0051607

S

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 648341

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental ○ Direct Revision ◉ Change ECN ○ Temporary ○ Standby ○ Supersedure ○ Cancel/Void ○	J.C. Henderson, Tank Farm Vadose Zone, HO-22, 372-9234	○ Yes ◉ No	7/15/99
	6. Project Title/No./Work Order No. Preliminary Site-Specific Work Plan Addendum for WMA S-SX	7. Bldg./Sys./Fac. No. TWRS Vadose Zone	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-4380, Rev. 1	10. Related ECN No(s). N/A	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Completed	12d. Restored to Original Condition (Temp. or Standby ECNs only)
○ Yes (fill out Blk. 12b) ◉ No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? ○ Yes ◉ No

Sampling and analysis plan revised based on Washington State Department of Ecology comments.

SEP 1999 RECEIVED EDMC

14a. Justification (mark one)	14b. Justification Details
Criteria Change ◉ Design Improvement ○ Environmental ○ Facility Deactivation ○ As-Found ○ Facilitate Const. ○ Const. Error/Omission ○ Design Error/Omission ○	Changes required to incorporate comments on Rev 1 received from Washington State Department of Ecology.

15. Distribution (include name, MSIN, and no. of copies)

Central Files B1-07
DOE/RL Reading Room H2-53
Vadose Zone Project Files HO-22
R.M. Yasek HO-12
L.E. Borneman H2-53
J.C. Henderson HO-22
D.L. Nichols B2-05
T. Knepp HO-22
C. Lindenmeier K6-81

RELEASE STAMP

JUL 16 1999
DATE:
STA: 15
HANFORD RELEASE
ID: 21

A-7900-013-1

A-7900-013-2 (10/97)

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 648341

16. Design Verification Required	17. Cost Impact		18. Schedule Impact (days)
	ENGINEERING	CONSTRUCTION	
○ Yes	Additional ○ $ _____	Additional ○ $ _____	Improvement ○ _____
◉ No	Savings ○ $ _____	Savings ○ $ _____	Delay ○ _____

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	☐	Seismic/Stress Analysis	☐	Tank Calibration Manual	☐
Functional Design Criteria	☐	Stress/Design Report	☐	Health Physics Procedure	☐
Operating Specification	☐	Interface Control Drawing	☐	Spares Multiple Unit Listing	☐
Criticality Specification	☐	Calibration Procedure	☐	Test Procedures/Specification	☐
Conceptual Design Report	☐	Installation Procedure	☐	Component Index	☐
Equipment Spec.	☐	Maintenance Procedure	☐	ASME Coded Item	☐
Const. Spec.	☐	Engineering Procedure	☐	Human Factor Consideration	☐
Procurement Spec.	☐	Operating Instruction	☐	Computer Software	☐
Vendor Information	☐	Operating Procedure	☐	Electric Circuit Schedule	☐
OM Manual	☐	Operational Safety Requirement	☐	ICRS Procedure	☐
FSAR/SAR	☐	IEFD Drawing	☐	Process Control Manual/Plan	☐
Safety Equipment List	☐	Cell Arrangement Drawing	☐	Process Flow Chart	☐
Radiation Work Permit	☐	Essential Material Specification	☐	Purchase Requisition	☐
Environmental Impact Statement	☐	Fac. Proc. Samp. Schedule	☐	Tickler File	☐
Environmental Report	☐	Inspection Plan	☐	_____	☐
Environmental Permit	☐	Inventory Adjustment Request	☐	_____	☐

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number/Revision
N/A		

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng.	K. Hanlan	7/15/99	PE		
Cog. Mgr.	A. J. Knopp	7/15/99	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

S

Preliminary Site-Specific SST Phase 1 RFI/CMS Work Plan Addendum for WMA S-SX

J.C. Henderson
Lockheed Martin Hanford Corporation
Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: 648341 UC: 2010
Org Code: 73100 Charge Code: 106501CA40
B&R Code: EW3130010 Total Pages: 275

Key Words: Vadose Zone, RFI/CMS Work Plan, WMA S-SX

Abstract: This Preliminary Site-Specific Waste Management Area S-SX Phase 1 RFI/CMS Work Plan Addendum addresses vadose zone and groundwater characterization activities in and near the WMA S-SX. Vadose zone characterization activities associated with decommissioning borehole 41-09-39, installation of a new borehole in the SX Tank Farm near SX-115, and installation of three RCRA groundwater monitoring wells are described.

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Karen L. Noland 7/16/99
Release Approval Date

Release Stamp

Approved For Public Release

RECORD OF REVISION	(1) Document Number HNF-4380	Page 1

(2) Title
Preliminary Site-Specific SST Phase 1 RFI/CMS Work Plan Addendum for WMA S-SX

Change Control Record

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release		
		(5) Cog. Engr.	(6) Cog. Mgr.	Date
0	(7) Initially released 4/26/99 on EDT 621750	JCH	C.C. Haass	
0A	Incorporated per ECN-648339 - Replaced page C-5	JCH	C.C. Haass	
1	Complete revision per ECN-648340	JCH	A.J. Knepp	
1A RS	Incorporated per ECN-648341 - Replaced pageA-14, A-16, and C-5	[signature]	[signature]	7/15/99

A-7320-005 (10/97)

Table A.1. Constituents and Methods for New Borehole Sediment Sample Analyses and Borehole 41-09-39 Decommissioning Samples

Analysis/ Constituent	Preparation Method	Preparation Procedure Number	Analytical Method	Analytical Procedure Number
^{137}Cs	Bulk sediment	N/A	GEA	PNL-RRL-001
^{14}C	Bulk sediment Water extract	N/A Methods of Soil Analysis, Part 2; 62-1.3.2.2	Total combustion LSC method in review based on:	ASTM D 4129-82 PNL-ALO-476
^{152}Eu	Bulk sediment	N/A	GEA	PNL-RRL-001
^{237}Np ^{239}Pu ^{240}Pu ^{241}Am	Acid leach Fusion	PNL-ALO-106 PNL-ALO-235	ICP-MS	PNL-ALO-211
^{90}Sr	Acid leach Fusion	PNL-ALO-106 PNL-ALO-235	LSC	PNL-ALO-476
^{60}Co	Bulk sediment	N/A	GEA	PNL-RRL-001
^{99}Tc	Acid leach Fusion	PNL-ALO-106 PNL-ALO-235	ICP-MS LSC	PNL-ALO-211 PNL-ALO-476
^{3}H	Water extract	Methods of Soil Analysis, Part 2; 62-1.3.2.2	LSC	PNL-ALO-476
^{129}I	Acid leach	PNL-ALO-106	ICP-MS	PNL-ALO-211
^{79}Se	Note 2	Note 2	Note 2	Note 2
Total uranium	Water extract Fusion	Methods of Soil Analysis, Part 2; 62-1.3.2.2 PNL-ALO-235	ICP-MS	PNL-ALO-211
Metals	Water extract Acid leach Fusion	Methods of Soil Analysis, Part 2; 62-1.3.2.2 PNL-ALO-106 PNL-ALO-235	ICP-MS	PNL-ALO-211
VOA	Bulk sediment	Note 1	GC/MS	SW846-8260
SVOAs with TICs	Bulk sediment	Note 1	CG/MS	SW846-8270
pH	Water extract	Methods of Soil Analysis, Part 2; 62-1.3.2.2	Electrometric	Methods of Soil Analysis; 60-3.4
Anions	Water extract	Methods of Soil Analysis, Part 2; 62-1.3.2.2	IC ISE Colorimetric	PNL-ALO-212 US EPA Method 300.0A Orion-720a Hach procedure

The background subsample, backfill – Hanford formation contact subsample, the two subsamples obtained at the Hanford formation and Plio-Pleistocene Unit contact, and the Plio-Pleistocene Unit and Ringold Formation contact, and the subsample obtained just above the water table in the capillary fringe zone will be analyzed for the constituents and properties identified in Table A.1. It is recognized that conditions may occur when all of the analyses identified in Table A.1 are not warranted (e.g., limited potential for data) and these occurrences will be evaluated on a case-by-case basis.

The remaining subsamples will be analyzed for specific constituents listed in Table A.1 depending on the results of the nitrate, electrical conductivity, and pH screening analyses. A review of the screening analyses results with technical representatives along with Ecology will be conducted prior to performing additional analyses. Screening analysis may be used to determine whether alternative analytical techniques with lower detection limits should be used for specific radionuclides of concern. The screening criteria and associated analytical requirements are identified as follows.

- Gamma-emitting radioisotopes by GEA
- Carbon 14
- Metals and radioisotopes by ICP-MS
- Tritium and strontium 90 by the LSC method
- Particle size distribution
- Volatile and semi-volatile organic analysis, including tentatively identified compounds.

A minimum of two subsamples collected within the Hanford formation will be analyzed for volatile and semi-volatile organic compounds, including tentatively identified compounds and metals.

The data obtained from the above analyses will be used to evaluate the location of contamination plumes in the sediment column. If isolated peaks or unusual results are found, additional subsamples from the archived drive sample may be obtained and analyzed. The results of the above analyses will also be used to determine if additional analyses are warranted. Additional analyses would be performed based on the judgement and expertise of the responsible PNNL geochemist, with concurrence from the LMHC technical representative and Ecology. The following analyses would be performed as additional analyses:

Table C.1. Analytical Methods, Analytical Parameters, Detection Limits, and Precision and Accuracy Requirements for the WMA S-SX

Analytical Category	Analytical Parameters	Detection Limit	Precision[3]	Accuracy[3]
Inorganics	Metals	10-25 ppb	± 20	75-125
	Anions	3-5 ppm	± 20	75-125
Organics	SVOAs w/TICS	Varies	Note 1	Note 1
	VOAs w/TICS	Varies	Note 1	Note 1
Radionuclides	Carbon-14	Unknown	± 20	80-120
	Tritium	5 pCi/g	± 20	80-120
	Strontium-90	4 pCi/g	± 20	80-120
	Radioisotopes by ICP-MS	10 ppb	± 20	80-120
	Technetium-99 by separations/beta counting	1 pCi/g	± 20	80-120
	Gamma-Emitting Isotopes	10 pCi/g	± 20	80-120
Hydraulic and Physical Properties	pH	N/A	Note 2	Note 2
	Cation Exchange Capacity	Method-dependent	Note 2	Note 2
	Particle Size Distribution	N/A	Note 2	Note 2
	Mineralogy	N/A	Note 2	Note 2
	Electrical Conductivity	10 microsiemens/cm	Note 2	Note 2
	Moisture Content	1.0 wt%	Note 2	Note 2
	Matric Potential	N/A	Note 2	Note 2
	Kd	N/A	Note 2	Note 2
	Bulk Density	Method-dependent	Note 2	Note 2
	Moisture Retention	N/A	Note 2	Note 2
	Saturated hydraulic Conductivity	N/A	Note 2	Note 2

Notes:

1 Precision and accuracy related to VOA and SVOA analyses should be in accordance with HASQARD.
2 Precision and accuracy for these measurements are not required because of the nature of the measurement.
3 Precision is expressed as Relative Percent Difference (RPD); accuracy is expressed as percent recovery (%R). These limits apply to sample results greater than 5 times the detection limit. If these limits cannot be met, documentation of this fact must be presented in the data report.

C.4.0 SAMPLING PROCEDURES

C.4.1 PROCEDURE APPROVALS AND CONTROL

All procedures required for vadose zone sampling activities shall be approved and shall comply with applicable LMHC and/or PHMC procedures. Where WMFS procedures are referenced, the latest approved version shall be used. Procedures to be used for the groundwater sampling may be found in Johnson and Chou (1999).