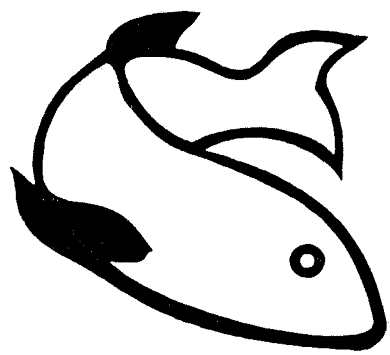
DIOXIN MONITORING PROGRAM

STATE OF MAINE

1991



by

Barry Mower

Department of Environmental Protection

Augusta, Maine

February 7, 1992

TABLE OF CONTENTS

LIST OF TABLES

EXECUTIVE SUMMARY

In 1988 the Maine legislature enacted 38 MRSA section 420-A, Maine's Dioxin Monitoring Program. The purpose of the program is to "determine the nature of dioxin contamination in the waters and fisheries of the State". In 1990 the program was extended through 1995 in order to track any changes in levels of contamination, that may result from recent reductions in the discharge of dioxin from the sources.

Under the provision, the Department of Environmental Protection (DEP) is required to sample wastewater treatment plant sludge once a quarter and fish once each year downstream of no more than 12 municipal treatment plants or bleached pulp mills. The act requires DEP to analyze "a sufficient number of fish to provide a reasonable estimate of the level of contamination in the population of each water body affected" and to "coordinate the monitoring program with other dioxin monitoring programs conducted by the Department, the US Environmental Protection Agency (EPA), or dischargers of wastewater".

DEP is required to report to the Energy and Natural Resources Committee of the Maine legislature by December 1 of each year on the results of the program. The report "shall contain the Departments conclusions as to the levels of dioxin contamination in the samples and the likely scope of dioxin contamination in the State's waters". This document is intended to fulfill the reporting requirements for the 1991 program. Although due by 1 December 1991, the report was delayed to allow verification of the lower results as discussed in the following sections.

CONCLUSIONS

***Results of the interlaboratory study show that the labs used by DEP in 1990 (TLI) and in 1991 (MRI) and by the paper industry in 1991 (Alta Analytical) produced data with the same general accuracy, although MRI was consistently the highest and Alta was consistently the lowest when splits of each of three samples were sent to the three labs.

***Results of the 1991 program showed levels of dioxin in fish ranging from 35-90% lower than in previous years in the few cases where direct comparisons could be made with the same species at the same site.

***For other sites, levels are lower than expected when compared to different sites or other species on the same river.

***Levels of dioxin in fish were still significant at stations on the Androscoggin, Kennebec, Penobscot, and Presumpscot Rivers.

***Levels of dioxin were not significant in fish from Messalonskee Lake and Webber Pond (the two control stations), the Piscataquis River below the Guilford Industries textile mill discharge in Guilford, and the St. Croix River below the Georgia Pacific Inc. pulp and paper mill discharge in Woodland.

RECOMMENDATIONS

***The statute establishing the Dioxin Monitoring Program, 38 MRSA section 420-A, should be amended to remove the part that limits sampling to 12 sites per year. This prevents collection of current data at all necessary sites in any one year.

***Sampling in 1992 should be designed to fill in the holes to provide recent data for all species and sites of interest to the public.

***Funding for the program should be increased to cover the costs of sludge testing as required by statute or the requirement eliminated.

***Effluent monitoring for dioxin should be included as a requirement of waste discharge licenses.

***DEP should delist the St. Croix River and Georgia Pacific Inc. from the 304 L list.

***To insure more effective data collection, DEP requests the authority to use gill nets.

METHODS

The 1991 program was initially developed by DEP staff from the Division of Environmental Evaluation and Lake Studies and Division of Licensing and Enforcement in the Bureau of Water Quality Control and from the sludge spreading program in the (then) Bureau of Solid Waste Management. As requested by each, copies of the draft program were then sent to the Paper Industry Information Office (PIIO) consultant, Maine Bureau of Health, and Natural Resources Council of Maine for comments. Subsequently, a meeting was held with PIIO, at their request, for the purpose of additional comment. The final program (Table 1) was determined by DEP staff from the three separate divisions .

Sampling locations chosen included historical sites showing recent high concentrations in fish, some historically high sites without recent data (Kennebec River at Sidney), historical sites for different species of interest (Kennebec River at Shawmut, bass), new sites of concern (Androscoggin River at Rumford and Livermore Falls, Piscataquis River at Sangerville) and 2 reference sites (Messalonskee Lake and Webber Pond). Limited to no more than 12 sites, DEP cannot monitor all appropriate sites in any one year. The more contaminated sites will be monitored annually while the less contaminated sites will be monitored less frequently. Furthermore, not all sites were successfully sampled. No fish were captured from the St. John River or the East Branch of the Sebasticook River.

Fish were collected by DEP, DIFW, the Atlantic Sea Run Salmon Commission, Penobscot Indian Nation, and DEP selected anglers using various methods. Reference site fish were collected by DEP at bass tournaments hosted by the Ambassadors of Maine and Androscoggin Bassmasters. To facilitate comparisons with earlier data and document the risk to human and wildlife consumers, the target was to collect 10 predators and 10 bottom feeders at each station. This was not always accomplished, but some fish were captured at all but two sites. Fish were captured, killed quickly, rinsed in river water, wrapped in aluminum foil with the shiny side out, labelled and placed on ice until transferred back to a location where they were then frozen for shipment to the lab.

In order to determine the variation in levels of contamination important for the protection of pregnant women and nursing infants, predators were analyzed individually as skinless fillets. Bottom feeders were usually combined into 2 composites of five whole fish each. Samples were

Table 1. Fish species and sampling locations for the 1991 Dioxin Monitoring Program

SAMPLING SITE	FACILITY	SPECIES
1. Androscoggin R Rumford	Boise Cascade Corp. Rumford	bass sucker
2. Androscoggin R Livermore Falls	International Paper Jay	bass bullhead
3. Kennebec R Shawmut	SD Warren Co Skowhegan	bass sucker
4. Kennebec R Sidney	Kennebec Sanitary Treatment District Waterville	bass sucker
5. Piscataquis R Sangerville	Guilford-Sangerville Sewer District Guilford	trout/bass sucker
6. Penobscot R S Lincoln	Lincoln Pulp & Paper Lincoln	bass sucker
7. Penobscot R Veazie	James River Co. Old Town	bass sucker
8. Presumpscot R Westbrook	SD Warren Co. Westbrook	bass sucker
9. St. Croix R Woodland	Georgia Pacific Co Woodland	bass sucker
10. St. John R. Madawaska	Fraser Paper Ltd. Madawaska	brook trout sucker
11. Sebasticook R. East Branch Newport	Corinna Sewer Dist. Corinna	bass sucker
12. Messalonskee Lake Webber Pond	reference sites	bass sucker

analyzed by Midwest Research Institute (MRI) of Kansas City, Missouri for all 2378 substituted and all tetra through octa chlorinated dioxins and furans. MRI was selected from a group of 4 nationally prominent labs on the basis of an appropriate quality assurance and quality control program and the ablility to provide lower detection limits and a lower cost than the other labs.

A separate sludge sampling program was not conducted. Not enough funds were allocated in the amended bill to conduct a separate program. Monitoring results from DEP's sludge spreading program and some pre-1991 effluent data supplied by the paper industry were available for some of the facilities and were used to meet the goals of identifying sources and showing recent reductions in the discharge of dioxin and furan to some of the waterbodies.

As proposed in the 1990 report, sediments from 5 sites on the Androscoggin River were collected during March 1991. Surficial grabs were collected by use of an Ekman dredge at the Otis impoundment in Livermore Falls, approximately 3 miles below the discharge from IP's mill into the Jay impoundment, and from the Worumbo Impoundment in Lisbon, approximately 44 miles further downstream. Core samples were collected from the Virginia impoundment just above Boise Cascade in Rumford, from the Riley impoundment in Jay about 21 miles below Boise, and from Gulf Island Pond about 29 miles below IP by use of a piston corer driven to refusal. Cores were sectioned at 2 cm intevals and surface sections analyzed with grabs from the other two stations for dioxin and total organic carbon. All other sections were frozen in storage for future analysis. Aliquots of each section of the core samples were delivered to Dr. Stephen Norton, Department of Geology, University of Maine at Orono for dating.

For water quality management planning for the protection of human consumers of contaminated fish against certain involuntary health risks, the BOH has recommended maximum allowable levels of 2378-TCDD in fish fillets as follows (Frakes, 1990). "For a one in one million (10^{-6}) upper limit cancer risk the concentration of 2378-TCDD in the edible portion (fillets) of fish should not exceed 0.15 ppt (parts per trillion) and for a one in one hundred thousand (10^{-5}) upper limit cancer risk the concentration of 2378-TCDD in the edible portion (fillets) of fish should not exceed 1.5 ppt. For protection against adverse reproductive effects, the concentration of 2378-TCDD in the edible portion (fillets) of fish should not exceed 0.37 ppt (parts per trillion)." Although no risk level has been selected for the cancer risk, the Board of Environmental Protection used 10^{-6} in setting a limit for dioxin in the sludge spreading rules in 1986. For this report levels of dioxin in fish exceeding any of these recommendations will be reported as significant.

For managing the risk to consumers of eating fish already contaminated with dioxin, the BOH publishes fish consumption advisories for particular waterbodies. In past years a level of 1.0 ppt was used by the BOH as the threshold for setting a fish consumption advisory. Due to a recent downward revision in the cancer potency of 2378-TCDD, the new threshold is 1.5 ppt. Results of the 1991 program have been reviewed by the BOH and used to revise the fish consumption advisories (Appendix 1).

RESULTS

Fish

The results (Table 2, Appendix 2) showed lower levels of 2378-TCDD and 2378-TCDF in fish than in previous years at those sites with historical data for the same species (shaded area). All other congers were not present in significant amounts; therefore, the term dioxin will be used to mean 2378-TCDD and 2378-TCDF together throughout the remainder of this report.

Since a different lab was used in 1991 than in previous years and since some of the values for dioxin were significantly lower than in previous years or lower than expected based on limited knowledge of reductions in discharges, DEP desired to verify the results. Consequently, an interlaboratory study was conducted in which an aliquot of each of four fish samples and a blind duplicate of one of those was sent from MRI to Triangle Labs (TLI), which had analyzed Maine's 1988-1990 samples. Three of those samples were also sent to Alta Analytical, a lab used by the paper industry, which found even lower values (Appendix 5) than MRI in fish sampled in 1991 at some of the same locations as the DEP program. Results of the interlaboratory study (Appendix 6) showed that, while there were consistent differences among the three labs, MRI giving the highest values and Alta Analytical the lowest, all gave values generally within the the same range. Therefore, the MRI data reported here are believed to be reasonably accurate.

Androscoggin River

<u>Rumford</u> Nine smallmouth bass were collected from the river between the bridge to Boise Cascade's bleached kraft pulp and paper mill in Rumford and the Dixfield-West Peru bridge, within a distance of about 3 miles below the mill. This was a new site this year which should represent the greatest impact of the Boise Cascade discharge. Results showed that levels of dioxin in the bass were lower than expected compared to earlier data at other sites in the river. This may be a result of a reduction in discharge of dioxin from the mill as documented by effluent data collected through mid-1990 by Boise Cascade (Appendix 4), although no newer data are available to determine more recent concentrations of dioxin in the discharge. These levels in fish are significant but much lower than levels reported in 1990 in fish above Riley Dam further downstream of Boise. However, it has since been discovered the Riley Dam fish were actually collected below Riley Dam in the Jay impoundment near Bean Island about 1 mile above the discharge from International Paper Company's (IP) bleached kraft pulp and paper mill into the same impoundment. Therefore, those fish

TABLE 2. DIOXIN AND FURAN LEVELS IN MAINE FISH (pg/g)

WATER/STATION	SPECIES	TYPE	EPA NDS/NBS 1984-86	DEP DIOXIN MONITORING PROGRAM 1988-90			DEP DIOXIN MONITORING PROGRAM 1991		
			TCDD	TCDD	TCDF	TEQ	TCDD	TCDF	TEQ
ANDROSCOGGIN R									
Gilead	sucker	f/w	1.8/6.5						
Rumford	bass	f					1.4	6.2	2.0
Jay	sucker	f/w	<2.1/13.0						
	bass	f		17.6	30.5	20.7			
Livermore Falls	bass	f					2.4	4.8	2.9
N Turner	sucker	f/w	6.2/30.0						
Turner-GIP	sucker	f/w	8.3/29.0						
	bullhead	f/w	7.8/29.6						
	bass	f/w	3.7/24.0						
Lisbon Falls	sucker	f/w	5.1/12.0						
	bass	f		4.5	4.9	5.0			
	trout	f		5.3	6.1	5.9			
Brunswick	carp	f	11.0						
	sucker	w	19.0						
BEARCE LAKE									
Baring	pickerel	f	<0.1						
KENNEBEC R									
Fairfield	sucker	w	6.4	10.3	32.8	13.6			
	trout	f		6.2	5.6	6.8			
	bass	f					1.4	0.8	1.5
Sidney	sucker	f/w	1.2/11.4						
	bass	f/w	/20.3				1.0/	0.9/	1.1/
Augusta	sucker	w		5.0	13.4	6.3			
	trout	f		2.2	2.1	2.4			
MESSALONSKEE LAKE									
Belgrade	bass						<0.09	0.2	<0.11
NARRAGUAGUS R									
Cherryfield	fallfish	w	<1.0						
NORTH POND									
Chesterfield	sucker	w	0.37						
	pickerel	f	<0.1						
PENOBSCOT R									
E Branch	sucker	w		<0.1	0.8	<0.4			
	bass	f		<0.4	<0.2	<0.4			
E Millinocket	sucker	w		0.7	24.3	3.1			
	bass	f		<0.2	3.6	<0.6			
N Lincoln	sucker	w		<0.5/20.8	.6/1	2.3/31.2			
	bass	f		<0.4	1.6	<0.4			
S Lincoln	sucker	w		37.0	201	57.0			
	bass	f	5.0	1.7	3.2	2.0	0.8	2.1	1.0
Passadumkeag	sucker	w		2.8	37.4	6.6			
	bass	f		1.8	6.7	2.4			
Milford	sucker	w		9.7	74.1	17.1			
	bass	f		0.9	3.8	1.3			
Veazie	sucker	f/w	2.6/7.6	/5.9	/25.0	/7.4	/2.5	/17.4	/4.2
	bass	f/w	/4.6	1.9/	2.5/	2.1/	1.2/	1.8/	1.4/
Owls Head	mussels	w	<0.8						

TABLE 2. (cont.)

WATER/STATION	SPECIES	TYPE	EPA NDS/NBS 1984-86	DEP DIOXIN MONITORING PROGRAM 1988-90			1991		
			TCDD	TCDD	TCDF	TEQ	TCDD	TCDF	TEQ
PISCATAQUIS R									
Sangerville	sucker						0.3	1.1	0.4
	bass						<0.09	0.3	<0.09
	trout						<0.1	0.3	<0.1
Howland	bass	f		<0.2	0.2	<0.2			
PRESUMPSCOT R									
Westbrook	sucker	w	5.2	5.1	11.5	6.2	0.7	4.3	1.1
	bass	f		1.8	2.2	2.0	0.1	0.5	0.2
	pickerel	f		<2.6	0.5	<2.6			
	w perch	f		1.2	4.2	1.6	0.4	2.1	0.6
ST CROIX R									
Calais	sucker	w	<0.7	0.6	2.3	0.8			
Woodland	bass	f		0.3	0.5	0.3	<0.08	0.2	<0.1
ST JOHN R									
Madawaska	y perch	f		<0.5	0.7	<0.6			
SACO R									
Dayton	sucker	w	<0.3						
SALMON FALLS R									
S Berwick	sucker	w		1.5	1.7	1.7			
	bass	f		0.4	0.4	0.4			
	pickerel	f		0.2	0.3	0.3			
SANDY P									
N Anson	bass	f	<1.0						
SEBAGO L									
Naples	bass	w	<0.6						
SEBASTICOOK R									
E Br Newport	bass	f	<0.2						
	w perch	f		1.0	4.4	1.4			
W Br Palmyra	sucker	w	1.57	3.3	1.6	3.5			
	pickerel	f	<0.1						
	bass	f		1.2	0.4	1.2			
WEBBER POND									
Vassalboro	bass	f					<0.08	0.3	<0.11

f=fillet
w=whole
TEQ = toxic equivalents = 2378-TCDD + 0.1 x 2378 TCDF
shaded stations have historical data for the same species and sample type

may have travelled within the impoundment and been exposed to the IP effluent at some time, which might explain the high values. Nevertheless, the Jay impoundment data are considered representative of that site.

Livermore Falls Ten smallmouth bass were collected from the Otis impoundment from the same site as the sediment sample. This was also a new site and was selected to represent a nearly maximum exposure to IP's discharge, without suffering from the problems of interpretation as with the Jay site. Levels of dioxin in the bass were significantly lower than those of the Jay site in 1989. This shows either a reduction in discharge of dioxin since 1989, which remains unknown due to a lack of data, or perhaps the difference in sites. Levels were, however, significant and the highest detected in this year's program.

Kennebec River

Fairfield Ten smallmouth bass were collected within a 1 mile section of the tailrace immediately below the Shawmut Dam, about 7-8 miles below SD Warren Inc.'s bleached kraft pulp and paper mill in Skowhegan. Levels of dioxin in the bass were significant although lower than historical levels in brown trout and white suckers, which are the only species ever sampled at this site. Since there are no previous data for bass, it is unknown whether the 1991 data reflect a reduced discharge of dioxin from the mill or the variation among species. Levels of dioxin in limited samples of wastewater in 1990 were lower than in the one sample in 1988 (Appendix 4) but levels of dioxin in sludge in 1990 and 1991 are not lower than some of the earlier data (Appendix 3).

Sidney Ten smallmouth bass were collected near the Sidney boat landing, about 25 miles below the discharge from the SD Warren mill and about 9-10 miles below the discharges from Scott Paper Company's paper mill in Winslow and the Kennebec Sanitary District's discharge in Waterville. All of these discharges have significant levels of dioxin in the wastewater sludge, (Appendix 3) and therefore probably in the wastewater as documented for the SD Warren mill (Appendix 4). Levels of dioxin in fish at Sidney were lower than those at Fairfield. No direct comparison with earlier data can be made at this site as previous samples of bass, which had much higher levels of dioxin, were analyzed as whole fish. However, levels in this year's bass were similar to those in sucker fillets collected during EPA's National Dioxin Study during 1984-1986.

Messalonskee Lake

Five smallmouth bass were collected during a bass tournament from this site to represent natural background since there are no known sources of dioxin to the lake. Results showed no significant amount of dioxin detected in these samples.

Penobscot River

South Lincoln Nine smallmouth bass were collected near the South Lincoln boat ramp approximately 3-4 miles below the discharge from Lincoln Pulp and Paper Company's bleached kraft pulp and paper mill in Lincoln. Levels of dioxin in the fish were significant, although statistically significantly lower than levels found in bass during EPA's National Dioxin Study in 1986 and DEP's 1988-1990 program. There are no new data for Lincoln Pulp and Paper Co.'s effluent or sludge since 1989 to document the extent of any recent changes in discharge from the mill.

Veazie Ten smallmouth bass and ten white suckers were collected at the trap operated by the Atlantic Sea Run Salmon Commission at the Veazie Dam, approximately 8 miles below James River Corporation's bleached kraft pulp and paper mill in Old Town. Levels of dioxin in both species were significant, although statistically significantly lower than in samples collected in 1990. Although there are no new data for concentrations of dioxin in effluent or sludge for 1991, effluent concentrations of dioxin in 1990 were lower than those from previous years (Appendix 4) which may have resulted in lower levels in fish in 1991.

Piscataquis River

Guilford Three brook trout, two smallmouth bass, and two white suckers were collected near the confluence of Black Stream about 3 miles below the Guilford-Sangerville wastewater treatment plant serving the Guilford Industries textile mill and the town of Guilford. No significant levels of dioxin were found in any of these fish.

Presumpscot River

Westbrook Five smallmouth bass, one largemouth bass, four white perch, and ten white suckers were collected near the route 302 bridge crossing about 1.5 miles below SD Warren's bleached kraft pulp and paper mill. Levels of dioxin all species were significant. Levels in the bass and white perch were statistically significantly lower than those from 1989. Levels in suckers were not statistically significantly different from earlier data (at a 95%

probability, but were at a 90% probability). This is likely a result of lower discharges of dioxin from SD Warren, as documented by reduced levels in the sludge following installation of a new pulping system in 1989 (Appendix 3).

St. Croix River

Woodland- Smallmouth bass were collected just below Georgia Pacific's bleached kraft pulp and paper mill from the confluence of Wapsaconhagen Stream. No significant amounts of dioxin were detected. Since these results are similar to those of previous years, DEP will now delist this waterbody and the mill from the 304L list, which is a list of waterbodies not attaining their classification standards due to the point source discharge of toxic pollutants.

Webber Pond

Five largemouth bass were collected at a bass tournament at this site to represent fish from a site with no known sources of dioxin. No significant amounts of dioxin were detected.

Sediments

Results of the sediment sampling program showed that concentrations of dioxin were highest in Gulf Island Pond and were similar to those seen in 1985 (Appendix 7). These sediments may remain a significant source of dioxin and result in continued high dioxin levels in fish, but as no fish were collected from this site in 1991 this idea cannot be confirmed at this time. Both fish and sediment were collected only at the Otis impoundment site which had no historical fish data to compare. The abundance of sediment at this site and all others was much lower than in Gulf Island Pond. Sediments at these sites may not be such an important continuing source of dioxin to the fish as the sediments in Gulf Island Pond. This may also help explain why the level of dioxin in the fish from the Otis impoundment were so much lower than expected compared to the 1989 data from the Jay impoundment

REFERENCES

Frakes, R.A., 1990. Health-based water quality criteria for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Maine Department of Human Services, Bureau of Health, Augusta, Maine. 32pp & appendices.

Mower, B., 1990. Maine's Dioxin Monitoring Program, 1988-1990. Department of Environmental Protection, Augusta, Maine. 51pp.

APPENDIX 1

MAINE BUREAU OF HEALTH

FISH CONSUMPTION ADVISORY

10 FEBRUARY 1992

HUMAN SERVICES News

Office of Public Affairs & Communications
Maine Department of Human Services
State House Station 11
Augusta, Maine 04333
Tel. 289-3707

JOINT STATEMENT, FEBRUARY 10, 1992:
Department of Environmental Protection
Department of Human Services
Department of Inland Fish and Wildlife

SUBJECT: REDUCED DIOXIN LEVELS PROMPT REVISED FISH ADVISORY

CONTACT: Robert Frakes
Department of Human Services
Bureau of Health
Telephone: 289-5378

Dean Marriott, Commissioner
Department of Environmental Protection
Telephone: 289-2812

AUGUSTA - Recent tests by the Department of Environmental Protection (DEP) showed reductions in levels of dioxin in fish taken from Maine's major rivers. The results are similar to those reported by the paper industry in August 1991.

Officials say the changes reflect reduced discharges of the chemical from pulp and paper mills across the state. The improvements have prompted a revision of a fish consumption advisory issued in March 1990.

The new language raises recommended consumption limits for most segments of the population. Previous advisories that pregnant women and nursing mothers not eat fish caught in the Presumpscot River below Westbrook and the West Branch of the Sebasticook below Hartland have also been lifted.

-MORE-

According to State Toxicologist Dr. Robert Frakes, data from Maine's dioxin Monitoring Program supports revising the warnings to be published in the State Open Water Fishing Regulations. However, some cautions remain in place.

"Women of childbearing age still should not eat any fish from the Androscoggin River, the Kennebec River below Skowhegan and the Penobscot River below Lincoln. Furthermore, the general public should not eat more than one fish meal per month from the Androscoggin or more than two fish meals per month from those sections of the Kennebec and Penobscot".

A "fish meal" is considered to be one 8-ounce portion.

Dioxion levels in fish have been monitored under the DEP administered program since 1988. Because even very low levels of TCDD dioxin have been linked to increased cancer rates and reproductive problems in laboratory animals, health advisories were issued in 1985, 1987 and 1990.

Commenting on the latest revision to the advisories, DEP Commissioner Dean Marriott emphasized the progress that has been made in a relatively short period of time.

"Industry has been working to reduce the formation of dioxin by actually changing the manufactoring process. The recent data would seem to indicate that these efforts are showing positive results."

A full report of the 1991 Dioxin Monitoring Program is now being prepared and will be presented to the legislature's Joint Standing Committee on Energy and Natural Resources.

APPENDIX 2

DIOXINS AND FURANS IN MAINE FISH

1991

CODES

STATIONS

ARR	ANDROSCOGGIN RIVER AT RUMFORD
ARLF	ANDROSCOGGIN RIVER AT LIVERMORE FALLS
KRSD	KENNEBEC RIVER AT SIDNEY
KRSM	KENNEBEC RIVER AT SHAWMUT DAM, FAIRFIELD
ML	MESSALONSKEE LAKE
PBL	PENOBSCOT RIVER AT SOUTH LINCOLN
PB	PENOBSCOT RIVER AT VEAZIE
PS	PISCATAQUIS RIVER AT GUILFORD
PR	PRESUMPSCOT RIVER AT WESTBROOK
SC	ST. CROIX RIVER AT WOODLAND
WP	WEBBER POND

SPECIES

BKT	BROOK TROUT
LMB	LARGEMOUTH BASS
SMB	SMALLMOUTH BASS
WHP	WHITE PERCH
WSU	WHITE SUCKER

Analyte	Field ID Extract ID MS File	Method Blank 1 32615 K19V11.RPT	ARR-SMB-01 32593 K19V12.RPT	ARR-SMB-02 32594 K19V13.RPT	ARR-SMB-03 32595 K20V31.RPT	ARR-SMB-04 32596 K19V14.RPT	ARR-SMB-05 32597 K19V15.RPT	ARR-SMB-06 32598 K19V16.RPT
2378TCDF		ND(.102 cdl) (a)	9.98	6.9	4.3	4.49	3	7.88
2378TCDD		ND(.112 cdl)	2.09	1.28	0.97	0.888	1.16	1.86
12378PECDF		ND(.0894 cdl)	0.399	ND(.508 mpc) (b)	0.181	0.203	0.286	ND(.464 mpc)
23478PECDF		ND(.0894 cdl)	0.663	0.78	0.275	0.316	0.388	0.645
12378PECDD		ND(.0914 cdl)	ND(.104 mpc)	ND(.164 mpc)	0.0828	ND(.0873 mpc)	ND(.0999 mpc)	0.139
123478HXCDF		ND(.239 cdl)	ND(1.23 mpc)	ND(2.13 mpc)	ND(.792 mpc)	ND(1.98 mpc) (c)	ND(1.77 mpc) (c)	ND(1.42 mpc)
123678HXCDF		ND(.239 cdl)	ND(.477 mpc)	ND(1.32 mpc)	ND(.263 mpc)	ND(1.72 mpc) (c)	ND(1.2 mpc) (c)	ND(.55 mpc)
234678HXCDF		ND(.239 cdl)	ND(.405 mpc)	ND(.88 mpc)	ND(.196 cdl)	ND(1.16 mpc) (c)	ND(.884 mpc) (c)	ND(.449 mpc)
123789HXCDF		ND(.239 cdl)	ND(.243 mpc)	ND(.292 mpc)	ND(.196 cdl)	ND(.972) (c)	ND(.928) (c)	ND(.317)
123478HXCDD		ND(.232 cdl)	ND(.218 mpc)	ND(.688 mpc)	ND(.46 mpc)	ND(.275 mpc)	ND(.31 mpc)	ND(.326 mpc)
123678HXCDD		ND(.232 cdl)	0.299	1.11	ND(.192 cdl)	ND(.204 cdl)	ND(.223 cdl)	ND(.18 cdl)
123789HXCDD		ND(.232 cdl)	ND(.162 cdl)	0.23	ND(.192 cdl)	ND(.204 cdl)	ND(.223 cdl)	ND(.18 cdl)
1234678HPCDF		ND(.232 cdl)	ND(.321 cdl) (c)	0.36	ND(.37 cdl) (c)	ND(.236 cdl)	ND(.309 cdl)	ND(.805 mpc) (c)
1234789HPCDF		ND(.232 cdl)	ND(.321 cdl) (c)	ND(.273 cdl)	ND(.37 cdl) (c)	ND(.236 cdl)	ND(.309 cdl)	ND(.365 cdl) (c)
1234678HPCDD		ND(.268 cdl)	ND(.398 cdl) (c)	1.21 (c)	ND(.461 cdl) (c)	ND(.258 cdl)	ND(.356 cdl) (c)	ND(.431 cdl) (c)
123467890CDF		ND(.689 cdl) (c)	ND(1.39 cdl) (c)	ND(1.06 cdl) (c)	ND(1.48 cdl) (c)	ND(.894 cdl) (c)	ND(1.35 cdl) (c)	ND(1.42 cdl) (c)
123467890CDD		0.859 (c)	1.54 (c)	6.58 (c)	ND(1.48 cdl) (c)	ND(.894 cdl) (c)	ND(1.35 cdl) (c)	ND(1.42 cdl) (c)
TCDF		ND(.102 cdl)	10.7	7.87	4.99	5.02	4.17	8.92
TCDD		0.198	2.3	1.28	1.12	1.04	1.32	2.11
PeCDF		ND(.0894 cdl)	1.97	1.33	1.18	1.18	1.39	1.7
PeCDD		ND(.0914 cdl)	ND(.104)	ND(.195)	0.0828	ND(.0458)	ND(.0445 cdl)	0.139
HxCDF		ND(.239 cdl)	ND(.24 cdl)	ND(.242 cdl)	ND(.196 cdl)	ND(.822) (c)	ND(.785) (c)	ND(.268)
HxCDD		ND(.232 cdl)	0.315	1.43	ND(.192 cdl)	ND(.204 cdl)	ND(.223 cdl)	ND(.18 cdl)
HpCDF		ND(.232 cdl)	0.801 (c)	1.02	0.623 (c)	ND(.236 cdl)	1.08	1.11 (c)
HpCDD		ND(.268 cdl)	ND(.398 cdl) (c)	1.21 (c)	ND(.461 cdl) (c)	ND(.258 cdl)	ND(.356 cdl) (c)	ND(.431 cdl) (c)
% Lipid		-	2.20	1.87	1.64	2.14	1.61	2.65

(a) - Not detected with a curve-based detection limit (cdl) in parenthesis. Method blank MDLs based on nominal 50-g sample size.
(b) - Not detected with a maximum possible concentration (mpc) in parenthesis.
(c) - Estimated concentration or detection limit. Corresponding labeled analog exhibited recovery outside SOP criteria (40-120%).

Analyte	Field ID Extract ID MS File	ARR-SMB-07 32599 K19V22.RPT	ARR-SMB-08 32600 K27V31.RPT	ARR-SMB-09 32601 K20V11.RPT	KRSD-SMB-01 32602 K20V12.RPT	KRSD-SMB-02 32603 K20V32.RPT	KRSD-SMB-03 32604 K20V33.RPT	KRSD-SMB-04 32605 K20V34.RPT
2378TCDF		6.03	6.25	6.54	1.67	0.801	0.713	0.612
2378TCDD		1.19	1.55	1.24	1.48	1.14	0.913	0.833
12378PECDF		0.373	0.354	0.266	ND(3.09 mpc)	ND(.0652 cdl)	ND(1.99 mpc)	0.43
23478PECDF		0.489	0.537	0.423	0.471	0.303	0.293	ND(.107 mpc)
12378PECDD		0.0949	0.191	ND(.119 mpc)	0.36	ND(.13 mpc)	ND(.119 mpc)	0.13
123478HXCDF		ND(1.32 mpc)	ND(.192 cdl)	ND(1.62 mpc)	ND(21.6 mpc) (c)	ND(9.63 mpc)	ND(10.4 mpc)	ND(3.96 mpc)
123678HXCDF		ND(.998 mpc)	ND(.192 cdl)	ND(.982)	ND(2.62 mpc) (c)	ND(1.06 mpc)	ND(.769 mpc)	0.311
234678HXCDF		ND(.732 mpc)	ND(.192 cdl)	ND(1.12)	ND(1.55 mpc) (c)	ND(.867 mpc)	ND(.312 mpc)	ND(.149 cdl)
123789HXCDF		ND(.573)	ND(.192 cdl)	ND(1.35)	ND(2.97 mpc) (c)	ND(1.58 mpc)	1.23	ND(.764 mpc)
123478HXCDD		ND(.178 cdl)	ND(.195 cdl)	ND(.289 mpc)	ND(1.24 mpc)	ND(.173 cdl)	ND(.518 mpc)	ND(.173 cdl)
123678HXCDD		ND(.178 cdl)	ND(.195 cdl)	ND(.204 cdl)	0.361	0.421	ND(.16 cdl)	ND(.173 cdl)
123789HXCDD		ND(.178 cdl)	ND(.195 cdl)	ND(.204 cdl)	ND(.243 cdl)	ND(.173 cdl)	ND(.16 cdl)	ND(.173 cdl)
1234678HPCDF		ND(.241 cdl)	ND(.182 cdl)	ND(.379 cdl) (c)	ND(.291 cdl)	ND(.265 cdl)	ND(.252 cdl)	ND(.254 cdl)
1234789HPCDF		ND(.241 cdl)	ND(.182 cdl)	ND(.379 cdl) (c)	ND(.291 cdl)	ND(.265 cdl)	ND(.252 cdl)	ND(.254 cdl)
1234678HPCDD		ND(.289 cdl)	0.475	ND(.372 cdl) (c)	ND(.3 cdl)	ND(.327 cdl) (c)	ND(.293 cdl)	ND(.307 cdl)
12346789OCDF		ND(.858 cdl) (c)	ND(.544 cdl)	ND(1.25 cdl) (c)	ND(1.03 cdl) (c)	ND(1.19 cdl) (c)	ND(1.06 cdl) (c)	ND(.832 cdl) (c)
12346789OCDD		1.12 (c)	3.32	ND(1.25 cdl) (c)	ND(1.03 cdl) (c)	ND(1.19 cdl) (c)	ND(1.06 cdl) (c)	ND(.832 cdl) (c)
TCDF		6.96	6.73	7.52	4.81	5.32	3.8	5.51
TCDD		1.35	1.55	1.37	1.59	1.24	1.02	0.945
PeCDF		1.1	0.903	1.82	3.14	4	1.55	2.45
PeCDD		0.0949	0.191	ND(.0484 cdl)	0.36	ND(.179)	ND(.0873)	0.13
HxCDF		ND(.485)	ND(.192 cdl)	ND(1.15)	ND(.32 cdl) (c)	ND(.245 cdl)	2.49	1.16
HxCDD		ND(.178 cdl)	ND(.195 cdl)	ND(.204 cdl)	0.381	0.315	ND(.16 cdl)	ND(.173 cdl)
HpCDF		ND(.241 cdl)	ND(.182 cdl)	1.28 (c)	ND(.291 cdl)	ND(.265 cdl)	ND(.252 cdl)	ND(.254 cdl)
HpCDD		ND(.289 cdl)	0.73	ND(.372 cdl) (c)	ND(.3 cdl)	ND(.327 cdl) (c)	ND(.293 cdl)	ND(.307 cdl)
% Lipid		2.06	2.00	2.02	1.51	1.28	1.25	1.06

Analyte	Field ID Extract ID MS File	KRSD-SMB-05 32606 K20V35.RPT	KRSD-SMB-06 32607 K20V36.RPT	KRSD-SMB-07 32608 K21V13.RPT	KRSD-SMB-08 32609 K21V12.RPT	KRSD-SMB-09 32610 K21V14.RPT	KRSD-SMB-10 32611 K27V41.RPT	WP-LMB-05 32612 K21V16.RPT
2378TCDF		0.764	0.825	0.52	1.07	1.42	0.582	0.165
2378TCDD		0.751	1.1	0.641	1.07	1.56	0.767	ND(.0802 cdl)
12378PECDF		ND(.921 mpc)	ND(1.05 mpc)	ND(.534 mpc)	ND(.844 mpc)	ND(.0835 cdl)	ND(.0688 cdl)	0.138
23478PECDF		0.209	0.287	ND(.0627 cdl)	0.277	0.361	0.112	ND(.0645 cdl)
12378PECDD		0.162	0.25	0.144	0.29	0.304	ND(.165 mpc)	ND(.0589 cdl)
123478HXCDF		ND(5.63 mpc)	ND(5.5 mpc)	ND(4.38 mpc)	ND(6.2 mpc)	ND(5.29 mpc)	ND(.179 cdl)	ND(1.76 mpc)
123678HXCDF		ND(.427 mpc)	ND(.951 mpc)	ND(.317 mpc)	ND(.348 mpc)	ND(.575 mpc)	ND(.179 cdl)	ND(.176 cdl)
234678HXCDF		ND(.198 cdl)	ND(.632 mpc)	0.254	0.269	ND(.812 mpc)	ND(.179 cdl)	0.193
123789HXCDF		ND(.323 mpc)	ND(.518 mpc)	0.709	ND(1.06 mpc)	ND(1.33 mpc)	ND(.179 cdl)	ND(.176 cdl)
123478HXCDD		ND(.2 mpc)	ND(.405 mpc)	ND(.228 mpc)	ND(.192 cdl)	ND(.334 mpc)	ND(.19 cdl)	ND(.19 mpc)
123678HXCDD		ND(.181 cdl)	ND(.208 cdl)	ND(.162 cdl)	0.211	ND(.254 mpc)	ND(.19 cdl)	ND(.174 cdl)
123789HXCDD		ND(.181 cdl)	ND(.208 cdl)	ND(.162 cdl)	ND(.192 cdl)	ND(.247 cdl)	ND(.19 cdl)	ND(.174 cdl)
1234678HPCDF		ND(.335 cdl) (c)	ND(.329 cdl) (c)	ND(.392 cdl) (c)	ND(.296 cdl)	ND(.335 cdl) (c)	0.234	ND(.305 cdl)
1234789HPCDF		ND(.335 cdl) (c)	ND(.329 cdl) (c)	ND(.392 cdl) (c)	ND(.296 cdl)	ND(.335 cdl) (c)	ND(.186 cdl)	ND(.305 cdl)
1234678HPCDD		ND(.407 cdl) (c)	ND(.423 cdl) (c)	ND(.502 cdl) (c)	ND(.341 cdl) (c)	ND(.424 cdl) (c)	0.519	ND(.372 cdl) (c)
12346789OCDF		ND(1.35 cdl) (c)	ND(1.66 cdl) (c)	ND(1.95 cdl) (c)	ND(1.14 cdl) (c)	ND(1.58 cdl) (c)	1.55	ND(1.13 cdl) (c)
12346789OCDD		ND(1.35 cdl) (c)	ND(1.66 cdl) (c)	ND(1.95 cdl) (c)	ND(1.14 cdl) (c)	ND(1.58 cdl) (c)	5.86	ND(1.13 cdl) (c)
TCDF		2.35	5.35	2.03	3.5	4.5	0.582	1.83
TCDD		0.865	1.23	0.77	1.29	1.83	0.95	0.162
PeCDF		1.69	1.37	0.52	2.11	2.21	0.119	2.25
PeCDD		0.162	0.25	0.144	0.29	0.304	ND(.0703 cdl)	ND(.0589 cdl)
HxCDF		0.287	ND(.303)	0.86	1.46	ND(.494)	ND(.179 cdl)	0.562
HxCDD		ND(.181 cdl)	ND(.208 cdl)	ND(.162 cdl)	0.223	ND(.247 cdl)	ND(.19 cdl)	ND(.174 cdl)
HpCDF		ND(.335 cdl) (c)	ND(.329 cdl) (c)	ND(.392 cdl) (c)	ND(.296 cdl)	ND(.335 cdl) (c)	0.802	ND(.305 cdl)
HpCDD		ND(.407 cdl) (c)	ND(.423 cdl) (c)	ND(.502 cdl) (c)	ND(.341 cdl) (c)	ND(.424 cdl) (c)	0.906	ND(.372 cdl) (c)
% Lipid		1.26	1.02	1.05	1.39	1.61	1.12	0.99

Analyte	Field ID Extract ID MS File	Method Blank 2 32638 K21V21.RPT	PB-SMB-01 32616 K26V14.RPT	PB-SMB-02 32617 K21V42.RPT	PB-SMB-03 32618 K21V44.RPT	PB-SMB-04 32619 K21V45.RPT	PB-SMB-05 32620 K21V46.RPT	PB-SMB-06 32621 K21V47.RPT
2378TCDF		ND(.0894 cdl)	0.689	1.2	4.66	0.423	1.86	2.39
2378TCDD		ND(.096 cdl)	0.987	1.22	1.85	0.775	1.37	0.989
12378PECDF		ND(.0825 cdl)	0.0807	ND(.0771 cdl)	0.155	ND(.114 cdl)	0.0923	0.128
23478PECDF		ND(.0825 cdl)	0.137	0.167	0.234	ND(.114 cdl)	0.143	0.195
12378PECDD		ND(.0891 cdl)	ND(.091 mpc)	0.168	0.265	ND(.116 cdl)	0.133	0.166
123478HXCDF		ND(.189 cdl)	ND(.188 cdl)	ND(.167 cdl)	ND(.172 cdl)	ND(.243 cdl)	ND(.163 cdl)	ND(.19 cdl)
123678HXCDF		ND(.189 cdl)	ND(.188 cdl)	ND(.167 cdl)	ND(.172 cdl)	ND(.243 cdl)	ND(.163 cdl)	ND(.19 cdl)
234678HXCDF		ND(.189 cdl)	ND(.188 cdl)	ND(.167 cdl)	ND(.172 cdl)	ND(.243 cdl)	ND(.163 cdl)	ND(.19 cdl)
123789HXCDF		ND(.189 cdl)	ND(.188 cdl)	ND(.167 cdl)	ND(.172 cdl)	ND(.243 cdl)	ND(.163 cdl)	ND(.19 cdl)
123478HXCDD		ND(.184 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.192 cdl)	ND(.258 cdl)	ND(.177 cdl)	ND(.193 cdl)
123678HXCDD		ND(.184 cdl)	ND(.188 cdl)	ND(.174 cdl)	0.326	ND(.258 cdl)	ND(.177 cdl)	ND(.193 cdl)
123789HXCDD		ND(.184 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.192 cdl)	ND(.258 cdl)	ND(.177 cdl)	ND(.193 cdl)
1234678HPCDF		ND(.197 cdl)	ND(.17 cdl)	ND(.179 cdl)	ND(.192 cdl)	ND(.264 cdl)	ND(.174 cdl)	ND(.188 cdl)
1234789HPCDF		ND(.197 cdl)	ND(.17 cdl)	ND(.179 cdl)	ND(.192 cdl)	ND(.264 cdl)	ND(.174 cdl)	ND(.188 cdl)
1234678HPCDD		ND(.201 cdl)	ND(.196 cdl)	0.22	0.25	ND(.288 cdl)	ND(.199 cdl)	0.222
12346789OCDF		ND(.465 cdl)	ND(.474 cdl)	ND(.488 cdl)	ND(.526 cdl)	ND(.706 cdl)	ND(.45 cdl)	ND(.488 cdl)
12346789OCDD		0.624	0.719	1.62	0.8	1.01	0.8	0.797
TCDF		ND(.0894 cdl)	0.689	1.2	4.66	0.423	2.08	2.39
TCDD		ND(.096 cdl)	0.987	1.32	1.85	0.775	1.46	0.989
PeCDF		ND(.0825 cdl)	0.222	0.178	0.555	ND(.114 cdl)	0.364	0.455
PeCDD		ND(.0891 cdl)	ND(.0718 cdl)	0.168	0.265	ND(.116 cdl)	0.133	0.166
HxCDF		ND(.189 cdl)	ND(.188 cdl)	ND(.167 cdl)	ND(.172 cdl)	ND(.243 cdl)	ND(.163 cdl)	ND(.19 cdl)
HxCDD		ND(.184 cdl)	ND(.188 cdl)	ND(.174 cdl)	0.345	ND(.258 cdl)	ND(.177 cdl)	0.201
HpCDF		ND(.197 cdl)	ND(.17 cdl)	0.242	0.206	ND(.264 cdl)	0.183	ND(.188 cdl)
HpCDD		ND(.201 cdl)	ND(.196 cdl)	0.432	0.25	ND(.288 cdl)	ND(.199 cdl)	0.222
% Lipid		-	0.58	0.51	1.06	0.94	0.72	0.67

Analyte	Field ID Extract ID MS File	PB-SMB-07 32622 K21V48.RPT	PB-SMB-08 32623 K21V49.RPT	PB-SMB-09 32624 K22V12.RPT	PB-SMB-10 32625 K23V28.RPT	WP-LMB-01 32626 K22V15.RPT	WP-LMB-02 32627 K22V16.RPT	WP-LMB-03 32628 K22V17.RPT
2378TCDF		2.09	1.65	2.62	0.749	0.359	0.257	0.264
2378TCDD		1	1.9	1.23	0.556	ND(.0868 cdl)	ND(.0911 cdl)	ND(.0728 cdl)
12378PECDF		ND(.0825 cdl)	0.101	0.176	ND(.0702 cdl)	ND(.0658 cdl)	ND(.0826 cdl)	ND(.06 cdl)
23478PECDF		0.142	0.159	0.192	0.0935	ND(.0658 cdl)	ND(.0826 cdl)	ND(.06 cdl)
12378PECDD		0.135	0.175	0.167	0.098	ND(.0718 cdl)	ND(.083 cdl)	ND(.0372 cdl)
123478HXCDF		ND(.179 cdl)	ND(.174 cdl)	ND(.2 cdl)	ND(.184 cdl)	ND(.154 cdl)	ND(.191 cdl)	ND(.167 cdl)
123678HXCDF		ND(.179 cdl)	ND(.174 cdl)	ND(.2 cdl)	ND(.184 cdl)	ND(.154 cdl)	ND(.191 cdl)	ND(.167 cdl)
234678HXCDF		ND(.179 cdl)	ND(.174 cdl)	ND(.2 cdl)	ND(.184 cdl)	ND(.154 cdl)	ND(.191 cdl)	ND(.167 cdl)
123789HXCDF		ND(.179 cdl)	ND(.174 cdl)	ND(.2 cdl)	ND(.184 cdl)	ND(.154 cdl)	ND(.191 cdl)	ND(.167 cdl)
123478HXCDD		ND(.179 cdl)	ND(.183 cdl)	ND(.195 cdl)	ND(.183 cdl)	ND(.16 cdl)	ND(.187 cdl)	ND(.136 cdl)
123678HXCDD		ND(.179 cdl)	ND(.183 cdl)	ND(.195 cdl)	ND(.183 cdl)	ND(.16 cdl)	ND(.187 cdl)	ND(.136 cdl)
123789HXCDD		ND(.179 cdl)	ND(.183 cdl)	ND(.195 cdl)	ND(.183 cdl)	ND(.16 cdl)	ND(.187 cdl)	ND(.136 cdl)
1234678HPCDF		ND(.182 cdl)	ND(.178 cdl)	ND(.195 cdl)	ND(.167 cdl)	ND(.148 cdl)	ND(.177 cdl)	ND(.147 cdl)
1234789HPCDF		ND(.182 cdl)	ND(.178 cdl)	ND(.195 cdl)	ND(.167 cdl)	ND(.148 cdl)	ND(.177 cdl)	ND(.147 cdl)
1234678HPCDD		ND(.2 cdl)	ND(.203 cdl)	0.225	ND(.194 cdl)	ND(.159 cdl)	ND(.196 cdl)	ND(.164 cdl)
12346789OCDF		ND(.483 cdl)	ND(.472 cdl)	ND(.456 cdl)	ND(.416 cdl)	ND(.36 cdl)	ND(.447 cdl)	ND(.374 cdl)
12346789OCDD		0.65	0.699	0.843	0.73	0.586	0.635	0.583
TCDF		2.18	1.65	2.73	0.749	0.359	0.257	0.41
TCDD		1	1.9	1.23	0.556	ND(.0868 cdl)	ND(.0911 cdl)	ND(.0728 cdl)
PeCDF		0.278	0.378	0.49	0.0994	0.145	0.148	0.135
PeCDD		0.135	0.175	0.167	0.098	ND(.0718 cdl)	ND(.083 cdl)	ND(.0372 cdl)
HxCDF		ND(.179 cdl)	ND(.174 cdl)	ND(.2 cdl)	ND(.184 cdl)	ND(.154 cdl)	ND(.191 cdl)	ND(.167 cdl)
HxCDD		ND(.179 cdl)	0.188	ND(.195 cdl)	ND(.183 cdl)	ND(.16 cdl)	ND(.187 cdl)	ND(.136 cdl)
HpCDF		ND(.182 cdl)	0.319	ND(.195 cdl)	ND(.167 cdl)	ND(.148 cdl)	ND(.177 cdl)	ND(.147 cdl)
HpCDD		ND(.2 cdl)	ND(.203 cdl)	0.225	ND(.194 cdl)	ND(.159 cdl)	ND(.196 cdl)	ND(.164 cdl)
% Lipid		0.91	0.53	0.72	0.67	1.79	1.34	1.67

Analyte	Field ID Extract ID MS File	WP-LMB-04 32629 K22V18.RPT	PB-WSU-01 TO PB-WSU-05 32630 K22V19.RPT	PB-WSU-06 TO PB-WSU-10 32631 K22V110.RPT	KRSM-SMB-01 32632 K22V111.RPT	KRSM-SMB-02 32633 K22V22.RPT
2378TCDF		0.479	17.5	17.4	0.557	1.09
2378TCDD		ND(.0808 cdl)	2.6	2.38	0.737	2.26
12378PECDF		ND(.0635 cdl)	0.41	0.374	ND(.0639 cdl)	ND(.0733 cdl)
23478PECDF		ND(.0635 cdl)	0.578	0.539	ND(.0639 cdl)	0.101
12378PECDD		ND(.068 cdl)	0.497	0.452	ND(.069 cdl)	0.105
123478HXCDF		ND(.156 cdl)	0.184	0.15	ND(.159 cdl)	ND(.172 cdl)
123678HXCDF		ND(.156 cdl)	ND(.144 cdl)	ND(.15 cdl)	ND(.159 cdl)	ND(.172 cdl)
234678HXCDF		ND(.156 cdl)	0.178	ND(.15 cdl)	ND(.159 cdl)	ND(.172 cdl)
123789HXCDF		ND(.156 cdl)	ND(.144 cdl)	ND(.15 cdl)	ND(.159 cdl)	ND(.172 cdl)
123478HXCDD		ND(.157 cdl)	0.247	0.219	ND(.163 cdl)	ND(.178 cdl)
123678HXCDD		ND(.157 cdl)	0.845	0.713	ND(.163 cdl)	ND(.178 cdl)
123789HXCDD		ND(.157 cdl)	ND(.155 cdl)	ND(.147 cdl)	ND(.163 cdl)	ND(.178 cdl)
1234678HPCDF		ND(.133 cdl)	0.331	0.328	ND(.138 cdl)	ND(.148 cdl)
1234789HPCDF		ND(.133 cdl)	ND(.134 cdl)	ND(.139 cdl)	ND(.138 cdl)	ND(.148 cdl)
1234678HPCDD		0.182	1.36	1.32	ND(.153 cdl)	0.175
12346789OCDF		ND(.343 cdl)	ND(.34 cdl)	ND(.328 cdl)	ND(.338 cdl)	ND(.347 cdl)
12346789OCDD		0.773	1.46	1.63	0.552	1.12
TCDF		0.693	19.2	18.6	0.557	1.09
TCDD		ND(.0808 cdl)	2.93	2.65	0.813	2.26
PeCDF		0.188	2.29	1.87	ND(.0639 cdl)	0.195
PeCDD		ND(.068 cdl)	0.497	0.452	ND(.069 cdl)	0.105
HxCDF		ND(.156 cdl)	1.54	0.804	ND(.159 cdl)	ND(.172 cdl)
HxCDD		ND(.157 cdl)	1.31	1.12	ND(.163 cdl)	ND(.178 cdl)
HpCDF		ND(.133 cdl)	0.35	0.609	ND(.138 cdl)	ND(.148 cdl)
HpCDD		0.182	1.36	1.5	ND(.153 cdl)	0.175
% Lipid		2.15	7.72	7.73	1.28	1.87

Analyte	Field ID Extract ID MS File	KRSM-SMB-03 32634 K23V22.RPT	KRSM-SMB-07 32635 K23V23.RPT	Method Blank 3 32657 K23V33.RPT	KRSM-SMB-04 32639 K23V34.RPT	KRSM-SMB-05 32640 K23V35.RPT	KRSM-SMB-06 32641 K23V36.RPT	KRSM-SMB-08 32642 K23V37.RPT
2378TCDF		1.17	0.6	ND(.0739 cdl)	0.505	0.868	0.859	1.11
2378TCDD		2.12	0.582	ND(.0933 cdl)	0.931	1.03	0.734	1.76
12378PECDF		ND(.0611 cdl)	ND(.0573 cdl)	ND(.0747 cdl)	ND(.0857 cdl)	0.109	ND(.0682 cdl)	ND(.0687 cdl)
23478PECDF		0.118	ND(.0573 cdl)	ND(.0747 cdl)	ND(.0857 cdl)	0.132	ND(.0682 cdl)	0.0811
12378PECDD		0.0806	ND(.0591 cdl)	ND(.0758 cdl)	ND(.088 cdl)	ND(.0739 mpc)	ND(.0662 cdl)	0.0752
123478HXCDF		ND(.17 cdl)	ND(.186 cdl)	ND(.191 cdl)	ND(.238 cdl)	ND(.181 cdl)	ND(.174 cdl)	ND(.174 cdl)
123678HXCDF		ND(.17 cdl)	ND(.186 cdl)	ND(.191 cdl)	ND(.238 cdl)	ND(.181 cdl)	ND(.174 cdl)	ND(.174 cdl)
234678HXCDF		ND(.17 cdl)	ND(.186 cdl)	ND(.191 cdl)	ND(.238 cdl)	ND(.181 cdl)	ND(.174 cdl)	ND(.174 cdl)
123789HXCDF		ND(.17 cdl)	ND(.186 cdl)	ND(.191 cdl)	ND(.238 cdl)	ND(.181 cdl)	ND(.174 cdl)	ND(.174 cdl)
123478HXCDD		ND(.16 cdl)	ND(.183 cdl)	ND(.192 cdl)	ND(.221 cdl)	ND(.17 cdl)	ND(.168 cdl)	ND(.182 cdl)
123678HXCDD		ND(.16 cdl)	ND(.183 cdl)	ND(.192 cdl)	ND(.221 cdl)	ND(.17 cdl)	ND(.168 cdl)	ND(.182 cdl)
123789HXCDD		ND(.16 cdl)	ND(.183 cdl)	ND(.192 cdl)	ND(.221 cdl)	ND(.17 cdl)	ND(.168 cdl)	ND(.182 cdl)
1234678HPCDF		ND(.152 cdl)	ND(.164 cdl)	ND(.19 cdl)	ND(.219 cdl)	ND(.167 cdl)	ND(.17 cdl)	ND(.161 cdl)
1234789HPCDF		ND(.152 cdl)	ND(.164 cdl)	ND(.19 cdl)	ND(.219 cdl)	ND(.167 cdl)	ND(.17 cdl)	ND(.161 cdl)
1234678HPCDD		0.186	ND(.179 cdl)	ND(.179 cdl)	ND(.236 cdl)	ND(.183 cdl)	ND(.19 cdl)	ND(.175 cdl)
12346789OCDF		ND(.364 cdl)	ND(.416 cdl)	ND(.364 cdl)	ND(.588 cdl)	ND(.401 cdl)	ND(.399 cdl)	ND(.38 cdl)
12346789OCDD		0.878	0.699	0.542	0.7	0.589	0.602	0.624
TCDF		1.17	0.6	ND(.0739 cdl)	0.505	1	0.945	1.2
TCDD		2.12	0.582	ND(.0933 cdl)	0.931	1.03	0.842	1.76
PeCDF		0.227	0.125	ND(.0747 cdl)	ND(.0857 cdl)	0.328	ND(.0682 cdl)	0.164
PeCDD		0.0806	ND(.0591 cdl)	ND(.0758 cdl)	ND(.088 cdl)	ND(.0612 cdl)	ND(.0662 cdl)	0.0752
HxCDF		ND(.17 cdl)	ND(.186 cdl)	ND(.191 cdl)	ND(.238 cdl)	ND(.181 cdl)	ND(.174 cdl)	ND(.174 cdl)
HxCDD		ND(.16 cdl)	ND(.183 cdl)	ND(.192 cdl)	ND(.221 cdl)	ND(.17 cdl)	ND(.168 cdl)	ND(.182 cdl)
HpCDF		ND(.152 cdl)	ND(.164 cdl)	ND(.19 cdl)	ND(.219 cdl)	ND(.167 cdl)	ND(.17 cdl)	ND(.161 cdl)
HpCDD		0.186	ND(.179 cdl)	ND(.179 cdl)	ND(.236 cdl)	ND(.183 cdl)	ND(.19 cdl)	ND(.175 cdl)
% Lipid		1.85	1.57	-	0.58	0.88	1.53	1.65

Analyte	Field ID / Extract ID / MS File	KRSM-SMB-09 32643 K23V38.RPT	KRSM-SMB-10 32644 K23V39.RPT	ARLF-SMB-01 32645 K23V310.RPT	ARLF-SMB-02 32646 K23V311.RPT	ARLF-SMB-03 32647 K23V312.RPT	ARLF-SMB-04 32648 K23V313.RPT	ARLF-SMB-05 32649 K24V12.RPT
2378TCDF		1.05	0.406	1.78	3.4	2.98	7.06	6.76
2378TCDD		2.42	1.73	0.816	2.12	1.45	2.78	3.34
12378PECDF		ND(.0781 cdl)	ND(.0825 cdl)	0.0883	0.222	0.147	0.251	0.304
23478PECDF		0.0927	ND(.0825 cdl)	0.123	0.351	0.241	0.515	0.5
12378PECDD		ND(.0793 cdl)	ND(.0799 cdl)	ND(.0715 cdl)	ND(.108 mpc)	ND(.0777 cdl)	0.143	0.173
123478HXCDF		ND(.193 cdl)	ND(.219 cdl)	ND(.177 cdl)	ND(.186 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.145 cdl)
123678HXCDF		ND(.193 cdl)	ND(.219 cdl)	ND(.177 cdl)	ND(.186 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.145 cdl)
234678HXCDF		ND(.193 cdl)	ND(.219 cdl)	ND(.177 cdl)	ND(.186 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.145 cdl)
123789HXCDF		ND(.193 cdl)	ND(.219 cdl)	ND(.177 cdl)	ND(.186 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.145 cdl)
123478HXCDD		ND(.19 cdl)	ND(.21 cdl)	ND(.187 cdl)	ND(.179 cdl)	ND(.187 cdl)	ND(.186 cdl)	ND(.152 cdl)
123678HXCDD		ND(.19 cdl)	ND(.21 cdl)	ND(.187 cdl)	ND(.179 cdl)	ND(.187 cdl)	ND(.186 cdl)	ND(.152 cdl)
123789HXCDD		ND(.19 cdl)	ND(.21 cdl)	ND(.187 cdl)	ND(.179 cdl)	ND(.187 cdl)	ND(.186 cdl)	ND(.152 cdl)
1234678HPCDF		ND(.177 cdl)	ND(.19 cdl)	ND(.206 cdl)	ND(.171 cdl)	ND(.171 cdl)	ND(.154 cdl)	ND(.14 cdl)
1234789HPCDF		ND(.177 cdl)	ND(.19 cdl)	ND(.206 cdl)	ND(.171 cdl)	ND(.171 cdl)	ND(.154 cdl)	ND(.14 cdl)
1234678HPCDD		ND(.19 cdl)	ND(.209 cdl)	ND(.169 cdl)	ND(.178 cdl)	ND(.186 cdl)	ND(.165 cdl)	ND(.161 cdl)
12346789OCDF		ND(.426 cdl)	ND(.46 cdl)	ND(.354 cdl)	ND(.362 cdl)	ND(.37 cdl)	ND(.342 cdl)	ND(.37 cdl)
12346789OCDD		0.534	0.711	0.603	0.518	0.48	0.451	ND(.477 mpc)
TCDF		1.05	0.406	1.78	3.4	2.98	7.2	7.05
TCDD		2.42	1.73	0.816	2.12	1.45	2.78	3.34
PeCDF		0.0986	ND(.0825 cdl)	0.214	0.663	0.394	0.864	0.912
PeCDD		ND(.0793 cdl)	ND(.0799 cdl)	ND(.0715 cdl)	ND(.0758 cdl)	ND(.0777 cdl)	0.143	0.173
HxCDF		ND(.193 cdl)	ND(.219 cdl)	ND(.177 cdl)	ND(.186 cdl)	ND(.188 cdl)	ND(.174 cdl)	ND(.145 cdl)
HxCDD		ND(.19 cdl)	ND(.21 cdl)	ND(.187 cdl)	ND(.179 cdl)	ND(.187 cdl)	ND(.186 cdl)	ND(.152 cdl)
HpCDF		ND(.177 cdl)	ND(.19 cdl)	ND(.206 cdl)	ND(.171 cdl)	ND(.171 cdl)	ND(.154 cdl)	ND(.14 cdl)
HpCDD		ND(.19 cdl)	ND(.209 cdl)	ND(.169 cdl)	ND(.178 cdl)	ND(.186 cdl)	ND(.165 cdl)	ND(.161 cdl)
% Lipid		1.17	0.90	0.80	0.90	1.14	2.34	1.80

Analyte	Field ID Extract ID MS File	ARLF-SMB-06 32650 K24V13.RPT	ML-SMB-01 32651 K24V14.RPT	ML-SMB-02 32652 K24V15.RPT	ML-SMB-03 32653 K24V34.RPT	ML-SMB-04 32654 K24V35.RPT	Method Blank 4 32680 K24V38.RPT	ARLF-SMB-07 32658 K24V39.RPT
2378TCDF		4.93	0.229	0.233	ND(.127 mpc)	0.209	ND(.0862 cdl)	4.67
2378TCDD		4.18	ND(.0963 cdl)	ND(.0852 mpc)	ND(.0799 cdl)	ND(.101 cdl)	ND(.101 cdl)	1.89
12378PECDF		0.237	ND(.0723 cdl)	0.0707	ND(.0778 cdl)	ND(.0779 cdl)	ND(.0821 cdl)	0.196
23478PECDF		0.615	ND(.0723 cdl)	0.129	ND(.0778 cdl)	ND(.0779 cdl)	ND(.0821 cdl)	0.358
12378PECDD		0.17	ND(.0695 cdl)	0.078	ND(.0707 cdl)	ND(.0792 cdl)	ND(.0752 cdl)	0.129
123478HXCDF		ND(.174 cdl)	ND(.182 cdl)	ND(.166 cdl)	ND(.18 cdl)	ND(.19 cdl)	ND(.201 cdl)	ND(.231 cdl)
123678HXCDF		ND(.174 cdl)	ND(.182 cdl)	ND(.166 cdl)	ND(.18 cdl)	ND(.19 cdl)	ND(.201 cdl)	ND(.231 cdl)
234678HXCDF		ND(.174 cdl)	ND(.182 cdl)	ND(.166 cdl)	ND(.18 cdl)	ND(.19 cdl)	ND(.201 cdl)	ND(.231 cdl)
123789HXCDF		ND(.174 cdl)	ND(.182 cdl)	ND(.166 cdl)	ND(.18 cdl)	ND(.19 cdl)	ND(.201 cdl)	ND(.231 cdl)
123478HXCDD		ND(.18 cdl)	ND(.187 cdl)	ND(.167 cdl)	ND(.178 cdl)	ND(.196 cdl)	ND(.176 cdl)	ND(.208 cdl)
123678HXCDD		ND(.18 cdl)	ND(.187 cdl)	ND(.167 cdl)	ND(.178 cdl)	ND(.196 cdl)	ND(.176 cdl)	ND(.208 cdl)
123789HXCDD		ND(.18 cdl)	ND(.187 cdl)	ND(.167 cdl)	ND(.178 cdl)	ND(.196 cdl)	ND(.176 cdl)	ND(.208 cdl)
1234678HPCDF		ND(.154 cdl)	ND(.162 cdl)	ND(.153 cdl)	ND(.166 cdl)	ND(.169 cdl)	ND(.17 cdl)	ND(.189 cdl)
1234789HPCDF		ND(.154 cdl)	ND(.162 cdl)	ND(.153 cdl)	ND(.166 cdl)	ND(.169 cdl)	ND(.17 cdl)	ND(.189 cdl)
1234678HPCDD		0.194	ND(.18 cdl)	ND(.172 cdl)	ND(.165 cdl)	ND(.169 cdl)	ND(.187 cdl)	ND(.195 cdl)
12346789OCDF		ND(.409 cdl)	ND(.409 cdl)	ND(.382 cdl)	ND(.339 cdl)	ND(.343 cdl)	ND(.448 cdl)	ND(.458 cdl)
12346789OCDD		0.739	0.537	0.543	0.516	0.511	0.695	0.762
TCDF		5	0.229	0.233	ND(.0696 cdl)	0.209	ND(.0862 cdl)	4.67
TCDD		4.18	ND(.0963 cdl)	ND(.0824 cdl)	ND(.0799 cdl)	ND(.101 cdl)	ND(.101 cdl)	1.89
PeCDF		0.979	0.0953	0.315	ND(.0778 cdl)	0.0932	ND(.0821 cdl)	0.564
PeCDD		0.17	ND(.0695 cdl)	0.078	ND(.0707 cdl)	ND(.0792 cdl)	ND(.0752 cdl)	0.129
HxCDF		ND(.174 cdl)	ND(.182 cdl)	ND(.166 cdl)	ND(.18 cdl)	ND(.19 cdl)	ND(.201 cdl)	ND(.231 cdl)
HxCDD		ND(.18 cdl)	ND(.187 cdl)	ND(.167 cdl)	ND(.178 cdl)	ND(.196 cdl)	ND(.176 cdl)	ND(.208 cdl)
HpCDF		ND(.154 cdl)	ND(.162 cdl)	ND(.153 cdl)	ND(.166 cdl)	ND(.169 cdl)	ND(.17 cdl)	ND(.189 cdl)
HpCDD		0.194	ND(.18 cdl)	ND(.172 cdl)	ND(.165 cdl)	ND(.169 cdl)	ND(.187 cdl)	ND(.195 cdl)
% Lipid		1.59	1.70	1.64	0.89	1.27	-	0.93

Analyte	Field ID Extract ID MS File	ARLF-SMB-08 32659 K24V310.RPT	ARLF-SMB-09 32660 K24V311.RPT	ARLF-SMB-10 32661 K24V312.RPT	ML-SMB-05 32662 K24V313.RPT	PBL-SMB-01 32663 K27V42.RPT	PBL-SMB-02 32664 K24V33.RPT	PBL-SMB-03 32665 K25V12.RPT
2378TCDF		5.47	3.02	7.85	0.287	1	0.955	1.04
2378TCDD		2.28	1.32	3.63	ND(.103 cdl)	0.518	0.577	0.182
12378PECDF		0.242	ND(.157 mpc)	0.336	ND(.0741 cdl)	ND(.0738 cdl)	ND(.0827 cdl)	ND(.075 cdl)
23478PECDF		0.47	0.204	0.597	ND(.0741 cdl)	0.114	0.137	0.101
12378PECDD		0.126	0.0806	0.177	ND(.0647 cdl)	0.105	0.13	0.0902
123478HXCDF		ND(.197 cdl)	ND(.193 cdl)	ND(.223 cdl)	ND(.238 cdl)	ND(.178 cdl)	ND(.214 cdl)	ND(.169 cdl)
123678HXCDF		ND(.197 cdl)	ND(.193 cdl)	ND(.223 cdl)	ND(.238 cdl)	ND(.178 cdl)	ND(.214 cdl)	ND(.169 cdl)
234678HXCDF		ND(.197 cdl)	ND(.193 cdl)	ND(.223 cdl)	ND(.238 cdl)	ND(.178 cdl)	ND(.214 cdl)	ND(.169 cdl)
123789HXCDF		ND(.197 cdl)	ND(.193 cdl)	ND(.223 cdl)	ND(.238 cdl)	ND(.178 cdl)	ND(.214 cdl)	ND(.169 cdl)
123478HXCDD		ND(.187 cdl)	ND(.188 cdl)	ND(.181 cdl)	ND(.206 cdl)	ND(.188 cdl)	ND(.19 cdl)	ND(.157 cdl)
123678HXCDD		ND(.187 cdl)	ND(.188 cdl)	ND(.181 cdl)	ND(.206 cdl)	0.192	ND(.19 cdl)	ND(.157 cdl)
123789HXCDD		ND(.187 cdl)	ND(.188 cdl)	ND(.181 cdl)	ND(.206 cdl)	ND(.188 cdl)	ND(.19 cdl)	ND(.157 cdl)
1234678HPCDF		ND(.158 cdl)	ND(.169 cdl)	ND(.183 cdl)	ND(.272 cdl)	ND(.172 cdl)	ND(.187 cdl)	ND(.184 cdl)
1234789HPCDF		ND(.158 cdl)	ND(.169 cdl)	ND(.183 cdl)	ND(.272 cdl)	ND(.172 cdl)	ND(.187 cdl)	ND(.184 cdl)
1234678HPCDD		ND(.167 cdl)	ND(.196 cdl)	ND(.233 cdl)	ND(.237 cdl)	0.412	ND(.214 cdl)	ND(.201 cdl)
123467890CDF		ND(.391 cdl)	ND(.45 cdl)	ND(.644 cdl) (c)	ND(.836 cdl) (c)	ND(.463 cdl)	ND(.516 cdl)	ND(.458 cdl)
123467890CDD		0.66	0.666	0.645 (c)	ND(.836 cdl) (c)	1.67	0.674	0.563
TCDF		5.47	3.02	7.85	0.42	1	1.04	1.14
TCDD		2.28	1.32	3.63	0.117	0.654	0.737	0.38
PeCDF		0.727	0.217	1.05	0.122	0.59	0.402	0.29
PeCDD		0.126	0.0806	0.177	ND(.0647 cdl)	0.105	0.13	0.0902
HxCDF		ND(.197 cdl)	ND(.193 cdl)	ND(.223 cdl)	ND(.238 cdl)	0.242	ND(.214 cdl)	ND(.169 cdl)
HxCDD		ND(.187 cdl)	ND(.188 cdl)	ND(.181 cdl)	ND(.206 cdl)	0.203	ND(.19 cdl)	ND(.157 cdl)
HpCDF		ND(.158 cdl)	ND(.169 cdl)	ND(.183 cdl)	ND(.272 cdl)	ND(.172 cdl)	ND(.187 cdl)	ND(.184 cdl)
HpCDD		ND(.167 cdl)	ND(.196 cdl)	ND(.233 cdl)	ND(.237 cdl)	0.629	ND(.214 cdl)	ND(.201 cdl)
% Lipid		1.02	1.15	1.60	1.47	1.52	1.61	1.79

Analyte	Field ID / Extract ID / MS File	PBL-SMB-04 / 32666 / K25V13.RPT	PBL-SMB-05 / 32667 / K25V14.RPT	PBL-SMB-06 / 32668 / K25V15.RPT	PBL-SMB-07 / 32669 / K25V16.RPT	PBL-SMB-08 / 32670 / K25V17.RPT	PBL-SMB-09 / 32671 / K25V18.RPT
2378TCDF		3.83	1.35	3.79	1.64	3.73	1.56
2378TCDD		1.01	0.35	1.82	1.6	1.41	0.378
12378PECDF		0.103	ND(.0899 cdl)	0.131	ND(.0985 cdl)	ND(.105 cdl)	ND(.0845 cdl)
23478PECDF		0.105	0.0955	0.14	0.126	ND(.105 cdl)	0.0886
12378PECDD		0.0913	0.115	0.109	0.131	ND(.101 cdl)	0.0836
123478HXCDF		ND(.208 cdl)	ND(.235 cdl)	ND(.236 cdl)	ND(.227 cdl)	ND(.195 cdl)	ND(.202 cdl)
123678HXCDF		ND(.208 cdl)	ND(.235 cdl)	ND(.236 cdl)	ND(.227 cdl)	ND(.195 cdl)	ND(.202 cdl)
234678HXCDF		ND(.208 cdl)	ND(.235 cdl)	ND(.236 cdl)	ND(.227 cdl)	ND(.195 cdl)	ND(.202 cdl)
123789HXCDF		ND(.208 cdl)	ND(.235 cdl)	ND(.236 cdl)	ND(.227 cdl)	ND(.195 cdl)	ND(.202 cdl)
123478HXCDD		ND(.182 cdl)	ND(.194 cdl)	ND(0) (d)	ND(.202 cdl)	ND(.191 cdl)	ND(.184 cdl)
123678HXCDD		ND(.182 cdl)	ND(.194 cdl)	ND(0) (d)	ND(.202 cdl)	ND(.191 cdl)	ND(.184 cdl)
123789HXCDD		ND(.182 cdl)	ND(.194 cdl)	ND(0) (d)	ND(.202 cdl)	ND(.191 cdl)	ND(.184 cdl)
1234678HPCDF		ND(.226 cdl)	ND(.25 cdl)	ND(.393 cdl)	ND(.25 cdl)	ND(.219 cdl)	ND(.211 cdl)
1234789HPCDF		ND(.226 cdl)	ND(.25 cdl)	ND(.393 cdl)	ND(.25 cdl)	ND(.219 cdl)	ND(.211 cdl)
1234678HPCDD		ND(.256 cdl)	ND(.279 cdl)	ND(.232 cdl)	0.306	ND(.239 cdl)	ND(.235 cdl)
12346789OCDF		ND(.606 cdl)	ND(.687 cdl) (c)	ND(.654 cdl) (c)	ND(.644 cdl) (c)	ND(.508 cdl)	ND(.516 cdl)
12346789OCDD		ND(.606 cdl)	0.691 (c)	0.703 (c)	0.782 (c)	0.738	0.77
TCDF		3.83	1.35	3.79	1.64	3.82	1.56
TCDD		1.17	0.514	1.96	1.79	1.41	0.378
PeCDF		0.208	0.391	0.364	0.252	ND(.105 cdl)	0.0942
PeCDD		0.0913	0.115	0.109	0.131	ND(.101 cdl)	0.0836
HxCDF		ND(.208 cdl)	ND(.235 cdl)	ND(.236 cdl)	ND(.227 cdl)	ND(.195 cdl)	ND(.202 cdl)
HxCDD		ND(.182 cdl)	0.2	ND(0) (d)	ND(.202 cdl)	ND(.191 cdl)	ND(.184 cdl)
HpCDF		ND(.226 cdl)	ND(.25 cdl)	ND(.393 cdl)	ND(.25 cdl)	ND(.219 cdl)	ND(.211 cdl)
HpCDD		ND(.256 cdl)	ND(.279 cdl)	ND(.232 cdl)	0.306	ND(.239 cdl)	ND(.235 cdl)
% Lipid		1.36	1.35	1.19	1.00	1.15	1.51

(d) - Interferences precluded quantitation of corresponding labeled analog.
Will undergo additional cleanup and reanalysis.

Analyte	Field ID	PS-BKT-01 TO PS-BKT-03	PS-SMB-01 TO PS-SMB-02	PS-WSU-01 TO PS-WSU-02	PR-SMB-01	PR-SMB-02
	Extract ID	32672	32673	32674	32675	32676
	MS File	K25V19.RPT	K25V32.RPT	K25V33.RPT	K25V34.RPT	K25V35.RPT
2378TCDF		0.343	0.266	1.14	1.17	0.645
2378TCDD		ND(.108 cdl)	ND(.0887 cdl)	0.262	0.229	0.158 (c)
12378PECDF		ND(.0881 cdl)	ND(.0708 cdl)	0.134	0.0735	ND(.0771 cdl)
23478PECDF		ND(.0881 cdl)	ND(.0708 cdl)	0.249	0.126	ND(.0771 cdl)
12378PECDD		ND(.0831 cdl)	ND(.0699 cdl)	0.184	0.104	0.075
123478HXCDF		ND(.212 cdl)	ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.182 cdl)
123678HXCDF		ND(.212 cdl)	ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.182 cdl)
234678HXCDF		ND(.212 cdl)	ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.182 cdl)
123789HXCDF		ND(.212 cdl)	ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.182 cdl)
123478HXCDD		ND(.179 cdl)	ND(.182 cdl)	0.153	ND(.158 cdl)	ND(.186 cdl)
123678HXCDD		ND(.179 cdl)	ND(.182 cdl)	0.201	ND(.158 cdl)	ND(.186 cdl)
123789HXCDD		ND(.179 cdl)	ND(.182 cdl)	ND(.152 cdl)	ND(.158 cdl)	ND(.186 cdl)
1234678HPCDF		ND(.233 cdl)	ND(.177 cdl)	ND(.161 cdl)	ND(.184 cdl)	ND(.187 cdl)
1234789HPCDF		ND(.233 cdl)	ND(.177 cdl)	ND(.161 cdl)	ND(.184 cdl)	ND(.187 cdl)
1234678HPCDD		ND(.285 cdl)	ND(.191 cdl)	0.589	ND(.245 cdl)	ND(.202 cdl)
12346789OCDF		ND(.735 cdl) (c)	ND(.414 cdl)	ND(.43 cdl)	ND(.633 cdl) (c)	ND(.446 cdl)
12346789OCDD		0.968 (c)	0.666	1.16	0.746 (c)	0.68
TCDF		0.512	0.407	3.25	1.24	0.645
TCDD		ND(.108 cdl)	0.136	0.779	0.229	0.158 (c)
PeCDF		0.111	0.0817	1.57	0.317	0.0788
PeCDD		ND(.0831 cdl)	ND(.0699 cdl)	0.184	0.104	0.075
HxCDF		ND(.212 cdl)	ND(.179 cdl)	0.208	ND(.188 cdl)	ND(.182 cdl)
HxCDD		ND(.179 cdl)	ND(.182 cdl)	0.213	ND(.158 cdl)	ND(.186 cdl)
HpCDF		ND(.233 cdl)	ND(.177 cdl)	ND(.161 cdl)	ND(.184 cdl)	ND(.187 cdl)
HpCDD		ND(.285 cdl)	ND(.191 cdl)	0.589	ND(.245 cdl)	ND(.202 cdl)
% Lipid		1.85	1.09	6.29	2.51	1.49

Analyte	Field ID Extract ID MS File	PR-SMB-03 32677 K25V36.RPT	Method Blank 5 32702 K25V39.RPT	PR-SMB-04 32681 K26V11.RPT	PR-SMB-05 32682 K26V12.RPT	PR-LMB-01 32683 K26V13.RPT	PR-WHP-01 32684 K26V15.RPT	PR-WHP-02 32685 K26V16.RPT
2378TCDF		0.477	ND(.0693 cdl)	0.353	0.337	0.123	4.27	1.37
2378TCDD		ND(.177 cdl)	ND(.0885 cdl)	0.111	0.124	ND(.092 cdl)	0.995	0.235
12378PECDF		ND(.147 cdl)	ND(.0693 cdl)	ND(.0704 cdl)	ND(.0689 cdl)	ND(.064 cdl)	0.251	0.095
23478PECDF		ND(.147 cdl)	ND(.0693 cdl)	ND(.0704 cdl)	ND(.0689 cdl)	ND(.064 cdl)	0.606	0.19
12378PECDD		ND(.138 cdl)	ND(.0655 cdl)	ND(.0678 cdl)	ND(.0669 cdl)	ND(.0628 cdl)	0.362	0.148
123478HXCDF		ND(.34 cdl)	ND(.173 cdl)	ND(.19 cdl)	ND(.167 cdl)	ND(.168 cdl)	ND(.221 cdl)	ND(.168 cdl)
123678HXCDF		ND(.34 cdl)	ND(.173 cdl)	ND(.19 cdl)	ND(.167 cdl)	ND(.168 cdl)	ND(.221 cdl)	ND(.168 cdl)
234678HXCDF		ND(.34 cdl)	ND(.173 cdl)	ND(.19 cdl)	ND(.167 cdl)	ND(.168 cdl)	ND(.221 cdl)	ND(.168 cdl)
123789HXCDF		ND(.34 cdl)	ND(.173 cdl)	ND(.19 cdl)	ND(.167 cdl)	ND(.168 cdl)	ND(.221 cdl)	ND(.168 cdl)
123478HXCDD		ND(.318 cdl)	ND(.163 cdl)	ND(.187 cdl)	ND(.166 cdl)	ND(.167 cdl)	ND(.189 cdl)	ND(.161 cdl)
123678HXCDD		ND(.318 cdl)	ND(.163 cdl)	ND(.187 cdl)	ND(.166 cdl)	ND(.167 cdl)	0.639	0.205
123789HXCDD		ND(.318 cdl)	ND(.163 cdl)	ND(.187 cdl)	ND(.166 cdl)	ND(.167 cdl)	ND(.189 cdl)	ND(.161 cdl)
1234678HPCDF		ND(.321 cdl)	ND(.21 cdl)	ND(.177 cdl)	ND(.168 cdl)	ND(.168 cdl)	ND(.235 cdl)	ND(.163 cdl)
1234789HPCDF		ND(.321 cdl)	ND(.21 cdl)	ND(.177 cdl)	ND(.168 cdl)	ND(.168 cdl)	ND(.235 cdl)	ND(.163 cdl)
1234678HPCDD		ND(.341 cdl)	ND(.166 cdl)	ND(.192 cdl)	0.215	0.184	0.725	0.306
12346789OCDF		ND(.746 cdl)	ND(.371 cdl)	ND(.451 cdl)	ND(.428 cdl)	ND(.394 cdl)	ND(.67 cdl) (c)	ND(.376 cdl)
12346789OCDD		1.3	0.469	0.675	0.877	0.732	1.51 (c)	0.938
TCDF		0.477	ND(.0693 cdl)	0.353	0.337	0.37	4.92	1.51
TCDD		ND(.177 cdl)	ND(.0885 cdl)	0.111	0.124	ND(.092 cdl)	1.15	0.36
PeCDF		ND(.147 cdl)	ND(.0693 cdl)	ND(.0704 cdl)	ND(.0689 cdl)	0.249	1.49	0.665
PeCDD		ND(.138 cdl)	ND(.0655 cdl)	ND(.0678 cdl)	ND(.0669 cdl)	ND(.0628 cdl)	0.362	0.148
HxCDF		ND(.34 cdl)	ND(.173 cdl)	ND(.19 cdl)	ND(.167 cdl)	ND(.168 cdl)	0.47	ND(.168 cdl)
HxCDD		ND(.318 cdl)	ND(.163 cdl)	ND(.187 cdl)	ND(.166 cdl)	ND(.167 cdl)	0.675	0.217
HpCDF		ND(.321 cdl)	ND(.21 cdl)	ND(.177 cdl)	ND(.168 cdl)	ND(.168 cdl)	ND(.235 cdl)	ND(.163 cdl)
HpCDD		ND(.341 cdl)	ND(.166 cdl)	ND(.192 cdl)	0.215	0.184	0.725	0.306
% Lipid		1.25	-	1.41	1.05	0.74	3.60	2.54

Analyte	Field ID Extract ID MS File	PR-WHP-03 32686 K26V17.RPT	PR-WHP-04 32687 K26V18.RPT	PR-WSU-01 TO PR-WSU-05 32688 K26V19.RPT	PR-WSU-06 TO PR-WSU-10 32689 K26V110.RPT	SC-SMB-01 32690 K26V22.RPT
2378TCDF		1.05	1.56	4.36	4.23	0.311
2378TCDD		0.156	0.186	0.69	0.617	ND(.0924 cdl)
12378PECDF		0.104	0.141	0.342	0.337	ND(.0705 cdl)
23478PECDF		0.262	0.319	0.407	0.364	0.0732
12378PECDD		ND(.145 mpc)	0.183	0.344	0.296	ND(.0666 cdl)
123478HXCDF		ND(.186 cdl)	ND(.215 cdl)	0.246	ND(.178 mpc)	ND(.196 cdl)
123678HXCDF		ND(.186 cdl)	ND(.215 cdl)	ND(.17 cdl)	ND(.172 cdl)	ND(.196 cdl)
234678HXCDF		ND(.186 cdl)	ND(.215 cdl)	ND(.17 cdl)	ND(.172 cdl)	ND(.196 cdl)
123789HXCDF		ND(.186 cdl)	ND(.215 cdl)	ND(.17 cdl)	ND(.172 cdl)	ND(.196 cdl)
123478HXCDD		ND(.197 cdl)	ND(.223 cdl)	0.325	0.207	ND(.162 cdl)
123678HXCDD		ND(.197 cdl)	ND(.223 cdl)	0.837	0.581	ND(.162 cdl)
123789HXCDD		ND(.197 cdl)	ND(.223 cdl)	0.175	ND(.178 cdl)	ND(.162 cdl)
1234678HPCDF		ND(.179 cdl)	ND(.207 cdl)	0.399	0.282	ND(.177 cdl)
1234789HPCDF		ND(.179 cdl)	ND(.207 cdl)	ND(.157 cdl)	ND(.158 cdl)	ND(.177 cdl)
1234678HPCDD		0.292	0.314	2.14	1.53	ND(.239 cdl)
12346789OCDF		ND(.479 cdl)	ND(.485 cdl)	ND(.396 cdl)	ND(.378 cdl)	ND(.69 cdl) (c)
12346789OCDD		0.918	0.884	2.74	2.66	ND(.69 cdl) (c)
TCDF		1.3	2.01	5.03	4.75	0.425
TCDD		0.274	0.328	0.881	0.781	0.24
PeCDF		0.963	1.91	1.66	1.31	0.163
PeCDD		ND(.0721 cdl)	0.183	0.344	0.296	ND(.0666 cdl)
HxCDF		0.229	0.333	1.68	0.689	ND(.196 cdl)
HxCDD		ND(.197 cdl)	ND(.223 cdl)	1.6	0.793	ND(.162 cdl)
HpCDF		ND(.179 cdl)	ND(.207 cdl)	0.971	0.616	ND(.177 cdl)
HpCDD		0.292	0.314	2.38	1.77	ND(.239 cdl)
% Lipid		2.63	3.05	5.77	6.44	2.08

Analyte	Field ID	SC-SMB-02	SC-SMB-03	SC-SMB-04	SC-SMB-05	SC-SMB-06	SC-SMB-07	SC-SMB-08
	Extract ID	32691	32692	32693	32694	32695	32696	32697
	MS File	K26V23.RPT	K26V24.RPT	K26V25.RPT	K26V26.RPT	K26V27.RPT	K26V28.RPT	K26V29.RPT
2378TCDF		0.216	0.185	0.254	0.245	0.213	0.245	0.211
2378TCDD		ND(.0876 cdl)	ND(.0827 cdl)	ND(.0848 cdl)	ND(.0735 cdl)	ND(.0832 cdl)	ND(.0895 cdl)	ND(.0933 cdl)
12378PECDF		ND(.072 cdl)	ND(.0656 cdl)	ND(.0688 cdl)	ND(.0675 cdl)	ND(.0666 cdl)	ND(.0687 cdl)	ND(.0662 cdl)
23478PECDF		ND(.072 cdl)	ND(.0656 cdl)	0.0744	ND(.0675 cdl)	ND(.0666 cdl)	ND(.0687 cdl)	0.069
12378PECDD		ND(.0696 cdl)	ND(.0633 cdl)	ND(.0688 cdl)	ND(.0656 cdl)	ND(.0629 cdl)	ND(.0673 cdl)	ND(.0571 cdl)
123478HXCDF		ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.173 cdl)	ND(.169 cdl)	ND(.185 cdl)	ND(.17 cdl)
123678HXCDF		ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.173 cdl)	ND(.169 cdl)	ND(.185 cdl)	ND(.17 cdl)
234678HXCDF		ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.173 cdl)	ND(.169 cdl)	ND(.185 cdl)	ND(.17 cdl)
123789HXCDF		ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.173 cdl)	ND(.169 cdl)	ND(.185 cdl)	ND(.17 cdl)
123478HXCDD		ND(.181 cdl)	ND(.175 cdl)	ND(.183 cdl)	ND(.159 cdl)	ND(.176 cdl)	ND(.186 cdl)	ND(.156 cdl)
123678HXCDD		ND(.181 cdl)	ND(.175 cdl)	ND(.183 cdl)	ND(.159 cdl)	ND(.176 cdl)	ND(.186 cdl)	ND(.156 cdl)
123789HXCDD		ND(.181 cdl)	ND(.175 cdl)	ND(.183 cdl)	ND(.159 cdl)	ND(.176 cdl)	ND(.186 cdl)	ND(.156 cdl)
1234678HPCDF		ND(.163 cdl)	ND(.157 cdl)	ND(.172 cdl)	ND(.163 cdl)	ND(.153 cdl)	ND(.158 cdl)	ND(.153 cdl)
1234789HPCDF		ND(.163 cdl)	ND(.157 cdl)	ND(.172 cdl)	ND(.163 cdl)	ND(.153 cdl)	ND(.158 cdl)	ND(.153 cdl)
1234678HPCDD		ND(.185 cdl)	ND(.176 cdl)	ND(.189 cdl)	ND(.194 cdl)	ND(.185 cdl)	ND(.177 cdl)	ND(.211 cdl)
12346789OCDF		ND(.399 cdl)	ND(.385 cdl)	ND(.414 cdl)	ND(.467 cdl)	ND(.368 cdl)	ND(.372 cdl)	ND(.414 cdl)
12346789OCDD		0.506	0.583	0.501	0.486	0.524	0.534	0.526
TCDF		0.404	0.185	0.339	0.351	0.321	0.329	0.353
TCDD		0.224	0.253	0.274	0.197	0.137	0.267	0.21
PeCDF		ND(.072 cdl)	0.0795	0.164	0.141	ND(.0666 cdl)	0.0722	0.156
PeCDD		ND(.0696 cdl)	ND(.0633 cdl)	ND(.0688 cdl)	ND(.0656 cdl)	ND(.0629 cdl)	ND(.0673 cdl)	ND(.0571 cdl)
HxCDF		ND(.179 cdl)	ND(.17 cdl)	ND(.188 cdl)	ND(.173 cdl)	ND(.169 cdl)	ND(.185 cdl)	ND(.17 cdl)
HxCDD		ND(.181 cdl)	ND(.175 cdl)	ND(.183 cdl)	ND(.159 cdl)	ND(.176 cdl)	ND(.186 cdl)	ND(.156 cdl)
HpCDF		ND(.163 cdl)	ND(.157 cdl)	ND(.172 cdl)	ND(.163 cdl)	ND(.153 cdl)	ND(.158 cdl)	ND(.153 cdl)
HpCDD		ND(.185 cdl)	ND(.176 cdl)	ND(.189 cdl)	ND(.194 cdl)	ND(.185 cdl)	ND(.177 cdl)	ND(.211 cdl)
% Lipid		2.52	1.81	2.29	2.92	2.10	2.67	2.68

Analyte	Field ID Extract ID MS File	SC-SMB-09 32698 K26V210.RPT	SC-SMB-10 32699 K26V211.RPT
2378TCDF		0.178	0.271
2378TCDD		ND(.0904 cdl)	ND(.0804 cdl)
12378PECDF		ND(.0715 cdl)	ND(.0679 cdl)
23478PECDF		ND(.0715 cdl)	0.0687
12378PECDD		ND(.0655 cdl)	ND(.0663 cdl)
123478HXCDF		ND(.163 cdl)	ND(.173 cdl)
123678HXCDF		ND(.163 cdl)	ND(.173 cdl)
234678HXCDF		ND(.163 cdl)	ND(.173 cdl)
123789HXCDF		ND(.163 cdl)	ND(.173 cdl)
123478HXCDD		ND(.158 cdl)	ND(.17 cdl)
123678HXCDD		ND(.158 cdl)	ND(.17 cdl)
123789HXCDD		ND(.158 cdl)	ND(.17 cdl)
1234678HPCDF		ND(.159 cdl)	ND(.152 cdl)
1234789HPCDF		ND(.159 cdl)	ND(.152 cdl)
1234678HPCDD		ND(.198 cdl)	ND(.178 cdl)
12346789OCDF		ND(.389 cdl)	ND(.358 cdl)
12346789OCDD		0.482	0.506
TCDF		0.178	0.271
TCDD		0.2	0.248
PeCDF		0.0735	0.161
PeCDD		ND(.0655 cdl)	ND(.0663 cdl)
HxCDF		ND(.163 cdl)	ND(.173 cdl)
HxCDD		ND(.158 cdl)	ND(.17 cdl)
HpCDF		ND(.159 cdl)	ND(.152 cdl)
HpCDD		ND(.198 cdl)	ND(.178 cdl)
% Lipid		2.67	2.42

APPENDIX 3

2378-TCDD AND 2378-TCDF IN SLUDGE FROM MAINE WASTEWATER TREATMENT PLANTS

APPENDIX 3. DIOXIN AND FURAN IN SLUDGE FROM MAINE WASTEWATER TREATM
(pg/g dry weight)

LOCATION	DATE	%MOIST	TCDD	TCDF	TEQ
AUGUSTA SANITARY	900409		1.2	<1.3	1.3
DISTRICT	900607		<3.9	2.5	<4.2
	900914		<20.0	E20.0	<22.0
	910220		<1.9	0.79	<11.1
BERWICK SEWER DISTRICT	861111		<2.5	<4.0	<2.9
	890301	76.4	3.3	4.7	3.8
	890927	75.3	<3.0	<3.0	<3.3
	891208	87.5	144	109	155
BOISE CASCADE CORP	850621		32.0		
RUMFORD	880602		105.0	674.0	171.4
	890108	77.1	26.2	130.4	39.2
	890407	73.1	12.5	49.6	17.5
	890628	76.8	E2.3	31	E5.4
CORINNA SEWER DISTRICT	861106		<0.5	<2.5	<0.7
	871117		<3.6		
	880501		<3.0	E8.5	<3.8
	890222		<13.0	<54.0	<18.4
	890510		<5.0	E41.0	<9.1
	900131		2.3	127	15.0
	900606		<4.0	E130	<17.0
			<4.9	E169	<21.8
FRASER PAPER LTD	880903	68.3	4.4	73.9	11.8
MADAWASKA	890106	79.1	E4.9	42.6	E9.2
	890406	71.3	E1.1	3.7	1.5
	890930	80.1	1.0	E5.3	1.5
GARDINER WATER DISTRIC	900818		<0.87	0.46	<2.2
	910401		1.4	<0.85	<4.7
GEORGIA PACIFIC CO					
MILLINOCKET	850618		<0.4		
	891217		0.94	3.2	2.4
WOODLAND	880602		<1.9	7.3	<2.6
	890113	75.8	<1.5	<0.86	1.6
	890424	74.7	<0.16	1.2	<1.4
	890718	66.0	<0.6	4.4	<1.0

APPENDIX 3. (CONT.)

LOCATION	DATE	%MOIST	TCDD	TCDF	TEQ
HARTLAND WASTEWATER	881007	65.0	<1.0	<0.6	<1.0
TREATMENT PLANT	881221	65.5	<2.5	E2.1	<2.7
	890312	64.3	<0.1	2.0	<0.3
	890627	63.3	<0.5	2.4	<0.7
HAWK RIDGE COMPOST	1989-90	mean n=6	6.6	15.9	8.2
UNITY	910104				1.9
(compost)	910401				13
	910724				8.3
INTERNATIONAL PAPER CO	850621		51.3W		
JAY	870115		190	760	266
	880218		24	130	39
	880219		23	121	34.1
	880223		14	75	21.5
	880225		57	250	82
	880226		15	79	22.9
	880227		13	79	20.9
	881231		16.6W	143W	30.9W
	890124		15W	77W	22.7W
	890126		28	112	39.2
	890214	ash		0.1	0.2
	890323		7.7W	42.6W	12.0W
	890417		24	150	39.0
	890714	ash	0.07	0.02	0.1
	891012	ash	0.14	0	2.63
	891231	ash	0.06	0	0.06
	900205		<18.7	150	<33.7
	900402	ash	0.04	0	0.05
	900501	ash	0	0.002	0.002
	900614	ash	0	0	0
	901201	ash	<2.4	<0.08	<4.88
	910117	ash	<3.9	0.11	<0.80
	910701	ash	<0.44	<0.1	<1.07
JAMES RIVER CORP	880801		12.0	34.0	15.4
OLD TOWN	881225	78.6	64.5	206	85.1
	890423	78.7	80.9	255	106.4
	890718	68.8	15.8	149	30.7
BERLIN, NH	88		104	2930	397

APPENDIX 3. (CONT.)

LOCATION	DATE	%MOIST	TCDD	TCDF	TEQ
KENNEBEC SANITARY	870713				38.5
TREATMENT DISTRICT	871105				10.2
WATERVILLE	880118				7.2
	880322				5.4
	880518				18.1
	880921				3.6
	890711				42.2
	891011				106.9
	900410		E7.9	121	20.0
	900824		3.3	54.0	12.7
	900909		3.3	2.4	<26.0
	901101		3.6	1.2	<20.1
	901221		3.5	0.67	<21.3
	910408		<2.3	<3.3	<15.0
	910606		<2.9	<5.0	<19.4
	910808		3.1	4.1	<19.2
	910911		3.1	4.1	<12.2
LEWISTON-AUBURN	871231		<1.0	mean for year (n=	
TREATMENT PLANT	881031		0.04		
	910306		<7.3	<9.4	<19.0
LINCOLN PULP & PAPER C	881119		48	223	70.3
LINCOLN	890123	80.9	228	909	318.9
	890407	85.1	49.5	219	71.4
	890831	8305	41.3	294	70.7
OAKLAND TREATMENT PLAN	910304		<5	<3.14	<20.9
ORONO TREATMENT PLANT	901004		E3.5	9.2	E4.4
	910328		<2.1	<1.4	<12.6
PORTLAND WATER DISTRIC	861205				3.8
PORTLAND	870402				4.1
	871124				1.0
	891205		E1.2	11.3	3.6
WESTBROOK	861205				0.5
	870402				4.9
	871119				0.2
	891205		E1.6	14.5	4.9

APPENDIX 3. (CONT.)

LOCATION	DATE	%MOIST	TCDD	TCDF	TEQ
REGIONAL WASTE SYSTEMS	890111	ash	5.5	28	8.3
PORTLAND	890112	ash	6	24	8.4
	890113	ash	10	50	15
	890114	ash	10	20	12
	890121	ash	6	90	15
	900211	ash	E20	210	E41
ROBINSON MANUFACTURING	870113		10.1	17.5	18.5
OXFORD	880419		<0.4	<0.2	<0.4
	881004		<7.3	<9.6	<8.2
	890119		<2.1	<1.1	<2.2
	910305		<3	<0.3	<8.0
SCOTT PAPER CO	871008		36		49.8
WINSLOW			31		48.8
	871201		13.5		23.7
	880331		25	219	52.8
	880630		19	177	38.6
	880930		22	189	43.8
	881231		17	181	37.1
	890301	ash	9.7	89	20.3
	890331		18	177	38.5
	890630		14	89	25.1
		ash	7.4	58	14.1
		ash	9.5	63	17.5
	890930		11	67	17.7
	910330		8.3	10	20.5
		ash	6.9	12.3	47.1
	910630		4.6	6.2	13.4
		ash	8.1	16.1	28.9
SD WARREN CO	850711		<1.95	pulp mill sludge	
SKOWHEGAN			2.9	paper mill sludge	
	871201		60		60.1
	880331		27	88	39
	880628		33.0	106	43.6
			6.9	29	9.8
			39.0	149	53.9
			67.0	330	100.0
	881207		40	98	52.1
	881231		54	177	76.5
	890331		54	91	65.6
	901231		39.5	12.9	57.8
	910331		23.1	5.7	32.0
	910630		39.4	16.3	66.5

APPENDIX 3. (CONT)

LOCATION	DATE	%MOIST	TCDD	TCDF	TEQ
SD WARREN CO.	850620		17.2		
WESTBROOK	870929		31		31.1
	871231		21	135	34.7
	880331		5.6	21	7.7
	880401		8.7	3.9	14.9
	880630		13	55	18.5
	881207		19	127	34.2
			19	69	27.5
	890106		<1.8	31	<4.9
	890331		6.2	18	8.6
	890731		5	37	16
	890831		8	40	14.9
	890931		9	60	17.8
	891031		5	30	12.9
	891131		3	30	15.5
	891231		7	50	15.2
	900131		6	20	14.0
	900231		2.7	24.6	7.7
	900331		5.1	33.6	17.1
	900431		5.9	34.6	14.9
	900531		5.3	25.8	10.5
	900631		19.0	26.0	29.5
	900831		2.9	12.1	9.8
	911031		3.8	2.8	11.8
S PORTLAND STP	900314		<5.3	3.5	<5.6
	910531		<5	<0.001	<11.2
	880930	62.6	13.8	155	29.3
STATLER TISSUE CO	881223	61.4	14.5	126	27.1
AUGUSTA	890403	61.6	13.3	93	22.6
	890628	65.5	6.1	143	20.4

APPENDIX 4

2378-TCDD AND 2378-TCDF IN WASTEWATER
FROM MAINE BLEACHED KRAFT
PULP AND PAPER MILLS

BOISE CASCADE, RUMFORD				
TREATED PROCESS WASTEWATER DIOXIN DATA				
	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE (week of)	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data 5/18/88	120		570	
3/1/89	25		80	
8/7/89	ND	6	20	
8/10/89	ND	13	20	
8/14/89	ND	5	13	
8/17/89	ND	5	18	
8/21/89	ND	8	21	
8/24/89	ND	5	10	
8/29/89	ND	5	18	
8/31/89	ND	11	20	
9/5/89	ND	11	20	
9/7/89	ND	9	18	
10/23/89	ND	3	7	
10/26/89	ND	5	6	
12/22/89	ND	5	20	
2/16/90	ND	2	6	
2/16/90	ND	1	7	
5/15/90	ND	10	ND	8
5/15/90	ND	1	5	
6/27/90	ND	3	8	
6/27/90	ND	3	9	

GEORGIA PACIFIC, WOODLAND				
TREATED PROCESS WASTEWATER DIOXIN DATA				
	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data - 1988	6.8		25	
3/16/90	ND	5	4	
4/23/90	ND	3	ND	6
5/31/90	ND	8	ND	5
6/19/90	ND	3	ND	1
7/16/90	ND	1	ND	3
8/7/90	ND	2	ND	5

INTERNATIONAL PAPER, JAY

TREATED PROCESS WASTEWATER DIOXIN DATA

	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
5 mill data 1/87	88		420	
7/15/88(C)	30		150	
3/7/89(G)	30		100	
3/7/89(G)	EMPC(6)		EMPC(20)	
3/7/89(G)	EMPC(20)		EMPC(20)	
3/10/89(C)	16		74	
6/18/89(C)	ND	8	980	
6/21/89(C)	17		140	
7/13/89(C)	ND	16	50	
8/16/89(C)	20		110	
4/13/90(G)	ND	10	90	
7/20/89	30		150	DEP

JAMES RIVER CORP., OLD TOWN

TREATED PROCESS WASTEWATER DIOXIN DATA

	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data 6/88	39		130	
1/31/89	27		120	
2/22/89	210		340	
2/23/89	92		290	
2/24/89	77		340	
3/20/89	ND		34	
3/21/89	52		170	
3/22/89	61		200	
3/23/89	47		120	
3/24/89	ND		24	
3/25/89	36		73	
4/5/89	30		110	
4/10/89	17		52	
4/11/89	32		89	
8/24/89	32		94	
8/31/89	13		150	
9/11/89	ND	4.1	14	
9/15/89	ND	3.3	ND	8.1
9/21/89	ND	5.7	13	
9/27/89	ND	5.3	9.7	
10/11/89	ND	3.0	11	
10/19/89	ND	5.2	14	
11/2/89	ND	6.0	18	
11/6/89	6.7		22	
11/14/89	ND	9.5	ND	7.1
11/27/89	ND	6.4	20	
12/6/89	ND	8.4	13	
12/13/89	ND	8.3	20	
12/21/89	ND	4.7	23	
1/5/90	ND	6.8	ND	8.3
1/11/90	ND	9.0	ND	8.5
1/18/90	ND	5.9	6.1	
1/25/90	ND	6.7	10	
2/7/90	ND	4.6	17	
2/14/90	ND	6.6	23	
2/22/90	ND	7.3	15	
3/1/90	ND	6.0	11	
3/8/90	ND	3.0	12	
3/15/90	ND	4.0	16	
3/29/90	ND	7.4	14	
4/7/90	ND	7.2	24	
5/2/90	ND	7.0	19	
7/29/90	ND	9.9	49	

LINCOLN PULP AND PAPER				
TREATED PROCESS WASTEWATER DIOXIN DATA				
	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data 11/88	32		130	

S.D. WARREN CO., SKOWHEGAN				
TREATED PROCESS WASTEWATER DIOXIN DATA				
	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data 6/88	16, 19		63, 100	
7/10/90	ND	7.1	8.4	
7/16/90	ND	6.1	5.9	
7/16/90 DUP	ND	5.5	ND	7.3
7/24/90	ND	3.6	ND	3.9

S.D. WAREN CO., - WESTBROOK				
TREATED PROCESS WASTEWATER DIOXIN DATA				
	TCDD (PPQ)		TCDF (PPQ)	
SAMPLE DATE	CONC.	DET. LIMIT	CONC.	DET. LIMIT
104 mill data 88	6.3			
summer 1989	1			

APPENDIX 5

PAPER INDUSTRY 1991 DATA

2378-TCDD AND 2378-TCDF IN FISH

FROM SELECTED MAINE RIVERS

TABLE 1
SAMPLING SITES AND SPECIES
FOR FISH TISSUE DIOXIN STUDY

	Site		Species
1.	Androscoggin River -	Dixfield	Smallmouth bass
2.	Androscoggin River -	Riley Dam Impoundment, Jay	Smallmouth bass
3.	Androscoggin River -	Jay Impoundment, Jay	Smallmouth bass
4.	Androscoggin River -	Otis Impoundment, Livermore Falls	Smallmouth bass
5.	Androscoggin River -	Gulf Island Pond, Auburn	Smallmouth bass Brown bullhead Largemouth Bass
6.	Kennebec River -	Shawmut Dam Impoundment, Fairfield	Smallmouth bass
7.	Penobscot River -	Veazie	Smallmouth bass

TABLE 2
MATRIX SPIKE RECOVERIES FOR 2378-TCDD
AND 2378-TCDF IN FISH FILETS

Sampling Date	Analysis Date	Sample Number	Spike Recovery (%)	
			2378-TCDD	2378-TCDF
5/6/91	5/23/91	91-05-009-04 91-05-009-04 DUP	107 96	75 39
5/13/91	6/5/91	91-05-019-03 91-05-019-03 DUP	108 128	130 140
8/1/91	8/15/91	91-08-003.01-.05 91-08-003.01-.05 DUP	100 100	115 110
9/16/91	10/1/91	91-09-027.06-.10 91-09-027.06-.10 DUP	105 111	99 104

TABLE 3
FISH TISSUE DIOXIN RESULTS
ANDROSCOGGIN RIVER
RILEY DAM IMPOUNDMENT

SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
5/6/91	12.5	0.0	1.5	6.2			
	12	0.40	1.0	3.6			
	12.5	0.40	0.52	3.2			
	13	3.2	1.8	11			
	12.5	0.0	1.0	4.0			
5/13/91	17.5	4.8**	1.2	3.4			
	14.5	8.8**	1.3	2.0			
	15.25	8.0**	1.9	3.0			
	16.75	8.8**	2.5	2.3			
	17	8.0**	3.0	4.0			
6/11-12/91	12-18*	1.2	0.75	0.72			
	13-17½*	2.0	0.87	1.2			
7/22-23/91	11-15½*	3.2	0.27	0.51	0.27	0.05	0.32
	10¼-17*	2.8	0.38	0.50	0.38	0.05	0.43
8/28/91	9¾-14*	7.2	ND(<0.24)	0.50			
	9¾-17¼*	6.8	0.48	0.53			

* *Analysis of 5-Fish Composite of Skinless Filets*
** *% Lipid of Whole Fish*
TTE = Total Toxic Equivalents calculated from Toxic Equivalency Factors developed by EPA

TABLE 3, CONT'D.
FISH TISSUE DIOXIN RESULTS

JAY IMPOUNDMENT
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
9/16/91	9½-16¼*	19.5	0.48	1.1			
	10-13½	14.0	0.82	1.2			

* *Analysis of 5-Fish Composite of Skinless Filets*

OTIS IMPOUNDMENT
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
9/16/91	11¼-16*	14.8	1.2	1.8			
	12½-17½*	15.6	1.6	3.7			

* *Analysis of 5-Fish Composite of Skinless Filets*

DIXFIELD BRIDGE
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
9/17/91	12½-13½*	13.5	0.84	2.3			
	12¼-16*	14.8	0.95	2.3			

* *Analysis of 3-Fish Composite of Skinless Filets*

TABLE 3, CONT'D.
FISH TISSUE DIOXIN RESULTS

MT. BLUE POND
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
5/30/91	12.5	1.9	ND (<.15)	1.7		.17	.17
	13	1.9	ND (<.15)	2.2		.22	.22
	15.5	2.8	ND (<.23)	3.3		.33	.33

WENTWORTH POND
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
8/21/91	8-11½*	8.0	ND(<0.34)	0.54			

LAKE GEORGE
SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
8/13/91	10¼-10½*	6.4	ND(<0.36)	0.43			

ND - Not Detected
TTE = Total Toxic Equivalents calculated from Toxic Equivalency Factors developed by EPA
* *Analysis of two-fish composites of skinless filets*

TABLE 3, CONT'D.
FISH TISSUE DIOXIN RESULTS
ANDROSCOGGIN RIVER
GULF ISLAND POND

BROWN BULLHEADS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
7/1/91	9½ - 10½*	3.3	1.6	6.6	1.6	0.99	2.6
	9½ - 12*	2.7	1.3	14	1.3	1.6	2.9
8/1/91	10-10¾*	6.8	0.73	2.8	0.73	0.28	1.0
	10-13½*	6.0	0.49	1.5	0.49	0.15	0.64

* *Analysis of 5-Fish Composites of Skinless Filets*

TTE = Total Toxic Equivalents calculated from Toxic Equivalency Factors developed by EPA

SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
8/17/91	11½-16¼*	8.0	0.52	1.7			

* *Analysis of 7-fish composite of skinless filets*

LARGEMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
8/17/91	13-13¾*	7.6	ND(<0.18)	0.36			

* *Analysis of 3-fish composite of skinless filets*

TABLE 3, CONT'D.
FISH TISSUE DIOXIN RESULTS
VEAZIE DAM
PENOBSCOT RIVER

SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
7/9-10/91	8¾ - 12*	2.4	0.30	0.42	0.30	0.04	0.34
	9 - 16¼*	4.4	0.34	0.53	0.34	0.05	0.39
8/6/91	9½-11	9.0	ND(<0.26)	ND(<0.33)	0.0	0.0	0.0
	9¼-11½	6.7	ND(<0.09)	ND(<0.11)	0.0	0.0	0.0

* *Analysis of 5-Fish Composites of Skinless Filets*

TTE = Total Toxic Equivalents calculated from Toxic Equivalency Factors developed by EPA

TABLE 3, CONT'D.
FISH TISSUE DIOXIN RESULTS
SHAWMUT DAM
KENNEBEC RIVER

SMALLMOUTH BASS

Sampling Date	Length (inches)	% Lipid	2378 TCDD (pg/g)	2378 TCDF (pg/g)	TTE PCDD	TTE PCDF	Total TTE
7/15-17/91	8-17¾*	3.2	ND (<0.3)	ND (<0.17)			
	9¼-16¾*	2.8	ND (<0.14)	ND (<0.11)			
8/27/91	9¾-16*	6.7	ND(<0.20)	ND(<0.14)			
	9½-14½*	6.4	ND(<0.18)	ND(<0.23)			

* *Analysis of 5-Fish Composites of Skinless Filets*
ND - Not Detected
TTE = Total Toxic Equivalents calculated from Toxic Equivalency Factors developed by EPA

TABLE 4
AVERAGE CONCENTRATIONS OF 2378-TCDD AND
2378-TCDF IN FISH FILETS*

Locations	2378-TCDD (pg/g)	2378-TCDF (pg/g)
Androscoggin River		
Dixfield	0.90	2.3
Riley Dam	0.74	1.6
Jay Dam	0.65	1.2
Otis Dam	1.4	2.8
Gulf Island Pond	0.81	4.6
Kennebec River		
Shawmut Dam	ND	ND
Penobscot River		
Veazie	0.16	0.24
Control Sites	ND	1.3
Mount Blue Pond		
Wentworth Pond		
Lake George		

* ***Number-weighted average concentrations for all samples collected from May through September 1991.***
ND = Not detected

TABLE 5
2378-TCDD CONCENTRATIONS IN
FISH FILETS
1984-1991

River (Location)	EPA NDS/NBS	Maine DMP	Acheron MP	
	1984-1986	1988-1990	1991	Number of Fish
Androscoggin				
Dixfield	NA	NA	0.90	6
Riley Impoundment	NA	NA	0.74	40
Jay Impoundment	NA	16.9*	0.65	10
Otis Impoundment	ND (<2.1)*	NA	1.4	10
Gulf Island Pond	6.6	NA	0.81	30
Kennebec				
Fairfield	NA	6.2	ND (<0.21)	20
Penobscot				
S. Lincoln	5.0	1.7	NA	
Veazie	2.6	1.9	0.16	20
Presumpscott				
Westbrook	NA	0.9	NA	
St. Croix				
Woodland	NA	ND	NA	
Controls				
Mt. Blue Pond			ND (<0.18)	3
Wentworth Pond			ND (<0.34)	2
Lake George			ND (<0.36)	2

* *Misidentified as Riley Dam*
NA = No Data Available
ND = Not Detected

APPENDIX 6

DEP INTERLABORATORY STUDY

DEP DIOXIN INTERLABORATORY STUDY
1/92

LAB	MRI		TLI		ALTA	
SAMPLE	TCDD	TCDF	TCDD	TCDF	TCDD	TCDF
ARLF-SMB-06	4.18	4.93	2.0	E4.8	1.7	1.3
RDX (dup)			2.3	E4.8		
KRSM-SMB-09	2.42	1.05	1.6	E7.9	1.2	0.35
PB-SMB-09	1.23	2.62	0.87	E3.8		
PR-SMB-02	0.16	0.64	0.15	E0.67	<0.19	0.28

all values in pg/g

APPENDIX 7

2378-TCDD AND 2378-TCDF IN SEDIMENTS

FROM VARIOUS STATIONS

ON THE ANDROSCOGGIN RIVER

APPENDIX 7. 2378-TCDD AND 2378-TCDF IN SEDIMENTS FROM VARIOUS STATIONS ON THE ANDROSCOGGIN RIVER. ((pg/g)

LOCATION	DATE	2378-TCDD	2378-TCDF	% MOISTURE	% DOC
Virginia Impoundment Rumford N443147 W703217	910308	4.4	185		2.35
Riley Impoundment Jay N443002 W701458	910306	5.3	168		3.31
Otis Impoundment Livermore Falls N442846 W701213	910327	E6.8	162		2.85
Gulf Island Pond Turner N441520 W701050	850711	23.1			
Gulf Island Pond Turner N441420 W701125	850711	30.3			
Gulf Island Pond Turner N441225 W701210	850711	20.4			
Gulf Island Pond Greene N441040 W701240	850711	39.5 42.6dup			
Gulf Island Pond Greene N440932 W701222	910313	27.4	371		6.79
Worumbo Impound. Lisbon Falls N435950 W700405	910327	4.7	64.2		2.31
Brunswick below dam N435445 W695550	850711	2.5			
Brunswick Cow Island N435520 W695745	850711	1.7			