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UNITED STATES ARMY
BRAC ENVIROMENTAL OFFICE
In Coordination With The
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

BEFORE: James C. Chambers, BRAC Environmental Coordinator, U.S. Army

PRESENT: Hussein Aldis, Ecology and Environmental, Inc.; James P. Byrne, U.S. Environmental Protection Agency

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<u>Deponent/Witness</u>	<u>Taken</u>	<u>Delv'd</u>	<u>Orig to</u>	<u>To Be Signed</u> Y or N
Public Hearing	2/21/96	3/05/96	Devo	N/A

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UNITED STATES ARMY
BRAC ENVIRONMENTAL OFFICE
In Coordination With The
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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PUBLIC HEARING ON THE PROPOSED PLAN :
FOR THE SOUTH POST IMPACT AREA :
GROUNDWATER AND AREAS OF :
CONTAMINATION 25, 26 and 27 :
- - - - -x

BEFORE CHAIRMAN:

James C. Chambers, BRAC Environmental
Coordinator, U.S. Army

PRESENT:

Hussein Aldis, Ecology and Environment,
Inc., Buffalo Corporate Center,
368 Pleasantview Drive, Lancaster,
NY 14086.

James P. Bryne, U.S. Environmental
Protection Agency, Region 1,
J.F.K. Federal Building,
Boston, MA 02203.

Building P-12, Buena Vista Street
Fort Devens, Massachusetts
Wednesday, February 21, 1996
7:05 p.m.

(Anne H. Bohan, Registered Diplomate Reporter)

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P R O C E E D I N G S

1
2 CHAIRMAN CHAMBERS: We're going to get
3 started. Welcome everybody. This is a Public
4 Hearing on the Proposed Plan for the South Post
5 Impact Area. My name is James C. Chambers; I'm the
6 BRAC Environmental Coordinator here for the U.S.
7 Army at Fort Devens. This evening we're meeting
8 here; my offices are upstairs. This is now space
9 operated by the Massachusetts Government Land Bank,
10 so we thank them for providing us the space for this
11 evening's meeting.

12 Tonight we're going to have Mr. Hussein
13 Aldis from Ecology and Environment who is a
14 consultant with the Army Environmental Center out of
15 Aberdeen, Maryland. He's going to discuss the
16 studies that were done at South Post and what our
17 proposed plan is for the actions necessary for the
18 environment down there. There was a study done, a
19 remedial investigation done of the South Post Impact
20 Area and how it affects the groundwater, and that's
21 what he'll be discussing tonight.

22 Now, he's going to give his presentation.
23 You've welcome to ask questions at any time, but I
24 must remind you that this is a public hearing. I

1 would ask everybody who's in attendance to sign the
2 attendance sheet, because this is a matter of public
3 record, so we want to know who is at the meeting
4 this evening. If you choose to speak, please
5 announce your name and what town or organization you
6 are from.

7 So I'll start by asking if there are any
8 questions right now before we start the
9 presentation.

10 I would also like to thank you all for
11 coming out tonight. I know the weather is quite
12 horrible out there, we've had a number of public
13 meetings, and I must say that this is one of the
14 more attended ones that we've had. So I do thank
15 you all for coming out this evening.

16 MR. CHRISTOPH: Actually, we came to check
17 the water contamination; that's why we're all here.
18 Never mind.

19 CHAIRMAN CHAMBERS: Mr. Hussein Aldis from
20 Ecology and Environment.

21 MR. ALDIS: First of all, I would like to
22 explain that all of this material which I am
23 presenting is taken directly from the remedial
24 investigation reports that are available in the

1 public repositories in various towns or in the area,
2 so you can check the details in those remedial
3 investigation reports. All of the material that I'm
4 presenting tonight is also displayed on the boards
5 at the back of the room. These will remain here and
6 will be available from the BRAC office.

7 If you find that I am going too fast, by
8 all means, stop me. But of course in trying to
9 explain the results of, say, three years of work at
10 essentially five different sites, I am going to be
11 touching on a large amount of work very lightly,
12 just trying to hit the highlights and give you a
13 feeling for the conclusions and the results and, as
14 a result of the investigation, what it is that the
15 Army is likely to do with the South Post area.

16 First of all, I would like to start off by
17 defining --

18 MRS. vom EIGEN: Excuse me, I have a
19 question. You said the information was on file in
20 the town library, and I understand there is no file
21 at the Lancaster Library, so that we could check it
22 with regard to the reports that were done.

23 CHAIRMAN CHAMBERS: Could you state your
24 name, please.

1 MRS. vom EIGEN: Florence vom Eigen of
2 Lancaster.

3 CHAIRMAN CHAMBERS: Well, we do maintain
4 repositories of information at public libraries, and
5 Lancaster is one of them. If this particular
6 information is not there, I'm not aware of that.

7 MRS. vom EIGEN: Well, I was told by
8 someone that it was not in the Lancaster Library,
9 and I'll have to check that out.

10 MR. LIDSTONE: Is there some way that
11 people should refer to this body of documentation
12 when they talk to the library? Maybe the librarian
13 didn't understand what they're looking. I'm Bob
14 Lidstone, Lancaster Conversation Commission.

15 CHAIRMAN CHAMBERS: Some of you know, but
16 because this is a public hearing, it's part of the
17 process that you must announce your name.

18 Again, we make regular distributions to the
19 four towns: Ayer, Harvard, Shirley and Lancaster,
20 as well as the Davis Library here on Post. And
21 there's an administrative record maintained in the
22 Town Hall in Ayer. So what they should do is ask
23 for -- we refer to it as the "information
24 repository." And we make a periodic notification in

1 the newspapers of what documents are available at
2 the repositories, as well as we do a mass mailing to
3 a certain mailing list to announce that these
4 documents are available.

5 So I will make a note and then check to see
6 if these documents are there. But I can assure you,
7 there are volumes of documents relating to the
8 environmental restoration at Fort Devens maintained
9 at the Lancaster Library.

10 MRS. vom EIGEN: It was Mr. Lidstone who
11 told me that there weren't any.

12 MR. LIDSTONE: Oh, yeah?

13 MRS. vom EIGEN: This afternoon. Sorry, I
14 didn't recognize you.

15 MR. ALDIS: I would like to explain the
16 limitations of what I'm going to talk about tonight,
17 because we didn't investigate the entire South
18 Post. What we did was, we investigated those sites
19 that had been identified, as a result of their
20 history and use, as being areas of potential
21 concern; and they were primarily within what is
22 known as the South Post Impact Area.

23 This diagram shows part of the South Post.
24 The boundary of the South Post goes close to or

1 along the Nashua River, as you probably are aware,
2 and across to the North Nashua to the west. But
3 this area outlined with the red dashed line is
4 what's known as the South Post Impact Area, and it's
5 the impact area for weapons firing in the South
6 Post. They have fired antitank weapons; they have
7 fired shells from the Main Post across Route 2 into
8 this area; they have fired bazookas and mortars and
9 small arms of all kinds. This has been the area
10 which has received the impacts of those weapons.

11 The four ranges that we specifically
12 investigated were, from the south to the north, the
13 Explosives Ordnance Disposal, the EOD range, AOC 25
14 as it's known, which is the area of contamination or
15 area of concern.. Then the Zulu Ranges on the west
16 side of the impact area; one of them is a grenade
17 range, and one is a demolitions practice area. The
18 Hotel Range is now a small arms firing range, but it
19 was formerly used for the disposal of explosives and
20 munitions. And Cranberry Pond, right next to Hotel
21 Range, it was discovered during the course of the RI
22 had been used to dispose of explosives by detonating
23 them on the surface of the pond when it was frozen
24 in winter. So that area was expanded to include

1 Cranberry Pond as well as Hotel Range.

2 Other sites around the impact area have
3 included a small landfill at SA 12, a burn pit up
4 here at SA 15, a small what was known as the beer
5 can landfill at SA 41. Those have been the subject
6 of other previous investigations or even subsequent
7 investigations and are reported separately.

8 We looked at the overall impact not only of
9 the individual ranges within the South Post Impact
10 Area but the whole impact area itself. And I'd like
11 to explain that it's really divided physically into
12 two portions. On the north and west side is Slate
13 Rock Brook which receives the groundwater discharge
14 from the west side of the range -- of the impact
15 area. On the other side there is this unnamed
16 stream, Heron Pond, another unnamed stream leading
17 to New Cranberry Pond, that runs through the middle
18 of the impact area.

19 So that, basically, the area is divided
20 into three sections: that which drains to Slate
21 Rock Brook; that which drains to the unnamed streams
22 here; and that which drains to the unnamed streams
23 from the southeast side. Almost no groundwater
24 which is generated by rainfall or snow melt on the

1 South Post Impact Area leaves the South Post without
2 first discharging to surface water. The only
3 possible impact area are a few acres along the very
4 southeast side, and this is not the impact area of
5 the ranges here but the firing point of the ranges
6 down here.

7 Now, what I'd like to do is run briefly
8 through this slide show, and I really will make it
9 brief.

10 (Whereupon, there was a slide presentation)

11 MR. ALDIS: I think most people who are
12 members of the public around here have not probably
13 been on South Post. It is open for fishing and for
14 hunting under certain conditions with certain
15 permissions and certain times, but most people
16 probably aren't aware of what the South Post Impact
17 Area looks like. Let me see if I can show you
18 something.

19 This is what most people see, the public, I
20 mean. That's the entrance, and if you're going in
21 there to hunt or fish with specific permission at
22 specific times, you're not going to see anything
23 much else of the South Post Impact Area except by
24 looking through the fencing that otherwise surrounds

1 the site. It is controlled access. This is the
2 range control at the main gate.

3 I've already discussed the fact that the
4 area was the target of a large variety of weapons
5 over a long period of time. One of the points that
6 needs to be made is that its future use will
7 continue to be military training, and as far as we
8 know, the Army is going to retain it for the
9 foreseeable future.

10 The scope of our study was to look at the
11 overall impact of the SPIA on the groundwater, the
12 sediments and surface water around it, as well as
13 the specific ranges within it.

14 This is the same map that I was discussing
15 at the introduction showing the topography and
16 drainage. The blue arrows are the direction of the
17 groundwater flows, as far as we can deduce them,
18 from the wells that we install.

19 Some parts of the South Post Impact Area
20 are quite open; they are burned off fairly regularly
21 to help explode any munitions which didn't explode
22 on impact. This is one of the ranges used for
23 antitank weapons. The dark shadows in the middle
24 ground are some target vehicles that you use for

1 mortar and antitank fire.

2 This is another area which is kept in a
3 mowed and controlled state; it's used as a sniper
4 range.

5 Other areas are wetlands. As you saw,
6 there are streams on either side and in the middle
7 of the South Post Impact Area.

8 And some parts of it are quite forested.

9 This is a beaver pond on Slate Rock Brook.

10 One of the things that's rather obvious to
11 people who visit the South Post is it's really a
12 nice, natural area, and it's become almost a
13 wildlife refuge. The scope of our investigation is
14 outlined in these slides where we have the writing,
15 but I don't want to go into it in great detail. You
16 can read up on that yourself.

17 What we found as a result of the studies
18 that we had done on the groundwater was that the
19 major control for groundwater flow is not the
20 surface topography, which consists of glacial sands
21 and gravels, but the underlying bedrock. You may
22 not be able to see this very well, but the bedrock
23 contours show a ridge of phyllite or slate that runs
24 underneath here, underneath the area colored green,

1 which is the impact area, and the groundwater flows
2 off that ridge to either side to discharge to the
3 surface water.

4 None of the groundwater that's generated by
5 the South Post Impact Area leaves the South Post
6 without first entering surface water, either this
7 unnamed stream or Slate Rock Brook directly to the
8 Nashua River, with the sole exception of a very
9 small area down here on the southeast corner, as I
10 mentioned before.

11 MR. LIDSTONE: Question. Bob Lidstone.
12 Does that mean that the significant aquifer that
13 runs under the Main Post does not get any recharge
14 from the South Post or at least from the impact
15 area --

16 MR. ALDIS: That's correct.

17 MR. LIDSTONE: -- without going off the
18 South Post first?

19 MR. ALDIS: That's correct. The
20 groundwater that's generated within the South Post
21 Impact Area enters surface water before it can ever
22 reach the Main Post.

23 MR. LIDSTONE: But from the surface water,
24 it doesn't then go down into an aquifer recharge

1 without going off the Post?

2 MR. ALDIS: The Nashua River is a gaining
3 stream, which means groundwater is discharging to
4 the river, not the river to the groundwater, at any
5 point along its course. Fortunately, the only place
6 that can possibly happen is where there is a pump
7 well, and the only instance I know of that is the
8 McPherson well in North Post, which is near the
9 river. If the McPherson well is pumped at high
10 volume for a long period of time, it did induce some
11 flow from the Nashua River into the well.

12 MR. LIDSTONE: But the only way for this
13 water to get into the aquifer of the Main Post would
14 be through the river?

15 MR. ALDIS: Through the river, that is
16 correct.

17 MR. LIDSTONE: Good.

18 MR. ALDIS: Going backwards again. The
19 nature and extent of contamination that we found on
20 investigation was in the wells that were placed
21 around the SPIA and within the SPIA; that is, not
22 specifically at an individual range. It was very
23 low levels of explosives, low levels of pesticides,
24 like DDT and its derivatives primarily, which are

1 almost certainly the result of spraying from
2 mosquito control, et cetera.

3 There are two places -- let me show
4 you -- on the east side. This well is slightly
5 contaminated with explosives. This well directly
6 downgradient from it is completely clean. This well
7 is slightly contaminated with explosives, and so is
8 this well. This is three out of the 13 wells which
9 are placed around the SPIA. And this well, which is
10 the only water supply well on the South Post, has
11 also been tested and found to be clean. So these
12 wells between impacted areas of the South Post where
13 there are slight levels of explosives in the
14 groundwater are in fact between them and the
15 discharge points in the river, and they're found to
16 be clean.

17 We have found some slight traces of
18 explosives getting into surface water and sediment,
19 and I'll cover that later.

20 DR. CRAMER: Dr. Cramer, David Cramer. I
21 have a question. Contaminated with explosives?

22 MR. ALDIS: Yes.

23 DR. CRAMER: Excuse my ignorance. What's
24 an "explosive"?

1 MR. ALDIS: They're usually oxygen and
2 nitrogen organic compounds. They contain their own
3 oxygen, and, consequently, when they react
4 violently, the explosive basically decomposes very
5 rapidly burning the oxygen within the molecule of
6 the explosive. It's the rapidity of reaction which
7 distinguishes them from other compounds.

8 DR. CRAMER: So what's left over?

9 MR. ALDIS: Nitrous oxide, carbon dioxide,
10 oxygen; just simple molecules usually. What we have
11 found is actual molecules of the explosive, HRX,
12 RDX, these are fairly complex molecules, with
13 nitrate groups attached, which provide the oxygen
14 result which causes them to be reactive. They're
15 relatively unstable; that's their distinguishing
16 mark. They could be set off by other explosives or
17 by simple heat or friction or impact.

18 DR. CRAMER: Okay. Now, when you say that
19 one well is contaminated -- two wells are
20 contaminated with the explosives, so these are
21 unspent chemical compounds that are in there? Let's
22 say, for example, stuff that's leached out of shells
23 or compounds that have not exploded, not reacted; is
24 that what I hear you saying?

1 MR. ALDIS: That's the assumption, that
2 these were explosives that were in part of the
3 munitions, and they just didn't react at the time
4 that they were fired. Either they never exploded at
5 all, or they were not completely destroyed in the
6 explosion. We are talking about micrograms per
7 liter; that's parts per billion, low-level parts per
8 billion. Nothing more than 6 parts per billion of
9 any explosive was found in any groundwater well.

10 DR. CRAMER: Okay. So you could drink that
11 water, and you wouldn't get sick?

12 MR. ALDIS: Oh, yes. The fact is that not
13 a great deal is known about the long-term medical or
14 health impacts of drinking water contaminated with
15 explosives, because there's very little data on it.
16 But as far as risks are concerned, they're extremely
17 low, even if they were being drawn.

18 DR. CRAMER: The next question for my own
19 education. You have wells in that area, and certain
20 wells are contaminated with low volumes -- low
21 concentrations of the pollutants, or whatever you
22 want to call it. Now, how come the other wells in
23 the same area are not contaminated? My concept is
24 that there's like an underground aquifer and the

1 wells all tap into the same aquifer. This is where
2 my education leaves me. And if one well is
3 contaminated, aren't they drawing from the same
4 underground lake or river or aquifer?

5 MR. ALDIS: What I would say about
6 groundwater is that it's all generated by rainfall
7 and snow melt, that it sinks into the ground. It
8 initiates from the point where the rainfall and the
9 snow melts start. And it depends entirely on
10 whether the soils, which have rain and snow melt,
11 passing through have been contaminated.

12 Now, the impact area has been subject to a
13 large number of explosions, but very erratically
14 distributed. And clearly, it's a matter of chance
15 or happenstance if one well happens to be directly
16 downgradient from an explosion that left some
17 unexploded material there.

18 DR. CRAMER: So those areas, those
19 underground pockets of water don't necessarily
20 communicate with each other?

21 MR. ALDIS: They're all interconnected; but
22 groundwater flow is so slow that it's not turbulent,
23 so it doesn't mix. And if you followed the path of
24 a single drop of rain that fell on the surface, it

1 would go down to the water table, and it would
2 travel in a single-flow path that would not cross
3 any other until it reached surface water and
4 discharge.

5 So each individual area of the aquifer can
6 be considered to be unmixed, except for those parts
7 of the aquifer directly upgradient of it. It's like
8 a series of streams that run side by side but don't
9 mix. It's only if you disturb them in some way. If
10 you place a well in them and you pump the water,
11 then it will draw water from around it.

12 DR. CRAMER: So would you at some time
13 later give me a reading list? I'm interested about
14 the aquifers and which way the -- what you just
15 explained to me --

16 MR. CHRISTOPH: The flow.

17 DR. CRAMER: The flow, I'd like to read
18 about that, for somebody that's a beginner like me.

19 MR. ALDIS: I think the best thing you
20 could do is probably look at the references in the
21 back of the remedial investigation reports for the
22 South Post Impact Area --

23 DR. CRAMER: Okay, thank you.

24 MR. ALDIS: -- as a start.

1 DR. CRAMER: Thank you.

2 MR. ALDIS: This is repeating what I just
3 said about the three wells being slightly
4 contaminated with explosives, and yet there don't
5 appear to be any explosives leaving the South Post
6 in the groundwater, because at least two wells
7 between those that are contaminated and the rivers
8 are in fact themselves uncontaminated.

9 There is one water supply well on South
10 Post that's used by troops who exercise there, and
11 it was analyzed several times, and it does not
12 contain anything above drinking water standards.

13 There are no risks to human health from the
14 groundwater as a result of existing use, and because
15 the Army is going to retain the area and no new
16 wells will be installed, there cannot be any new
17 wells which will have risks. The existing water
18 supply well will continue to be evaluated and
19 analyzed on a regular basis to make sure that no
20 change occurs which will not be detected.

21 MRS. BIRTWELL: Anne Birtwell, Lancaster.
22 How deep are the wells you're using to test?

23 MR. ALDIS: The D-1 well is 65 feet; it's
24 quite shallow.

1 MRS. BIRTWELL: That's a drinking water
2 well?

3 MR. ALDIS: Yes.

4 MRS. BIRTWELL: And that's quite shallow.

5 MR. ALDIS: This was quite shallow. There
6 was no need for them to go deeper to get the volume
7 of flow that they needed.

8 MRS. BIRTWELL: To get water.

9 MR. ALDIS: Incidentally, it's almost the
10 same depth as the well which is contaminated
11 directly offgradient of -- no, I take that back.
12 It's almost the same depth as the contaminated well
13 on the South Post near it, so it's clear that the
14 explosives can reach that depth.

15 MRS. BIRTWELL: You don't know how far down
16 they go.

17 MR. ALDIS: They travel in the groundwater,
18 they're dissolving in the groundwater, and it
19 depends on the flow patterns of the groundwater.
20 They're not going to go to any great depth before
21 they resurface at the river, because they discharge
22 to the river.

23 MRS. vom EIGEN: I have a question about
24 how long has the contaminated well been in use over

1 and above the uncontaminated ones, so that is there
2 a pattern of migration of the contamination?

3 MR. ALDIS: The drinking water well I am
4 not sure of the age of. I think it was 1939 or
5 something similar. Can anyone tell me that? It's
6 been there a fairly long time. The monitoring well,
7 which was found to be contaminated, was I believe
8 installed in '93; and you can tell by looking at the
9 name of the well. It's not marked, but I believe it
10 was '93, and certainly it's about that time. So
11 this was installed considerably after the drinking
12 water well.

13 MR. CHRISTOPH: This is not what you would
14 really consider a contaminated well, except as it
15 showed up in the test.

16 CHAIRMAN CHAMBERS: Again, sir, this is a
17 public hearing.

18 MR. CHRISTOPH: Eugene Christoph,
19 Lancaster.

20 MR. ALDIS: What we call "contaminated" is
21 a well which has a detectable level of a foreign
22 substance which is clearly not naturally derived.
23 And, as I said, these wells have less than six parts
24 per billion of detectable explosive in them. So

1 it's at an extremely low level.

2 One of the factors that we also looked at
3 on the South Post was, since the groundwater
4 discharges to surface water, is the surface water
5 and the sediment associated with it also impacted?
6 So we did look at the ecological impact, and some
7 potential risks were identified. The odd thing is
8 that they were not from things which you would
9 expect to be from the ranges, lead and zinc,
10 possibly lead, could come from the ranges. Lead,
11 zinc and DDT were identified as being potential
12 risks to some aquatic invertebrates; but these were
13 regarded as being very marginal. They might have
14 detectable effects, but they were definitely
15 marginal. In fact, the wildlife was found to be
16 flourishing generally in South Post.

17 MR. LIDSTONE: Are aquatic invertebrates
18 more sensitive to lead, zinc and DDT than humans; is
19 that why it's an ecological and not human health
20 risk?

21 MR. ALDIS: No. The reason they're
22 selected is because they are the most widespread and
23 common biological organisms that are used to assess
24 the health of an aquatic system.

1 MR. LIDSTONE: So the lead, zinc and DDT
2 could be a hazard to human health if someone were to
3 drink the water, but nobody is planning on drinking
4 the water?

5 MR. ALDIS: No. This was an effect in the
6 sediments, and as far as humans were concerned,
7 there was no significant impact at all from exposure
8 to sediments.

9 MR. LIDSTONE: Because nobody plans to eat
10 the sediment.

11 MR. ALDIS: Well, not so much that, but
12 even trespassers who splash through the mud and in
13 marshy areas might get some on the skin and could
14 presumably absorb a tiny amount. This was
15 considered, and there was no health effect from
16 that.

17 MR. LIDSTONE: That's sediment not in the
18 water itself.

19 MR. ALDIS: That's right.

20 In fact, one of the interesting things was
21 to see some of the rarer animals you find on South
22 Post. This is a beaver lodge along Slate Rock
23 Brook.

24 And this was a Blanding's turtle which was

1 found at Zulu Ranges.

2 Now, the individual explosives that were
3 looked at in the Explosive Ordnance Disposal Range,
4 EOD Range, this is a picture of it taken from the
5 air looking southeast. The actual disposal area was
6 this closed depression which you can see here. You
7 may be able to detect faintly a track which runs
8 around it. This was the area that explosives were
9 disposed of by open burning or other detonation.
10 Three sides have banks of sand around it that
11 contain the force of any explosion.

12 And if you look across the rest of the
13 South Post Impact Area across to here, this is the
14 stream and wetland which divides the SPIA into two.
15 These are the ranges on the other side, and the
16 trees beyond the wetland along the Nashua River. So
17 this is looking southeast across the range, just to
18 give you a feel for it.

19 There are no boundaries on the South Post
20 Impact Area, very few fences; this is just an
21 arbitrary line today drawn around the area where
22 they disposed of explosives. We put several wells
23 in here; one, two, three, four, five, six, seven,
24 eight, nine and ten wells were dotted around the

1 area. Quite a number of soil samples were taken,
2 bore holes were placed to sample the soils, and in
3 effect what we found was almost nothing.

4 The groundwater discharges through the
5 disposal area and turns to the east and discharges
6 to the unnamed stream and New Cranberry Pond. The
7 only well which showed any contamination at all at
8 the end of the RI was this one, which had minuscule
9 amounts -- again talking parts per billion here --
10 it had the nearly 7 parts per billion of RDX and
11 just 1 part per billion of HRX, which are two
12 explosives that were disposed of on the site.

13 MR. CHRISTOPH: The area that you just
14 described there, is that perhaps an old course of
15 the Nashua River?

16 MR. ALDIS: No. This is an area of a
17 glacial delta into a glacial lake, and the reason
18 there is this depression in the ground is probably
19 because a lot of ice was stranded there, surrounded
20 with sand and melted, and where the ice melted, it
21 left a depression.

22 This shows the effects of the explosive
23 disposal and the surface; it blew holes in it,
24 basically.

1 What we did was we tried to determine the
2 depth of bedrock, to choose the locations to put the
3 monitoring wells, since we believed the bedrock
4 determined the flow of groundwater, as it appeared
5 to do. We installed bore holes, took surface soil
6 samples and subsurface soil samples. And we did
7 take one surface water and sediment sample, but it
8 turned out to be in an area that could not possibly
9 be impacted by the site.

10 This gives you an idea of the actual site
11 itself. The only real impact has been the removal
12 of the natural vegetation to a large extent.

13 There were no human health risks found from
14 exposure to the soils. There was no potential for
15 exposure to the groundwater and therefore no risks.

16 And small areas of the soil were obviously
17 affected, but they were so small that the ecological
18 effects were minimal, and the surface water and
19 sediment is not affected by this site, period.

20 Zulu Range consists of two side-by-side
21 ranges. This is the spur of a hill seen from the
22 east; from an aerial view looking west towards the
23 wetlands along Slate Rock Brook, the forested
24 wetlands. There's a wetland to the north, a wetland

1 to the south. This spur was modified with a berm
2 and a couple of amphitheaters of sand here, and
3 there are a couple of positions here, concrete boxes
4 that you could throw grenades from safely. This is
5 the range control.

6 Here is Zulu I, which is the demolition
7 practice area. They have a bunker here where they
8 hide when they're letting off explosives; but
9 basically, they construct things and then demolish
10 them to show people how to practice demolitions.

11 What we found on investigating this, we
12 installed about seven wells, one here, two, three, a
13 pair here at different depths, and two here. All
14 the downgradient wells were contaminated with
15 explosives. So the groundwater flow is from the
16 south to the north. Here's a SPIA well over here,
17 and it appears to indicate the flow is going north
18 to Slate Rock Brook. But these wells that monitor
19 the groundwater on the range are all contaminated on
20 the north side, which shows that the groundwater is
21 contaminated on the range and is discharging to this
22 wetland on the north side. The soil effects are
23 less.

24 This is a wetland which receives the flow

1 of contaminated groundwater. This is a wetland on
2 the south side which appears to be less affected.

3 This is a view of the grenade range with
4 the berm and the two grenade-throwing positions.

5 This is a shot of the mock bridge that was
6 erected for demolition as a practice exercise on
7 Zulu I. These are just to give you a feeling of the
8 nature of the country. It's been largely open, and
9 of course there's been disturbance where the
10 explosives and the construction modifications have
11 taken place.

12 We did a seismic survey to determine the
13 depths of bedrock and where to put in monitoring
14 wells. We took a number of surface soil samples, we
15 did a number of test pits, and we took a lot of
16 surface water and sediment samples around the two
17 ranges.

18 One well showed manganese slightly
19 elevated, and this seems to be pretty certainly of
20 natural origin. We found high manganese in a number
21 of wells around Fort Devens which are clearly not
22 affected by any site activities.

23 The soils have shown some polynuclear
24 aromatic hydrocarbons, PAHs, soot, you might call

1 it, probably as a result of their burning on-site.
2 They did dispose of some explosives by burning. One
3 soil sample showed Cyclonite (RDX), as well as DDT
4 and its derivatives, and some TPH, total petroleum
5 hydrocarbons, and toluene.

6 MR. BIRTWELL: Toluene?

7 MR. ALDIS: Yes, from fuels. Gasoline
8 contains benzene-toluene-xylene, BTX.

9 MR. BIRTWELL: That's highly --

10 MR. ALDIS: Not highly; we deal with it
11 every day. We breathe it in every time we gas up
12 our cars.

13 MR. BIRTWELL: We had toluene and they shut
14 our plant down.

15 MR. ALDIS: Because of the exposure of the
16 workers to toluene?

17 MR. BIRTWELL: Air. We moved it and then
18 put in a recovery system.

19 MR. ALDIS: However, it's not particularly
20 toxic in comparison to many other compounds; it just
21 depends on the concentration.

22 We did find some explosives in the soil,
23 and this was particularly during the RI, but there
24 were none we discovered during the SI aside from

1 that slight trace of Cyclonite.

2 There were impacts on sediments but not on
3 surface water. There were low level hits of
4 explosives, particularly in the northern wetlands;
5 again, some other compounds you might or might not
6 recognize. Where these came from, it's not clear.
7 Some of them might be breakdowns of explosives; some
8 might be originating in phenolic herbicides; the
9 trichloroethylene might have come from some solvent,
10 perhaps used for cleaning something. But we have no
11 reason to suppose that these are widely used there.

12 There were lead levels in the sediment that
13 were above background, but these did not seem to
14 come from range activities, and they may be of
15 natural origin.

16 When we looked at the risks for that lead,
17 just to continue with the same thought, the elevated
18 lead levels in the sediment were tested with aquatic
19 organisms, and they were found to have no
20 discernible impact. So they're not bioavailable,
21 and they're not toxic to the aquatic invertebrates
22 that were living in the sediment.

23 The ecosystems around the ranges appear to
24 be in good shape; in fact, the turtles may benefit

1 from the disturbance of the soil and the creation of
2 open sandy areas, because they like to bury their
3 eggs in sand, even though they live themselves in
4 wetlands. The wildlife risks as a whole were
5 minimal. There is no human health impact of any
6 discernible level, because the groundwater is not
7 being used and will not be used as long as the Army
8 has the area. And the soils levels are well below
9 those that would affect people working on the ranges
10 or visiting the ranges or trespassers or sportsmen.

11 Hotel Range, as I said, was an impact area
12 for small arms. Right now they use it for machine
13 gun firing; but prior to its extensive modification
14 and creation for its present use, it was the site of
15 disposal of explosives by open burning and open
16 detonation.

17 The Cranberry Pond, which is right next to
18 it -- this is a map showing their relationship.
19 This is an embankment in the hill with banks of
20 gravel, natural banks of gravel surrounding it.
21 This is used as a target area for Hotel Range. And
22 formerly at the foot of these gravels banks there
23 was an area where they disposed of explosives by
24 open burning or open detonation, but they also

1 apparently took explosives out onto the ice in
2 winter in Cranberry Pond and detonated there. So
3 once this was discovered during the course of the
4 RI, the Army asked us to take sediments and surface
5 water samples within Cranberry Pond to investigate
6 those possible impacts also.

7 This is a view of the southwest corner of
8 Cranberry Pond. You can see it's really a lovely
9 place.

10 North of the range there is a small stream
11 beginning in a wetland. This area is kept cleared
12 of vegetation, because it's part of the area over
13 where the machine guns were fired; but you can see
14 the stream which starts in this wetlands, and this
15 is the point where the groundwater appears to
16 discharge.

17 The range of our investigation is much the
18 same as the others. We did a seismic survey to try
19 and determine depth of bedrock, to select locations
20 for installing monitoring wells. We did do a
21 geophysical survey looking for scrap metal that had
22 been dumped in Cranberry Pond, and we found quite a
23 bit, primarily steel drums. We did a large number
24 of borings and took a large number of soil samples

1 over the former disposal and burning area. We
2 installed several monitoring wells. There were
3 already four from the site investigation.

4 MR. CHRISTOPH: The drums that you found in
5 Cranberry Pond, where are they now?

6 MR. ALDIS: They are mostly rotted out and
7 still lying right there.

8 MR. CHRISTOPH: In the pond?

9 MR. ALDIS: In the pond.

10 DR. CRAMER: What's in the drums?

11 MR. ALDIS: Nothing.

12 DR. CRAMER: What was in them?

13 MR. ALDIS: What was in them, we have no
14 idea. I mean, there are several of them that I have
15 seen photographs of. I didn't take part in this,
16 but several photographs are just rotted steel
17 drums. Mainly you just have the hoops and a few
18 bits of rusted metal between them. I have no idea
19 how they got there or what they contained, but they
20 certainly have not had, as you'll see, an impact on
21 the pond that we can discern. We did collect the
22 surface water and sediment within the pond, and that
23 was the basis for our conclusions.

24 There were no impacts from metals on the

1 groundwater, but all the wells within the Hotel
2 Range itself, all of them have some level of
3 explosives in them.

4 Because of the location of the disposal
5 area right at the foot of the steep slope we could
6 not put any wells upgradient of them within the
7 range, but we did have a well here which was part of
8 the South Post Impact Area well monitoring system,
9 and this is completely uncontaminated. So all of
10 these wells in this area are either within or
11 downgradient of the disposal area, and they did show
12 low levels of explosives.

13 The same sort of thing, RDX and HMX, as we
14 saw elsewhere. The sediment samples from the bottom
15 of Cranberry Pond did show elevated metals, but they
16 also had a much higher level of organic carbon than
17 the sediments to which we compared them around the
18 South Post. There was no contamination in the
19 surface water, and I'll discuss the risk from the
20 sediments in the next slide.

21 The soils themselves had no trace beyond
22 the very lowest levels of any of the disposal
23 activities. So evidently significant accumulations
24 of either the fuels that we use for burning or the

1 explosives from South Post were not found in the
2 soil.

3 MRS. vom EIGEN: Florence vom Eigen,
4 Lancaster. Could you please explain the difference
5 between "sediment" and "soil."

6 MR. ALDIS: Well, sediment is found
7 underwater, basically. And the thing that we found
8 around the South Post Impact Area is that most of
9 the sediments have high organic carbon, they have a
10 lot of plant material, rotting plant material in
11 them, leaves and aquatic plants, stems and twigs,
12 and so on. These have an impact on the way in which
13 metals or organics can accumulate in them, because
14 organic carbon tends to absorb materials, and the
15 difference is simply where they're found.

16 MRS. vom EIGEN: Okay. Essentially --

17 MR. ALDIS: In the bottoms of ponds or
18 streams, they're sediment; elsewhere they're soils.

19 MRS. vom EIGEN: Thanks.

20 MR. ALDIS: The human health risk was found
21 to be negligible as far as the soils were
22 concerned. The groundwater exposure doesn't exist
23 and will not exist as long as the Army retains the
24 base.

1 The ecological risks were found to be
2 possible, certainly several of the metals were high
3 enough and certainly one sediment sample from
4 Cranberry Pond. They weren't uniformly high, and
5 there was 4-amino-2,6-dinitrotoluene, which I think
6 is a derivative from explosives, which was found in
7 the sediment. The only metal that was found to be
8 of concern in the sediment was the copper was high
9 enough it might have some effect on mallards,
10 although we did find mallards nesting around
11 Cranberry Pond.

12 And this is a clutch of mallard eggs
13 photographed by the biologist.

14 The whole point around our investigation
15 was we spent a great deal of time, effort and money;
16 and we did a very intensive investigation of the
17 entire area, particularly the ranges, and the levels
18 of contamination that we found were very slight.
19 Particularly the explosives, which were disposed of
20 and have been disposed of and are being used there
21 in large quantities, we found minuscule amounts of
22 them in the groundwater, in the soils, in the
23 sediment. And certainly they do not appear to have
24 a significant impact, they can't have on human

1 health at present usage. They don't appear to have
2 a significant impact on the wildlife. Some other
3 slight impacts were noted, but on the whole the
4 ecological situation in South Post is excellent, and
5 the wildlife are flourishing.

6 MR. LIDSTONE: The Cranberry Pond made me
7 think, because of a finding of drums in there, that
8 opens up the point that we don't know what it was
9 that was in those drums. But were there tests done
10 of a wide range of potential contaminants, or were
11 tests only done for the things that we were
12 expecting, like explosives and heavy metals?

13 MR. ALDIS: A wide range of analyses were
14 done. And you see that we took -- these were taken
15 during the site investigation; the other samples
16 were taken during the RI. We did both surface water
17 and sediment samples. Considering the area of the
18 pond, which is only 12 acres, we took a fairly
19 intensive series of samples there. And this sample
20 showed high levels of metals, and that was basically
21 it.

22 MR. LIDSTONE: But you tested for a wide
23 range of potential contaminants?

24 MR. ALDIS: We did, yes, we did.

1 MR. LIDSTONE: Good.

2 MR. ALDIS: The wells, as you see, the
3 groundwater enters the pond from the south and exits
4 from the north; it's basically an outcrop of the
5 water table, you might say. It's another kettle
6 pond; that is to say, it's the result of a block of
7 ice being stranded there and then melting. And this
8 is in effect an outcrop of the water table. This
9 flows out on the west side and discharges through
10 Hotel Range, so these wells are in fact measuring
11 the water quality coming out of Cranberry Pond.

12 They're also measuring the water quality of
13 the groundwater which is affected by the soils in
14 the area of the disposal. And yes, they do show
15 contamination. But most of it is discharging to
16 this wetland and stream north of here, and whatever
17 is not is going to end up in Slate Rock Pond. So
18 all of it is going to enter the surface water before
19 it exits South Post.

20 MR. LIDSTONE: And that stream flows into
21 Slate Rock Pond also.

22 MR. ALDIS: This also flows into Slate Rock
23 Brook and then to Slate Rock Pond. And as I said,
24 the biological surveys that we did seem to suggest

1 that the ecology in South Post is flourishing. It's
2 really a wildlife refuge in many ways.

3 MR. CHRISTOPH: In the report that I have
4 read -- and I'm in the process of rereading a second
5 or third time to make sure I can get on top of it --
6 I keep hearing repeatedly that the Army is going to
7 stay here, the Reserves, for the foreseeable
8 future.

9 MR. ALDIS: Yes

10 MR. CHRISTOPH: I doubt that anybody in the
11 room, or perhaps in Northern Worcester County, would
12 have guessed five years ago that Fort Devens would
13 have been closing, since at that time the Congress
14 had voted to enlarge the Intelligence School by
15 bringing facilities here; and all of a sudden, bang,
16 we're on the hit list and Main Post and North Post
17 are vacated.

18 Now, if in fact the Reserves left here in
19 the next five years, for whatever reason,
20 unforeseeable tonight, obviously, what shape would
21 South Post be in? For example, Lancaster's
22 willingness to tap into the big aquifer on South
23 Post related to the Nashua River, so that we could
24 sell that 3 1/2 million gallons a day to Main Post

1 for industrial purposes or to Boston, as has been
2 discussed with the Fish & Wildlife Service. Could
3 you enlighten me at all.

4 MR. ALDIS: As far as the groundwater is
5 concerned, I think I'd be the one to answer that.
6 The Army may want to respond to other issues.

7 MR. CHRISTOPH: That's what I'm after, your
8 response.

9 MR. ALDIS: As far as the groundwater is
10 concerned, as I mentioned in the course of
11 describing this work, there is not a very good basis
12 for estimating the toxicity of explosives in
13 drinking water sources. Because of the EPA's
14 methodology in estimating risks, they always tend to
15 overestimate them, because they take conservative
16 values at every stage of the risk investigation.
17 These levels that have been found in the groundwater
18 may conceivably have some effect on someone drinking
19 them for a lifetime; but the issue is, are these
20 just the declining residual amounts that are there
21 as a result of past activities?

22 In this case of EOD Range, for example, it
23 was very clear during the course of our
24 investigation the explosives levels in the

1 groundwater were declining.

2 MR. CHRISTOPH: That's good.

3 MR. ALDIS: Yes. In the case of Hotel
4 Range, there were only samples taken twice, and it's
5 not clear that they are declining, but they are at,
6 such low levels it's extremely unlikely they would
7 see any human health impact.

8 The other issue is, of course, the Army
9 maintains responsibility for this no matter what
10 happens to the land in the future, and I think
11 really the Army needs to sort of address the issue
12 of land use.

13 MR. CHRISTOPH: I'm more concerned with
14 water quality, because the Army is less predictable
15 than the water is, I think.

16 MR. ALDIS: None of the water in the South
17 Post is contaminated to a level that I would think
18 is significant. As I said, there may be exceedences
19 of no detectable effect levels as derived from
20 certain approaches used by the EPA in estimating
21 risks; but these are very conservative approaches,
22 and they tend to overestimate risk.

23 MR. CHRISTOPH: I'm glad to hear it's a
24 conservative approach, because you mentioned in one

1 of the wells there have been two tests. Over how
2 long a period of time was that?

3 MR. ALDIS: In the case of Hotel Range, EPA
4 took the samples during the SI, and we took samples
5 during the RI, and I think they were separated by
6 about a year and a half.

7 MR. CHRISTOPH: In your customary area of
8 expertise, would that year and a half two samplings
9 be sufficient to give you satisfaction that the
10 water there is not contaminated?

11 MR. ALDIS: But it is contaminated. And
12 it's because very similar levels were found in both
13 samplings that we are satisfied that we have a good
14 understanding of what the levels are based on.

15 MR. CHRISTOPH: And they are not
16 increasing?

17 MR. ALDIS: They're not increasing, and
18 there are no additional sources. The results that
19 we found are consistent with the historical disposal
20 of explosives there, not with the current use.

21 MR. CHRISTOPH: That current use doesn't
22 concern me; it's the future use at some point in
23 time when the Department of Defense vacates South
24 Post. Now, the foreseeable future, as I said, it

1 may be five years, it may be ten, it may be fifty;
2 but I'm concerned, will we be able to market that
3 water for drinking purposes, whenever it is
4 vacated?

5 MR. ALDIS: I would refer you to Mr.
6 Byrne.

7 MR. BYRNE: My name is from James Byrne
8 from the EPA Regional Office in Boston. Basically,
9 right now the reason we're making this decision to
10 basically leave things be is because it's under the
11 current foreseeable future use as we discussed.
12 When and if the property changes hands, what we
13 would require under law is that another assessment
14 take place on the status of the water at that point
15 in time, whether it be tomorrow or ten years from
16 now. And at that time we would look at those
17 contaminants, and in fact the record of
18 contaminants.

19 I'm kind of jumping the gun here, but part
20 of this record of decision we're signing here is to
21 sign a long-term monitoring plan to measure those
22 contaminants from the Army explosives ordnance
23 disposal. What we plan to do is look at that data
24 and make sure, number one, it is staying on South

1 Post. If it were to migrate off Post during the
2 next five years, say, when the Army still owns the
3 land, the Army again would be obligated to do
4 something about that.

5 So there were basically two trigger points
6 here. Point one, for the foreseeable future the
7 Army is using the land, and we're instituting a type
8 of long-term groundwater monitoring plan to take a
9 look at this to make sure that none of these
10 contaminants migrate off Post and cause any harm in
11 the drinking water supplies.

12 Point two would be if sometime in the near
13 future the Army leaves this area, and the property
14 is going to be transferred or sent to another agency
15 or back into private hands. We would take a look at
16 that library of groundwater data, we would take a
17 look at groundwater data at the current situation
18 and make an assessment at that point as to whether
19 this water is safe for Lancaster, for instance, to
20 tap into and start marketing, or is additional
21 clean-up or something needed before you could
22 undertake that activity.

23 MR. CHRISTOPH: Okay. You can understand
24 my concern.

1 MR. BYRNE: Yes, I can.

2 MR. CHRISTOPH: With decreasing
3 availability of good water, especially in this area,
4 our understanding, at least verbally, is that it is
5 the Fish & Wildlife Service on a federal basis who
6 would probably be assuming the property. It is
7 obviously to our advantage and interest to ascertain
8 that enough will be done in the way of monitoring to
9 make sure that we do have in fact a marketable
10 source.

11 MR. BYRNE: What we would do is similar to
12 what we did now. We would look at the situation at
13 the point, what you people intend or something like
14 that, and run these risk numbers, exposure numbers
15 based on the contamination we see. And what would
16 come out of that is, in a sense, a yes, go ahead and
17 use it with no problem; or a maybe, let's hold on,
18 this water might need some additional treatment
19 before you can use it; or worst case, no, forget
20 about it.

21 MR. CHRISTOPH: Well, if worst case ever
22 occurred, who do we sue?

23 MR. BYRNE: The Army would come back;
24 they'd be obligated to do something. The worst case

1 is if the Federal Government goes broke.

2 MR. CHRISTOPH: You wouldn't sue.

3 DR. CRAMER: Two questions. Actually,
4 three questions. Number one, if, let's say, the
5 water is to be sold today to Boston or tomorrow,
6 given the information you have, would they buy it?
7 Could they drink it?

8 MR. BYRNE: That's a tough question,
9 because we really didn't look at that. Basically,
10 we'd have to look at that scenario. That's one we
11 did not look at.

12 MS. WELSH: I can answer that question.
13 Lynne Welsh from the Massachusetts Department of
14 Environmental Protection. I've worked with Jim and
15 Jim on evaluating the results of testing that
16 they've done. We're three different agencies; we
17 have three slightly different ways of evaluating the
18 data that came in.

19 We have concurred with the EPA and the Army
20 that, for right now, this is the best way to handle
21 the situation at Fort Devens. A lot of study has
22 been done, but because the activities are going to
23 continue on at the Post, they're going to somehow
24 slightly alter the results that we have from today

1 to year one and year two on out. And the Army is
2 going to be here, and they have to have training
3 facilities. But we did some calculations of our own
4 on the water -- the risk from the contamination
5 levels at the worst case that the Army found in
6 their investigations and found that they did exceed
7 our 1-in-100,000 cancer risk factors.

8 So to answer your question, yes. But also
9 the good news is, you can treat this water, these
10 chemicals can be treated. So that if you did need
11 to use the water today, which is not likely and is
12 not going to happen, you could treat it to make it
13 safe.

14 MR. LIDSTONE: I think I'm missing
15 something here. There are no suggestions that
16 there's a substantial aquifer that this water is
17 involved with, correct?

18 MS. WELSH: No, there are.

19 MR. LIDSTONE: We're talking about water on
20 top of slate here.

21 MS. WELSH: No.

22 MR. LIDSTONE: This water could contaminate
23 significant aquifers?

24 MR. ALDIS: May I answer that. For the

1 most part the South Post Impact Area has only a thin
2 and not very productive aquifer, but there is a
3 fairly productive aquifer under the Nashua River,
4 and part of this is under the eastern margin and on
5 the northern side of the South Post Impact Area. So
6 there's a similar --

7 MR. LIDSTONE: So while the contamination
8 would likely get into this aquifer through the
9 river -- or could it get in there -- I guess my
10 question is, can the aquifer be contaminated without
11 this water leaving the South Post?

12 MR. ALDIS: The answer to that is an
13 aquifer that could be usable and is used in the
14 South Post water point well could be impacted by
15 some of the water off the South Post Impact Area,
16 yes.

17 MR. LIDSTONE: So there is some significant
18 aquifer that is at risk.

19 MS. WELSH: There is glacial outwash sand
20 and gravel, what we call an aquifer, running through
21 the South Post, and it does have samples indicating
22 contamination. One of the things that we have
23 worked on with the EPA, and we're discussing with
24 the Army, is to tighten up the monitoring that's

1 going on, so that we have assurances that that
2 contamination is not moving off Post and is not
3 going to impact either private wells in the area, or
4 we have other wells besides Fort Devens, we have
5 MCI-Shirley that is a significant water supply for
6 this area. So that while there is contamination,
7 the monitoring is going to ensure that it's not
8 going to affect people.

9 MR. LIDSTONE: That it could be getting
10 worse, that it could be spreading.

11 MS. WELSH: That's correct.

12 MR. LIDSTONE: Not to push everyone aside,
13 but are there, I guess, some procedures to be
14 changed, so that this contamination would be reduced
15 in the future compared to what's happened so far, or
16 should we expect this aquifer to remain contaminated
17 for the foreseeable future and we'll simply have to
18 watch it closely as it spreads?

19 MS. WELSH: That is what we hope long-term
20 monitoring will tell us. There is contamination
21 because of training, but there's also, we think,
22 contamination because of concentrated disposal in
23 the areas that Hussein identified for you. And we
24 have asked and are working with the Army to change

1 those concentrated disposal activities so that they
2 are more environmentally -- happen in a more
3 environmentally sound way and those are concentrated
4 areas of emissions disposal. And the Army staff --
5 and Jim should speak to this -- is looking at the
6 way they do training, so that it has less
7 environmental impact than past activities. So this
8 long-term monitoring plan, again with Army
9 procedures and with the change of the concentrated
10 munitions disposal, hopefully doesn't make the
11 matter worse.

12 MR. LIDSTONE: And those procedural changes
13 will be documented in the near future?

14 MS. WELSH: They will be in some cases.

15 CHAIRMAN CHAMBERS: I'm not sure I
16 understand "procedural changes."

17 MR. LIDSTONE: In the disposal of
18 munitions. Since there appears to have been some
19 contamination from past practices, will there be any
20 attempt to change future practices so that we reduce
21 the contamination going into the aquifers?

22 CHAIRMAN CHAMBERS: Okay. Well, first of
23 all, yes, past practices is that there were disposal
24 of munitions. Current practice is there is only

1 disposal in the event of an emergency or something.
2 Typically, waste munitions are not disposed of.

3 MR. LIDSTONE: Oh, is that right? That's a
4 big change. I have to admit, I haven't heard any
5 bangs lately.

6 CHAIRMAN CHAMBERS: Another thing to be
7 aware of is that there has been a change of activity
8 on the South Post. It continues to be a training
9 area and will continue to be a training area, but we
10 don't have the same type of military units training
11 there. So that a majority of the type of training
12 that involves munitions is small arms training now,
13 rifles and handgun-type training, not so much of
14 explosive munitions.

15 MR. LIDSTONE: Less total explosives to be
16 disposed of?

17 CHAIRMAN CHAMBERS: Yes. The other thing
18 is, you said spreading. There is no evidence of
19 this spreading. That's one of the reasons that
20 we're proposing the groundwater monitoring, to
21 ensure that there is no spreading. But if that had
22 been the case -- and that will probably be not what
23 we would be proposing -- there will probably be some
24 more proactive action being taken.

1 In answer as far as future use of the
2 water, I can't really speak to that. But I can say,
3 from my experience, that the locating of the wells,
4 we're talking about the impact area here, and where
5 the location of the well is, whoever does that type
6 of hydrogeological study that needs to be done to
7 locate a well probably would have to take into
8 account Massachusetts regulations as far as where to
9 locate it -- not probably but we'd certainly have
10 to -- and where. They would seek the point where
11 they could get the most production out of that well
12 but would have to be at a certain distance away and
13 probably would be minimally impacted by the activity
14 that's here.

15 DR. CRAMER: Question 1-B. Or A, because
16 you made a statement. You say the water as is can
17 be made fit to drink. In Pennsylvania I had a home
18 with a water purification system, supposedly we
19 didn't need it, but for the money I spent, it was
20 peace of mind. So basically, it was an activated
21 charcoal system for organics and halogens, and then
22 there was a three-way system for heavy metals and a
23 polishing filter and stuff for bacteria, whatever.
24 So I can relate to that. But on a commercial basis,

1 how does that water -- let's say, for example,
2 you've got organic pollutants, for lack of a better
3 word. How does that get taken care of?

4 MS. WELSH: Lynne Welsh from the
5 Massachusetts DEP. The same things you did on your
6 individual home, activated carbon; there's also air
7 stripping, because these are volatile compounds,
8 which can be done on a commercial basis. In fact,
9 several towns also already do that. Acton, for one,
10 has --

11 DR. CRAMER: Really.

12 MS. WELSH: They have air strippers on
13 their water supply, because there has been past
14 contamination. I'm sorry, I can't speak to the cost
15 of that, but they are available commercially.

16 The statement I was trying to make is that
17 these chemicals, while they are explosive and
18 exotic, have chemical reactions that can be dealt
19 with under present technology.

20 DR. CRAMER: Okay.

21 MR. ALDIS: May I point out that these
22 compounds also naturally biodegrade as a result of
23 bacterial action in the groundwater and in surface
24 water.

1 DR. CRAMER: Question number two.
2 Fantasyland. I'm President of the United
3 States -- okay, we're all laughing, okay -- and I
4 say to you folks, "I'm the boss, executive order,
5 clean it up. I don't want to take anything -- I
6 won't take no for an answer, just do it." Okay.
7 What do you do to change it? What are the
8 alternatives to leaving this the way it is? What's
9 the opposite?

10 CHAIRMAN CHAMBERS: Well, first of all,
11 then, as the --

12 DR. CRAMER: I'm not running, by the way.

13 CHAIRMAN CHAMBERS: -- as I guess the
14 supreme commander, he would have to say he's not
15 going to have military training here any longer,
16 because in order for there not to be this problem,
17 we would not be able to use the ranges at all down
18 there.

19 Now, once that happened, then if that were
20 to happen, then we would go through it. We would
21 probably have a good sense of history here, with all
22 the studies that we've done so far, but now we would
23 have to go into a process that we call a remediation
24 investigation feasibility study. The intent of that

1 is to look at the technology that's available and
2 see how it may be applied to the situation that we
3 have.

4 So that if it involves monitoring, if it
5 involves air stripping, we will evaluate all those
6 alternatives. We would look to evaluating a variety
7 of things, cost being one of them, and not a primary
8 but a parameter to evaluate. We would evaluate risk
9 to human health, risk to ecology, community
10 acceptance. We would be going through the same
11 process that we're doing here this evening,
12 eventually to select a particular remedial action
13 that would allow us to clean the water, if it was
14 deemed necessary.

15 But it would have to be shown that there is
16 a certain level of risk, that there is a certain
17 benefit to having this water available, and then we
18 would choose a remedy. And then we would have to
19 present it to the public and say, "This is how we've
20 chosen to clean this up, this is how much we intend
21 to spend, this is what the results will be." And we
22 would come up with a record of decision then that
23 the Army would be bound by that record of decision
24 to implement that action.

1 DR. CRAMER: It would be something like
2 strip-mining for coal; you just bulldoze the whole
3 area and take the stuff away?

4 CHAIRMAN CHAMBERS: Hypothetically, it
5 would probably involve -- if it was deemed
6 necessary, it might involve a pump-and-treat system
7 where we would pump the water out of the ground,
8 treat it, and then discharge it back to the ground.
9 And then the ground is nature's best filter, and by
10 the time the water was redrawn out for consumption
11 purposes, it would probably be tested again, but it
12 would prove suitable for human consumption.

13 MR. CHRISTOPH: I won't play President, but
14 I would like to play Speaker of the House for a
15 minute. How comfortable are you that the EPA budget
16 will not be sliced to ribbons so that your function
17 will cease to exist? Any assurances at all?

18 MR. BYRNE: Call your Congressman.

19 MS. WELSH: I think what you have are three
20 agencies, the Army, the EPA and the State; we all
21 have individual budgets, and we're all working on
22 this. If EPA, Jim, were to go away tomorrow, I
23 would still be here. And if the Army were to go
24 away tomorrow, we'd still be here. I mean, we are

1 public servants for the Commonwealth of
2 Massachusetts, not the Federal Government or the
3 Army.

4 MR. CHRISTOPH: Gotcha. And you're fairly
5 comfortable?

6 MS. WELSH: I'm fairly comfortable that
7 Governor Weld is not going to do anything
8 problematic.

9 MR. BIRTWELL: Again, first of all, let me
10 preface my remark by saying most of us over the
11 years from the Spec Pond area have been comfortable
12 with Fort Devens and hated very much to see them
13 go. We test our pond every year. I have given
14 copies of that to the Commandant when he was here;
15 the last one went to a ranger. Does anybody know
16 who controls the access to South Post now for
17 fishing or whatever?

18 CHAIRMAN CHAMBERS: Well, there's range
19 control. We also have the natural resources
20 manager; his name is Tom Poole.

21 MR. BIRTWELL: It was this year, I know,
22 limited to the Fort Devens personnel. Prior to that
23 other people would come in, which is fine, and we
24 haven't had any problems; we have handouts on file

1 or whatever. The thing that kind of surprises me is
2 that South Post does border Spec Pond. Apparently
3 no testing has been done on Spec Pond.

4 MR. ALDIS: The flow is from Spectacle Pond
5 to South Post, not the other way around.

6 MR. BIRTWELL: I understand the aquifer
7 goes east to west.

8 MR. ALDIS: The flow is --

9 MR. BIRTWELL: We have that little stream
10 going through, if that's what you mean.

11 MR. ALDIS: Spectacle Pond is an outcrop of
12 the water table, but it overflows as a small stream,
13 as you say. But even so, the water at Spectacle
14 Pond is from rainfall and snow melt right there, and
15 the discharge is going away from the pond.

16 MRS. BIRTWELL: And springs.

17 MR. ALDIS: Well, the springs, of course,
18 themselves are generated from rainfall.

19 MR. ALDIS: Infiltrating through the soil.

20 MR. BIRTWELL: You have a well 65 feet
21 deep.

22 MR. ALDIS: The water circulates; depending
23 on where it falls, it goes deeper or shallower into
24 the ground. The point is, though, that South Post

1 cannot contaminate Spectacle Pond; Spectacle Pond
2 can contaminate South Post.

3 MR. BIRTWELL: How about the wells in the
4 people's homes? There must be 100 homes in the
5 general Spec Pond area.

6 MR. ALDIS: Only if they pump an enormous
7 amount of water could they possibly draw anything
8 out from under the South Post. The volume of water
9 that falls on the average acre around here and
10 infiltrates into the ground I think is of the order
11 of 500,000 gallons per acre per year.

12 MR. BIRTWELL: So what you're saying is,
13 there's absolutely no problem relative to drinking
14 water in the wells surrounding the Spec Pond area.

15 MR. ALDIS: As for being impacted by South
16 Post, yes, there is no problem at all.

17 CHAIRMAN CHAMBERS: Sir.

18 DR. vom EIGEN: I'm thinking about the list
19 of chemicals and contaminants that you mentioned.
20 It seems to me that there are by-products of
21 explosives, and since they are rapidly oxidized
22 chemicals to cause the explosion, they are also
23 probably oxidized in the soil, maybe at a slower
24 rate, but they certainly are.

1 MR. ALDIS: They are affected by bacterial
2 decay, yes, they are acted on by organisms.

3 DR. vom EIGEN: This is completely
4 different if you have contamination with lead or
5 zinc or heavy metal, right, they cannot be
6 destroyed.

7 DR. vom EIGEN: So I think any idea of
8 digging this up or treating it chemically or
9 anything else would be foolish, because it would
10 probably improve itself in time, unless you're going
11 to start shooting a lot of heavy stuff in there
12 again.

13 MR. ALDIS: That's correct. The points we
14 investigated with the greatest detail were all areas
15 which in the past had been used for open burning or
16 open detonation. Either they bought explosives or
17 munitions there, and they covered them with wood and
18 saturated them with kerosene or something similar
19 and set fire to them, or they detonated them, and
20 those were the areas that were most suspect and the
21 ones that were most intensely evaluated. The
22 additional work that we did around the South Post
23 Impact Area was really because the Army just raised
24 the question that perhaps the overall impact of

1 firing weapons produces a detectable level of
2 contamination, not from concentrated disposal, but
3 just general impact areas on the ranges. And we did
4 find that there were detectable levels, but they
5 were simply not significant. There is certainly no
6 smoking gun, no public health or ecological concern.

7 DR. vom EIGEN: They would be more likely
8 to be at the point of firing than at the point of
9 impact of the bullet or shell.

10 MR. ALDIS: That I don't know; it depends
11 if they're explosive shells or just projectiles.

12 DR. vom EIGEN: I don't think if they used
13 explosive shells here, perhaps they did, or like
14 bazookas. But I think that the results I've heard
15 sound very encouraging that this is going to be a
16 contained area with minor contamination and will
17 improve in time. But are you going to be able to,
18 or do you feel that you should, retest all these
19 areas over periods of time, in a year or two years?

20 MR. ALDIS: That is the intention.

21 CHAIRMAN CHAMBERS: Yes, sir. That is what
22 we've proposed to do, that we will have a long-term
23 monitoring plan. We're going to test these wells.
24 And I just want to make the point clear that these

1 wells are not used on a continuing basis, it's not
2 like what we think of as wells at our home where
3 we're constantly pumping water out of them. These
4 wells pretty much have no activity at all until we
5 test them, so the water that's there, it's not like
6 we're cleansing this water by getting fresh water
7 out of it all the time, these are wells that are
8 actually -- we're grabbing samples of what's
9 actually there at that particular time.

10 DR. vom EIGEN: Will there be reports put
11 in these places in cities and towns that you
12 described of these results when they're done?

13 CHAIRMAN CHAMBERS: Yes, sir.

14 DR. vom EIGEN: So it will be available,
15 and if they show improvement, everything goes well.
16 If they start showing things are getting worse, then
17 we have to find out why, I guess.

18 CHAIRMAN CHAMBERS: Any other?

19 MR. JANELL: John Janell, Lancaster. You
20 talked a lot about groundwater. I guess I'm
21 concerned about what hasn't gotten in. Has anyone
22 looked at the landfills? I know it wasn't that many
23 years ago we thought lead paint was safe, PCBs,
24 people would just take transformers and throw them

1 away. Today you have to drain out the PCBs. Has
2 anyone ever looked what's in the landfills?

3 CHAIRMAN CHAMBERS: Yes, sir, there have
4 been studies done, that's another action that we
5 plan to take. Some of the landfills, there's about
6 half a dozen landfills or so that we've identified
7 on the South Post. Most of them are from
8 homesteaders or people that lived there prior to the
9 Army taking over the land. We found old farm dumps,
10 things like that, where we found the pots and pans
11 from whoever lived there were thrown out the back
12 forty, and there they are. But there are a couple
13 of sites from Army activity as well, and we have
14 identified those. The Army is working with US EPA
15 and the Massachusetts Department of Environmental
16 Protection right now to develop a plan on what we're
17 going to do about those landfills, and it could
18 involve excavating those landfills, or we're looking
19 at what other alternatives there are. But that's
20 one of the ones we're considering right now.

21 MRS. vom EIGEN: Florence vom Eigen,
22 Spectacle Pond. I have a couple incidental-type
23 questions, I think. You haven't mentioned deer, and
24 I've seen deer in the area. I mean, you allow

1 hunters to go into the area. Have any studies been
2 done on them to know whether they're contaminated in
3 any way, and should and can people who hunt take
4 them home and butcher them and eat them?

5 MR. ALDIS: I think you have to ask someone
6 else about that, because I'm not familiar with that.

7 MR. BYRNE: As part of my former life I did
8 some wildlife biology work; basically, we performed
9 ecological assessments. Basically what we did, the
10 short answer is, no, we didn't take any deer and cut
11 them up and analyze their tissues. What we did is
12 more or less start at the bottom of the food chain,
13 stuff deer might be eating. And what we found
14 there, as you have seen mentioned in the summary,
15 was minimal impacts to the wildlife populations here
16 at Fort Devens. I mean, there are some contaminants
17 in the soils but not at high enough levels that it
18 would make it all the way to a deer and perhaps make
19 a deer unsafe to eat.

20 MRS. vom EIGEN: It's my understanding that
21 they eat leaves and twigs.

22 MS. McCARTNEY: I'm Sheila McCartney with
23 the Army Environmental Center. I'm from Aberdeen,
24 Maryland, and our agency works with many

1 installations like Fort Devens. And work has been
2 done at the Aberdeen and Jefferson Proving Grounds
3 with the deer, specifically during hunting season.
4 And we'll have hunters give us some of their deer,
5 and they've done studies on them at those
6 installations, which have similar contamination as
7 South Post here, and they haven't found any risks.

8 MS. vom EIGEN: Another thing that concerns
9 me is that you think nothing of disposing or
10 detonating on ice, which then goes into the water,
11 and you say you tested the sediment.

12 MR. ALDIS: This was a former practice,
13 remember. This was a practice that was discontinued
14 maybe 20 years ago; I don't know.

15 CHAIRMAN CHAMBERS: I can't speak to that.

16 MR. ALDIS: The whole point about these
17 areas that we investigated was that they were areas
18 of heavy disposal of explosives and ordnance of
19 various kinds, and the Army has completely stopped
20 doing this, with the solid exception of emergencies
21 like, for example, a bomb squad wishes to dispose of
22 something suspicious and things like that. The Army
23 is not disposing of explosives; they're simply using
24 them as firing ranges now.

1 MRS. vom EIGEN: All right. Then are there
2 geodetic maps available showing which way the
3 aquifers flow in this area, and do those arrows
4 indicate surface water?

5 MR. ALDIS: I tried to simplify this to
6 show you the directions of flow, but the individual
7 remedial investigation reports show specific
8 groundwater contours. Now, in a sand and gravel
9 aquifer, the water flows at right angles to the
10 contours, and we indicate on our maps the
11 groundwater with arrows showing the direction flow
12 down the contours; and you can have a look at those
13 in detail. I know that this is true in general. If
14 you were to point to any one particular arrow and
15 say, What's the basis for the evidence, I would
16 simply have to say that it's higher on the left, and
17 it's lower on the right, and it flows from left to
18 right.

19 MRS. vom EIGEN: That's not the underwater
20 aquifer that you're talking about?

21 MR. ALDIS: No, I'm talking about the
22 aquifer. This is groundwater. All of the
23 groundwater in South Post definitely goes into the
24 Nashua River or over here into the North Nashua

1 River. Now, before it gets to the Nashua River,
2 most of it discharges to smaller streams which
3 themselves discharge to the Nashua. And that we
4 know as just a matter of physical behavior of water
5 in the kind of environment. There's no question
6 about it, in my mind. That's where it goes, it goes
7 into the surface water on South Post, and that
8 drains into the Nashua River.

9 MRS. vom EIGEN: And Spec Pond is a
10 different entity.

11 MR. ALDIS: Spec Pond is up here.

12 MRS. vom EIGEN: And you described that as
13 a different type of water.

14 MR. ALDIS: No, I'm not saying that, I'm
15 saying that Spectacle Pond is full of water which is
16 generated at and immediately around Spectacle Pond,
17 and it is not coming off South Post, it is going on
18 to South Post. As I said, Spectacle Pond could
19 contaminate South Post, but South Post could not
20 contaminate Spectacle Pond.

21 MRS. vom EIGEN: I'm thinking of Spectacle
22 Pond wells and wondering if there's an underwater
23 flow direction that's different.

24 MR. ALDIS: No. The water around Spectacle

1 Pond is flowing into Spectacle Pond, so it's the
2 area immediately adjacent to the pond and the pond
3 itself which is supplying those wells.

4 MRS. vom EIGEN: My last question has to do
5 with your terminology of "no action." Now, I
6 understand from reading these that the Army is going
7 to recommend no action, which puts on hold --

8 MR. ALDIS: What they're doing is
9 recommending no clean-up action. What they are
10 recommending is continued monitoring, which is an
11 action, if you like, but it's not a clean-up
12 action. It's simply observation.

13 MRS. vom EIGEN: When you say "no action,"
14 it doesn't mean a closure of the whole thing.

15 MR. ALDIS: It doesn't mean that nothing is
16 going to happen in the future; it means that only
17 monitoring, no clean-up.

18 MRS. vom EIGEN: My understanding in
19 perusing the fact sheets was that no action might
20 mean --

21 MR. ALDIS: Literally that.

22 MRS. vom EIGEN: -- literally that, right,
23 exactly.

24 MR. ALDIS: That is a little misleading,

1 but what it means is that no clean-up action will be
2 taken, just monitoring.

3 MRS. vom EIGEN: Thank you very much; it's
4 been very informative.

5 CHAIRMAN CHAMBERS: Okay. I'd like to
6 close this public hearing. Then I guess you have
7 the poster session down here; we could spend a few
8 more minutes there. If anyone else would like to
9 say anything for the record, please do.

10 MR. CHRISTOPH: I would like to thank the
11 Department of Defense and the other organizations
12 for what I consider to be an openness, a willingness
13 to talk to us. I appreciate that.

14 CHAIRMAN CHAMBERS: You're welcome.

15 DR. CRAMER: He stole my thunder.

16 CHAIRMAN CHAMBERS: One more thing, if I
17 might add, please. The public comment period is
18 open to March 1st, so if you would like to submit
19 any comments in written form, the address is on the
20 fact sheet and the proposed plan; you have until
21 March 1st to submit it in writing.

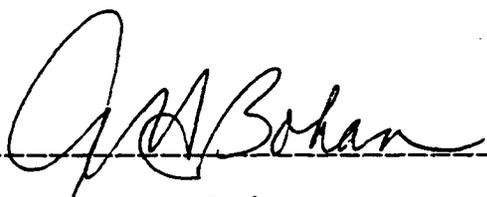
22 (Whereupon, at 8:40 p.m.

23 the hearing was concluded)

24

C E R T I F I C A T E

I, Anne H. Bohan, Registered Diplomate Reporter, do hereby certify that the foregoing transcript, Volume I, is a true and accurate transcription of my stenographic notes taken on February 21, 1996.



Anne H. Bohan

Registered Diplomate Reporter

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