U.S. Department of Transportation

Pipeline and Hazardous Materials Safety Administration

SEP 8 2010

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Washington, D.C. 20590

Mr. Charles T. Simmons
Law Offices of Charles T. Simmons, LLC
1250 Connecticut Avenue, N.W.,
Suite 200
Washington, D.C. 20036
Ref. No. 10-0106

Dear Mr. Simmons:

This responds to your May 5, 2010 letter requesting that the Pipeline and Hazardous Materials Safety Administration (PHMSA) re-visit its response to your original request for interpretation of the Hazardous Materials Regulations (49 CFR Parts 171-180). The response to your original request was issued June 26, 2006 [Ref. No. 06-0003; Attached] and signed by Hattie L. Mitchell, Chief, Regulatory Review and Reinvention, Office of Hazardous Materials Standards. In that original request, you asked PHMSA if the exception in § 173.401 (b)(4), which provides regulatory relief from the Class 7 (radioactive) material regulations for natural material and ores containing naturally occurring radionuclides, applies to zeolite media used as part of a water treatment process to remove radionuclides from drinking water. PHMSA responded stating the exception does not apply to the contaminated zeolite. You assert that the letter issued on June 26, 2006 [Ref. No. 06-0003] is in conflict with other more recent letters issued by PHMSA on the applicability of § 173.401 (b)(4). Thus, you are asking PHMSA to reconsider the response to that June 26, 2006 letter.

PHMSA disagrees with your assertion that the June 26, 2006 [Ref. No. 06-0003] letter conflicts with other more recent letters of interpretation that have been issued on the applicability of the exception in § 173.401 (b)(4). Each of the more recent letters that you reference concern ores or materials remaining from the processing of ores. As your request does not involve "natural material" (due to the man-made processing involved) or "ores containing naturally occurring radionuclides" our previous response to you is not inconsistent with the other letters you reference. Therefore, PHMSA is not revising the letter of interpretation that was issued to you on June 26, 2006.

I hope this answers your inquiry. If you need further assistance, please contact this Office.

Sincerely,

Charles E. Betts
Chief, Standards Development
Office of Hazardous Materials Standards

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Eichenlaub
§ 173.401(b)(4)
RAM
10-0106

May 5, 2010

Office of Hazardous Materials Standards
Pipeline and Hazardous Materials Safety Administration
Attn: PHH-10
U.S. Department of Transportation
East Building
1200 New Jersey Avenue, S.E.
Washington, D.C. 20590-0001

Re: Request for Revised Interpretation of 49 CFR 173.401(b)(4)

To Whom It May Concern:

In a letter to the undersigned dated June 26, 2006 [Ref. No. 06-0003, hereafter "Simmons letter"], the Pipeline and Hazardous Materials Safety Administration (PHMSA) concluded that the exclusion from the scope of regulation set forth in 49 CFR 173.401(b)(4) was inapplicable to natural zeolite drinking water treatment media containing naturally occurring radionuclides.

This letter requests PHMSA to re-visit its conclusion in the Simmons letter and revise it to be consistent with conflicting, and more recent, interpretations by PHMSA of 173.401(b)(4) that are more aligned with the International Atomic Energy Agency (IAEA) *Regulations for the Safe Transport of Radioactive Material No. TS-R-1* (2009) and associated IAEA guidance.

1. The Simmons Letter

In the Simmons letter, PHMSA interpreted the applicability of 49 CFR 173.404(b)(4) to drinking water treatment media containing naturally occurring radionuclides as follows:

Q1. Does the exception for "natural materials" in § 173.401(b)(4) include naturally occurring zeolite water treatment medium that have absorbed naturally occurring radionuclides from public drinking water supplies and are intended to be managed as waste?

A1. The answer is no. The term "natural materials" in § 173.401(b)(4) means materials and radionuclides existing in nature, not those produced by humans. Radionuclides addressed by § 173.401(b)(4) do not include those contained in filters used in removal of radionuclides from drinking water, produced in nuclear reactors, or by other technological means. In the scenario described in your letter, the naturally occurring radionuclides in public drinking water supplies are absorbed onto zeolite medium through a water treatment process. Therefore, these radionuclides, while naturally occurring in the pre-treatment drinking water, are not naturally occurring in the zeolite medium since they are transferred from another medium (i.e., the water). If the zeolite medium contains naturally occurring radionuclides prior to its use as a filtering medium, the exception in § 173.401(b)(4) is applicable. However, after the drinking water is processed through the zeolite medium and additional radionuclides are absorbed, § 173.401(b)(4) does not apply.

PHMSA's conclusion is apparently based on a belief that transferring naturally occurring radionuclides from a medium where they are found in nature to another natural medium where they are not causes the radionuclides to lose their "naturalness" and become equivalent to radionuclides "produced in nuclear reactors or by other technological means." This belief conflicts with interpretations by PHMSA discussed below which conclude that primordial radionuclides are covered by 173.401(b)(4) following transfer to different materials. Moreover, established science and the IAEA recognize that primordial radionuclides and their progeny remain "natural," even after processing (provided such processing is not intended to extract radionuclides for use of their radioactive properties).

Central to the act of processing material containing natural radionuclides, whether by chemical or physical treatment, including filtration, is an intention to transfer or partition the material into desired and unwanted fractions. Radionuclides are not created by such processing, just transferred from one fraction to the other. As long as the underlying intention is not to extract natural radionuclides for use of their radioactive properties (as in nuclear fuel), IAEA recognizes that processing *per se* does not render naturally occurring radioactive materials within the scope of regulation.

2. The Lambert Letter

An interpretive letter dated January 15, 2008 to Michael Lambert [Ref. No. 07-0218, hereafter "Lambert letter"] addressed the applicability of 173.401(b)(4) to shipments of soil contaminated by natural uranium removed from a molybdenum ore processing facility that was licensed by the U.S. Nuclear Regulatory Commission. (NRC). The request for interpretation stated "It is not known whether the natural uranium contamination in soil is the result of the presence of ore

brought onto the project site over the many years of operation or residual material resulting from processing ore of a presently unknown origin." Natural uranium contamination in soil was reported to be less than ten times the activity concentration for exempt material in 49 CFR 173.436 and the soil was being transported for laboratory analysis. PHMSA responded:

> **Q1.** May the samples of material that are to be shipped for additional characterization be offered for transportation and transported under the exception in 173.40 1 (b)(4) for natural materials and ores?
>
> **Al.** Yes. Section 173.40 1 (b)(4) provides an exception for natural material and ores containing naturally occurring radionuclides which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in §173.436. Since the preliminary characterization of your material shows that the known concentration of the natural uranium is slightly less than 10 times the exempt concentration limit, and because the sample of material is being transported for purposes other than the extraction of radionuclides, the exception in §173.401 (b)(4) may be used.

Natural uranium was not originally present at high levels in the contaminated soil to be transported, but was transferred to the soil by technological activity involving ore handling and/or processing to recover molybdenum. Unprocessed molybdenum ore contained natural uranium; ore spillage or the release of uranium-contaminated residues arising from ore processing activities caused soil to become contaminated with elevated concentrations of natural uranium. PHMSA's conclusion in the Lambert letter contradicts the Simmons letter: both situations involve the *transfer* of naturally occurring radionuclides from a medium where they occur in nature to another natural medium where they do not; and, in both cases, the intended objective was processing a natural material – molybdenum ore in Lambert and ground water in Simmons— to obtain a purified product – molybdenum and drinking water meeting EPA standards. In neither case was processing carried out for the use of the radionuclides.

3. The Colborn Letter

An interpretative letter dated July 1, 2005 to Kurt Colborn [Ref. No. 05-0145, the "Colborn letter"] addressed the applicability of 49 CFR 173.401(b)(4) to natural uranium and thorium in "material" to be transported from a defunct tungsten processing facility "which represent the residual radioactivity remaining after the tungsten extraction process" and was being "transported for disposal and will not be processed for use of the radionuclides."

The exact nature of the "material" described by Mr. Colborn isn't clear – just that it is matter containing "contamination from naturally occurring radionuclides," and it is "being shipped as

waste for disposal." PHMSA responded:

> In order to determine whether the material to be shipped satisfies the conditions in § 173.401(b)(4) to be exempt from Class 7 transport requirements, one must compare the actual activity concentration of the material (defined as the sum of the activity concentrations of the parents, i.e., of U^{238}, Th^{232}, and K^{40} in your case) with 10 times the calculated activity concentration limit for the mixture.

Here, PHMSA did not qualify the applicability of 173.401(b)(4) on whether natural radionuclides were intrinsic or extrinsic (i.e., transferred to) the material in issue. Instead, PHMSA considered only the identity and concentration of the natural radionuclides in issue, all of which were primordial and below 10 times the exempt activity concentrations in 173.436. PHMSA's interpretation in Colborn is consistent with Lambert, which are both in conflict with the Simmons letter.

4. IAEA TS-R-1 (2009) and IAEA Guidance support revising the Simmons letter.

The IAEA *Regulations for the Safe Transport of Radioactive Material* TS-R-1 (1996) forms the underpinning of DOT's regulations governing transportation of radioactive materials.[1] RSPA's (PHMSA's predecessor agency's) stated purpose for modeling U.S. rules on IAEA's was "to harmonize requirements of the [hazardous materials regulations] with international standards for radioactive materials."[2] IAEA reviews its transportation regulations on a two year cycle in order "to reflect new information and accumulated experience." [3]

In the 2009 edition of TS-R-1, the IAEA provided a more expansive description of materials outside the scope of regulation, and emphasized the exclusion from regulation of "processed" materials as long as the materials were not intended to be further processed for *use* of the radionuclides:

> 107.These Regulations do not apply to:
>
> (e) Natural material and ores containing naturally occurring radionuclides which are either in their natural state, or have only been processed for purposes other than for extraction of the radionuclides, and which are not intended to be processed for use of these radionuclides, provided the activity concentration of the material does not exceed 10 times the values specified in Table 2, or calculated in accordance with paras 403–407

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[1] 67 Fed. Reg. 21328 (April 30, 2002).

[2] Id.

[3] 72 Fed. Reg. 65470 (November 21, 2007).

While the 2009 edition of TS-R-1 may not control PHMSA's interpretation of its own rules, it is persuasive that international authorities in their accumulated experience consider "processing" materials containing natural radionuclides not to be dispositive of their excluded status, provided the materials are not intended to be further processed "in order to use their radioactive properties."[4]

All of the situations described in the Simmons, Lambert and Colborn letters involved natural materials containing naturally occurring radionuclides that were processed for purposes other than use of the radionuclides. All situations involved the presence of natural radionuclides in a natural material that had to be transported to a place for permanent disposal. Accordingly, the exclusion of 49 CFR 173.401(b)(4) should apply equally in all situations.

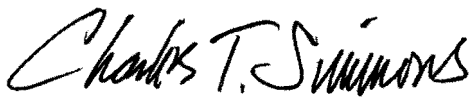
6. Question for Reconsideration

In light of the foregoing discussion, it is respectfully requested that PHMSA reconsider interpretation in the Simmons letter in its response to the following question:

Question: May natural zeolites that have been used for water treatment and as a result of such use contain naturally occurring radionuclides be transported for disposal under the exception in 49 CFR 173.401(b)(4) for natural materials and ores?

Please feel free to contact the undersigned if you have any questions regarding this letter.

Respectfully submitted,



Charles T. Simmons

[4] IAEA Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material, TS-G-1.1 (2008) at para. 107.4.