

50-332

PDR
Return to
39655

Allied-General Nuclear Services
Post Office Box 347
Barnwell, South Carolina 29812

J. A. Buckham
President

(803) 259-1711

January 26, 1984



Mr. Leland C. Rouse
U. S. Nuclear Regulatory Commission
Washington
DC 20555

Dear Mr. Rouse:

In our continuing effort to keep you informed as to the status of the Barnwell Nuclear Fuel Plant, I am enclosing for your information copies of:

- 1) Consultant's Final Report - Barnwell Nuclear Fuel Plant Decommissioning Project ESG-83-47
- 2) Report of Radiological Overview Survey for the Barnwell Nuclear Fuel Plant Decommissioning Project ESG-83-48
- 3) A revised Radioactive Materials Inventory (Attachment 4 to Application for Amendment submitted to South Carolina Department of Health and Environmental Control) showing that all materials have been properly disposed of.

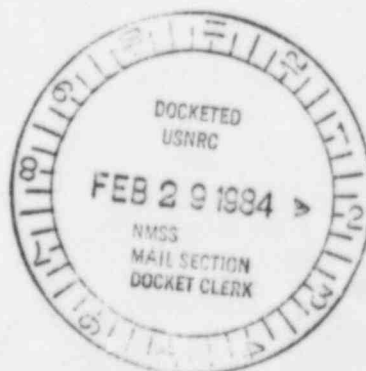
Should you have any questions, please contact me.

Sincerely,

J. A. Buckham H.F.
J. A. Buckham

JAB: jr

Enclosures: 3



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FEE EXEMPT.
info only

23382

FINAL

12/31/83

BNFP SOURCE INVENTORY

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Plated	0096 QB	1 μCi mixed gamma	2/1/80	CNSI waste	
Plated	10-27-78	.8 mCi/Cd ¹⁰⁹	9/78	CNSI waste	
Plated	7683	.1288 $\mu\text{Ci}/\text{Pu}^{239}$	10/12/77	Transferred to Carolina Metals	Completed 12/83
Plated	7684	1.2222 $\mu\text{Ci}/\text{Pu}^{239}$	10/12/77	Transferred to Carolina Metals	Completed 12/83
Plated	7682	.012 $\mu\text{Ci}/\text{Pu}^{239}$	10/12/77	Transferred to Carolina Metals	Completed 12/83
Plated	S-1620	.022 $\mu\text{Ci}/\text{Pu}^{239}$	10/12/77	Transferred to Carolina Metals	Completed 12/83
Plated	S-1619	.0211 $\mu\text{Ci}/\text{Pu}^{239}$	10/12/77	Transferred to Carolina Metals	Completed 12/83
Plated	Nen 4/7/77	.183 $\mu\text{Ci}/\text{Am}^{241}$	4/7/77	Transferred to DOE	
Plated	F-311	50 mCi/Fe ⁵⁵	2/16/76	CNSI waste	
Plated	D-365	5 mCi/Cd ¹⁰⁹	2/11/76	CNSI waste	
Plated	A-343	25 mCi/Am ²⁴¹	2/11/76	DOE/SRP waste	
Plated	SRM 4907-82	.078 $\mu\text{Ci}/\text{Gd}^{148}$	1/13/73	CNSI waste	
Plated	4904-D-103	.22 $\mu\text{Ci}/\text{Am}^{241}$	2/2/75	Transferred to DOE	
Plated	18121-1	1.092 $\mu\text{Ci}/\text{Am}^{241}$	6/1/78	Transferred to DOE	
Plated	No. 2	.5 $\mu\text{Ci}/\text{Pu}^{239}$	9/29/75	Transferred to DOE	
Plated	No. 1	.5 $\mu\text{Ci}/\text{Pu}^{239}$	9/29/75	Transferred to DOE	
Plated	No. 1	5 mCi/Sr ⁹⁰	9/17/75	Transferred to Carolina Metals	Completed 11/83
Plated	No. 2	5 mCi/Sr ⁹⁰	9/17/75	Transferred to Carolina Metals	Completed 11/83
Plated	81-001	Pu ²³⁸	7/1/78	Transferred to DOE	
	NBS(4906-B-64)	5 μg			

FINAL BNPP SOURCE INVENTORY (CONTINUED)

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Solid Salt	C-2342 to C-2357	16 sources 166.4 mCi total/Co ⁵⁷	1/17/83	Transferred to DOE	
	C-2342	Included	1/17/83	Transferred to DOE	
	C-2343	Above			
Sealed Source	C-1903	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Sealed Source	C-1904	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Encapsulated	C-1905	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Encapsulated	C-1906	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Sealed Source	C-1907	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Sealed Source	C-1908	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Encapsulated	C-1909	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Sealed Encap.	C-1910	10 mCi/Co ⁵⁷	12/11/80	CNSI waste	
Sealed	7-14	1 mCi/Pu ²³⁸	4/19/77	Transferred to DOE	
Encapsulated	HCB Pu & BE-374	4.1 Ci/Pu ²³⁸ Be	12/29/76	Transferred to DOE	
Sealed	A-4530-5	300 Ci/Co ⁶⁰	9/72	CNSI waste	
Sealed in a plastic vial Metal Pellet	949-E #153	36 mCi/Pu ²³⁹	7/15/76	Transferred to DOE	
Sealed Encap.	R-141, R-2966	7.01 μ Ci/U ²³⁵ (3.26 g total)	10/16/75	Transferred to DOE	
Solid Sealed Source	94-238-2 (total) 94-238-3	40 Ci/Pu ²³⁸ Be	10/2/75	Transferred to DOE	
Solid Sealed	CE-104	1 mCi/Ce ¹⁴⁴	3/16/76	CNSI waste	
Solid Sealed	1000577	40 μ Ci/Cs ¹³⁷	10/7/74	To USC-Columbia, SC License No. SC 085-04	

FINAL BNPP SOURCE INVENTORY (CONTINUED)

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Sealed Rod Source	909	113 mCi/Cs 137	5/21/74	CMSI waste	
Sealed Rod Source	814	10.2 mCi/Cs 137	4/14/74	CMSI waste	
Calibrated Source Sealed	2638-1	10 mCi/Cs 137	11/12/75	CMSI waste	
Solid Sealed Source	Cat. No. (10 ea.)	2 mCi ea.		CMSI waste	
Solid Sealed Source	CHCQ 1126	20 mCi total/Ce 144		CMSI waste	
Solid Sealed Source	Cat. No.	150 mCi/Ru 106	1/13/76	CMSI waste	
Solid Sealed Source	8KCQ 1127				
Solid Sealed Source	Cat. No.	4.2 mCi/Cs 137	1/12/76	CMSI waste	
Solid Sealed Source	CDCQ 1128				
Solid Sealed Source	Cat. No.	42 mCi/Cs 137	1/12/76	CMSI waste	
Solid Sealed Source	CDCQ 1129				
Solid Sealed Source	0905	19.8 Ci/Co 60		CMSI waste	
Solid Sealed Source	CDCQ 1130	420 mCi/Cs 137	1/27/76	CMSI waste	
Sealed (79)	3037	2.7 mCi/Pm 147	1979		
Encapsulated	3289			Both sources to DOE with weapons.	
Liquid	83-17	.037 mCi/U235, U238	2/7/83	Solidified to CMSI waste	
Liquid	82-7	1.33 mCi/HNO ₃ , U233	7/23/82	Solidified to CMSI waste	
Liquid	82-6	109 µCi/Zr 95, Nb 95	4/28/82	Solidified to CMSI waste	
Liquid	82-5	1 µCi/Co 57	4/30/82	Solidified to CMSI waste	
Liquid	82-4	1 mCi/Ru 103	4/13/82	Solidified to CMSI waste	
Liquid - In	82-3	22 g/U238, U235		Solidified to CMSI waste	
Liquid	82-2 (SRM 996)	.106 mCi/Pu 244	1/4/82	Transferred to DOE	
Liquid	82-1	127 µCi/Zr 95, Nb 95	12/22/81	Decayed - to DOE waste	

FINAL BNFP SOURCE INVENTORY (CONTINUED)

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Liquid	Sale March 1981 January 1982	1.32 g/U235 45.5 g/U238	3/2/81	Solidified to CNSI waste	
Liquid	SRM-995	.005 g/U233	8/25/80	Solidified to U.S.E.-Washington	
Liquid	8791HJ1	2 mCi/Ce144	8/19/80	Solidified to CNSI waste	
Liquid	10M28-J8	2 mCi/Sr85	8/19/80	Solidified to CNSI waste	
Liquid	6801	2 mCi/Co60	8/19/80	Solidified to CNSI waste	
Liquid	5B, 6B, 7B, 8B	41 g total U1.1 gU235		Solidified to CNSI waste	
Liquid	59/69/34	29 μ Ci/Ce144	11/26/79	Solidified to CNSI waste	
Liquid	So-30-12 Depleted	59 μ Ci/Ce144	6/11/80	Solidified to CNSI waste	
Liquid	So-30-13 Depleted				
Liquid	So-30-14				
Liquid	F-10124-1	20 mCi/Co60	6/8/80	Solidified to CNSI waste	
Liquid	F-10124-0				
Liquid	RO/25/121	5 micro curies/ mixed gamma	2/1/80	Solidified to CNSI waste	
Liquid	4233B	.2 mCi/Ca137	8/29/79	Solidified to CNSI waste	
Liquid	4926-C	.18 μ Ci/H3		Solidified to CNSI waste	
Liquid	SRM 4234-8 4234-16	62 μ Ci/Sr90, Y90		Solidified to CNSI waste	
Liquid	85/217/5	50 μ Ci/Rd106	11/20/75	Solidified to CNSI waste	
Liquid	SRM-4232-33	23 μ Ci/Ag110	6/4/74	Solidified to CNSI waste	
Liquid	SRM-4949	.193 μ Ci/I129	9/29/73	Solidified to CNSI waste	
Liquid	63010	6 mCi/Ce144	11/13/75	Solidified to CNSI waste	

FINAL BNFP SOURCE INVENTORY (CONTINUED)

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Liquid	82-2	.106 Millicuries/ Pu244	1/4/82	Transferred to inventory section DOE/SRP	
Plated	44026	5 μ Cl/Se75	8/13/77	CNSI waste	
Plated	61008-63	5 mCi/Co57	10/4/78	CNSI waste	
Plated	62034-Sr-1	5 μ Cl/Se75	10/4/78	CNSI waste	
Plated	7779-C2	5 mCi/Co57	8/15/77	CNSI waste	
	878073-136				
Plated	SRH-4906-74	.36 μ Cl/Pu238	4/25/69	SRP waste	
Liquid	6801 M6(2)	2 mCi/Ce137	8/19/80	Returned to CNSI	
Liquid	Item #227975 Code 8K264 Solution #59/48/12	60 μ Cl/Ku106	10/31/78	Solidified to SRP waste	
Liquid	59/60/12	63 μ Cl/Ce144	11/26/79	Solidified to CNSI waste	
Liquid	50299/61008	5 mCi/Co57	5/19/78	Solidified to CNSI waste	
Liquid	62011	1 mCi/Ce134	9/1/74	Decayed	
Liquid	63027	25 mCi/Sr90	7/23/76	To DOE/SRP waste	
Liquid (NEH)	9891A	2 mCi/Ce60	9/25/74	To DOE/SRP waste	
Liquid (NEH)	9891	119 μ Cl/Ba133	9/25/74	To DOE/SRP waste	
Liquid (NEH)	7743	1 mCi/Ce137	9/25/74	To DOE/SRP waste	
Plated	61008-63	5 mCi/Co57	4/8/77	CNSI waste	
Plated	62034-SR-1	5 mCi/Se75	4/11/77	CNSI waste	
Solid	SRH944 Batch #15	.5 grams/Pu239		Not accepted.	Returned to New Brunswick Lab.

FINAL BRFP SOURCE INVENTORY (CONTINUED)

Source Description	Serial No.	Activity	Assay Date	Final Disposition	Remarks
Plated	18121-3	1.039 $\mu\text{Ci}/\text{Co}^{60}$	6/1/74	CNSI waste	
Plated	SRM-4215-C	~5 $\mu\text{Ci}/\text{mixed gamma}$	9/1/75	CNSI waste	
Plated	SRM-4215-B	~5 $\mu\text{Ci}/\text{mixed gamma}$	8/1/74	CNSI waste	
Solution	RM-4243B	5 $\mu\text{Ci}/\text{mixed gamma}$	12/1/75	CNSI waste	
Liquid	605355-143	100 $\mu\text{Ci}/\text{I}^{131}$	1/19/76	Decayed	
Sealed Source	4-A	31 $\mu\text{Ci}/\text{Pu}^{239}$	3/17/76	Transferred to Los Alamos	
Solid					
Plated	SRM-4215E	5 $\mu\text{Ci}/\text{mixed gamma}$	8/1/76	CNSI waste	

BNFP SNM AND SOURCE MATERIAL INVENTORY

<u>Material</u>	<u>Transaction</u>	<u>Quantity</u>	<u>Final Disposition</u>	<u>Remarks</u>
Natural U	Receipt	136,610.20	--	
	Receipt	100.01	--	
	Receipt	4.56	--	
	Receipt	2.64	--	
		136,717.41 Kg/U		
	Transfer	109.28	SRP	
	Transfer	116,507.00	DOE-Paducah	as UO ₃
	Transfer	0.14	NBS-NBL	
	Transfer	14,222.11	Kerr-McGee	As Un solution
	Transfer	75.70	DOE-Hanford	Waste
	Transfer	4,717.79	CNSI	Waste
	Transfer	171.00	CNSI	Waste
	Transfer	574.00	Allied-Metropolis	
		136,377.02 Kg/U		
	Residual in Plant	5.0 Kg/U Est.		
	Inventory Difference ⁽¹⁾	335.39 Kg/U		
	Composite Measurement Error ⁽²⁾	~+680 Kg/U (~0.5%)		

- (1) The inventory difference is the arithmetic difference between the measured receipts and transfers, adjusted for the quantity remaining in plant.
- (2) The composite measurement error is an estimate of the uncertainty of the measurements made upon receipt and prior to transfer of SNM or source materials at the BNFP. This estimate is based on the results of calibrations, standards programs, and experience and is expressed as a mass quantity and as a percent of throughput. Inventory differences within the range of uncertainty are not statistically significant.

BNPP SHH AND SOURCE MATERIAL INVENTORY (CONTINUED)

Material	Transaction	Quantity	Final Disposition	Remarks
Plutonium	Receipt	157.70	--	
	Receipt	0.26	--	
	Receipt	31.00	--	
	Receipt	25.30	--	
	Receipt	3.00	--	
		217.26 g/Pu		
	Transfer	44.73	DOE-SRP	
	Transfer	2.00	MBS-MBL	
	Transfer	132.12	DOE-SRP	Waste +10%
	Transfer	30.82	DOE-HANFORD	Waste +10%
		209.67 g/Pu		
	Residual in Plant	0.80 g/Pu		
	Inventory Difference	6.79 g/Pu		
	Composite Measurement			
	Error	~+16 g/Pu (based on +10% uncertainty on waste measurements)		
U-233	Receipt	0.058	--	
	Receipt	1.270	--	
	Receipt	0.025	--	
		1.353 g/U ²³³		
	Transfer	0.860	DOE-SRP	
	Transfer	0.470	DOE-SRP	Waste +10%
	Transfer	0.060	DOE-HANFORD	Waste +10%
		1.390 g/U ²³³		
	Residual in Plant	- 0 -		
	Inventory Difference	(0.037) g/U ²³³		
	Composite Measurement	+0.06 g/U ²³³		
	Error	+0.06 g/U ²³³ (Based on +10% on waste, 1% on balance)		

BNFP SNM AND SOURCE MATERIAL INVENTORY (CONTINUED)

Material	Transaction	Quantity	Final Disposition	Remarks
Enriched U ↓	Receipt	3.66	--	
	Receipt	0.27	--	
	Receipt	6.00	--	
	Receipt	22.64	--	
	Receipt	3.27	--	
	Receipt	4.20	--	
		<u>40.04 g/U²³⁵</u>		
	Transfer	13.38	DOE-SRP	Standards
	Transfer	1.58	DOE-SRP	Waste
	Transfer	3.60	CNSI	Waste
	Transfer	21.78	Internsl	Blended with
		<u>40.34 g/U²³⁵</u>		Nat. U. Inventory
	Residual in Plant	- 0 -		
	Inventory Difference	0.3 g/U ²³⁵		
	Composite Measurement Error	<u>+0.4 g/U²³⁵ (-1.0%)</u>		
Thorium ↓	Receipt	59.00 Kg/Th		
	Transfer	0.90	DOE-SRP	
	Transfer	31.96	CNSI	Waste
	Transfer	26.14	CNSI	Waste
		<u>59.00 Kg/Th</u>		
	Residual in Plant	- 0 - Kg/Th		
	Inventory Difference	- 0 - Kg/Th		
	Composite Measurement Error	<u>+3.0 Kg/Th (+5%)</u>		

BNPP SNM AND SOURCE MATERIAL INVENTORY (CONTINUED)

<u>Material</u>	<u>Transaction</u>	<u>Quantity</u>	<u>Final Disposition</u>	<u>Remarks</u>
Depleted U ↓	Receipt	394.33 Kg/U	--	
	Transfer	8.07	DOE-SRP	
	Transfer	2.43	Internal	Blended with Enriched U
	Transfer	<u>389.30</u>	CNSI	Waste
		399.80 Kg/U		
	Residual in Plant	- 0 - Kg/U		
	Inventory Difference	(5.47) Kg/U		
	Composite Measurement Error	<u>+20 Kg/U (5%)</u>		
<hr/>				
Neptunium ↓	Receipt	20.00 g/Np		
	Transfer	10.80	DOE-SRP	
	Transfer	6.20	DOE-SRP	Waste
	Transfer	1.00	DOE-HANFORD	Waste
	Transfer	<u>3.00</u>	CNSI	Waste
		21.00 g/Np		
	Residual in Plant	- 0 - g/Np		
	Inventory Difference	(1.00) g/Np		
	Composite Measurement Error	<u>+2.00 g/Np</u>	(based on <u>+10%</u> on waste measurements)	

DOCKET NO. 50-332
CONTROL NO. 23382
DATE OF DOC. 01/26/84
DATE RCVD. 02/28/84
FCUF _____ PDR ✓
FCAF ✓ LPDR ✓
WM _____ I&E REF. ✓
W&UR _____ SAFEGUARDS _____
FCTC _____ OTHER _____

DESCRIPTION:

informing you as
to the status of
the Barnwell Nuclear
Fuel Plant, enclosed for
your information copies of.....
03/06/84 INITIAL CEC