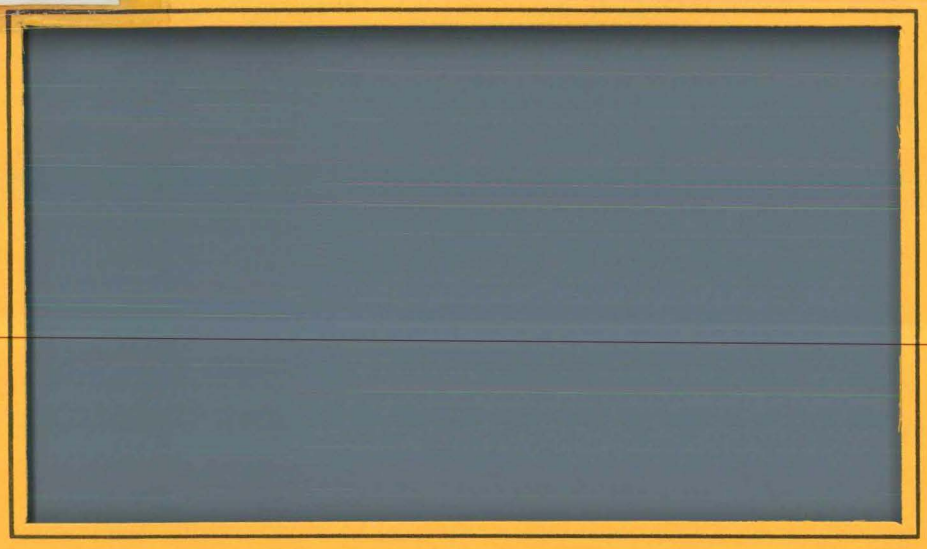

A REPORT FROM

The State Hygienic Laboratory

MEDICAL LABORATORIES BUILDING

THE UNIVERSITY OF IOWA

IOWA CITY, IOWA 52242

BOONE RIVER

Winter Water Quality Survey

#76-20

Submitted to the Iowa Department of Environmental Quality
by the Limnology Division of the State Hygienic Laboratory

4/8/76

INTRODUCTION

The Boone River, with a drainage area of 906 square miles is located in north central Iowa (Hancock, Wright and Hamilton counties). Like many streams that originate in northern Iowa, the headwaters lie in a slightly rolling, highly agricultural area. As the Boone River proceeds over its 100 mile course to join with the Des Moines River, it cuts into the glacial overburden to form a scenic river valley in the Eagle Grove-Webster City vicinity. It is reportedly one of the most important producers of smallmouth bass in the Des Moines River basin (Iowa Conservation Commission).

Major sources of waste discharge in the Boone River basin are the towns of Britt, Eagle Grove, Clarion and Webster City. Except for Webster City, they all discharge into small tributaries which join the Boone River.

The Boone River (Fig. 1) is classified as a class B, fresh, warm water stream from its mouth to the Hancock county line. White Fox Creek is classified similarly from its mouth to the Wright county line.

Previous water quality data acquisition has been limited for the Boone River. In view of this, the Iowa Department of Environmental Quality requested the Limnology Division to conduct a winter water quality survey of the Boone River and its major tributaries Samples were collected for analysis on January 19 and 20, 1976,

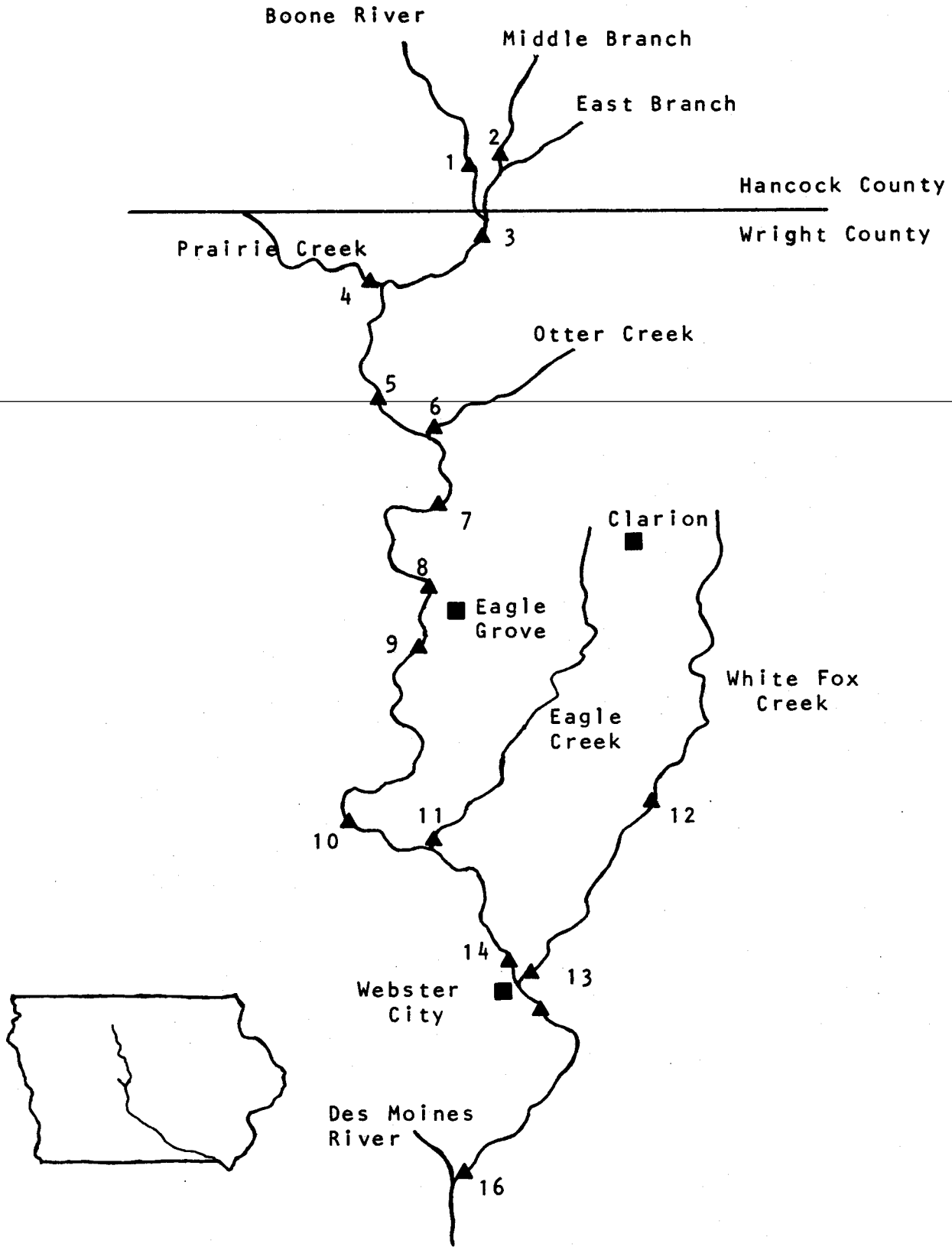

Fig.1 Map of the Boone River and Tributaries Showing Sampling Locations

TABLE 1

SAMPLING STATION LOCATIONS

STATION		LOCATION
*	Boone River	Hancock Co.Rd. Bridge T94N R26W Sec. 5 & 8
1	Boone River	Hancock Co.Rd. Bridge T94N R26W Sec.26 & 35
2	Middle Branch Boone River	Hancock Co.Rd. Bridge T94N R26W Sec. 25 & 36
*	East Branch Boone River	Hancock Co.Rd. Bridge T94N R26W Sec.36
3	Boone River	Wright Co.Rd. Bridge T93N R26W Sec. 9 & 10
4	Prairie Creek	Wright Co.Rd. Bridge T93N R26W Sec. 19 & 30
5	Boone River	Wright Co.Rd. Bridge T92N R26W Sec.20
6	Otter Creek	Wright Co.Rd. Bridge T92N R26W Sec. 21
7	Boone River	Wright Co.Rd. Bridge T91N R26W Sec.5
8	Boone River	Wright Co.Rd. Bridge T91N R26W Sec. 17
9	Boone River	Wright Co.Rd. Bridge T90N R26W Sec. 4 & 9
10	Boone River	Hamilton Co. Hwy Bridge R27 T89N R26W Sec. 1
11	Eagle Creek	Wright Co.Rd. Bridge T90N R26W Sec. 36
12	White Fox Creek	Hamilton Co.Rd. Bridge T89N R25W Sec.3
13	White Fox Creek	Hamilton Co.Rd. Bridge T89N R25W Sec. 28
14	Boone River	Hamilton Co.Rd. Bridge T89N R25W Sec.30 & 31
15	Boone River	Hamilton Co.Rd. Bridge T88N R25W Sec. 18
16	Boone River	Webster Co.Rd. Bridge T87N R27W Sec. 25

* No water sample collected - river frozen to bottom

during a period of heavy ice cover and little precipitation. Because of the heavy ice cover and low flows water was not obtained at two stations located on the upper reaches of the Boone River.

Flow data obtained from the United States Geological Survey for the gauge station at Webster City indicated flows were down considerably. Flows for January 19 and 20 were 14 cfs (cubic feet per second) and 10 cfs which is equalled or exceeded 90% of the time. Even then, the January flows were greater than the calculated 7 day Q_{10} of 3.6 cfs which is equalled or exceeded 99% of the time.

RESULTS AND DISCUSSION

Table 2 lists, for the convenience of the reader, selected data from a variety of analyses that were performed. Discussion of the data will be confined to that found in the table, all data obtained are listed in the appendix.

Fecal coliforms ranged from 10 to 30,000 organisms per 100ml. Only two stations, station 2 - 1300 organisms/100ml, and station 15 - 30,000 organisms/100ml, had unexpected values. Both values can be related to the point source waste discharge of Britt and Webster City.

Values for specific conductance were quite high, ranging from 910 to 1400 micromhos. Specific conductance gives indication of the concentration of dissolved substances and the ionic strength of the water. Generally, water contains more dissolved solids in winter than in summer. This is because during low

TABLE 2

SELECTED CHEMICAL AND BACTERIOLOGICAL DATA
Boone River - January 1976

(All values in mg/L unless designated otherwise)

Station	Fecal Coliform per 100 ml	Specific Conductance micromhos	Ammonia N	Nitrate N	Total PO_4	DO	BOD	Turbidity	Chloride
1	380	920	0.14	6.6	0.16	13.1	2	6	34
2[1]	1,300	1400	2.0	2.2	0.65	8.2	2	4	73
3	270	990	0.09	4.9	0.15	17.2	2	3	34
4[2]	40	1000	0.02	4.3	0.10	17.1	2	6	35
5	10	1000	0.08	4.0	0.13	14.6	2	2	31
6[3]	30	1400	0.19	6.5	0.15	11.2	1	2	52
7	60	1200	0.19	3.9	0.19	11.6	1	2	41
8	50	1200	0.15	3.6	0.19	10.0	2	2	44
9	60	1200	0.24	2.9	0.20	9.8	1	2	52
10	70	1100	0.98	3.2	0.59	14.3	2	3	50
11[4]	30	1300	0.85	4.3	0.66	11.4	2	4	9
12[5]	200	900	0.12	3.3	0.09	13.2	2	6	15
13[5]	40	910	0.12	3.1	0.07	12.6	2	4	16
14	30	1100	0.60	2.6	0.44	15.8	2	3	52
15	30,000	1200	1.5	2.7	1.09	14.4	3	3	56
16	120	1100	0.42	2.7	0.59	19.7	3	2	44

[1]Mid Branch Boone
[2]Prairie Creek
[3]Otter Creek
[4]Eagle Creek
[5]White Fox Creek

flow winter conditions ground water makes up much of the stream flow and ground water is usually high in dissolved solids.

Ammonia nitrogen in the Boone River ranged from 0.02 mg/L to 2.0 mg/L. Stations 2,10,11,14,15 and 16 had elevated ammonia-N levels relative to the other sampling stations. All of the elevated ammonia-N values can be attributed to several point source waste discharges i.e., station 2 was located downstream of Britt, station 10 below Eagle Grove, station 11 below Clarion, station 14 a combination of stations 10 and 11, stations 15 and 16 located below Webster City.

Total phosphate follows the same general trend as ammonia nitrogen. This would be expected, as point source organic waste discharges are the major source of phosphates. Almost all of the phosphate found was soluble phosphate. In summer there is very little soluble phosphate because it is rapidly assimilated by plant life. The lack of plant life during winter results in more soluble phosphate found in the streams.

Although dissolved oxygen values were adequate, ranging from 8.2 - 19.7 mg/L, when related to percent saturation, several stations were less than 100% saturation. The solubility of dissolved oxygen varies inversely with temperature. In order to have 100% saturation at $0^{o}C$, the stream dissolved oxygen would have to be 14.5. While several stations were less than 100% saturation, no problems were encountered and none are expected.

BOD (ranged from 1 - 3 mg/L) and turbidity (2 - 6 mg/L) were consistently low throughout the entire river.

Chlorophyll a and cell count analysis were performed on several Boone River samples. The data are listed below:

STATION	Chlorophyll a mg/M^3	Cell Count per ml	Dominate Taxa
8	0.9	500	pennate diatoms
9	1.8	1100	pennate diatoms
10	4.2	1650	pennate diatoms
13*	32.6	11,150	pennate diatoms
14	3.8	1750	pennate diatoms
15	6.3	1700	pennate diatoms
16	3.7	650	pennate diatoms

*White Fox Creek

Except for station 13 all values were within expected winter ranges. The higher algal population found at station 13 may be attributable to the ponding of water from a beaver dam at that station.

Franklin Manufacturing, located in Webster City, utilizes a number of compounds containing heavy metals in their manufacturing process. To determine if any of these metals were entering the Boone River, water samples for heavy metals analysis were collected above and below Webster City. The results (Appendix) indicate heavy metals values were quite low at the three stations The samples from below Webster City had similar values as the samples above Webster City.

CONCLUSIONS

Although there were no violations of the Iowa Water Quality Standards, the quality of the water declined in the Boone River below the towns of Britt, Eagle Grove, Clarion and Webster City. This decline occurred at a time when flows were approaching the 7 day Q_{10} and some effects of point source discharges are to be expected at these low flows. In general, winter water quality of the Boone River was quite good.

Jack O. Kennedy
Limnologist

R.L.Morris, PhD
Associate Director and
Principal Chemist

APPENDIX

WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town			
Source	Boone River	Mid-branch Boone R.	Boone River
Specific Location	Co.Rd. bridge, T94N, R26W, Sec. 26 & 35	Co.Rd. bridge, T94N, R26W, Sec. 25 & 36	Co.Rd. bridge, T93N, R26W, Sec. 9 & 10
Date Collected	19 January 1976	19 January 1976	19 January 1976
Date Received	20 January 1976	20 January 1976	20 January 1976
Lab Number	2737	2738	2739
	FIELD DATA		
Collection Time	1:15	1:30	2:15
pH			
Temperature	-1°C	-1°C	-1.0°C
Dissolved Oxygen			
	BACTERIOLOGICAL EXAMINATION		
Fecal Coliform/100 ml	380 (>24 hrs.)	1300 (>24 Hrs.)	270 (>24 hrs.)
	CHEMICAL ANALYSIS (as mg/l unless designated otherwise)		
Conductance (micromhos)	920	1400	990
MBAS (as LAS)			
pH (units)	7.7	7.55	7.8
Alkalinity: P	None	None	None
T	314	450	358
NITROGEN: Organic N	0.51	0.89	0.53
Ammonia N	0.14	2.0	0.09
Nitrite N	0.062	0.076	0.061
Nitrate N	6.6	2.2	4.9
Nitrate as NO_3			
RESIDUE: Total	610	900	660
Fixed	470	740	530
Volatile	140	160	130
Filtrable Residue T	580	860	630
F	470	740	530
V	110	120	100
Nonfiltrable Residue T	10	5	6
F	10	5	6
V	0	0	0
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.15	0.63	0.13
Total P	0.16	0.65	0.15
Dissolved Oxygen	13.1	8.2	17.2
BOD	2*	2	2
COD	12	20	12
Grease or Oil			
Turbidity (JTU)	6.3	4.3	3.7
Total Hardness (as $CaCO_3$)	444	602	480
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	34	73	34
Sulfate (SO_4^{--})			

*Comprehensive note for lab numbers 2737 through 2752--BOD samples held at 4°C for 16 hours before analysis.

REMARKS: 100% ice cover | 100% ice cover | 100% ice cover

COLLECTOR
REPORT TO

Cramer & Kennedy
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

LIMNOLOGY SURVEY

WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town			
Source	Prairie Creek	Boone River	Otter Creek
Specific Location	Co.Rd. bridge, T93N, R26W, Sec. 19 & 30	Co. Rd. bridge, T92N, R26W, Sec.20	Co.Rd. bridge, T92N, R26W, Sec.21
Date Collected	19 January 1976	19 January 1976	19 January 1976
Date Received	20 January 1976	20 January 1976	20 January 1976
Lab Number	2740	2741	2742
	FIELD DATA		
Collection Time	2:40	3:15	3:30
pH			
Temperature	-1.0°C	-1°C	-2°C
Dissolved Oxygen			
	BACTERIOLOGICAL EXAMINATION		
Fecal Coliform/100 ml	40 (>24 hrs.)	10 (>24 hrs.)	30 (>24 hrs.)
	CHEMICAL ANALYSIS (as mg/l unless designated otherwise)		
Conductance (micromhos)	1000	1000	1400
MBAS (as LAS)			
pH (units)	7.7	7.7	7.65
Alkalinity: P	None	None	None
T	359	383	508
NITROGEN: Organic N	0.74	0.47	0.71
Ammonia N	0.02	0.08	0.19
Nitrite N	0.045	0.029	0.044
Nitrate N	4.3	4.0	6.5
Nitrate as NO_3			
RESIDUE: Total	690	670	940
Fixed	520	520	730
Volatile	170	150	210
Filtrable Residue T	640	620	900
F	510	500	720
V	130	120	180
Nonfiltrable Residue T	12	4	0
F	12	4	0
V	0	0	0
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.09	0.12	0.14
Total P	0.10	0.13	0.15
Dissolved Oxygen	17.1	14.6	11.2
BOD	2	2	1
COD	16	6	16
Grease or Oil			
Turbidity (JTU)	5.7	2.0	1.8
Total Hardness (as $CaCO_3$)	514	502	705
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	35	31	52
Sulfate (SO_4^{--})			
REMARKS:	100% ice cover	100% ice cover	100% ice cover

COLLECTOR
REPORT TO

Cramer & Kennedy
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town			
Source	Boone River	Boone River	Boone River
Specific Location	Co.Rd. bridge, T91N, R26W, Sec.5	Co.Rd. bridge, T91N, R26W, Sec.17	Co. Rd. bridge, T90N, R26W, Sec. 4 & 9
Date Collected	19 January 1976	19 January 1976	19 January 1976
Date Received	20 January 1976	20 January 1976	20 January 1976
Lab Number	2743	2744	2745
	FIELD DATA		
Collection Time	4:00	4:30	5:00
pH			
Temperature	-2°C	-1°C	-2.0°C
Dissolved Oxygen			
	BACTERIOLOGICAL EXAMINATION		
Fecal Coliform/100 ml	60 (>24 hrs.)	50 (>8 hrs.)	60 (>8 hrs.)
	CHEMICAL ANALYSIS (as mg/l unless designated otherwise)		
Conductance (micromhos)	1200	1200	1200
MBAS (as LAS)			
pH (units)	7.7	7.6	7.6
Alkalinity: P	None	None	None
T	445	458	446
NITROGEN: Organic N	0.86	0.60	0.56
Ammonia N	0.19	0.15	0.24
Nitrite N	0.10	0.047	0.046
Nitrate N	3.9	3.6	2.9
Nitrate as NO_3			
RESIDUE: Total	770	810	790
Fixed	610	630	620
Volatile	160	180	170
Filtrable Residue T	760	770	760
F	610	620	620
V	150	150	140
Nonfiltrable Residue T	3	0	3
F	3	0	3
V	0	0	0
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.19	0.19	0.18
Total P	0.19	0.19	0.20
Dissolved Oxygen	11.6	10.0	9.8
BOD	1	2	1
COD	10	14	12
Grease or Oil			
Turbidity (JTU)	2.2	2.0	2.3
Total Hardness (as $CaCO_3$)	586	580	578
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	41	44	52
Sulfate (SO_4^{--})			
REMARKS:	100% ice cover	100% ice cover	100% ice cover

COLLECTOR
REPORT TO

Cramer & Kennedy
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town			
Source	Boone River	Eagle Creek	White Fox Creek
Specific Location	Co.Rd. R27 bridge, T89N, R26W, Sec. 1	Co.Rd. bridge, T90N, R26W, Sec.36	Co.Rd. bridge, T89N, R25W, Sec. 3
Date Collected	20 January 1976	20 January 1976	20 January 1976
Date Received	20 January 1976	20 January 1976	20 January 1976
Lab. Number	2746	2747	2748
FIELD DATA			
Collection Time	9:50	10:15	10:30
pH			
Temperature	-2°C	-1°C	-2°C
Dissolved Oxygen			
BACTERIOLOGICAL EXAMINATION			
Fecal Coliform/100 ml	70 (<8 hrs.)	30 (<8 hrs.)	200 (<8 hrs.)
CHEMICAL ANALYSIS (as mg/l unless designated otherwise)			
Conductance (micromhos)	1100	1300	900
MBAS (as LAS)			
pH (units)	7.8	7.7	7.8
Alkalinity: P	None	None	None
T	427	457	400
NITROGEN: Organic N	0.82	0.62	0.65
Ammonia N	0.98	0.85	0.12
Nitrite N	0.055	0.082	0.023
Nitrate N	3.2	4.3	3.3
Nitrate as NO_3			
RESIDUE: Total	760	830	610
Fixed	600	670	470
Volatile	160	160	140
Filtrable Residue T	720	820	580
F	580	670	470
V	140	150	110
Nonfiltrable Residue T	6	7	12
F	6	7	12
V	0	0	0
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.57	0.63	0.04
Total P	0.59	0.66	0.09
Dissolved Oxygen	14.3	11.4	13.2
BOD	2	2	2
COD	16	16	16
Grease or Oil			
Turbidity (JTU)	2.7	3.8	5.8
Total Hardness (as $CaCO_3$)	554	588	462
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	50	9.0	15
Sulfate (SO_4^-)			
REMARKS:	100% ice cover	100% ice cover	100% ice cover

COLLECTOR
REPORT TO

Kennedy & Cramer
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

LIMNOLOGY SURVEY — WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town			
Source	White Fox Creek	Boone River	Boone River
Specific Location	Co.Rd. bridge, T89N, R25W, Sec.28	Co.Rd. bridge, T89N, R25W, Sec. 30 & 31	Co.Rd. bridge, T88N, R25W, Sec. 18
Date Collected	20 January 1976	20 January 1976	20 January 1976
Date Received	20 January 1976	20 January 1976	20 January 1976
Lab Number	2749	2750	2751
	FIELD DATA		
Collection Time	11:00	11:20	12:00
pH			
Temperature	-2°C	-1°C	-1°C
Dissolved Oxygen			
	BACTERIOLOGICAL EXAMINATION		
Fecal Coliform/100 ml	40 (< 8 hrs.)	30 (< 8 hrs.)	30,000 (< 8 hrs.)
	CHEMICAL ANALYSIS (as mg/l unless designated otherwise)		
Conductance (micromhos)	910	1100	1200
MBAS (as LAS)			
pH (units)	7.85	7.75	7.85
Alkalinity: P	None	None	None
T	402	429	427
NITROGEN: Organic N	0.40	0.60	0.84
Ammonia N	0.12	0.60	1.5
Nitrite N	0.020	0.056	0.073
Nitrate N	3.1	2.6	2.7
Nitrate as NO_3			
RESIDUE: Total	620	750	800
Fixed	480	600	650
Volatile	140	150	150
Filtrable Residue T	580	720	760
F	480	590	640
V	100	130	120
Nonfiltrable Residue T	10	2	0
F	10	2	0
V	0	0	0
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.03	0.41	0.96
Total P	0.07	0.44	1.09
Dissolved Oxygen	12.6	15.8	14.4
BOD	2	2	3
COD	14	16	16
Grease or Oil			
Turbidity (JTU)	4.5	2.7	3.2
Total Hardness (as $CaCO_3$)	482	552	536
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	16	52	56
Sulfate (SO_4^{--})			
REMARKS:	100% ice cover	100% ice cover	100% ice cover

COLLECTOR
REPORT TO

Cramer & Kennedy
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

WATER QUALITY REPORT

STATE HYGIENIC LABORATORY, Des Moines Branch
The University of Iowa
E 7th & Court, Rm 405, Des Moines, Iowa 50309

Town	Boone River		
Source	Co.Rd. bridge,		
Specific Location	T87N, R27W, Sec.25		
Date Collected	20 January 1976		
Date Received	20 January 1976		
Lab Number	2752		
		FIELD DATA	
Collection Time	12:40		
pH			
Temperature	-1°C		
Dissolved Oxygen			
	BACTERIOLOGICAL EXAMINATION		
Fecal Coliform/100 ml	120 (<8 hrs.)		
	CHEMICAL ANALYSIS (as mg/l unless designated otherwise)		
Conductance (micromhos)	1100		
MBAS (as LAS)			
pH (units)	8.0		
Alkalinity: P	None		
T	422		
NITROGEN: Organic N	0.65		
Ammonia N	0.42		
Nitrite N	0.051		
Nitrate N	2.7		
Nitrate as NO_3			
RESIDUE: Total	750		
Fixed	610		
Volatile	140		
Filtrable Residue T	730		
F	610		
V	120		
Nonfiltrable Residue T	2		
F	2		
V	0		
Settleable Matter (ml/l)			
PHOSPHATE: Filtrable P	0.57		
Total P	0.59		
Dissolved Oxygen	19.7		
BOD	3		
COD	18		
Grease or Oil			
Turbidity (JTU)	2.4		
Total Hardness (as $CaCO_3$)	496		
Calcium (Ca^{++})			
Magnesium (Mg^{++})			
Chloride (Cl^-)	44		
Sulfate (SO_4^-)			

REMARKS: 100% ice cover

COLLECTOR
REPORT TO

Cramer & Kennedy
Limnology Division
State Hygienic Laboratory
Des Moines, Iowa

R. L. Morris, Ph.D.
Associate Director & Principal Chemist

FEB 12 1976

METALS ANALYSIS

TOWN:			
SOURCE:	Boone River	Boone River	Boone River
SPECIFIC LOCATION:	Co.Rd. bridge, T89N, R25W, Sec. 30 and 31	Co.Rd. bridge, T88N, R25W, Sec. 18	Co.Rd. bridge, T87N, R27W, Sec. 25
DATE COLLECTED:	20 January 1976	20 January 1976	20 January 1976
DATE RECEIVED:	20 January 1976	20 January 1976	20 January 1976
COLLECTED BY:	Kennedy & Cramer		
REPORT TO:	Limnology Division State Hygienic Laboratory Des Moines, Iowa		
LAB NUMBER	2750	2751	2752
ALUMINUM			
ANTIMONY			
ARSENIC			
BARIUM	<0.1	0.1	<0.1
CADMIUM	<0.01	<0.01	<0.01
CHROMIUM, TOTAL	<0.01	<0.01	<0.01
CHROMIUM, HEXAVALENT			
COPPER	<0.01	<0.01	<0.01
IRON			
LEAD	<0.01	<0.01	<0.01
MAGNESIUM			
MANGANESE			
MERCURY			
NICKEL	<0.01	<0.01	<0.01
SILVER	<0.01	<0.01	<0.01
TIN			
ZINC	0.01	0.01	0.01

DETERMINATIONS REPORTED AS MILLIGRAMS PER LITER (MG/L) UNLESS OTHERWISE STATED.