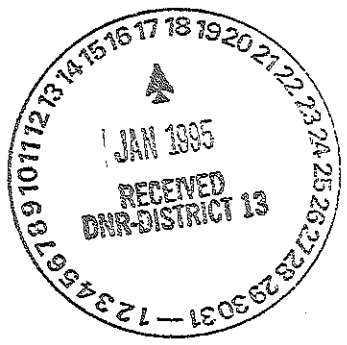
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE COMMUNICATION



January 12, 1995

TO: Mary Ellen Cromwell, Supervisor
Jackson District Office
Surface Water Quality Division

FROM: Chris Wood
Great Lakes and Environmental Assessment Section
Surface Water Quality Division

SUBJECT: Honey Creek Biological Survey

Attached are 2 copies of our staff report No. MI/DNR/SWQ-95/006 for the biological survey conducted on Honey Creek and First, Second and Third Sister Lakes in Washtenaw County. The report presents the results of macroinvertebrate community sampling and water monitoring for 1,4-dioxane conducted in 1987.

Please provide a copy of this report to the appropriate unit of government, such as the City of Ann Arbor or Scio Township.

Attachments

cc: Mr. Leonard Lipinski, Jackson District, ERD
Ms. Sandra Kosek, GLEAS, SWQD
Mr. William Creal/Section Files

C Wood

MI/DNR/SWQ-95/006

MICHIGAN DEPARTMENT OF NATURAL RESOURCES
SURFACE WATER QUALITY DIVISION
JANUARY, 1995

STAFF REPORT

BIOLOGICAL SURVEY OF HONEY CREEK AND FIRST, SECOND AND THIRD SISTER LAKES WASHTENAW COUNTY, MICHIGAN NOVEMBER 16, AND DECEMBER 11, 1987

A biological survey of Honey Creek and water sampling of First, Second and Third Sister Lakes was conducted on November 16, 1987. Additional water sampling of Honey Creek, an un-named tributary and adjacent peat lakes was conducted on December 11, 1987. The purpose of the survey and sampling was to determine surface water concentrations of 1,4-dioxane and obtain data on macro-invertebrate communities. Honey Creek is a warmwater stream tributary to the Huron River. Located in the vicinity of Honey Creek is the Gelman Science's contaminated groundwater site which serves as a source of 1,4-dioxane to these adjacent surface waters.

METHODS

Water samples were collected at 14 locations on Honey Creek, its tributaries and adjacent lakes (Figure 1). Samples were delivered to Thermo Analytical Inc. - ERG in Ann Arbor for analysis. All of the samples were analyzed for 1,4-dioxane, while several were also analyzed for additional organic constituents (Table 2). All of the water samples were collected just below the water surface except for SW4b and SW5b. These two samples were collected about 2 feet from the lake bottom.

Data on benthic macroinvertebrate communities and stream characteristics were collected at two stations on Honey Creek (Figure 1). Macroinvertebrates were sampled using a triangular dip net and by hand picking all available substrates. Sampling continued until no new taxa were found. Taxa were identified as collected with unknown taxa preserved and returned to the Water Quality Appraisal Unit (WQAU) laboratory for identification. Stream observations were recorded on Stream Survey Cards (Appendix A).

RESULTS

Station 1 was located on the Honey Creek Tributary at Jackson Road (Figure 1). At this location, the tributary is a second order intermittent warmwater stream. The stream was 3 feet wide

and 0.5 feet deep with a 50% gravel/cobble substrate. The macroinvertebrate community was moderate in abundance with 11 species including stoneflies.

At Station 2 at Zeeb Road (Figure 1), Honey Creek is a third order warmwater stream. The bottom substrate was primarily sand (60%) with some gravel/cobble (20%). The macroinvertebrate community was sparse in abundance with 9 species present.

The results of water sampling are presented in Table 2. 1,4-dioxane was present in Third Sister Lake, the two peat lakes, Honey Creek and the un-named tributary. The detectable concentrations ranged from 10 to 230 ug/l. 1,4-dioxane was not detected (<1 ug/l) in First or Second Sister Lakes or the west branch of the un-named Honey Creek tributary. In addition, methylene chloride was detected in all of the waterbodies samples with concentrations ranging from 5 to 17 ug/l.

The allowable levels of 1,4-dioxane and methylene chloride in surface waters not used as a drinking water source calculated pursuant to Rule 57(2) of the Michigan Water Quality Standards (MWQS) are 2000 and 59 ug/l, respectively. The water sampling results indicated that the levels of 1,4-dioxane and methylene chloride were below MWQS at the locations sampled.

Fieldwork by: William Creal, Aquatic Biologist
Chris Wood, Aquatic Biologist

Report by: Chris Wood, Aquatic Biologist
Water Quality Appraisal Unit North
Surface Water Quality Division

Table 1. Results of qualitative macroinvertebrate sampling conducted on Honey Creek and a tributary on November 16, 1987.

Station	1	2
Location	Honey Creek Tributary	Honey Creek
Taxa		
Hirudinea (Leeches)		S
Gastropoda (Snails)		
Ferrissia sp.		M
Physa sp.	M	M
Helisoma sp.	S	S
Plecoptera (Stoneflies)	M	
Zygoptera (Damselflies)		M
Hemiptera (True Bugs)		
Belastomatidae		
Belostoma sp.		S
Corixidae		M
Gerridae		S
Veliidae	S	
Megaloptera (Alderflies, Dobson flies)		
Sialidae		
Sialis sp.	S	
Trichoptera (Caddisflies)		
Hydropsychidae	A	A
Limnephilidae	M	S
Diptera (Flies, Midges)		
Athericidae		
Atherix sp.	S	
Chironomidae	S	S
Total No. of Taxa	9	11
Overall macroinvertebrate abundance	S	M
Overall habitat quality	Medium/High	Medium

S = sparse
M = moderate
A = abundant
P = profuse

Table 2. Analytical results for water samples collected from Honey Creek, a tributary and First, Second and Third Sister Lakes.

Sample Number:	SW1	SW2	SW3	SW4a	SW4b	SW5a	SW5b	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14
Date:	11/16/87	11/16/87	11/16/87	12/11/87	12/11/87	12/11/8	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87	12/11/87
Constituent (ug/l)																
1,4-Dioxane	k 1	k 1	k 1	180	230	180	150	53	47	43	72	58	k 1	78	k 1	10
1,2-Dichlorobenzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,3-Dichlorobenzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,4-Dichlorobenzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Acrolein				k 25	k 25	k 25	k 25	k 25	k 25	k 25						
Acrylonitrile				k 25	k 25	k 25	k 25	k 25	k 25	k 25						
Benzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Bromodichloromethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Bromoform				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Bromomethane				k 10	k 10	k 10	k 10	k 10	k 10	k 10						
Carbon Tetrachloride				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Chlorobenzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Chloroethane				k 10	k 10	k 10	k 10	k 10	k 10	k 10						
2-Chloroethylvinylether				k 10	k 10	k 10	k 10	k 10	k 10	k 10						
Chloroform				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Chloromethane				k 10	k 10	k 10	k 10	k 10	k 10	k 10						
Dibromochloromethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,1-Dichloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,2-Dichloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,1-Dichloroethene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
trans-1,2-Dichloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,2-Dichloropropane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
cis-1,3-Dichloropropene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
trans-1,2-Dichloropropene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Ethylbenzene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Methylene chloride				17	16	17	k 5	9	10	11						
1,1,2,2-Tetrachloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Tetrachloroethene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Toluene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,1,1-Trichloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
1,1,2-Trichloroethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Trichloroethene				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Trichlorofluoromethane				k 5	k 5	k 5	k 5	k 5	k 5	k 5						
Vinyl chloride				k 10	k 10	k 10	k 10	k 10	k 10	k 10						

k indicates the constituent was not detected and the level indicated.

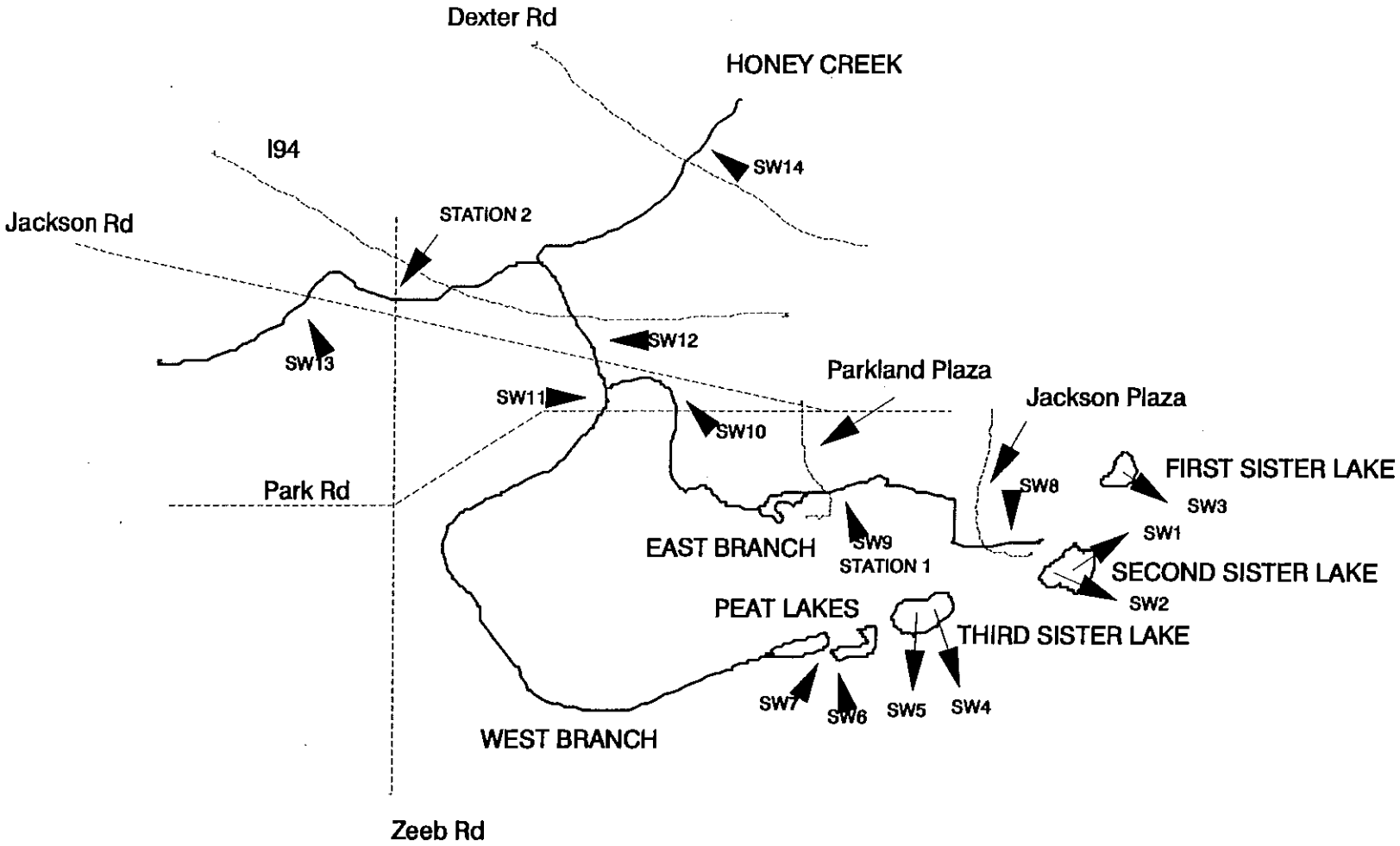


Figure 1. Sample locations for the biological survey conducted on November 16, and December 11, 1987 on Honey Creek and First, Second and Third Sister Lakes.

MICHIGAN DNR — STREAM SURVEY CARD
SWQD/GLEAS — STORET NO.:

STREAM:	Honey Creek	INVESTIGATORS:	Waggoner/Creal	DATE:	11/16/87
STATION:	2	LOCATION:	Zeeb Road	TIME:	2:30
STREAM TYPE:	Warmwater	LAND USE:	Suburban/Agriculture	REACH LENGTH(FT):	
WEATHER:	Partly Cloudy	AIR TEMP(F):	60	WATER TEMP(F):	
SHADING(%):	40	DAM U/S:	No	CHANNELIZED:	No
DISCH. STABILITY:	Stable	BANK STABILITY:	Stable	UNDERCUT BANKS:	No
WIDTH(FT):	8	DEPTH(FT):	1	VELOCITY(FPS):	0.7
BANKFUL WIDTH(FT):		BANKFUL HGT.(FT):		EST DISCH(CFS):	5-6
CHANNEL SLOPE(%):		BANK SLOPE(%):		WATER COLOR:	Light Brown
CHANNEL SHAPE:	U - shaped	TURBIDITY:	Slight	RUBBLE BLACK?	No
WATER OILS:	None	WATER ODORS:	Normal		
SED OILS:	None	SED ODORS:	Normal		

VEGETATION:	GRASSES	HERBACEOUS	BRUSH	DECIDUOUS	CONIFER	BARREN	OTHER
COVERAGE(%)	30	30		40			
HEIGHT(FT)	2	5		30			

INORGANIC SUBSTRATE	FLOW VELOCITY	CHARACTERISTICS OR SIZE (INCH)	PERCENT IN SAMPLING AREA	ORGANIC SUBSTRATE	CHARACTERISTICS OR SIZE	PERCENT IN SAMPLING AREA
INORGANICS:						
BOULDERS*	>3 fps	> 10"		MUCK-MUD	BLK. VERY FINE ORGANIC	
RUBBLE*	2 fps	2.5 - 10"	10	PULPY-PEAT	INDISTINGUISHABLE PLANT PARTS	
GRAVEL	1 fps	0.1 -2.5"	10	FIBROUS PEAT	PARTIALLY DECOMPOSED PLANT MATERIAL	
SAND	0.7 fps	0.002 - 0.079"	60	DETRITUS	STICK, WOOD, COARSE PLANT MATERIAL	
SILT	0.4 fps		10	LOGS, LIMBS	SNAGS, SWEEPS	
CLAY		SLICK TEXTURE	10			

*EMBEDDEDNESS: (1) None (2) 1/3 or less (3) 1/3 to 2/3 (4) 2/3 or more

SITE SUBSTRATE COMPOSITION: % INORGANIC 100 % ORGANIC