

APR 18 1993

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HOWARD L. NATIONS

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DIPLOMATE, AMERICAN BOARD OF LEGAL MEDICINE  
OF COUNSEL

RICHARD H. SJARDA  
OF COUNSEL  
ADMITTED TO PRACTICE  
IN TEXAS, ILLINOIS & MISSOURI

April 12, 1993

VIA FEDERAL EXPRESS

Admiral E. R. Zumwalt, Jr.  
1500 Wilson Blvd., Suite 641  
Arlington, Virginia 22209

RE: Cause No. 92-G-2397; Brawder Alpin, et al vs. Dow  
Chemical Company, et al; In the 239th Judicial  
District Court of Brazoria County, Texas

Dear Admiral Zumwalt:

As we discussed, please find enclosed an outline of the topics which we hope you can briefly comment on in your video interview with Howard L. Nations at 10:00 a.m. on Sunday, April 18, 1993 at your office located at 1500 Wilson Boulevard, Suite 641, Arlington, Virginia 22209. Also enclosed is a copy of documents relating to the specific case referenced above which is based upon the injury suffered by the commercial fishing industry as a result of dioxin contamination of fish.

If you have any questions, please do not hesitate to contact me.

Very truly yours,

THE LAW OFFICES OF HOWARD L. NATIONS

  
Mark E. Price

MEP\cdb  
Enclosures

cc: James Zumwalt

Summarized  
by JGZ

TOPICS FOR ADMIRAL ZUMWALT

- I. Brief history of private industry influencing governmental entities and public officials on dioxin-related issues.
  - A. Dow Chemical Company
  - B. American Paper Institute
  - C. Individual paper companies:
    1. Champion
    2. Temple-Inland
    3. Simpson Paper Company
  
- II. Dangers associated with dioxin. Brief review from his personal experience and work for the Veterans Administration.



American Paper Institute, Inc.

260 Madison Avenue, New York, N.Y. 10016(212) 340-0676

cable address: AMPAPINST New York

RECEIVED

JUN 16 1986

for Chron

ENERGY & ENVIRONMENTAL AFFAIRS  
Office of the President

TO: API Executive Committee

June 13, 1986

VIA: Red Cavaney

FROM: Mike Farrar

DIOXIN STUDY -- REQUEST FOR  
PROGRAM APPROVAL AND CONTINGENCY FUNDS

At the Board of Directors' meeting last week, we reported on the results of the previous day's dioxin negotiations with EPA. Those negotiations were directed toward establishing a joint EPA-industry study program to look into the possible presence of dioxin in materials at bleached kraft mills.

The results of the negotiations were later committed to writing, subject to approval of the respective principals, and a copy of the proposed agreement is attached. Its main features are outlined in the attached background paper, as are its principal advantages and disadvantages.

A vote of the Executive Committee on this matter is needed. If the proposed agreement is approved, implementation will require a draw of \$120,000 against the API contingency fund to pay for laboratory analysis of samples. The Environmental and Health Council has unanimously endorsed the recommendation of the dioxin negotiating group that the proposed study program, and the contingency funding for it, be approved.

Please telephone your vote to Mike Farrar at 202-463-2440 by noon on Friday, June 20th (earlier if possible). The timing is important because, during the lengthy negotiations and in order to stave off a looming legal battle over the validity of EPA's "Section 308" administrative subpoena, arrangements were made for EPA's inspection team to begin the study by entering Boise Cascade's International Falls mill on Monday, June 23rd (subject, of course, to an agreement being reached before that date). Accordingly, if approved, we would like to sign the agreement with EPA on the afternoon of June 20th.

In concert with that signing, we will finalize arrangements for a CEO-level meeting with the EPA Administrator on the need for the Agency to bring sound risk assessment principles to bear on whatever findings result from the screening study. The Administrator's office has indicated he will not only agree to, but would welcome participating in, such a meeting.

Attachments

cc: API Board of Directors  
API "Dioxin Contact" List

## BACKGROUND

### The Negotiations

As authorized by the Executive Committee in May, industry negotiators had a final meeting with EPA staff on Tuesday, June 3rd. In addition to API and NCASI staff and house counsel from a member company, the negotiating team consisted of representatives of the five volunteer member companies whose mills had been selected as a representative cross-section of the industry. Specifically, Boise Cascade, the recipient of EPA's Section 308 administrative subpoena, was joined by Champion, International Paper, James River and Mead.

One result of the negotiations was to change the tone of the attached agreement from that of an indictment of the industry to one that more properly portrays the joint study effort as a cooperative, scientific venture. The funding shifted from EPA's proposed 5:1 ratio to one in which industry will bear 3/4 of the cost, EPA 1/4, with a \$150,000 cap on industry's share. Preliminary discussions among the industry representatives led them to suggest among themselves that industry's share be funded by \$120,000 from API's contingency fund and \$30,000 from NCASI funds that otherwise would have been devoted to similar aspects of that organization's own dioxin research plan.<sup>1</sup>

As Table 1 of the attached proposed agreement indicates, EPA will take a large number of samples at each of the five participating mills. Many of those samples will be of various incoming materials and wastewater streams, but some pulp samples, bracketing the bleaching process, will be taken. However -- and this was important to the industry negotiators -- none will be taken of individual wash waters within the bleaching process. In order to save costs, expensive analyses will be performed of only certain samples initially, with those results determining whether analyses of other samples are run.

EPA plans to send its sampling teams to the participating mills at approximately one-month intervals, beginning on Monday, June 23rd, at Boise's International Falls location. Given the backup of analytical work at the laboratories and the length of time needed to prepare the ultimate study report -- in which API and NCASI will participate -- our best estimate is that the results of the screening study will not be available for approximately a year. Every effort will be made during that period to avoid premature disclosure of information.

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<sup>1</sup> NCASI's Operating Committee has since approved the NCASI share of the funding.

D007054

## Pros -- Cons

In our May 14th memorandum seeking authorization to engage in these negotiations, we listed some of the advantages and disadvantages of this study. These can best be stated now as follows:

### Advantages

1. The study would eliminate, at least for now, the adversarial relationship and public notoriety that might have been generated by a legal battle over Boise's pending Section 308 request, and others that would have been forthcoming. Although the agreement itself is silent on this point (because of EPA's understandable unwillingness to limit publicly its enforcement capability), our tacit understanding with EPA is that, absent changed circumstances, no similar 308 request will be sent to other member companies during the pendency of the study. In that regard, some industry lawyers had indicated the disadvantage of having to argue in court about the proper scope of Section 308 with dioxin as the pollutant in controversy. Even if the scope of any 308 requests could have been properly limited,<sup>2</sup> legal fees and the cost of analysis of those effluent samples to which EPA would in any event be entitled under 308 would have quickly used up the \$150,000 industry is being asked to contribute to the study. In that regard, EPA is said to have been ready to issue more than one hundred Section 308 requests to industry facilities.
2. By creating and participating in a joint study with EPA, the industry is in a better position (1) to respond to inquiries about dioxin from the press and to portray the industry as acting responsibly to protect the public interest and (2) to attempt to focus any regulatory initiatives at EPA Headquarters rather than in the regions or in the states.

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<sup>2</sup> My earlier memo said that "many industry lawyers believe we cannot successfully oppose a 308 request in those circumstances \*\*\*." In retrospect, that attempt to capture in shorthand a summary of the industry's concern could have been stated more artfully. It would have been more accurate to say that some industry lawyers feared that the involvement of dioxin posed a danger of a court's giving Section 308 an improperly broad reading. I did not intend to suggest that the industry could not put forward a strong defense to those portions of the 308 request that went beyond effluent samples and attempted to reach intermediate products. In fact, some industry lawyers were of the opinion that on this point a strong defense could be mounted, but many preferred to avoid having to do so if possible.

3. By studying a representative sample of mills, the industry may avoid the clamor that could have been forthcoming from a set of aberrational findings from one non-representative mill.

4. This cooperative endeavor with EPA establishes an excellent climate for the CEO-level meeting with the EPA Administrator on the need for sound risk assessment policies. We are endeavoring to schedule that meeting in the near future.

#### Disadvantages

1. EPA will have possession of intermediate pulp samples that it will be free to have analyzed. It is problematical whether the Agency could have obtained such samples by pressing Section 308 requests, but they most likely could have been obtained in the market place, as had been threatened. In addition, two API members based in Wisconsin have, under pressure from that state's regulators, already agreed to a similar sampling program in that state in which pulp samples will be made available.

2. The five volunteer companies whose mills have been selected for participation have thereby exposed themselves to possible unflattering public attention when the findings are eventually released. Although the samples taken will be coded to preserve anonymity initially, and confidentiality of results will be attempted to be maintained as the study progresses, we have to assume that ultimately the results will be made known and identified with the respective mills. The five companies have, we believe, earned the gratitude of the rest of the industry, as did those other companies who volunteered but whose mills were not selected.

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As indicated above, the Environmental and Health Council has already endorsed this program and recommended that the necessary funding be supplied from the contingency fund.<sup>3</sup> However, the pressures of time have kept us from circulating the proposal, as would ordinarily be done, to other affected groups and committees within API -- such as the Environmental Law or General Counsels' Committee, the Employee Relations Committee, the various product groups, and so forth -- and many affected officials in your companies have not yet seen the enclosed agreement. Therefore, because of the many ramifications of this project, we strongly suggest that you insure that each of your interested managers be

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<sup>3</sup> This \$120,000 would represent the first draw in 1986 against API's basic \$300,000 contingency fund. (The \$160,000 to fund the Johns Hopkins "Employee Workplace Health Profile System" came from a special budget reserve added to the basic contingency fund for that express purpose.)

consulted before you cast your vote. To aid that process, we are sending a copy of this memorandum and agreement to the designated "Dioxin Contact" in your company with instructions to circulate it broadly to aid in your decision making.<sup>4</sup>

If the telephone vote of the Executive Committee is favorable, we will execute the agreement for API on Friday, June 20th, and the EPA sampling team will enter Boise's mill on Monday, June 23rd. The cover letter transmitting the signed copies of the agreement will refer to the expectations we have about the freedom we expect API members to enjoy from similar Section 308 requests during the pendency of the screening study. If any of you receive such requests in the future, please feel free to inform us immediately so that we can enlist the aid of EPA Headquarters in having the request withdrawn unless the Agency has some special reason requiring it to pursue it.

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<sup>4</sup> We are also sending the memorandum to all the members of the API Board of Directors, and to their dioxin contacts, so that they too will be fully informed of the status of this matter.

D007057

To:  
Jerry Craig

Date:  
June 29, 1989

From:  
Xuan Nguyen

Subject:  
Peroxide Bleaching Trials at Lufkin  
and Sheldon - Summary & Pulp  
Quality

3413002

## Introduction

Peroxide can be used in the bleach plant, either in the extraction stage or in the high density tower, to extend the delignification and increase the pulp brightness. Pulp strength can be improved by reducing the hypochlorite addition in a CEH bleaching sequence by using peroxide<sup>1,2</sup>. Studies at PPRIC and in Scandinavia have indicated that chlorine usage at levels below 0.15-0.17 chlorine multiple (% chlorine on pulp divided by kappa number) could reduce dioxin formation to non-detectable levels. Hydrogen peroxide was also used in several mill trials to reduce the chlorine multiple<sup>3</sup>. In these trials, a 30% chlorine reduction was achieved when 0.3% to 0.5% peroxide was added in the extraction stage.

As improvements in pulp quality and reductions of chloroform, AOX and dioxin from bleach plant effluents are pursued at Champion mills, peroxide has been considered as an option to achieve these goals. Two bleaching trials, with hydrogen peroxide applied either in the extraction stage or in the high density storage, were recently conducted at the Sheldon and Lufkin mills to quantify the strength improvement and chemical costs. Detailed results of the two mill trials were reported previously<sup>4-6</sup> and a synopsis of the trial events is shown in Table 1.

The purpose of this report is to summarize the results of these trials and to quantify the impact of pulp quality.

## Conclusions

1. Lufkin's peroxide trial results indicated that peroxide can be used in the extraction stage to reduce the chlorine multiple to a level that would be close to "dioxin-free" or be used to significantly reduce hypochlorite with little increase in costs relative to the baseline.
2. Because mixing and retention time in the high density tower varied significantly during the trial at Lufkin, the final bleached pulp brightness was below target. The reverted brightness of the final bleached stock, however, was higher than the normal reverted brightness.

## Timeline

### 1987-1989

Dioxins and furans were first identified in the Brazos River by the Environmental Protection Agency (EPA) as part of nationwide testing completed in 1987. Dow was first made aware of the results during permit negotiations with TWC. The EPA study involved testing samples of sea catfish and black drum.

### February, 1990

TWC asked Dow to verify EPA results, identify any potential Dow sources, and remedy the situation. TWC in the permit asked Dow to perform analytical tests on the water discharged from the site as well as test two types of sport fish. Dow tested samples of black drum and croaker fillets. Water discharge samples also were tested.

### August 2, 1990

Dow reports first round of fish and water samples showing TEC levels above FDA guidelines for unlimited fish consumption. Reports information to EPA and TWC.

### September 19, 1990

On Sept. 19 the Texas Department of Health (TDH) posted a fish consumption advisory on the Brazos River from the FM 521 bridge in Brazoria to the mouth of the river. This advisory suggested that levels of consumption on all finfish be curtailed to one meal of eight ounces each month. It also suggested that women of childbearing age and children not eat finfish taken from the Brazos.

This advisory was posted along with two others: one on the Neches River and one on the upper Galveston Bay.

### October 16, 1990

Dow reports second round of fish samples. Waiting on water. Results confirm results of first findings. Dow initiates four-part plan to focus search.

### December 12, 1990

Dow reports second water data and results of "possible sources." Announces formation of Technical Solutions Team and establishment of "screening" lab.

**Dow has pledged to continue to work with TWC to determine the levels of dioxins and the sources of contamination.**

*Cont as 2474*

SIMPSON W/ JADENA

PRODUCED

01/25/90

TFA PULP & PAPER COMMITTEE MEETING  
- DIOXIN, 304(1) PERMITTING -  
January 25, 1990

Card in 267c

Chairman Don Padfield called the meeting to order at 10:15 a.m. in the Houston Airport Marriott, Austin Room. A listing of attendees is attached to this report.

Chairman Padfield reminded the group of anti-trust procedures, reviewed TFA Committee structure realignment and concluded with the group that non-site mill specific expenses would be covered by dividing the expenses five ways (five mills). He also reported that Bob Fisher, NCASI -Florida, has been out of work with an illness.

Mr. Ed Clem reviewed state permitting activities. Alabama has adopted a 1.2 ppq water quality standard,  $10^{-5}$  and lower potency. Kentucky has recommended 1.3 ppq water standard, Georgia has set an interim standard of 7.2 and Virginia and Maryland have adopted approximately 1 ppq standard. Tennessee is considering a threshold approach. North Carolina adopted EPA's .014 but is being asked to reconsider. Because of activities in Maine, Dr. Squire re-evaluated his slides of the Kociba work and concluded that dioxin potency conclusions may dramatically change. A review of the slides will be undertaken by a national toxicology program review, and FDA has agreed. Mid-February in Washington, D.C. The results are expected to reduce potency decisions about dioxin. However, EPA's reaction is not known.

Mr. Radford asked if the Texas mills could accept a 1 ppq water quality standard. Mr. Clem pointed this would be approximately 20% of EPA's proposed interim permit limit for Evadale and Lufkin. All mills indicated they thought that this would be a standard which could be met.

There was some discussion of oxygen delignification, but general feeling that this was not going to be a widespread practice to solve dioxin generation. Mr. Clem mentioned the potential for reduced pulp production (recovery boiler limitations). There was some thought that close attention to defoamers may bring compliance for some, but that would of course depend upon the levels from which one began. Champion representatives noted that chlorine dioxide substitution and defoamer changes had given a 90% dioxin reduction at the Canton mill.

78/00 12

There was general consensus that regardless of receiving water standards and waste water permits, the industry was committed to meet the 2 ppt level in pulp. Nonetheless, as Mr. Clem pointed out, continuing with dioxin process changes should be expected to benefit AOX.

Lial Tischler reported that the TWC is not comfortable with the 5 ppq. They want a better way to define a number or standard, that the FDA approach is inappropriate.

David Lutrick reports that Oregon has adopted EPA's criteria without evaluation (.013). Washington has not adopted this yet but is expected to do so because they share the Columbia River with Oregon. Greenpeace (headquartered in Washington) is keeping focus, lots of pressure on agencies. The first greenfield mill since the 1960's was turned down (Columbia River, Oregon) on the basis of dioxin. California has not opened a mill permit for review but is proposing a standard of approximately .004.

Mr. Clem reported two EPA memoranda are available which would be of interest. January 4 - a question and answer memorandum related to 304 implementation. January 5 - a memo to the regions, new guidance to states for TCDD policies.

The discussion then returned to the reviewing of Lial Tischler's Texas Water Quality Standards draft proposal, January 21.

Mr. Tischler reported that TWC is telling him that we should suggest subjects which they should consider for health standards and setting criteria. The TWC wants us to take part in the review of the triennial water standards procedure, avoiding surprises and pre-empting arguments where possible. Essentially one might view this as a pre-rulemaking notification.

Further, Texas clearly allows a site-specific study and permit with the study conducted by the discharger. On the PQL, we need to try to get a more definitive statement as to its intended use. In trying to achieve a site-specific standard, as for example using ENSR's model, one would have to go to a public hearing. One should expect severe opposition but this avenue is allowed by the regulations.

It was noted that the petrochemical industry is not finding much TCDD in their effluents. One should not expect much help from the American Petroleum Institute.

Texas has indicated they will not write a permit limit below a PQL. The TWC PQL (25 ppq) should not be challenged. While it was set by discussion and agreement, a more

scientific-laboratory approach would be expensive and time-consuming. Further, NCASI is undertaking a study of this on the national level.

The Committee concluded that other states setting standards for water quality more lenient than EPA should be communicated to Texas with our comments. This is to be done as an attachment.

Mr. Tischler felt it likely that Texas would come to a water quality standard between 0.5 and 5, and discomfort with the FDA derived 5 level seemed quite likely. Most likely would be a standard of approximately 1 ppq. To reiterate, rather than presenting numbers to the State, we should give them scientific information for their considerations in deriving a number.

A copy of Dr. Squire's letter was supplied by Mr. Feldcamp. Mr. Radford reminded the Committee that when opportunity presents, visit with Mr. Palachek and/or Ms. Pedde, expressing our appreciation for their continued work on this matter. Mr. Radford and Mr. Tischler discussed that our comments must be filed by the February 5 deadline, but that additional comments may be added at a later date.

Chairman Padfield noted that he would mail out a list of Committee mailing addresses to all committee members and also a copy of a Tennessee letter.

With respect to the Exposure Assumption section of Mr. Tischler's draft, the group concluded that it would rather that a  $10^{-5}$  risk assumption be presented than the draft usage of  $10^{-6}$ . Mr. Tischler discussed pros and cons of this, the manner which assumptions partly help to define the risk assumption levels. The Committee reviewed mechanisms of states setting risk policies.

Mr. Dave Lutrick presented informative discussion on partition coefficients and the possibility that the agencies should rethink the water quality standards to derive waste water discharge permit allowables for dioxin. There was concern by some that a partition coefficient assumes equal masses of solids and liquids in determining the partitioning of the dioxin between the liquid and solid phases.

Mr. Lutrick reported that some scientists are now saying that one must look at the water and the food chain; the food chain provides the fish tissue residue of dioxin. Preliminarily, mills might already meet the EPA .013 ppq water quality standard if only the dissolved portion of the dioxin is used in setting the permit limitations.

The derivation of the FDA 25 ppt for fish tissue was discussed. It was reiterated that this number from the Great Lakes study assumed that only 10% of the fish was contaminated. Committee members were reminded that 25 ppt is possibly not a useful standard, that EPA uses 0.3 ppt (?) for determining a harmful level.

Mr. Lutrick noted that in Simpson's observations, sediments typically range from 1 - 50 ppt. In view of the food chain discussion, reduced solids in the effluent may not improve the levels of dioxin in fish tissue.

Mr. Lutrick reminded Committee members that it would be helpful to talk about solids in effluent as not being sediments but might include colloidal solids (such as color bodies).

Mr. Clem, Mr. Feldcamp and Mr. Radford led a discussion on Texas PSD delegation. Some members and API had concern that EPA's conditions for delegation of PSD to Texas would allow EPA to set regulations in Texas by memorandum rather than rule proposal, public hearing and so forth. The Committee concluded that it would prefer to achieve delegation and to argue later on defining or cutting the strings which came with the delegation. Mr. Radford and Mr. Feldcamp noted that they would return to Senator Gramm with this message, that they had concurrence of industry, and associations that we did not want delegation withdrawn or held up.

Mr. Feldcamp then reviewed proposed revisions to Texas Air Control Board General Rules. A fuel oil surcharge which would impact major urban areas and non-attainment areas Secondly, Rule 101.7 would add a new Subpart A, the wording of which would require a plant shutdown under certain environmental system outages.

The meeting adjourned at 2:10 p.m. and without a break for lunch!

Mike Harbordt

COMMITTEE DISTRIBUTION LIST

COMPANIES

LEGAL

CONSULTANTS

Champion

- \* Ed Clem - Stanford
- \* Tan Badar - Sheldon
- \* John Turner - Lufkin

- Ben Bilus - Stanford
- \* Larry Feldcamp - B&B
- Mark White - B&B
- \* Norman Radford - V&E

- \* Lial Tischler - Round Rock
- Paul Anderson - ENSR
- \* Robert Fisher - NCASI - Fla.

IP

- Ted Peyser - Dallas
- \* Howard Lienert - Dallas

Temple

Other?

- \* Linda Syler

- TWC
- EPA
- ENSR?

Simpson

- \* Don Padfield - Pasadena
- \* David Lutrick - Anderson, Ca.

- \* Meeting List

Dr. ~~Detmer~~ Schillbore  
714 X  
703430  
Outhart Physician 7759  
harry expansion  
125/100A/shuff  
300 patients  
Blood Feud \*  
infectious diseases  
by Mark D. ~~Rowe~~

002

2211

## DIOXINS - DISASTER OR DIVERSION?

John Leach  
British Columbia Research Corporation  
3650 Wesbrook Mall  
Vancouver, B.C.  
V6S 2L2

Paper presented at the CPPA Environmental Conference  
Vancouver, October 25-27, 1988

Dioxins have attracted a lot of attention lately. They have become a symbol of the general public's apprehension about chemical usage in general and chemical pollution in particular. This presentation summarises facts relevant to dioxins, and provides a personal interpretation of the information.

Scientists have responded to the challenge by publishing ever-increasing numbers of papers, making dioxin research one of the growth industries of the 1980's. Since 1974, when Sanderman first indicated that kraft mill bleach plant effluents might contain chlorinated dibenzo-dioxins and furans, publications have increased from approximately 80 per year to the present level of over 450 a year.

Hundreds of millions of dollars have probably been spent gathering information and data on the levels and sources of dioxins worldwide. This is an expensive business to be in. For example, at B.C. Research we have recently completed a self-contained high hazard laboratory for analysis of contaminants such as chlorinated dioxins and furans at a cost of approximately \$400,000. The laboratory consists of stainless furnishings including bench tops, and three 2.6 m fumehoods rated for carcinogen use equipped with flow alarms; a separate air supply filtered through HEPA and carbon filters to remove particulates and organics; a vestibule kept at positive pressure relative to the rest of the laboratory; and two adjoining laboratories, which are at successively increasing negative pressure relative to the remainder of the building to retain contaminants within the confines of the high hazard laboratory; ultraviolet screens on the windows, and incandescent lighting throughout to reduce the risk of photodegradation of dioxins; and a sealed pass-through for transfer of concentrates for final analysis from the sample preparation area to the adjoining gas chromatograph-mass spectrometer laboratory.

Chlorinated dioxins and furans have been detected in a wide range of foodstuffs, consumer items and natural products including all manner of environmental samples. This is not really surprising, since the sensitivity of dioxin analysis has improved from 1 ppm in 1966 to 1 ppq (one part per quadrillion) in 1988 (Figure 1). This seems to be a classical case of learning more and more about less and less until we know everything about nothing! Sadly, knowledge without understanding can be very painful.

The proper names for dioxins and furans in the context that they are normally used are polychlorodibenzo-p-dioxins (PCDD) and polychlorodibenzo-furans (PCDF). The chemical structures consist of the basic dioxin or furan unit with between one and eight chlorine atoms distributed around the two benzene rings. The various combinations of chlorine positions give rise to 75 different dioxin isomers and 135 isomers of the furans.

Generally, when the 2,3,7, and 8 positions are all substituted with chlorine, the molecule tends to be more toxic than when one or more of those positions does not contain chlorine. The most notorious dioxin of all, 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) has only those positions substituted, and is reputedly the most toxic man-made chemical known. It is one of 22 tetrachloro-substituted dioxins and is by far the most toxic of them all. As the number of chlorines increases beyond four the toxicity diminishes, even when the 2,3,7,8 positions are substituted (Figures 2, 3).

For example, the median lethal dose (LD50) of 2,3,7,8-TCDD for guinea pigs is between 0.6 and 2  $\mu\text{g}/\text{kg}$  of body weight. However, the 1,3,6,8-TCDD isomer has an LD50 of more than  $15 \times 10^6 \mu\text{g}/\text{kg}$ . 1,2,3,7,8-Pentachloro-dibenzodioxin is the next most toxic dioxin to 2,3,7,8-TCDD for guinea pigs. Three 2,3,7,8-substituted hexachloro-isomers of dioxin are all very toxic also. A similar pattern is found with the 2,3,7,8 substituted chlorinated dibenzofurans (Figure 4).

Just as the various substituted dioxins and furans have widely differing toxicities to guinea pigs, so does 2,3,7,8-TCDD have greatly differing toxicity to various animals. The guinea pig is by far the most sensitive animal to this compound. The hamster is between 500- and 8,000-times less susceptible to TCDD (Figure 5).

To simplify expressing the toxicity of mixtures of dioxins and furans, scales have been derived to normalize the toxicity of the various isomers relative to 2,3,7,8-TCDD. In the most widely used scheme at the present time, the so-called Nordic system, 1,2,3,7,8-pentachlorodibenzodioxin is given a toxic equivalence of 0.5-times that of TCDD, whereas octachlorodibenzodioxin is rated as one thousandth the toxicity of TCDD (Figure 6). Toxic equivalence factors are added, following analysis of the individual isomers, to give a single number expressed as toxic equivalents of TCDD.

Let's now look at the effects of dioxins on human beings. By far the most common toxic symptom of over-exposure to chlorinated dioxins (and to many other chlorinated organics) is a condition known as chloracne. This is a particularly unpleasant type of acne which appears primarily on the neck and around the jaw and ears, but it may occur on other parts of the body also. Other symptoms which have been related to severe dioxin exposure include weight loss, liver disease, effects on the immune system, and damage to the central nervous system. However, it is believed that these symptoms occur only after severe exposure to at least part per million levels of chlorinated dioxins, and to 2,3,7,8-TCDD in particular.

There have been several accidents, primarily explosions, at industrial plants manufacturing either trichlorophenol or trichlorophenoxyacetic acid, as a result of which 2,3,7,8-TCDD has been released into the workplace, and in some instances to neighbouring areas. Follow-up health studies on exposed workers and the general public have usually found chloracne as the only detectable symptom experienced by those severely exposed. In the case of an incident in Seveso, Italy in 1976, where as much as 2 kg of 2,3,7,8-TCDD was dispersed over the surrounding countryside, there was a statistically significant increase in spontaneous abortions over the following year, but no other detrimental effects on public health, apart from chloracne, which persisted for several years afterwards.

None of the epidemiological studies have shown an increased incidence of cancers in the exposed populations, even though the incidents date back to 1947. However, the most severe accident, at Seveso, occurred too recently to say with certainty that no increased cancer incidences have resulted.

Epidemiological studies of herbicide sprayers, including United States war veterans in Vietnam, and of members of the public in Missouri who have been exposed to dioxin-contaminated oil used on roads and horse arenas have not, with one exception, found increased incidences of cancer. The exception is a series of studies on herbicide applicators carried out in Sweden in the late 1970's and early 1980's, in which it was claimed that there were increases in soft tissue sarcomas, of rare cancer of the connective tissues, but the findings have been questioned on the basis of poor study design and interpretation.

Epidemiology is a blunt instrument with which to pry open complex dose-effect relationships; but absence of evidence does not necessarily indicate evidence of absence. It is extremely difficult to prove a negative point, i.e. to prove that dioxins, which always occur as trace contaminants together with much higher concentrations of other chlorinated organics, are not present in dangerous quantities. However, PCDD's have not been mutagenic in most tests carried out to date.

The no observable effect level (NOEL) for 2,3,7,8-TCDD is based on the NOEL for rats, which is 1 ng/kg/day. Health and Welfare Canada has applied a 100-fold safety factor to this figure to arrive at an acceptable daily intake for humans of 10 pg (picograms)/kg/day, which amounts to 600 pg/day for the so-called "typical" 60 kg female or 700 pg/day for the "typical" 70 kg male. Actual intake of dioxins and furans estimated for the Canadian public range from 0.7 to 2.4 pg/kg/day, or approximately 25%, at most, of the allowable daily intake. The main source of intake in Canada is food, which accounts for between 87 and 96% of the total intake. Fatty foods such as certain fish, meat, and dairy products are the primary sources; fruits and vegetables contain extremely low levels of dioxins and are not a significant source of intake.

In a rather bizarre experiment, a Swiss toxicologist, Dr. Poiger, consumed 105 ng of 2,3,7,8-TCDD in 1984. This amounted to 1.14 ng/kg body weight, or approximately 100 times the Canadian allowable daily intake. The TCDD was labelled with radioactive tritium. He has monitored the excretion of the TCDD, primarily by measuring the radioactivity in faeces. Based on his results, the half-life of TCDD in his body is 9.5 years, i.e. every 10 years or so the amount of TCDD diminishes by one-half. This indicates that dioxin taken into the body is released from fatty tissues only very slowly, and the tendency of dioxins to accumulate in such tissues dictates a need for vigilance to minimize the exposure and uptake of these compounds by humans and other animals.

Incineration in its various forms is by far the most important source of dioxins released to the environment in Canada. Similar data have been obtained in Sweden, where it is believed that pulp mills are responsible for less than 5% of the total dioxin loading (Figure 7). It has recently been shown that chlorinated organics are produced during what otherwise might be effective destructive incineration of organic materials. Oxygen, carbon, a source of chloride ions and moisture, in the presence of cupric catalyst with a silica support at 250-400°C have been shown to produce a wide variety of chlorinated dioxins, furans, benzenes and naphthalenes in the cooling zone above an incinerator bed. Good design of incinerators is necessary to prevent these serendipitous reactions from occurring.

In bleached pulp mill effluent discharges, the total amount of chlorinated dioxins and furans discharged is a very small portion of the total organically bound chlorine (Figure 8). In fact the total loading of chlorinated organics amounts to 20-30 kg/tonne of pulp, i.e. 20 to 30 tonnes/day for a thousand tonne-a-day bleached kraft mill. While chlorinated dioxins and furans may not be present in disastrous quantities in pulp mill effluents, they can serve to focus attention on the much more important concern regarding total chlorinated organics.

There is no shortage of data or information on the levels and sources of dioxins but there is an apparent reluctance or inability to interpret these data and explain in everyday terms what their significance is. For example, at the Dioxin '88 Conference in Sweden there were more than 280 papers presented, of which only 10 related to risk assessment. What seems to be needed is a realistic appraisal of the hazards and risks of dioxin exposure for various population groups. For this information to be meaningful and to be readily understood by most people it must be expressed in terms which relate to everyday risks to which we voluntarily or unwittingly expose ourselves (Figure 9). Until this relative risk assessment is done we can expect more headlines and news media stories about threats posed by dioxins. The forest products industry and the public at large need and deserve to receive a clearer message from scientists on whether dioxins do indeed threaten disaster or whether they are diverting us from more important problems.

FIGURE 1

**DETECTION LIMITS**

YEAR	LIMIT	(pg/g: ppl)
1965	1,000,000	(1 ppm)
1970	50,000	(0.5 ppm)
1975	10	(0.01 ppb)
1980	0.2	
1983	0.01	(10 ppq)
1988	0.001	(1 ppq)

FIGURE 2

**LETHAL DOSE (LD50) OF DIOXINS FOR GUINEA PIGS**

2,3,7,8 - Tetra	0.6-2 $\mu\text{g}/\text{kg}$
2,8 - Di	>300,000
2,3,7 - Tri	30,000
1,3,6,8 - Tetra	>15,000,000
1,2,3,7,8 - Penta	3.1
1,2,4,7,8 - Penta	1,125

FIGURE 3

**LETHAL DOSE (LD50) OF DIOXINS FOR GUINEA PIG**

1,2,3,4,7,8 - Hexa	} 60 - 100 $\mu\text{g}/\text{kg}$
1,2,3,6,7,8 - Hexa	
1,2,3,7,8,9 - Hexa	
1,2,3,4,6,7,8 - Hepta	>600 $\mu\text{g}/\text{kg}$

FIGURE 4

**LETHAL DOSE (LD50) OF FURANS FOR GUINEA PIG**

2,3,7,8 - TCDD	0.6 - 2 $\mu\text{g}/\text{kg}$
2,3,7,8 - TCDF	5 - 10 $\mu\text{g}/\text{kg}$
2,3,4,7,8 - PnCDF	<10 $\mu\text{g}/\text{kg}$
2,3,4,6,7,8 - HxCDF	120 $\mu\text{g}/\text{kg}$

FIGURE 5

**LETHAL DOSE (LD50)  
2,3,7,8 - TCDD**

Guinea pig	0.6 - 2 $\mu\text{g}/\text{kg}$
Rat	22-45 $\mu\text{g}/\text{kg}$
Monkey	70 $\mu\text{g}/\text{kg}$
Rabbit	115 $\mu\text{g}/\text{kg}$
Hamster	1157 - 5051 $\mu\text{g}/\text{kg}$

FIGURE 6

**TOXIC EQUIVALENCE FACTORS  
PCDD's**

2,3,7,8 - TCDD	1.0
1,2,3,7,8 - PnCDD	0.5
2,3,7,8 - substituted HxCDD	0.1
1,2,3,4,7,8,9 - HpCDD	0.01
1,2,3,4,6,7,8,9 - OCDD	0.001

FIGURE 7

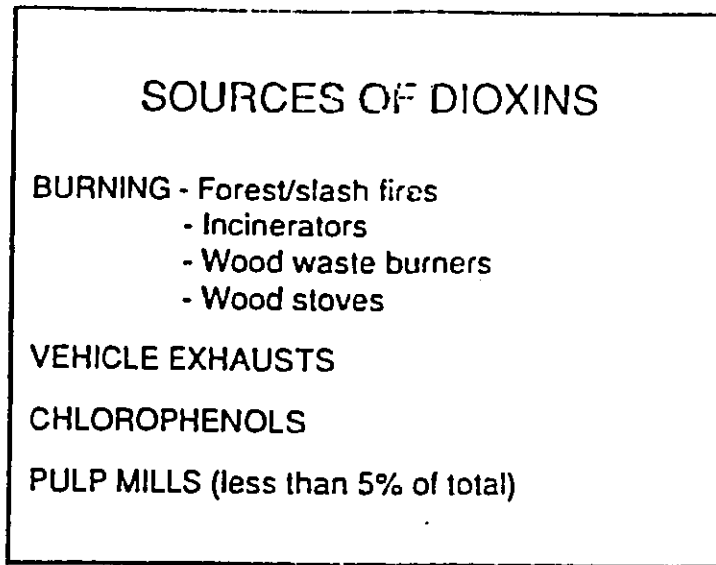


FIGURE 8

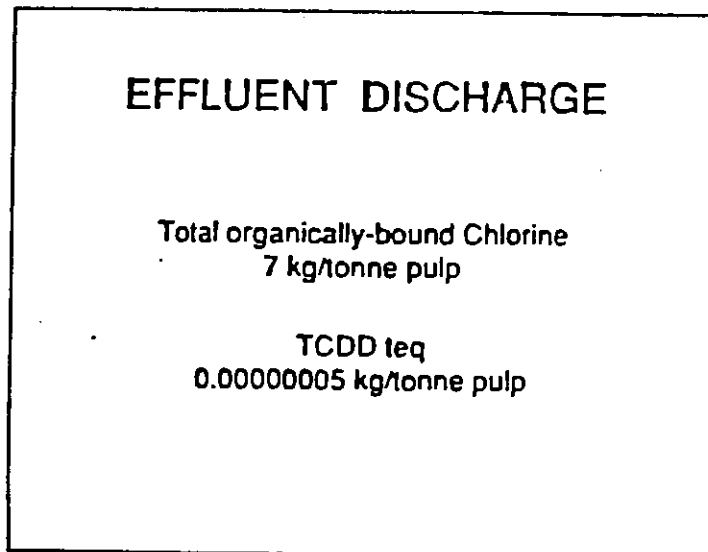
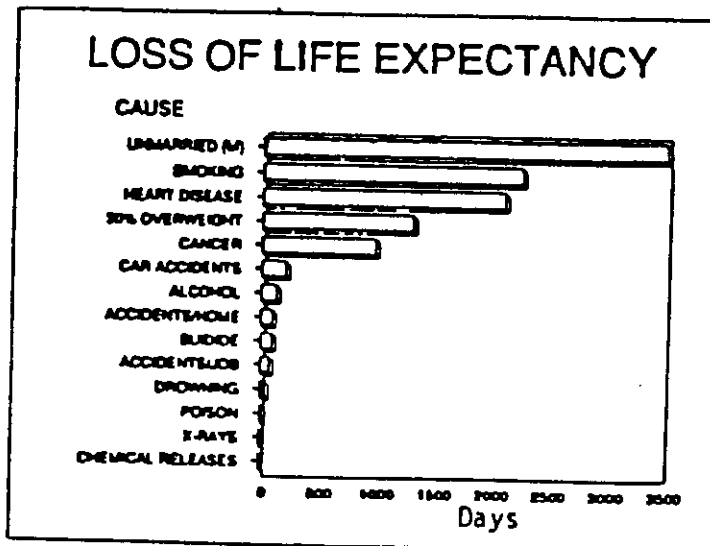


FIGURE 9



*Card on 269a*

02709-0370  
CHAMPION INTERNATIONAL CORPORATION  
(Sheldon Mill)

March 9, 1990

Ms. Ellen Caldwell  
Permits Branch (6W-PS)  
U.S. Environmental Protection Agency  
1445 Ross Avenue  
Dallas, Texas 75202-2733

Re: Draft NPDES Permit No. TX0053023

Dear Ms. Caldwell:

I.

INTRODUCTION

In response to the Environmental Protection Agency's ("EPA") public notice regarding draft NPDES Permit No. TX0053023 for the Champion International Corporation ("Champion") Sheldon newsprint paper mill, Champion hereby submits its comments on the draft permit. The draft Sheldon mill permit was originally noticed for public comment on January 20, 1990. Champion was granted an extension of time to comment on this draft permit until March 9, 1990. Champion submits that many of the provisions contained in the draft permit are not consistent with the development of water quality based limitations derived from water quality standards and implementation procedures adopted by the State of Texas and approved by the EPA. As many of these issues have already been addressed in Comments of Texas Forestry

L0075/1376/01A021

MAR 9 1990

Association on EPA's Decisions with Regard to the State of Texas' List of Waters Submitted Under Section 304(1) of the Clean Water Act (the "TFA Comments"), a copy of these comments is attached as part of Champion's comments and for incorporation into the Administrative Record for Permit No. TX0053023. See Attachment A. Champion is a member of the Texas Forestry Association and participated in the preparation of the TFA Comments. Champion's comments on the specific permit provisions, as well as comments supplementing the TFA Comments, are outlined below.

## II.

### NO DEMONSTRATED NEED EXISTS FOR ANY DIOXIN (2378-TCDD) LIMITATIONS

#### A. *No 2378-TCDD detected in the Sheldon mill effluent.*

Because there is a lack of data indicating that 2378-TCDD exists in detectable amounts in the Sheldon mill effluent, Champion submits that there is no factual or legal basis for establishing any 2378-TCDD effluent limit in the Sheldon mill permit. The EPA Fact Sheet states that the Sheldon mill plant effluent contains <5.5 parts per quadrillion (ppq) of 2378-TCDD. According to the footnote to this information, this data is derived from one analysis contained in the EPA/Paper Industry Cooperative Dioxin Screening Study. This one sample yielded less than the detection limits using EPA protocols. There is no reported data stating that 2378-TCDD has actually been detected in the effluent. Where no known discharge exists of a particular constituent, there is no need or legal requirement for an effluent limit.

B. *Concentrations of 2378-TCDD consistent with State water quality standards.*

The EPA has also attempted to develop a 2378-TCDD effluent limit based upon the fact that 2378-TCDD has been detected in fish tissue downstream from the Champion Sheldon mill. Reported data of fish tissue downstream show concentrations of 2378-TCDD in fish tissue of 6.7 parts per trillion (ppt). Champion notes that there are many other potential sources upstream from the location where the study yielding these results was conducted. Given these circumstances, Champion does not acknowledge that it is the source of the results reported by the EPA. This point is somewhat moot, in any event, since the reported data of 6.7 ppt is well below the FDA Action Level for 2378-TCDD in fish tissue of 25 ppt. This FDA Action Level is incorporated into the State water quality standard, which standard has been approved by the EPA. See 31 Tex. Admin. Code § 307.6(b)(3). Since this standard is being met, there exists no basis under either federal or state law for requiring a 2378-TCDD effluent limitation.

C. *Section 304 "Short List" Designation for Segment 1006 Provides No Basis for Permit Limitation*

The EPA attempts to justify imposing a dioxin limitation on the basis of the proposed listing of Segment 1006 of the San Jacinto River Basin on the Section 304 (1)(1)(B) "short list" as being a receiving water where 2378-TCDD has been detected in fish tissue. See Fact Sheet, p. 13. Champion submits that the EPA's proposal to so designate Segment 1006 is completely improper since (1) the EPA has failed to first implement technology-based limits and

assess the impact of those limits and (2) the State standards, as approved by the EPA, are being met.

1. EPA has failed to implement and assess the impact of technology-based limits.

Champion asserts that the EPA's failure to carry out technology-based limits and assess the impact of these limits, as statutorily required, invalidates its "short list" designation of Segment 1006. Section 304(1)(1)(B) of the Clean Water Act ("CWA") requires a state to list on the "short list" all navigable waters for which the state does not expect applicable standards to be achieved "after the requirements of sections 301(b), 306, and 307(b) are met . . . ." 33 U.S.C.A. §1314(1)(1)(B). Sections 301(b), 306 and 307(b) refer to requirements for technology-based effluent limitations, new source performance standards, and pretreatment standards (collectively "technology-based limits"). Thus, in determining whether a waterbody should be placed on the "short list," a state must determine whether a waterbody will meet applicable water quality standards after technology-based limits are achieved. EPA's rule codifying Section 304(1)(1)(B) recites the statutory language regarding this requirement verbatim. 54 Fed. Reg. 258 (1989) (to be codified at 40 C.F.R. §130.10(d)(2)). Nevertheless, the rule does not provide any clarification about how a state should consider the effect of technology-based limits in making listing decisions. In practice, both the states and EPA have ignored this statutory requirement.

In preparing its "short list," a state must evaluate expected water quality once all technology-based limits have been met. The Conference Report accompanying the Water Quality Act of 1987 underscores this point:

The conference substitute modifies section 303 and 304 of the Act, to provide for the development of water quality based effluent limitations after the implementation of best available technology (BAT). Under subsection (1) of the conference substitute, States are required to undertake a progressive program of toxic pollutant load reduction where BAT is not sufficient to meet State water quality standards and support public health and water quality objectives of the Act.

H.R. Rep. No. 99-1004, 99th Cong., 2d Sess. (1986) (emphasis added).

This analysis is not discretionary with EPA or the states; it is required by the Act. Congress obviously intended that the "short list" contain only waters for which the technology-based limits are insufficient to meet water quality standards. Champion submits that the EPA's failure to adhere to these statutory requirements make its proposed "short list" designation of Segment 1006 invalid, and consequently, make its imposition of a dioxin limitation based upon such designation meaningless.

2. State water quality standards are being achieved.

As previously noted, the EPA attempts to justify imposing a dioxin limitation on the basis of the proposed listing of Segment 1006 of the San Jacinto River Basin on the Section 304(1)(1)(B) "short list." This is an erroneous interpretation of the Texas water quality standards

and the Texas Water Commission's ("TWC's") interpretation and application of those standards. In accordance with its interpretation of its own standards, the TWC has not included this stream segment in its "short list" under Section 304(1)(1)(B). Clearly, EPA did not have any reason to believe that the State's water quality standard for 2378-TCDD would not be achieved in the San Jacinto River Basin and acted arbitrarily and capriciously when it proposed listing Segment 1006 on the Section 304(1)(1)(B) "short list." Therefore, since the State's water quality standard for 2378-TCDD is being met, there is no basis under Section 304(1) of the CWA or any other law or regulation for including Segment 1006 on the Section 304(1) list.

The inappropriateness of EPA action in this regard is discussed in some detail in the TFA Comments. Since the EPA has not yet taken final action under 304(1) and until such final action is completed, Section 304(1) cannot be used as the legal basis for NPDES permit provisions.

### III.

#### LEVEL OF DIOXIN (2378-TCDD) LIMITATION, IF ANY

A. *State water quality standards should be basis of any limits.*

If a dioxin limitation is imposed over Champions' objection, then the limits should be based on the State water quality standards as interpreted by the TWC. The interim 2378-TCDD limits contained in the draft permit are derived in such a manner. However, these interim limits are only effective for a three year period. The final 2378-TCDD limitations

contained in the draft permit are 3 ppq daily average, 6 ppq daily maximum, and 2 ppq annual average. The final 2378-TCDD limitations are not based on any existing federal or state water quality standard, but represent arbitrary limits established by the EPA in contravention of the specific responsibilities delegated to the states by Congress in the Water Quality Act of 1987 and established scientific methodologies.

The EPA attempts to justify these final limits on its conclusion that the State of Texas does not have a water quality standard for dioxin. See e.g., Part II.D. The State of Texas has in effect a means for calculating a numerical standard:

(3) Water in the state shall be maintained to preclude adverse toxic effects on human health resulting from contact recreation, consumption of aquatic organisms, or consumption of drinking water after reasonable treatment. In addition to other provisions of this section, permitted discharges or other controllable sources shall not cause maximum contaminant levels for public drinking water supplies, as established in the federal Safe Drinking Water Act (42 United States Code 300f et seq.), to be exceeded after reasonable treatment by a water supply treatment plant. The Commission will utilize available investigative and regulatory means to identify and control sources of toxic pollutants which cause or could potentially cause the following guidelines to be exceeded:

(A) EPA maximum contaminant levels for drinking water supplies; and

(B) U.S. Food and Drug Administration Action Levels for toxic concentrations in fish and shellfish tissue.

31 Tex. Admin. Code § 307.6(b)(3). It should be noted that Section 3(B) of the Texas standard satisfies the requirements outlined by the EPA in the preamble of National Pollution Discharge Elimination System; Surface Water Toxic Control Program, 54 Fed. Reg. 23875 (June 2, 1989).

Once it has dismissed the state standard and procedures out of hand, EPA attempts to rely on 40 C.F.R. § 122.44(d)(1)(vi) (54 Fed. Reg. 23896 (June 2, 1989)) to establish the final 2378-TCDD effluent limitations, incorporating by reference the federal ambient water quality criteria for 2378-TCDD at the  $10^{-5}$  risk level (0.14 ppq). However, by its own terms, that provision of the regulations is only to be used where the state has not adopted a water quality standard or established a numeric water quality criterion. The State of Texas has done so and Champion objects to the imposition of any 2378-TCDD limit designed to meet the EPA recommended water quality criterion for dioxin.

B. *Dioxin limits must comport with most recent scientific data.*

Should the EPA persist in adopting final water quality based limitations for 2378-TCDD in the final permit and refuse to follow the Texas water quality standards and the TWC's interpretation thereof, an action to which Champion would object, the limitation must reflect the most recent scientific data, including epidemiological evidence, applied on a site-specific basis. The 0.14 ppq water quality criterion used by the EPA in developing the final 2378-TCDD effluent limits is not supported by the weight of available scientific evidence. As demonstrated

in the TFA Comments and reports elsewhere<sup>1</sup>, the EPA water quality criterion is much too conservative. This conservatism is based primarily on the EPA's assumption that there is no threshold related to the 2378-TCDD cancer causing mechanism. A large body of scientific evidence does not support that assumption and the resulting methodology; instead it uses a dose-response assessment method that incorporates a threshold. See TFA Comments, pp. 15-18 and supporting attachments. As Dr. Paul Anderson notes on pages ES-1 to ES-2 of his study, which is included as Attachment 7 in the TFA Comments, other unrealistic and arbitrary EPA assumptions resulting in this conservatism are based upon (1) the use of "animal experiments to extrapolate to effects in humans", (2) the application of unrealistic consumption data and (3) the use of incorrect data in determining the percentage of the population which might be exposed.

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<sup>1</sup> Among the most recent scientific information illustrating that the EPA's water quality criterion is flawed is (1) a memorandum of November 28, 1989 from Mr. J. Leonard Ledbetter, Commissioner of the Georgia Department of Natural Resources, and attachments thereto, supporting the adoption of a 7.2 ppq water quality criterion by The Georgia Department of Natural Resources (Attachment B) and (2) a letter of January 8, 1990, from Dr. Robert A. Squire reporting on his reevaluation of the rat liver slides from the Dow two-year study of 2378-TCDD and his preliminary reassessment that the number of tumor incidences changed substantially under the current classification scheme (Attachment C). Dr. Squire made the initial evaluation of the rat liver slides that provided the basis for the current EPA potency factor for 2378-TCDD.

## IV.

DILUTION FACTOR

EPA has calculated dilution factors for the receiving waters using the procedures in the TWC's implementation procedures (*Implementation of the Texas Water Commission Standards Via Permitting*, May 5, 1989) (Attachment D). These dilution factors are intended to assure the protection of aquatic life from acute and chronic toxicity. For coastal waters, the dilution factor computations are based on a zone of initial dilution (ZID) of 50 feet, and a regulatory mixing zone of 200 feet. The resulting dilution factors are 30 percent and 8 percent, respectively.

These dilution factors, as stated above, are established to protect aquatic life from the adverse effects of toxic constituents. They are not intended to apply to toxicants that exert long-term effects, such as the bioaccumulation of substances that may have human health impacts. The appropriate dilution estimates for such substances, and specifically for 2378-TCDD, are made using a long-term average dilution factor in order to be consistent with the assumptions that underpin the EPA water quality criteria.

The TWC screening procedure for calculating dilution estimates for bioaccumulative substances in coastal waters, where advective fresh water flows are not a significant factor in the dilution estimates, is to use the dilution factors calculated for aquatic life protection. For fresh waters, the TWC implementation procedures recommend use of annual

stream flow for calculating the dilution factor for bioaccumulative chemicals that may affect human health.

Using the aquatic life dilution factors for calculating the allowable dilution of 2378-TCDD in the Houston Ship Channel is not a realistic representation of the actual potential for exposure. Although the Ship Channel is tidally-affected at the point of discharge, it is subject to a continuous and significant advective fresh water flow (Texas Department of Water Resources, 1983, *Waste Load Evaluation for the Houston Ship Channel System in the San Jacinto River Basin*, draft). On a long-term average, which is the basis for the exposure calculations for bioaccumulative chemicals, these advective flows will be the primary source of dilution. This is readily documented by the analyses presented in the *Waste Load Evaluation*. In addition, the Ship Channel does not have a designated aquatic life use until it joins with the San Jacinto River (to form segment 1005), which adds additional advective fresh water inflow.

In the case of discharges to the Houston Ship Channel, the most technically accurate dilution basis for establishing permit limits for bioaccumulative substances is the sum of the fresh water flows into the Houston Ship Channel and the San Jacinto River. The TWC has calculated the annual average stream flows for all of the gaged stations in Texas. All of the major inflows to the Houston Ship Channel and San Jacinto River are gaged. The annual average flows for each of the major inflows to this system are shown on Attachment E, based on TWC records. The total annual average streamflow at the confluence of the Houston Ship

Channel and San Jacinto River is estimated as 1276 million gallons per day (MGD) using these data. Although no releases are made from Lake Houston during low streamflow periods, on a long-term average basis, the annual outflow from the lake is approximately equal to the inflow. This is shown by comparing the calculated flow using these gaging stations to the inflows estimated by the TWC for its bay and estuary studies (Texas Department of Water Resources, *The Influence of Freshwater Inflows Upon the Major Bays and Estuaries of the Texas Gulf Coast, Executive Summary*, LP 115, 2d edition, September 1982). This report estimates the annual average inflow to Galveston Bay from the San Jacinto River to be 1428 MGD. The higher figure is presumably due to fresh water inflows entering downstream of the Houston Ship Channel - San Jacinto River confluence.

These flows do not include return flows (treated effluents) from the major dischargers to the Houston Ship Channel. The Texas Department of Water Resources report estimates that return flows amount to an average flow of 326 MGD.

If the estimated annual average flow at the Ship Channel - San Jacinto River confluence is used as the appropriate dilution flow for bioaccumulative substances, the resulting dilution factor is calculated as follows:

$$\text{Dilution Factor} = \text{Effluent flow} \div [\text{Dilution flow} + \text{Effluent Flow}]$$

$$\text{Dilution Factor} = 16.6 \text{ MGD} \div [16.6 \text{ MGD} + 1276 \text{ MGD}]$$

$$\text{Dilution Factor} = 0.0128 \text{ (1.28 percent)}$$

Application of this 1.28 percent dilution factor would result in a significant change in the interim and final effluent limitations. The interim effluent limitation would be 391 ppq for the annual average, 574 ppq for the daily average, and 1216 ppq for the daily maximum limit. The final effluent limitations would be 11 ppq for the annual average, 16 ppq for the daily average limit, and 34 ppq for the daily maximum limit.

Champion believes that this is the appropriate dilution factor to use to calculate the NPDES permit limits for TCDD. It is consistent with the actual dilution that will occur at the point where the receiving waters have a designated aquatic life use. It is also consistent with the TWC implementation procedures, which have been used by EPA Region VI to calculate permit conditions.

Champion further believes that the fish tissue data generated by the EPA's National Bioaccumulation Study support the proposed method for calculating the allowable dilution factor for the discharge of chemicals with human-health based criteria to the Houston Ship Channel. EPA analyzed fillets from 9 croakers captured in the Houston Ship Channel at Morgans Point. EPA found *no* 2378-TCDD in the croaker fillets. The toxicity equivalent

concentration (TEF) was calculated as 0.16 parts per quadrillion (ppq), based on all of the tetra, penta, hexa, and hepta dioxins and dibenzofurans present in the tissue samples, and 88 percent of this TEF was due to the presence of 2,3,7,8-tetrachloro-dibenzofuran and 1,2,3,7,8-pentachloro-p-dioxin. See Attachment F.

Based on these fish samples that were collected from the part of the Houston Ship Channel that has a designated aquatic life use, there has been no significant bioaccumulation of 2378-TCDD from the existing discharges. Therefore, the proposed restrictive dilution factor for the Champion discharge is not warranted based on any available data.

Finally, while Champion is aware of the TWC's comments proposing that a dilution factor of 10 percent be applied in the final permit, for the reasons set forth above, Champion strenuously objects to the application of the TWC's proposed dilution factor.

## V.

### DIOXIN DETECTION LIMIT

The draft permit requires a maximum analytical detection level for effluent samples of 10 ppq. This requirement, which is based on the *target level or goal* for this analysis for the 104-mill study, may not be achievable in Champion's effluent.

The 10 ppq minimum level is not based on a demonstrated achievable detection limit for mill effluents. During the 104-mill study, approximately 25 percent of the effluent

samples were reported as not detected, with reported detection limits ranging from 4.5 to 17 ppq. This is not unusual. Method detection limits (MDL) are matrix specific, as discussed in 40 CFR 136, Appendix B. The EPA has developed and used the practical quantification level (PQL) to account for matrix effects and interlaboratory precision. The draft permit recognizes this by establishing compliance with the daily average and daily maximum limits for 2378-TCDD at a PQL of 25 ppq. However, provision IIA ignores this by establishing a minimum analytical detection level. Champion cannot accept a permit that specifies a preassigned detection limit.

Champion requests that the permit specify that the detection limit used for determining compliance with the dioxin permit limits be an MDL, estimated using the methodology presented in Appendix B to 40 CFR 136, and use the mill effluent for this determination. Champion should be allowed to repeat this MDL determination, as necessary, and pool the resulting data as provided for in Appendix B.

The pulp and paper industry has authorized a study that will utilize multiple laboratories all using the same test procedures (in accordance with Appendix B) and samples to determine an industry-wide PQL. This study is expected to be completed this year. When this PQL is determined, Champion would like to have the option of submitting this number for the current proposed PQL for compliance determinations.

## VI.

COMPLIANCE SCHEDULE FOR CHLORINE AND TOTAL  
SUSPENDED SOLIDS MINIMIZATION SHOULD BE REVISED

Champion submits that the timetables outlined in Parts II.H and II.I, setting forth a chlorine minimization program and total suspended solids minimization program, are unreasonable and thus should be revised. Since compliance with the final effluent limitations for dioxin is to be achieved within three years from the issuance of the final permit, Champion submits that there is no valid reason for compressing the compliance programs set out in Parts II.H and II.I into a period of less than a year as is currently required in the draft permit.

Rather, Champion submits that a better procedure for addressing the scheduling problems within the three year time frame for achieving the final dioxin effluent limitations is the use of a dioxin control plan ("DCP"). This provision, which would be in lieu of the schedules for the chlorine and total suspended solids minimization programs, would allow the company sixty days after the issuance of the permit to develop and submit a DCP that sets forth a schedule for implementation of the chlorine and total suspended solids minimization programs. To provide for the submission of a DCP, the following provision, which is similar to the provision inserted in the EPA Region IV draft permit no. NC0000272 for Champion's Canton, North Carolina, Mill, should be inserted in the permit:

Within sixty days of the issuance of the permit, the permittee shall submit to EPA a dioxin control plan (DCP). The DCP shall

present projected schedules to implement the total suspended solids and chlorine minimization programs (See Parts II.H and II.I). Upon approval by the permitting authority, the DCP implementation schedule shall become an enforceable part of the permit.

## VII.

ENFORCEABLE LIMITS FOR DIOXIN (PQL)

EPA states in the Fact Sheet at page 15 that "[p]ermit compliance will be based on a practical quantification level (PQL) of 25 ppq for the daily average effluent limitation of 3 ppq and the daily maximum effluent limitation of 6 ppq." This requirement, while discussed in the Fact Sheet, is not listed in the permit itself. Champion requests that this requirement be added as a condition to the permit itself. To clarify this requirement, Champion would suggest using the language in Comment 2 of the TWC's February 22, 1990 comments, which is as follows: "A value reported by the permittee which is lower than the threshold of compliance is not an exceedance of the permitted value." If the PQL is not expressly stated in the permit, Champion objects to the daily average and daily maximum limits.

On a related matter, Champion objects to the EPA's refusal to allow use of the 25 ppq PQL for purposes of determining permit compliance with the annual average 2378-TCDD effluent limitation. As noted above, the EPA is allowing its use for purposes of the daily average and daily maximum requirements. The rationale for applying the 25 ppq PQL is equally

applicable to the annual average requirement. Champion submits that if an annual average is imposed, the PQL should be allowed for compliance purposes across the board.

Alternatively, Champion submits that the annual average be deleted altogether, particularly given the fact that it is highly unlikely that the annual average of 2 ppq will be achieved based upon four samples per year when the daily average is 3 ppq.<sup>2</sup> Based on this fact, Champion concurs with the Texas Water Commission that the annual average should be deleted altogether. (See Texas Water Commission Comments -- February 22, 1990).

#### VIII.

#### DIOXIN LABORATORY UPTAKE STUDY IS UNNECESSARY AND COSTLY

Champion submits that the bio-upstake study for dioxin in fish as required in the draft permit at Part II.J is unnecessary. The requirement that this study be conducted annually is excessive and costly.

Should such a study be required, however, Champion submits that the methodology should not be used without modification. The cited methodology, "Standard Practice for Conducting Bioconcentration Tests with Fish and Saltwater Bivalve Mollusc," ASTM Designation: Method E 1022-84, is inappropriate. As Dr. Paul Anderson states on page

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<sup>2</sup> Once again, Champion notes that if an annual average is imposed, it should be set at the higher final effluent limitation of 11 ppq, with a daily average limit of 16 ppq and a daily maximum limit of 34 ppq. See infra p. 13.

5-9 of his report (Attachment 7 of the TFA Comments) evidence indicates that dioxin is bioaccumulated in fish primarily from food, not bioconcentrated from the water column. The method clearly states in paragraph 1.1, "Procedures for obtaining laboratory data concerning accumulation of a test material added to dilution water but not to food. . . ." Use of a bioconcentration method would not yield meaningful data. The method further states that "this practice is applicable to all chemicals that can be measured accurately at the necessary concentrations in water and in appropriate tissues." Obviously, since 2378-TCDD cannot be measured accurately or even detected in the concentration possibly present in the mill effluent, use of this methodology is inappropriate.

IX.

MONITORING REQUIREMENTS SHOULD BE  
CONSISTENT WITH STATE PERMIT REQUIREMENTS

Champion is currently required under the terms of its State permit to retrieve samples at Outfall 002 as the overflow leaves the property. See Texas Water Commission Permit No. 01160 (Attachment G). The EPA draft permit requires samples to be taken at the overflow of the bark trap. See Draft Permit Part I--Outfall 002. Champion proposes that the most expeditious manner of handling the sampling is to make the sampling requirements of the state and federal permits identical. Thus, Champion proposes that the draft permit be amended

so as to require any sampling at Outfall 002 to occur as the overflow leaves the property, and not at the bark trap, as currently required in the draft permit.

X.

#### BIOMONITORING DILUTION SERIES

In its certification letter, the TWC advised EPA that a critical dilution factor of 40 percent should be used for the Sheldon Mill effluent. Information obtained from Ms. Leslie Pedde of TWC (Attachment H) described how this dilution factor was calculated.

Ms. Pedde used the Sheldon Mill flow and the methodology attached to her letter to calculate the 40 percent dilution factor. This method is, as pointed out by Ms Pedde, not site-specific. Champion has recalculated the dilution factor using the actual outfall diameter.

The mill outfall is a 42-inch (3.5 foot) diameter pipe, which discharges below the surface of the Houston Ship Channel. Applying the horizontal jet mixing model used by the TWC to calculate the dilution of the effluent at a radius 50 feet from the point of discharge, the following result is obtained:

$$\begin{aligned}\text{percent effluent} &= 100 \cdot [2.8 \cdot 3.5 \cdot \sqrt{\pi}] \div 50 \\ \text{percent effluent} &= 34.7\end{aligned}$$

Thus, the critical dilution in the NPDES permit, for the purpose of all permit limits based on the protection of aquatic life from acute toxicity (including the biomonitoring dilutions), should be 34.7. The dilution series should be adjusted accordingly.

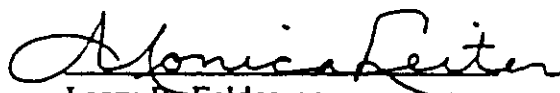
XI.

CONCLUSION

For the reasons set forth above, Champion respectfully requests that EPA incorporate its suggested changes in any final permit issued by the agency.

Sincerely,

BAKER & BOTTS



Larry B. Feldcamp  
Monica L. Leiter  
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Corporation



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Senior Environmental Counsel

September 21, 1990

**BY FEDERAL EXPRESS**

To: 104-Mill Chief Executive Officers  
Designated Mill Recipients  
Dioxin Steering Committee

cc: (by first class mail)  
Dioxin Risk Assessment Committee  
API/NFPA Water Quality Committee  
API/NFPA Industrial Waste Committee  
Dioxin FDA Compliance Committee

From: Matthew B. Van Hook *MVH*

Subject: **EPA Releases Dioxin Multi-Media Risk Assessments  
Monday, September 24; Selected Materials Enclosed**

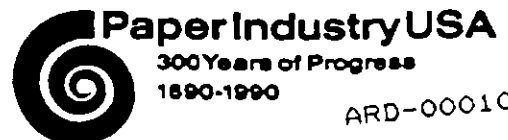


On Monday, September 24, EPA will release its Integrated Risk Assessment for Dioxins and Furans from Chlorine Bleaching in Pulp and Paper Mills, and a number of supporting individual risk assessments. EPA will accompany its release with a press statement, which we will telefax to the industry as soon as we obtain a copy Monday morning; EPA will not hold a press conference.

Included among the materials is a listing of all 104 mills in terms of EPA's estimated cancer risk associated with fish consumption, ranked in order of highest estimated risk.

As previously announced, there is the potential for public and press attention for each of the 104 mills. In responding to inquiries, please refer to the Talking Points contained in the attached memorandum of September 19.

EPA will be releasing approximately 13 documents/papers in total on Monday. (see attached EPA List of Risk Assessment Documents and How To Obtain Them). However, we are today only providing selected documents which are known to be of immediate interest, or possible utility in responding to public or press inquiries. Among all of these materials, the Summary requires first and immediate attention. In addition to ranking mills according to fish-related risk, there are three tables which list specific mills, based on EPA calculated risks greater than 10<sup>-4</sup> (one in one thousand) based on fish tissue data, or calculations based on effluent modeling (5,000 and 50,000 bioconcentration factors).



ARD-0001063

As summarized in the accompanying chart, every addressee will receive:

- \* The 13-page Summary of Potential Risks Posed By Discharges To Surface Waters. This Summary will accompany EPA's press release on Monday. It has generic summary materials regarding the pulp and paper industry and dioxin, and includes a 104-mill chart listing dioxin risk estimates, 304(l) status, fish advisory status, and state water quality standards information. [Summary]
- \* The 73-page Integrated Risk Assessment for Dioxins and Furans from Chlorine Bleaching in Pulp and Paper Mills. This is the document which summarizes and integrates all of the various risk assessments. [Integrated]
- \* The 2-page List of Risk Assessment Documents and How To Obtain Them. [List]

Other documents that selected addressees will receive with this mailing include:

- \* The 400 page Risk Assessment For 2378-TCDD and 2378-TCDF Contaminated Receiving Waters From U.S. Chlorine-Bleaching Pulp and Paper Mills. [EPA Water]
- \* The 13-page Report of the Quantitative Risk Assessment Committee -- Carcinogenic Risk Assessment for Dioxins and Furans in Fish. [FDA Fish]
- \* The 700-page Assessment of Risks from . . . Disposal and Use of Sludge. [Sludge]
- \* The 19-page Report of the Quantitative Risk Assessment Committee -- Carcinogenic Risk Assessment for Dioxins and Furans in Foods. [FDA Foods]
- \* The 12-page Report of the Quantitative Risk Assessment Committee -- Risk Assessment for Dioxins and Furans in Cellulose Derivatives Used In Foods. [FDA Cellulose]

As detailed in the attached memorandum of September 19, API plans to provide the media with perspective at the national level, using the Talking Points outlined therein. A decision will be made Monday morning whether to prepare an API press release, or simply to respond to press inquiries with these talking points. Members are urged to consider the Talking Points in responding to local inquiries, and to be sure you know your mill-specific situation, particularly in terms of any recent effluent or fish flesh data which documents improvements.

The Integrated Assessment also is notable, in identifying the following types of individuals as possibly being at "significant risk" (see pp. xiii - xvii):

- o Sport and subsistence fishers.
- o Persons obtaining drinking water immediately downstream from pulp and paper mills.
- o Workers who handle sludge.
- o Gardners/subsistence farmers using sludge-amended soil.
- o Persons obtaining drinking water and ingesting fish from water bodies downstream from pulp and paper mill sludge land disposal and land application sites.
- o Pulp and paper manufacturing workers.
- o Consumers of food packaged in or contacting bleached paper.
- o consumers of food and drug products containing cellulose derivatives.

Distribution of documents today is summarized as follows:

	<u>Summary</u>			<u>FDA Fish</u>		<u>FDA Cellulose</u>	
	<u>Integrated</u>			<u>Sludge</u>		<u>List</u>	
		<u>EPA</u>	<u>Water</u>		<u>FDA</u>	<u>Food</u>	
CEO list	*	*	*	*			*
Desig.Mills	*	*	*	*			*
DxSteering	*	*	*	*	*	*	*
DxRiskAssess	*	*	*	*	*	*	*
WaterQuality	*	*	*	*			*
IndustWaste	*	*			*		*
FDA Compliance	*	*			*	*	*

For further technical information, please contact John Festa at API (202/463-2587), or Bill Gillespie at NCASI (212/532-9000).

# TEXAS Newsline

TEXAS OPERATIONS - FIFTY YEARS



October 17, 1990

## Four-part technical plan announced— Dow reports second round of fish testing

Dow U.S.A., Texas Operations, is reporting the results of its second round of dioxins/furans testing. This testing is the result of the permit arrangement between the Texas Water Commission (TWC) and Dow U.S.A., Texas Operations. The testing was designed to verify levels of these compounds as well as find the sources.

In announcing the results, John Harrison, Environmental manager, also described Dow's four-part technical plan incorporating the work under way with TWC as well as new considerations as part of Dow's continuing commitment to determine the potential Dow sources and what to do about them. This four-part plan involves the following:

- First, Texas Operations will continue the study according to the permit worked out between Texas

Operations and TWC;  
• additionally, Texas Operations will sample potential sources;

- and lastly, follow-up fish analyses will be completed.

The results of the first and second rounds of testing on fish begun in May and August are shown in the box at left.

"We want to find the source of these trace contaminants and fix the problem," said Harrison, "and we are working with the Texas Water Commission. We will continue other rounds of testing and investigation. We will be checking more fish samples and sampling further upstream in our plants to see if we can verify a source. This testing is very complex and time consuming, and we want to make sure we use our resources in the best way possible."

If you have questions, call Margaret Gaspard at 238-7623 or Carolyn Johnson at 238-5210.

Numbers for Texas

agencies involved:  
Texas Department of Health—512-458-7111  
Texas Water Commission—512-463-7830.

	First test—May (Parts Per Trillion)	Second test—August
<b>Croaker Fillet</b>		
2,3,7,8 - TCDD	ND (0.6*)	ND (0.5*)
Total Toxicity Equivalent Concentration	37.5 (Parts Per Billion)	39.8
Hexachlorobenzene	1,000	850
<b>Black Drum Fillet</b>		
2,3,7,8 - TCDD	0.6	0.6
Total Toxicity Equivalent Concentration	15.6 (Parts Per Billion)	27.3
Hexachlorobenzene	ND (30*)	15

*(Toxicity Equivalent Concentrations, TECs, are calculations that help relate all dioxins/furans concentrations to the one dioxin isomer, 2,3,7,8-TCDD.)*  
\* ND - not detected at these detection levels

- thirdly, a group of technology center experts are assessing these units for the possibility of dioxins/furans formation;

(see back)

OT 307732

## Questions and Answers--

### What are dioxins/furans?

"Dioxins/furans" are a family of over 200 different compounds, trace quantities of which are created by man-made and natural chemical processes. Where is the contamination coming from?

At this point, we cannot tell conclusively where the contamination is coming from. The dioxin/furan family of compounds has been studied extensively and found to be by-products of most combustion processes. It is our understanding, supported by literature, that dioxins and furans may be found in most all things at some level. We speculate that our combustion activities may contribute—or there may be contamination contributed from upstream sources. However, if it is from our plants and is above a level of concern, we will take steps to address this in complete compliance with regulatory requirements.

### Can we eat the fish?

The data we have indicate that the concentrations of dioxins/furans is in

an area of concern. A fish advisory suggesting limitations on fish consumption has been placed by the Texas Department of Health for the Brazos River from the FM 521 bridge in Brazoria to the mouth of the Brazos. What about fish in the local fish markets or in the supermarkets?

Dow cannot give any advice on whether to eat the fish or not. According to the TDH, the advisory on consumption is on fish in the Brazos. Markets may get their fish from any number of places. If you have a concern Dow recommends that you call the TDH or Dr. Leo O'Gorman at the county health office.

I have a freezer full of fish, can I eat the fish?

Again, we can't tell you whether you can or cannot. The fish advisory is a cautious advisory, and we would be irresponsible to go against anything the state agency has said.

What is Dow doing to remedy the situation?

We're still looking upstream in our

plants to determine the source. We brought in a group of experts from the Environmental Technology Center to examine three "likely" sources just to make sure they are running the best they can. After we determine where the source from Dow is, we will examine several technologies in order to remedy the situation. Sand filters can be one option as well as operating the sources at higher temperatures.

Can you taste dioxin? Can you smell it when you cook it?

No, you can't taste dioxin at the level found. You cannot smell it either when you cook. Remember this material is in the fish at an extremely low level: .00000000030 parts of dioxin per part of fish.

Could the contamination be due to others along the Brazos River?

We don't know. It's possible. But we feel fairly certain that we do contribute to the contamination, and we want to take care of what we can.

## Background on identification of dioxins and furans in the Brazos

Dioxins and furans were first identified in the Brazos River by the Environmental Protection Agency (EPA) as part of nationwide testing completed in 1987. Dow was first made aware of the results during permit negotiations with TWC. The EPA study involved testing samples of sea catfish and black drum. TWC in the permit asked Dow to perform analytical tests on the water discharged from the site as well as test two types of sport fish. Dow tested samples of black drum and croaker filets. Water discharge samples also were tested.

TWC asked Dow to verify EPA results, identify any potential Dow sources, and remedy the situation. The company has been working with TWC to determine the levels of dioxins and the sources of contamina-

tion.

After the first round of testing, Dow also informed EPA of the results as part of the Toxic Substance Control Act (TSCA). This information was reported under TSCA because it was believed the data would be useful to EPA in determining any possible health risk.

The Food and Drug Administration uses 25 parts per trillion (PPT) of 2,3,7,8-TCDD (a form of dioxin) or Toxicity Equivalent Concentrations (TECs) as a safe level for unlimited consumption of fish. At levels of 25 to 50 PPT, FDA has recommended limiting fish consumption to two meals per month. TECs are calculations that help relate all concentrations to the one dioxin isomer, 2,3,7,8-TCDD, the only isomer that has been studied extensively.

On Sept. 19 the Texas Department of Health posted a fish consumption advisory on the Brazos River from the FM 521 bridge in Brazoria to the mouth of the river. This advisory suggested that levels of consumption on all finfish be curtailed to one meal of eight ounces each month. It also suggested that women of childbearing age and children not eat finfish taken from the Brazos.

This advisory was posted along with two others: one on the Neches River and one on the upper Galveston Bay.

In working with the state, Texas Operations has pledged itself to four rounds of fish and water testing as well as samples at the three outfalls to verify the levels of dioxin. It also will work to determine the source and mitigate the situation.