

SEMIANNUAL

HEALTH PHYSICS REVIEW

July - December 2004

Radiological monitoring data has been reviewed for the last half of 2004. The air activity for the sampling plant and the auger room were essentially the same as those for the last year. Feeds building air activity results decreased by 18% and the drum dumper results decreased by 38%. Uranium losses to the air increased by 33% and losses to the river increased by 26%. The average concentration of fence line monitor samples increased 17% for the last six months of 2004 compared to 2003. The effluent increases were due to increased operations compared to 2003. The Nearest Resident monitor showed a significant decrease to of the NRC License limit for the last half of 2004. The elevated 2003 averages were due to the Uranium Hexafluoride release on December 22, 2003. The Nearest Resident results for the year 2004 were essentially the same as previous periods excluding the last 6 months of 2003.

Airborne Radioactivity - % of NRC Limit (DAC=1.7E-10 uCi/ml)

2004	SAMPLING PLANT		FEEDS MATERIAL BLDG	
	AUGER ROOM	FLOOR AVE	DRUM DUMPER	FLOOR AVE
JULY	5.3	1.2	2.3	5.5
AUGUST	5.9	0.8	3.6	6.5
SEPTEMBER	6.1	1.6	3.2	7.7
OCTOBER	3.1	1.1	2.4	8.2
NOVEMBER	2.1	0.5	2.2	8.1
DECEMBER	3.2	1.2	1.6	6.9
6 Mo. AVG	4.3	1.1	2.6	7.2
6 Mo. AVG 2003	4.2	1.3	4.2	5.9

Environmental Losses

Uranium Loss to Air

2004	Total Pounds "U" Loss
JULY	24.3
AUGUST	32.1
SEPTEMBER	29.1
OCTOBER	36.2
NOVEMBER	29.9
DECEMBER	15.1
6 Mo. AVG	27.8
6 Mo. AVG 2003	18.7

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Uranium Loss to River

2004	Average ppm "U"	Total Pounds "U" Loss
JULY	0.06	54.7
AUGUST	0.04	32.4
SEPTEMBER	0.08	64.3
OCTOBER	0.15	129.8
NOVEMBER	0.21	184.3
DECEMBER	0.11	106.1
6 Mo. AVG	0.11	95.3
6 Mo. AVG 2003	0.08	70.9

Environmental Monitoring

Fence Monitors

The Metropolis facility has committed to a Nearest Resident maximum annual exposure of 10 mrem as a condition of its NRC License. This exposure corresponds to an activity of 3.0×10^{-14} uCi/ml at the NR-7 monitoring station. An internal investigation limit of 2.0×10^{-14} uCi/ml has been established for the average of the quarterly fence line results. Quarterly fluoride results were less than the Kentucky EPA limit of 0.76 ug/m^3 . The NR-7 data for the third and fourth quarters of 2004 indicate that results for Ra-226 and Th-230 were less than 1% of the 10 CFR Part 20 limits.

Fence Line Results

QUARTERLY FENCE LINE AVERAGES						
	2004			2003		
	Uranium		Fluoride	Uranium		Fluoride
	uCi/ml	% NRC License Limit	ug/m3	uCi/ml	% NRC License Limit	ug/m3
3rd Qtr	1.10E-14	36.7	0.28	8.08E-15	26.9	0.13
4th Qtr	1.86E-14	62.0	0.15	1.16E-14	39.0	0.07

Nearest Resident Monitor (NR 7)

QUARTERLY AVERAGE - % NRC LICENSE LIMIT			
	3rd Quarter	4th Quarter	6 Mo. Avg. uCi/ml
2004	17.0	25.6	6.38E-15
2003	18.3	274.0	4.39E-14

Ra-226 and Th-230 (NR7)

6 MONTH AVG				
JUL – DEC				
2004	3rd Quarter uCi/cc	4th Quarter uCi/cc	6 mo. Avg uCi/cc	% NRC Limit*
Ra-226	1.63E-17	1.22E-25	8.15E-18	<1.0
Th-230	3.11E-17	1.73E-25	1.56E-17	<1.0
<ul style="list-style-type: none">• Limit taken from 10 CFR 20.• Note: Blank was not subtracted.• 4th Quarter results were a greater sensitivity of 10e-16.				

Surface Contamination Smears

Weekly Smears

There were 2054 weekly smears taken during this period to demonstrate NRC compliance. Thirteen smears exceeded the weekly limit of 200 dpm/100 cm². The locations where high smear results were obtained were cleaned and resmeared to assure compliance.

Monthly Smears

A total of 522 monthly smears were taken to demonstrate NRC compliance. One smear exceeded the 5000 dpm/100 cm² limit. The location where the high smear result was obtained was cleaned and resmeared to assure compliance.

Quarterly Smears

A total of 126 quarterly smears were taken to demonstrate compliance. No smears exceeded the 200 dpm/100 cm² limit.

UF₆ Product Cylinder Smears

Beta smears were taken on 561 UF₆ cylinders to demonstrate DOT compliance. None of these smears exceeded the 2200 dpm/100 cm² limit. The highest smear was 84 dpm/100 cm² beta on the valve end of a full size cylinder.

Daily Dispensary Smears

Alpha smears were taken in the dispensary Monday through Friday to assure that there was no spreadable contamination present. The smear average for July through December was 9.6 dpm/100 cm². The highest smear was taken in the waiting room area and was 33 dpm/100cm².

Container Smears

A total of 362 containers that delivered ore concentrates to the Sampling Plant were monitored by direct reading methods. All containers met DOT limits and were released by Health Physics.

Personal Contamination Investigations

Health Physics is notified each time that a confirmed alarm is sounded at the exit monitors. The technician on duty oversees the decontamination of the individual or the contaminated articles. He also performs an investigation of the incident. During the last six months of 2004, three contamination investigations were completed. All individuals, equipment, etc. that were confirmed to be contaminated were either cleaned and released or retained as LLRW.

Incident and Spill Reports

There were 39 radiological Incident Reports filed during this period. None of these incidents involved an employee exposure in excess of the 10 mg weekly soluble uranium limit.

Employee Exposures

External Exposures (TLD)

This section of the report has been changed to reflect number of employees that have dose in the ranges per quarter. The dose is the accumulative for the quarter.

Dose Ranges (Rems)	Monthly Issue 2004		Quarterly Issue 2004	
	3 rd Q	4 th Q	3 rd Q	4 th Q
No Measurable Exposure	124	160	21	57
Measurable Exposure < 0.100	127	105	98	76
0.100 - 0.250	42	32	5	2
0.250 - 0.500	1	0	0	0
0.500 - 0.750	0	0	0	0
> 0.750	0	0	0	0

Internal Exposures (Bioassays)

Routine pre-shift bioassay monitoring indicates 99.2% of the samples were < 15 ugU/L. Approximately 91% of post shift special samples collected for tank entries, dust collector work, and UF₆ releases were < 15 ugU/L. There were no over exposures during this period.

Routine Urinary Uranium Samples

Range ug U/L	Jul – Dec 2004	% of Total
< 5	3205	91.70
5 - 15	263	7.53
15 - 60	26	0.74
> 60	1	0.03
Total	3495	100

Special Urinary Uranium Samples

Range (ug U/L)	Jul - Dec 2004	% of Total
<5	95	67.38
5 - 15	33	23.40
15 - 60	13	9.22
> 60	0	0
Total	141	100.0

Routine Urinary Fluoride Samples

	Jul-Dec 2004
Routine Pre Shift Urine Samples	289
Samples > 4.0 mgF/L	14

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cc: D. Edwards D. E. Mays ALARA Committee

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