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TO: Carl Neuchterlein

THROUGH: Bill Yake

FROM: Art Johnson, Dave Serdar, and Stuart Magoon

SUBJECT: Second Progress Report on Ecology's Dioxin/Furan Survey in Lake Roosevelt

Field work for Ecology's dioxin/furan survey of Lake Roosevelt was completed this month. Approximately 250 sportfish - walleye, rainbow trout, lake whitefish, sturgeon, kokanee, and burbot - were collected between May and October 1990 for analysis of dioxin (2,3,7,8-TCDD) and furan (2,3,7,8-TCDF) concentrations in edible tissue. Sampling locations are shown in Figure 1. The fish are being analyzed as composite samples of five fish each. This report represents partial data for both fish tissue for various species and locations within the study area. The present status of their analysis is summarized in Table 1.

We now have final data on dioxin/furan concentrations in 27 sportfish composites representing 135 individual fish (Table 2). All of these data have passed an independent quality assurance review. Eleven samples (numbers 328080 - 328090) of walleye, rainbow trout, and sturgeon have been analyzed since our first progress report in August. The new data for walleye and rainbow (except sample 328086) are consistent with initial results. The sturgeon data are the first obtained during the survey and show high concentrations of furan (117 - 222 parts per trillion) in two of the three samples analyzed. The furan concentrations measured in three samples (328086 - rainbow; 328088 - sturgeon; and 188239 - whitefish) appear to be outliers (i.e., either well above or below the range of similar samples). As indicated in Table 2, separate subsamples from these fish will be re-analyzed.

Analysis of all sportfish samples, including intercomparison samples provided by Environment Canada, should be completed by mid-December. The final report on dioxin and furan levels in Lake Roosevelt sportfish should be available by the end of January, 1991. As the data are received they are being transmitted to the Washington Department of Health. They will assess the potential risks to human health from eating Lake Roosevelt fish after all the data are in.

Dioxin and furan are also being analyzed in a series of bottom sediment and largescale sucker samples collected during June 26-28, 1990, at eight sites along the reservoir and in a suspended matter sample collected in the upper reaches of the lake by continuous centrifuge during October 9-12, 1990. The centrifuge work was timed to coincide with similar samples being collected above the border by Environment Canada. Analysis of these samples should be completed by the end of the year. Reports of the results are expected in February 1991.

AJ:krc

cc: Claude Sappington, Dick Burkhalter, Renee Guillierie, Phil KauzLoric, Lynn Singleton, Ron Holcomb, Carol Jolly, Neil Aaland, Steve Hunter, Steve Saunders, Jim Krull, Jerry Jewett, Bob Monn

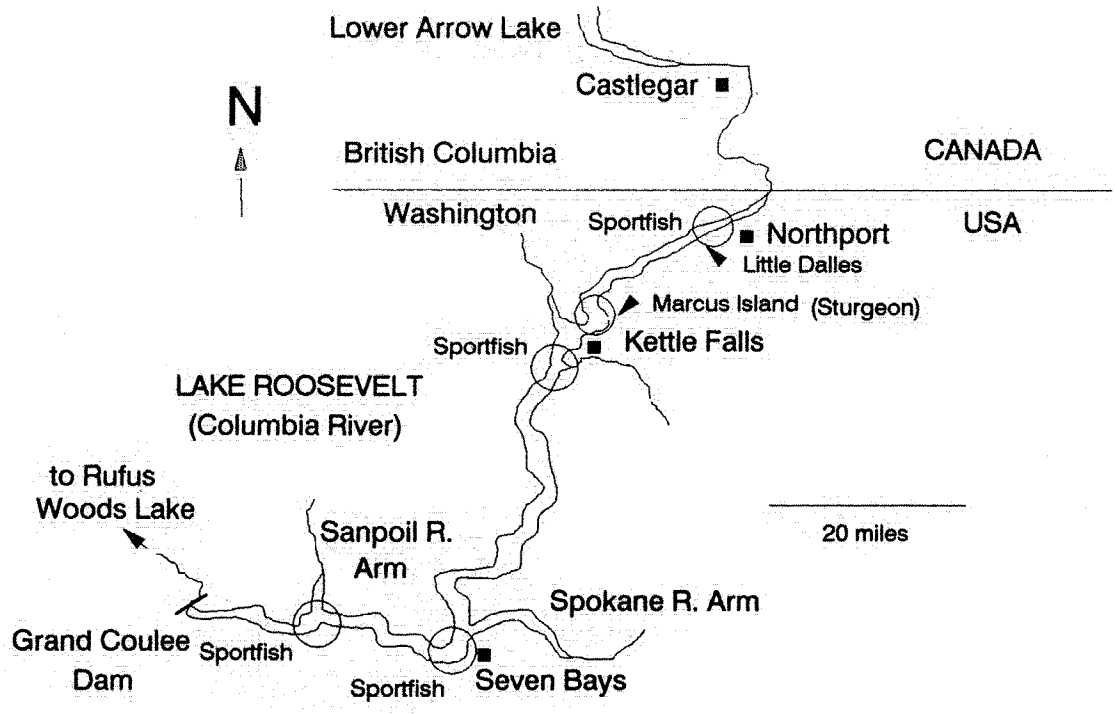

Figure 1. Lake Roosevelt Showing Location of Sportfish Samples Collected for TCDD/TCDF Analysis May - October, 1990

Table 1. Status of TCDD/TCDF Analysis of Lake Roosevelt Sportfish as of November, 1990 (each sample a 5 fish composite).

Species	Sample Size: Target	Final	Status of Analysis: Completed	Pending
	UPPER LAKE ROOSEVELT			
Walleye	6	6	6	0
Lake Whitefish	6	6	3	3
Rainbow Trout	6	6	2	4
White Sturgeon	6	4	3	1
Kokanee	2	0	0	0
Burbot	0	1	0	1
	LOWER LAKE ROOSEVELT			
Walleye	6	6	3	3
Lake Whitefish	6	6	3	3
Rainbow Trout	6	6	6	0
Kokanee	2	2	1	1
Burbot	0	1	0	1
	RUFUS WOODS LAKE (next downstream reservoir)			
Walleye	1	2	0	2
Lake Whitefish	1	2	0	2
Rainbow Trout	1	2	0	2
total =	49	50	27	23

Table 2. TCDD/TCDF analysis of muscle tissue samples from Lake Roosevelt sportfish collected by Ecology, May - August, 1990 (parts per trillion, wet weight; each sample a 5 fish composite)

Sample No.	Aproximate Location	Species	Mean Length (mm)	Mean Weight (g)	2,3,7,8-TCDD	2,3,7,8-TCDF	TEQ
		UPPER LAKE ROOSEVELT					
188234*	Kettle Falls	Walleye	427	693	ND(0.6)	6.0	0.9
188235	" "	"	434	686	0.31	4.1	0.7
188236	" "	"	427	678	ND(0.23)	2.8	0.4
328083	" "	"	428	673	ND(0.2)	2.1	0.3
328084	" "	"	418	657	ND(0.2)	0.88	0.2
328085	" "	"	434	605	ND(1.0)	0.88	0.6
						mean =	0.5
188243*	" "	Lake Whitefish	450	1050	2.3	154	18
188244	" "	" "	458	1066	1.9	131	15
188245	" "	" "	435	1060	1.9	120	14
						mean =	16
328086	Little Dalles/ Kettle Falls	Rainbow Trout	354	666	1.3	88**	10**
328087	" "	" "	375	635	1.5 EMPC	21.9	3.7
						mean =	6.8
328088	Marcus Island	White Sturgeon	1505	-	0.70	45**	5.2**
328089	" "	" "	1455	-	2.6	222	25
328090	" "	" "	1455	-	1.7	117	13
						mean =	14
		LOWER LAKE ROOSEVELT					
188240	Seven Bays	Walleye	451	788	0.32 EMPC	4.9	0.8
188241	" "	"	426	685	0.21 EMPC	2.2	0.4
188242	" "	"	428	678	0.15 EMPC	1.2	0.3
						mean =	0.5
188237	" "	Lake Whitefish	458	1115	2.3	174	20
188238	" "	" "	481	1138	1.5	133	15
188239	" "	" "	478	1138	0.51	38.3**	4.3**
						mean =	13
188230	Seven Bays/ Sanpoil Arm	Rainbow Trout	393	816	ND(0.2)	6.2	0.7
188231	" "	" "	419	801	0.69 EMPC	35.6	4.2
188232	" "	" "	430	798	1.1	9.7	2.1
328080	" "	" "	376	703	ND(1.2)	7.9	1.4
328081	" "	" "	353	526	ND(0.2)	8.0	0.9
328082	" "	" "	320	482	ND(0.08)	3.7	0.4
						mean =	1.6
188233	Spring Canyon	Kokanee	421	720	0.88	63.3	7.2

Table 2 footnotes:

TEQ = 2,3,7,8-TCDD Toxic Equivalents (TCDD+0.1xTCDF)

ND = not detected; detection limit shown in parenthesis

EMPC = estimated maximum possible concentration

*mean of duplicates

**result appears an outlier; separate subsample to be re-analyzed

Note: 1) TCDD data based on DB-5 column; TCDF data based on DB-225 column

2) 1/2 detection limit used to calculate TEQ for samples where TCDD not detected