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Department of Energy

Richland Operations Office
P.O. Box 550
Richland, Washington 99352

MAY 12 1994

94-RPS-218

Mr. David C. Nylander
Nuclear Waste Program
State of Washington
Department of Ecology
7601 West Clearwater, Suite 102
Kennewick, Washington 99336

9413282.0936

Dear Mr. Nylander:

TOXIC AIR POLLUTANT INVENTORY FOR DEACTIVATION OF THE PLUTONIUM URANIUM EXTRACTION PLANT

Enclosed please find the toxic air pollutants (TAPs) inventory comparison requested by your office in a letter dated April 11, 1994, to Mr. James D. Bauer, U.S. Department of Energy, Richland Operations Office (RL). The request for the TAPs comparison was made in response to a letter dated March 10, 1994, from Mr. Bauer, RL, to Ms. Dru Butler, State of Washington Department of Ecology (Ecology), "Request for Concurrence with Emissions Evaluation for Approval of Deactivation of PUREX Plant Pursuant to WAC 173-400 and WAC 173-460."

Ecology requested that RL provide the TAPs inventory 30 days from receipt of the April 11, 1994 letter. The letter was received by RL on April 13, 1994.

Should you have any questions, please contact me or Mr. S. D. Stites of my staff on 376-8566.

Sincerely,

Steven H. Wisness, Acting Program Manager
Office of Environmental Assurance,
Permits, and Policy

EAP:SDS

Enclosure:
TAPs Inventory in Pipe & Operating Gallery

cc w/encl:
M. N. Jaraysi, Ecology

cc w/o encl:
R. C. H. King, Ecology
J. J. Luke, WHC

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Enclosure

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TAPS INVENTORY IN PIPE & OPERATING GALLERY
DEACTIVATION VS. OPERATION

The chemicals present in the Pipe & Operating (P&O) Gallery have been estimated for both deactivation and past operation of the Plutonium Uranium Extraction Plant. Tables 1 and 2 show the amount of solution present, as well as the weight percent and amount of each chemical, in each of the two headers active during deactivation and the 23 headers used during plant operation. Table 3 provides the diameter and length of each header, which was used to determine the volume of solution present. The Instrument and Equipment Flow Diagrams (IEFDs) were used to trace each header back to its feed tank in the Aqueous Makeup (AMU) Facility. Based on the acceptable concentration limits of each feed tank in the AMU Facility, the solution composition in each header was determined, assuming each header was full (which was the case during normal plant operations).

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TABLE 1: CHEMICAL INVENTORY IN P&O GALLERY HEADERS DURING DEACTIVATION

Header Number	Header Volume (gal.)	Solution Specific Gravity	Pounds of Solution	Solution composition		
				Material	Weight %	Pounds
7004	220	1.1	2000	$NaNO_2$	13	260
7006*	270	1.5	3400	NaOH	50	1700

* Headers passing into White Room.

TABLE 2: CHEMICAL INVENTORY IN P&O GALLERY HEADERS DURING PLANT OPERATION

Header Number	Header Volume (gal.)	Solution Specific Gravity	Pounds of Solution	Solution composition		
				Material	Weight %	Pounds
205	250	1.1	2300	NH_4F	37	850
				NH_4NO_3	7.2	170
206	110	1.5	1400	KOH	50	700
7001*	47	1.4	550	HNO_3	57	310
7004	220	1.1	2000	$NaNO_2$	13	260
7006*	270	1.5	3400	NaOH	50	1700
7008*	400	1.0	3300	Na_2CO_3	2.5	83
				$KMnO_4$	0.37	12

TABLE 2: CHEMICAL INVENTORY IN P&O GALLERY HEADERS DURING PLANT OPERATION

Header Number	Header Volume (gal.)	Solution Specific Gravity	Pounds of Solution	Solution composition		
				Material	Weight %	Pounds
7009	68	1.0	560	$NaNO_2$	5.1	29
3AS*	1.1	1.0	9	HNO_3	7.4	0.7
3AS-L11*	7	1.1	64	$Cd(NO_3)_2$	6.1	3.9
3BX*	6	1.0	50	HNO_3	0.94	0.5
N048	7	1.1	64	HN	18	12
				HNO_3	1.5	1.0
N051	13	1.0	110	KOH	.83	0.9
N056	130	1.3	1400	ANN	50	700
N075	6.7	1.1	61	HNO_3	11.6	7.1
				$Fe(NH_2SO_3)_2$	0.78	0.5
				N_2H_4	0.18	0.1
N110*	3.1	1.4	36	HNO_3	57	21
N116*	8.2	1.0	68	HNO_3	1.8	1.2
				HN	0.92	0.6
				N_2H_4	0.15	0.1
N137*	8.2	1.0	68	SULFAMIC ACID	1.08	0.7
				HNO_3	1.9	1.3
				$Fe(NH_2SO_3)_2$	.93	0.6
N162*	13	1.0	110	N_2H_4	35	39
N191	36	1.4	420	HNO_3	57	240
N206	150	1.3	1600	ANN	50	800
N211	40	1.0	330	HNO_3	7.4	24
N243	17	1.1	160	SUGAR	22	35
N289	9.7	1.0	81	HNO_3	0.063	0.05

* Headers passing into White Room.

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TABLE 3: P&O Gallery Headers Volume Determinations

Header #	Diameter (in.)	Length (ft.)	Volume cu. ft.	Volume gallons
3AS	0.364	210	0.15	1.1
3AS-L11	1.05 1.51	15 230	.94	7.0
3BX*	0.622	400	0.84	6.2
205*	3.07	640	33	250
206*	2.07	640	15	110
7001	1.05 1.61	380 280	6.3	47
7004	2.07 3.07	60 550	29	220
7006*	3.07 0.622	700 80	36	270
7008*	4.03	600	53	400
7009*	1.05 0.622 2.07	320 140 300	9.2	68
N048*	0.622 1.05	180 100	1.0	7.5
N051*	1.05	300	1.8	13
N056*	2.07	760	18	130
N075	1.05 2.07	110 10	0.9	6.7
N110	1.05	70	0.42	3.1
N116	1.05	190	1.1	8.2
N137	1.05	190	1.1	8.2
N162*	1.05	300	1.8	13
N191	1.61	340	4.8	36
N206*	3.07 2.07	600 100	33	250
N211	2.07 3.07	190 20	5.4	40
N243	1.61	160	2.3	17
N289	1.61	90	1.3	9.7

Table 4 provides the amount of solution present, as well as the weight percent and amount of each chemical, in each of the five P&O Gallery Tanks used during plant operation. The P&O Gallery Tanks contain no solution now, and no solution will be placed in the tanks during deactivation. The volume of each tank is based on the volume prepared for each batch makeup plus a heel from the previous batch.

TABLE 4: CHEMICAL INVENTORY IN P&O GALLERY TANKS DURING PLANT OPERATION**

Tank	Tank Volume (gal)	Soln. Vol. (gal)	Specific Gravity	Pounds of Solution	Solution Composition		
					Material	Weight %	Pounds
G5-A	3000	1500	1.2	15000	$NaOH$	8.5	1300
					$NaNO_2$	15	2300
L9-A*	20	15	1.35	170	HNO_3	57	96
N38*	13	10	1.0	83	HNO_3	7.4	6.1
R1-A*	3000	1000	0.90	7500	NPH	30	2250
					TBP	70	5250
R5-A*	3000	1000	1.1	9100	$NaNO_2$	13	1200

* Tanks in White Room.
** No P&O gallery tanks will be used during deactivation

The information from Tables 1 through 4 is summarized in Tables 5 and 6, which show the total amount of each chemical present in the P&O Gallery during deactivation and plant operation, respectively.

TABLE 5: TOTAL CHEMICAL INVENTORY IN THE P&O GALLERY DURING DEACTIVATION

Material		Pounds
SODIUM NITRITE	$NaNO_2$	260
SODIUM HYDROXIDE	$NaOH$	1700

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TABLE 6: TOTAL CHEMICAL INVENTORY IN THE P&O GALLERY DURING PLANT OPERATION

Material		Pounds
ALUMINUM NITRATE NONOHYDRATE	ANN	1500
CADMIUM NITRATE	$Cd(NO_3)_2$	3.9
FERROUS SULFAMATE	$Fe(NH_2SO_3)_2$	1.1
HYDROXYLAMINE NITRATE	HN	13
NITRIC ACID	HNO_3	685
POTASSIUM PERMANGANATE	$KMnO_4$	12
POTASSIUM HYDROXIDE	KOH	700
SODIUM CARBONATE	Na_2CO_3	83
SODIUM NITRITE	$NaNO_2$	3800
SODIUM HYDROXIDE	NaOH	3000
HYDRAZINE	N_2H_4	39
AMMONIUM FLUORIDE	NH_4F	850
AMMONIUM NITRATE	NH_4NO_3	170
NORMAL PARAFFIN HYDROCARBON	NPH	2250
	SUGAR	35
TRIBUTYL PHOSPHATE	TBP	5250
	SULFAMIC ACID	0.7

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CORRESPONDENCE DISTRIBUTION COVERSHEET

Author	Addressee	Correspondence No.
S. H. Wisness, RL (C. E. Sowa, WHC)	D. C. Nylander, Ecology	Incoming:9400891 XRef:9453003D

Subject: TOXIC AIR POLLUTANT INVENTORY FOR DEACTIVATION OF THE PLUTONIUM URANIUM EXTRACTION PLANT

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