

The other possibility is surface applications. We are looking at manufactured soils, what type of material you need to add to them, how suitable they are for growing crops versus other types of vegetation (e.g., forest cover), and so forth. I am sure that a lot of work has been done on this, but it certainly has not been documented to the point that the coal industry is either comfortable with it or aware of all of it. Most of the costs will be related to material handling, transportation, slurring, bringing in cementing agents, and drilling.

What do we need to make this happen? No coal operator or AML agency would want to turn a plain-vanilla coal mine, no matter how bad it looks, into a Superfund site. Therefore, they need to know ahead of time how suitable a material is for their application and what the potential liabilities are. For that reason, it is necessary to have a classification system, not just "good" and "bad" sediment but several classes of it, indicating whether the material will pose a potential problem. If it will, they need to know that up front. They either have to encapsulate the material or take some special precautions.

A neat thing about moving this material underground is that the whole operation can be handled hydraulically. There would be no dust; the PCBs would not be mobile. To a large extent, mine acid is a sedentary agent. It contains a lot of acid and ferric iron, so there may be some dechlorination potential; this issue has not been explored yet.

The recipient states will develop their own guidelines at some point, if this gets to be an application. It would be beneficial if EPA or some other federal agency came out with guidance documents, pooled all the information, tried to develop at least guidelines for a classification system, and then let the states take it from there. In terms of the other issues, we need regulatory coherence. We need to define the relationship between the states and federal agencies. The liability issues also need to be simplified, and then we need research on suitability classification and on quality assurance and quality control (QA/QC) issues.

We need to have a QA/QC program so that a truck could come on site, and within a day or so, an analysis could be performed indicating whether or not the material meets the specifications for that particular classification. We cannot have a six-month test if we want an ongoing delivery system. These tests need to be collapsed into a relatively simple QA/QC procedure. We need to know mix formulations, their suitability, their stability in a chemical environment, and their strength.

We need, for example, materials that can develop unconfined compressive strengths of 200 to 300 lbs/in² to ensure roof control in underground mines. We need to know the flowability, which determines

how many drill holes you will need and what your ultimate delivery costs will be. Ultimately, we need well-documented demonstrations on site so that state agencies and the public can be comfortable—or at least know how these various procedures will work for them and whether they will create an environmental benefit or another risk.

INLAND WATERWAYS AND LAKES PERSPECTIVE

Stephen Garbaciak, Jr.

I want to talk about an item that kept popping up during the presentations and breakout sessions, at least the two in which I participated. That item is uncertainty, and its role in a variety of issues related to dealing with contaminated sediments, for both remediation projects and navigational dredging. I think we heard some uncertainty about who this audience is; we heard a reference to this symposium as a dredging meeting. We heard talk about whether dredging is a presumptive remedy when it comes to reducing risk. The issue of uncertainty—including what it means for the selection and implementation of effective remedial options—is where the contaminated sediments debate is going. That would be a recommendation for the future.

We heard about uncertainty in assessment techniques, in establishing remedial objectives, and in what the beneficial reuse markets might be or how we can develop them. We heard uncertainty about the regulations. Do we have enough regulations? Are they being applied correctly or incorrectly? We heard about the uncertainty regarding dredged material among the potential processors and developers of beneficial reuse products. How can we overcome that uncertainty?

We heard uncertainty—and I was a little disappointed at this—when Tommy Myers and Dennis Timberlake reviewed the technology recommendations of the NRC report and expressed skepticism about natural recovery. They put bounds on it and were careful to say that natural recovery is limited to a select few cases. I understand the caveats that USACE would put on it, because we have to remove material for navigational dredging purposes. But EPA's contaminated sediment management strategy is clear in identifying natural recovery as the first option to be evaluated, indicating that we should only proceed to more invasive (and therefore more expensive and complex) remedial options after we eliminate the possibility that natural recovery will achieve the same risk-reduction

goals in a reasonable time frame. That feeds back into the uncertainty.

John Connolly's presentation expressed it well, echoing some of the things that John Haggard had said. We need to work toward developing better quantitative models. I think that is an extreme challenge. We have a hard enough time developing models so that all sides in a negotiation can agree on the relative differences between model runs. Coming up with the more objective modeling techniques that he was talking about will be an even greater challenge.

In conclusion, it is important for both the regulatory side in the remedial-objective negotiation process and the identified responsible parties to realize that uncertainty can be used as either a tool or a weapon, depending on your perspective. It can be a tool to help you or a weapon for avoiding action. It also can be used, when there is uncertainty, as an argument for requiring unnecessary and illogical actions. We should do what we can in all respects, but particularly in developing true remedial actions and in evaluating the effectiveness of remediation projects, to help eliminate that uncertainty in the future.

INDUSTRY RESPONSE

Summary of Dialogue with Audience

Funding Assessments

Audience Member: I spend a lot of time working with Lillian Borrone and her staff; I agree with the panel on the notion of developing quantitative tools. We are spending some of our own money, some of the Port Authority of New York and New Jersey's money, and some of EPA's and USACE's money, to develop the sorts of tools that John Connolly talked about. I am glad that you endorse this. I also got the impression that you strongly endorse the application of those tools, which really means a system-wide approach, as we discussed in one of the breakout sessions. It also means spending money on other things, such as data collection, which has turned out to be very expensive. We have a \$13 million monitoring program just to provide verification data to run the model for which the Port Authority is paying.

Richard Schwer mentioned that his organization and U.S. chemical manufacturers have some responsibility for contaminating the sediments. If that is the case, do you not have some responsibility, within the industry side of things, to provide some of the money for the assessments that you endorse?

Richard Schwer: We have worked in a cooperative fashion to evaluate assessment techniques through the RTDF approach. You have to look at each situation, because there is enough responsibility to spread around in a lot of cases. When it is clearly the responsibility of a particular party, that party certainly needs to do what is necessary to reduce the risk to the point where the contamination is not harming human health and the environment.

Audience Member: If you are recommending, from the industry's perspective, that we need these improved tools, who should pay for them?

Schwer: I think that amount of money is overwhelming for any one party.

Audience Member: I understand that. But many of the companies you represent are Fortune 500 companies that probably had their best year ever on record, and it seems only appropriate that a very small percentage of that money could be spent on this. It seems to me that if people accept certain responsibilities, and if you are sincere about improving assessment techniques, and if your industries are responsible, then there should be some mechanism to fund the types of things that are necessary, because the government does not seem to have the money these days.

Schwer: It has to be a joint effort. We are talking about huge programs. We are talking about situations in which there is often more than one responsible party. There is often a group of parties who have some joint responsibility for a situation, and they need to work together and pool resources. They need to come up with a cost-effective monitoring and assessment approach and then do the best they can to go about solving that particular problem. I would not want to say that one particular party should take on the total responsibility for funding something like this.

Skip Missimer: I know of at least one example on the Fox River, where a group of paper companies (includ-