Finding of No Significant Impact
Waste Tank Safety Program at the Hanford Site

AGENCY: U.S. Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The U.S. Department of Energy (DOE) has prepared an Environmental Assessment (EA), DOE/EA-0915, to assess potential environmental impacts of a proposed action involving activities needed to resolve high-level radioactive waste tank safety issues at the Hanford Site. These activities would include the installation, operation, maintenance, and removal of in-tank and external monitoring devices and mitigation equipment; minor modifications to ventilation systems and other portions of the tank farm infrastructure; waste stabilization; sampling for waste characterization; and removal of organic waste from one high-level waste tank for storage in a non-high-level waste tank.

Based on the evaluation in the EA, the DOE has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969 , 42 U.S.C. 4321, et seq. Therefore, the preparation of an environmental impact statement (EIS) is not required.

Addresses and Further Information:

Single copies of the EA and further information about the proposed project are available from:

Mr. R. E. Gerton, Director
Tank Waste Storage Division
U.S. Department of Energy
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P.O. Box 550
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Phone: (509) 376-9106

For further information regarding the DOE NEPA process, contact:

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Background: DOE has conducted radioactive waste management operations at the Hanford Site for nearly 50 years. Operations have included storage of high-level radioactive waste in 177 underground storage tanks in both single-shell tanks and double-shell tanks. Many of the tanks and the equipment needed to operate them are deteriorated. Sixty-seven of the single-shell tanks are presumed to have leaked. Knowledge of the tank contents is incomplete and is based primarily on historical operating records and limited sampling information.

Safety issues associated with the waste include: (1) flammable gas generation and episodic release; (2) potentially explosive ferrocyanide-containing wastes; (3) a potentially flammable or explosive floating organic solvent layer in Tank 241-C-103; (4) nuclear criticality; (5) toxic vapors; (6) the need for infrastructure upgrades; and (7) the need to pump liquids from single-shell tanks that are assumed to be leaking (interim stabilization).

DOE needs to take action to accelerate resolution of waste tank safety issues at the Hanford Site to reduce the risks associated with operations and

management of the waste tanks, to respond to Congressional concerns about the safety of Hanford tank operations as reflected in Public Law 101-510, to meet Resource Conservation and Recovery Act (RCRA) analytical data requirements, and to meet characterization commitments contained in the Hanford Federal Facility Agreement and Consent Order, more commonly known as the Tri-Party Agreement.

Proposed action: The proposed action would include general and specific waste tank characterization and mitigation activities, and minor facility modifications, at the Hanford Site. These activities would include the installation, operation, maintenance, and removal of in-tank and external monitoring devices and mitigation equipment (including thermocouples, multi-function instrument trees, liquid observation wells, various types of probes, surface level detectors, video cameras, infrared scanners, sludge weights, air lances, and various types of equipment designed to mitigate the buildup of flammable gases in waste tanks); sampling for waste characterization; minor modifications to ventilation systems and other portions of the tank farm infrastructure; interim stabilization of single-shell tanks suspected of leaking by pumping liquids to secure double-shell tanks; and removal of the layer of organic waste from Tank 241-C-103 to a tanker truck or a non-high-level waste tank for storage. Before the proposed activities are conducted, DOE would review or prepare appropriate safety and environmental documentation to ensure that the activities can be conducted safely and that potential risks were evaluated in the EA.

Alternatives considered: A no-action alternative was considered that would consist of continuing ongoing tank farm operations. Under that alternative

DOE would not gather the information needed to resolve waste tank safety issues at Hanford.

DOE also considered alternative strategies involving less intrusive techniques for resolution of tank safety issues. For example, DOE considered characterization using solely non-intrusive methods such as calculations based on historical process knowledge, and laboratory simulants. DOE also considered minimizing intrusive operations (e.g., monitoring without intrusive characterization activities). These alternative strategies were not considered viable, because new in-tank data are required to validate the theoretical projections that would be derived from the information produced by the non-intrusive alternatives. No other reasonable methods of addressing DOE's tank safety issues were identified.

Environmental impacts: Routine conduct of the proposed activities would not result in any increase in tank emissions. Before beginning the proposed activities, appropriate procedures and administrative controls would be in place to maintain radiation exposure to workers and other onsite personnel within requirements of DOE Orders and as low as reasonably achievable. Radiation and hazardous chemical levels at the sample riser and exposure of the workers would be monitored. Gas sampling of each tank's vapor space would be conducted, as appropriate, to assure that no flammable gases greater than 20 percent of the lower flammability limit (LFL) are present. Gas samples would be obtained from a riser test port, which is isolated from the environment by a high-efficiency particulate air filter. If flammable gas levels above 20 percent of the LFL are detected, the proposed activities would not be performed in the tank unless additional evaluations show that flammable gas concentrations are at safe levels. Additional safety controls (such as

electrical grounding, spark resistant tools, vapor space purging, and the use of protective clothing and/or supplied air) also would be utilized when appropriate.

During routine conduct of the proposed activities, potential radiological doses to members of the public and workers performing the work would be extremely small, and are not expected to result in any health effects. The risks to workers from chemical exposures, burns and other common industrial hazards are expected to be low, and would be minimized by training and the use of appropriate personal protective equipment.

Small quantities of low-concentration hazardous wastes, such as solvents and cleaning agents, would be generated as a result of the proposed action. Such wastes would be managed at existing Hanford Site facilities in accordance with all applicable requirements.

Cumulative impacts: The proposed tank farm operations would not have a substantial cumulative effect on day-to-day operations on the Hanford Site with respect to worker exposure. The incremental impact of handling the increased amount of radioactive and non-radioactive materials would be very small. When added to the impacts from day-to-day operations on the Hanford Site and surrounding community, the total impact also would remain very small. The proposed activities are expected to slightly increase the potential risk of tank accidents in the short-term, but resolution of tank safety issues would minimize the potential for tank accidents in the long-term.

Impacts from potential accidents: The EA considered a range of reasonably foreseeable accident scenarios associated with the proposed action that could

result in a release of radioactive material or toxic gases. These include a range of low probability, high consequence events and relatively higher probability, lower consequence events. Events with a relatively higher probability include a pumping system break (probability of 1.4 chances in 1,000 per year) or a hydrogen ignition during interim stabilization operations (probability of between 1 chance in 100 to 1 chance in 10,000 per year), a spill during removal of a sample (probability of 5 chances in 100,000 per year), and a release of toxic vapors (probability of 1 chance in 10,000 per year). None of these more probable events would be expected to have any adverse health impacts on either workers or members of the public.

More severe accidents such as ignition of flammable gas within a tank (probability of 1 chance in 10,000,000 per year) and the maximum reasonably foreseeable accident, detonation of Tank 241-SY-101 (probability of less than 1 chance in 1,000,000 per year) were also analyzed. The consequences of the maximum reasonably foreseeable accident would be no greater than those projected for a ferrocyanide tank explosion in the 1987 Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes, (DOE/EIS-0013). The 1987 EIS projected that such an explosion would result in a short-term radiation dose of 200 millirems to the maximally exposed member of the public, and an offsite collective dose of 7,000 person-rem. Such an explosion would be expected to result in 4 offsite latent cancer fatalities, the contamination of a substantial area of land, and large doses to workers. A 1990 General Accounting Office study estimated that the consequences of the ferrocyanide tank explosion could be 10 to 100 times greater than those projected in the 1987 EIS. The GAO study did not reach a conclusion regarding the probability of a tank explosion. Even if the severe consequences of a ferrocyanide tank explosion projected by the GAO are

assumed, in view of the extremely low probability of occurrence for the most severe accidents that the proposed action could cause, the risks posed to the environment and human health by this potential accident are small.

Determination: Based on the analysis in the EA, and after considering the preapproval review comments of the State of Washington, the Confederated Tribes of the Umatilla Indian Reservation, and the Yakama Indian Nation, I conclude that the proposed activities to address the DOE's safety initiatives do not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA. Therefore, an EIS for the proposed action is not required.

Issued at Washington, D.C., this 25th day of February, 1994.

for Jana O'Toole, M.D., M.P.H.
Assistant Secretary
Environment, Safety and Health