

Appendix H

Excerpts from my conversation with soil scientist Professor Charles Mulchi, August 23, 1980. Initials indicate who is speaking.

KF: How significant is the plastic liner?

CM: The plastic liner would be one of the safeguards that should not be avoided. Anything they put down in Warren County has got to be encased. The artificial barrier--I don't like it; it bothers me to have to think that that's the kind of thing they're going to have to do. But the least they could do is that. And the point I was making, and the point I tried to stress in this whole hearing [EPA public hearing, Warrenton, North Carolina, January 4, 1979], and in any subsequent negotiations and talks we've had through the lawyers, is that that soil physically has not met the criteria they call for in their standards, and that's the whole point I've been trying to make. Now, they can come up with artificial means to beef it up a little bit, but that's not the point. The point is to pick a site that meets the criteria.

KF: Getting back to that sand layer just above the clay liner, the sand layer which is part of the leachate collection system, apparently, what they're saying is that the leachate system will prevent a concentration of water from building up above the clay liner because the water would flow by gravity into the sump. But would it be compatible with your thinking to say that even though this is true, there would always be, without the plastic liner [between the top of the clay liner and the sand layer], a moisture on top of that clay liner which would diffuse eventually down through the pit?

CM: There has to be. It would be a very slow movement of moisture in the system. And the whole idea is to create a system that will be self-sealing. However, this montmorillonite type clay I've been talking about [see in Mulchi's report, p.7 ], when water comes in contact with it, it slowly expands a bit. It increases its volume, which totally makes it impervious. So, in effect, it's a self-sealing type material and would, in effect, form a natural barrier that water will not diffuse through. As a matter of fact, that is what they use to seal ponds. If some guy's got a leaky pond, or a leaky basement, he wants to seal his basement, he buys this stuff commercially, and he packs it in there around his footings, and once the water comes in contact with it, it expands a little bit, tightens up, and makes a permanent seal. Of course, now, eventually it can dry out; it will shrink down a little bit. And that's an argument they're making, "Well, what if we go into a long drought spell and it shrinks a little bit?" Well, that might create a pore, but the first time it rains again, it's going to rewet and reseal. In areas such as here in the East where we get about forty-five to fifty inches of water per year on the average, I think it would remain moderately wet all the time, and I don't think you're going to get a total drought situation down in the soil. You do up on the surface, of course, but down in there around the pit and all, it will be wet at all times. And rarely do you get a complete drying unless you get something like in Texas.

KF: In so far as the state is saying that through its compaction methods and other engineering principles, through the engineering principles of the land-fill itself, they can compensate for the inadequacies of the Warren County site and produce a situation over there that would be safe, would you, at this time, agree with that contention?

CM: I disagree with it on two general principles: The first thing is I don't think anybody in North Carolina has ever created a chemical waste site, so I don't think they've got the "in-house expertise" to do it right. Obviously, they would have put together a better proposal if they had. That's the point I'm making. This is something that they've turned over to a bunch of highway engineers, and they go out there and take a few bulldozers, knock down a few mounds, and compact it a little bit, and that's about the limit of their expertise. But it is possible, I think, to go out and bring in, perhaps, an engineering firm that really specializes in this, and they may develop the expertise. But I don't think that they have it right now. Not in-house, and they've been trying to do everything in-house. That's what's bothered me alot. That's the first point.

The second point is that these soils are highly, highly variable. They are not nice uniform soils as they tried to indicate in some of those graphics in that first proposal. It was the most ridiculous description of the soils at those particular sites that I think I've ever read. It was the most non-professional description of the soils that they could possibly have put together. And that bothered me that there these are supposed to be engineers, soil engineers--at least, they're more in the area of civil engineers, I would think. They had totally ignored the soil expertise that was available in the state to characterize these soils, and to really do an excellent job of delineating the variability there to where that would help them better plan to construct a better site. That is totally missing from all of their work, and that's been a main sticking point that I have. You should have parameters estimated with much more confidence. For example, they've got the water table varying as much as six to ten feet. They don't even really know where the mean water table is. You read four or five different descriptions, and each one says it's at a different place. Well, they're talking about setting this thing seven feet above the mean water table, when they can't even identify where the mean water table is. So, that is the kind of lack of professional description of the site that really bothered me and it's bothered some other consultant firms that I've had look at it. I haven't just trusted my judgment; I've gotten another outfit totally divorced from my thinking to look at it, and they came up with the identically same conclusions that I did. So, I felt a little bit better after that, that, at least, I'm not totally whistling in the wind.

KF: That night of the public hearing, when you told White that the state had put misrepresentative data in its application, was that ever verified?

CM: Oh, it was verified that night in the last thirty minutes of the hearing. It comes right at the end of the tape. You'll find their engineer admitting that he had to select a very narrow band of soil--what we call the B2--which is a zone of maximum clay accumulation. He had to go and hunt for that little narrow zone to get the engineering parameter that he was talking about that was so significant there. And then he said that they automatically assumed that the whole site met that, which is a bunch of bunk.

KF: As a layman, I wasn't too sure about the meaning of diffusion. I knew that you had a central point because I knew that if they hadn't really seriously considered the possibility of diffusion, then they had constructed safety criteria which had too narrowly presupposed only one side of the picture, namely mass flow.

CM: That's right

KF: So I knew you had them on that point, and it does challenge the presupposition upon which that particular waiver would be based, it would seem to me.

CM: To me it was totally done in a very hasty manner. They were very anxious to get this thing swept under. And without some knowledge of people in Warren County putting up some resistance, I think it would have been signed, sealed, and delivered.

KF: Let me ask you this one last question. It seems to me to be crucial because if your report does what I think it does, you know, coupled with the arguments that you made at the hearing, I think you tend to undermine the toxic waste industry in terms of a scientific basis.

So, let me ask you this question. Are you saying that the presupposition on which the waivers themselves depend, namely, that an unsafe site can be made safe by engineering principles--are you saying that that is precisely the presupposition that has to be proved, and so there is no real scientific basis as yet for waivers?

CM: I think that's a good case. I think your logic is coming quite close to mine, especially, in an area like Warren County. Now, there are some areas around the country, and, presumably, in North Carolina, if they look long enough, there are some sites that I think most people would confidently feel could hold toxic waste. But not these marginal areas. There are many areas along the East Coast, especially--they just are not suitable. The soils just don't have the physical features. And I hate to see them pick these sites and try to go in there and create artificial this and that, to try to get around these things. Politics-wise, it makes sense, but safety-wise, you're cutting off your hand to spite your arm.

KF: So within the context of this Piedmont area here, your study raises the question of whether or not they have a scientific basis on which to construct these landfills because--

CM: [breaks in] On marginal areas.

KF: So you challenge the basis on which the location of landfills in these marginal areas would depend, namely, the waivers.

CM: Right. I just don't like waivers. I don't like to see them knock three or four key characteristics out, especially, when they're on shaky grounds to begin with. If they had had the points like the permeability index and things like that, if they had had those really nailed down, without any doubt, then I would not feel so bad. But they're in a very variable situation there, and it's

not a clear-cut case of soil that can be made safe. I don't think they can tell me it can be made safe. They haven't told me one thing that will guarantee me a hundred years from now that stuff won't be out of there. If they had, I wouldn't be in this thing. I'd be, you know, doing something else.

KF: When you have a situation in Alabama where it's over six-hundred feet from the water tables, would that be more scientifically sound?

CM: Oh, I'd feel much more comfortable about that. There's a very, very remote possibility of anything getting through and contaminating a municipal water supply under those situations. But, when you're only talking seven feet, that's dumb. It doesn't even make sense. It's completely illogical.

KF: I think Jim Scarborough said in his presentation, which was just a little bit before yours, I think he suggested that they were going to give us ten feet.

CM: Seven feet, ten feet, what's the problem? The government set it up as a minimum of fifty. I mean, they didn't even know why they picked that fifty. It was sort of like, "Well, that sounds like a good, safe distance." That's about the logic that those lawyers use down there who wrote this regulation. You know, fifty feet sounded good to them. But still, there's very little basis for this.

KF: In other words, there was no scientific basis even for the fifty foot regulation. That was an arbitrary selection.

CM: I won't say there's no scientific basis. I'm saying it's a judgment basis, based on the data at the time. The stuff is going to be moving very, very slowly. Therefore, fifty feet sounds like it's a good safe distance. What is a safe distance? I think six-hundred feet, without a doubt, is a clear-cut case most everybody will agree with. You bury something six-hundred feet, it's got to diffuse, or flow, or whatever, and from here to yonder, six-hundred feet is a right good long ways. But seven feet, or ten feet? That's ridiculous. It doesn't even make sense, especially, when they're talking about creating something forever. You see, that's the thing most people don't realize, that this thing will be there from now till doomsday.

KF: Given the due process aspect of this thing, would it seem to come down to what the courts are prepared to accept as criteria, your criteria, or the EPA's criteria, I mean, as the basis for making the decision as to whether the site is safe?

CM: I hope the courts would pick the scientific criteria. This is what I've been talking about, and I hope that if they're going to create chemical waste sites, I hope that they would leave the politics out of it. That's all I want--to get down to the facts.

What bothered me most was he [Hunt] totally ignored some of the best minds in the country talking about soil. He had them right at his disposal. I could name him five or six people who would have gladly come down and really spent some good, hard knowledge in selecting a site. And if he had gone out, say, to North Carolina State, the Soil Science Department there, and called a group

site selection

of four or five people I could name, and said, "Alright, fellows, we've got a problem here in this state. I want you guys to give me the best scientific judgment of where we should put this." Alright. Let them go by all the soil maps, and they could come up with several recommendations, and then let him [the Governor] start looking at the EPA requirements--how much population density, how much this, how much that. Then you could sort of use that to weed the sites out. But not to pick the worst site in the state and then say, "Alright, it doesn't meet the EPA standards; therefore, let's get waivers."

KF: Even though there are other sites available, the problem would be to get them. Is that right?

CM: Yes, because there could be local pressure. You know, that's what happened up at Alamance County. They had it all nailed down, and they were ready to go with it, and then probably a politician got a few calls from a few irate citizens, and, you know, the right call to the Governor, saying, "We can't have it there. I've got to get reelected next month," or next year, or, whatever. That's the kind of logic they use. They could write that whole area off and forget it.

I've given some materials to the lawyers based on engineering data that would qualify this soil as one of the least likely type sites. And I think I've got that verified without any kind of doubt. That it does meet the absolute minimal soil criteria, if you're going to stretch it--if you're very selective in your sampling, you can find pockets of little zones in that soil that will meet the very minimal criteria that they call for--I'm not disputing that point. The point that I am disputing is, number one, there is a very thin mantle of that soil there. It's not going to be an ample quantity unless they totally scrape the whole area and compact it into a very, very small, confined area. And my question is this: how about the engineering controls to assure that all of the soil that they're scraping and packing in these sites meets the minimal criteria? That's the question that I've got. It's such a marginal site. I'm not going to tell them that there's no soil there that doesn't meet some of those minimal criteria. As a soil specialist, I admit that. They have found a small amount there that they could say does meet the minimal criteria. But it's no ten feet, and I'll tell them that.