

memorandum

DATE: November 16, 1990

DOE/EA--0479

REPLY TO
ATTN OF: EH-25

DE91 004350

SUBJECT: Environmental Assessment for Collecting Crust Samples from
Level Detectors in Tank 101-SY at the Hanford SiteTO: Leo P. Duffy, Director
Office of Environmental Restoration
and Waste Management

This is in response to your November 15, 1990, request for approval of the environmental assessment (EA) for Level Sensor Replacement/Sampling of Tank 241-SY-101 at the Hanford Site (DOE/EA-0479) and issuance of a finding of no significant impact (FONSI) for the proposed action.

The Office of Environment, Safety and Health has reviewed the EA in accordance with our responsibilities under Department of Energy Order 5440.1C regarding compliance with the National Environmental Policy Act (NEPA). The EA incorporates comments provided by the Office of NEPA Oversight on preliminary versions of the EA. The State of Washington has been informed of the proposed action by letter dated November 15, 1990.

Based upon my staff's review and analysis and its recommendations, and after consultation with the Office of General Counsel, I have determined that this EA is adequate for publication and that the proposed action is not a major Federal action significantly affecting the quality of the human environment, within the meaning of NEPA. Therefore, the preparation of an environmental impact statement is not required. The basis for the determination is explained in the attached FONSI.

Environmental Restoration and Waste Management is responsible for providing public notice of the availability of the EA and FONSI as required in Section 1506(b)(3) of the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA. Please send five copies of the EA and a copy of the distribution to the Office of NEPA Oversight for our files.



Paul L. Ziemer, Ph.D.
Assistant Secretary
Environment, Safety and Health

cc: R. Scott, EM-20
NEPA Compliance Officer

MASTER

**FINDING OF NO SIGNIFICANT IMPACT,
LEVEL SENSOR REPLACEMENT/SAMPLING OF TANK 241-SY-101
AT THE HANFORD SITE, RICHLAND, WA**

AGENCY: Department of Energy

ACTION: Finding of No Significant Impact

SUMMARY: The Department of Energy (DOE) has prepared an environmental assessment (EA), DOE/EA-0479, to assess environmental impacts associated with obtaining waste characterization information in order to enhance DOE's understanding of the hydrogen generation/accumulation phenomenon in Tank 241-SY-101 at the Hanford Site. The proposed action is to remove three level detectors from Tank 241-SY-101 and analyze the waste that is presently encrusted on the detectors. Based on the analyses in the EA, 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. Therefore, the preparation of an environmental impact statement is not required and the Department is issuing this Finding of No Significant Impact (FONSI).

COPIES OF THE EA ARE AVAILABLE FROM:

Mr. R. E. Gerton, Director
Tank Farm Project Office
U. S. Department of Energy
P. O. Box 550
Richland, WA 99352
(509) 376-1366

FOR FURTHER INFORMATION CONTACT:

Carol M. Borgstrom, Director
Office of NEPA Oversight
U. S. Department of Energy
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BACKGROUND: The generation/accumulation of hydrogen has been recognized as a safety concern for some waste tanks at the Hanford Site. The interaction of hydrogen, oxygen, and nitrous oxide gases (also generated by waste reactions), could result in a hydrogen explosion. Furthermore, the presence of organic and nitrate/nitrite in the crust could result in a secondary reaction, increasing the potential for releases of radioactive material into the environment. DOE proposes to implement a program to obtain waste characterization information in order to better understand the chemical and physical reactions in the tank.

PROPOSED ACTION: The proposed action is to gather waste characterization information regarding Tank 241-SY-101 by removing three level detectors (i.e., automatic tape, manual tape and sludge weight) from the tank, and analyzing crusted waste that has been deposited on the detectors. The sludge weight will not be replaced. Replacement of level detectors normally is a routine maintenance activity on the Hanford Site. However, given the concerns associated with hydrogen accumulation and the potential for secondary crust reactions, DOE has prepared a

safety evaluation and environmental assessment to ensure that the proposed action is conducted in a safe and environmentally sound manner. Standard operating procedures (SOPs) will be revised to reflect the potential presence of hydrogen gas.

ENVIRONMENTAL IMPACTS: The potential environmental consequences from the proposed action were analyzed for detector retrieval/replacement and laboratory analysis activities. No significant environmental impacts were identified for routine operations.

The Tank 241-SY-101 primary ventilation system will be operational during sensor retrieval in order to prevent build-up of hydrogen in the tank dome space and to maintain airborne radioactive emissions well below DOE and contractor guidelines. A backup exhauster will be available and ready to operate should the primary ventilation be lost. Procedures and administrative controls will be in place prior to detector retrieval and replacement activities to maintain radiation exposure to onsite personnel below DOE Orders and contractor guidelines (5 and 3 rem/year, respectively) in keeping with the philosophy of maintaining exposures as low as reasonably achievable (ALARA). Constant radiation monitoring will be conducted during detector retrieval and replacement, and laboratory analysis. Radioactive material, radioactively contaminated equipment, including the retrieved detectors after removal of crust materials, and

radioactive mixed wastes will be packaged and stored/disposed at the Hanford Site. None of these wastes are expected to contribute significantly to the volume of waste generated annually at the Hanford Site (e.g., the recorded total volume of waste received at the 200 Areas for storage or burial in calendar year 1988 was 17,453 m³).

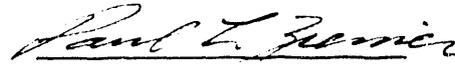
Based on the analyses provided in the Safety Evaluation (attached to the EA), DOE has concluded that the likelihood of an accident would be low based on past experience. The offsite whole body doses due to a postulated bounding accident would be less than 3 rem. Exposure to operators equipped with the required respiratory protection would result in doses less than 5 rem. Therefore the accident risk posed by the proposed action is small. In addition, operating conditions will be imposed which would further lessen the doses from, or likelihood of, an accident.

With respect to cumulative effects, analysis indicates that Tank 241-SY-101 will not significantly increase the risks associated with the continued operation of the tank farms.

ALTERNATIVES CONSIDERED: The "no action" alternative was considered in the EA. The proposed action is preferable to "no action" in that it will generate waste characterization data that can be used to measure and ultimately reduce risk to the environment.

DETERMINATION: Based on the analysis in the EA, the proposed 241-SY-101 waste characterization activities do not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the NEPA. Therefore, an environmental impact statement for the proposed action is not required.

Issued at Washington, D.C., this 16th day of Nov. 1990.



Paul L. Ziemer, Ph.D.

Assistant Secretary

Environment, Safety and Health

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LEVEL SENSOR REPLACEMENT/SAMPLING OF TANK 241-SY-101

HANFORD SITE, RICHLAND, WASHINGTON

ENVIRONMENTAL ASSESSMENT

DOE/EA-0479

NOVEMBER 1990

1.0 Purpose and Need

The U.S. Department of Energy (DOE) is responsible for management and storage of waste accumulated from the processing of defense reactor irradiated fuels for plutonium recovery at the Hanford Site. Hydrogen has been recognized as a gas that could be generated from waste and released into the tank dome space of some waste storage tanks (depending upon the waste composition). The interaction of hydrogen, oxygen, and nitrous oxide gases (also generated under the waste crust) in the tank dome space could result in a hydrogen reaction. The presence of organics and nitrates in the crust could result in a secondary reaction, increasing the potential for releases of radioactive material into the environment. The DOE is proposing to obtain waste characterization information in order to understand the hydrogen generation/accumulation phenomenon. To that end, DOE is proposing to remove three level detectors from Tank 241-SY-101 and analyze the waste that is presently encrusted on the detectors. The proposed sampling is less intrusive than core sampling and will provide data regarding characterization of the crust to support future core sampling.

The purpose of this environmental assessment (EA) is to provide information about the proposed action such that a decision can be made on whether a Finding of No Significant Impact should be issued or an environmental impact statement should be prepared. Therefore, this EA evaluates the proposed action and the no action alternative, in keeping with requirements of the National Environmental Policy Act of 1969 (NEPA) and regulations of the Council on Environmental Quality, Title 40, Code of Federal Regulations, parts 1500-1508.

2.0 Description of Proposed Action

The proposed action involves gathering waste characterization information for Tank 241-SY-101 by removing three level detectors (i.e., automatic tape, manual tape and a sludge weight). Encrusted wastes on the detectors will be analyzed at Hanford laboratories. Replacement of level detectors normally is a routine maintenance activity on the Hanford Site. However, given an unresolved safety question associated with hydrogen accumulation and potential for secondary reaction in Tank 241-SY-101, a safety evaluation and this EA have been prepared to ensure that the proposed action is conducted in a safe and environmentally sound fashion. Standard operating procedures will be revised to reflect the potential presence of hydrogen gas. Mitigation of the potential environmental impacts of the proposed action involves preventing spark generation that might cause a fire or explosion during opening of tank risers to retrieve the detectors. A negative pressure will be maintained at all times by an existing, filtered ventilation system to ensure no radiological releases to the environment. The

automatic and manual tapes will be replaced. The sludge weight will not be replaced as it is not needed for current operations.

3.0 Location of Tank 241-SY-101 and Laboratory 222-S

Tank 241-SY-101 and Laboratory 222-S are located in the 200 West Area of the 560 square mile semiarid Hanford Site in southeastern Washington. The 200 West Area is approximately 10 miles from the Columbia River, the nearest natural watercourse. The nearest population center is the city of Richland, about 25 miles away.

More detailed descriptions of the Hanford Site may be found in ERDA 1975, DOE 1987 and PNL 1989b. (See references, Section 7.0)

4.0 Alternatives to Proposed Action

No Action. The no action alternative would not provide characterization data about the waste composition in Tank 241-SY-101, and is therefore deemed to be an unreasonable alternative. There are no other alternatives to the proposed action.

5.0 Potential Environmental Impacts of Proposed Activity

5.1 Routine Impact

No significant environmental impacts have been identified for routine retrieval and replacement of the sensors or laboratory analysis activities. This section provides information on those impacts which have been identified.

The Tank 241-SY-101 primary ventilation system (providing filtration of waste tank airborne effluent) will be operational during sensor retrieval and replacement in order to maintain radioactive emissions well below DOE and contractor guidelines. A backup exhauster will be available to provide containment should the primary ventilation be lost. Therefore, no significant exposure to the public or workers is anticipated as a result of this action above that currently experienced from Hanford Site operations (PNL 1989a).

Procedures and administrative controls will be in place prior to detector retrieval and replacement activities to maintain radiation exposure to onsite personnel below DOE Orders and contractor guidelines (5 and 3 rem/year, respectively) in keeping with the philosophy of as low as reasonably achievable (ALARA). Constant radiation monitoring will be conducted during sensor retrieval, replacement, and laboratory analysis.

Small quantities of hazardous materials (e.g., solvents, cleaning agents, etc.) which may be generated will be managed and disposed of in accordance with applicable Federal and state regulations. Radioactive material, radioactively contaminated equipment, including the retrieved detectors, and radioactive mixed wastes will be appropriately packaged and stored/d~~i~~sposed at the Hanford Site. None of these wastes are expected to contribute significantly to the volume of waste generated annually at the Hanford Site (e.g., the recorded total volume of waste received at the 200 Areas for storage or burial in calendar year 1988 was 17,453 m³).

5.2 Risk Assessment

The proposed activity was reviewed to determine if a spark or static buildup, crust disturbance, contamination spread, or operator injury could occur. The results of this review are summarized in the safety evaluation, which is attached to this EA. As discussed in the safety evaluation, it was concluded that the likelihood of an accident would be low based on past experience. The offsite whole body doses due to a postulated bounding accident would be less than 3 mrem. The operator doses would be no more than 45 rem assuming no respiratory protection; however, the operator will have respiratory protection so the estimated dose would be less than 5 rem. Therefore, the risk posed by this operation is small. In addition, operating conditions will be imposed that would further lessen the doses from, or likelihood of, an accident. Such conditions may include continuous operation of the primary ventilation system, availability of the back-up ventilation system, consideration of electrically bonding the riser cover to the tank, and use of sparkless tools.

5.3 Cumulative Impacts

With respect to cumulative effects, current information indicates that sampling the crust in Tank 241-SY-101 will not significantly increase the risks associated with the continued operation of the Hanford Site tank farms. The proposed action will not significantly impact the surrounding population and environment.

6.0 Summary

The proposed action involves collection of waste characterization information for Tank 241-SY-101 by removal of level detectors and analysis of waste that is encrusted on the detectors. The proposed activities on Tank 241-SY-101 are on land dedicated to DOE nuclear production and waste management. There would be no terrestrial, aquatic, or air quality impacts

resulting from the crust sampling and analysis. No routine or potential accidental impacts of the proposed action would have a significant impact on the quality of the human environment.

7.0 References

DOE 1980, Final Environmental Impact Statement, Supplement to ERDA-1538, December 1975, Waste Management Operations, Hanford Site, Richland, Washington, Double-Shell Tanks for Defense High-Level Radioactive Waste Storage, DOE/EIS-0063, U. S. Department of Energy, Washington D. C.

DOE 1987, Environmental Impact Statement, Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes, DOE/EIS 0113, U. S. Department of Energy, Washington D. C.

ERDA 1975, Waste Management Operations Hanford Reservation, ERDA-1538, United States Energy Research and Development Administration, Richland, Washington.

PNL 1986, Potential Radiological Impacts of Upper-Bound Operational Accidents During Proposed Disposal Alternatives for Hanford Defense Waste, PNL-5356, Pacific Northwest Laboratory, Richland, Washington.

PNL 1989a, Environmental Monitoring at Hanford for 1988, PNL-6825, Pacific Northwest Laboratory, Richland, Washington.

PNL 1989b, Hanford Site National Environmental Policy Act (NEPA) Characterization, PNL-6415 Rev 2, Pacific Northwest Laboratory, Richland, Washington.

END

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