

FEB 28 1992

Docket No. 40-8027

NOTE TO: L. J. Callan, Director
Division of Radiation Safety and Safeguards
Region IV

FROM: Ramon E. Hall, Director
Uranium Recovery Field Office
Division of Radiation Safety and Safeguards
Region IV

SUBJECT: CALCULATION OF SLUDGE AND CONTAMINATED SOIL AT THE SEQUOYAH
FUELS CORPORATION SITE

At your request, G. Konwinski has calculated the volume of sludge that exists at the SFC site as well as the amount of contaminated soil that may require specialized disposal. The sludge characterization was a subject of previous inspection. SFC has calculated volumes in the various impoundments listed below and described in detail in the licensee's October 22, 1990, documentation (attached).

<u>Impoundment</u>	<u>Estimated Sludge Volume (1000 cu. ft.)</u>
Basin No. 1	50.0
N. Ditch/Emergency Basin	2.3
Sanitary Lagoon	14.0
Raffinate Clarifier A1	1.0
Raffinate Clarifier A2	135.0
Raffinate Clarifier A3	0.8
Raffinate Clarifier A4	208.0
Raffinate Pond 2	487.0
Fluoride Sludge Settling Basin 1	29.3
Fluoride Sludge Settling Basin 2	40.0
Fluoride Clarifier	20.0
Fluoride Retention Basin 4	59.0
Fluoride Sludge Holding Basin 1	171.4
Fluoride Sludge Holding Basin 2	186.0
Pond 4	1,123.0
Pond 3E	0
Pond 3W	0
Pond 5	0
Pond 6	0
Decorative Pond	0
TOTAL SLUDGE VOLUME	2,526.8

PM: URFO
GRK/wh/ki/lv
02/26/92

DD: URFO
EFH/Hawkins
02/27/92

DRURFO: RIV
REHa11
02/27/92

9301130170 920824
PDR FOIA
CURRAN92-204 PDR

FROM URFO, DENVER

04/30/91 08:47 P.12

m-15

The above figures represent estimates of the sludges that are present as of October 22, 1990. Chemical data on these sludges indicates that radionuclides are present in sufficient quantities that controlled disposal will be necessary. Ultimate decommissioning criteria will dictate clean up levels and which of these sludges must receive specialized disposal.

The volume of contaminated soils at the site was calculated utilizing the data from the Facility Environmental Investigation. The specific data that were utilized are presented on Figures 104-110. The volumes of contaminated soils were determined utilizing uranium as an indicator and the following depth intervals: 0-1 foot, 1-5 feet, 5-10 feet, 10-15 feet, 15-20 feet, 20-25 feet, and 25-30 feet. For each of the depth increments the square footage of soils with a uranium concentration exceeding 40 $\mu\text{g/g}$ was calculated. The data are shown below.

Depth Increment (ft)	Area (ft ²)	Thickness Factor (ft)	Contaminated Soil Volume 1000 ft ³
0- 1	931,137	1	931
1- 5	523,309	4	2,093
5-10	48,715	5	243
10-15	40,856	5	244
15-20	17,872	5	89
20-25	0	5	0
25-30	7,251	5	36
TOTAL VOLUME CONTAMINATED SOILS			3,636

The contaminated soil data do not include the areas of contamination that were identified in the drainages to the west of the site. The delineation in these areas would not support an accurate calculation of the volumes. However, the volumes shown above are probably representative for the site. It should also be noted that stockpiled contaminated soils, from the SX vault excavation and the 1986 incident are not included in this total.

Combining the volume of sludge 2,527,000 cubic feet and the volume of contaminated soils 3,636,000 cubic feet gives an estimated 6,163,000 cubic feet of material. You will note that of the total, 59 percent represents contaminated soils and the remaining 41 percent is sludge.

Should you have any further questions concerning this issue please contact Gary Konwinski.

Original Signed By:
R. E. HALL

Ramon E. Hall
Director

Attachment:
As stated

bcc:
URFO r/f
GKonwinski, URFO
EHawkins, URFO
REHall, URFO
GMVasquez, RIV

SPRINGS FACILITY IMPROVEMENTS

DATE ISSUED: OCT. 22, 1988

ITEM NO.	INCIDENT OR UNLINED	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)				ESTIMATED FLOW			
		CAPACITY (SLUDGE VOL.)	LIQUID VOL.	SLUDGE COMPOSITION	SOURCE	IN-FLOW RATE (GPM)	LIQUID COMPOSITION	DISCHARGE TO	OUT-FLOW RATE (GPM)
1.	NO. 1 BASIN	UNLINED	133.3	58.8	1.8	MUD SEDIMENT -4 #/1 U			
					BASIN AREA EROSION	- 0.5 AVERAGE	RAINWATER	COMP. STREAM	20 INTERMIT.
					NO. 2 BASIN GROUND EROSION	1.5 AVERAGE	RAINWATER 6.01 #/1 U TRACE NO3- TRACE P- TRACE H42003		
					WASH DITCH (EMERGENCY ONLY)	1.5 APPROXIMATE	RAINWATER 0.01 #/1 U TRACE NO3- TRACE P- TRACE H42003		
2.	WASH DITCH/ EMERGENCY BASIN	UNLINED	12.6	2.3	6.8	MUD SEDIMENT -8.6 #/1 U			
					TANK YARD DRAINS	INTERMITTENT	RAINWATER	COMBINATION STEEL OR NO. 1 BASIN (EMERGENCY)	20 INTERMIT.
					SULFURIC ACID PAD EROSION	INTERMITTENT	RAINWATER TRACE H2SO4		
					EROSION FROM ON YARD AND BY SCOURER AREAS	2 AVERAGE	RAINWATER TRACE NO3- P- U		
					COOLING TOWER BLOWDOWN	EMERGENCY ONLY	TREATED RECIRCULATIVE COOLING WATER TRACE NO3- P2- U		
					SEEDING STATION BUMP BLOWDOWN	INTERMITTENT	SETTLING FROM LAKE TRIMMER WATER		
					ROOF DRAIN SEWER (REGG.)	EMERGENCY ONLY	RAINWATER ROILER BLOWDOWN H42003 SOFTENER BLOWDOWN		

DATE ISSUED: OCT. 22, 1998

[illegible]

SENOYAH FACILITY IMPROVEMENTS

DATE ISSUED: OCT. 22, 1996

ITEM NO.	IMPROVEMENT	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)				ESTIMATED FLOW			
		CAPACITY	SLUDGE VOL.	LIQUID VOL.	SLUDGE COMPOSITION	SOURCES	IN-FLOW RATE GPM	LIQUID COMPOSITION	DISCHARGE TO
5.	RAFFINATE CLARIFIER A2	336.0	136.0	192.0	RAFFINATE SLUDGE	RAW RAFFINATE FROM EX	14 - 20 AVERAGE	AMMON. NIT. SOLUTION APPROX. <1 LB./GAL. RHANOS RADION	RAFFINATE CLARIFIER A4
					Ra225 ~22 PCU/S Th230 ~5000 PCU/S U <270 PCU/S	SLUDGE CONC. SUPERNATE	10 - 20 INTERMITTENT		100 INTERMITT.
						RADONNIDE RUCOFF FROM OLD RAFF. TREATMENT	1	RAINWATER	
6.	RAFFINATE CLARIFIER A3	336.0	0.0	252.4	BARIUM SULFATE AND RAFFINATE SLUDGE (TRACE) - IN SOLIDS	CLARIFIER A1 RAFF. POND 2	150-200 ~100	AMMONIUM NITRATE SOLUTION APPROX. <1 LB./GAL. SHANOS	POND 35 OR POND 34
					Ra225 ~22 PCU/S Th230 ~5000 PCU/S U <270 PCU/S			<2 PCU/L Ra225	
						BARIUM CHLORIDE FEED	0.3		

DATE ISSUED: OCT. 22, 1984

SEQUOIA FACILITY IMPROVEMENTS

ITEM NO.	IMPROVEMENT OR UNLINED	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)				ESTIMATED FLOW			
		CAPACITY	SLUDGE VOL.	LIQUID VOL.	SLUDGE COMPOSITION	SOURCES	IN-FLOW RATE GPM	LIQUID COMPOSITION	DISCHARGE TO OUT-FLOW RATE GPM
7.	RAFFINATE CLARIFIER A4	335.0	265.0	22.0	RAFF. SLUDGE 5% SOLIDS RA226 72 PCL/G FROM TH230 5000 PCL/G DOLPHIN U 278 PCL/G EXTRACT/ON (ALTERNATIVE)	CLARIFIER A2	150-400 INTERMITTENT 14 - 20 AVERAGE	AMMONIUM NITRATE SOLUTION APPROX. 1 LB./GAL. NH4NO3 SODIUM THORIUM	CLARIFIER A1 150-200 INTERMITTENT
8.	RAFFINATE POND 2	2,953.0	457.0	1,419.0	RAFF. SLUDGE 5% SOLIDS TH SOLIDS RA226 72 PCL/G TH230 5000 PCL/G U 278 PCL/G	NO REA SOURCES POND BEING DECOMMISSIONED		AMMONIUM NITRATE SOLUTION APPROX. 1 LB./GAL. NH4NO3 200 PCL/G RA226	CLARIFIER A1 100-200 CLARIFIER A3 700
9.	FLUORIDE SLUDGE SETTLING BASIN#1	45.8	23.3	19.7	U 748 PCL/G CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(OH)2 2% TOTALS 75% SOLIDS	LINE REPT. (ALTERNATE) FLUOR. SLUDGE HOLDIN BASIN#2 (ALTERNATE)	35 INTERMITTENT 50	CALCIUM FLUORIDE CALCIUM HYDROXIDE WATER URANIUM (TRACE)	35 PLUS RAINFALL
10.	FLUORIDE SLUDGE SETTLING BASIN#2	45.8	48.0	1.0	U 748 PCL/G CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(OH)2 2% TOTALS 75% SOLIDS	LINE REPT. (ALTERNATE) FLUOR. SLUDGE HOLDIN BASIN#2 (ALTERNATE)	INTERMITTENT 50	CALCIUM FLUORIDE CALCIUM HYDROXIDE WATER URANIUM (TRACE)	35 PLUS RAINFALL

SEQUOIA FACILITY IMPROVEMENTS

DATE ISSUED: OCT. 22, 1990

ITEM NO.	IMPROVEMENT OR UNLINED	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)				ESTIMATED FLOW			
		CAPACITY	SLUDGE VOL.	LIQUID VOL.	SLUDGE COMPOSITION	SOURCES	IN-FLOW RATE GPM	LIQUID COMPOSITION	DISCHARGE TO OUT-FLOW RATE GPM
11.	FLUORIDE CLARI. UNLINED	102.1	20.0	82.1	U CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(CO3)2 7% TOTALS ~35% SOLIDS	~740 PCL/G FLUOR. SLUDGE SETTLING BASIN #1 OR #2	50	WATER WITH TRACE CaF2 & Ca(OH)2	CONSIGRATION STREAM ~35 PLS RAINFALL
12.	FLUORIDE RETENTION BASIN #4 UNLINED	60.0	60.0	3.5	U CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(CO3)2 7% TOTALS ~35% SOLIDS	~740 PCL/G FLUORIDE SLUDGE SETTLING BASIN #1 & #2	0	RAINWATER	RAINWATER PUMP OFF TO FLUORIDE SLUDGE SETTLING BASINS #1 & #2 INTERMIT.
13.	FLUORIDE SLUDGE HOLDING BASIN #1 UNLINED	188.0	171.4	9.0	U CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(CO3)2 7% TOTALS ~35% SOLIDS	~740 PCL/G FLUORIDE SLUDGE SETTLING BASIN #1 & #2	0	RAINWATER	RAINWATER PUMP OFF TO FLUORIDE SLUDGE SETTLING BASINS #1 & #2 INTERMIT.
14.	FLUORIDE SLUDGE CLAY HOLDING BASIN #2 UNLINED	201.0	188.0	12.0	U CaF2 85% Ca(OH)2 7% CaSO4 1% Ca(CO3)2 7% TOTALS ~35% SOLIDS	~740 PCL/G LIME NEUTRALIZATION	~35 (ALTERNATE)	CaF2 WATER Ca(OH)2 URANIUM-TRACE	FLUORIDE SLUDGE SETTLING BASIN #1 OR #2 ~50 INTERMIT.

SEELYAH FACILITY IMPROVEMENTS

DATE ISSUED: OCT. 22, 1990

ITEM NO.	IMPROVEMENT	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)				ESTIMATED FLOW				
		LINED OR UNLINED	CAPACITY	SLUDGE VOL.	LIQUID VOL.	SLUDGE COMPOSITION	SOURCES	IN-FLOW RATE GPM	DISCHARGE TO	OUT-FLOW RATE GPM
15.	POND 4	CLAY LINED	2,235.9	1,123.8	-8-	RAVYNATE SLUDGE "8X SOLIDS Ra226 -22 PCL/g Th238-5959 PCL/g U -278 PCL/g	CLARIFIER A* POND 2	180-400 INTERMITTENT	AMMONIUM NITRATE SOLUTION, APPLC. <1 LB./GAL. NH4NO3 PLUS SUSPENDED RAVY. SLUDGE	SLUDGES DEMATERING 100-300 INTERMITT.
16.	POND 3E	CLAY LINED HYDALON LINED AND WITH UNDER- TRAIN MONITORING SYSTEM	2,100.9	992.0	- - -	- - -	CLARIFIER A3	~300 INTERMITTENT	AMMONIUM NITRATE <1 LB./GAL. NH4NO3 <2 PCL/l Ra226	LAND APPLIC. INTERMITT.
17.	POND 3N	CLAY LINED HYDALON LINED AND WITH UNDER- TRAIN MONITORING SYSTEM	2,213.0	1,346.8	- - -	- - -	CLARIFIER A3 OTHER FERTILIZER PONDS	~300 1-600 INTERMITTENT	AMMONIUM NITRATE <1 LB./GAL. NH4NO3 <2 PCL/l Ra226	LAND APPLIC. INTERMITT.

SEWAGE TREATMENT FACILITY IMPROVEMENTS

DATE ISSUED: OCT. 22, 1996

ITEM NO.	IMPROVEMENT	LINED OR UNLINED	ESTIMATED CURRENT INVENTORY (1,000 CU. FT.)			CAPACITY	ESTIMATED FLOW			IN-FLOW RATE GPM	LIQUID COMPOSITION	DISCHARGE TO	OUT-FLOW RATE GPM
			SLUDGE VOL.	SLUDGE COMPOSITION	SOURCES		SLUDGE VOL.	SLUDGE COMPOSITION	OTHER				
18.	POUD 6	CLAY LINED	2,178.0	0	1,464.0	0	2,178.0	0	OTHER FERTILIZER POND	1-000 INTERMITTENT	AMMONIUM NITRATE <1 LB./GAL. NH4NO3 <2 PCL/1 R2226	LAND APPLIC.	INTERMITT
19.	POUD 6	CLAY LINED	2,142.0	0	2,654.0	0	2,142.0	0	OTHER FERTILIZER POND	1-000 INTERMITTENT	AMMONIUM NITRATE <1 LB./GAL. NH4NO3 <2 PCL/1 R2226	LAND APPLIC.	INTERMITT
20.	DECORATIVE (FISH POND)	UNLINED	75.0	0	75.0	0	75.0	0	LAKE TANKILLER VIA RAN WATER GUMP	50 INTERMITTENT	LAKE WATER	CONSERVATION STRAIN	50 INTERMITT