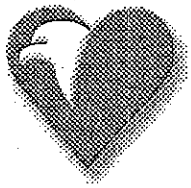

Heart of America Northwest

The Public's Voice for Hanford Cleanup

On the Web: http://www.hoanw.org

Heart of America Northwest,
Heart of America Northwest Research Center

Comments on the Proposed Plan for Hanford's U-Area Clean-Up (200-UW-1 Operable Unit) And the U-12 Liquid Waste Discharge Crib

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Summary of Comments

The U-Area Proposed Plan needs to be withdrawn and revised to present to the public for comment:

1. plans that retrieve, treat and dispose properly of waste from all sites – followed by use of engineered barriers and caps to protect against exposure and migration of remaining, deeper contamination. The Proposed Plan is unacceptable and violates statutes and public values by leaving wastes in 11 sites with no action – even while acknowledging that the sites will pose health hazards for 129 to 150 years. As shown in our comments, these sites will pose unacceptable cancer health risks for far longer than 150 years.
2. meaningful alternatives based on "actual characterization" (real, in fact sampling) of the numerous waste sites and large areas of potentially contaminated soils;
    a. The plan is presented without actual sampling of all waste sites to determine what wastes were in fact disposed and how far they have spread. Instead, sites are irrationally lumped together with unsupportable claims that sampling at one (e.g., a pipeline or vault) will be representative of what was disposed and how far waste may have spread at a crib or burial ground under vastly different circumstances (e.g., quantities of acid or other liquids dumped).
3. meaningful alternatives which reflect and respect the values of the region's public, and provisions of Washington State laws, requiring a preference for permanent remedies based on retrieving wastes to the extent practicable, and disposing of treated wastes in a protective manner.
    a. The proposed plan is based instead on a presumption of capping vast areas without retrieving wastes, including Transuranic wastes. The proposed plan presents a red herring straw man alternative of retrieval based on digging down 200 feet to retrieve contamination, instead of presenting a range of reasonable alternatives which are practicable for retrieval of wastes at every site.
    b. The proposed Plan is based on an assumption that a mountain will be built to cap the entire UO3 Plant (U-221, or U-Plant), covering some of the waste areas near the Plant. This is not an integrated plan. It would make far more sense to either review and decide on how to cleanup the U-Plant at the same time – or, proceed with protective remedies removing waste (preferring permanent remedies) from all sites near the U-Plant.
4. a new plan base on a clear Washington State policy that USDOE and other illegal polluters and operators of unpermitted hazardous waste facilities are not to be rewarded by having unpermitted facilities avoid characterization and cleanup ("closure") under state hazardous waste law.
    a. USDOE illegally operated many of the liquid waste discharge cribs, burial grounds, sewers and tanks -not just the U-12 crib - without permits after 1987. On the sole basis that these illegal hazardous waste units never had permits applied for or granted, this plan is based on the less protective (including for public participation) processes than closure of a treatment, storage or disposal unit under RCRA and Washington's Hazardous Waste Management Act.
5. The Plan is based on allowing unacceptable levels of cancer risk from remaining contaminants and exposure. The Plan ignores Washington State standards and legal requirements that Washington's cancer risk standard for residual contamination is for the contamination remaining to pose no greater risk than one additional cancer per hundred thousand persons exposed – explicitly including radionuclide risk. This risk must be met (via remedial action objectives) for reasonably foreseeable failure of institutional controls. The Plan is based on leaving waste in 16 sites where loss of controls is likely – causing exposure which will likely exceed state standards and increased contaminant migration.

Remedial Action Objectives (RAO) (= cleanup levels):

The proposed Plan for the U-Area fails to meet the human health and ecological risk standards set in Washington State laws and required to be followed whether the unit is closed under the federal Superfund program (CERCLA) or under state law. CERCLA requires that all applicable and relevant standards from state rules be applied in setting the cleanup levels – remedial action objectives.

Remedial Action Objective #2 in the Proposed Plan applies a far weaker standard and illegally separates radionuclide carcinogen risk from all other carcinogens. The 15 millirem per year dose set for Remedial Action Objective 2 is at least five times higher than the permissible standard – NRC and EPA estimate that 15 millirem annual exposure will cause an additional 3 to 5 fatal cancers per ten thousand persons exposed (e.g., 3E-4).[1]

CERCLA's requirement from Sec. 120 that applicable or relevant state standards (ARARs)be applied in selecting the remedy requires that standards which EPA may not view as enforceable must still be explicitly considered and applied if they are "relevant". Thus, Washington State's standard for total carcinogen risk is a requirement that must be met whether the site is being cleaned up under CERCLA or Washington's Hazardous Waste Management Act (using delegated authority under the federal RCRA hazardous waste law, which allows the state to have more protective standards). The applicable and relevant Washington State standard for carcinogens – explicitly including all radionuclides – is one additional cancer for every one hundred thousand persons exposed (expressed in scientific notation as 1E-5). SEE RCW Chapter 70.105D and WAC Chapter 173-340; and, RCW 70.105E.050.

Washington's citizens have spoken clearly that they expect Ecology and EPA to stop ignoring Washington's standard, as the agencies have done in setting cleanup levels which allow future cancer risks to far exceed the Model Toxics Control Act (MTCA, RCW Chapter 70.105D) standard at Hanford and any other mixed waste contamination release site. Section 5 of the Cleanup Priority Act (RCW 70.105E.050 – adopted as part of Initiative 297) repeats the existing mandate that the cleanup levels for sites with mixed waste releases, such as the U-Area, must meet the cancer protective standard of MTCA. The CPA restates that it is not allowable under Washington law to separately calculate the total carcinogen risk from all other carcinogens, and then apply a much less protective standard for cancer from exposure to the radioactive portion of hazardous substances released or remaining at a cleanup site.

Nor is it permissible under CERCLA for a proposed plan to calculate and present cancer risk for radionuclides separately from all other carcinogens. EPA's CERCLA Guidance clearly states that:

> "(c)ancer risk from both radiological and non-radiological contaminants should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants… risk estimates contained in proposed and final site decision documents

[1] This estimate of 3 to 5 fatal cancers per ten thousand is not consistent with the new data from the National Academy of Sciences, National Research Council Biological Effects of Ionizing Radiation (BEIR) VII report. The new data, summarized in the text box further on in these comments, shows that 15 millirem would result in 8 fatal cancers per ten thousand exposed adults (shown in scientific notation as a risk level of 8×10^{-4}, or 8 E-4).

(e.g., proposed plans, Record of Decisions…) should be summed to provide an estimate of the combined risk to individuals presented by **all** carcinogenic contaminants."[2]

Whether proceeding under CERCLA, or under RCRA and Washington's HWMA, the cleanup of the U-Area must meet the relevant MTCA carcinogen risk standard.

We object to Washington Ecology giving up its clear authority to be the lead agency for cleanup of the U-Area with its numerous hazardous wastes storage, treatment and disposal sites (which spread contamination). If Washington Ecology proceeds to require closure under RCW Chapter 70.105, then the MTCA standards will be clearly enforceable, not just "relevant".

It is absolutely unacceptable that Washington Ecology proposed and presented a plan which ignores the requirement that the state's MTCA cancer risk standard be applied and used in all cleanup plans for mixed waste sites. This has been existing law for years. Washington's voters sent a clear message that Ecology was to stop ignoring this requirement when the voters passed Initiative 297 and enacted the Cleanup Priority Act (CPA). Section 5 of the CPA has a mandatory duty for Ecology to use the MTCA standard for all carcinogens, and explicitly requires that Ecology not approve any plan from EPA or any other agency which fails to use our state standard. We have reproduced this requirement in the footnote to educate the agency staffs.[3]

EPA has officially determined that 25 millirem of radiation dose from residual contaminants at a Superfund site is "not protective" of human health. SEE OSWER 1997: "Analysis of what radiation dose is protective of human health at Superfund sites".[4] This is because annual exposure to 25 millirem is expected under EPA exposure and risk assessment assumptions (less conservative than Washington's default assumptions) to cause 5 fatal cancers in every 10,000

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[2] US Environmental Protection Agency; OSWER 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination", Aug 22, 1997. At 4. (parenthetical and **bold** emphasis in original).

[3] RCW 70.105E.050 provides:

The department shall require corrective action for, or remediation of, such releases to meet the same health risk based minimum clean-up standards as adopted for other carcinogenic, toxic, or other hazardous substances posing similar health risks pursuant to RCW 70.105D.030.

(2) The department shall include all known or suspected human carcinogens, including radionuclides and radioactive substances, in calculating the applicable clean-up standard, corrective action level, or maximum allowable projected release from a landfill or other facility or unit at which mixed wastes are stored, disposed, or are reasonably believed by the department to be present, for purposes of chapter 70.105 RCW, this chapter, or chapter 70.105D RCW. In making any permit decision pursuant to chapter 70.105 RCW or this chapter, or in reviewing the adequacy of any environmental document prepared by another state, local, or federal agency, relating to mixed waste sites or facilities, the department shall ensure that the cumulative risk from all such carcinogens does not exceed the maximum acceptable carcinogen risk established by the department for purposes of determining clean-up standards pursuant to RCW 70.105D.030, or one additional cancer caused from exposure to all potential releases of hazardous substances at the site per one hundred thousand exposed individuals, whichever is more protective.

[4] US Environmental Protection Agency, August 20, 1997. EPA "does not believe" that "exposure from decommissioned facilities of 25 mrem/yr, which equates to a cancer risk of approximately 5×10^{-4},… is generally protective within the framework of CERCLA." At 2.

adults exposed (5×10^{-4}).[5] EPA has formally acknowledged that children are 3 to 10 times more likely to get cancer from the same exposure to carcinogens, including radiation, as adults.[6]

The 15 millirem remedial action objective for radiation exposure from contaminants left at sites is multiples higher than the relevant and applicable standard under Washington law. Further, as a remedial action objective, the Plan fails to protect against even this level of exposure in the event of reasonably foreseeable loss of institutional controls and / or intrusion. Note: intrusion is not the only reasonably foreseeable loss of institutional controls – for instance, laying of water lines or allowing "lost" pipelines to remain and create future preferential pathways for migration or increased migration due to application of water nearby. For 11 of these sites, loss of institutional controls leading to significant potential exposures could come from the very real likelihood of USDOE (or a successor agency) not budgeting to control plant growth or animals at sites where no action is taken to clean up, or waste remains at the surface under a cap.[7]

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[5] US Environmental Protection Agency; OSWER 9200.4-18, "Establishment of Cleanup Levels for CERCLA Sites with Radioactive Contamination", Aug 22, 1997. A cleanup level of 25 millirem per year was calculated to be "equivalent to approximately 5×10^{-4} increased lifetime risk" and 100 millirem per year was calculated to be "equivalent to approximately 2×10^{-3} increased lifetime risk" of cancer. At page 3.
EPA's guidance requires that "(c)ancer risk from both radiological and non-radiological contaminants should be summed to provide risk estimates for persons exposed to both types of carcinogenic contaminants… risk estimates contained in proposed and final site decision documents (e.g., proposed plans, Record of Decisions…) should be summed to provide an estimate of the combined risk to individuals presented by **all** carcinogenic contaminants." At 4. (parenthetical and **bold** emphasis in original).

[6] March 3, 2003. http://epa.gov/ncea/raf/cancer2003.html "Draft Final Guidelines for Carcinogen Risk Assessment"

[7] State law and RCRA (federal hazardous waste law) require closure plans to include long term monitoring and maintenance funds – typically via funding in an account or bond,. However, Ecology and EPA have never required monitoring and maintenance funds from USDOE – despite USDOE's history of not requesting funds to meet cleanup requirements and failing to plan to fund "long term stewardship". Such funding must be required to be set aside as part of this and all similar closure permits or remedial action plans that claim to rely on long-term monitoring and maintenance for the remedy to remain effective.

New National Academy of Sciences Report Confirms:
15 Millirem Radiation Dose is Not Protective of Human Health –

Fails to Meet EPA Superfund Cancer Risk Standard as well as falling far short of Washington's Model Toxics Control Act and Cleanup Priority Act Standards

On July 29, 2005 (the day prior to the end of the comment period for the U-Area Plan), the The National Academy of Sciences released an over 700-page report on the risks from ionizing radiation. The report specifically covers the risks from long-term exposure to radiation in doses, and under circumstances, similar to those encountered from the waste remaining at Superfund or other hazardous and mixed waste substance release sites, such as Hanford. The findings of the National Academy relating to the risk of cancer from exposure to the levels of radiation from wastes released or stored at Hanford need to be taken into consideration for all Hanford cleanup plans. Ecology and EPA are legally obligated to consider this new report and data in setting cleanup levels which will protect the public from cancer. Under the new report, cleanup levels (remedial action objectives) must be reduced from levels allowing exposure to 15 millirem per year of radiation, to levels below 3mrem/yr.

The BEIR VII (seventh Biological Effects of Ionizing Radiation) report on "Health Risks from Exposure to Low Levels of Ionizing Radiation" reconfirmed low doses of radiation can cause cancer and the validity of the linear, no threshold dose model. Risks from low dose radiation are equal to, or greater than, previously thought, and additional mechanisms by which radiation causes damage to cells has been confirmed.

Federal and state law require that the findings of the National Academy be considered in determining what levels of exposure to carcinogens will cause cancers in excess of the standard in the National Contingency Plan (NCP – the federal Superfund regulation) and for Washington's Model Toxics Control Act (MTCA). Whether the U-Area Plan is allowed to proceed under EPA's lead or is moved, as we urge, to Washington's lead, the state cleanup standard to protect against potential exposure which would result in more than one additional cancer per one hundred thousand exposed persons (from all carcinogens, including radionuclides) must still be met (or attempted to be met to the extent practicable).

As the initial submission of our comments indicated, the U-Area Proposed Plan failed to meet either the state MTCA standard or the EPA Superfund standard. ***The new BEIR VII Report by the National Academy of Sciences establishes conclusively that the remedial action objective of 15 millirem dose from exposure in the Proposed Plan is not protective of human health and will not meet the EPA's own standard for Superfund sites. 15 mrem falls many times short of protecting health under Washington's standard.***

The Proposed Plan asserts:

> "A dose rate limit of 15 mrem/yr above background generally achieves the EPA excess cancer risk threshold, which ranges from 1 x 10^{-6} to 1 x 10^{-4}."[Proposed Plan at page 11].

(These risks expressed in scientific notation mean that no more than one additional cancer can be caused for every 10,000 people exposed = 1x10^{-4}, or, 1 E-4) *continued...*

New Report on Radiation Risk Confirms Cleanup Levels Need Revision *continued*

The data and findings of the new National Academy of Sciences BEIR VII Report establishes that 15 millirem per year of radiation exposure from contamination at Hanford (or other contaminated sites) would result in far more than 1 additional fatal cancer for every ten thousand persons exposed. Thus, the new report establishes conclusively that the proposed cleanup level for Hanford sites (including the "remedial action objectives" for the U-Area) will not achieve EPA's own excess cancer risk threshold standard – and falls far short of the more protective state MTCA standard.

In fact, the BEIR VII data establishes that 15 mrem/year of exposure to an adult would be estimated to result in 8 additional cancers per ten thousand exposed adults (8×10^{-4}), or ***8 times the EPA standard, and at least 80 times the state MTCA standard.*** (Unlike the EPA standard, the state standard under MTCA requires protection of the most vulnerable individuals who are likely to be exposed. Children are 3 to 10 times more susceptible to cancer from the same dose of ionizing radiation or other carcinogens as are adults. [March 3, 2003. http://epa.gov/ncea/raf/cancer2003.html "Draft Final Guidelines for Carcinogen Risk Assessment"]. Recent research also shows that older adult workers at Hanford are more susceptible to cancer from the same dose than younger workers. [Univ. of North Carolina – Chapel Hill and NIOSH, June 16, 2005]). EPA, Washington Ecology and USDOE have improperly ignored the findings of prior research and the Draft Final Guidelines for calculating cancer risk in children when we have urged their consideration in setting performance and cleanup standards for Hanford decisions. The regulators, however, can not ignore the new National Academy of Sciences BEIR VII Report.

The BEIR VII report (page 500, Table 12-9) estimates that 100 mrem/year of exposure will result in approximately 1 (1.142) cancer in every 100 people exposed, which includes 1 fatal cancer in every 175 people so exposed (5.7 in 1000). USDOE uses 100 mrem/year as an acceptable dose to the public in its performance assessments. [DOE Order 435.1]. The BEIR VII data shows that this would result in cancers in 1% of exposed adults.

15 millirem of annual dose would result in one fatal cancer in every 1,172 exposed persons, under the linear model confirmed as valid by the National Academy of Sciences in the BEIR VII Report. This equates to slightly more than 8 fatal cancers per ten thousand exposed adults. In scientific notation, to compare with the EPA standard, 15 mrem/yr would result in 8×10^{-4} fatal cancers, whereas the EPA standard is 1×10^{-4}. If a worker exposure of 35 years for an industrial cleanup site is substituted for a 70 year life exposure from an unrestricted cleanup site, then the resultant risk is still 4 times the EPA standard: at 4 E-4. However, since the U-Area Plan is based on loss of institutional controls at 150 years, at that point in time (if not far sooner under more realistic assumptions), the risk must be based on exposure to the public and future residential or Native American treaty right users of the site for 70 years. Under the Proposed Plan, the risk at that time will be 8 times higher from the "do nothing" and capped sites than is allowable under EPA's own standards.

15 millirem of annual exposure will exceed Washington's standards by far more than eight times because Washington standard of $1x\ 10^{-5}$ requires protection of children (3 to 10 times greater risk per dose) and is based on total cancers, rather than just fatal cancers. Based on what is achievable (experience at other cleanup sites and differentiating between radionuclides) a remedial action level/objective of 1.5 to 3 millirem should be required to replace the 15 millirem exposure proposed.

As with all cleanup standards and Remedial Action Objectives – if it is not practicable to meet the objective of a dose below 3 millirem per year, then additional controls may be used in lieu of removal of waste to meet the remedial action objective.[8] Thus, it is not appropriate to claim that a higher RAO is justified simply because it is difficult to meet it.

The Proposed Plan similarly fails to meet the Washington State standards and procedures for determining ecological risk. The plan is based on an allowable exposure to animals of .1rad/day; or, an incredible dose of 36.5 rads/year. This fails to consider the known biological effects or the effects of concentration in the food chain[9]. Thus, if the 'terrestrial animal' receptor has a dose of 36.5 rad per year (e.g., a rabbit burrowing in or near the waste sites – especially those with no remedial action proposed), then a raptor may have a dose that easily may exceed 365 rad per year to critical organs, and its young may have higher doses. 365 rad is a dose that would result in more than 50% of humans exposed to die from acute radiation effects.

The proposed Plan fails to consider the ecological (or human health effects) of its "Do Nothing"[10] proposal for 11 waste sites – including the effect of required continual application of herbicides and pesticides for 150 years to prevent spread of contamination.

Remedial Action Objectives (or their state equivalents under MTCA and HWMA) are required to be met for reasonably foreseeable losses of institutional controls. This Plan fails to meet that test for 11 sites. Highly contaminated cribs (U-16, U-17 U-4 well and drain and release sites) all pose significant hazards from loss of institutional controls that are not only reasonably foreseeable – they are likely given the past experience that USDOE has lost "configuration control" of sites and pipelines in this area in the past while presumably under strict operating conditions! The basic rule is that if it has happened in the past, then it must be assigned a likelihood of recurrence of 100%.[11]

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[8] At Uranium Mill Tailing Sites (UMTCRA) cleanup levels of 5pCi/gm near the surface and 15 just below are used. These result in more protective cleanup levels that 15 mrem.

[9] The Proposed Plan impermissibly utilizes only USDOE's own ridiculous standard for ecological risk, which has been severely criticized as inadequate –even by PNNL and numerous international and national bodies. The regulators are required to follow MTCA's evaluation of ecological risk.

[10] Referred to in the Proposed Plan as "Alternative 2 – Maintain Existing Cover, Institutional Controls, and Monitored Natural Attenuation".

[11] The **Uranium Remedial Action Objective** is set untenably high, based on assumptions that the ability of Uranium to migrate in the soil is far lower than it has been shown to be in reality due to the co-disposal of powerful solvents designed to mobilize uranium, and acids and the sheer magnitude of uranium disposed. A kD of 3.0 is postulated, whereas a far lower kD is much more likely in reality.

The Plan's Institutional Control Assumptions Are Not Valid – Plan Assumes No Intrusion, No Installations or Abandonment of Pipes, No Budget Reductions for Controls for 150 Years:

The Proposed Plan – without any justification – bases the remedial action objectives (cleanup levels) and proposals for doing nothing or leaving waste at many units on the assumption that intruders are the only loss of institutional controls that need be considered – and, *that no intruder will disturb any waste site for 150 years.* [12]

From all appearances, the 150 year date for when an intruder might disturb a waste site was chosen based on the claim that, after 150 years, radioactive decay will reduce the dose to intruders to a level below the standard referenced in the Plan: 15 millirem per year. Thus, instead of assessing the likelihood of failure of institutional controls as required by WAC Chapter 173-340, the date of failure for purposes of the risk assessment was arbitrarily chosen to be the date at which the radiation dose would fall below the (wrong) regulatory requirement of 15 millirem.

USDOE has – during active management of these units – lost track of wells, failed to decommission abandoned wells, failed to close and remove pipelines which served as a source of liquid to spread contamination, had floods or fires spread contamination beyond the units, had utilities installed where the workers did not know units or contamination was located....

For example, the U-Area Plan acknowledges that the U-16 Crib was dug and operated in the mid 1980's in a manner that led to the liquids discharged to this crib spreading under the U-1 and U-2 cribs. The contaminated liquids then flowed down abandoned wells causing groundwater contamination and soil column contamination at significant depths. *Not only does this illustrate the potential for loss of institutional controls, this example shows claims that the lateral spread from units is small are not supported by actual experience.*[13] Only sampling (characterization) can determine the lateral spread, especially along "preferential" pathways – which this Proposed Plan fails to have utilized.

This actual loss of "institutional controls" (also referred to as loss of configuration control, when a map or blueprint does not show a pipeline, waste unit, etc...) requires that the presumption be that USDOE can not maintain institutional controls for 150 years. Indeed, Washington state has joined with Tribes, Oregon and citizen groups in criticizing USDOE for its lack of planning and funding for "long-term stewardship" to prevent such loss of institutional controls.

Further, the potential loss of institutional controls must not be limited to the dose to the intruder who builds on the site of a waste unit (whether 25 years or 150 years). The Proposed Plan relies upon vegetative and animal control measures, which are unlikely to be continued when the first budget cut comes (this has already happened). The Plan fails to consider the effects of wildfire after intrusion or animal or vegetative intrusion, must less the effect of soil dug up in 35 years during utility installation in an area which USDOE says will remain industrial. .

The Proposed Plan and Remedial Action Objective fail to protect human health from a loss of institutional controls over the next 150 years. The Plan must be based on taking remedial action

[12] SEE Plan at 10.
[13] Data for U-12 shows significant lateral spread, which is ignored.

steps which remove contaminants – after actual characterization for both what hazardous substances are present and where they have migrated – to the degree necessary to meet the human health and ecological risk standards in light of the reasonably foreseeable loss of institutional controls over 150 years: i.e., loss of maps, an end to vegetative control or animal control (e.g., due to budget constraints).

All Remedial Action Objectives / Remedial Action (cleanup) Levels need to be recalculated to reflect that the maximum allowable exposure and dose is far less than the 15 millirem claimed to be the relevant standard throughout the Proposed Plan. As discussed extensively in these comments, the Plan (e.g., at page 11) claims to be protective of human health by modeling that the future exposed individuals will have a radiation dose no greater than 15 millirem. The Proposed Plan fails to disclose and consider the existence of Washington State's more protective standard; and, the Plan erroneously misrepresents that 15 millirem of exposure per year "generally achieves the EPA excess lifetime cancer risk threshold, which ranges from 1 x 10-6 to 1 x10-4."[14] *Per the discussion of the National Academy of Sciences latest report, 15 millirem results in risk which is eight times the allowable risk under CERCLA and far more than eight times the allowable risk under MTCA.*

The Plan Proposes "Do Nothing" for 11 Sites, which will Violate RAOs and state laws:

The Proposed Plan for the "Do Nothing" sites is based on claims that the maximum exposure will be less than 15 millirem of dose to the public (e.g, to an industrial worker or future site user, Treaty right user or other user) within 150 years due to decay. This is asserted to be a reasonable time period for allowing decay to occur to the 15 millirem exposure level in the proposed (impermissible) Remedial Action Objective. However, the RAO, as noted here, is set at a level that is impermissibly high and fails to meet the MTCA standard. The RAO and Plan for these sites would allow exposure after the acknowledged loss of institutional controls after 150 years to a level of radiation and carcinogen risk which is absolutely unacceptable:

- 15 millirem of exposure is proposed as acceptable, but it results in cancer risks which are eight times those allowed for Superfund sites and much more thana magnitude higher than allowed under MTCA – even without the loss of institutional controls;
- The Plan acknowledges that loss of institutional controls is likely in 150 years – therefore, the model should be based on uncontrolled access by children and others, not just industrial workers after 150 years. The assumptions for uncontrolled access after loss of institutional controls means that the RAO should be one magnitude lower for residual contamination.
- These factors require removal of contamination, rather than doing nothing.
- To meet the cleanup standard and RAO, which should be applied under MTCA and the Cleanup Priority Act, would require maintaining institutional controls for a far longer period of time (e.g. 3 half lives of Cs 137 or well over another hundred years). This is ridiculous.
- It is ridiculous to assume that institutional controls will work for 150 years to: prevent excavation for new utilities, pipelines or facilities in an industrial area; or, to ensure, that animals and plants do not infiltrate the waste site.

[14] Proposed Plan at 11. Repeated throughout Plan.

- As noted above, pipelines will be left in place, and new utilities will be installed. Even while actively managing Uranium and Plutonium disposal sites, USDOE lost "configuration control". The Proposed Plan relies upon vegetative and animal control measures, which are unlikely to be continued when the first budget cut comes (this has already happened). The Plan fails to consider the effects of wildfire after intrusion or animal or vegetative intrusion, must less the effect of soil dug up in 35 years during utility installation in an area which USDOE says will remain industrial.

- It is even more ridiculous to claim that loss of institutional controls is not reasonably foreseeable for 150 years. The RAO must be based on that reasonably foreseeable loss. This is why WA State prefers permanent remedies.

Finally, we must note that the cost of a permanent remedy for all 11 proposed "Do Nothing" sites is quite low. As noted by the Hanford Advisory Board, the presentation of "Present Worth" costs for placing a cap over these sites after remediation presents a falsely skewed picture. What the Board did not note was that the costs are further skewed for all evaluations of capping alternatives by an illegal assumption that the implementation time for a cap is 20 years. Continuous remedial action at the units is required within 18 months of the record of decision if the cleanup proceeds under CERCLA (a similar, or faster requirement may be imposed under RCRA). Thus, there is no basis for adding 20 years of institutional control cost prior to capping, for the analysis of remedies which use caps.

The Promise of an "Integrated" Approach for the U-Plant Area Is Not Being Met; and, Washington State Should Be the Lead Agency for 'Closure' of U-Plant and the U-Area:

By addressing U-Plant separately from the contaminated soil sites around the U-Plant, the promise that this plan would be a model for integration and efficiency is totally broken. U-Plant closure may or may not involve a massive mountain of a cap extending over numerous waste sites in this plan and affecting contaminant migration and total acceptable contamination from the entire area. Cumulative risks from the entire area must be considered – instead, this plan acknowledges that it takes a piece meal approach and only tries to meet RAOs and maximum allowable concentrations in groundwater or maximum health exposures for the units as individual units. Yet, in the midst of the unit, with the same compliance boundary and groundwater, sits an elephant: U-Plant with the sites immediately around it.

If U-Plant remains with a mountain to cap it, we have no idea how these remedies for the sites in this proposed plan will be affected. The Plan fails to examine the high benefits from removal of contamination for executing a future remedy for U-Plant, and how this will avoid inadvertent intrusion into waste sites when a remedy for U-Plant is undertaken.

One of the differences between the CERCLA lead versus RCRA/HWMA lead under Ecology is consideration of cumulative impacts from the entire area, including related sites. The public, under state hazardous waste unit closure rules – which use MTCA for cleanup – is guaranteed that cumulative impacts from all related units at the site must be considered and data presented for public review. Many of the source terms and cumulative impacts to future users (and ecological receptors) will be greatly increased dependent upon what is removed from U-Plant

and what will be done to remove, collapse or cover the Plant itself (and whether it will be filled with wastes). Because there are proposals to add waste and cover the plant, these cumulative impacts must be presented and cleanup levels selected to protect human health based on the potential for those cumulative impacts to occur. It is not ok to pretend that a mountain of waste might not be sitting in the midst of the U-Area.

The U-Plant is NOT a past practice unit. It operated with hazardous wastes and discharged hazardous wastes in the 1990's – while USDOE resisted application of RCRA to the plant. Now, it must be closed pursuant to the HWMA, which does not include an exemption from the State Environmental Policy Act (SEPA) and consideration of these cumulative impacts.

Heart of America Northwest and our members, and many members of the public, have urged for years that Washington State remain the lead agency for cleanup of Hanford's processing plants, like U-Plant, and the waste sites which they discharged to and burial grounds and unplanned release sites associated with them. For a plant which stored, generated and discharged dangerous wastes into the 1990s, it is unacceptable for Washington State to drop from being the lead agency. It is unacceptable to us and the public for Washington State to drop the procedural protections and requirements of state law in order to allow an understaffed EPA with looser requirements under CERCLA, to be the lead agency for this cleanup. The discussion of Remedial Action Objectives and the failure of this plan to consider, much less meet, Washington's Model Toxics Control Act shows why the appropriate lead agency is Washington State.

Contaminants of Concern and the Need for Actual Characterization to Replace Claimed Process Knowledge and Use of "Analagous Sites":

Numerous contaminants known to be present in the sites –and even known to be spreading with serious consequences – are ignored as "contaminants of concern" in the Proposed Plan. The Plan proposes remedies without having done the sampling designed to inventory what hazardous substances are actually present and how far they have spread. The Plan is a house of cards proposing remedies without sampling and based on nonexistent records of chemical wastes disposed, burned, spread... On this inadequate base, the Plan proposes remedies based on claims that sites with totally different histories and types of facilities are "analogous" – proposing to allow the inadequate data and proposed remedy for one "representative" site to be considered as data and a remedy (without sampling) for other sites in the same artificially created group.

We looked for example at the U-12 Crib, for which the only contaminant of concern referenced for group 3, representative waste site U-12 Crib and analogous sites, is nitrogen as nitrate and nitrite.

Over 100 Curies of Strontium 90 was discharged to the U-12 Crib – yet, this proposed Plan ignores Sr90 as a contaminant of concern for these sites and others. Likewise, acids and powerful solvents used in processing Uranium are known to have been discharged in massive quantities, and are ignored. Technetium 99 (Tc99) has spread from the crib to groundwater – yet, the Proposed Plan failed to discuss either Tc99 or the Uranium as a contaminant of concern.

In the early 1990's Heart of America Northwest urged Ecology to exercise its RCRA authority at U-Plant and regulate the storage, use and disposal of numerous chemicals, hazardous and mixed wastes – including the illegal discharge of hundreds of millions of gallons of untreated liquids to soil. The U-12 Crib had been used for those discharges – including from the chemical sewer line – after the July 1987 date that Ecology has arbitrarily agreed to use as the date for which a site generating, receiving, storing, treating or disposing of mixed or hazardous wastes (including the release of hazardous substances) is subject to state authority requiring permitting and closure under the HWMA (as opposed to being considered a past practice unit). The UO3 Plant (U-Plant) used highly volatile chemicals, powerful solvents (e.g, Tributyl Phosphate, carbon tetrachloride), toxic metals and red oils, acids – all of which were discharged in unknown quantities to the cribs and pipelines, chemical sewer, burial grounds – including U-12. *The Plan and Feasibility Study absolutely fail to describe these chemicals and their fate.* This illustrates the need for a closure plan under RCRA – not just a FFS under CERCLA. No action should be determined without creating an inventory of all hazardous substances likely to have been disposed and present, with a sampling plan designed to confirm or exclude the presence of all potential contaminant hazards from all units (not just claimed representational units).[15] USDOE's

[15] The hazard from the chemicals and Uranium Oxide is illustrated by the fact that the calcining operation had temperature control limits imposed after Heart of America Northwest warned that heating the solutions to the degree allowed in the calciners (which was not very hot) had resulted in prior explosions of the same solutions at other USDOE facilities. It was later discovered that Hanford had also had such an explosion. Some of the chemicals present in UO3 can degrade resulting in an exothermic reaction, which would ignite or explode uranium oxide solutions. Red oil reactions could also cause an explosion with the addition of heat along with the solvent and Uranium or Plutonium metal. The FFS and Plan fail to present an inventory of what happened to these chemicals and solutions – where they were discharged, dumped, buried, and which pipelines may have residues...

illegal failure to monitor and record the discharge or burial of those chemical / mixed wastes must now be cured by requiring an effort to inventory and sample.

Strontium 90 is known to be spreading from U-12 and presenting a serious threat to groundwater. In USDOE's Groundwater/Vadose Zone Integration Project State of Knowledge (DOE/RL-98-48; 1999), Strontium 90 is shown to be at significant concentrations below U-12 from 5 meters through 50 meters. "These date indicate that a considerable amount of low pH wastes were discharged to the crib. This also was provided as the explanation for the depth to which the strontium had moved. The acidic discharge was reacted with the natural calcium carbonate in the soil, and dissolved the solid releasing high concentrations of calcium to compete with strontium for sorption sites. Groundwater in this area has been impacted by operation of the crib, as indicated by elevated levels of 99Tc and nitrate detected in groundwater downgradient of the crib (Williams and Chous 1997)."[16]

The Proposed Plan fails to take heed that the voters of Washington State spoke clearly that they expect 'actual characterization' of soil sites, not reliance upon old paperwork and "analogous sites". RCW 70.105E.060.

The Proposed Plan for U-Area is a house of cards based upon totally unsubstantiated claims that waste disposed in one site is analagous to waste in another relying upon the very types of records which Washington State itself has said are so unreliable as to be the primary cause of hazardous waste law violations at Hanford. On top of this inadequate base the plan piles a total lack of "characterization" (which is required by Chapter 173-303 WAC pursuant to the HWMA and chapter 173-340 pursuant to MTCA) of the sites to determine what hazardous substances are present in fact, and how far they have spread.

The drafters of I-297 were aware of, and participants in, litigation in which Washington State found that anything short of actually characterizing wastes in trenches was a source of great environmental risk and numerous environmental law violations. Indeed, the drafters had issued reports documenting such failures and violations due to inadequate "designation", characterization and sampling of wastes disposed in Hanford's unlined burial grounds – the subject of Sec. 6 of the CPA.

In Washington v. Abraham, No CT3-5018-AAM, Eastern District of WA, Washington filed an affidavit by Ecology Compliance Specialist Robert Wilson stating that reliance upon "process knowledge" rather than actually sampling and characterizing wastes was a source of numerous legal violations at Hanford:

> "reliance solely on "process knowledge" to characterize waste has been a major regulatory compliance problem for DOE throughout the Hanford Site. Process knowledge refers to the reliance upon descriptions of the process generating the waste or other historical information in order to determine if the waste is hazardous or not, in lieu of testing and analyzing the waste itself. Inadequate waste designation due to reliance upon process knowledge has resulted in the most violations by DOE at Hanford."
>
> Affidavit of Wilson, Para R, Page 6, June 10, 2003.

[16] Groundwater/Vadose Zone Integration Project State of Knowledge (DOE/RL-98-48; 1999) at 4-35

Wilson describes the violations and flaws stemming from use of process knowledge in the very trenches and burial grounds – similar to claims of process knowledge relied upon for this Plan without sampling:

> S. .... As decades-old containers of transuranic and RH transuranic waste are exhumed from Hanford's burial grounds, some sampling and analysis will surely be required since the process knowledge regarding these wastes is poor or non-existent. ...
>
> V. Mr. Schrader states in his Declaration that all TRU and TRUM at the Hanford Site have been subjected to a RCRA-compliant waste designation process. Schrader Declaration at ¶ 9. However, regarding TRU wastes, this waste designation process is often flawed because it relies almost exclusively on process knowledge with virtually no confirmational sampling and analysis of the waste. As discussed above in ¶ R, inaccurate waste designation has resulted in numerous RCRA violations by DOE at Hanford. Thus, while the *process* as described by Mr. Schrader may itself be RCRA compliant, the *application* of that process in terms of adequacy of process knowledge relied on has been and continues to result in the largest amount of regulatory violations at Hanford. Although process knowledge is sometimes acceptable for determining if a waste is hazardous or not, the process knowledge for wastes stored at the Hanford Site is often unacceptable. This is because process knowledge for wastes stored at Hanford ranges from detailed inventory listing of container contents to vague descriptions and poorly documented descriptions of long discontinued industrial processes. In some cases, process knowledge for Hanford wastes is based primarily on interviews of personnel associated with the process with little or no documentation of the process itself. Use of process knowledge without confirmational sampling and analysis is problematic because of this wide range of informational quality. Thus, waste designation of transuranic waste at the Site has been very problematic. ....
>
> Wilson Affidavit Pages 6-8.

Ecology Inspector Wilson's affidavit establishes that reliance upon paper work and "process knowledge" for stored TRU is not acceptable as a replacement for sampling and designation of wastes stored since 1970 for shipment to WIPP. Yet, the Proposed Plan for U-Area improperly substitutes process knowledge or a paperwork search for conducting actual sampling in two key aspects of the U-Area Plan:

1. paperwork is substituted for sampling of sites (actual characterization for investigation) by use of claimed "analogous sites"; and,

2. old paperwork, in the absence of legally required monitoring records, which does not meet RCRA and HWMA standards is proposed as the basis for reclassifying the U-12 crib and claiming that hazardous wastes were not disposed. The opposite should be occurring: the lack of records (and the rules require that the records are fully maintained for process knowledge to substitute for sampling) should mean that all facilities in the U-Area which had the potential to receive waste after July 1987, or which still stored waste after that date, should all be RCRA units. The initial records for these facilities and waste streams did not meet RCRA and HWMA standards.

There is, therefore, no authority to allow reliance on paperwork to claim that wastes disposed to sites was from similar processes with the same discharges or that sites did not receive hazardous wastes after any particular date. Characterization with real sampling of all sites is required, and the sites can not be reclassified out of RCRA closure by some bizarre twisting of the notion of "process knowledge" based on partial reconstruction of monitoring records for monitoring which did not meet HWMA and RCRA standards.

Section 6 of the Cleanup Priority Act should be viewed as a mandate to Ecology to require characterization via sampling to create an inventory of hazardous substances likely to be present in each unit before issuance of a plan.

The Proposed Plan is inefficient and deprives the public of the right to comment on whether it is adequate by claiming that remedies may be changed AFTER sampling. This haphazard and piecemeal approach assumes that USDOE is willing to negotiate changes and that EPA or Ecology then elevates concerns and imposes a change in an already issued record of decision and remedy for a unit. We have no reason to trust that this will work. Further, it is lousy policy and not supported by applicable regulations, and deprives the public of the right to comment on a proposed plan for the entire area based on actual characterization.

The HWMA requires characterization ***for investigation*** of contamination at units, including burial grounds, cribs and release sites. See WAC 173-340-350(7)(a).

WAC 173-340-350(7)(c)(iii) requires that field investigations shall be: "Sufficient investigations to **characterize** the distribution of hazardous substances present at the site, and threat to human health and the environment." (emphasis added).

This Plan fails to follow this requirement for all units. Characterization and investigation to determine the actual distribution of hazardous substances at the site and to determine the threats they pose is required. Use of claimed "analogous" sites can not be substituted for actual investigation and characterization.

This illustrates why all units which received or stored waste after 1987 should be undergoing closure pursuant to RCRA and HWMA, not as past practice sites. Characterization is required for the investigation of units (such as the unlined burial grounds, discharge cribs, unplanned release sites, etc... in the U-Area). Even under the CERCLA approach, this is a substantive requirement that should be followed, and it is a state requirement which Ecology has a direct mandate to ensure actual characterization occurs before remedies are proposed:

WAC 173-303-64620 sets forth requirements for "corrective action" under the HWMA, by requiring use of the rules adopted in Washington's toxic waste cleanup statute, the Model Toxics Control Act, RCW Chapter 70.105D at WAC Chapter 173-340. Under the rules for investigations to "characterize" the site of a release or suspected release – applicable to unlined landfills, cribs, unplanned release sites... – actual sampling is required:

> The purpose of the remedial investigation is to collect data necessary to adequately characterize the site for the purpose of developing and evaluating cleanup action alternatives. Site characterization may be conducted in one or more phases to focus sampling efforts and increase the efficiency of the remedial investigation. WAC 340-350(7)(a)

WAC 173-340-350(7)(c)(iii) requires that the field investigation meet very specific requirements for sampling:

> (iii) Field investigations. Sufficient investigations to characterize the distribution of hazardous substances present at the site, and threat to human health and the environment

The rules require specific elements for such characterization. These are not waivable or replaceable by use of limited investigations into "analogous sites" or use of "process knowledge.

Thus, the plain language of the state rules requires "actual characterization" with physical sampling consistent with the statistically valid sampling plans which the Department must approve for remedial investigations. This Plan fails to meet the requirements for a remedial investigation – finding out what hazardous substances are present, and how far they have spread – which is the precursor to the cleanup and exhumation of the hazardous substances.

The Plan Must be Reissued With a Clear Statement of Policy By Washington State that Failure to Apply for, or Receive, a Hazardous Waste Permit Does Not Relieve a Polluter From Closure Under Washington's Hazardous Waste Management Act (HWMA), Chapter 70.105 RCW.

Numerous sites covered by this Proposed Plan received waste and were operated as active treatment, storage and disposal units –as those terms are defined by RCRA and Washington's HWMA – after the 1987 date which the parties have agreed is the cutoff for determining if an unit is a past practice site or must be closed under RCRA and the HWMA requirements.

The U-12 crib is the sole unit for which USDOE applied for a permit – because USDOE was planning to stop using that crib and starting to discharge in new cribs. (E.g., U-17[17],) Those new cribs, pipes, etc... should all be regulated and closed under the HWMA/RCRA, not as historic past practice units as proposed in this plan. Many of the units actively stored waste after 1987, even to this date; e.g., the U-361 Settling Tank is acknowledged to have an estimated 28,000 gallons of waste sludge remaining.[18] No permit was ever applied for (but, this does not exempt the facility form RCRA/ HWMA closure requirements). From 1987 through 1993, when USDOE restarted U-Plant for a short while, USDOE fought against efforts to require it to comply with state HWMA requirements for dangerous waste facilities, including permitting for the untreated liquid waste discharges from U-Plant and the partial treatment (e.g., adding acids to change the pH of discharges to U-12). USDOE failed to apply for or receive permits for these illegal hazardous waste facilities and units.

Now, because it never applied for a permit, except for U-12, USDOE wants to be rewarded and allowed to close under less protective standards – avoiding characterization, closure, groundwater monitoring, public notice and participation, SEPA and closure plan requirements under HWMA. For U-12, USDOE wants to be rewarded and reclassify the crib on the basis of records that fail to meet HWMA standards because USDOE refused to submit to HWMA jurisdiction for the crib and the dangerous waste treatment facilities upstream of the crib, where it added vast amounts of sulfuric, hydrochloric, phosphoric and other acids and other dangerous wastes to the waste stream.

The record provided to us for review by Ecology relevant to the U-12 Crib shows that the U-12 crib can not be re-defined into a past practice unit:

- There is no dispute that U-12 received wastes after July 1987.
- USDOE added numerous acids to the discharge stream of U-12 after July, 1987 to adjust pH. This was the illegal discharge of additional, unpermitted hazardous wastes. USDOE failed to identify and use waste codes for sulfuric, hydrochloric, phosphoric acids and other additions to the waste stream in its permit application. There is no dispute from the records that these constituents were present -- and USDOE's failure to monitor the waste stream for these constituents can not be an excuse now for allowing the waste stream to be reclassified as non-hazardous.
- There is no dispute that USDOE discharged a toxic metal, uranium, to the crib after 1987. USDOE failed to designate and disclose this discharge of uranium in

[17] U-17 is acknowledged by the Plan as having received waste"Between 1989 and 1992". Page B-12. Uranium, nitrates, fluoride and Tc99 are acknowledged to have been discharged.
[18] Proposed Plan at B-4.

its permit application. However, there is no dispute that uranium was discharged (that was a prime purpose of the discharge).

- The logs clearly show that the chemical sewer line was a potential discharge source to the crib after July, 1987. Again, failure to monitor under RCRA compliant requirements can not be used as a basis for claiming that no discharge occurred. Under the HWMA and RCRA, the presence and potential of the sewer line to discharge makes the crib part of a hazardous waste storage, treatment and disposal unit after 1987.
- Manipulation of pH was not perfected and the logs show numerous instances of low pH below the pH of 5, for which discharge was supposed to be controlled after July, 1987. Claims in the log that readings well below 5 were erroneous must be taken with a grain of salt and not accorded any weight because the operators had an incentive to claim the actual monitoring data was wrong. Log entries show the system was not calibrated and it certainly was not operated under HWMA standards after July 1987. For instance, log entries show repeated efforts and problems with calibration in the latter part of 1987. One log entry shows pH at .4 in February 1988 and discharges continuing even after discovery that nuetralization had been turned off (this would be a serious and willful violation of RCRA – even without a permit). Again, the failure to have a RCRA permit and approved monitoring and sampling plan means that USDOE must now live with the crib –and all the other cribs which received waste or were not totally disconnected from pipes and sewers as of July 1987 – being closed under RCRA and the HWMA.

The Proposed Plan Does Not Attempt to Restore Groundwater; The Proposed Plan Impermissibly Fails to Have Enforceable Groundwater Protection Requirements and Would Allow Increased Harm to Groundwater:

Numerous units in the U-Area received dangerous wastes and hazardous substances after July, 1987 – the date which the Tri-Party Agreement parties (USDOE, Ecology and EPA) have set for determining if units should be closed under RCRA / HWMA state closure requirements and a dangerous waste permit if they received or stored wastes after that date.

A fundamental flaw of this so-called "integrated plan", as with other Hanford cleanup plans, is that groundwater remediation decisions are arbitrarily removed to a separate groundwater unit, with decisions to be made much later – if ever. USDOE has formally asserted that it may declare the groundwater in the vicinity of the U-Area "irreversibly and irretrievably committed" to contamination and has adopted proposed goals, strategies and end states under which it would not remediate or restore the groundwater within any reasonable period of time.

Groundwater in Central Washington is a highly valuable resource, and will grow in value. Proposals to allow groundwater to remain unusable for 50 years or longer are not acceptable nor are they legal since state requirements are that contaminated sites attempt to restore groundwater to beneficial use.

Instead of seeking to restore groundwater, the Plan is based on: "No consumptive use of groundwater for the next 150 yr".[19]

The Proposed Plan – by substituting use of CERCLA and RCRA Past practice unit status for closure of a RCRA /HWMA dangerous waste unit – fails to set any enforceable requirements for monitoring and remediation of groundwater, and for corrective action to decrease the likelihood of harm to groundwater. Washington State law requires such permit conditions.

The enforceable monitoring and corrective action program – with dates and specific standards – which is required by WAC 173-340-645 is entirely missing from this Proposed Plan. By failing to specify permit conditions with a compliance program, the public and State are deprived of a readily enforceable corrective action and monitoring program. This will also have great effect on Congressional funding, since Congress and the USDOE itself have consistently been interested in providing full compliance funding, while deferring funding for negotiated plans, especially when they are subject to additional negotiation. Specific examples of the required monitoring and corrective action elements which should be in an enforceable permit are given in the footnote below.[20] Annual groundwater monitoring reports and other documents (e.g., the USDOE Groundwater / Vadose Zone State of Knowledge and investigatory data show that dangerous constituents have been detected in the groundwater from the U-Area units and exceed standards.

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[19] Proposed Plan at page 10.

[20] 173-303-645 Releases

(2) Required programs.

(a) Owners and operators subject to this section must conduct a monitoring and response program as follows:

(i) Whenever dangerous constituents under subsection (4) of this section, from a regulated unit are detected at the compliance point under subsection (6) of this section, the owner or operator must institute a compliance monitoring program under subsection (10) of this section. Detected is defined as statistically significant evidence of contamination as described in subsection (9)(f) of this section;

(ii) Whenever the ground water protection standard under subsection (3) of this section, is exceeded, the owner or operator must institute a corrective action program under subsection (11) of this section. Exceeded is defined as statistically significant evidence of increased contamination as described in subsection (10)(h) of this section. Exceeded is defined as statistically significant evidence of contamination as described in WAC 173-303-645 (10)(d);

(iii) Whenever dangerous constituents under subsection (4) of this section, from a regulated unit exceed concentration limits under subsection (5) of this section, in ground water between the compliance point under subsection (6) of this section and the downgradient facility property boundary, the owner or operator must institute a corrective action program under subsection (11) of this section; and

(iv) In all other cases, the owner or operator must institute a detection monitoring program under subsection (9) of this section.

(b) The department will specify in the facility permit the specific elements of the monitoring and response program. The department may include one or more of the programs identified in (a) of this subsection, in the facility permit as may be necessary to protect human health and the environment and will specify the circumstances under which each of the programs will be required. In deciding whether to require the owner or operator to be prepared to institute a particular program, the department will consider the potential adverse effects on human health and the environment that might occur before final administrative action on a permit modification application to incorporate such a program could be taken.

(3) Ground water protection standard. The owner or operator must comply with conditions specified in the facility permit that are designed to ensure that dangerous constituents under subsection (4) of this section, detected in the ground water from a regulated unit do not exceed the concentration limits under subsection (5) of this section, in the uppermost aquifer underlying the waste management area beyond the point of compliance under subsection (6) of this section, during the compliance period under subsection (7) of this section. To the extent practical, the department will establish this ground water protection standard in the facility permit at the time the permit is issued. If the department determines that an established standard is not protective enough, or if the department decides that it is not practical to establish standards at the time of permit issuance, the department will establish the ground water protection standard in the facility permit when dangerous constituents have been detected in the ground water from a regulated unit.

There is no enforceable provision in the Proposed Plan – because it fails to rely upon a closure permit with corrective action under HWMA – to ensure that dangerous constituents from the U-Area units do not violate, or increase the violation of, groundwater protection standards.

There are no elements of a monitoring and response plan specified.

Rather than include the required elements for enforceable monitoring, response and corrective action plans, the U-Area Proposed Plan talks of how the USDOE has "voluntarily" chosen to take actions to decrease the impact of the Units on groundwater and decrease the spread of contaminants by decommissioning abandoned wells and cutting off old water pipelines.

However, these are not "voluntary" actions. They are long ignored legal requirements, and must be spelled out as enforceable permit conditions. For too long, these illegal conditions have persisted – until Inspector General (2005) and other reports have made inaction politically untenable. Even after an Inspector General Report highlighting the failure of USDOE to meet legal requirements for groundwater well decommissioning[21] (and, shame on Ecology for not having instituted enforceable compliance schedules before the IG report), USDOE's commitment to ask for full funding to meet this requirement is in question. Only an enforceable compliance schedule will ensure full funding and action on an acceptable timeline for well decommissioning and pipeline removal. *Indeed, this Proposed Plan itself fails to remove pipelines* in its proposed remedies – allowing pipelines to remain and be "lost" until hit by future utility or building excavations, allowing them to serve as conduits for the spread of contamination, to allow infiltration of water to sites, and provide a route for animals to spread contamination. Since this Proposed Plan fails to require removal of pipelines with contamination, it is hardly likely that USDOE will voluntarily remove other pipelines.

The public's rights to enforceable corrective action provisions for RCRA TSD units with releases are spelled out in the rules implementing Washington's Hazardous Waste Management Act (RCW Chapter 70,105, with rules in WAC Chapter 173-303). The rules clearly require enforceable permit conditions incorporating use of Model Toxics Control Act standards (e.g., the cleanup levels and standards for carcinogens, and standards for groundwater restoration, default assumptions for risk assessment). These rights of the public are not protected in the Proposed Plan, which substitutes CERCLA (with weaker standards, fewer public participation and disclosure rights, and a negotiation approach under EPA) for enforceable permits and environmental impact statement processes (with disclosure of cumulative impacts) for corrective action and closure.

The state's rules provide:

> iii) WAC 173-340-400, cleanup actions.
> (3) Use of the Model Toxics Control Act.
> (a) The department may require the owner/operator of a facility to fulfill his corrective action responsibilities under subsection (2) of this section using an enforceable action

[21] The failure to decommission wells and the failure to replace or remove leaking and abandoned pipelines illustrates our point about the likelihood of failure of institutional controls to protect human health and the environment from any decision to leave waste in place (at either the "do nothing" sites or the cap in place sites). If USDOE allowed wells to illegally remain as conduits for contamination and allowed pipelines to leak in contaminated areas, it is extremely probable that similar conditions will occur again in the vicinity of these same units after waste is left in place. The Proposed Plan fails to require cleanup to levels protective of human health and the environment in the event of such likely failures of the institutional controls.

issued pursuant to the Model Toxics Control Act, as amended, (chapter 70.105D RCW) and its implementing regulations.

(b) Corrective action requirements imposed by the department in an action issued pursuant to the Model Toxics Control Act will be in compliance with the requirements of subsection (2) of this section and the requirements of chapter 173-303 WAC to the extent required by RCW 70.105D.030 (2)(d) and WAC 173-340-710.

(c) In the case of facilities seeking or required to have a permit under the provisions of this chapter the department will incorporate corrective action requirements imposed pursuant to the Model Toxics Control Act into permits at the time of permit issuance. Such incorporation will in no way affect the timing or scope of review of the Model Toxics Control Act action.

An example of those rights for enforceable permit conditions and information which this Proposed Plan does not protect is the requirements of WAC 173-340-350(7)(c)(iii), requiring that the field investigation meet very specific requirements for sampling:

(iii) Field investigations. Sufficient investigations to characterize the distribution of hazardous substances present at the site, and threat to human health and the environment

The rules require specific elements for such characterization. These are not waivable or replaceable by use of limited investigations into "analogous sites" or use of "process knowledge.

The approach of the Proposed Plan is to substitute the public's rights: for enforceable actions (monitoring, sampling, corrective action) to meet specific state standards determined by state risk assessment minimum requirements; the public rights to disclosure and consideration of actual sampling data for all potentially present hazardous substances; and, the public's rights to consideration of cumulative impacts in a holistic fashion for the entire U-Area. The Proposed Plan inappropriately replaces these with a piecemeal approach, which is not based on actual investigation; and, lacks enforceable permit conditions for monitoring, sampling and corrective action and protection of groundwater; and, which substitutes state standards for carcinogens with unsupportable remedial action objectives which will lead to unacceptable future health and ecological risks from wastes abandoned where they are.

The U-Area Proposed Plan and Feasibility Study need to be withdrawn and reissued after:

1. actually characterizing, via sampling, all hazardous constituents likely to be present (based on a thorough review of chemicals used in U-Plant and sampling of containers, pipelines, process vessels). This characterization must include:
    - lateral spread; concentrations,
    - whether vapors may be harmful under excavation or intrusion (e.g., solvents, organics, flammables, hydrogen);
    - presence of mobilizing constituents or chemicals present (and their impact on mobility of other constituents, as with the addition of acids mobilizing Sr90, or solvents mobilizing Uranium and Plutonium)
    - inventorying the quantities of Transuranic waste present (or soil or waste which would now qualify as TRU if generated or exhumed by reason of concentration exceeding 100nCi/g), and presenting a plan for retrieval and disposal (federal law requires disposal of TRU in a deep geological repository, not in near surface landfills).
    - all elements necessary to fulfill WAC 173-303 and 340 characterization for a closure plan.
    - Identifying and sampling surface contamination and release sites which are not in this Proposed Plan because they were not in the official Waste Id System. There appear to be surface contamination areas in the records (ie., log books provided to us by Ecology to evaluate for U-12) that do not appear in the Plan: e.g.: access route to 272-U; access road east of 224-UA (over 200cpm, 9/20/87); burial grounds had major releases beyond their boundaries which the Plan (because it does not use actual sampling) does not take into account. Burial grounds had both floods from snow melt and fires carry contamination over wide areas – sometimes a quarter mile. This Plan is based on assumptions that waste is where it was buried or discharged. Cribs also were subject to such flood conditions at the surface during snow melt, etc... The agencies must go back and identify these release sites and spreads, followed by sampling.

2. Characterization data is presented to the public, with an unbiased presentation of cost[22] and a new presentation on the likelihood of failure of institutional controls, for each waste site.
3. Presenting to the public a reasonable retrieve, treat and dispose alternative for each waste unit with retrieval to the extent practicable (typically around 50 feet – rather than a biased presentation of an impractical 200 feet of excavation) prior to capping and monitoring. The costs of this would appear quite reasonable in the picture of Hanford Cleanup. This alternative must be presented to the public for comment in a new proposed plan. Failure to present this to the public is inconsistent with MTCA, HWMA, CPA and CERCLA which requires use of relevant state standards and guarantees of public rights. Evaluation solely under CERCLA failed to use Washington's Priorities for cleanup, with a preference for permanent remedies; and instead, solely substituted CERCLA's nine criteria (which are less protective). Washington Ecology failed to protect the interest of

[22] E.g., as noted above and also in Hanford advisory Board advice, the cost presentation should not show institutional control costs for 20 years before a cap and should not be biased by discounting institutional control costs that will extend for hundreds of years.

Washington's citizens by failing to ensure use of Washington's Waste Management priorities instead of CERCLA.

4. Washington State Ecology is made the lead agency in a revised corrective action and compliance plan based on following Washington's Hazardous Waste Management Act and Model Toxics Control Act procedures. Ecology must not abandon its obligations by allowing the sites to be removed from RCRA status and having EPA substituted as the lead agency. As repeatedly shown in these comments, state standards have been ignored in the proposed Plan and state requirements for enforceable permit conditions are ignored – abandoning the public's procedural rights.
5. Re-evaluating all alternatives to meet the goal of protecting and restoring groundwater, rather than basing proposed decisions on an impermissible goal of allowing groundwater contamination to increase, while restricting ground water use as a resource for 150 years at minimum.
6. Presenting the risks from the likely failure of the proposed institutional controls, and discussing how USDOE has already lost 'configuration control" in the 200 East Area and how that has resulted in pipelines, cribs and other excavations occurring where there were 'lost" waste sites. This must be presented with the risk of this repeating – and the remedial action levels must be set with cleanup occurring so that in the event of such likely loss of controls, the total risk will still not exceed the remedial action objective. The proposed plan assumes no loss of controls in setting those objectives. This does not comport with MTCA and HWMA rules. Assumptions that institutional controls will work to prevent excavations, utility installations, continued prevention of animal or pest intrusion etc... for 150 years are simply not credible.
7. Presenting an alternative that protects and restores groundwater to beneficial use in a reasonable time frame (150 years is not reasonable).
8. Present RCRA/HWMA closure plans flowing WAC Chapters 173-303 and 340 for all units which received any waste after 1987 -- actual characterization of each unit for ALL potentially discharged/disposed hazardous substances must occur and results be presented;
9. Establish cleanup levels and remedial action levels based on the MTCA total carcinogen risk level of 1 additional cancer per one hundred thousand exposed persons, including radionuclides in the carcinogen evaluation. Use of 15 millirem of exposure per year is not protective of human health under state law. Whether CERCLA or RCRA is applied, the state standard must still be utilized in setting remedial action objectives / remedial action levels and cleanup standards. The new report issued by the National Academy of Sciences on the effects of low doses of ionizing radiation also confirms that the Proposed Plan's claim that 15 millirem of radiation exposure will be protective of human health and meet the EPA's excess lifetime cancer risk standard for exposure at Superfund sites is quite wrong. The proposed 15 millirem / year dose for a cleanup level (remedial action objective) exceeds the EPA standard for allowable cancer risk at Superfund sites by eight times, and exceeds the state standard by far more than that. Far lower levels are achievable at reasonable cost. Therefore, all sites in the U-Area should have waste retrieved and treated for disposal in regulated landfills, rather than have waste abandoned with a claim they will be monitored for 150 years, or left in place under a cap with the same assumptions about effective monitoring and institutional controls.