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Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

APR 2 5 1995

95-LEP-015

Mr. Douglas R. Sherwood
Hanford Project Manager
U. S. Environmental Protection Agency
712 Swift Boulevard, Suite 5
Richland, Washington 99352

Dear Mr. Sherwood:

LIQUID EFFLUENT RETENTION FACILITY (LERF) TREATMENT EXEMPTION

Reference: EPA Letter, to J. M. Hennig, RL, from D. Duncan, EPA, "Liquid Effluent Retention Facility (LERF) Land Disposal Restrictions Treatment Exemption - Regulatory Interpretation," EPA/Ecology ID No: WA7 89000 8967, dated December 6, 1994. 40019

The U. S. Department of Energy, Richland Operations Office (RL) has reviewed the requirements for complying with the treatment surface impoundment exemption (40 CFR 268.4). As indicated in the December 6, 1994 regulatory interpretation provided by the EPA (Reference), the exemption allows Land Disposal Restricted (LDR) waste to be managed in the LERF prior to treatment in the 200 Area Effluent Treatment Facility (ETF). RL has elected to utilize this exemption. The enclosed discussion paper describes how the exemption compliance requirements will be satisfied.

Requirements specifically addressed are:

- 40 CFR 268.4(a)(2) - (i) Sampling and Testing; (ii) Annual Removal; (iii) Subsequent Management; and (iv) Recordkeeping;
- 40 CFR 268.4(a)(2) - Providing the EPA Administrator with the LERF Waste Analysis Plan;
- 40 CFR 268.4(a)(3) - Certification of Design and
- 40 CFR 268.4(a)(4) - Providing the specific certification statement required by the treatment surface impoundment exemption.

A notice of intent to modify the Hanford Facility Dangerous Waste Permit, Part A, Form 3 for the LERF to include the T02 treatment code, will be submitted to the State of Washington, Department of Ecology in the immediate future, followed by submittal of the revised Part A, Form 3 at the end of the 150 day period. In the interim, RL will proceed to manage the LERF as described in the discussion paper, and as part of a larger treatment train consisting of the 242-A Evaporator, LERF, and ETF.

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Use of this LDR treatment exemption demonstrates that RL and the EPA are committed to cost efficiency through forward thinking design and operational activities, while protecting people and the environment. This effort directly supports the Cost and Management Efficiency Initiative that was signed by the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement) signatories in January 1994. Specifically, these efforts support the commitments of cost reduction and regulatory reform, and represent major progress in support of the $1 billion cost reduction goal. Cost savings will be realized over the life of the 242-A Evaporator-LERF-ETF waste treatment system.

If you have any questions or comments regarding this matter, please call Elizabeth M. Bowers, of my staff, on 373-9276.

Sincerely,

Thomas K. Teynor, Director
Waste Programs Division

WPD:GLS

Enclosure:

cc: A. J. DiLiberto, WHC, w/o encl.
D. Duncan, EPA, w/encl.
S. D. Godfrey, WHC, w/o encl.
M. N. Jaraysi, Ecology, w/encl.
R. F. Stanley, Ecology, w/encl.
J. D. Williams, WHC, w/encl.

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ATTACHMENT 1

LERF Treatment Exemption Discussion Paper

LERF TREATMENT EXEMPTION COMPLIANCE DESCRIPTION

1.0 Introduction

This paper provides information to the United States Environmental Protection Agency (EPA) Region 10 Administrator detailing how the Liquid Effluent Retention Facility (LERF) will be managed - as part of a double-shell tank waste treatment train consisting of the 242-A Evaporator, LERF, and 200 Area Effluent Treatment Facility (ETF) - to comply with the treatment exemption requirements stated in 40 CFR 268.4.

2.0 Background

The EPA reviewed the applicability of the surface impoundment exemption from Land Disposal Restriction (LDR) regulations, under 40 CFR 268.4, to the LERF. EPA determined that management of process condensate (PC) produced by the 242-A Evaporator and held in the LERF prior to treatment in the 200 Area ETF is consistent with the regulatory definition of "treatment" under 40 CFR 260.10 in the context of the 40 CFR 268.4 treatment exemption (reference 1). Treatment was determined applicable for flow and pH equalization (described in reference 2).

To qualify for the exemption, the Department of Energy - Richland Operations Office (RL) was directed by the EPA to comply with the full provisions of 40 CFR 268.4 (a)(2). These provisions address: annual removal, sampling and testing, subsequent management, and record keeping. Also, pursuant to 40 CFR 268.4(a)(4), RL was directed to submit written certification to the EPA Region 10 Regional Administrator that the LERF meets the design requirements of 40 CFR 268.4(3), as well as, submit a copy of the LERF Waste Analysis Plan (WAP) required under 40 CFR 268.4(a)(2).

In subsequent meetings with EPA and the Washington State Department of Ecology (Ecology), RL committed to address the provisions of the requirements cited in 40 CFR 268.4.

3.0 Implementation

This section describes how RL plans to meet the specific requirements known as: annual removal, sampling and testing, subsequent management, record keeping, written certification, and design requirements.

3.1 Annual Removal

This provision requires the annual removal of wastewaters and treatment residues. If the volume of liquid flowing through the impoundment annually is greater than the volume of the impoundment, the "flow-through" constitutes "removal" for the liquids (i.e., supernatant).

RL plans to operate the LERF and Effluent Treatment Facility (ETF) in conjunction such that liquids transferred to a LERF basin will be subsequently treated in the ETF within a one-year period. Consequently, RL expects to manage the waste in a "flow-through" mode, except when the volume of processed waste is less than the volume of a LERF basin. In that case, the volume processed out of a LERF basin will equal the volume transferred into the basin, on a yearly basis. Note that a heel will always be left in the basins after treatment in the ETF has been completed. The heel is necessary to protect the liner from damage.

It is not anticipated that the LERF basins will accumulate solids, as long as the method of treatment for LDR aqueous wastes (flow and pH equalization) remains unchanged. Therefore, no removal of solids is anticipated to be required. Section 3.2 describes monitoring that will be used to confirm that solids removal is not required.

The reasons solids are not anticipated are:

1) The 242-A Evaporator process condensate (PC) which is transferred into the LERF is basically distilled water that contains ammonia, trace organic material, and very little undissolved solids. As a reference point, the attached tables show unvalidated data from the first sampling and analysis of LERF and the 242-A Evaporator. The initial sampling data supports the low level of organics expected in the effluent. These organic materials are expected to be dissolved in the aqueous PC solution to a nearly complete extent.

   Since steam jets are used to pull a vacuum in the evaporator, a very small amount of solids may enter the PC stream via the resulting steam condensate. However, tank waste residues are actively deterred from entering into the PC by virtue of the evaporator's design. The minimal amounts of solids entrained into the vapor phase during boiling are impinged by deentrainer pads and washed back into the slurry by water sprays. In addition, the PC is collected in an unagitated tank and then passed through a strainer prior to discharge into the LERF.

   Overall, the separation of PC from tank waste is quite efficient. Since non-volatile radionuclides are associated with tank waste solids, the ratio of such radionuclides in the evaporator slurry to that in the PC are a good measure of that efficiency. A decontamination factor of about 100,000 has been observed for radionuclides such as cesium. Consequently, very few solids are transferred from the tank wastes into the PC stream.

2) Process condensate samples taken for process control at the 242-A Evaporator do not show any evidence of solids precipitating out of solution.

3) The LERF basins are covered and all incoming air first goes through a breather filter. Therefore, solids cannot result from the accumulation of airborne dust.

4) No co-precipitating or flocculating chemicals are used in flow and pH equalization.

Risk and Cost Avoidance

Due to the factors described above, it is unlikely that any significant amount of solid residue generated as part of the treatment process will ever be present in the LERF basins. Therefore, the basins will present little, if any, threat to human health or the environment due to the presence of solids. Physical removal of any solid residue would present more of a threat due to the potential for damaging the liner and or cover during clean out activities, which would lead to an increased environmental risk rather than a small decrease as a result of clean-out activities.

Additionally, the monetary cost of any clean out activities would be expected to exceed the value of the additional protection to human health or the environment. Since the amount of residual solids generated by the treatment is expected to be very small, if any, and any solids will be contained in a RCRA compliant unit, the threat to human health or the environment is negligible. However, the cost of clean out activities would be significant, even if they went well, and could be extremely expensive if they resulted in damage to the liner and/or cover.

Even though the potential for treatment residue solids to occur in the basins is low, RL will continue to consider risks to the environment and the public, worker safety, and the costs of retrieval and disposal during LERF operation. Should it become evident through the process monitoring for the 242-A Evaporator or the ETF that the possibility for treatment residue solids to occur in LERF has increased, RL will re-evaluate the merits of residue removal.

3.2 Sampling and Testing

This provision requires a determination if the residues (i.e., supernatant and sludge) in the basins can meet applicable standards of treatment. These standards are summarized under the "wastewater standard" entry of **Table UTS - Universal Treatment Standards** found in 40 CFR 268.48.

To meet these provisions, RL will monitor for the potential of solids to build-up in the LERF. Monitoring will be done at the discharge from the 242-A Evaporator and will consist of measuring Total Suspended Solids (TSS) and any filterables from weekly

samples taken during a campaign. The next campaign is tentatively set to start in June 1995. A trending analysis will be used to quantify the amount of solids discharged to the LERF during a campaign. As a check on this analysis, operators will continue to visually monitor process control samples for indications of solids. If monitoring suggests that a significant quantity of solids could be deposited in the LERF, a procedure will be developed, with EPA concurrence, to inspect for, and if necessary, remove the solids. However, as noted in section 3.1, this is a highly unlikely scenario since potential solid residues are actively removed in the 242-A Evaporator.

3.3 Subsequent Management

This provision prohibits the transferring of treatment residues from one basin (i.e., surface impoundment) to another basin, or to any other surface impoundment. RL will comply with this position as stated.

3.4 Record Keeping

This provision requires the LERF WAP to specify: the procedures and schedule for the sampling of the LERF contents, the analysis of test data, and the annual removal of treatment residues not meeting the standards of treatment.

The LERF WAP is currently in force, as required for an Interim Status Resource Conservation and Recovery Act (RCRA) facility. The EPA has copies of the present WAP, as required by the RCRA Part B Permit Application (reference 3). The WAP specifies the procedures and schedule for the RCRA compliant sampling of basin contents. RL will continue to send WAP updates to the Administrator as they become available. Therefore, RL will meet the provisions for record keeping via the RCRA Part B Permit Application and WAP (Chapter 3 of reference 3).

3.5 Design Requirements and Written Certification

This provision requires the submittal of the LERF WAP and a certificate stating the LERF meets RCRA design requirements and applicable groundwater monitoring requirements.

The LERF basins were built to meet RCRA regulations, as documented in the LERF Part B Permit Application (reference 3). They are also monitored according to the permit application. Therefore, RL has met the provisions of 40 CFR 268.4(3). The certification statement required by 268.4(a)(4) will be submitted under separate cover.

4.0 References

1. Letter from Daniel Duncan (EPA) to June Hennig (RL), "Liquid Effluent Retention Facility (LERF) Land Disposal Restrictions Treatment Exemption - Regulatory Interpretation," EPA/Ecology ID No: WA7 89000 8967, December 6, 1994.

2. Letter from A.J. Diliberto (WHC) to J.M. Hennig (RL), "Proposed use of Liquid Effluent Retention Facility (LERF) for Treatment in 200 Area Effluent Treatment Facility (ETF) System," Correspondence No. 9453506D, dated August 23, 1994.

3. LERF Dangerous Waste Permit Application, DOE/RL-90-43, Rev. 0, United States Department of Energy, Richland Operations Office, Richland, Washington, 1991.

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LERF CHARACTERIZATION SAMPLES
UNVALIDATED DATA OF FIRST ROUND OF SAMPLING

Constituent	Units	N	n	Minimum	Average	Maximum
pH	pH	24	24	9.4	9.6	9.7
Ammonia (Nitrogen)	mg/L	24	24	25.6	28.2	34.6
Chloromethane	ug/L	24	0			
Bromomethane	ug/L	24	0			
Vinyl Chloride	ug/L	24	0			
Chloroethane	ug/L	24	0			
Methylene Chloride	ug/L	24	0			
Acetone	ug/L	24	24	990	1,404	1800
2-Propanol	ug/L	24	17	20	54.6	100
1-Butanol	ug/L	24	0			
Carbon Disulfide	ug/L	24	0			
Tetrahydrofuran	ug/L	24	24	50	60.25	84
1,1-Dichloroethene	ug/L	24	0			
1,1-Dichloroethane	ug/L	24	0			
1,2-Dichloroethene (Total)	ug/L	24	0			
Chloroform	ug/L	24	0			
1,2-Dichloroethane	ug/L	24	0			
2-Butanone	ug/L	24	0			
1,1,1-Trichloroethane	ug/L	24	0			
Carbon Tetrachloride	ug/L	24	0			
Vinyl Acetate	ug/L	24	0			
Bromodichloromethane	ug/L	24	0			
1,2-Dichloropropane	ug/L	24	0			
cis-1,3-Dichloropropene	ug/L	24	0			
Trichloroethene	ug/L	24	0			
Dibromochloromethane	ug/L	24	0			
1,1,2-Trichloroethane	ug/L	24	0			
Benzene	ug/L	24	0			
trans-1,3-Dichloropropene	ug/L	24	0			
2-Chloroethyl Vinyl Ether	ug/L	24	0			
Bromoform	ug/L	24	0			
4-Methyl-2-pentanone	ug/L	24	0			
2-Hexanone	ug/L	24	0			
Tetrachloroethene	ug/L	24	0			
1,1,2,2-Tetrachloroethane	ug/L	24	0			
Toluene	ug/L	24	0			
Chlorobenzene	ug/L	24	0			
Ethylbenzene	ug/L	24	0			
Styrene	ug/L	24	0			
Xylene (Total)	ug/L	24	0			
Gross Alpha	pCi/L	24	4	5.4	7.4	8.9
Gross Beta	pCi/L	24	24	220	803.3	1,300
Tritium	pCi/L	2	2	3,700,000	3,700,000	3,700,000
Selenium 79	pCi/L	2	0			
Carbon 14	pCi/L	2	0			
Strontium 90	pCi/L	2	2	77	77.5	78
Technetium 99	pCi/L	2	0			
Iodine 129	pCi/L	2	0			
Total Uranium	pCi/L	2	2	0.033	0.034	0.035
Neptunium 237	pCi/L	2	1			0.96
Plutonium 238	pCi/L	2	0			
Plutonium 239/240	pCi/L	2	0			
Americium 241	pCi/L	2	2	0.03	0.04	0.05
Curium 244	pCi/L	2	0			
Cesium 137	pCi/L	2	2	510	545	580

N = The number of samples analyzed
n = Number of samples above the Method Detection Limit
Average is based on the data meeting the criteria for n.

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242-A Evaporator Campaign 94-1 Process Condensate Protocol Data

Sample #	3C8TW4	3C8TW8	3C8TX2	3C8TX6	3C8TY0
Date	04-May-94	05-May-94	16-May-94	23-May-94	06-Jun-94
acetone (ug/L)	1300 BD	1100 BD	900 BD	700 BE	210 BE
2-butanone (ug/L)	44 B	39	35	34	
4-methyl-2-pentanone (ug/L)		5 J	3 J		
2-hexanone (ug/L)			12		6 BJ
2-propanol (ug/L)		740 JN	530 JN	2200 JN	97 J
tetrahydrofuran (ug/L)	90 JN	67 JN	72 JN		44 J
n-butanol (ug/L)	2500 JN	4600 JN	3300 JN	1200 JN	1200 J
2-butoxyethanol (ug/L)	54 J	400 J	250 J	330 J	46 J
benzyl alcohol (ug/L)	4 J			3 J	5 J
2-methylphenol (ug/L)			12		
bis(2-ethylhexyl) phthalate (ug/L)	3 BJ	3 J			
tetradecane (ug/L)	160	130	340 E	11	270 E
tributyl phosphate (ug/L)	38	21	30	12	13
tridecane (ug/L)	34	54	160 E	3 J	150
aluminum (ug/L)	306	127	239	599	57.3
barium (ug/L)	2.1			3.9	
calcium (ug/L)	254	246	255	750	
iron (ug/L)	36.3	16.3	15.1	50.4	
lead (ug/L)		3	4.7		2.2
magnesium (ug/L)				105	39
potassium (ug/L)					1120
sodium (ug/L)	959	348	496	996	1760
zinc (ug/L)	10.1	24	10.3	32.5	5.4
strontium (ug/L)	2		1.3	2.5	
ammonia (mg/L)	35	114	45	29.4 J	0.1
nitrate/nitrite (mg/L)	0.03	0.02	0.02		
pH	9.86 J	10.15 J	10.1 J	10 J	9.09 J
sulfate (mg/L)		5.2			
nitrite (mg/L)		0.54			
chloride (mg/L)		1.3	0.5		
TOC (mg/L)	3	4	4	4	2
Am-241 (pCi/L)	7.52E-02	4.14E-02	7.38E-02	1.58E-01	5.25E-02
Pu-238 (pCi/L)	0.00E+00	0.00E+00 *	0.00E+00	0.00E+00	0.00E+00
Pu-239/240 (pCi/L)	0.00E+00 *	8.79E-02	1.04E-01	1.01E-01	5.75E-02
Co-58 (pCi/L)	0.00E+00 *	6.85E-01	0.00E+00 *	2.25E+00	4.66E+00
Co-60 (pCi/L)	3.85E+00	0.00E+00 *	3.01E+00	0.00E+00 *	0.00E+00 *
Cs-137 (pCi/L)	1.34E+03	7.00E+02	1.40E+02	5.15E+01	3.88E+02
Eu-152 (pCi/L)	1.39E+01	2.23E+01	2.42E+01	2.50E+00	0.00E+00 *
Eu-154 (pCi/L)	4.49E+00	0.00E+00 *	0.00E+00 *	9.27E-01	5.10E+00
Eu-155 (pCi/L)	0.00E+00 *	5.53E+00	0.00E+00 *	0.00E+00 *	4.28E+00
Fe-59 (pCi/L)	0.00E+00 *	0.00E+00 *	0.00E+00 *	0.00E+00 *	0.00E+00 *
Ru-106 (pCi/L)	0.00E+00 *	3.59E+01	9.86E+00	9.26E+00	0.00E+00 *
Sr (pCi/L)	4.63E+01	2.04E+01	1.52E+01	3.07E+00	4.76E+01
H-3 (pCi/L)	3.99E+06	3.31E+06	3.48E+06	4.52E+06	4.37E+06
Total Alpha (pCi/L)	4.17E-02	9.29E-02	4.11E-02	6.33E-02	4.95E-01
Total Beta (pCi/L)	1.43E+03	5.05E+02	1.22E+02	4.77E+01	4.55E-02

Definition of Qualifiers

J - estimated value

N - Tentatively Identified Compound (TIC), indicates presumptive evidence of a compound

B - analyte detected in blank

E - concentration exceeds calibrated range

D - result based on secondary dilution

* - indicates the result was a negative number

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CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
T. K. Teynor, RL	D. R. Sherwood, EPA	Incoming 9502176 xref 9551397 40557

Subject: LIQUID EFFLUENT RETENTION FACILITY (LERF) TREATMENT EXEMPTION

INTERNAL DISTRIBUTION

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		R. C. Bowman	H6-24	
		D. J. Carrell	H6-22	
		J. G. Coenenberg	H6-24	
		A. J. DiLiberto, Assignee	H6-10	
		W. T. Dixon	H6-21	
		D. L. Flyckt	S6-71	X
		S. D. Godfrey	B2-35	X
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		B. D. Williamson	B3-15	X
		EDMC	H6-08	X