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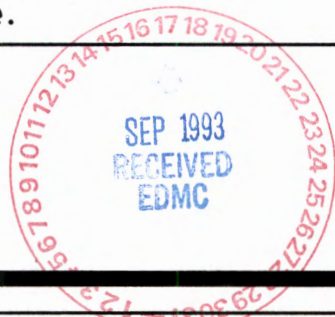
ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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1	1	Safety	T.M. Brun	<i>T.M. Brun</i>	8/24/93							
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Title Safety Evaluation for the Interim Stabilization of the 216-B-3 Pond, 216-B-3-3 Ditch, and 216-B-3A Lobe	Unclassified Category UC-	Impact Level 3E
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SUPPORTING DOCUMENT

1. Total Pages 8

2. Title

Safety Evaluation for the Interim Stabilization of the 216-B-3 Pond, 216-B-3-3 Ditch, and 216-B-3A Lobe

3. Number

WHC-SD-DD-TI-082

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5. Key Words

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6. Author

Name: D. L. Smith

D. L. Smith 8/27/93
Signature

Organization/Charge Code 85100/PV841

7. Abstract

This document is based on an analysis of work at the 216-A-24 crib. Possible exposure routes are examined and dose rates developed for work of similar scope at the 216-B-3 pond system.

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10. RELEASE STAMP

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**SAFETY EVALUATION FOR THE INTERIM STABILIZATION OF
THE 216-B-3 POND, 216-B-3-3 DITCH, AND 216-B-3A LOBE**

D. L. Smith

August 1993

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Post Office Box-1970
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**SAFETY EVALUATION FOR THE INTERIM STABILIZATION OF THE
216-B-3 DITCH, 216-B-3-3 POND, AND 216-B-3A LOBE**

1. INTRODUCTION

Interim stabilization of the 216-B-3 pond, 216-B-3-3 ditch, and potentially the 216-B-3A lobe is required to prevent migration of radioactive material from these site between decommissioning and final closure of the system. The planned actions are outlined in WHC-SD-DD-AP-015, *216-B-3 Pond System Interim Stabilization Plan* (WHC 1992). Briefly, interim stabilization consists of drawing water out of the pond thereby exposing potentially contaminated sediments, then covering these sediments with a layer of uncontaminated soil. The depth of this layer will vary, but will be no less than 4 ft deep. Some soils from the 216-B-3-3 ditch and potentially the 216-B-3A lobe will be consolidated in the 216-B-23 pond.

In 1988, a safety evaluation, *Safety Evaluation of Stabilization of 216-A-24 Crib* (WHC 1988), was prepared for the stabilization of the 216-A-24 crib (A-24 for the rest of the document), which is located just outside the east fence of 200 East Area. After analyzing explosion, resuspension of contaminated soils, and resuspension of excavated soils scenarios, it was concluded that the consequences of these scenarios were well within the radiological and toxicological risk acceptance guidelines. These scenarios, with the exception of the explosion, are applicable in regards to interim stabilization activities at the 216-B-3 pond system. Explosion is not a credible scenario as there has been no recorded discharge of volatile organic materials to the pond, and there are no structures or areas where an explosive atmosphere could develop.

The 216-B-3 pond is a 35 acre pond located east of the 200 East Area. The pond has a maximum depth of 13 ft, with the majority of the pond being less than 4 ft deep. The 216-B-3-3 ditch is the inlet to the 216-B-3 pond. This ditch carries approximately 500 gal per minute, and has a length of 3200 ft. The 216-B-3A lobe is approximately 11 acres. It is only 2 ft deep with the exception of a excavated trench found in the center of the pond. This trench has a depth of 6 ft. For more complete descriptions refer to WHC-SD-DD-AP-015 (WHC 1992). The 216-B-3 pond and 216-B-3-3 ditch will be interim stabilized. The 216-B-3A lobe will be interim stabilized or decontaminated only if radioactive contamination is noted.

The proposed work at the 216-B-3 pond system is similar to work conducted at the A-24, i.e., removal and interim stabilization of contaminated soil with heavy equipment. Distances to onsite structures are similar, with the 216-B-3 pond system being more isolated than A-24. Excavated soil at the A-24 crib was contaminated with radioactive material at levels similar to those found in the vicinity of the 216-B-3 pond system. Small amounts of contaminated soil will be excavated, with the vast majority of contaminated soil being interim stabilized. This minimizes the possibility of resuspension. The hazards associated with work at A-24 were found to be within the risk acceptance guidelines. Therefore, the hazards associated with excavating and interim stabilizing soil at the 216-B-3 pond system are also be within the risk

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acceptance guidelines. Provided there are no differences between the facilities which cause the results of the evaluation to exceed the risk guidelines, the safety evaluation is applicable to both.

2. COMPARISON OF RADIONUCLIDES INVENTORIES AND RISK

Table 1 presents the radionuclides inventories for the A-24 crib and the 216-B-3 pond. No radionuclide or chemical inventories are given for the 216-B-3-3 ditch or the 216-B-3A lobe. It can be assumed that the 216-B-3-3 ditch and 216-B-3A lobe are less contaminated than the main pond. This has been established by sampling. The data for A-24 was taken from the safety evaluation (WHC 1988); the data for 216-B-3 pond was taken from the Waste Inventory Data Sheets (WIDS) (WHC 1991b). The inventories are decayed to 1986 for A-24 and 1989 for 216-B-3 pond. To establish a reasonable basis for comparison, the quantities of the major dose contributing isotopes for each waste site were added together. This value was then divided by the value for the A-24 crib. The results are shown in the bottom row of Table 1. This yielded a ratio of 0.154 times that of A-24. Note that the radionuclide inventory for the 216-B-3 pond system is lower than for the A-24 crib, and distributed over a much larger area. Using 0.154 as a multiplier for the doses from the A-24 evaluation should provide a reasonable estimation of the consequences from similar events at 216-B-3 pond system. Table 2 presents the results of this calculation and a comparison of radiological risk. The radiological risk for these waste sites is below the risk acceptance guidelines.

3. CRITICALITY

There are no criticality concerns at the 216-B-3 pond (WHC 1991a).

4. COMPARISON OF CHEMICAL INVENTORIES AND RISK

There are no chemical inventories established for the 216-B-3 pond system, even though it is known that chemicals have been disposed of in this facility. Even though there is no record of disposal, there are several factors which will minimize the chance of exposure. First, there has likely been no volatile organic materials disposed in the 216-B-3 pond system. This minimizes the chance of exposure. Also, any chemicals that have been disposed of in the pond system have been dilute with large volumes of water, so that it is unlikely that significant concentrations of chemicals exist. Note that most, if not all of the disposed chemicals were water soluble. Finally, interim stabilization activities are designed to minimize exposure to potentially contaminated sediments.

Table 1. Radionuclides for the A-24 Crib and the 216-B-3 Pond System.

CURIES DECAYED TO 1986 (A-24) AND 1989 (216-U-5 and 216-U-6).

RADIONUCLIDES	A-24	216-B-3	216-B-3-3	216-B-3A
H-3 ¹	3680	7.9E+2	-	-
Co-60	.0575	-	-	-
Sr-90	52.8	1.01E+2	-	-
Ru-106	.00005	1.42E-0	-	-
Cs-137	767	9.35E-1	-	-
Pu-239 ²	.76	1.62E+1	-	-
Pu-240	.204	-	-	-
Am-241	-	3.96E-0	-	-
Sn-113	-	7.32E-7	-	-
Pm-147	-	8.18E-1	-	-
U-238 ³	.441	2.1E-0	-	-
TOTAL	820.56	126.43	-	-
RATIO BX/A24	1.00	0.154	-	-

1. Major dose contributing radionuclides only, tritium not included to avoid overstatement.
2. Reported only as plutonium in WIDS, November 20, 1991.
3. Reported as "U-gross" in WIDS, November 20, 1991.

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Table 2. 216-A-24 Crib and 216-T-X Radiological Risk Comparison.

RECEPTOR	RESUSPENSION OF SURFACE SOIL EDE (rem)	RESUSPENSION OF EXCAVATED SOIL EDE (rem)
Onsite Individual A-24 Crib	4.50 E-6	4.30 E-4
Onsite Individual U-X	6.93E-7	6.62-5
Risk Acceptance Guidelines	5.00 E-1	5.00 E-1
Offsite Individual A-24	4.30 E-6	1.80 E-5
Offsite Individual U-X	6.62 E-7	2.77 E-6
Risk Acceptance Guidelines	1.00 E-1	1.00 E-1

5. INDUSTRIAL SAFETY HAZARDS

Industrial safety hazards will be addressed in a Job Safety Analysis (JSA). A JSA will be prepared specifically for this interim stabilization and decontamination job and will be reviewed with the workers at the prejob safety meeting. Radiological hazards will be documented in the Radiation Work Permit (RWP).

6. CONCLUSION

Based on the above comparison, the Safety Evaluation for 216-A-24 Crib (WHC 1988) is applicable to the work planned at the 216-B-3 pond system. Radiological hazards are due mainly to the resuspension of radioactive material due to earth moving activities. However, interim stabilization will be performed so that the chances of this occurring are minimal. No further safety analysis is required. All work will be driven by an approved procedure and other operating level documents. All field personnel will have been trained in (as a minimum) to the 24-Hour Hazardous Waste Site Basic training and radiation worker training. In addition, a prejob safety meeting will be conducted and documented. All equipment used on this job will be inspected to assure it is in safe operating condition.

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7. REFERENCES

- WHC, 1988, *Safety Evaluation of Stabilization of 216-A-24 Crib*, WHC-SD-DD-TI-032 Rev. 0, September 13, 1988, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1991a, *CSAR 80-024, Addendum 5; Criticality Hazard Reviews of Restoration Work Plans for WHC Deactivated Cribs*, WHC-SD-SQA-CSA-20342, August 30, 1991, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1991b, *Waste Inventory Data Sheet*, November 20, 1991, Westinghouse Hanford Company, Richland, Washington.
- WHC, 1992, *216-B-3 Pond System Interim Stabilization Plan*, WHC-SD-DD-AP-015 Rev. 0, June 1992, Westinghouse Hanford Company, Richland, Washington.

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