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contains 3,900 pCi/g of thorium and 1,800 pCi/g of uranium. Another rare earth ore, bastnasite, typically contains less than 97 pCi/g of thorium.

These concentrations generally are far above typical background concentrations expected in surface soils across most of the U.S. (i.e., uranium-238 ranging from 0.12 to 3.8 pCi/g, with an average of 1 pCi/g, and thorium-232 ranging from 0.10 to 3.4 pCi/g, with an average of 1 pCi/g). The concentrations in uranium ore, phosphate rock, and rare earth ores (including monazite mined for its thorium content) also are above the elevated background concentrations known to exist at or near the land surface in certain hot spot regions of the country, such as the Reading Prong region.

Just as the relatively low concentrations in iron, zinc, limestone, copper, and other mining sectors proposed to be exempted do not necessarily mean that the radiation risks are low, the relatively high concentrations encountered during uranium, phosphate, tin, titanium, zirconium, hafnium, vanadium, and rare earth mining do not necessarily mean that the radiation risks at these sites are high. To the contrary, EPA's risk analysis⁴ supporting the National Emission Standards for Hazardous Air Pollutants (NESHAPs) shows that airborne emissions of radionuclides from surface uranium mines result in a maximally exposed individual risk of fatal cancer of 5×10^{-5} . Furthermore, U.S. Nuclear Regulatory Commission licenses control radionuclide releases to all media from in-situ uranium mines and an EPA NESHAP limits radon emissions to the air from underground uranium mines (40 CFR part 61, subpart B); as a consequence, releases in compliance with these limits may be federally permitted under CERCLA and thus excluded from CERCLA reporting and liability requirements.

EPA believes, however, that the elevated radionuclide concentrations in raw materials handled at uranium, phosphate, tin, titanium, zirconium, hafnium, vanadium, and rare earth mines distinguish such materials from the soil and rock disturbed at the vast majority of farming and construction sites across the U.S. When these elevated radionuclide concentrations are coupled with other factors that tend to distinguish mining from farming and

construction—generally much larger sites, larger quantities of earthen materials moved and stockpiled, longerterm and more frequent land disturbances at a given site, and frequently substantially greater depths uncovered (see the Technical Background Document for more detail)—EPA believes there is a reasonable basis for not including uranium, phosphate, tin, titanium, zirconium, hafnium, vanadium, and rare earth mining in the reporting exemption for land disturbance activities. Again, this does not mean that the radiation risks at such mines are necessarily high, but only that, in EPA's judgment, further evaluation would be required before it can be concluded with a sufficient degree of confidence that such risks are indeed low and that a government response would be unwarranted or infeasible.

Commenters wishing to support exemptions for uranium, phosphate, tin, titanium, zirconium, hafnium, vanadium, and rare earth mining and wishing to obtain a reporting exemption are requested to submit particular kinds of information along with their comments on this proposal. Data and analyses regarding the radionuclide concentrations in ores and other raw materials handled in these mining sectors relative to the undisturbed, naturally occurring levels at or near the land surface around the mine sites would be especially helpful. If such data and analyses can demonstrate that the radionuclide concentrations in the ores and raw materials being handled are generally within the normal background range for surficial rocks and soils in the same area, a basis for broadening the reporting exemptions further to include these mining sectors may exist. If such a demonstration cannot be made, EPA requests information on special circumstances that would make a CERCLA response to radionuclide releases at these mine sites very unlikely, infeasible, and/or inappropriate.

These special circumstances could include a demonstration that the radiation exposures and risks, for all radionuclides and all possible exposure pathways (not just radon and not just the air pathway), are low (e.g., 10^{-4} or lower lifetime cancer risk) for reasonably maximally exposed individuals, including closest offsite residents and onsite workers. Any analysis of risks should focus either on all sites within a given mining sector or on a model site that is demonstrated to conservatively represent other sites. Anecdotal information or basic assertions regarding independent factors

that might influence risk, such as generalized statements that mines are commonly located in remote areas or that radon released from mines disperses rapidly and causes no incremental exposure above natural background radiation, are not convincing unless supported by data and an integrated risk analysis. Moreover, EPA believes that broad comparisons of the cumulative amount of soil moved or the cumulative amount of radon released at all mines versus all farming and construction sites are immaterial, since the need for a CERCLA response hinges on the particular conditions at any individual site, not all like sites in aggregate.

Other special circumstances that might argue for additional reporting exemptions include a demonstration that a CERCLA response is infeasible or inappropriate at a particular type of mine. With respect to this issue, the Agency wishes to point out that appropriate CERCLA responses at mines can fall well short of covering the entire site with soil or water, which would defeat the very purpose of extraction. For example, it may be feasible or appropriate to cover certain waste piles or inactive mine areas with soil or water. Many other types of response actions have actually been taken at mine sites on the National Priorities List, although not in response to releases of radionuclides. These actions have included measures to control and treat mine water, diverting and controlling stormwater runoff, dumping materials in areas engineered for waste disposal, isolating contaminated areas with fences and signs, providing nearby communities with alternate sources of drinking water, excavating and removing contaminated soil, and injecting concrete into inactive underground mine workings. If these or other responses to radionuclide releases at mines would be infeasible or inappropriate, EPA requests information explaining why.

B. Alternative Exemptions

As outlined below, EPA is considering two alternative approaches for broadening the existing reporting exemptions for certain radionuclide releases. EPA solicits comments and data to assist in consideration of these alternatives with regard to differences in protection of public health and welfare and the environment. All comments on these alternatives, together with comments on the proposed approach described above, will be considered in developing the final rule.

⁴U.S. EPA, "Risk Assessments, Environmental Impact Statement, NESHAPS for Radionuclides, Background Information Document—Volume 2," Office of Radiation Programs, EPA/520/1–89–006– 1, Chapter 12, 1989.