BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

BORDEN CHEMICALS AND PLASTICS
OPERATING LIMITED PARTNERSHIP,
Petitioner,
vs. No. PCB 97-102
ILLINOIS ENVIRONMENTAL PROTECTION
AGENCY,
Respondent.

Proceedings held on September 11, 1997, at 9:00 a.m., at the Illinois Pollution Control Board, 600 South Second Street, Suite 402, Springfield, Illinois, before the Honorable Deborah Frank-Feinen, Hearing Officer.

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I N D E X

E X H I B I T S

NUMBER	MARKED FOR I.D.	ENTERED
Petitioner Exhibit 1	10	19
Petitioner Exhibit 2	10	26
Petitioner Exhibit 3	10	39
Petitioner Exhibit 4	18	18
Petitioner Exhibit 5	48	54

P R O C E E D I N G S

(September 11, 1997; 9:00 a.m.)

HEARING OFFICER FRANK-FEINEN: Good morning and welcome to the hearing in Borden Chemicals and Plastics Operating Limited Partnership versus the Illinois Environmental Protection Agency. This is a water variance case, PCB 97-102. We are here because there has been an objection from a member of the public requesting a hearing today.

My name is Deborah Feinen. I am the Hearing Officer in this case here representing the Pollution Control Board. We are going to go ahead and let the parties enter their evidence into the record, and then if the members of the public wish to enter their name and be sworn in and make a statement on the record, they can do so at that time.

Before we begin, are there any preliminary matters or any questions about how this is going to work today?

MR. WARCHALL: I have only one question. There is one person here I don't know.

MS. DAVIDSON: Susan Davidson. I work at

the Illinois EPA in Compliance Assurance.

MR. WARCHALL: Okay. Hi, Susan.

HEARING OFFICER FRANK-FEINEN: Why don't the parties go ahead and make their appearances on the record, and anybody who is going to be testifying today if you want to go ahead and introduce them to make sure the court reporter has them.

MR. WARCHALL: I am Jim Warchall with Sidley & Austin representing Borden Chemicals and Plastics Operating Limited Partnership, which we will call BCP from now on. With me today is Erika Godwin-Saad, to my left, with the ADVENT Company, an environmental consulting firm.

In the corner in the blue jacket is Mr. Sam Shelby who is also with ADVENT.

Sal Jantrania, to Erika's left, is with BCP. He is the Technical Manager of BCP.

HEARING OFFICER FRANK-FEINEN: Okay.

MS. HOWARD: My name is Margaret Howard. I am an attorney with the Illinois Environmental Protection Agency.

With me is Steve Vance from our Water Planning Section, and he would be testifying.

This is Susan Davidson from our Compliance Assurance Section. She is here to observe.

HEARING OFFICER FRANK-FEINEN: All right. Are there opening statements by the parties?

MR. WARCHALL: Yes.

HEARING OFFICER FRANK-FEINEN: Okay. Please continue.

MR. WARCHALL: BCP's plant in Illiopolis, Illinois, is seeking a variance for a period of five years from the Board's general use water quality standards for temperature, which are set forth in 35 Illinois Administrative Code, Section 302.11. As described in our petition, and as we will discuss today, BCP believes that the Board should grant the requested variance for three reasons.

Exceedances of the temperature standards result primarily from the need to maintain conditions in BCP's wastewater treatment system which maximize biodegradation of organics and ammonia nitrogen, which are two of the primary pollutants that the plant needs to control.

Secondly, no treatment technology or process changes are available, at least in the short term, that would result in compliance with the temperature standards.

Third, granting the variance will not have an adverse effect on the available uses of the receiving stream, which is what we call the unnamed ditch, which then flows into Long Point Slough, and will not have an adverse effect on the environment or human health.

BCP believes that refusing to grant the variance which is requested today, would impose an arbitrary and unreasonable hardship on BCP, its employees, and on the local community.

In the petition, BCP asked that the variance be conditioned on BCP's conducting further evaluation of the impact of the temperature of the effluent on aquatic life in the receiving waters, and also BCP's investigating technical and economic feasibility of controlling the temperature of the effluent. There is a schedule for the work that BCP would intend to perform under the variance in Paragraph 48 of the petition.

BCP also asks that the requested variance

be conditioned on the company's maintaining the temperature in its biological reactor under 35 degrees centigrade. That proposal was based on really two factors. One, BCP does inject steam to keep the temperature of its biological treatment system at an appropriate temperature in the winter. They have pretty much control over that and they can keep it under 35.

Secondly, BCP believed, based on the existing temperature data it had, that in the summer when it doesn't inject steam and the system is just subject to the heat of the summer, they still thought that based on normal weather conditions they could keep the temperature at all times below 35 degrees.

This summer BCP monitored the temperature in the biological reactor for a period of two months in July and August. Basically, during that two month period the temperature in the final polishing clarifier was between 35 and 36, just a little bit over 35 on three afternoons. Down in the serpentine stream, which is the lower part of the treatment system, on two days the temperature was a little bit over 35.

Those temperature measurements were taken in the afternoon after the sun had heated things up. On those same days the temperature in the morning at those monitoring points was quite a bit lower. I think it was maybe 29, 32 degrees, something like that. Such that the average for each of those days was below 35.

Therefore, what Borden would like to do is to amend its requested variance condition to state that it will agree to maintain the temperature in the final clarifier at a daily average of less than or equal to 35 degrees. We talked to the Agency about that earlier this week, and Ms. Howard indicated that was agreeable to the Agency.

As I mentioned before, we have three witnesses today. Our first witness will be Mr. Sal Jantrania, Borden's Technical Manager. Also, Erika Godwin-Saad, who is a biologist and aquatic toxicologist with the ADVENT Group, and Sam Shelby, who is a Licensed Professional Engineer specializing in wastewater system treatment and design.

We have submitted prefiled testimony in

this matter, which we have copies of today, which we would like to have entered into the record. We have two minor corrections to Ms. Saad's testimony and Mr. Shelby's testimony, which we would like to make on the record. If it is agreeable to the Hearing Officer, we will have that prefiled testimony entered into the record and our witnesses will simply provide a summary of that testimony today.

HEARING OFFICER FRANK-FEINEN: That would be fine. Are they in the order that you are going to do it: Sal, Erika and Sam?

MR. WARCHALL: That's correct.

HEARING OFFICER FRANK-FEINEN: We will make Sal's testimony Petitioner's Exhibit 1.

MR. WARCHALL: Okay.

HEARING OFFICER FRANK-FEINEN: Erika's is Petitioner Exhibit 2. Sam Shelby's is Petitioner's Exhibit 3.

MR. WARCHALL: Okay.

(Whereupon said documents were duly marked for purposes of identification as Petitioner's Exhibits 1, 2 and 3 as of this

date.)

MR. WARCHALL: After our witnesses provide summaries of the testimony, I think I have one additional question for Ms. Saad and an additional exhibit and a few extra questions for Mr. Shelby, which we would like to do on the record.

HEARING OFFICER FRANK-FEINEN: That's fine.

MR. WARCHALL: I guess one final matter at this point, as an alternative to seeking a variance from one of the provisions of Section 302.211(e), that's the -- those are the maximum and absolute temperature standards. We suggested in our petition that the Board may find that we don't -- that Borden does not need a variance from those petitions because they do not apply to a small stream like the unnamed ditch at Long Point Slough.

Our argument was based on the fact that Section 302.211(e) states that it applies to the quote, main river, unquote. We believe that these water bodies do not constitute the main river. We cited in our petition one Board opinion from

several years back which seemed to support our position.

The Agency's variance recommendation, which supported granting the variance in this case took the other side of the argument and suggested that this provision of 302.211(e) does, in fact, apply to the unnamed ditch at Long Point Slough. We do not have any additional authority or argument on that today, and we don't see any need to brief that or do anything else with that at this point, and simply would ask the Board to decide that issue on the materials already presented to it.

We would point out, though, that in the event the Board does not agree with us we would, of course, desire a variance from the 302.211(e) as well as the other sections of Section 302.211. That concludes my statement.

HEARING OFFICER FRANK-FEINEN: Okay, Ms. Howard.

MS. HOWARD: Good morning. The Agency has been reviewing this case, and we have been having meetings with Borden since -- beginning in, like, January of 1996, and we have reviewed quite a bit of the data that they have provided to us. We

have had some meetings where we have been able to discuss the type of sampling and testing that we think would be necessary in order to look at exactly what is happening in that stream with respect to the temperatures and the different affects on the aquatic life.

We have come to an agreement with Borden that the types of sampling that they are suggesting would be beneficial. We think that it is something that needs to be done in order to go on in any other types of proceedings or in any other decisions that have to be made with respect to the facility as to whether or not they are going to have to make any changes to the procedures or their processes, whether they are going to have to do anything to help protect the aquatic life if we find, in fact, that it is being affected.

So the Agency, in its recommendation, did make the statement, and we still stand by our statement, that this should be granted. The variance should be granted. I did take a look at the changes that they would like, and what we were -- in the recommendation on page six, letter V, it originally stated that during the variance

period the temperature in the plant's biological treatment system shall not exceed 35 degrees Celsius.

What we would agree with Borden on is to change that wording so that it would now read during the variance period the temperature in the plant's biological treatment system shall not exceed a daily average of 35 degrees Celsius.

MR. WARCHALL: I would just like to state that we are monitoring the temperature in a particular unit called the final polishing clarifier, which I understand to be the final unit after biological treatment but before the serpentine stream. I would simply suggest that we specify that it is in that final polishing clarifier that the measurement would be taken. That is the place we are sampling now in addition to the serpentine stream.

MR. VANCE: Is there a diagram of the treatment --

MR. JANTRANIA: There should be one.

MR. WARCHALL: That diagram would be in Exhibit G to the petition.

Sal, would you point out where exactly

that is.

MR. JANTRANIA: Yes. This is the polishing clarifier, and we are sampling right at the exit of the polishing clarifier.

MR. VANCE: There are no heat sources from these two?

MR. JANTRANIA: Those are heat sources but they actually, you know --

MR. VANCE: So really you are sampling right ahead of the serpentine, right?

MR. JANTRANIA: No, the sampling that we are doing is at the -- the effluent of the polishing clarifier.

MR. WARCHALL: Right. We are also sampling -- pursuant to the sampling plan, we are also sampling those two other streams; isn't that correct?

MR. JANTRANIA: Yes, this is sampled and we sample at this point, also.

HEARING OFFICER FRANK-FEINEN: Okay. You have to explain for the record what "this" and "this" is. You have to give a verbal description of what it is you are pointing to.

MR. JANTRANIA: Okay. As part of the

agreement that we came to with the IEPA some months ago, the sampling -- the number of sampling stations that we are sampling, some of those we are sampling twice a day, five days a week. Some of them we sample once a day, five days a week.

HEARING OFFICER FRANK-FEINEN: Okay. Why don't we go ahead and get you sworn in since you are testifying.

Would you please swear the witness.

(Whereupon the witness was sworn by the Notary Public.)

MR. WARCHALL: Did we finish our discussion?

HEARING OFFICER FRANK-FEINEN: I think so. Do you want to go ahead and continue with your opening statement, if you can remember where you were at.

MS. HOWARD: Yes. Just a second.

HEARING OFFICER FRANK-FEINEN: Let's go off the record for a second.

(Discussion off the record.)

HEARING OFFICER FRANK-FEINEN: Back on the record.

MS. HOWARD: Okay. Thank you. Sorry

about that.

Originally, when we had talked about the change in letter V, the Agency had just anticipated that it would just add a daily average 35 degrees Celsius at the end. But now, after looking at it, we don't have any objection to adding the words in addition to that in final polishing clarifier. That would be fine. I just wanted to make sure before I committed our Agency to that.

With respect to the testimony, we did receive the testimony ahead of time. Our field people and our technical staff has reviewed it. Other than a few questions for Ms. Saad, we do not have any objection to it being entered into the record as read, and unless anything is brought up today that is something that we are not anticipating, or the additional witnesses here bring up a concern or something that we would like to further explore, at this point the Agency is still in agreement with Borden for the variance.

HEARING OFFICER FRANK-FEINEN: Okay. Mr. Warchall?

MR. WARCHALL: Yes, I just forgot one thing. Margaret Howard and I had discussed earlier

in the week stipulating as to the admission into evidence the petition and all of the Exhibits A through AA.

HEARING OFFICER FRANK-FEINEN: Okay.

MR. WARCHALL: I believe that was our agreement.

HEARING OFFICER FRANK-FEINEN: Okay. The petition then will be Exhibit 4.

(Whereupon said document was duly marked for purposes of identification and admitted into the record as Petitioner's Exhibit 4 as of this date.)

HEARING OFFICER FRANK-FEINEN: But I will not submit an additional copy to the Board since all of the Board members have copies from when you filed it.

You are talking about the most recent amended petition?

MR. WARCHALL: Right. The amended verified petition.

HEARING OFFICER FRANK-FEINEN: All right. Then you may continue with your first witness.

MR. WARCHALL: Okay. We call Mr. Sal Jantrania to provide a summary of his testimony.

HEARING OFFICER FRANK-FEINEN: You have been sworn, so I will go ahead and enter your Exhibit 1 into the record as though it were read, but will let you go ahead and do your summary and then answer any questions.

(Whereupon said document was admitted into the record as Petitioner's Exhibit 1 as of this date.)

S A I L E S H J A N T R A N I A,

having been first duly sworn by the Notary Public, saith as follows:

MR. JANTRANIA: My name is Sailesh Jantrania. I am the Technical Manager of Borden Chemicals and Plastics Operating Limited Partnership's plant in Illiopolis, Illinois. I have submitted prefiled testimony in this matter. I will now present a summary of that testimony. In that summary I will refer to the plant as BCP.

BCP is seeking a variance from the Board's general use water quality standards for temperature. Section 302.211(e) imposes

temperature standards of 16 degrees Celsius for December through March and 32 degrees Celsius for April through November. These standards may not be exceeded during more than 1 percent of the hours in any 12 month period. I will refer to these as the maximum temperature standards.

Section 302.211(e) also provides that the summer and winter maximum temperature standards may not be exceeded by more than 1.7 degrees Celsius at any time. I will refer to these as the absolute temperature standards. Section 302.211(d) provides that the maximum temperature rise above natural temperatures shall not exceed 2.8 degrees Celsius. I will refer to this as the temperature rise standard.

Finally, Section 302.211(b) and (c) prohibit abnormal temperature changes that may adversely affect aquatic life unless caused by natural temperatures and require that normal daily and seasonal temperature fluctuations which existed before addition of heat due to other than natural causes be maintained.

The requested variance would apply to the effluent discharge from BCP's Illiopolis, Illinois

plant and the waters receiving that discharge. As discussed in detail in BCP's Verified Amended Petition for Variance and my written testimony, BCP believes the Board should grant the requested variance because the temperature of BCP's effluent results primarily from the need to maintain an elevated temperature in BCP's wastewater treatment system. No treatment technology or process changes are available in the short term that would result in compliance with the temperature standards. Granting the variance will not have an adverse effect on the environment, and refusal to grant the variance would impose an arbitrary and unreasonable hardship on BCP, its employees, and the local community.

As described in the written testimony, the plant treats most of its wastewater through a treatment train providing primary clarification, activated sludge treatment, tertiary clarification, and final polishing in an 800 foot long serpentine stream. The plant discharges its treated wastewater through an unnamed ditch which has very low flow. The unnamed ditch drains into Long Point Slough about three miles downstream from BCP's

outfall. Although a variety of aquatic species inhabit the ditch and the Slough, these waters are of little use for recreational or other purposes due to their small size and low and variable flows.

BCP's need for a variance results primarily from the necessity of maintaining the plant's activated sludge wastewater treatment system at a temperature of approximately 30 degrees Celsius. Our testimony of our second witness, Mr. Sam Shelby of the ADVENT Group, Inc., will discuss the sources of heat at the plant and the plant's wastewater treatment in more detail.

Although in winter some cooling of the wastewater occurs before it enters the unnamed ditch, that cooling is not always sufficient to assure that water in the ditch does not exceed the winter maximum temperature standard of 16 degrees Celsius. In summer, although exceedances of the 32 degrees Celsius maximum temperature standard in the ditch are relatively rare, exceedances have been recorded.

The Verified Petition as well as a new exhibit appended to my testimony provide all of the

relevant temperature data BCP has recorded. The data set forth in the Verified Petition and the exhibit appended to my written testimony indicate the following:

There is often a temperature rise of more than 2.8 degrees Celsius between Sampling Point A, upstream of BCP's outfall, and Sampling Point C, downstream of BCP's outfall.

Based on historical sampling data the summer maximum temperature standard was exceeded at sampling point C on 1 out of 334 sampling events, and the winter maximum temperature standard was exceeded at Sampling Point C on 57 out of 238 sampling events.

Based on more recently collected data, the summer maximum temperature standard was exceeded at Sampling Location C on 1 out of 18 sampling events.

In the summer, effluent temperature correlates well with the ambient air temperature. The temperature of the plant's effluent (Sample Point B) tends to exceed 32 degrees Celsius after noon on warm days due to the lack of ambient cooling.

Despite the effluent discharge, sizable daily variations in the temperature of the ditch occur. BCP believes that this data shows that the effluent discharge is not inconsistent with the requirement of 35 Illinois Administrative Code 302.211(c) that normal daily and seasonal temperature fluctuations which existed before addition of heat due to other than natural causes be maintained.

Additional temperature data are available from a study of the unnamed ditch and Long Point Slough conducted by the Academy of Natural Sciences of Philadelphia in the summer of 1984. These data indicate that the average temperatures recorded downstream in the ditch were very similar in the summers of 1984 and 1996.

The 1984 data also indicated that over short periods there was substantial natural variation in water temperature in portions of the ditch and Slough unaffected by BCP's discharge. Moreover, in these portions of the ditch and Slough, natural heating caused exceedances of the temperature rise standard over short distances. In fact, in the portions of the ditch and Slough

affected by BCP's discharge, it appears that BCP's wastewater stabilizes the temperature of the ditch and the Slough, preventing rapid temperature changes of more than 2.8 degrees Celsius except immediately downstream of BCP's outfall.

This concludes my summary. I will be happy to answer any questions that the Board or the Illinois EPA may have.

MS. HOWARD: The EPA doesn't have any questions at this time.

HEARING OFFICER FRANK-FEINEN: Mr. Warchall, do you have anything for your witness?

MR. WARCHALL: No, I don't.

HEARING OFFICER FRANK-FEINEN: Okay. Thank you.

You may call your next witness.

MR. WARCHALL: All right. I would like to call Erika Godwin-Saad to provide a summary of her testimony.

HEARING OFFICER FRANK-FEINEN: Will you please swear the witness.

(Whereupon the witness was sworn by the Notary Public.)

HEARING OFFICER FRANK-FEINEN: Now that

she has been sworn, her testimony is entered into the record.

MR. WARCHALL: Okay. Ms. Saad, I believe you had one change, a correction, that you wanted to make to your prefiled testimony?

MS. GODWIN-SAAD: That's correct. On page 3, the first paragraph, as discussed in the Verified Petition, a 1989 study of the Slough performed by the Illinois EPA supported similar conclusions regarding species diversity in the Slough. It is an extension of that sentence.

MR. WARCHALL: So to the -- on page 3 of your prefiled testimony, the second sentence starting on that page, you are adding at the end of that sentence the words "regarding species diversity in the Slough," period?

MS. GODWIN-SAAD: That's right.

MR. WARCHALL: Okay. That was all, right?

MS. GODWIN-SAAD: Yes.

MR. WARCHALL: All right.

(Whereupon said document was admitted into the record as Petitioner's Exhibit 2 as of

this date.)

E R I K A G O D W I N - S A A D,

having been first duly sworn by the Notary Public, saith as follows:

MS. GODWIN-SAAD: My name is Erika Godwin-Saad. I am employed by the ADVENT Group, an environmental consulting firm, as a project scientist. I have submitted prefiled testimony in this matter, and I would now present a summary of that testimony.

BCP asked my advice on whether the temperature of BCP's effluent was likely to have an adverse impact on fish populations inhabiting the waters that receive BCP's effluent. These receiving waters are referred to as the unnamed ditch and Long Point Slough.

After reviewing the existing historical data regarding fish and other aquatic life inhabiting these waters, as well as scientific articles regarding the affect of temperature on fish, I have concluded that the temperature of BCP's effluent is not having an adverse impact on fish populations and other aquatic life.

HEARING OFFICER FRANK-FEINEN: Ms. Saad,

can you slow down a little bit for the court reporter.

MS. GODWIN-SAAD: Sure.

HEARING OFFICER FRANK-FEINEN: Thank you.

MS. GODWIN-SAAD: I also believe that there would be a lower population and diversity of aquatic life in these waters in the absence of BCP's discharge. The available field and laboratory data indicate that the temperature of BCP's effluent has not had an adverse effect on fish populations in the receiving waters.

As indicated by Mr. Jantrania, the temperatures of BCP's effluent, the unnamed ditch and Long Point Slough, have remained approximately the same from 1984 to the present. In 1984 a study conducted by the Academy of Natural Sciences of Philadelphia concluded that the unnamed ditch downstream of BCP's outfall and Long Point Slough support a variety of aquatic life. In fact, 12 species of fish were collected in the ditch downstream of BCP's outfall and 22 species of fish were collected in the Slough. The 1984 study noted that the diversity of fish in the unnamed ditch was within the expected range of diversity that occurs

in small streams such as the unnamed ditch, and did not appear to be a result of Borden operations.

A 1989 study conducted by Illinois EPA also reported the existence of a variety of fish in the ditch and Slough. Informal observations since that date by BCP personnel have also confirmed that fish inhabit the ditch and Slough.

In June of 1997 ADVENT personnel conducted the first phase of an additional fish survey of the ditch and Slough. Based on a preliminary analysis of data collected in that survey, the abundance and diversity of the current fish populations appears comparable to historical observations. These findings suggest that the fish population characteristics have remained unchanged through time and, therefore, also support the conclusion that BCP's effluent temperature is not having an adverse impact.

In fact, I believe that BCP's discharges minimize the temperature changes that would otherwise naturally occur in the ditch and, therefore, in the absence of BCP's discharge, the ditch would likely be largely uninhabitable by fish and other aquatic life due to winter freezing and

the lack of flow in summer.

The scientific literature on the affects of temperature on fish also support the conclusion that BCP's discharge is not having an adverse effect on fish populations. Using this laboratory data in conjunction with the available field data I was able to draw the following conclusions for the unnamed ditch and the Slough:

When resident warm water fish are acclimated to a temperature of 15 degrees Celsius their upper temperature thresholds are, at a minimum, at least 9 degrees above the 15 degrees Celsius acclimation temperature. Similarly, when fish are acclimated to water temperatures of around 30 degrees Celsius the upper lethal temperature limits for resident fish are all greater than 34 degrees Celsius.

Based on the existing temperature data, it is clear that the majority of fish in the ditch and Slough would rarely, if ever, encounter water temperatures at or above their upper thermal limits as a result of exposure to BCP's effluent. Furthermore, if a fish were to encounter unfavorable water temperatures, they could

behaviorally avoid those waters.

The literature reports that the maximum weekly average temperatures encountered by resident warm water fish species in their natural habitats often exceed 32 degrees Celsius (the Illinois summer maximum temperature). This information, coupled with the previously mentioned information, suggests that the highest temperatures observed in the ditch would not result in fish mortality. Both in spring and summer the temperature of the unnamed ditch downstream of BCP's outfall, as well as the temperature of the effluent itself was generally in the range of preferred water temperatures for many of the resident warm water fish.

As temperature falls, the preferred temperature selected by most warm water fish species increases relative to their acclimation temperature. This trend in fish behavior, that is, selecting temperatures warmer than the acclimation temperature under decreasing temperature conditions, is documented in the literature and provides evidence that elevated water temperatures in the ditch in the winter are unlikely to have any significant adverse effects on fish populations.

To summarize, based on the temperature data, historical field observations, a preliminary analysis of data from a recent stream survey, and the scientific literature, it appears that for the extent of habitat available, an appropriate fish population exists in the unnamed ditch and Long Point Slough, that the fish population characteristics of the unnamed ditch and Slough have remained unchanged through time, and that the temperature of BCP's effluent is not having an adverse impact.

This concludes my summary. I will be happy to answer any questions that the Board or the Illinois EPA may have.

HEARING OFFICER FRANK-FEINEN: All right. Ms. Howard?

DIRECT EXAMINATION

BY MS. HOWARD:

Q Ms. Saad, in your first paragraph on the first page of your testimony, you stated that during the course of your employment you participated in the evaluation of numerous water quality standards and criteria.

Could you tell me how many? What do you

mean by the word "numerous"?

A Well, with individual chemicals, I have participated in the evaluation of water quality criteria derivation, both aquatic life and human health, for about 15 to 16 different individual chemicals.

Q These were water quality standards for 15 to 16 of the --

A Under the GLI, yes. That's what I was trying to say. Yes, under the GLI.

HEARING OFFICER FRANK-FEINEN: You are talking about the Great Lakes Initiative?

MS. GODWIN-SAAD: Yes, yes. Acronyms.

Q (By Ms. Howard) And were those standards in any particular states or were they just within the GLI, within the --

A They were within the State of Illinois and for the State of Indiana.

Q Other than the GLI, which deals with the Great Lakes, have you evaluated any other streams or water bodies in Illinois?

A No, ma'am.

Q So the majority of your experience is with the water body of Lake Michigan?

A Yes.
Q When did you receive your B.S. Degree?
A In 1988.
Q And your M.S.?
A In 1991.
Q On page 3 of your testimony, I believe in the -- well, in the first -- not in paragraph five, but in the end of paragraph four, on the top of page three, the June 1997, that's the first phase that you referred to?
A Yes.
Q Okay. Could you tell me, did you participate in collecting the samples in the field for that first phase?
A No, I did not.
Q Could you tell me who did collect those samples?
A Members of the ADVENT Group, and my boss, Mr. Scott Hall, and two technicians, Ms. Terri Gajewski, and Mr. Bret Rosenberg.
Q Okay. How do you spell the last name of Terri --
A Gajewski, G-A-J-E-W-S-K-I.
Q And the other person?

A Bret Rosenberg, R-O-S-E-N-B-E-R-G.

Q Okay. Would you happen to know what their experience is in collecting fish samples in the field?

A Yes. Scott Hall has been an aquatic biologist and ecotoxicologist for ten plus years. He is an avid fisherman, and has been employed by the ADVENT Group about five years.

Q Okay.

A Terri Gajewski has been with the ADVENT Group for approximately four years working as an aquatic toxicologist and biologist. Bret Rosenberg is a fairly newly hired employee.

Q Okay. Is he a toxicologist, or do you --

A I don't know. He does not work out of our office. He is, I believe, an environmental science major.

Q Okay.

A He works out of the D.C. office, so I don't know him very well.

MS. HOWARD: Okay. That's all of the questions we have.

HEARING OFFICER FRANK-FEINEN: Okay. Mr. Warchall?

MR. WARCHALL: Yes, I have some questions.

CROSS EXAMINATION

BY MR. WARCHALL:

Q Is there anything you recall off the top of your head at this point about the fish that were collected in June of 1997?

A Okay. Now, I did not participate in the June of 1997 study. I did participate in the September study which occurred in the last couple of days.

Q Can you tell us anything about that?

A Yes, I personally was at each of the stations and participated in the fish collections and did observe the fish species that were collected at each of these stations as well as the habitat that is available there. This is recently. This is the second phase, but we have just collected the data in the last couple of days.

Q One question I did have for you, Ms. Saad, is one thing that might not be that clear from the record is the habitat upstream of the BCP outfall in what we are calling the unnamed creek or ditch. Can you just tell us a little bit about

that?

A Right. Yes. I did observe station -- the station we have named as Station A1. This station had a channel width of approximately three feet and a water width, at the time that we were there, and this was the last couple of days, of approximately one foot. The depth of water at the midpoint of the stream was approximately one inch.

MR. WARCHALL: Okay. Thank you.

HEARING OFFICER FRANK-FEINEN: Okay. Ms. Howard?

REDIRECT EXAMINATION

BY MS. HOWARD:

Q I just want to make sure I have the date right. What date did you say you were out there?

A We were sampling September 9th and September 10th.

Q Of?

A Of this month, of 1997.

MR. WARCHALL: After that data is analyzed it will, of course, be part of the report which, I believe, BCP has committed to the Agency to submit in October, I believe.

MS. GODWIN-SAAD: That's correct.

MS. HOWARD: Okay. Just one other quick question.

Q (By Ms. Howard) So when you have made your conclusions in this report, I am assuming that it is based on reviewing the data that was collected by the three individuals --

A That's correct.

Q -- that you talked to?

A That's correct.

MS. HOWARD: Okay. That's all.

HEARING OFFICER FRANK-FEINEN: Okay. Anything further?

MR. WARCHALL: No.

HEARING OFFICER FRANK-FEINEN: Okay. Can we go off the record for a second.

(Discussion off the record.)

HEARING OFFICER FRANK-FEINEN: Back on the record.

You may call your next witness.

MR. WARCHALL: Okay. I would like to call Mr. Sam Shelby to provide us with a summary of his testimony.

HEARING OFFICER FRANK-FEINEN: Okay. Would you swear in the witness.

(Whereupon the witness was sworn by the Notary Public.)

HEARING OFFICER FRANK-FEINEN: Mr. Shelby, your written testimony has been admitted into the record now as read, so you may do your summary.

MR. SHELBY: Okay. I have a change.

HEARING OFFICER FRANK-FEINEN: Okay.

MR. WARCHALL: Oh, I forgot.

HEARING OFFICER FRANK-FEINEN: Okay. That is fine.

MR. SHELBY: In the submitted or prefiled testimony, the change is on page four in the paragraph under wastestream number two. The fifth line, please delete the two words, "tertiary clarifier" and replace them with, "serpentine stream," such that that sentence now reads, the effluent from this unit enters the serpentine stream.

HEARING OFFICER FRANK-FEINEN: All right. Then it is entered into the record with that change.

(Whereupon said document was admitted into the record as

Petitioner's Exhibit 3 as of this date.)

MR. SHELBY: Okay. Shall I read my summary?

HEARING OFFICER FRANK-FEINEN: Yes, please do.

S A M E. S H E L B Y, JR.,

having been first duly sworn by the Notary Public, saith as follows:

MR. SHELBY: My name is Sam Shelby. I am a principal of the ADVENT Group, and a Licensed Professional Engineer in the State of Illinois. I have submitted prefiled testimony in this matter. I will now present a summary of that testimony.

BCP retained ADVENT to provide it certain technical advice in connection with this variance proceeding. I was asked to advise BCP regarding improvements that might be made to the plant's wastewater treatment system and/or operating practices that could reduce the temperature of the plant's effluent such that it would not contribute to the exceedances of the Board's general use water quality standards for temperature.

As described in my written testimony, the

BCP plant has three primary wastestreams. Wastestream number one, which is treated using a biological treatment system, is the primary source of the elevated temperature of the plant's wastewater. The biological treatment system is maintained at a temperature of between 28 and 32 degrees Celsius to achieve optimum nitrification, that is, reduction in ammonia concentrations. I have found that nitrification rates can decrease at temperatures above 35 degrees Celsius, and that a practical optimum operating temperature is around 30 degrees Celsius.

Although nitrification at somewhat lower temperatures is possible, this would require a substantial increase in the residence time and, therefore, a major physical increase in the physical size of the wastewater treatment system. The system is maintained at between 28 and 32 degrees Celsius by injecting steam into the aeration basins between the months of November and March. The plant's other wastestreams, wastestreams numbers one and two, are lesser contributors of heat to the BCP's final effluent.

At BCP's request, I have performed a

preliminary investigation of the technical and economic feasibility of achieving consistent compliance with the maximum temperature standards and the temperature rise standard. The following technical options were considered for compliance with both of these standards:

A, aeration of the serpentine stream; B, installation of cooling towers; C, installation of a water chiller with a heat exchanger system; D, installation of a cooling pond; E, replacing the wastewater treatment plant with a larger system that could achieve equivalent organic and ammonia nitrogen removal at a lower temperature; and F, cooling wastewaters that are not provided biological treatment prior to combining with the biologically-treated wastewaters.

All of the above-referenced options would require a significant period of time for feasibility analysis, design and construction. Feasibility analysis would need to consider and address several difficult technical issues. My written testimony details several of these issues that need to be addressed for each option, which include the following:

Difficulty in placing aerators to enhance cooling in the final polishing unit, called the serpentine stream, due to its narrow width and depth.

Potential for exceedance of the plant's 12 milligrams per liter monthly average and 12 milligrams per liter daily maximum total suspended solids limits due to resuspension of settled solids.

Ability to achieve effluent temperature below the winter maximum temperature standard during relatively warm periods in the winter.

Algal growth potentially leading to the exceedance of effluent total suspended solids limitations.

Land availability for cooling towers and similar units.

Water quality concerns resulting from chemical control of algal or slime growth in cooling towers or similar units.

The use of chlorine for algal or slime control resulting in the need for dechlorination and the potential for formation of chlorinated organics.

Capital and operating costs.

In addition, as detailed in my testimony, consistent compliance with the temperature rise standard appears to pose difficulties that may be more formidable than those posed by compliance with the maximum and absolute temperature standards. It may not, in fact, be possible to achieve compliance with the temperature rise standard consistently throughout the year.

When the upstream flow in the unnamed ditch is a small fraction of the effluent flow, the ditch would violate the temperature rise standard unless the effluent temperature was controlled to within approximately 2.8 degrees Celsius of the upstream temperature. As discussed in my testimony, this may be virtually impossible to do in both the summer and winter, due to the large fluctuations in the temperature and flow of the stream upstream of the outfall and the large variations in the amount of cooling that would be required at different times of the year.

Although there may be significant technical and economic obstacles to consistent compliance with the maximum temperature and

temperature rise standards, BCP is committed to performing a comprehensive investigation of the options for compliance with these standards. That investigation includes: Additional in-plant monitoring of wastewater temperature consistent with the work plan that is now attached to the Verified Petition as Exhibit AA, and a detailed evaluation of compliance options. Paragraph 48 of the Verified Petition sets forth a schedule for the work BCP will undertake.

This concludes my summary. I will be happy to answer any questions that the Board or the Illinois EPA may have.

HEARING OFFICER FRANK-FEINEN: Ms. Howard?

MS. HOWARD: I don't have any questions.

HEARING OFFICER FRANK-FEINEN: Mr. Warchall?

MR. WARCHALL: Yes, I have a few additional questions for Mr. Shelby.

DIRECT EXAMINATION

BY MR. WARCHALL:

Q Mr. Shelby, I would like to show you Paragraph 48 of the Petition, which I believe has

been marked as Exhibit 1.

HEARING OFFICER FRANK-FEINEN: It is Exhibit 4.

MR. WARCHALL: It is Exhibit 4. I am sorry.

HEARING OFFICER FRANK-FEINEN: That's okay. We did it backwards. What page? I am sorry.

MR. WARCHALL: This is on page 39.

HEARING OFFICER FRANK-FEINEN: Okay. Thank you.

Q (By Mr. Warchall) Referring to item number two, which reads description is completion of in-plant wastestream temperature monitoring, could you tell us a bit about that work and the purpose of that work?

A Yes. The purpose of this work is to conduct temperature monitoring on four wastestreams in the Borden plant for approximately one year, beginning a few months ago, in June of 1997, and continuing until June of 1998. The purpose of this work is to fully characterize the temperature and temperature variations of these in-plant wastestreams to allow us to fully develop and

evaluate compliance options.

Q Okay. Then referring you to item three, then, that basically provides two months, then, after that data has been compiled to further evaluate the compliance options that have been set forth and described, both in your testimony and in the petition?

A Yes, it does.

Q Okay. I would like to call your attention to number five, item number five, which is identification of adverse environmental impacts. Can you just give us an idea of maybe an example of what sort of adverse environmental impacts we have to look at?

A Yes. Potential adverse environmental impacts might be resuspension of suspended solids or some other activity that would cause effluent, suspended solids or some other parameter to increase. Another example might be the use of chemicals to control algae or slime in the cooling unit that would enter the environment and be a concern.

Q Okay. The remainder of this schedule, which continues over on to page 40 of the Petition,

describes a schedule for evaluation of technical feasibility and environmental impact, capital and operating costs, design, etcetera, with basically the schedule going out to about October of the year 2000. Do you think this is a reasonable schedule for the work that BCP has undertaken?

A Yes, I do.

MR. WARCHALL: I would like to provide you a document which I would mark as --

HEARING OFFICER FRANK-FEINEN: It will be Petitioner's Exhibit 5.

(Whereupon said document was duly marked for purposes of identification as Petitioner's Exhibit 5 as of this date.)

MR. WARCHALL: I think Ms. Howard has one.

HEARING OFFICER FRANK-FEINEN: Okay. Thank you.

Q (By Mr. Warchall) Mr. Shelby, can you -- this document is, I believe, a 15 page document, and it consists of several tables and diagrams. Can you describe, very briefly, what this packet of materials is and who prepared it?

A Yes. This was a -- it is a summary of figures and tables, diagrams and charts, that was prepared by members of the ADVENT Group under my direction and signature for submission to Borden regarding preliminary temperature control options that were developed regarding preliminary design sizing and preliminary costing on these options.

Q And this is called preliminary because, I take it, the result of the temperature monitoring may result in revisions of these estimates or changes?

A That's right. That's right.

Q Okay. Referring to the first page, which is entitled Table 1, preliminary order of magnitude cost estimate survey, these options here, one through eight, are these the options which are identified in the petition?

A Yes, they are. There is one option here, option six, that is not identified in the petition, but the others are.

Q Okay. Why isn't number six identified in the petition?

A Well, option six is an option involving flow augmentation of the effluent using

groundwater, cool groundwater to blend with the treated effluent, such that the combined effluent would then comply with temperature standards. We felt that would not be very palatable to the Agency and, therefore, did not include that in the petition.

Q Most of the options have cost figures attached to them. Option one, instead of a cost figure it says not feasible. Can you tell us why that was not feasible?

A Yes. This option involves installing aerators in the serpentine stream to enhance cooling. However, the installation of aerators would prevent the settling of suspended solids and thereby cause a potential violation of the plant's -- or exceedance of the plant's limits on suspended solids. Therefore, we felt this was not a feasible control option for temperature.

Q Okay. Option number 7, entitled utilities stream cooling, is also labeled as not feasible?

A Yes, this option would involve cooling or involves cooling of the other utility wastestreams such that when they would combine with the

biologically-treated wastewater the effluent would achieve compliance. However, our evaluation indicated that it would be necessary to cool these other utility wastestreams to below the freezing point at certain times to achieve compliance which, of course, is not feasible.

Q Okay. Then, finally, on Table 1, can you tell us about option number eight, which is control of temperature increases?

A Yes. This is an option or indicated as an option of additional controls that would be required to achieve compliance with the temperature rise standard, and would be in addition to any of the other options which deal only with compliance with maximum temperature standards.

Q Okay. So if -- so based on these preliminary numbers, if BCP was to go with option number three, which is 1.67 million, then they would also have to use option eight for another 1.1 million? You add those two numbers together?

A That's correct.

Q Does Table 1 include operating costs?

A No, it does not. These are only the capital costs or installation costs.

Q Okay. Quickly, now, I don't want to spend too much time on this, but I would just like to refer to it. I apologize that it may be a little tricky here. I want to refer to Tables 2, 3, 5, 7 and 9, all of which appear to be breakdowns of the cost estimates for the various options. Is that what these are here?

A Yes, they are.

Q And are operating costs reflected on these exhibits?

A Yes, they are. They are at the bottom of each of the respective tables.

Q Okay. Those seem pretty straight forward. I do, though, want to ask a couple questions about some of the exhibits which are a little less straight forward.

A Okay.

Q If you could turn to Table 4, and just briefly describe what Table 4 is?

A Table 4 is a table that -- a printout of a spread sheet that was performed to evaluate thermal balance on -- this is option four on a cooling pond system to help us evaluate the technical feasibility of this option and help us

achieve preliminary sizing, information which, of course, we use in our preliminary cost analysis.

Q Okay. Could you also then describe Table 6?

A Well, again, it is a similar table, a spread sheet on thermal balance calculations on option five. Again, it is used to do additional sizing calculations which were used for additional costing evaluations.

Q Okay. Then Table 8, if you would just, again, briefly describe it?

A Yes, this is a similar table or spread sheet for option six, the flow augmentation option.

Q Okay. Then Table 11 -- I am sorry. Table 10.

A Yes, this is, again, a similar table showing the thermal or heat balance results for option seven involving utility water cooling.

Q Okay. Can we turn to Table 11? Again, would you just briefly describe this one?

A This is a summary of the technical and economic advantages and disadvantages of all of the options. Also included are concerns -- other water quality concerns of each of the options where

applicable.

Q Okay. And, finally, I would refer you to the last four pages, which are figures one through four, and if you could just tell us what those are?

A Yes, these are schematic diagrams of each of the options.

MR. WARCHALL: Okay. I don't think I have any more questions for Mr. Shelby.

I would move for the admission of Exhibit 5 into evidence.

MS. HOWARD: I don't have an objection to its admission. But as a point of clarification, after reviewing all of the information, as Mr. Shelby had testified, this is a preliminary analysis of the options, the applicable costs of those options, and then especially, for example, on Table 11, where it lists the advantages and disadvantages, and it also takes into consideration Borden's concerns with respect to those advantages and the disadvantages.

We would consider this exhibit admissable or we don't object to its admission for the purposes of this variance, but depending on what the sampling shows and other considerations that

would be taken after we conclude the variance period, the Agency certainly may not agree with all of these conclusions and the costs and stuff, but as long as that is taken into consideration, we have no objection.

HEARING OFFICER FRANK-FEINEN: Okay. Well, then Exhibit 5 is then admitted into evidence.

(Whereupon said document was admitted into the record as Petitioner's Exhibit 5 as of this date.)

MR. WARCHALL: I would ask if we could have a short break.

HEARING OFFICER FRANK-FEINEN: Sure. Let's go off the record.

(Whereupon a short recess was taken.)

HEARING OFFICER FRANK-FEINEN: Back on the record.

MR. WARCHALL: The Petitioner has nothing further.

HEARING OFFICER FRANK-FEINEN: Okay. How about the Agency?

MS. HOWARD: The Agency doesn't have anything in terms of witnesses. We have gotten the information we need through cross-examination.

HEARING OFFICER FRANK-FEINEN: Okay. How about the members of the public? Do either of you wish to make a statement on the record?

MS. SHOWALTER: I don't care to have it on the record. My only statement is that I --

HEARING OFFICER FRANK-FEINEN: Okay. Hang on just a second. If you don't want it on the record, we have to the tell the reporter to stop.

MS. SHOWALTER: Okay.

HEARING OFFICER FRANK-FEINEN: Okay. Off the record.

(Discussion off the record.)

HEARING OFFICER FRANK-FEINEN: Back on the record.

I would just like to note, for the record, that we do have members of the public present, and we had a discussion off the record just kind of explaining the permitting process and how the sampling is done.

Is there anything else? Do you have closing statements or do either of you feel that

you need a briefing schedule?

MR. WARCHALL: We do not.

MS. HOWARD: We don't think a briefing schedule is necessary. I don't have any closing statements.

HEARING OFFICER FRANK-FEINEN: Okay. Do our members of the public wish to file anything in writing? Do you believe that you will want to file anything in writing?

MS. SHOWALTER: I would like -- the only thing I would like would be to -- some way to let me know how it comes out eventually.

HEARING OFFICER FRANK-FEINEN: Okay. What we can do is I can make sure I have your address, and the Board will send you a copy of its opinion and order.

MS. SHOWALTER: Okay.

HEARING OFFICER FRANK-FEINEN: Are you Ms. Showalter?

MS. SHOWALTER: Yes.

HEARING OFFICER FRANK-FEINEN: You should be on their list already as an objector so you should get a copy of that. I will check into that.

MS. SHOWALTER: Okay. Thank you.

MS. GODWIN-SAAD: Could we go off the record? I would like to make a statement to the public.

HEARING OFFICER FRANK-FEINEN: Okay. Sure. That is fine. Just a second.

MS. GODWIN-SAAD: Okay.

HEARING OFFICER FRANK-FEINEN: Why don't we go ahead and close the hearing at this time.

MS. HOWARD: Could I just ask -- I am sorry. Have you received -- you should have received the Agency's submission.

MS. SHOWALTER: Yes, I did. Thank you.

MS. HOWARD: Okay. I just wanted to make sure.

HEARING OFFICER FRANK-FEINEN: I found all the witnesses credible. That will be part of my written post hearing report including the exhibit list. There will be no briefing schedule, so this case will go to the Board and ready to write as soon as the transcript is in.

Is there anything further?

MR. WARCHALL: I don't think so.

MS. HOWARD: No.

HEARING OFFICER FRANK-FEINEN: Okay. Then the hearing is adjourned. Thank you.

MR. WARCHALL: Thank you.

MS. HOWARD: Thank you.

(Petitioner's Exhibits 1 through 5 retained by Hearing Officer Frank-Feinen.)

STATE OF ILLINOIS)
) SS
COUNTY OF MONTGOMERY)

C E R T I F I C A T E

I, DARLENE M. NIEMEYER, a Notary Public in and for the County of Montgomery, State of Illinois, DO HEREBY CERTIFY that the foregoing 59 pages comprise a true, complete and correct transcript of the proceedings held on the 11th of September A.D., 1997, at 600 South Second Street, Springfield, Illinois, in the case of Borden Chemicals and Plastics Operating Limited Partnership v. Illinois Environmental Protection Agency, in proceedings held before the Honorable Deborah Frank-Feinen, Hearing Officer, and recorded in machine shorthand by me.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my Notarial Seal this 22nd day of September A.D., 1997.

Notary Public and
Certified Shorthand Reporter and
Registered Professional Reporter

CSR License No. 084-003677
My Commission Expires: 03-02-99