Brief Chronology of Soluble Uranium Requirement

1991 NUREG-1391, USNRC
Chemical Toxicity of Uranium Hexafluoride Compared to Acute Effects of Radiation

Identifies: nephrotoxic threshold of 0.3 micrograms U per gram of kidney tissue (dog)

1994 Pacific Northwest Laboratory Report PNL-10065 **Copy attached**
Uranium Hexafluoride Public Risk
August 1, 1994

Describes: threshold for severe renal injury at 70 micrograms U per kilogram body weight for humans

Short Term Exposure Limit (STEL) is 0.6 mg U per m^3 air

1994 NRC Final Rule 59 FR 48944
10 CFR Part 76, Certification Of Gaseous Diffusion Plants **Copy attached**
September 23, 1994

Refers to PNL report and states that "...the best estimate of a toxicity threshold would be an intake of 30 milligrams of uranium...the NRC will consider whether the potential consequences of a reasonable spectrum of postulated accident scenarios exceed [criteria] taking into account uncertainties associated with modeling..."

1999 NRC Proposed Rule 64 FR 41388
10 CFR Part 70, Domestic Licensing of Special Nuclear Material **Copy attached**
July 30, 1999

70.61(b)(3) lists 30 mg soluble uranium intake as high consequence to public

Explains that the source is the PNL report and justification in Part 76

Refers to 10 CFR 20.1201(e): "In addition to the annual dose limits, the licensee shall limit the soluble uranium intake by an individual to 10 milligrams in a week in consideration of chemical toxicity (see footnote 3 of appendix B to Part 20)."

2000 NRC Final Rule 65 FR 56226
10 CFR Part 70, Domestic Licensing of Special Nuclear Material
September 18, 2000

70.61(b)(3) lists 30 mg soluble uranium intake as high consequence to public

OSHA and EPA standards on Soluble Uranium

OSHA:
OSHA limits are generally airborne limits and thus inhalation entry routes.

- 29 CFR 1910.1000 Table Z-1 gives limits of air contaminants and sol U is listed as 0.05 mg/m^3, i.e., mg of substance per cubic meter of air. The table can be found at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992

- Some exposure limits are addressed in http://www.osha.gov/dts/chemicalsampling/data/CH_274900.html and copied below, which is a repeat of some values in Table Z-1:

  OSHA GENERAL INDUSTRY PEL: 0.05 mg/m3

  OSHA CONSTRUCTION INDUSTRY PEL: 0.2 mg/m3 TWA

  ACGIH TLV: 0.2 mg/m3 TWA; 0.6 mg/m3 STEL; Appendix A1 (Confirmed Human Carcinogen)

  NIOSH REL: 0.05 mg/m3 TWA; Potential carcinogen

- The link, http://www.osha.gov/dts/sltc/methods/partial/id170sg/id170sg.html appears to give a description of a testing method for airborne concentrations of soluble U.

EPA:
EPA's limits of soluble U are on drinking water levels and set by the Safe Drinking Water Act and described in 40 CFR Parts 9, 141, and 142 and seen at http://www.epa.gov/EPA-GENERAL/2000/December/Day-07/g30421.htm . This describes a cost-benefit analysis done and can be summarized as:

> (1) Costs and Benefits of Uranium MCLs (max contamination limits) of 20, 40, and 80g/L or pCi/L: Most commenters stated that the benefits of an MCL of 20 g/L or pCi/L did not justify the costs and suggested that EPA should exercise its authority under SDWA section 1412(b)(6) to set an MCL higher than the feasible level. As discussed previously in this section, EPA agrees that the benefits of an MCL at 20 g/L do not justify the costs and has exercised its SDWA authority by setting the uranium MCL at a level of 30 g/L, a level at which EPA believes the benefits do justify the costs.

Since these limits are on drinking water, it is deduced that the U limits are for soluble U, but that is not explicitly stated.