

# Questions about Living Near Rocky Flats

*In Environment, Jefferson Parkway, Nuclear Guardianship, Plutonium, Public Health, Rocky Flats, Wildlife Refuge on July 18, 2013 at 4:14 am*

Several times a year I hear from people who wonder if it's wise to live near Rocky Flats. The most extensive exchange I have had on this topic was with a woman who about a year before writing to me had moved with her husband and daughter into a new house near Rocky Flats and only recently had learned of possible dangers of living in the area. Because of the searching quality of her questions, I asked her if I could share our correspondence with others, provided I did not use her name or identify the precise location of the house she and her family occupied. She agreed. What follows, therefore, is a verbatim copy of our correspondence, without use of her name or other identifying words.

9-29-12

Dear Dr. Moore,

About a year ago we moved to Whisper Creek, a new development located between Indiana and Alkire around 87th Pkwy in Arvada. There is constant development in the area, and it seems that there will be for quite some time with plans for more development just west of us on Candelas Pkwy. We just recently began to research Rocky Flats and the potential risks it poses. We have a 2.5 year old, and are expecting a second child in a few weeks. We're concerned having read several of your articles and papers. Based on what we have read, we understand that there is plutonium in the soil. What we are unclear about is how much plutonium we are actually being exposed to. Is this area so unsafe that we should consider moving? Is there a safe distance from Rocky Flats? Would we be exposed to plutonium anywhere in this larger area? What are the boundaries that you

would not consider living within? We love it here and do not want to move. At the same time we clearly do not want to put our family in harm's way. We're trying to determine how big of a factor this is. Most importantly, is the risk of the amount of plutonium that we are being exposed to so significantly greater than other harmful substances, such as pesticides, BPA, and other such contaminants? Finally, would our situation change if the Jefferson Parkway is constructed as proposed?

Thank you for your time and expertise,

Concerned Person (CP)

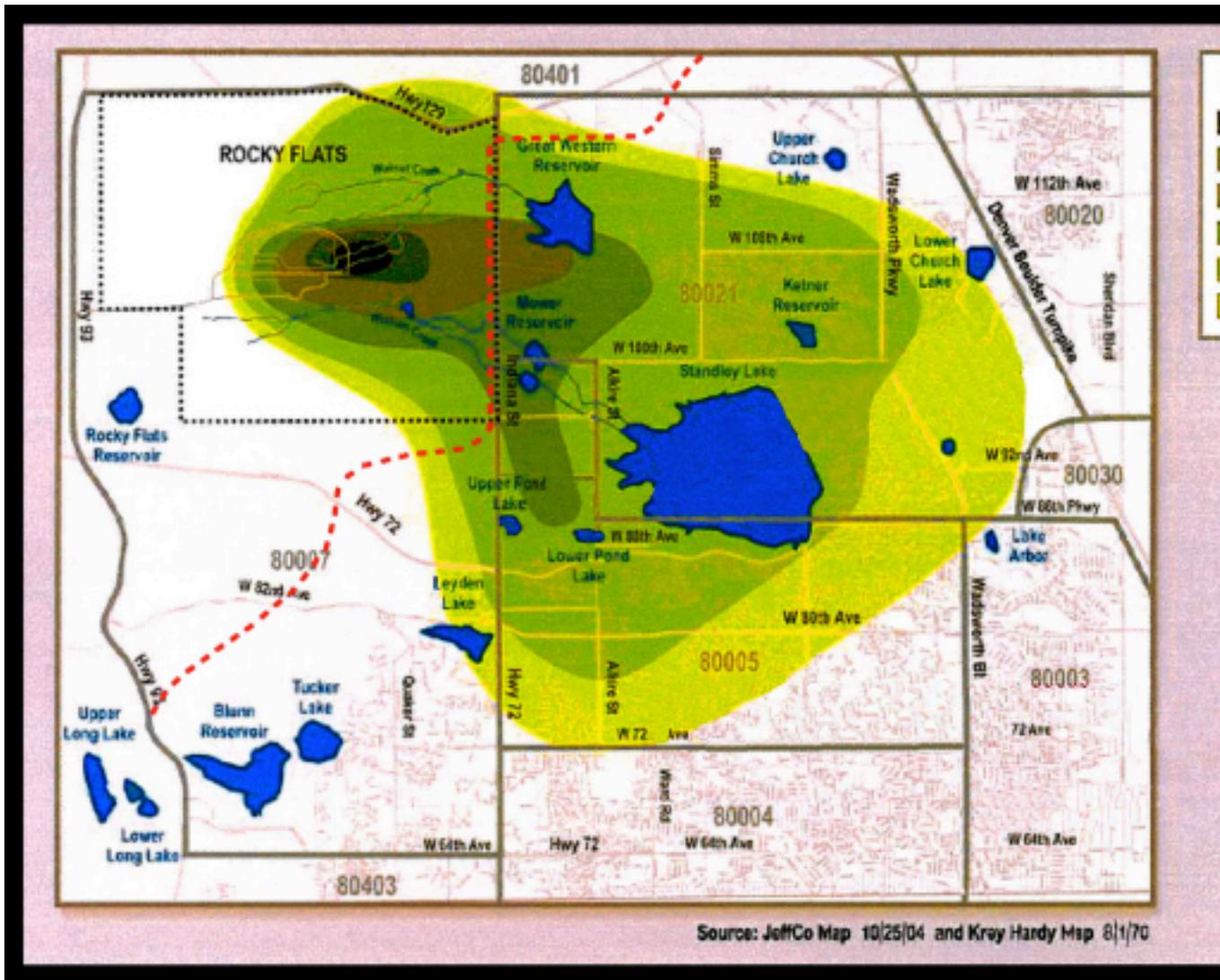
9-30-12

Hello CP:

I write in response to your message. I do not envy you and your family the dilemma you face.

Below is a map produced by Atomic Energy Commission scientists P. W. Krey and E. P. Hardy in 1970 showing areas on and off the Rocky Flats site contaminated with plutonium. As you can see from this map, the area where you purchased a home is in what they showed to be the more highly contaminated area. In September 2011 Marco Kaltofen of the Boston Chemical Data Corp. collected soil samples on the eastern edge of the Rocky Flats site along the route of the proposed Jefferson Parkway. Analysis of his samples showed that the plutonium present in this area in September 2011 was roughly equivalent to the amount found there by Krey and Hardy in 1970. Plutonium has a half-life of 24,000 years, meaning that after 24,000 years the radioactivity emitted by the material will have declined by half, after another 24,000 years by another half, and so on. Thus, from a human perspective, any quantity of plutonium in the environment poses an essentially permanent danger. The

plutonium released from Rocky Flats is in the form of minute particles too small to see but not too small to do harm. Inhalation of such particles is the worst way to be exposed to the alpha radiation that it emits. If particles lodge within the body, for as long as they remain there, which is likely to be for the remainder of one's life, the plutonium continually irradiates surrounding tissue. The result 20 or 30 years later may be cancer, harm to one's immune system, or genetic damage that may be passed on to future generations.



If the government agencies responsible for public health vis-à-vis Rocky Flats took a precautionary approach, they would not allow new residential developments in the area shown by Krey and

Hardy to be contaminated with plutonium, nor would they allow construction of the proposed Jefferson Parkway, nor would they allow public access to the Rocky Flats National Wildlife Refuge, as U.S. Fish & Wildlife Service plans. Unfortunately, most government entities related to Rocky Flats take what I believe is an incautious approach, one that takes unnecessary risks with human life.

Were I in your position, I would not want to raise a family in the area where you have purchased a home. I would seek a home elsewhere, well outside the area shown by Krey and Hardy to be contaminated.

Perhaps you have heard of the recently published book entitled **FULL BODY BURDEN: GROWING UP IN THE NUCLEAR SHADOW OF ROCKY FLATS**, by Kristen Iversen. She describes in a vivid way what it was like to grow up near Standley Lake during the production years at Rocky Flats and how she only gradually learned about dangers posed by the facility. I think you might find the book helpful. It was reviewed in the New York Times on Friday, on line at [http://www.nytimes.com/2012/09/28/books/book-review-full-body-burden-by-kristen-iversen.html?\\_r=0](http://www.nytimes.com/2012/09/28/books/book-review-full-body-burden-by-kristen-iversen.html?_r=0)

I hope you find this message helpful. I'm curious how you learned about my writings and how to contact me. Let me know if you have questions or if there's more that I can do to be helpful.

Warm regards,

LeRoy Moore

10/2/12

Dear LeRoy Moore,

Thank you very much for your prompt, thorough, and thoughtful response. As I mentioned before, we are due with another baby in a few weeks, so are not making any life changing decisions within the next couple months. Knowing what we know, it seems that the chance of remaining healthy is greater than that of getting sick. But the potential risks are so severe that we could not justify living here long-term. We will revisit the topic in January and see what we feel is right for our family.

I found your articles and papers by googling “Is Rocky Flats Safe,” and read on from there. We found your writing to be very accessible and unbiased. Your email address was listed in this article: <<http://denverdirect.blogspot.com/2012/02/citizens-see-sampling-of-air-for.html>>. So if you don't want future people contacting your from out of the blue, you may want to have that access limited. My husband and I deeply appreciate the work that you are doing, and feel lucky that you have done work to get the word out about the potential dangers that this area poses. I appreciate your offer to answer any future questions. I just may take you up on that in the upcoming months.

Thanks again for your time and thoughtfulness,

CP

10-3-12

Dear CP:

Thank you for this message.

My question about how you learned about my writings and came to contact me was simply one of curiosity. I am not at all opposed to having people contact me, in fact am pleased when it happens.

I understand the difficulty of the decisions you face about your

place of residence and certainly wish you well as you deliberate and decide what to do. If I can be of any further help, let me know.

Cordially,

LeRoy Moore

10/3/12

Dear LeRoy Moore,

I do have one more question for you. A friend of mine said I need to pick my battles, and that there is really no safe utopia that I will be able to take my family to regarding toxins, drugs, sex-offenders, traffic accidents, poor schools, bad influences, etc. She's right, of course, and I'm trying to figure out how much weight to put on the potential risks from plutonium exposure. I imagine an expert on BPA would say to avoid it all costs, an expert on pesticides would say to consume only organic produce, and an expert on Oxybenzone would say to never purchase a sunscreen with the chemical in it. So is plutonium among those risks – just one of many harmful substances that we'd all be healthier without, or is it in a class of its own and should truly be avoided at all costs? Would avoiding plutonium be just one of many things that we should be doing, or is this potentially another Erin Brockovich situation where these dangers far outweigh those from other toxins?

Thanks again for your time. I know my anxiety is heightened being pregnant, and you have been such a concrete help as we wade through all of this information.

CP

10-4-12

Hello CP”

I appreciate your searching questions. Your friend raises a good point. Why bother about one problem when there are dozens more that call out for attention? Or why select this problem rather than another? How does one choose? There certainly is no safe utopia in our polluting, contentious industrial civilization. Here's an effort at a response.

The period we live in since 1945 isn't called the "nuclear age" for nothing. Beginning with the splitting of the atom and the use of this ability to produce weapons of mass destruction (nothing else like them, really), we entered a new era. Humans have always lived in a radioactive environment. The late Edward Martell, a radiochemist at the National Center for Atmospheric Research in Boulder and the foremost student of radiation health effects in this part of the country, emphasized that humankind had evolved in a radiation-rich environment. He thought radioactivity was probably a spur to our evolution. He realized that the naturally occurring radioactivity in the midst of which we humans have always spent our lives will harm some individuals, even kill some. So he thought adding more radioactivity to the already existing burden of natural background radiation should be avoided insofar as possible.

Martell bemoaned the fact that atmospheric detonations of nuclear weapons had altered the environment globally by increasing the amount of radiation to which everyone everywhere is exposed. As a result, there is increased illness and death worldwide. Andrei Sakharov, the Nobel prize winning physicist often referred to as the father of the Soviet H-bomb, reached a similar conclusion. His rejection of nuclear weapons and publicizing the potential harm of further bomb testing helped bring about the Limited Test Ban Treaty of 1963 that outlawed atmospheric explosion of nuclear devices, while it also got him decades of house arrest. The crucial point is that in

terms of radioactivity we no longer live in a context of naturally occurring radiation. We all are exposed to more radioactivity than our pre-1945 forebears were.

Rocky Flats fits into this context as a site where carelessness prevailed over caution. This is true not only for the years of production at the plant, when releases of plutonium and other toxins were part of the routine, but also after production ended when the government decided not to do what many in the public recommended, namely, clean the site to the maximum extent possible with existing technology. Instead, they decided to do a faster, cheaper cleanup, one that would leave an unknown quantity of minute plutonium particles and other toxins in the environment. This means that in addition to the worldwide increase in radiation exposure due to atmospheric explosions, people locally will continue to be adversely affected by Rocky Flats. And, as I emphasized earlier, this isn't a temporary reality; it's a permanent one.

The radioactive particles which might be stirred up in the environment and made airborne will be too small to see. If particles are inhaled, the doses to which one might be exposed will be small. They may prove harmless. But if they lodge in the body they may prove harmful. This is the gamble. If you ask officials from the EPA, the Colo. Dept. of Public Health and Environment, or the Department of Energy, they will tell you there is no reason for concern. I disagree for a host of reasons that are detailed in writings on our web site ([www.rockyflatsnuclearguardianship.org](http://www.rockyflatsnuclearguardianship.org)). In my view, they have made public health decisions based on an outmoded science geared more to keeping an industry going than to fullest possible protection to public health and environmental integrity.

Finally, if you look on our web site at the long piece on "Plutonium and People Don't Mix," on p. 17 of the version now posted (we'll soon post an updated, somewhat longer version) you'll find a statement about the distinct vulnerability of a human child exposed to plutonium.

Our industrial civilization has produced an abundance of toxins. With the unleashing of radioactivity, we created a problem for which we so far lack a solution. Nuclear guardianship addresses the problem. See

<<http://www.joannamacy.net/nuclearguardianship/nuclear-guardianship-et&gt;>

Best, LeRoy

10-9-12

Hello again, LeRoy,

Thank you for your response. I have two additional points that I am seeking your opinion about. First, I think I know your overall conclusion, but I don't want to risk misinterpreting as we face potentially life-changing choices. To clarify, you acknowledge that there are many contaminants and toxins no matter where we live, and you still think that plutonium poses a much larger risk than all others, correct? Enough of a risk that you recommend that we move our family away from a house, neighborhood, and school district that we are very happy with in all other aspects?

Second, I came across a study that seems to conclude that there were not any statistically significant increases in cancer rates in our area from 1980-1989. Here's a link to the study:

<http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheadername1=Content-Disposition&blobheadername2=Content-Type&blobheadervalue1=inline%3B+filename%3D%22Ratios+of+cancer+incidence+in+ten+areas+around+Rocky+Flats.pdf%22&blobheadervalue2=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1251811738408&ssbinary=true>.

What do you make of this study? Do you know of any other studies that have similar or different results, whether in people

or animals?

Any and all information and opinions you provide continue to be very helpful as we decide which course to take.

With much appreciation,

CP

10-10-12

Hello CP:

Your questions are always good ones, going right to a crucial point.

In response to your first question, several times each year I get asked by total strangers whether or not it's safe to live near Rocky Flats. My answer is, first, to inform people that in 1970 scientists from the nuclear establishment — the Atomic Energy Commission, predecessor to the Dept of Energy — collected soil samples and produced maps that show areas off the Rocky Flats site contaminated with plutonium and that more recent sampling shows deposits along the eastern downwind edge of the Rocky Flats site roughly equivalent to what they were in 1970. I tell people, as I told you, that I personally would not choose to live in the contaminated area. I can't make this decision for anyone else, can only say what I would do, given what is known about the adverse health effects that can result from exposure to plutonium taken into the body plus the fact that because of plutonium's long half-life any quantity of this material in the environment poses an essentially permanent hazard. You and your family are in a particularly difficult situation, in that you have already purchased a home in an area shown by AEC scientists to be contaminated. Were I in your shoes I would want to relocate, especially for the sake of the children.

The question whether it is safe to live near Rocky Flats was most forcefully raised by Carl Johnson, MD. who from September 1973 until May 1981 was Director of the Health Department of Jefferson County, the county where Rocky Flats is located. The work of the AEC scientists P. W. Krey and E. P. Hardy showed contaminated areas. The map I sent to you in response to your first message shows the results of their original sampling for plutonium on and near the Rocky Flats site. Krey later published another map, the purpose of which was to estimate the total inventory of plutonium released from Rocky Flats by determining via soil sampling where throughout the Denver metro area plutonium released from the plant had been deposited. This map, again using amoeba-like isopleths to show varying concentrations of contamination, showed that plutonium had been deposited east and southeast of the plant in a very large area extending as far as across almost the whole of the City of Denver. Carl Johnson wanted to go beyond showing areas of contamination to see if there was a relation between zones of contamination and cancer incidence in these zones. To make his own map he collected about three times as many soil samples as Krey had done. He divided the metro area into three contaminated zones shown again by amoeba-like isopleths, with Area I being closest to Rocky Flats, Area II extending into central Denver, Area III reaching to the far side of Denver and including suburban areas east of the plant and north of Denver. His Area IV was the surrounding non-contaminated zone. He then analyzed cancer incidence data for 1969-71 for these four zones. His Area I had 16% more cancer than the non-contaminated Area IV; Area II 10% more cancer than Area IV; and Area III 6% more cancer. He concluded that the cause of the increased incidence of cancer in Areas I-III was most likely the presence of plutonium in those three areas — a good example of what the legal profession refers to as “circumstantial evidence.” Clearly, Johnson’s answer to the question, is it safe to live near Rocky Flats, is NO. This particular work, only one of many Rocky Flats-related studies done by Johnson, was his best-known study. It was also by far the most controversial. By the time it was published in a prestigious technical journal in October 1981 he

had been forced out of his job by real estate interests who had gained control of the Jefferson County Commissioners.

But Johnson had forcefully raised the question whether it's a good idea to live near Rocky Flats. The Dept of Energy very quickly gave the task of refuting Johnson to one of its own scientists, K. S. Crump. When Crump replicated Johnson's work he got the same results. He then abandoned Johnson's isopleth approach in favor of dividing the Denver area into six equal pie-shaped parts centered on and radiating out from the State Capitol building in Denver. When he analyzed cancer incidence in each of these six areas, he concluded that cancer incidence in the area that included Rocky Flats was not appreciably different from other areas. But the one-sixth portion that included Rocky Flats also included the upwind non-contaminated City of Boulder; having the population of Boulder added in meant that Crump greatly diluted cancer incidence in this piece of the pie. Johnson showed Crump's work for what it was, but the Dept. of Energy persisted in citing Crump as a genuine refutation of Johnson, and those eager to dismiss Johnson continued to cite Crump as well.

An example of citing Crump as a way of dismissing Johnson is the 1998 paper that you found on line. This paper, produced by the Colo. Dept of Public Health and Environment, makes the claim that those living near Rocky Flats have no higher incidence of cancer than people elsewhere in the metro area. But it, like Crump's study, distorts reality by mixing populations exposed to plutonium with unexposed populations. German radiation specialist Bernd Franke criticized this paper as seriously flawed. "It appears," he wrote, "that the study design was chosen to calm people down, for public relations purposes, rather than for any real scientific reason." He made this comment in a letter dated December 2, 2002, sent to attorney Caron Balkany.

(FYI, Balkany is co-author with Wes McKinley of THE AMBUSHED GRAND JURY, a book that tells the story of the special grand jury convened to review evidence of environmental

lawbreaking at Rocky Flats gathered when the FBI raided to plant in June 1989 specifically to collect such evidence. The thesis of this book is that the real purpose of the raid on Rocky Flats was not to expose environmental lawbreaking but to cover it up. Balkany's co-author, Wes McKinley, was chair of the special grand jury that spent nearly three years reviewing evidence. When the Dept of Justice reached an out-of-court settlement with Rockwell Internatl., then the operator of the Rocky Flats plant, the company pled guilty to relatively minor charges and paid a fine. The documents reviewed by the grand jury were sealed in the Denver federal courthouse, and the grand jury was dismissed, despite the fact that the jurors wanted to indict and put on trial several Dept of Energy and Rockwell officials. McKinley and the other jurors are forbidden by law from revealing what they learned during their time reviewing evidence. Balkany and McKinley's book is an effort to expose what happened.)

As is usual for your questions, I'm not able to give a simple answer. My answers are long and freighted with uncertainty and caution. But here I'll stop on this one about living near Rocky Flats and will refer you to a recently published article that I wrote about the two independent scientists who contributed most regarding Rocky Flats to public awareness in the way of compassion and care, namely, Carl Johnson and Edward Martell. If you go on line to <http://www.rockyflatsnuclearguardianship.org>; and go to LeRoy Moore/Blog, then Papers by me, scroll down to "Democracy and Public Health at Rocky Flats." This paper contains in the section on Carl Johnson a more detailed discussion than I've provided above on the question of living near Rocky Flats. One of the points made in this paper is that no actual health studies have ever been made on people that live in areas known to be contaminated with plutonium released from Rocky Flats. Johnson's and a smaller one by Richard W. Clapp are the only epidemiological (that is, statistical) studies done on off-site populations. My article appeared earlier this year in a book called TORTURED SCIENCE: HEALTH STUDIES, ETHICS

AND NUCLEAR WEAPONS IN THE UNITED STATES, edited by Dianne Quigley, Amy Lowman and Steve Wing.

I hope I'm not overwhelming you and yours with too much information. I honor your concerns and appreciate the fact that you are paying close attention to a matter that I believe needs close attention.

Yours sincerely,

LeRoy

12-28-12

Hi again LeRoy,

Some time has passed since we last had contact and a lot has happened since then! We had a baby girl, and have been quite busy juggling her and our two year old. We have decided that we need to move our family away from the contaminated area. I still think about it several times a day, and that alone is enough motivation to move, as I cannot live with constant worry. We're planning to put our house on the market in January. We're sad to be leaving, but know that we can't raise our kids here.

Thank you again for your thoughtful and thorough responses. I shared the information you provided with many people, including my sister, as you know. I wish I had known all of this before we bought our house and became involved in our community. I would like for the contamination to be more known in the public eye, though admittedly I hope that happens after we sell our house!

I am so incredibly appreciative of your time and responsiveness. The information and opinions you provided have played a huge role in our family, and we are moving to a safer place because of

it.

Most sincerely,

CP

12-31-12

Hello CP:

Thank you for this note. I'm glad to hear from you. Congratulations on the new daughter. I know that with two so young your life has to be full.

I heard from your sister a couple of weeks ago and thought from what she said that you and your husband had decided not to remain so near Rocky Flats. I think this is a wise decision, better in the face of uncertainty to be cautious rather than careless. I wish government agencies responsible for Rocky Flats would adopt this approach.

You probably have seen the news that the Federal Appeals Court in Denver gave a green light last Friday for land to be transferred for the proposed Jefferson Parkway. If built, this privately financed toll highway will run along the downwind most contaminated side of the Rocky Flats. I hope we can prevent it from being built, since construction activity will stir up plutonium left in the soil, possibly endangering people who live nearby. From what I've seen, construction isn't likely to begin for two years.

The small group of people with whom I work on the Rocky Flats Nuclear Guardianship are engaged in activities to educate the public and make more people aware of the hazards posed by the contamination at Rocky Flats. I'd like to request your permission to copy verbatim the email exchange you and I had for use in

educational efforts. I would not use your exact name or your email address or anything else that would identify you directly, including your address, which I don't know anyway. A colleague has suggested printing the exchange as a pamphlet that could be made available to concerned people. As I said repeatedly to you, you asked very good questions, putting me to the test to answer them as honestly as possible without telling you what to do. Think about this request, and let me know.

Meanwhile, as we turn the calendar to the new year, I wish you and yours well.

LeRoy Moore

3-9-13

Hello LeRoy,

We have officially sold our house! The people who bought it grew up in the area, so Rocky Flats should not be a curve ball for them. I know how much of a toll living there was taking on me psychologically, yet I'm still surprised at the deep relief I feel being out of the area. . . . Letting my two-year-old play in the dirt and snow has never been more refreshing.

Thank you again for your help and support.

CP

Conclusion: In a later email I received the following message from CP:

I never told you this story, but while we were in the throws of all of this information gathering, I was talking on the phone to a

friend about it all within earshot of my then 2.5 year old. When I hung up the phone she asked, “Mommy, what’s Rocky Flats?” I said it was an old factory. Then she said, “Oh, ok. What’s plutonium?” The very question brought tears to my eyes. At the absolute minimum, my children have a much happier mother now that I’m no longer worrying about the air they breathe!