



U.S. Department
of Transportation

1200 New Jersey Avenue, SE
Washington, DC 20590

**Pipeline and Hazardous
Materials Safety
Administration**

Mr. Clayton Manning
Department of the Interior
US Geological Survey
Box 25046 MS-974
Denver, CO 80225

October 3, 2018

Dear Mr. Manning:

This letter is in response to your August 9, 2018 request for an alternate A₂ Value for Bromine-80m (Br-80m). In accordance with §173.433(b)(2) of Title 49 of the U.S. Code of Federal Regulations, the following A₂ value for Br-80m is approved for use by the US Geological Survey for domestic transport.

| Radioisotope | A ₁ Value | A ₂ Value |
|--------------|----------------------|----------------------|
| Bromine-80m | 0.40 TBq 11.0 Ci | 0.40 TBq 11.0 Ci |

This approval may be used until November 1, 2023.

If you have any questions or require further information on this matter, please contact me at 202-366-2993 or by email at rick.boyle@dot.gov.

Sincerely,

Richard W. Boyle,
Chief Radioactive Materials Branch
Office of Hazardous Materials Safety



AUG 16 2018

BA

Department of the Interior
US Geological Survey
Box 25046 MS-974
Denver CO, 80225

August 9, 2018

ATTN: William Schoonover
Associate Administrator of Hazardous Materials Safety
Pipeline and Hazardous Materials Safety Administration
Hazardous Materials Information Center
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590
United States

SUBJ.: Request For Approval For Use of Alternative A2 Value For Isotope Br-80m
under 49 CFR §173.433

Mr. Schoonover,

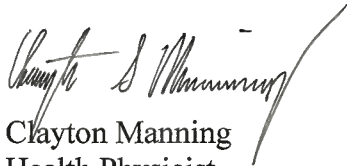
The US Geological Survey TRIGA Reactor Facility (GSTR) is a 1-MegaWatt research reactor in Denver, CO, operated under NRC Docket 50-274, License R-113. As part of the facility's operations, radioactive tracer materials are produced for industrial processes; these are shipped as Normal Form materials in DOT Type 7A Containers. One of these tracers is the isotope Br-82, produced by irradiating a bromine target compound in the reactor. Incident to the production of Br-82 are smaller amounts of the isotope Br-80m. Although Br-82 has an entry for its A2 value in 49 CFR §173.435, Br-80m does not. Thus, the general value for A2 listed in Table 7 of 49 CFR §173.433 is to be used for Br-80m. This presents a challenge because the general A2 value (0.54 Ci) is unduly restrictive compared to the A2 value for Br-82 (11 Ci).

The general A2 value is considered unduly conservative for calculations in this particular case because Br-80m presents less of a hazard in transportation than Br-82 does. For instance, the Annual Limit on Intake set by the NRC for Br-82 (3000 microCuries) is over 3 times lower (and thus more restrictive) than Br-80m (10,000 microCuries). Additionally, the half-life of Br-80m (4.4 hours) is so short compared to Br-82 (35 hours), that the hazard with the former isotope will drop off quickly in transit. The external hazard provided by gamma rays is also much higher for Br-82 than Br-80m (approximately 1295 keV total energy per disintegration for Br-82 vs under 20 keV for Br-80m).

In order to remedy the effects of the overly conservative default A2 value for Br-80m, the GSTR is requesting approval to use the A2 value for Br-82 (11 Ci), the more hazardous isotope, as the A2 value for Br-80m. This change would still produce a conservative effect on the safety of transporting these isotopes without being overly conservative to the point of being unwieldy. This approval would not supersede any other regulations.

Please contact me if you need any more information.

Sincerely,

A handwritten signature in black ink, appearing to read "Clayton S. Manning". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Clayton Manning
Health Physicist
US Geological Survey TRIGA Reactor
Phone: 303-236-4726
Email: cmanning@usgs.gov