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Followup to US EPA Meeting on Remediation Approaches for the Lava Cap Mine Superfund Site Lost Lake Area

Janet Cohen, Executive Director
SYRCL

Janet,

I want to follow up on the Lava Cap Mine Lost Lake December workshop organized by the US EPA, to provide some general comments on these discussions.

First, I found that the US EPA and its consultants' discussions of issues and their responses to questions were, with very few exceptions, technically correct and appropriate. The remediation options discussed cover the range of options that are possible for this area. As they discussed, there are some important issues on which the public needs to express their views. As we saw, there are widely differing views among the public, depending on their proximity and interest in Lost Lake.

One of the technically weak aspects of the meeting was the voting, especially as it relates to the ecological restoration option. The public was not informed adequately or reliably on what would be the difference between what is there now and what would be there if ecological restoration occurred. Without this information, the public cannot reliably evaluate that option. As you pointed out, to our knowledge there are no three-headed frogs at Lost Lake. Therefore, it is not clear what the ecological damage is that is caused by the tailings, other than some habitat alteration – i.e., filling of a lake that was designed to be a tailings storage area.

With respect to remediation options, it is clear that there will be need to clean up (remove) all of the tailings along the creek that occur at concentrations above US EPA guidelines. The key issue is protection of children from exposure to arsenic contained in the soils along the creeks and around Lost Lake and downstream. There will also likely need to be removal or containment of arsenic-containing tailings in Lost Lake that are located around the shoreline. There will need to be capping of some type for the deposition area, to isolate the deposited tailings from the surface.

All of the tailings that are excavated from the areas will have to be placed at some location – likely, in a new landfill. The proposed design of the landfill is such that the cap and liner will eventually fail to prevent moisture from entering the landfilled tailings and arsenic-containing leachate from being generated in them. At a typical landfill situation, the pollution of groundwaters by leachate is primarily of concern because the pollution can enter a domestic

water supply well. In this situation, it is unlikely that the landfills would be sited in a location where there are or could be down groundwater gradient domestic wells. This would be an issue that would have to be followed in perpetuity to be certain that this does not occur, since there will be pollution of groundwaters underlying the landfilled arsenic at some time in the future. Is it better to collect all of the arsenic that is exposed now and place it in a landfill that will eventually fail? Yes, provided that there is proper monitoring of this landfill so that action can be taken when the failure occurs. This failure could occur within a few years (if there is sloppy construction or tailings placement) or in many decades, but it will occur. A key issue that has yet to be defined as part of any remediation approach is the monitoring program that will be conducted, in perpetuity, to detect when the containment systems developed fail to prevent the further contamination of the area by arsenic.

The US EPA consultant made comments on a couple of occasions about how capping technology is well established. While this is true, it means only that caps have been constructed on landfills. It does not mean that they function as designed, for as long as the wastes are a threat. Further, and most importantly, the low permeability layers in these caps are not subject to inspection to determine if failure has occurred. Caps can be designed and constructed which will isolate the waste from the surface, as well as achieve low rates of infiltration of water into the waste. In time, with typical maintenance, the cap's low permeability characteristics will deteriorate, and substantial amounts of moisture (rainfall and snowmelt) will penetrate into the waste, generating leachate. Does this have to occur? No. We have known for a number of years how to build leak-detectable caps. No one does this, because the regulatory agencies, from the US EPA to the states, are unwilling to require that this level of long-term protection be provided to those who live or use properties near a landfill.

It is also clear that there will be need to treat mine discharge waters, tailings seeps and Lost Lake discharge waters through the dam, to control the concentrations of arsenic. This means that treatment works will have to be constructed in several areas to treat the water to prevent excessive concentrations of arsenic in discharges from these areas. A key issue will be the reliability, operation/maintenance and monitoring of these treatment works. These issues are to be addressed at future workshops.

There has been discussion in the US EPA Lava Cap Mine newsletter, as well as at the workshops, regarding groundwater contamination issues, especially for private wells. The situation that they discussed of having some unreliable analytical results is not atypical of what frequently occurs. Ordinarily, we do not know that such results occur.

Several times, the US EPA staff talked about the five-year review that is required of Superfund sites. This is an issue that has been of concern to me for some time, since, while there are some five-year reviews conducted at Superfund sites, there are also situations where the US EPA has not had the funds necessary to do this. The consequence is that, at some sites, the review is fairly superficial or not conducted at all. There is no assurance that there will be comprehensive five-year reviews of the "remediated" Lava Cap Mine Superfund site for as long as the tailings that are contained therein after remediation are a threat – i.e., forever.

At the meeting, Dave Seter repeatedly emphasized that the US EPA drinking water standard of 10 µg/L was considered “safe.” That is an inappropriate assessment of that standard. That standard is based on a regulatory limit which has considerable politics built into it. It is not a risk-based standard and should not be considered safe. Data were presented by the state of Wisconsin at the international arsenic conference that was held last July in San Diego, which indicated that people were becoming ill from arsenic at concentrations less than 10 µg/L in their drinking water. For almost every other chemical that is regulated in drinking water which is a potential carcinogen (like arsenic), the approach used is risk-based, where the hazards are considered of consuming water in a certain amount over a certain period of time, to cause cancer. The 10 µg/L standard adopted by the US EPA was a politically-based standard, which has a risk much higher than that allowed for every other chemical that is regulated as a carcinogen.

It is not clear that the Central Valley Regional Water Quality Control Board will allow pollution of groundwaters by tailings-derived sources to the 10 µg/L MCL. As I have discussed, the Regional Board has taken the position that any pollution that is from man’s activities must be cleaned up to a risk-based level, not a political level.

This situation arises to a considerable extent out of the fact that many surface and ground waters in the US contain arsenic naturally at concentrations which are well above the 1 in 100,000 or 1 in 1,000,000 risk level commonly used to regulate carcinogens. This does not mean that those estimates of cancer risk are in error. It just means that some of the cancer that occurs in the US in many areas could be due to low levels of arsenic in the water supply. It is important to remember that 1 in 3 people in the US will acquire cancer in their lifetime, and about half of them will die from it. Therefore, a 1 in 10,000 or 1 in 100,000 cancer risk associated with elevated arsenic represents a very small part of the total cancer that occurs in the US. It should also be noted that the risk level of dying from acquiring cancer from low levels of arsenic are very low compared to common risks that people accept in everyday life as not being particularly risky.

At the meeting I was asked by a member of the public about the symptoms of arsenic poisoning. I have previously brought to your attention that the International Society for Geochemistry and Health has held periodic international conferences on arsenic. I attended the conference that was held in San Diego last July and presented a review paper on the Lava Cap Mine situation at that conference. I had previously provided SYRCL with a preprint copy of my paper. It will appear in the Proceedings. Based on the information provided at the conference, at the levels of arsenic of concern at the Lava Cap Mine site, there would not likely be readily discernible symptoms of arsenic poisoning. The information available indicates that a low level of arsenic attacks a number of organs, with the result that it is difficult to associate a particular illness with arsenic.

Overall, I felt that the US EPA workshop was worthwhile. They provided the public the opportunity to gain more of an understanding of the approach that is used to develop remedial programs for Superfund sites. The public also gained a better understanding of the range of options that are available for remediation (containment) of the arsenic-containing tailings associated with Little Clipper Creek, Clipper Creek, the deposition area and Lost Lake.

If there are questions about these comments, please contact me.

Fred