

PANELIST PRESENTATION

Beneficial Uses of Processed Sediment

Anne Montague, *Montague Associates*

I will discuss the beneficial uses of processed sediment, getting from barriers to benefits, with a marketing perspective. I was disheartened to hear yesterday in our breakout session that people say cleanup is more expensive than litigation. That is not going to be true.

I like to do what I call “back-asking,” a concept I got from Scandinavians. When they start an initiative, rather than forecast where they will be in 10 years, they say, “Where do we *want* to be in the future?” Then they back-ask from there. I think our long-term goal is for processed dredged material to be a commodity. In other words, most types of sediment will be commonly used, and the uses will be varied.

The mid-term goal is significant demand for most processed sediments. A new industry to produce and use processed sediment will be established. We can quibble about whether or not it should be called a new industry, because it will be many industries. The initial thrust has to come from research and development (R&D) focusing on sediments. The near-term goal is for site buyers to choose and use processed sediment products because they perform better, cost less, and can be more attractive than conventional materials. We are getting there more quickly than people recognize.

What has happened to allow this confidence? First, there is growing acceptance of fixation and encapsulation, as well as passive processes such as wetlands creation or construction and manufactured soil, which

reduce the cost of remediation of contaminated sediment. Second, there are growing indications that decontamination technologies will be less expensive and less in demand. I am sure you see that those trends tie together. Third, most people do not realize this yet, but there is strong evidence that it is cost-effective to process clean sediments as opposed to conventional materials. What I am saying is that we need to look at all sediments, and we need to use them as well as we can. By focusing on the needs of the site and the user, sediment uses will be market driven.

My own research began in 1996 when Dick Lee at the U.S. Army Engineer Waterways Experiment Station asked me to do research on beneficial uses. This would be comprehensive research. At that point, the general focus in the nation was on (a) decontamination and (b) other technologies (i.e., those that bind up toxins so they are not available to the environment). My focus was to get to uses, so I held in-depth discussions with at least 300 people on any issue I could find related to the use of sediment. I talked to scientists about “how clean is clean?” I talked to materials specialists for departments of transportation, people who drive standards, and so on. I still go back to the uses I offered as possibilities very early in my research. I believe that many are still to emerge; some already are emerging.

Standards definition was the most exciting part of this research early on, because I realized that we can establish standards, even if they are process standards or

performance standards. I began to look in-depth at this and tried to list the standards that have to be met, like those of the American Society for Testing and Materials and the American Association of State Highway and Transportation Officials, and others for products to be used in given ways. One issue at that time was end-product validity. If a vendor says its process makes an aggregate, what does the vendor really know? How do we establish the validity of that end product? How clean is clean? We still hear that constantly. To me, it is one of the most exciting questions.

Other issues included volume—not only the volume coming in, but also the volume of product that can be used—transport, public perception, and user criteria. Blends were a big thing. I discovered that low-tech processes, in which sediment is blended with materials from ash to manure, often work. Another issue was sediment characteristics, which we heard a lot about yesterday. Last year, the general focus was on watching New York policy emerge. I was nervous, as were a lot of people, about the idea of using sediments on sites such as brownfields or landfills, where there would be no adverse impact. Would the public accept it? Was it really safe?

Stabilization and solidification have been around a long time as a set of processes, but ECDC and its partner ITECH certainly were on the cutting edge in some notable applications. Other low-tech processes include manufactured soils and cement-substitute products, such as bricks and blocks for erosion control. Brookhaven National Laboratory on Long Island emphasized decontamination in choosing technologies to be considered seriously for cleaning up New York/New Jersey Harbor. These included plasma arc technology, a proposed process called “cement lock,” and soil washing. Again, I make a distinction between decontamination and making contaminated sediments environmentally safe without completely decontaminating them. As one might suspect, the dividing line is not always clear. The issues are safety, cost, and what can best be done with the end product.

Through that time I was doing more interviews, focusing on New York/New Jersey Harbor and what was happening in planning regulations for specific uses, such as landfills. That is complicated but fascinating. I also was introducing new technologies and processes; I have been excited about that and continue to be. Thus far, I have been objective in my research and have had no contracts with vendors. This has been exciting because I can introduce something, say what seem to be its advantages, and then back off and see whether or not it develops. There is still a lot of R&D and development to be done, but I think the potential is huge.

Public attitude is still an issue. It is very different when you start talking about specific sites. Of course, there is

case-by-case site evaluation. The emerging uses include mine land reclamation, which involves taking the material into the mines of Pennsylvania to a site that will be a living laboratory at Bark Camp. Other uses include remediation of sites designated under the Comprehensive Environmental Response, Cleanup, and Liability Act (Superfund); landfill covers; brownfield remediation or redevelopment; road fill; and constructed wetlands.

We are trying to commercialize low-tech, low-cost processes. We now are manufacturing soils from clean Toledo (Ohio) Harbor sediment. The demonstration was at the University of Toledo. We also are trying to provide products. We put a block on the table in a New York Dredged Material Management Plan meeting in January, and that block has great promise. Still, it needs a lot of testing, and there is no money to do it. We are trying to succeed with both clean and contaminated sediments.

There has been growing pressure to get decontamination below \$35 per cubic yard. Some people think this is impossible. New Jersey is confident that it can be done, as am I. The emphasis there is on emptying confined disposal facilities (CDFs) and avoiding ocean disposal. This is not to say we should avoid building CDFs. We need to do that in a limited way. But we also need to learn to empty them. That is a complicated issue, but the potential for using sediment will be very great and very quick. I think it will be applied first to material that is already dredged.

We need to find money to test and demonstrate remediation processes and demonstrate clean sediment products on site. My focus was on brownfields; I did a good assessment of brownfields in New England. At one point, I said: “This will be the day when I find a brownfield that is on a clean water source that can really benefit.” I found a 240-acre brownfield site that is a slag dump on the Monongahela River in Pennsylvania, and we are moving forward. We have been there twice now. My commitment was to prove that we could engineer sediment to perform better than conventional material, save money, serve as a model, and display an array of products with clean sediment.

What do we need to do? We need to work with clean sediments when possible, focusing on engineering a product for performance without fear of contamination. We also need to work with contaminated sediments simultaneously, focusing on engineering products that are environmentally protective. In other words, we should make the applications that are best for the environment early on. The most pressing need is for visible sites to demonstrate structural and aesthetic superiority. I stress the aesthetic; we can make beautiful things.

The barriers to progress include mindsets, which are very bad. There is a dire need for professional and public education, demonstrating, testing, and market

analysis. I have a vested interest and hope that I am able to move on both national and site-by-site levels to make sure we drive this with markets, which include everything from the technologies used to make the products, to the products, to cost-benefit analyses, and so on. Another barrier is that people are unable to see the specific products and big picture. They want to kick the tires.

Common concepts of marketing deter progress. Take the concept of push versus pull. You never push if you can get the buyer to pull, and we have been pushing. The supplier must get rid of the product, and this is a bad image. It has slowed us down. Obviously, pull is when the market says "I want that product and know how." In addition, people who commercialize technology know that the "techies" emphasize how it works. They really talk about the features of the technology because it is the market that essentially creates or fills the need.

When should the government get out of the way? The private sector has to see a market before it will invest. The market, on the other hand, must see savings and demos and testing before it will demand the product. If you tell transportation officials that they must use this fill, they give you the PQRST test. They want to know if the price (P) and quality (Q) are better or the same as before. They also want no risk (R). The S is for standards and many other things, including support from colleagues, and T means they do not want to pay for testing. In essence, the market has to see the savings and those other things I mentioned, and it needs to know that demos and testing have been done.

How do we get to savings and demos and testings? We still need money to prove that we will save money.

Of course, the money people—the government and investors—must see the big picture. The big picture is that sediment is a valuable resource. I cannot say that I believed this when I first started the research. I wanted to believe it but did not. It was almost like wanting to know that your President is going to do a good job and not get into trouble; I wanted it to happen, but I did not believe it would happen.

The low-tech processes are lowering the barriers to benefits. I am not diminishing decontamination technologies in any way, but it is because of the low-tech processes that we are able to move forward with a tangible product. The low-tech processes are proving to be sufficiently low cost that we can use clean sediment, and, by using clean sediment, we can lead with what the people want without worrying about contamination.

I want to leave you with two quick quotes. Like Martin Luther King, I have a dream. I have a dream that we can make a facility that will be sizable and have many interesting structures made of sediment that nobody ever thought of making before. It will be an environmentally sound place where people can go safely. There will be statues; I actually know a person who can design a statue for me, and a vendor who says he can make statues of this material. This facility will be what I laughingly call the "sediment wonder of the world." I really mean this; this is no joke. I have been a long time coming to this. If anyone would like to sign a noncompete agreement, then I would be glad to show you my artist's rendering.

My second quote is from Wayne Young, who said, "Hey, folks, how in the world are we going to do something with the bad stuff unless we know what we can do with the good stuff?"