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Citizens Awareness Network ♦ The Southern Alliance for Clean Energy ♦ SEED Coalition
Nuclear Watch South ♦ Crabshell Alliance ♦ Living Rivers ♦ Mothers for Peace
Uranium Watch ♦ Coalition for a Nuclear Free Great Lakes ♦ Tri-Valley CAREs
Nuclear Age Peace Foundation ♦ Snake River Alliance ♦ Alliance for a Green Economy
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Tennessee Environmental Council ♦ Abalone Alliance Clearinghouse
Citizens to End Nuclear Dumping in Tennessee ♦ Pax Christi Florida ♦ Don't Waste Michigan
Green Party PA ♦ Rocketdyne Cleanup Coalition ♦ Rocky Mountain Peace and Justice Center
Jones River Watershed Association ♦ Pilgrim Watch ♦ Pilgrim Legislative Advisory Coalition
National Nuclear Workers for Justice ♦ Citizens' Resistance At Fermi 2 ♦ Energia Mia
Fernald Residents for Environmental Safety & Health, Inc. ♦ San Onofre Safety
Nuclear Hotseat ♦ Hilton Head for Peace ♦ Alliance For A Clean Environment
Nukewatch/Progressive Foundation ♦ Manhattan Project for a Nuclear Free World
Council on Intelligent Energy & Conservation Policy ♦ On Behalf of Planet Earth
Portsmouth/Piketon Residents for Environmental Safety and Security
Multicultural Alliance for a Safe Environment ♦ Ecological Options Network
Physicians for Social Responsibility- Chesapeake Bay ♦ Physicians for Social Responsibility - Kansas
Beyond Nuclear ♦ North American Water Office ♦ Committee to Bridge the Gap
Environment America ♦ Riverkeeper ♦ Southern California Federation of Scientists ♦ Public Citizen

July 25, 2016

The Honorable Gina McCarthy, Administrator
United States Environmental Protection Agency
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Mail Code 1101A
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McCarthy.Gina@epa.gov

and via www.regulations.gov at
<https://www.regulations.gov/comment?D=EPA-HQ-OAR-2007-0268-0210>

Re: Draft Protective Action Guides for Radionuclides in Drinking Water
Docket Number (EPA-HQ-OAR-2007-0268; FRL-9947-55-OW)
FR 81:112 page 37589-37592, June 10, 2016

Dear Administrator McCarthy:

We write to express our strong opposition to the Environmental Protection Agency's proposal to increase permissible concentrations of radionuclides in drinking water by factors of tens, hundreds or thousands of times, or even more, above Safe Drinking Water Act (SDWA) levels.

We urge you to withdraw the proposal and reaffirm EPA commitment to protecting the American public from contaminated drinking water.

At issue are proposed Protective Action Guides (PAGs). PAGs are levels of radiation or radioactivity below which no actions are deemed needed to protect the public by reducing or avoiding that dose.¹ They are thus absolutely critical to protection of the public. If set too high, no protective actions will be taken and people could receive excessive doses leading to markedly increased risk of cancer and other health effects.

EPA Implies That the PAGs Are Restricted to Catastrophic Nuclear Emergencies, But in Fact the PAGs Have Been Expanded to Cover Essentially All Radiological Releases for Which a Protective Response May Be Considered

EPA's original PAGs in 1980 were restricted to major nuclear power plant accidents, and the 1992 revised PAGs remained focused on nuclear reactor events, although they also included other fuel cycle facilities.² The 2013 proposed PAGs applied them to "an expanded range of sources of potential radiological releases," including from transportation accidents and events at radiopharmaceutical facilities.³ The PAGs' scope covers virtually all radiological releases that could affect the public⁴:

For purposes of this document, a radiological incident is an event or a series of events, deliberate or accidental, leading to the release or potential release into the environment of radioactive materials in sufficient quantity to warrant consideration of protective actions. This Manual provides radiological protection criteria for application to all incidents that would require consideration of protective actions, with the exception of nuclear war.

In addition, the Water PAGs are for the intermediate phase of a release, not the immediate or early phase. The intermediate phase is defined as "the period beginning after the source and releases have been brought under control (has not necessarily stopped but is no longer growing) and reliable environmental measurements are available for use as a basis for decisions on protective actions and extending until these protective actions are no longer needed."⁵ Thus, the Water PAGs are not restricted to use in catastrophic events and are not even applicable to the emergency phase of such events. Rather, they apply by their own terms to any radiation release for which actions to protect the public might be contemplated.

Controversial Efforts in the Waning Hours of the Bush Administration to Release the PAGs

In the last days of the Bush Administration, in January 2009, EPA posted on its website and transmitted to the Federal Register for publication draft PAGs for radionuclides.⁶ The PAGs contained, among other matters, proposed levels for radioactivity in drinking water, including a table of concentrations ("Derived Response Levels" or DRLs) for 110 different radionuclides. Two sets of DRLs were provided for each radionuclide, one assuming decay and one without.

All told, thus, 220 separate proposed PAG values were provided for radioactivity in drinking water.⁷

The last-minute proposals triggered significant controversy, in no small part because the drinking water PAGs were orders of magnitude higher than Maximum Contaminant Limits (MCLs) set pursuant to the Safe Drinking Water Act.⁸ Internal EPA analyses, not made public with the PAG proposal but obtained by Public Employees for Environmental Responsibility (PEER) pursuant to litigation under the Freedom of Information Act, calculated that depending on the radionuclide, the PAGs were hundreds, thousands, tens of thousands, hundreds of thousands, and in a few cases, millions of times higher than EPA's longstanding MCLs for drinking water.⁹ Indeed, the internal EPA analyses indicated that for some radionuclides, drinking even a single glass of water could give a lifetime's permissible radiation exposure under the Safe Drinking Water Act.¹⁰ The EPA non-public review further indicated that doses could be so high as to cause not merely significantly increased risk of cancer later but prompt, acute radiation sickness.¹¹ And the EPA analysis showed that the proposed PAG concentrations for drinking water would produce cancer risks far outside EPA's acceptable risk range.¹² An independent analysis by one of this letter's signatory groups reached similar conclusions to those of the internal EPA analysis.¹³

The notice of the proposal was not published in the *Federal Register* before the inauguration of Barack Obama, and thus, in the face of significant concerns about the proposal, a couple of days thereafter the new administration withdrew the proposed notice and commenced a review of the issue.

That review resulted in a conclusion in early 2011 to use the longstanding EPA MCLs instead of markedly higher values for drinking water PAGs.¹⁴ EPA prepared a new proposed set of PAGs that relied upon the Safe Drinking Water Act limits. The U.S. Nuclear Regulatory Commission was unhappy with this decision and pressured EPA to reverse it, based on NRC's position that public health concerns should be overridden in this case by cost considerations involved in protecting the public from radioactivity in drinking water.¹⁵ Whether due to that pressure or other factors, EPA has now reversed itself again, and is proposing water PAGs orders of magnitude higher than its longstanding MCLs under the Safe Drinking Water Act and that are even more troubling than were those proposed in the last days of the prior administration. And similar to 2009, EPA again is apparently cutting corners in terms of transparency and public process in order to push through these worrisome proposals in the last months in office.

The Recently Proposed Water PAGs are Even More Troubling Than Were Those Proposed in January 2009 at the End of the Bush Administration

Remarkably, as high and controversial as were the 2009 proposed drinking water PAGs, the ones recently put forward in June 2016 are even higher.¹⁶

TABLE 1

Radionuclide	Bush Jan 2009 Proposal in pico-Curies/liter	Obama June 2016 Proposal in pico-Curies/liter
iodine-131	8,490	10,350
strontium-90	6,650	7,400
cesium-137	13,600	16,570

The New Proposed Water PAGs are Orders of Magnitude Higher Than Safe Drinking Water Act Levels

The current proposal for water PAGs are very much higher than the MCLs from the Safe Drinking Water Act. The MCL for cesium-137 is 200 pico-Curies per liter (pCi/L); the proposed PAG is 16,570 pCi/L—82 times higher. The MCL for strontium-90 is 8 pCi/L; EPA is proposing a PAG of 7,400 pCi/L—925 times higher. And the MCL for iodine-131 is 3 pCi/L; the proposed PAG is 10,350 pCi/L—3,450 times higher.¹⁷

TABLE 2

Radionuclide	June 2016 Proposal in pico-Curies/liter	Safe Drinking Water Act limit in pico-Curies/liter	Factor by Which Proposal Exceeds Safe Drinking Water Act limit
iodine-131	10,350	3	3,450
strontium-90	7,400	8	925
cesium-137	16,570	200	83

EPA’s Current Proposal Discloses Proposed Drinking Water Response Levels for Only 3 of 110 Radionuclides; the Rest Are Shielded From Public Scrutiny and Comment

The 2009 PAG proposal provided no comparison of the radionuclide concentrations for drinking water and EPA’s MCLs. EPA’s internal analyses mentioned above raising serious concerns were not disclosed at that time, and came to light only because of the public interest and effort at understanding the basis for EPA’s misguided proposal. But at least the prior administration’s EPA identified the new concentrations it was proposing for each of 110 radionuclides, and did that both for conditions assuming radioactive decay and without, providing a total of 220 proposed response levels for drinking water contamination.

By contrast, the current proposal fails to disclose 217 of those levels. Only cesium-137, strontium-90, and iodine-131 are disclosed, and only for the no-decay assumption. All others are hidden from scrutiny, making public comment impossible.

EPA states that only once it adopts the PAGs, the allowable radionuclide concentrations in drinking water for the rest of the radionuclides will be revealed.¹⁸ This game of “hide the ball” is unacceptable for a public agency and in matters of such public importance.

One can understand why EPA might wish to keep the public from seeing the other radionuclide concentrations it proposes to allow in their drinking water. The values previously proposed, which did become public, were, for some radionuclides, tens of thousands of times higher than EPA’s MCLs; some were hundreds of thousands of times higher; one was more than a million times higher.¹⁹ Given that the three radionuclides for which EPA does now provide proposed concentrations have even higher levels than those proposed in 2009, one can surmise that were EPA to disclose the figures for the rest it could be apparent that they exceed MCLs by even larger amounts. But again, at this stage, we don’t know for certain what those figures might be.

Fear of government embarrassment is not a legal exemption from disclosure requirements. Meaningful opportunity for public review and comment is frustrated when virtually all of an agency’s proposed action is hidden from public view.

As EPA is well aware, when an agency promulgates legislative rules, or rules made pursuant to congressionally delegated authority – or in this instance, PAGs that will be standards and have the force and effect of rules (see discussion at 10, *infra*), the exercise of that authority is governed by the informal rulemaking procedures outlined in the Administrative Procedures Act (APA), 5 U.S.C. § 553.5. EPA is required to provide the public with adequate notice of a proposed rule followed by a meaningful opportunity to comment on the rule’s content. 5 U.S.C. § 553 (b)-(c). The requirement under § 553 to provide the public with adequate notice of a proposed rule is generally achieved through the publication of a notice of proposed rulemaking in the Federal Register, and the APA requires that the notice of proposed rulemaking include “(1) the time, place, and nature of public rulemaking proceedings; (2) reference to the legal authority under which the rule is proposed; and (3) either the terms or substance of the proposed rule or a description of the subjects and issues involved.” 5 U.S.C. § 553(b)1-3. Generally speaking, the notice requirement of § 553 is satisfied when the agency “affords interested persons a reasonable and meaningful opportunity to participate in the rulemaking process.” *Forester v. Consumer Product Safety Commission*, 559 F.2d 774, 787 (D.C. Cir. 1977). Without public release of the radionuclide concentrations it proposes to allow in their drinking water in the event of a radiological incident, EPA fails to present the terms or substance of the proposed action or a description of the subjects and issues involved. Thus, the public is denied a reasonable and meaningful opportunity to participate in the rulemaking process.

The Draft EPA Water PAGs Do Not Disclose How Much They Exceed Safe Drinking Water Act Limits and Misleadingly Imply a Far Smaller Increase Than is Actually Proposed

In addition to not disclosing PAG concentrations for 97% of the radionuclides in question, the draft Water PAGs do not make public the actual degree to which they are proposed to exceed Safe Drinking Water Act levels, and mischaracterize those limits and their use. The draft Water PAGs state that the Safe Drinking Water Act concentrations are based on 70 years of exposure, implying that the PAGs are merely allowing in one year a lifetime’s permissible exposure under

SDWA.²⁰ EPA's implied assertion is inaccurate. The proposed radionuclide PAGs that are disclosed are not 70 times higher than SDWA MCLs, but as much as thousands of times higher, and the non-disclosed radionuclides apparently even orders of magnitude higher than that, as EPA's own internal analysis of the 2009 proposed water PAGs demonstrated. That analysis further concluded that drinking even a single glass of water at the proposed levels for certain radionuclides would result in a lifetime's permissible exposure.²¹

Further, the proposed Water PAGs also mischaracterize the Safe Drinking Water Act limits. They are not 70 year limits. Under SDWA, a water purveyor is not permitted to exceed MCLs in any single year.²² Thus, comparing the PAG concentrations to the MCLs is entirely appropriate.

Additionally, the PAGs are not limited to exposure times of a year. By the PAGs' own terms, the intermediate phase, for which the drinking Water PAGs apply, can extend for several years. (The Water PAG and associated Federal Register notice of availability are misleading in this regard, referring to "months" or a single year.) The intermediate phase is described in the 2013 PAGs as being based on a "first year" and "subsequent years."²³

EPA also asserts that the proposed water PAGs would produce 500 millirem/year exposure to people over the age of 15, compared with the 4 millirem/year limit of the Safe Drinking Water Act.²⁴ That is an increase of a factor of 125 by EPA's own admission. As shown in Table 2 above, however, the increases in radionuclide concentrations in drinking water for strontium-90 and iodine-131 are in fact much higher—a factor of 925 for the former and 3,450 for the latter. This is due to EPA also changing its definition of radiation dose, and eliminating organ dose limits, without disclosing in the draft Water PAGs that it has done so.

The MCLs under the Safe Drinking Water Act are based on the concentrations of beta-emitting radionuclides that would produce 4 millirem/year exposure to the whole body or to any critical organ.²⁵ The PAGs, however, are based on Committed Effective Dose, which reduces the calculated organ dose by multiplying it by a controversial and arbitrary organ weighting fraction.²⁶ This contributes to the actual increase in radionuclide concentrations compared to MCLs being not a factor of 125 but as much as hundreds of thousands or even millions.

The Proposed Water PAGs Would Give Radiation Doses Roughly Equivalent to 250 Unnecessary Chest X-rays Annually

500 millirem per year Committed Effective Dose, the level to which EPA proposes to allow people over the age of 15 to be exposed from their drinking water without protective actions being taken, is approximately equivalent to 250 chest X-rays, with no medical benefit or informed consent.²⁷ Thus, by their own terms, the EPA Water PAGs would require members of the public to drink water that would give them a radiation dose similar to getting a chest X-ray every weekday for a year or more. (The proposed 100 millirem/year level for children and pregnant women would be the equivalent of about 50 chest X-rays a year, one a week.)

The Proposed PAGs Would Result in Cancer Risks Exceeding EPA's Longstanding Acceptable Risk Range

EPA asserts in the Notice of Availability for the draft Water PAGs that the SWDA MCLs are associated with cancer risks that are within EPA's historically acceptable risk range and that the proposed Water PAGs are as well.²⁸ The assertion with respect to the SDWA MCLs is generally accurate; the latter assertion for the PAGs is not. Indeed, EPA provides no support for its claim about the risk from the Water PAG, let alone even a risk estimate. However, using EPA's own figures for cancer risk per unit dose, it is apparent that the Water PAGs are outside EPA's own acceptable risk range.

EPA aims to regulate carcinogens to a one in a million (10^{-6}) excess risk of cancer incidence.²⁹ When that cannot be accomplished, risk levels may be permitted above that level, aiming to get as close to it as possible, but in no case exceeding approximately one in ten thousand (10^{-4}).³⁰

EPA and other agencies contracted with the National Academy of Sciences (NAS) to review the current science and establish best estimates of cancer risk per unit dose.³¹ The NAS age-averaged cancer incidence risk estimate is 1.14×10^{-3} /person-rem—a bit more than a one in a thousand risk per rem of exposure.³²

After reviewing the National Academy's findings, EPA has adopted a value slightly higher, 1.16×10^{-3} cancers per person-rem.³³ Thus, a cumulative dose of approximately 0.116 rem (116 millirem) yields a risk at the upper (highest risk, least acceptable) end of EPA's risk range, 10^{-4} . 1.16 millirem equals the risk at the preferred end of EPA's risk range, 10^{-6} . Put simply, cumulative doses of between approximately 1 and 100 millirem represent EPA's range of acceptable risk; anything higher is considered an unacceptable risk.

Both the NAS and EPA risk estimates for radiation have increased repeatedly over the years as the science shows greater risks than previously presumed. When the Safe Drinking Water Act limit for beta emitting radionuclides of 4 millirem in any year was established, the risk estimates were lower. But as seen from the above discussion, a single year exposure at the SWDA MCL would produce a risk near the preferred end of the risk range, and 70 years of exposure at that level would be associated with a risk near the upper (least protective) end of the risk range.³⁴

But the claim in the draft Water PAGs that they too are within the risk range is unsupported and inaccurate. Even assuming only one year of exposure at 500 millirem (0.5 rem) produces a risk of cancer of approximately 6×10^{-4} , using EPA's own current risk figure of 1.16×10^{-3} cancers per rem. And because the PAGs define the intermediate phase as lasting as much as several years, as discussed above, the risk associated with the proposed Water PAGs would be $\sim 1.7 \times 10^{-3}$, or more.³⁵ That is roughly ten to a thousand times the risk range.

The Notice of Availability requests comment on the option of including a two-tier PAG, including a tier of 100 millirem/year for pregnant women and children 15 or younger. While we agree strongly that such rules should take into account the greater risk for females and the young, 100 millirem/year for them remains far too high. EPA estimates that cancer risks for a female infant are roughly five times greater than its age- and gender-averaged radiation-dose risk

figure.³⁶ Thus reducing permitted dose five-fold for a young girl compared to a 500 millirem/year limit for the general population still ends up with approximately the same unacceptable risk level discussed above for an age- and gender-averaged general population.

Failure to Consider Cumulative Impacts and Risks

A fundamental error of environmental impact analysis is to artificially segment the components of the project, which in turn can severely underestimate the environmental effects it can produce. One cannot slice and dice environmental impacts into little pieces and consider only each individual component without considering the whole. Here, the Water PAGs are merely one component of the overall proposal and total radiation exposures contemplated as allowable under the PAGs as a whole.

The proposed PAGs, for just the intermediate phase alone, already allow 2 rem (2000 millirem) for the first year and 500 millirem for subsequent years from radioactive contamination of ground and structures (“relocation PAG”), or 3000 millirem (3 rem) in 3 years of that phase.³⁷ They also allow 500 millirem each of those years from food intake.³⁸ With the 500 millirem per year now proposed for water, that would produce a dose of 6,000 millirem (6 rem) from the intermediate phase alone. Thus, the cumulative risk from the proposed intermediate phase PAGs would be approximately 7×10^{-3} , seven people coming down with cancer from the exposure out of every thousand people exposed, or 1 out of every 143 people. That is or 35 to 7000 times higher than the EPA’s acceptable risk range.³⁹

But the proposed PAGs are not restricted to the intermediate phase. They propose allowing doses to the public in the early phase of as much as 5 rem in 4 days.⁴⁰ The early phase is defined as the first hours or days of a release before it is brought under control.⁴¹ Thus, the early and intermediate phases together would allow doses to the public of 11 rem, with an associated risk of 1.3×10^{-2} , using EPA’s own cancer risk per unit dose figure. That is one cancer produced from the radiation exposure in every 78 people, above and beyond the cancers that would occur in the absence of that exposure. This is about a hundred to ten thousand times higher than the EPA risk range.

The other draft PAGs do not have a second tier of lower allowed exposures for pregnant women and children. Thus the cumulative risk for a young girl would be several times higher than the risk estimated above for the general population, as high as every twentieth getting cancer from exposures that do not trigger actions to protect her.⁴²

And these cumulative risk figures for the early and intermediate phases, relying on EPA’s own official radiation cancer risk coefficients, do not take into account the contemplated exposures for the late phase under the PAGs. (The late phase is the long-term cleanup stage.⁴³) When the late phase is added in, the cumulative risks numbers are even higher.

In short, the proposed PAGs would allow risks to the public greatly in excess of EPA’s acceptable risk range, a matter not disclosed in the proposals.

Despite the Claims in the Water PAGs that the Food and Drug Administration (FDA) Food PAGs Do Not Include Drinking Water, They Do, and Creating a New Water PAG Would Thus Needlessly Double Public Doses for Ingestion of Foodstuffs

The draft Water PAGs assert that the “FDA food PAG accounts for water intrinsic in food as purchased and EPA’s proposed PAG accounts for drinking water, including water added to foods during preparation.” This is inaccurate. The FDA food PAGs (incorporated into the EPA 2013 PAGs) states that its intervention limits are based on the total diet and “the ‘entire diet’ includes tap water used for drinking.”⁴⁴ It says further, “Food intake included all dietary components including tap water used for drinking.”⁴⁵

We believe that the FDA food PAGs, already incorporated in EPA’s 2013 draft non-final PAGs, are insufficiently protective on their own. Indeed, EPA’s own internal analysis of the matter found that the food PAGs resulted in cancer risks higher than EPA’s risk range.⁴⁶ But since drinking water is already included in it, there is no need in any case to create a new drinking water PAGs that would essentially allow doubling of the dose to the public from food and water that they ingest.

Fukushima Demonstrates the Critical Importance of Truly Protective Actions to Reduce Radiation Dose

The EPA Water PAG implies that the Fukushima accident demonstrates the need for lax protective action standards. In fact, the opposite is clearly the case.

Populations near the damaged plant were evacuated and foodstuffs grown in the contaminated area were restricted. These protective actions reduced doses to the public and should thereby reduce the number of latent cancers eventually resulting from the accident. It is misleading to focus on whether there were immediate, acute radiation-induced fatalities (i.e., from Hiroshima/Nagasaki-type acute radiation syndrome). The issue is the reduction of latent, long-term cancers. And protective actions are essential in that regard, and needed to be stronger than they were at Fukushima, not weaker. The lesson of Fukushima is the need for rigorous protective actions, not the opposite.

The Proposed Water PAGs Appear to Conflict With the Safe Drinking Water Act, CERCLA, the Administrative Procedure Act, and the National Environmental Policy Act

There have long been efforts to weaken the public protections of the Safe Drinking Water Act and allow much higher concentrations of radioactivity in drinking water. Such efforts have been rejected judicially because they would violate the anti-backsliding provisions of the Act, which bar increasing permissible concentrations of pollutants.⁴⁷

The draft Water PAGs seem to be an attempt to evade those anti-backsliding prohibitions. Despite EPA’s suggestion that the PAGs do not undermine any statutory obligations⁴⁸, that seems precisely their intent. Applicable by their own terms to any radiological release for which

a protective action might apply, they directly come up against the SDWA requirements that radiological releases into drinking water not exceed the MCLs.

Any argument that the SWDA cannot be taken into account for these kinds of releases is wrong. SWDA has mechanisms for dealing with emergency situations, and, as noted above, the Water PAGs aren't restricted to emergencies, and don't even apply to the immediate emergency but only kick in after the release has been stabilized. And historically, EPA has used the MCLs of the SWDA for emergency releases; for example, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) program routinely employs them for both time-critical removal responses.⁴⁹

The proposed PAGs also appear to undermine CERCLA. CERCLA covers radiation releases of the range the PAGs say they cover. By allowing vastly higher exposures and associated risks, however, the PAGs are at variance with CERCLA, a problem not avoided by vague assertions to the contrary.

The proposed PAGs appear also to be essentially underground regulations, in violation of the Administrative Procedure Act (APA). Adding a phrase or two asserting that the PAGs are not regulatory and are denominated as "guidance" does not change what they really are, *de facto* rules. There is no pretense that the PAGs are in fact not used. Indeed, the Federal Register notice of availability of the draft PAGs states explicitly, "Emergency management officials use PAGs for making decisions regarding actions to protect the public from exposure to radiation during an emergency."⁵⁰ EPA requires incorporation of the PAGs into emergency response plans within one year of the finalization of the PAGs⁵¹:

Once comments on this proposed, additional draft action have been addressed, EPA will add drinking water guidance to the full PAG Manual, which will then be issued in final form for incorporation into state, local, tribal and federal emergency response plans over a one-year implementation timeframe.

Furthermore, as noted above (*supra* at 5), EPA appears to have violated the APA notice-and-comment requirements by hiding 107 of the 110 proposed PAG values for radionuclides without decay and all 110 of the proposed PAG values with decay. The public cannot comment on what they cannot see. EPA has asked for public comment on Water PAGs that it says will be established only after the PAGs are finalized, defeating the entire purpose of APA notice-and-comment requirements.

Additionally, there is question about conformance with the National Environmental Policy Act (NEPA), which requires review of environmental impacts of all major federal actions that can have a significant impact on the human environment. EPA establishing extremely high radioactivity concentrations and radiation doses below which no protective actions are to be taken could have significant impacts on the human environment, and these are not analyzed in an Environmental Impact Statement or Environmental Assessment.

It is not clear that EPA has the legal authority to undertake the actions it has proposed. Nothing in the Executive Order or Department of Homeland Security regulation it cites would empower EPA to act contrary to SWDA, CERCLA, APA, or NEPA. Furthermore, even if EPA

had legal authority to establish PAGs, there is nothing in that authority that would allow it to instead hand over to the Department of Energy's Federal Radiological Monitoring and Assessment Center the responsibility to establish the specific PAG values for the great majority of radionuclides.⁵² DOE is, after all, a primary Responsible Party for the kind of radioactive releases the PAGs are supposed to control and has an obvious conflict-of-interest in setting response requirements for its own radiation releases. In any case, even if EPA is correct that it has authority to establish PAGs, it has identified no authority whereby it can abdicate that power and give it instead to an entity that might be responsible for the very radioactivity releases the PAGs are supposed to protect against.

Conclusion

Many of the groups signatory to these comments have previously been part of joint letters to EPA regarding earlier aspects of proposed PAGs.⁵³ We continue to be concerned about those proposals and urge EPA to not proceed with the problematic portions of those draft PAGs we had identified.

The proposed Water PAGs would, if adopted, place the public at significant risk. We find it perplexing that EPA, in the face of the controversies associated with its performance in the Flint, Michigan and Gold King Mine, Colorado matters, would attempt in the last months of this administration to push through radically weakened allowable concentrations of radioactivity in drinking water. The Flint and Gold King fiascos involved contaminants exceeding Safe Drinking Water Act levels.⁵⁴ The proposed Water PAGs for radionuclides would, if finalized, allow the public to be exposed to radioactivity thousands of times higher than SDWA limits, with no actions taken to protect them. This would be unwise in the extreme.

We respectfully urge the rejection of these proposals and instead EPA should continue to adhere to the Safe Drinking Water Act limits. EPA's primary mission is supposed to be environmental protection.

Sincerely,
(signatories after end notes)

NOTE: Because of a potential size limitation for attachments at regulation.gov, documents cited in this letter and incorporated as attachments are also being transmitted by mail to EPA on a CD.

¹ EPA, *Draft Protective Action Guide for Drinking Water*, June 2016 (hereafter "2016 Water PAG"), p. 4

² EPA *Manual of Protection Action Guides and Protective Actions for Nuclear Incidents*, 400-r-1992-001, pp. iii, 1-1

³ EPA, *PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents*, draft for interim use and public comment, March 2013 (hereafter "2013 PAGs"), pp. 2,4,

⁴ 2013 PAGs, p. 1

⁵ 2016 Water PAGs, p. 4, fn. 1. Note that the reference to months is contradicted by the 2013 PAGs statement that the intermediate phase lasts for a first year + subsequent years.

⁶ EPA, *Revisions to the Protective Action Guides Manual for Radiological Incidents*, draft for public review and comment, January 2009 (hereafter 2009 PAGs)

⁷ 2009 PAGs, Chapter 4, “Immediate Phase Protective Action Guide for Drinking Water,” pp. 4-1 to 4-9; see particularly Table 4-1, two right-hand columns.

⁸ The MCL for beta-emitting radionuclides is 4 mrem/year to any critical organ. EPA has calculated the derived concentrations for each radionuclide that would produce that dose. They can be found in, for example, USEPA Office of Ground Water and Drinking Water, *Radionuclides in Drinking Water: A Small Entity Compliance Guide*, February 2002, pp. 3, 4, 13 (hereafter “EPA, *Radionuclides in Drinking Water*”). For simplicity, we here refer to those SWDA derived concentrations as MCLs.

⁹ email from Charles Openchowski, EPA OGC, to Susan Stahle, EPA OGC, January 23, 2009, (hereafter “Openchowski email”); email and attachments thereto, from Stuart Walker, EPA OSRTI, to Charles Openchowski, January 23, 2009 [hereafter “Walker Analysis 1”]; and additional analyses by Walker [hereafter “Walker Analysis 2”]

¹⁰ Walker Analysis 1, pdf p. 8, Walker Analysis 2, p. 3

¹¹ Walker Analysis 1, pdf pp. 2-3

¹² Walker Analysis 1, pdf pp. 3, 8,13-15; Walker Analysis 2, p. 3, 10-12

¹³ Hirsch, D. and Marx, J., *Proposed Relaxation of EPA Drinking Water Standards for Radioactivity*, Committee to Bridge the Gap, October 2008, (hereafter, “Hirsch/Marx study”).

¹⁴ R. W. Borchardt, Executive Director of Operations, U.S. Nuclear Regulatory Commission, to The Commissioners, SECY-11-0078, “U.S. Environmental Protection Agency Revisions to the Protective Action Guidance Manual,” June 9, 2011, p. 4

¹⁵ *Id.*

¹⁶ Compare Table 4-1 of 2009 Draft PAGs with Table 1, p. 18, of the June 2016 proposed Water PAGs. Because the latter only gives figures assuming no decay, we compare with the no-decay values from the 2009 draft PAGs to be consistent.

¹⁷ MCLs can be found in EPA, *Radionuclides in Drinking Water*, pp. 3, 4, 13

¹⁸ EPA, *Notice of Availability: Draft Protective Action Guide (PAG) for Drinking Water After a Radiological Incident*, June 10, 2016, 81 FR 37589, 37592; June 2016 draft Water PAG, pp. 17, 18, 22 (see particularly fn. 35,40)

¹⁹ See the EPA internal analyses (Openchowski email, Walker Analyses 1 and 2) and Hirsch/Marx study.

²⁰ 2016 Water PAGs, pp. 9-10

²¹ Walker Analysis 1, pdf p. 8; Walker Analysis 2, p. 3

²² EPA, *Radionuclides in Drinking Water*, p. 14

²³ p. 7, Table 1-1

²⁴ 2016 Water PAG, pp. 4, 10

²⁵ EPA, *Radionuclides in Drinking Water*, p. 13

²⁶ 2016 EPA Water PAG, fn. 3, p. 5. For the controversy surrounding the appropriateness of the use of “effective dose” and the “subjective, committee-defined” tissue weighting factors, see Brenner, D. J., “Effective Dose: A Flawed Concept That Could and Should Be Replaced,” *The British Journal of Radiology*, 81 (2008), 521-523

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- ²⁷ A chest X-ray is approximately 2 millirem effective dose. See, e.g., EPA, “How Much Radiation Am I Exposed to When I Get a Medical X-Ray Procedure,” <https://radiation.zendesk.com/hc/en-us/articles/211658638-How-much-radiation-am-i-exposed-to-when-i-get-a-medical-x-ray-procedure->, last accessed 21 July 2016. (0.02 millisievert = 2 millirem)
- ²⁸ Notice of Availability for the proposed 2016 Water PAGs, 81FR37589, 37591
- ²⁹ See, e.g., 40 CFR 300.430(e)(2)(i)(A)(2), (hereafter “NCP regulations”); EPA, *Radiation Risk Assessment at CERCLA Sites: Q&A*, OSWER 9285.6-20, June 1, 2014 (hereafter EPA, “*Radiation Risk Q&A*, pdf pp .2, 26, 30 ; ”see also the Notice of Availability, *Id.*
- ³⁰ *Id.*; EPA has indicated that while it generally uses 1×10^{-4} as the upper end of the acceptable risk range, risks as high as 3×10^{-4} can in certain circumstances be considered within the risk range. See, e.g., EPA, *Radiation Risk Q&A*, pdf pp. 30-31
- ³¹ National Research Council of the National Academies, *Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2*, 2006, p. vii, (hereafter “BEIR VII”)
- ³² BEIR VII, p. 281
- ³³ EPA, *EPA Radiogenic Cancer Risk Models and Projections for the U.S. Population*, April 2011, EPA 402-R-11-001, p. 1 (hereafter “EPA Blue Book”). (1 Gray \cong 1 Rem)
- ³⁴ $0.004 \text{ rem/year} \times 70 \text{ years} \times 1.16 \times 10^{-3} \text{ cancers/rem} = \sim 3 \times 10^{-4} \text{ risk}$
- ³⁵ $0.5 \text{ rem/year} \times 3 \text{ years} \times 1.16 \times 10^{-3} \text{ cancers/rem} = 1.74 \times 10^{-3} \text{ risk}$
- ³⁶ EPA Blue Book, Table 3-12b, p. 54
- ³⁷ 2013 PAGS, p. 7
- ³⁸ *Id.*
- ³⁹ $6 \text{ rem} \times 1.16 \times 10^{-3} \text{ cancers/rem} = 6.96 \times 10^{-3}$
- ⁴⁰ 2013 PAGs, p. 7
- ⁴¹ 2013 PAGs, p. 5
- ⁴² A child is allowed under the draft PAGs the same dose as adults, with the exception, if the two-tier proposal were adopted by EPA for drinking water, 1.2 rem less over three years from water. Thus a child would be allowed to be exposed to nearly 10 rem. Using the EPA’s Blue Book risk figure for a young girl, that would produce a risk of roughly 1 in 20.
- ⁴³ 2-13 PAGs, p. 51
- ⁴⁴ Food and Drug Agency, *Accidental Radioactive Contamination of Human Food and Animal Feeds: Recommendations for State and Local Agencies*, August 3, (hereafter “1998 FDA Food PAGs”), p. 11, fn 10
- ⁴⁵ 1998 FDA Food PAGS, p. 31
- ⁴⁶ Walker Analysis 1, pdf pp. 2, 4, 21-25
- ⁴⁷ see *City of Waukesha v. Environmental Protection Agency*, 320 F.3d 228
- ⁴⁸ 2016 Water PAGs, p. 4, fn. 2
- ⁴⁹ Walker Analysis 1, pdf p. 3, citing OSWER Directive 9360.1-02 “Final Guidance on Numeric Removal Action Levels for Contaminated Drinking Water Sites”
- ⁵⁰ p. 375890
- ⁵¹ p. 37591
- ⁵² p. 37592
- ⁵³ These are included in the attachments to this letter.
- ⁵⁴ In the Gold King mine episode, EPA contractors actually caused the release.

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