CN - Orgo Farms + Greenhouse 5/11/79

Transcript of proceedings: Deposition of Joseph Skupien

p 83

CN 000 004 G

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - MONMOUTH COUNTY
DOCKET NO. L-3299-78 P.W.

ORGO FARMS & GREENHOUSES, INC., a New Jersey Corporation; and RICHARD J. BRUNELLI, Plaintiffs, -vs- TOWNSHIP OF COLTS NECK, a Muncicipal Corporation, Defendant.	CIVIL ACTION DEPOSITION OF: JOSEPH SKUPIEN

TRANSCRIPT of the stenographic notes of the proceedings in the above-entitled matter as taken by and before FRANCINE RUDD, a Shorthand Reporter and Notary Public of New Jersey at the offices of FRIZELL, POZYCKI & WILEY, ESQS., 312 Amboy Avenue, Metuchen, New Jersey 08840, on Monday, April 30, 1979, commencing at eleven o'clock in the forenoon.

APPEARANCES

FRIZELL, POZYCKI & WILEY, ESQS.,
BY: DAVID JOSEPH FRIZELL, ESQ.,
For the Plaintiffs.

STOUT, O'HAGAN & O'HAGAN, ESQS.,
BY: ROBERT W. O'HAGAN, ESQ.,
For the Defendant.

STATE SHORTHAND REPORTING SERVICE
P. O. Box 227
Allenhurst, N.J. 07711
(201) 531-9500
(800) 392-6823
Frederick J. Johnson, III, C.S.R., President
SSRS

I N D E X

E X H I B I T S

J O S E P H S K U P I E N, Sworn.

DIRECT EXAMINATION BY MR. O'HAGAN:

Q Mr. Skupien, has your attorney explained to you the nature of these proceedings?

A Yes, he has.

Q And you know that I'll be asking you questions and your answers will be recorded?

A Yes.

Q And, of course, you realize you're under oath?

A Yes, I do.

Q And the answers that you might give may be used at some subsequent date at trial?

A Yes, I do.

Q Now, if I ask you a question and you don't understand it, please ask me to repeat it or if you want it to be rephrased, please feel free to ask me to rephrase it or for any reason you want the answer or the question - pardon me - repeated, I'd ask you to ask me to repeat it and I'll do so. If you don't do that, I'm going to assume that you understand the question and that the answer you give is responsive to it.

Tell us by whom you're employed?

A Ellson T. Killam Associates.

Q In what capacity?

A I am -- my official capacity in the company is designer.

Q What does that mean?

A Okay. The field I work in is Flood Control, Hydraulics, Hydrology. Designer means that I am a grade below a Project Engineer.

Q Now, you mentioned words "hydrology" and "hydraulics".

A Uh-huh.

Q When you use the word "hydraulics", what do you mean?

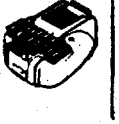
A As far as I understand it, it means once the run off, the rainfall as converted into run off and is on the ground or flowing, the art or science of moving that flow on the ground is hydraulics or it can deal with pipes and channels for that.

Q What does hydrology mean?

A The procedure of estimating relationship between rainfall and run off, how much rainfall will become run off, what kind of volume or peak rate of flow it will produce, the timings involved. I guess you could refer to textbooks on it.

MR. FRIZELL: Off the record.

(Whereupon there is a discussion off the record.)



BY MR. O'HAGAN:

Q Now, you have indicated that you're a Designer and that is just below a Project Engineer?

A Okay. In specific levels, there are two more levels: A Senior Designer and Assistant Project Engineer, then a Project Engineer, to be exact.

Q Between your level and the Project Engineer?

A Right.

Q Now, who would be below you in the hierarchy?

A It would be an Assistant Designer.

Q What actually do you do; what function do you perform?

A Okay. Myself, under the guidance of either the Project Engineer or a Licensed Engineer in the company, will -- well, it ranges over a number of things. But under their direction, design things, analyze sites - how do you phrase it in a few words? My background has been in a range of projects from conceptual and feasibility reports on up through preliminary design to final design, mainly again in the field of Flood Control.

Q Am I understanding that your work would be reviewed and corrected if necessary by the people on the ladder going up to the Project Engineer?

A Yes.

Q In Ellson Killam, who was the Project Engineer

who was involved in this conceptual engineering report for the Colts Neck Village, which is dated January of 1979?

A The Project Engineer was Gale McDonald.

Q Gale or Dale?

A Dale, I'm sorry.

Q What role did he play in the preparation of the -- strike that.

Am I correct in understanding that your input in this report was limited to that section entitled Storm Water Drainage?

A Yes, it was.

Q What role, if any, did he play in the preparation of that aspect of the report?

A In terms of the actual development of the numbers and the parameters and the sizes, it was more or less left up to a gentleman by the name of Ken Zippler in our office and a gentleman by the name of Leo Coakley in our office, who are more familiar with details of storm drainage than Dale. Dale was involved in the forming of the report, the structure of the report itself. He coordinated all the three areas in terms of obtaining the materials, helping with suggestions and things. I would say more the actual details of the report were more involved with Mr. Zippler and Mr. Coakley.

Q What job title does Mr. Zippler have?

A Either Executive or Senior Vice-President. I can't really recall.

MR. O'HAGAN: Off the record for a minute.

(Whereupon there is a discussion off the record.)

BY MR. O'HAGAN:

Q Now, Mr. Coakley, what position does he hold?

A He is an associate with the firm.

Q What's his job title?

A Associate.

Q What does that mean?

A Okay. It is -- now, this I am not too familiar with. I would have to check. It's a level quite a bit above mine and I'm really not too familiar with it.

Q Now, with reference to Mr. Zippler, what, if anything, did he do with reference to the preparation of the portion of this report entitled Storm Water Drainage?

A Okay. In looking back, the actual breakdown between Mr. Zippler and Coakley, I am not really sure of but when it came down to a decision in my job whether to use one number or another, insertion of the ordinance or the codes or any real design decision that would affect the outcome, I would check with either one of those

gentlemen, both of whom I worked with before on other projects.

Q Now, with reference to this report - I'm doing it now from an overview - do you recall the nature of the questions that you directed firstly to Mr. Zippler?

A No, I can't -- I could not recall specific questions.

Q Do you know the nature of the questions that you directed to Mr. Coakley?

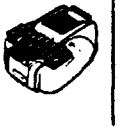
A No, again.

Q Now, you've indicated that you can't recall specific questions. I'm referring to in a generalized fashion the nature of the questions that you directed to them.

A In one instance, I can't recall again the specific questions, no, but in general. We had the County Sub-Division Resolution. We had the Town Land Use Ordinance that we were to base our report on and if there was a question when there were any apparent conflicts, well, which one do we go with, if one seemed to be more extreme than the other, one required more than the other one, that was discussed. When we had to refer to references for rational sea coefficients or for rainfall values, that would be discussed.

Q Who made the actual calculations, you?

A Yes.



Q Subsequent to their approval?

A Yes, and even before the calculations were made, a review of how I was planning to go about it. Even before the calculations were made, they were aware of what I was doing.

Q Would you communicate with them in writing?

A No, verbally. It would be a walk down the hall to the office.

Q When I asked you as to your employment with Ellson Killam, I neglected to ask how long you had been employed by Killam?

A I've been employed by Ellson T. Killam Associates full time since July of 1973.

Q Always in the same position?

A As a Designer, no. I started off as Assistant Designer.

Q Now, where were you employed prior to that?

A On a -- well, I graduated from Rutgers University in May or June of '73 and thereafter leaving Rutgers, I joined Killam. I worked with Killam part time during my senior year in college and the summer before my senior year as a field man.

Q What degree did you receive?

A Bachelor of Science in Civil Engineering.

Q Now, is that the extent of your formal

education?

A Yes.

Q Your graduation -- strike that.

Was it a four year course at Rutgers?

A Yes.

Q Okay. So you've been employed by Killam from that time to the present?

A Yes.

Q Now, turning to the report, are you in a position to advise us as to the soil composition of the subject site, of the soils on the site?

A Okay. In specific -- exact, specific areas right now, no. We did receive in developing the report, we did receive some soil interpretations from the soil conservation service and some generalized soil maps of the area from them, and we used those in developing some of the values we used in the report. I think that's mentioned in the report.

Q Okay. Now, the data that you received, that was in writing, of course?

A Yes.

Q Would you send me a copy of the data that you received?

A Surely.

Q And the maps that you received, are they

capable of photocopying?

MR. FRIZELL: Could we identify what data we're talking about one by one?

BY MR. O'HAGAN:

Q Let's speak of the data. What did you receive from the group --

MR. FRIZELL: Just for the purpose of procedure, he'll send them to me and I, to you.

MR. O'HAGAN: Okay.

THE WITNESS: The total package received from the soil conservation service, I could not inventory right now. The two items I used in working on the report were things called Soil Property and Soil Survey Interpretation Reports and a soil map, the title of which I am not sure of, but it is a large scale map of the area and it shows areas of different soil type.

BY MR. O'HAGAN:

Q Okay. Now, with reference to the soil property and soil interpretation reports, were they two separate reports or one?

A No, it was one sheet, one data sheet for each type of soil.

Q Would you make a photocopy of that?

A Yes.

Q Send one to Mr. Frizell with subsequent copying to me.

MR. FRIZELL: Sure.

BY MR. O'HAGAN:

Q With reference to the map, could you describe the type of map it was?

A Describe in what way?

Q What does it depict?

A Well, it depicts the area that the project site is located on, in fact quite a bit of area around it as well.

Q Would it describe the soil as to suitability for agricultural uses?

A No, I'm not familiar specifically with the information on the soil interpretation reports, but the map would just show the -- delineate the area in that a certain type of soil could be found and it would be designated on the soil map by a number. That number could be correlated to a number on the reports and from there, you could obtain information about the soil itself.

Now, the main number I was interested in or main value or parameter I was interested in was known as the run-off curve number for the type of soil that it was with

regard to storm water runoff.

Q Would that have to do with the permeability of the soil, how much it could absorb?

A Yes.

Q Are you in a position to advise us as to the characteristics of the soil on the subject site with reference to the runoff coefficient or the extent of permeability?

A Okay. The exact designations, to be absolutely accurate, no. But there were varying types of soil on the site. Maybe I can describe it a little bit in general as to the soil in its hydrology or the hydraulogical method recognized four major groups of soil, which they label A, B, C and D; A being the least impervious, the most pervious, the type of soil that would be expected to produce the least runoff of the four. This decreases down to soil D, which would be expected to give off the most amount of runoff, that portion of rainfall that becomes surface flow and doesn't infiltrate into the ground, into the soil.

There were, as I recall, soils A, B and D but I -- okay. I'm trying to supply an answer. I believe that's correct. I would really have to check the calculations.

Q Are you in a position to advise us as to whether the majority of the site was classified as soil A?

A Yes, that I can recall. Most of the soil was in soil groub B.

Q And that's a soil that's relatively -- has relatively a great amount of permeability and can absorb the water runoff?

A All I can characterize it is by saying you can anticipate more runoff from A but not as much as you'd get from D.

Q Okay. Now, with reference to that portion of the site north of Route 18, can you advise us in that regard as to the acreage, firstly, involved in that portion of the property?

A The exact number, no, not without looking through my notes or adding up the numbers in the report.

Q You're looking at notes which seem to have writing on them. Please feel free to examine it.

A Okay. Can I go off the record. Can I ask for that?

Q Okay.

MR. O'HAGAN: Off the record.

(Whereupon there is a discussion off the record.)

MR. O'HAGAN: Would you repeat the last question?

(Whereupon reporter reads back

pending question.)

THE WITNESS: If you could repeat the question again.

BY MR. O'HAGAN:

Q I think the question was what acreage is there on the subject site located north of Route 18?

A Okay. That I would have to compute from this, the proposed conditions plate.

Q At anytime did you make that calculation?

A Yes, it was done.

Q Did you bring your notes with you today as I asked you to do to provide us with the field data as to what you had actually calculated?

A No, I was not aware that I should bring any information.

MR. O'HAGAN: You and I had had a discussion about that. I asked you to have him bring his field notes and calculations.

MR. FRIZELL: Truthfully, I don't remember your saying he should bring his notes.

MR. O'HAGAN: I did.

BY MR. O'HAGAN:

Q At any rate, did you reduce that to writing, Mr. Skupien?

A Yes, those notes -- that number should be, yes.

Q Would you send me a copy of them, routing them first through your attorney?

A Fine. Now, with reference to your calculations as to the present amount of runoff from the subject site, was it important for you to know the acreage involved in the lands north of Route 18?

A Yes, it was.

Q And did you actually go on the site after a rainfall and observe the water running off from the site?

A No, I did not. I did visit the site but I did not observe it during the rainfall.

Q It would be accurate to say then the calculations you made as to runoff would be theoretical in nature then?

A Yes, insofar as they do not depict an actual event I witnessed, no.

Q Are you in a position to advise us now as to the amount of total run -- strike that.

In your report, you make reference to a 50-year storm. Please tell us what you mean by that.

A Okay. A 50-year storm, as we refer to it, is a statistical event that has the probability based on statistical analysis of occurring once in 50 years on the average. It is not a regularly scheduled that happens once in 50 years, but based on - in this case - analysis

of rainfall in the general area in which the project site is located that rainfall there could produce this peak flow would occur on the average of once in 50 years.

Q When you speak of a 50-year storm, do you have a specific duration of the storm in mind?

A The duration of the storm would depend upon the drainage area in which the storm was falling. It would depend on how fast the runoff that occurs over that drainage area would drain itself to the outlet point, to the watershed we're looking at.

Q It wouldn't make any difference whether a storm was of ten minutes duration or two hours, three or five?

A No, what I'm saying is it would. There is not one duration or one intensity of rain that would apply to every watershed. Each watershed would be unique. The amount of rain, the duration of it, the intensity would depend on each individual watershed.

Q With reference to this conceptual plan, of what duration was the storm that you utilized in making your calculations?

A The duration varied for each of the four outlet points although some of them might have been the same, but the durations in each case were equal to the time of concentration to each of the points.

Q What is time of concentration?

A Time of concentration has been defined - I can define it here - as the time it would take for a drop of rainfall that become runoff and has not infiltrated the soil to go from the hydraulically most distant point of the watershed to the point where you wish to analyze.

Q Point A, Plate 4, that would appear to drain on to Route 537, County Route 537?

A Underneath County Route 537, I believe.

Q What is the hydraulically most distant point in the watershed that you utilized in your calculations?

A I cannot show you from this plate because the plate does not depict the limits of the drainage area. But on maps we have in the office, the drainage is delineated off that map and I could show you.

Q It was important for me to have you bring your plans and whatever so I'd have a meaningful way of questioning you on this.

Is it your testimony that you can't testify as to the outermost limits from the hydraulogical viewpoint as to drainage area without consulting such maps?

A Yes, I really couldn't recall exactly where it is on this map.

Q With reference to Point A, how long and what was the intensity of the storm that you utilized in your calculations?

A Again I would have to refer to the calculations. I could not recall.

Q Now, who performed those calculations; who made those calculations?

A In regard to the calculation of time of concentration, it was either myself or another gentleman in the office who was helping me on the report.

Q Who was that?

A A gentleman by the name of Scott Lin. The last name is L-i-n.

Q What job title does he have?

A I am not sure. I believe Assistant Designer but I am not sure.

Q How long has he worked for Killam?

A I believe in the area of a year but again I really shouldn't state without knowing for sure.

Q Now, which one of these calculations did you make and I make reference to points A, B, C and D depicted on Plate 4?

A As I recall, I -- I laid out the -- located the most hydraulically distant route or routes where there was a question as to which one it would be and Mr. Lin did the calculation as to how long it would take water from each of those points to reach the point we were questioning. From that, we had cited what was the time

of concentration and from that time of concentration, a duration and intensity was selected.

Q You're not able to tell us as to the duration of the storm for points A, Point B, C and D; is that correct.

A At this time, no, although the information would be in our calculations.

Q Are you able to tell us as to the intensity of the storm for any of those points?

A No, sir.

Q And I understand that was reduced to writing?

A Yes.

Q Would you send me a copy of those calculations routing it through your attorney?

A Fine, if that's okay.

Q Is this something you can send out in tomorrow's mail?

A It's -- whether it would be tomorrow, I would have to take a look. The calculations were not as straight-forward as what you're depicting for some of the locations. On some of them again, I'd have to refer back to the calculations to see which one the total drainage area to the points A, B, C and D were broken up into sub areas and individual flows for. Each of the subject areas were combined to form a total so it would not be a straight-

forward copying of some calculations. We'd have to go through and find the calculations for each subject area and find out how they were combined. It could be done in a period of time, I believe.

MR. FRIZELL: What have you asked for exactly?

MR. O'HAGAN: I want his calculations utilized for making the judgments that were made for Points A, B, C and D for the existing runoff under the present condition of the land.

MR. FRIZELL: Are those reduced -- are those calculations reduced to writing on a piece of paper somewhere?

THE WITNESS: They are.

MR. FRIZELL: Make copies of them because if there's a question about the calculations that you want answered, maybe you can ask today --

MR. O'HAGAN: Without seeing the calculations?

MR. FRIZELL: It's the best we can do. It seems as if you're talking about answering a question using the calculations or combining the calculations. In any

event, we'll supply the calculations.

MR. O'HAGAN: Off the record.

(Whereupon there is a discussion off the record.)

BY MR. O'HAGAN:

Q Mr. Skupien, as I understand it, you're advising us that you can't delineate the precise locations of the outmost portion of the drainage area without consulting your notes, but you're able to do it in a rough sense?

A Yes, I could. Yes, it would not be --

Q Now --

A Exact but that has been done already. But I could give you in general what areas do flow to what points, yes.

Q Now, in making that calculation, is it important for you to know the topography of the land?

A Yes, it would be.

Q Is it important for you to know the type of soil?

A Yes, it would be.

Q What other factors are important?

A The existing use that the land is being talked about. Now, I presume they are talking about existing conditions not developed. We would need to know the size of the drainage area, the topography, the type of soil or the use

of the land as being used for at the present time.

Q Would it be accurate to say that the present use of the land would be calculated so as to absorb more water than would be if the site were developed in the manner proposed by Mr. Brunelli and Orgo Farms and Greenhouses?

A Yes, in that particular instance, yes, the soil in its existing condition, I would think, would absorb more water than under developed conditions.

Q Have you made calculations as to what the runoff from the site would be if you had a 50-year storm in the manner which you described, which had a duration of one hour as to the volume of water that would run off the site?

A No, I do not believe that calculation was made. In other words, you're asking - if I can repeat your question - has the volume of runoff from a one hour 50-year storm been computed.

Q Right.

A No, I don't believe that has been computed.

Q Now, of any specific duration was there a calculation or were there calculations made as to the extent of runoff from a 50-year storm?

A When you say "extent of runoff", do you mean volume of runoff?

Q Volume of runoff.

A Let me explain, not perhaps explicitly. In developing the conceptual drainage plan, an estimate of the peak rate of flow and an estimate of the hydrograph of flow from the site at four points were made for both existing and proposed conditions, and the estimate was made of how much storage or volume of storage would have to be provided to reduce the proposed peak rate back to the existing peak rate. That volume was computed but the total volume of runoff was not. An estimate was made of the difference but not of the total amount in either case.

I can say something. This -- when we or when a storm water plan is developed or engineering plans in general perhaps, they are done in stages and this can be described as basically the first stage, as it was explained to me, how I learned to approach the project was that it was to be conceptual in nature. This was a site that was being investigated for development and before final design and actual detail of the design could be developed, the project could not be designed in one sitting, we would have to do it in stages. This is really a conceptual design, really just to see if the site really lends itself to development at all before we proceeded any farther and got into more detail. We wanted to see could the site be condidered for development and conceptually could we

come up with a general plan to drain the site.

So the detail is not the detail you would find in contract design or preliminary plans even. This was a first look, what we define as conceptual design.

Q Have you been involved in conceptual projects prior to this one?

A In actual wording, conceptual design, I cannot recall. I have been involved in feasibility studies, which I think can be defined as generally the same.

Q What would be the difference between a feasibility study and a conceptual study?

A I would be hard pressed to give you a real distinction. I've been involved with drainage designs on feasibility, conceptual and feasibility and financial design for storm drainage piping, for open channels, for detention basins. I've been involved in drainage projects at different levels of a design process on a number of occasions.

Q Now, am I correct in understanding then that the conceptual report that you've prepared here was really just looking at the bare bones outline of the matter as to whether this was possible in any respect?

A Okay. A lot would depend on how you defined "bare bones". Like I said, the design of the facilities for this site would proceed in phases and at the conceptual stage, which we completed, showed that it would appear feasible

and there's perhaps why I'm having trouble distinguishing between conceptual and feasibility. But from the results of our conceptual study, it appeared it was feasible to proceed with the next stage of design.

Q What's the title of the next stage?

A The specific title, I could not tell you. I would not be sure of it. It would be some sort of preliminary design of the facilities. Once more specific site details were known.

Q After that, what's the stage?

A It was okay, again I'm not sure of the exact process, but I'm sure it would be like some type of final design where actual contract drawings would be prepared showing exact dimensions and exact locations where it would be built. There might be intermediate studies but in general, that would be it.

Q Before you would recommend a client to go forward with a project of this nature, am I correct in understanding that you'd have to go past the conceptual or feasibility stage at least to the preliminary design stage in order to make finer calculations as to the characteristics of the site?

A Okay. I'm a little confused by your question. If you're asking is it necessary to go on to a higher level of design before more accurate numbers can be developed,

yes. If you're saying that you'd have to go to a further stage of design before you could determine the feasibility of the site, I would say, no, not in general, no. It's always -- every site is unique. I don't think you can say specifically that every feasibility question can be answered at the feasibility stage.

Q Fine.

A But as far as -- as far as the site feasibility, I think that's what the site feasibility level of planning accomplishes.

Q Sometime, as I understand your answer, you might make an initial determination at the conceptual stage and then find, once you had gotten into it to do the final engineering work that's required, that your original calculations and determination was in error?

A In error? Well, again, how do you define "in error"? I don't know if it is mathematically or the arithmetic was wrong, but if the assumptions it was based on might have proven to be erroneous, yes. And I believe we state that in the report. There hasn't been a look at sub-surface soil conditions or things of that nature. It was not really necessary to come up with a conceptual design. It was a first see to whether the site lent itself to development.

Q And sometime after making those additional

investigations, you might find that a site which at first you thought was feasible to be developed was indeed unfeasible and not suitable for development?

A I guess tecnically, yes, mainly because I don't know what's out under the ground there, what we could possibly run into. But I guess tecnically, it could occur. Whether it could occur at this site, I couldn't really say.

Q Now, what investigations do you have to make between the feasibility or the conceptual stage and the preliminary design stage?

A Okay. Those are general levels of design and we don't really have a check list that we look at this under feasibility level and we look under this for preliminary design. I would say in general, the same type of calculations would be made with more detailed back up information, more detailed soil information. In terms of the report here, more details in terms of the exact nature of the proposed development. To develop the report here, we really only used a generalized land development plan and not specific proposed improvements, the specific locations of roadways, the specific locations of drainage inlets. Things like that were not used. That would be one thing we would look into at the later stage of the design.

Q Between preliminary design and final design, what would you do?

A Again, I couldn't cite specific things, but again a more detailed look between preliminary design and final design. One distinguishing characteristic between the two would be more attention to the proposed designs themselves, structural designs, more specific dimensions, actual dimensions that someone could take the plans and build off them. We know earlier on that we can do it, that at the later stage of design perhaps at final, the actualizing of structures, the actual thickness of walls. There's a whole number of structural details.

Q Would it be at the final stage that you would get precise estimates as to the cost of the improvements and the drainage improvements, I'm referring to specifically?

A I would say that the estimates would be more precise than at the earlier stage of design. I guess you don't know the precise cost until it's built. Yes, because we have detailed information, we have developed more detailed information about what we would build, we get more detailed cost information.

Q What facts would there be that would cause your original calculations as to cost to be in error?

A One in general would be more specific sub-surface soil information.

Q Why is that important?

A If there was a problem with sub-soils and foundations of headwalls or foundations of detention basins, outlet structures, some accommodation would have to be made for that to support the structures that you hope to build. In excavating, if the soil was such that water would be encountered or - I'm not really an expert on construction - but I could see where problems that you did not expect to run into, when you costed the facilities at this level, that could come up at a later time. That would affect the price. I don't think in a major sense --

Q Well, when you say not "in a major sense" --

A Okay.

Q -- Wouldn't that depend on the extent and amount of problems that you discovered?

A Okay.

Q And the nature of the problems that you discovered?

A Yes.

Q Isn't that so?

A I'm not really sure again now what you're asking "is that so".

Q If you discovered a condition that required an extensive amount of work, that would have a greater impact upon your cost figures than if it were something that only

required a minor deviation or change; isn't that correct?

A Yes, that would be correct if a condition like that were encountered. I think that again the costs that were developed for the --

Q Just answer my questions, Mr. Skupien.

A Okay.

Q Now, how else would the further investigations --

MR. FRIZELL: Could we back up please? Could we go back to the question to which you interrupted the answer and re-read the question and re-read the answer.

(Whereupon reporter reads back as follows:

"Question: If you discovered a condition that required an extensive amount of work, that would have a greater impact upon your cost figures than if it were something that only required a minor deviation or change; isn't that correct?

"Answer: Yes, that would be correct if a condition like that were encountered. I think that again the costs that were developed for the --

"Just answer my question, Mr. Skupien.")

BY MR. O'HAGAN:

Q So, Mr. Skupien, I would be correct in concluding that the cost figures that you've set forth in the report as to the section pertaining to drainage might differ when the final design work was performed?

A Yes, they might differ.

Q And they might differ when the preliminary design work was performed?

A Yes, they might.

Q Now, you've mentioned that the sub-soil conditions might affect the ultimate cost. What other factors would affect the ultimate cost?

A Okay. As I stated earlier, the conceptual level that we were working on at this point, particularly proposed conditions only concerned itself with a generalized land use, proposed land use and that under preliminary or final design or let's say more advanced levels of design, more exact sizes of facilities would be determined and that, of course, would affect the cost. If you have a larger or a different size or a different length than you originally estimated, that could affect the cost. Let's say, in answer to that, what else could affect the costs as we present them in the report, one other fact would be more details with regard to the proposed development itself.

We only dealt with a generalized land use and we had to make estimates of how many facilities, how many feet of pipe or channel or inlets would be required, and they were only general in nature. I think that the cost estimates are again, like I said, the same way I described the drainage values we came up with, the costs are in keeping with the conceptual nature of the report and aren't really a final cost but at the same level as the rest of the section would be.

Q Now, you have indicated that you're unable to advise us as to the amount of water that would run off the site in a 50-year storm of various durations in five, ten, fifteen -- five, ten, fifteen, twenty minutes or an hour; is that correct?

A The site in existing conditions?

Q Yes.

A Yes.

Q Are you familiar with the proposed development of the site?

A Only again in a general nature as the plate in the report shows. In other words, general areas being proposed for certain types of land use.

Q Now, what do you understand as to the proposed development of the site?

A Okay. Perhaps the best way to indicate my

understanding would be to refer to the plate in the report that indicates different areas of the site proposed for different types of development: Single-family apartments, multi-family town houses; office park; things of that nature. Again, it wasn't specific but it did give us at the conceptual level an idea of how much run off we could expect and approximately how fast it would come out of the different areas.

Q Now, in making a judment as to the increased runoff -- strike that.

Am I correct in understanding that the runoff would increase if the development were constructed?

A If our calculations are correct, yes, the peak rate of flow from the site and the volume of runoff from the site would increase.

Q Now --

A Over what it is existing or when I was out there.

Q Now, in determining the extent of the increase, would it be important to know how much of the site was to be blacktopped?

A Yes, it would be.

Q Why is that?

A Well, the -- by blacktop, I'm assuming you mean some type of impervious surface?

Q Yes.

A Not just asphalt paving.

Q Right.

A Just as we spoke earlier that there are different types of soil and each type of soil has a different amount of storm water or rainfall that it can accept and infiltrate and not run off, you can see that if soil were to be replaced by something, an impervious surface, that more water would run off so that the amount of impervious surface would be important in determining how much water would run off.

Q How much blacktop is to be on the site after it's improved?

A The exact number, I could not give you. An approximation of impervious surface was made.

Q What was that?

A Again, that would be in the calculations.

Q Didn't you review your calculations before you came --

A Yes.

Q -- Here to testify?

A Yes, I did.

Q Isn't that an important factor?

A Yes, but there are so many numbers and so many subareas that the site was broken into, that to give you an exact answer for each point, no, that number I could not

remember. It is available.

Q Now, would it be important to realize the extent of roof areas of the buildings that were to be constructed?

A Yes, it would.

Q Can you tell us what acreage there is for the various roof areas on the improved -- improved on the structure or on the structures that are to be constructed on the site?

A Here in the office, that number has not been determined. As I said, the flows for proposed conditions were based on a generalized land use plan. In other words, we knew that a certain area was going to be used for a certain type of development. So in computing or estimating for flows, the specific amount of roof area, driveway area, sidewalk area, was not computed because it has not been determined yet. But in an overall sense, we knew that what approximately -- approximately what percentage of impervious surface would be in each of the different proposed land uses. So that at this point and even in the calculations, there is not a specific calculation as to how much roof area there was, how much driveway area, how much parking lot. I don't believe at least at the time the report was developed that number to me was not available, but I did know the general areas of the

site were going to be used for certain types of development. And from those descriptions, we could make an estimate of how much impervious surface was in that area.

Q What other factors would result in increased runoff from the subject site after it was developed?

A Other than impervious surface?

Q Yes, other than blacktop and roof areas.

A Well, I could in general characterize as impervious surface, blacktop, sidewalk, roof area, street area, even though it would not be impervious surface laid down. If the exact amount of impervious area was changed, that could produce more runoff. If you went from a woodland to a nice tightly knit lawn area, there could be more runoff from that.

Q Is there woodland on the site?

A A portion of it, yes.

Q Do you know whether that's to be preserved?

A A portion of the woodland is to be preserved, yes.

Q Do you know how much of the woodland?

A Percentage before and after, I could not give you but I do know the open spaces were selected around the wooded areas of the site. Now, whether that was the only consideration, that I wouldn't know.

Q So I'm understanding you to say when you prepared this report, you had no precise estimate as to the

acreage that would be devoted to sidewalks, driveways, streets, parking lots and roof areas?

A No precise estimate.

MR. FRIZELL: Do I understand that question only -- it just went through my mind, as we all understood, there was a precise estimate as to the total but in terms of breaking it up, that wasn't done?

THE WITNESS: Right. There was no --

MR. FRIZELL: There isn't --

THE WITNESS: -- There was no precise estimate of each one of the things you mentioned, but I believe there was an accurate enough estimate of the total to meet the conceptual needs of the design.

BY MR. O'HAGAN:

Q What was that figure?

A That I'd have to go to the notes for.

MR. FRIZELL: Off the record.

(Whereupon there is a discussion off the record.)

BY MR. O'HAGAN:

Q Mr. Skupien, off the record, your attorney indicates that there is a total of impervious figures that

were utilized in the plan for development of most units of 67 point some acres. Does that figure sound familiar to you?

A It sounds familiar but I couldn't swear to it without checking the calculations.

Q Okay. Now, in order for you to determine what effect runoff from the subject site would have on downstream areas, wouldn't it be necessary for you to make calculations as to the volume of water flowing off the site in a 50-year storm of varying durations?

A The -- let me see if I understand your question. You're saying that in order to -- in fact, could you repeat the question.

(Whereupon reporter reads back pending question.)

THE WITNESS: At this level, at the conceptual level of design, we felt it was important to estimate the peak rate of flow from the site leaving the site under existing conditions.

BY MR. O'HAGAN:

Q That's a peak rate per minute?

A Of flow.

Q On a 50-year storm?

A Right. In that if we could maintain that peak

rate of flow that theoretically we could assume that levels of flow in the waterways downstream would not increase. Now, I can't deny or I'd have to say that the site would produce a greater volume of runoff into the waterways.

Q After construction?

A After construction. The detention facilities as we propose them would not have a marked effect. There would be some - I imagine - runoff while water was in the basin itself but it would not have as large an effect on the volume of water as it would on the peak rate. More water volume-wise would be released from the site; however, in a properly designed system, the peak rate of flow from the site would not be any greater than it was under existing conditions. If the peak rate were maintained, it would be expected that the level of flow downstream would be the same. We would not be raising levels downstream.

Q Do you know how high the water flows in the channel on the brook downstream from the present site during the peak periods of discharge presently?

A No, sir, I don't.

Q And you're not in a position then to tell us whether they could accommodate the peak areas of discharge -- peak times of discharge?

A No, sir, I couldn't.

Q And would I be correct in understanding that the peak discharge from the subject site after construction of detention basins would continue over an extended period of time?

A If extended period of time is defined as longer than existing, yes.

Q Now, the Slope Brook, would I be correct in understanding that the headwaters of that are at the subject site?

A Yes, I believe so.

Q And you're not in a position to tell us presently as to whether there's flooding downstream from the subject site during peak areas of discharge following rainfall from water flowing from the subject site?

A No, sir, I would not, no.

Q If there were, would I be correct in understanding that the flooding downstream would continue over extended periods of time due to the fact that the detention basin is metering the flow out?

A It would all depend on the exact rate of flow that would produce flooding. If I could go back to a question that you asked just a few minutes earlier, I believe you asked would the peak rate continue for a longer period of time. I imagine, theoretically, the peak rate would be an instantaneous event but that larger amounts of flow

would last for -- or the same amounts of flow in the brook other than the peak would last for longer periods of time after development than before development. Yes, I think the peak would be -- theoretically, the peak would be instantaneous whether it could be measured or not. Now, if flooding could be produced at some rate lower than peak rate of flow downstream, you asked if that flooding would remain for a longer period of time and I would have to say yes.

Q With reference to the portion of the drainage basins depicted on Plate 4, am I correct in understanding that some of them drain toward the Yellow Brook; is that correct?

A If -- if my recollection is correct, that Yellow Brook is north of County Route 537. Yes, it would. I'm not exactly sure of the name of the brook. I believe it's Yellow Brook.

Q Do you know if any of the other drainage areas drain to Mine Brook?

A Again, I cannot recall the names. I'd have to refer back to the calculations.

Q Are you in a position to advise us as to the drainage areas upstream from the subject site which feed either Mine Brook or Yellow Brook?

A Well --

Q I'm talking in terms of acreage.

A Yes, the exact acreage I would have to refer back to the calculations although if it would help at this point, I don't believe -- I don't believe that there is any off site area from the site that under proposed conditions would flow to Yellow or Mine Brook. I believe that all the upstream off site area would flow to Slope Brook. Now, this is on the assumption that it's Yellow or Mine Brook that Point A discharges to. You can see at Point A, there is no upstream tributary indicated. Point B has an off site area of approximately 24 acres that would flow from off site upstream to the site, on site and hit Slope Brook.

Q Are you saying Points B and C will flow to Slope Brook on Plate 4?

A Yes.

Q Where are you saying that Point A would flow to?

A I can't recall if it's Yellow or Mine Brook. It will flow into an existing waterway that will flow to the reservoir.

Q Presently where do areas on B and C flow to?

A To Slope Brook. I believe Point B is on the stream named Slope Brook and C would be on a tributary to Slope Brook.

Q Now, in your report you indicate that one of the objectives was to maintain existing drainage patterns and limits wherever possible; is that correct?

A Yes.

Q Okay. Now, did you ever communicate with the Department of Environmental Protection regarding a change or diversion of the water from one watershed to another?

A If my recollection is correct and I would have to check, there is possibly a notation in the notes that someone at the Department of Environmental Protection was contacted but at this point, it could just be a recollection. I believe that was discussed over the telephone about the problems of diverting storm water from one watershed to another and that due to the size of drainage areas involved, that the Department would not have an encroachment or a division type of permit would not be required.

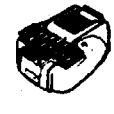
Q Who initiated the discussions regarding changing the flow of the water from one watershed to another?

A I don't understand.

Q Was it your office? As I understand it, at one point you considered changing the present flow of the water from one watershed to another?

A I don't recall that being the case.

Q Well, why, if that's not the case, did you



communicate in that vein to the Department of Environmental Protection?

A Okay. Besides diverting water from one watershed to another, the plan would call for the realignment or the enclosure of some of the streams or let's say, it may require the realignment or enclosure of some of the streams.

Q Do you know which stream?

A On site, I'm talking about on site. In order to do this, possibly a stream encroachment permit would have to be issued by the State and that was one of the two areas for which the Department was contacted. I believe the diversion idea, because portions of the stream drained -- portions of the site drained into the reservoir, we did not want to start diverting water away from the reservoir if that land or the runoff from that land was counted on as supply to the reservoir, and I cannot recall whether it was -- if he did consider at one point and then checked it with the Department to see if we could or just in general that question was asked. That I can't recall.

MR. O'HAGAN: I ask that this be marked.

(A letter from Narinder K. Ahuja, Acting Supervising Engineer of the State of New Jersey, to Richard Burnelli dated October 17, 1978, is received and marked D-1 for

identification.)

BY MR. O'HAGAN:

Q I show you a letter dated October 17, 1978, from the State of New Jersey, Department of Environmental Protection, Division of Water Resources, addressed to Mr. Richard J. Burnelli and signed by a gentleman named Narinder K. Ahuja, N-a-r-i-n-d-e-r initial K A-h-u-j-a, who's the Acting Supervising Engineer for the Stream Encroachment Section, Bureau of Flood Plain Management.

A Yes.

Q Please make reference to that letter. Mr. Skupien, you've examined that and you've seen that before?

A Yes.

Q Do you know what prompted the sending of this letter by Mr. Ahuja?

A No, sir, I don't.

Q Prior to -- strike that.

This letter makes reference to a letter of September 26, 1978 apparently from Mr. Richard J. Brunelli. Prior to September 26, 1978, did you have discussions with Mr. Brunelli?

A Prior to what date?

Q September 26, 1978.

A I do not believe so. I would have to check my notes on when our first meeting was held. I do not

believe it was before that date.

Q Have you seen Mr. Brunelli's letter dated September 26, 1978?

A That I can't recall. I might have; I might not have.

MR. O'HAGAN: I'd like to get a copy of that letter, if I might.

MR. FRIZELL: I'd be glad to supply it if I can obtain it. Brunelli to whom?

MR. O'HAGAN: The Department of Environmental Protection.

BY MR. O'HAGAN:

Q Now, Mr. Ahuja makes reference to the diversion of water from one watershed to another watershed. Now, do you know specifically what watersheds he makes reference to?

A I can only surmise from what I read in the letter that he says from one watershed to another. I don't know if he is referring to a specific one or not as I read from one to another.

Q The watersheds we're speaking of here can generally be described as those which flow to Hockhockson Brook and those which flow to the reservoir. Would that be correct?

A That would be correct.

Q Okay. Doing your work preparation for your report which was prepared in January of 1979, your report was, did you consider diverting the water so that it flowed to Hockhockson Brook rather than to the reservoir?

A In -- and this is a recollection, but, yes, in the beginning when I was first involved in the project and this is before, if I recall correctly, any detail topographic mapping as detailed as we were later supplied was provided, the thought was, one alternative was to divert the storm water to one outlet location.

Q Now, would that be to Hockhockson Brook?

A If I recall correctly, yes, it was to the blower, the southern end of the site to Hockhockson Brook.

Q Was that a conception of your company?

A That I can't recall. That -- it came up, I believe, in a project meeting. That might be a little more of a formal name than it really was. When the project was first discussed, that was one of the alternatives.

Q Who was present at the meeting?

A Again that would be a difficult question to answer exactly. I remember discussion with Mr. McDonald though.

Q You were present?

A Yes.

Q And other representatives of your company?

A That I could not recall exactly.

Q Now, do you know why the initial determination was made to divert the water from the Swimming River reservoir watershed to the Hockhockson Brook watershed?

MR. O'HAGAN: Off the record.

(Whereupon there is a discussion off the record.)

(Whereupon reporter reads back pending question.)

MR. FRIZELL: I'm going to object to the question because, number one, I don't think any determination was established.

THE WITNESS: You took the words right out of my mouth. That's what I was going to say.

MR. FRIZELL: Secondly, I don't know how Mr. Skupien could possibly know why anything was done that he didn't personally do. If you can, answer it.

THE WITNESS: Okay. Let me echo your words. I can't say why. I think when the project was first discussed - and this was prior to the topographical mapping that we received later, alternatives just like any other engineering solution were discussed in general not having to do with any particular

aspect of the site and possibly one of the alternatives just conceded generally that it was one storm water outlet point as opposed to a number of them, not saying that one was any better or worse than what was planned as far as we knew at the time, just as a general alternative, just as if you were going to paint your room and you were surmizing on different colors. I don't think it had anything to do with this specific site itself. It was just a general solution to any drainage problem.

It could have been any site at all at that point.

BY MR. O'HAGAN:

Q You knew the topography of the land was such that it would be necessary if this plan were to be approved to divert water from one watershed to another; isn't that correct?

A From what I had been told, now again I had not seen any mapping but I had been told that there was a number -- let me change that. There were more than one outlet points for storm water and that the idea of possibly having one outlet came up, but I don't think it was something that was -- it was based on nothing more than

an abstract solution to an abstract problem and not a specific solution to a specific problem. It was just a general engineering discussion of draining a site, site X, and not the Brunelli site.

Q If you were able to drain the water to the Hockhockson Brook, you wouldn't have to worry about pollutants entering into the reservoir; isn't that correct?

A If such pollutants were going to enter and if the pollutants would cause a problem in the reservoir, then, yes, that would be a benefit of that idea.

Q Wasn't that one of the facts that was considered initially when the communication was directed to the Department of Environmental Protection?

A That I have no idea of.

Q Now, did you correspond in writing to the Department?

A I don't believe so.

Q Did your firm correspond in writing to the Department?

A That I can't say.

Q Did you direct Mr. Brunelli to correspond with the PUC -- strike that -- with the DEP?

A That again I couldn't say myself.

Q Yes?

A I don't believe I directed him, no.

Q Now, when you speak of the subject site and the existing drainage conditions, you make reference on Plate 4 in your report to existing pond areas; do you not?

A Reference only to the fact that a pond is shown through a symbol. I don't think there's any reference to its size. There is a reference to the -- to the estimated effects that the existing ponds have on the existing peak rates of flow to the site. Yes, there is a reference to that.

Q Were the ponds measured?

A Yes, from a topographic map of the site, not physically measured in the field.

Q Can you tell us what the measurements of the ponds are and the depth of the ponds?

A At this point, no. There is a measurement as to the size or an estimate of the size of the ponds. The depth in regard to -- excuse me. The depth in regard to the depth of water below any outlet point from the pond was not measured, but an estimate of depth was made above -- above a point where water would flow out of the pond.

Q Now, are you in a position to approximate the size of the pond at Point B?

A No, I would hesitate to do that. It is in the notes. It is in the calculations.

Q Now, can you give us a percentage increase of the amount of runoff that will flow from the subject site after the proposed development is constructed?

A A percent increase in what exactly, volume, peak?

Q Volume.

A That would depend on the duration of the storm. We are dealing with design storms in this case, but that in actuality, the rain can fall in any pattern it so pleases - I guess - and that would depend on the duration.

Q Now, are you able to advise us as to the size of the pond that would have to be constructed at Point B after the development was constructed?

A Okay. In the report there is a table, Table D-3.

MR. FRIZELL: Page?

THE WITNESS: Page 13. That does present an approximate required area for storm water detention at the four sites. Now, as it discusses in the text above, this is not the area of the water surface during any portion of the storm, but this is an approximate area, an approximate area of land that would be required to construct the facility. If I can sign the portion of the report -- okay. The values contained in this table are based on assumed average depth flood storage in each

basin with additional surface area included for freeboard and outlets. In other words, as I stated earlier, an estimate was made of how much storage volume would have to be provided at each of the outlets to maintain the same peak rate of flow from the site to the four points, and that based on volume being - for simplicity sake - three dimensional, if we could estimate how deeply we could store the water at each of the four outlet points, that would provide us with one of the three dimensions and in effect simple division would give you how much surface area -- well, how much of the other two dimensions you would need. It wouldn't be surface area totally because it would be conical side slopes. Estimates based on other jobs done for detentions, an estimate was made of how much additional land over and above water surface area would be required to conduct a detention facility.

BY MR. O'HAGAN:

Q What duration storm did you utilize in making the calculations?

A The durations would depend on each point to the

time of concentration of each point. The actual calculations I can't recall. On times of some of the calculations, it was not drainage area and one time of concentration to the outlet point -- no, excuse me. Yes, that is true. On one perhaps more, I can't remember exactly, I have to take a look at the calculations but the total drainage area to the points were broken up into sub areas and flows developed for each of the sub areas, and then combined to produce a total so that more than one time of concentration might have been involved in computing the total flow to each point.

Q Are you able to tell me now as to the duration?

A No, the actual numbers I could not give you.

Q If the rain fell for a period longer than the duration utilized in the calculations that led to the size of the detention basin as depicted on Table D-3, what would happen to that additional water?

A It would depend. You say if the rain fell for a longer duration?

Q Yes, and if it was a 50-year storm, what would happen to the additional water?

A Okay. I'm not sure I understand the question. You're saying if the -- let me back up then.

A Yes, please.

Q Am I correct in understanding that the capacity of the detention basin was -- is designed to handle the rain and the runoff expected from a 50-year storm of a prescribed duration?

A Correct.

Q Or a calculated duration?

A Correct.

Q If the storm lasted for a period longer than that duration --

A At the same intensity?

Q Right. -- What would happen to the excess water?

MR. FRIZELL: Excuse me. If we're talking about longer durations maybe -- off the record.

(Whereupon there is a discussion off the record.)

MR. O'HAGAN: Read the last question.

(Whereupon reporter reads back as follows:

"Question: If the storm lasted for a period longer than that duration --

"Answer: At the same intensity?

"Question: Right. -- What would happen to the excess water?")

THE WITNESS: If the duration of the storm extended a longer period of time than the -- either the overall peak -- overall intensity would decrease if the total amount of rainfall that fell remained the same, the frequency of the storm would increase and we'd exceed the design storm that the detention basins were designed for.

BY MR. O'HAGAN:

Q What would happen then to the excess water?

A What would happen then is emergency facilities would be included in the design of the basin that would pass this excess water and preserve the -- without endangering the detention basin.

Q So in other words, then more water would flow from the subject site than would have if the development were not constructed?

A Peak flow or volume?

Q Let's speak of volume.

A Yes.

Q And let's speak of peak flow.

A I would -- in general, I could say yes. Specifically, I couldn't really tell you until we designed the detention basin. But my general experience with detention basins, yes, above that design storm, the peak rate of flow would

increase.

Q If the water in the detention basin reached the top of the banks, the water then would just flow off the property without going into the detention basin in the first place; wouldn't it?

A That would depend on the exact configuration of the basin and the drainage outlet points. Whether the water coming from the site would completely bypass the basin or not, I don't know if I can answer that specifically.

Q Now, in your calculations as to the cost, I'm correct in assuming that you made no determinations as to this emergency device that you had spoken of just a moment ago?

A No, this was included in the cost. The price that we show in the report, again it's conceptual and it was based on estimates and not actual design of the facilities, but it does take into account the cost that it would take to construct the detention basin complete, not just provide for the design storm but supply for freeboard emergency facilities.

Q That was taken into consideration. We got a little bit distracted. When I questioned you regarding the size of the basins, I am correct that on page 39 D-3, that size may increase when construction is --

A By "size", you mean volume or size in approximate area, both could increase, sure.

Q Are you in a position to advise as to how many units would have to be completed to accommodate the detention at location B where you speak of 10 acres?

A If I can refer to the report for some help, I believe, yes, the report does state that additional area at Points A dn C must be provided to accommodate the proposed detention basins. That is based on the generalized land use that was shown in Plate 1. That is also stated in the report.

That additional space would have to be provided at Points A and C of approximately six tenths and 1.2 acres respectively.

How many units that would involve, I know your question originally addressed Point B. But if we could address points A and C, now how many units exactly, no, I couldn't tell at this time.

MR. O'HAGAN: Let's take a break for a minute.

(Whereupon there is a recess.)

MR. O'HAGAN: Would you read back the last question.

(Whereupon reporter reads back as follows:

"Question: Are you in a position to advise as to how many units would have to be completed to accommodate the detention basin at location B where you speak of 10 acres?")

BY MR. O'HAGAN:

Q Now, Mr. Skupien, in the text of your report, you indicate that at Point B there will be a permanent lake. Are you in a position to advise us as to the depth of the lake after the development is constructed?

A Not exact depth I couldn't tell you.

Q And you've already said you can't advise us as to its dimensions?

A No.

Q Are you familiar with the volume of sedimentation that flows from the subject site under present conditions?

A No, sir, I'm not.

Q Has anyone from your company measured that?

A I don't know that.

Q Have you observed the site in order to ascertain whether there is evidence of erosion on the site?

A I visited the site, looked at the -- the lake at Point B, observed some of the channels open on the

stream -- on the site and some of the farmland or what was once farmland and appears to be presently. I noticed some erosion, yes.

Q But you can't tell us as to the volume?

A No, sir.

Q And you're not able to advise us as to the chemical makeup of the sedimentation in the materials leaving the site as presently constituted?

A No, sir.

Q After development of the site, would it be accurate to say that there will be pollutants flowing from the subject site?

A I don't know if I can answer yes or no to that. I don't know if my areas of expertise would let me. I couldn't say yes or no.

Q Can you advise us as to the nature of the pollutants that would flow from a development such as that planned by the Plaintiff in this suit?

A I don't know if -- again, my area of expertise deals with storm water pollution and my involvement in the report did not deal in very much detail with the storm water pollutants not with the quality aspect, more with the quantity. I think I better leave that up to somebody better versed than I am.

Q Is there somebody in your company better

versed than you?

A Possibly, I couldn't say.

Q Would it be fair to say that your company doesn't involve itself in the extent of pollutants running off from a planned unit development such as that proposed by Mr. Brunelli?

A I -- in general, we would be familiar. The firm would be familiar with pollutants in storm water. Whether we are familiar with the particular pollutants that could be expected from this particular development, I don't know. I was just involved with the -- more or less the quantity aspect of the storm water.

Q Okay. So your report does not in any nature deal with the amount of pollutants expected or reasonably expected to flow from a development such as that proposed by Mr. Brunelli?

A Okay. We do touch on - if it can be described as pollutants; some experts call it that - the amount of sedimentation or soil particles that would be suspended in the water. The report does touch on that. The fact that we will be ponding the water and storing it out of sight at the boundary area of the site and not letting it go off unhindered, but we shall be metering the flow out of the detention basin. This will allow the water to pond for a certain amount of time and will allow some of

the suspended soil particles to settle out in the detention basin rather than continue on downstream if the detention basin wasn't there.

Q You can't tell us how much of the sedimentation will settle out?

A No, I can't put a figure on that.

Q And you can't tell us whether the sedimentation that ultimately settled out would flow from the site in the event of a heavy storm that would stir the basin up?

A That again -- we do talk of other measures that can be added during later stages of design that would prevent things like that. I think that would be something of interest in final design stages or later design stages. The -- I could not detail whether they will be effective or not.

Q You have never designed those other devices that you've spoken of?

A Personally, myself, no.

Q And you're not in a position to advise us as to their effect?

A In general --

Q From a personal point of view based upon past experience?

A Okay. I could only answer not from an experience as to designing them and testing them but only from a

general experience with storm water that solids could be expected to settle out in the ponds that normally wouldn't have settled or would remain on the site, but settling on the pond if the pond wasn't there and the sediment continued downstream.

Q At Point B, there is a pond already?

A Yes.

Q Are you saying that presently the sediments don't settle out at that location before flowing from the property?

A I couldn't tell you specifically but using the same logic that I used in my previous answer, I would say yes.

Q You're not able to tell us then whether after development more sediments would settle out than presently do?

A No, that I couldn't.

Q If in fact the sediments settled in the pond, the volume of the pond or detention basin would be diminished; would it not?

A Temporarily, yes.

Q If it occurred over an extended period of time, would the volume be further reduced?

A Theoretically, yes, the longer the condition existed, the less volume we have.

Q Would some of that sediment flow out from the site in the natural course of nature and events?

A Yeah, I don't think that I could claim that 100% of the sediment entering the basin would remain there. Yes, some would flow out during the course of a storm. The basin would not collect 100%.

Q What percentage would flow out?

A I can't give you a figure on that.

Q Therefore, you can't tell us what portion would remain?

A No, sir.

Q Could you advise us as to how much it would be to dredge out the detention basin?

A That would depend upon more accurate information as to the site itself, what was going to be proposed and how much sediment we could expect from that area.

Q Based upon your present knowledge, do you think it's reasonably necessary to dredge out the silt and sediment that would develop in the detention ponds?

A At a certain point in time, that might become necessary, yes.

Q Now, in your study did you make any calculations as to the cost of that type of maintenance?

A No, the maintenance, no. If it was done on a regular interval, which I believe is required for

detention basins, not only for the sediment aspect but just to make sure the thing is functioning or is in a condition that it's supposed to be in, in other words, there is no debris or something hasn't happened on the outlet structure, items like that, I don't feel that that's on a regularly scheduled maintenance program. It might not be as vast an undertaking as one might think.

Q How much would it cost?

A I have no idea.

Q Now, you've indicated that the -- it would be expected that sediments that were heavier than water would be -- would either settle out or be removed by the mitigating measures that you've spoken of that might possibly be installed --

A If some of them were heavier than water, I can't say all of them.

Q No matter what you do as far as mitigating measures, some of those sediments are going to flow downstream?

A In general, I would say, yes, just to be technically correct. I can't state -- I can't state the opposite. I can't state here that we could contain 100% of the sediment.

Q And you can't tell as to whether the volume of the sediment that would flow out after development

and after installation of these mitigating measures would be greater than the sediment that now flows from the subject site?

A I think we've stated in the report that the amount of sediment leaving the site would be less under developed conditions than existing.

Q How much sediment would flow from the site after mitigating devices?

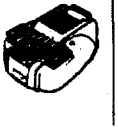
A That I couldn't put a number on.

Q How much presently flows from the site?

A Again, I can't say.

Q With reference to the mitigating measures, what are they again?

A I think in the report - I will have to deal with them in a general nature rather than exact details of their makeup - the outlet structure could be designed or some type of screening or baffles be placed in front of the outlet structure such that the flow velocity immediately upstream of the outlet would be relatively low so that it would allow sediment to drop out for the greatest amount of surface area. In other words, around -- immediately upstream of the outlet structure, we did not generate high velocity and scatter any sediment that might fall there, baffling as well could be placed nearer to the storm water inlets to help again when the water



enters the basin, dissipate its energy and slow it down so it again would have a longer pass, give it a longer time for which to settle.

Q You haven't designed them yourself?

A No, sir.

Q And you haven't worked on any project where they have been utilized?

A No, sir.

Q Therefore, you can't tell us the extent of their -- the extent of sediment that it removes?

A No, a number, no.

Q You can advise us, however, that water soluable pollutants would not be affected in any nature by the baffling or screen?

A Again, I am not as well versed in the quality aspect as quantity. Just from my general knowledge, if the pollutants or the particles or the items you talk about are dissolved in the water, then I can't see any -- I can't see where the detention time would affect them. However, I can't present myself as an expert on that subject.

Q Okay. So from what you know, those water soluable pollutants, regardless of the detention basin and regardless of the screening and baffling would flow off the site?

A I think it would be best to say that I wouldn't

know either way.

Q Okay. Can you advise as to what urban pollutants are?

A What types of pollutants can be found in urban storm water?

Q Yes.

A Just from my general knowledge of the area, of the area of storm water pollution, heavy metals, lead, zinc, copper, there would be --

Q Where --

A -- Hydrocarbons, oils, grease and suspended material, be it soil particles or - I believe it can be called a pollutant - any type of debris.

Q I think my question was inarticulate and I should have asked you as to what type of pollutants could be expected to flow from a PUD such as that projected by Mr. Brunelli?

A Again I don't feel I have the expertise to answer that question.

Q Now, with reference to the screens and the baffles, I'm correct -- and other mitigating devices that you've spoken of, I'm correct in understanding that you didn't place any cost figures on them whatsoever in the preparation of your report?

A Not specific costs on them, no.

Q Okay.

A As I said earlier, the costs of the detention basins were conceptual again just like the whole report was. It was just based on estimates of total construction cost to build something of this nature in size.

Q Were you --

A I think that the thinking was that any mitigating measures that were discussed in the report would not be a substantial portion of the total cost. In other words, it wasn't a specific price given to the outlet structure. It wasn't a specific price given to each detail, but more or less a general estimate of the cost based on previous work we had done.

Q Now, did you work on that portion of the report in developing cost figures?

A Portions of, yes.

Q Now, with reference to the internal drainage --

A Yes, sir.

Q -- How many lineal feet of piping did you estimate?

A I could not give you that number at the present time.

Q Would --

A There would be an estimate though.

Q Is that reduced to writing?

A I don't know if it would be reduced to writing or taken from the -- completely. It might have been taken from the one reference we cite in the beginning of the section. At the beginning of the section, storm drainage costs, cost estimates for both the internal and arterial drainage systems have been based in part on the cost information contained in cost effective site planning, singe family development.

Q What I'm asking you is, did you break that down as to cost of pipe, cost of labor, cost of site preparation and any other related costs?

A I would again, to give you an exact answer, I'd have to refer back to the cost estimates. I believe for the internal drainage at least for the types of development that are mentioned in the book, a total cost was -- total cost was used per dwelling unit, a cost that was developed in the book and then an estimate of dwelling units in an acre was made and cost derived.

Q So no delineation was made as between materials and labor?

A No, sir, I don't believe so.

Q Would the same be true of the arterial drainage cost?

A Yes.

Q Now, with reference to the storm water

detention cost, would that be true also that no breakdown was made as tothe cost of labor and the cost of materials?

A No differentiation between labor and materials, no.

Q And you've already advised us that you can't tell us the precise size of the detention basins?

A At this point, at this session here, no, in the calculations there was an estimate made of the size of the basin and based on that estimate of the size, a cost figure was arrived at.

Q And you'llforward to me all of those calculations routing them through your attorney?

A Yes, if it's possible at the end I could have a list of something that's being requested so that I can remember what to send.

MR. FRIZELL: I don't see why not.

BY MR. O'HAGAN:

Q Am I correct in understanding that you did not calculate in any manner the cost of maintenance of the storm water facilities and the detention basins?

A No, I don't believe that was.

Q All right.

A Okay. Let me, if I can, add a point here. There were in the cost estimates contingencies added. Now, the maintenance might fall in as a contingency.

Q But you're not sure?

A Yes, but if what you were asking when these contingencies developed, was maintenance development included or was there a specific estimate of maintenance cost, no, that wasn't made.

Q Now, Mr. Skupien, at one point when we were off the record you inquired of Mr. Frizell as to whether we should go into your present professional status and I'd ask you to advise us as to your present professional status.

A I am a registered engineer in training with the State of New Jersey, number 368. I am not a professional engineer, a licensed professional engineer.

Q Have you as yet taken the test to qualify?

A I have passed parts one and two of the test that qualifies as an engineer in training.

Q How many parts are there?

A Three, I took part 3 in January and unfortunately am scheduled to take it again in June.

Q What specific area did part 3 deal with?

A With regard to this specific test I took or in general what does part 3 deal with?

Q Yes.

A I asked you two questions.

Q I'm supposed to be doing the questions. What particular area of questions were there?

A The test that I took?

Q Yes.

A The questions ranged from structural engineering questions, hydraulic engineering, transportation engineering, some engineering economics, soils engineering. I believe there was even one question on sanitary engineering.

Q Did some of that pertain to storm water runoff and storm water detention facilities?

A If my recollection is correct, I don't believe there was a question on the test regarding storm water runoff or detention, no.

MR. O'HAGAN: Now, Mr. Frizell, on various occasions I have inquired of you and in fact I've corresponded with you to advise me specifically who specifically, who from Killam, will testify at the trial in this matter and it's my recollection that you indicated possibly Mr. McDonald and possibly Mr. Skupien, and no other?

MR. FRIZELL: Except for Mr. DeNicolo.

MR. O'HAGAN: He's the fellow whose prime area of concern are the wells?

MR. FRIZELL: Potable water, correct.

MR. O'HAGAN: No other representative, correct?

MR. FRIZELL: Correct.

BY MR. O'HAGAN:

Q I've asked this, but I'm not absolutely sure that I have your answer. I'm interested in ascertaining the total volume of water that will run off the site after development in a 50-year storm - and we'll take it first - of an hour's duration. Can you advise us as to the expected runoff from Points A, B and C?

A No, that I could not tell you at this point. I could not tell you at this point the volume of storm water from a 50-year storm that would leave the area from the four points.

Q Can you advise as to the expected volume of a 50-year storm of any duration?

A At this session, no, but an estimate of that volume would be in the calculations.

Q Are those the calculations that we've made reference to on several occasions?

A I believe so, yes.

Q You'll send them to Mr. Frizell for subsequent delivery to me?

A If that's okay.

MR. O'HAGAN: No further questions.

CROSS-EXAMINATION BY MR. FRIZELL:

Q Mr. Skupien, are there -- does the design for storm water detention which you have done a conceptual -- assisted in doing a conceptual feasibility study on meet with all Township standards that you were able to find?

A As far as we know, as far as I know, yes, it does.

Q Does it meet with all County standards?

A Again, as far as I know, it does.

Q Does it meet with all State standards?

A As far as I know, it does.

Q All Federal standards?

A Federal, I did not -- I cannot say for sure. I don't think we checked the Federal level. I don't know if the Federal Government would have any regulations as far as storm water drainage affecting a site of this size.

Q Are you aware of any Federal standards which it does not meet?

A No, sir, I'm not.

Q Is it your understanding that a detention basin, which is -- for which the standard use is the 50-year design flood would meet all 50-year design floods, all durations which have been established and calculated for the 50-year flood?

A (No response).

Q Do you understand the question?

A No, sir.

Q There has been -- we've had various discussions on and off the record about what a 50-year design flood is and based on your answers and also those of Mr. McDonald, a 50-year design flood is a flood which has a 2% chance of occurring in any given year and it will have -- and there are different - excuse me - different calculations or different standards.

MR. O'HAGAN: I object to the leading nature of the question. I think if you have a question to ask, fine.

MR. FRIZELL: You can object all you want. I'm going to state it.

BY MR. FRIZELL:

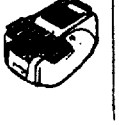
Q It's my understanding - and you can correct me if I'm wrong - that a 50-year design flood has many different definitions at different durations.

MR. O'HAGAN: I'll have a continuing objection to this so I don't have to keep interrupting.

BY MR. FRIZELL:

Q I want to understand what was done in the report.

A Maybe I can clarify your question before I answer it. If you're stating whether different durations for a



15 year -- 50 year storm, yes, there are. The 50-year storm at one point -- the 50-year duration at one point might not be the same duration at another point. It would vary from point to point.

Q All right.

A Now, if you're stating --

Q That's enough.

A Okay.

Q That's good. All right. Now, in it's -- in the summary in your report or in the forwarding letter, it says that this -- that the on site detention facilities were designed for a 50-year storm. Does that mean that it will retain any 50-year storm of any duration? Is that the standard that they're talking about? That is when I say "50-year storm", I mean if they've calculated it to a 24 hour period or a 48 hour period that that is the standard. In other words, the duration isn't going to --

A I don't think you can separate the duration from the location. That's what I tried to point out earlier. Can we go off the record? I want to compose some thoughts.

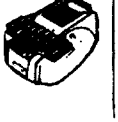
MR. FRIZELL: Off the record.

(Whereupon there is a discussion off the record.)

THE WITNESS: If I can have the question repeated.

MR. FRIZELL: Let me restate the question so it's clear at this point. My question is, in accepting the 50-year design standard for this particular project, would you describe for us exactly what that standard was and what it means?

THE WITNESS: Okay. As per the Colts Neck Ordinance and -- which called for a rational method of analysis of the flows and as for the theory behind that method, the duration of rainfall that would produce the peak rate of flow in the worst condition, if we can call it that, would be of a duration equal to the time of concentration. The theory states if that duration is designed for, that duration will be the critical one and other durations will not be as severe. If that is designed for, other durations can be accommodated as well. So when we talk about 50-year design, the rational thesis, if you designed for a duration of the 50-year storm equal to the time of concentration, that will be the most severe case.



BY MR. FRIZELL:

Q The standard was the most severe anticipated rainstorm?

A At a 50-year frequency.

MR. FRIZELL: No other questions.

REDIRECT EXAMINATION BY MR. O'HAGAN:

Q Mr. Skupien, Mr. Frizell questioned you as to your investigations of the Township standards, the County standards, the State standards and the Federal standards. I think you have indicated you didn't consult the Federal standards?

A No, only because I don't believe there are any.

Q As to the Township standards, what investigations did you make?

A A survey of the formal Town Ordinance regarding development. I believe the title of it is mentioned in the report, if I can read it, the Colts Neck Development Regulation Ordinance.

Q Now, is the matter of a 50-year storm a function in part of the uses of land? By that I mean, you advised us before that in determining the 50-year storm, you calculated the length of time it would take the first drop of rain to reach the detention basin from the furthest point in the drainage area. So with that

in mind, is it accurate to say that when we speak of a 50-year storm, we must do it in the context of allowed land uses?

A No, I think the 50-year -- the 50-year protection or the design storm that is adopted, be it 50 year or 100 year or 10 year, whatever it happens to be, is a -- is a statement as to the frequency that that storm can occur and then to come up with the actual 50-year - let's say, peak flow at that point would depend on the site itself. But the site -- the site itself doesn't necessarily have to bear on the selection of a frequency. The 50-year was selected from the Colts Neck Ordinance. That's where the frequency of design storm was.

Q Would a 50-year storm design be adequate when we speak of a community that was not developed and rural in nature, and be inadequate when we speak of surfaces that are blacktop for large expanses so that the water would flow more quickly and in greater volume over the land area to reach the ultimate --

A I don't --

Q -- Discharge point?

A -- No if that would be true, whether the type of development would necessarily require a certain type of design frequency.

Q It's accurate to say, however, that water

flowing over blacktop will reach the discharge point more rapidly than water flowing over an impervious surface?

A Two points: Blacktop is impervious.

Q Right. I'm sorry. One with a greater degree of permeability.

A With the same slope?

Q Yes.

A In general, yes, I imagine somebody could come up with a case where it wouldn't be true if it was bare soil. Possibly not, it's hard to generalize it.

MR. O'HAGAN: Thank you.

MR. FRIZELL: No further questions.

(Witness excused)

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - MONMOUTH COUNTY
DOCKET NO. L-3299-78 P.W.

x - - - - - - - - - - - - - - - - - x

ORGO FARMS & GREENHOUSES, INC., a New Jersey Corporation; and RICHARD J. BRUNELLI,

Plaintiffs,

-vs-

TOWNSHIP OF COLTS NECK, a Municipal Corporation,

Defendant.

x - - - - - - - - - - - - - - - - - x

C E R T I F I C A T E

I, FRANCINE RUDD, a Shorthand Reporter and Notary Public of the State of New Jersey, certify that the foregoing is a true and accurate transcript of the Deposition of JOSEPH SKUPIEN, who was first duly sworn by me.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any of the parties to the action in which the Deposition is taken, and further that I am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in the action.

Dated: May 11, 1979
My Commission Expires on
May 10, 1984

Francine Rudd
FRANCINE RUDD
Notary Public of New Jersey