

RULS - AD - 1972 - 90

9/28/1972

- DEPOSITION OF DR. RUTH PATRICK

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THE ALLAN-DEANE CORPORATION,
a Delaware corporation qualified
to do business in the State of
New Jersey,

Plaintiff,

v.

THE TOWNSHIP OF BEDMINSTER,
a municipal corporation of the
State of New Jersey, and
THE TOWNSHIP OF BEDMINSTER
PLANNING BOARD,

Defendants.

RULS - AD - 1972 - 90

Depositions of:

Dr. Ruth Patrick

TRANSCRIPT OF TESTIMONY taken by and before
Herman Nedzela, a Notary Public and Certified Shorthand
Reporter of the State of New Jersey, at the Academy of
Natural Sciences, 19th Street and Benjamin Franklin Parkway,
Philadelphia, Pennsylvania, on Thursday, September 28, 1972,
commencing at 10 a.m.

A P P E A R A N C E S :

William W. Lanigan, Esq.,
Attorney for Plaintiff.

McCarter & English, Esqs.,
By: Nicholas Conover English, Esq.,
Attorney for Defendants.

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I N D E X T O W I T N E S S

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1 R U T H P A T R I C K

sworn.

2 DIRECT EXAMINATION BY MR. LANIGAN:

3 Q Doctor, for the benefit of the record, could
4 you give us your home address.

5 A Yes. I live on Thomas Road. Our property extends
6 to Germantown Avenue in Springfield Township of Pennsylvania.

7 Q Thank you.

8 And by whom are you employed and in what capacity?

9 A I am employed by the Academy of Natural Sciences.
10 I am chairman of the limnology department of the Academy
11 of Natural Sciences.

12 Q Just what is the academy?

13 A The Academy of Natural Sciences is a nonprofit
14 institution which was founded in 1812 and it is the oldest
15 or one of the oldest institutions in the western hemisphere
16 for the study of plants and animals.

17 Q And do you, in addition to being the chairman
18 of the department, engage in consulting work?

19 A I do not personally engage in any consulting work.

20 All contracts are made with the Academy of Natural Sciences,
21 and my salary is in no way influenced by any contract that
22 comes into the academy.

23 Q Is there such a contract in existence between
24 the academy and the Township of Bedminster?

25 A I do not think--at the present time, there is no

1 contract with the academy and the Town of Bedminster.

2 ~~There isn't~~ even a contract at the present time, I don't
3 believe, between the watershed and the academy.

4 Q At whose request are you going to testify?

5 A Well, I am not quite sure because I have not been
6 formally approached to testify, but I would judge it would be
7 ~~the~~ /watershed that I would testify as not in their behalf at all
8 but simply as an expert witness saying exactly what I have
9 found. That's all I can say.

10 Q Thank you.

11 Now, what is limnology?

12 A Limnology--the word as originally derived means--
13 "limno-" is pool, and "-ology" is science of pools; however,
14 this term has been broadened, and the common definition of
15 limnology is the study of surface fresh waters.

16 Q That is both within the stream itself and
17 the watershed?

18 A Well, it would be lakes and streams. It wouldn't be
19 ground water though occasionally--I mean I can't imagine any
20 ~~limnologist~~ not having a pretty good idea of ground water.

21 Q Does your examination--is it limited
22 geographically in any way or is it throughout the United
23 States?

24 A Oh, we have studied streams throughout the United
25 States. I have personally inspected over 800 sections of

1 streams in the United States. I have been in the stream and
2 studied the aquatic life.

3 Q What is your educational background?

4 A I have, sir, my bibliography, if you would like
5 to introduce it.

6 Q We need not enter it into the record, but I
7 would appreciate having a copy. Do you have an additional
8 copy for Mr. English?

9 MR. ENGLISH: I have one already.

10 A If you want my list of publications, you may have that
11 too.

12 Q If you have that, yes.

13 (Short recess.)

14 MR. ENGLISH: The record should show that
15 the witness gave Mr. Lanigan a list of her
16 publications up to 1971.

17 Q Thank you.

18 Doctor, with respect to the Township of Bedminster,
19 have you physically been to Bedminster?

20 A Yes, sir. Well, when you say "physically been to
21 Bedminster," yes, I guess you would say I have physically been
22 to Bedminster. I have certainly driven through Bedminster.
23 I have visited all these areas that are designated here as
24 stations and just this past week have visited certain ones
25 which I thought were critical.

1 Q And you're referring to what now?

2 A "The Water Quality Survey of the Upper Raritan
3 Watershed."

4 Q Did you assist in any way in the preparation
5 of that document?

6 A Yes.

7 Q In what capacity?

8 A I, one, laid out the program of the study; number two,
9 I did visit--I believe this was done in 1968--I know I
10 visited all the stations. I actually went into--I
11 couldn't tell you right now exactly how many, but certainly
12 the greater majority of them, and personally looked at the
13 aquatic life in the stream.

14 Q Did you concern yourself solely with the
15 streams in the Township of Bedminster or were you concerned
16 with water areas outside the township as well?

17 A May I ask you is there more than one township in this
18 area?

19 Q Yes. A Well then, if
20 these areas represent more than one township, I was con-
21 cerned with the streams and water in more than one township.

22 Q How far downstream from the Township of
23 Bedminster did you go?

24 A We went to--I have examined this station on Chambers--
25 well, I have examined the station just recently, the other

1 day, at State Highway I believe it is 28, which is below where
2 Chambers Brook enters the east branch of the Raritan.

3 Q And when did you examine that station?

4 A I was out--what is today? This past Monday.

5 Q And did you prepare any sort of report of your
6 examination?

7 A I have submitted no formal report of our examination,
8 but we have been doing a series of studies at the request--
9 though I do not think we have any formal contract--of the
10 watershed and we have been gathering since the 24th of
11 August through September 19th chemical analyses of the water
12 at certain stations in the watershed and, therefore, I have
13 gone over these and have summarized them and I have--I am
14 working on these at the moment. I am not ready to give a
15 formal report on them. I just got this morning some of the
16 data, so I cannot give you the formal report.

17 Q At what point would you be able to give
18 someone a formal report?

19 A I will be able to give someone a formal report
20 within about, I would hope, two weeks or some such--if that's
21 soon enough. I guess it is.

22 Q At that time, would you make a copy of your
23 report available to me.

24 (Off the record.)

25 Q With respect to the chemical analysis, do you

1 have a copy of your reports on those stations for the
2 period of time which you referred to?

3 A You mean recent period of time--

4 Q Yes, ma'am.

5 A --that I have studied them?

6 Yes, we have a chemical analysis of that period.

7 Q May I have a copy of that.

8 A In due course, yes. I have to check them over. I am
9 not ready to release them this morning.

10 BY MR. ENGLISH:

11 Q Would the results of the chemical analysis
12 be in this report you are proposing to send Mr. Larson in a
13 couple of weeks?

14 A That is correct. We will have everything.

15 MR. LANIGAN: Fine.

16 BY MR. LANIGAN:

17 Q what at this point conclusions have you drawn
18 from your recent examination of the stations in the
19 ~~Bedminster~~ area?

20 A May I ask you to more clearly define what you mean by
21 the ~~Bedminster~~ area."

22 Q I mean the actual Township of Bedminster and
23 the--

24 A Can you designate to me where this is?

25 Q Marked "Pluckemin-Bedminster-Burnt Mill."

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MR. ENGLISH: Can we help Dr. Patrick by stating that the boundaries of Bedminster--the west boundary is the Lamington River beginning approximately at Pottersville. Then it is north--well, it goes down to Chambers Brook, and Chambers Brook is part of the southern boundary. The boundaries go roughly up to the eastern watershed of the Raritan from--well, let me draw that.

THE WITNESS: Why don't we put it down here.

MR. ENGLISH: You make sure that I'm correct on this.

From about between the "m" and "b"--or the "b" in "Chambers Brook" as it appears to be the boundary and it goes northeasterly to the watershed boundary. Goes roughly up there. It takes in the Village of Bedminster, but not the dot on the map for Far Hills, and then goes to the west.

THE WITNESS: Just mark it, will you please.

MR. ENGLISH: Sure.

Is that about it, for Dr. Patrick's guidance?

MR. LANIGAN: Yes.

Specifically in the Pluckemin area as designate on the watershed map.

1 A You mean in Chambers Brook.

2 Q Yes.

3 A Chambers Brook would be the brook that would drain
4 into the Pluckemin area.

5 Q Yes. A Yes, I have
6 looked--did look the other day at three areas in Chambers
7 Brook.

8 Q And what conclusions did you come to with
9 respect to the quality of the water?

10 A I have not come to any conclusions, but my preliminary
11 estimate--and it's very preliminary until I get everything
12 together--indicates that there is considerable organic
13 enrichment in the stream and there is a rather heavy
14 silt load in the lower part of the stream.

15 Q Do you know where that's coming from?

16 A I do not know because "know" is a very definite
17 word. I can say that there is development on the side of the
18 stream near what we called our Station 24, which is above
19 your Station 23, which is near the mouth and that there was
20 considerable silt load in the stream, and the banks of the
21 stream were being severely eroded.

22 Q Have you ever heard of something called
23 "Sunset Lake"?

24 A Yes, sir. I think I did.

25 That's up here, isn't it, above our station?

1 Q Yes. A We didn't look
2 at Sunset Lake or I did not.

3 Q It feeds into your watershed, does it not?
4 A Yes, and we examined the stream just below Sunset
5 Lake. Our Station 25 is just--let me see the description.
6 25--that's a new station.

7 Station 25 is located just below Sunset Lake. We
8 found a very heavy bloom or growth of cladophora, which is a
9 green alga, and this species is one that commonly indicates
10 increased organic load along with other organisms. Our
11 judgment of any stream is never based on any one group but
12 by summing the knowledge taken from algae, various major
13 groups of invertebrates and also by looking at the chemistry
14 of water and bacteriological counting.

15 Q Is it possible that this condition is caused
16 by exfiltration, for example, of effluent from a sewer line
17 which is in the bed of Chambers Brook?

18 A It would be possible, but I of course as a scientist
19 unless I know more about just where this sewer line is and
20 definitely identify it would not want to draw any conclusion
21 ~~like that~~ until I know more thoroughly what the relationships
22 were.

23 Q Did you examine the station which is in-
24 dicated to the north of the designation "Pluckemin"?

25 A Here is Pluckemin in here.

1 Q Yes.

2 A This is Chambers Brook.

3 Q Yes. Now I'm asking you to look to the
4 stations which are immediately to the north, 13 and 12.

5 MR. ENGLISH: They're on Middle Brook?

6 A Yes, we have looked at those stations. I don't
7 think--I know I haven't looked at them. When you're taking a
8 deposition, I will try to be exactly accurate.

9 I didn't look at them the other day. They have been
10 looked at in the past. We have not studied them at this
11 particular time.

12 Q In the course of your examination, were you
13 able to form any opinion as to the amount of sewage, effluent
14 in the stream?

15 A We have not completed those kinds of studies yet.
16 We hope to try to work out a nitrogen and phosphorus balance,
17 but that takes a little bit of mathematical calculation and
18 I just got the results in and we have not done this. Whether
19 we can or not on this short a study I cannot tell you at
20 this time, but we will attempt to.

21 Q Do you have any opinion as a result of your
22 examination of the area as to the necessity for sewerage
23 systems or is that outside the scope of your examination?

24 A Well, you would say--let us say this. What I can say
25 definitely is that certain streams in the general system--

1 Criteria Committee of the National Academy of Sciences and
2 we have tentatively said that a lake should not have more
3 than--or one of the things that we have talked about, whether
4 it comes out in the final report; but the scientists believe
5 that .01 parts per million of P, as PO_4 , phosphorus, will
6 endanger a lake for having nuisance growths in it. We say
7 in a free-flowing stream that doesn't enter a lake, this
8 might be up to a tenth of a part per million without causing
9 undue harm but a stream that enters a lake should not have
10 over .05 milligrams per liter of PO_4 .

11 Now, you can calculate what is the amount of
12 phosphorus and nitrogen--I'm using phosphorus just as an
13 example--in human sewage. You can calculate this for animal
14 manure and then you can calculate the volume of flow of the
15 stream and from that you can say, "Well, this much sewage
16 or this much equivalent sewage like from a sewage treatment
17 plant or this much from cattle--no more than that should
18 enter the stream."

19 There are also many other criteria. For example,
20 siltation, one of our worst, worst problems in our streams
21 with urbanization--and Dr. Bruno Leopold has written a
22 little pamphlet which clearly cites the very, very--in other
23 words, as work in cover showed, when you reduce just forest
24 cover from 80 to 20 percent, you increase the silt load
25 about eight times from a stream. Now these kinds of things--

1 of carelessly denuding an area to build houses, like taking
2 down all the trees and taking off all the grass--this has a
3 very severe effect on streams or can have.

4 Q If large green areas and tree areas are
5 allowed to remain, that would not disturb the ecology then.

6 A That's correct, and the water inevitably improves,
7 as we have shown here, not in this township, but will be able
8 to show in other streams up here improvement with low-density
9 housing upstream.

10 Q And what density are you talking about?

11 A Well, I will have to in my report exactly relate this;
12 but when I talk about low density, it's--and density depends
13 on the characteristics of the watershed. A watershed that
14 has a very steep slope will not support as many people, and
15 very poor permeability of the soil will not support as many
16 people or the watershed cannot assimilate shall we say as
17 much waste as in a watershed which has a much lower gradient
18 of the watershed and soils that are more suitable for
19 absorption rates.

20 Q Which type is Bedminster?

21 A Glory be. I don't think that I can give you in--
22 whereabouts in Bedminster? It's a big township. Do you
23 mean in Chambers Creek or do you mean up near the Town of
24 Bedminster?

25 Q Let's take the--

6 A No, sir, not at this time.

7 Q Have you made any recommendations in the
8 past and prior to today to the watershed associations
9 as to the desirable density within their watershed?

10 A Pardon me. I'll have to look a little bit to see.
11 Mr. Thomas Lloyd did a considerable amount of this study
12 along with Mr. Grant and other people.

13 BY MR. ENGLISH:

14 Q Are you referring to a different study than
15 the one we have identified previously?

16 A I am referring to a different one than this, yes.

17 Q Could you give us for the record the title
18 and date of the study you are now looking at?

19 A Well, I guess this is the one. This one is, I guess,
20 the same as this. I would have to verify it. This I think
21 is the same.

22 Yes, and here it tells you exactly who did the studies.
23 The field work was done by Dr. Patrick, Mr. Robert L. Grant,
24 Jr., and Mr. Lloyd did some of the studies. He is not
25 mentioned in this book. I will have to check to know

1 whether--I know he made maps--I'm sure he did some of the
2 work in this.

3 Q Which is the date of the study you are
4 talking about? A This is August and
5 November of 1967.

6 BY MR. LANIGAN:

7 Q That's the "Water Quality Survey, Upper
8 Raritan Watershed."

9 A That's correct.

10 Q What is the other study you're referring
11 to? A "Natural Resources
12 Inventory of the Upper Raritan Watershed."

13 Q Do you have a copy of that?

14 (Off the record.)

15 Q May I have a copy of the report entitled
16 "Natural Resources Inventory of the Upper Raritan Watershed."

17 A This is not validated as being a report that we
18 produced.

19 MR. ENGLISH: The record will show that
20 Mr. English handed Mr. Lanigan a copy of the
21 document which Mr. Lanigan described.

22 MR. LANIGAN: Thank you.

23 Q Was this report, the "Natural Resources
24 Inventory," any more than a representation at July 1969 as
25 to the quality of the water?

1 A It has not very much to do with the quality of the
2 water. It has a great deal to do with the slopes and
3 geology and soil characteristics, which are terribly
4 important in determining what the density of the people can
5 be in an area.

6 Q Is there any conclusion reached--

7 A Yes, on--I'll read the conclusion. I don't know
8 whether--let me take yours and just check it to make sure.
9 You know, you give somebody a report and often they take
10 pages out or change it around, so I just can't vouch that
11 these things--

12 MR. ENGLISH: Nobody is trying to pressure
13 you into identifying a document you haven't studied.

14 A (Continuing) Yes, I think you will see on "3" there,
15 under "Summary: An Inventory of Natural Resources,"
16 "To assist those involved in making decisions concerning
17 appropriate land use, in determining the suitability of
18 both existing and future land use with respect to intrinsic
19 capability of the land," and then it goes on.

20 Q Thank you.

21 Referring to the conclusion then in Item 5, Paragraph
22 5, on the next page--

23 A Yes.

24 Q --in what manner can the limitations, the
25 soil limitations, be overcome?

6 not removing vegetation from the banks of streams, from not
7 having houses too close together, from having septic tanks--
8 examining the soil structure very carefully before you
9 build a septic tank, of having the septic tank, if possible,
10 300 yards from the stream. These kinds of things are the
11 kinds of things that we go into some--

12 Q In Paragraph 6 the statement is made that
13 "If future development is carefully planned, many more
14 people can be accommodated." Do you have an opinion as

15 to how many more? A I do not,
16 no. I don't right off the bat. I think that we could--in some
17 areas it would take a very expensive study to exactly
18 determine this for the whole watershed, but it would be
19 perfectly possible to determine the carrying capacity for
20 minimum areas of the watershed.

21 Q You have not done so, however, for any areas
22 within Bedminster?

23 A No, sir.

24 Q In terms of your testimony or any
25 appearance which you may make in behalf of the township, will

1 to help you to prepare briefs, to help to get together the
2 data as of the time.

3 As I say, we have--I have a great deal of--I
4 suppose you don't understand this, but scientists are
5 people that have interests in areas, and money doesn't mean
6 as much to them as to other kinds of people. I am sure
7 there is no business on earth that would be doing what we
8 did or are doing right now without any contract or any
9 definite obligation, and we've just been doing this work.
10 Now before I go much further, we've got to firm up, exactly
11 how--what's going to be paid and a few other things.

12 Q Will you, if you know at this point, be
13 testifying from the use of notes in any respect?

14 A Oh, I probably will have a written statement.

15 Q Written report--

16 A I usually--

17 Q --or statement?

18 A Yes. I usually do when I testify.

19 Q Will you be preparing that prior to--

20 A Yes, sir.

21 Q --the trial? A Oh,
22 yes.

23 Q How far in advance?

24 A The night before.

25 MR. LANIGAN: Thank you.

1 Doctor, I don't have any other questions.

2
3 CROSS-EXAMINATION BY MR. ENGLISH:

4 Q May I refer to the "Natural Resources
5 Inventory."

6 A Yes, sir.

7 Q Do I understand correctly that a number of
8 particular individuals participated in the preparation of
9 this document? A Yes, sir.

10 Q And what was your relationship to the
11 study which resulted in the document?

12 A Well, my relationship to any such study is this.
13 Number one, I help in the design of the study. Number two,
14 I have a rather broad scientific education and though I have
15 many specialists in my department, I sort of snoop in
16 on things and say, "Is this right? How do you come to this
17 conclusion? What is the basis for this, that or the other
18 thing?" I guess you would say that that is my role. The
19 watershed has some very large maps that go along with this
20 study.

21 BY MR. LANIGAN:

22 Q I'm interested--these maps I referred
23 and the report is not of great value without the maps.

24 A That's correct. The maps are with the watershed.

25 Q They have the maps? A That's

1 right.

2 MR. LANIGAN: I wonder if we could at
3 least get a look at them.

4 MR. ENGLISH: Yes.

5 MR. LANIGAN: Maybe if you will tell
6 Mr. Larson, I can either go look at them or have
7 someone look at them.

8 MR. ENGLISH: I'll be glad to follow
9 through.

10 BY MR. ENGLISH:

11 Q I note on the cover page of the "Natural
12 Resources Inventory" down at the bottom it says, "Department
13 of Limnology."

14 A Yes.

15 Q Does that mean that you as the chairman of
16 the department have some kind of overall supervision or
17 responsibility for it?

18 A That's right.

19 Q So you as a professional would--do you as a
20 professional endorse this report as something you can assume
21 responsibility for as a scientist?

22 A Surely. Oh, certainly as to the general statements.
23 I have not read your copy. I have not read this copy. There
24 may be some technical--you know, little errors or what not that
25 creep into something like this; but in general, I would be

1 glad to read it over and tell you: "Yes, indeed, I believe
2 it's absolutely correct."

3 (Off the record.)

4 Q Now, with respect to these maps which have
5 been referred to, which you understand are in the possession
6 of the Upper Raritan Watershed Association, were they prepared
7 under your overall professional supervision?

8 A Yes, sir.

9 Q And are those maps a work product of the
10 Department of Limnology?

11 A Yes, sir.

12 Q So then would you be prepared to give the
13 same kind of authoritative endorsement to the maps that you
14 can give to the "Natural Resources Inventory"?

15 A Yes, sir.

16 MR. ENGLISH: That's all I have.

17 MR. LANIGAN: Thank you for your time,
18 doctor.

19 THE WITNESS: Your welcome.
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SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - SOMERSET COUNTY
Docket No. L-36896-70 P.W.

1 THE ALLAN-DEANE CORPORATION, etc., :

2
3 Plaintiff, :

4
5 v. : CERTIFICATE

6 THE TOWNSHIP OF BEDMINSTER, et al., :

7 Defendants. :

8 I, HERMAN NEDZELA, a Notary Public and Certified
9 Shorthand Reporter of the State of New Jersey, do hereby
10 certify that the foregoing deposition of Ruth Patrick was
11 taken before me on Thursday, September 28, 1972 and was
12 reported stenographically by me; and the foregoing is a
13 true and accurate transcription of my stenographic notes.

14 I further certify that the witness was duly sworn by
15 me according to law prior to testifying.

16 I further certify that I am neither attorney for nor
17 counsel to any of the parties; that I am not related to or
18 employed by any of the parties or any of the attorneys in
19 this action; and that I am not financially interested in
20 the action.

21
22 
23 HERMAN NEDZELA, C.S.R.

24 DATED: October 18, 1972.
25