

February 13, 1997

Stephen M. Johnson, Chief
Site Management Section
Bureau of Waste Site Clean-up
Commonwealth of Massachusetts
Department of Environmental Protection
10 Commerce Way
Woburn, Massachusetts 01801

Dear Mr. Johnson:

This letter provides the past and current airborne release limits for uranium, as requested in your letter dated January 22, 1997. We understand that you need this information to assist in your review of a recent request from a member of the public near Nuclear Metals, Inc. (NMI), in Concord, Massachusetts. The enclosed Table lists the average annual airborne concentration release limits for natural uranium and for the uranium (U) isotopes of U-234, U-235, and U-238, as required by the Atomic Energy Commission and later the Nuclear Regulatory Commission.

As you are aware, the NRC has periodically received written and verbal requests to provide NMI airborne sampling records to the public for their review. As part of the NRC routine inspection program, NMI's airborne data is reviewed and evaluated to ensure that members of the public would not receive a radiation dose in excess of that specified in the NRC regulations. NRC inspection reports document this review and are available to the public.

For any questions related to this matter, Marie Miller may be contacted at (610) 337-5205.

Sincerely,

Original Signed By:
Ronald R. Bellamy

Ronald R. Bellamy, Chief
Decommissioning & Lab Branch
Division of Nuclear Materials Safety

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PDR ADOCK 04000672
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Enclosure: Table 1

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Cynthia Weidner, MADEP

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TABLE I

Average Annual Effluent Limits in Air Applicable to NMI

	Up to 01/29/57 Effluent in Air ($\mu\text{Ci/ml}$)	1957 - 1974 ($\mu\text{Ci/ml}$)	1975 - 1994 ($\mu\text{Ci/ml}$) ¹	Y-class ² 1994 - Present ($\mu\text{Ci/ml}$) ³
U-234		S - 2×10^{-11} I - 4×10^{-12}	S - 2×10^{-11} I - 4×10^{-12}	5×10^{-14}
U-235		S - 2×10^{-11} I - 4×10^{-12}	S - 2×10^{-11} I - 4×10^{-12}	6×10^{-14}
U-238		S - 3×10^{-12} I - 5×10^{-12}	S - 3×10^{-12} I - 5×10^{-12}	6×10^{-14}
U-Natural (S) ⁴	1.7×10^{-12}	3×10^{-12}	5×10^{-12}	9×10^{-14}
U-Natural (I)	1.7×10^{-12}	2×10^{-12}	5×10^{-12}	

¹(From 10 CFR Part 20, Appendix B, Footnote 3) For soluble mixtures of U-238, U-234, and U-235 in air, chemical toxicity may be the limiting factor (see §20.1201(a)). If the percent by weight (enrichment) of U-235 is not greater than 5, the concentration value for a 40-hour workweek is 0.2 milligrams uranium per cubic meter of air average. For any enrichment, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed $8\text{E-}3$ (SA) $\mu\text{Ci-hr/ml}$, where SA is the specific activity of the uranium inhaled. The specific activity for natural uranium is $6.77\text{E-}7$ curies per gram U. The specific activity for other mixtures of U-238, U-235, and U-234, if not known, shall be:

$$\text{SA} = 3.6\text{E-}7 \text{ curies/gram U} \quad \text{U-depleted}$$

$$\text{SA} = [0.4 + 0.38 (\text{enrichment}) + 0.0034 (\text{enrichment})^2]\text{E-}6, \text{ enrichment} \geq 0.72$$

where enrichment is the percentage by weight of U-235, expressed as percent.

²This classification applies to particle clearance half-times greater than 100 days based on a mathematical lung model.

³For enriched uranium the same radioactivities per unit volume as those for natural uranium are applicable. It should be noted that the contribution of U-234 to the gross activity of enriched uranium is 20-40 times that of the U-235.

⁴(S) and (I) refer to the soluble and insoluble forms of U-natural, respectively.