

Final Report on the
Investigation of PCBs in the
Sheboygan River System

July 12, 1978

Prepared By:

Technical Committee for the Sheboygan River PCB Investigation; S. J. Kleinert, T. B. Sheffy, J. Addis, J. Bode, P. Shultz, J. J. Delfino, and L. Lueschow.

Introduction

The Department of Natural Resources monitored Lake Michigan fish near Sheboygan in 1975 and 1977, and monitored Sheboygan Harbor fish in 1976 (Appendix 1). The average PCB levels found in these samples were similar to PCB levels found in Lake Michigan fish sampled at other locations along the coast. In March, 1978, the Department tested fish from the Sheboygan River (three miles upstream from Sheboygan Harbor) and found high levels of PCBs.

A Summary of Events leading to and following the discovery of high levels of PCBs in Sheboygan River fish is as follows:

1. On September 9, 1977 fish samples were collected for the first time in the Sheboygan River at Kiwanis Park in the City of Sheboygan. This new location was one of the 29 stations which comprise Wisconsin's share of the New National Water Quality Monitoring Network. Water samples are to be taken from the 29 stations each month and fish samples are to be collected and analyzed for contaminants annually.
2. During March of 1978 these fish samples were routinely analyzed at the State Laboratory of Hygiene. The test results for whole fish samples were as follows:

Species & Length	PCB ug/g (ppm)	Fat* (%)
5 Carp (12-23")	750	24.0
5 Northern Pike (18-25")	55	3.7
5 White Sucker (10-14.5")	26	3.4

Because these levels were well in excess of the U.S. Food and Drug Administration tolerance level of 5 ppm (for fish sold in Interstate Commerce), we requested that the location be sampled again and the high test values confirmed.

*PCBs are fat-soluble and tend to accumulate in the lipid portion of fish tissue. A positive correlation exists between PCB burdens and fat concentrations in fish tissue. Because different species of fish differ markedly in fat content, it is more meaningful to include fat percentages with PCB concentrations.

3. On March 31, 1978 fish samples were again collected from the Sheboygan River at Kiwanis Park. The test results for whole fish samples were reported by the laboratory on April 18, 1978 as follows:

Species & Length	PCB ug/g (ppm)	Fat (%)
17 Black Bullheads (3.5-9")	41.8	7.0
12 Black Bullheads (4-9")	34.3	5.2
1 Rock Bass (8")	10.0	1.9
2 Common Shiners (4")	49.8	2.3
1 Coho Salmon (23")	8.3	0.5
2 Walleye (17")	241.5	8.9
3 Carp (10-18.5")	180.0	5.4
4 Carp (23-24")	158.4	8.7
5 Suckers (12-21")	30.0	5.4
4 Northern Pike (21-27")	62.6	4.0

The test results confirmed the elevated PCB levels in fish at this location. The values ranged from 8.3 ppm for a Coho Salmon which may have just entered the river to 241.5 ppm for 2 walleyes which probably lived in the lower river most of the year.

4. On April 20, 1978 a telephone conference call was held between the Central Office, the Southeast District Office and the Plymouth Office to discuss the situation. Following the conference call, the data were reviewed with the Department of Health and Social Services and a joint press release (Appendix 2) was prepared and mailed announcing the findings and recommending that the public not eat fish caught in the following waters until further notice:

Sheboygan River - from the Sheboygan Marsh Dam to the Coast Guard Station in Sheboygan.

Mullet River - from the lower mill pond dam, Plymouth, to the junction with the Sheboygan River.

Onion River - from the Waldo mill pond dam to the junction with the Sheboygan River.

Signs providing this information were posted on the rivers on April 21, 1978 (Appendix 3).

The Natural Resources Board was appraised of the Sheboygan River PCB situation at its April 26, 1978 meeting, after which Secretary Earl appointed the technical committee to coordinate the Sheboygan River PCB Investigation (Appendix 4). The investigation included the collection and testing of many samples from the drainage basin including fish, river bottom sediment, municipal/industrial effluents, and river water. This report summarizes the findings of the Sheboygan River Investigation.

PCB Data on Sheboygan River Fish Samples

The levels of PCBs found in fish collected at 11 locations in the drainage basin (Fig. 1.) are listed in Table 1. Forty samples of fish taken from the Sheboygan River below the Sheboygan Falls Dam to the confluence with Lake Michigan, including the Weeden's Creek and Greendale Creek tributaries, averaged 155 ppm PCBs. Thirty-eight samples of fish from the Sheboygan River upstream from the Sheboygan Falls Dam, the Mullet River, and the Onion River were found to contain levels below the FDA tolerance of 5 ppm.

A collaborative study was conducted by the State Laboratory of Hygiene and the State Department of Agriculture, Trade and Consumer Protection, Bureau of Laboratory Services, to confirm the accuracy of PCB analyses in fish samples. Appendix 5 contains the results of the study. The independent analyses of split fish samples closely agreed.

PCB Data on Sheboygan River Bottom Sediment Samples

Table 2 lists the levels of PCBs found in bottom sediment samples collected at 13 locations in the drainage basin. The highest concentration of PCBs was detected immediately downstream from the Tecumseh Products Die-Casting Plant in Sheboygan Falls. Lower but significant amounts of PCB were detected farther downstream in the reach from Sheboygan Falls to Sheboygan. Low levels of PCB were found in the Sheboygan River upstream from the Sheboygan Falls Dam, the Mullet River, and the Onion River.

Municipal/Industrial PCB Point Source Samples

Table 3 lists the concentrations of PCBs found in municipal and industrial effluents collected from facilities in the drainage basin. Also listed are the concentrations of PCBs found in river water, and hydraulic fluid taken from 3 aluminum die-casting plants. No significant PCB point source to the Sheboygan River was detected by monitoring these municipal and industrial discharges.

PCB Analysis of Soil Samples From The Tecumseh Products Company At Sheboygan Falls

Table 4 lists the levels of PCBs found in soil samples collected on the Tecumseh property (Fig. 2) in Sheboygan Falls. Granular oil absorbent material deposited on the property contained up to 120,000 ug/g (ppm) PCB (12%).

This PCB-contaminated waste deposited on the dike bordering the Sheboygan River is a significant source of PCBs to the lower Sheboygan River. During periods of high water the Sheboygan River flows along the dike and is in direct contact with highly contaminated fill materials. During rains PCBs in the dike are subject to washing into the stream. PCBs at other locations on the plant property are likely to soak into the ground and reach the river via ground water discharge. The area is subject to periodic flooding which occurred as recently as May, 1978.

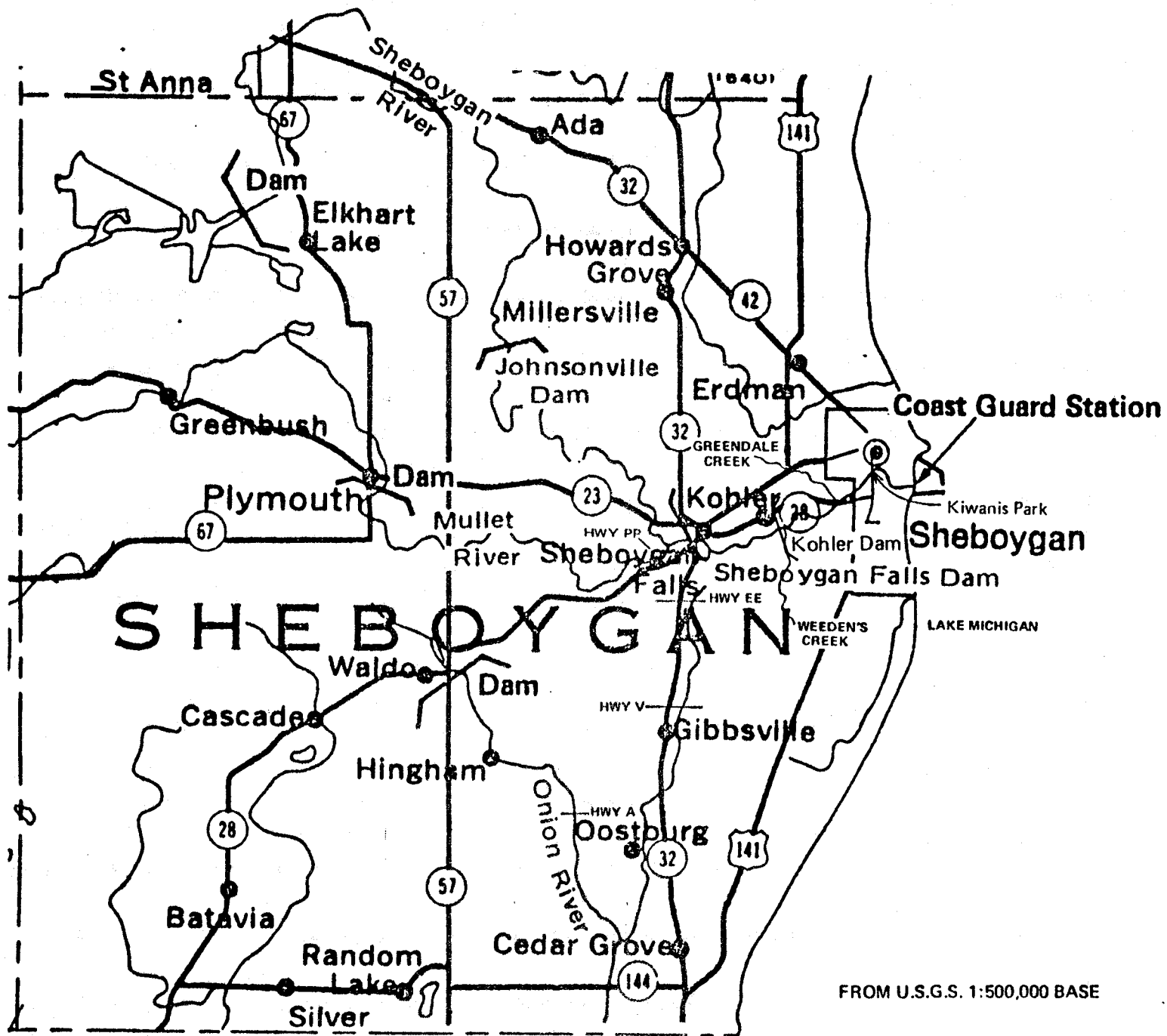


Figure 1. Sheboygan River Drainage Basin (PCB Investigation Area).

TABLE 1. PCB DATA ON SHEBOYGAN RIVER FISH SAMPLES

Kiwanis Park Samples

Drainage Area	Sample Location	Collection Date	No. / Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F*	27"	15.3	9.5
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F	23"	17.0	10.7
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F	22"	12.1	15.4
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F	25"	2.0	11.2
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F	23.5"	333.0	9.5
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	1 Carp	F	24.5"	970.0	16.3
Lk. Michigan	Kiwanis Pk.-Sheboygan	5-16-78	4 W. Suckers	** WF	14"	23.9	4.7

GREENDALE & WEEDEN'S CREEK SAMPLES

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	Greendale Creek	4-28-78	1 N. Pike	WF	15.0"	169	3.0
"	"	"	8 Minnows	WF	6.0"	5.9	4.1
"	"	"	17 Minnows	WF	4.5"	14.0	2.8
"	Weeden's Creek	4-28-78	1 C. Salmon	WF	14.5"	0.9	.5
"	"	"	6 Creek Chubs	WF	6.0"	150.0	3.9
"	"	"	18 Minnows	WF	5.0"	61.0	2.1

* F indicates boneless fillet sample

** WF indicates whole fish sample

TABLE 1. (Con't.)

Kohler Dam Samples

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	1 Carp	F	25"	240.0	9.3
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	1 Carp	F	25"	180.0	3.8
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	1 Carp	F	22"	150.0	6.4
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	1 Carp	F	25"	250.0	5.6
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	3 Carp	WF	22-25"	350.0	11.6
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	1 Carp	F	27"	250.0	12.2
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Carp	WF	18.5-20"	460.0	11.7
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	3 Carp	WF	21.5-22"	320.0	9.0
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Suckers	F	12.5-13"	88.0	.7
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Suckers	WF	9-10.5"	130.0	2.5
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Suckers	WF	10.5-11"	39.0	.9
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Suckers	F	10-11"	40.0	.5
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	5 Rock Bass	WF	4.5-7.5"	190.0	3.1
Lk. Michigan	Above Kohler Dam-Kohler	4-26-78	12 Common Shiners	WF	5"	100.0	2.5

TABLE 1. (Con't.)

** Sheboygan Lagoon Samples (Above Sheyboygan Falls)

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average total length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	Above Sheb. Falls Dam (Sheb. Lagoon)	4-27-78	38 Bluegills	WF	3.5"	< 5.0	1.0
"	"	"	10 Redhorse	WF	8.0"	< .5	2.2
"	"	"	2 Crappies	WF	6.5"	< 2.0	1.1
"	"	"	6 Rock Bass	WF	8.0"	< 2.0	.9
"	"	"	4 N. Pike	F	16.0"	< 1.0	.4
"	"	"	7 Redhorse	F	15.0"	< 1.0	1.5
"	"	"	1 Carp	F	25.5"	< 1.0	.5
"	"	"	1 Carp	F	23.5"	< .8	1.0
"	"	"	4 Carp	F	17.0"	< 1.0	1.6
"	"	"	5 Carp	WF	17.0"	< 3.0	3.4
"	"	"	5 Carp	WF	16.0"	< 4.0	4.9
"	"	"	8 Carp	WF	15.0"	< 2.0	7.1
"	"	"	8 Carp	WF	14.0"	< 2.0	3.7

** There is Chlordane interference in fish samples from Sheboygan Lagoon, making it difficult to quantify an exact PCB number. Therefore these values are listed as 'less than' the given number. In most cases, the real PCB level in the sample would be less than the given number.

JOHNSONVILLE DAM SAMPLES

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	Above Johnsonville Dam	4-28-78	4 Carp	WF	20"	.8	3.3
"	"	"	4 Carp	WF	17"	.8	5.1
"	"	"	1 Carp	F	21.5"	.4	1.4
"	"	"	1 Carp	F	23.5"	.6	2.2
"	"	"	14 Suckers	WF	10.0"	.2	2.3
"	"	"	9 Rock Bass	WF	6.5"	.5	2.4
"	"	"	3 Crappies	WF	6.0"	< .5	.4
"	"	"	1 L.M. Bass	WF	9.5"	.7	1.6
"	"	"	14 Stonecats	WF	5.0"	< .4	1.1
"	"	"	60 Minnows	WF	3.0"	< .4	2.3

TABLE 1. (Con't.)

**** MULLET RIVER SAMPLES**

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	2 Miles Upstream From Plymouth	5-4-78	5 Carp	WF	13.0"	<.2	1.2
"	"	"	5 Carp	WF	12.5"	<.2	2.2
"	"	"	1 W. Sucker	WF	10.5"	<.2	.6
"	"	"	10 W. Suckers	WF	7.5"	<1.0	2.1
"	"	"	14 Bullheads	WF	6.5"	<3.0	1.6
"	"	"	9 Creek Chubs	WF	5"	<.2	3.2
"	2 Miles Downstream From Plymouth STP	"	5 Carp	WF	15.5"	<5.0	3.7
"	"	"	5 Carp	WF	12.5"	<5.0	4.1

**There is Chlordane interference in fish samples from below the Plymouth STP, making it difficult to quantify an exact PCB number. Therefore these values are listed as 'less than' the given number. In most cases, the real PCB level in the sample would be less than the given number.

ONION RIVER SAMPLES

Drainage Area	Sample Location	Collection Date	No./Species	Type of Sample	Average Total Length	PCB ug/g (ppm)	Fat (%)
Lk. Michigan	At Hwy. V	4-28-78	5 Rock Bass	WF	6.5"	.2	2.0
"	At Hwy. A	4-28-78	3 Carp	WF	13.0"	.4	1.8
"	"	"	5 Carp	WF	15.0"	.2	2.2
"	Below Waldo	4-28-78	1 N. Pike	F	20.5"	<.2	.5
"	"	"	5 Carp	WF	13.0"	.2	2.0
"	"	"	5 Carp	WF	18.0"	<.2	1.3
"	"	"	3 Carp	F	24.0"	<.2	.4

TABLE 2. PCB CONCENTRATIONS IN SHEBOYGAN RIVER WATERSHED BOTTOM SEDIMENTS*

Name	Date of Collection	Date of Analysis	Type of Sample(time)	PCB ug/g (ppm)	Water depth
Sheboygan River Kiwanis Park	5-9-78	6-7-78	Grab (11:00)	9.6	2.5'
Sheboygan River Between 8th & 14th St., Sheboygan	4-27-78	6-7-78	Grab (10:30)	3.6	7-11'
Sheboygan River Upstream From USGS Gauging Station	4-27-78	5-10-78	Grab (13:45)	2.4	4'
Kohler Landfill	4-27-78	5-15-78	Grab (13:15)	1.3	
Kohler Landfill	5-9-78	6-7-78	Grab(12:30)	< .2	NA
Sheboygan River Upstream From Kohler Dam	4-27-78	5-10-78	Grab (14:30)	52	2'
Sheboygan River Upstream From Kohler Dam	4-27-78	5-10-78	Grab (14:30)	81	2'
Sheboygan River Upstream From Kohler Dam	5-9-78	6-7-78	Grab (11:50)	27	2'
Sheboygan River 100 feet Downstream From Tecumseh	5-9-78	6-7-78	Grab (14:00)	190	3"
Sheboygan River 70 yards Upstream From Tecumseh	5-9-78	6-7-78	Grab (13:00)	2.4	6"
Upstream From Sheboygan Falls Dam	4-27-78	6-7-78	Grab (15:15)	< .2	4'
Upstream From Johnsonville Dam	4-27-78	6-7-78	Grab (19:30)	< .2	2'
Mullet River Hwy. PP	4-27-78	6-7-78	Grab (16:30)	3.4	
Mullet River - Hwy. PP	5-9-78	6-7-78	Grab (15:00)	< .2	2'
Mullet River Upstream from Plymouth	4-27-78	6-7-78	Composite(17:45)	< .2	3'
Mullet River Below Plymouth STP	4-27-78	6-7-78	Grab (17:00)	< .1	2'
Onion River at Hwy. EE	4-27-78	6-7-78	Grab (15:45)	< .1	3'

* A complete sample description is provided in Appendix 6

TABLE 3. PCB CONCENTRATIONS IN MUNICIPAL AND INDUSTRIAL POINT SOURCES,
RIVER WATERS, AND HYDRAULIC FLUIDS

Municipal Sewage Treatment Plants

Name	Collection Date	Date of Analysis	PCB ug/l (ppm)	Comments
Sheboygan STP *	3-31-78	4-14-78	<.4	Final Effluent
Sheboygan Falls STP	3-31-78	4-12-78	<1.0	Final Effluent
Kohler STP	3-31-78	4-14-78	<.2	Final Effluent
Plymouth STP	4-4-78	4-11-78	9.0	Final Effluent (Flood Stage)
Plymouth STP	4-27-78	5-15-78	<.2	Final Effluent (Normal)
Belgium STP	4-21-78	5-8-78	<2.0	Final Effluent
Kiel STP	4-24-78	5-8-78	<1.0	Final Effluent
Sheboygan Incinerator	4-21-78	5-8-78	<1.0	Final Effluent

* STP means Sewage Treatment Plant

TABLE 3. (Con't.)

Name	Collection Date	Industrial Effluents		Type of Sample (time)	PCB ug/1 (ppb)	Comments
		Date of Analysis				
J.L. French Co. (S)*	4-4-78	4-14-78		Grab	21	Effluent to STP
Thomas Industries (S)	4-4-78	4-7-78		Grab	140	Effluent to STP
Thomas Industries	5-3-78	5-23-78		Grab (11:00)	.2	Surface water Discharge
Tecumseh Prod. (SF)**	4-4-78	4-20-78		Grab	2.2	Effluent to STP
Tecumseh Prod. (SF)	4-4-78	4-11-78		Grab	<.4	Effluent to Surface Waters
Kohler Co.	4-6-78	4-13-78		Grab	<.2	Effluent to Surface Waters
Kohler Landfill	4-21-78	5-8-78		Grab (09:30)	<1.0	Effluent to Surface Waters
Gilson Co. (P)***	4-21-78	5-8-78		Grab	<.5	Effluent to STP
Ametek (S)	4-24-78	5-8-78		Grab (11:00)	<2.0	Effluent to Surface Waters
Bemis Mfg. (SF)	4-24-78	5-8-78		Grab (14:00)	<.3	Effluent to Surface Waters
Schrier Malting (S)	4-24-78	5-8-78		Grab (10:00)	<1.0	Effluent to Surface Waters
Vollrath Inc. (S)	4-24-78	5-8-78		Grab (11:30)	<.3	Effluent to Surface Waters
Plastic Engineering (S)	4-24-78	5-8-78		Grab (13:00)	<.3	Effluent to Surface Waters
Plastic Engineering (15th Avenue) (S)	4-24-78	5-8-78		Grab (13:30)	<1.0	Effluent to Lake Michigan

* Sheboygan

** Sheboygan Falls

*** Plymouth

TABLE 3. (Con't.)

Name	River Water Samples		Type of Sample (time)	PCB ug/l (ppm)	Comments
	Date of Sample Collection	Date of Analysis			
Junction of Hwy. 28 & Sheboygan River	4-4-78	4-12-78	Grab	3.0	Flood Stage
Sheboygan River above Sheboygan Falls Dam	4-4-78	4-6-78	Grab	<.5	Flood Stage
Sheboygan River above Sheboygan Falls Dam	4-27-78	5-15-78	Grab (15:15)	<.3	
Sheboygan River above Kohler Dam	4-27-78	5-15-78	Grab (13:25)	<.2	
Sheboygan River below Johnsonville Dam	4-27-78	5-15-78	Grab (19:30)	<.2	
Onion River at Hwy. EE	4-27-78	5-15-78	Grab (15:46)	<.2	
Kohler Landfill	4-27-78	5-15-78	Grab (13:10)	<.3	Leachate
Mullet River above Plymouth Dam	4-27-78	5-15-78	Grab (18:00)	<.2	
Sheboygan River ¼ mile upstream from USGS gaging station	4-27-78	5-15-78	Grab (13:30)	.3	
Sheboygan River & 14th St in Sheboygan	4-27-78	5-15-78	Grab (21:00)	.3	
Sheboygan River immediately downstream from Tecumseh Products	5-10-78	6-7-78	Grab (01:15)	<.4	
Sheboygan River immediately upstream from Tecumseh Products	5-10-78	6-16-78	Grab (01:15)	<.2	

TABLE 3. (Con't.)

Name	Collection Date	Date of Analysis	Type of Sample (time)	<u>Hydraulic Fluids</u>	
				PCB ug/g (ppm)	Comments
J.L. French Co. (Sheboygan)	8-26-76	9-16-76	Grabs	10, 42, 104, 175, 21, 94, 72, 19, 12, 19, 14, 10	Hydraulic Fluids were obtained from on-line aluminum die-cast machines
Thomas Industries (Sheboygan)	4-4-78	4-19-78	Grabs	.8, 3.3, 3.0	"
Tecumseh Products (Sheboygan Falls)	4-4-78	4-19-78	Grabs	6.0, 2.5, 7.0	"

Subsequent to the discovery of highly contaminated PCB waste deposits at the Tecumseh Products site, the Department of Natural Resources issued an order on May 12, 1978 banning further disposal of solid waste on Tecumseh property (Appendix 7). On June 21, 1978 the Department issued a second order requiring the excavation, collection and proper storage of all materials likely to contain PCBs from the dike on the Sheboygan River behind the Tecumseh Plant. PCB-containing materials include oil absorbent material, scrap pressure hose, and oil soaked debris (Appendix 8).

On June 21, 1978 the Department together with the Department of Health and Social Services lifted the warning against fish consumption in the following sections of the river basin: the Sheboygan River from the Sheboygan Marsh to the Sheboygan Falls Dam, the Mullet River from Plymouth to the junction with the Sheboygan River at Sheboygan Falls and the Onion River from Waldo to Gibbsville. (Appendix 9).

However, the PCB warning will continue in the Onion River from Gibbsville to Sheboygan Falls, on the Sheboygan River from the Sheboygan Falls dam to the Coast Guard Station at Lake Michigan and on two tributaries of the Sheboygan--Weeden's Creek and Greendale Creek. The Onion, Weeden's Creek and Greendale Creek were included because they are accessible to migrating main channel fish.

Conclusions

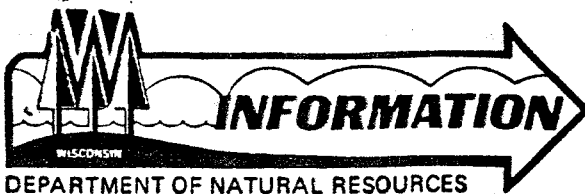
1. Fish sampled in the Sheboygan River (and its tributaries, Weeden's Creek and Greendale Creek) downstream from the Sheboygan Falls dam, to its confluence with Lake Michigan are contaminated with PCBs well in excess of the FDA standard of 5 ppm. Fish in the Sheboygan River above the Sheboygan Falls dam, the Mullet River, and the Onion River are below the FDA tolerance level for PCBs.
2. Sheboygan River bottom sediment is contaminated with PCBs from the Sheboygan Falls dam downstream to its confluence with Lake Michigan. Bottom sediment from the Sheboygan River above the Sheboygan Falls dam, the Mullet River, and the Onion River contains low levels of PCB.
3. A survey of municipal and industrial PCB point sources indicates no significant PCB concentrations in effluent discharges to the drainage basin.
4. A survey of soil from the Tecumseh Products Aluminum Die-Cast property at Sheboygan Falls revealed a significant source of PCBs to the Sheboygan River. This source is highly contaminated solid waste deposited adjacent to the Sheboygan River.
5. The highest levels of PCB detected in fish and river bottom sediments in the Sheboygan River System occur in the reach from the Tecumseh property downstream to Lake Michigan.

PCB ANALYSIS ON LAKE MICHIGAN FISH
COLLECTED OFFSHORE FROM SHEBOYGAN

<u>Lake Michigan Samples</u>										length	PPM PCB	% FAT
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	HYG*	70169	BROWN TROUT	F	13.8	.003	08.0
290	60	LK	MICH	SHEB BEACH 5TH	07/24/75	HYG	56367	BROWN TROUT	F	19.6	05.1	12.2
290	60	LK	MICH	SHEBOYGAN#1502	05/15/75	HYG	70168	BROWN TROUT	F	24.4	03.4	0015
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	HYG	70159	LAKE TROUT	F	12.2	0.50	01.1
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	HYG	70160	LAKE TROUT	F	16.7	02.4	04.3
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	HYG	70146	LAKE TROUT	F	19.5	01.8	06.0
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	HYG	70147	LAKE TROUT	F	20.0	0.09	05.3
290	60	LK	MICH	SHEBOYGAN#1502	05/25/75	HYG	70165	LAKE TROUT	F	20.4	09.0	12.1
290	60	LK	MICH	SHEBOYGAN#1502	05/15/75	AG**	13944	LAKE TROUT	F	21.8	04.4	10.0
290	60	LK	MICH	SHEBOYGAN#1502	05/15/75	AG	13945	LAKE TROUT	F	25.9	10.6	19.4
290	60	LK	MICH	SHEBOYGAN#1502	05/14/75	AG	13946	LAKE TROUT	F	28.7	18.2	21.0
290	60	LK	MICH	SHEB BEACH	07/24/75	HYG	56368	CARP	F	23.8	02.8	09.5
290	60	LK	MICH	SHEB BEACH NTH	07/22/75	HYG	57166	CARP	F	24.2	28.0	08.0
290	60	LK	MICH	SHEB BEACH NTH	07/22/75	HYG	57170	CARP	E	30.5	12.0	22.0
290	60	LK	MICH	SHEBOYGAN#1503	05/14/75	HYG	70154	BLOATER CHUB	F	10.7	0.25	04.5
AVERAGE											6.57	10.6
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05533	5 ALEWIFES	EP		03.4	04.0
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05534	3 W SUCKER	F	14.7	22.0	02.4
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05536	3 WHITEFISH	F	17.0	07.7	05.4
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05535	BROOK TROUT	F	12.5	07.8	04.8
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05540	K TROUT	F	17.8	05.4	10.1
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05542	2 BR TROUT	F	18.3	06.3	12.6
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05543	2 BR TROUT	F	19.7	05.1	15.3
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05541	BROWN TROUT	F	29.0	12.0	12.0
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05539	LAKE TROUT	F	22.7	07.9	12.2
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05538	LAKE TROUT	F	31.0	25.0	12.1
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05532	COHO SALMON	F	18.4	26.0	05.7
290	60	LK	MICH	SHEBOYGAN HARB	06/24/76	HYG	05537	CHINOOK	F	34.5	11.0	02.6
AVERAGE											11.6	8.26
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67539	5 CHUBS	WF	08.7	02.0	04.9
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67538	5 CHUBS	WF	09.5	01.8	07.3
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67536	5 CHUBS	WF	10.0	01.5	11.5
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67535	5 CHUBS	WF	10.3	02.6	13.3
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67534	5 CHUBS	WF	11.1	01.7	15.5
290		LK	MICH	10 MI SE SHEB	04/19/77	HYG	67537	5 CHUBS	WF	12.0	02.3	13.3
AVERAGE											1.98	10.9

*State Laboratory of Hygiene

**State Department of Agriculture Laboratory



DEPARTMENT OF NATURAL RESOURCES
Box 7921 Madison, WI 53707

MADISON, WI--No fish taken from the lower Sheboygan River watershed should be eaten until further notice because of "extremely high" PCB contamination. Department of Health and Social Services (HSS) and Department of Natural Resources (DNR) officials warned today.

In a joint release today HSS Secretary Donald Percy and DNR Secretary Anthony S. Earl warned the public to stop eating fish taken from the Sheboygan River between Sheboygan Marsh Dam and the coast guard station at Lake Michigan, the Onion River from Waldo Dam to its junction with the Sheboygan River, and the Mullet River between lower Mill Pond Dam at Plymouth and its junction with the Sheboygan, until additional test results explain the PCB contamination. Approximately 129 river miles are included in the warning.

The levels of polychlorinated biphenyls (PCBs) discovered through routine fish testing "are greater than anything we've discovered before," according to Stanton Kleinert, who directs DNR's hazardous substance surveillance.

Health officials said that they are concerned about long-lasting, lifetime exposures to PCBs rather than any short term exposure.

An annual warning in Wisconsin's fishing regulations asks the public to eat only one meal a week (1/2 pound) of fish from certain waters, including Lake Michigan, because of high PCB content. This advisory further recommends that lactating mothers, expectant mothers, females who anticipate bearing children, and children less than six-years-old not eat these fish. Federal regulations prohibit the sale of fish with higher than 5 parts per million (ppm) PCB concentration.

In testing on the lower Sheboygan River at Kiwanis Park, however, DNR found an average of 126 ppm PCBs in 13 fish samples. Researchers found an average of 59 ppm in northern pike, 28 ppm in suckers, 241 ppm in walleye, 38 ppm in bullheads, 8.3 ppm in coho salmon, and one catch of carp containing 750 ppm PCBs. The levels are the highest recorded in live fish sampled in Wisconsin.

(more)

APPENDIX 2

Kleinert said the DNR was initiating an investigation to determine the source of the contamination but, at present, "there are few leads," Kleinert said.

"We are not certain where the pollution is coming from," the official said. "Several weeks will be required to complete our investigation. We will be concentrating our efforts on testing river waters and river sediments to pin down the source or sources of contamination. We will also be testing many fish samples from various locations in the river system."

DNR Secretary Anthony Earl ordered reassignment of toxic investigators and fish management specialists onto the case, saying "this effort demands the prompt attention of personnel with diverse skills whose cooperation is essential to protect the public health and natural resource."

Earl notified HSS Secretary Donald Percy of the discovery, which came about through a routine, cooperative program between the DNR's fish management and water quality personnel.

The DNR Secretary also ordered notification of local officials, sportsmen's organizations, local news media and others of the existing problem. Affected areas will be posted with health warnings until the problem is resolved.

Elevated PCB levels were first detected by routine test results in March. DNR toxic substances specialists ordered immediate additional testing at several sites to verify the PCB problem.

More testing for PCB concentrations and the source or sources of the contaminant will have to wait at least one week according to Kleinert. He said previous rains will probably keep the river at flood stage at least that long.

"Flood waters make it difficult to trace down PCBs because we can't easily sample fish and the diluted water makes it tougher to track down the source," he said.

DNR researchers face a tough job in locating the source of the PCB buildup, he said. The toxin could be buried in riverbed sediments or seeping in from neighboring industries, or landfills, which will require extreme checking.

(more)

APPENDIX 2. (Con't.)

Researchers will test sediment core samples, water, land sites, and fish to try and pinpoint the PCB problem. Four sewage treatment plants and four industries have already been tested with inconclusive results. Many more sites along the river will be tested.

PCBs concentrate in fatty tissues of fish which are exposed to the pollutant over a long time period.

"Smelt and stream trout which many anglers are now fishing probably won't contain high concentration of PCBs," Kleinert said, "but why take the chance until we know more from our testing. We hope this is a localized problem confined to fish which live the entire year in the lower Sheboygan River system. We have not seen these excessive levels in lake-run fish which don't live in the river for long periods of time."

Tests show that large, fatty fish like carp, salmon, and lake trout concentrate more PCBs than leaner fish like stream trout and smelt. In previous studies, Lake Superior smelt measured 0.3 ppm PCBs, Green Bay smelt had 3 ppm PCBs and Lake Michigan smelt contained 0.6 ppm PCBs. Experienced anglers know that careful trimming of back, belly, and side fat can remove some of the PCBs from infected fish.

Human health effects from PCB exposure, especially long term, low level exposures from eating infected fish, are not clearly understood. U.S. workers who received long term occupational exposures to PCBs developed skin rashes. Similar long term tests in rats and monkeys produced liver tumors, skin lesions, and reproductive impairment. That's why the Food and Drug Administration considers continual exposure to PCBs a health risk.

PCBs were manufactured in the U.S. from 1929 to 1966 before any deliterious effects were noticed. The compounds are highly stable -- nonflammable; resistant to heat, acids, and bases - therefore, they had many industrial uses. PCBs have been used as dielectric fluids in transformers and capacitors, electrical wiring insulation, plasticizers, hydraulic fluids, lubricants, sealants, molding waxes, epoxy paints, and in many other

(more)

APPENDIX 2 (Con't.)

WARNING

Wisconsin Department of Natural Resources water quality sampling has identified PCB's (polychlorinated biphenyls) in fish in this area. Based on this information, the Wisconsin Department of Health and Social Services recommends that the public not eat fish caught in the following waters until further notice:

Sheboygan River—From the Sheboygan Marsh Dam to the Coast Guard Station in Sheboygan.

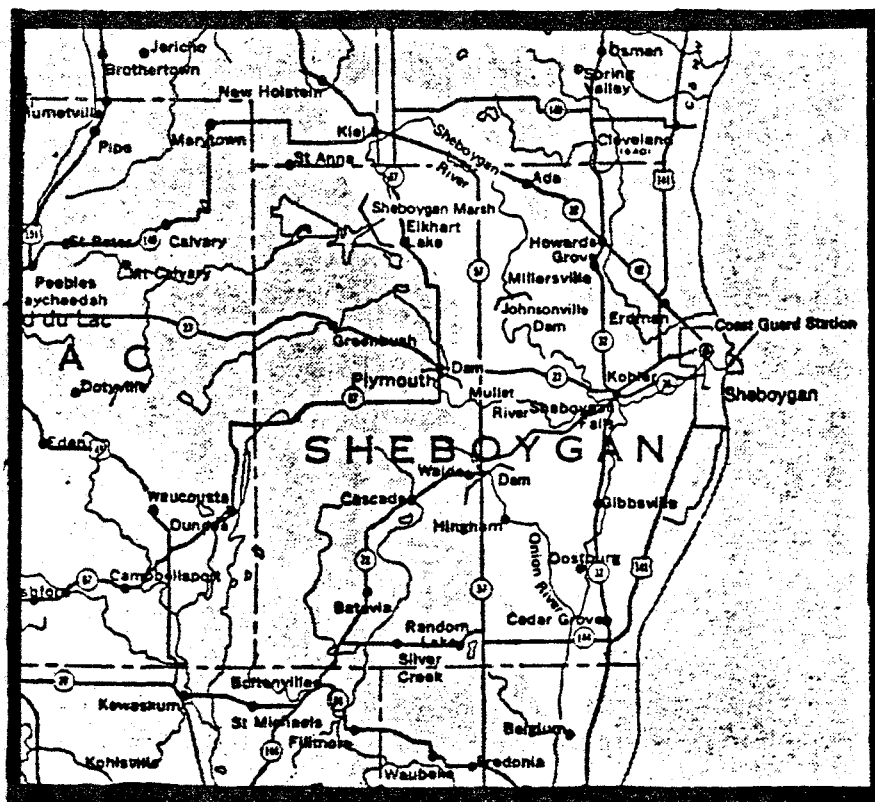
Mullet River—From the lower mill pond dam, Plymouth, to the junction with the Sheboygan River.

Onion River— From the Waldo mill pond dam to the junction with the Sheboygan River in Sheboygan Falls.

Anthony S. Earl

Anthony S. Earl,
Secretary
Department of
Natural Resources

April 21, 1978



APPENDIX 3

CORRESPONDENCE/MEMORANDUM

Date: May 4, 1978

File Ref: 3210-3

To: Stan Kleinert - 10
Tom Sheffy - 10
Jim Addis - 6

Lloyd Lueschow - 14
Jeff Bode - SE Dist.
Paul Shultz - SE Dist.

Joe Delfino - Lab. of
Hygiene

From: Anthony S. Earl *AE*

MAY 05 1978

Subject: Technical Committee for the Sheboygan River PCB Investigation

I am requesting your participation on a technical committee to review the data that is being gathered in the Sheboygan River Investigation. By copy of this letter, I am also asking that Dr. Delfino of the Laboratory of Hygiene be a member of the committee.

Stan Kleinert will act as the committee chairman and the first meeting will be held in Room 1306 of the Pyare Square Building at 9:30 a.m., on Monday, May 22, 1978. If you are unable to attend, please send an alternate.

The Surveillance Section will be responsible for assembling the Investigation findings into a report. Each of you as members of the technical committee will be requested to review the report prior to its release by the Department. We hope this investigation will proceed as swiftly as possible and the report can be issued by the target date of July 1, 1978.

SJK:km

APPENDIX 4

SHEBOYGAN RIVER

Table 1: Sediment Sampling Locations

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Site Access</u>	<u>Reach</u>	<u>Sample Type</u>	<u>Sample Taken</u>
SHE 1	Upstream Johnsonville Dam	STH 23 to CTH M to CTH JM	D	Composite	Grab
SHE 2	Upstream Sheboygan Falls Dam	STH 28 to STH 32	D-C	Composite	Composite
SHE 3	Upstream Kohler Dam	STH 28	C-B	Composite	Grab
SHE 4	Upstream U.S.G.S. Station	STH 28 & U.S. 141	B-A	Grab	Grab
SHE 5	Downstream 14th St. to 8th St., Sheboygan	STH 28 to N. 14th to 8th St.	A	Composite	Composite Start Sampling at Penn Ave.
SHE 6	Onion River above Confluence with Sheboygan River	STH 28 to CTH EE	Trib.	Grab	Grab
SHE 7	Mullet River above Confluence with Sheboygan River	CTH PP to Willow Road	Trib.	Grab	Grab
SHE 8	Mullet River below Plymouth STP	CTH PP to CTH AC	Trib.	Composite	Composite
SHE 9	Mullet River upstream Plymouth Dam	CTH AC to STH 23	Trib.	Composite	Composite
SHE 10	Kohler Landfill Point Source Composite	STH 28 at U.S. Geological Survey	Point Source	Composite	Composite

SHEBOYGAN RIVER
Sediment Survey - April 27, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
<u>Sampling Site 1</u>								
19:30	Sediment grab	10 ft. from left bank, 30 yds. upstream of dam	2 ft.	Black	Mucky, very wet sample	Septic-type smell	None	Lots of detritus in sediment-Rt. bank gravel
21:00	Water sample grab		Surface					
<u>Sampling Site 2</u>								
15:15	Sediment grab	100 yds. upstream of dam, rt. bank #2, 1	4 ft.	Brown & gray	Muck & fine sand	Natural decaying smell	None	Oil present in sediment sample
15:25	"	250 yds. upstream of dam, rt. bank #2, 2	3 ft.	"	" "	" "	"	Detritus in sample
15:30	Water sample grab	100 yds. upstream of dam	Surface					
<u>Sampling Site 3</u>								
14:25	Grab sediment	7 ft. from rt. bank	2 ft.	Gray & brown	Sandy, some muck, medium coarseness	Organic odor	None	Detritus, oil in sediments
14:35	Grab sediment	" "	"	"				
14:40	Water sample grab	Mid-stream	Surface					Water turbid, high in suspended solids

SHEBOYGAN RIVER
Sediment Survey - April 27, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
<u>Sampling Site 4</u>								
13:25	Sediment grab	5 ft. from right bank, 1/4 mi. upstream of U.S.G.S. gaging station at Hwy. 28	4 ft.	Gray & brown	Sandy, medium coarseness, detritus	Natural decaying odor	No benthic organisms present	Observed several dying bullheads
13:30	Water grab	10 ft. from left bank, 1/4 mi. upstream of U.S.G.S. gaging station at Hwy. 28	Surface					Water turbid, high in suspended solids
13:45	Water grab	At U.S.G.S. gaging station	Surface					Water turbid, high in suspended solids
<u>Sampling Site 5</u>								
10:15	Sediment grab	30 ft. from left bank, Site #5, 1	7 ft.	Grayish brown	Mucky, some sand, fine detritus	Natural decaying odor	No benthic organisms	Used rubber gloves to handle sample oil in sample (1/10th of total sample)
10:30	Sediment grab	50 ft. from rt. bank, Site #5, 2	11 ft.	Grayish brown	Muck, 50% sand Detritus	Natural odor	Few Oligochaetes present	Some oil in sample
10:35	Sediment Grab	30 ft. from left bank, Site #5, 3	8 ft.	Grayish brown	Muck Fine sand 50%	Fishy odor	No Oligochaetes	Water turbid
10:45	Sediment Grab	45 ft. from left bank, Site #5, 4	8 ft.	Grayish brown	Muck sand	Fishy odor	Few Oligochaetes	Granular or more coarse type sand

SHEBOYGAN RIVER
Sediment Survey - April 27, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
17:00	Water sample grab	Plymouth Wastewater Treatment Plant Outfall						Sample taken at Plymouth WWTP Water clear
<u>Sampling Site 9</u>								
17:45	Sediment composite	All sediment samples taken 100 yd. upstream of Plymouth Dam	3 ft.	Black	Fine muck	Organic odor	None	Pond algae floating on surface
		1st sample 20 ft. off rt. bank Sample #9, 1	3 ft.	Black	Fine muck	Organic odor	None	Very turbid water, fish jumping out of water
		2nd sample 50 ft. off left bank Sample #9, 2	3 ft.	Black	Fine muck	Organic odor	None	
18:00	Water sample grab	Taken at water surface at dam spillway						Some oil observed in water sample
<u>Sampling Site 10 Kohler Landfill Point Sources</u>								
13:00	Shovel grab sediment and grab water sample	KLF-1 ≈ 50 ft. upstream U.S. Geological Survey Gaging Station (USGS)	1 in.	Brown	Wet, muck sand	None	None	Point source, 20% of water sample taken here
13:05	Shovel grab sediment	KLF-3 ≈ 500 ft. upstream of USGS, at dead tree	1/2-1 in.	Dark brown	Dry soil; i.e. top soil	None	None	Point source

Appendix 6 (con't)

SHEBOYGAN RIVER
Sediment Survey - April 27, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
13:10	Shovel grab sediment	KLF-4 Opening in berm to stream, \approx 800 ft. upstream USGS, landfill culverts drain to area behind berm	1/4 in.	Light brown surface, reddish brown below surface	Dry mud surface, below surface 75% sandy	None	None	Point source
13:15	Shovel grab sediment	KLF-5 - Opening in berm, \approx 900 ft. upstream USGS, drains landfill culvert and pond	1/2 in.	Brown	Wet muck, sand	None	None	Point source, 80% of water sampled here

Samples taken at Site 5 were composited to make 1 sediment sample; Sample #5-1, 10% of total sample; Sample #5-2, 25% of total sample; Sample #5-3, 55% of total sample; and Sample 5-4, 20% of total sample. Sampling ended at the 8th Street Bridge, where an oil film was observed floating on the water.

Sampling Site 8: Sample #8, 1 taken 25 ft. upstream of bridge at CTH AC. Sample #8, 2 taken 60 ft. upstream of bridge at CTH AC. These 2 samples were combined to make 1 sediment sample (50% each).

Sampling Site 9: Samples #9, 1 and #9, 2 at Plymouth Dam were composited to make 1 sediment sample (50% each). Sediment here was a very fine organic silt or muck.

Sampling Site 10: Water samples only taken at Sites #10-1 and #10-5; other sites did not have flowing water.

SHEBOYGAN RIVER

Table 2: Sediment Sampling Locations II

<u>Sample Number</u>	<u>Sample Location</u>	<u>Sample Site Access</u>	<u>Sample Taken</u>
SHE 11	Kiwanis Park from boat launch pier.	Kiwanis Park Ave. in City of Sheboygan	Grab
SHE 12	Kohler landfill upstream of U.S.G.S. Station.	STH 28 & U.S. 141	Composite made up of 4 grabs
Site 13	50 yds. upstream of Kohler Dam	STH 28	Grab
Site 14,15,16,17	Tecumseh Products Co., Sheboygan Falls	Cleveland Ave.	Grabs

SHEBOYGAN RIVER
Sediment Survey II - May 9, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
<u>Site 11</u>								
11:00	Sediment grab	Kiwanis Park boat launch on Kiwanis Park Ave. Sample taken at end of pier about 25 feet from lt. bank	2.5 ft.	Grayish Brown	Silty with fine sand	Organic decaying odor some oily smell	Oligocheate present	Some oil in sample. Drizzling rain - water turbid
<u>Site 12 Kohler Landfill</u>								
11:35	Shovel grabs of sediment leachate to make 1 sediment composite	KLF about 500 ft. upstream of U.S.G.S. at dead tree	1/2"-1"	Reddish Brown, Gray-Brown, Gray-Black	Fine soil sand & silt	Septic odor some oily smell	None	Kohler landfill 4 samples 25% each to make 1 composite sample U.S.G.S. reading 3.79
<u>Site 13</u>								
11:50	Sediment grab	40 yds. upstream of Kohler Dam 2-1/2 ft. off of lt. bank	1-1/2 ft.	Brown, Gray-Black	Silt & muck, some fine sand	Very organic decaying odor	None observed	Some oil in sample, water turbid
<u>Site 14 at Tecumseh Products</u>								
12:00	Shovel grab from berm	Behind Tecumseh Product on Cleveland Ave., Sheboygan Falls berm between river & building-20 ft. from river mid-length of building	Surface to 6" below surface	Brown, Whitish-green	Sandy & coarse	Strong chemical odor	None	Chemical odor - oxidizing material in sample oil dry or speedy dry material-aluminum pieces in sample & other scraps

SHEBOYGAN RIVER
Sediment Survey II - May 9, 1978
Field Data

Sample Time	Sample Type (Grab or Composite)	Sample Site	Sampling Depth Approx. Feet	Sample Color	Sample Texture	Sample Odor	Type of Benthic Organisms Present	Other Remarks
<u>Site 15</u>								
12:20	Grab sample sediment from river	70 yds. upstream of Tecumsech Products outfall 3 ft. from lt. bank	6"	Brown & Black	Silty & muck organic detritus	Hydrogen sulfide odor	None	Water turbid-a lot of dead crayfish shells. Large amount of debris along banks
<u>Site 16</u>								
12:35	Shovel grab sediment	100 ft. downstream of Tecumsech Products outfall 1 ft. from lt. bank	3"	Brown	Watery, sandy	Natural decaying odor	No benthics present	Watery sample
<u>Site 17</u>								
12:40	Shovel grab from berm	Behind Tecumsech Products	Surface to 6" below surface	Brown, Whitish-green	Sandy, gravel or coarse	Chemical smell	No benthics present	Oil dry or speedy dry material present. Scrap aluminum present in sample & white crystal material

Sheboygan River Sediment Survey II
May 9, 1978
Supplemental Field Information

A second sediment sampling survey was conducted on the Sheboygan River on May 9, 1978. Weather conditions were moderate with temperatures ranging in the high forties to mid-fifties. A slight amount of precipitation (rain) occurred in the morning, ending by noon. Sky conditions were 100 percent overcast with winds out of the east, north-east from 15-20 miles per hour (mph), gusting to 35-40 mph. These conditions prevailed throughout the duration of the survey period.

Site 12

At Kohlers landfill, four (4) shovel grab samples were taken of landfill leachate and combined to make one sediment sample (25% of each). Samples were taken approximately 500 feet upstream of U.S.G.S. at dead tree.

Site 14, 15, 16, 17

These sampling sites were in the vicinity of the Tecumseh Products Co.

Samples 14 and 17 were samples taken from the berm built up between the river and building. Both samples had aluminum scraps in them, a whitish-green crystalline like substance, made up of speedy dry material, and had a heavy chemical odor. The berm had apparently been built from waste products of the company and used as fill material.

Samples 15 and 16 were upstream and downstream sediment samples from the river, respectively. The upstream sample was approximately 70 yards from the Tecumseh Products outfall. The downstream sample was 100 feet from the outfall.



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Anthony S. Earl
Secretary

BOX 7921
MADISON, WISCONSIN 53707

May 12, 1978

IN REPLY REFER TO: 4530

Mr. Dee Sherman, Plant Manager
Diecast Division of Tecumseh Products Company
415 Cleveland Street
Sheboygan Falls, Wisconsin 53085

Honorable Gladys Morken
Mayor of Sheboygan Falls
Municipal Building
Sheboygan Falls, Wisconsin 53085

Dear Mr. Sherman and Mayor Morken:

Enclosed is a special order issued by the Department of Natural Resources relating to operations of your solid waste management facilities.

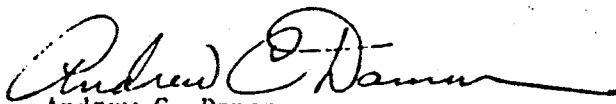
This order is issued pursuant to Section 144.35, Wisconsin Statutes, and Chapter NR 151, Wisconsin Administrative Code. It is based on a field investigation and finding that your solid waste management operations are not in full compliance with State standards.

If a public hearing on this order is desired, written notice must be given to the Department no later than 10 days after the date the notice and order are served.

Should the order become delinquent, your attention is directed to Section 144.536 and Section 144.57, Wisconsin Statutes, which provide for enforcement of the order by the Attorney General and forfeitures of from \$10 to \$5,000 per day for each day of violation, failure or refusal to obey the provisions of the order.

If you have any questions with regard to this matter, please contact Mr. Bernard Schultz, Asst. Director, Southeast District Headquarters, 9722 West Watertown Plank Road, Milwaukee, Wisconsin 53226.

Sincerely,


Andrew C. Damon
Deputy Director

Enc.

cc: Tecumseh Products Company
Tecumseh, Michigan 49286

APPENDIX 7



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Anthony S. Earl
Secretary

BOX 7921
MADISON, WISCONSIN 53707

IN REPLY REFER TO: 4530

May 12, 1978

Tecumseh Products Company; and
City of Sheboygan Falls

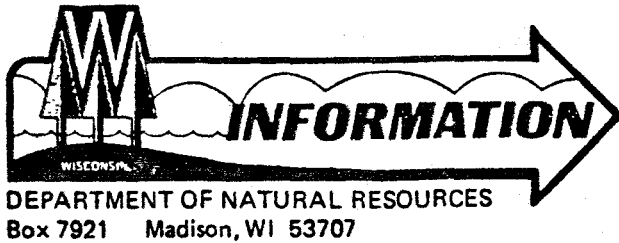
Order Number 2A-78-1190

FINDINGS OF FACT

THE DEPARTMENT FINDS:

1. That the Diecast Division of Tecumseh Products Company, 415 Cleveland Street, Sheboygan Falls, Wisconsin operates an aluminum diecasting plant located in the NW 1/4 of the SE 1/4, Section 36, T15N, R22E, Sheboygan County, Wisconsin.
2. That a dike is located between the diecasting plant and the Sheboygan River.
3. That on information and belief the dike is owned by Tecumseh Products Company and is maintained by Tecumseh Products Company and/or the the City of Sheboygan Falls.
4. That the dike and the property between the dike and the diecasting plant are within the floodplain of the Sheboygan River.
5. That solid waste materials have been deposited on the dike and in areas directly adjacent to the plant on property owned by Tecumseh Products Company.
6. That these solid waste materials contain significant concentrations of polychlorinated biphenols.
7. That concentrations of polychlorinated biphenols have been found in fish in the Sheboygan River, well in excess of United States Food and Drug Administration tolerance levels.
8. That because of these significant concentrations of polychlorinated biphenols in fish tissue, the Department of Natural Resources in conjunction with the Department of Health and Social Services has advised consumers not to eat fish taken from the Sheboygan River until further notice.

APPENDIX 7 (Con't)



MADISON, WI. -- The Department of Natural Resources has ordered an immediate halt to industrial waste dumping on a Sheboygan Falls site that toxic investigators say contains "substantial amounts" of PCB contaminants. Some samples exceeded 1% or 10,000 parts per million PCBs.

Stanton Kleinert, director of DNR hazardous substance surveillance, said the order affects the Diecast Division of Tecumseh Products Co. and the City of Sheboygan Falls, which maintains a dike adjoining the firm's property on the Sheboygan River.

Kleinert said it appears that industrial wastes used as fill and dike materials deposited in the river's floodplain are "an important source" of PCB contamination.

Tecumseh is located at 415 Cleveland Ave. The firm's land extends from Cleveland Avenue toward the river. A fence and 10-foot-wide dike separate the property from the Sheboygan River.

Rains or periodic flooding could have washed the PCB materials into the river and downstream, Kleinert said. Federal and state laws regulate floodplain use to protect life and property as well as to prevent uses incompatible with periodic flooding. Kleinert said PCBs could enter the river through runoff or seepage underground.

(more)

one add

Three weeks ago, the DNR's discovery of "extremely high" PCB levels in Sheboygan River fish triggered an intensive environmental detective effort to find possible sources of contamination. Kleinert said that investigation would continue, as would an advisory not to eat fish in 129 miles of the Sheboygan, Mullet and Onion Rivers.

Deputy DNR Secretary Andrew Damon, who signed the Tecumseh order, said the agency also was asking the Attorney General for advice on whether other legal action was warranted against the firm or any other party.

The department found that "the dike and property between the plant and river are in the river's floodplain" and that waste materials containing "significant concentrations of polychlorinated biphenyls" were deposited in the area and on the dike.

The order directed Tecumseh, whose parent offices are in Tecumseh, Michigan, to "discontinue any disposal of solid waste material except at a licensed solid waste disposal facility." It specifically directed that PCB materials be disposed of in accordance with regulations governing that kind of toxic waste.

Kleinert said the PCB contamination was found in soils and solid waste material from plant property. Until 1971, hydraulic fluids and some industrial oils were manufactured with high concentrations of PCBs, which are highly stable, nonflammable and resistant to heat.

The department was particularly concerned that PCBs were incorporated in the dike and, therefore, the city was added to the order, according to Charles Hammer, a DNR attorney.

Kleinert said tests of the hydraulic fluid now being used by Tecumseh failed to show a PCB problem. He said further analysis of the area's wastes would continue and plans for remedial actions would be investigated.

(more)



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Anthony S. Earl
Secretary

June 21, 1978

BOX 7921
MADISON, WISCONSIN 53707

IN REPLY REFER TO: 4530

Mr. Dee Sherman, Plant Manager
Diecast Division of Tecumseh Products Company
415 Cleveland Street
Sheboygan Falls, Wisconsin 53085

Honorable Gladys Morken
Mayor of Sheboygan Falls
Municipal Building
Sheboygan Falls, Wisconsin 53085

Dear Mr. Sherman and Mayor Morken:

Enclosed is a special order issued by the Department of Natural Resources relating to operations of your solid waste management facilities.

This order is issued pursuant to Section 144.35, Wisconsin Statutes, and Chapter NR 151, Wisconsin Administrative Code. It is based on a field investigation and finding that your solid waste management operations are not in full compliance with State standards.

If a public hearing on this order is desired, written notice must be given to the Department no later than 10 days after the date the notice and order are served.

Should the order become delinquent, your attention is directed to Section 144.536 and Section 144.57, Wisconsin Statutes, which provide for enforcement of the order by the Attorney General and forfeitures of from \$10 to \$5,000 per day for each day of violation, failure or refusal to obey the provisions of the order.

At this stage it appears that Chapter 30 permits are not required prior to the commencement of excavation.

If you have any questions with regard to this matter, please contact Mr. Bernard Schultz, Asst. Director, Southeast District Headquarters, 9722 West Watertown Plank Road, Milwaukee, Wisconsin 53226.

Sincerely,
Division of Enforcement

Andrew C. Damon
Andrew C. Damon
Administrator

Enc.

cc: Tecumseh Products Company
Mary Ann Calef, Assistant A.G.
Bureau of Legal Services
Allen Williams - Foley & Lardner

Bureau of Waste Management
Bureau of Water Quality
Southeast District



State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

June 21, 1978

Anthony S. Earl
Secretary

Tecumseh Products Company; and
City of Sheboygan Falls

BOX 7921
MADISON, WISCONSIN 53707

IN REPLY REFER TO: _____

Order Number 2A-78-1191

FINDINGS OF FACT

THE DEPARTMENT FINDS:

1. That the Diecast Division of Tecumseh Products Company, 415 Cleveland Street, Sheboygan Falls, Wisconsin operates an aluminum diecasting plant located in the NW 1/4 of the SE 1/4, Section 36, T15N, R22E, Sheboygan County, Wisconsin.
2. That a dike is located between the diecasting plant and the Sheboygan River.
3. That on information and belief the dike is owned by Tecumseh Products Company and is maintained by Tecumseh Products Company and/or the City of Sheboygan Falls.
4. That the dike and the property between the dike and the diecasting plant are within the floodplain of the Sheboygan River.
5. That solid waste materials have been deposited on the dike and in areas directly adjacent to the plant on property owned by Tecumseh Products Company.
6. That some of these solid waste materials contain significant concentrations of polychlorinated biphenyls.
7. That concentrations of polychlorinated biphenyls have been found in fish in the Sheboygan River, well in excess of United States Food and Drug Administration tolerance levels.
8. That because of these significant concentrations of polychlorinated biphenyls in fish tissue, the Department of Natural Resources in conjunction with the Department of Health and Social Services has advised consumers not to eat fish taken from the Sheboygan River until further notice.

CONCLUSION OF LAW

1. That Section 144.44, Wisconsin Statutes, and Chapter NR 151, Wisconsin Administrative Code, prohibit disposal of solid waste except in a licensed landfill facility.
2. That Section 144.50, Wisconsin Statutes, and Chapters NR 151 and 157, Wisconsin Administrative Code, establish criteria for proper storage, transportation and disposal of polychlorinated biphenyls and products containing polychlorinated biphenyls.

APPENDIX 8 (Con't.)

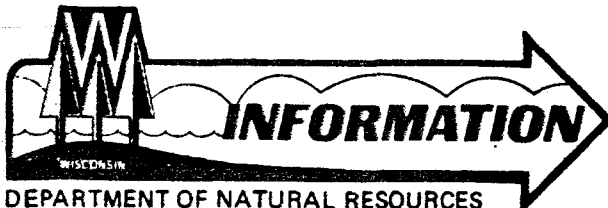
F. Descriptions for on-site and/or off-site storage of the barrels.

Dated at Madison, Wisconsin this 21 day of June, 1978.

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES
For the Secretary

By Andrew C. Damon *RP*
Andrew C. Damon, Deputy Secretary

cc: Tecumseh Products Company
Mary Ann Calef, Assistant Attorney General
Bureau of Waste Management
Bureau of Water Quality
Southeast District
Allen Williams, Foley and Lardner
Bureau of Legal Services



DEPARTMENT OF NATURAL RESOURCES
Box 7921 Madison, WI 53707

MADISON, WI---State natural resources and health officials today reduced the area covered by a fish consumption warning following the discovery two months ago of high PCB levels in the Lower Sheboygan River.

The warning will be lifted, effective immediately, for 105 miles of Sheboygan County rivers now declared safe from PCB contamination, according to officials of the Departments of Natural Resources and Health and Social Services. The officials say investigations and tests have isolated the PCB problem in the Sheboygan Falls area and indicated about 24 miles of streams in the Lower Sheboygan River basin would be included in the revised advisory.

Stanton Kleinert, director of the DNR's hazardous substance surveillance unit, said the warning against fish consumption would be lifted in the following rivers: the Sheboygan from the Sheboygan Marsh to Sheboygan Falls dam; the Mullet from Plymouth to Sheboygan Falls and the Onion from Waldo to Gibbsville.

However, the PCB warning will continue in the Onion River from Gibbsville to Sheboygan Falls, on the Sheboygan River from the Sheboygan Falls dam to the Coast Guard Station at Lake Michigan and on two tributaries of the Sheboygan--Weeden's Creek and Greendale Creek. Kleinert said the Onion, Weeden's Creek and Greendale Creek were included because they are accessible to migrating or itinerant main channel fish.

At the same time, the DNR today ordered cleanup activities near the Tecumseh Products Company, a Sheboygan Falls aluminum die casting firm which once used PCB-containing hydraulic fluids.

DNR hazardous substance investigators discovered high levels of PCB materials in the Sheboygan River floodplain behind the Tecumseh plant and in a dike along the river near the plant. The removal order was directed to both the firm and the City of Sheboygan Falls.

(more)

APPENDIX 9

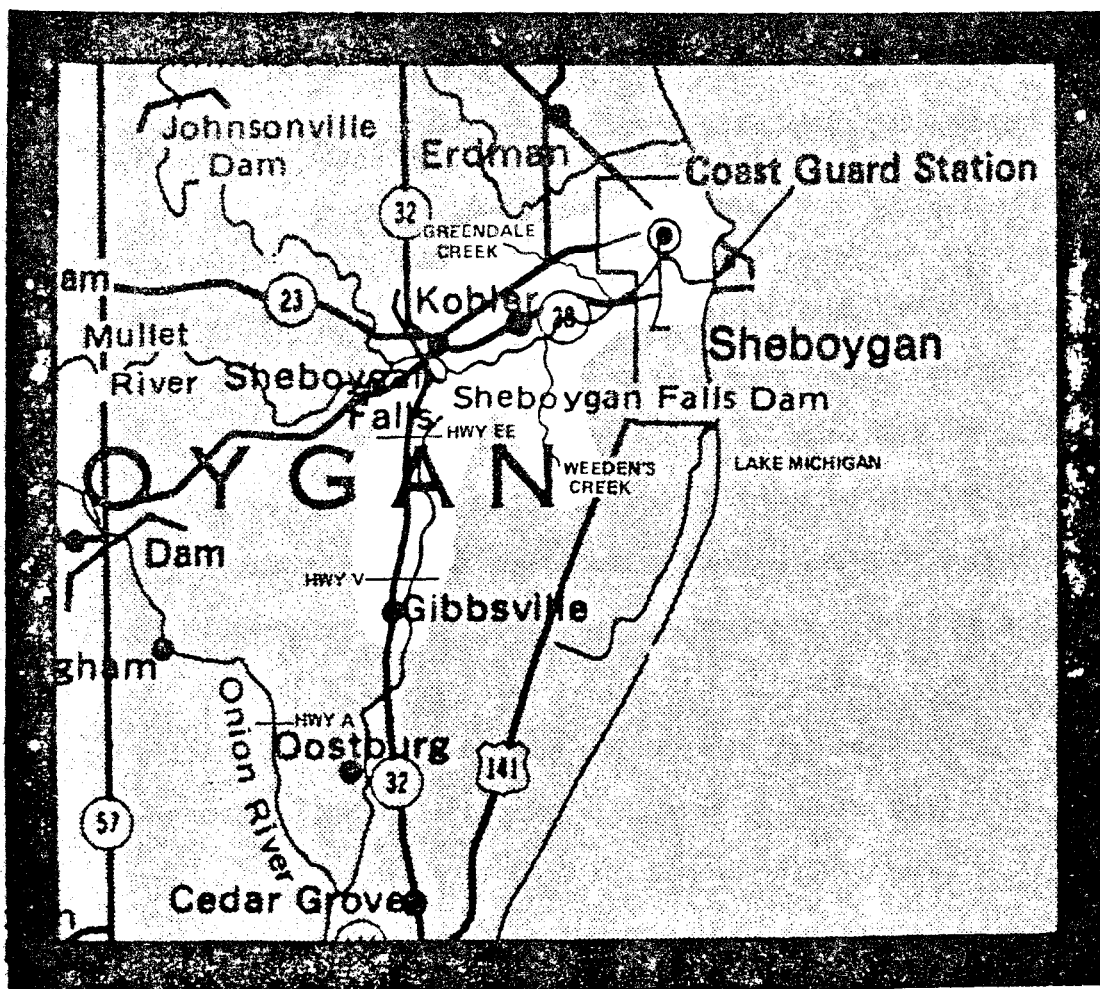
two add

Health officials said that they are concerned about long-lasting, lifetime exposures to PCBs rather than any short term exposure. Federal regulations prohibit the sale of fish with higher than 5 parts per million (ppm) PCB concentration.

FOR MORE INFORMATION CONTACT:

Stanton Kleinert, Chief
Surveillance Section
Phone: Code 608, 266-7721

Thomas Sheffy, Chemist
Surveillance Section
Phone: Code 608, 266-8343



Acknowledgments

The Committee would like to thank the following personnel for their efforts in this study. Samples were collected by Tom Petri, John Schultz, Terry Yakich, Frank Schultz, Chris Magruder, Collin Beveridge, Brian Belonger, Dave Vetrano, Roy Kalmerton, Kent Logan and Jerry Raeder of the Southeast District. Fish samples were prepared for analysis by Mike Gappa of the Surveillance Section, Madison. PCB analyses were performed at the State Laboratory of Hygiene, Madison, by Tom Gibson, Nancy Korda, Wayne Carter, Frank Priznar, Mary Ellan Ley, Paul Peterman, and Doug Dube.