United States
Environmental Protection
Agency

Region 10
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Seattle WA 98101

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SF 1.1.2

EPA

April 24, 1990

Reply To
Attn Of: HW-113

FOIA EXEMPT - ENFORCEMENT CONFIDENTIAL

MEMORANDUM

SUBJECT: Southeast Idaho Radionuclide Issue

FROM: Charles E. Findley, Director
Hazardous Waste Division

(for) Lynn McKee, Acting Director
Air & Toxics Division

TO: Thomas P. Dunne
Acting Regional Administrator

Purpose

The purpose of this report is to brief you on an upcoming issue regarding radionuclide exposure in two communities in southeast Idaho and to request your concurrence with a potential Superfund response. This report represents Region 10's initial evaluation of the problem and a range of responses. The recommended option below will need to be evaluated in greater detail over the next few weeks to better define the response. Also included as attachments are an outline of the tasks to be completed next to further define our response (Attachment 1) and a summary of the legal issues (Attachment 2).

Summary

The EPA Office of Radiation Programs in Las Vegas is about to issue a report on an investigation of radionuclide exposure related to phosphate mining and processing in southeast Idaho. The primary source of this exposure is from the use of radioactive slag as a building material throughout the local area. This slag originated from two facilities, FMC in Pocatello and Monsanto in Soda Springs. A secondary source of exposure is the airborne stack emissions from these facilities, although this is primarily a problem with FMC and not Monsanto. Both of these facilities have recently become Superfund sites for on-site problems not directly related to this radionuclide issue.

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Altogether there are presently five final or proposed Superfund sites in southeast Idaho:

1. **Monsanto**, Soda Springs
2. Eastern Michaud Flats, Pocatello
   A. **FMC**
   B. J.R. Simplot
3. Kerr-McGee, Soda Springs
4. Pacific Hide & Fur, Pocatello
5. Union Pacific Railroad, Pocatello

Of these, only FMC and Monsanto are thought to be related to this radionuclide issue. The other sites are in various stages of the Superfund process and though not directly affected by any radionuclide response action, may be affected by community attitudes toward any agency response.

Because of the tie of this radionuclide issue to the FMC and Monsanto Superfund sites we have been evaluating a range of options for response actions under this program. Of the options we have identified, we are recommending Option A which consists of:

1. Banning all future off-site use of slag as construction material.
2. Removal action to clean up homes constructed with slag.
3. Remediation of roads and other areas constructed with slag via a long-term maintenance agreement involving local governments and PRPs.
4. Reduction of emissions at the FMC plant as soon as possible to reduce the airborne exposure in Pocatello.

A more detailed background and the range of options are presented below.

Background

Vast quantities of phosphate ores are mined and processed annually in southeast Idaho. These ores contain uranium and radioactive decay products in concentrations many times higher than normal background levels. Three facilities, FMC and J.R. Simplot in Pocatello, and Monsanto in Soda Springs, are the main processors of this ore in this area. There are two major processes involved at these facilities: a "wet process" at J.R. Simplot which produces phosphate fertilizers and a "thermal process" at FMC and Monsanto which produces elemental phosphorus for use in a variety

of chemical applications. The thermal process produces a waste slag that contains high concentrations of uranium and the resulting radioactive decay products. The stack emissions from these thermal process plants also contain polonium, a radioactive decay product. Slag and the thermal process stack emissions are thought to be the major sources of human radionuclide exposure.

Due to the scarcity of economical quantities of natural aggregate materials like gravel or sand in southeast Idaho, the phosphate slag has been used extensively for such construction purposes as aggregate in concrete and asphalt, roadbed fill, backfill, railroad ballast, stabilization material for stock yards, and in Soda Springs, foundations of some homes. FMC and possibly Monsanto have sold or given this material for use off-site. Bannock Paving in Pocatello has operated a slag crushing operation for decades, although the details and extent of this operation are not known at this time.

The use of slag for house foundations was curtailed by executive order of the governor of Idaho in 1977. However, slag continued to be used for outdoor construction after that time. Monsanto discontinued the distribution of all slag generated at their plant in 1987. Between 50 and 200 homes in Soda Springs are thought to contain slag, and most of the streets in Pocatello and Soda Springs contain slag.

Radionuclide Study

From April 1986 through September 1988, the EPA Office of Radiation Programs investigated the dispersion of radionuclides in the area of southeastern Idaho around Pocatello and Soda Springs. The exposure assessment addressed by the Idaho Radionuclide Exposure Study examined: 1) How much radioactive material is in the community; 2) How much time do various elements of the population spend in close proximity to the radiation; and, 3) What is the magnitude of the radiological dose and the human health risks associated with this exposure?

The results of this study show that while polonium in the atmosphere is a contributor to human exposure, it is the wide distribution of slag that has created the greatest concern for individual exposure. The radioactive decay process results, among other things, in the release of gamma rays. Gamma rays are capable of penetrating bodily tissues and are known to cause cancer in humans. Gamma rays do not travel great distances, and it is necessary to be in close proximity (one or two yards) to the source in order for exposure to be significant. Thus, a person living in a slag-constructed basement apartment or spending his/her work day on a slag covered asphalt street is at higher risk than a person living in an above-ground residence and working in a second story office.

As a secondary source of exposure, the polonium in the stack emissions may cause a radiological dose to the lungs of the people in the communities surrounding the plants. Polonium emissions are now regulated by the radionuclide NESHAP regulations of the EPA. Monsanto has installed emission controls, while FMC has recently been granted a two year waiver of compliance to complete their stack controls.

The natural background radiation in the affected area is about 12 micro-rem per hour. At one meter, the slag containing material reads about 30 micro-rem over background due to the gamma emitting elements in the slag. These levels exceed that which would be tolerated off-site by a DOE or commercial power nuclear reactor facility.

After many statistical machinations involving the distribution of slag and the lifestyle considerations affecting exposure to the slag, the conclusion is that the average lifetime risk of an additional fatal cancer in Pocatello is 4 in 10,000. In Soda Springs the average risk is 14 in 10,000. The maximum risk in Pocatello is 4 in 1,000 and in Soda Springs it is 6 in 1,000. This would account for 0.3 additional deaths per year in Pocatello and 0.1 in Soda Springs (based on a 70-year lifetime exposure).

The variations are due to the different frequency of use of slag in streets and homes in the communities. Different populations were examined and assumptions about where they spend their time were made. The Maximum Exposed Individual (MEI) would be a person living in a slag-containing home and having an occupation around slag-contaminated pavement. The assumptions for the MEI in the report describe an unusual individual, but one who probably exists. The possibility of houses with higher levels of gamma exists, as the sample in the survey is small, and the most contaminated home was surely not found.

Recommended Option

A. Issue report with risk communication and a recommendation to the state to ban all future use of slag. As soon as possible, EPA would conduct a more detailed survey of homes in Soda Springs and Pocatello to determine the extent of the problem. EPA would use Superfund removal authorities to clean up homes built with slag without putting these communities on the NPL. (b) (5)

(b) (5)

[redacted] In addition, Superfund would work closely with air programs to try to ensure that the installation of additional emission control equipment at FMC occurs as soon as possible.

Analysis

If most of the problem with homes is indeed limited to Soda Springs, this option would, in the short term, reduce overall risk only in that city and not in Pocatello. The short term reduction of risk in Pocatello would be primarily through the eventual addition of emission controls at FMC. Option A has the advantage of dealing with the cleanup of homes in the short term using removal authorities while potentially keeping the remediation of the streets and other areas out of the lengthy Superfund remedial process. Hopefully both the PRPs and the local governments would see the benefit of working out this part of the problem without further expansion of the FMC and Monsanto Superfund sites. Expansion of the current sites would occur only as a last resort if a local agreement could not be reached.

Constraints

1. (b) (5)

[redacted]

See Attachment 2 for a more detailed discussion of these legal issues.

2. A Fund-financed removal action would require a major funding commitment from EPA Headquarters and an additional personnel resource commitment for the Region, particularly for the removal program in Region 10. It is not likely that any action could be initiated this FY, so the earliest work could begin would be the 1991 construction season.

   We do not have any real cost estimate at this time. The estimate of affected homes in Soda Springs ranges from 50 to 200 and it is assumed that homes in Pocatello are not affected. We do not know how accurate this estimate is without conducting a more comprehensive field survey. For comparison, however, the removal of contaminated residential soil at the Bunker Hill site in 1989 cost about $18,000 per home. As a rough estimate, reconstruction of basements and foundations of homes would probably be two or more times as expensive. It would therefore probably cost at least two million dollars just for a removal action involving only 50 homes. Costs would go up from there.

3. Another apparent difficulty with any removal or remedial action is that the radioactivity associated with the slag exceeds the Idaho state standards (radium content threshold) and would have to be disposed of in a special landfill. We need to determine what this would entail.

4. It is not clear at this time what position the governor's office or other state officials will take regarding a ban on slag. This is an election year for both the governor and the U.S. senators and an issue such as this could become politicized. It is not likely that such a decision would be made quickly.

Other Options Considered

B. EPA issues the report with risk communication to the affected public, but no action by Superfund. The overall risk in Pocatello would eventually decrease somewhat when FMC installs stack emission control equipment, but there would be no change in Soda Springs. Leave any decision regarding the future use of slag up to the local governments and FMC as it is now.

C. EPA issues the report with risk communication and a recommendation to the state to ban all future use of slag, but again no action by Superfund. Installation of stack emission controls at FMC would reduce some of the risk as above. If the state agrees to a ban on slag, there would at least be some assurance that the risk would not increase further with time.

Analysis

Options B and C are essentially No Action Alternatives for the Superfund program--inform public of the risk but leave most of the decision making at the local level. In light of this study it would make sense to try to ban the future use of slag to keep the problem from getting worse. The political climate in Soda Springs probably would support this minimal response, however Pocatello might not.

D. **Removal Option** Ban all future use of slag. Again, EPA would conduct a more detailed survey of homes. If the appropriate findings regarding authorities under Section 104 can be made, EPA could use either a Fund or enforcement Superfund removal to clean up homes built with slag (again, without putting these communities on the NPL). No other response activities would be conducted regarding the streets and other sources, and therefore the potential exposure to these areas would continue.

Analysis

If most of the problem with homes is indeed limited to Soda Springs, this scenario would, in the short term, reduce overall risk only in that city and not in Pocatello. The reduction of risk in Pocatello would be primarily through the eventual emission controls at FMC. (b) (5) [redacted]

As above, use of the Fund would require major funding and resource committments, and no action would likely begin before 1991. The issue of the disposal of the contaminated construction material would also have to be resolved.

E. **Remedial Option** Ban all future use of slag. Use Superfund remedial authorities to address the entire problem. The extent of contamination and possible responses would be evaluated through the traditional RI/FS process. There are several variations to this option:

1. Expand the FMC and Monsanto NPL sites to include areas where slag has been used.

2. Create new sites when the revised Hazard Ranking System is finalized. Presumably most of Pocatello and Soda Springs would be included in these new sites.

3. Same as E.2 except have ATSDR use their authority to recommend placement on the NPL.

4. Same as E.2 except have the state use their "free pick" to put a site on the NPL.

Analysis

Option E would also be very difficult to implement and will take a long time before any action is started. The creation of a new Superfund site has many drawbacks. It would take about two years for EPA to propose a new site once the revised HRS is adopted. An ATSDR recommendation or a state "free pick" might speed this up somewhat, but even after final listing it would likely take three to four years to work through the RI/FS process before any action could occur.

Judging from this region's experiences at the Bunker Hill site, it is likely that there would be strong local opposition to having these communities named as a Superfund site. Such an action could have a major impact on property values, economic growth, and possibly employment, without offering any immediate solutions. Creation of such a site would brand these communities as being an unsafe place to live for at least the next decade while we work through the lengthy Superfund process. Furthermore, it does not seem likely that there would ever be enough Superfund money to conduct remediation of all of the affected roads in the area, so any plans to conduct such work would rely on enforcement actions.

(b) (5)

[redacted]

Expansion of the FMC and Monsanto Superfund sites would probably make the most sense if remedial authorities are considered. Cleanup of roads and homes could be conducted as operable units of the sites' RI/FSs. This option would have less of the negative publicity impact on the communities, but might still involve a lengthy enforcement battle and many years before any cleanup would begin.

F. **Combined Remedial and Removal** This option would be a combination of D and E with removal authority used primarily for work on homes and the remedial process used to address the streets and other sources. This option would involve all of the issues discussed in the removal and remedial options above.

Analysis

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Attachments

Recommendations

Please indicate your concurrence or non-concurrence (on the recommended option) below.

Concurrence:

Thomas P. Dunne 4/24/90

Thomas P. Dunne Date
Acting Regional Administrator
Region 10

Non-Concurrence:

Thomas P. Dunne Date
Acting Regional Administrator
Region 10

ATTACHMENT 1

SOUTHEAST IDAHO RADIONUCLIDE ISSUE

SUPERFUND RESPONSE IMPLEMENTATION PLAN

The following issues need to be addressed within the next few weeks in order to better evaluate the potential Superfund response to this problem:

	Issue	Lead	Due
1.	Development of a Communications Strategy to include:	Community Relations Meyer	April 27
A.	Press release and possible press briefing.		
B.	Fact sheet to accompany the Radionuclide report.		
C.	Community relations plan.		
D.	Arrangements for possible public meeting to discuss this issue with the local communities.		
E.	Arrangements for possible meetings with local elected officials and company representatives.		
2.	Meeting with state officials to discuss their involvement regarding the banning of future off-site use of slag as construction material.	McKee	May 4

3.	Evaluate implementation of a more detailed survey of private residences to better determine the extent of the exposure problem. Find out whether EPA Office of Radiation Programs in Las Vegas could conduct or assist in this survey.	Leitch Meyer	May 4
4.	Meeting with EPA Headquarters to provide a briefing on the problem, possible responses, and to request funding for initial response activities.	Everts Meyer	May 4
5.	Evaluate the initiation of a work assignment for an Engineering Evaluation / Cost Analysis for residential area removal activities. In particular an EE/CA needs to address:	Everts	May 25
A.	Types of response activities to reduce or eliminate radionuclide exposure in homes including possible radon reduction measures.		
B.	Cost estimates for various responses.		
C.	Determination of an Action Level		
D.	Prioritization of activities (i.e., high risk groups, maybe radon reduction first, etc.)		

6.	Development of an Enforcement Strategy to further define the legal issues including:	Mackey Meyer	May 11
A.	EPA authority to ban slag.		
B.	Possible PRP search regarding use of slag.		
C.	Region 10 ORC coordination with OECM and OGC.		
D.	Evaluation of the scope of potential administrative orders to the PRPs.		

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ATTACHMENT 2

APR 18 1990

CONFIDENTIAL
ENFORCEMENT CONFIDENTIAL
ATTORNEY-CLIENT PRIVILEGE

MEMORANDUM

SUBJECT: Summary Of Legal Issues Concerning Radionuclide Actions Under CERLCA In Southeast Idaho

FROM: Cynthia Mackey
Assistant Regional Counsel

TO: John Meyer
Superfund Project Manager

(b) (5)

[redacted]

(b) (5)

Recommendations

Please indicate your concurrence or non-concurrence (on the recommended option) below.

Concurrence:

Thomas P. Dunne Date
Acting Regional Administrator
Region 10

Non-Concurrence:

Thomas P. Dunne Date
Actong Regional Administrator
Region 10

j.meyer;wpf5.0;4/18/90;G:\USER\SHARE\RADISSUE.001

CONCURRENCES

SYMBOL ▸	PW	JM	CK	PM							
SURNAME ▸	WINSETT	MEYER	KRUEGER	MILLAM							
DATE ▸	4-18	4-18	4-18	4/19							