact Statement that DOE Idaho has just issued for public review and comment is the critical first step in this decision-making process. While it is not a decision document itself, it provides the scientific information about the potential impacts to the environment of various management alternatives that DOE is considering. The document gives Idahoans the opportunity to study these environmental issues, compare the impacts of different actions, and to make their voices heard under the National Environmental Policy Act process.

5-1
IX.A(2)

The DOE project staff have obviously worked hard to convey technical information in a manner that the general public can understand. I encourage all Idaho citizens to review the EIS and send their comments on to the Department of Energy. Public comment is an important part of federal agency decision making and is one of several factors that the Secretary of Energy will consider when choosing a course of action.

Document 6, Senator Larry E. Craig, Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - (AR) PF
Control #DC-06

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APPROPRIATIONS
FOREIGN TRADE, NUTRITION, AND FORESTRY
ENERGY AND NATURAL RESOURCES
SPECIAL COMMITTEE ON AGING
VETERANS' AFFAIRS

United States Senate
WASHINGTON, DC 20510-1203

February 7, 2000

STATEMENT ON TRANSMITTAL OF THE IDAHO HIGH-LEVEL WASTE & FACILITIES DISPOSITION DRAFT
By U.S. Senator Larry E. Craig

The Department of Energy in Idaho has managed dry granular calcined mixed high-level waste in above-ground storage tanks and liquid mixed transuranic waste in tanks below the ground according to regulatory requirements for many years.

With the agreement made between the State of Idaho and the Department of Energy, this waste will be treated for transportation in the highest and most safely effective way possible. This Draft Environmental Impact Statement analyzes five waste treatment alternatives that span the years between the years 2000 and 2035. It also analyzes six facilities disposition alternatives.

6-1
IX.A(2)

I am ~~very~~ impressed with the readability of this document. It is very unusual for a Draft Environmental Impact Statement to be a document that is "user-friendly". I must congratulate the project staff for their efforts to provide scientific information in a manner that the general public can understand. It is important to know that the decisions made from this document and the public input will determine how DOE will treat the great amount of radioactive and hazardous material for shipment out of Idaho.

I encourage all Idahoans to review this DEIS and send their comments to the DOE by the deadline of March 20, 2000.

Thank you!

Larry E. Craig
United States Senator

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BOISE, ID 83702

HARBOR PLAZA
610 HUBBARD, SUITE 121
COEUR D'ALENE, ID 83814

846 MAIN STREET
LEWISTON, ID 83501-1864

ROOM 193
801 E. SHERMAN STREET
POCATELLO, ID 83201

http://craig.senate.gov

EXHIBIT #3
HLW&FD Draft EIS
Idaho Falls, ID
February 7, 2000
Name: Georgia Dixon

Document 10, Jeffrey Joel, Kelly, WY
Page 1 of 1

Comments on Draft EIS on Idaho High Level Waste and Facilities Disposition

SNOW KING resort

2/9/2000

EIS PROJECT - (AR) PF
Control # DC-10
HLW & FD

JEFFREY JOEL, PO Box 70, Kelly WY 83011

I have a Ph.D. in mathematics from MIT and masters degree in electrical engineering. I have some questions.

10-1 11.A(3) (1) I realize that this problem is very complicated. First, why can't some mixture of the alternatives be used? For example, why can't no action be taken on the already existing bin sets? (2) I look at the process diagrams for the various alternatives. I am struck by the increasing complexity of these alternatives. In fact the "Minimum INEEL Processing" is the most complicated. With so much handling it seems that the

10-2 11.A(3) likelihood of some problem's occurring is increased. I am certain that some method could be devised that would involve less handling, especially thermal treatment. Such a method would probably not be a standard batch-feed model. (3) NEPA apparently does not

10-3 X(2) require cost-benefit analyses. But it seems that, since all alternatives will have human and socioeconomic effects, they (alternatives) absolutely need to be included in any final discussion of and decision among alternatives.

10-4 III.C(6) (4) Finally, a technical question: Is there a way of precipitating out salts of the acidic effluents?

P.O. Box SKI | Jackson Hole, Wyoming 83001 | Telephone 307-733-5200 | Fax 307-733-4086

(1)

Document 11, Avril Currier, Jackson, WY
Page 1 of 2

HLW & FD

EIS PROJECT - (AR) PF
Control # DC-11

RECEIVED
FEB 14 2000

Avril Currier
Jackson Wy
Resident 13 yrs

I. Acknowledge the problem.
1. National & Global
2. sympathized with Idaho
11-1 3. cars or accidents, anything mech.
VIII.B(4) a. Plane crashes
II. National treasures YS. & GTP
1. Human effect
2. Animals
3. total ecology.
III. Viable solution.
1. Buy land in the sahara desert.
2. extremely low populated area,
b. build state of the Art processing plant - non polluting self contained
11-2 2. Build a fleet of Semi's
II.A(2) 1. designed to handle
2 hire the best & most conscientious drivers
3. Naval ships in Mothballs
1. refit to carry waste safely.
2. Put Americans to work.
4. Charge other countries to treat their waste.
5. Put Americans to work to solve this problem

(1)

Document 10, Jeffrey Joel, Kelly, WY
Page 1 of 1

Comments on Draft EIS on Idaho High Level Waste and Facilities Disposition

SNOW KING resort

2/9/2000

EIS PROJECT - (AR) PF
Control # DC-10
HLW & FD

JEFFREY JOEL, PO Box 70, Kelly WY 83011

I have a Ph.D. in mathematics from MIT and masters degree in electrical engineering. I have some questions.

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(1)

Document 11, Avril Currier, Jackson, WY
Page 1 of 2

HLW & FD

EIS PROJECT - (AR) PF
Control # DC-11

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FEB 14 2000

Avril Currier
Jackson Wy
Resident 13 yrs

I. Acknowledge the problem.
1. National & Global
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VIII.B(4) a. Plane crashes
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1. refit to carry waste safely.
2. Put Americans to work.
4. Charge other countries to treat their waste.
5. Put Americans to work to solve this problem

(1)

IV. People from Jackson
- ~~m~~ost of ~~the~~ are from some where else.
- contact families tell them what the DOE is intending to do.
- Call the ~~Nedias~~ net works
- Call the newspapers
- get the word out to the rest of America that our fore fathers work is in jeperdy

V. DOE is afraid of National attention.

11-3 IX.D(2) 1. They won't listen to our 4000 ~ 5000 people ~~be~~here.]

2. We need ~~every~~ every one of you to help get us National attention
   a. National news/programming
   b. " wires

2 This is much larger than the Gold mine in Cooke city. the president shut down.

EXHIBIT #3
HLW F&D EIS
Jackson, WY
February 9, 2000
Name: Currier

(2)

HLW & FD EIS PROJECT - AR/PF
Control # DC-12
RECEIVED FEB 14 2000

Idaho High-level Waste and Facilities Disposition
Draft Environmental Impact Statement
U.S. Department of Energy Idaho Operations Office

Written Comment Form
Must be postmarked or dated by March 20, 2000

MY NAME IS CISCO OLDANI I AM A VALLEY RESIDENT OF 27
12-1 YEARS. [I DO NOT APPROVE OF
XI(5) INCINERATOR PROCESSING PLANT OF INEEL. I WOULD LIKE TO SEE ONE OF THE ALTERNATIVE OPTIONS DISPOSE OF THE WASTES. I KNOW THAT THE PEOPLE OF JACKSON OPPOSE THIS PERMIT. BECAUSE IT IS BAD FOR ANY(THING) ONE DOWN WIND NONE OF US WISH TO BE IN ITS PATH. EVERY-ONE I TALK TO ABOUT THE PERMIT IS OPPOSED AND I ENCOURAGE THEM TO MAKE A STAND. I PRAY THAT WE ALL MAKE AN EFFORT TO CONTACT OUR TOWN REPRESENTITIVES OUR PRESIDENT CONGRESS AND NEIBORS. PLEASE DONT PROCESS THIS WASTE IN OUR NIEBORHOOD. DO IT IN AN EXISTING PLANT ELSWHERE.]
Box 9067 JACKSON WY 83002

Written comment forms may be faxed to:
Thomas L. Wichmann
EIS Document Manager
208-526-1184

Written comment forms may be mailed to:
Thomas L. Wichmann
EIS Document Manager
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

Or send comments via the internet at: http://www.jason.com/hlwfdeis

IV. People from Jackson
- ~~m~~ost of ~~the~~ are from some where else.
- contact families tell them what the DOE is intending to do.
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HLW & FD

EIS PROJECT - AR/PF
Control # DC-13

Fax to: US Deptartment of Energy
c/o Snow King Resort, DOE meeting at 6:30pm today
attn: Amy at the front desk for delivery to the DOE meeting
733-4086

From: Dr. & Mrs. Paul Ruttle
ph: 307-733-0267
fax: 307-733-2618

RECEIVED
FEB 14 2000

CC: Keep Yellowstone Nuclear Free, 732-0129

Date: 2/9/00

To whom it may concern,
We are full time residents of Jackson Hole, Wyoming, and would like to register our complete opposition to the proposed nuclear waste incinerator planned for INEEL. Here are several of our reasons for opposing the project:

13-1 XI(5) - We believe geological evidence supports the fact that prevailing winds will bring airborne waste from INEEL to Jackson Hole (see testimony of most recent meeting in Jackson held at the JH Middle School, and transcribed by a court reporter)

13-2 XI(5) - The incinerator's design is not proven, and is totally theoretical; the DOE is suppose to protect the citizens of the United States, not ram unproven technology and nuclear wastes down our throats.

13-3 XI(6) - The BNFL has a seriously flawed track record; they are not qualified to run an operation of this sensitive a nature. You cannot ignore their being found guilty of falsifying records concerning shipments of nuclear fuels in Japan. If they are willing to do that, what else are they willing to do?

13-4 IX.D(1) Neither does INEEL appear capable of handling this kind of project; what about the 30 emission control system breakdowns at INEEL between 1990 and 1999?

13-5 IX.D(1) And what about the 700 boxes of records that the Center for Disease control requested of INEEL during the 1990's on the subject of radiation received by people downwind from INEEL... oh they were destroyed!

13-6 XI(5) - We know that "failsafe" designs do fail, which will mean the raw incinerated waste will be sent out the stack. This cannot be the right technology for handling this waste.

13-7 XI(5) - Because of "deadlines" (a very appropriate term), the DOE and Idaho DEQ are pushing this project forward with no regard for alternative, safer technologies. The very first thing the DOE needs to do is extend the deadline for evaluating this project and the nuclear wastes.

FEB 9 '00 17:14 PAGE.02

13-8 XI(5) - Finally, also because of "deadlines", the DOE and the Idaho DEQ and have assiduously avoided the normal process of getting input from Wyoming residents until the project was well on it was. What happened to environmental impact statements, notification, meetings to inform the public early on in the planning of the incinerator? It is as if the DOE is trying to pull a fast one, and circumvent normal procedures in order to get this project underway. And when the Idaho DEQ finally did take the time to get input on the project from Wyoming residents, they dismissed the comments as "not relevant because they don't speak to the technicalities of the draft permit". What a sham. If there had been meetings early on in the process, maybe you and they would have listened then. Haven't you, in effect, robbed the people of Wyoming of our due process?

In short, we are totally opposed to the incinerator project, and cannot believe that the DOE has gotten away with the poor handling of this project thus far. Rest assured that we and our neighbors will fight you every step of the way.

Regards,

Paul Ruttle + Ann Ruttle

Paul & Ann Ruttle
PO Box 7959
Jackson, Wy. 83002

HLW & FD

EIS PROJECT - (AR) PF

Control # DC-14 1

February 9, 2000

i am speaking as an individual

My name is Melissa Clark Rhodes
My address is Apartment 345 M Blair Place, Jackson, WY

I hold a Ph.D. in Geology from the University of Pennsylvania

(Although I am currently retired, my previous research involved travel all over the world, and included diving off the Antarctic shelf to study marine fauna.)

As a former Adjunct Assistant Professor at Rider University, I taught basic Environmental science, as well as Geology courses.

Therefore, the INEEL's problems with waste disposal, both stored mixed hazardous and tru contaminated waste AND SEPARATELY, the underground High level wastes, have caused me some concern. (these issues are separate but parallel problems with WAC

****

**WY is the Geology State. Our economy is driven by our underground resources i.e., Uranium, natural gas, oil, and coal. All of these sources of energy have their own sets of problems. We have some of the finest geologists and engineers in the country. I Am totally not anti-nuclear. There is a need for nuclear power at this point in time because we have not solved pollution problems associated with the utilization of fossil fuels. Solar and wind power sources still remain in a state of research and development.

**However, dealing with the radioactive waste effectively remains a national problem. The problems at Hanford are ~~several orders of magnitude greater~~ comparable if not greater than INEEL's difficulties. We do not wish to see INEEL become another Hanford.

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FEB 14 2000

2

[**Good science is a result of interaction between opposing points of view. I and other concerned scientists would like to hold a technical forum with outside scientists and engineers interacting with the DOE scientists. If we can participate in neutral territory, perhaps we can evaluate the best options in collaboration, rather than opposition.

14-1
IX.D(3)

To DOE - this is a challenge

(science is a universal Language)]

Document 15, Tom Henry, Jackson, WY
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-15

Idaho High-level Waste and Facilities Disposition
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U.S. Department of Energy Idaho Operations Office

Written Comment Form
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[I would prefer not to
15-1 live down-wind from a plutonium
XI(5) incinerator. work with the State
governments so the waste
can be transported across state
lines to the dugway site
or Tooele sites in Utah.
Don't waste tax-payer dollars
on something which already
exists (after upgrading) a days drive away.
Find an alternative.]

Tom Henry
Box 10767
Jackson WY 83002

RECEIVED FEB 14 2000

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Thomas L. Wichmann
EIS Document Manager
208-526-1184

Written comment forms may be mailed to:
Thomas L. Wichmann
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Document 16, Tom Stoner, Jackson, WY
Page 1 of 1

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EIS PROJECT - AR/PF
Control # DC-16

HLW & FD

Idaho High-level Waste and Facilities Disposition
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U.S. Department of Energy Idaho Operations Office

Written Comment Form
Must be postmarked or dated by March 20, 2000

FROM, TOM STONER JACKSON WY 83001
733-8075
BOX 3287

16-1 IX.D(1) [ONCE AGAIN A NEW SURPRISE
FROM INEEL. A CALCINATION WASTE.
I KNOW YOU'VE KNOWN ABOUT IT ALONG TIME.]
THIS IS NOT FROM A GENIUS, SO
16-2 VIII.A(4) PLEASE CONSIDER THIS. [CARDINAL ROLE!
DON'T SPREAD NUCLEAR WASTE! NONE!]
YOU HAVE TIME! YOU WILL GET THE
16-3 VII.B(3) MONEY EVENTUALLY! [CLEAN UP THE
WORST FIRST - PIT 9 - AND WHO KNOWS
16-4 III.F.2(5) WHAT ELSE IS WORSE?] [FIND A SAFE
REPOSITORY - WIPP?] [TAKE NEW RECYCLED
WASTE FROM THE WORLD TO YUCCA MTN.
16-5 III.D.1(1) NEW FACILITY. BUILD THEM A GOOD
SAFE PLACE. NO SENCE TAKING IT
TO INEEL & THEN NEVADA.]
ALSO IDAHO WANTED INEEL.
YOU ADDED THE OTHER 9E TO SOUND
SAFE. [IDAHO CAN'T NEW CONTAINERS
16-6 III.E(1) OR WHATEVER INEEL NEEDS. THEY HAVE IT
THEY CAN KEEP IT, TILL IT CAN BE 100%
SAFELY MOVED. IF TECHNOLOGY TAKES 100 YRS
WAIT + DO IT RIGHT]

THANK YOU
TOM

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EIS Document Manager
208-526-1184

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Document 15, Tom Henry, Jackson, WY
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-15

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governments so the waste
can be transported across state
lines to the dugway site
or Tooele sites in Utah.
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exists (after upgrading) a days drive away.
Find an alternative.]

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Document 16, Tom Stoner, Jackson, WY
Page 1 of 1

RECEIVED FEB 14 2000

EIS PROJECT - AR/PF
Control # DC-16

HLW & FD

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U.S. Department of Energy Idaho Operations Office

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THANK YOU
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HLW & FD

EIS PROJECT - (AR) PF
Control # DC-17

HLW EIS Web Comments

RECEIVED
FEB 14 2000

From: HLWFDEIS Web Site
Sent: Thursday, February 10, 2000 3:05 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Auto-Assigned Comment Number: 6
Name: Dr Lee Plansky
Affiliation: INEEL - LLW Program/RWMC
Address1: 165 East 14th Street
Address2:
City, State Zip: Idaho Falls, ID 83404
Telephone: 208-526-2788
Date Entered: {ts '2000-02-10 15:04:50'}
Comment:

17-1 IX.A(8) 1. Would you consider please to add a table of co-located facilites and support equipment by alternative(s).

17-2 IX.A(8) 2. Section 5.2.13.4 has 1/2 of the 2nd Order topic headings missing - eg: product waste..... through process waste. The individual waste types and whether they are product or process waste is not clear.

17-3 V(3) 3. NGLW --- need a clear definition early on in each of the volumes Summary ---> appendices AND GLOSSARY. It is not clearly defined for the public reader and is not present in the Glossary.

Thanks

HLW & FD

EIS PROJECT - (AR) PF
Control # DC-18

HLW EIS Web Comments

RECEIVED
FEB 14 2000

From: HLWFDEIS Web Site
Sent: Friday, February 11, 2000 4:09 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Janet Sluszka
Affiliation:
Address1: 3225 Teton Pines Drive
Address2:
City, State Zip: Wilson, WY 83014
Telephone: 307 734-5257
Date Entered: {ts '2000-02-11 16:08:58'}
Comment:

18-1 V(6) Please do not rush into making a decision as to how to treat the high-level waste at INEEL. Please consider a number of methods and follow-through with them all to see which method is the safest for people and the environment. Please do not make the same mistake you did with the proposed hazardous and nuclear waste incinerator and lock yourselves into a time frame and contract without taking the time to consider the safest alternatives. There is no reason to rush into treating these wastes if the proper technology is not yet there. Thank you for having the health of people and the health of the environment as your utmost concern.

HLW & FD

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Control # DC-17

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Sent: Thursday, February 10, 2000 3:05 PM
To: web@jason.com
Cc: web_archive@jason.com
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Auto-Assigned Comment Number: 6
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Affiliation: INEEL - LLW Program/RWMC
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Telephone: 208-526-2788
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Document 19, Jan Nissl, Boise, ID
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-19

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Monday, February 14, 2000 9:12 AM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

RECEIVED FEB 14 2000

Name: Jan Nissl
Affiliation:
Address1: 1115 E. State
Address2:
City, State Zip. Boise, Id 83712
Telephone: 208-384-9139
Date Entered: {ts '2000-02-14 09:11:47'}
Comment:

19-1 II.A(5) Treatment should proceed strictly out of concern for environmental protection.
Don't use unproven technology.
"Separations" presents three major problems:
19-2 III.D.3(1) a. Creates more waste streams to manage
b. Produces greater waste volumes compared to non-separations
c. Poses tremendous technical uncertainties. These technologies have never been demonstrated to work on an industrial scale.

19-3 II.A(1) Treat the calcine and liquid wastes independently. These wastes have different properties and therefore require different approaches. This was also recommended in a recent report from the National Academy of Sciences.

19-4 VII.B(1) Coordinate treatment so as to address all forms of contamination such as groundwater, soil, facilities and the High-level waste.

thank you

Document 20, Donald W. Rhodes, Idaho Falls, ID
Page 1 of 2

HLW & FD EIS PROJECT - AR/PF
Control # DC-20

Idaho Falls, Idaho
February 10, 2000

RECEIVED FEB 14 2000

Mr. Thomas L. Wichmann
U.S. Dept.of Energy
Idaho Falls, Idaho 83401

Dear Mr Wichmann:

I am sending you my comments on the High Level Waste Treatment options that appeared in the Post Register recently. My comments are of a technical nature based on my many years experience at the Chemical Processing Plant, where I was in charge of developing the chemistry for the calcination process for many years as well as other related waste treatment processes. These comments are not presented in any logical sequence, but are given as they occur to me while preparing this letter.

20-1 III.D.3(1) 1. Dissolving the calcine seems to me to border on the ridiculous. Many millions of dollars and thousands of man hours were spent converting the high level waste to the present granular form. I believe that both Hanford and Savannah River would be very happy to have their high level waste in such an innocuos form. In actual practice, dissolving the calcine is not an easy task. Even the calcine from the aluminum nitrate waste would require some sort of fusion process to dissolve the alpha alumiina that is small in total amount, but is distributed throught the calcine. Extraacting the radionuclides from the liquid after dissolution is not a simple process. Many attempts were made to do this before the waste was calcined, with little success. The end result was a number of wastes, large in volume and containing different levels of radionuclides that would require further treatment for disposal.

7.0-2 III.D.2.c(3) 2. Although a glass prepared from the calcine is probably a desirable product, converting the calcine to a glass is quite difficult. The process requires very high temperatures, and is dependent on the chemical composition of the calcine. The CPP has four different types of calcine: (1) calcine from calcination of aluminum nitrate waste, (2) calcine from the calcination of ammonium nitrate waste, (3) calcine from the calcination of zirconium fluoride waste, and (4) some calcine from the calcination of intermediate or second cycle waste. I don't believe that records can clearly separate these wastes as to location in the bins. Each of these wastes would probably require some modification for any solidification process that was used. In terms of the contained radionuclides in the waste, the Ru-106, Ce-144, and Zr-Nb-95 would probably be largely decayed.
The Sr-90 would still be there, but would probably not cause a migration problem during the glassification process. The Cs-137, on the other hand, would largely be released and have to be collected during the glassification process. In fact, migration of Cs-137 has been occurring during storage in the bins because of the heat generated by the decay of fission products. In addition to these problems, the energy requirements for glasification will be very high, and the materials of construction that will be needed for the equipment to do the glassification will be very espensive.

20-3 III.D.4(1) 3. There is another potential process to immobilize and protect the calcine, that was not included in the options, that I believe could be used. It would be much less costly than any of the other

Document 19, Jan Nissl, Boise, ID
Page 1 of 1

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Document 20, Donald W. Rhodes, Idaho Falls, ID
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20-3 III.D.4(1) 3. There is another potential process to immobilize and protect the calcine, that was not included in the options, that I believe could be used. It would be much less costly than any of the other

options presented, and provide a high level of safety during storage. This process consists of imbedding the calcine in a metal matrix which is itself contained within a metal cylinder. The metal matrix that I suggest is aluminum. This was done on a laboratory scale as early as 1969, and was reported in IN-1322 The author is myself. The laboratory study was done with nonradioactive calcine. A stainless tube was filled with granular calcine. Molten aluminum was then drawn up through the calcine using a vacuum, and an inert atmosphere to prevent aluminum oxide from forming.The metal is allowed to extend beyong the calcine at both ends of the tube, thus forming a sealed system. In order for the radionuclides to be leached from the calcine, the tube would have to be penetrated by corrosion. Even then, the leaching would be very slow because of the aluminum matrix that protects the calcine particles. The tubing containing the calcine could be any thickness desired to provide the desired long-term protection. If really, really long term protection were desired, the tube containing the calcine could be placed within a second stainless steel or ceramic cylinder and a second pouring of metal could be made to seal the tube containing the calcine within the secondary container. Long term stability could easily be provided by the proper choice of containers. Some of the advantages of this process over the other proposed processes are as follows:

1. This process can be done at relatively low temperatures (aluminum m.p. 650 decgrees C), compared to a glassification process.
2.. The energy requirements are low compared to a glassification proecess..
3. Migration of Cs-137 would be negligible at the low temperatures required to melt aluminum.
4. The cost of materials would be relatively low, because ordinary stainless steel and/or ceramic tubing could be used.
5. Argon, which is reasonable in cost, could be used to provide the inert atmosphere.
6. Leaching of radionuclides could be zero for as long as desired by choosing the right containment materials.
7. Handling the stainless steel or ceramics tubes could be done with conventional equipment.
8. The tubes containing the calcine could be transported and stored easily.
9, The aluminum metal and steel container would reduce the external radiation significantly.
10 The process is basically not affected by the chemical composition of the calcine.
11. End caps can be welded on the ends of the tube, thus making it a totally sealed system.
12. The ss tubing would totally shield out the beta radiation, and attenuate somewhot the gamma.
13. The metal matrix provides good heat transfer for any decay heat.]

If you have any questions or if I can be of any help, I can be reached at 652 Brentwood Circle, Idaho Falls, Idaho 83402, phone, 522-8673.

Very truly yours,

D W Rhodes

D. W. Rhodes

HLW & FD

EIS PROJECT (AR/PF)
Control # DC-21

Idaho High-level Waste and Facilities Disposition
Draft Environmental Impact Statement
U.S. Department of Energy Idaho Operations Office

Written Comment Form
Must be postmarked or dated by March 20, 2000

I don't know enough about the issues discussed at this meeting, but this seems like a complicated ordeal. All I know is
21-1 III.E(3) that [I prefer storing the waste in the safest possible way (i.e. not harmful to the public, workers, or environment), or to move the waste elsewhere.] [I don't think cost should matter. Feeling
21-3 X(9) safe doesn't have a dollar value.]

21-4 IX.B(3) [The high schools in the area should have been notified, because the Times News cannot be counted on as a source of information — this meeting was reported to be about nuclear incinerators. Basically, the next generation needs to understand these issues.]

21-5 IX.C(3) [The registration staff was not only helpful, but friendly — a good change of pace in this area! Most public hearings have no staff at all, or are there only to get people to pick up informative papers.]

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208-526-1184

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EIS PROJECT - AR PF
Control # DC-22
HLW & FD

Feb. 13, 2000

Box 293
Ketchum, Id. 8334

Dear Mr. Wichmann,

22-1
II A(2)

I am opposed to the draft plan for treating & disposing of radioactive waste at sites throughout the west, including the INEEL in Idaho Falls.

I am concerned about the safety of workers who could be exposed to these toxic wastes as well as the possible contamination of the Snake River Plain Aquifer.

Impacts to Idaho depend on which waste processing facilities DOE selects disposition alternatives.

22-2
X1(5)

The Advanced Mixed Waste Treatment Facility has not been proven to protect our Snake environment and human health.

22-3
VIII.B(4)

Please consider the sanctity of all living beings when determining disposal & treatment of poisons.

Char Roth

DEPARTMENT OF HEALTH & HUMAN SERVICES
Public Health Service

HLW & FD

EIS PROJECT - AR PF
Control # DC-23

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30341-3724

February 7, 2000

RECEIVED
FEB 16 2000

Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563
Attention: Public Comment: Idaho HLW & FD EIS

Dear Mr. Wichmann:

We have completed our review of the Draft Environmental Impact Statement (DEIS) for Idaho High-Level Waste and Facilities Disposition. We are responding on behalf of the U.S. Public Health Service, Department of Health and Human Services (DHHS). This letter serves as a response to your letters of request sent to Dr. Jeffery Koplan, Director, Centers for Disease Control and Prevention (CDC), to Mr. Richard Green , Environment and Safety Officer, (DHHS), and to Mr. Kenneth W. Holt, National Center for Environmental Health, CDC.

23-1
IX.B(2)

We request that future correspondence related to the National Environmental Policy Act (NEPA), specifically requests for review of environmental impact statements, be sent only to Mr. Holt for coordination at the following address:

Kenneth W. Holt, MSEH
Centers for Disease Control & Prevention
National Center for Environmental Health
Emergency & Environmental Health Services Division (F16)
4770 Buford Hwy. NE
Atlanta, GA 30341-3724

Technical assistance for this review was provided by Mr. Charles M. Wood, Radiation Studies Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, CDC. Please consider the following comment provided by Mr. Wood:

23-2
VIII.B(1)

"The Defense Nuclear Facilities Safety Board audited the Department of Energy program for HEPA filters and cited several serious deficiencies. I have attached a copy of this audit for your information. One of the more serious deficiencies is that DOE has shut down its facility for quality assurance testing of new filters. All the machinery is now at Lawrence Livermore National Laboratory, but there is no funding to assemble the equipment and put it back into operation. The proposed facilities in the DEIS will depend on HEPA filters to meet emissions standards. For new facilities DOE should address the deficiencies cited in the DNFSB audit. How do they propose to do that?"

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Page 2 - Mr. Wichmann

Thank you for the opportunity to review and comment on this DEIS. Please send us a copy of the Final DEIS, and any future environmental impact statements which may indicate potential public health impact and are developed under the National Environmental Policy Act (NEPA).

Sincerely,

Kenneth W. Holt

Kenneth W. Holt, MSEH
Emergency & Environmental Health Services Division
National Center for Environmental Health (F16)

enclosure

CDC:NCEH:EEHS:CDB:CMWOOD/KHolt;jm doc:idahowastes; 2/7/00
Necessary Action Folder ID: 11331

June 8, 1999

The Honorable Bill Richardson
Secretary of Energy
1000 Independence Avenue, SW
Washington, DC 20585-1000

Dear Secretary Richardson:

Since its inception, the Defense Nuclear Facilities Safety Board (Board) has provided its observations on a number of issues associated with confinement ventilation systems installed in the facilities under the Board's purview. In particular, issues involving high-efficiency particulate air (HEPA) filters identified by the Board's staff during its reviews of ventilation systems have been highlighted in the Board's correspondence. Many of these issues remain unresolved, as indicated in the enclosed report by our staff.

The report describes significant degradation of the infrastructure supporting the Department of Energy's (DOE) HEPA filter program. Confinement viability demands high dependability of these filters, yet beyond question their efficacy has deteriorated. The filters can be restored to an acceptable level of reliability only if the robust infrastructure required to support continued assurance of their performance is restored. The Board's staff has identified a number of actions that could be taken to achieve that restoration and the Board believes that DOE should act promptly to initiate a definitive corrective action plan to address those issues.

Accordingly, pursuant to 42 U.S.C. § 2286b(d) the Board requests that DOE provide a report within 60 days outlining the steps it plans to resolve these issues in a manner that restores confidence that confinement ventilation systems using HEPA filters do, indeed, adequately protect workers, the public, and the environment.

In the future, the Board intends to closely examine operational and maintenance aspects of confinement ventilation systems in general, and will share our findings with you upon completion of that review.

Sincerely,

John T. Conway
Chairman

c: Mr. Mark B. Whitaker, Jr.

Enclosure

HEPA Filters

Used in the

Department of Energy's Hazardous Facilities

Defense Nuclear Facilities Safety Board

Technical Report

May 1999

HEPA Filters

Used in the

Department of Energy's Hazardous Facilities

This technical report was prepared for the Defense Nuclear Facilities Safety Board by the following staff members:

Roger Zavadoski
Dudley Thompson

with assistance from:

Ronald Barton
J. Kent Fortenberry

EXECUTIVE SUMMARY

Confinement ventilation systems are important safety features of Department of Energy (DOE) facilities in which hazardous materials are handled in dispersible form. High-efficiency particulate air (HEPA) filters are critical elements of these confinement systems. They are the final physical barrier to the release of material to the atmosphere and thereby serve to protect workers, the public, and the environment. For accident scenarios, HEPA filters are credited with reducing emissions by factors of thousands to billions.

Reviews of ventilation systems at DOE defense nuclear facilities conducted by the staff of the Defense Nuclear Facilities Safety Board (Board) during the early 1990s led to the Board's first report on this subject, *Overview of Ventilation Systems at Selected DOE Plutonium Processing and Handling Facilities* (DNFSB/TECH-3). More recent reviews have identified additional potentially significant weaknesses in the maintenance and operation of these systems, particularly in the procurement, testing, application, and use of HEPA filters. These weaknesses support the conclusion that confinement ventilation systems at some DOE facilities may be vulnerable to failure when most needed.

For many years, an informal but highly effective nationwide infrastructure supported production of and quality assurance for HEPA filters for safety-related service in a variety of hazardous operations, including those conducted in DOE facilities. Today there is convincing evidence that this infrastructure is failing; this report describes significant degradation of the infrastructure supporting DOE's HEPA filter program. Confinement viability demands that these filters be highly dependable, yet beyond question their efficacy has deteriorated. The filters can be restored to an acceptable level of reliability only if the robust infrastructure required to support continued assurance of their performance is restored. This report identifies a number of actions that could be taken to achieve that restoration.

The Board will continue to focus attention on deficiencies and weaknesses in confinement ventilation systems at DOE facilities. These efforts will be aimed at identifying situations in which DOE can act to improve protection of workers, the public, and the environment.

TABLE OF CONTENTS

1. INTRODUCTION

Confinement, the Department of Energy's (DOE) preferred method for protecting the public and workers from exposure to hazardous materials, encompasses both the physical structures in which the material resides and the associated ventilation systems. Before air from the confinement is released to the environment, it is filtered through high-efficiency particulate air (HEPA) filters to ensure that any residual contamination is well below acceptable, safe levels for public exposure (Burchsted et al., 1976). In such applications, HEPA filters can reduce emissions by factors of thousands to billions.

An acceptable confinement system starts with a robust and well-documented design—robust not only in the physical structures involved, but also in the attributes of defense in depth incorporated in the overall system design. Confinement systems are expected to be documented comprehensively in safety documents, such as Safety Analysis Reports (SARs), Technical Safety Requirements (TSRs), and Operational Safety Requirements (OSRs) (DiNunno, May 31, 1995). Typically, the strenuous demands imposed by the need for uninterrupted operation of confinement ventilation systems for extended periods of time—often decades—have led to the rugged designs often found in DOE facilities. Redundant filter banks and power supplies are common in modern applications (U.S. Department of Energy, April 6, 1989; October 24, 1996). Despite their otherwise robust construction, however, all confinement ventilation systems that use HEPA filters are vulnerable to failure of their most fragile component, the HEPA filter itself, which uses a medium no thicker than the typical desk blotter. Like paper, this medium becomes brittle with age and is significantly degraded by wetting. As a result, HEPA filters must be regarded as consumables that require replacement at defined intervals. However, DOE does not currently require replacement.

On March 20, 1995, the Defense Nuclear Facilities Safety Board (Board) issued a technical report entitled *Overview of Ventilation Systems at Selected DOE Plutonium Processing and Handling Facilities* (DNFSB/TECH-3) (Defense Nuclear Facilities Safety Board, March 20, 1995). This report identifies numerous instances of a lack of adequate accounting of how and whether facilities met and maintained compliance with specific requirements. The report concludes that as a result of these shortcomings, confinement systems at DOE's plutonium facilities might not perform as expected in the event of an accident.

In its letter forwarding this report (Conway, June 15, 1995) and in subsequent correspondence (Conway, July 21, 1995), the Board requested that DOE evaluate the design, construction, operation, and maintenance of ventilation systems at its plutonium processing and handling facilities and set forth a plan for corrective actions deemed necessary as a result of this evaluation. DOE formally responded to these requests in early spring 1996 (O'Leary, March 15, 1996). Approximately one-quarter of the 36 actions proposed by DOE in its corrective action plan still remain open.

Since the issuance of DNFSB/TECH-3, several related issues have been identified. These include (1) the need for pre-installation filter test facilities (Zavadoski, May 24–26, 1994; July 11–13, 1995); (2) the need for a Qualified Products List (QPL) test laboratory (Zavadoski,

August 4–8, 1997; Conway, October 30, 1997); (3) the problem of filter wetting (Zavadoski, August 4–8, 1997; Conway, October 30, 1997; Frethold et al., July 14, 1997); (4) the effects of aging on the integrity of filters (Zavadoski, August 4–8, 1997; Frethold et al., July 14, 1997); (5) by-pass leakage considerations (Frethold et al., July 14, 1997; Roberson, March 3, 1997); (6) radiation-induced degradation (Conway, May 9, 1996); and (7) issues involving the infrastructure associated with HEPA filters (Alm, January 15, 1998; Conway, February 9, 1998; March 26, 1998; Owendoff, April 27, 1998). In addition, relevant research results that raise questions about fundamental assumptions used in Safety Analysis Reports have been presented in national and international forums (Frethold et al., July 14, 1997; Bergman et al., 1994; Carbaugh, 1982; Johnson et al., 1988; Moeller, 1982; First, 1996; Robinson et al., 1985). These issues are explored in the following sections.

2. HEPA FILTER INFRASTRUCTURE

The program for producing high-quality HEPA filters and fabricating the filter banks used in nuclear installations has evolved during the past 50 years. This evolution has involved many interrelated assumptions associated with materials, specifications, testing, and use (Burchsted et al., 1976; Frethold et al., July 14, 1997; Johnson et al., 1988; First, 1996).

As the name suggests, HEPA filters are high-efficiency air filters designed to remove extremely fine particles suspended in the air; they do not remove gases. HEPA filters are expendable, extended-pleated-medium, dry-type filters with (1) a rigid casing enclosing the full depth of the pleats; (2) a minimum particle removal efficiency of 99.97 percent of thermally generated dioctalphthalate (DOP) 0.3 micron smoke particles (particles about one- third of one-thousandth of a millimeter in diameter) or larger (i.e., 99.97 percent of these particles are stopped by the filter); and (3) at a maximum a pressure drop of 1 inch of water gauge when clean and operated at rated airflow capacity (Burchsted et al., 1976). Such filters offer a high-volume, high-efficiency cleanup mechanism for relatively low concentrations of airborne particulate contaminants.

Safety analyses for confinement systems using HEPA filters routinely take credit for reductions in airborne contamination by factors of thousands to billions. These reduction factors are reasonable for intact filters installed in well-designed and well-constructed filter banks that are properly maintained. These conditions are difficult to attain, however, partly because of the fragile nature of the filter medium. A very few small holes in the filter medium (on the order of 1–10 mm in diameter) can reduce filter efficiency significantly.

HEPA filters are manufactured by a process similar to that used for making paper, but with fiberglass strands as the principal ingredient. After the medium is formed into a sheet similar in appearance and texture to a large desk blotter, it is carefully folded into a series of accordion pleats (125 pleats in the most widely used standard industrial HEPA filter). The folded medium is then mounted with the edges sealed in a plywood or metal case. This constitutes a single HEPA filter unit. Dozens or even hundreds of such units may be installed in a single confinement filter installation.

2.1 ACHIEVING INITIAL PRODUCT QUALITY

2.1.1 Specifications

HEPA filters are produced with a high degree of quality and uniformity through the application of stringent yet manageable specifications. The foundation for HEPA quality includes sample specifications found in the 1976 Nuclear Air Cleaning Handbook (Burchsted et al., 1976), issued by the Energy Research and Development Administration, and more recently in DOE Standard 3020-97 (DOE-STD-3020-97), *Specification for HEPA Filters Used by DOE Contractors* (U.S. Department of Energy, 1997), together with the numerous standards they cite and the QPL and Filter Test Facility (FTF) testing they call for. Nevertheless, there are ongoing

technical issues associated with each of these building blocks that have serious implications for maintaining the quality of the filters.

The current version of the Nuclear Air Cleaning Handbook is more than 20 years old. In the intervening years, several unsuccessful attempts have been made to revise and update the handbook, primarily to accommodate numerous changes in applicable national standards. In 1996, the Secretary of Energy made a commitment to the Board (O'Leary, March 15, 1996) to have a revised draft available by the end of that year. That draft has not yet been produced, nor are there any indications that a revised handbook may emerge in the near future.

2.1.2 Filter Testing

Both the Nuclear Air Cleaning Handbook and DOE-STD-3020-97 call for manufacturers to retain their QPL[1] listings. This mandate includes, among other requirements, providing representative sample filter units to an independent, certified QPL laboratory for destructive testing at least once every 5 years.

In the past, manufacturers could choose to have their QPL testing done at either the Army's Edgewood Arsenal or the Rocky Flats Environmental Technology Site (RFETS). Today, the Edgewood Arsenal facility no longer performs QPL testing, and the test facility at RFETS is closed. Edgewood Arsenal still has the capability to run such tests, but there is no budget for maintenance of the necessary equipment. During 1997, the QPL test equipment at RFETS was sent to Lawrence Livermore National Laboratory (LLNL), where most of it remains—still crated and unfunded. The Assistant Secretary of Energy for Environmental Management informed the Board in writing (Alm, January 15, 1998) that a QPL testing laboratory would be available for testing of HEPA filters to be used in DOE facilities. No time frame was specified for that commitment, and such a laboratory has not yet been designated.

In addition to QPL testing, both the handbook and DOE-STD-3020-97 call for representative filters to be provided routinely to a designated FTF for the purpose of verifying filter efficiency. The current DOE standard recognizes that manufacturers may themselves conduct tests similar to those performed at a designated FTF. Even in such cases, however, the standard requires that all filters destined for use in DOE facilities be tested at an independent FTF prior to installation.

For years, manufacturers routinely pretested their HEPA filters before sending them to a DOE FTF. Even with this pretesting, rejection rates of 3–6 percent were common at DOE's three FTFs. Such rejection rates support the value of testing at a DOE FTF, since the tests help avoid the unnecessary generation of contaminated waste and contribute to lowering personnel exposure. This avoidance comes about because the filters that fail the FTF tests are not installed, as they would have been in the absence of the tests; thus the need to remove substandard filters contaminated in service is avoided.

---

[1] Products on QPLs have met stringent requirements for quality and reliability, demonstrated by periodic independent testing at certified testing laboratories, most of which are operated by the federal government.

Currently, DOE operates only one FTF (at Oak Ridge). Despite the DOE-STD-3020-97 specification calling for FTF testing of HEPA filters prior to installation in DOE facilities, and in the face of DOE's own studies (Lytle, August 1996), there have been repeated proposals to stop testing of filters at the Oak Ridge FTF. Indeed, testing there was stopped in January 1999, but was resumed 2 months later with user fees being imposed for tests. This situation tends to discourage FTF usage and increase per-filter test costs. Ongoing attempts to find a programmatic solution have thus far been unsuccessful.

2.2 MAINTAINING PERFORMANCE

HEPA filters cannot simply be installed and forgotten. Once installed in safety systems, they are subject to significant operating constraints to ensure the desired level of performance. Typically, these constraints involve TSRs and/or OSRs (U.S. Department of Energy, April 30, 1992) that specify a maximum pressure drop for system operation and a level of efficiency as demonstrated by periodic in-place leakage tests. Operating procedures, specific surveillance actions, and scheduled maintenance are usually prescribed to ensure that these performance requirements are met.

Industry consensus standards for in-place HEPA filter testing stress the need for visual inspections and system-specific procedures (American Society of Mechanical Engineers, December 15, 1989). Although specific procedures addressing filter operation are required by industry standards, they are typically lacking throughout the defense nuclear complex (Conway, January 30, 1998) and have not been made mandatory by DOE. These procedures are important for ensuring the safety of workers, the public, and the environment. Only the Savannah River Site has employed them extensively.

For most other systems and components, meeting TSRs ensures that a constrained or challenged item will perform its intended function as called for by the design. This assumption is not valid when nondestructive in-place field tests address only the tightness of the filter's fit against the frame and the absence of other gross leakage paths. There is a widespread assumption that periodic in-place DOP field testing demonstrates the ability of a HEPA filter to perform under accident conditions. Yet, experience has shown that filters can be severely weakened and still successfully pass these in-place tests (Frethold et al., July 14, 1997; Johnson et al., 1988; First, 1996). Under accident conditions, such filters are vulnerable to subsequent failure in use, for example, after becoming heavily loaded with smoke particles.

The question of whether a HEPA filter will perform as intended in the future cannot be answered simply by examining adherence to existing TSRs. Filter performance does not lend itself to a simple "go-no go" test. With today's technology, that assurance is available only through a reliable and effective infrastructure that addresses all aspects of HEPA filter quality—design, manufacture, installation, operation, and maintenance.

2.3 CHALLENGES

2.3.1 Fires

The largest potential threat to the public from a facility that houses processes in which relatively large quantities of radioactive materials are handled is most commonly a fire accident scenario. Since fires often generate large volumes of smoke, they pose a potential threat to the effective functioning of filtration systems because the filters can become rapidly loaded with smoke particles. This increases the pressure drop across the filter, potentially leading to a breach of confinement. There are times during some fire scenarios when it may be necessary to stop flow to the filter systems to prevent their destruction. Such scenarios need to be carefully evaluated ahead of time; a mitigating strategy must be developed, clearly captured in procedures, and rigorously practiced (Defense Nuclear Facilities Safety Board, March 20, 1995; Conway, January 30, 1998; Klein, April 24, 1998).

In the event of a breakthrough of the filter during a fire, the particulate material deposited on the filters is readily lifted by buoyancy into the atmosphere, where it can be further dispersed in potentially unfavorable downwind patterns. As a result, some fires can be more serious than explosions, which generally drive much of the particulate matter into surrounding structures rather than elevating it into the atmosphere and dispersing it via prevailing winds.

2.3.2 Heat and Elevated Temperatures

Because of their materials of construction, HEPA filter installations can easily be damaged or destroyed by heat if they are not properly designed and maintained. Exposure of the filter medium to temperatures of 700–750°F for only 5 minutes can significantly reduce filter efficiency (Burchsted et al., 1976). Fires involving burning metals, which may be encountered in many defense nuclear facilities, can produce flame temperatures of several thousand degrees. With sufficient flow of cooler air, these high temperatures can be reduced to acceptable levels in the downstream HEPA filters. If this cooling effect is to be provided, however, detailed plans and designs are essential. Such plans and designs in turn require appropriate guidance.

In this connection, DOE Handbook 3010 (DOE-HDBK-3010-94) (U.S. Department of Energy, December 1994) implies that HEPA filters can withstand temperatures substantially greater than 1500° F for tens of minutes without losing their nominal efficiency of 99.97 percent. This is not correct, since fiberglass will melt before reaching such temperatures. This erroneous information was used in a recent Basis for Interim Operation (U.S. Department of Energy, April 1998) in which a filter efficiency of 99.8 plus percent was assumed in calculating dose assessments. In this instance, recalculation determined that the temperature likely to be encountered at that facility would not have reached 750°F. However, the same error (i.e., the assumption of no filter damage and filter availability for dose reduction) could recur if the handbook is not revised.

2.3.3 Wetting

Like paper, HEPA filter medium is especially susceptible to water damage, despite the fact that water repellents are applied to the medium during manufacture. When installed fire suppression systems are activated to protect systems, structures, and components inside

confinement, the moisture-laden air carried downstream to the HEPA filters can seriously degrade filter performance—at a time when high-efficiency filter performance is crucial.

2.3.4 Filter Strength

The remaining strength of HEPA filters must be adequately considered, especially under challenging conditions, such as having to cope with a fire. Making this determination is particularly difficult, however, since no nondestructive in-place test is available. Further, many unpredictable factors can degrade the filter installation's strength without the operators' knowledge. Filter strength is affected by such factors as manufacturing variables, aging, loss of binder, loss of water-repellent capability, shelf life, history of prior wetting, exposure to high temperature, exposure to high radiation, exposure to chemicals, and exposure to moisture-laden air (Frethold et al., July 14, 1997; Bergman et al., 1994; Carbaugh, 1982; Johnson et al., 1988; Moeller, 1982; First, 1996). While many of these factors have been investigated, a quantitative assessment does not appear possible at this time. More important, a conservative limit on filter life is not currently mandated by DOE.

2.3.5 Air Leaks

Careful design, attentive operation, and disciplined maintenance of a HEPA installation can be negated by air leaks in the negative pressure region of the system downstream of the filters and upstream of the fans. Leaking gaskets, fan seals, and damper actuator penetrations are particularly vulnerable. These regions are not routinely checked for leaks (Frethold et al., July 14, 1997; Roberson, March 3, 1997). When RFETS addressed this issue, such leaks were found.

2.4 RESULTS OF PRIOR RESEARCH

The literature is replete with studies that examine possible negative influences on HEPA filter performance (Frethold et al., July 14, 1997; Bergman et al., 1994; Johnson et al., 1988; Robinson et al., 1985). The data presented in these studies are based almost entirely on HEPA filters less than 15 years old. A few of the filters examined in the studies were 15–20 years old, and a very few were older than that (the age of these filters typically includes both shelf and service life).

Frethold's work (Appendix 4, Figure 4-1) (Frethold et al., July 14, 1997) shows some unused but aged filters with less than minimum specified initial tensile strength of 2.5 pounds per inch for unfolded media and 2.0 pounds per inch for folded media. "Folded" versus "unfolded" here is significant because the most commonly observed failure point on a HEPA filter is on the downstream fold. Further, Frethold's work (Figure 6-1) reveals variability for this parameter by factors of 2–3 for the same manufacturer.

The loss of water-repellent capability has also been observed by several investigators. This can be a significant factor if moisture carryover or sprays from firefighting efforts impinge on the filters. Filters untreated for water repellency are expected to absorb some fraction of the

impinging moisture or water. This moisture absorption can dramatically increase the pressure drop across the filter and lead to filter failures. According to Frethold (Figures 2-1 and 2-2), loss of the ability to repel water does not appear to be a problem in storage, but can be significant in service. Johnson's data (Johnson et al., 1988) show a 57–100 percent loss of water-repellent capability among filters in service for 13–14 years.

These data suggest that remaining strength and ability to repel water are important considerations for continued HEPA filter use, but it is not possible to specify an exact service life. Qualitatively, however, the data clearly indicate that filters cannot stay in service indefinitely. Since an exact service life cannot be determined and data variability is significant, individual vulnerability assessments that examine the expected efficiency, life, and mission for installed HEPA filters would appear to be desirable.

Frethold (Appendix 3) presents the results of soaking a HEPA filter, drying it, and then testing the dried media for tensile strength. This investigation was designed to simulate the effects of direct impingement spray testing for fire protection purposes. The results revealed that one soaking can reduce the strength of the filter media to less than the initial purchase specification value. Additional tests conducted by Frethold without presoaking also demonstrated weakening of the filters. On the basis of these data, the safety significance of the application, and a consideration of future building use, one DOE site (RFETS) decided to replace various previously wetted HEPA stages (in Buildings 371 and 707). The choice appears to have been a prudent one.

It should be noted that most of the investigations cited above were carried out under funding provided by DOE and its predecessor agencies. Today almost no funding is available for conducting such investigations, even though there are many unanswered questions. No programmatic office within DOE has stepped forward to set priorities regarding the additional information required.

Taken collectively, the published data also suggest that there could be some unused HEPA filters in storage—ready to be installed in safety systems—that would not meet newly purchased filter specifications. Further, the data suggest that installed HEPA filters could be so degraded by age and loss of ability to repel water that they might not perform their expected safety function when called upon to do so.

Several attempts have been made to establish an age limit for HEPA filters, taking into consideration the weaknesses observed during testing. First (1996) of the Harvard Air Cleaning Laboratory recommends 5 years for HEPA filters used in biological cabinets. The Savannah River Site has a 5-year limit in place, including both shelf life and service life. LLNL previously proposed an 8-year limit, and is currently proposing a 10-year limit. Some DOE facilities have filters in service that were installed more than 20 years ago. A prominent filter manufacturer claims a 3-year shelf life, but only under proper storage conditions. No other age limits at DOE facilities have been proposed to date. Nor have any additional routine measurements or assessments to evaluate the residual strength of HEPA filters been proposed.

3. REVIVING THE INFRASTRUCTURE

To be effective, any management system requires feedback. In the case of HEPA filters, there are many indications that an acceptable program for feedback of experience is either absent or seriously degraded. At a time when additional HEPA filter investigations may be called for, budgets have been cut to the point that meaningful research in this area is no longer possible. Moreover, after nearly 50 years of continuing support for the Nuclear Air Cleaning Conferences, DOE has decided to withdraw support for future conferences, seriously compromising opportunities for feedback from peer review and a free exchange of ideas. Reconsideration of this decision is warranted in order to restore vigor to this important safety-related research area and to provide better assurance of adequate information exchange on the subject of ventilation filtration. This report should be regarded as an impetus for a revitalized feedback and improvement program for DOE's HEPA filter program, following the tenets set forth in Board Recommendations 95-2, *Safety Management*, and 98-1, *Integrated Safety Management*.

There is physical evidence that some HEPA filters presently in service may be too weak to perform their safety function effectively (Frethold et al., July 14, 1997), and there is continued reliance on a field test that provides no information on the filters' remaining physical strength. Indeed, physical evidence suggests that even unused but aged filters may not meet minimum strength requirements. These findings indicate a need to strengthen quality assurance and quality control programs for HEPA filters. At the same time, however:

- The QPL laboratory committed to by senior DOE management is not yet in place.
- The existence of the last remaining FTF is tenuous.
- An updated Nuclear Air Cleaning Handbook, a draft revision of which was originally committed to by December 1996, is not yet available.
- There is a serious need to update a related DOE Handbook to correct errors that could lead to nonconservative analyses, as has occurred at least once.

To address these issues and restore vitality to its filter program, DOE should give serious consideration to the following actions:

- Designate a location and firmly commit to providing funding, personnel and physical resources, and continued programmatic support for a replacement for the QPL laboratory, on an expedited schedule.
- Ensure continued operation of the Oak Ridge FTF.
- Identify needed resources and assign responsibility for early publication of a revised Nuclear Air Cleaning Handbook, in order to make accurate, up-to-date guidance on the subject available.

- Revise, update, and implement DOE-HDBK-3010-94 to eliminate confusing guidance regarding the performance characteristics of installed HEPA filters, and to improve the quality and reliability of assumptions supporting safety analyses involving these critical components of confinement systems protecting workers, the public, and the environment.
- Establish a conservative maximum age limit for HEPA filters involved in safety-related service. Such a limit should be established, simply because the filters degrade with time, and only 10–15 years of meaningful data is available to justify extended service life. Any age limit established should be supported by a systematic evaluation of how the strength of HEPA filters varies over time, for both installed filters and those in storage.

The above actions are called for to restore DOE's failing infrastructure supporting its HEPA filter program. At this time, however, higher priority should be attached to prompt completion of a vulnerability assessment of each facility relying on HEPA filters for accident mitigation. Filters specifically required to operate (and those being stored in place that could interact with these filters—as in the case of standby, bypass filter banks) in a stressed situation (e.g., in fires, during sprays, or in high temperatures) while called upon to perform a safety function should be assessed for their ability to perform acceptably. Installed filters that have already exceeded their useful life should be replaced on a prioritized basis. Finally, systematic evaluations of the anticipated performance of installed HEPA filters compared with the tasks they are expected to perform should be completed. These evaluations should be based on reasonable but conservative assumptions regarding potential mechanisms for filter degradation, pending the conduct of meaningful research aimed at definitively establishing a better understanding of how filter strength varies with time.

This report has described a significantly degraded DOE infrastructure for HEPA filters. Confinement viability demands high dependability of these filters. An acceptable level of reliability can be assured only if the robust infrastructure required to support continued assurance of their performance is restored.

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GLOSSARY OF ACRONYMS

Abbreviation	Definition
Board	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
DOP	Dioctalphthalate
FTF	Filter Test Facility
HEPA	High-Efficiency Particulate Air
LLNL	Lawrence Livermore National Laboratory
OSR	Operational Safety Requirements
QPL	Qualified Products List
RFETS	Rocky Flats Environmental Technology Site
SAR	Safety Analysis Reports
TSR	Technical Safety Requirements

HLW EIS Web Comments

HLW & FD EIS PROJECT - (AR) PF
Control # DC-24

From: HLWFDEIS Web Site
Sent: Monday, February 14, 2000 12:46 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Jay Hormel
Affiliation: Snake River Alliance
Address1: P.O. Box 153
Address2:
City, State Zip: Bliss, ID 83314
Telephone: 208/352-4234
Date Entered: {ts '2000-02-14 12:45:45'}
Comment:
I support the "Early Vitrification" alternative. It is proven technology and there are fewer risks involved than with an unproven method. 24-1 III.D.2.C(1)

The highest priority is to protect the environment from these materials, whether they are shipped out of state or not.
24-2 II.A(5)

RECEIVED FEB 17 2000

HLW & FD EIS PROJECT - (AR) PF
Control # DC-25

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Tuesday, February 22, 2000 3:41 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

RECEIVED FEB 23 2000

Name: Ruthann Saphier
Affiliation: private citizen
Address1: POBox 5557
Address2:
City, State Zip: Ketchum, ID 83340
Telephone: 208-622-3114
Date Entered: {ts '2000-02-22 15:41:21'}
Comment:
I say STOP THE INCINERATOR! The air we breathe is precious. Do not contaminate it! CONTAIN radioactivity, do not spread it. 25-1 XI (5)
1) Don't aim at an uncertain target. Safer treatment and storage-no matter where-should be the goal. Treatment should proceed strictly out of concern for environmental protection. 25-2 II.A(5)
2) Don't use unproven technology. The three separations alternatives analyzed: Full Separations, Planning Basis, and Transuranic Separations should be dropped from consideration. "Separations" presents three major problems:
a. Creates more waste streams to manage
b. Produces greater waste volumes compared to non-separations
c. Poses tremendous technical uncertainties. These technologies have never been demonstrated to work on an industrial scale. If the technology fails then environmental protection is failed. 25-3 III.D.3(1)
3) Treat the calcine and liquid wastes independently. These wastes have different properties and therefore require different approaches. This was also recommended in a recent report from the National Academy of Sciences. 25-4 II.A(1)
4) Coordinate treatment so as to address all forms of contamination such as groundwater, soil, facilities and the High-level waste. 25-5 VII.B(1)
I trust that you will take this email into consideration.
Thank you,
Ruthann Saphier
Concerned Citizen
rsaphier@sunvalley.net

HLW EIS Web Comments

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Subject: HLW EIS Web Comment

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Name: Ruthann Saphier
Affiliation: private citizen
Address1: POBox 5557
Address2:
City, State Zip: Ketchum, ID 83340
Telephone: 208-622-3114
Date Entered: {ts '2000-02-22 15:41:21'}
Comment:
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I trust that you will take this email into consideration.
Thank you,
Ruthann Saphier
Concerned Citizen
rsaphier@sunvalley.net

Document 26, Wayne Ross, Richland, WA
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-26

HLW EIS Web Comments

From:	HLWFDEIS Web Site
Sent:	Friday, February 18, 2000 9:29 AM
To:	web@jason.com
Cc:	web_archive@jason.com
Subject:	HLW EIS Web Comment

RECEIVED FEB 23 2000

Name: Wayne Ross
Affiliation: Private Citizen but employee of PNNL
Address1: 1955 Pine
Address2:
City, State Zip: Richland, WA 99352
Telephone: 509 372-4684
Date Entered: {ts '2000-02-18 09:29:05'}
Comment:
I have over 25 years experience dealing with HLW in the DOE complex (including the INEEL wastes) and am commenting from that perspective, but as a private citizen.

I prepared a comment a few minutes ago, but it apparently got lost in our server. I will try again with this comment.

1) Learn from the past. One of the most costly decisions make at Hanford was to shut down PUREX before it has processed all of the spent fuel. The management of that fuel is now costing the taxpayer over a $1 billion and the price will go up when it is sent to the repository. It could easily become a $2B mistake. The implications of this comment is keep the calciner running and process off all of the liquid wastes. Get them into a stable and low dispersible solid form.
26-1 III.C(1) 26-2 VII.D(6) 26-3 II.E(4)

2) Make the decision to immobilize for disposal soon. I also favor use of the Hanford future vitrification facility. The sooner the decision the easier and low cost will be the introduction of the waste into the process. I have not studied the specifics, but I suspect that there will be the opportunity to reduce the total volume of wastes if the feed streams from Hanford and INEEL are blended. Some of the constituents of the INEEL calcine (Zr for example) will increase the chemical durability of the Hanford Glass. The large volume of the Hanford waste will dilute the low solubility in glass components in the INEEL calcine (e.g. Zr again). 26-4 II.E(4)

1

Document 27, State of Oregon (Ken Niles), Portland, OR
Page 1 of 3

HLW & FD EIS PROJECT - AR/PF
Control # DC-27

Preliminary Comments of the State of Oregon
on the Idaho High-Level Waste and Facilities Disposition
Draft Environmental Impact Statement
February 22, 2000

Good evening, I am Ken Niles, Deputy Administrator of the Oregon Office of Energy's Nuclear Safety Division. We are the lead state agency for Hanford issues.

We appreciate the opportunity to provide comments to the U.S. Department of Energy and the State of Idaho on their draft Environmental Impact Statement concerning the treatment of high-level radioactive waste at the Idaho National Engineering and Environmental Laboratory. Our comments focus solely on one element of the draft EIS – the proposal to bring Idaho's high-level waste to Hanford for vitrification. Oregon is directly impacted by major activities at Hanford.

27-1 II.E(5) It is Oregon's position that it is premature to consider bringing Idaho waste to Hanford for two reasons: one, Hanford does not currently have a vitrification facility; and two, once it does, there is a pressing need to treat Hanford's waste as soon as possible. These discussions should not occur until after Hanford's waste is completely treated. Under current schedules, that means about 45 years from now.

27-2 II.E(4) We recognize the financial constraints that drive this proposal to bring Idaho waste to Hanford rather than build additional treatment facilities at Idaho. We believe it may make sense to consider this proposal at some future time. However, even then – sometime in the distant future – the State of Oregon would not consider treatment of Idaho's high-level waste at Hanford unless the following conditions were met: use this statement as a preface to each of the next 5 comments

- Idaho waste would not be treated at Hanford until all of Hanford's high-level waste is treated.
- Idaho waste would not come to Hanford until it is time for treatment.
- Upon vitrification of Idaho waste, it must then be returned to Idaho or to a national repository, if one is available. It must not remain in storage at Hanford.
- The transportation of this waste must adhere to enhanced transportation safety protocols developed by Western states for shipments to the Waste Isolation Pilot Plant.
- Oregon must be allowed to participate fully in Hanford decision-making meetings in order to assure these conditions are met.

Let me elaborate on each of these conditions.

27-3 II.E(5) 27-4 II.E(1) **Idaho waste cannot be treated at Hanford until all of Hanford's high-level waste is treated.** Hanford has 54 million gallons of high-level waste stored in 177 aging underground tanks. The waste in these tanks, along with more than one million gallons that have already leaked from failing tanks, poses a direct threat to the Columbia River. The current timetable calls for Hanford's pre-treatment and high-level vitrification facilities to be operational in 2009, but that only 10 per cent of Hanford's high-level waste will be treated by 2018. At that point, waste will still remain – waiting for treatment – in 147 of Hanford's 149 single shell tanks.

EXHIBIT #2
HLW F&D EIS
Portland, OR
February 22, 2000
Name: Ken Niles - State of Oregon

Document 26, Wayne Ross, Richland, WA
Page 1 of 1

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Sent:	Friday, February 18, 2000 9:29 AM
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I prepared a comment a few minutes ago, but it apparently got lost in our server. I will try again with this comment.

1) Learn from the past. One of the most costly decisions make at Hanford was to shut down PUREX before it has processed all of the spent fuel. The management of that fuel is now costing the taxpayer over a $1 billion and the price will go up when it is sent to the repository. It could easily become a $2B mistake. The implications of this comment is keep the calciner running and process off all of the liquid wastes. Get them into a stable and low dispersible solid form.
26-1 III.C(1) 26-2 VII.D(6) 26-3 II.E(4)

2) Make the decision to immobilize for disposal soon. I also favor use of the Hanford future vitrification facility. The sooner the decision the easier and low cost will be the introduction of the waste into the process. I have not studied the specifics, but I suspect that there will be the opportunity to reduce the total volume of wastes if the feed streams from Hanford and INEEL are blended. Some of the constituents of the INEEL calcine (Zr for example) will increase the chemical durability of the Hanford Glass. The large volume of the Hanford waste will dilute the low solubility in glass components in the INEEL calcine (e.g. Zr again). 26-4 II.E(4)

1

Document 27, State of Oregon (Ken Niles), Portland, OR
Page 1 of 3

HLW & FD EIS PROJECT - AR/PF
Control # DC-27

Preliminary Comments of the State of Oregon
on the Idaho High-Level Waste and Facilities Disposition
Draft Environmental Impact Statement
February 22, 2000

Good evening, I am Ken Niles, Deputy Administrator of the Oregon Office of Energy's Nuclear Safety Division. We are the lead state agency for Hanford issues.

We appreciate the opportunity to provide comments to the U.S. Department of Energy and the State of Idaho on their draft Environmental Impact Statement concerning the treatment of high-level radioactive waste at the Idaho National Engineering and Environmental Laboratory. Our comments focus solely on one element of the draft EIS – the proposal to bring Idaho's high-level waste to Hanford for vitrification. Oregon is directly impacted by major activities at Hanford.

27-1 II.E(5) It is Oregon's position that it is premature to consider bringing Idaho waste to Hanford for two reasons: one, Hanford does not currently have a vitrification facility; and two, once it does, there is a pressing need to treat Hanford's waste as soon as possible. These discussions should not occur until after Hanford's waste is completely treated. Under current schedules, that means about 45 years from now.

27-2 II.E(4) We recognize the financial constraints that drive this proposal to bring Idaho waste to Hanford rather than build additional treatment facilities at Idaho. We believe it may make sense to consider this proposal at some future time. However, even then – sometime in the distant future – the State of Oregon would not consider treatment of Idaho's high-level waste at Hanford unless the following conditions were met: use this statement as a preface to each of the next 5 comments

- Idaho waste would not be treated at Hanford until all of Hanford's high-level waste is treated.
- Idaho waste would not come to Hanford until it is time for treatment.
- Upon vitrification of Idaho waste, it must then be returned to Idaho or to a national repository, if one is available. It must not remain in storage at Hanford.
- The transportation of this waste must adhere to enhanced transportation safety protocols developed by Western states for shipments to the Waste Isolation Pilot Plant.
- Oregon must be allowed to participate fully in Hanford decision-making meetings in order to assure these conditions are met.

Let me elaborate on each of these conditions.

27-3 II.E(5) 27-4 II.E(1) **Idaho waste cannot be treated at Hanford until all of Hanford's high-level waste is treated.** Hanford has 54 million gallons of high-level waste stored in 177 aging underground tanks. The waste in these tanks, along with more than one million gallons that have already leaked from failing tanks, poses a direct threat to the Columbia River. The current timetable calls for Hanford's pre-treatment and high-level vitrification facilities to be operational in 2009, but that only 10 per cent of Hanford's high-level waste will be treated by 2018. At that point, waste will still remain – waiting for treatment – in 147 of Hanford's 149 single shell tanks.

EXHIBIT #2
HLW F&D EIS
Portland, OR
February 22, 2000
Name: Ken Niles - State of Oregon

By 2018, the newest of Hanford's single shell tanks will be 52 years old. The oldest tanks will be more than 70 years old. And keep in mind these were designed to have a 20 year operational life. With nearly 70 leaking tanks in the first 50 years of Hanford operations, how many more leakers should we anticipate during the next 20 years?

The double shell tanks are aging as well. By 2018, the oldest of Hanford's double shell tanks will be 47 years old. The newest Hanford tank – presuming more don't have to be built in coming years – will be 32 years old.

The U.S. Department of Energy predicts it will take until 2047 to treat all of Hanford's tank waste. By then, some of Hanford's single shell tanks will be 100 years old. The newest double shell tanks would be 61 years old. Given the age and condition of the tanks, the extent of contamination in the vadose zone and groundwater beneath the Hanford Site, and the fact that the Columbia River is at risk from this contamination, it will take a compelling argument for the State of Oregon and Oregon's residents to support treatment of Idaho's high-level waste at Hanford before all the waste has been removed from Hanford's tanks and treated. We believe that's an argument the Department of Energy can not convincingly make.

27-5 II.E(4)

Our second condition is that **Idaho waste would not be brought to Hanford until it is time for treatment.** The draft Environmental Impact Statement suggests two possible timeframes to bring waste to Hanford – beginning in 2028 or sometime thereafter – presumably after Hanford's wastes have been treated, or between 2012 and 2025, and building new storage facilities at Hanford for interim storage prior to treatment at some undesignated time. The calcined waste at Idaho is currently stored in bin sets, which are designed to safely store the waste for up to 500 years. It would be financially irresponsible to squander many millions of dollars on temporary storage facilities at Hanford, when the waste is safely stored at Idaho. Moving the waste from Idaho to Hanford between 2012 and 2025 or any time prior to actual treatment makes absolutely no sense from a scientific standpoint, from a regulatory standpoint, and most certainly not from a financial standpoint.

27-7 II.E(4)
27-8 II.E(5)
27-15 II.E(1)

Upon vitrification of Idaho waste, it must then be returned to Idaho or to a national repository, if one is available. It must not remain in storage at Hanford. Hanford already has a significant burden of waste – a burden of environmental risks from 50 years of mis-managing waste which even now we do not fully understand. The current draft Environmental Impact Statement for a national repository at Yucca Mountain offers little hope that there will be room for disposal of Hanford's vitrified high-level waste. If Yucca Mountain is not the final destination for this waste, it will be stored indefinitely in Hanford's new Canister Storage Building. That facility – impressive as it is – is not designed for permanent storage. Sometime before the end of this century, new or additional storage facilities would have to be constructed. Waste from another site should not be added to this burden.

27-9 II.E(8)
27-10 VIII.H(5)

The transportation of this waste must adhere to enhanced transportation safety protocols developed for shipments to the Waste Isolation Pilot Plant. For the past ten years, Western States, including Idaho, Oregon and Washington, have worked with the U.S. Department of Energy to develop a comprehensive transportation safety plan for the shipment of transuranic waste to the Waste Isolation Pilot Plant. This transportation program was intended as a model

for transport of other, more radioactive materials such as spent fuel and high-level waste. The transportation program developed for WIPP shipments includes a number of safety elements that go well beyond the minimum legal requirements, such as higher driver and carrier standards, bad weather protocols, shipment tracking, and enhanced truck inspections. High-level waste moved from Idaho to Hanford – and then back again – would travel through about 200 miles of northeast Oregon. The State of Oregon could not support any proposal to treat Idaho waste at Hanford unless the enhanced transportation safety program was used for all of these shipments.

27-11 IX.C(5)
27-12 VII.A(2)

Oregon must be allowed to participate fully in Hanford decision-making meetings in order to assure these conditions are met. The environmental hazards presented by Hanford do not recognize state boundaries. The State of Oregon and its residents are at risk from Hanford, and the state should have every opportunity to influence the decisions that are made that affect Hanford cleanup.

Any proposal which is not consistent with the five conditions we have outlined here is one which the State of Oregon cannot accept.

Again, we appreciate the opportunity to provide comments on the draft Environmental Impact Statement. We will submit more detailed comments in writing prior to the end of the comment deadline. We look forward to seeing how our comments are considered.

Document 28, Dennis Donnelly, Pocatello, ID
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-28

Dennis Donnelly
56 Tulane Avenue
Pocatello ID 83201

RECEIVED FEB 14 2000

Feb 9, 2000

Mr. Hitesh Nigam
Environmental Protection Specialist
Office of NEPA Oversight (EH-25)
1000 Independence Avenue SW
Washington, DC 20585

Dear Mr. Nigam,

I enjoyed meeting you at the Pocatello comment meeting for the high-level waste EIS.

Given the short time to the next meeting in this area(March 2 at Fort Hall) I would like to request your help in finding answers to the following questions that I have on the subject. Please understand that I have not yet received the document for review.

28-1 VIII.H(2) 28-2 III.F.2(2) 1. What are the waste form requirements for (a.) Transport and (b) disposal of the high-level waste materials being addressed by this Environmental Impact Statement? I don't want any vague answers here. If the requirements are not yet defined, I want to know that too.

28-3 III.F.2(2) 2. What are the repository requirements, and possible locations that meet these requirements, for the high-level waste materials being addressed by this Environmental Impact Statement?

28-4 III.F.2(5) 3. What about all those defunct reactor cores at INEL? Are they not high-level waste also?

28-5 V(11)

To follow up on George Woods' question at the meeting, which did not get answered, I have the following additional question:

28-6 VIII.C(1) 4. What is the amount of water which would dilute the high level wastes addressed by this EIS to a level which meets current EPA Maximum Permissible Concentrations for drinking water? Please consider both chemical and radiological toxicity, and compare to the amount of water in the Snake River Plain aquifer. 28-7 VIII.C(1)

I look forward to your answers in time to prepare for the March 2 meeting.

Sincerely,

Dennis Donnelly

Dennis Donnelly

(donnelly@poky.srv.net)

Document 29, U.S. Department of Transportation (Anthony J. Ossi), Washington, D.C.
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-29

U.S. Department of Transportation
Federal Transit Administration

400 Seventh St., S.W.
Washington, D.C. 20590

RECEIVED FEB 14 2000

February 7, 2000

Ms. Carol M. Borgstrom
Director
Office of NEPA Policy and Assistance, EH-42
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585

Dear Ms. Borgstrom:

29-1 IX.B(2) The Federal Transit Administration has received a copy of the draft environmental impact statement for the Idaho High-Level Waste and Facilities Disposition. I am returning the documents to your agency's document manager in the Idaho Operations Office. The U.S. Department of Energy (DOE) should send an unsolicited copy of an EIS to FTA only if:

1. FTA has participated substantively in the scoping process for the document; or

2. There are specific transit issues associated with the project about which you are requesting FTA comment.

If you have any questions, my phone number is (202)366-0096. Thank you.

Sincerely,

Anthony J. Ossi, Jr.
Environmental Planner

cc: T.L. Wichmann
DOE Document Manager

Document 28, Dennis Donnelly, Pocatello, ID
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-28

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56 Tulane Avenue
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Document 29, U.S. Department of Transportation (Anthony J. Ossi), Washington, D.C.
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
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Environmental Planner

cc: T.L. Wichmann
DOE Document Manager

HLW & FD

Idaho High-level Waste and Facilities Disposition
Draft Environmental Impact Statement
U.S. Department of Energy Idaho Operations Office

EIS PROJECT - AR/PF
Control # DC-30

Written Comment Form
Must be postmarked or dated by March 20, 2000

February 18, 2000

Thomas L. Wichmann
DOE Idaho
ATTN: EIS Public Comment

RECEIVED
FEB 28 2000

Dear Mr. Wichmann,

30-1 IX.C (4) Thank you for holding the meeting in Jackson on February 9th. It helped clarify a complex problem.

After reading and considering your information I believe that the method of disposal should be the Direct Cement Waste Option which would 30-2 II.A.2.b (1) solidify the waste without moving it, but rather store in the stainless steel bins already placed 60 ft. below ground and transport new liquid waste to WIPP.

Since INEEL will continue to operate for some years, I think the alternative for closure should be 30-3 IV.C (1) Closure to Landfill Standards in accordance with state and federal requirements. In summary is:

1. The Direct Cement Waste Option
2. Closure to Landfill Standards . . .

Sincerely,

Mrs. Joyce E. Batezel
PO Box 513 Moose, WY 83012

Written comment forms may be faxed to:
Thomas L. Wichmann
EIS Document Manager
208-526-1184

Written comment forms may be mailed to:
Thomas L. Wichmann
EIS Document Manager
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

Or send comments via the internet at: http://www.jason.com/hlwfdeis

HLW & FD

EIS PROJECT - AR/PF
Control # DC-31

TRIDEC
TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL

901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

RECEIVED
FEB 28 2000

STATEMENT PREPARED FOR
DEPARTMENT OF ENERGY PUBLIC HEARING
ON DRAFT EIS REGARDING
IDAHO HIGH LEVEL WASTE AND FACILITIES DISPOSITION
PASCO, WASHINGTON
FEBRUARY 24, 2000

The Tri-City Industrial Development Council (TRIDEC) is composed of over 350 dues paying individuals, organizations, and firms having an interest in the economic vitality and growth of the Tri-Cities area. We have been designated by the Department of Energy as the "one voice" spokesman for the Tri-Cities on economic development issues. We have a consistent record of interest in and support for the expeditious cleanup and restoration of the Hanford site and the utilization of site for economic diversification. We appreciate the opportunity to present the views of our organization on this draft EIS.

31-1 II.E(5) The possible utilization of the Hanford Waste Vitrification Plant for the processing of high level fuel processing wastes at Hanford could have a significant impact on the Hanford cleanup program. Based on currently available preliminary information, the use of the Hanford vitrification plant for processing and vitrification of the Idaho high level wastes would provide 31-2 II.E(4) significant cost savings to the Department of Energy over other realistic alternatives. The environmental impacts of this alternative appear to be equivalent or less than those of the other 31-3 II.E(4) alternatives.

However, this alternative has not been studied in sufficient depth to support a firm position for or against this alternative at this time. If the use of the Hanford vitrification plant for the processing 31-4 VII.A(2) of the Idaho High Level Wastes is to be considered further a more detailed Environmental Impact Analysis of this alternative must be prepared and reviewed by the public including the State of Washington agencies having an interest in this subject. In the preparations of this analysis there are several considerations which must be included in the evaluation.

31-5 II.E(2)
- The Hanford Waste Vitrification Plant must be adequately funded, completed, and in full operation before any consideration can be given to the processing of off site wastes.

31-7 II.E(5)
- The processing of Idaho wastes cannot delay or interfere with the planned or accelerated processing of Hanford wastes.

31-8 VIII.1(2)
- Consideration must be given to the impact that additions to the plant will have on local governmental services, police, fire, roads, schools, etc.

EXHIBIT #2
HLW F&D EIS
Pasco, WA
February 24, 2000
Name: Harold Heacock

HLW & FD

Idaho High-level Waste and Facilities Disposition
Draft Environmental Impact Statement
U.S. Department of Energy Idaho Operations Office

EIS PROJECT - AR/PF
Control # DC-30

Written Comment Form
Must be postmarked or dated by March 20, 2000

February 18, 2000

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ATTN: EIS Public Comment

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HLW & FD

EIS PROJECT - AR/PF
Control # DC-31

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TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL

901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

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FEB 28 2000

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ON DRAFT EIS REGARDING
IDAHO HIGH LEVEL WASTE AND FACILITIES DISPOSITION
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EXHIBIT #2
HLW F&D EIS
Pasco, WA
February 24, 2000
Name: Harold Heacock

Document 31, Tri-City Industrial Development Council (Harold Heacock), Kennewick, WA
Page 2 of 2

31-9 II.E(6)
- Any offsite wastes which are processed or vitrified in the plant must be returned to the sender or to a national repository. Interim or permanent disposal of the wastes at Hanford is not acceptable.

31-10 II.E(3)
- Full funding for all transportation, processing, and storage costs must be provided as an added increment to Hanford Environmental Management funding.

31-11 VIII.H(3)
- Consideration must be given to local environmental impacts resulting from the transportation and processing of the Idaho wastes.

31-12 VIII.H(3)
- Offsite transportation corridor safety, environmental impacts, and traffic issues must be thoroughly reviewed in cooperation with local and tribal governments. Provision must be made to alleviate any additional costs which may be incurred by local and state government agencies.

31-13 II.E(3)

31-14 II.E(4)
We believe that these issues are reasonable requirements that provide a bottom line basis for evaluation at the importation of high level wastes to Hanford for processing and vitrification. In view of the potential significant savings from the Hanford alternative that would accrue to the Department as compared to other feasible alternatives, this alternative should be given a more comprehensive evaluation than is currently available.

Thank you for the opportunity to present our views on this subject.

2

Document 32, U.S. Department of Commerce (Susan B. Fruchter), Washington, D.C.
Page 1 of 2

Feb 28 00 11:10a EH-421 202 586-7031 p.2

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230
HLW & FD

EIS PROJECT - (AR)PF
Control # DC-32

February 16, 2000

Ms. Carol M. Borgstrom, Director
Office of NEPA Policy and Assistance
Department of Energy
Washington, DC 20585

Dear Ms. Borgstrom:

Enclosed are comments on the Draft Environmental Impact Statement for Idaho High-Level Waste and Facilities Disposition Boise, Idaho. We hope our comments can assist you. Thank you for giving us an opportunity to review this document.

Sincerely,

Susan Fruchter

Susan B. Fruchter
Acting NEPA Coordinator

Enclosure

FEB 23 2000

EH-42

Printed on Recycled Paper

Document 31, Tri-City Industrial Development Council (Harold Heacock), Kennewick, WA
Page 2 of 2

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2

Document 32, U.S. Department of Commerce (Susan B. Fruchter), Washington, D.C.
Page 1 of 2

Feb 28 00 11:10a EH-421 202 586-7031 p.2

UNITED STATES DEPARTMENT OF COMMERCE
Office of the Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230
HLW & FD

EIS PROJECT - (AR)PF
Control # DC-32

February 16, 2000

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Office of NEPA Policy and Assistance
Department of Energy
Washington, DC 20585

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Sincerely,

Susan Fruchter

Susan B. Fruchter
Acting NEPA Coordinator

Enclosure

FEB 23 2000

EH-42

Printed on Recycled Paper

MEMORANDUM FOR: Susan B. Fruchter
Acting NEPA Coordinator

FROM: Charles W. Challstrom
Acting Director, National Geodetic Survey

SUBJECT: DEIS-0002-01 Idaho High-Level Waste and Facilities Disposition, Boise, Idaho

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise and in terms of the impact of the proposed actions on NGS activities and projects.

32-1 VIII.F(1) All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: http://www.ngs.noaa.gov. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheet." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

32-2 VIII.F(1) If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact Rick Yorczyk; SSMC3 8636, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3230 x142; fax: 301-713-4175.

3

W. Brad DeBow
2238 West 1000 South
Rexburg, Idaho 83440-3754

RECEIVED
FEB 29 2000

February 25, 2000

HLW & FD

Attn: Idaho HLW & FD EIS
c/o: T. L. Wichmann, Document Director
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, Mail Stop: 1108
Idaho Falls, Idaho 83401-1563

EIS PROJECT - (AR) FF
Control # DC -33

Dear Sir:

I would like to submit the following comment on the Idaho HLW & FD EIS. This comment applies to the selection of a final option that both the State of Idaho and the DOE can agree on, and to three of the alternatives listed in the EIS that will be able to gain this joint agreement if my comment on the upgrade of the NWCF Calciner is accepted. The

33-1 VII.D (4) three options to which I wish to comment are the Separations Alternative Planning Basis Option, the Non-Separations Alternative Hot Isostatic Pressed Option, and the Non-Separations Alternative Direct Cement Waste Option.

These three options all involve pre-treatment of the liquid tank farm waste with the NWCF Calciner. This pre-treatment is the only way that the Settlement Agreement requirement of having the Sodium Bearing Waste (SBW) removed from the tank farm by 2012 has a chance of being met. It is my opinion and my input to this process that this portion of the Settlement Agreement must be complied with whichever option is finally selected. The

33-2 III.D.1(b) liquid waste is by far the most hazardous of the various forms of waste and the State of Idaho was correct in insisting this form be eliminated by the soonest possible date, which is 2012. As a citizen of the area near where that liquid waste is stored, I cannot emphasize enough my comment that the 2012 date previously agreed to in a court ordered Settlement Agreement with the State of Idaho must be complied with.

33-3 III.C (8) It appears to me that this EIS process is being used as a vehicle to abrogate the Settlement Agreement with the State of Idaho. Specifically, it appears that the compliance with the 2012 date for the conversion of the liquid waste to a solid form is at risk. The EIS states that it would be difficult to stop using the tank farm by 2012. Oddly enough, the State of Idaho itself seems responsible for this attempted abrogation of responsibility through its insistence on the requirement to permit and MACT upgrade the Calciner. This permit and upgrade step is written in to every option in which the Calciner would be used to pre-treat

33-4 X (5) the liquid waste. The cost, in both dollars and more importantly time, to accomplish the MACT upgrade on the Calciner is not acceptable. The options that involve running the Calciner must be considered without the permit and MACT upgrade aspects. This would

33-5 III.C (8) allow the Calciner to continue operation after June 1, 2000 and accomplish the most critical aspect of the Settlement Agreement, the elimination of the liquid SBW by 2012.

MEMORANDUM FOR: Susan B. Fruchter
Acting NEPA Coordinator

FROM: Charles W. Challstrom
Acting Director, National Geodetic Survey

SUBJECT: DEIS-0002-01 Idaho High-Level Waste and Facilities Disposition, Boise, Idaho

The subject statement has been reviewed within the areas of the National Geodetic Survey's (NGS) responsibility and expertise and in terms of the impact of the proposed actions on NGS activities and projects.

32-1 VIII.F(1) All available geodetic control information about horizontal and vertical geodetic control monuments in the subject area is contained on the NGS home page at the following Internet World Wide Web address: http://www.ngs.noaa.gov. After entering the NGS home page, please access the topic "Products and Services" and then access the menu item "Data Sheet." This menu item will allow you to directly access geodetic control monument information from the NGS data base for the subject area project. This information should be reviewed for identifying the location and designation of any geodetic control monuments that may be affected by the proposed project.

32-2 VIII.F(1) If there are any planned activities which will disturb or destroy these monuments, NGS requires not less than 90 days' notification in advance of such activities in order to plan for their relocation. NGS recommends that funding for this project includes the cost of any relocation(s) required.

For further information about these monuments, please contact Rick Yorczyk; SSMC3 8636, NOAA, N/NGS; 1315 East West Highway; Silver Spring, Maryland 20910; telephone: 301-713-3230 x142; fax: 301-713-4175.

3

W. Brad DeBow
2238 West 1000 South
Rexburg, Idaho 83440-3754

RECEIVED
FEB 29 2000

February 25, 2000

HLW & FD

Attn: Idaho HLW & FD EIS
c/o: T. L. Wichmann, Document Director
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, Mail Stop: 1108
Idaho Falls, Idaho 83401-1563

EIS PROJECT - (AR) FF
Control # DC -33

Dear Sir:

I would like to submit the following comment on the Idaho HLW & FD EIS. This comment applies to the selection of a final option that both the State of Idaho and the DOE can agree on, and to three of the alternatives listed in the EIS that will be able to gain this joint agreement if my comment on the upgrade of the NWCF Calciner is accepted. The

33-1 VII.D (4) three options to which I wish to comment are the Separations Alternative Planning Basis Option, the Non-Separations Alternative Hot Isostatic Pressed Option, and the Non-Separations Alternative Direct Cement Waste Option.

These three options all involve pre-treatment of the liquid tank farm waste with the NWCF Calciner. This pre-treatment is the only way that the Settlement Agreement requirement of having the Sodium Bearing Waste (SBW) removed from the tank farm by 2012 has a chance of being met. It is my opinion and my input to this process that this portion of the Settlement Agreement must be complied with whichever option is finally selected. The

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33-5 III.C (8) allow the Calciner to continue operation after June 1, 2000 and accomplish the most critical aspect of the Settlement Agreement, the elimination of the liquid SBW by 2012.

The State of Idaho is telling the DOE on one hand that the liquid SBW must be solidified by 2012, and on the other hand that the only method of accomplishing that feat, the use of the Calciner, must be halted by June 1, 2000 because of emission requirements. I do not consider this acceptable behavior on the part of my State elected representatives, and so inform them by copy of this letter. The Calciner has operated for a number of years without a MACT upgrade and is perfectly capable of completing its mission without impacting the environment. 33-6 III.C(10)

Instead of using this EIS as a vehicle to abrogate the requirement to solidify the liquid waste by 2012, DOE should instead be confronting the issue directly with the State of Idaho. The Calciner is not an incinerator, by EPA's or any other definition of the word. I have looked at 40 CFR Part 60, et al. NESHAPS Standards, and have two conclusions. The Calciner does not fit the EPA definition of a Hazardous Waste Combustor, and the emissions requirements would accomplish nothing meaningful in the desert environment where the Calciner is located. On the other hand, the solidification of the liquid SBW waste by 2012 through the operation of the Calciner through this period would greatly reduce the risk to the subterranean environment. It is a shame our State bureaucrats seem unable to grasp these simple facts. 33-7 VII.O(2) 33-8 III.C(5) 33-9 III.A(1)

To elaborate on one area of the NESHAPS Standards the State bureaucrats are attempting to impose on the Calciner, on page 52832 of this document, the MACT rules are established for three source categories, namely: Hazardous waste burning incinerators, hazardous waste burning cement kilns, and hazardous waste burning lightweight aggregate kilns. These three source categories are referred to collectively as hazardous waste combustors in the EPA regulations. The NWCF Calciner fits none of these categories. It is not a combustor, it is a Calciner. The Calciner is a much higher technology facility than the commercial waste combustors that may be put up by commercial industries and utilities. A reading of the EPA regulations makes it very clear they were directed an the low technology units put up by commercial industrial plants and city utilities. 33-10 III.C(5)

To further support these facts, I would like to reference you to an EPA document. EPA530-R-97-057 PB98-108 129, November, 1997 is a Hotline Training Module for EPA hotline phone specialists on incineration regulations and definitions. In this document, incineration is defined as a technology to destroy hazardous waste. the Calciner certainly does not destroy the waste, but converts it from liquid to solid state. 33-11 III.C(5)

Another EPA document defining incinerators is the Final Technical Support Document for HWC MACT Standards, July, 1999. This document has a detailed description of incinerators that is very clear does not include the NWCF Calciner process. As an example, in its definition of a fluidized bed incinerator it describes how the bed media acts to scrub the waste particles, exposing fresh surface by the abrasion process which encourages rapid combustion of the waste. The Calciner process can be described as the opposite of that, where the waste particles are encouraged to adhere to the bed material and are not combusted, but carried off as waste transformed from liquid to solid. 33-12 III.C(5)

The DOE must face this problem directly with the State and obtain concurrence for the continued operation of the Calciner beyond June 1, 2000. 33-13 III.C(1)

Very truly yours,

W. Brad DeBow

HLW & FD EIS PROJECT - AR/PF
Control # DC-34

TRIDEC TRI-CITY INDUSTRIAL DEVELOPMENT COUNCIL

901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

February 28, 2000

Mr. Thomas L. Wichmann, Document Manager
U.S. DOE, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

Public Comments Regarding
Idaho HLW & FD EIS

Dear Mr. Wichmann:

We are submitting herewith a copy of our testimony which was presented at the February 24, 2000 public hearing in Pasco, WA. This submittal is for record purposes and contains several minor editorial corrections from the public comments.

Very truly yours,

Sam Volpentest
Executive Vice President

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W. Brad DeBow

HLW & FD EIS PROJECT - AR/PF
Control # DC-34

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901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

February 28, 2000

Mr. Thomas L. Wichmann, Document Manager
U.S. DOE, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

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Idaho HLW & FD EIS

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We are submitting herewith a copy of our testimony which was presented at the February 24, 2000 public hearing in Pasco, WA. This submittal is for record purposes and contains several minor editorial corrections from the public comments.

Very truly yours,

Sam Volpentest
Executive Vice President

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901 N. Colorado, Kennewick, WA 99336-7685 USA 1-800-TRI-CITY 509-735-1000 509-735-6609 fax tridec@owt.com www.owt.com/tridec/

STATEMENT PREPARED FOR
DEPARTMENT OF ENERGY PUBLIC HEARING
ON DRAFT EIS REGARDING
IDAHO HIGH LEVEL WASTE AND FACILITIES DISPOSITION
PASCO, WASHINGTON
FEBRUARY 24, 2000

The Tri-City Industrial Development Council (TRIDEC) is composed of over 350 dues paying individuals, organizations, and firms having an interest in the economic vitality and growth of the Tri-Cities area. We have been designated by the Department of Energy as the "one voice" spokesman for the Tri-Cities on economic development issues. We have a consistent record of interest in and support for the expeditious cleanup and restoration of the Hanford site and the utilization of site for economic diversification. We appreciate the opportunity to present the views of our organization on this draft EIS.

34-1 II.E(5) The possible utilization of the Hanford Waste Vitrification Plant for the processing of high level fuel processing wastes at Hanford could have a significant impact on the Hanford cleanup program. 34-2 II.E(4) Based on currently available preliminary information, the use of the Hanford vitrification plant for processing and vitrification of the Idaho high level wastes would provide significant cost savings to the Department of Energy over other realistic alternatives. 34-3 II.E(4) The environmental impacts of this alternative appear to be equivalent to or less than those of the other alternatives.

34-4 VII.A(2) However, this alternative has not been studied in sufficient depth to support a firm position for or against it at this time. If the use of the Hanford vitrification plant for the processing of the Idaho High Level Wastes is to be considered further a more detailed Environmental Impact Analysis of this alternative must be prepared and reviewed by the public including the State of Washington agencies having an interest in this subject. In the preparation of this analysis there are several considerations which must be included in the evaluation.

- 34-5 II.E(2) The Hanford Waste Vitrification Plant must be adequately funded, completed, and in full operation before any consideration can be given to the processing of off site wastes.
- 34-7 II.E(5) The processing of Idaho wastes cannot delay or interfere with the planned or accelerated processing of Hanford wastes.
- 34-8 VIII.I (2) Consideration must be given to the impact that additions to the plant will have on local governmental services, police, fire, roads, schools, etc..

- 34-9 II.E(6) Any offsite wastes which are processed or vitrified in the plant must be returned to the sender or to a national repository. Interim or permanent disposal of the wastes at Hanford is not acceptable.
- 34-10 II.E(3) Full funding for all transportation, processing, and storage costs must be provided as an added increment to Hanford Environmental Management program funding.
- 34-11 VIII.H(3) Consideration must be given to local environmental impacts resulting from the transportation and processing of the Idaho wastes.
- 34-12 VIII.H(3) Offsite transportation corridor safety, environmental impacts, and traffic issues must be thoroughly reviewed in cooperation with local and tribal governments. Provision must be made to alleviate any additional costs which may be incurred by local and state government agencies.

34-13 II.E(3) We believe that these issues are reasonable requirements and provide a bottom line basis for evaluation of the importation of high level wastes to Hanford for processing and vitrification. 34-14 II.E(4) In view of the potential significant savings from the Hanford alternative, that would accrue to the Department, as compared to other feasible alternatives, this alternative should be given a more comprehensive evaluation than is currently available.

Thank you for the opportunity to present our views on this subject.

2

HLW & FD EIS PROJECT - ~~AR~~ PF
Control # DC-35

UNITED STATES DEPARTMENT OF ENERGY
PUBLIC COMMENT HEARING ON
IDAHO HIGH-LEVEL WASTE
AND FACILITIES DISPOSITION
DRAFT ENVIRONMENTAL IMPACT STATEMENT

MONDAY, FEBRUARY 7, 2000

SHILO INN
IDAHO FALLS, IDAHO

Reported by:
Kimberly Carpenter, CSR #600

EASTERN IDAHO COURT REPORTERS
P. O. Box 50853
Idaho Falls, ID 83405
(208) 529-0222

understand that it's so we can get your comments on the record.

Okay. I think we're ready now to begin the formal comment portion of this evening's proceeding. I want to stress that this is a formal hearing and a recorded proceeding and a full transcript is being prepared.

And, finally, I want to take the time to thank you for attending the hearing and indulging me in the little rules we've got to help this thing proceed in an orderly fashion.

Our first speaker is Georgia Dixon.

And Ms. Dixon will be followed by Susan Hobbs.

MS. GEORGIA DIXON: My name is Georgia Dixon, G-E-O-R-G-I-A, D-I-X-O-N. I am the district assistant for United States Senator Larry Craig.

And I would like to read just a brief statement from Senator Craig. He is also -- he also serves on the Energy Committee of the United States Senate and will have other opportunity to speak further to this issue.

The Department of Energy in Idaho has managed dry granular calcined mixed high-level

waste in above-ground storage tanks and liquid mixed transuranic waste in tanks below the ground according to regulatory requirements for many years. With the agreement made between the State of Idaho and the Department of Energy, this waste will be treated for transportation in the highest and most safely effective way possible.

This Draft Environmental Impact Statement analyzes five waste treatment alternatives that span the years between the years 2000 and 2035. It also analyzes six facilities disposition alternatives.

35-1 IX.A(2)

I am very impressed with the reliability and the readability of this document. It is unusual for a Draft Environmental Impact Statement to be a document that is user-friendly. I must congratulate the project staff for their efforts to provide scientific information in a manner that the general public can understand.

It is important to know that the decisions made from this document and the public input will determine how DOE will treat the great amount of radioactive and hazardous material for shipment out of Idaho. I encourage all Idahoans

to review this DEIS and send their comments to the DOE by the deadline of March 20, 2000.

Thank you.

THE FACILITATOR: Thank you for your comments, Ms. Dixon. Thank you.

Just briefly, before Ms. Hobbs comes up -- after Ms. Hobbs will be Laurel Hall -- I have a couple housekeeping items.

As the hearing officer, I introduced as Exhibit No. 1 in this evening's proceeding the Federal Register Notice, notifying the public of the meeting.

I have also introduced, as Exhibit No. 2, the talking points from Mr. Wichmann. And those are Exhibits 1 and 2.

Exhibit 3 will be a one-page letter from Senator Larry Craig dated February 7.

Sorry for the interruption. Please proceed.

MS. SUZANNE HOBBS: My name is Suzanne Hobbs, S-U-Z-A-N-N-E, H-O-B-B-S. I'm the regional director for United States Senator Mike Crapo here in Idaho Falls. Mailing address is 490 Memorial Drive, Suite 102.

Mike Crapo wrote: I appreciate the

opportunity to provide input on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement and regret that I could not be here in person.

As a lifelong Idahoan, I am a strong supporter of the people and programs at the INEEL. The INEEL has served the nation and contributed to the enhancement of Idaho for more than 50 years, and continues to do so today and will continue to do so in the future.

Although the INEEL has been and continues to be an asset to the nation and Idaho, the environmental legacy of Cold War weapons production in the INEEL missions has left 4,200 cubic meters of mixed high-level waste calcine and 1.4 million gallons of liquid mixed transuranic sodium-bearing waste. This high-level waste must be safely disposed of so that future generations are not burdened by this legacy.

The process established by the National Environmental Policy Act includes an environmental impact statement as the method of ensuring that federal decisions that could significantly affect the quality of the

environment are made considering all the facts. Paramount in this process are considerations of the environment and public and worker health and safely.

This public comment period allows input to the decision-making process prior to initiation of major federal actions. As a step forward in cleaning up the waste in Idaho, the 1995 Settlement Agreement between the State of Idaho and the Departments of Energy and Navy identifies milestones that must be met for treatments and removal of the waste from Idaho.

I am a strong supporter of the 1995 Settlement Agreement and will do all that I can to ensure that the Department of Energy continues to meet its obligations to clean up the Cold War legacy at the INEEL. To date, all portions of the agreement have been met.

This Draft EIS discusses actions that feed directly into meeting the milestones to complete calcine-issued sodium-bearing and liquid high-level waste by December 31, 2012, and to complete the treatments of all high-level waste so it is ready to be moved out of Idaho by December 31, 2035.

Some of the waste processing alternatives, if chosen, would not meet all aspects of the Settlement Agreement. The Draft EIS states that two of the alternatives will not meet the 2035 milestone for having high-level waste ready for shipment out of Idaho.

One of these two is the no-action alternative, which is required to be investigated to provide a baseline for the NEPA process. In addition, the Draft EIS states that it may be difficult to have all of the waste out of the underground storage tanks and cease using them by 2012 for seven of the alternatives.

3501-1
VII.D(6)

I am a supporter of the Settlement Agreement and encourage the State and the Department of Energy to choose an alternative that meets the milestones in the court-enforceable agreement.

I also want to encourage all Idahoans to review the Draft EIS and participate ir the public comment period. Public comment is an important part of the federal agency's decision-making process and is one of the factors that will be considered when choosing a course of action.

Sincerely, Michael D. Crapo, United States Senator.

THE FACILITATOR: Thank you for your comments.

Ms. Hall.

Exhibit 4 will be a two-page document, letter from Senator Mike Crapo.

MS. LAUREL HALL: My name is Laurel Hall, L-A-U-R-E-L, Hall, H-A-L-L. I represent Representative Mike Simpson. I am the director of his United Resources INEEL Issues.

Statement by Representative Mike Simpson: The U.S. Department of Energy has some important decisions to make regarding management of high-level waste and mixed transuranic waste now stored at the Idaho National Engineering and Environmental Laboratory.

High-level waste management is a complex, technical subject, and it is important for Idahoans to understand that these decisions will determine how DOE will treat large amounts of radioactive and hazardous material stored over the Snake River Plain aquifer and how DOE will close contaminated facilities when they are no longer needed.

The Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement that DOE-Idaho has just issued for public review and comment is the critical first step in this decision-making process. While it is not a decision document itself, it provides the scientific information about the potential impacts to the environmental of various management alternatives that DOE is considering.

The document gives Idahoans the opportunity to study these environmental issues, compare the impacts of different actions and to make their voices heard under the National Environmental Policy Act.

The DOE project staff have obviously worked hard to convey technical information in a manner that -- manner that the general public can understand. I encourage all Idaho citizens to review the EIS and send their comments on to the Department of Energy.

3502-1 IX.A(2)

Public comment is a very important process that is provided for the public to give input. It is very important that we, as Idahoans, give our public comments, and that it should help and will help DOE in determining and

considering their choice of action.

Thank you.

THE FACILITATOR: Thank you for your comments.

Mr. Siemer is next, Darryl Siemer, followed by Joe Marantette.

If I've got the last name pronounced wrong, forgive me.

MR. DARRYL SIEMER: Name is Darryl Siemer, D-A-R-R-Y-L, S-I-E-M-E-R. Address, 12 North 3167 East, Idaho Falls.

Three minutes. I'm a technical guy. I've worked in high-level waste. I've worked in reprocessing. I've worked in quite a number of areas at the Site for quite a long time.

THE FACILITATOR: Mr. Siemer --

MR. DARRYL SIEMER: Yes?

THE FACILITATOR: -- if you stray too far from the microphone, we can't hear you.

MR. DARRYL SIEMER: Our mission is very simple. The State quite wisely asked and got DOE to agree to do two things. One is to finish calcining the liquid waste and convert it to a dry powder, add it to the other calcine, and then to convert all of these calcines into road-ready

3503-1 VII.D(6)

waste forms. That's our mission, very simple and straightforward.

The basic reason for this is that INEL is a lousy repository site. This is not the place we should be leaving large amounts of waste, whether it's radioactive or toxic. And we do need to close the loop on the nuclear fuel cycle. We can do that here.

This EIS is a document that is supposed to explain what the alternatives are and to be a document that guides decision-makers in making decisions.

How should we be doing this mission that we've been given?

One is, of course, we should obey the law. And the law is really pretty straightforward. Now, the law is different than the assumptions that are generally used when people make decisions in the DOE complex. Decisions are made based on DOE policy, not so much on the law.

And, of course, we should do it efficiently, because one of the impacts that we have is to the taxpayer, and we have tremendous impacts to the taxpayer.

3503-2 III.F.2(5)
3503-3 I(2)
3503-4 VII.A(3)
3503-5 III.F.2(1)
3503-6 III.E(2)

How can we do this more efficiently? Well, we can follow the example that Great Britain did. Great Britain faced the same problem we did and solved the same problem we did. And now, if you're familiar with BNFL -- big company -- it's over here taking jobs from us.

How did it solve its historic reprocessing waste problem?

With cements. That's how it did it. Very successfully. Now it's over here.

Why do we have all of these options up here to do something as simple as turn a pile of sand into rock?

Well, it's because there are certain assumptions under the way that we approach problems like this. One --

One minute. Technical. One minute.

One is that vitrification is the only way that high-level waste can be treated. That's not true. Another is that volume is the characteristic of waste that is most difficult to deal with. And that is not true either. Those options make both of those assumptions -- both of those assumptions are wrong.

3503-7 III.D.1(4)
3503-8 III.D.2.c(4)
3503-9 III.D.2.c(4)

I guess my time is about up, so I will give you these.

THE FACILITATOR: Thank you, Mr. Siemer. You still have a few moments, if you want to take them.

I would remind folks that written comments can be as long as you want. So, we're not limiting in any way your ability to put in the record your comments and concerns, we're just limiting the oral comment period here.

Joe Marantette is next -- and I have a question mark by Joe's name, suggesting he may or may not want to comment -- followed by Lowell Jobe.

MR. LOWELL JOBE: Jobe.

THE FACILITATOR: Jobe.

While Mr. Jobe's coming up, I will identify for the record Exhibit 5, statement by Representative Simpson's staff.

And then I have Exhibit 6, which is several multi-page documents entitled, "Comments on Draft INEEL HLW-EIS, Idaho High-Level Waste and Facilities Disposition, to Tom Wichmann and Ann Dold from Darryl Siemer." And that will be Exhibit 6.

MR. LOWELL JOBE: My name is Lowell Jobe, L-O-W-E-L-L, J-O-B-E. And I'm representing Coalition 21.

My comments with regard to this, the first one, seems to be partially, at least, solved when I got here tonight and find that the cost summary is on the table out there to be seen.

But the purpose of an EIS doesn't have to include the effective costs; however, cost-effective comparisons of the various alternatives is or should be a major factor in the public's, and also the DOE's, evaluations and decisions. Environmental concerns are important, but they are not the only important factors that determine the best interests of our United States.

3504-1 X(2)

Therefore, we, the public, need to know when the cost and evaluations will be available. And, hopefully, somebody can tell us when we might expect to receive them. Now, such information could very possibly narrow down the alternatives worth considering.

The second point is, we are not totally convinced that DOE supplied the National Resource

3504-2 X1(3)

Council Committee on INEEL with the sufficient data for them to arrive at a more definitive evaluation of all these different alternatives for handling this high-level waste.

To meet the Idaho Settlement's deadline, it is easy to postpone decisions and actions while waiting for better information, such as the NRC requested, but such postponement does not get things done. And it does sound as though DOE is trying here to expedite those.

3504-6 VII.D(1)

Third, we support the State of Idaho's view that DOE's current method of calculating the metric tons of heavy metal should be changed to either of the State's proposed methods to allow the DOE high-level waste to be within the proposed repository's space allotment.

3504-3 III.F.2(1)

Fourth, DOE should freeze the Waste Acceptance Criteria without waiting for details of the repositories. This would allow expediting a decision on INEEL waste handling by eliminating any bureaucratic procrastination.

3504-4 III.F.2(2)

And, fifth, greater DOE emphasis on public comment, input, should really be given tc recommendations and comments from the Citizen's Advisory Board, who are selected to represent a

3504-5 VII.A(1)

real cross-section of the public and who intensively study the issues before making consensus recommendations. Those of the public who make comments have an obligation to really study the issues and facts first, and base their comments on those, rather than any emotions.

And so, with that, I'll just say that this is only the preliminary comments, and we will have further ones in writing.

THE FACILITATOR: Thank you for your comments.

MR. LOWELL JOBE: And I'll leave you this.

THE FACILITATOR: Thank you, sir. All right.

Well, as Exhibit No. 6, a one-page document from Coalition 21 letterhead.

John Tanner is next, followed by Don Beckman.

Did I say Exhibit 6? I meant Exhibit 7.

MR. JOHN TANNER: John Tanner, J-O-H-N, T-A-N-N-E-R, from Idaho Falls, retired INEL employee.

I accept the statements made earlier that any of the methods chosen to deal with our

3505-1 III.D.1(1)

high-level waste should not have significant environmental effects, with exception, of course, of the no-action alternative, where it would be very sloppy, to say the least, to leave the liquid waste in the tank until they finally, someday, leak. And, also, having worked at the INEL, I believe there would be no more risk to workers from any of the methods than from any of the better industries around the country.

But I would like to give added encouragement to reasonable -- to calculating metric tons of heavy metal based on amount of radioactivity, rather than on waste volume. And the reason that this is more sensible is that it's amount of radioactivity that determines heat load, and heat load, in turn, limits -- is the limiting factor for packing density inside the repository.

And the practical importance of this is that some important methods are, more or less, being ruled out on the basis of disposal costs because of -- they entail a higher volume, waste volume. And I'm talking specifically about the suggestion to grout the calcine instead of doing a separations method or instead of vitrifying

3505-2 III.F.2(1)

3505-3 X(7)

it.

The cost document only was just released today, and they don't actually give the calculations for the cost, except by reference to other documents with which I'm not familiar.

But I strongly suspect that the enormously higher disposal costs attributed to grouting the calcine is simply due to counting metric tons of heavy metal as calculated on waste volume, rather than radioactivity and, therefore, assuming that they will be packed in the repository a certain waste -- by a certain waste volume fraction instead of the maximum density that the radioactive heat load would permit.

Thank you.

THE FACILITATOR: Thank you for your comments.

I would remind you, if you want to comment this evening, to register at the registration table just outside the door, and then I will get your name and call your name. And, also, there's a variety of ways, in addition to commenting verbally, that are available. And all those are identified and the items for doing so are available at the registration table.

I have Don Beckman.

MR. DON BECKMAN: I'm going to relinquish my three minutes and submit it in writing.

THE FACILITATOR: Are you Mr. Beckman?

MR. DON BECKMAN: Yes.

THE FACILITATOR: Okay. Thank you, Mr. Beckman.

Karol Kay Hope.

MS. KAROL KAY HOPE: No. I'll relinquish.

THE FACILITATOR: Thank you, Ms. Hope.

Harry Heiselman. Is Mr. Heiselman in the room?

Let the record reflect that he didn't come forward.

That concludes the list of folks who have signed up to comment. We're going to be here until ten o'clock, in the event that any of you want to comment and gather your thoughts. In the meantime, we will go off the record subject to call of the chair -- or of the hearing officer.

MR. DARRYL SIEMER: We go sign up again, is that what we do?

THE FACILITATOR: No, sir. We're allowing one opportunity for all commentors this evening. And the purpose for that is to give everyone equal opportunity to comment. We're not always sure we're going to have fewer commentors than time allotted. And, in terms of fairness, I think it's -- we'll restrict you to one shot this evening.

You do have plenty of additional shots, though, however, by filing written comments or through the other avenues that are available to you.

So, we'll be off the record subject to call of the hearing officer.

(A recess was taken.)

THE FACILITATOR: Okay. We'll be back on the record.

This is a continuation of the United States Department of Energy's Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement being held on February 7 in Idaho Falls, Idaho.

After our break, we're back on the record at 9:30. I note for the record that no additional commentors have registered to comment

this evening and would remind all the folks in the audience that, if you would like to comment, you can do so by March 20, 2000, by submitting written comments, fax comments, Internet comments, or by attending one of the other public meetings being held throughout the region.

We did have one commentor who I called earlier this evening who wasn't in the room when I called him. We'll see if he's departed or if he's here.

Joe Marantette.

I will note for the record that Mr. Marantette is not here, and ask if there's anyone else in the audience who has not yet had an opportunity to do so but would like to comment this evening on the Draft Environmental Impact Statement.

I will note for the record that no one has so indicated.

With that, we will close this evening's hearing, and we'll resume tomorrow in Pocatello at the Quality Inn --

MS. CAROL COLE: No. At Idaho State University.

THE FACILITATOR: -- at Idaho State

UNITED STATES DEPARTMENT OF ENERGY

PUBLIC COMMENT HEARING ON

IDAHO HIGH-LEVEL WASTE

AND FACILITIES DISPOSITION

DRAFT ENVIRONMENTAL IMPACT STATEMENT

WEDNESDAY, FEBRUARY 9, 2000

SNOW KING RESORT
JACKSON HOLE, WYOMING

Reported by:
Kimberly Carpenter, CSR #600

EASTERN IDAHO COURT REPORTERS
P. O. Box 50853
Idaho Falls, ID 83405
(208) 529-0222

Document 35, Public Comment Hearing, February 7, 2000, Idaho Falls, ID
Page 21 of 21

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Document 36, Public Comment Hearing, February 9, 2000, Jackson, WY
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HLW & FD EIS PROJECT (AR)/PF
Control # DC-316

UNITED STATES DEPARTMENT OF ENERGY

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S-H-U-P-T-R-I-N-E.

THE FACILITATOR: Got it.

Ken Cady will follow Ms. Shuptrine.

MS. SANDY SHUPTRINE: My name is Sandy Shuptrine. I am a Teton County Commissioner, but I am, at this moment, speaking on behalf of myself as an individual.

I would like to begin -- actually, I 36-1 IX.C(4) assume on behalf of our whole board -- at this point to thank you for the opportunity to hold this hearing in Jackson Hole. We very much appreciate the responsiveness in bringing both the information and the formal hearing to Jackson Hole.

With that, I would like to say that as I try to shift gears and become informed on the high-level waste EIS -- and after listening tonight, I do have a rather sinking feeling at the enormity, complexity and, most of all, the lack of certainty about the alternatives that are being suggested.

The fact that there is no preferred alternative -- alternative recommended makes it even more difficult for those of us as laypersons to present focused comments. So, I will have to

keep mine general. And I would like to say that my ultimate request is that human health and the environment be protected and that the alternative 36-2 II.A(5) that best accomplishes that be the chosen alternative.

There was a comment made by Beverly Cook that included tight budgets as one of the considerations in choosing alternatives. And I 36-3 X(9) would like to say, because of the implications for human health and our environment, I think that tight budgets should not be one of the primary considerations.

It was mentioned that a billion dollars was gained in recovering spent nuclear fuels. I'm wondering how many billions the ultimate 36-4 X(1) chosen alternative will cost and if those billions would not be better spent up front on more complete cost/benefit analyses, which include all closure implications.

It appears that DOE finds itself regrettably in the position of having to fix or rectify past actions that were taken without full understanding of where they were headed.

And I would like to suggest that we be 36-5 X(3) very careful. This does not relate specifically

to this EIS, but that DOE, our Congress, and all of us, pay particularly close attention to new technologies that we are willing to experiment with, that we put some of -- perhaps consider it -- put some of those resources, both the technical resources and the financial resources, into renewable technologies, especially for energy production.

And I will have to say that burial of waste at INEEL over the Snake River aquifer is always a concern, as is any emissions that may occur into the atmosphere. 36-6 VIII.A (9)

Finally, I would like to commend the Idaho Oversight Committee for acting as a cooperator. I would also like to just put a word of caution in there, because they are also the regulators at some point, and there is a fine line, and it has to be crossed. And I hope everybody will be extremely careful about making that transition -- transition from a cooperator on the EIS to a regulator. 36-8 VII.A(7)

One more question that I have that I was unable to ask is regarding regulatory standards that are set by DEQ and EPA. 36-9 VII.D(3)

My question is: Are these standards

fully documented, in terms of both scientific and health considerations?

I would hope that none of them have political considerations but that they're based on science and human health.

Thank you.

THE FACILITATOR: Thank you for your comments, Commissioner.

Ken Cady, followed by Jeffrey Joel.

I don't see Mr. Cady, so is Mr. Joel here?

MR. JEFFREY JOEL: I'm here.

THE FACILITATOR: Okay. Mr. Joel will be followed by Darryl Siemer.

MR. JEFFREY JOEL: My name is Jeffrey Joel. My mailing address is Post Office Box 70, Kelly, Wyoming. And I have mostly some questions to ask.

I realize this is a very complicated problem, and so the first question I ask is: Why can't some mixture of these alternatives be used? 3601-1 II.A(3)

For example, why might there be -- might there not be no action on already existing bin sets?

3601-2 II.A(3)

Secondly, I just looked at these process diagrams over here for the various alternatives, and I'm struck with how they get more and more complicated as they go along. And it's very strange that the minimum INEEL processing is the

3601-6 II.E(7)

most complicated. And with so much handling going on, it seems that the likelihood of some sort of problem for an accident in the processing would be increased.

It also seems certain that some method could be devised that would be simpler. I mean,

3601-3 II.A(3)

and such method might not be a normal batch-feed method. It would have -- might very well have some other model as its basis.

Another question is: NEPA, apparently, does not require cost/benefit analyses, as Mr. Wichmann said.

3601-4 X(2)

But it seems that -- to me, that since all the alternatives will have human and socioeconomic effects, then those cost/benefit analyses absolutely need to be included in any final decision amongst the alternatives. And, really, they need to be discussed before then.

3601-5 III.C(6)

And this, finally, is a technical question: Is there any way of precipitating out

salts of the acidic off gasses?

Thanks.

THE FACILITATOR: Thanks for your comments.

Mr. Siemer.

And Mr. Siemer is followed by Malissa Clark Rhodes.

MR. DARRYL SIEMER: So much to say, so little time. I attended the Idaho Falls meeting a couple of days ago and decided, based on what I saw there, that I better come up to this one, too.

I am a Site worker, but I'm speaking for myself. I believe you have my name and address already.

The problem that we are faced with here

3602-1 VII.D(6)

is really a straightforward problem that has been addressed and solved elsewhere. I raised the question earlier when I had the opportunity about calcination. It's one of the things that we promised to do. And we do know how to do that.

This is pilot planted. The way to solve

3602-2 III.C(1)

this problem was well-known about 30 years ago. It wasn't implemented at the Site because there wasn't any reason to do that. It was implemented

elsewhere, where they have addressed it and solved this problem.

And I -- again, it's hard to understand why it's not being done here. Because calcination was the good thing to do. We've always thought it was a good thing to do, and that's what we reported on at RCRA's meetings.

There are issues related to the volume of waste. The fact is that the volume of waste really isn't all that important. DOE chooses to implement a repository where there's plenty of space, and several places have already been carefully characterized. To implement such a repository where the volume of our waste in at 65-foot cubed is not a real issue.

3602-3 III.E(1)

It is a policy of DOE sometimes to translate one thing into another thing where there isn't any correlation whatsoever. And I raise that in my second point, that somehow the disposition of this much calcine is going to cost $11 billion, and, of course, has to be added to the cheapest and most straightforward way of actually making it suitable for transport. That is the direct cement option.

3602-4 X(8)

Which brings me to my suggestion that we

3602-5 III.D.2.b(1)

simply implement the same approach to dealing with this waste that Great Britain has already implemented successfully; in fact, by a company that now has a pretty good-sized chunk of the work at the Site and also has a pretty good-sized chunk of the work that's going on at Hanford.

The reason being, of course, is that they were able to succeed somewhere. They had good credibility. And now it's going to make money now in this country. Their solution to that problem was by virtue of that direct cement option. Now, they chose it because it's effective and it's cheap. Somehow, the way that this is looked at ID is that it is the most expensive option. You must question some of the things that you hear.

I have some revised comments.

THE FACILITATOR: Thank you. Thank you for your comments.

Malissa Clark Rhodes.

I'm going to introduce as Exhibit No. 1 at this proceeding an eight-page duplex document entitled, "Comments on Draft INEEL HLW EIS, Idaho High-Level Waste and Facilities Disposition," addressed to Mr. T. L. Wichmann, U.S. DOE-ID.

And it is not dated. It will be Exhibit No. 1 of the Jackson Hole proceedings.

Sorry to interrupt you.

MS. MALISSA CLARK RHODES: That's quite all right.

THE FACILITATOR: Please proceed.

MS. MALISSA CLARK RHODES: Okay. My name is Malissa Clark Rhodes. I'm a Jackson resident. I hold a Ph.D. in geology from the University of Pennsylvania. As a former adjunct assistant professor at Rider University, I taught basic environmental science, as well as geology courses.

Therefore, INEEL's problems with waste disposal, both stored mixed hazardous and TRU-contaminated waste, and, separately, the underground high-level waste, have caused me some concern. These issues are separate but parallel. They're dealing with problems of Waste Acceptance Criteria. We need to get the waste out of Idaho somehow.

3603-1
VII.D(6)

Wyoming is the geology state. Our economy is driven by our underground resources; i.e., uranium, natural gas, oil and coal. All of these sources of energy have their own sets of

problems. We have some of the finest geologists and engineers in the country.

I am not totally antinuclear. There is a need for nuclear power at this point in time because we have not solved pollution problems associated with the utilization of fossil fuels. Solar and wind power sources still remain in a state of research and development.

However, dealing with a radioactive waste effectively remains a national problem. The problems at Hanford are on orders of magnitude greater than INEEL's difficulties. We do not wish to see -- or I do not wish to see INEEL become another Hanford.

Good science is the result of interaction between opposing points of view. I and several other concerned scientists would like to hold a technical forum with outside scientists and engineers interacting with the DOE scientists. If we can participate in neutral territory, perhaps we can evaluate the best options in collaboration, rather than opposition.

3603-2
IX.D(3)

To DOE, this is the challenge. Science is a universal language.

Thank you.

THE FACILITATOR: Thank you for your comments. J. T. Stephens, followed by Jim Laybaum.

I will remind you, while Mr. Stephens is coming to the microphone, that if you would like to comment tonight that you can do so by registering at the table out at the front desk. And they will bring your name up to me, and we will get you on the record and get your concerns addressed by the Department for the final document.

Sorry to interrupt you. Please proceed.

MR. J. T. STEPHENS: My name is Tom Stephens, and Post Office Box 212. I'm a physical science technician retired from Puget Sound Naval shipyard, 14 years of experience with hazardous waste, radiological waste. Mostly I watched other people work in a radiological safe manner.

And when I reviewed the Environmental Impact Statement here proposed, I saw several flaws up here that the general public is not aware of.

The first thing I'd like to make

everybody aware of is what the limits are for NAV SEA, which is the Department of Defense's agency -- federal agency that governs radiological work.

The permissible airborne and detectable airborne limit is measured in microcuries per milliliter. In other words, how much air we breathe. And it's 1 times 10 to the minus 9 is the limit. Then we have another limit. One times 10 to the minus 8, we put on respirators to work in a radiological area.

Then 1 times 10 to the minus 7, we evacuate. We get out of the shipyard, we get out of the town, because the whole place is contaminated. We can't breathe. We're all going to die.

Then I looked up here and it says 3.2 to the minus 5.

What does that mean?

They don't say it's microcuries per milliliter, which I'm familiar with, even if the general public is not. Then they put another one here, 5 times 10 to the minus 4.

What does it mean?

They don't tell you on the Environmental

3604-1 IX.A(5)

3604-2 IX.A(3)

Impact Statement because they are misleading people, because the general public doesn't know. Minus figures are clean figures. I think that's what they're saying. It's not true.

3604-3 IX.A(3)

So, the Environmental Impact Statement should be geared to the general population, to facts and figures to what they can understand.

Another -- another thing: What is a millirem?

3604-4 IX.A(5)

What is a rem?

Most people don't know.

Thank you. I've got the time.

They also know the quote here of minus -- let's say 4 times 10 to the minus 4 millirem.

What does that mean?

Nothing. Not a thing. I can measure with an instrument .05 millirem. Well, that means something. That's a figure. One millirem is -- I can measure and give it in a dosimeter reading. I can't read minus 4 millirem. The only way you can do that is by mathematics.

And that's what they've done, mathematically given you figures that mean nothing.

Thank you very much.

THE FACILITATOR: Thank you for your comments.

Before Mr. Laybaum comes up, Mr. Cady is in the audience. And we called him second.

So, go ahead and come on up and make your comments, Mr. Cady.

And Jim Laybaum is next, followed by Dave Hensel.

MR. KEN CADY: My name's Ken Cady. I'm a resident of Jackson.

And I haven't had a chance to read the Draft EIS yet on the high-level waste. But what little bit I do know, I see one fundamental

3605-1 VIII.B(5)

flaw. It looks to be a lot of good engineering work on different processes. But the idea that we can -- we -- there's a standard that we can pollute to is unacceptable. These processes -- the first thing the DOE should have is a requirement of no releases. And once that's done, look at the processes that fit the bill.

Now, as we look at these things,

3605-2 II.A(3)

there's -- you know, there's a lot of thermal activity in these things, and it's very difficult to have zero pollution. But, in concert, having

two or three processes combined may well bring the pollution level to such a small level that it's insignificant.

We don't need tall stacks or we don't need a great deal of modeling expertise, because, right now, the air model is incorrect, so if there is a release, we're not exactly sure where it's going to go.

3605-3 VIII.B(2)

What we -- what I would just ask you to do is change the requirements, from an engineering standpoint to task the engineers with zero releases and see what they come up with. And that will change -- you know, a lot of these processes will go away.

3605-4 VIII.B(5)

I'll have some written comments in about 60 days, after I've read the EIS. But I think that would be the first order, if we could get that -- just that element down.

Thank you.

THE FACILITATOR: Thank you for your comments.

I would remind you that you have until March 20 to submit written comments, and to the postmarked date by March 20. And there's a variety of ways that you can submit written

comments, and we mentioned them earlier, all of which are detailed on the desk outside.

Jim Laybaum.

MR. JIM LAYBAUM: Hi. I'm Jim Laybaum.

3606-1 IX.C(4)

First, I'd like to say that I'm glad to see the DOE finally having hearings in Wyoming on INEEL projects that could have serious impacts on this region. But I am deeply disturbed at the timing of this hearing.

3606-2 IX.C(2)

I would also like to question why no hearings on this EIS are scheduled to be held in Montana or Utah, as I believe the citizens there also have a right to be heard on such important regional issues.

3606-3 IX.C(4)

I understand the DOE has spent several years with a large number of experts in this field creating this document. And the Wyoming public, which was not involved in the scoping process, most with no background in nuclear waste treatment, are expected to make an informed decision on these proposals which could affect them, as well as future generations, in less than a month.

3606-4 IX.C(2)

I personally received my copy of the EIS somewhere around January 17, only 22 days before

this hearing. I find this completely unacceptable, and I do not see how the DOE can claim that this is a reasonable amount of time for lay people to even begin to understand the many complex technologies outlined in this document.

In spite of the seemingly intentional effort to deny us the necessary time to research these issues, I have personally come to some conclusions.

First, I believe the New Waste Calciner must not operate any longer with or without modification due to the lack of understanding of emissions and that decommissioning should begin as soon as possible. (3606-5 III.C(4))

Second, proposals to dissolve the calcine for transuranic separation are unacceptable in that this is taking a step backwards with no proof that chemical separations are feasible on an industrial scale. (3606-6 III.D.3(1))

Third, all separation proposals are unacceptable and unrealistic, given the difficulties that DOE has experienced with separation projects at INEEL's Pit 9, the Waste Treatment Plant, and at other DOE facilities. (3606-7 III.D.3(1))

Fourth, the amount of shipping necessary to process this waste at Hanford and return it is an unacceptable hazard to the region, especially to the people living along the transport route. (3606-8 II.E(8))

Finally, I do not believe grout will retain its physical integrity for the extended time spans necessary to safely immobilize the waste from the environment. (3606-9 III.D.2.b(6))

This leaves only early vitrification as an acceptable alternative. While I am concerned about the potential emissions from such facility and would want to see much more specific details on the emissions control and the emissions monitoring technologies for such a facility, I believe the end result would be the safest form this waste can be converted to. (3606-10 III.D.2.c(1))

It is of utmost importance that all of this waste be immobilized in glass without separation or high-level reclassification, as there is, at present, no high-level waste repository operational and the potential that this waste may be waiting for a repository into the next century.

It is not enough to simply make this waste road-ready. It must be put into its safest (3606-11 III.E(3))

form for temporary storage and, later, permanent disposal. Costs should not be an issue. Ultimate safety should be.

3606-12 X(9)
3606-14 VIII.9(2)

I believe that the necessity for constructing a waste vitrification plant to further -- to prevent further contamination of the Snake River aquifer and the citizens of this region clearly shows that the plutonium incineration project should be canceled immediately and its budget devoted to this much more serious and pressing issue.

3606-15 X(11)

Thank you.

THE FACILITATOR: Thank you for your comments.

Dave Hensel will be followed by Tatiana Maxwell. Ms. Maxwell, I guess, we'll say.

MR. DAVE HENSEL: Hi. May name is Dave Hensel. I live at 303 South 200 East in Driggs, Idaho.

I'm a member of the Snake River Alliance, but I'm speaking as an individual tonight. And -- but I know that the Alliance has been looking forward to cleaning up the Chem Plant for 20 years now.

As an Idaho resident, I have to take a

little bit of -- just a second to comment on the term "road-ready." It seems to recur quite often in this EIS. And I feel that the term "road-ready" is basically defining a political goal that's driven by a political agenda.

3607-1 VII.D(3)

And I think that the ultimate goal of this cleanup process should be safer treatment and storage of the waste. Where it is less critical than that it be stored in -- stored safely. I mean, we have high-level waste coming into Idaho all the time and will in the foreseeable future, and it is, theoretically, road-ready.

3607-2 III.E(3)
3607-3 VIII.H(4)

I'm concerned with the various separation options. I think that these alternatives will just generate higher volumes of waste, just give the DOE more waste stream stock to keep track of, and are probably going to be infeasible technology. They certainly are unprovable. I tended -- I tend to feel that early vitrification is the most economically and environmentally sound process presented in the EIS.

3607-4 III.D.3(1)
3607-6 III.D.2.C(1)

I do want to commend the DOE and the State of Idaho for working together. And I want

3607-7 VII.B(1)

to specifically emphasize the fact that the cleanup process should be driven by the ultimate need to coordinate the treatment of all forms of contamination -- the soil, the water, the facilities and the high-level waste.

I do have a lot of questions about facility disposition. And I realize that the technical and engineering problems faced by the Department of Energy are huge.

And what do you do with a 300,000-gallon tank that's contaminated with radioactive waste?

However, on top of that -- or, rather, I should say, under it and around it, are immense quantities of contaminated soil. And I do not want to see that what the solution is is to simply put a cap over the problem and kind of sweep things under the rug and walk away from it.

A lot of effort should be put into examining the consequences of what is done in the cleanup to make sure that it doesn't compound the problem of dealing -- of the possibility of having to deal with this contaminated soil at a later date.

Thank you.

3607-8
IV.C(1)

3607-9
VII.B(1)

THE FACILITATOR: Thank you for your comments.

Ms. Maxwell, followed by S. Wakefield.

I apologize if I mispronounced your name.

MS. TATIANA MAXWELL: It's happened for about 36 years. That's okay.

Tatiana Maxwell. My address is P.O. Box 4856, Jackson, 83001.

I apologize for coming without my visual aides and support staff, but I'm really glad to see that my tax money has paid for this kind of elaborate setup here. You know, the next time I'll try to come a little more prepared.

I would like to take this opportunity to thank Brian Munson and the Idaho DEQ for making this second arduous journey over the pass to Jackson, although he assured us in his statement last week that the opinions of more than 1,000 U.S. citizens don't make a whit's worth of difference in his decision-making process. But it looks to me like you folks have hired a better PR firm.

As just another ignorant citizen today, I would like to take a stab at making one more

3608-1
IX.D(2)

statement to be disregarded by INEEL, Idaho DEQ and the United States Department of Energy.

Certainly the issues concerning the disposition of the high-level waste from the Idaho Chemical Processing Plant appear complex even to the scientists hired to study it. Let us at least learn from our mistakes in addressing this important issue. Two examples of attempting to solve problems with untested technologies or technologies that have been shown to be a mistake come to mind.

3608-2
IX.D(1)

In Denver, Colorado, in 1989, the Shattuck Corporation spent $28 million turning their radioactive waste into concrete grout and burying it under clay on a 6-acre site under the approval of the EPA and the DOE. A short ten years later, the EPA has ordered Shattuck to construct a huge tent over the concrete and proceed to break up the hardened material for further disposal.

Or we could look at the situation of the DOE and Lockheed Martin in charge of the tank waste at the Hanford site near Richland, Washington. This 20-year-old underground tank named SY-101 holds almost one million gallons of

nuclear bomb waste that produces unwanted hydrogen as radiation fields bombard organic chemicals that were added years ago in what officials now say --

THE FACILITATOR: Ms. Maxwell, the court reporter's having a difficult time keeping up, so if you would slow down a bit.

MS. TATIANA MAXWELL: -- in what officials now say was a mistaken strategy to reduce the waste's volume.

As recently as June of '96, the DOE crossed SY-101 off its list of problems and in October of that year announced that all safety issues with the tank are now understood.

Alas, in another example of where saying it's so doesn't necessarily make it so, the DOE now acknowledges that this tank is in danger of exploding. And as one consultant for the DOE puts it: I'm not convinced that anyone understands the chemistry and physics involved in this. And this is the best thinking of the best minds in the DOE.

3608-3
III.D.1(4)

All that being said, while the issue of stabilizing the high-level waste is integral in avoiding the further pollution of the Snake River

aquifer, let us not again use untested means or disproven technologies to create a larger waste stream.

I urge the Idaho DEQ, INEEL and the Department of Energy to fully examine the results of the failed grouting policy at Hanford, Washington, and to expand their vitrification processes and deal with the existing liquid waste at its current location without separation, especially as a permanent storage facility at Yucca Mountain, or elsewhere, is, at best, decades away.

3608-4
III.D.2.b(5)

3608-5
III.D.2.c(1)

THE FACILITATOR: Thank you for your comments.

Ms. Maxwell, I noticed that you were reading your comments. If you could make that -- a copy available to me, I will make it an exhibit for the hearing this evening. Or mail it in, because we want to make sure that the court reporter got all of that accurate.

MS. TATIANA MAXWELL: All right.

THE FACILITATOR: Thank you.

I would remind you that if you have material that you would like to use to supplement your written -- your oral comments this evening,

you can submit them in writing through the close of the comment period on March 20.

Good evening.

MS. SOPHIA WAKEFIELD: Good evening. My name is Sophia Wakefield, P.O. Box 2813, in Jackson, Wyoming, 83001.

I am coming without papers. I am not a technical person. I received the environmental impact study two days ago. It was sent to me. I had no time to look through that.

My chief concern is that we are only starting to learn to understand this very complicated problem we have next door. And I am very concerned that we are -- which we currently adhere to a time constraint, that we make decisions because four years or five years ago we set a subjective time that we have to comply to.

3609-1
VII.D(1)

I would ask the State of Idaho and DOE and the DEQ to let go of these time constraints and to reconsider really what we have at stake here, to start involving us in lay terms so we all can learn what the problem is.

3609-2
IX.A(7)

I am extremely concerned, also, not to have heard anything about the clean air shed. We have two in our neighborhood. One is the Crater

3609-3
VIII.B(2)

of the Moons, one is Yellowstone National Park and Grand Teton National Park.

And what it means, from what I understand, is that these areas are reserved in this country for the cleanest air we have. And I think there are a little more than one dozen. Two of them in our state and the state of Idaho.

I want to know from the permitting air quality how models are used to allow any

3609-4 VIII.B(2)

emissions, or any emissions that we don't now how to carcinogenically come together, and how these affect our clean air sheds. I have learned that the model is only done for the Crater of the

3609-8 VIII.B(2)

Moons, and then there is some quantitative assumption done how this may affect Yellowstone or Grand Teton National Park, but nothing else is done for them.

We also have learned that the models are

3609-5 VIII.B(2)

used for the other -- the incinerator are models that are faulty. I am very concern that we are

3609-6 VIII.B(2)

using models that are not putting into consideration foremost human health and the health of all life forms.

Another concern I have is that in the

3609-7 IX.D(5)

solution to the problems we have can only be

conceived on a new level of consciousness and not on the level that the problem was created. And I'm asking all the people we have elected to pay by our tax monies to use that new level to find solutions to this problem we have as a nation and as a whole word.

Thank you very much.

THE FACILITATOR: Thank you for your comments.

Benn Linn, followed by Whit Clayton.

MR. BENN LINN: My name is Benn Linn. I live in Jackson at Box 71, Wilson.

And I would like to thank the DOE for

3610-1 IX.C(4)

holding a public hearing where we get a chance -- and open a public hearing where we get a chance to come make comments. I think that's a step forward from where you have been in the past.

And I do wish that you would also be as

3610-2 IX.D(2)

open with your historical history of the past 50 years and let us, as the public, understand probably quite a bit more clearly why you make decisions and what you have to make decisions about.

I have been in the process -- the process of the low-level waste and have educated

myself to that to some extent. Then I think that we have all realized much more clearly that we have problems. We all agree that we have problems. We disagree on how we might want to go about solving them.

And I -- my greatest concern is that we're treating the atmosphere like we treated the ground above the aquifer in the '50s, in that it solves our short-term problem. It gets rid of waste. But I -- you know, I question whether that's a long-term solution. To my mind, it's not a long-term solution to use the atmosphere to absorb any part of the waste.

I can't really comment on this EIS. I haven't seen it yet. It's all new material. But my general comment is that I think that we should avoid a short-term solution like your predecessors did in the '50s. I think that we should deal with the problem now in an as long-term situation as we can.

Thank you.

THE FACILITATOR: Thank you for your comments.

Whit Clayton, followed by Avril Currier.

3610-3 III.D.1(5)

3610-4 VI(1)

MR. WHIT CLAYTON: Thank you. Whit Clayton, Box 12, Moose, Wyoming.

My wife and I have attended the INEEL invitation and took a tour of the institution about three weeks ago. I had a wonderful time and learned a lot.

If I am a proponent, I am a proponent of the INEEL and the professionalism we saw over there -- 8-, 9-, 10,000 people over there doing a wonderful job. If there's any question in my mind, it would be the British Nuclear Fuels, which put a company after their name so they could become an American company. A lot of objections made to them or about them and the problems that they have.

I got an M.D. in 1947, one year after the first bombs were dropped. And so I date through this whole affair. I've spent a lot of time in the last few months doing a lot of reading on nuclear matters. And then when we had a chance to do the INEEL tour, we took it, and we're happy that we did. I would recommend that you all take the tour, without a doubt.

I think the Oversight Committee of Idaho has done a wonderful job of this little piece

3611-1 IX.D(7)

3611-2 X1(6)

here that you've all seen. Maybe you have not. The Settlement Agreement -- we saw most of these installations. Not the ones with the rods in the water, but we saw the others. The high-level waste is a problem, and it's going to continue.

Transuranic wastes, those wastes that go beyond uranium to neptunium and cerium, americium, they're there, and they're going to continue.

We've been flooded with information about plutonium. I would recommend, before you overreact to this, that this -- this is the "Atlantic Monthly" of April '95. Before you react to plutonium too much, do that, read it. From "Nova," two articles on plutonium. And, from the "Encyclopedia Britannica," another article on plutonium. We understand it's there. There's a challenge.

If we are reminded of anything -- I think I can speak for my wife and myself -- okay -- it's like the "Sorcerer's Apprentice." It's not going to go away. It's going to get worse and worse and worse if we don't support and help these people to move in the right direction. So, I think we're a proponent of

getting things done in the best way.

3611-3 X1(1) If there's any question in your mind and in our mind, we would recommend the National Academy of Sciences, who can undoubtedly find honest and impartial people who can help with the solution to this huge problem. And we would recommend that it be done.

We -- in medicine, we're used to solving problems. All my life that's all I ever did was take the challenge that was presented and try to solve it. When I was on the hospital board, we had a challenger, and we built a new hospital. And it's a pleasure to see things being done positively.

And I feel that we should be positive about this. We should support these people. 3611.4 1X.D(7) I think the INEEL people are wonderful. They're well-trained. They're doing a wonderful job, and they're doing their best. I'm not speaking for British Nuclear Fuels. I do not know anything about them.

And I thank you very much.

THE FACILITATOR: Thank you for your comments.

Avril Currier, followed by Roxanne

Weaver.

And, Mr. Clayton, I will remind you that -- you referred to a couple of documents up there -- if you want those documents to be part of the record, you can bring them up to me or submit them by or before the close of the comment period.

Good evening.

MR. AVRIL CURRIER: Hi. Well, I've never talked in front of a group ever in my life before, but I feel very passionate about this. I'm from Jackson, been a resident here for 13 years.

And I've done -- I know that we have a problem. I know that we've got some very good people working on the problem. But we have a global community, because we have a global problem.

3612-1 VII.D(1) One thing that may be a viable solution would be to, as some people have said, back down from our timetables, take a little bit better look, grab some of these local people and come up 3612-2 II.A(2) with solutions that will take this nuclear waste away from populated areas, where you have a lot of animal life, human life, maybe like the Sahara

Desert.

I'm sure people from Morocco would love to have a couple of billion dollars to spend for a few acres of their desert, in which we could build a plant that would not pollute. We could contain the stuff where it's never going to be bothered by seismic activity.

And how do we get this to happen?

Well, we build a fleet of semi tractor-trailers that can transport this stuff. Put Americans to work on developing this stuff. We have a lot of Naval ships -- they're in mothballs -- that we could outfit to transport this stuff over to the Sahara Desert, putting more Americans to work to solve this problem and building this plant over there using American companies. Being the most technological country in the world, we should be able to handle our own problems. And with other nations that have waste, we'll have the facility to handle their stuff. And we can charge them for it and, therefore, make money on it.

Why should we be sending our money to someplace else when we have an economy here to support?

3612-3
III.D.1(1)

You know, the gold mine up in Cooke City, Montana, was really small potatoes to what the potential hazards of this plant is. And I'm talking to you folks. We have a national treasure. Our forefathers worked hard and diligently to make sure that this is available for our grandchildren.

Just like airplanes fly the air, cars break down, shit happens to us, and we don't want to pay the price. We don't want our grandkids for the next 245,000 years to pay the price. Let's deal with this smartly, please.

Thank you.

THE FACILITATOR: Thank you for your comments.

Roxanne Weaver.

And Ms. Weaver will be followed by Horton Spitzer.

Let's go off the record just a second.

(A brief discussion was held off the record.)

THE FACILITATOR: Ms. Weaver, let me interrupt you for just a moment.

I've been handed a document I need to introduce, an exhibit entitled, "Comments on Draft EIS and Idaho High-Level Waste Facilities

Disposition," dated 2/9, 2000, Jeffrey Joel, P.O. Box 78, Kelly, Wyoming, 83011. I'll introduce that as an exhibit.

But, also, you can drop written comments off at the comment box out front, as well.

I apologize for interrupting.

MS. ROXANNE WEAVER: No problem.

THE FACILITATOR: Please proceed with your comments, Ms. Weaver.

MS. ROXANNE WEAVER: Thank you.

My name's Roxanne Weaver. I live in Jackson Hole.

And the first thing I'd like to do is, for the record, have placed in the record -- all of Sandy Shuptrine and Ken Cady's comments, I concur with all of them. There's no reason for me to repeat them.

3613-1
IX.C(2)

I would like to remind you all that this is DOE's largest undertaking, one in which they will be spending billions of your tax dollars. It took them three years to compile these documents. And, at best, they qave us three weeks to read these. I don't think that's quite fair. In fact, I think it's a major insult to all of us in Jackson Hole.

3613-2 II.A(5)

And then I'd like to ask, as some others have, that you change direction and that you start looking at -- only at processes which will not put hazardous toxins into the air. And, to that end, I ask that you stop all plans for the

3613-3 X1(2)

incinerator at INEEL and spend that money, as was suggested earlier, on research and development, to find ways to deal with this hazardous waste safely.

Thank you.

THE FACILITATOR: Thank you for your comments.

Mr. Spitzer will be followed by Dan Fulton.

Good evening.

MR. HORTON SPITZER: Good evening. Horton Spitzer, Box 1307, Wilson. I'm sorry I couldn't have been here earlier to hear some of the other discussions. I was at another meeting.

But I did want to come and voice something which was expressed wholeheartedly a week ago. Trust. Trust. At the time they wrote the Constitution, they adopted a phrase -- it was interesting -- in God we trust. In God we

trust.

The writers of the Constitution had the opportunity to say, in government we trust. But they knew better. Because the Constitution protected us from the government. Unfortunately, there's been a long history -- and it's a good history in this country -- that you question your government.

3614-1 X1(5)

I feel we got a cheap shot a couple weeks ago. One thousand people spent hours there giving some excellent technical information relative to -- to the proposal that's been put forth in one method of disposal of hazardous waste.

We had people there in the government who could have said, wait a minute, you're not talking about the right thing. I'm sorry. They could have said that and moved on -- and might have given the same comments -- but that wasn't the case. We spent until eleven o'clock at night in heartfelt honest discussion, and then we're told it's not a part of the public record.

3614-2 IX.D(2)

This is a good step forward. I'm pleased that this is happening. This may be a step forward with trust. But before anything is

decided, based upon government presentations, government statistics, we have a ways to go for them to earn our trust. And that's their responsibility. They are here not because we want them to be here. The government should be listening to us because they have to be here. That's the way our government is run.

So, I would just say -- and I'm not qualified -- and we've had some, I think, excellent speakers, both a week or so ago and tonight, about technological suggestions. That's good. That's a step in the right direction.

I just ask that if good decisions can't be made by -- by -- considered to be good or in a wide enough scope, let's take some time. In that time, maybe we can build some trust. And maybe we need opinions other than from government officials or those who are going to do this and make a profit by it.

And so, as far as I'm concerned, in God we trust on this.

Thank you.

THE FACILITATOR: Thank you for your comments.

Mr. Fulton will be followed by Bertie

3614-3 IX.C(3)

3614-4 VII.A(b)

Herschfield.

If I may interrupt for a moment, Mr. Fulton.

Ms. Herschfield is the last preregistered commentor. I will remind you, if you would like to comment this evening, if something was said earlier that sparked a thought, go register. They'll bring your name to me, and we'll get your comments here on the record.

Sorry to interrupt. Please proceed.

MR. DAN FULTON: My name is Dan Fulton of Wilson, Wyoming, Box 576.

Most of the areas that I would like to cover have been covered by people. But I'm willing to go on record and ask the DOE to provide some information on how they went about hiring the British company to be the contractor to build this facility.

I'd also like to point out, with all due respect to the gentleman that spoke earlier, while I think there are a number of good people at the INEEL and DOE, I have grave concerns about their ability to make good decisions. And I base that on what's happened in Rocky Flats, Colorado,

3615-1 XI(b)

3615-2 IX.D(1)

and their choice of contractor, who's been barred from other countries, Japan and Switzerland.

So, my grave concerns are as to whether or not they're making good choices in things that are going to take a long time to rectify.

Thank you.

THE FACILITATOR: Thank you for your comments.

I'd also remind you that if you want to comment and would like to do so in a private setting that the Department of Energy has set up a mechanism for you to do so if you're feeling uncomfortable speaking in front of a group.

Good evening, Ms. Herschfield.

MS. BERTIE HERSCHFIELD: Hello. My name's Bert Herschfield. I'm president of the board of Keep Yellowstone Nuclear Free. Keep Yellowstone Nuclear Free was formed in opposition to proposed nuclear and hazardous waste incinerator at the INEEL. For the past six months, we've been most closely focused on this complex issue.

3616-1 IX.C(2) Only two weeks ago, the DOE released the Draft Environmental Impact Statement concerning disposal of liquid high-level and low-level waste

at the Idaho Nuclear Technology and Engineering Center, INTEC. The disposal of these wastes is a serious issue and deserves serious attention.

The disposal of this waste represents the largest single undertaking of waste disposal at INEEL. Considering the gravity of the situation, we feel that a mere two weeks is woefully insufficient to evaluate each waste disposal option. And, furthermore, we consider the long overdue release of the EIS to be suspect and dubious.

3616-2 IX.B(1)

Nevertheless, in any instance where there exists the potential for harm to be inflicted on human life and the environment as a result of onsite operations, we believe that citizens should be involved in the decision-making and implementation processes. As such, we appreciate the opportunity to speak in this forum.

3616-3 VII.A(6)

3616-4 VIII.G(7) Keep Yellowstone Nuclear Free is very concerned about the treatment and disposal of liquid high-level and low-level waste at INTEC. We support the DOE's and Idaho's desire to dispose of this waste. However, safety must be the overriding concern.

And we ask, is it and will it be?

Will the DOE select a method that threatens to release toxins into the air? (3616-5 III.D.1(1))

If it does, we will oppose it.

This waste has been in underground tanks for 50 years, 20 years longer than originally intended. (3616-6 III.A(1)) Although DOE claims the tanks are not leaking, the service lines to the tanks have experienced severe leaks.

What would it take in cost and time to repair these leaks as a temporary holding-pattern measure while it's investigated in terms of safe ways and alternatives?

As we know, the DOE's past record of dealing with low-level waste is horrific. (3616-7 IX.D(1)) For example -- and we don't have to look to other areas. We can look right in Idaho. The DOE has caused low-level waste to reach directly into the Snake River aquifer, resulting in a large plume of contaminated radioactive isotopes beneath the plant.

The DOE's record of dealing with high-level waste is equally irresponsible, as witnessed by the substantial radioactivity from the calciner plant into the atmosphere. The

calciner is an antiquated system which began operating in 1963 and is currently not operating. (3616-8 III.C(4)) We firmly oppose any efforts to restart the calciner and advocate for a safer alternative which poses the least threat to our environment and our health.

Keep Yellowstone Nuclear Free acknowledges that this high-level waste stream needs attention. (3616-9 VI(1)) As in the case of our opposition for proposed incinerator, we advocate for technology to deal with the waste in which containment and safe long-term stewardship, not expediency and profit, are emphasized.

We feel that potential methods of disposal being considered have not been reality-tested. (3616-10 III.F.2(5)) And, therefore, the consequences associated with these methods are difficult to predict and impossible to guarantee. As such, it is difficult to favor any one particular method of disposal. And there must never be any effort to reclassify these wastes in order to meet the criteria for a more convenient form of treatment; (3616-11 V(9)) i.e., incineration.

And so I ask: Are there any plans to reclassify the waste?

3616-12 V1(1)
3616-13 V11.A(6)

The reprocessing of nuclear waste has resulted in what can only be described as a dangerous mess in the state of Idaho. Please consider our input as an effort to be part of the solution to the serious problem of waste treatment and storage with emphasize on the safe and long-term stewardship of hazardous and nuclear waste, not on expediency and profit. Together, we can chart a course that will protect all of us from some of the most dangerous waste on earth.

Thank you.

THE FACILITATOR: Thank you for your comments.

We have a couple of additional commentors who have preregistered.

Christy Gillespie, who will be followed by David Henneberry.

And if you would like to comment, please go to the registration desk and register. And they'll bring your name up to me, and we'll get you on the record.

Good evening.

MS. CHRISTY GILLESPIE: Hi. My name's Christy Gillespie, and I live in Jackson,

Wyoming.

And tonight I would like to tell you about some of my concerns. I'm concerned about British Nuclear Fuels building this incinerator. Their past history has been inexcusable. I wonder how such a decision could be made to use a company like this, especially in the United States.

3617-1 X1(5)

I'm concerned about my health, my future, and my family's health and my neighbors' health. Given the recent public hearings that have been held in other towns with incinerators, people have come out and said that there's been years and years of people having problems of health effects, retardation, childhood leukemia.

All of these things are very serious problems, and they're just now becoming public. And these are towns just like ours that have had this happen to them years ago. And I don't want to become another statistic. I don't want to be standing here in ten years telling you how my kids have leukemia, how I have cancer.

I think I'm going to ask you once more to reconsider your decision. Put the money into research, please, until a better solution can be

3617-2 X(12)

found.

Thank you.

THE FACILITATOR: Thank you for your comments.

David Henneberry.

Good evening.

MR. DAVID HENNEBERRY: Hello. My name's David Henneberry. I live here in Jackson, Wyoming, P.O. Box 6962.

I understand that something does need to be done. We have created a problem, and we do need to fix it. I have nothing against that. One of the things -- okay. A plant does have to be built.

3618-1 II.A(2)

Why here?

Why in our area?

Why not where it's -- the problem is located?

Why ship it all the way over here, do one thing, ship it someplace else?

Isolate it and take care of it.

Okay. If the plant were problem-free, then there would be no problem or less of an issue. But, so far, the plants in operation are having continuous problems. And all these have

3618-2 X16(5)

to be addressed. They're not being adequately handled, and the situations aren't stopping. The dangers still exist.

Another thing is acceptable level.

3618-3 VIII.G(2)

How does somebody come up with an acceptable level?

It's like a population. You say, okay, well, it's okay to kill 200 people out of 200 million. That's still wrong. Say, okay, a billion parts per -- just as a figure -- a billion parts -- or one in a billion you can inhale.

Is that safe?

How much volume of this room is a billion parts?

You know, if there's 200 billion parts in here right now, that's enough to kill you then. I would like to see these figures properly addressed, know exactly where they come from.

And all the statistics aside -- excuse me -- who is saying this is acceptable?

Did someone come up with a figure?

That's my concern. For everybody's health hazards, the environment, everything. And I think this is something that really needs to be

addressed, making it for everybody's sake.
Thank you.
THE FACILITATOR: Thank you for your comments.
I don't have -- I have no more preregistered commentors. I would remind you if you would like to comment this evening that you can register at the registration desk. We'll get you on the record.
We're scheduled to be here until nine. We'll be here until nine o'clock. And if you would like to comment between now and then, register, and then we'll go back on the record.
In the meantime, I think we'll go off the record subject to call from the hearing officer.
But, before we do so, I want to remind you March 20 is the deadline for submitting written comments, as the postmark date. And there's a variety of other methods for submitting written comments that you may take advantage of, and those methods are detailed at the registration desk.
So, with this, we will take a break. We'll be subject to call of the hearing officer

until nine o'clock, when we're scheduled to conclude.
Thank you.
(A recess was taken.)
THE FACILITATOR: Okay. We'll be back on the record.
This is a continuation of the February 9 hearing. And we're in the private setting for taking oral comments for the record.
And you understand that your comments, although made in a private setting, will be part of the public record?
MR. DAN BENNETT: I do.
THE FACILITATOR: Okay. Please state your name and make your comments.
MR. DAN BENNETT: My name is Dan Bennett, P.O. Box 592, Jackson, Wyoming.
3619-1 X1(10) Two weeks ago I attended the town meeting's comment period at the middle school high school here in town for the incineration that's being proposed over at INEEL.
And although I realized that is not exactly the subject of tonight's meeting, I would want to request that the minutes of that town meeting and comment period be included in

tonight's record.

And the reason I am doing that is because it was a very remarkable meeting. The comments were very bright and informed. And it was a much larger attendance than tonight's meeting. And there has since been some kind of disrespect by the Idaho DEQ, saying that they are not going to regard -- or take into account any of the comments that were made at that hearing.

Thank you.

THE FACILITATOR: Thank you. You understand that your comments are part of the public record, but what you just asked to be made part of the public record would have to be submitted by you to be in the record at this proceeding?

And I do believe that those comments are transcribed and available for your review at the reading rooms. There is one at the Teton County Library here.

So, just understand that this is -- this is on the record, but things that you ask to put in the record, if you don't submit them, won't be part of this record.

MR. DAN BENNETT: I'll be glad to do

that, if I have the time to do it. I mean, if there's a time period available --

THE FACILITATOR: Through March 20.

MR. DAN BENNETT: And I wasn't here for the entire duration of tonight's comments, so I don't know if someone made that same request.

THE FACILITATOR: No.

MR. DAN BENNETT: Okay. Thank you.

THE FACILITATOR: Okay. Thank you, sir.

(A recess was taken.)

THE FACILITATOR: Okay. We'll be back on the record.

We're in continuation of our taking comments in private for the public record. And Mr. Henneberry had a comment.

MR. DAVID HENNEBERRY: Okay. I want the record to state that my comments were not directed at the proposed incinerator project. My comments were about my concern with hazardous waste treatment, containment, transport and storage, and the health and safety to everyone in the environment if a contamination situation should occur during any of the above-mentioned areas.

Thank you.

THE FACILITATOR: Thank you.

And, Mr. Henneberry, you understand that, although your comments are made in a private setting, they will be part of the public record?

MR. DAVID HENNEBERRY: Yes, sir.

THE FACILITATOR: Thank you.

MR. DAVID HENNEBERRY: Thank you.

THE FACILITATOR: We will be off the record.

(A recess was taken.)

THE FACILITATOR: We're back on the record, people.

I will ask that if anyone in the audience has -- who would like to comment orally this evening formally on the record and who has not commented yet would like to do so.

We've given you an opportunity to register at the front desk, and I will report, for the record, that no one has so registered. If there is anyone who has not commented and would like to do so, this is your final opportunity to do that this evening at the Jackson Hole hearing.

HLW & FD

EIS PROJECT - AR/PF
Control # DC-37

UNITED STATES DEPARTMENT OF ENERGY

PUBLIC COMMENT HEARING ON

IDAHO HIGH-LEVEL WASTE

AND FACILITIES DISPOSITION

DRAFT ENVIRONMENTAL IMPACT STATEMENT

TUESDAY, FEBRUARY 8, 2000

IDAHO STATE UNIVERSITY
POND STUDENT UNION BUILDING
POCATELLO, IDAHO

Reported by:
Kimberly Carpenter, CSR #600

EASTERN IDAHO COURT REPORTERS
P. O. Box 50853
Idaho Falls, ID 83405
(208) 529-0222

Thank you.

THE FACILITATOR: Thank you.

And, Mr. Henneberry, you understand that, although your comments are made in a private setting, they will be part of the public record?

MR. DAVID HENNEBERRY: Yes, sir.

THE FACILITATOR: Thank you.

MR. DAVID HENNEBERRY: Thank you.

THE FACILITATOR: We will be off the record.

(A recess was taken.)

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Reported by:
Kimberly Carpenter, CSR #600

EASTERN IDAHO COURT REPORTERS
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MR. GEORGE WOOD: Thank you very much.

My name is George Wood. I live at 1680 North Mink Creek Road, Pocatello, Idaho, 83204. I'm representing Coalition 21.

I would like to know a little bit about who I'm speaking to. So, I'd like a show of hands.

How many of you here actually work for the State, the EPA and INEEL? May a have a show of hands?

And those who are of just the public, who are not?

Well, I'm talking to the right people then. I didn't want to address my remarks so much to the public as I did to the people who are working for us.

37-1 VIII.A(1) There are several things I think are extremely necessary for an environmental impact statement to be effective. Number One, of course you want to know what the impact is going to be from a point of how much radiation, how much of this hazardous material, is going to go into our environment.

37-2 VIII.A(1) But, on the other hand, that doesn't mean a thing unless you know what the effect of

that radiation or that hazardous material is on the environment or on the people or the animals that are involved. And so we must consider what damage is it doing.

What damage is it doing?

How many people have been injured?

How many people -- how much property has been damaged by the radioactive nature and by the other hazardous materials, the nonradioactive materials, at INEEL?

That is certainly something that needs to be considered.

37-3 VIII.G(8) How much of a change in the environment does that make?

In other words, if we have a huge impact on the environment or the amount of radiation added to the state of Idaho by the activities at INEEL, that is one thing. But if those activities and those additions at INEEL are trivial compared to the natural background and the natural amount of radiation that we have in the state, perhaps we need to back off and look at the basic necessity of this whole procedure.

So, the Environmental Impact Statement should contain some of that information. For

37-4-
VIII.C(1)

instance, the 600,000 gallons of liquid waste should be compared to the amount of water in the aquifer.

So, how much would that change the aquifer or the water in the aquifer?

If it were all mixed directly into the aquifer, how much change would occur?

How much radioactivity would be added to the aquifer, if any?

And what percentage of change would that be?

37-5
VIII.B(4)

What difference would it make, as far as the soil is concerned, the people, the animals, the crops, if we did have this sort of thing?

The question came up awhile ago about how many cancer deaths, additional cancer deaths, are we talking about. And I -- I think the answer he gave was 9 per 10,000 people. And I believe, in just the natural scheme of things, about 2,100 or so out of 10,000 people get cancer anyhow. So, we're talking about 2,109 or maybe 2,091 cancers per 10,000 people in this state. And that is a very, very iffy question.

37-6
VIII.A(7)

So, what I would like to see added to the Environmental Impact Statement is the actual

effects on the people, the land, the crops, of the State of Idaho.

Thank you very much.

THE FACILITATOR: Thank you for your comments.

We have a clarifying questions perhaps from --

MR. THOMAS WICHMANN: I need a clarification question.

THE FACILITATOR: Mr. Wood, would you yield to a question?

Come back to the microphone, if you would. The Department of Energy might ask clarifying questions of commentors --

MR. GEORGE WOOD: All right.

THE FACILITATOR: -- just to ensure that they understand the nature of your comments so that they can be responded to adequately in the Final Environmental Impact Statement. And Mr. Wichmann has indicated he would like to ask a question of you, Mr. Wood.

MR. GEORGE WOOD: All right.

MR. THOMAS WICHMANN: Yes or no, did you read the accumulative impacts and the ground waters impacts section of this EIS before you

made your remarks, sir?
MR. GEORGE WOOD: No.
MR. THOMAS WICHMANN: Thank you.
THE FACILITATOR: Thank you for your comments, Mr. Wood.
I would like to remind you that you could file written comments -- submit written comments through a variety of ways. And all comments are reviewed and considered and analyzed by the Department of Energy and the State of Idaho in preparing the Final Environmental Impact Statement.
So, is anyone else in the room who has not had an opportunity that would like to comment formally this evening?
We'll let the record reflect that no one has so indicated.
We will stand at ease, subject to call of the hearing officer in the event that others come who would like to comment. So, right now, we'll be off the record.
(A recess was taken.)
THE FACILITATOR: We'll be back on the record.
This is a continuation of the public

U.S. DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICES

IDAHO HIGH-LEVEL WASTE AND FACILITIES DISPOSITION

Tuesday, February 22, 2000

Portland, Oregon

Doubletree Lloyd Center

5:00 p.m. to 8:30 p.m.

ORIGINAL

made your remarks, sir?
MR. GEORGE WOOD: No.
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If the court reporter is having trouble following you or keeping up, she may interrupt to ask you to either slow down or speak directly into the microphone.

I will begin now the formal comment portion of tonight's hearing. I want to stress this is a formal hearing and a recorded proceeding with a full transcript being prepared.

And finally, I would like to thank you all for attending and for your cooperation in observing the rules I set forth.

The first speaker this evening is Ken Niles. Please step up to the microphone at the podium.

KEN NILES: Good evening. I'm Ken Niles. I'm the Deputy Administrator of the Oregon Office of Energy's Nuclear Safety Division. I'm here on behalf of the State of Oregon.

I do have some written comments, and I will provide those upon completion of my oral comments. And I'll read these. I would just like to sum them up.

First off though, I would like to

deviate a bit from my prepared comments in my script to make a comment about the meeting format that we're having here tonight.

38-1
IX.C(3)

I would like to take issue with the rigidity of this format and say that I don't believe that it's fully serving the public's interests. The woman who spoke in the question and answer had a comment to make, had to leave, was not able to stay for this, and the fact that the comments that she made were not on the record, were not allowed to be on the record, I think that was a disservice to her, and I believe in keeping this type of rigid format, we don't fully serve the public, which is what we should be doing.

In terms of my comments, they will focus solely on the one aspect of the EIS. The draft EIS focuses on the proposals to bring high-level waste from Idaho to Hanford for vitrification.

We are certainly, from the State of Oregon's perspective, directly impacted by activities that occur at Hanford. This is an issue that certainly draws our interest.

It is Oregon's position that it is

38-2
II.E(5)

premature to consider bringing Idaho waste to Hanford at this point for two reasons. First that Hanford does not yet have vitrification facilities, and second that once we do gain those facilities, there is a pressing need to treat Hanford's waste as soon as possible.

The discussions that we're having now in terms of considering the ultimate state of Idaho's waste and whether it should come to Hanford are ones we have should have perhaps 45 years from now. It is, again, too premature.

38-3 II.E(4)

We recognize the financial constraints that drives this issue, and it is certainly the reason that Hanford is being looked at for Idaho's waste. And given that we believe that it may make sense down the road, in the future, to discuss bringing waste from Idaho to Hanford for treatment. However, even then in the distant future, the State of Oregon would not consider treatment of Idaho high-level waste at Hanford unless the following conditions were met: First, Idaho waste would not be treated at Hanford until all of Hanford's high-level waste is treated; second, Idaho waste would not come to Hanford until it is time for treatment;

38-4 II.E(5)

38-6 II.E(8)

third, upon vitrification of Idaho's waste, it must then be returned to Idaho or to a national repository, if one is available. The treated waste must not remain at Hanford; four, the transportation of this waste both to and from Idaho must adhere to enhanced transportation safety protocols. And we would offer up those as by developed by Western States for transportation of transuranic waste as a model; and fifth, Oregon must be allowed to participate fully in Hanford decision making meetings in order to assure these conditions are met.

There isn't time to go into great detail on each of these conditions that we offer. Let me just highlight a couple of issues. One is that Idaho waste not come to Hanford early. The draft EIS suggests, at least as we found, two possible time frames to bring Idaho waste to Hanford. One beginning in 2028 or sometime thereafter, which presumably would be after Hanford's waste has been vitrified. The other talks about a window between 2012 and 2025 and building new storage facilities at Hanford.

As we have heard, the calcine waste at

38-5 II.E(1)

Idaho is in bin sets which have a design life of 500 years. There is no rush to get that out of there. We believe it would be financially irresponsible to squander many millions of dollars on temporary storage facilities at Hanford when the waste is safely stored in Idaho.

With that, I think I'll conclude my comments, and again submit a written -- these are preliminary comments. We will follow-up with additional written comments that deal with more with some of the technical aspects of the EIS.

PETER RICHARDSON: Thank you for your comments Mr. Niles.

I would like to take this opportunity to note that I'll mark as Exhibit Number 1 to this proceeding a multi-paged document previously submitted to me by Mr. Wichmann entitled "Tom's Talking Points - Portland Idaho High-level Waste and Facilities Disposition Draft and Environmental Impact Statement."

That will be marked as Exhibit number 1. Exhibit number 2 of this evening's proceeding is a three-page document entitled

"Preliminary Comments of the State of Oregon on the Idaho High-level Waste and Facilities Disposition Draft Environmental Impact Statement" dated February 22, 2000. That, we'll mark as Exhibit number 2.

Our next scheduled commentor is Page Knight.

PAGE KNIGHT: I don't have an exhibit.

Yeah. I represent Hanford Watch here in Portland -- the Portland area. And we -- this is sort of a new issue for us. It certainly hasn't been on the top of our radar screen because of the tremendous problems that we're dealing with at Hanford right now and the fact that we can't even, you know, get the U.S. Department of Energy to agree to sign milestones for a possible vitrification plant. And Lynn Semmes who was here earlier mentioned that we are very worried right now that BNFL may crash in the United States with all the problems they are having in England, and we may not have a vitrification plant, and once again, be back to ground zero.

So, I'm going to make some just

general comments that some of my group and I talked about over the weekend, and these aren't definitive. We just don't know enough. I think that they may help your decision making process a little, hopefully.

First and foremost, we think this is a very premature EIS. Like Lynn said, we are putting the cart before the horse. I also want to say -- and I feel like I can speak for a great deal of the Northwest region, a great number of people here. I know that Woody has heard this on the Hanford Advisory Board that I sit on and, you know, we certainly hear it in our own circles. But none of us have any belief that there will be a final repository in our lifetimes.

Yucca Mountain is ten years behind schedule. It's millions of -- probably billions by now dollars overrun in cost. It's based on poor science is what we see more and more of the reports saying. So, we don't have any belief in the final repository.

And for any EIS to be driven by that makes the whole thing even more premature in my mind. One of the things that struck me when one

3801-1 II.D.1(4)

3801-2 III.E(1)

of you were speaking about the -- it was Tom -- was speaking about the values or the themes that you heard from the people in your scoping hearings. They remind me very much of some of the values at the Hanford Advisory Board, which is the Regional Citizens Advisory Board have and one of them was protect the aquifers. Our prime value is to protect the Columbia River.

If Hanford's wastes are not vitrified, some documents indicate that within the next 100 years, the Columbia River will be dead. That means no economy, no healthy environment, no fishing, nothing. I mean, that's dead.

So, that is of utmost value to us, and it sounds like it is the same kind of value to the people in your region. We have also the value of get on with it. And therefore, I can say I understand the planning of this EIS that you need to look at things ahead of time. And somehow this EIS, in terms of looking at all of the options far ahead of time makes sense on that particular level.

It also says, you know, one of the values was minimize the times of handling waste. What that translates into for a lot of

3801-3 XI (7)

3801-4 VI (1)

3801-5 II.E(8)

us in this region is that you minimize the transportation or the moving of any waste unless there is a dire danger. We have so many dire dangers.

3801-6 11.E(5) The two biggest dangers in the country are the 177 leaking tanks that, some of which are leaking up at Hanford. That is a dire danger.

We also have a decay basins which hold 2,300 fuel rods, most of which are corroding that sit 400 yards from the Columbia, and those pools that they sit in have leaked also. Those are dire dangers, and those need handling first.

So, this almost seems like, you know, talking about marbles or something inane when we have a lot of other things to worry about. So, with those things said, I would like to say that we have to handle -- one of our comments is we have to handle the most dangerous things first, and we -- this doesn't seem to be touching that.

The last thing I would like to say, -- and I hope you will let me go over by a minute since we have such a small crowd here --

is that one of the things that intrigues me about this whole thing -- and this is not that I am bought off on it, by any means because I don't have that right with my organization at this particular time, but I am really intrigued

3801-7 11.E(4) with the idea of a Northwest solution. I think that we can't afford to have states pitted against one another for cleanup dollars.

I think that we do have to work together, and we have got to get creative because Congress has not had the bill up to now to fund cleanup at any site the way it should be funded, and Hanford is the most contaminated site in the western hemisphere, and I think we all have to remember that.

And one of the things that I do appreciate from the Idaho people here is that you all seem to appreciate deeply and know that this is the most contaminated site. You have got nothing to compare to ours, and yet you still have dangers that are imminent to your livelihood, and health, and well-being.

So I'm intrigued with this, but I have

3801-8 III.D.1(4) to go back to saying that this is awfully premature. I would say that whatever actions

you do decide to take, move slowly. Do things a step at a time. Don't try to make all the decisions now because they are not going to hold up.

The fact is, all of us -- I would say most of us here by the time the tanks -- the tank waste at Hanford is vitrified are going to be dead. I'm going to be 100 in 47 years, and that's when this -- our date is for finishing the tank waste. Now, that's sort of interesting.

The same -- in two years, the political situation will change. So, we are going to have a whole new politics. So what you promise today isn't necessarily going to be given to us tomorrow. What we are looking at is a government who has made promises and promises to Hanford to clean it up, and we don't get it. And I would imagine you could say the same thing for yourselves.

30DI-9 IX.D(1)

So, I would just end with those cautionary remarks and wish you luck on this, and I also think it's really, really important for all of us to work together. And I really appreciate you coming here, and I'm sorry that

we don't have a bigger turnout.

PETER RICHARDSON: Thank you for your comments.

Bill Bires?

I remind you, you have until April 19 to submit your written comments, and that's a postmark date.

PAGE KNIGHT: These go on the record though, don't they?

PETER RICHARDSON: Absolutely. This is all on the record.

Good evening, Mr. Bires

BILL BIRES: Good evening. My name is Bill Bires.

I look around, and I'm probably the oldest person in this room. And I'm going to be dead a long time before any of these goals are met. And the decisions that you are going to make are going to involve future generations years to come -- years and years to come, and it behooves us, I believe, to make those kind of decisions especially when we don't know where we are going or what we are going to do.

I had the experience of having been under an atomic bomb via -- by virtue of my

Army service in 1951 at the atomic test site. And at that time, I knew we can destroy ourselves, and I think that we're well on our way.

I'm afraid that unless we take this process out of the hands of people that are in it for profit and put it in the hands of people who are given the task of applying themselves as best they can to this cleanup process.

When the bomb was built, I was around, and the United States gathered the best scientists from all over the world and put them to work on this job, and they produced the bomb. And then they went on and on -- the scientists went on and on and on creating huge amounts of lethal waste without any pre -- what's the word I'm searching for -- without any idea of how they are going to get rid of it, how it's going to be disposed of, if it can be disposed of safely. They go on with this half-baked idea down at Yucca Mountain.

I am sickened by the comments that are made: "We don't have enough money." We have enough money, and if we don't have enough money, we're all liable to die. That's just what it

3802-1 X(10)

boils down to.

The priorities of the government must be changed. The public should be made or must be made aware of the threat that is posed by installations like Hanford and INEEL.

3802-2 VIII.A(5)

I remember when it was INEL, and they threw in an environment. What's going on? Are they playing games with us? Who are they talking to, environment? INEL and environment. Look what Lockheed did for them up there trying to clean up that space, and how they over -- the cost overrun was so great.

It's beyond me why the Federal Government is not putting all of its available resources in the hands of people who can and will do the job and taking it out of the hands of people who are in it for profit only.

3802-3 VI(1)

As was mentioned earlier, BNFL is a British government-owned company. They are trying to raise money in the United States. Then they want the Department of Energy to assure them that if they raise money -- and lose money that the taxpayers of the United States is going to repay them. These shenanigans that go on are just, you know, just -- okay -- are

really -- I find abhorrent because the public is being treated as if they don't have a stake in this and as if they don't have any interest in it.

3802-4 IX.D(2)

The public does have a stake in it, and they do have an interest in it if they were informed -- properly informed. And I have said earlier that if the DOE really wants to get some money out of the Federal Government, they can take a full page ad out in the Oregonian or the New York Times or the Los Angeles Times or the Wall Street Journal and tell the people how many curies of radiation is sitting up there in that mess at Hanford and ready to go into the river, and how much of that waste is at INEEL is-- poses a threat to the public.

3802.5 X(13)

It's high time that the public be made aware. And the fact that nuclear industry has been on the public dole for so many years and that the power of the nuclear industry and the relationship between the military nuclear program and the civilian nuclear program must be recognized and dealt with effectively because there are economic forces involved that are going on in the world right now that may affect

what is going to take place in this country vis-a-vis the future of nuclear power.

And I would like to thank you people for coming. And I hope that my children's children's children's children are not posed with -- don't have the same problems posed to them that we have posed to us. I hope that it can be dealt with effectively and that they have a clean world in which to grow and be happy.

Thank you.

PETER RICHARDSON: Thank you, Mr. Bires.

Does is there anyone in the audience who has not had a chance yet this evening to speak formally on the record who hasn't had a chance to sign up. Raise your hand, and we will come up and get your comments on the record. I remind you that you have until April 19 in which to submit written comments. That's the postmark date.

Yes, sir. Just go ahead and step up to the microphone. We will give you three minutes to get all of your concerns on the record. If you would preface your remarks with a statement of your name. And if you would like

a copy of the final Environmental Impact Statement, your mailing address.

ED MARTISZUS: Hi. My name is Ed Martiszus. I'm a Registered Nurse, environmentalist in the State of Oregon here going on 23 years. And my address 53215 Timber Road, Vernonia, Oregon 97064. My phone number is 1 (503) 429-3136.

PETER RICHARDSON: Thank you. Proceed with your comments.

ED MARTISZUS: Yeah. I don't talk in terms of radiation getting into the environment. It's already here. In my practice as a nurse in this area twenty some years, I've seen the effects of it. So it's a matter of degrees to me. It's a matter of casualties mounting up as more and more isotopes get into the environment and get into the food chain, and things like that.

3803-1 III.A(1) My understanding is that the groundwater or the water going into the Snake River at the INEEL is also radioactive. So, already, you're transporting nuclear waste by Hanford already. So, it's coming to the area here as fast as we want it right now.

And Page is right, on the triage level, you know, as a nurse, we have to deal with the most immediate health threat first, and that is the tanks and the springs and the tritium plumes, and 2,300 fuel rods and decay basin, and things like that.

I would like to see more of a list of

3803-2 IX.C(8) isotopes and toxic chemicals in these handouts other than plutonium and uranium so, I know, you know, as a nurse environmentalist, I can figure out the toxicology of it and biological effects that people that are exposed and also like the amount of curies that will be lost in shipment from INEEL to Hanford, and as far as getting into the environment, and the proposed, you know, or projected lists of different diseases from this process as this stuff moves its away from INEEL towards Hanford, and the cost of what it's going to cost the community to pay for this as far as the medical treatment and the families going to visits to the hospital and all those things.

So, that would be more wholistic for

3803-3 VII.A(6) me to get a better view, as a nurse, to know what the real cost is to the community and the

real threat is so we can inform the community so they can make an informed consent under the U.N. Declaration on Human Rights because to be unnecessarily exposed would -- under our Constitution supremacy vote violate the Declaration on Human Rights, that right to life and having it arbitrarily taken away and also the rights under due process of the Constitution. They would -- Fourth and Fifth Amendment Rights, they would not arbitrarily be deprived of their life and property -- be dispossessed of that without any kind of due process of the law such as an arrest and invitement to trial and a conviction, which is usually the grounds in our society for taking away things from people, you know, under our Constitution, our rule of law.

So, that's basically all I have to say.

PETER RICHARDSON: Thank you.

ED MARTISZUS: Thanks a lot.

PETER RICHARDSON: Thank you, sir.

I'll ask the question again. If anyone in the audience who has not yet had an opportunity to comment would like to do so,

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

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EIS PROJECT - AR PF
Control # DC-39

March 7, 2000

Mr. Thomas L. Wichmann
Document Manager
U.S. DOE, Idaho Operations Office
850 Energy Drive; Mail Stop 1108
Idaho Falls, ID 83401-1563

Subject: INEEL High-Level Waste Draft EIS

Dear Mr. Wichmann:

Some members of the Hanford Advisory Board (HAB) attended the February 3 presentation conducted by staff of the U.S. Department of Energy on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (EIS). On behalf of the HAB, we are submitting the following statement to be considered by DOE.

The HAB is not prepared at this time to provide specific comments on the EIS. The Hanford vitrification plant has not been constructed and thus will not be available for several years. In addition, when it becomes operational, it will take many years to vitrify Hanford tank wastes. Thus, it would be premature at this time for us to comment on the EIS alternative that would send INEEL high-level wastes to Hanford for vitrification.

However, three consistent positions of our Board relate to the issue.

1. In Advice #13 and subsequent pieces of advice, we have stated that if another site sends waste to Hanford for treatment, it should not be sent until a treatment facility is built and operating. Once treated, the waste must be returned to the sending site.

39-1 11.E(6) 39-5 11.E(2)

2. We cannot support Idaho's waste coming to Hanford until all of Hanford's high-level waste has been treated. We emphasized in our recent statement on tank wastes that the Hanford tanks are one of the most urgent environmental threats to the country. We have three types of tanks: those that have leaked, those that will leak, and those that will leak again. The single-shell tanks are already beyond their design life and the double-shell tanks will reach that point before the vitrification process is completed. Vitrification of these wastes must proceed expeditiously and be completed before a major accident occurs with the aging tanks.

39-2 11.E(5)

3. We have indicated in several pieces of advice that if any wastes come to Hanford for treatment or disposition "the sending site should cover all costs." The Hanford budget is not adequate to cover even the costs of our own cleanup efforts in

39-3 11.E(9) 39-6 11.E(5)

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PETER RICHARDSON: Thank you.

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Document 39, Hanford Advisory Board (Merilyn Reeves), Richland, WA
Page 1 of 2

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EIS PROJECT - AR PF
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Phone: (509) 943-5319 Fax: (509) 943-5528

accordance with our Tri-Party Agreement and regulatory requirements. The impact of offsite wastes on the inadequate budget of Hanford and the environmental impacts of any diversion of Hanford cleanup funds must be factored into decisions on offsite wastes and should be thoroughly analyzed in this EIS. The Hanford cleanup dollars should not be used to subsidize the receipt, treatment, and/or storage of offsite wastes.

39-4 VII.A (6) We would appreciate being consulted as this process continues forward, particularly when a preferred alternative or other decisions are being considered which might impact Hanford.

Very truly yours,

Merilyn B Reeves

Merilyn B. Reeves, Chair
Hanford Advisory Board

cc: Keith Klein, Manager, DOE-RL
Dick French, Manager, DOE-ORP
Tom Fitzsimmons, Director, Washington Department of Ecology
Chuck Clarke, Regional Administrator, U.S. Environmental Protection Agency
Wade Ballard, Acting Designated Federal Official
The Oregon and Washington Congressional Delegations
Michael Gearheard, U.S. Environmental Protection Agency
Dan Silver, Washington Department of Ecology

HLW & FD
EIS PROJECT - AR/PF

KENNY C. GUINN
Governor

STATE OF NEVADA

Control # DC-40 JOHN P. COMEAUX
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
Fax (775) 684-0260
(775) 684-0222

March 10, 2000

Mr. Thomas L. Wichmann
Idaho HLW&FD EIS Project Manager
DOE, Idaho Operations Office
850 Energy Drive
Idaho Falls, ID 83401-1563

RECEIVED MAR 14 2000

Re: SAI NV # E2000-086

Project: Idaho High-Level Waste and Facilities Disposition DEIS

Dear Mr. Wichmann:

Enclosed are the comments from the Nevada Division of Water Resources and Department of Transportation concerning the above referenced report. These comments constitute the State Clearinghouse review of this proposal as per Executive Order 12372. Please address these comments or concerns in your final decision. If you have questions, please contact me at 684-0209.

Sincerely,

Heather K Elliott

Heather K. Elliott
Nevada State Clearinghouse/SPOC

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Nevada State Clearinghouse/SPOC

NEVADA STATE CLEARINGHOUSE
Department of Administration
Budget and Planning Division
209 East Musser Street, Room 200
Carson City, Nevada 89701-4298
(775) 684-0209
fax (775) 684-0260

RECEIVED MAR 14 2000

EIS PROJECT (AR) PF
Control # DC-40

HLW & FD

DATE: January 19, 2000

Governor's Office	Legislative Counsel Bureau	Conservation-Natural Resources
Agency for Nuclear Projects	Information Technology	Director's Office
Agriculture	Emp. Training & Rehab Research Div.	State Lands
Business & Industry	PUC	Environmental Protection
Energy	Transportation	Forestry
Minerals	UNR Bureau of Mines	Wildlife
Economic Development	UNR Library	Region 1
Tourism	UNLV Library	Region 2
Fire Marshal	Historic Preservation	Region 3
Human Resources	Emergency Management	Conservation Districts
Aging Services	Office of the Attorney General	State Parks
Health Division X 2	Washington Office	Water Resources
Indian Commission	Nevada Assoc. of Counties	Water Planning
Colorado River Commission	Nevada League of Cities	Natural Heritage
		Wild Horse Commission

Nevada SAI # E2000-086
Project: Idaho High-Level Waste and Facilities Disposition DEIS
NOTE: Actual Four Volume document is at NDEP. There is some mention of transportation through Nevada to both Yuccas Mountain and the Nevada Test Site in the document.

✓ Yes ___ No Send more information on this project as it becomes available.

CLEARINGHOUSE NOTES:
Enclosed, for your review and comment, is a copy of the above mentioned project. Please evaluate it with respect to its effect on your plans and program the importance of its contribution to state and/or local areawide goals and objectives; and its accord with any applicable laws, orders or regulations w which you are familiar.

Please submit your comments no later than **March 10, 2000**. Use the space below for short comments. If significant comments are provided, plea use agency letterhead and include the Nevada SAI number and comment due date for our reference. Questions? Heather Elliott, 684-0209.

THIS SECTION TO BE COMPLETED BY REVIEW AGENCY:

___No comment on this project
___Proposal supported as written
___Additional information below
___Conference desired (See below)
___Conditional support (See below)
___Disapproval (Explain below)

AGENCY COMMENTS:

Water Rights have been applied for use @ the Yucca Mtn Repository. The status of those water rights and the repository itself is still in question. 40-1 III.E(1)

RECEIVED FEB - 8 2000 DEPT OF ADMINISTRATION DIRECTOR'S OFFICE

Jason K — Signature
s:\sharda\clear\clear.doc
NDOW — Agency
1/31/00 — Date

HLW & FD

STATE OF NEVADA
DEPARTMENT OF TRANSPORTATION
1263 S. Stewart Street
Carson City, Nevada 89712

KENNY C. GUINN, Governor
TOM STEPHENS, P.E., Director

RECEIVED MAR 14 2000

EIS PROJECT - (AR) PF
Control # DC-40

February 3, 2000

In Reply Refer to: PSD 7.01

HEATHER ELLIOTT CHIEF PLANNER
NEVADA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
209 E MUSSER ST ROOM 204
CARSON CITY NV 89701-4298

Dear Ms. Elliott:

The Nevada Department of Transportation has reviewed the project titled: Idaho High Level waste and facilities Disposition DEIS SAI #E2000-086.

Based on the information submitted, the proposed project is not in conflict with any Department plan. 40-2 VIII.H(1)

Thank you for the opportunity to review this project.

Sincerely,

Thomas J. Fronapfel

Thomas J. Fronapfel, P.E.
Assistant Director - Planning

TJF:NCB:dg

RECEIVED FEB - 8 2000 DEPT OF ADMINISTRATION DIRECTOR'S OFFICE

03/16/2000 09:16 3877333271 STONER CONSTRUCTION PAGE 01

HLW & FD EIS PROJECT - AR/PF
Control # DC-41

RECEIVED MAR 16 2000

JACKSON HOLE NEWS, Wednesday 2000 - 7

3/16/2000

DEAR SIRS,

PLEASE HELP ME WITH THIS!

DOES NOT MEET E.T.A. STANDARDS! 41-1 III.C(3)

WHY IS IT ALLOWED TO RUN ANY WAY? NOT SURE IF IT CAN BE UPGRADED? THEN YOU BETTER NOT LOVE IT!

BUILD NEW TANKS THAT WONT LEAK, OR FIX YOUR PIPES THAT DO LEAK! 41-2 III.A(1)

EPA WONT LET SNOWMOBILES IN YELLOW STONE!

EPA WONT LET OUR UN-INCINERATED WASTE GO TO IDAHO!! ?? !!

EPA ALLOWS US TO LOOK THE OTHER WAY!?

'Hot' waste on fire now at INEEL

■ Calciner used to treat high-level waste until June 1.

By Rachel Odell

Officials at the Idaho National Engineering and Environmental Laboratory began Saturday feeding "hot," or radioactive, high-level waste into a calciner at the site.

They will continue using the calciner to treat high-level waste until June 1 as they measure the amount of emissions released by the machine, INEEL spokesman Brad Bugger said. The calciner is used to turn liquid high-level waste into a solid for long-term storage. It works by heating a dolomite base and spraying that base with the liquid waste, Bugger said.

The calciner at INEEL does not meet current Environmental Protection Agency emission standards. In order to decide whether to upgrade the facility, INEEL officials are doing this series of test runs to determine how polluting the facility actually is, Bugger said.

"We have to run it and see what kind of emissions we are putting out," he said. "We have to decide if we are going to upgrade and before we make a decision we want to know if we can really meet the standards."

Upgrading the calciner is one alternative in an environmental impact statement on managing high-level waste. To order a copy of the draft environmental impact statement call (888) 891-5100. The document is also available on the Internet at http://tis.eh.doe.gov/nepa/docs/docs.htm. Comments on the draft EIS are due April 19. Comments should be sent to Tom Wichmann, document manager, US DOE, Idaho Operations Office, 850 Energy Drive, Mail Stop 1108, Idaho Falls, ID, 83401-1563. They can also be faxed to (208) 526-1184 or registered electronically at http://www.jason.com/hlwfdeis.

f Clover look.

41-3 YOU NEED TO STOP WHILE YOU STILL HAVE THE MONEY TO DO IT RIGHT!

TOM STONER

TO, TOM WICHMANN,
FROM, TOM STONER
FAX 307-733-8271

[PLEASE WAIT TILL YOU GET THE MONEY, KNOWLEDGE, OR RIGHT PROCEDURE TO TREAT ALL 41-3 VI(1) THE WASTE PROPERLY.

FIX YOUR TANKS. BUILD NEW BUILDINGS. WHATEVER IT TAKES!] ONCE YOU MOVE IT UNSAFELY, YOU JUST SPREAD THE PROBLEM

I DONT KNOW HOW THE EPA IS LETTING THIS HAPPEN NOW. YOU SHOULD BE ORDERED TO STOP.

P.S. BMFL = BIG NASTY FUCKING LIARS. SORRY

THANKS tsm

HLW & FD

EIS PROJECT - AR PF
Control # NC-42

UNITED STATES DEPARTMENT OF ENERGY

PUBLIC COMMENT HEARING ON

IDAHO HIGH-LEVEL WASTE

AND FACILITIES DISPOSITION

DRAFT ENVIRONMENTAL IMPACT STATEMENT

THURSDAY, MARCH 2, 2000

TRIBAL BUSINESS CENTER
FORT HALL, IDAHO

Reported by:
Kimberly Carpenter, CSR #600

EASTERN IDAHO COURT REPORTERS
P. O. Box 50853
Idaho Falls, ID 83405
(208) 529-0222

which you represent it.

If the court reporter is having trouble hearing you or keeping up with you, she may ask for your help in ensuring that the record of your comments is as complete as possible.

We will now begin the formal comment portion of tonight's hearing. I want to stress that this is a formal hearing and a recorded proceeding. A full transcript will be prepared.

I do want to take this final opportunity to thank you for attending this hearing and for your cooperation in observing the procedures I have outlined tonight.

Our first speaker tonight will be Mr. Dennis Donnelly.

MR. DENNIS DONNELLY: Is this the microphone you want to use?

THE FACILITATOR: Yes.

MR. DENNIS DONNELLY: I'm Dennis Donnelly. That's D-E-N-N-I-S, D-O-N-N-E-L-L-Y. My mailing address is 56 Tulane Avenue, Pocatello, Idaho, 83201.

42-1 IX.C(2) I first want to say that there has been too little time to prepare a formal commentary. This is not a formal commentary that I would

respect because there's been so little time.

As one example, last weekend I went to the library at Idaho State University. I happened to be in it. And I asked for copies of these books which are listed as being kept there. And the staff couldn't find them for me. They hadn't been indexed yet in their finder system. And it's not pretty. This is way too rushed. I've been gone on business for a week and have had little time to spend with these materials.

42-2 VIII.C(1)

However, I want to repeat my question formally about the total toxicity of the materials that are held as radioactive waste in the INEEL reserve, or whatever it is, in the form of the total known radioactive material to be held up there as waste and the total radiotoxicity and chemical toxicity of these materials.

If they are diluted by water to the maximum permissible concentrations for release to the public for drinking use, how much water would it take, and compare that to the level of the amount of water in the Snake River Plain aquifer.

So, the question is: How many aquifers would it take?

42-4 III.B(3)

The second question has to do -- or comment has to do with the assumption that's built into the EIS. When retrieving the high-level waste, it is based on the assumption that the waste can be literally vacuumed out of those tanks, that it is vacuumable, that it can be suctioned out, that it hasn't caked up.

That is an assumption stated in the -- in the process, and apparently has never been tested empirically. These people are going to go in there after they have built their processing procedure, and they may find that the waste is not going to work, to be transported again by air -- it was blown in there by air. But it may have caked up and may not be vacuumable.

And it's -- to me, it speaks of very little preparation of this Environmental Impact Statement. They don't know if their whole project is doable.

42-5 IV.A(1)

I would like to stress that the -- there is a preferred alternative, as far as I'm concerned. Without a question, it is the clean closure alternative. Without a question, I want

to see all these wastes removed and the land returned with no radioactivity above background, so it's available for full general use.

I would like to address the costs involved. I hear rumors that it will be billions of dollars. I want to say that the -- the apparent cost to make this mess in the weapons business is like three thousand nine hundred billion dollars.

42-6
X(10)

And, to me, it would be nothing to ask for something like $30 billion to clean up the mess they made with three thousand nine hundred billion dollars. Please ask for a great deal of money. The pockets are deep. We want this mess cleaned up, and cost should not be an issue.

There is a history of a promise by Glen Seaborg, the chairman of the Atomic Energy Commission in the '70s -- in the '60s. He said he would come and clean this waste up. The promise is published in a document called ERDA 1536. Please read it and know that we have a promise before us at the very highest level of the Atomic Energy Commission.

42-7
IX.D(1)

Thank you very much.

THE FACILITATOR: Thank you.

The next speaker will be Mr. Blaine Edmo. And following Mr. Edmo will be Beatrice Brailsford.

MR. BLAINE EDMO: Good evening. My name is Blaine Edmo. I represent the Shoshone-Bannock Tribes as a member of the Tribal Council.

Probably the main focus that I would like to address to the group here tonight in regards to the EIS relating to the high-level liquid waste is that I'm not a technician, nor do I purport to be, relating to any of this information that you presented here today. What I'm speaking for is on behalf of our general populous here on the reservation.

We have approximately 4,500 Tribal members, as well as a number of other non-Tribal members and non-Indians who reside here on the reservation. This is our home. We're going to be here for perpetuity.

The sad part about this whole thing is that we have a legacy here that is going to probably live beyond our generation. And I say that after having listened to the comments and some of the documents that I've had the opportunity to review, although not in totality.

4201-1
IX.D(1)

My concern is that this legacy with the high-level liquid waste will live beyond our lifetimes. And I think it's a sad commentary for our society in general.

I know we have all of the assurances that the technology has proven that we will have the waste out of Southeast Idaho by 2035. I, myself, am very skeptical. I do not believe that the Department of Energy, you know, right or

4201-2
VII.D(5)

wrong, will live up to their word. I do not believe that the State of Idaho, in meeting their agreement with the Department of Energy, will have the clout to make them live up to that legacy or the promises that they've made.

And I find it really ironic that Dennis would quote this gentleman from the old Atomic Energy Commission who made these promises. Well,

4201-3
IX.D(1)

I think DOE has a legacy of promises that are unfulfilled.

Most recently, the Tribes were involved in some other promises that were made by Secretary Richardson himself, which we found to be not only untimely, done without consultation with the Tribes, and done in a very haphazard manner, without any regard to our standing or to

our place here in Southeast Idaho.

So, you know, whether it's this gentleman from the past or whether it's our current DOE manager or Secretary of Energy, you know, I find it hard to believe that they will live up to these promises.

4201-4
VII.E(1)

I would like to also comment that the Shoshone-Bannock Tribes has a unique status here in Southeast Idaho that no one else can claim. And that is the simple fact that we have a treaty signed and executed and recognized by the United States government.

The United States government, whether it's the Department of Energy, the EPA, or any other federal entity or agency, you have a trust responsibility to the Shoshone-Bannock Tribes as a government and as a people. Whether you wish to live up to that, whether you wish to recognize that, is your problem. We recognize it. We expect you to live up to that legacy and that promise as a federal trustee to our people.

It's been commented many times -- and I think a lot of people are probably tired of hearing it -- but we say that a treaty is the law of the land. There is nothing else outside the

treaty of the Tribe and the United States government that we would accept or recognize. All of the administrative actions done by the Department of Energy or their sub-entities or their employees we do not recognize simply because of the fact that if you do not recognize your trust responsibility, then we have no obligation to accept what you present to us, as well.

I think you need to keep that in the back of your mind at any time you're proposing action in our territory, in our aboriginal homelands. I know that's kind of another sad commentary that people are tired of hearing, as well, but -- you know, whether it's the Shoshone-Bannock Tribes or anyone else, the indigenous peoples to any country have -- most certainly have a right to have a say in their territory. And we would hope that DOE would honor that fact.

4201-5 VII.E(3)

And I think, in conclusion, I'm very concerned about this EIS, the timetable. I don't believe you're going to live up to it. I have a concern that the legacy of the high-level liquid waste and the solid waste will not be removed by

the timetable specified. And the Tribe will go on record as demanding that it all be removed by 2035, or we'll also demand other reparations.

Thank you.

THE FACILITATOR: Mr. Edmo, I don't believe I had you give your address for the record. So, if you would please provide that for the record now.

MR. BLAINE EDMO: My business address is P.O. Box 306, Pema Drive, Fort Hall, Idaho, 83203. My e-mail address is shbncoun@cyberhighway.net.

Thank you.

THE FACILITATOR: Okay. Our next speaker is Beatrice Brailsford. And following Ms. Brailsford will be Shirley Kaiyou, Tribal member.

MS. BEATRICE BRAILSFORD: My name is Beatrice Brailsford. I'm the program director of the Snake River Alliance. My address is 310 East Center, Room 205, Pocatello, 83201.

The Alliance will be making formal comments later in writing, and so these are sort of some general impressions more than anything else.

4202-1 IX.C(7)

I had forgotten how hostile DOE hearings

can be and how arrogant DOE officials can be.

4202-2 IX.D(1) the Department of Energy had been nearly as smart or nearly as thorough as its employees sometimes try to project, we wouldn't be in this mess.

The study that we're looking at tonight

4202-3 VIII.A(8) really is deeply flawed. And I know that a lot of us are feeling a lot of frustration. Mr. Edmo's right. This is one of the biggest problems facing the Site, and I don't think anybody has a sense that we've got our arms around it in any -- in any way.

We've got what is certainly the

4202-4 IX.A(4) glitziest Environmental Impact Statement Draft I have ever seen. That must have cost a good deal more than it needed to.

But the Draft looks at a set of

4202-5 III.D.1(4) technologies that are, admittedly, immature so that our choices will be, admittedly, flawed, perhaps have to be revisited later, but we will

4202-6 VII.D(1) have made some sort of fake deadline, which isn't the job. You know, the job is to protect the state of Idaho and its environment.

And we -- and the way the study is set

4202-7 11.A(3) up is -- and I know you folks have heard this a million times -- but it's like a Chinese menu.

You know, we've got all these options -- we've got the separations options, we've got the non-separations options, leave it where it is, turn it back into liquid, dat, dat, dat -- and it's like a Chinese menu.

And this evening I think I did hear some statement that there might even be more alternatives in the next go-around of this Environmental Impact Statement, based on the study that the National Academy of Sciences did.

The problem with Chinese menus is, you can pick one from Column A, one from Column B and one from Column C, and when the dinner is brought to the table, all the dishes are pork.

Overall, the Alliance questions

4202-8 III.D.3(1) seriously the ethicacy of all the separations options. Certainly, from a technical point of view, it looks -- those look even chancier than the non-separations options.

And I think we have to remember that we

4202-9 III.D.3(1) can divide this waste into any number of fractions we want. And there are charts in here that show us, you know, green is for transuranic and yellow is for high-level. Divide it no matter how you want, it will still be

radioactive. All the radioactivity will still remain. So, you have to look at the simplest way to treat this waste that doesn't add steps that don't get you much further down the road than we are right now.

The Alliance also would like to -- you know, though we agree with the State that the Department of Energy inappropriately has tried to reclassify the liquid waste in the tanks as non-high-level waste -- we think that's inappropriate. But we do think that it's perfectly appropriate that we look at the dried high-level waste and the liquid high-level waste separately, because they do present different environmental perils to the people here and to our water.

And having mentioned water, I guess another source of controversy that I hear about whenever I hear about this Environmental Impact Statement is whether this liquid and dried high-level waste is on 100-year flood plain or a 500-year flood plain.

And I would like to offer that either way the flood can happen this year. This can be the 100th year or the 500th year. And if you're

4202-10 V(9)
4202-11 II.A(1)
4202-12 VIII.C(5)

looking at substances that are among the most dangerous on earth, go ahead and be a little more prudent. If somebody says it's a 100-year flood plain, let's go with that assumption if that gives us more robust structures.

Thank you.

THE FACILITATOR: Thank you.

Our next commentor will be Shirley Kaiyou.

Ms. Kaiyou, if you would please give your affiliation and your -- spell your name for the record, as well as provide your address.

MS. SHIRLEY KAIYOU: It's Shirley Kaiyou, K-A-I-Y-O-U, Post Office Box 607, Fort Hall, Idaho, 83203.

And do you need my phone number, too?

THE FACILITATOR: No.

MS. SHIRLEY KAIYOU: Okay. I would like to make a comment in regard to this.

I respect the fact that the Department of Energy is making an effort to educate the public of DOE issues. And this hearing has just sprung up all of a sudden. We never hear about these hearings until the last second. Maybe a week in advance if we're lucky.

4203-1 IX.C(3)
4203-2 IX.C(6)

After meeting with a few of the STGWG meetings and attending them, I noticed that some of the Rocky Flats' officials were more or less commenting about receiving $200 million as a budget and wasting 100 of it. Well, I think that could be beneficial for the State of Idaho, to use money like that that's being thrown away to clean up this mess.

4203-3 X(13)

And, after experiencing a lot of abuses and backlash from other federal agencies, I believe DOE has a need to clean up their act.

4203-4 IX.D(1)

THE FACILITATOR: That is all of the preregistered speakers that we have at this time. We will now take a brief recess to allow any others who are here, and would like to register to speak, to register. And then we will reconvene the hearing at the call of the chair.

So, at this time, we will be off the record.

(A recess was taken.)

THE FACILITATOR: We're going to go back on the record now.

Let the record show that we are back on the record at 8:28 p.m. We do not have any other registered commentors for this evening's

hearing. And I understand that there are no other comments from the Tribe, as well. So, that will conclude the testimony part of tonight's hearing.

Prior to concluding the hearing, however, I am going to read into the record several exhibits that we will make a formal part of tonight's record.

And the first item that will be marked and entered into the record this evening is Exhibit -- as Exhibit 1 is the comments that were read into the record earlier tonight by Mr. Tom -- I'm sorry -- Tom Wichmann's talking points earlier tonight. And that will be marked and entered into the record as Exhibit 1.

Marked and entered into the record as Exhibit No. 2 will be the Federal Register notice announcing these public hearings that are being held on the Draft EIS.

Marked and entered into the record as Exhibit No. 3 will be the amended Federal Register notice dated February 24, announcing the additional meeting that was held this evening at Fort Hall, and, in addition, extending the public comment period until April 19, 2000.

And the final exhibit that we have to enter into the record as Exhibit No. 4 is the videotape that you watched earlier this evening by Ms. Beverly Cook.

Do any of the commentors that are here tonight have any documents that they want to enter into the record to supplement their testimony?

If so, I would need to enter those now.

MR. BLAINE EDMO: One comment on behalf of the Tribe. We would like to thank DOE for giving us the opportunity for the comments.

4204-1
IX.A(2)

And I will give you credit for one thing. We had a public hearing with EPA here the night before last, and you spared us the -- I think you've shown a little bit more class than FMC had. They provided us with a song and dance, a number of their employees purporting their claims towards being environmentally conscious. And we would like to thank you for not presenting that type of documentation or testimony here today.

So, thank you.

THE FACILITATOR: It is now 8:29 p.m., March 2 of the year 2000, and we have heard from

all our registered speakers.

I want to thank you for your participation in this public hearing on the Department of Energy Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement.

Please remember that you can submit your comments in writing by fax or via the Internet until April 19, 2000.

This hearing is now adjourned.

(The public comment hearing concluded at 8:30 p.m.)

****

HLW & FD

EIS PROJECT - AR/PF
Control # DC-43

RECEIVED
MAR 17 2000

3/09/00
Thomas L. Wichmann
US Department of Energy
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563
Attn: Public Comment: Idaho HLW

Dear Mr. Wichmann

43-1 IX.D(1) The Department of Energy doesn't exactly have a good track record of keeping deadlines. They do have a good track record of studying issues to death. They then often fail to make decisions implementing the conclusions of those studies. It appears that the INEEL's approach to implementing the HLW-related provisions of the Batt Agreement will be no different. This will continue to undermine public trust in the Lab, and in us as individual employees of the DOE contractor. The INEEL's single greatest accomplishment as the "Lead Lab" on waste issues is to have convinced the public that nuclear technology is too difficult to be a viable energy option.

43-2 XI(7)

43-3 III.C(2) In reality, there are no especially difficult technology issues associated with HLW. In fact, the solutions to our "problems" were designed decades ago. Solutions such as sugar addition to sodium-bearing HLW prior to calcining was demonstrated here on a pilot scale in 1965. Solutions to calcine offgas emission of NOx and Hg were also identified and ignored. Calcine conversion into monolithic concrete (FUETAP) was developed at Oak Ridge in the 1970's. A similar process was used in the UK, where these difficult problems were solved long ago. The existing solutions are effective, and only dangerous in the imagination.

43-4 III.C(2)

43-5 III.D.4(8)

43-6 III.D.1(3)

43-7 IX.D(1) The continued pretense that these issues are too complex to be dealt with in an expeditious and economical manner will only continue to erode public confidence in the Lab, and ultimately result in the loss of our mission.

43-8 III.C(1) The remaining liquid should be immediately calcined, and the calcine should be rendered ready for disposal via a FUETAP-like process, and shipped for disposal. If we got serious about actually solving this problem it could be done prior to the Batt Agreement deadlines. Our continued employment may depend on it. Thank you for the opportunity to comment.

43-9 VII.D(2)

43-10 VIII.1(1)

Sincerely yours,

Bruce J. Mincher, Ph.D.

RECEIVED
MAR 20 2000

HLW & FD

EIS PROJECT - AR/PF
Control # DC-44

P.O. Box 308
Wilson, WY 83014
March 16, 2000

Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563
Attention: Public Comment: Idaho HLW & FD EIS

The issues facing the INEEL are public trust, our responsibility to future generations, and present day safety.

44-1 IX.D(3) Without trust, we cannot move on. An oversight committee should consist of at least three citizens from each down wind and down stream community, plus competent scientists whose wages and reputation do not depend on the government or the nuclear industry. All activities and decisions should be as open as possible. Not only will this engender trust, it will also increase the hope of useful input.

44-2 X(9) We chose the activities which made the waste and we have a duty to clean it up as well as we possibly can. We should spend whatever money and effort it takes to do that, and not leave the burden to our grandchildren and great grandchildren.

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Anne Newcomb

Anne Newcomb
ph: 307-734-0970
ph/fax: 307-733-3315

HLW & FD

EIS PROJECT - AR/PF
Control # DC-45

BEFORE THE DEPARTMENT OF ENERGY

OF THE UNITED STATES OF AMERICA

PUBLIC HEARING

UNITED STATES DEPARTMENT OF ENERGY'S IDAHO HIGH LEVEL WASTE AND FACILITIES DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT

HEARING OFFICER: PETER RICHARDSON, ESQ.

DATE: February 15, 2000
TIME: 6:00 p.m.
PLACE: College of Southern Idaho
CITY: Twin Falls, Idaho

call your name, please come forward to the microphone at podium to my left, please preface your comments by stating and spelling your name, and providing your mailing address if you wish to receive a copy of the final Environmental Impact Statement. If you are representing an organization, state the name of that organization and the capacity in which you represent them. If the court reporter is having trouble following you or hearing, he may ask for your help to slow down or speak up or directly into the microphone in order to make a complete record of your comments.

I will now begin the formal comment portion of this evening's hearing. I would stress that this is a formal hearing and recorded this evening with a full transcript being prepared.

Finally, I want to thank you for attending the hearing and for your cooperation in observing the procedures I have just outlined.

My first commentor is Steve Hopkins.

MR. HOPKINS: My name is Steve Hopkins, S-t-e-v-e, H-o-p-k-i-n-s. I'm with the Snake River Alliance of Idaho. My mailing address is P.O. Box 1731, Boise, Idaho 83701.

I'm speaking tonight on behalf of the Snake River Alliance. I also will be submitting more

detailed written comments at a later time.

The Snake River Alliance has been watchdogging activities at the Idaho National Engineering Laboratory for 20 years now. So I think we can provide a very fresh and honest perspective as to how to approach the treatment of high-level waste at facilities disposition.

45-1 IX.C(4) For starters, I would like to thank the Department of Energy and the State of Idaho for putting on the hearing and allowing the public to testify. I am concerned about the timing of the 45-2 IX.C(2) release of the document. Originally, the document was supposed to be released back in August of '99 or even April of '99, and it's been delayed many times. And timing by which it came out coincided a lot with the RICRA process on the advancement waste treatment facility, and there was not adequate time allowed for review of the document before the public hearings. The public hearings should have been adjusted to reflect the release of the Environmental Impact Statement.

45-3 XI(7) One thing that appears over and over again as it concerns treatment of spent fuel through reprocessing historically at INEEL is it's never fully admitted that INEEL in bomb production activities

throughout the Department of Energy complex. The reprocessor reprocessed weapon-grade uranium that was later used to produce tritium and plutonium at Hanford; however, the open and honest role that the reprocessor played has never been fully explained, and that needs to be adjusted.

In looking at the document thus far, I see 45-4 III.D.3(i) that there is much more science fiction and politics in this document than science itself. Looking especially at the separations technologies in the document, it seems to me that the Department of Energy and the State might as well look at turning waste into wine because there is as much of a technical basis for doing so as there is, say, for something like transuranic separations. One of the things in terms 45-5 III.D.3(i) of the handout concerning areas of uncertainty and controversy is the technical maturity of alternative treatment processes. Alternatives have varying maturity levels. And it must be addressed in the final Environmental Impact Statement. Either options that have no technical basis need to be dropped for consideration in the final EIS or there has to be supporting technical documents to give some assurance to the public that the technology could actually work because, as things stand, the separations technology

there is little basis in reality in terms of how these technologies could really work.

In terms of the politics that's in the -- that is so dominant in the document, which is unfortunate because treatment of the waste should proceed strictly out of concern for environmental protection. It seems to me that separations is pursued strictly because of problems with Yucca Mountain in an attempt to engineer around Yucca Mountain to go to the Waste Isolation Pilot Plant, and this is really unfortunate because we should look at how best to isolate this waste from the environment where it is because there are tremendous uncertainties as to whether or not it can actually be shipped offsite. And, therefore, we must look at the best way to solidify the waste and protect it from where it's at.

I do believe I have five minutes because I'm representing an organization.

I point out that this has actually been done at Hanford, that the Tank Waste Task Force, which is a precursor to the site-specific advisory board consisting of tribes, the State, and stakeholders, basically they have been saying since 1994 that, as it concerns Hanford waste, which is much, is much greater

45-6 II.A(5)
45-7 III.D.3(3)
45-8 III.E(1)

volume and presents more problems because of the leakage of the tanks, that treatment should proceed to best solidify the waste without regard to Yucca Mountain. And I think Idaho could do well to learn from that example.

Looking at the options, I see the Planning Basis option as completely unrealistic. That it's done by the State basically to stick an alternative in the document that could potentially, if everything went as planned, which never happens, would meet the Governor's agreement. And that's where politics come in. The State should instead be cooperating with the Department of Energy to look at the best way to isolate the waste from the environment.

There is also a clause in the Governor's agreement that Ms. Dold spoke about earlier where modifications could be made to the Governor's agreement based upon equi-analyses, which would be one such analysis that could lead to adjustment of the Governor's agreement. So there is flexibility allowed there, and, therefore, I would like the State to not consider pushing for the Planning Basis option. Instead look at realistic ways to best treat the waste and put it in a solid form.

True separations should be entirely dropped

45-9 II.D(1)
45-10 II.D(1)
45-11 II.D(1)
45-12 III.D.3(1)

from the document unless there can be some support -- technical support offered in the final EIS.

Another option that should be dropped at this point is minimal processing because it assumes that the waste could go to Hanford. This is extremely unrealistic. For one, Hanford is not planning on separation for its waste, so Hanford would have to build additional facilities in addition to the WIPP plant in order to do separations of our small quantity of high-level waste compared to their waste.

MR. RICHARDSON: Mr. Hopkins, I note that five minutes can fly by, so if you can wrap up your remarks, I would appreciate it.

MR. HOPKINS: Finally, I would like to point out that it's mentioned in the document that the National Resource Counsel study, which is basically the National Academy of Sciences, is pointed out in the document that it does not present a substantially different picture than the EIS. But I would like to point out that in reading the NAS report that I found this not to be the case. That the NAS report looks at separations in a very critical light and basically concludes that separations are not realistic. The quote from page 41 and 42 of the NAS report, It is much less likely that the objective, meaning

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45-15 III.D.3(1)
45-16 III.D.1(8)

separations, can be met for intergrated operations at a realistic plant conditions without encountering undesireably complex problems, exorbitant costs, and generation of excessive amounts of secondary wastes.

MR. RICHARDSON: Thank you for your comments.

I would remind you that March 20th is the deadline for submitting written comments, and I would encourage you to finish your thoughts in writing and submit them in one of the variety of ways that we have provided.

Todd Martin.

MR. MARTIN: My name is Todd Martin, and I am representing an organization under the same name, my name, licensed in Washington state. My address is P.O. Box 58, Northport, Washington 99157.

MR. RICHARDSON: Excuse me. I didn't catch the name of the organization.

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MR. RICHARDSON: Mr. Martin, we'll give you five minutes.

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Snake River Alliance who asked me to come down and take a look at this document and comment. I'm not going to pretend I know a lot about INEEL because I don't. And I also come from a site, Hanford, which is probably one of the biggest glass houses in this complex that nobody should throw rocks from.

So what I would like to talk about is what Hanford has done wrong, what mistakes we've made as a site in terms of our high-level waste program. Hanford has 60 percent of the nation's defense high-level waste; INEEL has about three percent. We have 177 tanks, nearly a third of which are leaking, over a million gallons of waste that has reached the groundwater that will some day enter the Columbia River. Eleven tanks at INEEL, most of the waste is already in a solid form. It's not to minimize the challenge in Idaho, but rather to just emphasize the challenge we have at Hanford.

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expensive. The grout part was not found to be protective of human health and safety and was also abandoned. Five years, 1.2 billion dollars Hanford spent before we finally threw in the towel. Hanford then moved to a simple pretreatment process, essentially the solid liquid separation, cesium and strontium removal, which are the first three treatment steps in many of the options over there, and got rid of the grout program and to vitrify all of its low-activity waste.

What I want to talk about is the lessons learned from this process. First of all, don't rely on advanced separations. They're not science; they're science fiction. Hanford couldn't make it pay with 60 percent of the waste; it's unlikely that INEEL will be able to make it pay with only three percent of the waste. On top of that, the National Research Council document says, It's a long shot, in a nut shell.

4502-1 III.D.3(i)

Second lesson learned, don't rely on Yucca Mountain. As Steve pointed out, the Hanford stakeholders adopted a resolution in 1994 that said, Hanford's assumptions and programatic planning should not be based on Yucca Mountain costs. It's a speculated repository with speculated costs that currently is not sized and may never be licensed to

4502-2 III.E(i)

receive this waste.

On the option of sending waste to Hanford. I personally am welcoming that waste with open arms. It is unlikely, however, from a political standpoint that before Hanford waste is truly vitrified and finished any Idaho waste will be vitrified at Hanford. Right now the planning basis, if everything falls into place perfectly, Hanford will be done in 2047, after which we can receive INEEL waste. It's not a particularly realistic option at this point.

Looking at the document itself, I think the scope is too limited and needs to be altered. The final decisionmaker, and this is the document on which I'm making the decision, it doesn't do the job because I have too many questions. One, which option will work; two, which option can I pay for? Both of those characteristics are scoped out of this EIS. It's inappropriate to scope those out because the decisionmaker will not be able to make a reasonable decision without those two pieces of information.

Picking up on Steve's waste into wine option, we could add an alternative to the document that did essentially result in turning the waste into wine. It would be extremely difficult from a technical standpoint, but that's not considered in the

4502-3 II.E(5)
4502-5 VII.A(4)
4502-6 VII.A(4)

EIS. It would be obviously extremely expensive, but neither is that considered. But it would be very good on the cultural end of things, from the socioeconomic aspects, from the transportation aspects, it would fare very well in this EIS. It's an extreme and ridiculous example, but it demonstrates the uselessness of evaluating these alternatives without cost and technical viability. Those should be added.

Three times in the last decade, Hanford asked for everything in its high-level waste program. We went to Congress with an all or nothing proposal. Treat this stuff in a generation at Hanford. Minimize lifecycle costs by minimizing high-level waste volume to Yucca Mountain. Three times we got nothing. What I am here to urge INEEL to not do is go with the all or nothing bargain. Don't go for TRUEX advanced separations, don't rely on Yucca Mountain. Do store the calcine safely and do aggressively try to treat the liquids. Get them into a solid form as soon as you can.

I appreciate the opportunity to comment.

MR. RICHARDSON: Thank you for your thoughtful comment.

Mr. Martin was the last individual that I have who has preregistered to comment. Is there

4502-7 III.D.3(1)
4502-8 III.E(1)
4502-9 III.E(1)
4502-10 III.A.(1)

anyone in the audience who would like to comment but has not yet had an opportunity to do so? Indicate so and I will call you up to the podium and we'll get your comments on the record.

I note for the record that no one has so indicated. We will be at ease and off the record and subject to call of the chair.

(A RECESS WAS HAD.)

MR. RICHARDSON: It is now 8:30. We will be back on the record.

I would ask if there is anyone in the audience who would like to make a comment formally who has not had an opportunity to do so. Indicate by raising your hand and we will call you up and get you on the record.

I note that no one has so indicated.

I will mark as Exhibit 1 of the Twin Falls hearing a multi-page document entitled Idaho High-Level Waste and Facilities Disposition Draft, Environmental Impact Statement, Tom's Talking Points-Twin Falls. That will be Exhibit No. 1. I will note for the record no other Exhibits were submitted to me this evening, and everyone who would like to have commented has had an opportunity to do so.

HLW & FD

EIS PROJECT - (AK) PF
Control # DC-46

Mr. Mark M. Glese
1520 Bryn Mawr Ave.
Racine, WI 53403

Mark M Glese
E-mail: mmk@juno.com

MAR 14 2000

RECEIVED
MAR 20 2000

Mr. T. Wichman
Document Mgr
DOE Operations Off
Idaho Falls ID 83401

Dear Sir:

46-1
III.C(3)

[Please cancel plans to restart the Calcine high-level radioactive waste incinerator.

The risks of restarting are unacceptably high for the residents, workers, and environment.]

Thank you.

Sincerely,

100% Salvaged Paper

HLW & FD

EIS PROJECT - AR/PF
Control # DC-43

RECEIVED
MAR 17 2000

3/09/00
Thomas L. Wichmann
US Department of Energy
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563
Attn: Public Comment: Idaho HLW

Dear Mr. Wichmann

43-1 IX.D(1) The Department of Energy doesn't exactly have a good track record of keeping deadlines. They do have a good track record of studying issues to death. They then often fail to make decisions implementing the conclusions of those studies. It appears that the INEEL's approach to implementing the HLW-related provisions of the Batt Agreement will be no different. This will continue to undermine public trust in the Lab, and in us as individual employees of the DOE contractor. The INEEL's single greatest accomplishment as the "Lead Lab" on waste issues is to have convinced the public that nuclear technology is too difficult to be a viable energy option.

43-2 XI(7)

43-3 III.C(2) In reality, there are no especially difficult technology issues associated with HLW. In fact, the solutions to our "problems" were designed decades ago. Solutions such as sugar addition to sodium-bearing HLW prior to calcining was demonstrated here on a pilot scale in 1965. Solutions to calcine offgas emission of NOx and Hg were also identified and ignored. Calcine conversion into monolithic concrete (FUETAP) was developed at Oak Ridge in the 1970's. A similar process was used in the UK, where these difficult problems were solved long ago. The existing solutions are effective, and only dangerous in the imagination.

43-4 III.C(2)

43-5 III.D.4(8)

43-6 III.D.1(3)

43-7 IX.D(1) The continued pretense that these issues are too complex to be dealt with in an expeditious and economical manner will only continue to erode public confidence in the Lab, and ultimately result in the loss of our mission.

43-8 III.C(1) The remaining liquid should be immediately calcined, and the calcine should be rendered ready for disposal via a FUETAP-like process, and shipped for disposal. If we got serious about actually solving this problem it could be done prior to the Batt Agreement deadlines. Our continued employment may depend on it. Thank you for the opportunity to comment.

43-9 VII.D(2)

43-10 VIII.1(1)

Sincerely yours,

Bruce J. Mincher, Ph.D.

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MAR 20 2000

HLW & FD

EIS PROJECT - AR/PF
Control # DC-44

P.O. Box 308
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BEFORE THE DEPARTMENT OF ENERGY

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PUBLIC HEARING

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HEARING OFFICER: PETER RICHARDSON, ESQ.

DATE: February 15, 2000
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PLACE: College of Southern Idaho
CITY: Twin Falls, Idaho

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4502-1 III.D.3(i)

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4502-5 VII.A(4)
4502-6 VII.A(4)

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I appreciate the opportunity to comment.

MR. RICHARDSON: Thank you for your thoughtful comment.

Mr. Martin was the last individual that I have who has preregistered to comment. Is there

4502-7 III.D.3(1)
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HLW & FD

EIS PROJECT - (AK) PF
Control # DC-46

Mr. Mark M. Glese
1520 Bryn Mawr Ave.
Racine, WI 53403

Mark M Glese
E-mail: mmk@juno.com

MAR 14 2000

RECEIVED
MAR 20 2000

Mr. T. Wichman
Document Mgr
DOE Operations Off
Idaho Falls ID 83401

Dear Sir:

46-1
III.C(3)

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The risks of restarting are unacceptably high for the residents, workers, and environment.]

Thank you.

Sincerely,

100% Salvaged Paper

HLW & FD

EIS PROJECT - AR/PF
Control # DC-45

BEFORE THE DEPARTMENT OF ENERGY

OF THE UNITED STATES OF AMERICA

PUBLIC HEARING

UNITED STATES DEPARTMENT OF ENERGY'S IDAHO HIGH LEVEL WASTE AND FACILITIES DISPOSITION DRAFT ENVIRONMENTAL IMPACT STATEMENT

HEARING OFFICER: PETER RICHARDSON, ESQ.

DATE: February 15, 2000
TIME: 6:00 p.m.
PLACE: College of Southern Idaho
CITY: Twin Falls, Idaho

call your name, please come forward to the microphone at podium to my left, please preface your comments by stating and spelling your name, and providing your mailing address if you wish to receive a copy of the final Environmental Impact Statement. If you are representing an organization, state the name of that organization and the capacity in which you represent them. If the court reporter is having trouble following you or hearing, he may ask for your help to slow down or speak up or directly into the microphone in order to make a complete record of your comments.

I will now begin the formal comment portion of this evening's hearing. I would stress that this is a formal hearing and recorded this evening with a full transcript being prepared.

Finally, I want to thank you for attending the hearing and for your cooperation in observing the procedures I have just outlined.

My first commentor is Steve Hopkins.

MR. HOPKINS: My name is Steve Hopkins, S-t-e-v-e, H-o-p-k-i-n-s. I'm with the Snake River Alliance of Idaho. My mailing address is P.O. Box 1731, Boise, Idaho 83701.

I'm speaking tonight on behalf of the Snake River Alliance. I also will be submitting more

detailed written comments at a later time.

The Snake River Alliance has been watchdogging activities at the Idaho National Engineering Laboratory for 20 years now. So I think we can provide a very fresh and honest perspective as to how to approach the treatment of high-level waste at facilities disposition.

45-1 IX.C(4) For starters, I would like to thank the Department of Energy and the State of Idaho for putting on the hearing and allowing the public to testify. I am concerned about the timing of the 45-2 IX.C(2) release of the document. Originally, the document was supposed to be released back in August of '99 or even April of '99, and it's been delayed many times. And timing by which it came out coincided a lot with the RICRA process on the advancement waste treatment facility, and there was not adequate time allowed for review of the document before the public hearings. The public hearings should have been adjusted to reflect the release of the Environmental Impact Statement.

45-3 XI(7) One thing that appears over and over again as it concerns treatment of spent fuel through reprocessing historically at INEEL is it's never fully admitted that INEEL in bomb production activities

throughout the Department of Energy complex. The reprocessor reprocessed weapon-grade uranium that was later used to produce tritium and plutonium at Hanford; however, the open and honest role that the reprocessor played has never been fully explained, and that needs to be adjusted.

In looking at the document thus far, I see 45-4 III.D.3(i) that there is much more science fiction and politics in this document than science itself. Looking especially at the separations technologies in the document, it seems to me that the Department of Energy and the State might as well look at turning waste into wine because there is as much of a technical basis for doing so as there is, say, for something like transuranic separations. One of the things in terms 45-5 III.D.3(i) of the handout concerning areas of uncertainty and controversy is the technical maturity of alternative treatment processes. Alternatives have varying maturity levels. And it must be addressed in the final Environmental Impact Statement. Either options that have no technical basis need to be dropped for consideration in the final EIS or there has to be supporting technical documents to give some assurance to the public that the technology could actually work because, as things stand, the separations technology

there is little basis in reality in terms of how these technologies could really work.

In terms of the politics that's in the -- that is so dominant in the document, which is unfortunate because treatment of the waste should proceed strictly out of concern for environmental protection. It seems to me that separations is pursued strictly because of problems with Yucca Mountain in an attempt to engineer around Yucca Mountain to go to the Waste Isolation Pilot Plant, and this is really unfortunate because we should look at how best to isolate this waste from the environment where it is because there are tremendous uncertainties as to whether or not it can actually be shipped offsite. And, therefore, we must look at the best way to solidify the waste and protect it from where it's at.

I do believe I have five minutes because I'm representing an organization.

I point out that this has actually been done at Hanford, that the Tank Waste Task Force, which is a precursor to the site-specific advisory board consisting of tribes, the State, and stakeholders, basically they have been saying since 1994 that, as it concerns Hanford waste, which is much, is much greater

45-6 II.A(5)
45-7 III.D.3(3)
45-8 III.E(1)

volume and presents more problems because of the leakage of the tanks, that treatment should proceed to best solidify the waste without regard to Yucca Mountain. And I think Idaho could do well to learn from that example.

Looking at the options, I see the Planning Basis option as completely unrealistic. That it's done by the State basically to stick an alternative in the document that could potentially, if everything went as planned, which never happens, would meet the Governor's agreement. And that's where politics come in. The State should instead be cooperating with the Department of Energy to look at the best way to isolate the waste from the environment.

There is also a clause in the Governor's agreement that Ms. Dold spoke about earlier where modifications could be made to the Governor's agreement based upon equi-analyses, which would be one such analysis that could lead to adjustment of the Governor's agreement. So there is flexibility allowed there, and, therefore, I would like the State to not consider pushing for the Planning Basis option. Instead look at realistic ways to best treat the waste and put it in a solid form.

True separations should be entirely dropped

45-9 II.D(1)
45-10 II.D(1)
45-11 II.D(1)
45-12 III.D.3(1)

from the document unless there can be some support -- technical support offered in the final EIS.

Another option that should be dropped at this point is minimal processing because it assumes that the waste could go to Hanford. This is extremely unrealistic. For one, Hanford is not planning on separation for its waste, so Hanford would have to build additional facilities in addition to the WIPP plant in order to do separations of our small quantity of high-level waste compared to their waste.

MR. RICHARDSON: Mr. Hopkins, I note that five minutes can fly by, so if you can wrap up your remarks, I would appreciate it.

MR. HOPKINS: Finally, I would like to point out that it's mentioned in the document that the National Resource Counsel study, which is basically the National Academy of Sciences, is pointed out in the document that it does not present a substantially different picture than the EIS. But I would like to point out that in reading the NAS report that I found this not to be the case. That the NAS report looks at separations in a very critical light and basically concludes that separations are not realistic. The quote from page 41 and 42 of the NAS report, It is much less likely that the objective, meaning

45-13 II.E(2)
45-15 III.D.3(1)
45-16 III.D.1(8)

separations, can be met for intergrated operations at a realistic plant conditions without encountering undesireably complex problems, exorbitant costs, and generation of excessive amounts of secondary wastes.

MR. RICHARDSON: Thank you for your comments.

I would remind you that March 20th is the deadline for submitting written comments, and I would encourage you to finish your thoughts in writing and submit them in one of the variety of ways that we have provided.

Todd Martin.

MR. MARTIN: My name is Todd Martin, and I am representing an organization under the same name, my name, licensed in Washington state. My address is P.O. Box 58, Northport, Washington 99157.

MR. RICHARDSON: Excuse me. I didn't catch the name of the organization.

MR. MARTIN: The organization's name is Todd Martin. It's a sole proprietorship in Washington state. I need that loophole for that extra two minutes.

MR. RICHARDSON: Mr. Martin, we'll give you five minutes.

MR. MARTIN: I'm here at the pleasure of

Snake River Alliance who asked me to come down and take a look at this document and comment. I'm not going to pretend I know a lot about INEEL because I don't. And I also come from a site, Hanford, which is probably one of the biggest glass houses in this complex that nobody should throw rocks from.

So what I would like to talk about is what Hanford has done wrong, what mistakes we've made as a site in terms of our high-level waste program. Hanford has 60 percent of the nation's defense high-level waste; INEEL has about three percent. We have 177 tanks, nearly a third of which are leaking, over a million gallons of waste that has reached the groundwater that will some day enter the Columbia River. Eleven tanks at INEEL, most of the waste is already in a solid form. It's not to minimize the challenge in Idaho, but rather to just emphasize the challenge we have at Hanford.

In 1989, we desided to pursue TRUEX, do a separations process, vitrify the high-level, grout the level, much, many of these options that are outlined in the EIS. That facility was to start operating exactly two months ago, December 1999. Obviously, it didn't happen. TRUEX was too risky from a technical standpoint. Essentially it wouldn't work. It was too

expensive. The grout part was not found to be protective of human health and safety and was also abandoned. Five years, 1.2 billion dollars Hanford spent before we finally threw in the towel. Hanford then moved to a simple pretreatment process, essentially the solid liquid separation, cesium and strontium removal, which are the first three treatment steps in many of the options over there, and got rid of the grout program and to vitrify all of its low-activity waste.

What I want to talk about is the lessons learned from this process. First of all, don't rely on advanced separations. They're not science; they're science fiction. Hanford couldn't make it pay with 60 percent of the waste; it's unlikely that INEEL will be able to make it pay with only three percent of the waste. On top of that, the National Research Council document says, It's a long shot, in a nut shell.

4502-1 III.D.3(i)

Second lesson learned, don't rely on Yucca Mountain. As Steve pointed out, the Hanford stakeholders adopted a resolution in 1994 that said, Hanford's assumptions and programatic planning should not be based on Yucca Mountain costs. It's a speculated repository with speculated costs that currently is not sized and may never be licensed to

4502-2 III.E(i)

receive this waste.

On the option of sending waste to Hanford. I personally am welcoming that waste with open arms. It is unlikely, however, from a political standpoint that before Hanford waste is truly vitrified and finished any Idaho waste will be vitrified at Hanford. Right now the planning basis, if everything falls into place perfectly, Hanford will be done in 2047, after which we can receive INEEL waste. It's not a particularly realistic option at this point.

Looking at the document itself, I think the scope is too limited and needs to be altered. The final decisionmaker, and this is the document on which I'm making the decision, it doesn't do the job because I have too many questions. One, which option will work; two, which option can I pay for? Both of those characteristics are scoped out of this EIS. It's inappropriate to scope those out because the decisionmaker will not be able to make a reasonable decision without those two pieces of information.

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HLW & FD

EIS PROJECT - (AK) PF
Control # DC-46

Mr. Mark M. Glese
1520 Bryn Mawr Ave.
Racine, WI 53403

Mark M Glese
E-mail: mmk@juno.com

MAR 14 2000

RECEIVED
MAR 20 2000

Mr. T. Wichman
Document Mgr
DOE Operations Off
Idaho Falls ID 83401

Dear Sir:

46-1
III.C(3)

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The risks of restarting are unacceptably high for the residents, workers, and environment.]

Thank you.

Sincerely,

100% Salvaged Paper

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E-mail: mmk@juno.com

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Kemble and Mildred Stout
10419 N. Mayberry Dr. #9
Spokane, WA 99218-1508
(509) 464-4186

March 15, 2000

Mr. Tom Wichman, Document Manager
DOE Operations Office
850 Energy Dr., MS-1108
Idaho Falls, ID 83401-1563

Dear Mr. Wichman,

47-1
III.C(3)

I protest starting the New Waste Calciner Facility at INEEL. This facility has a history of environmental contamination and worker exposure.

The Defense Nuclear Facility Safety Board has repeatedly challenged its readiness to restart operations.

Sincerely,

Mildred Stout

HLW & FD EIS PROJECT AR/PS
Control # DC-48

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

IN REPLY REFER TO:

March 14, 2000

ER 00/0062

Mr. T.L. Wichmann
U.S. Department of Energy
Idaho Operations Office
ATTN: Idaho HLW & FD EIS
850 Energy Drive, MS 1108
Idaho Falls, Id. 83401-1563

Dear Mr. Wichmann:

The Department of the Interior reviewed the Draft Environmental Impact Statement for the Idaho High-Level Waste and Facilities Disposition, Idaho National Engineering and Environmental Laboratory (INEEL), Butte, Jefferson, Bingham and Bonneville Counties, Idaho. The Department does not have any comments to offer.

We appreciated the opportunity to comment.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

1

Kemble and Mildred Stout
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Spokane, WA 99218-1508
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HLW & FD

EIS PROJECT - AR/PF
Control # DC-49

HLW EIS Web Comments

RECEIVED
MAR 23 2000

From:	HLWFDEIS Web Site
Sent:	Tuesday, March 21, 2000 4:00 AM
To:	web@jason.com
Cc:	web_archive@jason.com
Subject:	HLW EIS Web Comment

Name: Lynn Sims
Affiliation:
Address1: 3959 NE 42
Address2:
City, State Zip: Portland, OR 97213
Telephone: 5032876329
Date Entered: {ts '2000-03-21 04:00:22'}
Comment:
Idaho High-level Waste and Facilities Disposition DEIS

Thank you for the opportunity to comment.

49-1 IX.C(4) I attended the public meeting in Portland, OR and compliment the participants upon both the quality of presentation and informative materials and displays. Unfortunately that meeting was not well-attended--not due to lack of interest, but bacause of very poor publicity and communications.

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49-7 VIII.A (10) Facility closures should be dtermined upon the risks to the environment and their ability to contain wastes and radiation. All facilities should be maintained as needed and depending upon the risk of failure be closed on a case by case basis.

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49-9 X.6(9) It also should not have to be mentioned, but unfortunately it must be said that more monies should be allocated to monitoring, maintenance, containment, clean up and research technology rather than going for wasteful projects such as stockpile stewardship, weapons research and star wars defense. We've already targeted our own homeland by mismanagement and wrong priorities. It is time to face up to our predicament and do what we can to avoid impending and future disaster.

Thank you to everyone who is working so hard on these tremendous issues

HLW & FD

EIS PROJECT - AR/PF
Control # DC-50

Original

United States Department of Energy

IN RE: U.S. Department of Energy)
)
)

BEFORE
Peter Richardson
Hearing Examiner

February 17, 2000, 6 p.m.

Doubletree Riverside
2900 Chinden Boulevard
Boise, Idaho

Reported by
Marta M. Rice
CSR No. T-205

HLW & FD

EIS PROJECT - AR/PF
Control # DC-49

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Reported by
Marta M. Rice
CSR No. T-205

Page 37

Individuals who wish to make oral comments tonight in this room will be given three minutes each, and those representing organizations will be given five minutes. If you are representing an organization, please let the staff know at the registration table when you sign up.

And I will appreciate your efforts to conclude your remarks within the allotted time frame. We have a staff person sitting here in the front row who has a yellow card. And he will raise that card when you have one minute left in your comments to get your attention to do so, and then you have one minute left.

Now, as the presiding officer for this evening's hearing, I will reserve the right to ask speakers to conclude their remarks in order to stay on schedule. I hope you will understand that if I do have to ask you to conclude your remarks, it will be because it is my job to make sure that all people who are interested in making oral comments have an equal and fair opportunity to do so.

If I do stop you before you have concluded your remarks, I hope you will submit the rest of your comments in writing through the internet or by telefax.

Page 38

A few points on decorum. Please avoid side-bar conversations in this room that might interfere with the proceedings or distract attention from the designated person who is providing comments. Smoking is not allowed in the hearing room. And in order to avoid disruptions at this meeting, if you have handout materials that you would like to make available, there is space on the registration tables for you to do so.

Finally, I would like to explain a little bit about the role of the court reporter at this meeting. Her job is to transcribe verbatim the formal comment portion of this evening's hearing. In order to help her create as accurate a record as possible, when I call your name, please come up to the podium and speak directly into the microphone, and preface your remarks with your name and the spelling of your name. And if you would like to receive a copy of the final Environmental Impact Statement, please provide your mailing address.

If you are also representing an organization, preface your remarks with the name of the organization you're representing and the capacity in which you are its representative. If

Page 39

the court reporter is having trouble hearing you or keeping up with you, she may interrupt to ask you to either slow down or speak up.

Now I will begin the formal comment portion of the hearing, and I want to stress that this is a formal hearing and a recorded proceeding with a full transcript being prepared. And finally, I would like to take the opportunity to thank you for your cooperation in observing the procedures I've outlined. Our first scheduled commentor is Steve Hopkins, and Mr. Hopkins will be followed by Todd Martin. Mr. Hopkins.

MR. HOPKINS: My name is Steve Hopkins, H-o-p-k-i-n-s. And I'm representing the Snake River Alliance of Idaho. The Snake River Alliance has served as a citizen watchdog of activities at the Idaho National Engineering and Environmental Laboratory for 20 years.

It should be noted first that we do support treatment of this waste and do believe that, contrary to the plant on the incinerator, that this waste does need to be treated and stabilized and isolated from the environment.

I would mainly like to talk about the various alternatives that are delineated in the

50-1
I(1)

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Environmental Impact Statement, because I feel, in reading this document, that there is a great deal more science fiction and politics than sound science in the document.

For instance, in looking at the various separations alternatives, these alternatives are unsound. They've never been demonstrated to work on an industrial scale. And I believe they would not even be attempted at this point if it weren't for the fact that largely this issue is about the moving of waste to a new place, and trying to engineer around Yucca Mountain in Nevada as an attempt to get down to the waste isolation plant in New Mexico.

I have to point out here that if treatment fails, then environmental protection has failed. And we have too much to risk here if treatment should fail, because this is dangerous material. It does pose a risk to the aquifer. We have contamination passed in the aquifer as a result of past nuclear weapons activities, and we do need to stabilize this waste.

I'm looking at the areas of uncertainty and controversy that were pointed out earlier in the presentation. And I have to say that it's just

50-2
III.D.3(1)

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III.D.3(3)

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III.D.1(1)

50-5
VII.D(6)

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IX.A(1)

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phenomenal that these issues are not looked at in the Environmental Impact Statement. For one, it is possible for DOE to select a hybrid of alternatives.

Something that's not actually separate in the EIS for the public to evaluate is that in the final EIS, we could have a preferred alternative that really was even in the Draft Environmental Impact Statement. And that doesn't allow the public to adequately review the selected alternative.

How can we, if we can't even see it. And that's the problem is that we couldn't live with an alternative that's not even specified in the Environmental Impact Statement.

The fact that the costs are analyzed separately. There is a separate document that is not part of the NEPA process. That presents a tremendous problem, because costs are the main factors when it comes to deciding what is done.

Although, I'm hearing from various DOE officials that it seems unlikely that there will be two vitrification plants that will be built in such a close proximity to one another.

However, if you look closely at the cost

50-7
II.A(3)

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X(2)

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analysis, which unfortunately is not in the document and is viewed separately, you'll see that the bifurcation treatment is actually among the more — among the cheapest of the various treatment technologies. It's far cheaper than the separations technologies — especially full separation.

It then becomes more expensive whether you add in these extremely speculative costs of disposing the wastes in Yucca Mountain. And I have to point out here that Yucca Mountain itself represents a tremendous uncertainty. It's likely that it should open. It's not going to open on time.

Also, looking at a statement in the draft EIS that points out a study done by the National Academy of Sciences under the National Resource Council, or Research Council, and it is stated that the study, which is important to the DOE in terms of deciding what to choose in the way of treatment, it's pointing out that it does not conflict with the Draft Environmental Impact Statement. But in looking closely at the NIC report, this is not the case.

At this point, separations technologies

50-9
X(4)

50-10
III.E(1)

50-11
III.D.1(6)

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are uncertain. They're not tried. They present tremendous technical uncertainties and the EIS basically said this. The report, on pages 41 and 42, it states is much less likely that the objective, which is in this case separations, can be matched for integrated operations and realistic pike conditions without encountering undesirable and complex problems, presenting costs and generation of excessive amounts of secondary wastes.

I might also point out that the EIS rarely uses adjectives. And in this case, there are a great number of them. I do encourage the Department of Energy to draw from consideration the separations alternatives in the final EIS.

The only way they can potentially be allowed in a final EIS is if there were some supporting documentation of these technologies actually working. At the present time, there is no demonstration of such. So at this point, they should be dropped from the consideration. Thank you.

MR. RICHARDSON: Thank you for your comments. Todd Martin. Mr. Martin will be followed by Joe Stratton.

50-12
III.D.3(1)

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X(3)

50-14
IX.A(6)

50-15
III.D.3(1)

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MR. MARTIN: My name is Todd Martin. It is spelled just like the tennis player. Two d's, M-a-r-t-i-n. I'm here at the pleasure of the Snake River Alliance. They asked me to come down and take a look at the document in light of experiences at the Hanford Nuclear Reservation where I focus my activism. I'm not going to pretend I know everything about INEEL, because I don't.

But I do know what has happened to Hanford and what has went wrong. And I hope that this site is not going to make the same mistakes as us. And I want to review some of those.

In 1989 Hanford decided to pursue a separations alternative similar to many that are outlined in this document. Hanford chose Truex, the same technology outlined in this document, to separate tank waste and put the low-activity waste in a cementisious ground form, the high-activity waste in glass, very similar to multiple separations alternatives in this document.

The facilities that were to do that were supposed to start operating exactly two months ago. If you go out to the Hanford Nuclear Reservation, you will see blank, empty fields where those

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facilities were supposed to be built. What happened?

Truex didn't work and wouldn't work. It was too risky, and it was too expensive. It wasn't science; it was science fiction. Grout was found to be not protective of human health in the environment. The DOE weapons context is littered with examples where grout is not a robust enough waste form to take the significant amount of radionuclides these sites try to force into it.

So after five years and $1.2 billion, Hanford finally threw in the towel, threw grout out and decided we will glassify, vitrify all of our wastes, including the low-activity waste, and we won't do Truex. We will do a simple pre-treatment process.

The lessons learned from this process can be applied at INEEL. First of all, don't do Truex. Don't do advanced separations. Hanford was 60 percent of the nation's high-level waste. Defense waste couldn't make it pay nor make it work. INEEL has only 3 percent.

It's highly unlikely that even if it worked that it would pay off. Plus, the document Steve cited, the NRC document, says it's a long

5001-1
III.D.3(1)

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shot that it would ever work.

Second lesson: Don't rely on Yucca Mountain. The speculated repository was speculated costs.

In 1994 a broad group of Hanford stakeholders, known as the Tank Waste Task Force, sent a recommendation to DOE that said, "We feel that the tank waste at Hanford is going to stay at Hanford for the foreseeable future. We don't really think Yucca Mountain will exist."

Therefore, Yucca Mountain assumptions about cost shouldn't drive the decisions we make here. Get it out of the tanks and in a safe and stable form here at Hanford. Don't let Yucca Mountain back us into a corner. It costs a lot of money and takes a lot of risks.

Third lesson: Don't make unrealistic assumptions about budget. If you look at the cost document, you see that three — all of these alternatives — three, four, sometimes ten times as much money as currently today goes into the high-level waste program would be required. It's highly unlikely that that money is going to appear.

If I were the decision maker, I'd have two questions that I'd need this document to

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III.E(1)

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X(1)

5001-4
III.E(1)

5001-5
X(2)

5001-6
X(1)

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answer. First, what will work? Second, what can I afford? Unfortunately, as has been pointed out, technical viability and cost are both scoped outside of this document.

As a result, we could enter an alternative into a document that says, let's just turn the waste into wine. It would be extremely technically difficult to do so, but that's not considered by the EIS.

It would be extremely expensive to figure out how to turn all this waste into wine, but neither is that considered by the EIS. The characteristics that are considered by the EIS, cultural values, transportation values, socioeconomic impacts in the local community.

Turning waste into wine would fare very well in all of those categories. It could easily become the preferred alternative. It's an extremely ridiculous example that demonstrates the uselessness of considering these alternatives without looking at cost or technical viability.

Hanford has the overwhelming burden of high-level waste. Three times in the last decade Hanford has went to congress with an all-or-nothing proposal. We have said Hanford's going to treat

5001-7
VII.A(4)

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all its tank waste in a generation. Hanford is going to minimize life-cycle cost by forcing it all into Yucca Mountain. We want it all.

Three times in the last decade congress has said, fine, you get nothing. What I'm here to say for INEEL is that you should not go to congress with an all-or-nothing proposal. Rather, you should ask for something, because that's probably what you can get.

And what I think that something is, is to aggressively retrieve, treat, and safely store the remaining liquids. Hanford has bent over backwards to figure out how to calcine our liquid tank waste, because calcine is a relatively safe and stable waste form.

Now, I look at this EIS and there are multiple alternatives that want to take a step backwards. Take that relatively safe waste form redissolve it into a dangerous liquid waste, all for the purpose of running it through a process that is unlikely to work and that the site probably can't afford. That seems like foolishness to me.

Any option that includes the dissolution of the calcine for the purpose of running it through a separations process, such as Truex,

5001-8
X(13)

5001-9
III.D.3(1)

5001-10
III.D.3(1)

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should be abandoned. The focus should remain on safely retrieving, solidifying, and storing the remaining liquid waste. Thank you for the opportunity to comment.

MR. RICHARDSON: Thank you for your comments. I believe Mr. Stratton is not going to be commenting. Steven Milhous Barr.

MR. BARR: I'll pass, thank you.

MR. RICHARDSON: Thank you, Mr. Barr. Reverend MsMere. Okay Reverend.

REVEREND MSMERE: Hello. My name is Reverend MsMere. That's M-s-M-e-r-e.

MR. RICHARDSON: Reverend, could you get a little closer to the microphone?

REVEREND MSMERE: Sure. I'm the Pastor of Mere Peace Church in Boise, Idaho. And my ministry is presenting, writing a spiritual peace poetry of prose for the children — to the children. I'm also a member of the Snake River Alliance.

And I speak in behalf of the children. Mere peace for the children. What can we do? What can we do about what we have done? What is our solution for the children? What can we do about our common mess? We're all involved through grandparents, parents, ourselves, our children, and

5001-11
VII.D(6)

Page 50

theirs. In God love. We need to clean up our mess.

This problem needs a miracle. And the way to produce this miracle is to continue to work together — each breath continuing our best efforts for the children. We are inseparably joined in our common mess.

And what can we do? As Ann said, list in list out, perpetually, move away, quit thinking about a solution for the children. As this gentleman said, consider a crap shoot. No, I think not.

We all know we need to make less waste, less mess. Less mess is part of a solution for the children. Yet, now we must focus on love on the existing mess and what is best for our children.

Putting the mess into the air is to pollute us even more. And the babies, how will they be contaminated? Will they be mutated? How will their cancers be cured? What else, pollute the waters, pollute our earth, pollute the heavens. What else can we do?

This is a mess we have together. What can we do together for the children? What can we do together? Pray together. What can we do?

5002-1
III.D.1(6)

5002-2
VIII.B(2)

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Love. Love together. How can we help ourselves? With the help of God. Love. How can we help together for the children?

In love, let's do something together. With the love of God, for the love of the children. Together, love is our answer now. And as Tom says, "Let's finish the job," somehow using love. Thank you, Jesus. Mere peace, love. Thanks.

MR. RICHARDSON: Thank you for your comment. Fritz Bjornsen indicated to me that he was going to decline to comment. At least orally this evening. Pamela Allister.

MS. ALLISTER: I need some clarifications, please. I represent the Snake River Alliance; however, I'm making personal comments. Am I a three-minute one, or a five-minute one?

MR. RICHARDSON: The rules are, if you are representing an organization, you have five minutes. If you are speaking on your own behalf, you have three minutes.

MS. ALLISTER: All right. Thank you. My name is Pamela Allister, A-l-l-i-s-t-e-r. I live in Boise, Idaho. What I like about this draft EIS is that it's not a simple yes and no EIS. It's a multiple orient equation — a complex

Page 52

decision-making process. It's really a lot of fun in a lot of ways.

And on the other hand, it is so entirely complex. I was looking at this display back here, and I could just feel myself going into a food coma, or gridlock, brain dead, or something, because there is just so much there.

So in that case, it's what the citizen needs to do, whether they're an activist or someone who is an observant citizen, is they need to start with some guiding principles for how they are going to wade through this process.

And that is exactly what the Snake River Alliance has recently done at one of its board meetings, is establish some operating contextual principles. And rather than speak to the specific draft EIS, although I may quickly refer to it, given that now I have to talk real fast.

I'd like to run through those guiding contextual principles that we use when we are looking at something like this. One of them is that we have and will always continue to fight for the guiding principle of an open process with full public participation and public involvement.

5003-1
VII.A(6)

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And I am specifically going to make a comment of somewhat of a distress about this particular hearing. It's very difficult to put something into three minutes that is weighing 15 to 20 pounds when it came into the office. 5003-2 IX.C(3)

So I would encourage the decision makers to be more flexible on the amount of time that people can have. And I was particularly thinking today about, there are some of us who are not white Anglo-Saxon Protesants and don't operate well in a very tight constraining time schedule that's extremely rigid.

And I know that, and I just wanted to commend you for going to the Fort Hall Reservation, and I hope that you are culturally sensitive when you do that, to the pressure the time constraints 5003-3 IX.C(4) can make on people who are trying to deal with such a complex issue. So that is principle number one.

A second and very important principle for the Snake River Alliance and activists, such as ourselves, is do not create more risks by the process that you are establishing.

And this particular EIS illustrates that there are at least four or five different places where we are running the risk of creating more risk 5003-4 III.D.1(4)

Page 54

with what we already have, that there is unproven technology and unsound scientific methods including the plans for where they may dispose of this waste in the long-term.

And many of the options are including transportation, which we feel is a risk. The grinding principle for the Alliance, then, is to store the waste as safely as possible in a monitored situation and try not to move it around too much. 5003-5 III.E(1)

Another principle is to stop creating more waste. It looks as if — that we need to create further efforts to be aware that we have this mess, because we used a process that we felt was a good idea at the time: reprocessing. 5003-6 III.D.1(4)

And we have now acquired a huge problem that is probably one of the most expensive cleanup jobs that we have in this state and in our neighboring state.

And I hope that we will take into account what an important lesson this has been about the use of technology that seems right at the moment, but may not be right later. I'm running out of time. 5003-7 VI(1)

So the last four are going really

Page 55

fast — just the basic principales, which are cleanup with scare, prioritize the money spent to the risk. Then we heard a lot about money tonight, whether the income is going to be there and whether or not we have a value to cost. 5003-8 VII.B(3)

Reduce the highest risk first. This is taking into consideration the entire DOE complex at INEEL. This is high-risk waste that does need to be attended to as soon as possible. 5003-9 VII.B(3)

And lastly, our guiding, over-acting principle, do everything we can to protect the land, the air, the water, from nuclear contamination, especially and particularly in our case, the Snake River Plains Aquifer, and thus, the human environment and all of these pieces. Thank you. 5003-10 II.A(5)

MR. RICHARDSON: Thank you for your comment. I remind you that the Department of Energy and the State of Idaho are providing a variety of methods for you to submit your comments.

You may submit them in writing. You may drop them off in the comment box. You may submit them over the Internet. You may submit them by telefax. There is no limit on the amount of written comments you may submit.

Page 56

And written comments receive the same weight in the record as do oral comments made at this and the other public meetings. If you would like to make an oral comment this evening and haven't had an opportunity to do so, I'd ask that you register at the registration table or, otherwise, just indicate to me that you would like to come up and make a comment.

Ms. Allister was our last pre-registered commentor this evening, and I'll note that no one so indicated. So what we will do at this point is take a break, subject to call of the chair, and we'll be off the record.

(Brief recess.)

MR. RICHARDSON: We'll take the Idaho hearing on the United States Department of Energy's, Idaho High-level Waste and Facilities Disposition Draft Environmental Impact Statement.

It's now 8:40 p.m. We're back on the record after a short break, having taken comments earlier. I'd ask if there is anyone in the audience this evening who would like to comment on the Draft Environmental Impact Statement, but who has not yet had an opportunity to do so.

We will let the record reflect that none

EIS PROJECT - (AR/PR-
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March 23, 2000

Mr. Thomas L. Wichman
Document Manager,
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

Dear Mr. Wichman,

Thank you for the opportunity to comment on the Idaho High Level Waste and Facilities Disposition draft Environmental Impact Statement (EIS). These comments are submitted on behalf of the State of Oregon. They should be considered as an addition to written comments provided by Ken Niles of my staff at the Portland public meeting on February 22, 2000.

Our previous comments focused primarily on conditions under which Oregon could potentially consider future treatment of Idaho's high-level waste at Hanford. The comments provided here focus more on the technical elements of the draft EIS.

We have two overarching concerns with this draft EIS:

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- We believe the "mix and match" philosophy of this EIS is inappropriate. Putting together pieces of different alternatives to create a hybrid alternative creates an alternative that has not been analyzed in an integrated fashion in the EIS.

51-2 II.E(2)
- This EIS is too hypothetical to be used as a decision making document. For example, construction on the facilities being considered for Hanford's own use in the Hanford Option will not begin for several years even if they are approved and funded. Final waste dispositions discussed in the EIS rely on facilities still in the research, planning and approval phase. The future existence of these facilities is not certain and is many years away at best. And, these facilities may not be compatible with Idaho waste.

51-3 II.E(2)
We recommend that Hanford references in this EIS be removed and re-evaluated and the ROD deferred due to the large uncertainties associated with the alternatives being considered.

51-4 II.E(2)

There is another point I would like to make. I am greatly concerned about the manner in which the Portland public meeting was conducted. Although the information provided was fair and understandable, I must object to the rigid format used in conducting the meeting. My staff suggested a less formal format to reflect the small turnout. We were

51-6 IX.C(3)

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51-6 IX.C(3)

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Control # DC-57

told this was not possible because the National Environmental Policy Act required that each public meeting be conducted exactly the same. We do not agree with this interpretation of NEPA's requirements.

Only five members of the public and two members of my staff attended the meeting. One highly interested and knowledgeable individual left her sick child with her husband to come to this meeting because of her passion about Hanford issues. She politely asked to give formal public comment after 90 minutes of presentations because she could not stay for the formal public comment period. She was allowed to give her comment during the question and answer period but was told her comments were not on the record. After giving her comments she was told that her comments were good but she should send written comments if she wanted them on the record. This inflexible approach to public involvement and NEPA serves neither the public nor the U.S. Department of Energy.

51-8 IX.C(5) Oregon Office of Energy staff also suggested a low cost facility which was not used. We are ever vigilant about getting the best possible result for money spent. Please provide the total cost of the Oregon public involvement effort to include meeting room and staff travel costs and perdiem. This information will be used in an Oregon report to USDOE on public involvement efforts in Oregon.

More specific technical comments on the draft EIS are attached. Should you have any questions about any of our comments, please contact me at 503-378-5544 or Mr. Douglas S. Huston of my staff at 503-378-4456.

I look forward to seeing how our comments and concerns are addressed.

Sincerely,

Mary Lou Blazek

Mary Lou Blazek
Administrator,
Nuclear Safety Division
Oregon Office of Energy

HLW & FD EIS PROJECT - AR PF
Control # DC-57

Oregon Office of Energy Technical Comments on the Idaho High Level Waste and Facilities Disposition Draft Environmental Impact Statement

51-9 III.D.2.c(5) 1. This EIS does not consider all reasonable alternatives. For example, vitrification plants exist and are operating at West Valley and Savannah River. The EIS should examine the alternative of vitrifying Idaho's waste at these locations.

51-10 IX.A(1) 2. Section 3.1, "Description of Waste Processing Alternatives," lists five alternatives. Table 3-1 on the next page lists nine alternatives/options. This is confusing and should be clarified.

51-11 VII.A(2) 3. As a result of the mix and match philosophy espoused in this EIS, Section 5 should analyze Hanford impacts for the Full Separations Option and Early Vitrification Option.

51-12 VIII.C(2) 4. Appendix C.8, Section C.8.3.2, "Water Resources," page C.8-11, "Surface Water," does not discuss Oregon's extensive use of the Columbia River for irrigation, drinking water, electrical power generation, commerce and tourism. We recommend these uses of the river be included in this section, and that the EIS examine and explain the impacts on these uses from the various alternatives being considered.

51-14 VIII.D(1) 5. The Hanford alternative is described as having a minimal impact on 52 acres of sage shrub-steppe habitat. However, no consultation was done with the Native American tribes in the area, or with the appropriate federal agencies to support this assertion. As a result of fires in the 1980s, much of this habitat was burned. This has drastically reduced the amount of prime sage shrub-steppe habitat. The State of Washington identifies this habitat as of special concern. It is home to about 17 species which are under consideration for listing as rare, threatened or endangered. As Hanford cleanup proceeds, additional land will be required for processing and cleanup facilities. Even more land will be disturbed as a direct result of cleanup. The EIS fails to consider or analyze the cumulative impacts of all of these activities at Hanford. We recommend these impacts be considered in the EIS.

51-16 VIII.C(3) 6. The models used to predict waste migration through the vadose zone and groundwater are overly simplified and fail to consider the broad uncertainties that occur due to preferential pathways and a general lack of understanding of the basic science involved in long term migration of radioactive materials through soil. We recommend that a discussion of these uncertainties be included in this EIS.

51-17 VIII.C(9) 7. Mobilization of plutonium and other actinides by the action of vegetative organic decay products such as humic and fulvic acids does not appear to have been considered, or by colloid formation and transport. We recommend these potential impacts be considered in the EIS.

51-18 II.E(3) 8. This EIS should discuss how the Hanford Option would be funded and the impacts of the various funding options on Hanford and Idaho cleanup.

DOE AMI 001

EIS PROJECT AR PF
Control # DC-52
HLW & FD

DEPARTMENT OF ENERGY
Richland Operations Office
P.O. Box 550
Richland, Washington 99335

Management Systems Division
NEPA

RECEIVED MAR 28 2000

Cindy Brown /

To: Tom Wichmann Fax: 208-526-1184

From: Paul F.X. Dunigan, Jr. Date: 3/29/00
(509) 376-6667
FAX (509) 376-0306

Re: INEEL HLW DEIS Pages: 3

CC:

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

Thank you for sending msg. Hope this helps!

L. Bayers for Paul F.X. Dunigan, Jr.

HANFORD ADVISORY BOARD

A Site Specific Advisory Board, Chartered under the Federal Advisory Committee Act

Advising:
US Dept of Energy
US Environmental Protection Agency
Washington State Dept of Ecology

CHAIR:
Merilyn B. Reeves

CO-VICE CHAIRS:
Ken Bracken
Shelley Cimon

BOARD MEMBERS:

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Elizabeth Tabbutt

State of Oregon
Shelley Cimon
Ken Niles

Ex-Officio
Confederated Tribes of the Umatilla
Washington State Department of Health

March 7, 2000

Mr. Thomas L. Wichmann
Document Manager
U.S. DOE, Idaho Operations Office
850 Energy Drive; Mail Stop 1108
Idaho Falls, ID 83401-1563

EIS PROJECT AR PF
Control # DC-52
HLW & FD

RECEIVED MAR 28 2000

Subject: INEEL High-Level Waste Draft EIS

Dear Mr. Wichmann:

Some members of the Hanford Advisory Board (HAB) attended the February 3 presentation conducted by staff of the U.S. Department of Energy on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (EIS). On behalf of the HAB, we are submitting the following statement to be considered by DOE.

The HAB is not prepared at this time to provide specific comments on the EIS. The Hanford vitrification plant has not been constructed and thus will not be available for several years. In addition, when it becomes operational, it will take many years to vitrify Hanford tank wastes. Thus, it would be premature at this time for us to comment on the EIS alternative that would send INEEL high-level wastes to Hanford for vitrification.

However, three consistent positions of our Board relate to the issue.

1. In Advice #13 and subsequent pieces of advice, we have stated that if another site sends waste to Hanford for treatment, it should not be sent until a treatment facility is built and operating. Once treated, the waste must be returned to the sending site. 52-1 II.E(2) + 52-5 II.E(6)

2. We cannot support Idaho's waste coming to Hanford until all of Hanford's high-level waste has been treated. We emphasized in our recent statement on tank wastes that the Hanford tanks are one of the most urgent environmental threats to the country. We have three types of tanks: those that have leaked, those that will leak, and those that will leak again. The single-shell tanks are already beyond their design life and the double-shell tanks will reach that point before the vitrification process is completed. Vitrification of these wastes must proceed expeditiously and be completed before a major accident occurs with the aging tanks. 52-2 II.E(5)

3. We have indicated in several pieces of advice that if any wastes come to Hanford for treatment or disposition "the sending site should cover all costs." The Hanford budget is not adequate to cover even the costs of our own cleanup efforts in 52-3 II.E(3) + 52-6 II.E(9)

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Nuvotec, Inc. - *Administration*
723 The Parkway, Suite 200, Richland, WA 99352
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Document 52, Hanford Advisory Board (Merilyn Reeves), Richland, WA
Page 3 of 3

accordance with our Tri-Party Agreement and regulatory requirements. The impact of offsite wastes on the inadequate budget of Hanford and the environmental impacts of any diversion of Hanford cleanup funds must be factored into decisions on offsite wastes and should be thoroughly analyzed in this EIS. The Hanford cleanup dollars should not be used to subsidize the receipt, treatment, and/or storage of offsite wastes.

52-4
VII.A(6)

We would appreciate being consulted as this process continues forward, particularly when a preferred alternative or other decisions are being considered which might impact Hanford.

Very truly yours,

Merilyn B Reeves

Merilyn B. Reeves, Chair
Hanford Advisory Board

cc: Keith Klein, Manager, DOE-RL
Dick French, Manager, DOE-ORP
Tom Fitzsimmons, Director, Washington Department of Ecology
Chuck Clarke, Regional Administrator, U.S. Environmental Protection Agency
Wade Ballard, Acting Designated Federal Official
The Oregon and Washington Congressional Delegations
Michael Gearheard, U.S. Environmental Protection Agency
Dan Silver, Washington Department of Ecology

Document 53, Public Comment Hearing, February 24, 2000, Pasco, WA
Page 1 of 6

HLW & FD EIS PROJECT AR/PF
Control # DC-53

UNITED STATES DEPARTMENT OF ENERGY

IDAHO OPERATIONS OFFICE

PUBLIC HEARING

DRAFT ENVIRONMENTAL IMPACT STATEMENT

IDAHO HIGH-LEVEL WASTE AND FACILITIES DISPOSITION

February 24, 2000

6:00 p.m.

Doubletree Inn

Pasco, Washington

BRIDGES & ASSOCIATES
Certified Shorthand Reporters
P. O. Box 223
Pendleton, OR 97801
(541) 276-9491 - (800) 358-2345

Document 52, Hanford Advisory Board (Merilyn Reeves), Richland, WA
Page 3 of 3

accordance with our Tri-Party Agreement and regulatory requirements. The impact of offsite wastes on the inadequate budget of Hanford and the environmental impacts of any diversion of Hanford cleanup funds must be factored into decisions on offsite wastes and should be thoroughly analyzed in this EIS. The Hanford cleanup dollars should not be used to subsidize the receipt, treatment, and/or storage of offsite wastes.

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Document 53, Public Comment Hearing, February 24, 2000, Pasco, WA
Page 1 of 6

HLW & FD EIS PROJECT AR/PF
Control # DC-53

UNITED STATES DEPARTMENT OF ENERGY

IDAHO OPERATIONS OFFICE

PUBLIC HEARING

DRAFT ENVIRONMENTAL IMPACT STATEMENT

IDAHO HIGH-LEVEL WASTE AND FACILITIES DISPOSITION

February 24, 2000

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formal hearing and a recorded proceeding with a full transcript being prepared.

And finally I would like to take the opportunity to personally thank you all for attending and for your cooperation in observing the procedures I have just outlined.

Our first scheduled commenter is John Swanson. Mr. Swanson? If you are not in the room when I call your name, I will go back and recall names. Harold Heacock.

MR. HEACOCK: Thank you. I am Harold Heacock of Kennewick, Washington, and I am presenting a statement tonight for the Tri-Cities Industrial Development Council. The possible utilization of the Hanford waste vitrification plant for the processing high-level fuel processing wastes at Hanford could have a significant impact on the Hanford cleanup program. 53-1 II.E(5)

Based on currently available preliminary information the use of the Hanford vitrification plant for processing and vitrification of the Idaho high-level wastes would provide significant cost savings to the Department of Energy over other realistic alternatives. 53-2 II.E(4)

The environmental impacts of this

alternative appear to be equivalent to or less than those of other alternatives. 53-3 II.E(4)

However, this alternative has not been studied in sufficient depth to support a firm position for or against it at this time. 53-4 VII.A(2)

If the use of the Hanford vitrification plant for the processing of high-level wastes is to be considered further, a more detailed environmental impact analysis of this alternative must be prepared and reviewed by the public, including the state of Washington agencies having an interest in the subject.

In the preparations of this analysis, there are several considerations which must be included.

The Hanford waste vitrification plant must be adequately funded, completed, and in full operation before any consideration can be given to the processing of off-site wastes. 53-5 II.E(2)

Processing of Idaho wastes cannot delay or interfere with the planned or accelerated process of Hanford wastes. 53-7 II.E(5)

Consideration must be given to the impact that additions to the plant will have on local governmental services, police, fire, roads, schools and so on. 53-8 VIII.1(2)

Any off-site wastes which will be processed

or vitrified in the plant must be returned to the center or to a national repository. Interim or permanent disposal of the waste at Hanford is not acceptable. 53-9 II.E(6)

Full funding for all transportation, processing, and storage costs must be provided as an added increment to the Hanford environmental management project program funding. 53-10 II.E(3)

Consideration must be given to the local environmental impacts resulting from the 53-11 VIII.H(3) transportation and processing of the Idaho wastes.

53-12 VIII.H (3) Off-site transportation corridor safety, environmental impacts, and traffic issues must be thoroughly reviewed in cooperation with local and tribal governments. Provision must be made to alleviate any additional costs which may be incurred by local or state government agencies. 53-13 II.E(3)

We believe these issues are a reasonable requirement and provide a bottom line basis for evaluation of the importation of high-level waste to Hanford for processing and vitrification.

53-14 VII.A (2) In view of the potential significant savings from the Hanford alternative that would accrue to the Department as compared to other feasible alternatives, this alternative should be given more

comprehensive evaluation than is currently available.

Thank you for the opportunity to present our views on this subject.

MR. RICHARDSON: Thank you for your commenting, Mr. Heacock.

Is Mr. Swanson in the room? I would ask if there is anyone in the room, Mr. Heacock and Mr. Swanson were our only registered commenters, if there is anyone in the room that would like to comment formally on the record this evening, let me know by raising your hand, or just standing up and walking up to the podium, and we will get your comments on the record.

In the meantime I will take care of a housekeeping matter. I am going to mark as Exhibit Number 1 of this evening's proceeding a multi-page document entitled Idaho high-level waste and facilities disposition Draft Environmental Impact Statement, Tom's Talking Points-- Pasco, that would be Exhibit Number 1.

I will mark as Exhibit Number 2 a two-page document on TRIDEC, Tri-City Industrial Development Council letterhead entitled statement prepared for Department of Energy public hearing on Draft EIS regarding Idaho High-level Waste and Facilities

Disposition, Pasco, Washington, February 24, 2000. That will be Exhibit Number 2 of this evening's proceeding.

I will note that no one has indicated that they have not had an opportunity to comment who wanted to. Mr. Swanson is not in the room. At this point I will stand at ease, subject to call of the chair, in the event Mr. Swanson returns, or another individual of the public would like to come up and make a comment. So we will be off the record, subject to call of the chair. It is 11 minutes before the hour.

(Recess taken).

MR. RICHARDSON: Okay. We will be back on the record. It is now 8:15. I understand Mr. John Swanson who pre-registered decided not to comment and left the hearing.

I will remind you that you have until April 19 in which to submit written comments. That's the postmark date. And there are a variety of ways that you can submit comments to the Department of Energy on this Environmental Impact Statement. I will ask if there is anyone in the hall who would like to comment and who has not had the opportunity to do so. If so, would you raise your hand.

I will note for the record, no one has so

HLW & FD EIS PROJECT - (AR) PF
Control # DC-54

Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

00-CAB-031

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APR 10 2000

April 3, 2000

Beverly Cook
U.S. Department of Energy
Idaho Field Office
850 Energy Drive, MS 1146
Idaho Falls, ID 83401

Dear Ms. Cook:

Note: The Site-Specific Advisory Board for the Idaho National Engineering and Environmental Laboratory (INEEL), also known as the INEEL Citizens Advisory Board (CAB), is a local advisory committee chartered under the Department of Energy's (DOE) Environmental Management SSAB Federal Advisory Committee Act Charter.

The INEEL Citizens Advisory Board (CAB) recently completed its review of the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (EIS) and preparing our recommendation on that document. We have submitted our comments, in consensus Recommendation #73, to those responsible for preparing the environmental documentation.

We are concerned, however, that the document preparers may determine that one of our most important comments falls outside the scope of acceptable comments for a document written in compliance with the National Environmental Policy Act (NEPA). That recommendation states that that DOE should develop a mechanism for informing the decision-maker and the public regarding the compliance issues arising under each alternative considered in the EIS if implemented under a flat budget to support comparison with impacts under a fully funded budget. We cannot believe the decision-maker will ignore this information during the decision process, regardless of the requirements under NEPA. The public similarly requires such information to support informed review of this EIS. Precluding provision of this information to the public jeopardizes the adequacy of public participation conducted to support this EIS. In our recommendation, we identify three approaches that would achieve our objective.

Should DOE determine that none of the three approaches is acceptable in compliance with NEPA, we request that DOE revise its cost analysis to include the recommended information and release that revised cost analysis for public review before issuing a record of decision for the HLW program at the INEEL.

We await your response to this request.

Sincerely,

Stan Hobson

Stanley Hobson, Interim Chair
INEEL CAB

cc: Thomas L. Wichmann, DOE-ID
Carolyn Huntoon, DOE-HQ
Carol Borstrom, DOE-HQ
Martha Crosland, DOE-HQ

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Charles M. Rice

Vice Chair:
Stanley Hobson

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Kathleen Trever
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Gerald C. Bowman

Jason Staff:
Carol Cole
Amanda Jo Edelmayer
Kathy Grebstad
Wendy Green Lowe
Trina Pettingill

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HLW & FD EIS PROJECT - (AR) PF
Control # DC-54

Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

00-CAB-031

RECEIVED
APR 10 2000

April 3, 2000

Beverly Cook
U.S. Department of Energy
Idaho Field Office
850 Energy Drive, MS 1146
Idaho Falls, ID 83401

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Should DOE determine that none of the three approaches is acceptable in compliance with NEPA, we request that DOE revise its cost analysis to include the recommended information and release that revised cost analysis for public review before issuing a record of decision for the HLW program at the INEEL.

We await your response to this request.

Sincerely,

Stan Hobson

Stanley Hobson, Interim Chair
INEEL CAB

cc: Thomas L. Wichmann, DOE-ID
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Amanda Jo Edelmayer
Kathy Grebstad
Wendy Green Lowe
Trina Pettingill

Fred Butterfield, DOE-HQ
Governor Dirk Kempthorne
Larry Craig, U.S. Senate
Mike Crapo, U.S. Senate
Mike Simpson, U.S. House of Representatives
Helen Chenowith, U.S. House of Representatives
Robert Geddes, President Pro-Tem, Idaho Senate
Laird Noh, Chair, Idaho Senate Resources and Environment Committee
Bruce Newcomb, Speaker, Idaho House of Representatives
Golden C. Linford, Chair, Idaho House Resources and Conservation Committee
Jack Barraclough, Chair, Idaho House Environmental Affairs Committee
Gerald Bowman, DOE-ID
Kathleen Trever, State of Idaho INEEL Oversight
Wayne Pierre, U.S. Environmental Protection Agency Region X
John Sackett, Argonne National Laboratory - West

Citizens Advisory Board
Idaho National Engineering and Environmental Laboratory

Idaho High-Level Waste and Facilities Disposition
Draft Environmental Impact Statement

The Idaho National Engineering and Environmental Laboratory (INEEL) Citizens Advisory Board (CAB) reviewed the Idaho High-Level Waste (HLW) and Facilities Disposition Draft Environmental Impact Statement (EIS). We appreciate the Department of Energy's willingness to extend the public comment period to allow the opportunity for the CAB to review the document and develop this consensus recommendation.

54-3 IX.C(2)

To support preparation of this recommendation, our HLW Committee spent extensive time and effort meeting with the preparers of the EIS and reviewing the Draft EIS. In addition to the Draft EIS, we received numerous presentations and reviewed other relevant documents, including: 1) the "Cost Analysis of Alternatives for the Idaho High-level Waste and Facilities Disposition Environmental Impact Statement" (DOE/ID 10702, January 2000), 2) the National Research Council's (NRC) document titled "Alternative High-Level Waste Treatments at the Idaho National Engineering and Environmental Laboratory," and 3) "Options for Determining Equivalent MTHM for DOE High-Level Waste" (INEEL/EXT-99-00317 Revision 1, April 1999). Each contributed to our understanding of the Draft EIS.

54-4 IX.A(2) We commend DOE on its careful preparation of a thorough document. We have several comments and recommendations for consideration in preparing the Final EIS and the related Record of Decision.

54-5 IX.A(3) The document presents some of the most technical and complicated information reviewed by the INEEL CAB since its inception. The EIS documents, although highly commendable, is nonetheless lacking. Documents written to comply with the National Environmental Policy Act (NEPA) must be understandable for the general public. DOE made a valiant effort in this EIS, but there remains room for improvement. **The INEEL CAB recommends DOE intensify its efforts to make the EIS as understandable as possible.**

ALTERNATIVES CONSIDERED IN THE DRAFT EIS

In order to prepare an EIS that complies with NEPA and can withstand challenges to its adequacy, DOE should evaluate all reasonable alternatives. There appear to be alternatives not evaluated in the Draft EIS that might be considered reasonable, however. **The INEEL CAB recommends analysis of the following additional alternatives in the Final EIS, or a full explanation of the reasons why they were excluded from further consideration:** use this as a preface to all 3 bullets

54-6 III.D.2.c(5)
- In recognition of the challenges associated with shipment of HLW to an offsite vitrification plant, the INEEL CAB suggests evaluation of moving an existing vitrification plant to the INEEL.

54-7 III.D.4(5)
- Because of the challenges associated with retrieving the HLW calcine from the bins, the INEEL CAB suggests evaluation of an alternative that would entomb the calcine in situ. We recognize the

requirements in the Idaho Settlement Agreement to make all HLW road ready to leave the state by 2035 and we understand entombment would in all likelihood make eventual shipment out of Idaho technically impossible.

54-8 III.D.4(1)

- Likewise, the INEEL CAB suggests evaluation of an alternative involving solidification and subsequent entombment of the sodium bearing waste in the tanks. We recognize the requirements in the Idaho Settlement Agreement to make all HLW road ready to leave the state by 2035 and we understand entombment would in all likelihood make eventual shipment out of Idaho technically impossible.

54-9 VII.D(3) While we recognize there may be alternatives the decision-maker will not consider politically feasible, we encourage DOE to use this document to support consideration of all alternatives that are reasonable from a technical standpoint.

54-10 VII.D(3) We understand one of the primary reasons for developing this EIS at this point in time was to provide better information on which to base renegotiations of the Idaho Settlement Agreement. On that basis, alternatives not in compliance with the Idaho Settlement Agreement should still be considered, if found to be reasonable.

54-11 II.E(2) In addition, we note specific details that should be included in the description of any alternative involving treatment of INEEL's calcine at a proposed vitrification plant to be located at Hanford. The Hanford Advisory Board made three recommendations of relevance to this alternative on prior occasions. All appear reasonable to the INEEL CAB. These include:

54-44 II.E(4)

1. Offsite waste shipped to any treatment facility at Hanford should not be shipped until the waste can be treated to avoid the necessity for storage capacity at Hanford.
2. Similarly, offsite waste shipped to any treatment facility at Hanford should be returned (to the site it was shipped from) to avoid the necessity for storage capacity at Hanford.
3. All costs associated with shipment of INEEL's waste to and from and treatment at Hanford should be borne by the INEEL so as not to impose additional costs on the Hanford cleanup program.

We note that the Hanford Advisory Board does not expect to consider a consensus recommendation on this EIS at this time and has taken no position on the acceptability of the alternative involving Hanford facilities. We nonetheless believe accommodation of the principles behind their prior recommendations could be accommodated in the implementation of the Hanford alternative, should it be selected by DOE. **The INEEL CAB recommends DOE incorporate these principles into the "Hanford Alternative" as described and evaluated in this EIS.**

THE INEEL BUDGET AND THE COSTS OF THE ALTERNATIVES

We note only one of the alternatives evaluated in the EIS would entail expenditures within the historical budget for the INEEL's HLW program. According to the cost assessment for the various alternatives, all of the other alternatives would run between $20 and $25 million dollars more per year than the budget for the INEEL HLW program in recent years. We further note that only one of the alternatives would comply fully with the Idaho Settlement Agreement; all others would fail to meet at least one of the provisions in the Agreement. Notably, the one alternative that is manageable within historic program

funding falls the shortest of meeting the terms in the Idaho Settlement Agreement. And the one that would allow compliance would be one of the more costly alternatives to implement.

54-12 X(11) We assume implementation of any of the more costly alternatives would require DOE to do one of two things: provide a significantly higher level of funding to the INEEL or make significant cuts elsewhere in the INEEL budget. It was our understanding the budget authorization for the INEEL in recent years has been barely enough to stay in compliance with all legally binding environmental regulations. In recent years, the proportion of DOE's total budget that has been allocated to the INEEL has remained constant, and we conclude that the political pressures surrounding DOE's budgeting process prevent large transfers of funds among DOE sites. These observations lead to three conclusions:

- First, additional funding for the INEEL is highly improbable.
- Second, funding the INEEL HLW program to support compliance with the Settlement Agreement will pose a risk to the site's ability to remain in compliance with other environmental regulations.
- Third, selection and implementation of any of the higher cost alternatives could force DOE-ID to fall out of compliance with other environmental regulations.

54-13 X(2) The INEEL CAB understands DOE does not address costs in documents written to comply with NEPA. We believe, however, that avoiding any discussion of costs in the Draft EIS leaves readers with the impression that additional funding can be found; it also makes all of the alternatives appear to be equally implementable from a cost perspective.

54-14 X(11) The INEEL CAB would like to know what environmental impacts would result from noncompliance resulting from insufficient funding under each alternative evaluated in the EIS. We note DOE prefers to evaluate only those impacts which would necessarily and directly result from implementation of each alternative in NEPA documents. We recognize any environmental impacts associated with noncompliance under any other program (i.e., other than the HLW program) would not be caused directly by the HLW program. As such, we acknowledge our concern may be considered "off scope." We nonetheless believe that environmental impacts resulting from diverted funding caused by implementation of an alternative must be evaluated to support a fully informed decision making process.

The INEEL CAB therefore recommends DOE develop a mechanism to inform the decision-maker and the public regarding the compliance issues arising under each alternative if implemented under a flat budget to support comparison with impacts under a fully funded budget. We cannot believe the decision-maker will ignore this information during the decision process, regardless of the requirements under NEPA. The public similarly requires such information to support informed review of this EIS. Precluding provision of this information to the public jeopardizes the adequacy of public participation conducted to support this EIS. At least three approaches would achieve our objective.

First, DOE could elect to include add a discussion of the budget requirements of each alternative in its description of the how each alternative would be implemented. Having presented this information, DOE could then include discussion of the impacts of implementation of each alternative under two possible budget scenarios (a flat budget scenario and a fully funded scenario) in the discussion of impacts. If implementation of any alternative would result in non-compliance with any legally binding environmental regulation, then the discussion of impacts associated with implementation of that alternative would presumably include environmental impacts resulting from noncompliance. If the environmental impacts of both budget scenarios were presented for each alternative evaluated, it would

allow the public and the decision-maker to evaluate all of the environmental impacts of all of the alternatives under two budgetary possibilities.

If DOE concludes the first approach is not appropriate under NEPA, we suggest a second alternative. DOE could evaluate the impacts of noncompliance in its discussion of cumulative impacts. As we understand it, the cumulative impacts section is supposed to address the impacts which would occur under each alternative within the context of other likely changes affecting the existing conditions as described. This strategy appears less appropriate, although it would better meet our expectations. It would result in providing a clearer picture of what the site would look like after implementation of decisions than is presently the case, however.

If DOE concludes our first two suggestions are inappropriate for a document written to evaluate only the HLW program at INEEL, we offer a third suggestion. We understand DOE-ID will reevaluate the final site-wide EIS for the INEEL (which supported a 1995 Record of Decision) later this year in accordance with department policy to review site wide EISs every five years. That reevaluation could be conducted in a manner that would allow comparisons of the risks posed by all radioactive and hazardous materials at the INEEL and prioritization of potential and ongoing projects in accordance with those risks. If choices are to be made about which legally binding requirements the INEEL will comply with (and which the site will not comply with), the INEEL CAB believes such a determination should be made in an open and publicly defensible manner.

54-15 VII.A(6) Obtaining additional funding authorization of this magnitude ($20-25 million) would likely require intense public scrutiny and congressional review. DOE would require a thorough understanding of pending environmental impacts to defend such a greatly increased budget request. DOE can prepare the decision-maker and the public for participation in these possible debates by providing more complete information. Neither the public nor Congress can be expected to support or defend DOE's budget requests without an adequate understanding of the impacts associated with continuing funding at historical levels. **The INEEL CAB recommends DOE make every effort to ensure the decision-maker and the public fully understand the tradeoffs between costs and environmental impacts that permeate the decisions the Draft EIS was written to support.**

A PATH FORWARD FOR INEEL'S HLW

Based on the analysis presented in the Draft EIS, the INEEL CAB makes the following recommendations for a path forward for managing the HLW at the INEEL in a responsible manner:

54-16 III.C(4) 1. **The INEEL CAB recommends DOE-ID cease operations at the New Waste Calcining Facility.** DOE-ID has had difficulty restarting the facility and getting it to operate reliably. In light of the uncertainties of operations at the higher temperatures needed to adequately treat sodium bearing waste, we question whether the facility would support DOE's objectives. The costs associated with attempting to upgrade the facility to meet the MACT rules simply do not appear justified. In addition, it appears obtaining a permit for the facility would be extremely difficult. 54-17 X(5) 54-18 III.C(4)

54-19 V(5) 2. **The INEEL CAB recommends DOE-ID undertake efforts to adequately characterize the calcine in the bin sets and the sodium bearing waste in the tanks as soon as possible**

to support decision making related to subsequent treatment of the calcine and the sodium bearing waste.

54-20 III.D.1(4) 3. **The INEEL CAB recommends DOE-ID pursue expedient development of a reliable method or methods for retrieving calcine.** We believe the sooner this effort begins the better chance DOE will have of optimizing the success of the effort.

54-21 III.A(1) 4. **The INEEL CAB recommends DOE-ID pursue a rigorous evaluation of alternative methods for solidifying the sodium bearing waste, including those evaluated by the National Research Council, and select the most appropriate treatment method in an expedient manner.** This liquid poses risks to human health and the environment in the present form and therefore should be stabilized as soon as possible.

54-22 II.A(1) 5. **The INEEL CAB recommends that following solidification, the sodium bearing waste should be stored at the INEEL in casks.** It should not be mixed with any HLW in order to ensure the maximum number of options for its ultimate disposal.

54-23 III.A(1) 6. **The INEEL CAB recommends DOE-ID pursue no additional treatment of the sodium bearing waste other than solidification until the ultimate disposal location has been identified.**

54-24 VII.D(6) 7. **The INEEL CAB recommends DOE-ID close all of the tanks in the tank farm as they are emptied, focusing first on the pillar and panel tanks.** DOE should use demonstrated technologies for removal of the heels and then fill the tanks and containment structures with grout. 54-25 IV.C(1)

54-26 VII.A(6) 8. **The INEEL CAB looks forward to continued involvement in decision making as DOE develops plans for tank closure and calcine disposition.**

54-27 III.D.4(5) 9. **The INEEL CAB recommends DOE-ID continue to conduct research and development efforts on alternatives that might be used to prepare the calcine for disposal, including direct cementation and, possibly, entombment of the bin sets.** We have concluded none of the technologies currently being evaluated is sufficiently mature to support selection at this time, and the waste acceptance criteria that will apply at the proposed geologic repository are not yet finalized. The calcine does not appear to pose any risks at this time. Expenditure of funds on its treatment at this time is not justified. 54-28 III.D.1(4) 54-29 III.F.2(2) 54-30 III.B(2)

54-31 III.F.2(1) 10. **The INEEL CAB recommends DOE pursue with vigor the resolution of the issues that could preclude receipt of INEEL's HLW at the proposed geologic repository.** DOE should adopt a method for calculating equivalent metric tons of heavy metal in the HLW based on the relative hazard compared with commercial spent nuclear fuel, such as levels of radioactivity or radiotoxicity to allow greater quantities of HLW to be disposed in the repository. DOE, perhaps with the help of Congress, must devise a strategy that will allow acceptance of hazardous materials in the repository for final disposal. Waste acceptance criteria must be developed to allow disposal of all of the INEEL HLW in the repository without jeopardy to human health and safety or the environment. Finally, schedules must be 54-32 VII.C(2) 54-33 III.F.2(2)

54-34 III.F.2(4) adjusted to ensure that all INEEL HLW can be treated and prepared for shipment in time to beat the likely closure date for the proposed geologic repository.

PHASED DECISION MAKING AND PUBLIC INVOLVEMENT

54-35 VI(1) It does not appear DOE will be able to make all of the decisions this EIS was written to support in the near future. Too little is known at this time to make that possible or prudent. For example, this EIS evaluates the possibility of treating INEEL's calcine at a proposed vitrification plant at Hanford, which has not even been given final approval, much less constructed and brought on line. It seems premature to consider this possibility even if the Hanford vitrification plant were operational until the best way to retrieve the calcine from the bins has been determined. It simply is not prudent to consider some number of specific decisions at this time. **The INEEL CAB recommends DOE develop phased decisions regarding the INEEL's HLW. We further recommend that later decisions occur only after relevant information becomes available, following implementation of the earlier decisions.** The INEEL CAB has attempted to suggest an approach to appropriate phasing for decisions in earlier sections of this recommendation.

54-36 VII.A(6) Public interest in and concerns regarding the various decisions supported by this EIS will remain. **Because NEPA requires public participation in federal decisions that may have significant environmental impacts, the INEEL CAB recommends DOE conduct public involvement activities to support each phase of its decision making.** Public outreach activities will be a critical component, as the public will require access to emerging information to support a meaningful role in later phases in the decision making.

54-37 VII.A(6) We understand the Hanford Advisory Board has determined it will not consider the possibility of treating INEEL's calcine at the proposed vitrification plant at Hanford until such time as that proposed facility becomes a reality. **The INEEL CAB recommends including stakeholders from all potentially affected sites in public participation efforts during all later phases of decision making.** The INEEL CAB stands ready to assist in these efforts in any way deemed appropriate.

SELECTION OF A PREFERRED ALTERNATIVE

54-38 VII.D(4) We recognize that all of the alternatives presented in the Draft EIS, including those that do not meet the Idaho Settlement Agreement milestones, must be included in the EIS. We commend DOE in that most of the alternatives (with the exception of the No Action alternative and the Continued Current Operations alternative) will meet the target date for treatment of the calcine and making it road ready to leave in support of being able to ship out of Idaho by 2035. **The INEEL CAB strongly recommends DOE select a preferred alternative in the final EIS that will meet the basic intent of the Idaho Settlement Agreement to 1) remove and process all of the sodium bearing waste from the tanks as soon as practicable and 2) treat the sodium bearing waste and the calcine so that it will be ready for shipment out of Idaho by 2035.**

54-39 VII.D(6)

54-40 XI(3) In particular, the INEEL CAB does not concur with the NRC's recommendation that "The need for immediate action and a rush to select a long term treatment option [for calcine] appear unwarranted . . ." While the NRC committee was aware of the Idaho Settlement Agreement, its recommendation appears to ignore the milestone that requires completion of calcine treatment to make it "road-ready" for shipment offsite by 2035.

54-41 X(12) The INEEL CAB is concerned that any delays or funding cuts that would impede the development of calcine treatment would result in a de-facto decision to leave the calcine in place. Even if there is time before a calcine treatment process decision can be made, funding is necessary immediately to provide the technical information necessary to support that decision. **Therefore, the INEEL CAB recommends that the preferred alternative in the final EIS and ROD must support continuation of activities to identify the path forward for treating the calcine on a schedule to meet the Idaho Settlement Agreement milestone, including critical waste characterization and processing research activities. Based on DOE funding cycles and the duration of time required to fully develop an appropriate technology, the INEEL CAB recommends DOE provide sufficient funding to ensure timely progress with respect to treatment of INEEL's calcine.**

USE OF BEST ENGINEERING ESTIMATES, ALONG WITH WORST-CASE "BOUNDING" SCENARIOS, IN NEPA DOCUMENTATION

54-42 VIII.A(2) The Draft EIS considers the impacts of worst-case scenarios to estimate "bounding" cases. These bounding cases are based on worst-case probabilities for doses to the public along with maximum possible waste quantities. While this approach may be effective to support scientific and legal review, it can have a serious negative impact on public perception. For example, the reported worst case emissions for the proposed Advanced Mixed Waste Treatment Project (AMWTP) are much higher than the actual emissions are expected to be with a result of causing excessive fear among individuals who consider themselves to be "downwinders." We note that the conservative approach is standard for environmental documentation prepared to satisfy NEPA, and agree that it is necessary to support an adequate and conservative evaluation of the impacts of a proposed new action. The INEEL CAB recommends DOE consider the possibility of modifying the existing approach to include an evaluation of impacts under a "best engineering judgment" case, in addition to that based on a bounding case. This approach would allow the public to better understand the risks and consequences of each alternative. **For the purposes of this EIS, which has proceeded to date based on worst-case scenarios, the INEEL CAB recommends that such the final EIS include best engineering estimates of impacts as well, if possible.**

CALCINE AND SODIUM-BEARING WASTE QUANTITIES AND COMPOSITION

54-43 V(5) Because the EIS evaluates the impacts of a range of alternatives for treating INEEL's HLW, the composition of the waste is an integral part of the EIS. We note that Chapter 5.2.13 describes the wastes generated under each alternative using general waste categories such as industrial, hazardous, low-level waste, mixed low-level waste, and HLW. We are unable to find a description of the waste composition and quantities of calcine and sodium-bearing waste requiring treatment, however, although we assume that information provides the basis for estimation of impacts.

The INEEL CAB recently reviewed the Draft EIS for the proposed geologic repository, and commended DOE for providing a detailed description of the compositions and quantities of all HLW and spent nuclear fuel. In fact, the information presented in that EIS appeared to be much more detailed than in previous DOE publications. **The INEEL CAB recommends that the INEEL HLW EIS include known information on existing calcine and sodium-bearing liquid waste compositions and quantities in a technical appendix in the Final EIS even though additional characterizations are needed.** We would expect to be able to compare that information with what was reported in the proposed geologic repository EIS. It will be difficult to conclude that the numbers are the same in the absence of evidence to that effect.

development of calcine treatment would result in a de-facto decision to leave the calcine in place. Even if there is time before a calcine treatment process decision can be made, funding is necessary immediately to provide the technical information necessary to support that decision. **Therefore, the INEEL CAB recommends that the preferred alternative in the final EIS and ROD must support continuation of activities to identify the path forward for treating the calcine on a schedule to meet the Idaho Settlement Agreement milestone, including critical waste characterization and processing research activities. Based on DOE funding cycles and the duration of time required to fully develop an appropriate technology, the INEEL CAB recommends DOE provide sufficient funding to ensure timely progress with respect to treatment of INEEL's calcine.**

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55-42
VIII.A(2)

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55-43
V(5)

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HLW & FD EIS PROJECT - AR/PF
Control # DC-56

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

RECEIVED
APR 11 2000

April 3, 2000

Reply To
Attn Of: ECO-088

Ref: 00-007-DOE

T.L. Wichmann
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563
Attn: Idaho HLW & FD EIS

Dear Mr. Wichmann:

We have reviewed the draft Environmental Impact Statement (EIS) for the proposed **Idaho High-Level Waste and Facilities Disposition** in accordance with our responsibilities under the National Environmental Policy Act and §309 of the Clean Air Act. The draft EIS analyzes the potential environmental consequences of managing two waste types at the Idaho National Engineering and Environmental Laboratory (INEEL), namely, High-Level Waste (HLW) in a calcine form and liquid mixed transuranic waste. The draft EIS also analyzes the disposition of existing and proposed HLW facilities after their missions have been completed. The draft EIS does not identify a preferred alternative.

Include circled text as prefix to each of the first 3 comments

56-1
IV.D(1)
56-21
V(5)
56-22
III.F.4(2)

Based on our review, we have rated the supplemental draft EIS, EC-2 (Environmental Concerns - Insufficient Information). Our concerns stem from the uncertainties (due to a lack of analysis and documentation in the EIS) that 1) grout containing the Low-Level Waste (LLW) would prevent contamination of the aquifer for 500 years, 2) that waste stream products could be reclassified as LLW, thus allowing DOE to pursue separations alternatives, and 3) that facilities exist for handling and storing LLW. We also identify important components missing from the cost report. This rating and a summary of our comments will be published in the *Federal Register*.

Modeling Transport of Contaminants to the Aquifer from Grouted Low-Level Waste (LLW)

56-2
VIII.C(4)

The analysis of transport of contaminants leached from Low-Level Waste (LLW) Class A and Class C grout placed in the tanks and calcined bins assumes that the grout has a 500 year lifetime over which leaching of contaminants does not occur. However, there is no evidence that the grout will in fact achieve the 500 year design lifetime. If the grout fails before 500 years, I-129 leaching from the grout could arrive at the aquifer at a time coinciding with the peak concentrations of I-129 from the abandoned INTEC injection well. This situation could result in an exceedance of the I-129 MCL in the aquifer and potential risks to human health. The EIS should provide modeling results predicting the impact to water quality in the aquifer if the grout and containing structures fail in shorter periods of time, such as 100, 200, 300, and 400 years.

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Disposal Options for LLW Generated in the Separation Alternatives

56-3 V
56-4 III.F.4
56-5 III.F.4

All the separation alternatives generate a waste stream identified in the EIS as LLW, which would be stabilized in grout and disposed either in LLW repositories at INEEL or off-site. Because of its origin, this waste stream is consider to be HLW until it is formally reclassified as LLW. The EIS should identify the process for reclassifying this waste and the uncertainties associated with achieving this reclassification. In addition, all the separation alternatives identify an off-site low-level waste disposal facility as an option for disposal of the generated LLW. The EIS should identify potential off-site LLW disposal facilities which would be available and the difficulties in utilizing these potential disposal facilities. If the ROD selects a remedy requiring disposal of LLW at INEEL, a contingent remedy should also be identified in the case that reclassification of the treated waste is not approved.

Capacity of the Yucca Mt. Repository for DOE High Level Waste (HLW)

56-6 III.F.2

In the draft EIS, DOE calculates metric tons of heavy metal (MTHM) for the INEEL HLW based on historical projections of radioactivity in typical HLW. If the historical projections method is used, the level of radioactivity for each MTHM of DOE HLW disposed at the geologic repository would be significantly lower than the level of radioactivity that would result from each MTHM of commercial Spent Nuclear Fuel disposed. The historical projections method does not recognize, however, that much of the waste located at INEEL is significantly less radioactive than typical commercial spent nuclear fuel and ever less radioactive than most other DOE waste. There are two methods for calculating the MTHM equivalency for HLW which would allow a more equitable allocation of storage space in the proposed Yucca Mountain repository between commercial and DOE waste. These methods are the Total Radioactivity Method and the Radiotoxicity Method. Either of these methods would allow the Department of Energy (DOE) to dispose all of its HLW at Yucca Mountain without exceeding the maximum limit established by Congress. EPA acknowledges that the draft EIS for the proposed Yucca Mountain depository addressed the capacity issue. EPA, however, recommends that DOE consider using either of these two alternative methods for calculating MTHM for its HLW to promote the NEPA goals of disclosing all relevant information to the public and the decision-maker (40 CFR 1500.1 (b)).

Hanford Alternative

56-7 II.E
56-8 II.E
56-9 II.E
56-10 II.E
57-11 II.E

EPA cannot support the alternative that proposes consolidation of INEEL waste at Hanford. At this time, DOE will not commit to treating the existing high-level waste at Hanford. The addition of HLW from INEEL can only make conditions at Hanford worse. No storage facilities exist at Hanford to manage these new wastes, and the chemical composition of the INEEL wastes would require pretreatment to be compatible with the waste currently in storage at Hanford. In addition, these wastes may not meet the waste acceptance criteria for the vitrification plant being designed to meet Hanford tank waste treatment requirements. Finally, the proposed vitrification plant would only treat 10 percent (5 million gallons) of Hanford Tank Waste by 2018. Transport of these INEEL wastes to Hanford would further delay processing of Hanford's own waste and extend the treatment schedule beyond 2050.

COMMENTS ON THE DRAFT IDAHO HIGH-LEVEL WASTE & FACILITIES DISPOSITION ENVIRONMENTAL IMPACT STATEMENT COST REPORT

56-12 X(11)
56-13 X(6)

The Cost Analysis of Alternatives, dated January 2000, was distributed to the public to provide relative cost data to be used in consideration of the decisions. Although cost is not typically associated with an evaluation of environmental impacts, given the limited and flat budgets available to DOE, we are currently experiencing the phenomena of one project being bought at the cost of terminating other environmentally necessary activities. For the CERCLA activities ongoing at INEEL, cost estimates and cost/benefit analysis are prepared for even relatively low cost projects at a level of detail sufficient to allow reviewers to understand the major cost elements of the capital and Operations and Maintenance (O&M) activities. This information is not available in the Cost Report. This is unfortunate given the billions of dollars involved in implementing the decisions under consideration. Our comments on the Cost Report are as follows:

56-14 X(6)

1. The summary cost data does not include major cost elements for capital, O&M or Contingency (which assumes an across the board 30%). Without this information, it is not possible to determine the accuracy of the cost figures. As depicted in Figure S-2, only the No Action alternative is within the current $51.2M annual funding allotment.

56-15 IV.C(1)
56-16 VII.B(1)
56-17 IV.C(1)
56-18 IV.C(3)
56-19 X(6)

2. Under the landfill closure option in Table S-2, it is not clear what steps are anticipated to meet the stated closure goals. Releases from piping and valve boxes associated with the high level waste tanks has resulted in extensive soil contamination above and into the bedrock. This contaminated earthen material is being managed under CERCLA, but the CERCLA implications of these decisions are not considered. Closure of the tanks and soil as a landfill assumes a cap would be placed over wastes to serve as a barrier against future leachate generation. This precludes that the CERCLA soils would also be capped. Typical RCRA cap costs are in the neighborhood of $1M per acre. Empty tanks and containers would represent a concern for landfill subsidence and need to be stabilized to minimize void spaces. Filling void spaces could be done with soils from local borrow areas rather than with relatively expensive Class A grout. Providing activity cost element data would allow the reader to value engineer the project costs with large potential cost savings.

56-20 X(6)

3. As no design basis documents were referenced in the Cost Report, nor were Functional and Operational Requirements (F&ORs) provided to support a cost estimate, it is difficult to see how a +50%/-30% cost estimate, much less a probabilistic cost estimate, can be prepared at this time.

Please contact Chris Gebhardt at (206) 553-0253 if you have any questions. Thank you for the opportunity to review this draft EIS.

Sincerely,

Richard B. Parkin

Richard B. Parkin, Manager
Geographic Implementation Unit

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HLW & FD

EIS PROJECT - AR/PF
Control # DC-57

Idaho High-Level Waste and Facilities Disposition
Draft Environmental Impact Statement (DOE/EIS-0287D)

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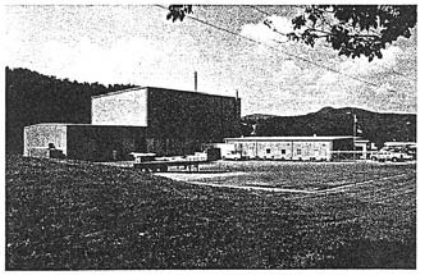
APR 14 2000

Studsvik, Inc. Comments



Studsvik's Fluid Bed/Steam Reforming Processing Facility
Erwin, TN

April 12, 2000

Studsvik, Inc.
111 Stonemark Lane, Suite 115
Columbia, SC 29210

ORIGINAL

Studsvik™

April 12, 2000
2K067L

Mr. T.L. Wichmann
US DOE
Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

Ms. Ann Dold
Project Lead
State of Idaho INEEL Oversight Program
900 N. Skyline, Suite C
Idaho Falls, ID 83706

Subject: **Studsvik's Comments on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (DOE/EIS-0287D)**

Dear Mr. Wichmann:

57-1
III.D.4(4)

Studsvik is requesting that the subject EIS provide recognition of newly commercialized "non-separation" technologies, such as Studsvik's patented THOR℠ pyrolysis/steam reforming fluid bed system, which is presently operational on a large-scale basis in the commercial nuclear power market.

Steam Reforming Technology as deployed by Studsvik in a fluid bed can offer:

- Non-Incineration Thermal Treatment
- Thermal treatment of SBW without the problems encountered with typical incinerators or the presently operated calciner.
  - Direct conversion of nitrates to nitrogen in the fluid bed without the resultant NOx emission problems.
  - Reduced operating temperatures, eliminating the need for bulky additives to prevent molten alkali metal salt agglomerations.
  - Elutriating operation to prevent the build up of waste salts in the fluid bed.
  - Low gas flow processing for simplified off-gas control.

Studsvik, Inc. • 111 Stonemark Lane • Suite 115 • Columbia, SC 29210 • Telephone (803) 731-8220 • Telefax (803) 731-8221

Studsvik™

- Reduced Overall Waste Processing Cost and Schedule
  - Duplication of existing full-scale, commercialized equipment already active in the nuclear marketplace.
  - Flexible Processing System
    - Input of liquid, slurry, solid, or gaseous nitrate and organic wastes.
    - Applicable to processing SBW, Low-Level Mixed Waste, gaseous NOx emissions and others.
- Inert, easy to handle final product that can be packaged for shipment to a final waste depository, or stored at INEEL
- Potential for replacement of the incinerator systems originally considered for the AMWTP

Studsvik recognizes that the EIS process has been very thorough and we do not desire to interject any new processing approaches that would delay the accomplishment of the INEEL waste cleanup mission. However, we feel that it should recognize technologies that have been commercialized in the private sector since the technical review activities for this EIS were completed. We regret that we have not brought this technology to your attention before this date, however, our total focus has been on the construction and operation of our processing facility in Erwin, TN. The Erwin facility focuses on the processing of high activity (up to 100 R/hr, beta/gamma activity) ion exchange resins produced by the commercial nuclear power stations. With this effort in full operation, we are now turning our attention to the needs of the DOE community. Attachment One provides a description of our technology and its deployment at the Studsvik Processing Facility.

Overview

Studsvik's patented THOR[sm] pyrolysis/steam reforming technology is presently deployed for the destruction of water slurries of high specific activity ion exchange resins (up to 100 R/hr beta/gamma). The THOR[sm] steam reformer in operation in Erwin, TN can continuously process over 500 kg/hr of slurry waste feed. The technology has been proven to be able to process nitrate bearing wastes by converting the nitrates directly to nitrogen without the associated NOx off-gas emissions typically present with other thermal conversion processes. The system can input either a wet, sodium bearing (high nitrate) waste slurry or solids.

Other adaptations of the technology can be utilized for processing of high NOx off-gas streams. By utilization of the THOR[sm] technology, expensive NOx off-gas conditioning units can be avoided. Additionally, and of significant importance, is the fact that the primary THOR[sm] technology, steam reforming, exhibits none of the attributes of an incinerator and in fact has been classified by DOE as an "alternative to incineration".

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The EIS (EIS Page No. F-2) indicates that the it has been developed in part to facilitate negotiations required by the Settlement Agreement.

> *"Because of technology developments and changes needed in existing treatment facilities to properly manage sodium-bearing waste, Idaho agreed with DOE that an EIS could facilitate negotiations required by the Settlement Agreement."*

It is within the scope of "technology developments", as referenced above, that these comments are submitted. We feel that the patented THOR[sm] technology is directly applicable to the processing of many of the waste streams at INEEL and is in fact superior in some aspects to the technologies specifically mentioned in the EIS. Comments to the EIS would have been made at an earlier date, however, full-scale commercial deployment of the THOR[sm] process did not commence until July 1999. Routine operations were established in December 1999 and over 8,000 ft^3 of radioactive waste was processed through March 2000. This fully demonstrates the large-scale application of the technology.

Alternative to Incineration

In 1997, the Mixed Waste Focus Group, completed an evaluation of Nonflame technologies to be utilized for an alternative to incineration for mixed waste processing. The final report from that effort, Evaluation of Alternative Nonflame Technologies for Destruction of Hazardous Organic Waste, INEL/EXT-97-00123 of April 1997 specifically listed the advantages of steam reforming for processing organic mixed wastes. In fact, steam reforming was listed as the recommended process. Studsvik's unique pyrolysis/steam reforming fluid bed system can not only process organic wastes, but has proven to be highly effective at processing liquid and solid nitrate waste streams. The unique operating modes for nitrate conversion using the THOR[sm] steam reformer are subjects of pending patents.

Comparison to Existing Calciner Technology

Studsvik is requesting that the subject EIS provide recognition of newly commercialized "non-separation" technologies, such as Studsvik's patented THOR[sm] pyrolysis/steam reforming fluid bed system. This technology had its genesis in fluid bed technology for biomass gasification utilizing auto-thermal steam reforming, but is truly a next generation design which offers the following advantages over the existing INTEC calciner:

1. Reformer has significantly reduced off-gas volume of $1/8^{th}$ to $1/20^{th}$ of the off-gas volume of the current calciner.
2. Reformer has gaseous NOx emissions that meet MACT standard without addition of gaseous de-NOx unit. Nitrates are fully converted to N_2 in the reformer fluid bed. Reformer has estimated NOx emissions at $1/1,000^{th}$ of those emitted from current calciner.

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3. Reformer minimizes use of additives to prevent agglomerations. Low temperature operation minimizes or eliminates the need for additives to prevent alkali metal compounds from melting in the bed. This also significantly reduces the final volume of the end product.
4. Reformer provides high conversion of nitrates to nitrogen and minimizes or eliminates the presence of nitrates in the high sodium end product.
5. Reformer has lower Cs volatility than high temperature units operating over 600 °C.
6. Efficient mercury recovery unit can be easily utilized in the off-gas from the reformer.
7. Construction labor to build new plant is estimated to be 2 times that required for performing continued current operations modifications of adding a de-NOx unit to existing calciner off-gas system. The new reformer plant could be designed and built to meet the same schedule as estimated to modify the existing calciner.

In addition to improvements directly related to utilization of the existing calciner, the fluid bed reformer has other significant advantages:

1. Potentially eliminate the use of the INTEC evaporator, as reformer can process large percentage water input waste streams.
2. Can process tank heels as well as SBW and newly generated liquid waste.
3. Can Safely and efficiently process/destroy spent organic solvents from Separations Alternatives operations in a "non-incineration" process.
4. Operations staff for new reformer facility is estimated to be 60 to 70 full-time personnel for operations, maintenance and plant management.

We have also reviewed the safety and accident aspects of a reformer facility compared to modification of the current calciner to meet MACT (as referenced in the EIS). The reformer provides a higher level of safety than the current calciner.

Accident Analysis:	Comments:
ABN 01	No liquid or gaseous fuel is used in the Reformer, therefore, no fuel spills or fire scenarios apply.
ABN 02	See above.
ABN 15	No ammonia additive is needed to promote NOx conversion in off-gas. Therefore, no ammonia spill scenarios apply.
DBE 01	The existing calciner uses kerosene injection that could cause explosive mixtures to form. An explosion could cause subsequent failure of HEPA filtration. This scenario is impossible as the reformer is of explosion-proof design and will contain any postulated explosion condition. The THOR^{sm} reformer does not use gaseous or liquid fuels that could cause such an explosion due to operator error or equipment or control failures.

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The THOR^{sm} steam reformer has direct applicability to many project elements as shown in Table 1.

Draft EIS References and Comments

Studsvik has performed a complete review of the Draft EIS and noted concerns about operation of the existing calciner and the time schedules involved with the processing options evaluated.

Attachment Two, Studsvik Comments on Draft EIS, provides excerpts from the Draft EIS and provides a brief description of how the THOR^{sm} technology could improve the overall processing approach under consideration. We request that these comments and those of this letter be considered in the final EIS.

Options to Current Processing Activities for Denitration and NOx Control

The THOR^{sm} approach has several unique advantages for the processing of SBW and other wastes due to its ability to process nitrate wastes without the generation of NOx as a significant off-gas component.

The system can either process the input waste streams directly or it can be utilized to receive the off-gas of an existing system, such as the calciner, and process this off-gas to meet MACT standards in a low cost, straight forward manner. Studsvik would recommend that the technology be evaluated on a stand-alone basis, however, it could be considered as an upgrade to existing facilities.

Potential upgrades are applicable to the following existing or evaluated technologies for gaseous NOx control:

1. Continued Present Calciner Operations
2. Planned Basis Option
3. Hot Isostatic Pressed Waste
4. Direct Cement Waste

Significant advantages include:

- Only NOx destruction process that requires no ammonia addition or expensive catalyst matrix
- Reduces NOx in off-gas streams from levels above 50,000 ppm to less than 100 ppm in a single step
- Reduces NOx using operating temperatures of 400 - 650°C

Table 1 - THOR^{sm} Pyrolysis/Steam Reformer Capabilities (Single Step Fluid Bed)

Project Number	Description	Slurry/Solid$^{(4)}$ Denitration Reformer	Integral$^{(3)}$ Evaporator	Off-gas$^{(1)}$ NOx Reduction	Off-gas$^{(1)}$ Organics Destruction	Liquid$^{(2)}$ Organics Destruction	Mercury Separation
P1A	Calcine SBW Including New Waste Calciner Facility Upgrades	Yes	NR*	Yes	Yes	NR	Yes
P1B	Newly Generated Liquid Waste and Tank Form Heel Waste Management	Yes	Yes	Yes	Yes	NR	Yes
P9J	HAW Denitration, Packaging, and Cask Loading Facility	Yes	Yes	Yes	Yes	NR	Yes
P9C, P23C	Class A Grout Plant	Yes	Yes	Yes	Yes	NR	Yes
P49C	Class C Grout Plant	Yes	Yes	Yes	Yes	NR	Yes
P88	Early Vitrification Facility with MACT	NR	NR	Yes	Yes	NR	Yes
P118	Separations Organic Incinerator	NR	NR	Yes	Yes	Yes	Yes
P133	Waste Treatment Pilot Plant	Yes	Yes	Yes	Yes	Yes	Yes
P111	SBW and Newly Generated Liquid Waste Treatment with Cs Ion Exchange of CH-TRU grout and LLW grout	NR	Yes$^{(5)}$	NR	NR	NR	NR

<u>Notes:</u>

1. THOR^{sm} steam reformer converts gaseous NOx to nitrogen and oxidizes organics to CO_2 and water. THOR^{sm} process utilized less energy than "Noxidizer" as the Reformer operates at only 400 to 700°C. THOR^{sm} process is much more efficient at converting NOx to nitrogen than "Noxidizer". The outlet of Reformer will contain less than 100 ppm NOx. THOR^{sm} reformer does not utilize ammonia injection or expensive catalysts.
2. THOR^{sm} steam reformer will fully oxidize liquid organics to CO_2 and water. Steam reforming is a non-incineration thermal treatment process.
3. THOR^{sm} steam reformer fluid bed has high water evaporation capacity that could eliminate need for separate liquid waste evaporator.
4. THOR^{sm} steam reformer can convert nitrates directly to nitrogen. Reformer can process direct injection of acidic or basic nitrate wastes. Little to no additives needed to prevent formation of alkali metal agglomerates. No liquid or gaseous fuels are used.
5. Use of THOR^{sm} reformer could replace evaporator and eliminate need to add CaO to neutralize liquid wastes.

*NR = Not Required

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Off-gas control is perhaps the most significant advantage of the THOR^{sm} technology. During the extensive, multi-year test program, Studsvik identified the need for a simple, single-step nitrate destruction process. Tests were performed to determine the capabilities of THOR^{sm} for nitrate destruction. A unique combination of operating parameters and equipment design yielded a simple system that can process liquid, slurry, solids and/or gaseous nitrates in a safe and efficient operation.

Nitrate destruction tests confirmed that the THOR^{sm} fluid bed system can achieve the following performance specifications:

Nitrate Feed:	5.2 M $NaNO_3$, in water slurry
Processing Rate:	Proprietary
Reductant:	
Main Additive:	Sucrose (granular sugar)
Other Additive:	Proprietary
Addition Rate:	Proprietary
Fluidizing Medium:	Proprietary Bed Material Used
Fluid Bed Media:	<2% nitrates, during steady state operation <0.5% nitrates during startup and shutdown periods
Heating Method:	Electrical Resistance Heaters
Operating Temp.:	450-700°C
Nitrate Destruction:	>99 percent, in solid outlet stream
Chromium +6:	Converted to Cr^{+3}, below detectable levels of Cr^{+6} on TCLP test
Bed Agglomerates:	None
Off-gas System:	Thermal Oxidizer and Scrubber

NOx in Off-gas at Outlet of THOR^{sm} Fluid Bed (prior to thermal oxidizer and scrubber):

At Startup:	>5,000 ppm, quickly dropped within one hour to steady state values
Steady State:	<100 ppm, normally <50 ppm, 25% of test time <15 ppm

NOx measurements were made continuously on-line using an extractive EPA method. In addition, gas bag samples were analyzed off-line at a certified lab. Off-gas analysis from a typical large-scale test run shows below detectable levels for NO and NO_2 and approximately 69 ppm of N_2O. Depending upon local air permit requirements and design throughput, the THOR^{sm} process will require <u>no</u> NOx off-gas control system.

We have performed numerous nitrate destruction tests utilizing fluid bed and mechanical contactor hardware over the past several years. The current process application practices have proven to be safe, efficient and easy to control. The unique reformer denitration operating parameters are subject of pending patents.

Utilization of Studsvik's approach would provide for waste processing that meets the MACT requirements in a single process operation thus yielding a "final" rather than an interim solution.

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The THOR℠ gaseous NOx conversion reformer far surpasses the ability of any other commercial scale technology for converting high NOx input streams directly to nitrogen.

Material Handling and Final Waste Form

Material handling of input waste and output residue are generally the most critical components of a processing system with the most potential for operational failures. Studsvik's fluid bed/steam reforming system can input waste in either a liquid slurry, solid (powder or small particle) or gaseous form. In working with radioactive waste, the wet slurry form is generally preferred because it provides for ease of handling, it provides a level of contamination control should a system require breaching, and it accommodates a wide variety of waste streams.

The output residue from the system is an inert dry granular material that can be pneumatically transferred to remotely filled and handled output packages or can be directly input to a grout facility. The output package would be designed specifically for criticality concerns and to meet the requirements of the final depository or interim storage location.

Criticality and Other Safety Considerations

A fluid bed system operating in a continuous feed, elutriating mode has a unique advantage over batch processing technologies in the area of criticality issues. Conventional waste processing fluid bed systems retain the waste residue in the fluid bed which is periodically drained. This build up of residue provides the potential for a criticality concern.

With the THOR℠ system operating in an elutriating mode, there is little to no "build up" of fissionable or other materials in the fluid bed. The process residue is continually carried with the gas stream out of the bed and captured downstream where it can be closely monitored and controlled. Controlled input and continuous removal of residue help to alleviate criticality concerns.

Studsvik, through one of its sister companies SCANDPOWER (formerly Studsvik USA, Inc.), has the capability to provide a complete criticality analysis of the system design. SCANDPOWER is one of the world leaders in the area of power reactor core reload analysis and other nuclear physics reaction calculations.

Another unique property of our continuously feed/elutriating system is that only a very small amount of material is actually "in process" at a given time. Should an upset condition occur, simply by securing feed, the chemical conversion processes and resultant off-gas ceases in a matter of seconds. This represents an important safety advantage for the system.

Additionally, the Studsvik system is design as an "explosion proof" system. The materials of construction and design is such that the maximum credible upset that can be postulated will be retained by the system without the requirement for a complicated relief and expansion gas

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capture system. This feature substantially reduces the overall complexity of the system and contributes to the innate safety of the system design.

The operational experience that we have gained at our commercial processing facility has demonstrated the inherent safety and the ease of operator control of the reformer. "Lessons learned" through present operations would translate directly to an improved design for any systems that may be provided for use at INEEL.

AMWTP

57-2
X1(5)

With the recent termination of the incinerator system originally incorporated into the AMWTP, there is the potential that improved technology, not available when the AMWTP was contracted for, such as pyrolysis/steam reforming could be incorporated into the revised facility design. If this were to be the case, then it could prove beneficial to include an evaluation of steam reforming for processing of SBW at the AMWTP in the final EIS. The steam reformer technology could be utilized to process low-level mixed TRU waste originally planned for the incinerator and to destroy the nitrates in the SBW. The resultant nitrate free, alkali compounds could then be efficiently packaged as TRU waste.

Modifications could be made to the AMWTP to enable the processing of SBW that would have no impact on the overall schedule for the AMWTP and would not jeopardize compliance with the Settlement Agreement/Consent Order.

Other Considerations

The Draft EIS provided a summary description of Project Number P9J, HAW Denitration, Packaging and Cask Loading Facility (listed in Table C.6.1-1 and more fully described in section C.6.2.10, page C.6-73). Project P9J discussed utilization of an elutriating fluid bed, of a similar nature to Studsvik steam reforming system, to process high-activity wastes with a nitrate component.

Due to the many advantages listed throughout this document, we feel that it is imperative that provisions be made for the evaluation of fully deployed technologies, such as steam reforming, prior to issuance of the final EIS. The advantages to be realized far outweigh the effort that would be required to perform the revision.

Again, we are asking that the fluid bed pyrolysis/steam reforming approach be evaluated in the EIS as a non-separation alternative for the various waste streams discussed in this letter. Additionally, we invite the DOE to visit our operating facility and view first-hand the Reformer technology application in commercial radioactive operation.

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We thank you for your time and consideration in this matter and look forward to having the opportunity to directly discuss the issues addressed in this letter. If you have any questions on this information, please call me directly at (803) 731-8220.

Sincerely,

Thomas W. Oliver, P.E.
Vice President

Attachments: 1. THOR℠ Technology and Processing Facility, Erwin TN
2. Studsvik Comments on the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (DOE/EIS-0287D),

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Attachment One
THOR℠ Technology and Processing Facility, Erwin TN

STUDSVIK PROCESSING FACILITY PYROLYSIS/STEAM REFORMING TECHNOLOGY FOR VOLUME AND WEIGHT REDUCTION AND STABILIZATION OF LLRW AND MIXED WASTES

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ABSTRACT

Studsvik has completed construction, start-up testing, and has commenced commercial operation of a Low-Level Radioactive Waste (LLRW) processing facility in Erwin, TN. The Studsvik Processing Facility (SPF) has the capability to safely and efficiently receive and process a wide variety of solid and liquid LLRW streams including: ion exchange resins (IER), charcoal, graphite, sludge, oils, solvents, and cleaning solutions with contact radiation levels of up to 1.5 Sv/h (150 R/hr). The licensed and heavily shielded SPF can receive and process liquid and solid LLRWs with high water and/or organic content.

The SPF employs the THermal Organic Reduction (THOR℠) process, developed and patented by Studsvik, which utilizes pyrolysis/steam reforming technology. THOR℠ reliably and safely processes a wide variety of LLRWs in a unique, moderate temperature, pyrolysis/reforming, fluidized bed treatment system. The THOR℠ technology is suitable for processing hazardous, mixed and dry active LLRW (DAW) with appropriate licensing and waste feed modifications.

Operations have demonstrated consistent, reliable, robust operating characteristics with consistent volume reductions of up to 70:1 and weight reductions of up to 30:1 when processing depleted, mixed bed, ion exchange resins with over 99.8% of all radionuclides in the waste feed incorporated in the final solid residue product. Final reformed residue comprises a non-dispersible, granular solid suitable for long-term storage or direct burial in a qualified container. THOR℠ effectively converts hexavalent chromium to non-hazardous trivalent chromium and can convert nitrates to nitrogen with over 99 percent efficiency in a single pass.

The paper provides an overview of the first 6 months of commercial operations processing radioactive ion exchange resins from commercial nuclear power plants. Process improvements and lessons learned will be discussed. Plans for new mixed waste and graphite steam reforming processing will be presented.

PROCESS OVERVIEW

Since 1947 Studsvik has been actively involved as a research center for nuclear power in Sweden. Studsvik operates a research test reactor and hot cell facility for production of medical isotopes, commercial nuclear fuel testing, and materials irradiation. Studsvik operates a Dry Active Waste (DAW) incinerator, which has been in commercial operation since the early 1970s. Full metal melting and recycling capabilities for carbon and stainless steels and aluminum have been in use for several years.

A five phase test program was implemented to develop a process that could effectively volume reduce and stabilize a wide variety of liquid and solid LLRWs that could not be processed by the Studsvik incinerator. The successful test program culminated in the decision to proceed with the licensing, design, and construction of a commercial LLRW processing facility that utilizes the patented THOR℠ process. The Studsvik Processing Facility (SPF) has completed construction, startup testing, and commenced commercial operations with processing of radioactive IER from nuclear power stations in July 1999.

The THOR℠ process utilizes two fluid bed contactors to process a wide variety of solid and liquid LLRWs. Figure 1 provides an overview flow diagram of the THOR℠ process. Radioactive waste feeds are received at the SPF and stored in holdup tanks. As waste is needed in the process, waste is transferred to the waste feed tanks for metering and injection into the first stage fluid bed pyrolyzer/reformer. Solid, dry, granular wastes such as charcoal, graphite, soil, etc are metered into the pyrolyzer by the solids feeder. Liquids and slurry wastes such as IER, sludges, oils, antifreeze, solvents, cleaning solutions, etc are metered into the pyrolyzer by a pump.

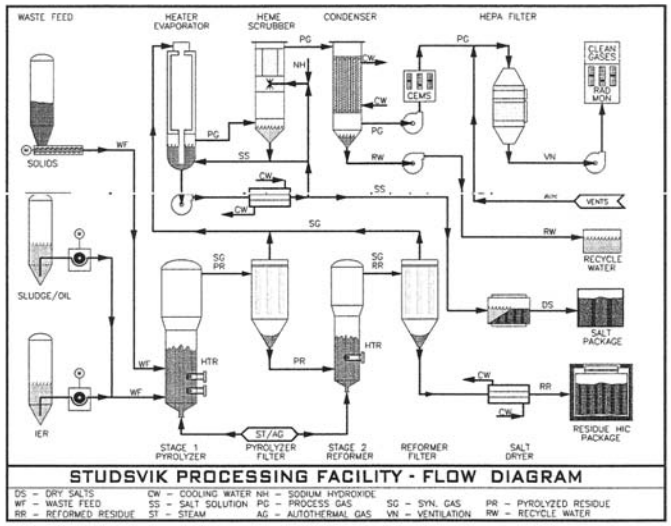

Figure 1 - THOR℠ Process Flow Diagram

The pyrolyzer fluid bed serves to evaporate all water from the IER slurry and liquid waste feeds, and pyrolyze the organic components through destructive distillation. Fluidizing gases, volatile organic vapors, and steam released in the pyrolyzer fluid bed comprise a synthesis gas which passes through the ceramic filters and to the gas handling system. The low-carbon, metal oxide-rich residue removed by the ceramic filter can be further processed in the second stage steam reformer to remove any final carbon or to convert the oxidation state of selected metals. The stage 2 Reformer can also be used as a primary waste processing unit by the direct injection of liquid wastes. The radioactive, volume reduced residue is packaged in qualified high integrity containers for burial at licensed burial sites or return to the generator. The final reformed residue volume is routinely only 1 to 4 percent of the incoming resin volume. For depleted, mixed-bed IER it is possible to achieve a volume reduction (VR) of 20-100 times with a corresponding weight reduction (WR) of 12-85 times.

Through selection of autothermal steam reforming operating conditions it is possible to produce an inert, inorganic final waste that consists of only the radioactive elements, metal oxides and inorganic calcium and silica compounds initially absorbed on the IER. It is possible to reach near theoretical mass reductions with the THOR℠ process. Another significant improvement realized by the THOR℠ process is the ability to process wastes with high water content. Aqueous wastes do not need to be dried prior to processing, but can be injected directly into the fluid bed using reliable slurry pumping equipment. Sodium nitrate slurry, oils, activated carbon, antifreeze solution, steam generator cleaning solvent and several types of IERs have all been successfully processed by the THOR℠ process.

STUDSVIK PROCESSING FACILITY

Studsvik has completed construction and start-up testing of a Low-Level Radioactive Waste (LLRW) processing facility in Erwin, TN. The SPF has all applicable licenses and permits for operation including a

radioactive materials license from the State of Tennessee. Commercial operation of the Studsvik Processing Facility (SPF) began in July 1999. The SPF and THOR℠ process systems are described below. The SPF is designed to meet all laws, codes, and standards related to processing LLRW. A photograph of the SPF is shown in Fig. 2.

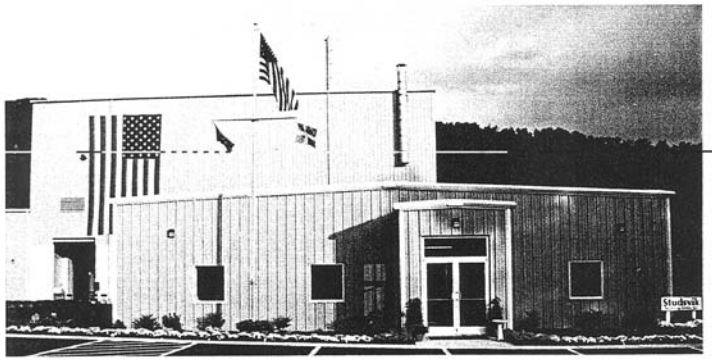

Figure 2 - SPF Overview

The SPF is designed to meet the following criteria:

Facility Curie Inventory:	up to 2,000 Ci (74 TBq)
LLRW Input Curies:	up to 2.0 Ci/cu.ft. (2.6 TBq/m^3) Contact dose of up to 150 R/h (1.5 Sv/h)
LLRW Inputs:	Ion Exchange Resins, Charcoal, Graphite, Organic Solvents and Oils, Aqueous Decon and Cleaning Solutions, Slurries, and Sludge

The SPF consists of a heavily shielded Process Building, unshielded Ancillary Building, and an Administration Building. The Process and Ancillary Buildings are licensed for receipt, handling, processing, and packaging of LLRW.

Process Building

The Process Building contains all radioactive processing, handling, and packaging systems for volume and weight reduction of incoming LLRW. Major areas include truckbays, LLRW input holding tank vault, pyrolysis/reforming vault, gas handling vault, salt dryer room, final residue packaging vault, and auxiliary equipment rooms.

Truckbays

LLRW is shipped to the SPF in DOT or NRC qualified non-shielded containers and/or shielded casks. Most LLRW is received in the truckbay where containers and casks are surveyed, opened and the waste transferred to shielded waste input holding tanks located in shielded vaults. Cask maintenance activities are performed in the truckbay where an overhead bridge crane provides lifting capability. Figure 3 is a photograph of the dual station truckbay.

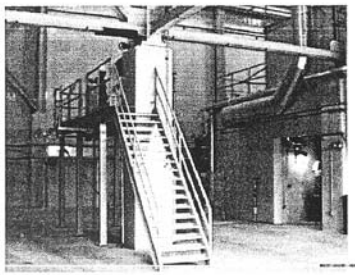

Figure 3 – Truckbay

Waste Input Holding Tanks

Three large stainless steel slurry holding tanks are provided for receipt and holdup of incoming liquid and slurry wastes. A separate liquid waste tank is used to receive more volatile organic solvents, cleaning solutions, and oils. A lockhopper feeder is used to receive and feed granular and powdered LLRW, such as charcoal. A separate waste feed tank with injection pumps is used to meter slurry and liquid wastes from the slurry holding tanks into the stage one pyrolysis vessel. Figure 4 is a photograph of the slurry holding tank vault.

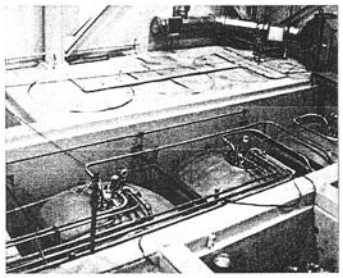

Figure 4 – Slurry Holding Tank

Pyrolysis/Reforming System

The Pyrolysis/Reforming THOR℠ system comprises: stage one pyrolysis contactor (pyrolyzer), stage two reformer contactor and associated filters. The pyrolyzer is a vertical, cylindrical fluid bed gasifier designed to operate at up to 800°C. LLRW is injected into the electrically heated, fluidized pyrolyzer where: 1) water is instantly vaporized and superheated, and 2) organic compounds are destroyed as organic bonds are broken and resulting synthesis gas (principally carbon dioxide, carbon monoxide, and steam) exits the Pyrolyzer. Residual solids from the pyrolysis of the LLRW (including fixed carbon, >99.8 percent of the incoming radionuclides, metal oxides and other inorganics and debris present in the LLRW feed) are removed from the pyrolyzer and collected in the stage one ceramic filter vessels. The pyrolyzer is fluidized with superheated steam and additive gas. Figure 5 is a photograph of the reformer process area.

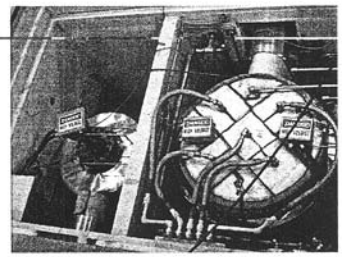

Figure 5 - Process Area - Reformer

The stage two reforming contactor is a vertical, cylindrical fluid bed designed to operate at up to 800°C. Pyrolyzed solid residues from the stage one filters or additional LLRW feed can be transferred to the reformer, which is an electrically heated, fluidized bed. The reformed, low-carbon, final residue is collected in the stage two ceramic filter vessel. The reformer is fluidized with superheated steam and additive gas.

Gas Handling System

The gas handling system comprises an energy recovery heater, submerged bed evaporator, scrubber/mist eliminator, condenser, CEMS, process blower, HEPA filter, vent blower and radiation monitor. The purpose of the gas handling system is to convert synthesis gas constituents to carbon dioxide and water, recover energy from the synthesis gas, convert acid gases to stable salts, control water content of exiting process gases, and control negative pressure levels throughout the THOR℠ pyrolysis/reformer system.

Synthesis gases from the pyrolyzer and reformer are filtered and then oxidized in the energy recovery heater to carbon dioxide and water. The heater recovers energy from the synthesis gas and provides heat to the submerged

bed evaporator where excess water is evaporated from the scrubber water. The heater is a vertical, refractory lined vessel that operates at up to 1200°C.

The submerged bed evaporator is an energy recovery system that channels the hot heater outlet gases through a volume of scrubber water, thereby evaporating excess water. The evaporator concentrates scrubber solution to 10 to 20 percent salts. The wet evaporator gases pass through the rotary atomizer scrubber where sulfur and halogen gases are efficiently converted to salts. Sodium hydroxide is metered into the scrubber to neutralize sulfur and halogen gases that are absorbed by the scrubber solution. The outlet of the scrubber is fitted with a mist eliminator that removes particulates and mists from the scrubber outlet.

The clean, moisture-laden gases exit the scrubber and excess moisture is condensed for recycle/reuse in the process. The condenser serves as the process heat sink and serves to control water balance in the SPF. The cool, clean gases are then compressed to atmospheric pressure by the process blower. A continuous emissions monitoring system (CEMs) is provided on the process blower outlet to monitor and record the release of any traces of carbon monoxide, acid gases, total hydrocarbons, and NOx.

The clean, cool process gases commingle with the building ventilation airflow. The combined gases flow through a HEPA filter bank, vent blower and are then released through a monitored vent stack. A complete radiation monitor system measures and documents any trace radionuclides that may pass through the stack. The radiation monitor system includes gamma, beta, alpha, iodine, carbon^{14}, and tritium samplers and detectors.

Salt Handling System

The salts that are formed in the scrubber and concentrated in the evaporator are transferred to the salt handling system, which comprises a filter, an ion exchange system and salt dryer. The concentrated salt solution is filtered to remove any trace particulates that may pass through the pyrolyzer and reformer filters. Any trace radioactive species are removed from the scrubber solution by a high-efficiency, metals selective ion exchange medium. The salt dryer dries the purified salt solution to form a salt cake suitable for direct disposal at a licensed landfill. The dry salt is very low in activity.

Residue Handling System

The reformed, low-carbon residue from the pyrolyzer and reformer is transferred to the high integrity container (HIC) packaging vault. Qualified HICs are filled with the solid, inert residue. Filled HICs are transferred from the packaging vault to a shipping cask be means of a shielded transfer bell. Dual containment and seals are provided on residue handling components. The packaging vault is provided with separate HEPA filtered ventilation system and water washdown capability.

The HIC packaged residue is suitable for direct burial at either the licensed Barnwell or Hanford LLRW burial sites. The packaged residue is also suitable for long-term storage due to its solid, inert, all inorganic nature. The packaged residue is not subject to common problems with long-term storage including bacterial activity and radiolysis of organic compounds.

It is possible to package the low-volume residue in any of the following forms:

- stabilized in High Integrity Containers (HIC);
- compacted, cold-sintered, high-density, metal oxide monolith;
- solidified monolith using polymer sulfur cement, portland cement, thermoplastics, or polymers;
- vitrified monolith using borosilicate or phosphate glass; or
- melted metal monolith.

Spill Protection and Contamination Control

All interior surfaces of the SPF are provided with durable, easy-to-decon coatings. The interior wall and roof panels are of interlocking and sealed construction to eliminate leakage paths from the inside of the SPF to the outdoors. Interior concrete and steel surfaces have a special multi-layer coating to prevent migration of spills or contaminants from the SPF to the environment. The HVAC system also maintains the inside of the SPF at a slight negative pressure relative to the ambient outdoors, effectively eliminating potential airborne releases. Dikes, berms and sumps are located so as to prevent tank leaks and even potential large firewater events from escaping to the outdoor environment.

Auxiliary Equipment and Utility Services

The Process Building contains all auxiliary and utility subsystems required to support SPF operations and THOR^{sm} operations including:

Steam Supply	Sluice Water
Nitrogen Supply	Steam Superheaters
Demineralized Water	Service Air
Steam Condensate	Potable Water
Instrument Air	HVAC and Ductwork Dryer
Condensate	Breathing Air
Natural Gas Supply	Cooling Water
Additive Gas	Motor Control Center
Hot Laboratory	DAW Compactor

ANCILLARY BUILDING

The Ancillary Building is designed for storage of spare parts, empty waste shipping containers and equipment for use at customers' locations. A spray dryer and collector are being installed to provide additional salt drying capability for the process. Full salt containers are accumulated for shipment for disposal. Low activity LLRW can also be received and offloaded in the Ancillary Building. Maintenance of plant equipment is also performed in a controlled area. A modular, skid-mounted, pilot-scale THOR^{sm} system can be located in the Ancillary or Process Building to perform testing on surrogate and low activity wastes.

ADMINISTRATION BUILDING

The Administration Building has: offices for plant staff and management, control room, switchgear and UPS, health physics and personnel contamination monitoring areas, and count room. The THOR^{sm} control room provides remote readout of all process parameters. Trained operations personnel utilize the fully automated supervisory control and data acquisition (SCADA) system to monitor and control all system operations. The SCADA provides a comprehensive human-machine-interface that monitors the PLC panels, instruments, and equipment located in the Process and Ancillary Buildings. Automated safety systems, alarms, and interlocks are provided together with real-time data acquisition and trending. The SCADA provides the operators automated flow diagram windows to monitor and control the process through graphical interfaces.

START-UP ACTIVITIES

SPF start-up activities commenced in February 1999 with the performance of a series of subsystem tests and hot functional tests. Process and SCADA control systems were tested over a several month period to demonstrate reliable performance and to verify that all systems work together as an integrated facility. Operations personnel training was certified on actual operating plant systems. Operating procedures were also verified to be accurate.

Testing activities uncovered several design and equipment deficiencies that were corrected throughout the testing and subsequent operational periods. The main problems encountered during the start-up activities as well as successes are discussed below.

The IER unloading system has worked very well. The incoming resin containers were opened and the dried or wet resins inside were removed as slurries. Using remote devices with very low personnel dose accumulation or direct hands-on effort required. Special stainless steel shipping containers were developed that allowed fully remote removal of incoming resins. Many resins were shipped to the facility in disposable plastic or metal containers that were not compatible with full remote slurrying operations. Such containers required manual intervention to remove the final contents from the container.

The water-slurried IER is transferred to the slurry holdup tanks where the resins are allowed to settle and excess water is then decanted off the top of the settled resin. The original tank manufacturer provided decant devices that did not work as the floats sank and the decant hoses became tangled. A modified, larger decant device with positive alignment guides was installed in each tank with good success. Decant operations require no operator intervention.

The settled IER from the slurry holdup tanks is transferred to the resin feed tank and then the low-water content resin slurry is injected directly into the pyrolyzer. The IER transfers and feed operations have worked very well except when substantial charcoal is commingled with the IER. Additional water flush connections were added to facilitate handling and injection of IER commingled with granular charcoal. Slurry injection lines were modified to remove excess bends.

The pyrolyzer has performed as designed for drying, pyrolyzing and steam reforming the various LLRW feeds processed. A problem was encountered in the superheated steam system that provides fluidizing gases to the pyrolyzer. The steam system did not have adequate condensate removal capability. Accumulated condensate occasionally entered the electrically heated superheaters. The presence of liquids in the superheater caused crack formation of the heater shell due to thermal stresses. The steam system was corrected to provide thorough condensate removal. The super-heated fluidizing gas systems have worked very well.

The pyrolyzer experienced several agglomeration events during testing and initial radioactive operations. Process shutdowns were required to remove accumulated deposits in the fluid bed. The pyrolyzer operating parameters have been adjusted and the design of the IER injector and internals inside the pyrolyzer have been changed with good success. A unique fluid bed media washing station (patent pending) has been added to allow the sand in the fluid bed to be automatically removed and washed to dissolve accumulated low-melting point salts on the sand media, without disturbing pyrolyzer on-line operations. The clean sand media is then returned to the pyrolyzer. No significant agglomerations have occurred for several months.

The ceramic filters have performed with high efficiency except during the initial non-radioactive tests. It was determined that several of the special high temperature seals were not large enough to seal the filter element tubesheet penetrations thereby allowing some reformed residue to bypass the filters elements and enter the gas handling system. Corrected seals have been installed on the tubesheet. Filter removal efficiency is now very high with typical particulate radionuclide removal efficiencies exceeding 99.999 percent.

The gas handling system has performed well except for the carryover of small quantities of salt from the scrubber to the HEPA filters and lower than specified performance of the process blower. A filter baghouse has been added just upstream of the HEPA filters to prevent rapid blinding of the HEPA filters with salt. Larger drive motors have been provided on the process blowers so that process pressures can be adequately maintained during all processing operations.

The salt dryer did not provide the required throughput capacity. Extensive revisions have been performed to the salt dryer system to provide full production throughput capacity and to significantly reduce the hands-on maintenance required of the initial system. A new spray dryer is being installed to provide improved salt drying capacity and to reduce the hands-on maintenance needs of the current salt dryer.

OPERATIONS SUMMARY

Commercial radioactive operations commenced on July 19, 1999. Initial operations were limited for several weeks to processing only very low activity IER at low waste feed rates. This allowed operations staff to gradually implement and perform maintenance activities on system components with full radiological controls but with only very limited radiation and contamination levels. Several plant hardware corrections were identified and accomplished during this period as discussed above. The initial low feed rates of 1 to 2 cubic ft per hour (0.03 to 0.05 cubic meter/hour) have been progressively improved up to the current 8 to 12 cubic ft per hour (0.22 to 0.34 cubic meter/hour) processing rate. Continued efforts are being made to reduce downtime for maintenance activities.

Higher activity IER and charcoal have been progressively received and processed. Table 1 provides a summary of SPF processing throughput and waste processing parameters from the start of commercial operations through February 8, 2000.

Table 1 - Processing Throughput and Parameters

Quantity of Radioactive Resin Processed:	>6,300 cuft (>178 cu meter)
Current Processing Rate:	8 to 12 cuft/h (0.22 to 0.34 cu meter/h)
Highest Activity Resin Processed:	150 R/h (1.5 Sv/h) On Contact
Volume Reductions Achieved:	Incoming Resin Volume : Final Residue Volume
Condensate Polisher Resin:	64:1 to 74:1 (1.3% to 1.5% Remaining)
Cleanup/CVCS/Radwaste System Resin:	15:1 to 58:1 (1.7% to 6.7% Remaining)
Torus Cleanup – High Inorganic Sludge:	5:1 to 8:1 (12.5% to 20.0% Remaining)

The volume reduction of the incoming waste is dependent on the inorganic content of the resin. Resins that are not fully depleted or have been ultrasonically cleaned to remove particulates will have VR factors exceeding 60:1. Typical water cleanup and radwaste resins will have VR factors of 20:1 to 60:1 depending upon the quantity of metals and particulates on the resin. Resins that have a very high inorganic loading, mainly particulates from floor drains and torus sludge removal efforts, may have VR factors as low as 5:1. Pyrolysis and steam reforming can only remove the water and organic fraction of the incoming waste feed. Essentially all inorganic cations (metals) including all non-volatile radionuclides will be in the final, low-volume residue. It is possible however, to change the oxidation state of various metal ions if desirable, e.g. hexavalent chromium is converted to non-hazardous trivalent chromium.

The processing rate has been increased and is anticipated to be at the annualized design throughput of over 60,000 cubic ft (1,700 cubic meter) of incoming IER when the new spray dryer is commissioned in April, 2000.

CONCLUSION

The THOR^{sm} process, as implemented in the SPF, has the following features and provides the following significant advantages over other current LLRW processing technologies.

- VR of 20 to 100 for IER wastes;
- WR of 12 to 85 for IER wastes;
- Atom-for-atom processing mode is possible;
- Inert, inorganic, homogeneous, final waste form;
- Direct disposal in qualified HICs;
- Accept IER with contact dose rates up to 150 R/h (1.5 Sv/h);
- Accept LLRW including: IER, graphite, charcoal, SGOG solvents, antifreeze, oils, sludge, high-water content wastes, and high-organic content wastes;
- Packaged final waste form suitable for long-term storage with no risk of gas generation due to bacterial or radiolysis action (residue has no organic content);
- Final waste form is reprocessable to alternative waste forms including vitrification, solidification, encapsulation, cold-sintering, and melting.

FUTURE PLANS

Studsvik has further developed the THOR^{sm} process for efficient handling of graphite and mixed wastes by utilizing a simplified single-stage reformer process (patent pending). A modular fluid bed reformer is now being designed for implementation in processing additional IER feed at the SPF. In addition, the modular THOR^{sm} reforming system can be transported and or modified to process significant quantities of LLRW and mixed wastes at other sites. Figure 6 illustrates the capabilities of the THOR^{sm} process.

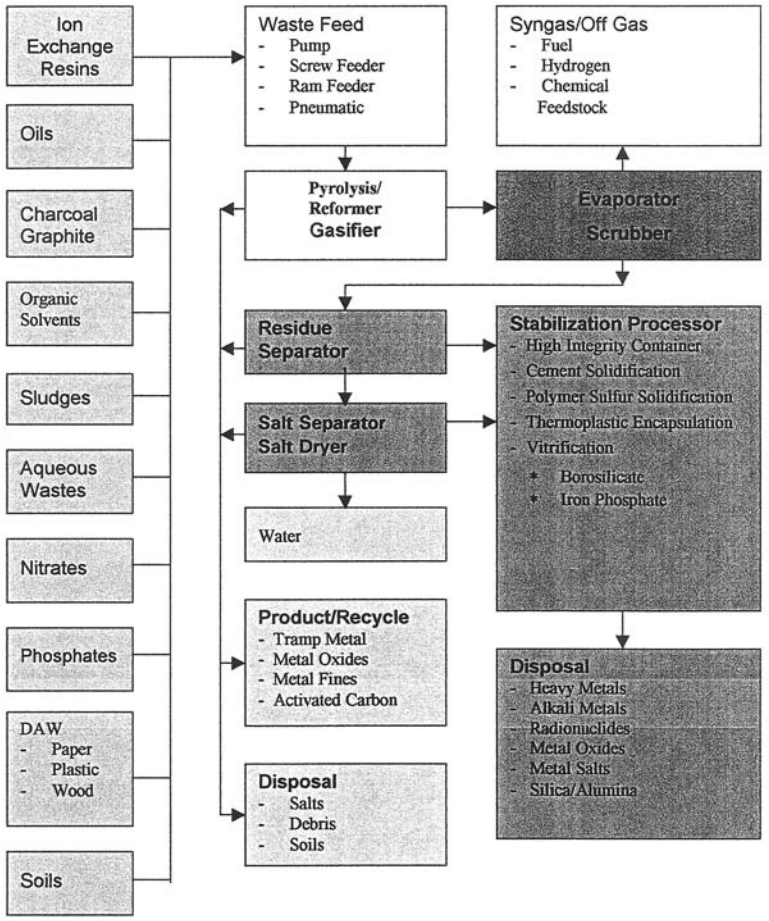

Figure 6 - Block Flow Diagram

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Attachment Two
Studsvik Comments on the Idaho High-Level Waste and Facilities Disposition
Draft Environmental Impact Statement (DOE/EIS-0287D)

Our review of the Draft EIS indicated that there were numerous tasks evaluated that could be more efficiently performed by a steam reformer system. In almost every case, the reforming technology would completely conform to the bounding parameters of the various environmental factors considered.

The following provides excerpts from the draft EIS and our comments on how reforming technology could be utilized to enhance each effort. This information is provided to enable the reader to fully understand the positive impact that reforming technology can have on the waste cleanup efforts at INEEL.

Studsvik highly recommends that an evaluation of the steam reforming technology be incorporated into the final EIS.

There is no significance to the order in which the comments are provided. Comments are provided in the order in which the topic appears in the Draft EIS.

EIS Page No. F-3:

"Notably, DOE and the State did not select a preferred alternative in the draft EIS. The State and DOE will discuss preferred alternatives after considering public input, and the Final EIS will announce the outcome of these discussions."

Studsvik desires that its Pyrolysis/Steam Reforming fluid bed technology be reviewed by the State and DOE, and be considered as an alternative for the processing of SBW, NGLW and other wastes at INEEL as more fully described throughout this document and its Attachments.

EIS Page No. 1-7:

"INTEC's current purpose is to:

- *Develop and apply technologies to minimize waste generation and manage radioactive and hazardous wastes."*

The EIS recognizes INTEC's mission to develop and apply technologies. Through private sector development activities, Studsvik has developed and deployed a patented process system that can be utilized to process a wide variety of nuclear waste forms. With our fluid bed pyrolysis/steam reforming technology, the Studsvik THOR℠ System can be operated in a variety of conversion

modes (oxidizing and/or reducing) with various additives to process, through organic destruction, evaporation, nitrate conversion, etc., solids or liquid slurries of low-level, mixed and/or high-level radioactive wastes of the following general types:

1. Predominantly organic materials such as ion exchange resins
2. Mixed waste such as materials contaminated with PCBs
3. DAW
4. Solid/Liquid Nitrate Wastes (SBW)
5. High NOx off-gas conversion

The exact adaptation of the process equipment and operating parameters would be based on the specific input waste stream and the specific activity of the input waste. Studsvik's fluid bed approach differs markedly from the fluid bed calciner presently in use at INEEL. The THOR^{sm} process incorporates many features to eliminate the problems associated with that generation of fluid bed systems.

Significant differences include:

1. Direct conversion of nitrates to nitrogen in the fluid bed without the resultant NOx emission problem of the current system.
2. Operation at reduced operating temperatures, thus eliminating the need for bulky additives to prevent molten salt agglomerations.
3. Operation in an "elutriating" mode to prevent the build up of waste salts in the fluid bed
4. Low gas flow for simplified off-gas control system
5. Unique construction for extended lifetime without costly maintenance requirements.
6. Controlled chemical reactions to achieve desired conversion result.

EIS Page No. 1-11:

"As of February 1998, all of the liquid HLW derived from first cycle uranium extraction was converted to calcine. Since that time, calcining of the mixed transuranic waste (SBW and newly generated liquid waste) remaining in the tanks has been underway. There are approximately 1,400,000 gallons of liquid currently in the tanks."

Steam reforming technology can be utilized to directly process the SBW and newly generated liquid waste in a single step process in a more efficient manner than is presently planned for using the existing calciner and/or other methods (should operation of the calciner be halted for environmental reasons).

EIS Page No. 1-16/17:

"Calcination of Mixed Transuranic Waste/SBW

The SNF & INEL EIS and Record of Decision determined that HLW and mixed transuranic waste/SBW in the Tank Farm should continue to be calcined while other treatment options were studied. Unlike the liquid HLW, the mixed transuranic waste/SBW cannot be calcined directly due to the presence of low melting point alkali compounds formed during calcinations that clog the New Waste Calcining Facility calcine bed. A large amount of nonradioactive aluminum nitrate solution must be added to the waste before it is fed into the calciner. In order to meet its commitments to complete calcinations of the liquid mixed transuranic waste/SBW by December 2012, DOE studied alternative methods for calcining this waste. Two techniques emerged as viable candidates: (1) high temperature calcinations and (2) sugar-additive calcinations (LMITCO 1977). Based on the results of the pilot plant studies, DOE determined high temperature calcinations to be the viable technological solution. High temperature calcinations will be demonstrated during calciner operations through June 2000."

THOR^{sm} utilizes a steam fluidized bed of inert material. The bed is heated by electrical steam superheaters. Steam reformation reactions can occur in auto-thermal mode requiring no additional energy input. Sodium compounds do not adhere to the bed media but are constantly elutriated out of the bed. The high, instantaneous conversion of low melting nitrates to nitrogen eliminates the potential agglomeration in the bed. Sodium oxide compounds are formed that have eutectic melting points higher than the Reformer operating temperature.

THOR^{sm} does not require the addition of aluminum nitrate to prevent alkali compound related agglomerations. Sugar additive can be performed in the THOR^{sm} process with no design changes. The THOR^{sm} reformer fluidized bed does not require high temperatures to provide complete nitrate conversion.

This technology had its genesis in fluid bed technology for biomass gasification, but is truly a next generation design which offers the following advantages for radioactive service:

- Reformer has significantly reduced off-gas volume of 1/8th to 1/20th of the off-gas volume of the current calciner.
- Reformer has gaseous NOx emissions that meet MACT standard without addition of gaseous de-NOx unit. Nitrates are fully converted to N_2 in the reformer fluid bed. Reformer has estimated NOx emissions at 1/1,000th of those emitted from current calciner.
- Reformer minimizes use of additives to prevent agglomerations. Low temperature operation minimizes or eliminates the need for additives to prevent alkali metal compounds from melting in the bed. This also significantly reduces the final volume of the end product.
- Reformer provides high conversion of nitrates to nitrogen and minimizes or eliminates the presence of nitrates in the high sodium end product.
- Reformer has lower Cs volatility than high temperature units operating over 600°C.

- Efficient mercury recovery unit can be easily utilized in the off-gas from the reformer.
- Construction labor to build new plant is estimated to be 2 times that required for performing continued current operations modifications of adding a de-NOx unit to existing calciner off-gas system. The new reformer plant could be designed and built to meet the same schedule as estimated to modify the existing calciner.

EIS Page No. 1-17:

"*Immobilization Technologies*

……DOE identified two ways to treat mixed transuranic waste/SBW and calcine: direct immobilization or radionuclide separation followed by vitrification……"

Granular solid sodium-bearing product from the reforming process is amenable to direct immobilization or radionuclide separations followed by vitrification.

EIS Page No. 1-32:

"The Advanced Mixed Waste Treatment Project (AMWTP) EIS -

…… The AMWTP EIS is potentially relevant to the proposed HLW EIS because a portion of the inventory of radioactive waste at INTEC may be considered for treatment at the proposed AMWTP. .."

57-3
X1(5)

Due to the flexibility of the reforming technology, it could be directly incorporated into the AMWTP as a potential replacement for the cancelled incinerator. If this were to occur, consideration should be given for utilization of this system to not only address low-level mixed wastes but also SBW and other INEEL waste streams. This would provide significant savings in overall facility construction and operational costs can be achieved, as well as providing for a superior technical solution.

EIS Page No. 2-4:

Section 2.2 states that DOE will evaluate *"..... innovative alternative scenarios and technologies..."*

"....it was determined that there are alternative technologies that would not involve calcining waste prior to further treatment...."

Steam reforming constitutes an innovative alternate technology of this type. Steam Reforming is a non-incineration thermal treatment process.

EIS Page No. 3-2:

"Time lines for alternatives analyzed in the EIS

The general timeframe for the waste processing alternatives analyzed in the EIS extends from the year 2000 through 2035. The year 2035 is when, in accordance with the Settlement Agreement/Consent Order, DOE must have all HLW treated and ready to be shipped to a storage facility or repository outside of Idaho. Specifically, this agreement states that all the liquid in the eleven 300,000-gallon, below -grade tanks would be calcined, treated, and ready to be transported out of Idaho by a target date of December 31, 2035. ……"

See comments to page No. 3-3 below.

EIS Page No. 3-3:

"The Settlement Agreement/Consent Order specifies that calcinations shall be completed by 2012.

……However, because some of the waste processing alternatives evaluated new treatment technologies at INTEC that would not use the calciner, the 2012 date for having all liquids out of the tanks would not be practicable under those alternatives. Time frames in these instances are dictated by the amount of time needed to design, construct, and permit a new treatment facility and how long it will take to treat the liquid and the calcine using the selected technology."

Throughout the EIS, reference is made to the time lines committed to in the Settlement Agreement/Consent Order. It was recognized that the alternative of development of a completely new technology to address the INEEL needs was not practicable because that approach would not be able to meet the ultimate processing deadlines.

Studsvik's THOR℠ technology is directly applicable to the processing of the waste currently processed in the calciner, is fully developed and deployed, and solves many of the current problems associated with calciner operations.

Studsvik can easily support the specified schedule as the THOR℠ process is now being used on a large-scale commercial basis to process a variety of LLRW using steam reforming. The Studsvik Processing Facility has a current throughput of approximately 75% of the existing INTEC calciner.

The technology could be deployed in a relatively short period of time:

Demonstrate to DOE	1 year
Licensing/Permitting	1 year
Design	1.5 years
Procurement/Construction	2.5 years
Testing	0.5 years
	6.5 years

The above estimates are based on a similar activity just completed for our commercial processing facility in Erwin, TN with appropriate additional time added for additional DOE requirements.

Through expedited efforts, the large majority of the waste under consideration could be processed before the year 2012.

Alternatively, a THOR[sm] steam reformer could be installed on the outlet of the existing calciner to convert the gaseous NOx to nitrogen without needing to modify the current calciner in any way. The NOx converter could be installed according to the following schedule

Demonstrate to DOE	1 year
Design/ Permit Revision	0.4 year
Procurement/Construction	2.5 years
Testing	0.1 years
	2.5 years

EIS Page No. 3-10:

"New Waste Calcining Facility

..... Calcination does not meet the applicable RCRA treatment standards for the INTEC waste and is considered an interim treatment step to stabilize the waste in a solid form pending its final treatment.

The Notice of Noncompliance Consent Order requires that the calciner be placed in standby in June 2000, pending DOE's decision whether to seek a permit or close the facility. Before continuing calciner operations, upgrades to the off-gas treatment system would be required to comply with the Maximum Achievable Control Technology air emissions standards. ..."

NOx Off-gas control is perhaps the most significant advantage of the THOR[sm] technology. During the extensive, multi-year test program, Studsvik identified the need for a simple, single-step nitrate destruction process. Tests were performed to determine the capabilities of THOR[sm] for nitrate destruction. A unique combination of operating parameters and equipment design

yielded a simple system that can process liquid, slurry, solids and/or gaseous nitrates (NOx) in a safe and efficient operation.

Nitrate destruction tests confirmed that the THOR[sm] fluid bed system can achieve the following performance specifications:

Nitrate Feed:	5.2 M $NaNO_3$, in water slurry
Processing Rate:	Proprietary
Reductant:	
Main Additive:	Sucrose (granular sugar)
Other Additive:	Proprietary
Addition Rate:	Proprietary
Fluidizing Medium:	Proprietary Bed Material Used
Fluid Bed Media:	<2% nitrates, during steady state operation
	<0.5% nitrates during startup and shutdown periods
Heating Method:	Electrical Resistance Heaters
Operating Temp.:	450-700°C
Nitrate Destruction:	>99 percent, in solid outlet stream
Chromium +6:	Converted to Cr^{+3}, below detectable levels of Cr^{+6} on TCLP test
Bed Agglomerates:	None
Off-gas System:	Thermal Oxidizer and Scrubber
NOx in Off-gas at Outlet of THOR[sm] Fluid Bed (prior to thermal oxidizer and scrubber):	
At Startup:	>5,000 ppm, quickly dropped within one hour to steady state values
Steady State:	<100 ppm, normally <50 ppm, 25% of test time <15 ppm

NOx measurements were made continuously on-line using an extractive EPA method. In addition, gas bag samples were analyzed off-line at a certified lab. Off-gas analysis from a typical large-scale test run shows below detectable levels for NO and NO_2 and approximately 69 ppm of N_2O. Depending upon local air permit requirements, the THOR[sm] process will require no NOx off-gas control system.

We have performed numerous nitrate destruction tests utilizing fluid bed and mechanical contactor hardware over the past several years. The current process application practices have proven to be safe, efficient and easy to control.

Utilization of Studsvik's approach would provide for waste processing that meets the MACT requirements in a single process operation thus yielding a "final" rather than an interim solution. The THOR[sm] gaseous NOx conversion reformer far surpasses the ability of any other commercial scale technology for converting high NOx input streams directly to nitrogen.

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EIS Page No. 3-11:

"Newly generated liquid wastes has historically been added to the liquid mixed transuranic waste in the below-grade tanks. Consequently it has been similarly managed, calcined, and transferred to bin sets where it is combined with HLW. However, DOE has determined that by September 30, 2005, new tanks will be constructed and available to accept the newly generated liquid waste. ....."

See comments provided in response to EIS Page No. 3-3 statements.

EIS Page No. 3-61:

"3.3.7 TREATMENT OF MIXED TRANSURANIC WASTE/SBW AT THE ADVANCED MIXED WASTE TREATMENT PROJECT

.....For these reasons, the option of treatment of mixed transuranic waste/SBW at the Advanced Mixed Waste Treatment Project was eliminated from further consideration in this EIS."

57-H
X1(5)

This section discusses the modifications that would be required to the AMWTP to enable the processing of SBW and makes the conclusion that such modifications would disrupt the schedule for the AMWTP and jeopardize compliance with the Settlement Agreement/Consent Order and increase costs.

With the recent event of termination of the incinerator system originally incorporated into the AMWTP, there is the potential that improved technology such as pyrolysis/steam reforming may be incorporated into the final revised facility design. If this were to be the case, then it could prove beneficial to include an evaluation of steam reforming and an evaluation of processing of SBW at the AMWTP in the final EIS

Processing of SBW at AMWTP was not considered in part due to the need for modifications that would no longer be applicable should a reforming system be employed:

1. Dry input form required - reforming technology can utilize a liquid slurry or solid waste input feed.
2. Pretreatment such as cesium ion exchange would be required - a reforming system can be easily shielded to handle high activity wastes.
3. Mods to off-gas system for NOx - a reforming system can directly process nitrates to nitrogen gas.

The THOR[sm] steam reformer process could be utilized in the AMWTP to destroy the nitrates in the mixed TRU/SBW. The resultant nitrate free, alkali compounds could then be efficiently packaged as TRU waste including grouting as required.

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Appendix B-9:

"B.3.3 CANDIDATE ALTERNATIVES"

This section indicated that DOE included all reasonable and viable alternatives that were available through late 1997. The Studsvik steam reforming facility was in its construction phase at that time and did not have demonstrated performance on a large-scale, commercial basis, thus it was not included in the evaluation.

The steam reforming technology does come within the overall boundaries of the various technologies that were expressly mentioned in the Draft EIS. Due to its many advantages as described in this document, an evaluation of this technology should be included in the final EIS.

Appendix B-10:

"B.3.3.2 Alternatives Not Considered for Initial Analysis

.....(2) required significantly more development work to achieve technical maturity,..."

Steam reforming for processing of nuclear waste has now been fully demonstrated with the opening and subsequent commercial large-scale radioactive operation of the Studsvik Processing Facility.

Appendix C. 6-25:

"C.6.2 PROJECT SUMMARIES
Waste Processing Projects

C.6.2.1 Calcine SBW Including New Waste Calcining Facility Upgrades (P1A)"

Appendix C. 6-31:

"C.6.2.2 Newly Generated Liquid Waste and Tank Farm Heel Waste Management (P1B)"

We have reviewed the construction and operational summaries provided in the referenced sections and find that construction and operation of a steam reforming facility would fall within the boundaries of these specifications.

Due to the similarities of environmental effects of steam reforming technology to the technologies fully evaluated, revisions to the EIS are felt to be feasible in a relatively short period of time with no expected alternations to the fundamental findings.

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Attachment Two
Studsvik Comments - Draft EIS
Page 10

Appendix C.6-73:

"C.6.2.10 HAW Denitration, Packaging and Cask Loading Facility (P9J)

..... The denitrator would be a fluidized bed reactor. The evaporator bottoms, mixed with a 2.2M aluminum nitrate solution would be fed into the bed. Kerosene and oxygen would also be fed into the reactor to maintain the reactor temperature of about 600 °C. The aluminum nitrate reacts with the waste to form solid pellets (calcine)."

The Draft EIS provided a summary description of Project Number P9J, HAW Denitration, Packaging and Cask Loading Facility (listed in Table C.6.1-1 and more fully described in section C.6.2.10, page C.6-73).

The THOR℠ steam reformer operates as an elutriating fluid bed. However, reference should be made to use of electrical heating and auto-thermal steam reforming for maintaining fluid bed operating temperatures of 450 to 700°C. The use of aluminum nitrate can be utilized in the Reformer, however, the use of such additives to prevent alkali; metal agglomerations are generally not necessary with the THOR℠ Reformer.

COGEMA, INC.

HLW & FD

EIS PROJECT - (AR) PF
Control # DC-58

Mr. Thomas L Wichmann
EIS Document Manager
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

RECEIVED
APR 14 2000

April 14, 2000

Dear Mr. Wichmann

Subject: COGEMA, Inc. Comments on the "Idaho High-level Waste and Facilities Draft Environmental Impact Statement (EIS)

COGEMA, Inc. is pleased to submit the attached comments on the December 1999 draft "Idaho High-level Waste and Facilities Draft Environmental Impact Statement (EIS)".

58-1
III.D.4(4)

As summarized in the attachment, there is a cost-effective, mature, industrial technology, which can be used to solidify the INEEL sodium bearing waste. This technology was not considered in the Draft EIS. COGEMA, Inc. encourages the Department of Energy to permit use of this technology in the Final EIS and Record of Decision (ROD).

If there are any questions or if additional information is needed, please contact me at the number referenced below, or Arvid Jensen (208-524-0466).

Sincerely yours,

Rhonnie Smith
Executive Vice-President, Engineering and Technology

cc:
Arvid Jensen

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1.0 COGEMA, INC. COMMENTS

The December 1999 draft *Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement* (EIS) addresses methods for early processing of Sodium Bearing Waste (SBW). COGEMA Inc. submits the following comments:

1. There is a variant to the Draft EIS alternatives that can process the SBW into a glass waste matrix using industrially available technology. This mature technology option, which was not considered in the Draft EIS, can be accomplished at cost/schedule competitive to those already identified in the Draft EIS.
2. COGEMA, Inc. encourages the DOE to permit use of this mature industrial technology for SBW solidification, in the final EIS and ROD.

2.0 COMMENT BASIS AND JUSTIFICATION

2.1 System Description

2.1.1 Overall SBW Processing System Figure 1 provides a general illustration of the proposed system, which is composed of the following major processes, and/or subsystems, which are all based on mature industrial technologies:

- Off-gas Collection and Purification Processes: This off-gas subsystem will service all of the other subsystems of the SBW processing system, and will provide particularly important support for certain subsystems (e.g., denitration, vitrification, and canister filling)
- Denitration Process: Formic acid will be added to incoming SBW to destroy nitrogen compounds (e.g., nitrates, etc.), prior to feeding SBW to the melter, for vitrification processing. Nitrogen gases resulting from denitration process will be dealt with by the off-gas subsystem.
- Mercury (Hg) Separation: Mercury will be removed from the SBW, during the denitration processing, and will be loaded into small containers, as a secondary waste product for later disposition.
- SBW Concentration Process to Feed Melter: SBW will be concentrated, mainly by removing some of the water, and fed to the vitrification subsystem (melter), as a dilute slurry (i.e., liquid containing some solids).
- Glass Formers to Feed Melter: Most of the materials needed to form the glass (waste form) matrix are not present in SBW, and will be formulated and added as a dry feed to the melter, in the form of a crushed glass (frit).
- Vitrification Processing: This is a combination of thermal and chemical processing that occurs within the melter. The melter, which is the key component of this subsystem, is a metal enclosure designed and fabricated to provide essential processing conditions. The melter has an internal heating system, a system to mechanically stir the incoming feed and glass melt, an external cooling system, and is linked to the off-gas system. The proposed vitrification subsystem uses a unique melter that has been developed by the French nuclear program over the past two decades and industrially applied during the last decade. It offers very substantial technical, cost and schedule advantages over melter designs that heat the melter by electrodes submerged in the glass (e.g., those currently operated by the U.S. DOE).

- Canister Filling Process: Glass waste form material that has completed processing in the melter is drained into thin-walled metal canisters. This process uses a French developed and industrially applied drain valve mechanism located in the bottom of the melter. The metal canisters will be, of a design, common in-type to canisters already being used by the U.S. DOE. Empty canisters will be fed into a carousel racking system, to support the high production rate of glass waste form.
- Canister Sealing Process: After being loaded with the molten glass waste form and allowed to cool, the canisters will be fully sealed by welding.
- Canister Decontamination Process: The canister exterior will be decontaminated to meet the requirements for lag storage, on-site interim storage and off-site transportation, for final disposal.
- Lag Storage Process: The overall processing system will include a handling system to provide temporary storage for a limited number of completed canisters (loaded with waste form), prior to their acceptance by DOE, in preparation for final disposition.
- Load-out Process: Canisters, from lag-storage, will be processed for transportation, in support of DOE preparations for final disposition.

The overall system will thus have the following general processing flow: 1) feed preparation will include processing SBW (i.e., denitration to destroy nitrogen compounds, remove some water to concentrate SBW) and providing glass forming materials in a dry frit feed to the melter), 2) perform vitrification processing in the melter, 3) drain resultant (molten) glass waste from melter into metal canisters, 4) after glass cools to a solid, seal canisters by welding, 4) decontaminate exterior of sealed canisters and 5) place canisters into lag-storage in production facility, in preparation for further disposition by DOE. The canisters of glass waste form (i.e., primary SBW disposal product) will be produced to comply with acceptance criteria for disposal in the DOE WIPP repository, in New Mexico (NM).

The supporting history of development and industrial application (French and licensees), in using combinations of these technologies to process nuclear wastes, will enable a highly integrated, highly automated and remotely operated system to be designed and implemented.

2.1.2 Vitrification Subsystem Because of the importance of the vitrification subsystem, further description is provided for this subsystem. Figure 2 illustrates the basic features and general configuration of this subsystem. The melter vessel is a metal shell that is specially designed and fabricated to enable direct high frequency induction technology to be used to heat the feed and glass melt mixture, during the in-melter processing to create the glass waste form. The molten glass is purposely separated from the vessel wall by a layer of non-molten (cold) glass, which is created and maintained by selectively cooling the melter vessel wall. This allows high temperature operation and limits contamination of the subsystem equipment (i.e., melter vessel, etc.). This technology allows the melter to be small in size and have a very long, if not unlimited, service lifetime. During melter processing, the glass melt is also mechanically stirred, to enable high production throughput, by shortening the glass residence time in the melter and improving product quality by creating a more uniform temperature distribution and by limiting settling of any insolubles. When processing in the melter is complete, the glass waste form is poured into canisters, via a valve mechanism in the bottom of the melter vessel.

This vitrification subsystem is capable of melter operation over a broad range of temperature, because of the high thermal power release produced by direct induction in the glass. Using this combination of

technologies (i.e., induction heating, cold glass layer protection and mechanical stirring), this vitrification subsystem is capable of processing, at high production rates, a wide range of feed types, and a wide range of glass compositions, as well as, those for glass-ceramic, or ceramic waste forms. The unique design of the vitrification subsystem, particularly the melter, allows it to be small in size (e.g., 1.4m in diameter for the proposed system) and weight, high in throughput, low in maintenance and amenable to change-out, if needed. These are major advantages over designs for Joule heated melters that use electrodes submerged in the glass melt (e.g. those currently in use by the U.S. DOE). These design features combine to provide substantial benefits to costs (capital installation and operations) and to schedule (design, startup and production).

2.2 Major Advantages of Proposed Variant to Early Vitrification Option for SBW Disposition

2.2.1 Maturity of Technology

Overall SBW Processing System

As evident by the preceding description of the system's subparts, this (SBW) processing system will use mature industrial technology for each stage of the processing, and will be modular in design and installation. Each part of the proposed SBW processing system [i.e., feed preparation, vitrification (melter, etc.), canister filling, sealing and decontamination, and off-gas collection and purification] will all use processes based on industrially mature technologies supported by extensive development testing and industrial production experience. Consequently, there in a high confidence that the proposed system offers a combination of performance advantages that are superior to the other options being considered in the EIS.

Vitrification Subsystem

The following discussion provides a more detailed overview of technological maturity, regarding the vitrification subsystem. Refer to Figure 1 for illustration of the overall system, Figure 2 for illustration of the vitrification subsystem, and Figure 3 for a cross-sectional illustration of the melter, as needed, during the following discussion.

The key portion of the proposed processing system is the vitrification subsystem, and within that subsystem, it is the melter, and its special combination of capabilities, that is most important. The melter design is based on extensive technological development in France and industrial application in France, as well as, several other countries. Since the 1980's, the French Atomic Energy Commission (CEA) and COGEMA have teamed to develop and apply the technology associated with using an induction heated cold crucible melter to prepare glass or glass-ceramic waste forms for immobilizing nuclear wastes. The first-generation of this technology is referred to as the Cold Crucible Melter (CCM) technology, with over 5000 hours of operation, which has qualified the system and its subparts. Development has matured to where this is industrially applied technology. In the last several years, this technology has been provided to domestic and international customers for nuclear (e.g., La Hague, France, Italy and South Korea) and non-nuclear applications (Ferro-France, etc.). The installation at La Hague (France) will go into production in 2003, to vitrify concentrated solutions of very corrosive wastes, and the process is currently being qualified on a full-scale pilot system. The second-generation

is called the Advanced Cold Crucible Melter (ACCM) technology, and in design it primarily differs from the CCM technology in regards to melter configuration (shape) and sizing, but is capable of higher throughput. Production versions of the ACCM technology are already being applied within the French nuclear program, and development testing on other versions continues. The advantages offered by the ACCM technology will be discussed later in this section. Other than the melter vessel, the basic support systems for these two generations of melter technology are essentially common, at least in-type, (e.g., power system, temperature monitoring system, mechanical stirring system, melter control system, etc.), which are tailored to specific system designs.

The melter vessel is fitted with the induction heating capability, cooling system, mechanical stirring of the melt, glass pouring valve and associated control systems. The metallic vessel design has been tailored to optimize use of electrical induction heating technology, in processing feed materials into a suitable glass waste form. Both of these systems (CCM or ACCM) can be set up to process solid feed, liquid-slurry feed or liquid feed. The proposed system for processing the SBW would use a concentrated (SBW) liquid, with some small fraction of solids in it, along with a solid glass frit feed, as the feed for the melter processing. In the melter, the feed and resultant glass mixture is heated, using this direct high frequency induction technology, and processed into a glass waste form. At startup, a brief preheating step must be performed, to enable such Joule heating to begin. The melter vessel (wall) is designed and fabricated to enable some of the energy deposition, from the power system, to occur in the feed and molten glass mixture (i.e., within the interior zone of the melter vessel). The melter vessel and power system are configured and sized to provide the needed processing temperature and throughput capabilities.

An essential design feature, in both the CCM and ACCM technology, is that the melter vessel is purposely cooled, to create a skull-like layer of solidified glass adjacent the inner-wall surface of the melter vessel. This layer acts as a refractory and protects the melter crucible from corrosion and mechanical wear attack, by the constituents in the molten waste form. Because the skull-layer is composed of basically the same materials as the molten waste form, it can provide such protection without contaminating the molten waste form. Constituents released into the glass melt, from refractory bricks or castables, is a relatively common problem that occurs with most other waste-glass melter designs, particularly as their production-life progresses.

The combined effectiveness achieved by the cooling system (skull layer) and the induction heating technology results in both the CCM and ACCM designs having higher ranges of operating temperature capability than other types of joule heated melters, used in preparing waste glasses. These latter melter designs typically use plate or rod electrodes submerged in the glass, and several of these melters are currently being used at U.S. DOE sites. As a further consequence, both the CCM and ACCM technology is capable of processing a wider range of feed compositions into suitable waste form product. For example, the French program is applying such technology to prepare not only glass waste forms, but also to develop production capability for glass-ceramic waste forms, and even high temperature crystalline ceramic waste forms. Perfecting the CCM design regarding the skull layer of cold glass protecting the melter vessel and improving fabrication of the melter vessel have combined to result in major increases in melter vessel lifetimes, so the need for change-outs has been markedly reduced. The ACCM design essentially eliminates the need for change-outs. The small size, low weight and cold glass layer, which helps lessen contamination of the melter vessel, are all important

features of the French melter design that also significantly reduce the cost and complexity of their eventual disposal.

Developing the ability to mechanically stir the waste form melt region, which is used in both the CCM and ACCM technology, resulted in significantly increasing waste form production rates, and improving both temperature and composition uniformity within the melt zone. The increased production rate is achieved by reducing the time to process feed into a molten glass condition and by reducing the time to complete the glass making process. The high production rate capability (e.g., 100 kg/hr of glass using liquid feed and 400 kg/hr of glass using solid feed) of the proposed SBW processing system would provide important benefits regarding cost and schedule, for performing this task. The cost and schedule advantages will be discussed in more detail in Section 2.2 and 2.2.3, respectively. The improved composition uniformity includes the important ability to keep certain insoluble constituents such as noble metals particles, inorganic crystals, etc., in suspension within the glass-melt. The settling of such material into the bottom region of other types of melter designs has been an on-going development problem in such systems, both in the U.S. and in elsewhere. The SBW is not expected to present any significant challenges in regards to such undissolved solids within the glass waste form. The fact that finished glass exits both the CCM and ACCM systems by a bottom drain valve also helps ensure that any tendency for material to settle towards the bottom of the melter vessel will not result in accumulations that could become a problem. The combination of technologies used in the French (CCM and ACCM) melter designs has enabled high production throughput to be achieved with melter vessels that are relative small in size and low in weight, which facilitates maintenance and change-outs, as needed. These capabilities have the further benefit of requiring less space to install such components into existing hot-cell facilities or new facilities. It also enables the system to be serviced using lower capacity and thus less costly equipment (e.g. service crane, etc.).

The proposed design for processing the SBW calls for using the ACCM technology. The primary advantages of using the ACCM technology, in this application, are as follows:

- All of the CCM advantages over other waste form processing melters
  - Broader range of processing temperatures
  - Higher production throughput than other types of Joule heated melters
  - Smaller size and lower weight of components
  - Long service lifetimes
  - Easier to maintain and change-out, if needed
- Higher throughputs than the CCM technology (e.g., more than 100 kg/hr with liquid feed)

2.2.2 Cost The proposed system will use processes that are widely recognized as being technical mature and for which there is extensive industrial experience in applying them to processing nuclear materials. In particular, the small size and weight, high throughput capacity, long service lifetime and ease of maintenance of the ACCM technology enables the design of the proposed system to offer very substantial cost advantages (i.e., capital and operational). One of the most significant cost advantages is that the system could very likely be installed in an existing facility. The French program (COGEMA) has recent experience with retrofitting vitrification technology systems (i.e., CCM) into existing nuclear facilities in other countries, and the cost advantages are significant.

The proposed system for processing SBW, is believed to be a variant option that offers significant cost advantages over the options portrayed in the (12/1999) draft EIS, regarding the early vitrification alternative.

This vitrification facility could be effectively attached to the existing New Waste Calcine Facility (NWCF), as an extension, taking benefit from the already existing installations for utilities, personnel support and waste feed supply. The estimated cost for design, construction and startup, of this extension, is 200M dollars; Figure 4 illustrates the estimated funding profile for this work. Based on French experience it is estimated that it will take approximately 20M dollars per year to operate the proposed system, during production.

2.2.3 Schedule Figure 5 illustrates the estimated schedule for the processing SBW with the proposed system. As this schedule illustrates, if the design of the proposed system is initiated before the end of year 2000, the processing could be completed in time to meet the State Agreement (Idaho:DOE) date of 2012, for SBW.

2.2.4 Waste Products Cogema, Inc. estimates the proposed SBW processing system will produce approximately 360 cubic meters of the primary disposal product (i.e., canistered glass waste form). The waste form will be a borosilicate glass. The canister will be made of stainless steel and designed as a thin-walled closed right-circular cylinder, which will be fabricated with one end closed and the other left open for loading in the waste form and then sealing. These decisions, regarding the proposed primary waste form and canister, are extensively supported by over two decades of U.S., European and Asian experience regarding nuclear and hazardous waste disposition. Such experience includes evaluating candidate waste forms, selecting preferred waste forms, continued process and product development, and selection of glass, and especially borosilicate glass, as a preferred waste form. During filling with molten waste form, the canister will be positioned upright, with the open end at the top, when being filled with molten (glass) waste form. After cooling, each loaded canister will be fully sealed, by welding, and then externally decontaminated, in preparation for lag-storage and then follow-on disposition by DOE (i.e., on-site interim storage and/or final disposal). The primary waste disposal product, as well as any secondary product, will be produced so as to comply with acceptance criteria for disposal of remotely handled – transuranic waste (RH-TRU) in the DOE WIPP facility, located in New Mexico.

3.0 SUMMARY

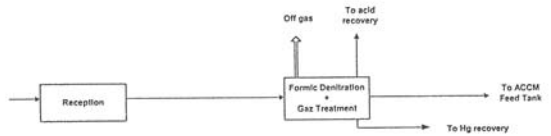
The proposed system, for processing SBW, offers several major advantages compared to option candidates evaluated in the 12/1999 draft EIS, for the Non-Separations alternative.

The proposed system will use a set of industrially mature processes whose combination offers a high confidence for achieving the customer's technical, cost and schedule goal. The unique set of technologies used in the vitrification subsystem will enable this subsystem to be small in size and weight, have a broad range of capability for processing feed into glass, and will have high production throughput and operational reliability. The overall system will be modular, highly integrated and automated and remotely operated. The modular design and size and weight advantages of key

components would enable it to be installed in an existing facility, providing significant cost and schedule advantages. The industrially mature nature of the processes, high production throughput, modest sizing, low maintenance and servicing change-out capability will provide significant cost advantages (i.e., capital and operational). The installation and operational advantages of the system could enable the State Agreement date of 2012 to be met. The waste disposal products will comply with acceptance criteria for disposal as RH-TRU in the DOE WIPP facility, in NM.

It is for these reasons that COGEMA, Inc. encourages the DOE to permit use of this mature industrial technology for SBW solidification, in the final EIS and ROD.

Block Diagram



System Schematic

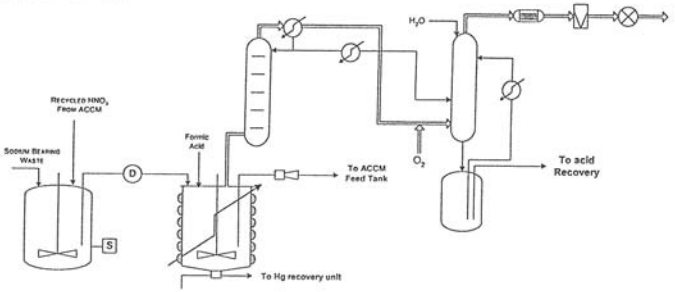


FIGURE 1 SBW PROCESSING SYSTEM

Document 58, COGEMA, Inc. (Rhonnie Smith), Idaho Falls, ID
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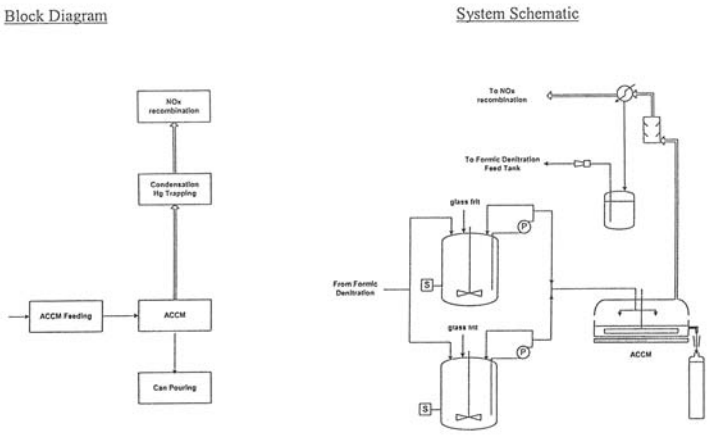

FIGURE 2 VITRIFICATION SUBSYSTEM

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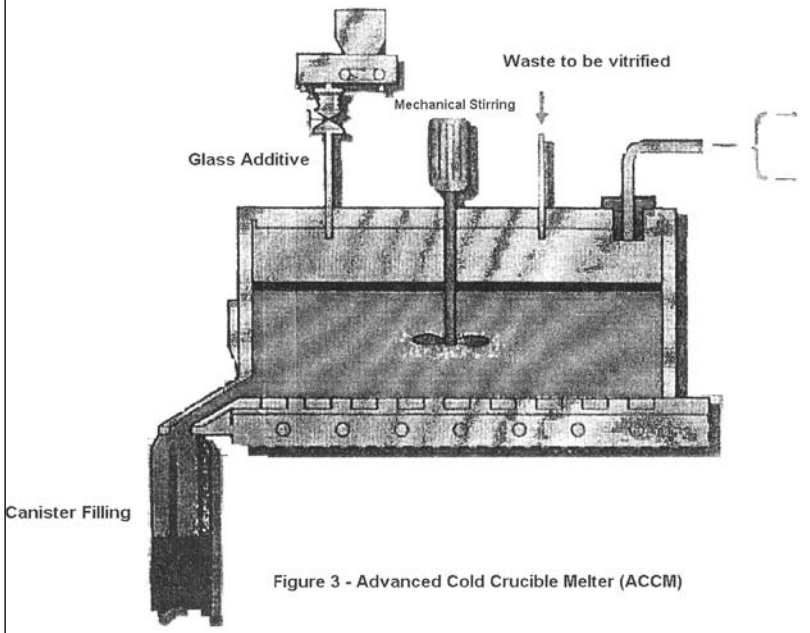

Figure 3 - Advanced Cold Crucible Melter (ACCM)

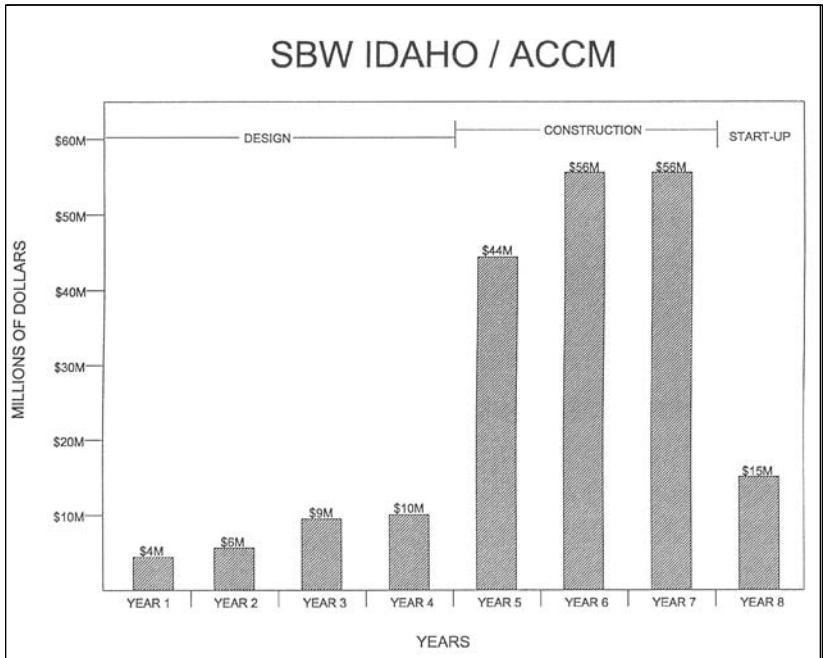

FIGURE 4 Estimated Cost Profile

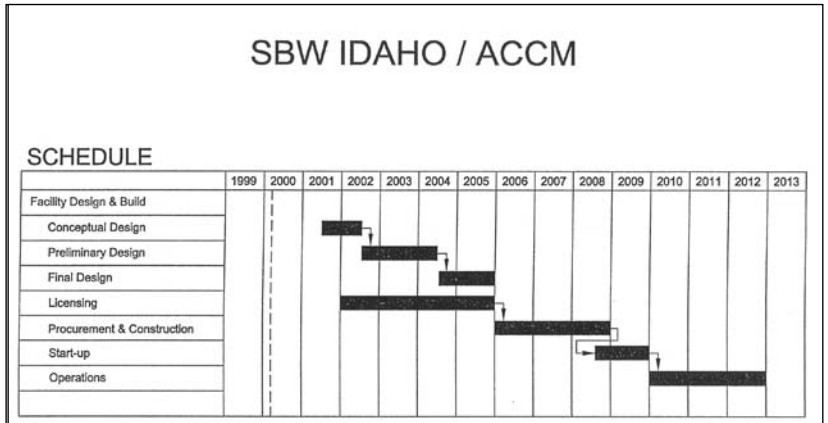

FIGURE 5 Estimated Schedule for SBW Processing

HLW & FD EIS PROJECT - ARPF
Control # DC-59

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Friday, April 14, 2000 11:27 AM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

RECEIVED APR 14 2000

Name: Bob Creed
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City, State Zip: Idaho Falls, IF 83491
Telephone: 208-524-0240
Date Entered: {ts '2000-04-14 11:26:38'}
Comment:
Comments of the use of "Estimated 100-year peak flows and flow volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory", U.S. Geological Survey, WRI 96-4163 for flood hazard delineation in the HLW EIS.

59-1 VIII.C (5) The USGS report cited in the HLWDEIS (Estimated 100-year peak flows and flow volumes in the Big Lost River and Birch Creek at the Idaho National Engineering Laboratory, U.S. Geological Survey, WRI 96-4163) does not represent the 100 year flow at the INEEL. The combined probability of all the assumptions used to obtain this flow frequency estimate results in a frequency of the calculated flow which is much less than 1/100. The DOE should not base programmatically critical decisions on such an extremely conservative flood hazard assessment. The detailed comments below rigorously demonstrate the internal inconsistencies of the report and strongly suggest that it should be revised to address these 59-2 VIII.C (5) internal inconsistencies, technical inaccuracies, and lack of mathematical rigor in determining the 100 year flow for the INEEL. Although it could be argued that the report represents "standard procedures" for the determination of a 100 year flow, these procedures clearly do not apply to the Big Lost River below th
e Mackay dam and the procedures are generally applied in a manner designed to produce the largest possible flow, independent of what the real frequency of that flow may be. The potential impact of such extremely conservative flood 59-3 VIII.C (5) hazard assessments could include decreasing resources for the mitigation of real risks. The rational risk based allocation of resources requires that flood hazard assessments be as systematic, thorough, and peer reviewed as possible. The comments below indicate that the USGS report meets none of these requirements.

Detailed Comments

59-4 VIII.C (5) Pg. 5- "Most surface-water inflow to Mackay Reservoir is the result of melting snowpacks." Such a record may not be homogeneous and require special treatment (see Bulletin 17B for example). The text should also note that the design discharge of Mackay dam is 3,250 CFS and historical releases from the dam for the floods cited.

59-5 VIII.C (5) Pg. 7- "Current estimates of flood frequency distributions for ungaged streams in Idaho are based on analyses done in 1977 and do not incorporate more recent peak-flow data or newly developed estimating techniques.", "Because of the amount and nature of additional data, current computed flood frequency values are likely to be substantially different from those used by Kjelstrom and Moffatt (1981) to develop their equations."- C. Berenbrock.
What is the effect of new data on the 1981 regional regression estimates?
How does the rain on snow effect affect homogeneity? What are the indirect methods used for the Arco 1965 flow? What are the uncertainties? How were they incorporated? How was this outlier used? Why is it legitimate to compare and include the indirect measurement with gage measurements? Where is the documentation to support this important flow value?

59-6 VIII.C (5) Pg. 8- "The estimates are less reliable where the natural peak flows have been significantly altered because of storage and diversion structures." Exactly what are the bounds on reliability for the reach downstream of the diversion dam? The Interagency Advisory Committee on Water Data Bulletin 17B (1982) states, "The procedures do not cover watersheds where flood flows are appreciably altered by reservoir regulation or where the possibility of unusual events, such as dam failures, must be considered." ; Summary, pg. 2-3. The Mackay dam is classified as a "high hazard" dam by the State of Idaho and clearly regulates Big Lost River flow.
Clearly, the log-Pearson III procedure should not be applied to the watershed below the Mackay dam. If the IACWD 17B were to be followed, it also recommends tests and procedures for rain on snow non-homogeneity, zero flow years, and outliers, such as the 1965 Arco data. None of these issues is explicitly addressed in this report with respect to the

"recommended" IAWCD procedures.

59-7 VIII.C (5) Pg. 9- Why is it appropriate to add the Howell Ranch data in downstream of Mackay dam given that the slope and elevation of the Howell Ranch area is significantly different from the rest of the basin?
There is a mathematical problem with the statement that- "Flood-frequency analysis resulted in a 100-year peak flow of 4,880 ft3/S at the Howell Ranch gaging station and compared favorably with the highest recorded peak flow of 4,420 ft3/S on May 25, 1967." There is no independent evidence for the frequency of the May 25 flow. It could have been a 5 or 5,000 year flow. Thus, the assertion that the 100 year flow is good because it "compares favorably" is mathematically invalid. At best, it relies on consensus and no real independent evidence.
There is an internal consistency problem related to actual and computed flow estimates for Howell Ranch and Arco. The 100 yr flow is 10% higher for Howell Ranch (which is apparently acceptable because of historic and consensus data) and 290% higher for Arco (which is acceptable in the report but inconsistent with historic and consensus data). Gage data indicates that flows above the Mackay dam, below the Mackay dam and at Arco are less than Howell Ranch .
What was the release rate assumed for Mackay dam? What was the release rate during the 1967 floods? The assumption that the dam was full is a deterministic worst case assumption that that should be evaluated probabilistically to determine the true 1% (1/100) chance per year flow. If the dam has been full once since 1917, the annual probability is 1/83 and the computed 100 year flow is now a 1/8300 flow with a 8,300 year return period.

59-8 VIII.C (5) Pg. 10- Why was a regression equation used to calculate what could easily be obtained from field data? Topographic maps indicate that the area of infiltration for the Chilly sinks is much larger than what is computed using the Dawdy equation. What is the standard error for this equation?
Infiltration was adjusted according to rock type but the rocks are inaccurately characterized as "carbonaceous". There are few or no carbonaceous rocks in the Big Lost River Valley or adjacent mountains. This type of inaccuracy in basic geohydrology leads to questions regarding the quality of internal review and the validity of the infiltration rate adjustments. Where are the detailed maps supporting assertions regarding rock type?

59-9 VIII.C (5) Pg. 11- If the width ranged from 200 ft to more than 1,000 ft; how can 350 ft be "representative"? In what sense is the term "conservative" used?

59-10 VIII.C (5) Pg. 12- What was Mackay dam releasing during the "full or nearly full" conditions? What does "full or nearly full" mean with respect to quantitative reservoir capacity and dam discharge? What are the combined probabilities for the 6 assumptions (per ANSI 2.8)? What are the bounds on the inputs described as "probably reasonable"? There is inadequate discussion of the simulation inputs to assess their accuracy and impacts on the assumptions. Likewise, none of the flow versus frequency curves are presented for critical evaluation. No evidence is provided showing that the gauge stations are responding only to a simultaneous regional rainfall event. A separate event could have occurred in the Antelope watershed providing a peak independent of the Howell Ranch event. This scenario is more consistent with local meteorology. No hydrographs are presented to support the assertions regarding the timing of peak arrivals. No evidence is provided on the timing of these peaks with respect to the Big Lost River p
eaks. The longest computed travel time was 6 hours from Howell Ranch to Arco. How does this compare with real data? The 1965 flow peak took 7 days to reach Arco from Howell Ranch and was reduced by 28%. This observation, the lack of graphical data, and the many assumptions involved in computing the peaks call into question the assumption that- "peak flows are not significantly attenuated, travel times are relatively fast, and sub-basin peaks occur within a relatively short period of time; thus the assumption that subbasin peaks occurred simultaneously is probably reasonable." What is the probability? Where do the subbasin peaks occur? The combined probability of all these assumptions actually occurring is far less than 1% per year.
The assumption that reservoir effects are minimized by taking an estimated 100 year flow from Howell Ranch and applying it to Arco is extremely conservative and inconsistent with the differences of elevation, topography and hydrology of the 2 regions.
No evidence is provided that the effects of reservoir regulation are variable and indeterminate. The record seems to indicate that the design discharge of 3,250 CFS has never been exceeded. No attempt was made to systematically evaluate the effects of reservoir storage. This subject is covered in most engineering hydrology textbooks. For example, the record shows that the reservoir contains a daily average of 32,500 acre-feet of water during June (maximum capacity= 38,500 acre-feet). Given the available reservoir data, It is reasonable to expect that this data would be presented and rigorously characterized in the report before it was asserted that reservoir effects were variable and indeterminate.
Flows as much as 2,000 CFS smaller than the Howell Ranch peak have been recorded entering Mackay reservoir the same day. If the intent is to remove the effect of Mackay reservoir, why not optimize the data available for the gage just upstream of Mackay Reservoir and input it just downstream of the reservoir?
Similar losses downstream of Mackay occur due to infiltration, even after removing the effects of irrigation.

59-11 VIII.C (5) Pg. 13- The assumption that Box Canyon infiltration is balanced by runoff may be valid but inadequate data is presented to justify this assumption. For example, Bennett (1986) found that 30% infiltration occurred in the Arco to Diversion dam reach and the basin area is only 60 square miles. What is the probability that there would be adequate rainfall (about 6 times the average) to offset infiltration and that it would occur at the same time the peak is in Box Canyon? How would infiltration effect the attenuation model? This (as well as other) assumptions seem to require that the "100 year rainfall?"

occur simultaneously across the entire Big Lost River watershed. This assumption is not consistent with the meteorology of the region and again calls into question the validity of the assertion that the assumptions represent conditions that have a 1% chance per year of occurring. The data that is presented in the report shows a decrease of 12% between Arco and the INEEL diversion dam.
An internal consistency problem presents itself with respect to the 2 hour hydrograph for Box Canyon. If the peak can go at least 50 miles from Howell Ranch to Arco in 6 hours (as asserted in the text); why can't it go the 7.5 miles in Box Canyon in 2 hours? The resulting attenuation of 170 CFS would seem to be legitimate and required given data presented earlier.

59-12 VIII.C (5) Pg. 15- The channel width discussion here indicates a serious inconsistency. If the Dowdy equation is used here, a channel width of 144 ft. is indicated but a bankfull width of only 38 ft. was measured. The Dowdy equation has a large uncertainty associated with it that must be quantitatively addressed. A more serious inconsistency is the selective application of the bankful discharge technique cited as "Harenberg, 1980". A similar estimate of "bankful" flow at the INEEL would lead to typical estimates of 2500 CFS for the 100 year flow. Why wasn't this important data point considered?

59-13 VIII.C (5) Pg. 16- "These assumptions would produce the largest possible flow-volume estimates for this method." The largest possible flow is by definition not a 100 year event. Also note that Bulletin 17B is not intended for the determination of flow volumes. The combined probability of a 100 year flow and a 60 day duration and a simultaneous arrival of subbasin peaks at Arco and the Howell Ranch peak arriving at Arco unattenuated and arriving at the INEEL diversion dam unattenuated is clearly much less than 1/100.

HLW & FD

EIS PROJECT - AR PF
Control # DC-60

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Friday, April 14, 2000 6:45 AM
To: web@jason.com
Cc: web_archive@jason.com
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APR 14 2000

Name: Tom Oliver
Affiliation: Studsvik, Inc.
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City, State Zip: Columbai, SC 29210
Telephone: 803-731-8220
Date Entered: {ts '2000-04-14 06:45:19'}
Comment:
Studsvik,Inc. has recently commercialized on a large scale its patented pyrolysis/steam reforming fluid bed technology for the processing of nuclear wastes generated by the nuclear power stations at its processing facility in Erwin, TN. This technology is also directly applicable to the processing of a large quantity of the mixed wastes presently within the DOE including the SBW at INEEL. Under separate cover, Studsvik has submitted comments on the draft EIS that requests that steam reforming, an alternative to incineration, be considered in the final EIS. This technology was not full deployed when the technical evaluations for the EIS were performed, however it is now a fully proven, fully deployed technology that offers significant advantages over present processing methods and those discussed in the draft EIS.

60-1 III.D.4(4)

occur simultaneously across the entire Big Lost River watershed. This assumption is not consistent with the meteorology of the region and again calls into question the validity of the assertion that the assumptions represent conditions that have a 1% chance per year of occurring. The data that is presented in the report shows a decrease of 12% between Arco and the INEEL diversion dam.
An internal consistency problem presents itself with respect to the 2 hour hydrograph for Box Canyon. If the peak can go at least 50 miles from Howell Ranch to Arco in 6 hours (as asserted in the text); why can't it go the 7.5 miles in Box Canyon in 2 hours? The resulting attenuation of 170 CFS would seem to be legitimate and required given data presented earlier.

59-12 VIII.C (5) Pg. 15- The channel width discussion here indicates a serious inconsistency. If the Dowdy equation is used here, a channel width of 144 ft. is indicated but a bankfull width of only 38 ft. was measured. The Dowdy equation has a large uncertainty associated with it that must be quantitatively addressed. A more serious inconsistency is the selective application of the bankful discharge technique cited as "Harenberg, 1980". A similar estimate of "bankful" flow at the INEEL would lead to typical estimates of 2500 CFS for the 100 year flow. Why wasn't this important data point considered?

59-13 VIII.C (5) Pg. 16- "These assumptions would produce the largest possible flow-volume estimates for this method." The largest possible flow is by definition not a 100 year event. Also note that Bulletin 17B is not intended for the determination of flow volumes. The combined probability of a 100 year flow and a 60 day duration and a simultaneous arrival of subbasin peaks at Arco and the Howell Ranch peak arriving at Arco unattenuated and arriving at the INEEL diversion dam unattenuated is clearly much less than 1/100.

HLW & FD

EIS PROJECT - AR PF
Control # DC-60

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Friday, April 14, 2000 6:45 AM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

RECEIVED
APR 14 2000

Name: Tom Oliver
Affiliation: Studsvik, Inc.
Address1: 111 Stonemark Lane
Address2: Suite 115
City, State Zip: Columbai, SC 29210
Telephone: 803-731-8220
Date Entered: {ts '2000-04-14 06:45:19'}
Comment:
Studsvik,Inc. has recently commercialized on a large scale its patented pyrolysis/steam reforming fluid bed technology for the processing of nuclear wastes generated by the nuclear power stations at its processing facility in Erwin, TN. This technology is also directly applicable to the processing of a large quantity of the mixed wastes presently within the DOE including the SBW at INEEL. Under separate cover, Studsvik has submitted comments on the draft EIS that requests that steam reforming, an alternative to incineration, be considered in the final EIS. This technology was not full deployed when the technical evaluations for the EIS were performed, however it is now a fully proven, fully deployed technology that offers significant advantages over present processing methods and those discussed in the draft EIS.

60-1 III.D.4(4)

HLW & FD

EIS PROJECT - (AR)PF
Control # DC-61

April 12, 2000
Aiken, South Carolina

T.L. Wichmann, Document Manager
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563
Attention: Idaho HLW&FD EIS

Subject: Comments on DOE/EIS-0287D

61-1 IX.A(2) I read with great interest the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement (DOE/EIS-0287D). The document is very readable, well laid out and its production values are far above any other EIS (DOE or otherwise) that I have seen. The graphics displaying the alternatives are particularly useful.

While I applaud the style of the document, I was somewhat distressed about its content. I was particularly concerned with inconsistencies and inappropriate use of risk factors with regards to the hazards of radiation.

61-2 VIII.G(3) Rather than centralize discussions regarding what radiation is, how the human health effects are calculated, and what they mean, this key information has been inconsistently repeated at various places throughout the document. References are made to risk factors from two different organizations, one of which has no validity by itself in this country.

61-3 VIII.A(11) The limitations on those risk factors have been ignored and risk factors have been applied to values for which they are invalid and yield ridiculous results.

61-4 VIII.A(6) While the main purpose of the document is to compare alternative actions, the inclusion of incorrect and inappropriate information raises credibility issues with other analyses in the document that have been performed properly. The document also is an official publication of the Government of the United States and lends a certain cachet of approval to the invalid methods used in its preparation.

61-5 VIII.A(6) I therefore offer the following comments and recommendations for the improvement of the document:

61-6 VIII.A(11) **Comment 1:** Risk factors for radiation are referenced as coming from both the International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurements (NCRP). While the numerical values are identical, the source of the reference is important. ICRP recommendations are multi-national and are supposed to be reviewed by national radiation protection organizations for adoption or revision by individual countries. This function is performed in the United States by the NCRP, which does not always adopt ICRP recommendations in full. Therefore, it is inappropriate to reference ICRP risk factors for radiation.

Recommendation 1: References within the document to ICRP risk factors for radiation should be changed to NCRP.

Comment 2: The Discussion of the Health Effects of Ionizing Radiation on pages 5-54 and 5-55 contains over-simplified , inaccurate, and incomplete information.

61-7 VIII.A(11) The text box includes a lengthy discussion about the calculation of collective dose and how extremely small doses to large numbers of people are equivalent to larger doses to smaller groups of people. This particular topic is the subject of much discussion within the radiation protection field and the source of some controversy. The NRCP even acknowledges this in publication 116, Section 2.2, stating that currently available observations in population samples do not exclude zero effects at very low doses. Yet, this discussion, as well as that in the Executive Summary make no mention of the uncertainties involved in the use of the risk factors.

61-8 VIII.A(11) The text box incorrectly states that the risk factors it uses are for doses of less than 20 rem. The key factor is not the dose, but the *dose rate*. The NCRP recommendations regarding the risk factors are for dose rates of less than 10 rem/hour. Most accident analyses are for a default time of 2 hours, hence the 20 rem short-term dose. However, this is an example of oversimplification to the point that the meaning is compromised.

61-9 VIII.A(11) There is much talk in this section regarding the calculation of small numbers of Latent Cancer Fatalities (LCF), yet very little information is provided to provide the public a useful reference. The document does mention that an average member of the public will receive 360 mrem/year of radiation exposure, yet no mention is made of the number of normal cancers in the local population. As much is made of the connection of the small radiation exposure values calculated in the report to latent cancer fatalities, the background value of "natural" cancer should be listed to provide a basis from which to evaluate the proposed consequences.

Recommendation 2: The Discussion of the Health Effects of Ionizing Radiation should be revised to add information regarding the limitations and uncertainties of the radiation risk factors, to correct the dose rate limitation, and to include baseline cancer risk data. In addition, in other portions of the document where descriptions of this type are duplicated, a reference should be added back to this section.

61-10 VIII.G(3)

61-11 VIII.A(11)

Comment 3: Throughout the document, radiation risk factors for calculating LCF are used inappropriately in calculating LCF probabilities to individuals.

61-12
VIII.A(11)

While this EIS was clearly prepared using the DOE Recommendations for the preparation of Environmental Impact Statements, those recommendations regarding human health effects contain inconsistent and scientifically inaccurate guidance. NCRP risk factors for radiation are for *populations*, not individuals and only apply at radiation levels expected in routine operations. It is clear from the NCRP reports that the risk factors are only valid for the range of radiation exposures where stocastic risks (cancer) dominate. It is clearly inappropriate to calculate the number of fatal cancers that may develop when the population is exposed to radiation levels that will induce deterministic effects (non-cancerous direct effects). While the DOE recommendations call for the presentation of probabilities of cancer-induction, the NCRP risk factors are only for populations.

As an example of this lunacy of blindly calculating individual LCF probabilities; Table 5.2-38, analysis BDB08, exposes a non-involved worker to 4600 rem of dose and calculates that their probability of a fatal cancer is greater than 100% (Specifically, 1.8). This at a dose level that would kill the worker from acute radiation effects long before they could live long enough to develop cancer. They should be so lucky as to live long enough to die from cancer.

The effects of radiation on the human body and estimating the risk of radiation is complex and requires numerous assumptions. There are also limits that must be placed on the validity of the analysis for it to remain scientifically accurate. Calculation of LCFs for doses well above routine radiation protection levels is clearly an example of the use of scientific values outside their valid range.

Recommendation 3: The calculated probabilities of Latent Cancer Fatalities to individuals (Maximally Exposed Individual and Noninvolved worker) presented in the document should be removed in full.

61-13
VIII.G(5)

Comment 4: The Facility Accident Appendix introduces the concept of Integrated Involved Worker Risk, combining the risk from non-radiological occupational accidents, the risk associated with occupational radiation exposure, and the normalized risk from accidental exposure to much higher levels of radiation. This combination of three extremely different types of risk is both novel and inappropriate.

Industrial fatalities are easy to understand. There is an accident and someone dies. Generally, something large and heavy falls on them or they fall and they die. There are many variations of industrial fatalities, but they all have one thing in common; they are immediate and final. You don't wait 20 years and then maybe develop a fatal disease; you just die.

Occupational radiation exposures are chronic in nature and the uncertainty associated with the risk is high. Occupational dose limits are set to keep the risk of developing a fatal cancer low, but high occupational doses within established occupational limits will not guarantee a fatal cancer.

Accident radiation doses to involved workers will vary in effect, but share more in common with industrial fatalities than with long-term occupational exposures. At the upper end of the possible radiation doses, the worker dies. At lesser but still high doses, the worker may be seriously ill for a long period of time. At accident doses in the range of occupational exposures, there will be no discernable effect on the worker and they may or may not contract a fatal cancer later in life. In its use of accident consequences for the Integrated Involved Worker Dose, the accident consequences are normalized by the probability of the accident. While this method is useful for comparing between alternatives and to ensure that contributors to risk have been identified, its use in combination with industrial fatality rates and occupational radiation exposure risks is inappropriate.

Combining three different risk types of three different mechanisms is much like combining apples, oranges, and filberts. You can do the math, but it really doesn't mean anything. The calculation and use of the Integrated Involved Worker Risk is technically invalid, misleading, and detracts from useful discussions regarding the relative risk of alternatives.

Recommendation 4: The discussion and calculation of Integrated Involved Worker Risk should be removed from the document in total.

61-14
IX.A(1)

Comment 5: The Executive Summary contains much material that is not presented in the main document.

A summary is supposed to summarize information from the report it is based upon. However, for this document, the Executive Summary appears to be a convenient place to put all sorts of new information. Normally, a member of the public having a question raised from material in the Executive Summary would refer to the appropriate section of the main report or a supporting appendix to find a more detailed description. However, that is not possible in this document as many of the figures and their supporting information on results are only presented in the summary and not in the main report.

The Executive Summary also suffers from the same problems listed above in Comments 1-4. Due to the size of this particular document, the Executive Summary may be the only thing that people actually read, making it even more important for the summary to accurately reflect the analysis of the main report. This includes the listing of the limitations and uncertainties of the analysis, more so than the extremely brief discussion in Section 4 of the summary.

Recommendation 5: The Executive Summary should be rewritten to actually summarize the report it is based upon.

This is a fine document in terms of readability and presentation. I am sure it will set a new standard for DOE Environmental Impact Statements once its technical flaws are corrected.

Sincerely,

Jim Willison, Certified Health Physicist

5

EIS PROJECT - (AR)PF
HLW & FD
Control # DC-62

The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION
PHONE (208) 238-3700
(208) 785-2080
FAX # (208) 237-0797

FORT HALL BUSINESS COUNCIL
P.O. BOX 306
FORT HALL, IDAHO 83203

RECEIVED
APR 24 2000

April 19, 2000

T.L. Wichmann, Document Manager
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

ATTN: Idaho HLW & FD EIS

Dear Mr. Wichmann:

62-1 VII.E(2) The Shoshone-Bannock Tribes have reviewed the draft EIS for High-Level Waste and Facilities Disposition dated December 1999. We have some technical questions and comments on this matter which are attached to this letter. We would like to have these questions and comments addressed at a meeting with the Fort Hall Business Council as the governing body of the Shoshone-Bannock Tribes and appropriate staff at a time to be set. In addition to the technical comments and questions we do have policy related comments and concerns as well. I will address these concerns in this letter.

The members of the Shoshone-Bannock Tribes (Tribes) had made their permanent home on the Fort Hall Indian Reservation located in southeastern Idaho pursuant to the 1868 Fort Bridger Treaty 15 Stat. 673. The membership of the Tribes includes almost 4000 members, many of whom live on the Fort Hall Indian Reservation and in the surrounding communities. There are two major interstates (I-15 and I-86) that go through the Fort Hall Indian Reservation. In addition, the Blackfoot River and Snake River make up the borders of the Fort Hall Indian Reservation. In addition certain Bands of the Shoshone and Bannock people have lived in this area since time immemorial. The INEEL site is included in the traditional and aboriginal areas frequented by the Shoshone and Bannock people. The Fort Bridger Treaty in Article 4 contemplates that tribal members will be allowed to continue their hunting, fishing and gathering activities off of the Reservation, including that area in and around the INEEL. Because of the location of INEEL less than fifty miles from the Fort Hall Indian Reservation, the Shoshone-Bannock Tribes are greatly concerned about the activities which occur on that site including the issues involving the high level waste and disposition of such waste which is the subject of the EIS. The Tribes are concerned that the air, land and water may be affected by the activities

62-2 VII.E(3)

Recommendation 5: The Executive Summary should be rewritten to actually summarize the report it is based upon.

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HLW & FD
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62-2 VII.E(3)

occurring at the INEEL. This is the permanent homeland of the Shoshone and Bannock people. If this areas becomes contaminated, companies, towns and non-Indians can move from this area. This is not so for the Shoshone and Bannock people. They have lived in this area for hundred of years and will continue to live in this area long after the INEEL is shut down and operations have ceased. The Tribes are concerned about the legacy such activity leaves for the future generations of the Shoshone and Bannock people and the resources of the area and the Fort Hall Indian Reservation.

62-3 VII.E(2) In light of the concerns of the Shoshone-Bannock Tribes and the trust responsibility of the U.S. Department of Energy to the Shoshone-Bannock Tribes, it is imperative that the EIS address the special needs of the Tribes. While DOE staff has met with tribal staff on this matter, there has not been any official consultation between the Secretary of Energy and the Fort Hall Business Council to assure complete discussion and resolution of issues with regard to this matter. This should occur as soon as possible. The tribal lands and resources which are trust assets held by the United States may potentially be affected by the actions which are the subject matter of the EIS.

62-4 VII.E(2) In order to provide for proper consultation on this matter, it may be necessary for the Department of Energy to fund an additional position for the Tribes to work on this matter along with sufficient funds to allow the Tribes the ability to hire the expertise needed for them to properly participate in the EIS process and the follow up implementation. This is something that can be discussed further in a consultation or perhaps in discussions about the Agreement in Principle.

62-5 VII.E(1) It is our understanding that while DOE has made the State of Idaho a cooperating agency in this EIS, they have not done so for the Shoshone-Bannock Tribes. In light of that, the Department of Energy should assure that any other federal agencies with trust responsibilities to the Tribes, such as the U.S. Department of the Interior, Bureau of Indian Affairs and U.S. Department of Health and Welfare, Indian Health Services are also involved in the EIS process at the INEEL. It may be appropriate to establish a Memorandum of Understanding of some sort between the federal agencies to ensure that the land, resources and people of the Fort Hall Indian Reservation are protected in the EIS.

62-6 VII.A(5) As there is no preferred alternative set forth in the EIS, it is difficult to ascertain which alternatives DOE is seriously considering. The DOE could have assisted stakeholders, including the Tribes, considerably by describing in detail, those alternatives which yield the best chance for the final waste form to be accepted at the federal repositories. The DOE has a responsibility to indicate which alternative treatment method would meet the RCRA de-listing requirements at Yucca Mountain and WIPP. Similarly the DOE should have detailed in the final EIS documents the capacity limits at both the WIPP and Yucca Mountain sites, and which alternative(s) provide for greater assurance that the treated waste would receive highest priority for acceptance at these repositories.

62-7 III.F.2(2)

62-8 III.E(1)

62-9 II.B(1) The Tribes are very concerned about several of the proposed alternatives because of their inherent adverse risks to Tribal populations and natural resources. The Tribes adamantly oppose the *No Action Alternative*, which stipulates the storage, for an indefinite period of time, of High-Level Waste at the INEEL. For similar reasons, the Tribes oppose the *Continued Operations Alternative,* because of significant uncertainties associated with the operation of the calciner, and the inability under this option, to make HLW, road-ready for shipments by the year 2035.

62-10 II.C(1)

62-11 III.F.2(2) There appears to be a significant risk in future use of the calciner, even after upgrading, that the calcine product would not meet the waste acceptance criteria at the High-Level Waste Repository. The EIS document reports that calcine products would not be acceptable at Yucca Mountain, for example, because they contain RCRA waste. Therefore, since RCRA-bearing waste would have to be further treated before it would meet the waste acceptance criteria, and because of the uncertainties of successfully permitting the calciner pursuant to RCRA and Air Quality requirements, the Tribes oppose all calciner-based alternatives in the EIS.

62-12 III.C(4)

62-13 V(9) The Tribes are very concerned about the apparent change in the definition of High-Level Waste, by DOE, associated with this draft EIS. In the description of the *Transuranic Separation Option*, the HLW is separated into TRU and LLW. This proposed change in classification is in contradiction to DOE's own definition of HLW. With the information available at this time, the Tribes oppose plans which would include permanent storage of Low-Level Class C waste at the INEEL.

The Shoshone-Bannock Tribes have more detailed comments attached in support of our position.

62-14 IX.C(4) The Tribes wish to thank the DOE for their presentations at Fort Hall regarding this important EIS, and appreciate the opportunity to submit these written comments.

Sincerely yours,

Claudeo Broncho

Claudeo Broncho, Vice Chairman
Fort Hall Indian Reservation

attachments

cc: Fort Hall Business Council (7)
Bill Richardson, Secretary of DOE
Bob Pence, DOE- Tribal Coordinator
Ann Dold, Manager, Idaho INEEL Oversight Office
Candy Jackson, Tribal Attorney
Robert Bobo, Tribal DOE Manager

SHOSHONE-BANNOCK TRIBES AIR QUALITY DEPARTMENT's High Level Waste — EIS Comments

62-15 II.B(1) • *No Action Alternative* - This alternative presents a higher level of risk to Snake River Plain Aquifer with storage of liquid waste. Also no treatment would occur to enable High-Level Waste (HLW) to be shipped out. The Tribes vehemently oppose the *No Action Alternative*, or any alternative which calls for indefinitely storing HLW at INEEL.

62-16 II.C(1) • Because of the inability to make HLW ready for shipment out of Idaho by 2035, and because of significant uncertainties associated with the operation of the calciner, including emissions violations, permitting issues, the Tribes oppose the *Continued Operations Alternative*.

62-17 III.D.2.b(6) • The *Hot Isostatic Pressed Waste Alternative*, in its treatment of Mixed waste, may yield a waste that cannot be accepted at the HLW repository - a demonstration to EPA would have to be done that ensures that it meets the standards of acceptance by EPA. This adds an additional uncertainty to this method. (See Summary pg.S-19), compared to vitrification treatment which has already been approved by EPA as a method to de-list RCRA wastes.(pg. 6-33). Note that Yucca Mountain does not plan on accepting RCRA waste, so all waste must be tested through treatability tests, on arrival at repository. Not only EPA, but the State has authority over waste acceptance, and States may have more stringent requirements, adding to the uncertainty of which treatment method has the best chance to meet the standard. It can be very difficult to get the waste sticker off. In terms of successfully getting the HLW out of Idaho, the most important question to DOE may be: Which alternative has the best chance to meet the de-listing or RCRA requirements?

62-18 III.F.2(2)

62-19 III.C (4) • *Oppose all Calciner-based Alternatives* - There appears to be a significant risk in future use of the calciner, even after upgrading, that the calcine product would not meet the waste acceptance criteria at the High-Level Waste Repository. The EIS document reports that calcine products would not be acceptable at Yucca Mountain, for example, because they contain RCRA waste. Therefore, since RCRA-bearing waste would have to be further treated before it would meet the waste acceptance criteria, and because of the uncertainties of successfully permitting the calciner pursuant to RCRA and Air Quality requirements, the Tribes oppose all calciner-based alternatives in the EIS.

62-20 III.F.3 (1) • The *Transuranic Separations Alternative* has advantages in that all the High-level waste goes away, is converted to either Transuranic waste which could go to WIPP, or Low-level waste for on-site or off-site landfill. (However, WIPP cannot receive all of DOE's inventory of TRU waste, so there is a risk that TRU waste generated by this treatment method will ultimately remain at INEEL.) How can DOE justify the disposal of HLW by reclassifying and managing it as LLW? Since the HLW fission compounds, including Cesium-137, and Strontium-90, cannot to our knowledge, be destroyed in the treatment process, the Tribes oppose the disposal of this highly radioactive material as Low-Level waste, especially in sub-surface burial over the Snake River Plain Aquifer.

62-21 V (9)

62-22 V(9) However, if DOE intends on storing at INEEL what would have been defined as High-Level Waste, but which is now defined as Low-Level - Class C (containing short-lived fission Cesium-137, and Strontium-90) the Shoshone-Bannock Tribes oppose the new classification. Through this classification process High-Level Waste may end up being permanently stored at INEEL. In general, the DOE fails to adequately describe the classification system, on-site and off-site storage plans, for the various sub-classifications of "Low-level waste". With the information available at this time, the Tribes oppose plans which would include the permanent storage of Low-Level Class C waste at the INEEL.

62-23 III.F.4(2)

62-24 III.D.3 (1)

62-25 III.E (1) • The EIS documents do not adequately investigate the capacity problems at the WIPP facility, in relation to the EIS alternatives that yield TRU waste (such as the *Transuranic Separations Option*). The question needs to be answered: How much TRU waste generated by INEEL in the future, will be accepted at WIPP? The DOE should have more adequately described the specific alternatives that creates additional TRU waste, which is unlikely to be accepted at WIPP, either because of capacity problems or because the waste would not meet the waste acceptance criteria. The EIS documents fail to adequately describe which alternatives would best result in the successful removal of HLW to federal repositories. The EIS should have more adequately addressed the capacity issue at Yucca Mountain, and waste acceptance criteria of each of the alternatives. For example, unless there is a significant change in the way that DOE calculates the metric tonnage of High-Level Waste, Yucca Mtn. has a capacity to receive only half of DOE's inventory of HLW.

62-26 III.F.2 (1) + 62-27 III.D.2.c (4)

The Tribes reserve the right to change their position on any of these proposed alternatives upon receipt of new or more detailed information.

COMMENTS ON HIGH-LEVEL WASTE EIS
Shoshone-Bannock Tribes

62-28 VII.D(4) pg. S-5, box - What is the status of negotiations with the State regarding a plan and schedule for treatment for calcined waste?

62-29 VII.D(4) pg. S-7, bottom left column - It is unclear if the deadline of October 1, 2001, refers to the time when a public announcement must be made regarding DOE's intention to upgrade the calciner, or if the deadline is October 2, 2000.

62-30 VII.D(6) pg. S-7, top right column, 2nd para. - what "activities envisioned in the Idaho Settlement Agreement/Consent Order might need to be changed"?

62-31 IX.A(8) pg. S-10, separations alternative - The transuranic separations option "does not result in a HLW faction"(however, the chart in Figure S-18, pg. S-49, shows that there *is* a HLW faction in the transuranic separations option.)

62-32 VII.D(6) Regardless of what DOE calls it, all the waste currently stored in high-level waste tanks and calcine-bin sets should be processed and removed from the INEEL.

62-33 II.E(6) pg. S-10, minimum INEEL processing - *If* DOE transports calcine to Hanford for treatment, why go to the expense and health risks to workers and public to ship it back to INEEL?

62-34 III.F.2(1) pg. S-21, sect. 5.2 - Why would DOE handicap itself by calculating MTHM equivalency in HLW in such a way that the proposed repository could only accept 50% of HLW, whereas there are two other methods for calculating MTHM equivalency that would put DOE within the current allocation of DOE HLW for the repository" What possible advantage would the former calculation hold over the latter?

62-35 III.D.3(1) pg. S-29, light column - To calcine SBW, store it in the bin sets, then retrieve the calcine and process it seems, at the best, highly inefficient.

62-36 VIII.H(2) pg. S-36, right column - Has the form in which the calcine would be packaged been determined? Any idea on the configuration of shipping containers? If this alternative was

62-37 VIII.H(2) picked, would another environmental assessment or ELS be performed? 62-38 VII.A(2)

62-39 V(2) pg. S-49, left column - The second paragraph states that "Construction activities produce relatively little radioactive and hazardous waste", but goes on to say that the construction impacts for the Full Separations Option would produce over 2000 cubic meters of hazardous, low-level and mixed waste. That value does not seem like an insignificant amount. Second, why is radioactive waste counted as construction-related waste? How is radioactive waste generated during the construction process?

62-40 IV.A(1) pg. S-55, left column - 2400 recordable injuries and 290 lost workdays!? That seems excessively high. Please explain how these data were derived.

62-41 VIII.C(7) pg. S-55, left column, long-term impacts - In determining the maximum individual dose, where is the hypothetical well drilled in relation to the tank farm. What is the proximity of one to the other?

62-42 VIII.C(6) pg. S-56, right column - Please explain how the concentration of plutonium can go from a current value of 0.1 picocurie per liter to 36 picocuries per liter in the year 3585.

62-43 III.A(2) pg. S-57, left column - The design life of storage tanks is either "500 years" or "well in excess of 500 years". The former value is "assumed"- and the latter value is "estimated". So which is which? What is the basis for your assumptions and estimates? Please be more precise.

62-44 V(1) pg. S-58, right column - The inventory of existing waste stored at INEEL fails to include HLW.

Document 63, John Tanner, Idaho Falls, ID
Page 1 of 1

HLW & FD EIS PROJECT - AR/PF
Control # DC-63

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Tuesday, April 18, 2000 4:25 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

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Telephone: 208-529-5605
Date Entered: {ts '2000-04-18 16:25:28'}
Comment:

I appreciate having had the comment period extended. 63-1 IX.C(2)

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Document 64, Margaret Macdonald Steward, Ketchum, ID
Page 1 of 2

HLW & FD EIS PROJECT - AR/PF
Control # DC-64

IDAHO HIGH-LEVEL WASTE & FACILITIES DISPOSITION
DRAFT ENVIRONMENTAL IMPACT STATEMENT
PUBLIC COMMENT
APRIL19, 2000

Thomas Wichmann, Document Manager
US DOE, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

Attention: Public Comment: Idaho HLW & FD DEIS

PUBLIC COMMENT FROM: MARGARET MACDONALD STEWART
PO BOX 2404
KETCHUM, ID 83340

64-1 VIII.G(7) Having lived for nearly 30 years in Blaine County, Idaho, I am, and have been for decades, very concerned by activities at the Idaho National Engineering and Environmental Laboratory. With alarming frequency, these activities, particularly those dealing with radioactive waste treatment and storage, are rarely based with protection of human health and the environment as the primary concern.

64-2 IX.D(4) If we are to ever get the mess of nuclear waste and contamination at the government's nuclear weapons and storage facilities under some sort of reasonable control, we must begin to deal with the mess in a logical and rational manner. This must be done with a concerted effort by the Department of Energy to fully engage - and listen to - its most important business partner – the public. Had this business partner been involved from the get-go, this nation would not be in the critical situation we find ourselves in today. People who live and work in the shadow of nuclear facilities have an uncanny ability to know what is going right, and what is going terribly wrong. They know when they are being lied to and they know how to best rectify a project that is terribly misguided. Enough said. Don't forget to listen to us. We have a voice and we will use it en mass to get this situation reversed to start protecting us and the world we depend on for survival.

64-3 II.A(4) The Idaho HLW & FD DEIS is a complicated mass of options in how to deal with INEEL's deadly high-level waste problem. There is really no good option currently available to correct the damage that has been done by this waste and by the future damage it will cause. Each option presented has its own pitfalls. However, it is clear that with any reasonable thought going into the possible processes, ANY TREATMENT METHOD CHOSEN MUST HAVE AS ITS # 1 GUIDELINE PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT. Anything less, is completely unacceptable. 64-14 II.A(5) 64-15 II.A(5)

64-4 III.E(1) To base a treatment program on an uncertain target – a non-existent permanent geologic repository – is sheer idiocy. We have waste. We have no where to dispose of it other than the site where it is right now. We must be realistic and not dwell on an over-the-

Document 63, John Tanner, Idaho Falls, ID
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64-6 X1 (7) rainbow destination for nuclear waste. The AEC and DOE have been denial for decades about the entire picture of nuclear weapons production. It is time to face the music that what we have now we will always have and we must care for it where it is now as safely as possible.

64-7 III.D.3(1) No "separation technologies" should be considered. Separation of existing waste creates more waste streams to manage; separation produces greater volumes of waste than non-separation; and separation technologies have not been proven safe or effective. This is 64-16 III.D.3(1) not the time or place for experimentation. Calcine and liquid wastes should be treated independently.

64-8 II.A(1)

64-9 VII.B(1) Treatment must address all forms of contamination – soil, groundwater, structures and facilities, and the high-level waste.

64-10 VII.D(1) No treatment of high-level waste should be chosen just to comply with the Settlement Agreement of 1995. The timelines in the Settlement Agreement were unrealistic from the beginning and compliance with words on paper rather than protection of people and their earth is an obscene thought.

64-12 III.D.2.C(1) Given the list of high-level waste treatment options, I would have to vote for the option of least offensiveness - Early Vitrification. It appears to be the treatment most readily do-able with the least amount of further harm done to people and the land. No matter what, it must be scrutinized carefully, every step of the way, with full public involvement, and the contractor must be thoroughly investigated for past and present safety and ethical work practices – with that information made available to the public.

64-13 IX.D(6)

Thank you,

Margaret Macdonald Steward

Margaret Macdonald Stewart
PO Box 2404
Ketchum, ID 83340

HLW & FD

EIS PROJECT - AR/PF

Control # DC-65

Snake River Alliance

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Comments on the
Idaho high-level waste and facilities disposition draft environmental impact statement

Snake River Alliance

April 19, 2000

The following comments and questions are submitted on behalf of the 1,300 dues-paying members of the Snake River Alliance, an Idaho-based grassroots group that has monitored activities at the Idaho National Engineering and Environmental Laboratory since 1979.

65-1 IX.C(2) We would like to thank the Department of Energy for extending the public comment period. In the your own words this document details "the largest, most expensive, and technically complex environmental management project at INEEL," and therefore the additional time was helpful.

65-2 III.E(1) The Alliance concurs with the Department's intent, as analyzed in all alternatives except "no action", to solidify the remaining liquid waste and eventually place the calcine in a less dispersible form. However, given that there is no repository in existence to receive this waste, any assumption of such a repository should be dropped from the final EIS. Presently, the DEIS is too influenced by the assumption of a near-term High-level waste repository, and by the 1995 settlement agreement, and not enough by a fundamental need to better isolate the waste from the environment where it resides. Overall, there is too little concern for environmental protection in this DEIS.

65-3 III.F.1(2)

65-4 III.D.1(1)

65-5 VII.A(4) The DEIS's limited scope makes it nearly useless as an analytical tool in terms of making the decisions it aims to make. Probably the two most important variables in analyzing these alternatives are: (1) the question of technical risk associated with an alternative (in other words, Will it work?); and (2) the costs of the alternative. Both of these considerations are *outside the scope of the DEIS*. Without cost or technical viability analysis, the ROD will be baseless. Also, the EIS scopes out considering that Yucca Mtn will not accommodate INEEL waste (because of RCRA issues). Therefore, this EIS is analyzing alternatives to come to the following conclusion: If INEEL were not bound by the realities of the current repository situation; if INEEL were not bound by the scientific realities of the physical world; and, if INEEL had all the money in the world, this is the option we would choose.

65-6 VII.A(4)

Separations options

65-7 III.D.3(3) Clearly the "separations" alternatives analyzed in the DEIS are not in the best interest of environmental protection, and are instead driven by the current repository situation and a burning need to fulfill the terms of the settlement agreement. These alternatives, Planning Basis, Transuranics Separations and Full Separations, if they were to work, and that is a big if, might reduce the "High-level" waste volume, but in the process, the *overall* volume of waste would *increase*. In the real world this would not decrease *the overall danger* of the waste. In fact, if you were to decide to leave the "low-level" waste grout fraction in the tanks, you would after spending billions of dollars, be leaving the hottest fraction and greatest near-term threat behind. It should also be noted that the "Hanford Tank Waste Task Force" recently recommended that the DOE forgo pursuit of this technology because of the tremendous cost and technical uncertainty. In addition, the Transuranics Separations alternative involves a greater risk of a criticality accident as admitted in the document.

65-8 III.D.3(1)

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65-10 V(9)

Defining High-level waste

Let's please continue to be consistent on the definition of high-level waste and not further confuse the public. The Office of Environmental Management defines high-level waste (HLW) as "highly radioactive material containing fission products, traces of uranium and plutonium, and other transuranic elements, that result from chemical processing of spent nuclear fuel." The sodium bearing waste while not as radioactive as most batches of HLW, absolutely meets the basic criteria of the definition in that it resulted from chemical processing of spent fuel and contains fission products, as well as transuranics. Therefore, the DOE's contention that this waste is not hlw is out of line.

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Conflicting Flood Plain studies

The U.S. Geological Survey estimates the INTEC lies within the 100-year flood plain while the U.S. Bureau of Reclamation estimates 500 years. Because we are dealing with some of the dangerous material known to man, we recommend that the DOE assume the more conservative USGS estimate.

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The Calciner

We request that the DOE inform the public about its decision regarding pursuit of permitting the calciner under the new MAC guidelines as soon as this decision is made, and not wait until the NEPA process is concluded. The calciner is integral to many of the alternatives in the DEIS and also the 1995 settlement agreement.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

EIS PROJECT - AR/PF
HLW & FD Control # DC-66

APR 14 2000

Reply To
Attn Of: ECO-088

RECEIVED
APR 19 2000

T.L. Wichmann, Document Manager
U.S. Department of Energy
Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, ID 83401-1563

Dear Mr. Wichmann:

Thank you for sending EPA multiple copies of the Idaho High-Level Waste & Facilities Disposition EIS. We requested multiple copies to better solicit comments from reviewers in our various programs here at EPA. We have finished reviewing the document and are returning two sets of the EIS. We hope that you can redistribute the copies we are returning.

66-1 IX.B(2) In the future, please send us two copies of the EIS unless we request additional copies. Thank you for giving us the opportunity to review this draft EIS. 66-2 IX.A(2)

Sincerely,

Christian F. Gebhardt
Interim Records Manager,
Geographic Implementation Unit

Printed on Recycled Paper

HLW & FD

EIS PROJECT - AR/PF
Control # DC-62

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Date Entered: {ts '2000-04-19 19:38:26'}
Comment:
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HLW & FD EIS PROJECT - AR/PF
Control # DC-68

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Telephone: 208-835-6152
Date Entered: {ts '2000-04-19 16:40:55'}
Comment:
Comments

on

Idaho National Engineering and Environmental Laboratory

Draft

High-Level Waste Environmental Impact Statement

Submitted on Behalf of the

Environmental Defense Institute
Post Office Box 220
Troy, Idaho 83871

by

Chuck Broscious

April 18, 2000

SUMMARY

The Problem

68-1 III.A(1) 1. The liquid high-level waste has been in INEEL underground tanks for over 50 years, 20 years beyond the tank's design life. This liquid waste has acids and solvents strong enough to dissolve reactor fuel rods. Highly enriched uranium and other isotopes were chemically separated from the dissolved fuel rods for the nuclear weapons program, and the leftover liquid "raffinate" was sent to the underground tanks. DOE claims the tanks have not leaked (tho the service lines have had major leaks), however, any alternative for treatment will take an additional 15 -20 years, making the leak issue extremely problematic. Further treatment delay could prove disastrous. We can see an example of this at Hanford's leaking tank farm.

68-2 III.A(1)

68-3 III.A(1) 2. The tanks and their concrete vaults were not built to meet current structural standards or seismic resistance standards. A minor earthquake or other stressful event could compromise the weakened tanks. A burst tank would spell disaster for the Snake River Aquifer and all water users of the Snake River downstream to the Columbia and the Pacific Ocean. The State of Idaho's justified concern over preventing further contamination of the aquifer through appropriate treatment of all high-level waste and requiring disposal in an out-of-state geologic repository of all high-level waste deserves our full support.

68-4 III.A(1)

68-5 VIII.C(8)

68-6 III.E(1) 3. Given the uncertainty of geologic repositories for TRU and high-level waste coming on line, and the reality of restricted space in those proposed repositories if they do come on line, and the commercial waste from nuclear power reactors have priority and will fill up available repository space; means INEEL is looking at long-term storage of high-level waste on-site.

68-8 V(12) + 68-9 V(4) 4. DOE must not be allowed to reclassify formerly high-level waste as a means of avoiding regulatory disposal requirements. The States of Idaho, Washington, and Oregon's position opposing reclassification is the right one. [EIS@F-3]

68-10 III.C(3) 5. The Calciner must be immediately shutdown because it does not meet current RCRA permitting requirements or new EPA MACT standards. DOE for many years has been unable to sample for all contaminates of concern in the stack emissions to determine if it meets current standards. [EIS@2-2]

68-11 II.A(3) 6. DOE failed to meet its legal requirements to offer alternatives in the EIS that meet all applicable and relevant regulations.

The Solution

68-13 III.E(1) 1. Only treatment options that offer a long-term stable waste form that can be safely stored on site without further risk to the environment should be considered. EDI supports the State of Idaho's principled position that the following HLW EIS

68-14 VII.D(6) alternatives are not acceptable:

- options that leave any waste (including tank heels) in the INTEC [formerly Idaho Chemical Processing Plant] Tank Farm beyond the year 2012; and
- options that result in treated waste from the INTEC Tank Farm not being ready to be moved out of Idaho by 2035, and
- alternatives that propose to dispose of low-level waste fractions separated from high-level waste at INTEC, or anywhere else at INEEL, and
- DOE attempts to manage the sodium-bearing high-level waste as anything but high-level waste.
- alternatives that allow continued operation of the Calciner in violation of RCRA permitting requirements and Clean Air Act requirements.

2. Grouting was tried at Hanford and it failed miserably. The State regulators in Oregon and Washington forced DOE to go to a full vitrification process for the liquid high-level waste. DOE insisted on a separations process to fraction out the TRU from the non-TRU, however the regulators required vitrification of both waste streams because there is no regulatory treatment distinction between the two, and they are both high-level wastes some of which will have to be stored at Hanford indefinitely.

3. No known treatment options are without risk to workers and the public. Discussions with Oregon and Washington regulators are clear that Hanford's vitrification plant will prioritize on-site waste first for processing which will take through the year 2038. Hanford's treatment is not a viable option for INEEL waste because of this time delay and regulators resistance to importing HLW from INEEL given the site's inability to deal with onsite waste. Additionally, DOE cannot ship liquid high-level waste, and DOE cannot put HLLW into non-compliant RCRA tanks at Hanford.

4. Vitrification does not offer the lowest estimated environmental releases, however it does offer the best stable waste form for all the high-level waste. The State's Settlement Agreement has numerous legitimate stipulations, which are restated in the EIS Forward. Through a process of elimination, portions of the "early vitrification" is the only alternative that meets all the Settlement Agreement stipulations, and is supported by EDI in principal assuming a complete separate NEPA and RCRA permitting process. Unacceptable and illegal parts of "early vitrification" are sending the sodium bearing waste to WIPP. This part is illegal because it remains HLW that New Mexico will not allow in WIPP, WIPP has a very limited capacity for remote handled waste. Even if DOE is able to over ride the State of New Mexico's justified legal objections to accepting HLW, the remote handled waste can only go in the sidewalls in limited locations, and there are ample hot TRU from many other sites vying for these spots.

5. Vitrification is a process of mixing ground glass with liquid or calcined high-level waste in a electrically heated melter then pouring the mixed liquid into stainless steel canisters. The glass is the most stable in terms of leach resistant

characteristics. A vitrification plant is currently operating at the DOE's Savannah River Site.

Caveats

1. DOE must gradually scale up through piolet scale demonstration project to first prove proof-of-process of unproven technologies and emission control removal efficiencies.
2. DOE must develop robust project management and strategic oversight of contractors to avoid another Pit-9 fiasco.
3. DOE must abandon its disastrous experiment with privatization of treatment facilities. The recent announcement that the BNFL vitrification plant planned for Hanford doubled in price from $3.6 to 13 billion is an example where cost savings turned into massive cost over runs.

Reclassifying High-Level Waste to Mixed Transuranic is Illegal

On July 28, 1998, the Natural Resources Defense Council (NRDC) filed a legal petition with the Nuclear Regulatory Commission (NRC) "to assume and exercise immediate licensing authority over all high-level radioactive waste (HLW) that is stored in the 51 underground tanks located on the DOE Savannah River Site (SRS). The SRS Tanks are being decommissioned under DOE's High-Level Waste Storage Closure Program."

Even the most casual reader of this petition will recognize the similarities between DOE's actions at SRS and those intended at INEEL with respect to the slight of hand and arguably illegal delisting of Idaho Chemical Processing Plant (ICPP) high-level tank farm waste. DOE has delayed the release of the Draft INEEL High-level Waste Environmental Impact Statement until the Spring of 1999. Until that draft is released it remains uncertain how DOE proposes disposition of this HLW. DOE's actions at SRS pose a serious threat because the lessons learned at Hanford are not translated to other sites. This letter is an attempt to demonstrate our collective solidarity on this issue of HLW definition and NRC jurisdiction. We will not wait until the draft EIS is released to comment. The momentum of the "decide, announce, and defend" decision making requires early intervention.

In October of 1996 DOE released a document called "Regulatory Analysis and Proposed Path Forward for the INEEL High-level Waste Program." This plan lays out in detail what the Department's intentions are for high-level waste disposition. From an environmental advocate's perspective, this plan is a shocking rerun of the terminated Hanford tank waste grouting program. This canceled program involved mixing Hanford's high-level liquid wastes in their tank farm with cement (grout) and dumping it back into the ground. The March 1998 summary of the HLW EIS scooping only reinforced the 1996 HLW program document. And again, the INEEL HLW Draft EIS perpetuates these illegal HLW management options.

68-46 V(9) DOE seems to have over looked what is clear language in the NRC rules and regulations listed in 10 CFR that define the INEEL talk waste as HLW and to require an NRC licence as a HLW geologic repository comparable to the proposed Yucca Mt. HLW geologic repository. DOE is proceeding with firm statements that the LAW is Low-Level Waste under DOE agreement with NRC, where NRC cited three requirements the waste must meet following the performance of a detailed performance assessment in order to be treated
68-48 V(10) equivalent to LLW. DOE only has authority to license disposal of LLW but not HLW. NRC has authority to licence both. NRC regulatory oversight and licensure is required since the waste is still HLW.

68-49 V(12) DOE wants to reclassify tank heels and remaining liquids as "residual" waste and consider it also as "incidental waste." DOE fails to recognize that "incidental waste" is not a separate waste class, bu is a subpart of HLW.

68-51 V(12) DOE attempt to reclassify HLW extends to a) leaked tank waste, b) previously intentionally disposed HLW, and c) HLW in ancillary piping, ventilation and equipment in the same way. The hazard posed by each of these categories of waste is enormous. DOE must treat this waste as HLW and obtain NRC licensure, and apply NRC standards to the waste disposal citing, and handling.

DOE is floating the idea that leaked waste can be handled and regulated under the CERCLA and RCRA and avoid the HLW/LLW licensure issues entirely. Superfund, and State Hazardous Waste Management statutes require the compliance with Applicable or Relevant and Appropriate Requirements (ARARS) that cannot be waived. The substantive portion of ARARS's must be met. Only the procedural and working parts of these ARARS's can be waived. EPA may waive all of an ARARS based on any of nine criteria, however, these waivers are difficult to invoke and can lead to later challenges. The National Environmental
68-53 VII.A(3) Policy Act (NEPA) and the state equivalent law (SEPA) must also be complied with. DOE continues to apply only one of these laws as a means to exclude the rest.

NEPA, SEPA, CERCLA, and RCRA require very similar information. The process to implement NEPA is governed by regulations from the presidents Council on Environmental quality. It is not difficult to meld these three processes into one continuous and integrated process. They are very similar in many ways. There are major philosophical differences in implementation of CERCLA and NEPA in the way the public is involved and in the ability of stakeholders, responsible parties and others to sue. However, the actual working processes are very similar. NEPA does a better job of requiring a long term look and of requiring examination of reasonable alternatives. CERCLA and RCRA require a much more detailed gathering of data. NEPA and SEPA require good public involvement and stewardship of resources, and CERCLA and RCRA have a more structured public involvement that is aimed at having the public review final documents. It is not hard to combine these.

There are three main categories of radioactive waste, high-level, transuranic, and low-level. Under each of these main waste categories there are numerous subgroups. Different federal regulations apply to the disposal of different waste categories. Because of this regulatory framework, considerable

emphasis is given to properly assigning the right category or class to a given waste. Unfortunately, the regulations are not as explicit in defining waste categories as one would hope.

The Nuclear Regulatory Commission defines high-level waste by the process that created it as opposed to specific characteristics. High-level is, (1) irradiated reactor fuel, (2) the waste generated by the processing of irradiated reactor fuel, (3) the solids into which the liquid wastes were converted.

Another wild card in this process is the regulation on the characteristics of treated wastes. Each high-level repository must have what are called waste acceptance criteria. This means all waste shipped to that repository must meet certain standards to ensure the contamination will not migrate and compromise the dump. Since DOE does not have a high-level dump yet there are no waste acceptance criteria. The Yucca Mt. Nevada site is still under evaluation. Currently, the collective wisdom is that waste vitrified into a glass form will meet any repository criteria, because the Land Disposal Restrictions (LDR) are met for RCRA listed hazardous wastes.

68-54 III.F.2(2) Despite the uncertainty of not having high-level waste acceptance criteria DOE must move forward in selecting treatment technologies and start building the plants. Court ordered compliance agreements with enforceable deadlines are the current drivers. Had DOE followed through with its 1977 Environmental Impact Statement commitments to vitrify the high-level wastes into a glass form, the Department would not be in its current bind. DOE's Record of Decision on its 1995 INEEL Environmental Impact Statement states that: "The technology selected [for high-level waste] is radionuclide partitioning for radioactive liquid and calcine waste treatment, grout for immobilizing the resulting low activity waste stream, and glass (vitrification) for immobilizing the resulting high-activity waste stream."

A similar high-level waste treatment program at the Hanford Nuclear Reservation in Washington State generated so much public opposition that DOE was forced to cancel the project. The question of waste classification played a crucial role in ending the Hanford grouting program. DOE tried in 1990 to delist much of its high-level liquid waste saying it was not really high-level and therefore could be mixed with cement (grout) and dumped back into the ground. The Oregon and Washington State regulator's position is that the tank farm waste is high-level and therefor regardless what DOE's separations treatment, it must be managed and disposed as high-level wastes.

68-55 V(9) DOE is trying to pull the same high-level low-level nonsense at INEEL apparently thinking Idahoans are not aware of the Hanford escapade. The radionuclide partitioning technology is a process of separating out the transuranic elements (heavier than uranium) from the rest of the waste and calling it "high-activity." This "high-activity" waste would then be vitrified (made into glass) and eventually shipped to a geologic repository. The "low-activity" (LAW) waste (everything else) would be mixed with cement and dumped back into the high-level tanks at the ICPP or into the ground at the INEEL Radioactive Waste Management Complex. The driver to this treatment approach is money. The separations approach is cheaper because the volume shipped to a geologic

repository is small and the volume dumped back into the ground is large. The Department also thinks that it can ship the small volume of high activity waste to another site to be vitrified, thereby avoiding building a plant at INEEL. Since DOE is buildi
ng a vitrification plant at Hanford, the Department likely will ship INEEL's high-level waste there for treatment and avoid spending the $3 billion on vitrification plant in Idaho.

Another driver is waste repository capacity. Even if DOE can open Yucca Mt., its design capacity is not sufficient to hold the accumulated volume of commercial power reactor waste plus the military high-level waste. INEEL's radioactive waste is considered military because it was generated in support of the nuclear weapons programs. DOE now acknowledges that ".. no [INEEL] HLW will be sent to the first repository by 2035. The second repository will take 30 years to license and open."

68-56 III E (1)

Because of this waste constipation, DOE is looking for every excuse to reduce the volume of high-level waste requiring repository space. To complicate the problem further, DOE is not looking for another repository site that will be needed even if Yucca Mt. opens.

68-57 III. F.2(5)

The show stopper of the Hanford grouting program occurred when the States of Washington and Oregon, and the Yakima Indian Nation filed a petition with the Nuclear Regulatory Commission (NRC) for a rule making on the classification of the Hanford tank wastes. DOE backed down when the grouting (mixing with Portland cement) the "low-activity" waste did not meet the disposal requirements for high-level waste in the NRC regulations. The NRC did subsequently release a vaguely worded discussion paper in an attempt to answer the Petitioners request.

Hanford now is planning to vitrify both the high and low activity parts of its high-level wastes. The low-activity parts are to be stored on-site in a retrievable form. Thomas Tebbs with the Washington Department of Ecology believes this is a step in the right direction; but that it is a waste of resources to separate the high and low wastes; best just vitrify the whole volume together in one operation. The bottom line for the regulators is that both "high" and "low activity" waste is high-level by definition and must be managed in compliance with the statutes and regulations.

68-58 V(9)

DOE's cleanup shortcuts at INEEL make it clear that the culture within the Department has not changed. Shortcuts taken over the last four decades are the reason we now see cleanup cost pushing $29 billion to partially remediate the site under Superfund. Every year, every decade that passes, the costs only escalate. The worst part of delaying environmental restoration is the pollution migrates away from the source every day. The further contaminates migrate the more unlikely any corrective action can be taken.

DOE's INEEL high-level waste (HLW) planning document perpetuates this shell game by stating: "The sodium-bearing and other mixed liquid wastes stored in the ICPP Tank Farm should not be classified and managed as HLW." This sodium-bearing waste constitutes about 3/4 of the total liquid high-level volume (~ 1.9 million gallons) in the ICPP tank farm. The Environmental Defense

68-60 V(4)

Institute's review of the ICPP's former operator, Phillips Petroleum Co., quarterly reports show clearly the chemicals used to dissolve the reactor fuel rods were sodium nitrate and sodium hydroxide. Wastes generated in the fuel dissolution process went to the tank farm. There is no question that this waste meets the definition of high-level waste.

68-61 V(7)

INEEL is unique from Hanford and other DOE sites because it used a calcining treatment process that converts most of the high-level liquid waste into a granular form stored in seven large underground silos at the ICPP. The Calciner is a incinerator that burns off the liquid portion and mixes the residual ash with granular calcine material so it can be pneumatically easily handled. Unfortunately, the sodium-bearing waste is not readily calcined unless it is diluted with aluminum nitrate. DOE put off calcining the sodium-bearing waste until it was faced with court ordered deadlines.

68-62 III.C (5)

68-63 VII.D(6)

The sodium-bearing waste volume in the ICPP tank farm is about 1,648,400 gallons. DOE's recent attempt to reclassify or delist this high-level waste is illegal because it meets the Nuclear Regulatory Commission definition that includes the waste generated by reprocessing spent reactor fuel and the concentrated wastes from subsequent extraction cycles, or equivalent.

68-64 V(4)

Between 1954 and 1963 the Idaho Chemical Processing Plant (ICPP) dissolved two day cooled Materials Test Reactor (MTR) fuel. This fuel reprocessing program was known collectively as the RaLa runs. INEEL's equivalent to Hanford's Green Runs. Over this period, more than 113 separate process campaigns were run for the separation of barium-140 delivered to the Oak Ridge National Laboratory and Los Alamos for military programs. The RaLa campaigns used unique chemical separation processes from other ICPP nitric, sulfuric, or hydrofluoric acid uranium extraction campaigns. "This [RaLa] process involved the dissolution of MTR assemblies in a sodium hydroxide-sodium nitrate solution leaving a precipitate of sodium diuranate and fission products." Early Atomic Energy Commission documents leave no doubt that the sodium-bearing high-level waste in the ICPP tank farm is the result of spent nuclear fuel reprocessing and therefore appropriately designated as high-level. Admittedly, a certain amount of the sodium-
bearing waste is from decontamination flushes. However, it is still a product of irradiated reactor fuel reprocessing containing all the characteristics of HLW. DOE's own characterization of the sodium-bearing waste acknowledges that it exceeds the low-level Class C definition because of its high alpha emitter constituents. Uranium and plutonium are alpha emitters. Even if a person accepted this > Class C category, near surface disposal would be prohibited by NRC regulations.

Even more troubling is DOE's attempt to use "cementitous [grouting] solidification for treatment" of this high-level waste. The discredited Hanford experience where hundreds of millions of dollars were wasted on a high-level waste grouting program appears to be conveniently forgotten at DOE Idaho Operations Office. Internal DOE Hanford contractor reports revealed that the physical integrity of the grout would not last long. When radionuclides decay, they give off heat and radiation.

"Under the expected disposal conditions...the grout will remain at elevated temperatures for many years. The high temperatures expected during the first few decades after disposal will increase the driving force for water vapor transport away from the grout; the loss of water may result in cracking ... as the grout cools... (it) may draw moisture back into the grout mass. The uptake of moisture may have detrimental impacts on the behavior of the grout."

68-65 V(9) + 68-66 VII.D(6) Additionally, DOE's attempt to reclassify the sodium-bearing waste may be a violation of the State Agreement with DOE that orders the Department to calcine all the waste in the ICPP tank farm. The order states that: "DOE shall commence calcination of sodium-bearing liquid high-level wastes by June 1, 2001. DOE shall complete calcination of sodium-bearing liquid high-level wastes by December 31, 2012." Even if DOE fulfills its commitment to calcine the sodium-bearing wastes the issue remains about the classification of the partitioned "low-activity" part that DOE wants to mix with concrete and dump back into the old waste tanks. All the calcine (~3,800 cubic meters) is slated for the same chemical separations process to divide the "high-activity" from the "low-activity" parts.

Another very troubling part of DOE's plan is to leave the high-level tank farm sediments (heels) in the tanks. "The ICPP Tank Farm heels will not be removed and the Tank Farm will be closed under RCRA [Resource Conservation Recovery Act]." "The closed Tank Farm would probably meet the subtitle D landfill standards for industrial waste." Subtitle D is a municipal garbage dump classification. It is obvious to the most pedestrian observer that garbage and radioactive waste are different. Actually, the ICPP would not even qualify as a Subtitle D dump because it lies in a flood plain. DOE's plan literally translates into ICPP becoming a permanent high-level waste dump site in clear violation to the applicable statutes.

68-67 IV.C(2)

The tank heels can be removed by conventional dredging technics or use the Hanford Tank Sluicer Mechanism. DOE believes: "However, it is not practical to remove all of the heels from the INEEL tanks, decontaminate the equipment, and remove all surrounding soils due to technological, economic, and health and safety factors involved."

68-68 III.D.2.c(1) The Environmental Defense Institute (EDI) believes that the best approach is to vitrify the whole volume of the sodium-bearing liquid, all tank heels, and the calcine high-level wastes without any partitioning or separation of "high-activity and low-activity" wastes. The State of Idaho must fully review the failed Hanford grout program before committing to a similar project at INEEL.

68-69 III.D.3(1) Another reason the Environmental Defense Institute disagrees with DOE's separating the high activity and low activity parts is the chemistry. Part of the problem is the complexity of the chemistry involved in separating or partitioning radionuclides from each other in this high-level witch's brew. INEEL scientists recently completed the first stage of a multi-year project called Efficient Separations and Processing Program that preprocesses high-level waste and is funded at a half million per year through DOE's Office of Science and Technology. This project reportedly "separates highly radioactive elements from waste, reducing the volume of high-activity waste that must be disposed of at a

repository." This separations/ partitioning process is also called Transuranic Extraction (TRUEX). Despite the proliferation implications of this program, the grouted residual from this solvent extraction process is destined for low-level burial; or the preferred option is dumping it on top of the waste tank heels. A Science Program Symposium in Richland Washington on June 26, 1996 sponsored by DOE showed that the Department is still struggling with the basic science of chemical separation and the applied technology is still in the hypothetical stage. This means that millions of additional R&D dollars will be required to actualize the technology.

The INEEL Pit 9 waste treatment plant could not get the chemical separations/ partitioning to work. The Pit-9 reburial of the residuals of chemical separations approach does not enjoy public acceptance for many reasons. First, the classification of low-level waste has no connection with environmental, health and safety hazards. It is merely a catchall category for all waste not classified as high-level or transuranic. Secondly, the public demands that the entire volume of the waste be processed directly into a stable vitrified form so that the inevitable interim on-site storage does not continue the migration of contaminates into the environment. Remember, DOE thinks maybe a second repository will be available in forty years. The Final Report from the Hanford Tank Waste Task Force got it right by recommending:

"The high cost and uncertainty of high-tech pretreatment and R&D threatens funding for higher performance low-level waste form, vitrification, and cleanup." "Put wastes in an environmentally safe form, using retrievable waste forms when potential hazards from the waste may require future retrieval and when retrievability does not cause inordinate delays in getting on with cleanup." "Let the ultimate best form for the waste drive decisions, not the size nor timing of a national repository." "Accept the fact that interim storage, at least, of the waste in an environmentally-safe form will occur for some time at Hanford. Select a waste form that will ensure safe interim storage of this waste."

The repeated mantra "get on with cleanup" in the Hanford Waste Tank Task Force is repeated in public interest group reports. DOE is wasting precious resources by refusing to recognize the public's demand for real solutions to the radioactive waste problem. DOE must "get on with cleanup" and apply research and development (R&D) to technologies that will put all radioactive waste into a stable vitrified form for on-site storage for the near-term because there are no guarantees on any repositories coming on line soon. Additionally, the DOE is remiss in not investing in the essential R&D on emissions control that will be key to health and safety issues in all waste processing.

68-71 III.D.2.c(2)

As the NRDC's petition shows, DOE's creative approach to its HLW problem is to generate new waste categories such as "low activity and incidental" that have no basis in the statutes or supporting regulations. HLW remains HLW even if it is leaked waste, intentionally disposed waste, waste in ancillary equipment and ventilation headers, pipelines, transfer lines, etc.. The HLW regulations extend to vitrified low activity waste (LAW), the salt grout, and related vitrification plants and facilities when these plants are used in support of a geologic disposal area under NRC definitions. DOE simply cannot avoid its legal

68-73 V(12) + 68-74 V(11)

68-75 V(10)

68-76 V(9)

68-77 V(10) obligation to permit its HLW disposition program under the NRC and follow the established waste definitions. Again, as the NRDC Petition shows, even if DOE gets an informal approval from the NRC, the Commission is not supported by the statutes or its own regulations.

68-78 III.D.2.C (1) * 68-79 III.D.2.C (2) Vitrification processing cannot be avoided in stabilizing and preparing the waste to meet future repository acceptance criteria. To ensure that the nuclear legacy mortgage is paid, the Department must make its case to Congress for specific funding for INEEL Waste Immobilization Vitrification Plant. Idaho State and Environmental Protection Agency regulators must aggressively challenge

68-81 V(9) DOE's attempt to reclassify formerly high-level waste as low-level and learn from the Hanford debacle.

68-82 VII.B(2) DOE's attempt to remediate the tank farm contaminated soils under CERCLA does not absolve the Department from meeting NRC HLW disposal requirements because of the ARARS's. Attached please find a copy of EDI's Draft Comments on the Draft ICPP Cleanup Plan. A subsequent briefing with the regulators and DOE verbally acknowledged major changes to the preferred alternative. Until a revised draft or the Proposed Plan is released, it is uncertain whether the discussed changes will survive.

AMWTP and the INEEL HLW EIS

1. Under the NEPA, the DOE is required to present its alternatives for High Level Waste (HLW) management before selection of an alternative and to compare the environmental impacts of each of the alternatives under examination.

2. DOE committed resources and time, etc. to contract with BNFL for the construction and operation of the Advanced Mixed Waste Treatment Project(the Plutonium Incinerator). Therefore, AMWTP is an actual, real alternative as a means to managing alpha-contaminated and transuranic wastes from INEEL or other DOE sites. (Sec. 3.3.7 at p. 3-61)

68-83 XI(5) 3. However, DOE does not consider AMWTP as a real alternative, but rather, puts the "TREATMENT OF MIXED TRANSURANIC WASTE/SBW AT THE ADVANCED MIXED WASTE TREATMENT PROJECT" under section 3.3 (p. 3-61) which is the section entitled "Alternatives Eliminated From Detailed Analysis."

68-85 XI(5) 4. Then DOE proceeds to omit the AMWTP from its analysis in Comparison of impacts with respect to the various other alternatives it has chosen to identify (No Action Alternative, Continued Current Operations Alternative, Separations Alternative, Non-Separations Alternative and the Minimum INEEL Processing Alternative). (Sec.3.4, p. 3-63).

68-86 XI(5) 5. Conclusion: EIS fails to identify AMWTP as an alternative and to compare the environmental , etc. effects of this alternative with its other chosen alternatives, thus violating the NEPA.

NWCF and the INEEL HLW EIS

68-87 XI (3) + 68-88 III.C(5) For four decades the Department of Energy and its predecessor agencies operated two high-level liquid radioactive waste incineration plants at the Idaho National Engineering and Environmental Laboratory.

On February 7th, DOE Officials met with members of Keep Yellowstone Nuclear Free to discuss the DOE's Draft Environmental Impact Statement for High-Level Waste. Mr. Case informed the group that DOE will very soon startup and operate the New Waste Calcine Facility (NWCF) or "Calciner" through June of this year. The Idaho INEEL Oversight Program informed us that the Calciner will restart on March 8, 2000. According to the Draft EIS, the rationale for doing this is:

" DOE studied alternative methods for calcining waste. Two technologies emerged as viable candidates: (1) high temperature calcination and (2) sugar-additive calcination. Based on results of the pilot plant studies, DOE determined high temperature calcination to be the viable technological solution. High temperature calcination will be demonstrated during Calciner operation throughout June 2000." [1-16]

The High-level Waste EIS also says "Since 1995 new regulatory considerations have necessitated another review of treatment options. Some of these considerations include technical constraints, which have hindered DOE s efforts to sample off gas emissions from the New Waste Calcine Facility Calciner,..." [page 2-2 & 2-3]

68-90 III.C (3) It is our opinion that the risks of restarting the Calciner, in order to determine a technological proof of concept, are unacceptably high for the residents, workers and the environment. EPA and the State of Idaho should not allow this restart to proceed. DOE is simply taking advantage of a regulatory

68-92 III.C(3) loophole to perform risky experiments that they won't be able to do after June.

The Relevance of the High-Level Radioactive Waste Incinerator at INEEL

The operation of the high-level waste calcine facility has significant relevance to the decision to grant environmental permits to proposed Advanced Mixed Waste Treatment Project (AMWTP) because both facilities involve the incineration of very dangerous radioactive substances. According to a recent discussion we had with officials at the Region X Office of the Environmental Protection Agency (EPA), we learned that since 1982, the INEEL Calciner incinerator operated on an interim status, under a 1992 "Consent Order" later

68-93 III.C (3) amended in 1994 and 1998. The Department of Energy was not held to the requirements under Part B of a RCRA permit. DOE only had to meet vague requirements for the past eighteen years under a regulatory regime that is best described as "hands off." Thus, one of the most dangerous hazardous waste incineration facilities in the country was allowed to operate between 1982 and

1990 with ad hoc RCRA regulatory requirements that were not tied to quantifiable performance standards normally re
quired for hazardous waste incinerators.

We find this situation highly disturbing. The incineration of high-level radioactive wastes is an ultra hazardous activity under federal law. Its risks to human health and the environment cannot even be remotely compared to the incineration of municipal wastes, which were subject to more stringent regulatory requirements over the past 18 years.

By virtue of having an "interim status" under a "Consent Order" with the EPA and the State of Idaho from 1982 to 2000, the clear implication is that this facility was not able to meet legal permitting requirements and would not have been allowed to operate. This leads us to believe that the failure to impose Part B RCRA permitting requirements on the high-level radioactive waste incinerator at INEEL, created unacceptable risks to workers and the public. This concern is underscored in the Appendices to our comments, which document continuing and serious operating problems which led to excessive releases and excessive worker exposures, as well as DOE Headquarter oversight findings of serious deficiencies, and repeated concerns by the Defense Nuclear Safety Board about the failure of DOE and its contractors to address fundamental safety issues at this facility.

68-95 III.C(3)

68-97 XI(5)

The lax regulation and troubling operation of the high-level radioactive waste incinerator or "Calciner" at INEEL deserve a focused independent review involving the Environmental Protection Agency and outside experts not affiliated with the DOE, before permits are granted for the Advanced Mixed Waste Treatment Project.

High-level Radioactive Waste Incineration at INEEL

Since the early 1960's the Idaho National Engineering and Environmental Laboratory operated high-level radioactive facilities for the purpose of converting these wastes to a solid and a more stable form for storage. The process involved a technology known as calcination. Calcination of high-level liquid radioactive wastes involve the use of fluidized-bed and combustion of kerosene to dry the liquified nitric acid high-level wastes.

The liquid high-level waste was generated from the chemical separation of highly enriched uranium and other materials from "high-burn-up" spent naval reactor fuel at the Idaho Chemical Processing Plant. These nitric acid wastes contain large concentrations of transuranic and fission products and were stored in stainless steel tanks. The wastes were then drawn from the Tank Farm and sprayed into a vessel containing an air-fluidized bed of granular calcine solids. The bed is heated by combustion of a mixture of kerosene and oxygen. All the liquid evaporates, while the radioactive fission products adhere to the granular calcine bed material in the vessel.

The Calciner involves several systems including a Denitration Plant which reduces the nitric acid content of the wastes, a High-level Liquid Waste

Evaporator to further reduce the liquids, and a fluidized bed incinerator that burn off the liquid leaving behind a granular mixture. In effect calcination is a technology to bake away the liquids from the waste. In doing so, this process involves the processing, handling of extremely dangerous radioactive wastes – which in minuscule quantities can be lethal. The high-level wastes come from the Idaho Chemical Processing Plant (ICPP) which extracted plutonium and highly enriched uranium from spent naval reactor fuel shipped to the Idaho site. The highly enriched uranium was used in the nuclear weapons program.

68-99 III.C(3)

A high-level waste Calciner, if not adequately controlled can be a major aerosol emitter of extremely dangerous radioactive wastes. By virtue of the extremely concentrated radioactivity in the wastes, the Calciner is even more dangerous than the proposed plutonium incinerator. INEEL has been calcining high-level wastes since 1963. According to DOE "old timers," we've been told that the early Waste Calcine Facility released significant amounts of radioactivity to the air.

The current New Waste Calcine Facility was brought on line in 1982 and ran four "campaigns," the most recent being between May 1997 and May 1999. DOE wants to restart the Calciner and run it through June of 2000, because the Department claims emission and waste characteristic data is needed to support a RCRA permit application which DOE must submit to the State of Idaho in order to continue running the Calciner. If such a permit has not been applied for by June 1, 2000, the State has ordered DOE to cease Calciner operations until such a permit is granted. The remaining 1.4 million gallons of high-level liquid sodium bearing waste that DOE is considering calcining have sufficiently different characteristics so that previous emission data is not applicable. In addition to the RCRA permit, EPA has new air quality standards for hazardous waste combustion units. These standards must be met to allow continued operation of the Calciner after 2002. DOE is required to formerly announce by June 1, 2000 its in
tent to upgrade the Calciner so compliance will be met by the year 2002 deadline. Physical upgrades to the Calciner and collection of additional data would be required in order to comply with these new standards at considerable expense. According the High-Level Waste EIS:

68-101 III.C(3)

68-102 VIII.B(3)

68-103 VII.C(3)

Calcining of sodium bearing waste may involve the addition of aluminum nitrate or other additives (approximately three volumes of aluminum nitrate per volume of sodium bearing waste) to prevent the sodium and potassium nitrates in the waste from clogging the calcine bed at the current operating temperature. Operating of the Calciner at elevated temperature (600 degree versus 500 degrees Celsius) may reduce the need for these large amounts of inert additives, increasing the sodium bearing waste processing rate and reducing the volume of calcine produced. [3-10]

Problems with the Calciner

The Calciner facility has a disturbing history of accidents equipment failures, widespread environmental contamination and worker over exposures. The Calciner is one of several operations within the 200 acre INTEC (formerly called Idaho Chemical Processing Plant) compound that share common safety and emission control systems. For instance between 1991 and 1999:

68-104 III.D-1(1)

- There were at least 18 incidents where equipment, and filter failures, power outages, and poor conduct of operations resulted in excessive atmospheric releases of radioactive aerosols. In some cases there was widespread and severe contamination. For example, in April 1992 employees were forced to remain indoors after an accidental release from the main stack went beyond the plant boundary. Forty acres were contaminated and five to six acres of land had to be decontaminated.

68-105 VIII.G(6)

- In 1991, an explosion at the INTEC caused worker over exposures, and significant damage to the facility due to negligence by the contractor and the DOE.

68-106 VIII.G(6)

- There were six fires at the Calciner and INTEC. Inspectors also found several instances where fire and radiation alarms were shut off.

68-107 VIII.G(6)

- There were at least 18 incidents where workers were overexposed to radiation.

- DOE safety oversight teams have reported a continuing decline in safety. According to a September report by the DOE Headquarters Office of Environment, Safety and Health,

"Workplace safety at INEEL has deteriorated since 1994 . . . corrective action plans found that deficiencies were not resolved and that lessons learned from previous accidents were not being effectively applied. In environmental management and controls, data indicate weak regulatory compliance and inadequate, short-term, quick fix solutions . . . one fifth of all INEEL occurrences in 1997 were related to radiation protection (personnel contamination) and environmental management occurrences have increased by one third from 1994 to 1997."

- DOE's contractors have been repeatedly fined for environmental and safety non-compliance. Since 1994 the State of Idaho issued four Notices of Violation for Non Compliance resulting in more than $1 million in penalties. During that time period there were 26 DOE enforcement actions.

- In the last five years, the Defense Nuclear Facility Safety Board issued nine reports on the Calciner and related high-level liquid waste evaporator. All five reports challenge the Calciner's readiness to restart operations. The June 2, 1997 report "commented on the failure of the DOE Idaho Operations Office to identify inadequacies in the contractor's state of readiness before certifying

readiness for operations and commencement of the Operational Readiness Review for the high-level liquid waste evaporator." See Exhibits

68-108 VIII.B(3) + 68-109 III.C(7)

- The High-level Waste EIS says that "technical constraints, have hindered DOE's efforts to sample off-gas emissions from the New Waste Calcine Facility," so there is uncertainty about what is going out the stack.

Discussion

DOE openly admits that the Calciner cannot meet the EPA's 1995 clean air act standards which take effect, coincidentally at the end of June of this year. It is highly unlikely that the Calciner will ever comply with the existing Clean Air Act standards. According to a meeting that Chuck Broscious had with Brian English of the Idaho Department of Environmental Quality on August 30, 1999, English stated that DOE is not doing real time continuous monitoring of the Calciner stack and is only taking periodic grab samples (presumably when the filters are not shut down from power failures). According to English, DOE is not monitoring for particulate emissions which means substances such as plutonium and nonvolatile beta/gamma emitters such as cesium-137 are not being monitored. Apparently the stack environment is so toxic and radioactive that instruments rapidly fail.

68-110 VIII.B(6)

68-111 III.C(3)

If DOE is not performing adequate measurements of the preponderance of contaminants by volume and toxicity then it is not complying with the current Clean Air Act standards, as promulgated before 1995. The Calciner has been operating since 1982 without a permit required by the Resource Conservation Recovery Act (RCRA), and has functioned for the last ten years as an "interim status" facility under a Consent Order granted by the State of Idaho and EPA. A modification to the Notice of Noncompliance Consent Order on April 19, 1999 stipulates that DOE must place the New Waste Calcining Facility Calciner in a standby mode by June 1, 2000 unless the facility receives a hazardous waste permit for continued operation. These agencies can hardly call themselves regulators when they failed for 18 years to require that DOE get a full Part A and Part B RCRA permit. The Part B involves trial burns that are extensively monitored to determine if the emissions are within regulatory requirements. The bottom line is DO
E has never wanted to spend the money required to upgrade the Calciner so it could meet full RCRA permit requirements.

68-113 III.C(3)

68-114 III.C(3)

68-116 VIII.B(6)

At the minimum, EPA should conduct a special review of the State of Idaho's Consent Order to determine if it is adequate with respect to minimal requirements for measuring airborne pollutants at the Calciner. The Calciner facility should not be restarted unless this is done.

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HLW & FD EIS PROJECT - AR PF
Control # DC-69

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:57 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Erika and Kaitlin Foldyna and Lloyd
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 2083319260
Date Entered: {ts '2000-04-19 14:57:19'}
Comment:
Dear Thomas L. Wichmann April 19, 2000

69-1 III.D.3(1)
We have a very good idea for how we can prevent nuclear waste from leaking into the Snake River. We do not think you should use the separation technique because it costs too much money and is unproven. Here is our idea: Maybe you could turn it into glass and keep it in a steel case as far under the Earth as possible. We think this is important because we have heard of what has happened in the past (Hiroshima and Chernobyl) and do not want history to repeat itself in that form. We are concerned for our health and the health of others. If you like our idea, please write back.

69-2 III.D.2.c (1)

69-3 IX.C(1)

Sincerely,

Kaitlin Lloyd (age 11) and Erika Foldyna (age 9)

1

Document 70, Foothills School of Arts and Sciences (Katherine Reardon & Briana Schueren), Boise, ID, Page 1 of 1

HLW & FD EIS PROJECT - AR PF
Control # DC-70

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:48 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Briana and Katherine Schueren and Reardon
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 208.331.9260
Date Entered: {ts '2000-04-19 14:47:58'}
Comment:
Dear Mr. Whichmann, 70-1 III.A(1)
It is come to our attention that the nuclear waste you are producing and storing has recently, and still is, leaking into the Snake River aquifer. That concerns my partner Briana and I Katherine.

We live in Boise, Idaho, but we consume many foods, and drinking water which was grown and produced in Eastern, Idaho. We are concerned that waste and other buy-products are leaking into the food and water suply. We're writing to you because we fear the risk of cancer and other sicknesses to the people of Idaho. We suggest you find a much more stable and secure way to store your waste. 70-3 III.E(3)

70-2 VIII.4 (1)

Thank You!

Sincerely,

Katherine Readon and Briana Schueren
Foothills School of Arts and Sciences

P.S. Please reply! 70-4 IX.C(1)

1

Document 69, Foothills School of Arts and Sciences (Kaitlin Lloyd & Erika Foldyna), Boise, ID, Page 1 of 1

HLW & FD EIS PROJECT - AR PF
Control # DC-69

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:57 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Erika and Kaitlin Foldyna and Lloyd
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 2083319260
Date Entered: {ts '2000-04-19 14:57:19'}
Comment:
Dear Thomas L. Wichmann April 19, 2000

69-1 III.D.3(1)
We have a very good idea for how we can prevent nuclear waste from leaking into the Snake River. We do not think you should use the separation technique because it costs too much money and is unproven. Here is our idea: Maybe you could turn it into glass and keep it in a steel case as far under the Earth as possible. We think this is important because we have heard of what has happened in the past (Hiroshima and Chernobyl) and do not want history to repeat itself in that form. We are concerned for our health and the health of others. If you like our idea, please write back.

69-2 III.D.2.c (1)

69-3 IX.C(1)

Sincerely,

Kaitlin Lloyd (age 11) and Erika Foldyna (age 9)

1

Document 70, Foothills School of Arts and Sciences (Katherine Reardon & Briana Schueren), Boise, ID, Page 1 of 1

HLW & FD EIS PROJECT - AR PF
Control # DC-70

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:48 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Briana and Katherine Schueren and Reardon
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 208.331.9260
Date Entered: {ts '2000-04-19 14:47:58'}
Comment:
Dear Mr. Whichmann, 70-1 III.A(1)
It is come to our attention that the nuclear waste you are producing and storing has recently, and still is, leaking into the Snake River aquifer. That concerns my partner Briana and I Katherine.

We live in Boise, Idaho, but we consume many foods, and drinking water which was grown and produced in Eastern, Idaho. We are concerned that waste and other buy-products are leaking into the food and water suply. We're writing to you because we fear the risk of cancer and other sicknesses to the people of Idaho. We suggest you find a much more stable and secure way to store your waste. 70-3 III.E(3)

70-2 VIII.4 (1)

Thank You!

Sincerely,

Katherine Readon and Briana Schueren
Foothills School of Arts and Sciences

P.S. Please reply! 70-4 IX.C(1)

1

HLW & FD EIS PROJECT -AR/P
Control # DC-71

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:43 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Ashina and Alexandra Sipiora and Asbury
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th Street
Address2: 3065 e. Bon View or 1025 w. El Pelar
City, State Zip: Boise, ID 83702
Telephone: 331-9260
Date Entered: {ts '2000-04-19 14:42:43'}
Comment:
Dear Thomas, April 19,2000

71-1 VII.A(2) Our names are Ashina and Alexandra. This was a school project; we're both in fifth grade and our ages are ten and eleven. We're writing to you about toxic waste. We think it was a great idea to ask for other opinions on the subject.

71-2 II.A(2) We could store it [under ground] in The Great Salt Lake Desert in Utah. Or there's a space in Coahuila. That is in between Las Delicias and Laguna De La Lecha. In all the places dig a hole and pour cement in it, then pump it in that. We would like to hear back from you. And we're sure our teacher would like to read the respose too.

71-3 IX.C(1)

Sincerely,
Ashina and Alexandra

1

HLW & FD EIS PROJECT -AR/PF
Control # DC-72

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:36 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Matt Dubman
Affiliation: Foothills School of Arts and Sciences
Address1: 2035 Silvercreek Lane
Address2:
City, State Zip: Boise, ID 83706
Telephone: 368-0093
Date Entered: {ts '2000-04-19 14:36:00'}
Comment:
Dear Thomas L. Wichmann, 4/19/00

72-1 III.D.2.C(1)
We think that you should stabilize the nuclear waste and use the strategy of turning the waste into glass, also known as vitrification, because the separation techniques cost much money and are not yet proven to work. Also if there are leaks into the Snake River aquifer, it will greatly affect or kill the people, animals, and plants native to the Snake River ecosystem. This is what we believe about your decision on how to stabilize nuclear waste.

72-2 III.A(1)

Sincerely,

Andrew Storms
Matt Dubman
Zach Lyons

1

HLW & FD EIS PROJECT -AR/P
Control # DC-71

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:43 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Ashina and Alexandra Sipiora and Asbury
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th Street
Address2: 3065 e. Bon View or 1025 w. El Pelar
City, State Zip: Boise, ID 83702
Telephone: 331-9260
Date Entered: {ts '2000-04-19 14:42:43'}
Comment:
Dear Thomas, April 19,2000

71-1 VII.A(2) Our names are Ashina and Alexandra. This was a school project; we're both in fifth grade and our ages are ten and eleven. We're writing to you about toxic waste. We think it was a great idea to ask for other opinions on the subject.

71-2 II.A(2) We could store it [under ground] in The Great Salt Lake Desert in Utah. Or there's a space in Coahuila. That is in between Las Delicias and Laguna De La Lecha. In all the places dig a hole and pour cement in it, then pump it in that. We would like to hear back from you. And we're sure our teacher would like to read the respose too.

71-3 IX.C(1)

Sincerely,
Ashina and Alexandra

1

HLW & FD EIS PROJECT -AR/PF
Control # DC-72

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:36 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Matt Dubman
Affiliation: Foothills School of Arts and Sciences
Address1: 2035 Silvercreek Lane
Address2:
City, State Zip: Boise, ID 83706
Telephone: 368-0093
Date Entered: {ts '2000-04-19 14:36:00'}
Comment:
Dear Thomas L. Wichmann, 4/19/00

72-1 III.D.2.C(1)
We think that you should stabilize the nuclear waste and use the strategy of turning the waste into glass, also known as vitrification, because the separation techniques cost much money and are not yet proven to work. Also if there are leaks into the Snake River aquifer, it will greatly affect or kill the people, animals, and plants native to the Snake River ecosystem. This is what we believe about your decision on how to stabilize nuclear waste.

72-2 III.A(1)

Sincerely,

Andrew Storms
Matt Dubman
Zach Lyons

1

Document 73, Foothills School of Arts and Sciences (Rebecca Ballenger), Boise, ID
Page 1 of 1

HLW & FD EIS PROJECT AR PF
Control # DC-73

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:19 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Rebecca Ballenger
Affiliation: Foothills School of Arts and Sciences
Address1: 1503 N. 25th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 331-9644
Date Entered: {ts '2000-04-19 14:19:12'}
Comment:
Apr. 19 '00

Dear Mr. Wichmann,

My name is Rebecca (Becca) Ballenger and I am 10 years old. My class and I are studying Idaho Rivers and we've been talking about nuclear waste. I am now realizing how dangerous the waste is. I have a few ideas on how we can keep ourselves and other citizens healthy and safe.

I think we should make the waste into glass (vitrification) and keep it all in a huge lead container out in the open where no water is, to ensure our health. 73-1 III.D.2.C(1)

Rebecca Ballenger

1

Document 74, Foothills School of Arts and Sciences (Ashton Goodenough), Boise, ID
Page 1 of 1

HLW & FD EIS PROJECT AR PF
Control # DC-74

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 3:06 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Ashten Goodenough
Affiliation: Foothills School O f Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: (208) 331-9260
Date Entered: {ts '2000-04-19 15:06:03'}
Comment:
Dear Thomas W.

My name is Ashten, most people call me Ashtie. I am 11 years old and love the ocean. I want to be a marine biologist when I grow up. I live in Boise, Idaho but I want to live in New Port Oregon.

74-1 III.A(1)

I am writing you about my ideas on nuclear waste in the world. Idaho is having the problem of the waste leaking into our aquifer. This is a problem because nuclear waste causes cancer and other sicknesses. Right now we are injecting the waste into the ground. I think we should launch it into space. In space it could go into a black hole.

Now you're probably thinking it might land on another planet. Well if we take the time to shoot it in the right direction and see how the planets rotate it won't land, hit or destroy another planet. Therefore it will not harm anything. I'm not the best at space work but I think this might work. 74-2 III.A(2)

Sincerely Ashten.

1

Document 73, Foothills School of Arts and Sciences (Rebecca Ballenger), Boise, ID
Page 1 of 1

HLW & FD EIS PROJECT AR PF
Control # DC-73

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:19 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Rebecca Ballenger
Affiliation: Foothills School of Arts and Sciences
Address1: 1503 N. 25th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: 331-9644
Date Entered: {ts '2000-04-19 14:19:12'}
Comment:
Apr. 19 '00

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I think we should make the waste into glass (vitrification) and keep it all in a huge lead container out in the open where no water is, to ensure our health. 73-1 III.D.2.C(1)

Rebecca Ballenger

1

Document 74, Foothills School of Arts and Sciences (Ashton Goodenough), Boise, ID
Page 1 of 1

HLW & FD EIS PROJECT AR PF
Control # DC-74

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 3:06 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Ashten Goodenough
Affiliation: Foothills School O f Arts and Sciences
Address1: 618 S. 8th St.
Address2:
City, State Zip: Boise, ID 83702
Telephone: (208) 331-9260
Date Entered: {ts '2000-04-19 15:06:03'}
Comment:
Dear Thomas W.

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74-1 III.A(1)

I am writing you about my ideas on nuclear waste in the world. Idaho is having the problem of the waste leaking into our aquifer. This is a problem because nuclear waste causes cancer and other sicknesses. Right now we are injecting the waste into the ground. I think we should launch it into space. In space it could go into a black hole.

Now you're probably thinking it might land on another planet. Well if we take the time to shoot it in the right direction and see how the planets rotate it won't land, hit or destroy another planet. Therefore it will not harm anything. I'm not the best at space work but I think this might work. 74-2 III.A(2)

Sincerely Ashten.

1

HLW & FD EIS PROJECT - (AR) PF
Control # DC-75

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 3:03 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Kevin Ward
Affiliation: Foothills School of Arts and Sciences
Address1: 1900 N 29th street
Address2:
City, State Zip: Boise, ID 83702
Telephone: 385-0746
Date Entered: {ts '2000-04-19 15:03:11'}
Comment:
Apr. 19 '00

Dear Thomas L. Wichmann,

75-1 III.A (1) I know that you and your colleagues have a very important, frustrating job and that you get a lot of these letters but I am concerned. I wish to state a few of my points why I am concerned. One is that the waste can leak out of the metal containers it is stored in. In doing so it could very possibly leak into the Snake River aquifer and then it could go from there into the Snake River itself. That would not only would affect me, but it could affect all of Idaho and further we don't know the timespan of this (I know that this may never happen or it could happen in 7 years), but I don't want it to affect the generation of the future. You may not be thinking so far ahead but I am and think that I want everbody to have a long-lived life. 75-2 VIII.G(1)

75-3 III.D.2.C (1)
To stabilize the waste, I think that you should turn it into glass. I know that this a very expensive process but I know, and hope you know, that you can't put a price on life. Thank you for your time and for taking my letter into consideration. Please write back. 75-4 IX.C (1)

From,
Kevin Ward - age 11

1

HLW & FD EIS PROJECT - (AR) PF
Control # DC-76

Name: Dean Taylor
Affiliation: Idaho Falls resident
Address1: 3110 Hartert
Address2:
City, State Zip: Idaho Falls, ID 83404
Telephone: (208)523-8519
Date Entered: {ts '2000-04-19 22:18:44'}
Comment:

76-1 VIII.A(6) 1) The information used in making the assessments in the EIS is based on fragmentary data, at best, and on non-existent data (GUESSES!) at worst. I have little faith in any decision based on these data. The potential costs of implementing some of these options are measured in Billions of dollars. Why

76-2 X(12) doesn't DOE fund work to provide GOOD data for ALL the options under consideration so that an INTELLIGENT choice can be made? The direct cementation option, for example, appears to have had little or no funding support to provide reasonable data on which to assess its merits.

76-3 III.F.2(1) 2) Mr. Wichmann claimed in one of the public meetings that DOE has 170,000 MTHM of HLW to dispose of, while the current allocation for such waste at Yucca Mtn is for only 4,400 MTHM. These numbers suggest that the only way to "fit" the INEEL's HLW into the Yucca Mtn repository is to separate the high-activity portion and send only that to YM, leaving the low-activity portion to be disposed of elsewhere. Mr. Wichmann's numbers, however, don't agree with those published in the Sandia Report, "Performance Assessment of the Direct Disposal in Unsaturated Tuff of Spent Nuclear Fuel and High-Level Waste Owned by U.S. Department of Energy" (SAND94-2563/1, 1995). This report indicates that the term MTHM (Metric Tons Heavy Metal) applies to the parent fissionable fuel mass from which the waste was derived, not the actual mass of the final waste form. The report further indicates there is a total of only 12,060 MTHM waste in the DOE complex, only 320 MTHM of which is at the INEEL. Based on this data, the INEEL's
waste would use roughly 7.3% of the 4,400 MTHM allocation, regardless of whether it is separated into high- and low-activity portions or not.

76-5 X(4) 3) If the INEEL's HLW is NOT separated into high- and low-activity fractions, the final waste form will consume more space at the repository and thus incur a higher disposal cost. However, when comparing these costs for the various candidate options, only INCREMENTAL costs BEYOND "sunk" costs associated with development of the repository, should be considered. The latter costs must be paid REGARDLESS of which treatment option is selected. Only those costs incurred as a DIRECT consequence of choosing a specific option should be considered when comparing all options if TOTAL cost to the taxpayers is to be minimized.

To put it more simply, the TOTAL cost to the taxpayers for treatment and disposal of DOE's HLW will be the sum of three cost items: (a) the research

HLW & FD EIS PROJECT - (AR) PF
Control # DC-75

HLW EIS Web Comments

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Cc: web_archive@jason.com
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Affiliation: Foothills School of Arts and Sciences
Address1: 1900 N 29th street
Address2:
City, State Zip: Boise, ID 83702
Telephone: 385-0746
Date Entered: {ts '2000-04-19 15:03:11'}
Comment:
Apr. 19 '00

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From,
Kevin Ward - age 11

1

HLW & FD EIS PROJECT - (AR) PF
Control # DC-76

Name: Dean Taylor
Affiliation: Idaho Falls resident
Address1: 3110 Hartert
Address2:
City, State Zip: Idaho Falls, ID 83404
Telephone: (208)523-8519
Date Entered: {ts '2000-04-19 22:18:44'}
Comment:

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To put it more simply, the TOTAL cost to the taxpayers for treatment and disposal of DOE's HLW will be the sum of three cost items: (a) the research

costs for development of the site at Yucca Mtn, plus (b) the cost of treating the waste prior to disposal, plus (c) the INCREMENTAL cost at the repository to physically "make room" for the waste. Cost item (a) does not depend on the choice of a treatment option. Cost item (b) is probably MUCH higher for the separations options than for non-separations (probably billions of dollars higher). Cost item (c) will be somewhat higher for non-separations options than for separations options. However, the difference will not be nearly as high as claimed by those who justify separations on the basis of cost. The reason is that when one considers only INCREMENTAL costs in the comparisons, the disposal cost will be only a small fraction of the $500,000 per cubic meter figure that has been used.

In summary, I believe that the TOTAL cost to the taxpayers will be much, much higher if any separations option is selected.

HLW & FD EIS PROJECT AR/PF
Control # DC-77

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 3:02 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Chelsea and Edie Porter and Spear
Affiliation: Foothills School of Arts and Sciences
Address1: 2222 S. Swallowtail
Address2:
City, State Zip: Boise, ID 83702
Telephone: 1-208 331-9260
Date Entered: {ts '2000-04-19 15:01:42'}
Comment:
Dear Mr. Wichmann 77-1 III.D.1(1)
This waste is harming a lot of people so STOP! We don't like the fact that you are puting things that are hazardous to our health into the Snake River! It is not safe people can get canser! Our main point is just stop!
Sincerely
Chelsea A. Porter
and
Edie I. Spear

costs for development of the site at Yucca Mtn, plus (b) the cost of treating the waste prior to disposal, plus (c) the INCREMENTAL cost at the repository to physically "make room" for the waste. Cost item (a) does not depend on the choice of a treatment option. Cost item (b) is probably MUCH higher for the separations options than for non-separations (probably billions of dollars higher). Cost item (c) will be somewhat higher for non-separations options than for separations options. However, the difference will not be nearly as high as claimed by those who justify separations on the basis of cost. The reason is that when one considers only INCREMENTAL costs in the comparisons, the disposal cost will be only a small fraction of the $500,000 per cubic meter figure that has been used.

In summary, I believe that the TOTAL cost to the taxpayers will be much, much higher if any separations option is selected.

HLW & FD EIS PROJECT AR/PF
Control # DC-77

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 3:02 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Chelsea and Edie Porter and Spear
Affiliation: Foothills School of Arts and Sciences
Address1: 2222 S. Swallowtail
Address2:
City, State Zip: Boise, ID 83702
Telephone: 1-208 331-9260
Date Entered: {ts '2000-04-19 15:01:42'}
Comment:
Dear Mr. Wichmann 77-1 III.D.1(1)
This waste is harming a lot of people so STOP! We don't like the fact that you are puting things that are hazardous to our health into the Snake River! It is not safe people can get canser! Our main point is just stop!
Sincerely
Chelsea A. Porter
and
Edie I. Spear

Document 78, Foothills School of Arts and Sciences (Logan Madsen, Jake Goicoechea, & Jeffrey Baehr), Boise, ID, Page 1 of 1

HLW & FD

EIS PROJECT - AR/PF
Control # DC-78

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:17 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Jake, Jeffrey and Logan Goicoechea, Baehr, and Madsen
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th Street
Address2:
City, State Zip: Boise, ID 83702
Telephone: 331-9260
Date Entered: {ts '2000-04-19 14:16:52'}
Comment:
Dear Thomas Wichman,

78-1 III.D.2.C.(1)

We think that you should turn your excess nuclear waste into glass. We think this because if the waste was burned, the smoke and radioactive dust would be spread around the area. After the waste is turned into glass, it will not be as harmful as injecting it into the ground. We are concerned about this issue because it affects our future.

From,
Logan Madsen, Jake Goicoechea and Jeffrey Baehr

April 19, 2000

1

Document 79, Vickie Hoke, Victor, ID
Page 1 of 1

HLW & FD

EIS PROJECT - AR/PF
Control # DC-79

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Monday, March 06, 2000 12:41 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: vickie Hoke
Affiliation: Teacher/Teton Cty Schools
Address1: vshoke@srv.net
Address2: 30 N. Sweethome Dr.
City, State Zip: Victor, ID 83455
Telephone: 208 789-3057
Date Entered: {ts '2000-03-06 12:40:51'}
Comment:
I feel strongly that the proposed incinerator has not been researched enough. These items are VERY subject to human error and you have given the building over to a company with a less than shining reputation. I agree that something must be done with the nuclear waste, but burning at all, let alone so close to a pristine area (as well as my home) seems ridiculous. There are other options for removal and destruction of these wastes. Please, reconsider the incinerator idea. It is a BAD idea!

79-1 X1(5)

1

Document 78, Foothills School of Arts and Sciences (Logan Madsen, Jake Goicoechea, & Jeffrey Baehr), Boise, ID, Page 1 of 1

HLW & FD

EIS PROJECT - AR/PF
Control # DC-78

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Wednesday, April 19, 2000 2:17 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: Jake, Jeffrey and Logan Goicoechea, Baehr, and Madsen
Affiliation: Foothills School of Arts and Sciences
Address1: 618 S. 8th Street
Address2:
City, State Zip: Boise, ID 83702
Telephone: 331-9260
Date Entered: {ts '2000-04-19 14:16:52'}
Comment:
Dear Thomas Wichman,

78-1 III.D.2.C.(1)

We think that you should turn your excess nuclear waste into glass. We think this because if the waste was burned, the smoke and radioactive dust would be spread around the area. After the waste is turned into glass, it will not be as harmful as injecting it into the ground. We are concerned about this issue because it affects our future.

From,
Logan Madsen, Jake Goicoechea and Jeffrey Baehr

April 19, 2000

1

Document 79, Vickie Hoke, Victor, ID
Page 1 of 1

HLW & FD

EIS PROJECT - AR/PF
Control # DC-79

HLW EIS Web Comments

From: HLWFDEIS Web Site
Sent: Monday, March 06, 2000 12:41 PM
To: web@jason.com
Cc: web_archive@jason.com
Subject: HLW EIS Web Comment

Name: vickie Hoke
Affiliation: Teacher/Teton Cty Schools
Address1: vshoke@srv.net
Address2: 30 N. Sweethome Dr.
City, State Zip: Victor, ID 83455
Telephone: 208 789-3057
Date Entered: {ts '2000-03-06 12:40:51'}
Comment:
I feel strongly that the proposed incinerator has not been researched enough. These items are VERY subject to human error and you have given the building over to a company with a less than shining reputation. I agree that something must be done with the nuclear waste, but burning at all, let alone so close to a pristine area (as well as my home) seems ridiculous. There are other options for removal and destruction of these wastes. Please, reconsider the incinerator idea. It is a BAD idea!

79-1 X1(5)

1

HLW & FD

EIS PROJECT - AR/PF
Control # DC-80

FAX

Page 1 of 17

To: Thomas L. Wichmann, Document Manager
US DOE, ID operations office
850 Energy Drive MS-1216
Idaho Falls, ID 83401-1563

From: Melissa Clark Rhodes, Ph.D.

Fax #: 1-208-524-1184

Message:

ATTN: Public Comment: IDAHO HLW & FD EIS

Kopy Katz Copy Center
tel. 307.733.0633 · fax 307.734.2499

Melissa Clark Rhodes <mrhodes@blissnet.com> on 04/20/2000 11:08:30 AM

Please respond to mrhodes@blissnet.com

To: cxb@inel.gov
cc:

Subject: Attention Cindy from M. Rhodes re failed fax

Thank you Cindy for your email! I was online and frustrated until late last night because I have put a great deal of effort into my comments, including the reading of the EIS, and discussion with a number of engineers.
Here is part 1 of 2: Melissa Clark Rhodes (307) 734-7665

- hilevel.doc

Melissa Clark Rhodes <mrhodes@blissnet.com> on 04/20/2000 11:15:28 AM

Please respond to mrhodes@blissnet.com

To: cxb@inel.gov
cc:

Subject: Attn Cindy, here is part 2 of my comment

This part is authored by a materials scientist, actually from the INEEL. Since I'd gathered a small group of engineers, and had had discussions, I feel that this hydroceramic solution made alot of sense. It appears to have been one of the alternatives which had been considered early on, and close to the Direct Cement option. Thank you for your trouble. Best regards, Melissa Rhodes PS: I'll be visiting the INEEL again in May. 307-734-7665

 - acidoc.doc

HLW & FD EIS PROJECT [illegible]
Control # DC-80

To be included in the ROD comments Re: INEEL HLW

April 19, 2000

Re: Comments regarding INEEL's management of its high-level waste treatment and disposal problem. These comments are for the Record of Decision.

My name is Melissa Clark Rhodes. My address is Apt. 345 M. Blair Place, Jackson, Wyoming, 83002.

I hold a Ph.D. in Geology, with a specialty in evolutionary theory and physiological ecology of "living fossils'. I have taught university level introductory courses in Geology, Environmental Science, Oceanography, and Geologic Resources and Hazards, as well as Advanced Optical Mineralogy, Igneous and Metamorphic Petrology, Crystallography, and Paleontology.

Since Chemical and Nuclear Engineering are not my areas of expertise, I am speaking here as a concerned citizen.

80-1
IX.A(2) The DOE has very considerately provided us with information and time, and has included us in their decision–making process. For this, I am grateful, and I appreciate the efforts of INEEL and DOE to make available to us the various options which will most likely be involved in the final decision-making process regarding INEEL's problems with the high level waste treatment and disposal, as well as the level of environmental remediation required after the INEEl has been closed.

Concerns:

I'll begin by elimination of the most undesirable options (in my opinion):

Undesirable:

80-2
III.D.3(1) Separations technologies:

The main benefit of these protocols seems to be reduction of the volume of waste – different fractions would be sent to the WIPP and the still hypothetical high-level waste repository. I consider any of the separations alternatives to be unacceptable. Dissolving the previously solidified calcine back into liquid form seems wasteful, since it nullifies all the previous calcining performed in order to get the HLW into a more stable granular form. Liquid HLW is a more hazardous and unstable entity, especially when it is sitting on Southeast Idaho's premier aquifer.

The separations technologies all involve a small incinerator, in order to treat the organic solvents, which would be contaminated with radionuclides. Even the slightest whisper of the word "incinerator" in the Jackson area would arouse more public opposition.

Undesirable:

80-3
II.E(8)
+
80-13
II.E(2)

Minimum INEEL processing solution:

This option involves a lot of transportation and handling. There are also too many uncertainties regarding Hanford's ability to deal with SBW/mixed TRU waste. The chemistries required for vitrification at Hanford don't match. INEEL's waste is more acidic than has been provided for at the Hanford facility. There is too much risk in transporting the waste back and forth. Transport presents a greater potential for accidents. Additionally, it appears that this option still hasn't been worked out fully. Too many uncertainties exist, and the planning appears to be complex.

Undesirable:

80-4
III.C(5)

The Hot Isostatic Pressed Waste option

Direct Cement Waste option (see postscript)

These alternatives both require the technology necessary to upgrade the calciner to MACT. This could be costly and time-consuming. The INEEL might encounter additional public opposition to the calciner, even after upgrades to MACT. It is a form of incinerator.

Most desirable:

Early Vitrification Option:

80-5
III.D.2.C(1)

This alternative does not require calcination of the remaining liquid SBW and mixed TRU waste. Therefore, it would not require upgrading of the calciner to MACT, and would eliminate public opposition to the operation of the calciner. The liquid mixed TRU/SBW would be converted into a glass acceptable to the WIPP, already in operation.

The mixed HLW Calcine would be vitrified with another variety of glass frit, and safely stored until a HLW repository could be located and confirmed. The vitrification of the HLW would put it in a stable form, so that if the hypothetical HLW repository were not found right away, it would be relatively safe parked right on the reservation.

Newly generated SBW etc. would be directly vitrified, and would skip the calcining step. The newly generated waste, after vitrification, would most likely be accepted at the WIPP, already in existence and operative.

This type of technology has been successfully utilized in European countries. However, this option is extremely expensive.

Remediation:

80-6
IV.A(1)

My first choice would be the "Clean Closure" Alternative. However, upon reviewing the worker mortality rates, I am doubtful as to whether "Clean Closure" is worth the increased site worker mortality rate.

I am undecided as to which choices are the most desirable for closure. The "Nuke Reservation" is right in the middle of a low gradient flood plain, and over Southeast Idaho's premier aquifer, which is already experiencing some contamination. The integrity of the aquifer must not be breached.

80-7
VIII.C(4)

The main problem is the leftover contaminants' location. The contamination is parked squarely in the path of any flood or alteration of flow pattern of the Big Lost River.

80-8
VIII.C(5)

Paleogeography of the Big Lost River clearly shows alterations in its meander patterns. Since the Arco Desert plain has a very low gradient, the river will be susceptible to large variations in its meander patterns, dependent upon short or long-term climatic variations. It will also be especially inclined to flooding, especially during the current short-term(?) climate changes. The contaminants could possibly end up in the middle of a newly formed river meander channel!

80-9
VIII.G(4)

Techniques involving more remote-handling protocols should be strenuously investigated, so that worker safety could be increased. I feel that it is essential for the underground contaminated structures such as the tanks, vaults and piping to be removed.

80-10
IV.A(2)

Respectfully yours,
Melissa Clark Rhodes, Ph.D. Geology

PostScript:

80-11
III.D.2.b(3)

It has been brought to my attention that vitrification may be prohibitively expensive. It could cost more than $1,000,000.00 per cubic meter of glass produced. Thus, as an alternative, a version of Hydroceramic Solidification might be preferable, even though it most likely would involve calcination of remaining liquids.
The hydroceramics as described in the following paper by Darryl D. Siemer, "WHY HYDROCERAMIC SOLIDIFICATION MAKES MORE SENSE THAN VITRIFICATION FOR INEEL HIGH LEVEL WASTE", submitted to the journal "Nuclear Technology", match leachability test results in comparison to glasses, and are cheaper. However, the main problem appears to be volume reduction. It appears to have been one of the alternatives analyzed and rejected by the DOE. Perhaps volume reduction is not as important as a speedy and cost effective solution for the INEEL's HLW. See the following paper:

WHY HYDROCERAMIC SOLIDIFICATION MAKES MORE SENSE THAN VITRIFICATION FOR *INEEL* HIGH LEVEL WASTE

Darryl D. Siemer, 12 N 3167 E, Idaho Falls, ID 83402
(evenings/weekends) (208) 524-2479 dsiemer@srv.net
(days) (208) 533-4080 siemdd@inel.gov

(Note: this paper does not necessarily reflect the views of the author's employer nor does it discuss research funded, encouraged, or otherwise "owned" by that employer)

ABSTRACT

"Hydroceramics" (HC) are geopolymeric[1] concretes designed to match the leach test performance of radwaste-type glasses. They are made by autoclaving mixtures of calcined waste, calcined clay, NaOH, plus water. This paper characterizes them and explains why this approach to solidification would be preferable to vitrification for Idaho National Engineering and Environmental Laboratory (INEEL) reprocessing waste.

INTRODUCTION

In 1970, Idaho's political leadership was assured that the "high level" waste (HLW) generated by the Federal Government's fuel reprocessing operation at INEEL (then "NRTS") would be prepared for disposal (made "road ready") in the first "official" HLW repository by 1980[2]. Since that time, billions of taxdollars have been spent on HLW management, no HLW repository has been provided, none of INEEL's reprocessing waste has been prepared for disposal, and today's official deadline for doing so has slipped to 2035 AD[3]. In 1996, a "controversial" National Research Council (NRC) report identified seven management "symptoms" responsible for the Federal Government's inability to deal with its own waste[4]. One of these is that DOE blinders both itself and its contractors to any but predetermined "preferred alternatives" when it addresses technical problems. This paper discusses one such "preferred alternative", vitrification, and explains why a cementitious technology ought to be used instead.

VITRIFICATION'S DRAWBACKS

A paper scheduled for publication in "*NUCLEAR TECHNOLOGY*" documents that the cost of rendering DOE HLW road-ready via vitrification will be well over $1 million (probably $2-4 million) for every cubic meter of glass produced[5]. Because DOE's contractors are unlikely to achieve >100% volumetric loading of its ~60,000 m^3 of high-solids reprocessing waste (~4000 m^3 of INEEL calcines, ~14,000 m^3 of SRS sludge, and 46,000 m^3 of Hanford sludge), the paper goes on to suggest that vitrification constitutes a barrier to progress and that other technologies should be considered. Another controversial NRC report reached the same conclusion over two decades earlier[6].

Let's critique some of the arguments employed by vitrification's champions.

One of these is, "vitrification is better because a glass melter can achieve greater volumetric waste loading than can low temperature solidification technologies". This argument is misleading, irrelevant, and harmful. It is misleading because it presumes both that alternative technologies *must* be implemented without appropriate waste pretreatment and, as I'll demonstrate later, that only a fraction of the waste "counts". Raw reprocessing waste consists primarily of volatile materials such as water, mineral acids, nitrate/nitrite ions and, in some cases, organics which may include "listed wastes", solvents, extractants, and chelating agents. Calcination (or incineration) [7,8] is a straightforward and well-established way to eliminate those fractions while producing inorganic ashes which can be converted to equally low-volume monoliths by other means. While glass melters can be (and sometimes are) used as "devolatilizers", it is much more efficient to do that unit operation with equipment optimized for that purpose.

Today's obsession with volume is irrelevant because the presumption that the ultimate cost of managing

HLW will be proportional to the geometric size of any waste forms made from it is invalid. First of all, history tells us that the cost of *any* DOE project will be exorbitant whether or not it actually ever produces anything. For example, the cost of making one canister (~1 m^3) of any sort of "rock" will be >90% that of making ten canisters (~10 m^3) of it with the same equipment. As far as the US taxpayer is concerned, a DOE EM project's overall cost (including research, development, design, licensing, administration, construction, personnel training, testing, decommissioning, etc., etc.) is virtually independent of the amount of product created or service rendered. Product/services are *incremental* costs.

Second, the total cost of disposing of waste forms produced from DOE HLW will *not* be proportional to their geometric volumes. Why ? 1) Formal analyses have repeatedly concluded that the transport of finished waste forms to a repository will represent a small fraction of total management cost regardless of their volumes[9], 2) today's official hypothetical HLW repository site, Yucca Mountain (YM), is physically large enough (several cubic miles - several tens of billions of cubic meters) to accommodate any type of material(s) that DOE might choose to make from its reprocessing wastes, 3) YM's "size" is defined in units related to the amount of radionuclides to be buried there (the equivalent of that in 70,000 "metric tons of heavy metal"), not geometric volume[10], 4) the drilling/boring equipment required to create space at YM has already been paid for, and, of course, 5) YM will (and has already) cost US taxpayers billions of dollars whether or not any real waste is ever buried there. Again, the cost of using the facility for its intended purpose will add only a relatively small *incremental* cos attributable to mass/volume.

The "volume obsession" is harmful because it diverts attention/resources from rendering waste road-ready to reclassifying it via "volume reduction". This waste is a "big" problem because it is chemically toxic, radioactive, corrosive, heterogeneous, situated in places poorly suited to become permanent geological repository sites, and has been mismanaged/ignored for several decades - not because of its physical size. In practice, the technologies used/proposed to affect volume-reduction serve to decease the physical size of "high level" fractions that "must be vitrified" for offsite disposal by increasing those of "low level" fractions to be left on site. These low-level fractions usually contain the bulk of the original waste's toxic/corrosive components and, due to the fact that chemicals are added to affect separation processes, are generally larger (often much larger) in terms of total mass, solids content, and volume than the waste was before it was "volume reduced". Stratagems used/proposed to make the vitrification of the "high" stuff in DOE's reprocessing waste more affordable range from the relatively simple sludge-washing now done at WVDP & SRS to the elaborate "full separation" scheme that has been championed by INEEL management. Another of history's lessons is that the volume-reduction of existing reprocessing waste is attractive only to those who might be employed designing, building, operating, managing, and/or overseeing the new facilities that would be required to accomplish it – and equally unattractive both to independent reviewers[11] and people who happen to live near the site in question but do not derive their incomes from it[12]. The only volume reduction operation that really makes much sense for this type of waste is "devolatilization".

Another rationale proffered for vitrification consists of a poor analogy; i.e., "because France and Great Britain vitrify high-level reprocessing waste, it must be 'best' for US HLW too". This argument is invalid because about the only characteristic that these wastes share are their labels. European HLW consists of relatively young, first-cycle, PUREX-type raffinate generated by a process that dissolves mechanically-declad commercial reactor fuel rods in nitric acid. The ash generated by the calciners used to prepare European HLW for vitrification typically contains 20-60 wt% fission products. On the other hand, DOE HLW is much older (typically >30 years out-of-reactor) and consists primarily (>99%) of non-radioactive materials derived from fuel cladding plus added solid-forming process reagents. Consequently, DOE HLWs are two orders of magnitude less radioactive and much more heterogeneous than their European namesakes. The *technical* reason why the vitrification of US HLW is prohibitively expensive is that a US glass melter capable of solidifying any given amount of "bad stuff" must be ~100 times larger and able to accommodate a much wider range of feedstocks than its European counterpart ("bad stuff" = the sum of RCRA metals +fission products + TRU).

A more fundamental drawback of glasses for this purpose is that they are "ineluctably metastable"[2]. Glasses are relatively rare in Nature because they are unstable and therefore inevitably decompose to form crystalline minerals/rocks; e.g., the "zeolitized tuff" that comprises much of today's official HLW repository site (the third such location) was originally volcanic glass. Radwaste-type glasses (i.e, glasses

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with low percentages of silica and alumina & high percentages of alkalies and boron) are apt to be especially unstable. Furthermore, because both classes of material enhance the corrosion rates of glasses under hypothesized repository conditions[13], some of DOE's radwaste management experts are suggesting that the YM repository must be implemented without concrete for construction or clays/soils for backfill – which, of course, constitutes a serious barrier to actual implementation.

I do not mean to imply that HLW disposal implemented with glass waste forms would necessarily "fail". "Performance assessments", both formal and otherwise, have consistently concluded that if this waste were to be buried at a suitable repository site, the characteristics of the waste forms would have negligible effect upon overall system performance[10, 14-17]. I do mean to say that glass is neither "best" nor necessary.

Let's examine a more constructive paradigm. Perhaps the best analogy to the US's present situation is Great Britain's "historic waste" problem circa 1980[18,19].

In 1982, the British government directed its prime nuclear-contractor, British Nuclear Fuels, Limited (BNFL), to design an up-to-date commercial fuel recycling facility at Sellafield (aka Windscale). It mandated that the new facility must not only be able to immediately process all newly-generated reprocessing wastes to disposable waste forms, but also to similarly deal with a ~30-plus year backlog of "temporarily" stored reprocessing waste previously generated. Unlike the situation in the USA, the British government did not impose a "preferred technology" - only that finished waste forms must satisfy performance-based standards; i.e., be suitable for disposal in any of the possible repositories that it might choose to implement within the next 50 years or so. Five years worth of constructive collaboration by technologists from BNFL and the British government's DOE (Department of Environment) led to a consensus that "inorganic cements" would be used for all radwastes generating less than ~500 watt/m^3 worth of radioactive heat; i.e., that the choice of solidification technology would be determined by a measurable and technically relevant characteristic of the waste, not its history or any labels that it may have picked up (e.g., "high-level", "low-level", "mixed", "incidental", "transuranic", etc.). This conclusion is consistent with sound technical and economic reasoning, IAEA guidelines, and the opinions of US technologists willing to risk the probable consequences of taking an unblindered look at this issue[6]. By 1991, BNFL had completed the new reprocessing plant and its cementitious solidification facilities started "hot operation" two years later – those facilities have since rendered most of Sellafield's >15,000 m^3 accumulation of historic radwaste (~150 distinguishable streams) road-ready.

Since then BNFL has become a prominent player in the US radwaste technology marketplace - in effect leveraging its success at home to compete with US-owned firms for US tax dollars. While this situation is galling to some US nuclear professionals, US taxpayers are being relatively well-served because, unlike the situation with many of USDOE's contractors, BNFL generally accomplishes what it promises to do on time and on budget. Of course, this does not mean that it is in the *best* interests of US taxpayers for USDOE to promise BNFL several million dollars for every glass "log" it might produce from US HLW[5] – those taxpayers would be much better served if it were allowed to apply an updated version of the same technology used for British radwaste.

There are two reasons why INEEL would be the logical place for DOE to initiate such a policy change. First, unlike the situation elsewhere, INEEL's decision makers have not yet *officially* committed themselves to implementing any particular HLW management scheme. Second, INEEL's fuel reprocessing facility, the "Idaho Chemical Processing Plant" (ICPP, recently-renamed "INTEC") calcined >90% of its raw liquid waste rather than converting it to a mixture of water soluble salts and sludge via neutralization. This plus the fact that those calcines generate ~40 watts/m^3 of radioactive heat make its HLW well suited for cementitious solidification.

THE HYDROCERAMIC ALTERNATIVE

There are three reasons why conventional "grouts" (including those employed by BNFL) don't perform as well as do glasses on radwaste-type leach tests. The first is that grouting is applied to the intrinsically soluble fraction of waste (liquids and uncalcined salts) while vitrification is reserved for "volume reduced" fractions from which readily soluble materials have already been leached. While the pH buffering provided by conventional calcium silicate-based cements renders them capable of immobilizing the intrinsically

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insoluble constituents of radwastes (this "easy stuff" consists of multivalent cations - all TRU elements[20], the majority of fission product elements, and most RCRA metals[21]), such cements do not chemically fix the alkali-salts that constitute the bulk of the waste so-treated. (From a material scientist's point of view, it would be better to consign salts to the glass melter and sludges to the concrete mixer.] Second, the protocols imposed by radwaste leach tests (small scale, short term, etc.) obviate the key advantages of cementitious solidification, i.e., that it would be relatively easy/cheap to make waste forms with low geometric surface areas relative to their volumes (in other words, large ones) and equally easy/cheap to then enhance their post-emplacement durability via in-situ grouting (grout "backfill" would destabilize glass waste forms). Third, because concretes are intrinsically porous, the actual surface area exposed to the leachant during these tests is much greater than is the case with equal-sized chunks of glass.

Hydroceramic concretes[22,23] eliminate this performance gap because their binder phases consist of minerals (sodalites, cancrinites, zeolites, etc.) capable of chemically fixing salts as well as the "easy stuff". Individual salt molecules are trapped within aluminosilicate "cages" which form around them during the curing process. Manufacture implements the cancrinite-making chemistry of Hanford's "Clay Reaction Process"[24] via Oak Ridge National Laboratory's almost equally venerable "Fixed Under Elevated Temperature and Pressure" (FUETAP) autoclaved-concrete technology[25]. Raw HC-type "grout" consists of a dough-like mix of water, calcined waste, calcined clay ("metakaolin") and NaOH plus smaller amounts of powdered vermiculite and/or illitic clay (which enhance Cs fixation) and sodium sulfide (which serves both as a redox buffer and a precipitant for RCRA metals). The relative amounts of alkali metals, aluminum, silicon and all anions other than hydroxide, aluminate, fluoride, and silicate in the formulation is adjusted to approximate sodalite; i.e., ratios of $(Na+K+Cs)_a:Al_b:Si_c:X_d$ are b≥a, c≥a, & d<0.25a. The physical characteristics (appearance, strength, porosity, density, etc., etc.) of the finished concretes are similar to those of conventional calcium silicate-based concretes.

LEACH TESTS

In order to have a reasonable chance of breaking vitrification's lock on US HLW solidification, an alternative must not only be simpler, cheaper, and safer to implement, it must also produce products that satisfy performance criteria established for glasses. Consequently, "good" HC concretes ought to possess the following characteristics: 1) gross matrix solubility less than that of DOE's HLW QC benchmark, "Environmental Assessment" (EA) glass as measured by the 7-day "Product Consistency Test"; 2) normalized 28-day MCC-1 leach test performance <1 g/day/m^2 for the toxic & radioactive materials in INEEL calcines; 3) satisfy "universal treatment standard" (UTS) criteria for RCRA metals via TCLP; and , 4) accommodate waste loadings ≥ 25%. In addition, they should evince individual-constituent ANS/ANSI-16.1 leach indices much higher than the usual "waste acceptance criteria" (6.0) for radwaste grouts and have similar physical strengths (>500 psi compressive).

Figure 1 compares 28-day MCC-1 leach test performance of a typical HC with those of several radwaste-type glasses and a hot-isostatically-pressed ceramic, "SYNROC B"[26]. The HC contained 42 wt % of a representative INEEL "zirconia-type" pilot-plant calcine, a calcined-clay pozzolan produced by the ASHGROVE Cement Co. ("Troy clay"), powdered-raw vermiculite, a small amount of sodium sulfide, plus household lye (sodium hydroxide). This test exposes a monolith of known composition and geometric surface area to a relatively large volume (to discourage saturation) of 90°C distilled water for one month. The fractions of the material's components found in the leachate are then used to derive normalized leach rates in units of gram/m^2/day.

Figure 1: Comparison of HCs with glasses on the MCC-1 Test

Table I lists detailed results of an ANS/ANSI 16.1 leach test of the same specimen. This protocol measures the mobility [i.e. bulk diffusion constants, D, in units of cm^2/s: "leach index" = -($\Sigma \log_{10}$ D)/n)] of individual components of a monolith immersed in water under conditions that discourage saturation effects (the leach water is periodically changed). Note both that the most readily-soluble bulk constituents of US radwaste (sodium and nitrate) evinced diffusivities ~four orders of magnitude lower (better) than the usual waste acceptance criterion for grouts (10^{-6} cm^2/sec) and that those of "easy" (Zr, Sr) components were

several orders of magnitude lower yet. The substantial shift in nitrate diffusivity between the first and later leach intervals indicates that ~90% of it had been "microencapsulated" within sodalite/cancrinite cages – the remainder leached as it would from conventional grout.

Table I: ANS/ANSI 16.1 Leach Test Performance

Today's most popular HLW leach test is the "product consistency test" (PCT)[27] because it is relatively simple and quick to do. Since it involves a week-long exposure of finely powdered sample material to a relatively small amount (10 x as much) of hot (90°C) water, it generates an estimate of the material's gross solubility under conditions apt to cause saturation. Table II compares several "representative" radwaste-type glasses[28] with several HCs with respect to dissolution of their most soluble common component, sodium. For "easy" components such as ^{90}Sr, the HC's would have outperformed the glasses by a greater margin.

Table II: Comparison of HCs with glasses on the PCT test

Most of the attention now being paid to INEEL's reprocessing wastes is focused upon the <10% which had not yet been calcined by the time (1991) ICPP/INTEC lost its reprocessing mission – and which still hasn't been. Because this "sodium bearing waste" (SBW) contains a higher proportion of thermally-stable alkali nitrates (which melt but don't decompose at practical calcination temperatures) than did the other liquid waste streams, it cannot be efficiently processed in the existing calciner unless a reducing agent (e.g., sugar) is first dissolved in it[7,8] - an option that DOE-ID has rejected. Table III gives the results of a TCLP (EPA Method 1311, SWP 846) leach test applied to an HC made with a sugar-calcined SBW simulant that had been doped with unrealistically high levels of several RCRA metals. The simulant was calcined as follows: After 38 grams of sucrose per mole of nitrate had been dissolved in the liquid, it was then slowly added to a stainless steel beaker situated on a maximum-temperature hotplate. Then that beaker was placed into a muffle furnace preheated to NWCF's normal operating temperature (500°C) to burn out residual elemental carbon. The HC formulation consisted of 30 wt % of this calcine, ~1% sodium sulfide, a small amount of household lye to provide "free" hydroxide (the sodium in the calcine itself was present as a ~1:2 mix of sodium aluminate plus sodium carbonate), plus sufficient water to make a "stiff" modeling clay-like dough. This was rolled into a ball, wrapped with tin (not aluminum!) foil, and than autoclaved for two hours at ~200°C. Table III lists regulatory limits along with the concentrations of "characteristic" metals in both the calcine and the TCLP leachate.

TABLE III: TCLP Results: Sugar-calcined "sodium bearing waste" specimen

HYDROCERAMICs vs "REGULAR" GEOPOLYMERIC CONCRETES

Hydroceramics are geopolymeric[1] concretes designed to minimize solubility of the "aggregate". In order to achieve the quick-set characteristics needed for construction work, commercial geopolymeric cements are usually activated with alkali polysilicate(s), not with alkali hydroxide(s) and often contain substantial proportions of CSH-forming components (e.g., granulated blast furnace slag) too[29]. Table 4 compares PCT leach performance of three "geopolymeric" concretes (same formulation, different curing conditions) activated with sodium silicate and a similar "hydroceramic" activated with hydroxide alone. The waste simulant represents the soluble fraction of the caustic-neutralized liquid waste present in tank #44 at DOE's SRS site [~11.5 M sodium hydroxide, 1.5 M sodium nitrate, 1.13 M sodium nitrate, 0.4 M sodium aluminate, 0.2 M sodium carbonate, plus a trace of cesium chloride.] A 10:1 mix of "Troy clay" plus powdered vermiculite was used for all of them. 1.1 grams of a 37% NaOH was added to the "hydroceramic" formulation (10 grams of the clay mix plus 5 grams of the simulant). The "geopolymeric" formulation (11 grams of the clay mix plus 5.06 grams of the waste simulant) was activated with 2.5 grams of liquid sodium silicate ("water glass", ~38% solids, SiO_2:Na_2O wt. ratio of 3.22:1). While the physical characteristics of all of the concretes appeared to be identical, the leach results indicate that polysilicate does not reform clay into salt-fixing minerals as effectively as does hydroxide alone. Because of their

excellent durabilities and chemical compatibility with HCs, the best use for conventional geopolymeric cements in this context would be as construction and/or backfill materials.

TABLE IV: PCT leachability of geopolymeric vs hydroceramic concretes

These leach tests indicate both that the chemical durability of HCs is equivalent to that of vitrified materials and that the leaching of individual constituents is not determined by congruent matrix dissolution. Single-phase waste form materials such as "WV-39-2" glass tend to release everything at the same concentration-normalized rate – HCs do not. Like many rocks, HC concretes consist of assemblages of physically interlocked crystalline minerals possessing differing intrinsic solubilities. Due to the rapid, batch-nature of the process used to make them, the porosity (~15-25 %) and BET surface areas (~15 m^2/g) of HCs are more like those of conventional concretes than natural rocks or glasses. HCs match the performance of glasses on leach tests because their lower intrinsic solubility compensates for their greater surface areas. Because the cation fixation sites in conventional grouts tend to be saturated with calcium ions (portland cement is ~65 wt% CaO), HC's generally outperform them with respect to the leachability of "easy stuff" too (e.g., ^{90}Sr). This may also explain why the MCC-1 leachability of Cs from HCs is about ~ 2 orders of magnitude lower than it was from the original FUETAP formulations[23].

SUITABILITY AS A DISPOSAL FORM

The US federal government's decision to confound disposal of its own waste with that produced by the commercial nuclear power industry constitutes another reason why it has failed to honor its promises to people living near its reprocessing facilities. Due to DOD insistence that DOE's civilian waste management responsibilities not interfere with its interests as NPS[6,39,251,252], the federal government chose to "withdraw" another ~600 km^2 of land from Nevada for today's official HLW repository modeling exercise (YM). This plus its assertion that *all* commercially-produced HLW is to be sent there plus the fact that the exact consequences of hypothesized future floods at YM are impossible to predict (YM is a heterogeneous assemblage of different types of brittle rock situated in a seismically active region) will continue to engender enough confusion/litigation/paperwork/excuses to indefinitely stall implementation of this repository too – which is why linking these two problems engenders total paralysis. The most reasonable place for the federal government to site a repository dedicated to its cold-war defense-type waste is at its cold-war defense-type test range, the Nevada Test Site (NTS). The NTS makes good sense because, a) it's already "federal land" (no new "withdrawal"-required), b) it receives less precipitation than do other DOE sites, c) it possesses the USA's deepest water table, d) it has already been the object of over thirty years worth of immediately relevant hydrological research[14-15], e) it has already been irredeemably "crapped up" by ~950 nuclear "events", and, finally, f) a little-publicized example of a practical repository (~$300/$m^3$ disposal cost) for this sort of waste has already been implemented there and then exhaustively tested[16,17]. However, it is *not* necessary for DOE to wait for a repository siting decision to render INEEL waste road-ready – regardless of exactly *where* in the Great Basin region this waste might eventually go, HC waste forms would probably prove to be more durable than glasses because their mineralogical similarity to surrounding soils/rocks would provide less thermodynamic driving force for alteration.

OTHER CONSIDERATIONS

The inventors of the original FUETAP process addressed the "radiolytic pressurization" bugaboo by proving that only the chemically uncombined water in concrete serves as a potential source of radiolytic gas[25]. Consequently, the porewater in HC concretes would also be baked out before the canisters were sealed. [Sellafield's "historic waste" solidification facilities sidestep this issue by venting their canisters through tiny filters.] Due to local stakeholder insistence that DOE-ID pay *some* attention to HLW management scenarios which would render all of the waste road-ready (not just "volume-reduced" fractions), several paper-engineering studies of the HC solidification process have been commissioned since 1996[30,31]. However, because no programmatic funding was allocated for laboratory or pilot plant studies, the process' main liability is "immaturity" – the same handicap that demoted FUETAP to "runner up" status in a independent review of solidification technologies for INEEL twenty years ago[32]. While it is reasonable to assume that an HC process could be implemented in a straightforward fashion, some

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important questions need to be answered before a real facility is designed. For example, "would a few month's worth of curing at the ambient-pressure boiling point of water at INEEL (zero gauge pressure) make an HC concrete comparable to one produced within two hours in a 200 psi autoclave?" If the answer is "yes", the process would be safer/simpler/cheaper to implement.

CONCLUSIONS

The "hydroceramic alternative" is especially attractive at INEEL for these reasons:

1) INEEL has not yet officially committed to vitrification.
2) Because INEEL calcines do not contain excessive concentrations of soluble salts, it would be possible to satisfy the "sodalite formulation" rule-of-thumb with high waste loadings.
3) Since two of the three elements making up HC binder phases (Na & Al) are high-percentage constituents of INEEL calcines, there is no need to separate them (or anything else) prior to solidification. This means that everything would be prepared for offsite disposal – the promise made to INEEL stakeholders. {A primary goal of the "volume reduction" practiced at WVDP and SRS is to transfer those elements to "low level" fractions.}
4) Straightforward changes to the existing calcination facility would permit it to efficiently calcine the remaining liquid waste[6,7] – either alone or (preferably) after it has been slurry-mixed with existing calcines[21]. The latter scenario would consolidate all INEEL reprocessing wastes into a single, relatively homogeneous, feedstream ideally suited for HC solidification.
5) It would also be a good way to deal with other INEEL wastes. For example, INEEL must find some way to dispose of ~1000 metric tons of radioactive NaOH generated by reacting metallic sodium reactor coolant with water. Since this just happens to be the amount of "activator" required to turn ICPP/INTEC's calcines into HC-type concrete, coprocessing them would solve both problems. If the changes to the existing calcination facility alluded to above were to be implemented, virtually any sort of liquid or particulate waste (e.g., contaminated soils) could also be accommodated.
6) It is probable that a formal proposal to implement an HC-type solidification process would satisfy INEEL stakeholders[12,35].
7) Finally, if a future generation of US taxpayer deems it to be both politically expedient and affordable, HC-type concrete monoliths could be hot-isostatically-pressed into "vitrified" monoliths without removing them from their original canisters[34-36].

Two months ago, DOE released a five-volume Draft Environmental Impact Statement (DEIS) describing proposed management scenarios for INEEL HLW[37]. Unfortunately, "command influence" has rendered this document useless as a tool for decision-making. For example, its authors were told to assume a "disposal fee" of $850,000/m^3 for any "high level" waste firms produced – which, of course, constitutes an overwhelming bias for schemes which invoke "volume reduction" of already-calcined waste. Let's look at numbers: if INEEL's 320 MTHM's worth of reprocessing waste (which represents 0.46% of YM's "capacity") were to be converted to 13,000 m^3 of HC-type concrete via the "Direct Cement Waste Option", DOE would charge US taxpayers $11 billion for disposal; if the same waste were to be dissolved (which would require about 200,000,000 gram-moles of nitric acid), chemically separated, and converted to 470 m^3 of high-level glass and 30,000 m^3 of low-level "grout" (the "Full Separations Option")", DOE would charge them *only* ~$400 million for the same service.

The National Research Council released its review[38] of INEEL's HLW management program one month before the DEIS was issued. While the NRC report again challenges the validity of many of DOE's assumptions, it eventually concludes that, under the present circumstances, it would be "best" to abrogate the latest promises made to Idaho; i.e., to not calcine the remaining liquid waste and to just let the existing calcines decay away in the binsets for a few hundred more years.

In this writer's opinion, that's precisely the conclusion that DOE had been hoping for. It is also unnecessarily defeatist because if DOE were willing to eschew some of its "symptoms"[4], it could keep those promises. "Sugar calcination" of SBW was discovered at Argonne National Laboratory in the late 1950s and tested in INEEL pilot plants 35 years ago[7] and, again, in a lab-scale system, 4 years ago. The

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same approach was reinvented, pilot-plant tested, & then heartily recommended by Hanford subcontractors in 1995[8]. BNFL routinely implements sugar-calcination of SBW in its rotary calciners at Sellafield. Its virtues relative to the "high temperature" (~600°C) approach espoused by DOE-ID include: the bulk of the nitrate is converted to elemental nitrogen rather than to toxic (& visible) NO_x, one third as much of the solid-forming "cold" additive (aluminum nitrate) is required, a lower percentage of troublesome "fines" are produced (they tend to plug the offgas system), and calcination of the remaining waste would take half as long and produce half as much calcine. In light of this, DOE-ID's arbitrary rejection of sugar calcination because of "safety considerations" simply suggests that it does not want to keep its promise. Similarly, its refusal to devote programmatic research funding to the alternative solidification technology described in this paper (and also, inaccurately, in its DEIS) suggests that the federal government is no more committed to rendering INEEL's calcines road-ready now than it was twenty years ago.

Because radionuclides have finite lifetimes and US reprocessing waste will never pose an *immediate* hazard to the public-at-large, it will always be possible for the federal government to make a plausible *technical* case for more "temporary delay". Management of this waste is not a purely "technical issue" because it also involves "people issues" such as missions, money, promises, careers, ethics, and institutional credibility. The viability of the US nuclear power industry requires tangible proof that the federal government's waste management bureaucracy is willing to deal with its own garbage.

ACKNOWLEDGMENT

Without the technical input of my colleagues at Pennsylvania State University's Materials Research Laboratory, Professors Barry Scheetz, Michael Grutzeck, and Della Roy, the "hydroceramic alternative" would not have been developed. Without the vision provided by that institution's founder, Professor Rustum Roy, the need for it would not have been realized.

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Figure 1: MCC-1 Performance of an HC vs Glasses and a HIP Glass-Ceramic

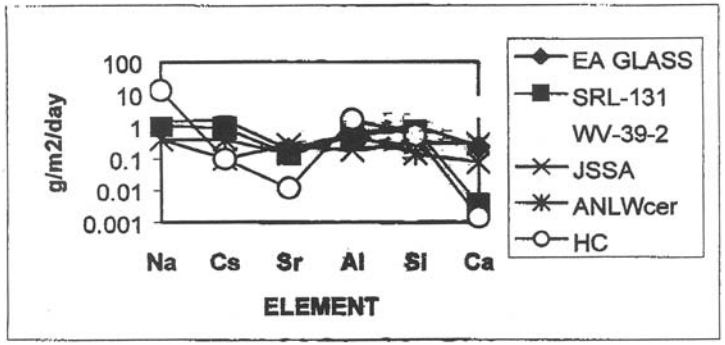

Table I: ANS/ANSI 16.1 Leach Performance*

Interval	Sodium		Cesium		Zirconium		Strontium		Chromium		NO_3^-	
(hrs)	ppm	-logD	ppb	-logD	ppb	-logD	ppb	-logD	ppm	-logD	ppm	-logD
2.83	32	9.55	<2	>13.8	33	15.3	3	14.1	0.28	10.6	23	8.3
5.7	20	9.7	<2	>13.5	68	14.4	2	14.1	0.21	10.6	5	9.3
15.3	28	9.8	<2	>13.9	140	14.1	7	13.5	0.076	11.8	2.3	10.4
19.5	13	10.3	<2	>13.7	<10	>15.3	1	15.0	0.05	11.1	0.9	11.1
22	22	9.8	<2	>13.9	100	14.2	6	13.4	0.03	12.4	1	10.9
35.8	21	10.1	<2	>13.5	<10	>15.4	1	15.2	0.02	13.0	1	11.1
25.5	15	9.9	<2	>13.7	<10	>16.0	3	14.2	0.02	12.6	0.4	11.5
36	14	10.2	<2	>13.7	<10	>15.2	1	14.9	0.01	13.4	0.9	11.0
LI	9.9		13.7		>15.4		14.3		12.0		10.4	
Total % Leached	8.26		<0.0099		<0.0025		0.015		1.2		10.5	

the <> figures in this table are based upon detection capabilities of the analytical instrumentation: ICPAES for all metals except Cs, graphite furnace AAS for Cs, and ion chromatography for nitrate

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Table II: Comparison of HCs and glasses on the PCT test

MATERIAL	% Na_2O	mg/l Na in leachate	% Na dissolved
EA GLASS	16.9	1720	13.7
PUREX GLASS	12.1	941	10.4
SRL-131	12.9	931	9.7
HC#1 $NaAlO_2$/NaOH/TROY clay	16.7	718	5.8
HC#2 NaOH, $NaNO_3$ (25% of Na)/TROY clay	12.6	513	5.5 (2.6% of the NO_3^- had also leached)
HC#3 38% alumina calcine/NaOH/DEA/TROY clay	13.1	554	5.7
HC#4 46% zirconia calcine/NaOH/TROY clay	12.4	558	6.1
HC#5 30% sugar-calcined SBW/TROY clay*	12.6	925	9.9
HC#6 NaOH/ Englehard Metakaolinite, 9-hr cure @ 200 °C	16.3	259	1.9 (ANSI 16.1 LI_{Na} = 11.6)

* This particular HC violated the "sodalite composition" rule of thumb - too much carbonate

TABLE III: TCLP Results: Sugar-calcined "sodium bearing waste" specimen

Analyte	Found(ug/g)	Limit (ug/g)	Calcine (ug/g)
As	<0.002	5	10.8
Ba	0.35	100	48
Cd	0.13	1	1372
Cr	0.023	5	950
Hg	<0.01	0.2	<0.01*
Pb	<0.1	5	1500
Se	<0.002	1	6.9
Ag	<0.1	5	1510

* Mercury was not added to the liquid simulant because it would have been lost during subsequent calcination. In a properly-implemented real calcination system, mercury would be recovered from the off gas.

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TABLE IV: PCT* leachability of geopolymeric vs hydroceramic concretes

	Hydroceramic	Geopolymer	Geopolymer	Geopolymer
Cure Conditions	200°C, 2 hours	200°C, 2 hours	90°C, 4 days	~20°C, 4 days
pH of leachate	10.7	11.3	11.7	12.3
% Na leached	7.1	9.6	21	52
% Cs leached	0.086	0.060	0.18	2.0
% nitrite leached	26	36	51	71
% nitrate leached	14	46	57	71

*samples crushed to pass 100 mesh screen (150 micron)- no lower size limit, powders leached with 10x as much 90°C distilled water,

ACIdoc

HLW & FD EIS PROJECT - (AR) PF
Control # DC-81

Dennis Donnelly
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Pocatello ID 83201

March 12, 2000

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Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563
Attention: Public Comment: Idaho HLW & FD EIS

Mr. Wichmann,

Please accept this as my formal written commentary on DOE/EIS-0287D, the Idaho High-Level Waste and Facilities Disposition Draft Environmental Impact Statement dated December 1999.

A fully acceptable solution to the problem of what to do with radioactive waste has never been implemented or even discussed. I will here present my thoughts on the subject.

A. Repository Location

81-1
X1 (7)

Because waste radioactive materials must be isolated from the biosphere and because water transport is the principal mechanism for migration (after carefully excluding tectonic activity), a truly dry location with no access to a water table must be chosen.

The current U.S. repository sites fail to meet the dual site-selection criteria: no tectonic activity and no water. In fact, no U.S. locations at all meet both these criteria. Have you seriously considered locations outside the United States? I would like to point out that according to the global seismic hazard map on the web at http://seismo.ethz.ch/GSHAP/ there are large regions in Africa that appear to be low seismic risk and presumably quite dry. In fact a line all the way across that continent at 20 degrees north latitude appears free of seismic hazard. I suggest serious negotiations (and serious resources) be engaged in this region for repository selection, characterization, and implementation.

I feel the Yucca Mountain site is totally unacceptable as a high-level waste repository due to the tectonic hazard there. The close proximity, geologically, to the phreatic eruption site at Ubehebe Crater in Death valley shows what I mean. This class of volcano has the potential to blow hundreds of cubic miles of earth into the sky, as it did just up the road, at the Crowley Lake / Mammoth Lakes area on the east side of the Sierra Nevada.

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B. Waste Form

81-2 III.D.2.c(4) The physical/chemical structure of radioactive waste to be disposed of must meet demanding criteria of long-term stability and non-dispersability to ensure its safety in transport and disposal site. DOE has considered glass and concrete forms, but glass is not as stable as it needs to be: in a radiation environment, glass becomes friable and tends to break down into dispersable fine powder. So does concrete, even without radiation.

81-3 III.D.4(2) Have you considered crystalline silicon? Silicon is abundant in the earth's crust, and when high purity is not required, need not be too expensive. When molten, silicon is practically a universal solvent, meaning it could dissolve every piece of radioactive material you have. When it solidifies, even with dissolved impurities, it forms a stable permanent material. Large amounts of dissolved impurities would tend to be concentrated at the boundaries between the microcrystals upon cooling to a solid, and thus be subject to leaching over time, but this can be prevented by site selection which excludes water. Waste bearing silicon ingots should be mechanically stable over geologic time periods, period. Silicon crystal conducts heat very well.

Furthermore, the silicon approach is one which should remove the need to characterize all the different types of radioactive waste into separate classifications and treat them separately. All the waste should just go into the silicon ingots and thence to a safe repository.

81-4 II.A(2) I seriously ask that you leave NO radioactive wastes in Idaho or elsewhere in America, we just have no place for it that is long-term safe. So I request that you dig up, process into silicon ingots, and remove all the radioactive materials at the Idaho NRTS/INEL/INEEL site.

81-5 III.D.2.c(6) I request that you create a fully contained, mobile furnace that could safely create stable ingots from the radioactive waste here, and then move this furnace to the other sites and repeat the same process there. A containment structure to fully contain, filter and reprocess the offgases should be the only nonmovable structure involved. The EBRII dome could do this job.

Dennis Donnelly

Dennis Donnelly

CC: Blaine Edmo, Fort Hall Tribal Council
Anne Minard, Idaho State Journal

HLW & FD EIS PROJECT - (AR)PF
Control # DC-82

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
500 NE Multnomah Street, Suite 356
Portland, Oregon 97232-2036

IN REPLY REFER TO:

RECEIVED APR 21 2000

April 14, 2000

ER 00/0062

Mr. T.L. Wichmann
U.S. Department of Energy
Idaho Operations Office
ATTN: Idaho HLW & FD EIS
850 Energy Drive, MS 1108
Idaho Falls, Id. 83401-1563

Dear Mr. Wichmann:

On March 14, 2000 the Department of the Interior (Department) sent you a letter, regarding the Draft Environmental Impact Statement for the Idaho High-Level Waste and Facilities Disposition, Idaho National Engineering and Environmental Laboratory (INEEL), Butte, Jefferson, Bingham and Bonneville Counties, Idaho, in which we stated that we did not have any comments to offer. Since that letter was sent the Department of Energy (DOE) extended the comment period and the Department is now providing the following comments for your use in preparing the Final Environmental Impact Statement. The March 14, 2000 no comment letter should be disregarded.

The Department has the following concerns regarding the air quality impact assessment for Yellowstone and Grand Teton National Parks (NP), and Craters of the Moon National Monument (NM), areas protected as Class I under the Clean Air Act:

82-1 VIII.B(2) 1) DOE should use the EPA CALPUFF modeling system at least in the "screening mode" to address impacts tc Class I increments and the NAAQS at Yellowstone and Grand Teton NPs.

82-2 VIII.B(2) 2) DOE should use the CALPUFF modeling system to address total deposition of sulfur and nitrogen to the three Class I areas.

82-3 VIII.B(2) 3) DOE should address far field visible haze impacts at the three Class I areas.

82-4 VIII.B(2) 4) All dispersion modeling for NPS areas as well as all other areas should use the on-site surface meteorological data with concurrent NWS upper air data.

B. Waste Form

81-2 III.D.2.c(4) The physical/chemical structure of radioactive waste to be disposed of must meet demanding criteria of long-term stability and non-dispersability to ensure its safety in transport and disposal site. DOE has considered glass and concrete forms, but glass is not as stable as it needs to be: in a radiation environment, glass becomes friable and tends to break down into dispersable fine powder. So does concrete, even without radiation.

81-3 III.D.4(2) Have you considered crystalline silicon? Silicon is abundant in the earth's crust, and when high purity is not required, need not be too expensive. When molten, silicon is practically a universal solvent, meaning it could dissolve every piece of radioactive material you have. When it solidifies, even with dissolved impurities, it forms a stable permanent material. Large amounts of dissolved impurities would tend to be concentrated at the boundaries between the microcrystals upon cooling to a solid, and thus be subject to leaching over time, but this can be prevented by site selection which excludes water. Waste bearing silicon ingots should be mechanically stable over geologic time periods, period. Silicon crystal conducts heat very well.

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82-4 VIII.B(2) 4) All dispersion modeling for NPS areas as well as all other areas should use the on-site surface meteorological data with concurrent NWS upper air data.

The proposed Idaho National Engineering and Environmental Laboratory (INEEL) Idaho High-level Waste & Facilities Disposition would be located 23 miles (37 kilometers (km)) east of Craters of the Moon National Monument (NM), 93 miles (150 km) southwest of Yellowstone National Park (NP) and 95 miles (153 km) west southwest of Grand Teton NP, all are Federal mandatory Class I areas administered by the National Park Service (NPS). The DEIS examines impacts from the proposed nine alternatives only to Craters of the Moon NM, but not Yellowstone or Grand Teton National Parks. Because several of the proposed alternatives exceed the significant emission rate of pollutants regulated under the Clean Air Act, the Department recommends that the impacts from the criteria pollutants to these two parks also be addressed in the DEIS.

82-5
VIII.B(2)

DEIS should address the impacts of three pollutants on Yellowstone and Grand Teton National Parks, specifically addressing impacts from the proposed alternatives whose emissions would exceed:

- Greater than 40 tons per year (TPY) of sulfur dioxide (SO_2)
- Greater than 40 TPY of nitrogen oxides (NO_x)
- Greater than 15 TPY of particulate matter (PM_{10})

82-6
VIII.B(2)

The impact analysis should include a state whether the alternatives would be in compliance with the National Ambient Air Quality Standards (NAAQS) and Class I PSD increments for each of the alternatives that will emit pollutants. The INEEL impact analysis should follow the guidance found in the EPA document Interagency Workgroup on Air Quality Modeling (IWAQM) Phase 2 Summary Report and Recommendations for Modeling Long Range Transport and Impacts (EPA-454/R-98-019, December 1998). This EPA guidance recommends that the EPA CALPUFF model be used either in the screening mode or in the refined mode when modeling long-range transport beyond 50 km. The EPA no longer recommends the model used in the DEIS, Industrial Source Complex Short Term (ISCST3) model, to analyze air quality impact analyses at distances beyond 50 km.

82-7
VIII.B(2)

82-11
VIII.B(2)

82-8
VIII.B(2)

The DEIS should also examine the impacts at the Class I areas to air quality related values (AQRVs) such as visibility and acid deposition to lakes, from the proposed alternatives with significant emissions. The DEIS does contain a coherent near field visibility analysis using the EPA VISCREEN model for Craters of the Moon NM. This analysis indicates that there will not be a coherent plume impact from any of the alternatives at Craters of the Moon NM. The Department requests sources locating greater than 50 km from its Class I areas conduct a far-field visible-haze analysis instead of a plume analysis. A far-field visible-haze analysis needs to be performed for the impacts from the alternatives to both Yellowstone and Grand Teton NPs. The far-field haze-visibility analysis should follow the procedures described in the IWAQM Phase 2 report. Since the distance from the INTEC area of INEEL is greater than 50 km from the western portion of Craters of the Moon NM, a far-field visibility analysis also needs to be performed for the monument. The NPS will provide DOE with the background extinction values for the three Class I areas to be used in the far-field visibility analysis.

82-9
VIII.B(2)

The Department also requests that the DEIS analyze the impacts of acid deposition to lakes at Grand Teton NP from the different alternatives with significant emission rates of criteria

pollutants. The generalized descriptions found in Chapter 5 of the DEIS are inadequate for the Department to make an informed decision regarding acid deposition impacts. The Department requests that the deposition analysis contain the impacts of total nitrogen (N) and total sulfur (S) from the various alternatives. The INEEL analysis should follow recommendations found in the EPA IWAQM Phase 2 report. Background information to assist DOE in addressing deposition impacts to Grand Teton NP can be found in the NPS document, Assessment of Air Quality and Air Pollutants Impacts in National Parks of the Rocky Mountains and Northern Great Plains, August 1998, NPS D-657.

82-10
VIII.B(2)

The Department recommends changing the source for the meteorological data used in all of the DEIS's modeling analyses for both near- and far-field. As described in Appendix C.2 of the DEIS, the air quality analyses applied two years of on-site surface meteorological data and climatic averaged upper air data to calculate the impacts from the nine different alternatives of the proposed project. The Department believes that using "climatic averaged" mixing heights is not appropriate for a project of national importance, especially considering the inexpensive cost of computing resources today. The Department recommends that DOE should purchase, for a few hundred dollars, concurrent National Weather Service (NWS) upper air data which is available through the National Climatic Data Center in Asheville, North Carolina. We believe that the concurrent Salt Lake City mixing height data would be most representative, but defer this opinion to the recommendations of the State of Idaho and the U.S. EPA.

We thank you for the opportunity to comment on this DEIS. The NPS Air Resources Division (ARD) is available to provide technical assistance to DOE for any of the Class I issues. For further information, or to set up a meeting, please contact John Notar of the NPS ARD at (303) 969-2079.

Sincerely,

Preston A. Sleeger
Regional Environmental Officer

Coalition 21 Coalition 21
Phone: 208-528-2161
FAX:
email: facts@srv.net

April 11, 2000

HLW & FD

EIS PROJECT AR/PF
Control # DC-83

U.S. Department of Energy
850 Energy Drive
Idaho Falls, Id. 83401

Attention: John Medema
HLW DEIS Comments

Dear Mr. Medema,

GENERAL COMMENTS

COALITION 21 has reviewed the Department of Energy's (DOE) "Idaho High Level Waste (HLW) and Facilities Disposition" Draft EIS document. The Coalition thanks DOE for extending the deadline for comments to allow time for more adequate review before submitting our comments. This proposal is undoubtedly the most complex project for the public to review, as well as being challenging for the INEEL technical personnel to produce.

Coalition 21 is a major group of public minded citizens from across the State of Idaho. IT includes many Idaho citizens who have technical knowledge and expertise in science and engineering. We have reviewed the DEIS, and its supplementary cost documents. The Coalition has also reviewed the recent National Research Council's "Alternative High Level Waste Treatment" document as well as a number of other papers and documents relative to this subject.

While The Coalition commends the DOE for the effort that went into the preparation of the document, we have a number of concerns and hopefully constructive criticisms about the resulting DEIS. We feel that a number of potentially viable alternatives have not been considered, nor were there explanations for their exclusion. Thus, many of our comments are expressed as questions that need considered, fact based, and responsive answers from DOE.

83-1 III.D.4(6)
83-2 IX.C(1)

An additional general concern of the Coalition is that recent actions by some members of the public, both instate as well as out of the State of relative to INEEL cleanup of wastes demonstrates the need for the DOE to go even further in assuring the safety, viability, and practicality of any proposed process or option.

83-3 VIII.G(7)

SPECIFIC COMMENTS RE: "IDAHO HIGH-LEVEL WASTE: DOE/EIS-0287D"

83-4 X(14)

1. Why does the DOE believe that a treatment cost of ~$.85 - 4 million dollars/cu. m. provides a realistic cost-effective solution to the handling of high-level wastes? An EIS is not required to consider costs. However, DOE needs to provide the public, as well as their congressional

represent- atives, a realistic cost-inclusive evaluation of the proposed alternatives to justify possible funding. Fig. S-1 of the DEIS supplementary "Cost Analysis" document DOE/ID 10712, shows a range of $3 - 6.5 billion for just treatment and storage of the 11 different processing alternatives discussed. These costs along with additional minor transportation and major (though questionable) disposal costs, results in total costs of ~$850,000/cu.m. All alternatives, except the "No-action" alternative and the "Continued Current Operation" would require peak accrual funding of approximately 2-8 times the current funding levels. It is totally unrealistic to think that either the Congress or the public would accept a funding level this high.

We strongly suggest that DOE develop some "fiscal common sense" in support of its proposals. This is the subject of a paper to be published in the spring 2000 issue of Nuclear Technology. This very worthwhile paper is entitled "Alternatives to High Level Waste Vitrification; the Need for Common Sense." The author is Jimmy Bell. DR. BELL estimates remediation costs for vitrification of site-wide DOE defense wastes will run from $2-4 Million/cu. m. or costs of $75 Billion for the INEEL, Savannah River & Hanford wastes. Will the public tolerate this huge and largely unnecessary expense? He (and we) think not. Compare these ridiculous figures: a US annual budget of say $2 trillion, against what would have to be an annual DOE request of $807 million for INEEL. The current annual INEEL cleanup budget is ~ $51 million.

83-5 VII.D(6)

2. How does DOE reconcile this DEIS with the implementation of the 1995 Idaho Settlement Agreement? This agreement between the Federal Government and the State of Idaho calls for calcining all of INEEL's reprocessing wastes by 2012. Four alternatives of the proposed in the DEIS do not use calcining. Also, four options (exclusive of the "No-Action" and "Continued Current Operation options) allow the on-site storage of wastes. Two of these are for grouting waste in storage tanks. These would have to be permanent storage at the INEEL options which are not permitted by the Agreement.

83-24 VII.D(2)

It is our understanding that this DEIS was supposed to be a cooperative report by the DOE and The State. Has secured the State Of Idaho's concurrence in or approval of these proposed options/alternatives? If not, it appears that legally-binding changes would be required to the original Settlement Agreement. If no changes to the Agreement are contemplated, what are DOE's alternative plans for resolving these issues? Decision makers and the public need and demand to know DOE'S plans for dealing with such issues.

83-6 III.D.4(6)

3. Why has DOE created some artificial and unnecessary barriers to full consideration of options for dealing with HLW? These barriers unnecessarily closed out some alternatives/ options and/or abnormally raised costs of some other options. The DOE should describe the rationale for not evaluating the environmental consequences and costs for a number of cases including the options described in: non DOE scientific and engineering journals; conference proceedings; the recent National Research Council (NRC) report on the INEEL's HLW program; the NRC reviewer's suggestion that DOE-ID accept STUDVIK's bid to replace the NWCF with a brand new MACT-compatible calcination system; and, NRC's suggestion that disposal is an incremental cost and should not dominate decision making. STUDVIK's bid had all the emission controls to meet the new EPA clean air requirements ... at a total cost less than half the estimated cost to modify the existing calciener.

83-7 VIII.A(2) One additional artificial barrier for making rational assessments of HLW is focusing on worst-case bounding scenarios without also including best engineering estimates of radiological doses to the public. Such a negative focus gives a distorted and unrealistic perception to the public: one that impairs the public's ability to make intelligent, facts-based evaluations of the issues and their attendant risks.

83-9 III.F.2(6) 4. Why are the of the INEEL's site-wide defense high level wastes (& low level for that matter) not being sent to the Nevada Test Site (NTS)? Defense wastes are entirely different materials from (the so-called) 'spent' nuclear fuel (SNF) and they should be kept separate from them. NTS is the best repository for defense wastes because:

a. It is already "federal land"
b. It has already been contaminated from nuclear weapon tests.
c. It has already been the subject of over 30 years of relevant hydrogeological research.
d. Tests have already been performed there, demonstrating disposal of nuclear wastes.
e. DOD could not object to disposal of defense wastes at the NTS as they did earlier to SNF.

83-10 XI(7) Irradiated commercial SNF is a future potential energy source, since only about 3% of the original fuel's available energy has been utilized. The Integral Fast Reactor (IFR) technology and its associated electrometalurgical technology has been proven effective. It is capable of utilizing most of the available remaining energy in SNF without a proliferation risk. This cutting edge technology also dramatically reduces the amount of final wastes with long-lived radioactive elements that need a final repository.

83-11 III.D.4(8) 5. Why didn't DOE give more consideration to the early NAS study which concluded that some sort of cementation process to solidify wastes would probably prove to be more practical (and affordable) than vitrification? In 1980, A panel of eminent scientists evaluated ICPP's HLW operations. The panel ranked ORNL's new FUETAP cementation process higher in merit than vitrification. The existing US defense reprocessing wastes are hundreds of times less radioactive and a much higher volume than the HLW produced in modern French/British reprocessing plants. Therefore, the choice of these nations to vitrification of the small amounts of their highly radioactive (thus real HLW) is not a directly valid reason for vitrification of US defense wastes. To the contrary, Britain has recently converted virtually all (>20,000 cu.m) of its 'historic' reprocessing wastes into road-ready/shipment form by cementitious technology. This British disposal program handled everything up to 500 W/cu.m total radioactivity, contrasted to INTEC calcine's ~40 W/cu.m. This proved that cementitious disposal of HLW can and should be done.

83-12 III.C(2) 6. Why did DOE reject the option of sugar calcination? Fluidized bed sugar-calcination of SBW was successfully tested on a pilot-plant scale at INEEL 35 years ago. and tested again on a smaller scale only four years ago. The technology was "rediscovered" at Hanford in 1995. and BNFL now routinely implements this beneficial use of sugar with rotary calciners in England. Using sugar in calcining supports reducing the nitrates to elemental nitrogen, rather than to toxic (and visible) NOX. Sugar/calcining also reduces the amount of additional "cold" aluminum nitrate nonahydrate ANN with the ANN'S attendant added cost and doubling the quantity

of calcine produced. Such facts should be compelling arguments for using sugar. The higher temperature proposed for the extra ANN method also could conceivably raises public concerns concerning stack emissions. This consideration again raises the STUDVIK question (item 3).

83-14 III.F.1(3) 7. How did DOE utilize the two Sandia National Laboratory's performance assessments of Idaho's HLW waste problems? The second of these (assuming a Yucca Mountain-like repository and that NRC 19 CFR 60 & EPA40 CFR-191 HLW regulations would apply) concluded that a competently-sited repository would adequately retain radionuclides. Such a repository would do this regardless of the characteristics of the waste form itself. This suggests that Idaho calcine could be directly disposed of without additional chemical treatment (full & TRU separations options), which would drastically reduce overall costs.

83-15 III.F.2(1) 8. We strongly support the State of Idaho's view that DOE's current method of calculating Metric Tons of Heavy Metal (MTHM) should be changed (see comment #3). Either of the State's methods are much more realistic. Using these more realistic calculations would allow DOE's HLW to be placed within today's proposed repository's "space" allotment.

83-16 III.F.2(2) 9. DOE should freeze the waste acceptance criteria without waiting for proposed design of the repository. This would allow expediting decision's on INEEL waste handling, by eliminating bureaucratic procrastination "OF WE'RE WAITING UNTIL THE DESIGN IS FINALIZED." Acceptance of the waste criteria would make it unnecessary for DOE to wait for a repository siting decision to begin preparing INEEL waste for road-ready shipments.

83-17 III.D.4(3) 10. Dr. Bell's article suggests that The DOE might want to consider using a Dry-Pack process (DOE-RFPC5-980R22516) for INEEL HLW wastes, at a much reduced total cost of <$1.5 Billion. This compares very favorably cost-wise to the $5 billion quoted for the "Full Separation" alternative in the DEIS cost evaluation document - Fig.12.

83-18 III.D.3(1) 11. The separations alternatives have higher treatment costs than non-separations alternatives, and are very likely to have processing complications. The higher disposal costs for non-separation alternatives seem due to exorbitant disposal charges, which brings up questions about the charges based on current MTHM. The higher treatment costs for separations alternatives are primarily due to vitrification. The separations process will also generate additional waste volumes and steps. Note that two of the three separation options leave the low level waste at INTEC, not off-site; such proposals violate the Idaho Settlement agreement.

83-19 VIII.A(8) 12. Each EIS dealing with nuclear matters should provide information regarding the basic natural radiation background. This should include what RADIOACTIVITY is already NATURALLY in the soil, and be identified by isotope and concentration. This would help the average person relate to how a given INEEL operation might affect their natural exposure to radiation.

83-20 VII.D(6) 13. DOE should justify why it has NO preferred alternative at this time, this after having selected "separations" as the preferred alternative in the 1995 INEEL Waste PEIS. We strongly

recommend that DOE select a cost-effective preferred alternative (not necessarily limited to the ones already presented in this DEIS). This alternative must comply with the Idaho Settlement Agreement stipulations to remove and treat the sodium based wastes (SBW), and calcine it so that it is road-ready for shipment out of Idaho by 2035.

83-21 IX.A(4) 14. DOE should provide an estimate of the additional unnecessary cost for the multi-color layout of this DEIS, and of the resulting final EIS. How much of this publication cost could be saved by issuing only the Summary in this way, and printing the rest of the document without the color layouts, as in other DEIS/EISs?

83-22 XI(1) 15. A final comment is based upon an independent evaluation of scientific and technical issues related to environmental remediation of defense waste sites managed by DOE. An NRC (NAS) 1996 report on governmental research and development operations entitled "Barriers to Science" reported a variety of problems. A number of these deficiencies appear to be applicable to the DOE, including:

1. Planning is driven by existing organizational structures, rather than establishing special groups to deal with the problems to be solved.
2. Commitments are often made without adequately considering technical feasibility, cost & schedule.
3. There is often an innate inability to look at more than one alternative at a time.
4. Priorities are often driven by narrow interpretations of regulations rather than regulation's purpose.
5. Production of documents often seems to be an end in itself, rather than a useful means to achieve an organizational or technical goal.
6. There often is a lack of organizational coordination.
7. There is an exclusionary "not-invented-here" syndrome at individual sites.

In summary, there appears to be some slight measures of improvement in some areas and programs of the DOE. However, much of the problems cited above are ingrained in the DOE culture. The DOE should challenge itself to make substantial progress in eliminating or at least reducing the above-noted problems. This is especially necessary for DOE/ID if INEEL is to truly be recognized as the lead laboratory for environmental remediation. And nuclear research.

LAJ: HLW-DEIS rev.5

Very truly yours

R A Kenney

Richard A. Kenney
President Coalition 21

HLW & FD

EIS PROJECT - AR/PF
Control # DC-84

April 18, 2000

TO: Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

FROM: Stephen D. Kruse
1950 South Park Ranch Road
Jackson Hole, Wyoming 83001-9437

SUBJ: Idaho HLW & FD EIS

84-1 IX.A(2) To all the ladies and gentlemen involved in researching and preparing the many documents for the preliminary stages of this Environmental Impact Statement (EIS) process for the Idaho High-level Waste and Facilities Disposition, I would express the thanks of the public you have served. Certainly, your many publications, news articles and public meetings have promoted public awareness. This public awareness, much more than public involvement, seems to have been your most beneficial task.

From the beginnings of my acquaintance with this *Draft* EIS, a personal disclaimer of ignorance and lack of fundamental knowledge was most suggestive in this land of technical giants. Hopefully a few of the questions which come through public comments will steer you more precisely toward your goals. Obviously for the general public, most of our time is devoted to slaying dragons in our own workplaces. Knowledge and experience gives us the ability to make and implement sound decisions. Appropriate, effective and inappropriate solutions for INEEL are not readily seen in a one-day tour.

Thus my comments will be more questions for your consideration and a few comments, as you prepare to slay this beast. If any questions and comments from the general public provoke thoughts, investigations, testing and insights toward your goal, then our public involvement will have had a positive result.

Just what are we trying to do?

Can we eliminate the entire problem here (meaning INEEL)?

If we transport a portion of the HLW to Hanford, are we passing the muck (i.e. buck)?

Can we take care of this problem once and for all? (or are we just making neat containers which must be dealt with at some time in the future, whatever the year?)
If **you** have to deal with this 75 years from now, what would **you** like to see?

How can we deal with this HLW with the least amount of handling?

Can the sodium-bearing liquid waste (SBW) be broken down, or go through some kind of evaporative process to reduce its total volume, rather than adding virgin materials (e.g. dolomite) thereby creating more total waste?

84-2 IX.P(6) Once we decide what we are going to do, procedures must be developed and followed. Follow procedure !!

recommend that DOE select a cost-effective preferred alternative (not necessarily limited to the ones already presented in this DEIS). This alternative must comply with the Idaho Settlement Agreement stipulations to remove and treat the sodium based wastes (SBW), and calcine it so that it is road-ready for shipment out of Idaho by 2035.

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LAJ: HLW-DEIS rev.5

Very truly yours

R A Kenney

Richard A. Kenney
President Coalition 21

HLW & FD

EIS PROJECT - AR/PF
Control # DC-84

April 18, 2000

TO: Thomas L. Wichmann, Document Manager
U.S. Department of Energy, Idaho Operations Office
850 Energy Drive, MS 1108
Idaho Falls, Idaho 83401-1563

FROM: Stephen D. Kruse
1950 South Park Ranch Road
Jackson Hole, Wyoming 83001-9437

SUBJ: Idaho HLW & FD EIS

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Just what are we trying to do?

Can we eliminate the entire problem here (meaning INEEL)?

If we transport a portion of the HLW to Hanford, are we passing the muck (i.e. buck)?

Can we take care of this problem once and for all? (or are we just making neat containers which must be dealt with at some time in the future, whatever the year?)
If **you** have to deal with this 75 years from now, what would **you** like to see?

How can we deal with this HLW with the least amount of handling?

Can the sodium-bearing liquid waste (SBW) be broken down, or go through some kind of evaporative process to reduce its total volume, rather than adding virgin materials (e.g. dolomite) thereby creating more total waste?

84-2 IX.P(6) Once we decide what we are going to do, procedures must be developed and followed. Follow procedure !!

Document 84, Stephen D. Kruse, Jackson, WY
Page 2 of 2

Often the best solution is a combination of solutions. Most of the time just one solution does not take care of everything. Some items go to a Waste Isolation Pilot Plant (WIPP), some to Hanford, most are processed here.

Where is the best place to process HLW?

If transportation is recommended, what is the safest mode of transport?

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84-5 X(6) [A well-written *Cost Analysis of Alternatives* has been published, and while cost is not the most significant factor, a solution so expensive that it is not funded is not a solution. Apparently the No Action option is the only option feasible at current funding levels. Reflect that the future cost of taking no action is often incalculable; if the environment is irreparably damaged, irreplaceable.]

Here again the questions of "What if ...?" and "How do you ...? and "Why do you ...?" come to mind.

84-6 IX.D(6) [Then again if the solutions are clear. Develop a plan, establish procedures, fund, and proceed.]

[Whatever we can do now, do now! Implement other plans as they are formulated and approved.]

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84-8 II.B(1) Under "What if's...?" we need to be mindful of weather, potential seismic influences, i.e. things not within our control; think, plan, prepare.]

For me, I still have much to learn. I wish you well.

Document 85, Ellen Glaccum, Ketchum, ID
Page 1 of 2

HLW & FD
EIS PROJECT - AR
Control # DC85
RECEIVED
MAY 15 2000

Box 1173, Ketchum, ID 83340
April 18, 2000

Thomas Wichmann
DOE
805 Energy Dr - MS 1108
IF, ID 83401-1563

Please include these comments in the official hearing record for the DEIS - Idaho High-level Waste + Facilities Disposition.

I am greatly concerned about this enormous problem and I am pleased that the department is inviting public comments and suggestions. From my reading of the summary document I have the following observations, comments, and suggestions which I feel need to be considered in the final EIS document:

(1.) [The INEL should be cleaned up to the standards described in the "Clean Closure Alternative."] I doubt very much if the DOE will be
85-1 IV.A(1) able to walk away by the latter years of this century — if ever. Plutonium, as we all know, has a half life which is twice as long as scientists estimate human occupation of North America, so [I suggest that DOE, or its successors, should acknowledge today that
85-2 IX.D(2) it's job most likely will never end — somebody is going to have to protect generations in the distant future from plutonium contamination.]

(2.) [Present and future groundwater contamination is a serious problem, considering that
85-3 III.A(1) the health of a major portion of the populace of the state is dependent on the Snake River Aquifer.] You say that iodine-129 levels exceed the standard by 11 times and that strontium-90 levels exceed the standard by 19 times, that Pu is in the ground water and will exceed the standard. You also predict that materials left in place after closure will migrate to the aquifer and "public exposure could occur if people use the aquifer for drinking water and other domestic purposes." Are you serious? What else would the public use an aquifer for? [The DOE must come to terms with the fact that they have seriously contaminated the aquifer already. In my opinion the #1 goal
85-4 III.A(1) of cleanup at INEL should be focused on cleaning up the water contaminants + preventing additional contamination. This is the most important problem and can't wait. How do you clean up a contaminated aquifer? This is even more pressing now that scientists at Los Alamos discovered that Pu travels much more easily and faster through water than had heretofore been believed.]

(3) I understand from reading this document that there seems to be no way that INEL high level waste will be leaving the state any time soon. At best, you are saying that it ~~will~~ might be "ready for shipment out" by 2035. So much for the stupid agreement which, as we all know, only gave the Navy the green light to continue to dump its SNF on the dumb spudheads. You also admit that "it would be difficult to stop using the tank farm by 2012." [Since you have admitted that the agreement isn't worth the
85-5 VII.D(1) paper it was signed on, why not really plan this HLW cleanup schedule correctly and stop having the tail wag the dog?] [For instance, why are you bothering to go through this EIS process to choose an alternative to treat the waste now — before DOE identifies its criteria for the mythical long-term repository? You admit that "the lack of criteria
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(4.) [I see that DOE is up to it's old trick of word fabrication and smoke + mirrors. Let's see, how do we make INEL more acceptable to the
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Document 84, Stephen D. Kruse, Jackson, WY
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[signature]

Document 85, Ellen Glaccum, Ketchum, ID
Page 1 of 2

HLW & FD EIS PROJECT - AR/PF
Control # DC85
RECEIVED MAY 15 2000

Box 1173, Ketchum, ID 83340
April 18, 2000

Thomas Wichmann
DOE
805 Energy Dr - MS 1108
IF, ID 83401-1563

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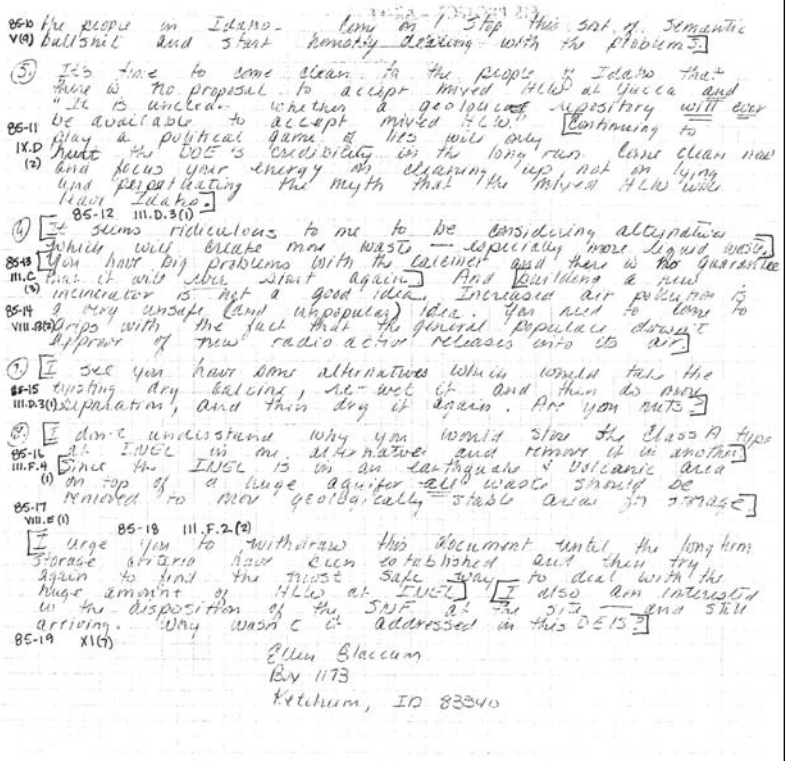

the people in Idaho - Lem's & Stop this sort of semantic
V(9) bullshit and start honestly dealing with the problem.

(5) It's time to come clean to the people of Idaho that there is no proposal to accept mixed HLW at Yucca and "it is unclear whether a geologic repository will ever
85-11 be available to accept mixed HLW." Continuing to
IX.D play a political game of lies will only
(2) hurt the DOE's credibility in the long run. Come clean now and focus your energy on cleaning up, not on lying and perpetuating the myth that the mixed HLW will leave Idaho.
85-12 III.D.3(1)

(4) It seems ridiculous to me to be considering alternatives which will create more waste — especially more liquid waste.
85-13 You have big problems with the caisson and there is no guarantee
III.C that it will not start again. And building a new
(2) incinerator is not a good idea. Increased air pollution is
85-14 a very unsafe (and unpopular) idea. You need to learn to
VIII.B(2) cope with the fact that the general populace doesn't approve of new radio active releases into its air.

(1) I see you have some alternatives which would take the
85-15 existing dry bedding, re-wet it and then do more
III.D.3(1) separations, and then dry it again. Are you nuts?

(3) I don't understand why you would store the Class A type
85-16 at INEL in one alternative and remove it in another.
III.F.4 Since the INEL is in an earthquake & volcanic area
(1) on top of a huge aquifer all waste should be removed to more geologically stable areas in storage.
85-17
VIII.E(1)
85-18 III.F.2(2)

I urge you to withdraw this document until the long term storage criteria have been established and then try again to find the most safe way to deal with the huge amount of HLW at INEL. I also am interested in the disposition of the SNF at the ATR and STEP arriving. Why wasn't it addressed in this DEIS?
85-19 X1(7)

Ellen Glaccum
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