

Nickel-63 Dose Conversion Factor Anomalies and Implications to RETS and Groundwater Monitoring Efforts

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ABSTRACT

Standard ODCM Guidance presented in NUREG-1301/1302 requires quarterly analysis of liquid effluent composites for Fe-55, Sr-89, and Sr-90, in addition to routine analyses for gamma emitters and tritium. Recent analyses of 10CFR61 waste streams and industry OE have indicated that Nickel-63 can constitute a sizable fraction of the total activity in certain waste streams, including those influencing liquid effluents. Analysis of Ni-63 dose factors in Regulatory Guide 1.109 reveals some inconsistencies relative to the resulting critical organ dose to bone when compared to more modern dose factors from ICRP-30 and ICRP-72. Dose factors are used to calculate resulting dose from liquid effluents or groundwater ingestion, as well as in deriving target detection sensitivities (LLDs) for liquid effluent and groundwater analyses. The use of erroneous dose factors can result in misleading dose and LLD consequences.

This presentation will discuss the discrepancies in RG-1.109 dose factors for Ni-63, as well as providing considerations for using ICRP-30 dose factors to derive target LLDs. The selection of representative 10CFR61 waste streams will also be discussed regarding potential influence on liquid effluent waste streams.

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