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FIRST JUDICIAL DISTRICT COURT
COUNTY OF LOS ALAMOS
STATE OF NEW MEXICO

MARGARET ANNE ROGERS,)
)
 Plaintiff,)
)
 vs.)
)
 BOARD OF REGENTS OF THE)
 UNIVERSITY OF CALIFORNIA,)
 d/b/a LOS ALAMOS NATIONAL)
 LABORATORY; ROSEMARY HARRIS;)
 JOHN BIRELY; PETER L. BUSSOLINI,)
 and RON GEOFFRION,)
)
 Defendants.)
)

No. LA 82-176 (C)

DEPOSITION OF WAYNE HANSEN
VOLUME II - Pages 42 - 191
Santa Fe, New Mexico
May 7, 1985
8:37 a.m.

The deposition of WAYNE R. HANSEN, was taken on behalf of the Plaintiff, on Tuesday, May 7, 1985, at 8:37 a.m., at the law offices of Montgomery & Andrews, 325 Paseo de Peralta, Santa Fe, New Mexico, before Frances J. Mehner, RPR, Certified Shorthand Reporter and Notary Public in and for the County of Bernalillo, State of New Mexico.

Prepared For: ~~MORTON~~ SIMON, ESQ.
ATTORNEY AT LAW

By: FRANCES MAHNER, RPR
CERTIFIED SHORTHAND REPORTER

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* * *

A P P E A R A N C E S

1
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9 Also Present: Judith Roberts
10 Frances Hatfield
Margaret Anne Rogers

11 * * *

S T I P U L A T I O N S

12
13
14 IT IS HEREBY STIPULATED AND AGREED by and between the
15 parties hereto, acting through their counsel of record,
16 that this deposition may be taken at this time and place
17 according to the Rules of Civil Procedure and Notice; that
18 the parties reserve all objections as to relevancy and
19 materiality until the time of trial; that they waive the
20 notice of filing of this deposition and do not waive the
21 signature of the witness.
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WAYNE R. HANSEN

the witness herein, having been first duly sworn by the
Notary Public, was examined and testified as follows:

EXAMINATION

BY MS. FRIEDLAND:

Q Mr. Hansen, you recall that you are still under
oath?

A Yes, I do.

Q When we left off, we were discussing criticisms of
Waste Management programs or practices at the Lab.

A Yes.

Q You had talked about Dames and Moore. Was that a
critical report?

A In my view, it wasn't really critical. It was
more an overview of the conditions of all the DOE facilities.

Q Plus Los Alamos?

A Plus Los Alamos.

Q Did it make certain recommendations concerning Los
Alamos?

A Yes, it did, as I recall.

Q Do you know what happened to those
recommendations?

A They were worked into the programs for the
Laboratory.

1 Q Did the criticisms or recommendations that were
2 made in that report relate to any suggestions or
3 recommendations made by Mrs. Rogers?

4 A They were similar.

5 Q Now, were there critical reports from the
6 Environmental Improvement Division of the State of New
7 Mexico?

8 A Those didn't occur until April 1984.

9 Q Has the Laboratory been cited for a violation of
10 regulations or something?

11 MS. SINGLETON: Just a minute. By the EID?

12 MS. FRIEDLAND: Right.

13 MS. SINGLETON: I am going to object on the grounds of
14 relevancy, to that question. I think it has nothing to do
15 with this lawsuit. However, he may go ahead and answer it.

16 A I think it was in June of 1984 we received a
17 letter stating some -- I am not sure if it was an official
18 Notice of Violation letter or not. On October 26th, 1984, we
19 did get a letter that had a number of Notice of Violations.
20 I believe it was eight. I am uncertain as to the exact
21 number.

22 Q Those October and June letters are the only
23 notices from EID which contain either a Notice of Violation
24 or criticisms of Lab practices from EID?

25 A There were other letters that had questions and

1 statements, where EID had in their perception criticized some
2 of the paperwork that had been submitted.

3 Q Has the Lab taken any sort of appeal?

4 A No.

5 Q Are there any other criticisms of management
6 practices or of monitoring, that you are aware of?

7 MS. SINGLETON: Just a minute. Does that mean by
8 another agency?

9 MS. FRIEDLAND: Right.

10 A I guess I am not sure what you mean by
11 "criticisms."

12 Q Well, recommendations that something is
13 inadequate, or should be changed, or could be done better.

14 A We have had consultants invited in, where we pay
15 for their fees, to evaluate our programs. These aren't on
16 any regular basis. It's at some point where we feel as
17 though a program is at a point that it needs an outside view,
18 someone that's familiar enough with nuclear waste or
19 hazardous waste management, but is an expert in the field.
20 We generally hire someone to come in.

21 Q Who have those consultants been?

22 A Melvin Carter, from the Georgia Institute of
23 Technology, is one that we have used. He is a professor of
24 nuclear engineering, which is a chair position.

25 The last time we had Carter in was in December of

1 1984. We had Dr. James Martin from the University of
2 Michigan School of Public Health with him. And the time
3 prior to that, we had Melvin Carter and Dr. Bernard Kahn.

4 Q When was that?

5 A I am trying to remember. I seem to recall it was
6 1980 or '81, right in that time frame. Dr. Kahn is with
7 Georgia Institute of Technology also, but we were
8 particularly interested in him, because he had headed up the
9 Cincinnati EPA laboratories for studies of nuclear facilities
10 before he went to Georgia Institute of Technology.

11 Q Any other consultants, or consultant reports, that
12 you can think of?

13 A There was. I think Mel Carter did a report. It
14 was in the transition period. I was still Section Leader, I
15 believe, or I had just become Group Leader of H-8 in early
16 '78. That one I saw the results of. I didn't participate in
17 that very much, myself.

18 Q The third one? Is that what you are talking about
19 right now?

20 A Yes. There was a third one. We have at other
21 times invited people to look at our programs, but not -- I
22 wouldn't call them exhaustive. We have had Ernest Gloyna,
23 Dean of the School of Engineering, University of Texas, talk
24 to us about our programs. It wasn't any lengthy visit.

25 Q Did he issue a report or write a letter?

1 A He didn't issue a report. He just sat down
2 verbally and talked about a day, on where our programs were
3 going, what we were doing, where does he think nuclear waste
4 is headed, in terms of new requirements.

5 Q When was that?

6 A I seem to recall it was '78 or '79.

7 Q Any others you can think of?

8 A Not right offhand. It may be possible there are
9 others.

10 Q What about the National Academy of Science?

11 A The National Academy of Science has not made a
12 visit to the Laboratory recently.

13 Q When did they last make a visit?

14 A It was in the '70s sometime, I am not sure.

15 They turn most of their attention to high level
16 waste, which we do not have at the Laboratory.

17 Q Have there been DOE evaluations of Waste
18 Management?

19 A Yes.

20 Q What are those?

21 A Those are called "appraisals," in the jargon of
22 the Department of Energy. The Division of Waste Management
23 out of the Albuquerque Operations Office sends staff up to
24 audit the Laboratory operations against DOE orders. Those
25 are not regular. They may occur with spacings as much as

1 three years between the last audit. Recently the pattern
2 seems to be an audit every two years.

3 Q When was the last audit?

4 A 1984.

5 Q When was the one before that?

6 A 1982.

7 Q When was the one before that?

8 A I am not really sure.

9 Q Two years or more?

10 A I am really not sure.

11 Q Who did the last two audits?

12 A James Bresson is a staff member at Albuquerque.

13 Q And who was the other?

14 A I think the '82 audit was also James Bresson.

15 I am not sure. Usually they are accompanied by
16 another office staffer. Since I wasn't directly involved in
17 those audits on the Waste Management side, I am not sure who
18 accompanied him.

19 Q Who was involved?

20 A From the Laboratory?

21 Q Right.

22 A John Warren, Leon Borduin.

23 Q Was there a third person?

24 A From the Laboratory?

25 Q Right.

1 A Jesse Aragon was always present at all the
2 close-outs, who is our Division Leader.

3 Q Do you know what Mr. Bresson, or anybody else
4 accompanying him, did with respect to monitoring of Waste
5 Management practices?

6 A He does not appraise the monitoring. That is
7 appraised by a separate office.

8 Q Who appraises monitoring?

9 A Their office, nowadays, is called Environment
10 Health & Safety Division. It used to be called Operational
11 Safety. They changed their name in the last year.

12 Q It used to be what?

13 A Operational Safety.

14 Q That's part of DOE?

15 A Yes. Again, it's a separate division in the
16 Albuquerque Operations Office.

17 Q Have they done audits or investigations?

18 A The last audit was April 1983.

19 Q Did they issue a report?

20 A Yes, a letter report.

21 Q Who issued the report?

22 A They had several changes in the Division Leader
23 and I am trying to remember. I believe Ramey was head of the
24 division at the time the actual work was done by Alex Griego.

25 Q Did that report, the last report, make

1 recommendations concerning monitoring practices?

2 A It had some recommendations in it, not many.

3 Q Did it issue any kind of rating of the Lab?

4 A It rated each aspect of the monitoring and
5 environmental program that they audited.

6 Q When was the inspection or audit prior to that
7 April 1983 audit?

8 A It was before my time as Group Leader.

9 Q So earlier than --

10 A We had small audits, that would involve very
11 specific subjects, that had to do with environmental
12 surveillance, but that was the first full-blown audit of the
13 whole surveillance program.

14 Q So, it would have been prior to 1978?

15 A 1978. That doesn't mean that they did not audit
16 small portions of the program. They relied more on review of
17 our environmental documentation.

18 Q Rather than doing an independent viewing?

19 A Rather than coming and doing an audit.

20 Q As a result of that 1983 audit, were any programs
21 designed to meet what their recommendations were?

22 A I wouldn't say we had new programs. What we did
23 was we improved a few programs.

24 Q What programs?

25 A In particular, the meteorology instrumentation of

1 new towers in several areas in the Laboratory. We were aware
2 that we had to do it.

3 Q Was there anything with respect to soil water?

4 A No. I think the audit more generally,
5 specifically addressed general areas of effort.

6 Q Have there been any audits with respect to
7 monitoring techniques, monitoring specifically related to
8 soil water?

9 A Well, the closest thing that comes to it -- I am
10 not sure of the date again -- the DOE hired Pacific Northwest
11 Laboratories to evaluate the monitoring programs for all of
12 the DOE facilities, just contracted out of headquarters. As
13 a result of that study by Pacific Northwest Labs, there was a
14 report issued for each laboratory, and then we received
15 copies of it.

16 Q When was that?

17 A I am trying to remember. The report came out kind
18 of late after the study was done. I think the actual work
19 was done around 1980 or '81, and the Pacific Northwest Lab
20 report came out much later.

21 Q Like how much later?

22 A I think it was about two years.

23 (A discussion was held off the record.)

24 MS. FRIEDLAND: My statement was, I don't think we have
25 all those Carter reports.

1 MS. SINGLETON: The second Carter report, which, as I
2 recollect, Mr. Hansen said was around 1980 to '81, we will
3 look for. Mr. Hansen informs me that the Group files were
4 cleaned out two years ago and things were rather
5 indiscriminately thrown away. However, we will look for it,
6 if it's within the time frame within the Order of Discovery.
7 We will get it to you. As soon as we take a break, I will
8 have someone call the Lab to start looking for that.

9 Q (By Ms. Friedland) Let me ask you more
10 particularly about that report, then. What precisely was
11 studied, and what precisely were the recommendations?

12 A We split the consultants up. Kahn has a strong
13 background in radiochemistry and laboratory procedure, and at
14 that time we still had our own chemistry section within the
15 Group. So we assigned him to evaluate our program of sample
16 handling, chemistry procedures, Quality Assurance programs
17 surrounding the Laboratory, and freedom to speak to anything
18 else that he saw.

19 At the same time, Carter was asked to look at our
20 sampling programs where we actually obtain samples of the
21 environment, go in the field with the technicians, observe
22 their technique, and at the same time look at positioning of
23 sampling stations, and then, together, we asked them to look
24 at our meteorology program from the standpoint of what
25 improvements we could make in that particular program.

1 Q What were their recommendations?

2 A In particular, on meteorology, they suggested that
3 we reinstrument a 300-foot meteorological tower that was
4 already existent, a lightning storm had ruined all the
5 instrumentation and the computers in 1975, I believe it was.
6 And there really had been no effort to reinstrument the
7 tower. We were asked to look at the Quality Assurance
8 program for how we actually obtained the samples. Didn't
9 have any program with our Quality Assurance once the samples
10 arrived in the Laboratory.

11 And this is still an open question within the
12 environmental surveillance community as to how you adequately
13 gather your sampling programs in the field. They had some
14 techniques that they suggested for us to try. And let me use
15 an example to make it a little more understandable.

16 Take a given air sampling station. How do you
17 know that the results are reproducible? Well, the solution
18 was quite simple. You set up a second station right beside
19 it and see how the results compare.

20 Q Let me go back to that tower you mentioned before.
21 Was that in Area C?

22 A Yes. It's within the radioactive waste area.

23 Q The samples that were referred to in Quality
24 Assurance, were those within particular sites?

25 A No. They were talking generically across our

1 whole survey program.

2 Q Did they look specifically at the disposal sites
3 themselves?

4 A I don't remember that that was part of the task on
5 that particular visit.

6 Q Was it ever?

7 A I seem to recall that Mel Carter was asked to look
8 at our waste sites at some point in time.

9 Q In the '80s?

10 A I don't remember.

11 Q Did he do a report concerning the waste sites?

12 A I don't believe he did. I think it was on one of
13 his visits where he looked at -- I seem to recall it was tied
14 to the '78 visit. The waste sites were involved from the
15 standpoint of looking at our overall surveillance program and
16 how it fits in with the sites.

17 Q Can you think of any outside audit that looked
18 particularly at the waste sites themselves?

19 A There were the DOE reports, or appraisals, as I
20 called them before.

21 Q Anything else?

22 A Not that I can think of at the moment.

23 Q Do you still have that letter report from Alex
24 Griego that you referred to before?

25 A It's in the file somewhere at the Laboratory. I

1 don't believe I have a personal copy, no.

2 MS. SINGLETON: Can we go off the record?

3 (A discussion was held off the record.

4 MS. FRIEDLAND: Sarah, that April 1983 report or letter
5 from Alex Griego, someone at the Laboratory will obtain that?

6 MR. SINGLETON: Someone at the Laboratory was instructed
7 yesterday to get a copy of that report as quickly as
8 possible.

9 Q Are there any other evaluations or audits that you
10 can think of with respect to Waste Management?

11 A Not that I can think of.

12 Q Let's look at the documents that you brought
13 pursuant to the subpoena. As I mentioned before, we have
14 tried to keep them in the order that we got them in the hopes
15 that that will simplify things.

16 Let me have you look at a document numbered
17 070750, which is a U.S. Atomic Energy Commission outgoing
18 telecommunication message. Do you have that one?

19 A Yes.

20 Q Did DOE fund the preparation of a Lab
21 Environmental Impact Statement?

22 A Yes, it did, but that has nothing to do with this
23 particular document.

24 Q What does this particular document have to do
25 with?

1 A In the 1979 time frame, the Department of Energy
2 thought they were going to fund an Environmental Impact
3 Statement on the removal of stored transuranic waste. The
4 TRU program of DOE thought they were going to be rewriting an
5 Environmental Impact Statement on the removal of the stored
6 transuranic waste from the DOE facility in shipment to a
7 repository WIPP.

8 This particular document has to do with the fact
9 that in 1979 I had attached some tasks to that EIS effort for
10 the transuranic waste that had to do with surveillance. They
11 canceled those funds for the EIS, and therefore I had to find
12 new funds to replace those.

13 Q Did you find new funds?

14 A Yes. This particular document resulted in the
15 supplement to the Interim Waste Operations Budget for the
16 surveillance.

17 Q Where did the funding come from?

18 A Department of Energy.

19 Q Did the funding come from the same technical
20 office as Operations Funds?

21 A It came from the Division. Well, it came, if you
22 want to track the funding, from the Department of Energy
23 headquarters. There was, within the Waste Management
24 program, funding generated through requests to Congress. The
25 funds come to that office. Then they are disbursed to the

1 Operations office. The money came from there to the
2 Albuquerque Operations Office, Division of Waste Management,
3 and then were assigned to the Laboratory.

4 Q So the money for the Environmental Impact
5 Statement did come from Operations funds?

6 MS. SINGLETON: If that is meant to be a summary of his
7 statement, his prior testimony, I think it's inaccurate.

8 MS. FRIEDLAND: Well, he can correct it.

9 A The Environmental Impact Statement for the
10 Laboratory, the site EIS, is not connected with this
11 document.

12 Are you asking me about the EIS for TRU waste or
13 the site EIS for the Laboratory?

14 Q Let me ask you about both.

15 Q Where did the funding come from for the site
16 report?

17 A Site EIS?

18 Q Right.

19 A That came out of Laboratory Operations.

20 Q For what's referred to in this document?

21 A This particular EIS on TRU waste was never
22 written.

23 Q Never?

24 A Never prepared.

25 Q I'm sorry to make you repeat this, but for the

1 EIS, the site report came from the Laboratory, but what
2 particular kind of funds at the Lab?

3 A They are called "Operational Funds." In the
4 Laboratory jargon occasionally you will hear it called
5 "Indirect Funding."

6 Q Why are H-8's funding requests included with
7 Operations, or included with H-7's?

8 A Normally they are not. It turns out that for the
9 surveillance of the waste areas, the Interim Waste Operations
10 Budget was -- well, the Interim Waste Operations funding
11 represents an unusual route of funding within the DOE.
12 Normally, our funding for H-8, most of it, goes directly
13 through the Division office to the Associate Director. For
14 the Interim Waste Operations, the DOE has decided to set up a
15 special funding mechanism to provide a means for dealing with
16 stored TRU waste, and dealing with low-level waste.

17 For some reason within the agency, surveillance
18 funds, to deal with environmental problems, are quite often
19 attached to that budget.

20 Q The money that goes through H-7, does that come
21 from Lab operating funds or Operational Funds?

22 A Well, H-7 is funded by a variety of ways, just as
23 HSE-8. The normal surveillance program, for example, for H-8
24 is funded out of the Lab Indirect Budget. It doesn't go
25 through H-7. HSE-7 gets part of their funding through the

1 same route, that is, funds to operate the liquid waste
2 treatment; for part of the Operations of the waste disposal
3 area come out of the Laboratory Indirect.

4 The Interim Waste Operations Budget is unique in
5 that it is funds provided by the Defense waste program. It
6 was Congress's intent, as I understand it -- I could be
7 incorrect -- to set up an interim funding mechanism for
8 handling of special nuclear wastes coming out of the Defense
9 programs, until such time as the overall agency's Waste
10 Management program is put in place, and that includes
11 shipping of waste to WIPP. And then at that time,
12 eventually, that budget would go away. That's the name
13 "interim."

14 Q Does John Warren make any decisions which affect
15 your H-8 funding?

16 A Yes. He could make those types of decisions that
17 affect it, but normally what happens is H-8 makes their
18 request to that budget when it's being prepared. By the way,
19 there is a two-year lead time on budget requests. He
20 incorporates it into the proposal that goes forward to the
21 Department of Energy.

22 Q He incorporates what you have proposed?

23 A What HSE-8 proposes.

24 Q Has he ever made any changes in what's been
25 proposed by H-8?

1 A Normally the changes have been in the capital
2 equipment area, which is a separate pot of money. You can
3 only spend it certain ways, and those changes have been to
4 essentially increase our expenditures in that area at times.

5 Q Has he ever made any changes in any other areas?

6 A Well, toward the end of the year we normally get
7 together to look at the budget balancing, where we are at,
8 say, three months before the fiscal year is over, and at that
9 time, if he is having problems and we aren't, in other words
10 he anticipates new expenses and we don't anticipate spending
11 all of our money, we will give it back. That happened the
12 year before last. Last year it went the other way. He
13 actually gave H-8 extra money to spend out of that budget
14 category.

15 Q By "the year before last" you mean 1983?

16 A Yes.

17 Q What did you give back?

18 A I think it was a very small amount, not a small
19 sum in terms of personal finances, but in terms of government
20 finances. I think it was about \$10,000.

21 Q What was that money left over from?

22 A We just hadn't used as many consultants as we
23 thought we would use.

24 Q Is surveillance and monitoring funded solely by
25 Operations?

1 A I think up until March of 1984 that was true.
2 However, if you look at the question in the broadest sense,
3 the research that was being funded in LS-6, and now HSE-12,
4 really contributed to the surveillance program, in that the
5 reports, the findings, the results of their work, all had a
6 bearing on our surveillance program.

7 Q What was the funding from Operations for
8 surveillance and monitoring?

9 A Do you mean dollarwise?

10 Q Right. From 1981 to 1984.

11 A I think in 1981 we were running around \$1.2
12 million out of the Indirect Budget. And what's important
13 about the Indirect Budget is it does not pay overhead, so the
14 money goes farther. Whereas contract money that's spent for
15 supportive research has to pay that overhead charge. I think
16 in 1984 we were running around -- 1984 is a bad year because
17 we did some reorganizing that affected the budget. I think
18 we started the year before, when reorganization also
19 occurred, at about \$1.6 million.

20 Q What about 1982 and 1983?

21 A I don't remember the numbers exactly. I really
22 don't remember the budget numbers that well.

23 Q Were the numbers in the same range as 1981?

24 A They would be within the same range.

25 Q Were there other sources of funding for

1 surveillance and monitoring during those same years?

2 A We had monies coming in under contract from one
3 program within DOE. It was called the FUSRAP program, but
4 that was very small. We made a few measurements on two
5 special sites off Laboratory property in Los Alamos County.

6 Q FUSRAP is "Formerly Utilized Site" --

7 A "Remedial Action Program."

8 Q Did you use that money for anything on the
9 Laboratory property?

10 A No.

11 Q How much money was that?

12 A Again, I don't recall the budget numbers that
13 well. I think it was on the order of -- it was a declining
14 budget. I think at one point it was \$100,000, and then
15 declined down to, I think, by fiscal year 1983 it was down to
16 around \$50,000, two separate tasks, each identified as
17 \$25,000 apiece.

18 Q Those two separate tasks were what?

19 A One of them was a task to -- I was chairing a
20 program to provide DOE guidance on how to clean up these
21 sites. How clean is "clean," if you want a simple way of
22 stating it. And that task was a committee made up of myself
23 from Los Alamos, Carlisle Roberts from Aragon National
24 Laboratory, Lee Keller from Oakridge Operations Office, Dan
25 Glenn was with the people from Bechtel National at Oakridge,

1 and that really was a contract effort that was on the site.

2 The other task had to do with making some
3 measurements at the Trinity site, which was the site of the
4 first atomic weapons test, White Sands Missile Range.

5 Q Were there any other sources of funding for
6 surveillance and monitoring from 1981 to '84?

7 A There were funds within the Group for surveillance
8 activities, but they did not have to do with Los Alamos
9 National Laboratory.

10 Q What did they have to do with?

11 A The PANTEX plant in Amarillo.

12 Q Let me have you look at the second page of this
13 same document, the last sentence of the first paragraph. "As
14 we discussed, some method of establishing the condition of
15 stored TRU waste would be useful."

16 Was their effort funded?

17 A Yes, it was.

18 Q By whom?

19 A Interim Waste Operations.

20 Q Which means what?

21 A That's the DOE program I discussed earlier that
22 has provided funds since 1980 to provide surveillance and
23 monitoring.

24 Q Separate from Laboratory Operations?

25 A Separate from Lab Operations.

1 Q Who established the method that's referred to in
2 that document?

3 A That particular sentence, "As we discussed, some
4 method of establishing the condition of stored TRU waste
5 would be useful," was part of the funding for 1980, and that
6 was work done by HSE-7.

7 That was a re-entry into the stored waste to
8 inspect the condition of the TRU waste barrels.

9 Q Was that in Pit 9?

10 A I don't know what the number of the pit is. It's
11 the only pit where we have TRU waste stored underground. The
12 rest of them are stored on the surface.

13 Q Who at DOE in the Albuquerque office decides
14 funding?

15 A Well, the track was that Jim Bresson, at the time
16 this was done, was a staff member that had to be convinced
17 first that the funding was needed. Then he had to convince
18 the Division Director, who at the time was Robert Lowery.
19 Then they have to convince DOE headquarters.

20 Q Was funding provided by DOE for implementation of
21 5820.2?

22 A Not specifically. We were expected to do the work
23 as part of the effort in carrying out our duties, but John
24 Warren can answer that question better than I can.

25 Q Because that implementation was done by H-7?

1 A The implementation plan was done by HSE-8. Some
2 parts of the appendices was done by HSE-8. Some of the
3 appendices were done by HSE-8.

4 Q So there was no special request for funding for
5 those parts?

6 A Not that I know of.

7 Q Let me have you look at Document Number 074010,
8 the monthly report from Don Mayfield to you.

9 A Yes.

10 MS. SINGLETON: For the record, I don't think it's to
11 him.

12 Q I'm sorry. To John Warren. About halfway down
13 that one paragraph, where it says, "Second, the Environmental
14 Science Group and the Environmental Surveillance Group will
15 jointly study mining and transport of waste in a short-term
16 study. "How are joint studies like that funded?

17 A Normally, one of the Groups sets up the funding
18 mechanism, and, if we can, what we like to do is identify a
19 principal investigator from each Group to put on the
20 appropriate paperwork and to manage, and the funds are
21 allocated at the beginning of the project. In other words,
22 each Group is given what their estimate of the costs are, and
23 pre-allocated an amount of money to spend on their effort,
24 and then people work together.

25 Q How was that funding done?

1 A This is a "bootleg" study, we call it, a study
2 where we saw a target of opportunity and people worked some
3 overtime and just got together and designed the study
4 together, from both HSE-8 and LS-6, and went out and did the
5 work.

6 Q So no money was asked for it?

7 A No money was asked for it.

8 Q It refers to a survey grid at the end of the
9 paragraph, "A survey grid of 1980 was reestablished."

10 A Yes.

11 Q Do all sites have such a grid?

12 A I think by now all of them should have a survey
13 grid. What we do is hire the Engineering survey crew to come
14 in and set up a flag at each sampling point.

15 Q Was it ever determined that they should all have
16 such a grid?

17 A That's a given, if you are going to do soil
18 surveys.

19 Q Is there a set procedure for precisely locating
20 samples' origins?

21 MS. SINGLETON: I didn't hear the question.

22 Q Is there a set procedure for precisely locating
23 vegetative and soil samples' origins?

24 A On soil samples we set up a predesigned
25 statistical grid by looking at previous data, if you have

1 any. You can determine what the probability of missing
2 activity is by using some statistical tests. You then use
3 that data to tell you how close those sampling points have to
4 be to each other. But at the same time you have to have a
5 satisfaction of random samples to use normal distribution
6 statistics. So with the help of Gary White, who was in LS-6 --
7 he is no longer with the Laboratory -- we set up such a
8 design.

9 The design is then translated to a diagram,
10 superimposed on a map of the waste area, and each grid is
11 designed specifically for each waste site. Then that is
12 turned over to Engineering for them to go flag where the
13 sampling points are.

14 Q Is that same thing true for vegetative sampling?

15 A Vegetative sampling is not quite as rigorous
16 because plants don't always grow where the random sample
17 point would fall, so you sample within a given size area.

18 Q Could you, for example, locate the precise
19 location of a sampling five years later, say?

20 A From the Engineering surveys. But the flags would
21 most likely be gone. You would have to have them go back and
22 reflag the area.

23 Q Which they could do from the survey?

24 A From the previous survey.

25 Q How is the grid that's referred to here

1 reestablished?

2 A They go out with a transit. The Engineering
3 Division personnel go out with transits. I wasn't there to
4 see it, but from what I know about Engineering surveys, they
5 go out, they pick a bench mark, which is a concrete-mounted
6 marker that is common throughout the Laboratory, and then
7 work from that in terms of distances, and use the diagrams
8 that they had set up before.

9 Q What are the "environmental conditions" that are
10 referred to in the first sentence?

11 A Essentially, invasion by trees was the most
12 common, I guess. I am not sure it was a problem, because we
13 didn't have any indication of large radionuclear ^{uptakes} updates, but
14 at the time the DOE guidance was to keep trees out of the
15 waste areas.

16 Q DOE guidance contained where?

17 A It was a set of interim criteria that DOE had
18 issued for operational low-level waste sites.

19 Q Did these interim criteria ever become final?

20 A Not to my knowledge. What really happened was
21 that through some management changes in DOE and different
22 approaches to how the contractors were regulated, DOE decided
23 to issue orders rather than finalize their criteria, and the
24 orders are those that we have talked about before, 5820.2.
25 There is now, it's still on the books, but useless, 5480 -- I

1 am not sure what the decimal is -- but it had to do with
2 mixed waste.

3 Q How long did the interim criteria remain in
4 effect?

5 A I think they were first generated about 1976 or
6 '77 as a draft for review, and they went under several
7 transitions, and there were several different drafts floating
8 in the DOE system. We used the one set that were called
9 "interim." They were very brief, because we had been given a
10 letter of guidance that we should follow those until more
11 detailed guidance was issued.

12 Q Was more detailed guidance ever issued?

13 A The orders were issued, but they weren't any more
14 detailed, in my opinion.

15 Q The "orders" meaning 5820?

16 A 5820.2.

17 Q Do you still follow what was in the interim
18 criteria, though?

19 A I would say partially, in that the DOE orders, and
20 new information that's been developed by the Low-Level Waste
21 Research Program, all help to change our programs. So that
22 as time goes, we supplement the program based on new
23 findings.

24 Q Is it fair to say that the DOE orders are fairly
25 general?

1 A Yes. They are general because of the need for
2 flexibility. Each DOE site is different, located in a
3 different climate, different soil zone, different geology,
4 has different wastes, generates different wastes.

5 Q So the DOE orders delegate considerable latitude
6 to particular sites, in determining how to do waste
7 management and monitoring?

8 A They expect the sites to exhibit good professional
9 judgment in how Waste Management practices and surveillance
10 are carried out. However, along with the order system, is
11 built in an appraisal program which had not been built in
12 before.

13 Q Does DOE or, I suppose, any of the audits that
14 have been done on Waste Management, put any emphasis on
15 relying more on good judgment, or good science, rather than
16 on particular regulations?

17 A Yes. I would say that they expect good judgment
18 and good science, modern state-of-the-art applications of
19 engineering practices, rather than rote following of some
20 legalese, or particular words.

21 Q Let me have you look at Document 070788, which is
22 a letter from you to Gerald W. Johnson, TRU Waste Management
23 Program, DOE.

24 In Paragraph 2 it says, "The estimated costs for
25 the present strategy include milestones for development of

1 evaluating methods at TRU waste burial sites." What does that
2 mean?

3 MS. SINGLETON: Take as much time as you need to read
4 the document.

5 A Okay. It's not real clear from the sentence, but
6 we were to evaluate alternatives for TRU Waste Management at
7 Los Alamos.

8 Q Was that evaluation done?

9 A Yes.

10 Q Was that funded for 1982?

11 A The document was completed in September of 1981.
12 There was funding from that office for some other tasks, as
13 you follow on, for fiscal year 1982.

14 Q What were the tasks for '82?

15 A For the fiscal year 1981, the transuranic or TRU
16 Program office and the Department of Energy decided they
17 wanted to reexamine the limits for what was used to define
18 something as TRU waste versus low-level waste. At the time,
19 or starting with approximately 1970 sometime, DOE had told
20 its contractors that they should put into storage, for
21 shipment to a repository, waste that contained greater than
22 10 nanocuries per gram of TRU elements.

23 They asked several contractors, not just Los
24 Alamos, during the FY '82, to look at what the environmental
25 implications would be of increasing that limit to a hundred

1 nanocuries per gram.

2 Q And that increase was contained in the DOE Order?

3 A It later was implemented, yes, in DOE Order
4 5820.2, as issued later, and did increase the limits to a
5 hundred nanocuries per gram.

6 Q How much before the time that the final order came
7 out was that?

8 A Well, the sequence of events was that we started
9 the study August 10 to 13, '82. There was a Waste Management
10 workshop in Gaithersburg, Maryland, to examine the question
11 of the increase from 10 to a hundred. I think a draft order,
12 as a result of that meeting, was issued for internal agency
13 review, approximately three or four months later.

14 Q Which alternative approach, as discussed in here,
15 was finally chosen?

16 A For the stored waste, the alternative was to ship
17 those stored wastes to WIPP. That was a recommendation.
18 Later on, DOE has, of course, put into effect a plan as to
19 how to do that. For the buried TRU waste, no decision was
20 made.

21 Q There is a reference, at the bottom of the page,
22 to Engineering studies in several environmental measurement
23 programs. What were these?

24 A The engineering studies were studies of: How does
25 one best retrieve the stored waste? What types of facilities

1 does one need? And for the buried wastes, the real challenge
2 was: How does one safely reenter an old waste area? And
3 what kind of equipment does one need? And included in that,
4 of course, are cost estimates.

5 The environmental measurement programs were those
6 that have been carried out since, ascertaining what the
7 radiological conditions were inside and outside the waste
8 areas.

9 Q When were those studies carried out?

10 A They have been carried out over time. Mrs. Rogers
11 started some of those programs, and they are still ongoing.

12 Q Let me have you look at the middle of the page
13 where it says, "Specific issues at LASL that need resolution
14 include," and then there are Paragraphs 1 through 9. Look
15 particularly at Paragraphs 1 through 4. Were any of these
16 recommendations based, in any way, on information or
17 recommendations received from Mrs. Rogers?

18 A Mrs. Rogers' Source Document certainly played a
19 key role in looking at Paragraphs 1, 2 and 3. Her document,
20 and later information about Area D, as a result of some more
21 searching of records, raised the question of whether Area D
22 is really a waste area.

23 Q Let me go back for a moment to the first two
24 documents that we looked at. Do those documents relate to
25 recommendations made by Mrs. Rogers?

1 A The first document, 070750, I don't recall Mrs.
2 Rogers specifically having any recommendations, except that
3 her program was connected with measurements at waste areas,
4 and this was a request for funding, I would say, to fill the
5 gaps in her program.

6 074010, the memo from Don Mayfield, is a sample
7 monthly report which represents ongoing reporting of the
8 surveillance of the waste areas. It's a continuation of the
9 program established by the funding obtained by the first
10 document.

11 Again, Mrs. Rogers' connection with it was that
12 she had, in the past, carried out measurements at the
13 inactive waste areas.

14 Q Now go back to document 070788.

15 With respect to Paragraph 6, on the second page of
16 that document, "Differences between LASL and other DOE
17 contractors in risk assessment methodology for short-term and
18 long-term environmental risks," what are those differences?

19 A Well, they are less now than they were at the time
20 that the memo was written. In fact, I helped lead a workshop
21 to try to find out what those differences were. Those
22 differences were basically in the assumptions and methods
23 used for calculations of migration of radionuclides, if any;
24 differences in calculations using sampling results, to
25 translate the results to radiation dose; differences in the

1 type of meteorological program materials assumed for forward
2 projection typical calculations.

3 Q What assumptions are you talking about?

4 A As an example, in meteorology there are two ways
5 to use the meteorological data one has on hand. If you want
6 to calculate the dose to someone off site from windborne
7 materials, you can do one of two things. You can either
8 assume 50 percent probability weather, which is the average
9 weather for the year, or you can assume 95 percent
10 probability weather, which is the probability that the
11 meteorological condition that you selected would 95 percent
12 of the time cover the worst offsite case.

13 Some of the contractors were using average weather
14 for the year as the worst case weather. We discussed that in
15 a workshop in Salt Lake City, Utah, and, as contractors, with
16 DOE present, we made recommendations, and decided that people
17 ought to use 95 percent probability occurrence.

18 Q Were there assumptions related to the geology of
19 the area?

20 A No.

21 MS. SINGLETON: I misunderstood the word "there."

22 Q Were there assumptions related to the geology of
23 the area?

24 A For each DOE facility there were assumptions made,
25 but those assumptions were not the subject of a lot of

1 discussion, because of the differences in the different DOE
2 facilities.

3 Q What were the particular assumptions, with respect
4 to Los Alamos, in the area of geology?

5 MS. SINGLETON: I'm sorry, Joan. Are we still talking
6 about Number 6?

7 MS. FRIEDLAND: Yes.

8 MS. SINGLETON: I object to your question as being
9 vague.

10 MS. FRIEDLAND: He talked about assumptions that were
11 made, and I am just trying to get at what those assumptions
12 were.

13 MS. SINGLETON: But his comment was in the context of
14 Number 6 being different between Los Alamos and other
15 contractors.

16 Q (By Ms. Friedland) Well, were there assumptions
17 concerning the geology of Los Alamos that related to that?

18 A No. We did not discuss a lot of geological
19 parameters.

20 Q With respect to Item 7, "Whether LASL Waste
21 Management environmental documents address only TRU wastes,
22 or all waste areas," was that issue resolved?

23 A That statement is in the context of the
24 preparation of the documentation discussed in this letter,
25 and that is an Alternatives documents for management of TRU

1 wastes. Then in the case of the Alternatives documents, it
2 was decided to leave out other waste areas, because the TRU
3 Program wanted to only address TRU issues.

4 Q Let me have you look at Document 070727.

5 MS. SINGLETON: Just a moment. If you are going to a
6 new document, could we take a break? And I will make these
7 calls.

8 MS. FRIEDLAND: Sure.

9 (At 9:50 a recess was taken.)

10 Q (By Ms. Friedland) With respect to Document
11 070727, a memo from you to H. S. Jordan concerning fencing of
12 Area F, when was Area F actually fenced?

13 A I think it was in 1982, or possibly even as late
14 as '83.

15 Q Does that fencing have to do with any
16 recommendations made by Mrs. Rogers?

17 A This memo actually goes back to -- I don't
18 remember her writing it down. I know we discussed it when I
19 was her Section Leader, that the area needed improved
20 fencing, so there is a tie to her.

21 Q You were her Section Leader when?

22 A July 1977 to March 1st, 1978.

23 Q Looking at Document 070666, this is an evaluation
24 of Margaret Anne Rogers done by you.

25 A You had a very thick document and I was looking

1 for a thick one.

2 Q I was wondering where I got that thick document.
3 Looking at the second paragraph, the middle of the paragraph,
4 where it says, "In particular, the first practical studies
5 involve the assessment of the condition of inactive waste
6 burial sites," does this refer to the Source Document?

7 A Yes.

8 Q How do the Site Characterization Technical Plans
9 for the Los Alamos National Laboratory, which we have as
10 Document 074114, differ from the Source Document?

11 A They are addressing different areas than her
12 studies addressed.

13 Q You mean different physical areas?

14 A Physically different sites. It includes some of
15 the same sites that her Source Document did.

16 Q When were the Site Characterization Studies
17 funded?

18 A At the beginning of fiscal year 1984.

19 Q When were the requests submitted for those
20 studies?

21 A January 1983.

22 Q Who submitted them?

23 A I did.

24 Q When was the planning done for that?

25 A November 1982; November, December.

1 Q Why were the Site Characterization Studies done?

2 A Well, they aren't complete yet, but it had been a
3 feeling at the Laboratory for a number of years that we
4 really needed to revisit every technical area on the site and
5 look at it from the standpoint of what went on at that site,
6 the physical location, and in particular, during the early
7 days of the Laboratory, while it was under the control of the
8 Manhattan Engineering District, and the early Atomic Energy
9 Commission case. This has been discussed with DOE
10 Albuquerque, and I think the first discussions, which I was
11 not privy to, took place after the completion of the cleanup
12 of Technical Area 1, which is now part of the community of
13 Los Alamos, and that cleanup was carried out -- it started in
14 1974, some of the first activities, and finished in 1976.

15 So when I became Group Leader in 1978, I was
16 informed of this desire on both the part of the DOE and the
17 Laboratory to visit these issues. We didn't believe there
18 was any real hazard lurking in the environment in terms of
19 anything immediate, but if there were contaminates, or
20 conditions, that we didn't know about, there was always
21 potential for something very long-term to happen, say, in the
22 time frame of 10, 20, 50, a hundred years.

23 It wasn't until late 1982 that we saw any kind of
24 opening either from the standpoint of our being able to
25 absorb the project within the Group, or an opening for

1 funding.

2 Q What changed then?

3 A Well, starting in 1980, HSE-8 was directed by the
4 DOE and the Laboratory Director to take on a large project
5 which was the PANTEX Environmental Impact Statement, which
6 was a project that took about three years, and it was given
7 to us as a very high priority project. They told us to put
8 all other special study type programs on the back burner.

9 In the fall of 1982, we were essentially complete
10 with our part of that program and we had an opening to sit
11 down and start planning how we would go about carrying out
12 our study of the site.

13 Q Who funded the Site Characterization Studies?

14 A I actually got funding from the Indirect
15 Laboratory Operations Budget, not very high level, but enough
16 to start the program.

17 Q How much did you get?

18 A The equivalent of one staff member and one
19 technician.

20 Q Who did the work?

21 A Well, since the funding didn't really start until
22 October of 1983 -- October '83 is the beginning of fiscal
23 year '84 -- John Alquist headed up the project.

24 Q Had he been in H-8?

25 A Yes. Well, he was from August or September of

1 1980 until October of 19 -- I'm sorry. From August or
2 September of 1981 until, I believe it was, September of '83.
3 No, that still doesn't come out. He was gone on three years
4 of absence. It had to be '80 to '83. What's confusing me is
5 October '83 is fiscal year '84. He was gone three years
6 prior to that time. He took a leave of absence. He had been
7 in HSE-8 for a number of years and, in fact, was a staff
8 member in charge of cleanup of Technical Area 1 during 1975
9 and '76.

10 Q What's his background?

11 A Master's degree in radiation protection,
12 bachelor's degree in physics, and his specialization is
13 environmental health physics. He is certified by the
14 American Board of Health Physics. He had been involved in
15 the design of surveillance network and sampling programs at
16 the Laboratory.

17 Q What was he doing on his leave of absence?

18 A He went to the International Atomic Energy Agency
19 to work with their Safeguards and Security Program, which is
20 to inspect agreement nations for compliance with the IAEA
21 safeguards on the movement of special nuclear materials.

22 Q Had he been told that he could come to work in
23 HSE-8 when he came back to the Lab?

24 A You have to go back to when they depart. When
25 someone leaves on a leave of absence like that, they are told

1 that they will have first choice of any position that exists,
2 if they fit the qualifications.

3 Q Any position that exists in their old Group or in
4 the Lab?

5 A No. They can come back to their old Group, if
6 they so desire. It's up to them.

7 Q When did you know that you would have the funding
8 for this program?

9 A It would have been about August or September of
10 1983.

11 Q Did you talk to him about coming back to the
12 Group?

13 A The first time I talked to him he wanted to return
14 in September of 1982, but I didn't have a position open. And
15 the IAEA wanted him to stay, so he decided to stay an extra
16 year, and we extended his leave of absence a year.

17 Q When did you know that there would be an opening?

18 A I was pretty certain by June or July of 1983 that
19 there would be a position associated with this Site
20 Characterization Study.

21 Q Is it the Supervisor's Manual that sets up this
22 procedure about a person who is on leave of absence having
23 first choice of any position?

24 A It's called the Administrative Manual nowadays.
25 It used to be called the Supervisor's Manual.

1 Q That's what happens when you go to Mexico for a
2 year, they change the names. But it's pursuant to that?

3 A Yes, the conditions are set up in that manual.

4 Q You didn't have to advertise this position in any
5 way?

6 A No.

7 Q What were the requirements for the position?

8 A Essentially, experience in design of surveillance
9 programs, some radiological assessment experience, that is
10 taking data from a sampling and measurement program and
11 translating it into radiation dose, and some knowledge of the
12 Laboratory.

13 Q He is still doing that work now?

14 A Yes. He is still connected with Site
15 Characterization.

16 Q Let me have you look at Document 070001, which is
17 a memo from you to H. S. Jordan about the proposed
18 Geohydrologics Advisory Committee.

19 Who selected the members of that committee?

20 MS. SINGLETON: Which committee?

21 Q The Geohydrologics Advisory Committee.

22 A As I recall, Jim Steger, who was then in LS-6,
23 myself, and Bill Purtymun sat down and talked about who could
24 serve on the committee.

25 Q Had this committee existed before?

1 A Not as a designated committee.

2 Q Did you consider Mrs. Rogers for this committee?

3 A We talked about it.

4 Q What was the discussion?

5 A Mrs. Rogers had brought up a particular point of
6 disagreement with how a particular waste trench had been
7 located on the mesa, and actually Virginia Christie wrote the
8 memoranda that resulted in the disagreement. We decided --
9 well, several factors went into it, but the basic factor was
10 that she was now in a confrontation with HSE or H-7 at the
11 time -- and we decided that we would pick people that were
12 not involved in the argument.

13 Q What do you mean by "confrontation"?

14 A Well, apparently -- this is only hearsay, but I
15 understood that there had been some rather heated arguments.

16 Q Between whom?

17 A Mrs. Rogers and some of the H-7 staff.

18 Q Who in particular in H-7?

19 A I don't have a name.

20 Q Was John Warren part of the argument?

21 A That's what I am trying to remember, if he was the
22 particular individual or not, but he would have been involved
23 in the arguments, if there were any, I would suspect.

24 Q What view did Bill Purtymun have of Mrs. Rogers
25 being on the committee?

1 A Well, he didn't really object. He felt we
2 probably ought to get somebody on the committee -- and
3 Frances West was one of the people included at the bottom of
4 the memo -- get someone from outside the Division that could
5 take, shall we say, more outside the Division, someone that
6 could take a little more objective view of how the criteria
7 had been written.

8 Q Did he have any concerns about how the criteria
9 had been written?

10 A Not really, but it was obvious, because of
11 disagreements that were taking place, that people were
12 interpreting the criteria differently.

13 Q Did he express any opinions about how Mrs. Rogers
14 had behaved in all of this?

15 A I don't recall any.

16 Q Did he express any opinions at that time about
17 working with Mrs. Rogers?

18 A At that particular time, no.

19 Q Did he later?

20 A Yes.

21 Q When was that?

22 A I guess, after the carrying out of the grievance
23 procedure, Mr. Purtymun decided that he would not like to
24 work with her.

25 Q Did he tell you this?

1 A Yes.

2 Q Did he say why?

3 A To the effect that she was argumentative rather
4 than a team player.

5 Q Did he say what he meant by that?

6 A He didn't really go on to elaborate.

7 Q Did you ask him to?

8 A No.

9 Q Did you understand what he meant by being a "team
10 player"?

11 A Well, in HSE-8 we tend to work in teams -- or
12 while I was Group Leader. And it means that people have to
13 work closely on problems. They have to share ideas and they
14 get credit jointly on something rather than individually,
15 except at evaluation time.

16 Q Had he expressed any similar sentiments before
17 this?

18 A Not to my knowledge.

19 Q Did that Advisory Committee meet?

20 A Yes, it did.

21 Q Did it meet regularly?

22 A I don't know what its schedule was.

23 Q It's this committee that drafted the new
24 guidelines?

25 A That's correct.

1 Q With respect to Document 070003, a memo from you
2 to Distribution, the subject is "documentation of inactive
3 waste area locations and inventories." It's dated October 23,
4 1979.

5 It refers to the surveillance of inactive waste
6 areas, and the existing conditions at some of the areas. How
7 did you become aware of existing conditions at those areas?

8 A Well, as a result of work that Mrs. Rogers and
9 Linda Trocki had carried out at the inactive waste areas. By
10 this time, October '79, H-12 had assembled a summary of all
11 the data from Surveillance within the fenced areas of the
12 inactive areas. That is the data that they had.

13 Q What's that summary called?

14 A It's really not a document, per se. It's a memo
15 with some data tables attached with no interpretation.

16 Q Who prepared that?

17 A I think a technician or an individual that was a
18 technician at the time did some of the work, named John
19 Booth, but I think there was some more work done on it later.
20 I don't recall who did it.

21 Q Was there any sort of published report?

22 A No.

23 Q Was there any sort of unpublished report?

24 A Like I say, there was a memo with a whole set of
25 data tables, just numerical values of "radioactivity" or "no

1 radioactivity" for each particular sample, listed by waste
2 area.

3 Q Other than that, was there any other document
4 which detailed those conditions?

5 A As of 1979?

6 Q Right.

7 A There were some monthly reports that had been
8 submitted under Mrs. Rogers' project, A4-15.

9 Q How about since then? Have there been any
10 documents which detailed those conditions?

11 A Well, in March 1983 there was a summary of the
12 data for Area G published, and that was for all the data that
13 had been taken up, until the Environmental Surveillance
14 Reports for 1983 and 1984. The '84 report is still at the
15 printer's. It has summary data on the surveillance of the
16 waste areas.

17 Q Is LA-6848-MS the Source Document?

18 A Yes.

19 Q Have you relied on this document as a source of
20 information since the date of that memo?

21 A Yes.

22 Q For what purposes?

23 A Well, during the preparation of the Alternatives
24 document dealing with TRU wastes, we relied on it as a source
25 of information. It's been referenced in, I believe, almost

1 all of the documentation that's been prepared having to do
2 with the waste areas at Los Alamos, either documentation sent
3 to DOE or reports that are prepared regarding the waste
4 areas.

5 Q Any other way that it has been relied on?

6 A Just as a desk reference. It's a summary of what
7 we knew about those particular waste areas at the time that
8 it was published, and most people that work in the area of
9 waste management or surveillance, or want to learn something
10 about one of the old areas, can refer to it.

11 Q Has there ever been any discussion of updating it?

12 A The word "ever" is all-inclusive. There was
13 discussion in the late '70s, early '80s, of continuing an
14 update. I believe Mrs. Rogers talked to me about updating it
15 at someplace in 1980 or '81, and the need for the update.

16 Q Did you think there was a need for an update?

17 A I think what would have been more helpful is a
18 similar document prepared for other waste areas that weren't
19 covered in the report.

20 Q Has that ever been done?

21 A That's the purpose of the Site Characterization
22 Program.

23 Q Could you look at Document 07004, a memo from you
24 to Distribution. The second page of it is entitled, HSE-8
25 Geohydrologic Advisory Committee for New Pit Construction

1 Related to Waste Disposal."

2 The second sentence. "After the pits are dug,
3 each new pit is mapped or documented (geologic joints,
4 fractions, etc.)."

5 Q Do you know whether or not all the pits were
6 mapped?

7 A It depends on whose definition of "mapping" you
8 use.

9 Q What does "mapping" mean to you?

10 A Essentially, locating where the pit exists on a
11 USGS survey map, or we have a Laboratory coordinate system
12 that is unique to Los Alamos. The pit should be located with
13 reference to that coordinate system.

14 Q Does the term have any meaning with respect to the
15 description of the pit?

16 A Yes. In the geologic sense it means looking at
17 identifying the geologic characteristics of the different
18 rock strata that exist in the pit.

19 Q Identifying them in what sense?

20 A Identifying what unit of tuff it's in, identifying
21 fractures. The word says "fractions," it should say
22 "fractures." Identifying the interface between different ash
23 flows which compose the geologic strata.

24 Q After this time, was mapping in that second sense
25 done on the new pits?

1 A I believe each one -- well, I know each pit is
2 examined in terms of the details that go into the file. I am
3 not totally aware of everything that's put into the file.

4 Q Is documentation that doesn't include precise
5 location of fractures adequate?

6 A I think it would depend on the size of the
7 fracture.

8 Q In other words, if it's a large fracture?

9 A If it's a large fracture, it ought to be noted.
10 If it's a small, hairline crack in the rock, it probably
11 shouldn't be noted.

12 Q By "noting," you mean the precise location being
13 noted?

14 A Locate where it is in the pit.

15 Q Are you aware of Bill Purtymun ever objecting to
16 the layout or construction or any other aspect of pits?

17 A Yes.

18 Q Did that happen frequently?

19 A Not real frequently. It wasn't a pit he objected
20 to, he objected to a shaft.

21 Q Where was that?

22 A I think it was in Area L, which is a hazardous
23 waste site.

24 Q What was his objection?

25 A The rock was too fractured.

1 Q What was the outcome of that?

2 A Fill up the hole and drill a new hole.

3 Q Can you think of any other objections that he
4 made?

5 A No.

6 Q With respect to Document 070006, a memo from you
7 to H. S. Jordan, the subject is "Conditions of Waste Burial
8 Areas that are Inactive." In the second paragraph, about
9 half of the way down, it says, "Previous surface surveys
10 inside the fence indicate large areas of contamination in the
11 eastern trench area." Who did those surveys?

12 A Based on the date, I think they were probably done
13 by Linda Trocki, or Margaret Anne, or a combination of the
14 two, probably.

15 Q Then it goes on to say, "While the contamination
16 levels are not of immediate concern." Why were they not of
17 immediate concern?

18 A Because they are inside a fenced area with access
19 control. They were low enough that they did not represent an
20 outside pathway to be of immediate concern.

21 Q What was the concern about improving the view?
22 Just the first part of Paragraph 2.

23 A Harry Jordan was concerned that there was a lot of
24 materials stored, drums and reels of cable. In one corner of
25 the fenced area that waste site has a corner where there were

1 no trenches used for waste disposal. Somebody was using it
2 to store empty drums. LS-6, I think -- I don't know if they
3 were LS-6 by this time -- but one of the staff members on the
4 Environmental staff had stored drums he was going to use for
5 experiments. And telephone cables. For security, somebody
6 let the phone company into a corner of the unused waste site
7 to store their cables, their reels. The fence was rusted.
8 It needed housekeeping.

9 Q Was that housekeeping done?

10 A Yes.

11 Q Do you remember when?

12 A I believe it was late summer of '79.

13 Q On Page 2 it refers to "two summers ago a surface
14 survey was completed inside the fence." What is a "surface
15 survey"?

16 A Oh, that's taking soil samples, and using a
17 radiation detection instrument to walk over the area.

18 Q Who did that?

19 A I believe, again, it was Margaret Anne Rogers,
20 Linda Trocki, and we had a technician assigned to that
21 project, too. I don't remember which one it was.

22 Q Does this memo have anything to do with
23 recommendations made by Mrs. Rogers?

24 A I would say more "observations." Mrs. Rogers had
25 made several observations about conditions within the area,

1 and made some suggestions.

2 Q When did she make those observations?

3 A It was during my tenure as Section Leader from
4 July of '77 to March of '78.

5 Q With respect to Document 070008, it's a program
6 and budget proposal. Is there a number on it that is
7 important for identifying it?

8 A In the upper right-hand corner there is a number,
9 LS-14-1-98. That would translate to an Accounting code of
10 A4-14 at the Laboratory at that time.

11 Q Was Mrs. Rogers involved in any aspect of this
12 program?

13 A Only from a standpoint that when the Section met
14 to discuss any kind of project change, project progress, she
15 was present usually at the Section meetings.

16 Q Let me have you look at 070112, which is further
17 on in that same document. Section 27. The third paragraph
18 down refers to "mechanisms which by contamination could be
19 released from the containment of the burial emplacement"? Do
20 you know whether or not fractures of the tuffs is one
21 mechanism by which contamination can be release from the
22 emplacement?

23 A At that time, we were discussing them as one of
24 several mechanisms.

25 Q Has this been studied since then?

1 A Again, it's an all-inclusive question. I think
2 some aspects of it have been studied in what became H-12,
3 LS-6.

4 Q What aspects?

5 A More a discussion of the modeling of waterflow
6 through a mass. A large area of geologic formation has
7 fractures in it.

8 Q Have any conclusions been drawn?

9 A Not yet.

10 Q At the time this budget proposal was written, it
11 hadn't been ruled out as a factor, as a mechanism by which
12 contamination could be released?

13 A It had not been ruled out.

14 Q It has still not been ruled out?

15 A No.

16 Q Is ponding water considered to be a factor that
17 could lead to migration?

18 A If it's left for a long enough period of time,
19 yes.

20 Q What constitutes a "long enough period"?

21 A Months.

22 Q Has that ever happened?

23 A Not for months, to my knowledge. To my knowledge,
24 there has been temporary ponding.

25 Q "Temporary ponding" is not considered a problem?

1 A Not unless it's a large enough volume of water.
2 We take measures to prevent ponding, let's put it that way.

3 Q Do you consider the information available, or
4 studies done by the Lab, on the potential for migration of
5 radionuclides through fractures in the tuff to the
6 groundwater, to be adequate?

7 A They are adequate for current planning purposes.

8 Q Are there other ways that they are not adequate?

9 A It would still be nice to have a calculational
10 model that would take into consideration the influence of
11 fractures on water, or water vapor migration, through the
12 tuff.

13 Q Does doing that model require field studies, field
14 work?

15 A Yes. The input parameters would be some of the
16 work that's already been done, and that's looking at the
17 size, depth, width, Distribution of the fractures in the
18 different formations.

19 MS. SINGLETON: Could we go off the record a minute?

20 (Discussion off the record.)

21 Q With respect to 070013, a page of that document,
22 at the top of the page, or towards the top of the page, it
23 says, "Computer simulations do not attempt to predict a real
24 answer."

25 How and when were field tests made on migration

1 through pit fractures to test the computer model?

2 A That particular computer model did not have a
3 geological component at the time, and what they were
4 referring to in that sentence is moving radionuclides into
5 vegetation.

6 Q Was there ever a geologic component to studies
7 like that?

8 A Currently, no. There is not a geologic component,
9 but there is a hydrologic component.

10 Q Is a geologic component needed?

11 A Only in that it influences the hydrology. We
12 think that's been taken care of.

13 Q You think that the geologic aspect has been taken
14 care of by studying the hydrology?

15 A The model being referred to is BIOTRANS. It is a
16 surface phenomenon model rather than a deep geologic model.
17 So surface hydrology is more important than geology.

18 Q Looking at 070014 in that same document, in the
19 first paragraph, "The waste disposal site study is providing
20 information on the system at LASL sites of the potential
21 movement of radionuclides on the utility monitoring systems."
22 How did these studies continue to provide this information
23 after Mrs. Rogers left?

24 A You said "after" she left?

25 Q Right.

1 A You must realize this was written in 1978, in
2 January. She left in 1981. During that time period most of
3 these projects underwent substantial change in terms of both
4 their direction and objectives, as directed by DOE and
5 low-level waste programs, so in terms of the projects after
6 she left, they did deal with potential movement of
7 radionuclides in the generic sense. They did not address Los
8 Alamos in particular, only in that some of the experiments
9 included Los Alamos soils and materials in the experiments.

10 There was a tendency to move away from the
11 monitoring system studies after she left, as well, although
12 in the last year some of that research on methods for
13 measurement has been revisited somewhat, nowadays, by HSE-12.

14 Q With respect to the same page, second paragraph,
15 that refers to the NRC. Is the Lab subject to NRC
16 regulation?

17 A No, it isn't.

18 MS. SINGLETON: I'm sorry. I want to object to the
19 extent that that calls for a legal conclusion. However, he
20 may answer, to the best of his ability.

21 A The Laboratory is not subject to the NRC
22 regulations or rules.

23 Q Is there something you wanted to add to that?

24 A No.

25 Q Looking at Document 070029, which is a Program and

1 Budget Proposal, whose number at the top is LS-20-1-9A;
2 within that is Document 070035. Can you describe how
3 monitoring techniques have been improved since 1978?

4 MS. SINGLETON: Are you referencing a specific sentence
5 you want him to look at?

6 Q It says in the first paragraph, "This program will
7 pay particular attention to improving monitoring techniques
8 in arid environments."

9 A Most of the improvements have come, in not the
10 basic methods used, but rather an ability to obtain better
11 data, from the standpoint of using modern-day acquisition
12 systems, applications of existing soil physics measurement
13 techniques, too, that are usually used in soil science; they
14 have been moved into the area of measurements in monitoring
15 of moisture for waste disposal areas.

16 Q Have the improvements been based primarily on data
17 gathered from simulation or modeling, or field studies or
18 what? Actually there were three things I mentioned.

19 A Modeling can be used as an analytical tool to
20 determine -- within the uncertainty of the parameters you
21 give the model, but you can tell where your biggest
22 uncertainties are, if you use the model in the correct way,
23 that is, make changes in one parameter and see how sensitive
24 the output is to those changes -- it tells you where you
25 ought to do your measurements.

1 Q Have there been studies of different monitoring
2 techniques?

3 A At Los Alamos?

4 Q Yes, at Los Alamos.

5 A At Los Alamos there have been different approaches
6 to the monitoring techniques. This particular program
7 underwent a transition away from monitoring sometime in the
8 1982 time frame. So a lot of that work was really
9 discontinued.

10 Q It goes on to say that "irregularities in
11 subsurface conditions may result in wide variability in the
12 amount of migration occurring from a burial site." What more
13 is known now about these irregularities?

14 A Well, Los Alamos is hard to use for an example,
15 because our formations are quite uniform, relative -- and
16 that's a comparison - to some of the other DOE sites. And
17 this program, in particular, was really not just strictly to
18 address Los Alamos problems, but other low-level waste sites
19 in the country. If one picks different waste sites, for
20 example, New York State and West Valley waste sites, or sand
21 lenses that represent irregularities in the soils there,
22 there are a lot of questions whether they are interconnected
23 between different burial areas on the site.

24 In Sheffield, Illinois there were gravel beds that
25 were immediately under the waste trenches that, since they

1 were discovered, have been illustrated to actually divert
2 waterflow a different direction than one might expect.

3 Q Have the differences in ion exchange capacities
4 permeability, or saturation properties, between different
5 types of rock units or tuff been identified?

6 A Not all of the parameters have been determined
7 yet, but some of the parameters have. Part of the effort in
8 the Environmental Sciences Group has been to make some of
9 those measurements.

10 Q What hasn't been determined yet?

11 A I would have to talk to the Group to determine
12 what they have and haven't done yet.

13 Q On 070036, at the bottom of the page, it says,
14 "Future field testing of monitoring will continue." Did that
15 happen?

16 A No. Some of it did, but some of it did not
17 happen.

18 Q What did and what didn't?

19 A Again, I would have to go back and check with the
20 Environmental Sciences Group to be more specific.

21 Q On 070037, second paragraph, last sentence, it
22 refers to an "internal trench drainage system." Was that ever
23 tried?

24 A No, it wasn't.

25 Q Was any other system dealing with drainage,

1 rainwater runoff, and ponding in pits tried?

2 A Just essentially surface diversion to get rid of
3 any kind of runoff into the pits, and surface diversion away
4 from pit areas that are open.

5 Q Was this ever considered a problem?

6 MS. SINGLETON: What is "this"?

7 Q Drainage, rainwater runoff, and ponding in pits.

8 A Yes.

9 Q In what sense was it a problem?

10 A Well, ponding and runoff are to be avoided just as
11 good practice in a waste disposal area. In terms of the
12 runoff, you don't want water running into open pits that are
13 in operation, so you put in structures or grades or mounds of
14 soil or crushed tuff to avoid the runoff back into the pit;
15 water diversion structures.

16 Q Looking at Document 07019, Program and Budget
17 Proposal, numbered LS-15-1-95, within that document is 07024,
18 Section 30, entitled "Expected Results in 1979."

19 In the middle of the paragraph it says, "Together,
20 the surface and subsurface investigations present a complete
21 picture of the Distribution of the radionuclides in the
22 vicinity of the waste disposal pits or shafts."

23 Do you consider that to be an accurate statement?

24 A At the time I did. I don't now.

25 Q What changed?

1 A Understanding of the role of plants and surface
2 cover design on the waste trenches, in terms of their effect
3 on water balance.

4 Q Where did the understanding come from?

5 A From the Environmental Sciences Group in their
6 research that has been carried out since the time this was
7 prepared.

8 Q Are such investigations conducted on each site
9 now?

10 A Not each site, no.

11 Q On which sites?

12 A We use a demonstration area, rather than one of
13 the active waste areas, to carry out our preliminary cover
14 designs. And in Area B, one of the old inactive sites, we
15 did a restoration of the surface, removed the trees and so
16 forth. So we worked with the Environmental Sciences Group to
17 put in an experimental cover there. And in Area G, which is
18 a currently active waste site, we have also put in an
19 experimental cover design in one of the pits, as they closed
20 it out, to look at using natural materials, or inexpensive
21 materials, such as gravel and cobble and so forth, to look at
22 different cover designs, in terms of the design, on the
23 influence on the moisture and water that might get through
24 the cover into the waste.

25 Q Can you explain what the difference is between

1 "sampling" and "monitoring," if there is a difference?

2 A "Monitoring" is just sort of a general term that
3 denotes an ongoing activity where sampling is part of that
4 program. Sampling is the specific act of going out and
5 taking physically -- I want to say a sample. I can't think
6 of another word. Where you physically go out and take a
7 portion of some media of the environment, soil, water,
8 vegetation, and the sampling program is part of an overall
9 monitoring program.

10 Q Look at Document 070040. It's entitled "Annual
11 Report for the Evaluation of TRU-Contaminated Waste Areas."

12 A I am going to have to take some time to find that.

13 Q Let me show you mine, if that will help.

14 A That will be fine.

15 Q Is there something missing from this, like the
16 results? Is this a complete document, as far as you know?

17 MS. SINGLETON: To speed this up, do you think what is
18 missing is at the end?

19 MS. FRIEDLAND: I think so.

20 Q Look at 070064, the last paragraph. Figure 3.

21 A Yes. There is a figure missing. This is Figure
22 3. That's the correct figure.

23 Q As far as you can tell, there is nothing missing
24 from the document?

25 A Well, from just reading it now, this much later,

1 it appears there is a lack of a table with the data, or some
2 patterns. There should be some patterns of contamination on
3 the diagram, which aren't there.

4 Q Do you know where that is? Is it possible to
5 locate that page? Was it ever part of the report?

6 A As this was copied, it probably wasn't, but the
7 intent was to have it there.

8 Q Did it exist?

9 A Yes, it existed.

10 MS. SINGLETON: Why don't we take a second for him to
11 look at his original and make sure a mistake was not made in
12 our copying of it.

13 MS. FRIEDLAND: Why don't we do that during a break, and
14 we will come back.

15 MS. FRIEDLAND: We can hold on to that.

16 Q With respect to Document 014807, it's a memo from
17 Purtymun through you to Miguel Salazar. The subject is
18 "Location of Triple Shaft at Area G, TA54." You can look at
19 my copy.

20 There is a discussion of a vertical joint. Was
21 this pit mapped in any way?

22 A It's not a pit, it's a shaft.

23 Q A shaft, sorry.

24 A I would have to talk to Bill to find out what he
25 put in the file on it.

1 Q From this description in that document, could you
2 locate the joint?

3 A No.

4 Q What's done when roots are present in the joints?

5 A They are left.

6 Q Look at Document 014820. It's a memo from
7 Purtymun to Harry Patterson. There is a reference to a joint
8 there. Could you locate the joint from that description?

9 A I probably couldn't, because I am not familiar
10 enough with the ash flow units to be able to say which is
11 which. I would have to use the reference materials.

12 Q What sort of reference materials?

13 A That which identified the ash flow units for that
14 particular area of the Lab. An example, is like there is a
15 report out on, I think, geohydrology of Mesita del Buey,
16 which is where this waste area is located. I am not familiar
17 with the tuff units by their specific names.

18 Q Looking at Documents 070714, it's a memo with an
19 attached document from you to John Warren dated January 23rd,
20 1981, subject, "Contribution to WPAs for 1-411."

21 Particularly with respect to a page within that,
22 070175, it says, "Where surface contamination has been
23 encountered, a more detailed surface and subsurface study
24 will be necessary during the following year."

25 Are subsurface studies generally initiated only

1 after discovery of surface contamination?

2 A No.

3 Q When are they initiated?

4 A They should be done on all of the areas.

5 Q Are they?

6 A I think all of the current inactive and the active
7 roadway sites have such subsurface monitoring in one form or
8 another.

9 Q When did that start?

10 A I think we actually did some sampling and drilling
11 in 1981. It's been continuing.

12 Q On Page 070720, within that document, where it
13 refers to DOE Final Burial Site Criteria, are there final
14 burial site criteria?

15 A Only in the form of the DOE orders, today.

16 Q That's the only place?

17 A Well, there was a document that had that title
18 floating in the DOE system, again for review at one time, but
19 it never was really published as an instructive set of
20 criteria to follow.

21 Q Was the addition of a staff member funded in
22 connection with this?

23 A No.

24 Q Do you know why not?

25 A Because we transitioned from funding on one

1 program. One staff member was transitioned from one set of
2 funding to another set.

3 Q Who was that?

4 A Don Mayfield.

5 Q Why was that done?

6 A Well, he was chosen in particular because -- well,
7 two factors. One, the funding for some of the surveillance
8 work under the FUSRAP program had declined, and he had been
9 the person who carried out most of the field surveys of Bayo
10 Canyon and Acid Pueblo Canyon under the FUSRAP program.
11 Therefore, he had environmental measurement type surveillance
12 experience. In other words, he had the experience on the use
13 of the instruments, experience in soil sampling, experience
14 in helping design sampling programs, and some experience in
15 subsurface sampling that was done in Bayo Canyon. And he is
16 a trained health physicist.

17 Q Is this your note on 070724? And if it is, can
18 you read it? The note that's scratched out.

19 A No, that's not my handwriting. I can't read the
20 last line, either, and it's not my handwriting.

21 Q Looking at 072171, which is an informal report
22 titled "Movement of Fluids and Plutonium from Shafts at Los
23 Alamos, New Mexico," there is an abstract on Page 072173. Do
24 you conclude from this study that fractures and joints in the
25 tuffs on unexposed pit walls are not dangerous enough to seal

1 them prior to disposal?

2 A I don't think you can conclude either way.

3 Q Are conditions in some disposal pits, for example
4 Pit 8 in Area G, comparable to the conditions in this
5 experiment, regarding the type of waste or its liquid state?

6 A I really don't know the answer to that one.

7 MS. SINGLETON: May I have a minute?

8 (A conference was held off the record.)

9 Q And on Page 072177, in that document where it
10 says, "Plutonium that moved with fluids in the tuff was
11 probably retained by the filtering properties and adsorption
12 (ion exchange) in the tuff."

13 Was the "probably" in that statement ever changed
14 to "definitely" by any field studies?

15 A I don't think you can ever say anything definitely
16 in science. There have been some measurements on the ion
17 exchange properties of tuffs that indicate that it's relative
18 to something else, usually a fairly strong adsorber of
19 plutonium, americium, cesium, in solution, out of solution.
20 Ion exchange properties are such that you never have absolute
21 adsorption. You always have some fraction, even though it
22 may be very small, because of radioactivity. With such a
23 powerful tracer you can still detect a small trace amount of
24 material that has gone from one part of the adsorption media
25 to the next.

1 We have what are called "distribution
2 coefficients," which is a parameter that's fairly
3 all-inclusive of physical filtering, physical absorptions,
4 chemical absorption on any media that we use in our models.
5 And we have those numbers for the tuff. They vary somewhat
6 with the units.

7 Q Is this assumption, that the plutonium was
8 probably retained, based on those studies?

9 A No. I think the assumption in that particular
10 publication is just based on overall behavior of plutonium
11 that's been put into the environment in other places in the
12 Laboratory in the past, where the plutonium and americium are
13 absorbed in the tuff. The examples are the TA-45 liquid
14 waste treatment plant that was used from 1952 to '63. The
15 outfall went onto the tuff and then the trace amounts of
16 radioactivity that were in the outfall materials were
17 absorbed in the tuff.

18 Q Do you know why the experiments in connection with
19 the study were done in 1968, but this study wasn't published
20 until '78?

21 A I suspect that people sat on the data, that they
22 didn't have time to sit down and put the data all together
23 and get it out as a publication. That's a common occurrence.

24 Q Let me show you Document 070697, a memo from you
25 to John Warren, a monthly report. It refers to sampling at

1 Area F, and proposed cleanup at Areas B and C, and some
2 activities at Area E, also. What was that pursuant to? Was
3 that pursuant to some project or program?

4 A It was part of that surveillance program that was
5 funded by the Interim Waste Operations program that we
6 started in FY '81, I think it was, or -- yes, it had to be.
7 I think it was FY '81.

8 Q Let me show you Document 070677, a letter from you
9 to Melvin W. Carter, dated April 22nd, 1982.

10 It refers, on the first page, to a report
11 entitled, "DOE Operating Guidelines for the Shallow Land
12 Burial of Low-level Radioactive Waste." This is the DOE
13 operating criteria?

14 A I think it was one at that particular time. It
15 was one version of it.

16 Q In the same document, on 070678, it says, "As a
17 second example, percolation through waste repository is
18 unlikely because the local rate of evapotranspiration exceeds
19 the rate of input by precipitation."

20 Is that a certainty?

21 A It's not a certainty. It's unlikely. I said it's
22 "unlikely." I think that's the word I used. The patterns of
23 rainfall input, and snowfall input, covered in that somewhat
24 -- and findings since, is, if one does simple straightforward
25 calculations -- the evapotranspiration rate on Waste Area G,

1 for example, is roughly twice that of the moisture input into
2 the plateau.

3 In other words, it could evaporate twice the water
4 that goes in. The Environmental Sciences Group is now
5 telling me that with proper vegetative cover that goes up to
6 around 80 percent. That would be called the
7 evapotranspiration rate. Let's see. It's not 80 percent.
8 It could handle 80 percent more water. Let's put it that
9 way. It's larger than we originally thought, if water
10 management in the trench covers is carried out properly.
11 Moisture measurements that were carried out in Area G
12 indicate that we do not have what you would call "free" water
13 in the tuff at depth.

14 What we have, and we are still arguing about it,
15 is about a 4 percent moisture content in the tuff. And
16 augering samples from down in the tuff below the trenches
17 would come up with anywhere from two tenths to three and a
18 half percent, someplace in there, in terms of percent water.

19 That's not free flowing water. That's essentially --
20 well, one argument is that it's bound water that's in the
21 tuffs all the time. The other argument is that it's water
22 that is moving as a vapor through the tuffs because of water
23 input from above. Obviously, some of that water has to go
24 down, that infiltrates into the soil, or into the waste
25 trench. The question is: What happens to it when it rains

1 and then the sun comes out and you get drying? What happens?

2 Well, there is a whole set of mechanisms that move
3 water upward, as well as downward, and what's the balance?
4 And that's the bottom line. What's the water management
5 strategy that's best for your trench covers? We don't have
6 all the hard, final answers. Our feeling is that, based on
7 moisture monitoring, we don't have a lot of water in the
8 bottom of our trenches. We don't have free water. We have
9 water. In other words there is moisture present, but the
10 question is, is it moving? And that one, we haven't seen any
11 trends in the moisture monitoring techniques that have been
12 used so far that say it's moving.

13 Q Does this sentence that we started out with take
14 into account the pocket of perched aquifers above the
15 groundwater?

16 A No. That sentence was really intended only to
17 address the tuffs. The perched aquifers in Los Alamos are to
18 the side and below the level of the bottom of the trenches.

19 Q It hasn't been determined that no such aquifers
20 exist?

21 A No. We have got holes deep enough for moisture
22 monitoring. If that aquifer were to extend back under the
23 waste area, those holes should have detected it. It didn't.

24 MS. SINGLETON: Might we take a little break?

25 MS. FRIEDLAND: Sure.

1 (At 11:24 A.M. a recess was taken.)

2 Q Look at Document 074018, a memo from you to John
3 Warren, on "A4-11 Waste Disposal Area Surveillance." What are
4 the maps referred to? What is the area that you report?

5 A The maps referred to is mapping of the whole Waste
6 Area G via computer, using computer graphics so that we have
7 a mapping system set up on the computer that you can go back,
8 and you can superimpose sampling points, locations of
9 different monitoring stations, and so forth, and then get a
10 nice printout of the map. But it takes some time to prepare
11 it.

12 Q Were the maps actually done?

13 A Yes. I think there should be some of them. It's
14 this type of map right here.

15 Q Document 07214 is the document, "Surface
16 Reconnaissance through 1980 for Radioactivity at Radioactive
17 Waste Disposal Area G, at the Los Alamos National
18 Laboratory." The number on the front is 071172.

19 Let me show you 073984 by John Rodgers, entitled
20 "Assessment of the Revision of the Manual, Chapter 0511,
21 Limits for Shallow Land Burial of TRU Wastes and of TRU
22 Greater Confinement Options at Los Alamos." When was that?

23 A It's not dated? It should have been fiscal year
24 1982.

25 Q Do you agree with the conclusions at the end of

1 that report?

2 A Could I look at them again? Yes, overall I do.

3 Q Within that document, 073993, it says, "And even
4 then, there remains the problem of knowing the density,
5 spacing and orientation of fractures and joints in the rock
6 along the flow path. It is axiomatic that additional
7 complexity in modeling requires a concomitant increase in
8 quantity and detail of data, which sometimes may be difficult
9 or practically impossible to obtain."

10 Does that suggest the need for more geologic work
11 in that area?

12 A If you are going to model, as I stated earlier,
13 fracture flow on a large geologic -- a large basis over a
14 large area, you have to find the field data. And the problem
15 is getting at the information you need. You essentially have
16 to dig up the rock formation to get the information you need
17 and by that time the fracture is no longer important.

18 Q Does the mapping project that Mrs. Rogers was
19 working on have any connection to what he is talking about
20 there?

21 A It was my impression the mapping project itself
22 did not address fractures in any detail. But there were
23 separate studies of fracturing of the tuffs that were done.

24 Q By whom?

25 A Mrs. Rogers.

1 Q On Page 074008, it refers to "more detailed
2 modeling based on detailed representation of the subsurface
3 geology and hydrology plan for the next phase of this study."

4 Was that work done?

5 A Yes.

6 Q Who was that done by?

7 A Myself and John Rodgers.

8 Q What does that mean, "representation of the
9 subsurface geology and hydrology"?

10 A That is, essentially, taking the existing
11 information that we have and making some assumptions about
12 that subsurface material, and then doing some modeling, some
13 calculational studies to test the assumptions from the
14 standpoint of, okay. If we assume the parameter on
15 hydrology, of conduction, at 10 to the minus 7 centimeters a
16 day, what does that mean in terms of migration down? What if
17 we use 10 to the minus 5 a day? How does that change the
18 calculation?

19 Q This did not involve further field studies in
20 geology?

21 A There was no way, with the resources we had, to do
22 more field measures.

23 Q I will show you 07321, entitled, "Distribution of
24 Radionuclides and Water in Bandelier Tuff Beneath the Former
25 Los Alamos Liquid Waste Disposal Site at 33 years,

1 Particularly with Respect to the Nuclear Waste Management
2 Implications on 073226."

3 Did this change the viewpoint concerning
4 radionuclide migration?

5 A It changes your viewpoint only if there is a
6 million-gallon head of water at it, which was the case in
7 this case. It was done deliberately to see what the
8 migration rates were. The chemical form was plutonium and
9 americium in nitric acid dumped into this waste absorption
10 bed. It was meant for disposal of liquids. It does not
11 relate directly. It does not translate directly to solid
12 waste management. There would have to be some careful
13 assumptions about the data before you could apply it directly
14 to our solid waste area.

15 Q Does it suggest the need for field sampling as
16 opposed to Laboratory tests?

17 A Oh, yes.

18 Q Was there any work that followed this?

19 A On this particular waste area?

20 Q Right.

21 A Not yet. We have requested to do so.

22 Q What have you requested, and to whom?

23 A Well, we are in the process of requesting that we
24 continue the drilling to deeper depths.

25 And the first request went into the system in what

1 we call an ISRD proposal within the Laboratory, but the
2 funding is too large for that particular source of funding,
3 so we have encouraged the principal investigator to seek
4 funding through the Department of Energy.

5 Q Who is the principal investigator?

6 A Jack Nyhan is the follow-up investigator to this
7 study.

8 Q There is a place, in the "nuclear waste management
9 implications" where he has an exclamation point. Is that
10 expressing some particular significance to that sentence or
11 what?

12 A That's Jack Nyhan. Yes. Obviously, he means to
13 emphasize that there is some movement taking place.

14 Q With respect to Document 072700, "Development of
15 Procedures to Estimate Surface Runoff Sediment Yield and
16 Contaminate Transport at Los Alamos, New Mexico," one author
17 was Leonard J. Lane, on temporary assignment at the Lab. Who
18 was paying him?

19 A I think that -- I am not sure how the money was
20 flowing. We were contributing to the budget of LS-6 at the
21 time to cover some of the costs of his working with us on
22 that project.

23 Q "We" meaning H-8?

24 A H-8 yes.

25 Q And LS-6 the rest?

1 A Yes. In one of their project funds. I am not
2 sure which one.

3 Q I am not sure what the date of this report was.
4 There is something written on the front, handwritten, "2/83."

5 A That would sound about right, February of '83.

6 Q Is this document, numbered 073703, the Dames and
7 Moore study that you referred to before?

8 A Yes.

9 Q What in here would you interpret to be criticisms
10 of the Lab?

11 MS. SINGLETON: If that was meant to characterize his
12 earlier testimony, I object. I don't think it's an
13 appropriate characterization.

14 A As I stated earlier, I didn't characterize what
15 they had done as criticisms, but rather observations and
16 suggestions. I would have to go back and reexamine the whole
17 study to really get more specific.

18 Q You can't think of anything beyond what you said
19 before?

20 A No. I characterize something that's an
21 observation or suggestion as not necessarily being a
22 criticism, but somebody else's view of how something ought to
23 be done.

24 Q Did you consider this to be accurate in its
25 observations?

1 A Yes. Pretty much so. It had a few mistakes in
2 it, but those mistakes are mistakes of interpretation, I
3 think.

4 Q Let me just ask you a few general questions about
5 the documents you have provided. Were these documents
6 provided as being the Laboratory's response to suggestions
7 made by Mrs. Rogers? Is that the general category? Is that
8 what you looked for in determining which documents to bring?

9 MS. SINGLETON: I want to make an objection to the
10 question, because it calls for the witness to make a legal
11 conclusion. I also think that the prior deposition record
12 will show the basis on which these documents were provided.

13 MS. FRIEDLAND: Well, tell me again the basis on which
14 they were provided.

15 MS. SINGLETON: As we explained to you, Mr. Hansen
16 brought down a number of documents which he did not
17 necessarily feel were responsive to any kind of comment Mrs.
18 Rogers had made. However, for some period of time, Mrs.
19 Rogers was in a Group where Mr. Hansen was the Section
20 Leader, and that Group had, generally, weekly staff meetings
21 at which matters were discussed, and Mrs. Rogers could have
22 made comments during those times on various subject matters.

23 In addition, he brought down documents which he
24 considered to be backup documents, to the extent that they
25 may have been on the area that was listed in your subpoena,

1 but not done in response to anything that Mrs. Rogers said.

2 Q (By Ms. Friedland) Do you agree with that?

3 A Yes.

4 Q Let me interrupt going through the documents to
5 ask you some other questions. Do you know whether any
6 aquifer tests have been conducted in the alluvial deposits in
7 Mortandad Canyon?

8 A Yes.

9 Q When was that?

10 A I think that was -- I guess I am not sure I am
11 familiar enough with what people call an aquifer test. But I
12 know there has been some testing of the perched aquifer in
13 Mortandad Canyon, both from the point of drilling into the
14 aquifer to see what's below it, and flow measurements in
15 terms of movement, of rate. The rate of movement is
16 generally down the water drain which is downhill.

17 Q When were those tests done?

18 A They have been done over a period of years,
19 starting -- I think some of those measurements were already
20 made when I came to the Laboratory in 1977, but there have
21 been some drillings done in -- I think they were done in the
22 '79 to '82 time frame, someplace in there.

23 Q Who was in charge of those? Who did those tests?

24 A One set of tests was done -- we had USGS come down
25 and direct a set of drillings in that particular aquifer.

1 Q What were the results from those tests?

2 A The water is indeed a real, true perched aquifer.
3 The aquifer is not going anywhere. Apparently the
4 evapotranspiration rate is enough that losses during the dry
5 seasons tend to offset the input to the aquifer. As I
6 recall, and Bill Purtymun can answer this better than I can,
7 the holes drilled through the aquifer down into the rock
8 below indicated there was some saturation of the tuff, but it
9 stopped at -- it's either 30 feet or 30 meters, and I am not
10 sure which it is.

11 Q Is there a manual or guide for monitoring
12 procedures?

13 A We have procedures written for some of our
14 monitoring programs, but not for all of them.

15 Q Where are those procedures contained, and for
16 which monitoring programs?

17 A There is a generalized procedure manual for air
18 sampling that was published by Tom Gunderson.

19 Q When was that done?

20 A 1982, I think.

21 There is, in preparation, a procedures manual for
22 all the chemical procedures being used for samples once they
23 hit the chemistry Laboratory. There is a procedures guide or
24 statement of what are current procedures for food sampling
25 that works.

1 Q Where is that contained?

2 A It's in a separate report published by John
3 Salazar.

4 Q When was that published?

5 A 1984, I believe. We are in the process of trying
6 to document all of our surveillance procedures, but not all
7 of them are complete.

8 Q How about soil, water and vegetation?

9 A I don't believe there is one on vegetation yet.
10 There is one on food and fish sampling. Soil sampling, I
11 don't believe we have documented a procedure, because we are
12 following a general DOE guidance manual on surveillance
13 methods.

14 Q This is different from the DOE Order?

15 A Yes. That's a rather thick publication. It first
16 came out as an ERDA document and was later reissued as a DOE
17 document. That is a generalized guidance document on the
18 design of monitoring programs for different environmental
19 media.

20 Q What's the frequency of sampling in the monitoring
21 programs that are in effect?

22 A It varies all over the map. Air samples are
23 continuous. Then, if we need to, we can set up selected air
24 sampling stations. External radiation monitoring is
25 continuous.

1 Getting into some of the more specific samplings,
2 for soil sampling we have a generalized network for soils
3 that's twice a year, if it's for Waste Management Areas. It
4 can vary, depending on the area and what we found the last
5 time that we were there, anywhere from once a year to once
6 every five years.

7 Sediment sampling is done, usually, twice a year
8 in terms of the canyon systems. This is all documented in
9 the Environmental Surveillance Report. So, if I say
10 something wrong, the surveillance report would take
11 precedence over what I said.

12 Q That talks about the frequency of sampling?

13 A Yes.

14 Q Is there any monitoring being done in Acid Canyon?

15 A Not anymore.

16 Q When did that stop?

17 A After the cleanup in 1983.

18 Q How many tritium monitoring sites are there on the
19 hill?

20 A We just rejuggled our air sampling stations is why
21 I have to stop and think of numbers. I believe right now we
22 are at something like 25 continuous monitoring stations.

23 Q Who is responsible for maintaining and replacement
24 of monitoring installations?

25 A Well, maintenance and sample changing is done --

1 replacement of parts and keeping the systems running -- is, I
2 think right now, George Brooks is in charge of doing that.
3 In the past, that was Johnny Salazar. But there is always a
4 staff member supervisor that oversees the technician's work.
5 In the past it was Tom Gunderson. Presently Tom Buhl is in
6 charge.

7 Q Is there a monitoring well at Area E that was
8 destroyed?

9 A Area E?

10 Q Yes.

11 A I don't personally know of one, but it's always
12 possible, if somebody drove a piece of heavy equipment over
13 one of our monitoring wells, somebody could have wrecked it.
14 It's always possible.

15 Q No one has reported to you that it was destroyed?

16 A They wouldn't, necessarily, in my present position
17 in the Division office. It's a Group function.

18 Q Do you know how frequently pressure readings are
19 taken at the trench area of Area G?

20 A I don't even know what you are referring to.

21 MRS. ROGERS: Trenches A, B, C, where they have
22 the stored waste.

23 Q In the concrete culverts.

24 A Okay. The stored TRU plutonium-238 waste. It's a
25 specific isotope. I don't know. HSE-7 would have to answer

1 that.

2 Q Do you know when the last measurements were made?

3 A No.

4 Q There is sort of a beehive in Area G?

5 A Yes.

6 Q Is that part of an ongoing study?

7 A It's part of our monitoring study.

8 Q What is it monitoring? What is it doing?

9 A The bees forage in the wild flowers and what not.

10 And if tritium is present in the plants, it will usually be
11 detected in the honey.

12 Q Has it been?

13 A Sure. Trace amounts.

14 Q How often is Area G completely traversed by foot
15 in order to check the pit cover?

16 A Once a year, minimum.

17 Q Is it normally only once a year, or is it more
18 than that?

19 A I am speaking for what I know the Surveillance
20 Group to do. The Surveillance Group does. I don't know if
21 HSE-7 makes those checks.

22 MS. FRIEDLAND: Why don't we take our lunch break now.

23 (The deposition was recessed at 11:55 A.M. and resumed
24 at 12:52 P.M. as follows:)

25

EXAMINATION (Continued)

1
2 BY MS. FRIEDLAND:

3 Q Mr. Hansen, following the arbitration from Mrs.
4 Rogers --

5 MS. SINGLETON: Objection to the form of the question,
6 your characterization of the grievance hearing as an
7 arbitration, but you can go ahead and answer, whatever it is.

8 Q Were you approached by anyone concerning work for
9 Mrs. Rogers?

10 A Following the grievance?

11 Q Right.

12 A Yes.

13 Q Who were you approached by?

14 A I think Sigfried Gustafson called me directly, I
15 am not sure what the position involved was, in terms of her
16 authority to talk to me directly. Anyhow, I directed --

17 MS. SINGLETON: Just a second.

18 (A conference was held off the record.)

19 A In any event, I directed the person that called me
20 to talk to my Division Officer. And, in fact, I think they
21 wanted to talk to the Associate Director's office.

22 Q I need to get it clear. Who called you?

23 A Let me backtrack. It's my recollection that
24 Sigfried Gustafson no longer worked at the Laboratory at the
25 time of the hearing or on the arbitration.

1 Q You can correct me if I am wrong, but as I
2 remember your testimony in earlier proceedings you were
3 contacted by her at the time that Mrs. Rogers was going to be
4 RIF'd about a position?

5 A Perhaps I am confusing the two.

6 Q You recall that as being accurate?

7 A Yes.

8 Q Now, try to be particular. Think particularly of
9 after the hearing.

10 A Okay.

11 Q I will call it a hearing so that we can save time
12 with objections. Try to think about that time.

13 A Okay.

14 Q The hearing was in January of 1982.

15 A Yes.

16 Q And the ruling was after that, April of '82.

17 A Okay.

18 Q Were you contacted following the ruling as to a
19 position for Mrs. Rogers?

20 A Yes. My Division Leader talked to me.

21 Q Who was your Division Leader?

22 A Jesse Aragon.

23 Q When did he contact you?

24 A Someplace in the April-May time frame, after the
25 hearing results were in the hands of the Laboratory.

1 Q What did he say to you?

2 A He asked me if I had a position that Mrs. Rogers
3 could fill.

4 Q What did you say?

5 A I said I didn't believe I had any positions open,
6 but to let me check.

7 Q What did you do to check?

8 A I sat down with the Deputy Group Leader and we
9 went over the budget situation to see if there was any
10 leeway, so to speak, in the budget for any additional person.

11 Q Did anyone suggest to you that you could apply for
12 additional funding for Mrs. Rogers?

13 A No.

14 Q Did anybody encourage you to do that?

15 A No.

16 Q Did you think that was possible to do that?

17 A No.

18 Q Why not?

19 A Because our budgets on the Indirect are set pretty
20 much ahead of time.

21 Q How much ahead of time?

22 A Well, usually for a given fiscal year, in March,
23 prior to that fiscal year, we ask for whatever our budget is
24 going to be, starting the October following. Then in August
25 and September we rework the program again. At that time our

1 budgets become reasonably well settled for the coming year.
2 In about the March time frame, during that fiscal year, we
3 rework the budget again and make our final request to finish
4 the year.

5 Q That time had already passed?

6 A Yes.

7 Q How about for future programs?

8 A Well, during that time frame we were a little
9 uncertain on future programs, but anytime you work on budgets
10 that are supported by contract work, there is a certain
11 amount of uncertainty. We were fully staffed, as far as we
12 could tell, for fiscal years'-end, '82 and '83.

13 Q Did you have any other conversations with Mr.
14 Aragon?

15 A He called me back and I think it was about -- I
16 don't remember the time span between the first and second
17 call, it was within a few days -- to double check to see if I
18 had any funding available.

19 Q Did anybody else contact you concerning a position
20 for Mrs. Rogers?

21 A Someone, I think, besides Jese did, but I can't
22 remember who it was.

23 Q Julia Hardin?

24 A It could have been her.

25 Q When did that other person contact you?

1 A It was in the same time frame as Jesse's phone
2 call.

3 Q Did you make a separate check when that other
4 person called you? In other words, did you do anything
5 additional to what you have already discussed?

6 A I don't believe I did. I think I had the
7 information on hand.

8 Q Who is Michelin Devaurs?

9 A She is currently a staff member in HSE-8.

10 Q When did she start there?

11 A Late 1984.

12 Q What is her background?

13 A She is a hydrologist, as far as I know.

14 Q What does she work on?

15 A I am not positive what all her assignments are,
16 since I am no longer Group Leader. In general, she has been
17 working on problems of hydrology connected with modeling
18 surface hydrology, and the projects that this type of work is
19 connected to was some of the hazardous waste programs that
20 HSE-8 has.

21 Q Whatever she is working on, when would that have
22 been proposed?

23 A Some of the work was proposed in January of 1983,
24 but wasn't funded until the beginning of fiscal year 1984,
25 October of '83. The work that she has been connected with --

1 most hazardous waste work really didn't start in full effort
2 until early 1984.

3 Q Are you sure she transferred in '84?

4 A Yes.

5 Q Did she come from somewhere else in the Lab?

6 A Yes, from Group LS-6.

7 Q How about Naomi Becker? When did she come?

8 A She joined the Group in 1980, I believe.

9 Q What's her background?

10 A She is a hydrologist environmental engineer.

11 Q Who were the geologists in the Group in 1982?

12 A Bill Purtymun.

13 Q That's it?

14 A Yes. I consider Naomi a hydrologist. There is
15 some difference in training.

16 Q Now, with respect to the Comprehensive
17 Environmental Assessment and Response Program, how is that
18 funded?

19 A That is funded out of the Albuquerque Operations
20 Office from the Department of Energy.

21 Q When was it funded?

22 A March 1984.

23 Q How many people, staff members and technicians,
24 worked on it?

25 A They are working on it now. Somewhere between

1 eight and twelve, depending on what stages we are in on the
2 program. They aren't full-time employees on it. We call in
3 their expertise as needed.

4 Q Is that done through H-8?

5 A I am the Project Leader on it.

6 Q How many geologists were assigned to CEARP?

7 A Right now there is only one, Bill Purtymun.

8 Q What was the program supposed to have
9 accomplished?

10 A The program is supposed to examine the past and
11 present practices in terms of all hazardous chemical waste,
12 whether it be disposal released through water pathways or air
13 pathways. We were supposed to assess each of five plants in
14 three national laboratories in the DOE system, for where they
15 are in terms of compliance with federal regulations and state
16 regulations. That's the Phase 1 of the project which we are
17 in right now.

18 Phase 2 is then to do full work monitoring and any
19 special studies of whatever environmental pathway we need to
20 look at. Some of those programs are to start this coming
21 summer.

22 And then it goes on into Phase 3, which is a
23 solutions phase, which is engineering studies, taking what we
24 learn from the other two phases and putting together some
25 kind of remedial action for the facility to correct any

1 problems they have.

2 Phase 4 is remedial action, which we don't spend a
3 lot of time on.

4 Q When did you know it would be funded?

5 A Oh, about January of 1984.

6 Q What was that program in response to? Was it in
7 response to a law or regulations or --

8 A It was the Albuquerque Operations Office of DOE
9 that felt that they did not have a unified approach in
10 looking at environmental problems in their plants or in their
11 national labs. They had two ways to go, and they discussed
12 it internally in late 1983. I am not sure exactly when their
13 discussions all started, but we got into the act someplace in
14 around November or December of '83, in that they contacted us
15 and asked us if we would be willing to take on the direction
16 of the program.

17 Q Was that the first you ever heard of that interest
18 on the part of DOE, or concern?

19 A One of their staff members had raised the concern
20 with me about mid summer, 1983.

21 Q Let me show you a performance evaluation for Naomi
22 Becker, or a collection of performance evaluations, 00679.
23 particularly directing your attention to 00683, under
24 "Development Plans," where it states, "An area of increasing
25 concern to which you can contribute is the potential for

1 movement of various nonradioactive toxic or hazardous
2 substances from current enclosed waste disposal areas."

3 A Yes.

4 Q Did you ever request funding for this area of
5 concern?

6 A Yes.

7 Q When did you do that?

8 A About January 1983.

9 Q To whom did you request funding?

10 A My Division office.

11 Q Was this for Indirect funding?

12 A Indirect funding.

13 Q Or DOE? Did you get funding?

14 A Not that year.

15 Q When did you get funding for it?

16 A We started in FY '85, October '84.

17 (A discussion was held off the record.)

18 Q Have you started that yet?

19 A Yes.

20 Q What's the work that's being done?

21 A Designing of surveillance and monitoring programs
22 for the hazardous waste sites.

23 Q Are many of the tasks that Naomi Becker performed
24 geologic in nature?

25 A There is some geology involved in her tasks, yes.

1 Q Are you talking of the present time or previously?

2 A Pretty much at the present time. What we do,
3 though, however, is we team people, as I have indicated
4 before. Purtymun works with her and puts in some of the
5 geologic input and she provides some of the hydrological.

6 Q From 1980 to '83, the end of '83, did her work
7 involve geology?

8 A Yes, some.

9 Q Could you give me the date again when she
10 transferred into the Group?

11 A I think it was the fall of 1980. I think I am
12 wrong on that. I think it was the fall of '81. It could
13 have been. It could have been the fall of '81. I may be off
14 a year.

15 Q Did anybody at any time state to you that Mrs.
16 Rogers should not come back to work with the Laboratory after
17 her RIF?

18 A I don't remember hearing that.

19 Q Did anybody infer that to you?

20 A I think somebody asked me the question once, why
21 would she would want to come back to the Laboratory after
22 creating a certain amount of hostility.

23 Q Who asked you that?

24 A I don't remember that.

25 Q What did that refer to, the "hostility"?

1 A Mainly that during the grievance proceeding Mrs.
2 Rogers was perceived as having accused people of being
3 incompetent.

4 Q Who indicated to you that that is how she was
5 perceived?

6 A As I answered before, I can't remember who the
7 individual was, but I remember the statement.

8 Q Did you ever hear of anybody else discussing any
9 hostility created by her?

10 A I think on one occasion, after the grievance
11 proceeding, James Steger said that Barry Burton felt as
12 though his competence and credentials had been strongly
13 challenged during the grievance proceeding, and that he,
14 Barry, was very unhappy about it, and so was Jim.

15 Q Did anybody else express anything else?

16 A I guess I don't remember anything else.

17 Q Was the grievance hearing a topic of discussion?

18 A I suspect amongst some of the staff it was.

19 Q Did you hear any discussion?

20 A I had questions rather than discussions. Staff
21 members were asking me if Mrs. Rogers was going to come into
22 H Division. I think it was H Division at the time.

23 Q Who asked you that?

24 A I think Roger Ferenbaugh, who seems to have a tie
25 to the grape vine all over the Laboratory, and it's more out

1 of curiosity than anything.

2 Q Anybody else?

3 A I think Bill Purtyman asked me.

4 Q Did either one of them, other than what you
5 testified already about Purtymun, express any concerns or
6 doubts or anything about her coming into the Group?

7 A I think Roger asked a follow-up question of how
8 could she expect to fit into the Group after Purtymun and
9 some of the other staff felt they had been so wrongly
10 criticized.

11 Q Who were the other staff that felt that they had
12 been criticized?

13 A Me, in particular.

14 Q Did you feel you had been criticized?

15 A Yes.

16 Q In what way?

17 A My competence as a manager.

18 Q How did that get raised?

19 A During the hearing.

20 Q In what way?

21 A Essentially a challenge of decisions made.

22 Q Which decisions?

23 A Decisions and timing of decisions during the
24 grievance proceeding, the implication on the part of the
25 questions that were asked, I assume, as stimulated by Mrs.

1 Rogers. They were, essentially, a challenge to the timing of
2 when things needed to be done.

3 Q Which decisions, in particular, are you referring
4 to?

5 A Cleanup of surface contaminations, waste areas.

6 Q Anything else?

7 A An implication that I wasn't doing anything about
8 any of the complaints.

9 Q You felt that it was an implication of the
10 hearing?

11 A No. Mrs. Rogers' counsel.

12 Q You are referring to me?

13 A Yes.

14 Q Any other ways that you felt your management or
15 anything else about you was put in question by the hearing?

16 A I think that my judgment as an expert in
17 environmental radiation hazards was questioned by
18 noncredentialed people.

19 Q How so?

20 A Again, I made statements at the hearing that there
21 was no immediate hazard from conditions as they existed, and
22 those statements were apparently not listened to.

23 Q By "noncredentialed people," who are you
24 referring to?

25 A I don't believe Mrs. Rogers is credentialed in

1 health physics or radiation assessment. I don't believe the
2 arbitrator really understood the difference between
3 short-term and long-term risks.

4 Q Are there any other ways you feel your management,
5 or anything else, was called into question?

6 A No.

7 Q Are you aware of any work Barry Burton did or
8 contributions he made to your Group as the LS-6 earth science
9 resource person?

10 A His contributions were indirect in that he was
11 author or co-author of several reports in LS-6. He was a
12 coauthor of "Geohydrology of Bandelier Tuff." He authored a
13 report on volcanic activity of the Jemez Mountains. He did
14 some examinations of tornado frequency in the Pajarito
15 Plateau area. All of these are information elements that
16 contribute, again -- we use the information in the
17 environmental area from the standpoint of planning for
18 accident response or tying the information into our programs.

19 Q Did you have an opinion on the quality of the
20 work, "Geohydrology of Bandelier Tuff"?

21 A It seemed to meet some of the needs. It was
22 somewhat incomplete, but it wasn't meant, I don't think, to
23 be the last word.

24 Q In what ways was it incomplete?

25 A It seemed as though there were a number of

1 parameters that we need to get further measurements on, on
2 the tuff.

3 Q Such as what?

4 A More field-oriented measurements in terms of some
5 of the changes in the parameters of the tuffs, such as
6 hydraulic conductivity with field conditions versus
7 Laboratory.

8 Q Were those field-oriented measurements obtained?

9 A Some of them have been. The current Environmental
10 Sciences Group has a field demonstration facility, and it's,
11 I think you could call it a pilot scale, a way to test in the
12 field under small scale conditions, not full-blown, mesa-top
13 measurements, like a full-blown waste trench. You can
14 simulate a waste trench under large enough conditions that
15 some of the side effects of container walls that are
16 introduced in the laboratories are no longer introduced in
17 the field.

18 Q Were you satisfied with the documentation or
19 support for the conclusions contained in "Geohydrology of
20 Bandelier Tuff"?

21 A Yes. I am not trained in that area, however.

22 Q Did Barry Burton do any field studies on the
23 disposal sites?

24 A I seemed to recall at one point he did go into the
25 field to look at one of the disposal sites. I remember his

1 coming to me and proposing some studies. I don't know that
2 they were ever done.

3 Q Going back to the arbitration --

4 MS. SINGLETON: The hearing?

5 MS. FRIEDLAND: I will call it "arbitration." I will
6 assume that you have a continuing objection to my use of the
7 word.

8 MS. SINGLETON: Fine.

9 Q (By Ms. Friedland) Did anybody else express to
10 you that they felt that their qualifications or their
11 competence had been put in doubt by the hearing or by the
12 ruling?

13 A I don't think anybody else specifically said.

14 Q Did you hear of anybody feeling that way?

15 A I don't know that anybody felt that way. They may
16 have disagreed.

17 Q Who disagreed?

18 A Gene Wewerka.

19 Q How do you know he disagreed?

20 A James Steger told me.

21 Q In what way did he disagree?

22 A He just felt the outcome was incorrect.

23 Q Anything else in particular?

24 A No. It was just more of a general -- apparently,
25 something that he had said that's hearsay. But he said to

1 Jim he just felt that it was an incorrect finding and that
2 that was not the cause of the RIF.

3 Q Was there anybody else?

4 A No.

5 Q Was there anybody else you can think of that you
6 heard discuss the arbitration?

7 A Since?

8 Q Right.

9 A Since this court case has come up?

10 MS. SINGLETON: I will instruct you not to answer as to
11 discussions with lawyers.

12 A I think that John Warren and I may have discussed
13 it, again from the standpoint of wondering aloud to each
14 other how some of the issues that we had been asked to give
15 depositions on have anything to do with the issue at hand.

16 Q What were you referring to?

17 A Well, we are giving a good deal of information on
18 Waste Management practices. Yet when we read the
19 documentation -- I guess I don't know the correct terminology
20 -- but there is a Count and then some type of statement as to
21 what that part of the court case is about, and then what kind
22 of damages are being sought. All of those seem to be
23 personnel action questions rather than Waste Management
24 questions.

25 Q When did you and John Warren talk about this?

1 A I am not sure. It's been more than a month ago.

2 Q How did you see the Complaint?

3 MS. SINGLETON: I am going to instruct him not to
4 answer, if it was as a result of counsel showing it to him.
5 And I also think I should observe that he did not know the
6 name of whatever it was he looked at.

7 Q The document that you saw that listed the Counts
8 and had damages in it.

9 MS. SINGLETON: Do you want to talk to me?

10 THE WITNESS: I am not sure where I am.

11 MS. SINGLETON: Let me talk to you.

12 (A conference was held off the record.)

13 MS. SINGLETON: Can you read me back the last question?

14 MS. FRIEDLAND: I was asking you who showed it to you.

15 MS. SINGLETON: I am going to instruct him not to answer
16 the question.

17 Q (By Ms. Friedland) If it was somebody other than
18 a lawyer who showed it to you, who was that person?

19 MS. SINGLETON: I am going to instruct him not to answer
20 the question.

21 MS. FRIEDLAND: Are you making an objection that it was
22 somebody from a legal staff or what?

23 MS. SINGLETON: I am objecting that you are asking him
24 about attorney-client communications. I am instructing him
25 not to answer.

1 MS. FRIEDLAND: Okay. Well, it depends on who showed it
2 to him. I mean if somebody else in his Group shows him the
3 document --

4 MS. SINGLETON: I think you are free to ask that
5 question. I won't instruct him not to answer that question.

6 MS. FRIEDLAND: I just asked it.

7 Q (By Ms. Friedland) If it was somebody other than
8 the legal staff who showed you the document, who showed it to
9 you?

10 MS. SINGLETON: I misunderstood your question. Go
11 ahead. You may answer that question.

12 A It was not other than legal staff.

13 Q When did Don Mayfield come into Group HSE-8?

14 A It was before I was a member.

15 Q Was he there continuously after that time?

16 A Yes.

17 Q Is he a geologist?

18 A No.

19 Q What is he?

20 A He is trained as an environmental health
21 physicist.

22 Q Let me show you Document 00880, his performance
23 evaluation, which refers to the "followup reports on a
24 monthly basis to the Interim Waste Program, and special
25 reports on each site as data become available for the

1 programs conducted within the Group." My question is whether
2 or not there are such any special reports.

3 A Monthly reports were done. I referred to this
4 earlier. It's the "Surface Reconnaissance through 1980 for
5 Radioactivity at Radioactive Waste Disposal Area G at the Los
6 Alamos National Laboratory." In 1983, as I indicated
7 previously, we started putting the reports into the annual
8 Environmental Surveillance Report, on environmental
9 surveillance at Los Alamos.

10 Q What about special reports?

11 A We changed that requirement.

12 Q When did you change that requirement?

13 A After some discussion, we decided that the
14 reporting via the annual Surveillance Report was more
15 important to put our effort on than the special reports.

16 Q When you say "we," who are you referring to?

17 A The Group management in HSE-8.

18 Q On that same document it says, "The assistance,"
19 and this refers to assistance to HSE-7, "in drafting the Los
20 Alamos National Laboratory Implementation Plan for meeting
21 the requirements of DOE 5820.2. The assistance was in the
22 form of recommending environmental surveillance measure
23 needed for hazardous waste areas and drafting the
24 corresponding sections of the plan." What recommendations
25 were made for surveillance and for monitoring?

1 MS. SINGLETON: May I read the sentence?

2 MS. FRIEDLAND: Yes.

3 MS. SINGLETON: What was your question again?

4 Q What recommendations were made for surveillance
5 and for monitoring?

6 A Well, there's a rather detailed Appendix to the
7 Implementation Plan which outlines. location of sampling
8 stations for air sampling at different sites and what
9 analyses to perform on samples taken at the different sites.

10 Q Where are they contained?

11 A In an Appendix to the Implementation Plan, and a
12 cross-check of tables for what types of sampling ought to be
13 carried out. I guess I have already mentioned types of
14 analysis. Types of analysis as to what media are sampled,
15 whether it's air, water, sediment, soils, groundwater
16 samples, whatever type of sample.

17 Q On the second page of his evaluation, Page 00881,
18 it refers to "your efforts in reporting the results of the
19 several pieces of surveillance data on each particular site
20 has not resulted in as many or as frequent reporting as
21 possible. Therefore, your efforts in this area need
22 improvement." What is that referring to?

23 A That's referring to what it says. He had not met
24 our expectations, in meeting what we felt were realistic
25 reporting requirements.

1 Q Which was how often?

2 A We felt that with the sampling load that he had,
3 that most of that could be carried out during the summer,
4 spring and fall months, and that would leave a good portion
5 of the winter months to work on reporting. We felt that in
6 addition to the Surveillance Report summary, that he could
7 get out one special report per year. And he wasn't meeting
8 that goal.

9 Q What kind of sampling was he doing?

10 A By the time this evaluation was written, it covers
11 1983 to '84. He was doing soil and vegetation sampling, and
12 then coordinating data from other staff members as they
13 brought in results from their different sampling programs.
14 In other words, air monitoring, for example, for Area G is
15 not assigned to Don Mayfield, but it is assigned to whoever
16 the staff member is in charge of air. The sample is in Bill
17 Purtymun's field. TL monitoring is done and then the data is
18 collated by Don to put together some kind of total picture.

19 Q Precisely how often was he to do sampling?

20 A We had originally planned that we would try to do
21 one inactive site study per year, or two, depending on the
22 size of the site, and how big the job was. We call it a
23 "detailed study." We are supposed to visit each site every
24 five years, and then every site should be visited once a
25 year, and soil samples at least, be taken in obvious runoff

1 pathways, where most of our waste areas have some. So there
2 is a fairly obvious point for water runoff that does come off
3 the surface of the site. You can do sampling at that point
4 and check for any chance that any surface contaminants could
5 go off site.

6 Q With respect to each of those?

7 A Yes.

8 Q How often was he to do sampling?

9 A Once a year.

10 Q On Page 00883 of his evaluation, with respect to
11 the reporting process for the Waste Management Surveillance
12 program, it states, "While a number of interruptions during
13 the past year slowed down the process," and my question is:
14 What were those interruptions?

15 A Don was also responsible for doing a follow-up
16 survey on any inactive waste site where we had gone in and
17 done restoration. That was mainly soil sampling. It was to
18 make sure we hadn't cross contaminated the new cover while
19 working on the site.

20 Q On Page 00884 it refers to a "surface renaissance
21 report." Is that referring to surface reconnaissance?

22 A Reconnaissance.

23 Q Let me show you Document 00894, a memo from James
24 W. Owens to you, subject, "Resignation." What position did he
25 hold?

1 A When he resigned he was a staff-member chemist.

2 Q Who filled his position?

3 A I don't think we bothered -- oh. We downgraded
4 the position to a Technician-3 level position and Richard
5 Robinson took over that Laboratory function.

6 Q Who were the staff members that left H-8 from 1981
7 to 1983? By that I mean, left for any reason, whether it was
8 temporary or permanent?

9 A John Alquist was on leave of absence during that
10 time period. David Dahl left during that time period.

11 Q What did he do?

12 A He was connected with the meteorology Section.
13 Well, actually, when he left he had an assignment on the
14 PANTEX. Fred Fernale left. He was a meteorologist.

15 Q Anybody else?

16 A I don't remember. We had a staff member named
17 David. Oh dear. I just went blank. I can't think of it.
18 He was an EE. He was electronic engineer that worked with
19 the Meteorology Section. I can't remember if he went in '81
20 or -- it was in that time frame.

21 Q Were their positions filled?

22 A David Dahl's was filled.

23 Q By whom?

24 A That's what I'm trying to remember. I don't
25 recall.

1 Q Who were people who came into H-8 from January of
2 '81 to the end of 1983?

3 A The Group was pretty stable during that time
4 period. Fred Fernale's replacement came in during that
5 period. No. She was already on board. Fred left right at
6 the beginning of '81, I think, and -- in any event, there was
7 a replacement Gene Dewart. I am trying to think who we
8 replaced, David Dahl with. We may not have bothered to fill
9 the position because we were getting toward the end of our
10 project.

11 Q Are you still thinking?

12 A Yes.

13 Q Okay.

14 A I don't recall that we replaced David. We had
15 some technician slots that turned over during that same time
16 period. Again, it's difficult to remember who they were.

17 Q What new directions, if any, did you understand to
18 be happening in 1981 and 1982?

19 A New directions for what?

20 Q For your work.

21 A For my work?

22 Q For H-8's work.

23 A Well, we knew that at the end of FY '83, starting
24 with FY '84, that we would have completed the PANTEX EIS,
25 which was a major project that was occupying a large number

1 of people in the Group. At the same time, during that time
2 period, fiscal year '81, fiscal year '82, we essentially were
3 not really showing a budget that should have grown as fast as
4 the needs would have indicated.

5 So, at the end of November or December of '82 we
6 went into a strong planning period with the staff members.
7 And then in January 1983 we put together requests for funding
8 for several areas that we felt needed attention, and resulted
9 in things like the Site Restoration Plan being funded. It
10 was essentially a planning situation period that we were
11 headed into.

12 Q What was talked about during the planning period
13 in 1981 and 1982?

14 A Well, the main planning took place in November and
15 December of 1982. The main thing was, what are we doing?
16 Should we be doing it, in terms of surveillance and
17 monitoring and the overall surveillance program, and in terms
18 of monitoring.

19 Then, secondly, what are we not doing that we
20 should be doing? And that's where we started getting to
21 programs like monitoring of the hazardous waste sites. We
22 didn't feel that we had an adequate program. We didn't feel
23 as though -- well, we felt as though we had a promise that we
24 had made way back in the late '70s to look at things that
25 might be ongoing in the currently active, or old technical

1 area sites, not necessarily waste disposal, but maybe surface
2 contaminates or something.

3 Therefore we put together a proposal for the Site
4 Characterization Plan. We had some -- I guess one would call
5 them small, detailed-type improvements in our existing
6 surveillance programs that we decided that we would like to
7 propose to Management.

8 Q What planning took place in 1981?

9 A We were in the peak of our PANTEX EIS effort, and
10 so very little planning was done during that time period, in
11 terms of new initiatives.

12 Q Well, what was that "very little"? What did that
13 consist of?

14 A Essentially, looking at what we were doing in
15 terms of the existing monitoring program.

16 Q Could you say that again?

17 A Examining what we were doing in terms of the
18 existing surveillance program.

19 Q With a view towards what?

20 A Just whether or not it was operating adequately.

21 Q Did you make any conclusions in late 1981?

22 A The program was working.

23 Q Do you make any distinctions between monitoring
24 and surveillance?

25 A I sometimes use them interchangeably.

1 Q How about in 1982, earlier than November and
2 December, that you have already discussed? What planning was
3 taking place then?

4 A I think maybe we sat down in October and did some
5 preliminary planning. It took us a series of meetings with
6 the staff over several months' period. And October was just
7 setting the groundwork in terms of planning.

8 Q When was the program to be over, or your part of
9 it?

10 A The end of the fiscal year '82, which would be --
11 I'm sorry. Fiscal year '83. We still had an involvement in
12 '83, which the end of the fiscal year is September of '83.

13 Q But you would have to have made proposals two
14 year before the end of FY '83.

15 A If I was going into the DOE budget cycle to
16 Contracts for outside house. However, most of the proposals
17 I went in for were Indirect funding which comes out of
18 Laboratory budgets. Then I make my proposals in March for
19 the coming October. It's true I have to make a proposal for
20 the two-year lead time. But with the two-year lead time on
21 the Indirect, we had to firm those up in the following year.

22 Q What had you proposed two years before?

23 A In the Contract side of the house or on the
24 Indirect Budget?

25 Q Both.

1 A On the Indirect side of the house I don't think we
2 had any proposals two years ahead of time. On the Contract
3 side of the house we had been working. Let's see. FY '82.
4 I think in FY '82 -- I don't think we had any new initiatives
5 on the Contract side during that time period.

6 Q You are not absolutely required to have that
7 two-year lead time on the Indirect funding; is that right?

8 A On the Indirect funding, that's correct. They ask
9 us to, you know, do two-year projections, three-year
10 projections, four-year, and obviously the longer the time
11 gets the more uncertain it becomes. But on the Indirect we
12 normally, I think, go through a cycle where about every six
13 months we made estimates. And the estimates on the Indirect
14 Budget, in particular, becomes very uncertain. Any time
15 longer than a year, it's true, they pay attention to it.

16 If we are going on the Contract side, where we are
17 talking to a sponsor such as low-level Waste Management
18 Programs, there is a two-year planning lead.

19 Q Let me show you performance evaluations for Alan
20 Stoker, starting at 00940. I am particularly directing your
21 attention to 00944, where it says, "It is likely the Group's
22 role in routine surveillance may take new directions as a
23 result of expanding DOE requirements and other new
24 regulations." What does that refer to? What are the
25 expanding DOE requirements and other regulations that that

1 refers to?

2 MS. SINGLETON: To the extent that the question calls
3 for a legal conclusion, I will object. He may answer, to the
4 best of his ability.

5 A This is May 1982 through May 1983, the evaluation
6 for that period.

7 Q Right.

8 A It's a generic statement that I believed at the
9 time that I wrote this, that we were going to see some
10 changes, in that the DOE would become more specific in what
11 their requirements for surveillance would be; and in that
12 this was prepared in May 1983, it certainly was obvious that
13 we were going to have some additional regulations in the
14 environmental area that we would have to be responsive to.

15 Q Between 1980 and the end of 1983?

16 A Yes.

17 Q What new regulations or laws or procedures came
18 out that had an effect on your programs?

19 A Well, probably the end of 1983.

20 MS. SINGLETON: May I have the question read?

21 (The last question was read back.)

22 MS. SINGLETON: Was there no time stated?

23 MS. FRIEDLAND: I said 1980.

24 MS. SINGLETON: I am going to object to the question
25 because it calls for a legal conclusion, but to the extent

1 that he is able to answer, he may. But I need to ask a
2 question. Did you ask, at the end of 1983?

3 MS. FRIEDLAND: I said between 1980 and 1983.

4 MS. SINGLETON: All right. Thank you.

5 A It was during that time period that DOE was trying
6 to establish its look-alike -- what I nickname a look-alike --
7 program in hazardous waste regulations. At that time the
8 Environmental Protection Agency had started to propose some
9 regulations late in that period. I think it was 1983 that
10 they proposed some regulations on emissions from DOE
11 facilities.

12 Q Emissions?

13 A Air emissions, I should say. I have to always
14 stop and think carefully. CERCLA was a federal law passed in
15 that time period. It's popularly known as the "Super Fund
16 Law" and deals with old, inactive hazardous waste sites.

17 Q Do you know when that was passed?

18 A I am not sure when the original congressional act
19 was passed, but it was in that time frame, as I recall.

20 Q Towards the beginning or towards the end?

21 A Towards the end. Much of the activity in the time
22 period was a good deal of activity spent reviewing DOE
23 proposed programs that would make their program parallel to
24 the Resource Conservation Recovery Act.

25 There were, at the same time, drafts of memoranda

1 of understanding between EPA and DOE, circulating for review.
2 All of the signs were there for a substantial change in the
3 regulatory climate.

4 Q Was that true in 1980?

5 A No. Most of this activity has occurred since
6 about 1982.

7 Q Let's take it back to 1980 until 1982. What was
8 going on then?

9 A Most of the DOE activities were centered on the
10 hazardous waste look-alike program at that point in time.

11 Q Between 1980 and 1982, what was going on with
12 respect to radioactive wastes and their regulation?

13 MS. SINGLETON: Just a minute. I am going to make the
14 same objection. He may answer.

15 A During that time period, we were examining the
16 definition of what TRU waste was. We were involved in that.
17 DOE orders were being revised quite often. It seems as
18 though we were getting drafts to review on the order of,
19 sometimes as much as every six months.

20 Q When you say "we," who are you referring to?

21 A The Laboratory. The way the system works is that
22 if a new DOE Order is drafted, normally the agency sends it
23 to their contractors for comment. And Albuquerque Operations
24 sends it through the local area office, the Los Alamos DOE
25 office, to the Laboratory, and they solicit our comments on

1 both the operational Waste Management aspects and the
2 environmental aspects. Normally what our Division does is
3 just direct it to the appropriate Groups. They may or may
4 not have comments.

5 Q The Site Characterization Program -- I know I
6 asked you this before, but so I can put it in context --
7 during what time period was that?

8 A It was funded at the beginning of fiscal year
9 1984.

10 Q Anything else from the 1980 to the 1982 period?

11 A There were a whole series of regulations that I
12 can't name specifically. There were changes in water quality
13 regulations. They are more detailed in terms of
14 implementation than the NPDE, the National Pollution
15 Discharge Elimination program. There were small changes in
16 DOE orders. In other words, we have to read those to make
17 sure that we know what those changes mean, and they may
18 affect us, or they may not, but it takes time to go over it.

19 Q Anything else during that time?

20 A I think I have highlighted some of the major
21 regulations that affected the Laboratory, and there were
22 other regulatory activities going on in EPA and NRC that
23 didn't affect the Laboratory.

24 Q That affected the Laboratory?

25 A Didn't affect the Laboratory.

1 MS. SINGLETON: I object to the last question on the
2 same grounds, but it's all right that you answer.

3 Q During the period from 1980 until 1983, were you
4 aware of any deficiencies in the Waste Mangement Surveillance
5 Programs at the Lab?

6 A Deficiencies are in the eye of the beholder. I
7 felt, during that time period, there certainly were some
8 needs for improvement in our own program.

9 Q Like what?

10 A I felt we were not moving as fast as we should on
11 some of the subsurface sampling programs. Obviously, I have
12 already stated that I wasn't happy about the rate of
13 reporting. And the data one obtains from these programs
14 needs to be interpreted in terms of what it means, and that
15 was not going as fast as I thought it should.

16 Q Taking it back just from 1980 to 1982, were those
17 needs for improvement present during that period, too?

18 A Yes.

19 Q Did you make budget requests during that period
20 that would deal with those needs for improvement?

21 A I made requests, yes, unsuccessfully.

22 Q To whom?

23 A To the Division Office and to our Associate
24 Director's Office.

25 Q That means for Indirect funding?

1 A Yes.

2 Q Did you make requests to DOE?

3 A I explored it to see if there was any chance of
4 getting money through the DOE system, and was told that there
5 would be no expansion of budgets in the Interim Waste
6 Operations area.

7 Q Who told you that?

8 A I think John Warren is the one who communicated it
9 to me, but future expansions in budget were not being
10 accepted by the Interim Waste Operations.

11 Q When were you told that?

12 A I am not sure what year it was, but it was in that
13 time frame. Although it was in 1980, I was successful in
14 getting a tack-on to John's program.

15 Q What was the tack-on?

16 A The very first document we discussed this morning,
17 which was a request for funding to Jim Bresson for
18 surveillance monies.

19 (At 2:04 P.M. a recess was taken.)

20 Q Let me show you a document Number 013613, it's a
21 Field Task Proposal Agreement, and ask you whether or not you
22 have seen that.

23 A Yes, I have read it in the past.

24 Q Why did you have to read it?

25 A Because there was environmental monitoring

1 involved in the proposal.

2 Q The environmental monitoring that's involved in
3 the proposal, was that done through H-8?

4 A Yes.

5 Q Had you prepared that part of the proposal?

6 A Parts of it, yes.

7 Q Who prepared the rest?

8 A John Warren.

9 Q It was work to be done by H-8?

10 A Yes.

11 Q Environmental monitoring is on 013618; is that
12 right?

13 A It's mentioned, yes. "Field monitoring support
14 will be necessary to support Task 1.3, Site Maintenance
15 Restoration."

16 Q Was this work to have come from existing staff?

17 A Yes.

18 Q Were you proposing anybody to be added to your
19 staff?

20 A Some technician help.

21 Q Who was added?

22 A I didn't really add anybody. We reassigned
23 funding on some chemical technicians.

24 Q Where does Karen Balo work?

25 A H-7.

1 Q Were any recommendations for remedial action
2 prepared in accordance with this?

3 A Well, we had put together what we called -- it was
4 called a Site Restoration type plan for this program, and
5 what we were supposed to do was by 1987 we were supposed to
6 have visited all of the inactive radioactive waste sites and
7 carried out whatever actions were necessary. On some of them
8 maybe no action, on some it may be just repairing fences, on
9 some it may be as complete as the job that we have done at
10 Area B already, where we went in, removed vegetation and put
11 on new cover and reseeded the area.

12 Q Where it says, "In addition, considerable field
13 monitoring support will be necessary to support Task 1.3,
14 Site Maintenance and Restoration," is that what you are
15 referring to?

16 A That's the monitoring portion of that task, yes.

17 Q Was this support to come from existing staff?

18 A From existing staff.

19 Q It did come from existing staff?

20 A Yes.

21 Q That was funded?

22 A Yes. To the extent that we got additional funds
23 to support technician help.

24 Q With respect to this report entitled "Hydrologic
25 Characteristics of the Main Aquifer in the Los Alamos Area,

1 Development of Groundwater Supplies," by W. D. Purtymun,
2 issued January 1984 --

3 MS. FRIEDLAND: It doesn't have your numbers on it,
4 Sarah.

5 MS. SINGLETON: Okay.

6 Q With reference to Page 28 -- I will show it to
7 you. First, are you familiar with this report?

8 A Not totally. Somewhat.

9 Q What are the hydrologic parameters on which the
10 areas for redevelopment of high-yield, low-drawdown wells are
11 defined?

12 A I am not qualified to answer the question.

13 Q Do you know how the parameters were determined?

14 A Not really.

15 Q Has the Sigma Mesa test hole ever been redrilled?

16 A No.

17 Q Are there any plans to?

18 A Not to my knowledge.

19 Q Concerning Well PM-5, which I think is referred to
20 on Page 8, what are the hydrologic properties, specifically
21 transmissivity of the area, of this well?

22 A I don't know. I am not qualified to answer the
23 question.

24 Q How about the transmissivity of the Pajarito
25 conglomerate, the Tesuque formation and the alluvium?

1 A I am not qualified to answer the question.

2 Q Do you know what procedures are used to collect
3 water samples during the runoff into Mortandad Pueblo and Los
4 Alamos Canyons?

5 A Not specifically, just generally.

6 Q How about generally?

7 A During the runoff on that, which is usually this
8 time of year when we have snow melt, or after thunderstorms,
9 we either have permanent weirs installed, or we have field
10 portable equipment that we can take and set in place. And
11 these allow us to measure the flow of the water, how much
12 water is going through that particular stretch of the canyon.
13 At that point we make the measurement, we collect water with
14 sediments in it, and then later they are separated from the
15 water in the Laboratory so we can get an idea of what's in
16 the water, dissolved, or what's in the sediment.

17 I am not real certain of the methodology. Bill
18 Purtymun has a special sediment collection system. I am not
19 sure what it is.

20 Q Are those samples taken during high runoff?

21 A We do it during spring runoff after snow melt and
22 we try to catch thunderstorm events during July and August
23 when we have our highest rainfall or highest intensity
24 rainfall events, usually.

25 Q Do you do it during low runoff times, too?

1 A In low runoff the canyons are dry, there is no
2 water to measure.

3 Q So what happens is either the spring runoff or the
4 thunderstorm events, basically?

5 A Yes. There is only water present during those
6 events.

7 Q Do you know when and where samples are taken from
8 the Rio Grande?

9 A The Rio Grande is sampled, usually, in the time
10 frame of September to October, from the springs along the Rio
11 Grande. That time is chosen because the river is at low
12 level. The springs that discharge into the river are exposed
13 and you can get at them to sample them. At this time of high
14 runoff, the springs are discharging into the river under the
15 water.

16 Another way is from Otowi on State Route 4 to the
17 Cochiti Reservoir. The only way to get to it is to float it
18 on rafts. And at other locations we sample water and
19 sediments on the Rio Grande both north and south. North on
20 the Otowi Bridge and south of Cochiti Reservoir, and I am not
21 certain if we switched the frequency from twice a year to
22 once a year. We may have gone to once a year, because we
23 hadn't been seeing anything.

24 Q How long did you do it at twice a year?

25 A I don't remember.

1 Q Do you remember when you switched to once a year?

2 A I am not sure that we have switched. I seem to
3 recall our evaluating it and saying we should, but it would
4 have been about 1983, I believe.

5 Q Let me have you look at the "DOE Operating
6 Criteria for the Shallow Land Disposal of Solid Low-level
7 Radioactive Waste," which doesn't have your numbers, and
8 which we discussed before. Can you tell me what groundwater
9 monitoring is done for each site?

10 A For each waste site?

11 Q Right.

12 A We do not have a specific site-by-site groundwater
13 monitoring program. We have an overall groundwater
14 monitoring program for the plateau.

15 Q Is there some reason why you don't have it site by
16 site?

17 A The main reason is that previous monitoring, such
18 as the horizontal core holes under Area G, indicated that we
19 don't have any migration. And therefore, it's not worth the
20 cost to drill those wells and, second of all, it's
21 technically not a good program to rely on for groundwater
22 monitoring in our case.

23 Q Why?

24 A By the time you detect it in the groundwater it's
25 too late. You have got 900 feet of contaminated rock. You

1 are better off designing a monitoring program that measures
2 in close to the waste site.

3 Q With respect to the DOE operating criteria, are
4 the 12 parameters that are listed on Page 24, in Section 6,
5 being sampled and measured from surface or groundwater at
6 each site each year?

7 A Gross alpha, gross beta, gamma scan from
8 groundwater, yes. Total dissolved solids, yes. Total
9 dissolved organic carbon, yes. FH in the field, yes.
10 Conductivity, yes. Water level and wells, yes. Temperature,
11 yes. Alkalinity, I don't know. DOED, yes. For surface
12 water we skipped the gross alpha, because we do specific
13 radiochemistry on the samples for the uranium, thorium,
14 plutonium, americium.

15 Q Are you saying that those 12 parameters are
16 sampled at each site each year?

17 A No. In the groundwater samples that we take we
18 measure those parameters.

19 Q But you have already said that it's not done at
20 each site?

21 A That's correct.

22 Q The sites that you are talking about, these are
23 coming from where?

24 A All of the well fields, all of the springs
25 discharging into the Rio Grande, or those springs that we

1 sample.

2 Q "Environmental Surveillance at Los Alamos During
3 1981," the one I am looking at doesn't have your numbers. I
4 am directing your attention to Page 13. It states there that
5 the Lab site is 111 kilometers.

6 A Square kilometers.

7 Q Right. And the tables on Pages 120 through 124
8 show that 40 groundwater samples were taken in 1981, at 20
9 locations which are outside the Lab parameters.

10 A Outside the Lab boundaries.

11 Q You are right. It seems to me this means there
12 are 20 samples for every 5.5 square kilometers; is that
13 correct?

14 A I haven't done the math, and it's a nonimportant
15 number.

16 Q Why is it nonimportant?

17 A You can't base groundwater samples on samples per
18 square kilometer. It's based on the aquifer characteristics
19 and the direction that it's moving.

20 Q Do you feel that this is adequate coverage as
21 indicated in that report?

22 MS. SINGLETON: Could you define what you mean by
23 "adequate"? For what purpose?

24 Q Adequate for monitoring, surveillance.

25 A I think it's adequate, if you have other

1 monitoring programs in place that can detect failure of
2 confinement of waste areas, for example.

3 Q Those other monitoring programs are in effect?

4 A They are in effect to some extent, not totally to
5 my satisfaction, at this point in time.

6 Q What's in effect and what's not in effect?

7 A We have monitoring programs around the inactive
8 sites and the active waste sites. We have previous
9 monitoring results such as the horizontal core holes that
10 indicate we don't have migration going on. We do sediment
11 sampling in the canyon bottoms. We do sample perched water
12 in the bottom of the canyons. We do air sampling, all of
13 which are giving us negative results.

14 Q What don't you have? I mean you said that there
15 are things that you don't have, so I just asked.

16 A I see. We don't have enough, as far as I am
17 concerned in some cases, of subsurface monitoring stations at
18 this point in time. We are working to correct that.

19 Q Where would you want them?

20 A I would like some more stations in some of the
21 canyons in sampling the perched water and probably some more
22 moisture monitoring holes around some. We have moisture
23 monitoring in place around the inactive waste sites. I think
24 we could use a few more.

25 Q Around the inactive?

1 A Yes.

2 Q How was the routing of liquid wastes to the
3 treatment facilities accomplished?

4 MS. SINGLETON: Just a minute, please.

5 (A conference was held off the record.)

6 A Could you repeat the question again?

7 Q How is the routing of liquid waste to the
8 treatment facilities accomplished?

9 A Are you referring to radioactive waste?

10 Q Right.

11 A Radioactive liquid wastes are sent to Technical
12 Area 50 from the facilities in the main technical areas,
13 Pajarito Road and Diamond Drive, through a doubled-lined,
14 instrumented, collection system than eventually gets to the
15 liquid waste treatment plant.

16 Q What are the pipes and holding tanks made of?

17 A I don't know what the pipes are made of.

18 Q How about the holding tanks?

19 A Again, I don't know what the details of their
20 construction are.

21 Q Is the pipeline monitored?

22 A It has an instrumentation system on it that allows
23 them to know what flow conditions are every so-many hundred
24 feet. I am not sure what it is. That reports to a computer
25 at the plant.

1 Q Are the holding tanks monitored?

2 A I believe they are.

3 Q Are the holding tanks above or below ground?

4 A There are a number of tanks, and I am not sure. I
5 know some are above ground and I think there is one that's
6 below ground.

7 Q Is there a balance between inflow and outflow?

8 A There has to be.

9 Q You mean by the laws of --

10 A Yes.

11 Q Are there calculations kept on that?

12 A I don't know. H-7 operates the plant, so they
13 would have to answer that for you.

14 Q Can you describe the Quality Assurance Program for
15 Waste Management?

16 A No, I don't think I can. I don't know the details
17 well enough to give an adequate answer, shall we say.

18 Q Who is in charge of Quality Assurance for Waste
19 Management?

20 A Well, most of that work is done in consultation
21 with the MST Division and they have a Quality Assurance
22 Group.

23 Q Is there anybody in H Division or HSE who is
24 assigned to Quality Assurance work?

25 A H-7 has someone involved in Quality Assurance, but

1 I can't remember the gentleman's name right offhand.

2 Q Are Los Alamos sewage facilities monitored for
3 tritium?

4 A Sanitary sewer?

5 Q Right.

6 A Not every one in the county. There has been a
7 change in the program again, and I think, based on lack of
8 routing from Laboratory facilities, we have dropped some
9 sampling stations. In other words, you can't get tritium
10 from the Lab to that sanitary sewage station so we dropped
11 it. But the TA-3, I believe, is monitored for tritium, which
12 is a sanitary sewer system that serves the main
13 administrative tech area, TA-3, and has several facilities in
14 it. I would have to go back and check the records to find
15 out what the other ones are.

16 Q Is that listed in the Environmental Surveillance
17 reports?

18 A It used to be, but I am not sure where to find it.
19 It should be in the appendices.

20 Q Do you know if data is gathered on a regular basis
21 from the sewage facilities?

22 A For what?

23 Q Tritium or other TRU wastes.

24 A No. I don't believe it's gathered -- well, for
25 those stations that are sampled, yes, it's regular for those,

1 but we do not sample every single sanitary sewer system.

2 Q Are the facilities monitored for other TRU wastes?

3 A Well, TRU waste is a category that covers all
4 transuranic elements.

5 Q But you are not covering it all by talking about
6 tritium.

7 A Tritium is not a transuranic waste.

8 Q Leave out the word "other." Are they monitored
9 for other radionuclides?

10 A I am not sure whether the sanitary sewer from HRL
11 is, the Health Research Lab, but that one is monitored for
12 the types of radionuclides that they use in their research
13 building.

14 Q Do you know what the depth of the water table
15 beneath the east end of Area G is?

16 A I don't know exactly. It's approximately, from
17 what I have been told by my staff, somewhere between 800 and
18 850 feet.

19 Q How about beneath the west end?

20 A Somewhere, approximately 900 feet.

21 Q Has the location and depth of the zones of high
22 permeability in Bandelier Tuff beneath the waste disposal
23 areas ever been determined?

24 A Not directly beneath the waste areas. We drilled
25 a water production well to the west of the waste areas. I am

1 not sure how far it is. I would say probably a mile or so
2 from the final boundary of Area G, probably two miles from
3 what's currently active. We use that water well to
4 characterize the geology of the area, and Bill Purtymun would
5 have to answer more specific questions on it.

6 Q As to the location and depth?

7 A Location and depth and characteristics of the
8 rock.

9 Q We went on a tour of the disposal sites. On the
10 fences we saw these little plastic yellow devices.

11 A Yes.

12 Q Are those thermoluminescent detectors?

13 A Yes.

14 Q What is their range?

15 A How much radiation they can detect or --

16 Q Distance.

17 A Oh. Well, since they measure only external
18 radiation, which is either gamma rays or X-rays, they should
19 be able to detect sources up to 50 yards, a hundred yards
20 away, because there is very little error attenuation with
21 that.

22 Q How frequently are they read?

23 A Once a quarter, on a calendar basis.

24 Q How frequently are they changed?

25 A Once a quarter.

1 Q That's what's involved in reading them? You put a
2 new one up?

3 A You put a new one up, take it to the Labs and read
4 them. On Area G, which is a currently active site, we had
5 one on the north side where there is a storage shed where TRU
6 wastes are handled. They are stored and wait until they have
7 got enough to put some in storage, and they let an inventory
8 start to build up in that shed before they went into the
9 storage pads and we picked it up.

10 Q When was that?

11 A I think it was about two years ago.

12 Q That's the only incident that you can think of?

13 A Yes. By the way, I should say that those things
14 detect natural radioactivity all the time. There is always a
15 background radiation detected.

16 Q I would like you to look at what has been referred
17 to as these Recommendations 1 through 25, and ask you, with
18 respect to all of them, whether or not you recall them as
19 recommendations made, whether orally or in writing, by Mrs.
20 Rogers.

21 A Starting at Number 1?

22 Q Right.

23 A Okay. "The need for establishment of site
24 specific monitoring and radioactive waste disposal areas."
25 When I was Section Leader, she was already working on such a

1 program. We discussed in detail some of the needs of that
2 program.

3 Number 2 --

4 Q Did you pass along anything that she may have
5 recommended to you about that? Pass along, or put it in a
6 budget proposal, or try to implement it in some way?

7 A We modified the A4-15 program, which we saw the
8 documentation for this morning, the proposal that was dated
9 January, 1978, that resulted from my input as Section Leader
10 and her input as a staff member. We did modify some of those
11 milestones, and what needed to be done on that program.

12 Q How about Number 2?

13 A "The need to collect and analyze monitoring data
14 on a regular basis." I think that goes hand in hand with the
15 first one we discussed, and that we needed to discuss a
16 program.

17 Q How about the third?

18 A "Need for studies to evaluate initiation of
19 various monitoring techniques to detect radionuclide movement
20 after waste burial." That wasn't part of Mrs. Rogers'
21 proposal but another proposal which was coded for budget
22 purposes, A4-20, dealt with monitoring techniques
23 development. Again, the one I am referring to, was dated
24 January 1978.

25 "The need to establish and publish" -- I believe

1 you mean "preliminary" -- "criteria for monitoring waste
2 burial and storage areas by March 31, 1976," was before my
3 time.

4 Q Number 5.

5 A "Accurate detailed engineering drawings as
6 constructed, dimensions, etc., problems with," referring to
7 problems getting into the records. We had discussed this
8 while she was a Staff Member under my supervision. I don't
9 know if I ever took any action, except to talk to the Group
10 Leader to see if there was a way of getting better
11 information. To my knowledge, things haven't changed in
12 terms of how you access records at the Laboratory.

13 "Detailed geological mapping should be done to
14 establish fracture patterns and stratigraphy. Mapping should
15 extend from area to area and should not result in individual
16 maps." That is what her mapping project was about, I believe.
17 And, yes, we proposed to continue that project, and we moved
18 some of the milestones to make the deadlines more realistic.

19 Q That hasn't been completed by anybody else?

20 A No, it has not.

21 Q Number 7.

22 A "Need for characterization and study of 16 other
23 disposal sites not documented in the Source Documents, about
24 which very little is known." The Site Characterization
25 program has finally started. I don't think that's a unique

1 recommendation of Mrs. Rogers. John Alquist had discussed it
2 with me long before his leave of absence, and Albuquerque
3 Operations Office had discussed that problem. I think it's
4 one that anyone paying attention to the Laboratory knew
5 needed doing.

6 Q Number 8.

7 A "More information on radioactive waste disposal in
8 Areas A, B and C. Location of the characterization of waste
9 pits and shafts in A, B, C, D and F." Some small amount of
10 work has been done in that area. Again, it's hard to say how
11 much of that work was caused by Mrs. Rogers' recommendations,
12 but certainly her Source Document started raising questions
13 about those areas.

14 Q Number 9.

15 A "Restoration treatments needed in those areas,"
16 etc. We did incorporate into the Interim Waste Program a
17 program to correct those things. Again, I believe that that
18 is a result of not just Mrs. Rogers' concerns, but a number
19 of Staff Members within HSE Division.

20 Q Number 10.

21 A "Documents of current waste disposal practices for
22 routine and nonroutine waste updated every two years."
23 Certainly it has not been updated.

24 Q Number 11.

25 A "Need for seismic reflection profiling to

1 determine" --

2 Q You don't need to read them out loud, unless you
3 need to.

4 A Okay. Number 11, the seismic profiling has been
5 done of the plateau in connection with studies for, oh,
6 geothermal energy potential. I disagree that it's vital to a
7 radionuclide pathway.

8 MS. SINGLETON: Excuse me, Joan. I am letting this go
9 on to speed things up, but what is your question to him? Did
10 Mrs. Rogers make these recommendations? Have these matters
11 been done?

12 MS. FRIEDLAND: Right. That's what he has answered.

13 MS. SINGLETON: Fine.

14 A Number 12. I don't believe that the isotopic
15 study has been done.

16 Number 13 --

17 Q Do you recall Mrs. Rogers making that
18 recommendation?

19 A I recall her making it to me verbally, or
20 suggesting something that could be done.

21 Q Is there any need for that to be done?

22 A There are other methods of looking at groundwater
23 migration rates.

24 Q Like what?

25 A I am not sure of the specific techniques. Bill

1 Purtymun would know them better than I would.

2 Q Okay. 13.

3 A I don't know if the work has been done or not.

4 The question is so specific you need a geologist or
5 hydrologist to answer it.

6 Q Did she recommend it?

7 A I don't know. I don't remember.

8 Q Okay. 14.

9 A "Ponding of water on disposal pits should not be
10 ignored." I agree. We have taken steps to do that.

11 Q As you have described before?

12 A Yes.

13 Q Number 15.

14 A 15 addresses a series of complex issues, and I
15 don't know that fractures have been dismissed as migration
16 pathways. We have attempted, in some cases, to do plugging
17 of the fractures with materials that have not worked, so we
18 have modified our disposal practices to backfill along
19 fractures and not use that part of the pit.

20 16 --

21 Q Were these recommendations made by Mrs. Rogers, in
22 15?

23 A She certainly made recommendations suggesting that
24 open fractures should be paid attention to, in a pit, and
25 some type of action ought to be taken. Her suggestion was

1 sealing. That did not work out, so we modified Operations.

2 16. Certainly she made the recommendation, and I
3 believe that it says "showing all prominent rock fractures."
4 I guess I don't know if we are showing all. We are certainly
5 doing a geological investigation of each pit before it's
6 used.

7 Q 17.

8 A The USGS report was being followed under the
9 program Mrs. Rogers was connected with. Not totally, but as
10 time has gone on the work has been supplemented.

11 Q 18.

12 A As far as I know, Zia does not dig holes except
13 for power poles and fence line foundations. Studies are not
14 done by Zia, they are done by HSE.

15 Q 19.

16 A I agree that there is a certain amount of
17 randomness necessary, in the layout of monitoring holes,
18 depending on what you are trying to accomplish. If you want
19 to use a statistically designed program to find out what the
20 Distribution over a large area of any pollutant is, you have
21 to follow the normal Distribution of statistics and design
22 random location for sampling. I agree that there has to be
23 some methodology for selection of where you put a monitoring
24 hole.

25 Q You think that's done?

1 A I believe that's done.

2 Q 20.

3 A "Drilling horizontal core holes below pits."
4 That's already been done. Mrs. Rogers was part of that
5 project.

6 Q 21.

7 A "Update of the Source Document should be done
8 every two years" is a matter of opinion and that has not been
9 done.

10 Q You don't think it's necessary?

11 A I don't believe it's necessary, since we now have
12 a record system that allows us to retrieve the same
13 information.

14 Q 22.

15 A "Records of waste disposal in the LA notebook need
16 to be compiled." There is only a certain amount that we are
17 going to be able to do on that. When we did the Alternatives
18 documents we revisited that issue, to try to go back over the
19 records one more time to see if we could get more information
20 that had not been gotten out, and we have hired consultants
21 and brought back retirees to look at the information, and I
22 think those records are about exhausted, in terms of what we
23 could get further out of them.

24 Q 23.

25 A "Guidelines for Los Alamos National Laboratory on

1 radioactive waste pits and shafts should be followed and
2 should be changed only with firm scientific or engineering
3 evidence, not to grandfather past errors." The only change
4 during my tenure was the forming of a committee to reexamine
5 those particular guidelines to see why there was a
6 misunderstanding as between measurements.

7 The guidelines, before they were revised, said
8 that the spill point of the pit should be 50 feet from canyon
9 edge. I went down personally with Jim Steger to look at that
10 pit that was being contested and could not figure out why
11 there was an argument. The spill point was over 50 feet from
12 the edge. Obviously Virginia Christie had measured from the
13 nearest edge of the canyon to the nearest edge of the pit.

14 We decided that probably made some sense and
15 revised it, so now the pits have to be located so the nearest
16 edge of the pit has to be 50 feet from the canyon wall.

17 Q You don't think any guidelines were changed to
18 grandfather past errors?

19 A No. I think the guidelines were unclear and it
20 was like, where were the measurements being made from on the
21 pit, and where was the canyon edge that was supposed to be 50
22 feet away? That's where the disagreements were.

23 Q 24.

24 A That's a safety issue, and HSE-3, our Safety
25 Group, does look at the pits, and we also take measures, when

1 they look, to loosen up logs that might fall or pieces of
2 rock.

3 Q 25.

4 A I think we discussed the topic before, and there
5 is a need to obtain ion exchange capacity and porosity,
6 permeability characteristics of the tuff. Some of that work
7 has been done, and I don't know that it's a direct result of
8 Mrs. Rogers' recommendation. She certainly was part of the
9 Section that put together a program to do those studies.

10 Q Do you think that 65-foot limit on pit and shaft
11 depth is more restrictive than previous guidelines?

12 A I don't know. I would have to go back and check
13 it. The previous guidelines had allowed them to select the
14 depth at the time the hole was drilled, and by changing it in
15 the new guidelines to fixed depths, that was based on what we
16 knew about the topography of the area, and gives the
17 engineers no excuse for missing the point.

18 (Discussion off the record.)

19 MS. FRIEDLAND: I object to the deposition stopping.
20 The hearing is not until 4:00, and I do want to put on the
21 record that we object to not getting the documents that we
22 discussed on Saturday, so that we could adequately do this
23 deposition.

24 MS. SINGLETON: Well, for the record, you scheduled the
25 deposition for half a day. It's now --

1 MS. FRIEDLAND: No, we didn't.

2 MS. SINGLETON: It was scheduled for one afternoon.

3 MS. FRIEDLAND: Then we agreed to it being continued all
4 day on Tuesday, today.

5 MS. SINGLETON: We agreed for it to be continued today.
6 Now it has been the equivalent length of one day, and at 3:00
7 o'clock I have to leave.

8 MS. FRIEDLAND: You have said what you would like to say
9 for the record on that.

10 MS. SINGLETON: As to the documents that you have not
11 gotten, you knew on Saturday that I couldn't reach anybody at
12 the Lab until yesterday, and they could not pull the
13 documents yesterday.

14 MS. FRIEDLAND: And we explained the need for it,
15 obviously, and it's a matter that has been discussed over a
16 long period of time.

17 It's 3:00 o'clock and we are recessing over my
18 objection.

19 (The foregoing deposition was concluded at the
20 approximate hour of 3:00 P.M.)

21 Proofread by: E. Adams

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CORRECTION PAGE

In accordance with the Rules of Procedure governing depositions, you are entitled to read and correct your deposition before it is filed. Accordingly, please carefully read your deposition and, on the Correction Page, make any changes or corrections in form or substance to your deposition that you feel should be made. You may add additional sheets if necessary. You are to identify these changes/corrections by page and line number, give the correction or change desired and state the reason (or the word "NONE"). PLEASE DO NOT MARK THE TRANSCRIPT. After completing this, sign the Signature Page before a Notary Public.

PAGE	LINE	CHANGE/CORRECTION	REASONS
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1 STATE OF NEW MEXICO)
2 COUNTY OF SANTA FE) ss.

3 REPORTER'S CERTIFICATE

4 BE IT KNOWN that the foregoing transcript of
5 proceedings was taken by me; that I was then and there a
6 Certified Shorthand Reporter and Notary Public in and for
7 the County of Santa Fe, State of New Mexico, and by virtue
8 thereof, authorized to administer an oath; that the witness
9 before testifying was duly sworn by me to testify to the
10 whole truth and nothing but the truth; that the questions
11 propounded by counsel and the answers of the witness
12 thereto were taken down by me, and that the foregoing
13 150 pages of typewritten matter contain a true and accurate
14 transcript as requested by counsel of the proceedings and
15 testimony had and adduced upon the taking of said
16 deposition, all to the best of my skill and ability.

17 I FURTHER CERTIFY that I am not related to nor
18 employed by any of the parties hereto, and have no interest
19 in the outcome hereof.

20 DATED at Santa Fe, New Mexico, this 9th day of
21 May, 1984.

22 *Frances J. Mehner*
23 FRANCES J. MEHNER, RPR, CM
24 Certified Shorthand Reporter
25 Notary Public

My commission expires:
February 2, 1989