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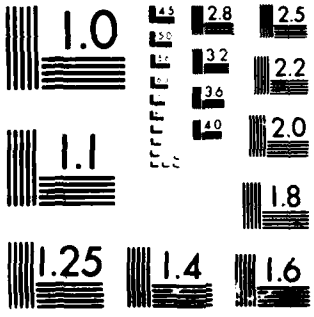
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Special Report 87-20

November 1987

ICE ATL
1985 – 1986

LAWRENCE W. GATTO
STEVEN F. DALY
KEVIN L. CAREY

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US Army Corps
of Engineers
Cold Regions Research &
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Prepared for
OFFICE OF THE CHIEF OF ENGINEERS

Approved for public release; distribution is unlimited.

MONONGAHELA RIVER
ALLEGHENY RIVER
OHIO RIVER
ILLINOIS RIVER
KANKAKEE RIVER

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			Ice reporting	Landsat image

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r	Kankakee River	Ohio River
	Landsat imagery	River ice

number)

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ice unit in the lower Allegheny. *Fragmented Ice Cover* and *Fragmented Ic*
Areas were the most extensive ice units above Hannibal Dam on the Ohio;
Pans were predominant below. *Solid Ice Cover, Fragmented Ice Cover* and
Open-Water Areas were the most extensive ice types on the lake-like area
Fragmented Ice Cover with Open-Water Areas and *Ice Floes or Frazil Slus*
where on the Illinois. *Solid Ice Cover* and *Fragmented Ice Cover* were the
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PREFACE

This report was prepared by Lawrence W. Gatto, Geologist, Geological Sciences Branch, Research Division; Steven F. Daly, Research Hydraulic Engineer, and Kevin L. Carey, Research Hydraulic Engineer, both of the Ice Engineering Research Branch, Experimental Engineering Division, U.S. Army Cold Regions Research and Engineering Laboratory. The work was funded by the Office of the Chief of Engineers, under the River Ice Management (RIM) Program, Work Units 32228, *Remote Ice Monitoring System*, and 32227, *Forecasting Ice Conditions on Inland Rivers*.

Northland Video Associates, Inc., of Lebanon, New Hampshire, under contract to CRREL, acquired the aerial video tapes used for mapping ice conditions on the Monongahela, Allegheny and Ohio Rivers. Video Production Group, Pekin, Illinois, acquired the tapes for the Illinois and Kankakee Rivers. Photographic Interpretation Corporation (PIC) of Lyme, New Hampshire, prepared the river ice maps under a contract to the New England Division of the Corps of Engineers. Vernon Anderson of PIC interpreted and mapped ice conditions from the video tapes, and Roger Arend of PIC measured the areal extent of the ice types and percentages of ice concentration. The authors thank Darryl Calkins and Michael Ferrick for technical reviews of the manuscript, Eleanor Huke for her assistance in planning and preparing the base maps, and Charles Clark and Richard Sterling for assisting in the collection of the air and water temperature data.

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Pool, River	*18*	*19*	*28*	*30*	*2*	*7*	*8*	*9*	*10*	*15*	*16*	*17*	*21*	*22*	*23*	*24*	*27*
Emsworth, Monongahela	7	—	35	—	63	65	67	—	71	81	—	—	—	109	119	—	—
Emsworth, Allegheny	7	—	35	—	63	65	67	—	71	81	—	—	—	109	119	—	—
L/D 2, Allegheny*	8	—	36	—	64	66	68	—	72	82	—	—	—	110	120	—	—
L/D 3, Allegheny	8	—	36	—	64	66	68	—	72	82	—	—	—	110	120	—	—
Emsworth, Ohio	—	9	—	37	—	—	69	—	73	—	83	—	—	111	121	—	—
Dashields, Ohio	—	9	—	37	—	—	69	—	73	—	83	—	—	111	121	—	—
Montgomery, Ohio	—	10	—	38	—	—	—	—	74	—	84	—	—	112	122	—	—
New Cumberland, Ohio	—	11	—	39	—	—	—	—	75	—	85	—	—	113	123	—	—
Pike Island, Ohio	—	12	—	40	—	—	—	—	76	—	86	—	—	114	124	—	—
Hannibal, Ohio	—	14	—	42	—	—	—	—	78	—	88	—	—	116	126	—	—
Willow Island, Ohio	—	16	—	44	—	—	—	—	—	—	90	—	—	—	—	—	—
Belleville, Ohio	—	18	—	46	—	—	—	—	—	—	92	—	—	—	—	—	—
Racine, Ohio	—	21	—	49	—	—	—	—	—	—	95	—	—	—	—	—	—
Gallipolis, Ohio	—	23	—	51	—	—	—	—	—	—	97	—	—	—	—	—	—
Greenup, Ohio	—	25	—	53	—	—	—	—	—	—	99	—	—	—	—	—	—
Meldahl, Ohio	—	29	—	57	—	—	—	—	—	—	103	—	—	—	—	—	—
La Grange, Illinois	—	—	—	—	—	143	—	—	163	175	—	187	199	—	—	211	223
Peoria, Illinois	—	—	—	—	—	145	—	155	165	177	—	189	201	—	—	213	225
Starved Rock, Illinois	—	—	—	—	—	149	—	159	169	181	—	193	205	—	—	217	229
Marseilles, Illinois	—	—	—	—	—	150	—	160	170	182	—	194	206	—	—	218	230
Kankakee	—	—	—	—	—	152	—	—	172	184	—	196	208	—	—	220	232

* L/D—lock and dam.

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January										*February*								*March*	
15	*16*	*17*	*21*	*22*	*23*	*24*	*27*	*28*	*30*	*9*	*11*	*13*	*15*	*21*	*25*	*27*	*28*	*2*	*5*
81	—	—	—	109	119	—	—	129	—	—	—	—	—	—	—	131	—	—	—
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82	—	—	—	110	120	—	—	130	—	—	—	—	—	—	—	132	—	—	—
—	83	—	—	111	121	—	—	—	—	—	—	—	—	—	—	—	133	—	—
—	83	—	—	111	121	—	—	—	—	—	—	—	—	—	—	—	133	—	—
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175	—	187	199	—	—	211	223	—	235	247	259	271	283	295	307	—	—	319	331
177	—	189	201	—	—	213	225	—	237	249	261	273	285	297	309	—	—	321	333
181	—	193	205	—	—	217	229	—	241	253	265	277	289	301	313	—	—	325	337
182	—	194	206	—	—	218	230	—	242	254	266	278	290	302	314	—	—	326	338
184	—	196	208	—	—	220	232	—	244	256	268	280	292	304	316	—	—	328	340

Ice Atlas, 1985–1986

Monongahela River, Allegheny River, Ohio River, Illinois I

LAWRENCE W. GATTO, STEVEN F. DALY AND KEVIN

INTRODUCTION

Background

This atlas is the second in a series of atlases that will provide a permanent record of the ice conditions over portions of the Monongahela, Allegheny, Ohio, Illinois and Kankakee Rivers (Fig. 1). This information is required throughout the winter during CRREL's River Ice Management (RIM) Program as input data and "ground truth" for developing a river ice forecast model and for developing and evaluating various remote sensing devices for real time monitoring of ice conditions. The atlas series should also prove valuable to any future research. Additional discussion of the purposes and objectives of RIM is given in *Ice Atlas for the Ohio, Allegheny and Monongahela Rivers, 1984–85.**

The purpose of this ice atlas is to document the areal extent and variation through time of river ice and open water in the area of study during the 1985–86 winter. No detailed analyses of the ice conditions were done in preparing this atlas beyond placing the observed ice into general categories. The *Results* section provides an overview of ice conditions, highlighting the ice categories and providing an introduction and guide to the ice information contained in the maps themselves.

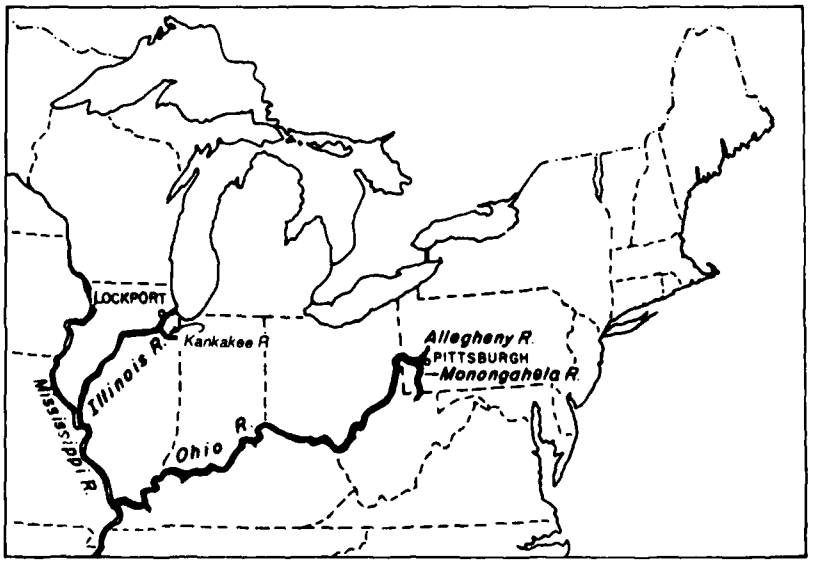

Figure 1. General location of rivers studied.

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ALY AND KEVIN L. CAREY

documented on the Illinois Waterway (Fig. 2b; Table 1) from mile 120, at Havana, Illinois, to mile 273, at Dresden Island Lock and Dam, and on the Kankakee River from its confluence with the Des Plaines River upstream to the Warner Bridge, approximately 21 river miles. However, as discussed in the *Results* section, coverage of the entire study area was not always possible on each flight date.

There are 12 dams and associated locks along the surveyed reach of the Ohio, one along the Monongahela, and two on the Allegheny. Navigation channels of at least 9 ft deep are maintained along these reaches. There are four dams and associated locks along the surveyed reach of the Illinois River. A 9-ft navigation channel is also maintained. There is no navigation on the Kankakee River but ice jam flooding occurs frequently along this reach, and for this reason it was included in the surveys.

Data on the Ohio River and Illinois River discharges (Fig. 3) and air and water temperatures (Fig. 4) are shown to display general hydraulic and meteorologic conditions during the time the video imagery was collected. The data are from specific locations as indicated; however, they are representative of the general conditions experienced in the watersheds.

Table 1. River pools monitored with video tapes, 1985–86.

Pool start to stop points (river miles)	*Length (mi)*	*Pool surface area ($\times 10^6$ m^2)*
Monongahela River		
Pittsburgh Point (0) to Dam 2 (11.2)	11.2	4.73
Dam 2 to river mile 12	0.8	0.43
Allegheny River		
Pittsburgh Point (0) to Dam 2 (6.7)	6.7	3.07
Dam 2 to Dam 3 (14.5)	7.8	4.02
Dam 3 to river mile 17	2.5	1.14
Ohio River		
Pittsburgh Point (0) to Emsworth (6.2)	6.2	4.49
Emsworth to Dashields (13.3)	7.1	5.00
Dashields to Montgomery (31.7)	18.4	11.27
Montgomery to New Cumberland (54.4)	22.7	14.87
New Cumberland to Pike Island (84.2)	29.8	18.92
Pike Island to Hannibal (126.4)	42.2	22.46
Hannibal to Willow Island (161.7)	35.3	21.21

ice information contained in the maps themselves.

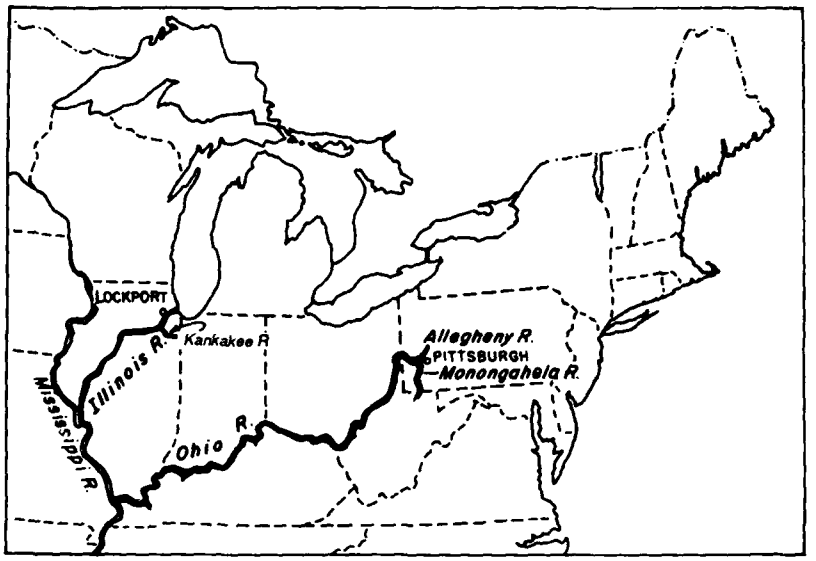

Figure 1. General location of rivers studied.

Area of study

During the 1985–86 winter season, ice conditions were documented on the Monongahela River (Fig. 2a, Table 1) from Pittsburgh Point (river mile 0) to mile 12, just upstream of Lock and Dam 2; on the Allegheny from the Point (mile 0) to mile 17 between Lock and Dam 3 and Lock and Dam 4; and on the Ohio from the Point (mile 0) to river mile 437, just downstream of Meldahl Locks and Dam. Ice conditions were also

* Gatto, L., S.F. Daly and K. Carey (1986) Ice atlas, 1984–1985: Ohio River, Allegheny River, Monongahela River. US Army Cold Regions Research and Engineering Laboratory, Special Report 86-23.

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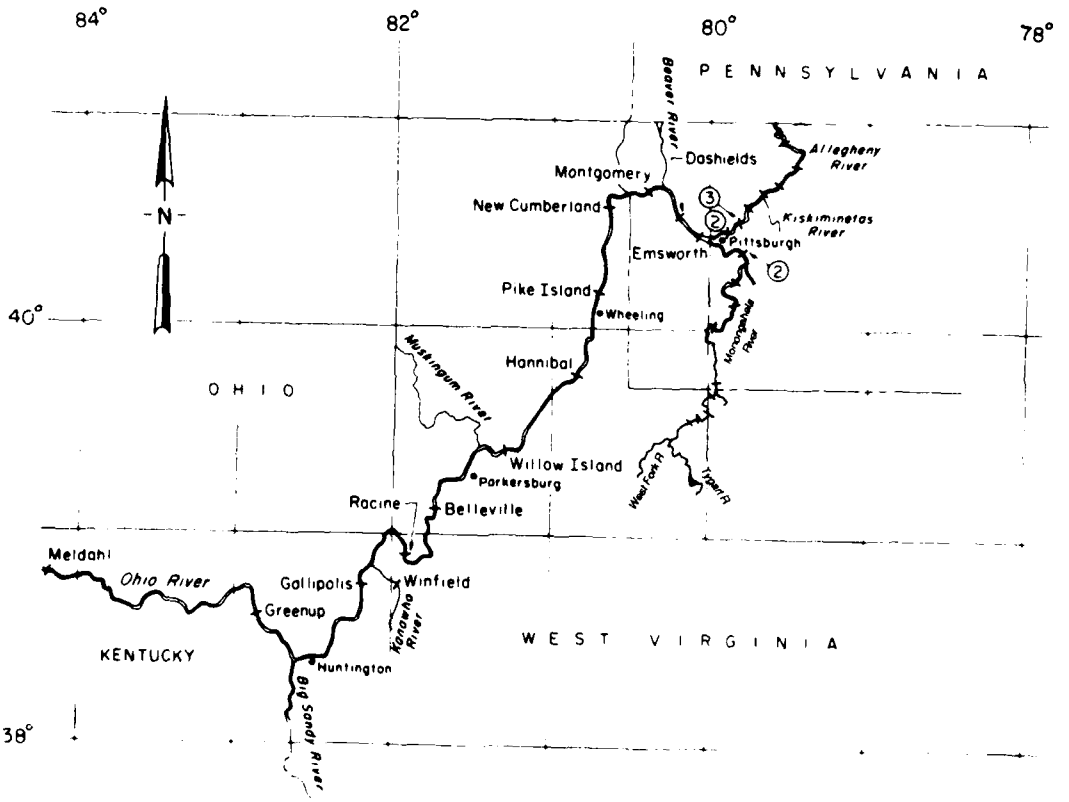
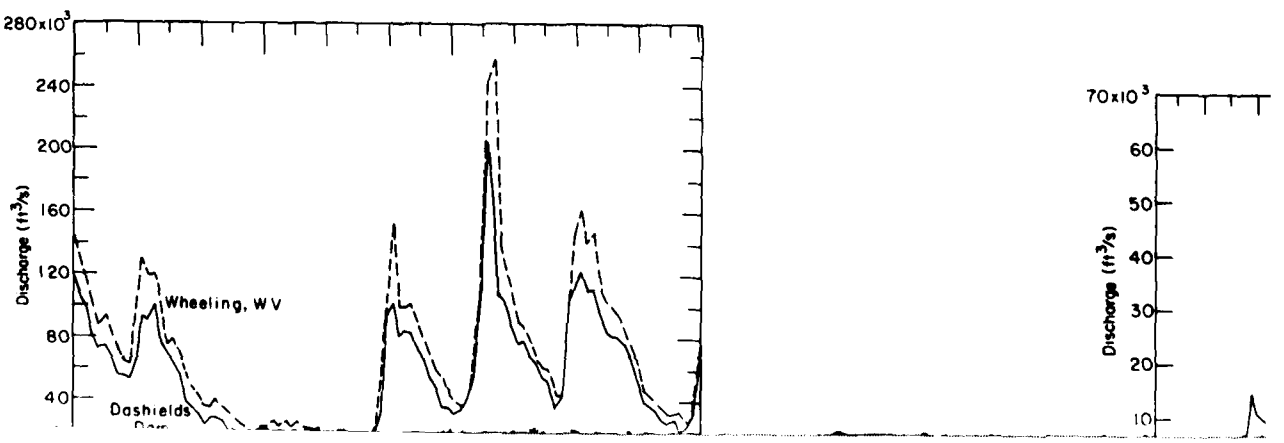
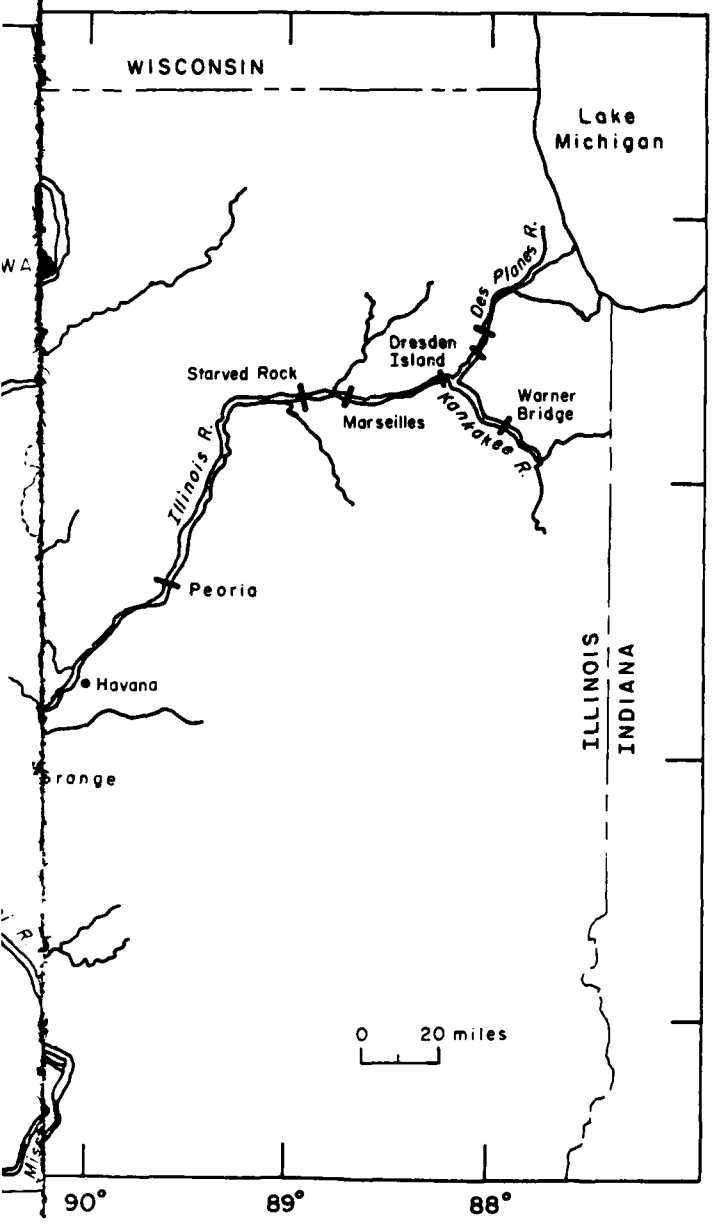
Pike Island to Hannibal (126.4)	42.2	22.46
Hannibal to Willow Island (161.7)	35.3	21.24
Willow Island to Belleville (203.9)	42.2	27.28
Belleville to Racine (237.5)	33.6	19.89
Racine to Gallipolis (279.2)	41.7	24.65
Gallipolis to Greenup (341.0)	61.8	41.19
Greenup to Meldahl (436.2)	95.2	73.77
Illinois River		
River mile 120 to Peoria (157.6)	37.6	11.71
Peoria to Starved Rock (231.1)	73.5	81.33
Starved Rock to Marseilles Lock (244.3)	13.2	10.19
Marseilles Lock to river mile 273	28.7	8.19
Kankakee River		
Mouth to river mile 21	21	7.30



a. Monongahela, Allegheny and Ohio Rivers.

Figure 2. Study areas; locations of locks and d





o. Illinois and Kankakee Rivers.

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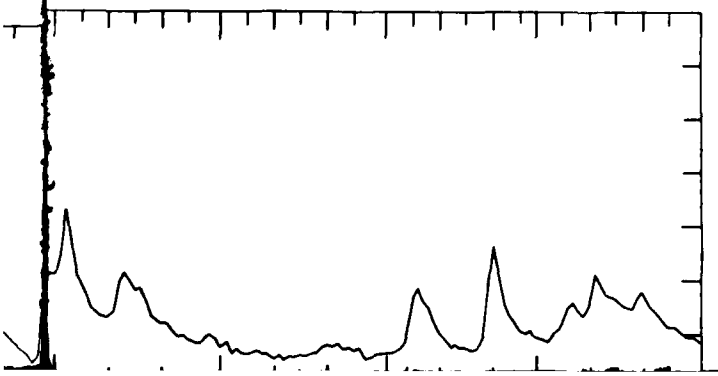
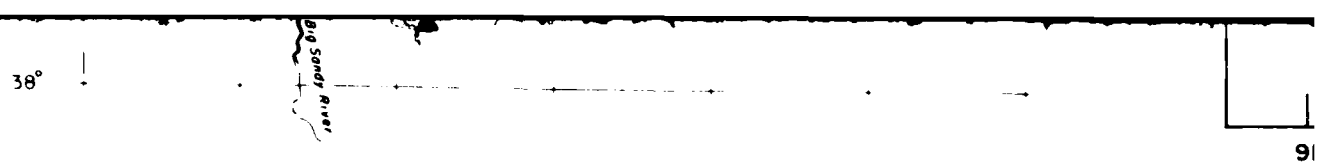
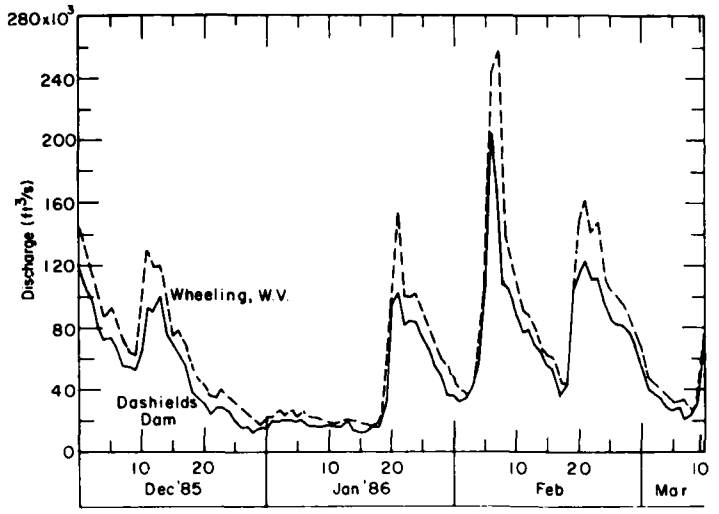
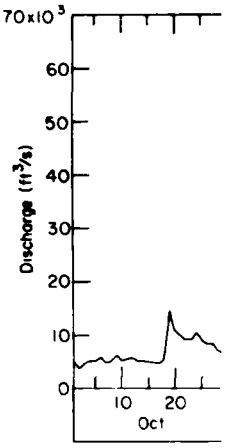




a. Monongahela, Allegheny and Ohio Rivers.

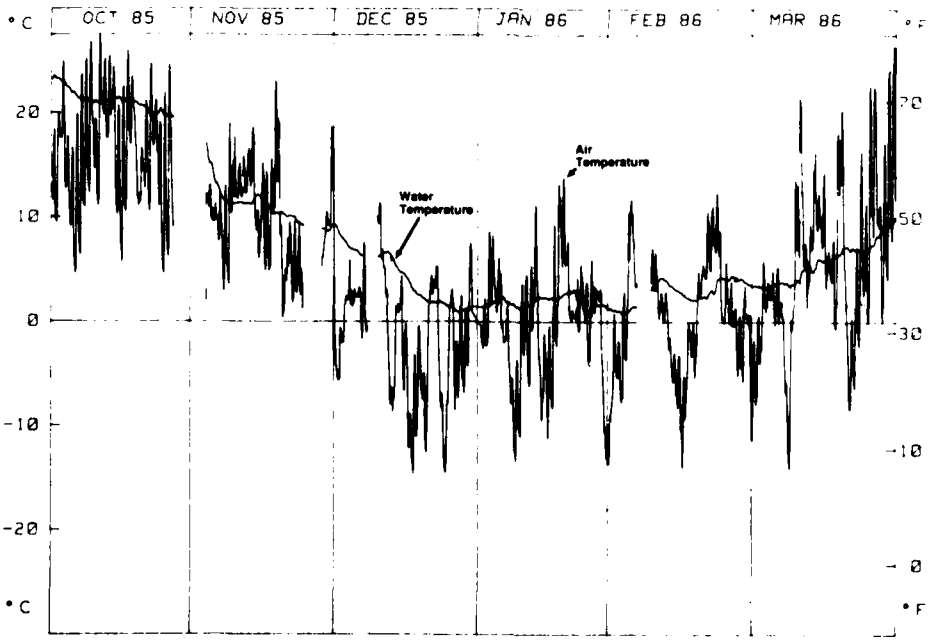
Figure 2. Study areas; locations of locks and dam

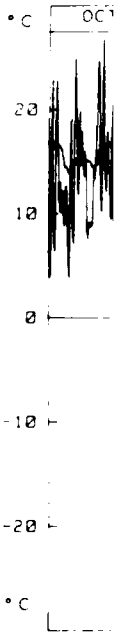




a. Dashields Dam and Wheeling (West Virginia), Ohio River.

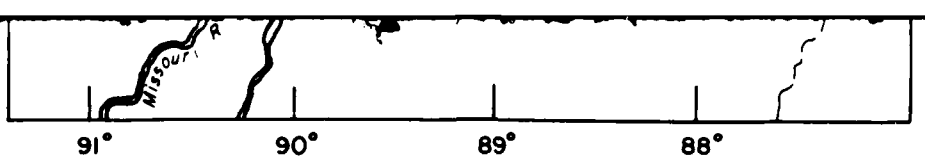
Figure 3. Daily discharge.





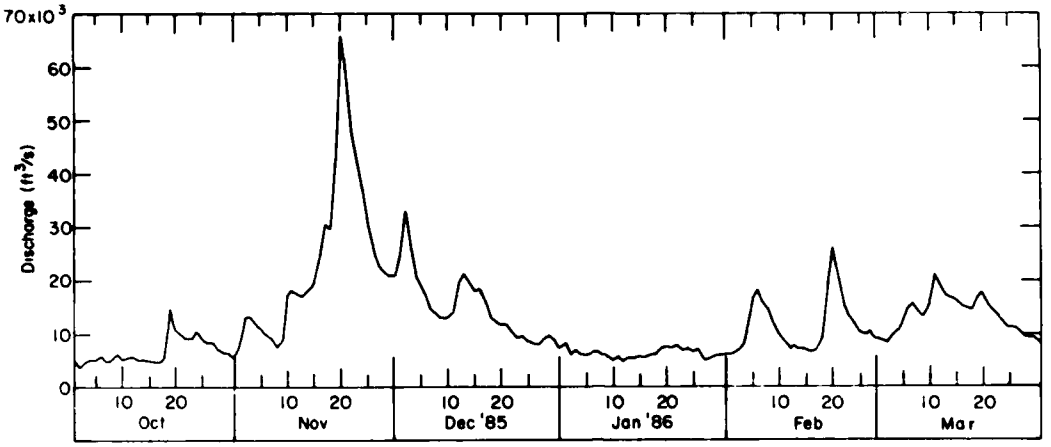
a. Hannibal Lock and Dam, Ohio River.

Figure 4. Hourly air temperature and hourly average water t



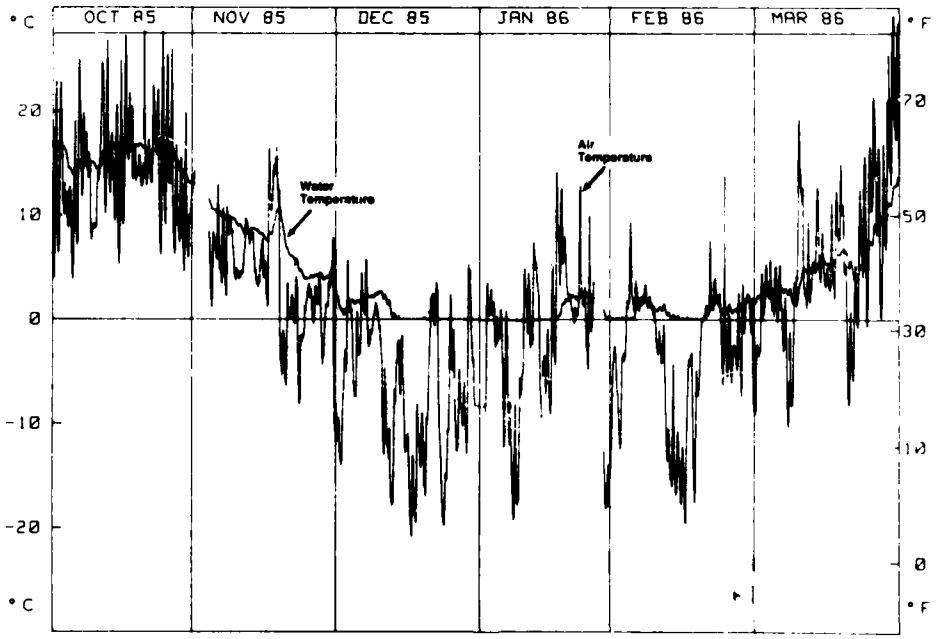
b. Illinois and Kankakee Rivers.

wr udy areas; locations of locks and dams shown.



b. Marseilles Dam, Illinois River.

Figure 3. Daily discharge.



b. Starved Rock Lock and Dam, Illinois River.

ra mperature and hourly average water temperature.

APPROACH

Video tapes (½-in. VHS) of the Ohio, Allegheny and Monongahela Rivers were taken vertically through a covered port with a Panasonic 777 video camera with a 12:1 zoom lens from a Cessna 172 fixed-wing aircraft, usually at an altitude between 2000 and 3500 ft above the ground. Aircraft altitude varied, depending on cloud conditions. Occasionally, the aircraft was not cleared to enter the controlled air space around Pittsburgh International Airport, and thus on those occasions tapes could not be acquired of the Ohio River from Pittsburgh Point to the vicinity of Ambridge, Pennsylvania (river mile 0 to 24).

For the Kankakee and Illinois Rivers, video tapes (½-in. VHS) were taken vertically with a JVC KY1900 video camera with a 10:1 zoom lens. The video was taken from a Cessna 172 through an open port, usually at an altitude between 2500 and 4500 ft. At Peoria Lake and the Starved Rock Dam Pool, the Illinois River is quite wide, and the contractor maintained the 4500-ft altitude over these sections. At Peoria Lake two side-by-side passes were required.

The tapes were viewed on a TV monitor and the observed ice was visually interpreted and classified into five units (Table 2). The acquisition of "ground truth" was not required, since the image interpretation was limited to the classification of the ice conditions as seen on the video tapes by an experienced ice interpreter-observer, and did not attempt to infer characteristics that could only be measured on the ground (e.g., porosity, strength or thickness). Boundaries between the units were transferred to 1:24,000 base maps by reference to Corps of Engineers navigation charts and U.S. Geological Survey topographic maps. The maps are organized according to the pools that exist between the dams. A pool is named for the dam at its downstream end, as listed in the *Index* and subsequently in this report.

The ice maps show the areal extent of the five ice types and open water. These six units were selected because they are readily identifiable on video imagery and they satisfactorily describe the range of ice that can occur on inland waterways.

The area of each map unit in a pool was measured from the base maps with a Los Angeles Scientific Instruments Co. digital compensating polar planimeter. The accuracy of areas reported is influenced by the accuracy of positioning the map unit boundaries on the maps while the imagery interpreter viewed the video tapes on a monitor (in part a subjective and

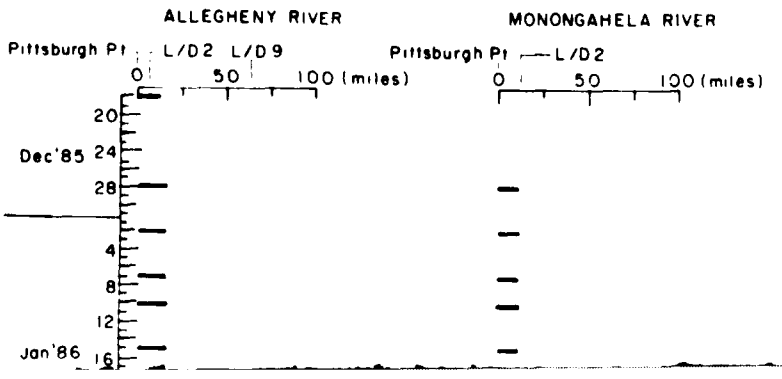


Table 2. Ice

Map unit
Open water
Solid ice cover
Solid ice cover with open-water areas
Fragmented ice cover
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans

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* Personal communication
Corp. 1986.

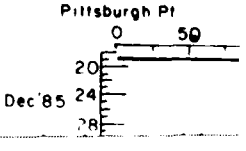


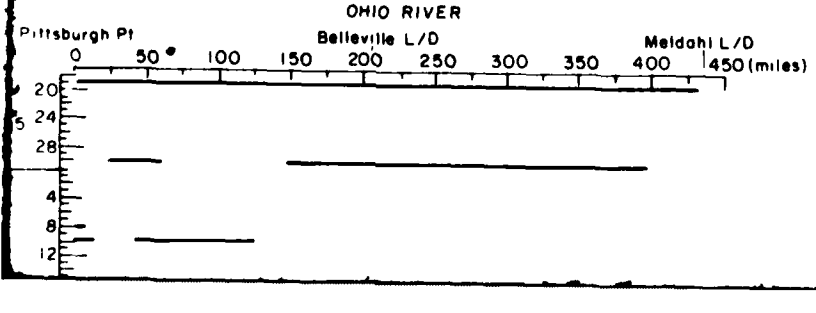
Table 2. Ice conditions as observed on video tapes.

Map unit	*Description*
ater	River is ice-free; no ice apparent.
ce cover	River is completely covered (100%) with ice; no individual ice pans, blocks or chunks are visible; ice may be snow-covered.
ce cover with ater areas	River is partially covered with solid ice (as described above) but has open (ice-free) areas.
ented ice cover	River is completely covered (100%) with ice that has distinct, variably sized, individual ice pans, blocks or chunks.
ented ice cover pen-water areas	River is partially covered with fragmented ice (as described above) but has open (ice-free) areas.
es or frazil and pans	River is primarily open (ice-free) with floating ice floes, slush or pans.

ental process), and by the planimeter measuring procedure. When apes provided bank-to-bank coverage of a river, the best referenc- map unit boundaries to shoreline features was achieved. Arend nderson* estimate that the area of each mapped unit is within 8 to of the actual area. When the tapes did not provide bank-to-bank ge, the areas of mapped units are estimated to be within 20 to 25% ual. The planimeter measuring procedure is straightforward and es an estimated ±2% accuracy in areas reported.

map units comprising both ice and open water—*Solid Ice with Water Areas, Fragmented Ice with Open-Water Areas,* and *Ice or Frazil Slush and Pans*—the surface concentration of ice to total ea was visually estimated with a probable accuracy of ±5%.* The e concentrations for the *Solid Ice Cover* and *Fragmented Ice Cover* ways 100% (Table 2). The measured areas and estimated concentra- are listed in Appendix A.

nal communication with R. Arend and V. Anderson, Photographic Interpretation 1986.



with a Los Angeles Scientific Instruments Co. digital compensating polar planimeter. The accuracy of areas reported is influenced by the accuracy of positioning the map unit boundaries on the maps while the imagery interpreter viewed the video tapes on a monitor (in part a subjective and

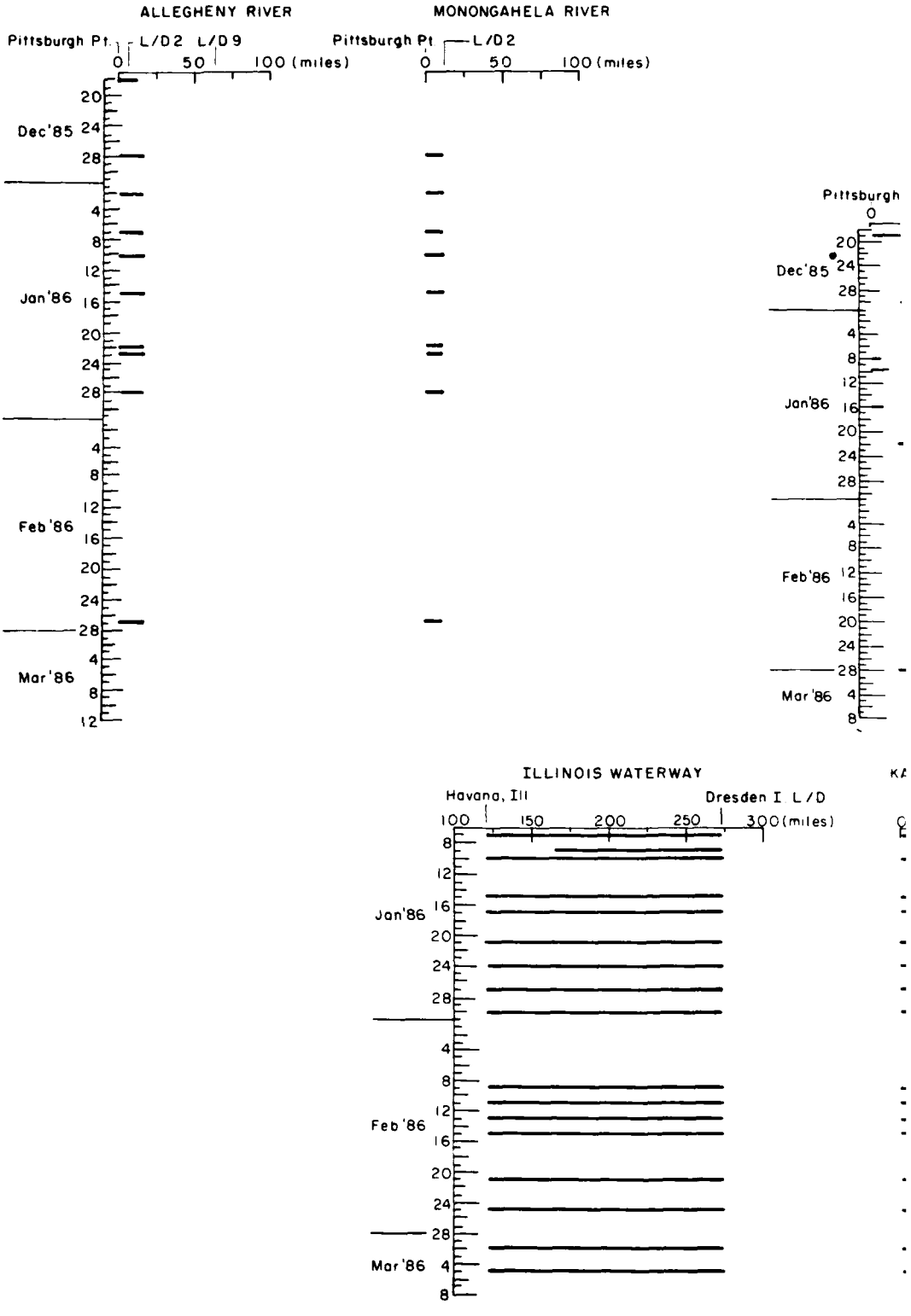


Figure 5. Dates of video tape acquisition (see also App

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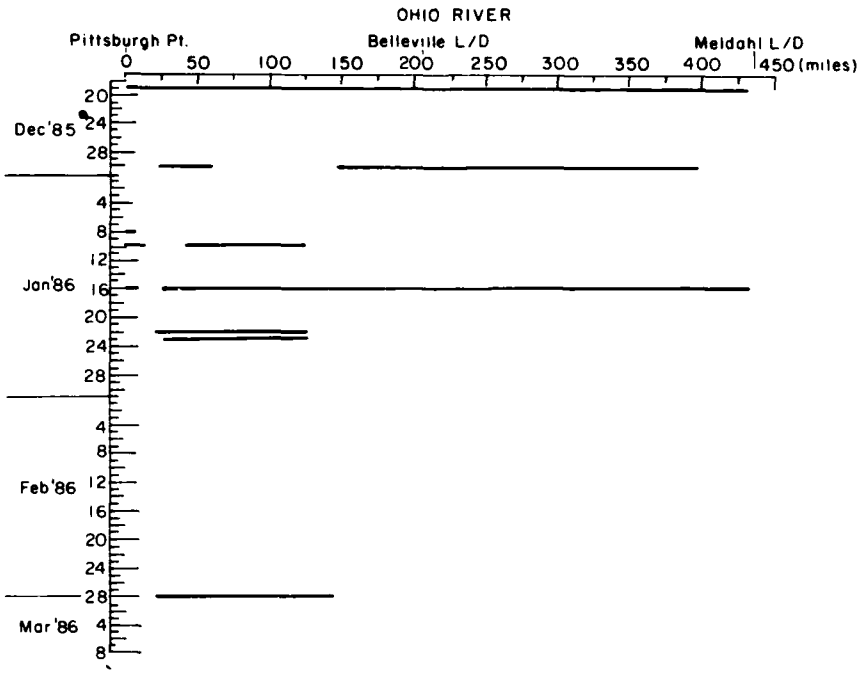
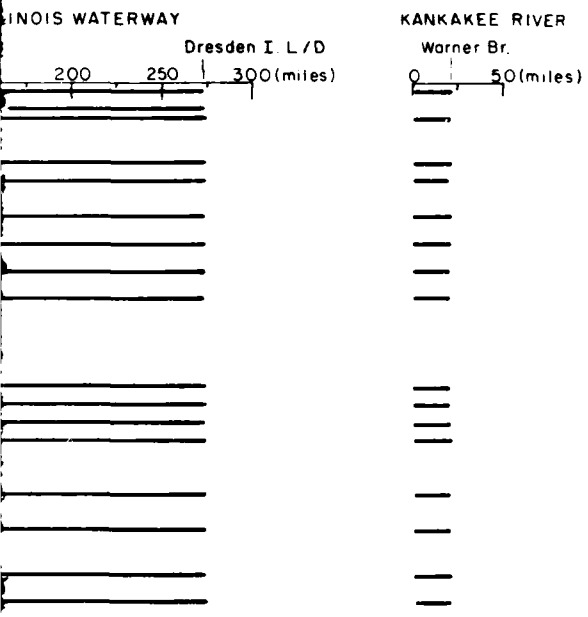
surface concentrations for the *Solid Ice Cover* and *Fragmented Ice Cover* are always 100% (Table 2). The measured areas and estimated concentrations are listed in Appendix A.

* Personal communication with R. Arend and V. Anderson, Photographic Interpretation Corp. 1986.

RIVER

100 (miles)





of video tape acquisition (see also Appendix B).

RESULTS

Video surveys were conducted on 29 dates during the 1985-86 winter (Fig. 5). Portions of the Monongahela were covered 9 times, the Allegheny 10 times, the Ohio 8 times, the Illinois 17 times and the Kankakee 16 times. Generally, cloud conditions did not interfere with video acquisition on the Illinois and Kankakee Rivers to the degree that it did on the Ohio, Allegheny and Monongahela Rivers. There were fewer flights along the Ohio River in 1985-86 than in the 1984-85 season because there was less observed ice in 1985-86 and poor weather and low ceilings were more frequent. Generally, in the areas surveyed, the ice cover was not as extensive and did not last as long in 1985-86 as in 1984-85.

Monongahela River

Ice Floes or Frazil Slush and Pans was the only ice unit present when ice was first observed on 28 December. Ice within this unit covered 16% of the study area. This was also the maximum ice coverage. Ice was last observed on 28 January when 1% of the reach was covered with floes and frazil. *Solid Ice Cover, Solid Cover with Open-Water Areas* and *Fragmented Ice Cover with Open-Water Areas* were not observed this year.

Allegheny River

Ice was first observed on 28 December (Table 3). It was found primarily within *Fragmented Ice Cover with Open-Water Areas*, and the ice within this unit covered 21% of the study area. Ice within the other four ice types covered 26% of the river. Maximum ice cover occurred on 8 January and covered 56% of the river; this ice was also primarily found within *Fragmented Ice Cover with Open-Water Areas*. Ice was last observed on 28 January when it covered 1% of the river, and was predominantly within *Ice Floes or Frazil Slush and Pans*. Very little *Solid Ice Cover* or *Solid Ice Cover with Open-Water Areas* formed this year.

Ohio River

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Illinois River

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Table 3. Summary of ice conditions, 1985-1986 (data in Append

		Total ice (all ice types)		*Predomin*
	Date	*Total ice area ($\times 10^6$ m^2)*	*Percent* of river (%)*	*Name*
		Monongahela River (5.16×10^6 m^2)		
First ice observed	28 Dec 85[a]	0.80	16	Ice floes or frazil slush and pans
Maximum ice extent observed	28 Dec 85	0.80	16	Ice floes or frazil slush and pans
Last ice observed	28 Jan 86	0.05	1	Ice floes or frazil slush and pans
		Allegheny River (8.23×10^6 m^2)		
First ice observed	28 Dec 85	3.87	47	Fragmented ice cover with open-water areas
Maximum ice extent observed	8 Jan 86	4.58	56	Fragmented ice cover with

Ohio River

Above Hannibal Lock and Dam, ice was first observed on 30 December; it covered 18% of this portion of the river, and was predominantly in the *Fragmented Ice Cover* unit. Below Hannibal Lock and Dam, ice was also first observed on 30 December. This ice was primarily within the *Ice Floes or Frazil Slush and Pans* unit, and covered 1% of the area. This was also the maximum ice coverage for the river area downstream of Hannibal. Maximum ice coverage (19%) occurred on 16 January above Hannibal, and the ice was primarily within *Fragmented Ice Cover with Open-Water Areas*. The last ice observed above Hannibal was primarily within *Ice Floes or Frazil Slush and Pans*, was observed on 23 January, and covered 3% of the area. Downstream of Hannibal, the same ice type was last observed on 16 January and covered so little of the area as to be reported as 0%. Very little *Solid Ice Cover* and *Solid Ice Cover with Open-Water Areas* formed during the 1985–86 winter, and what did form was limited to the Ohio River above Willow Island Dam.

Illinois River

When the first flight was made on 7 January, 28% of the area of study was covered with *Fragmented Ice Cover*, while an additional 36% was covered with ice in the other ice types. The ice cover was also at its maximum at this time. *Ice Floes or Frazil Slush and Pans* was the predominant ice type in the La Grange and Marseilles Pools, while *Solid Ice Cover, Fragmented Ice Cover* and *Fragmented Ice Cover with Open-Water Areas* were most common on the Peoria and Starved Rock pools. The Peoria Pool was generally covered with solid ice that remained in place throughout the winter. *Solid Ice Cover* was the last ice type observed on 5 March and covered 2% of the area. The extent of the ice area on the Illinois River changed dramatically during the winter, primarily in response to changing weather conditions rather than to significant changes in river discharge (see Fig. 3 and 4).

ons, 1985–1986 (data in Appendix A).

pes)	*Predominant ice types*		
*ent** *ver* *)*	*Name*	*Total ice area ($\times 10^6$ m²)*	*Percent* of river (%)*
tiver (5.16×10^6 m²)			
5	Ice floes or frazil slush and pans	0.80	16
5	Ice floes or frazil slush and pans	0.80	16
	Ice floes or frazil slush and pans	0.05	1
er (8.23×10^6 m²)			
	Fragmented ice cover with open-water areas	1.75	21
1	Fragmented ice cover with open-water areas	2.95	36
	Ice floes or frazil slush	0.05	1

Cover or Solid Ice Cover with Open-Water Areas formed this year.

Table 3. Summary of ice conditions, 1985–1986 (data

	Date	Total ice (all ice types)		Na
		Total ice area ($\times 10^6$ m^2)	Percent* of river (%)	
		Monongahela River (5.16×10^6 m^2)		
First ice observed	28 Dec 85[a]	0.80	16	Ice floes or fra and pans
Maximum ice extent observed	28 Dec 85	0.80	16	Ice floes or fra and pans
Last ice observed	28 Jan 86	0.05	1	Ice floes or fra and pans
		Allegheny River (8.23×10^6 m^2)		
First ice observed	28 Dec 85	3.87	47	Fragmented ice open-water a
Maximum ice extent observed	8 Jan 86	4.58	56	Fragmented ice open-water a
Last ice observed	28 Jan 86	0.08	1	Ice floes or fra and pans
		Ohio River above Hannibal Lock and Dam (77.		
First ice observed	30 Dec 85[c]	13.78	18	Fragmented ice
Maximum ice extent observed	16 Jan 85[d]	14.62	19	Fragmented ice open-water a
Last ice observed	23 Jan 86[d]	2.31	3	Ice floes or fra and pans
		Ohio River below Hannibal Lock and Dam (208		
First ice observed	30 Dec 85[f]	1.07	1	Ice floes or fra and pans
Maximum ice extent observed	30 Dec 85[f]	1.07	1	Ice floes or fra and pans
Last ice observed	16 Jan 85[b]	0.40	0	Ice floes or fra and pans
		Illinois River (111.42×10^6 m^2)		
First ice observed	7 Jan 86[a,g]	71.58	64	Fragmented ice
Maximum ice extent observed	7 Jan 86[b,h]	71.58	64	Fragmented ice
Last ice observed	5 Mar 86[a,i]	1.92	2	Solid ice cover
		Kankakee River (7.30×10^6 m^2)		
First ice observed	7 Jan 86[a,i]	5.46	75	Fragmented ice open-water a
Maximum ice extent observed	15 Jan 86[j]	6.65	91	Fragmented ice
Last ice observed	5 Mar 86[b,k]	0.41	6	Solid ice cover

* Rounded to nearest percent.

a—First date of video coverage.
b—Last date of video coverage.
c—No video coverage for 52.85×10^6 m^2.
d—No video coverage for 10.57×10^6 m^2.
e—No video coverage for 16.45×10^6 m^2.
f—No video coverage for 42.83×10^6 m^2.
g—No video coverage for 18.9
h—No video coverage for 27.3
i—No video coverage for 1.17
j—No video coverage for 0.12
k—No video coverage for 0.13

this year.

Summary of ice conditions, 1985–1986 (data in Appendix A).

Total ice (all ice types)		Predominant ice types		
Total ice area ($\times 10^6$ m^2)	*Percent* of river (%)*	*Name*	*Total ice area ($\times 10^6$ m^2)*	*Percent* of river (%)*
Monongahela River (5.16×10^6 m^2)				
0.80	16	Ice floes or frazil slush and pans	0.80	16
0.80	16	Ice floes or frazil slush and pans	0.80	16
0.05	1	Ice floes or frazil slush and pans	0.05	1
Allegheny River (8.23×10^6 m^2)				
3.87	47	Fragmented ice cover with open-water areas	1.75	21
4.58	56	Fragmented ice cover with open-water areas	2.95	36
0.08	1	Ice floes or frazil slush and pans	0.05	1
0⁶ river above Hannibal Lock and Dam (77.01×10^6 m^2)				
13.78	18	Fragmented ice cover	8.57	11
14.62	19	Fragmented ice cover with open-water areas	5.50	7
2.31	3	Ice floes or frazil slush and pans	1.98	3
10⁶ river below Hannibal Lock and Dam (208.02×10^6 m^2)				
1.07	1	Ice floes or frazil slush and pans	1.07	1
1.07	1	Ice floes or frazil slush and pans	1.07	1
0.40	0	Ice floes or frazil slush and pans	0.26	0
Illinois River (111.42×10^6 m^2)				
71.58	64	Fragmented ice cover	31.33	28
71.58	64	Fragmented ice cover	31.33	28
1.92	2	Solid ice cover	1.91	2
Kankakee River (7.30×10^6 m^2)				
5.46	75	Fragmented ice cover with open-water areas	2.65	36
6.65	91	Fragmented ice cover	3.18	44
0.41	6	Solid ice cover	0.39	5

g—No video coverage for 18.92×10^6 m^2.
h—No video coverage for 27.35×10^6 m^2.
i—No video coverage for 1.17×10^6 m^2.
j—No video coverage for 0.12×10^6 m^2.
k—No video coverage for 0.13×10^6 m^2.

Kankakee River

On 7 January, 75% of the area of study was ice-covered, primarily classified within *Fragmented Ice Cover with Open-Water Areas*. On 15 January, ice was at its maximum, with 44% of the area covered with *Fragmented Ice Cover*, while 47% was covered with *Solid Ice Cover* and ice within *Fragmented Ice Cover with Open-Water Areas*. By mid-February *Solid Ice Cover* and the ice portion of *Solid Ice Cover with Open-Water Areas* covered about 74%; these units were more common than the fragmented ice types (Appendix A). *Solid Ice Cover* covered 5% of the area on 5 March and persisted in the backwater pool created by the Dresden Island Dam later than 5 March, when the last flight was made.

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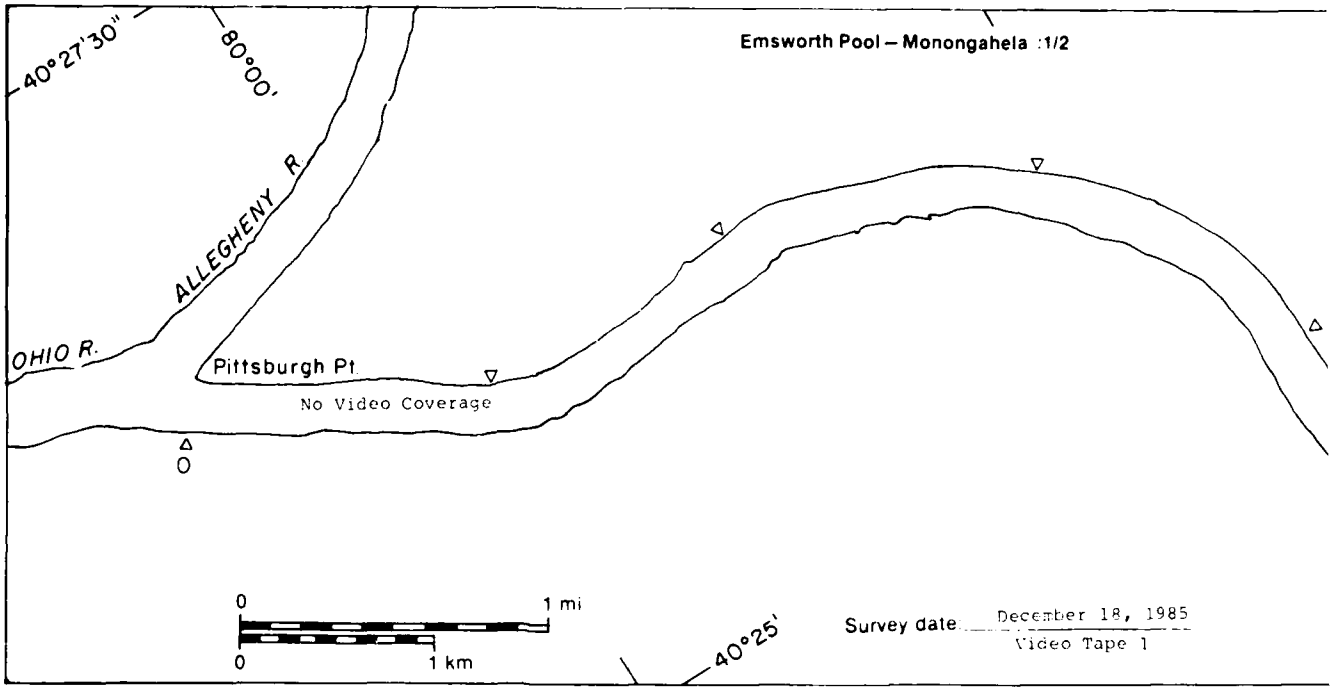
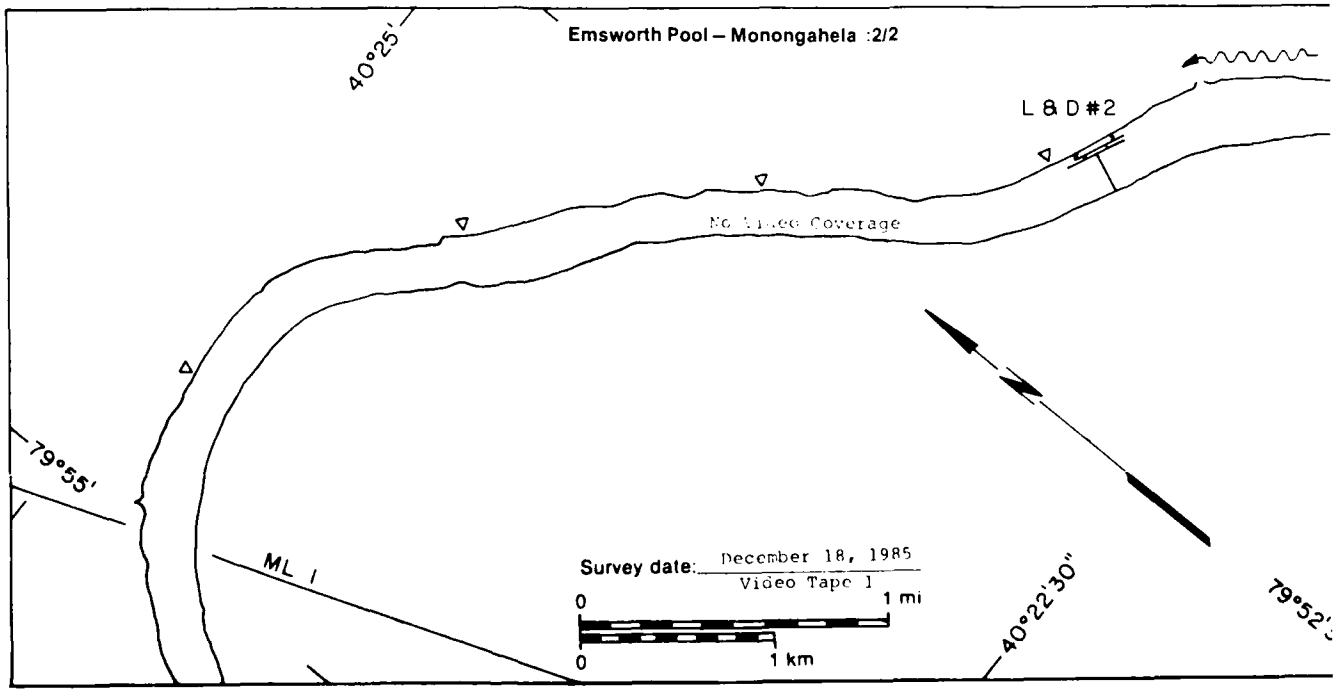
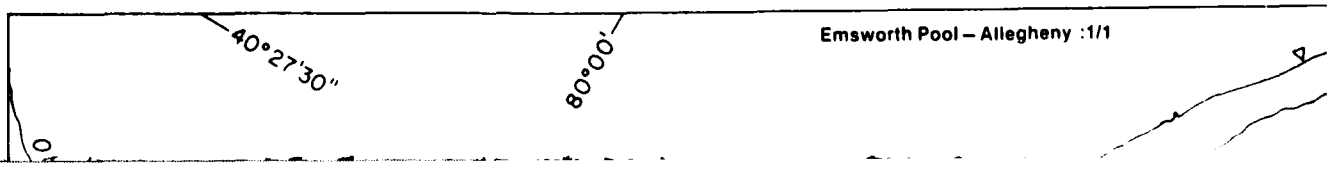
CONCLUSIONS

Ice conditions on the rivers change rapidly, often daily. Generally, the ice cover was less extensive and did not last as long during 1985–86 as during 1984–85. Poor flying weather with low ceilings occurred more frequently during 1985–86 and restricted the opportunities for getting more frequent video coverage, and sometimes caused large gaps between dates of video acquisition. In spite of these problems, videography is an economical, effective and accurate way to document the rapidly changing ice conditions. Videographic techniques also provide near-real-time data during periods of extreme ice conditions. Various options are being explored to get more frequent coverage in the future.

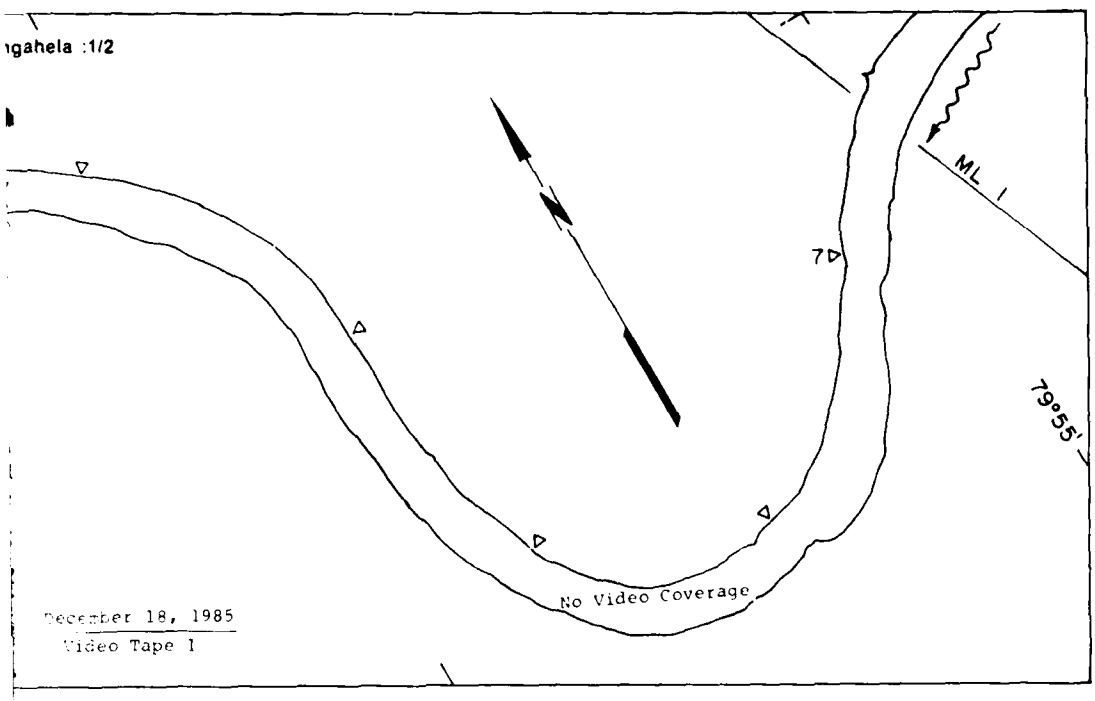
MAPS OF ICE CONDITIONS ON THE MONONGAHELA, ALLEGHENY AND OHIO RIVERS

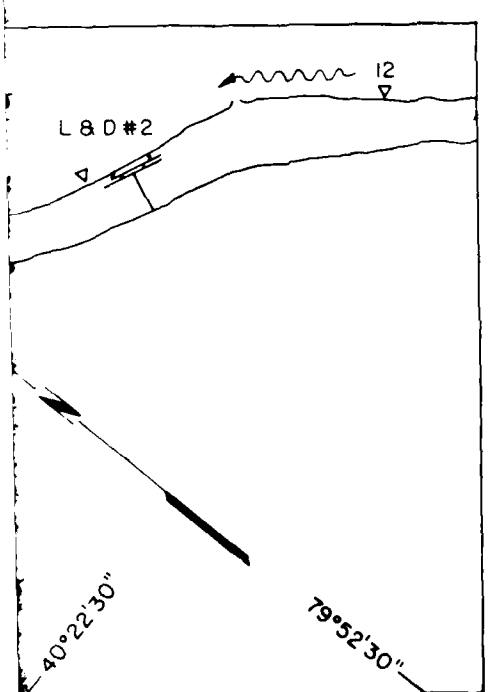






18 December 1985

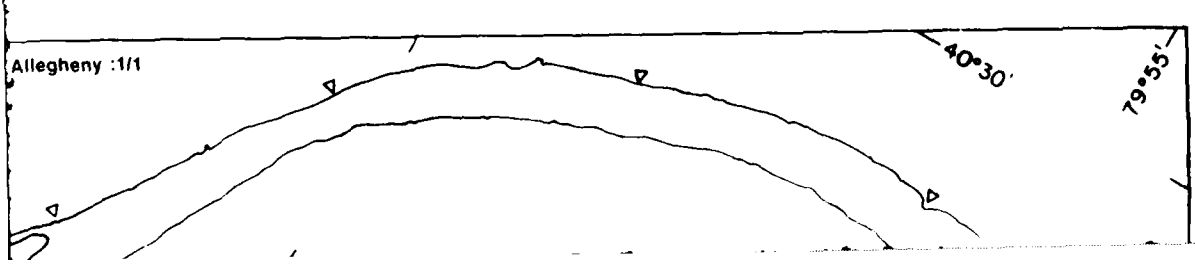


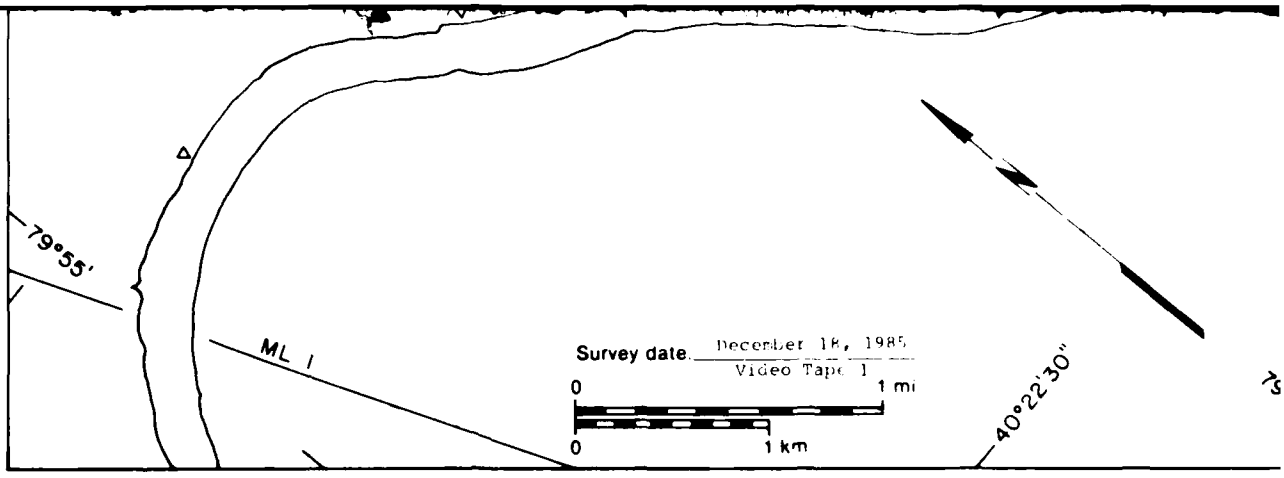


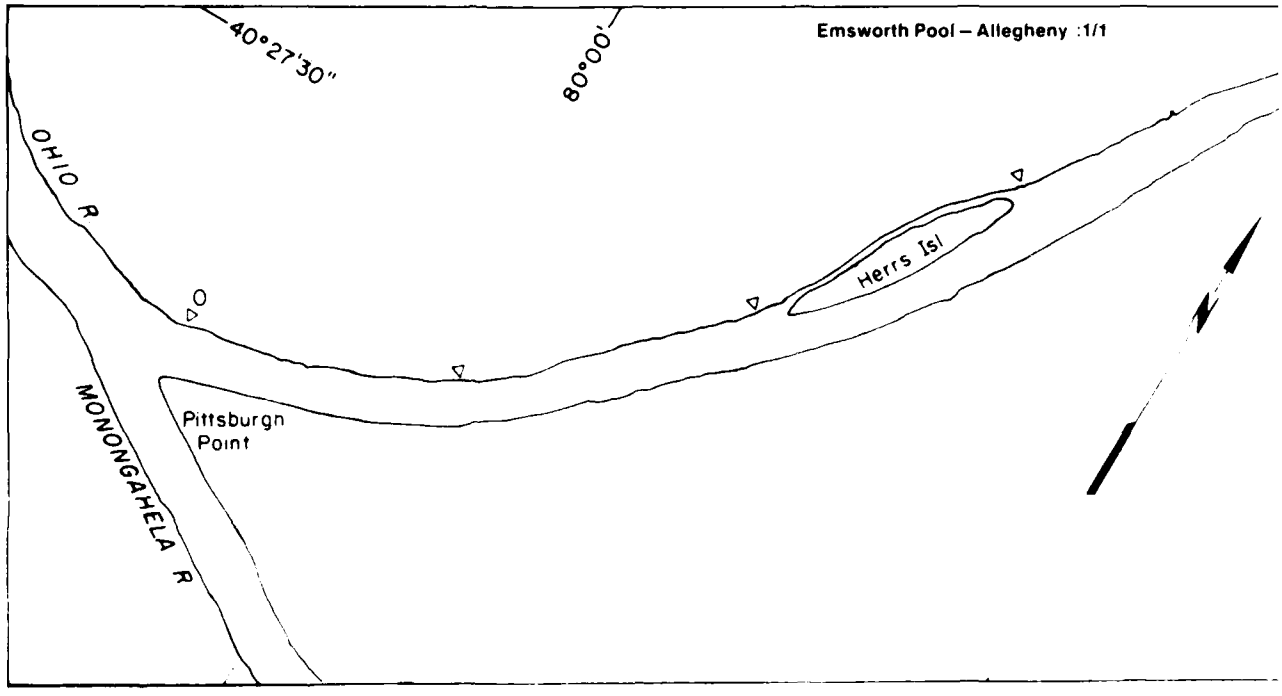
Emsworth Pool – Monungahela

	Area ($m^2 \times 10^6$)	
	0.00	NA
	0.00	NA
	0.00	—
	0.00	NA
	0.00	—
	0.00	—
Total area ($m^2 \times 10^6$)	5.16*	

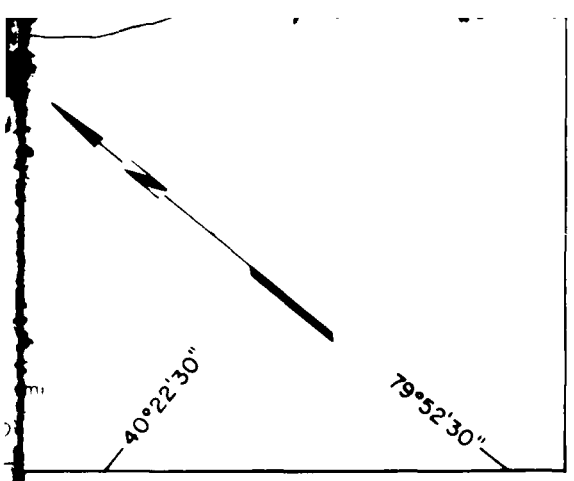
* Includes 5.16×10^6 m^2 of no video coverage





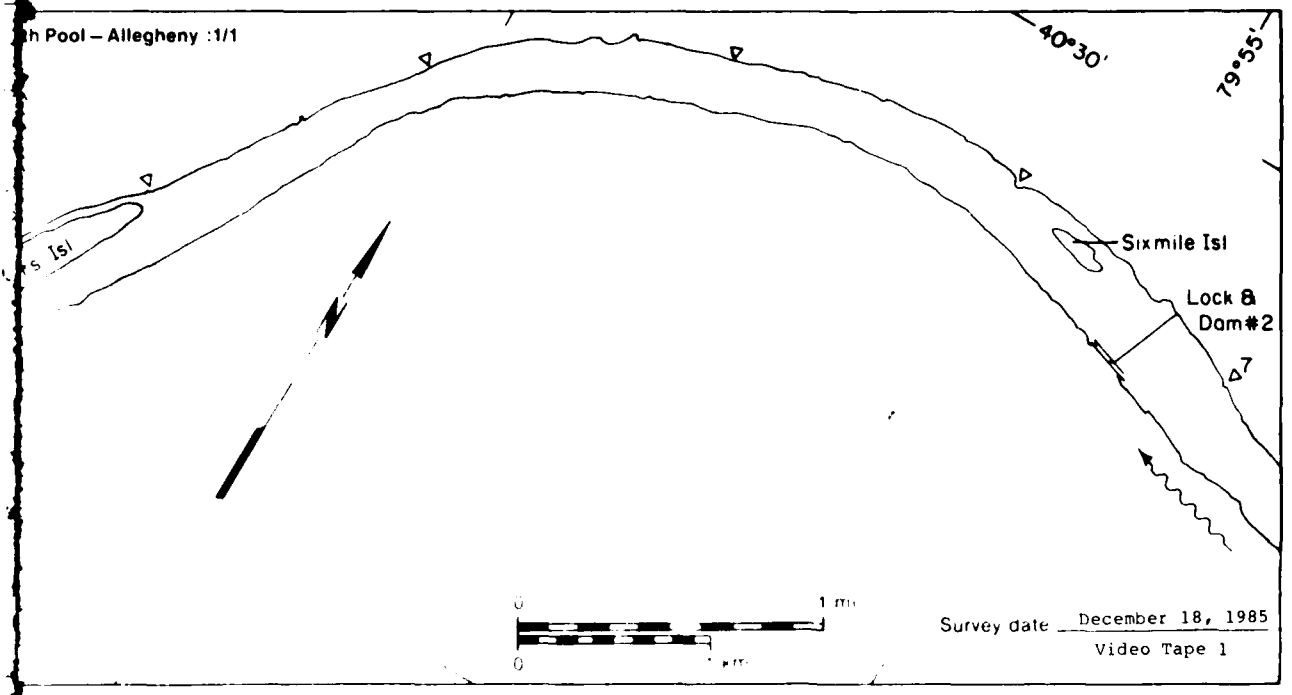


Emsworth Pool - Allegheny	Area ($m^2 \times 10^6$)
	3.07
	0.00
	0.00
	0.00
	0.00
	0.00
Total area ($m^2 \times 10^6$)	3.07

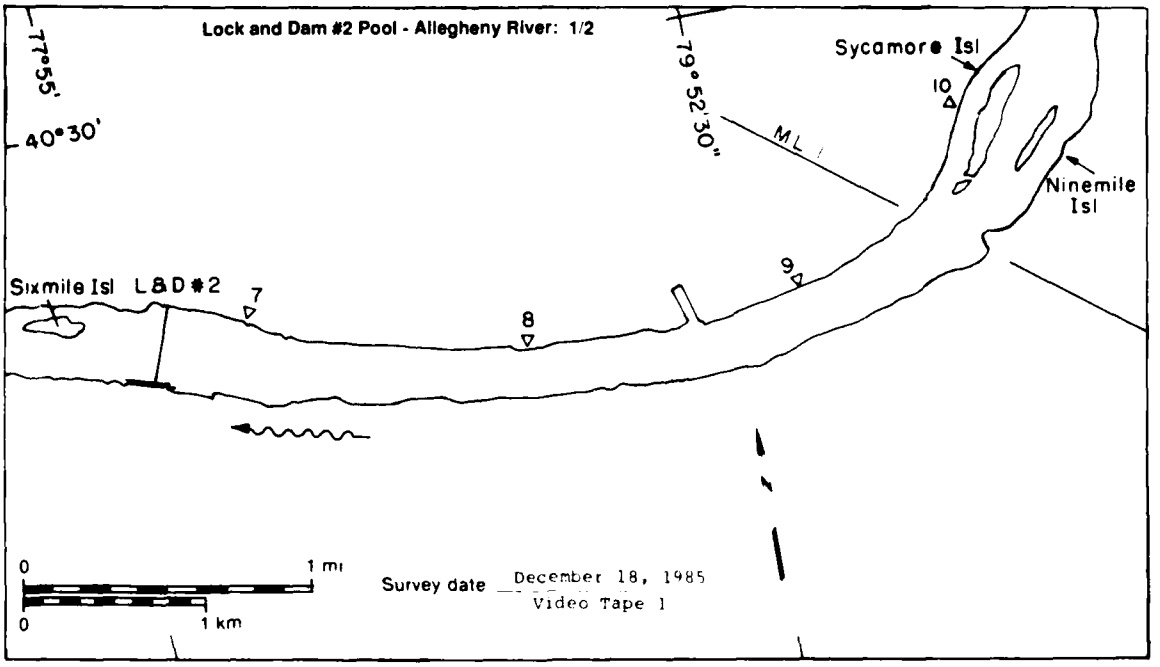


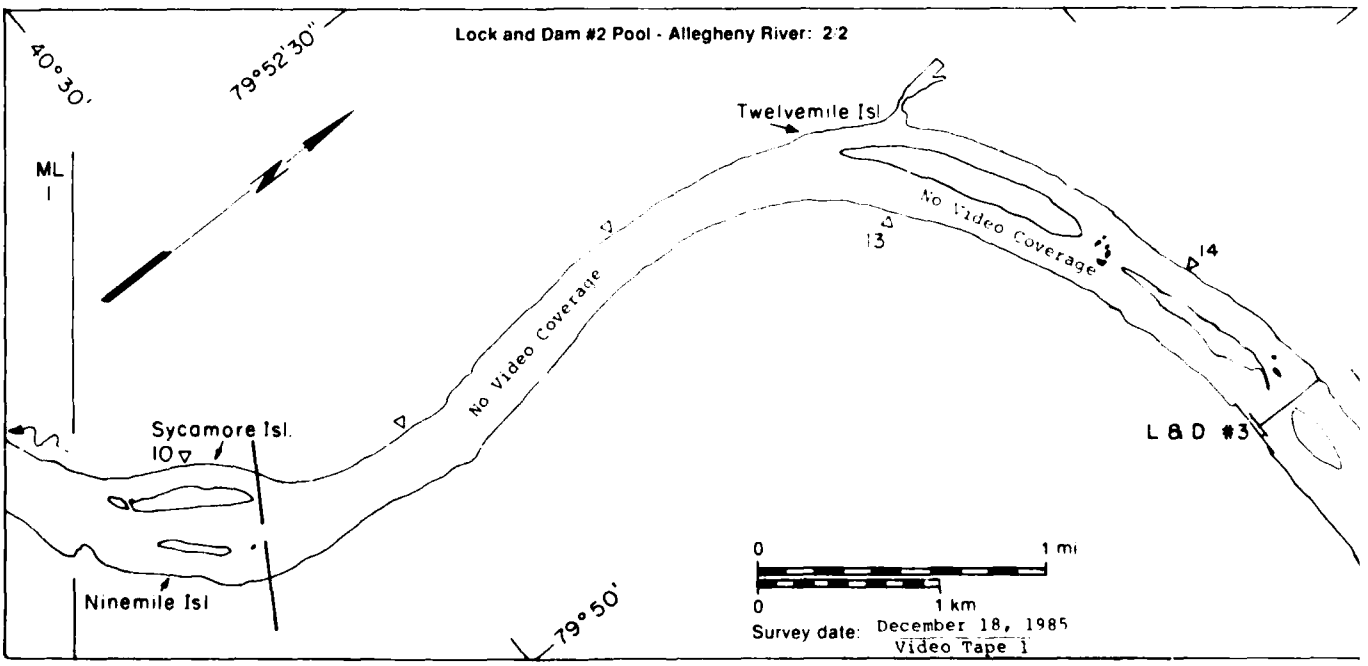
Emsworth Pool – Monongahela

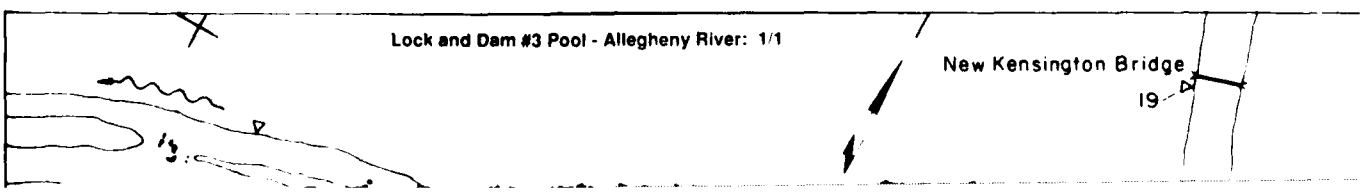
	Area ($m^2 \times 10^6$)	
	0.00	N/A
	0.00	N/A
	0.00	—
	0.00	N/A
	0.00	—
	0.00	—
Total area ($m^2 \times 10^6$)	5.16*	* Includes 5.16×10^6 m^2 of no video coverage



18 December 1985







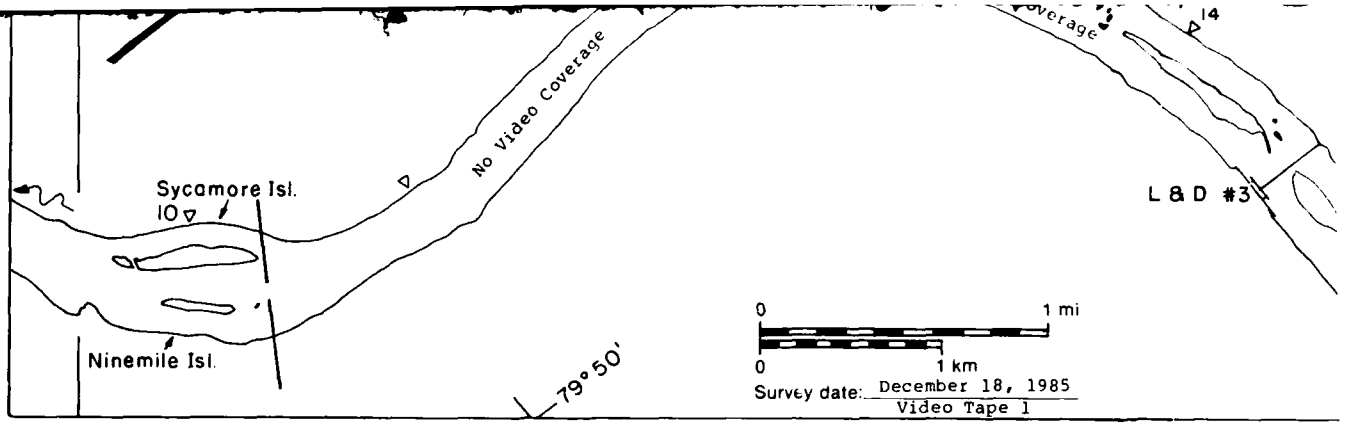
Lock and Dam #2 Pool

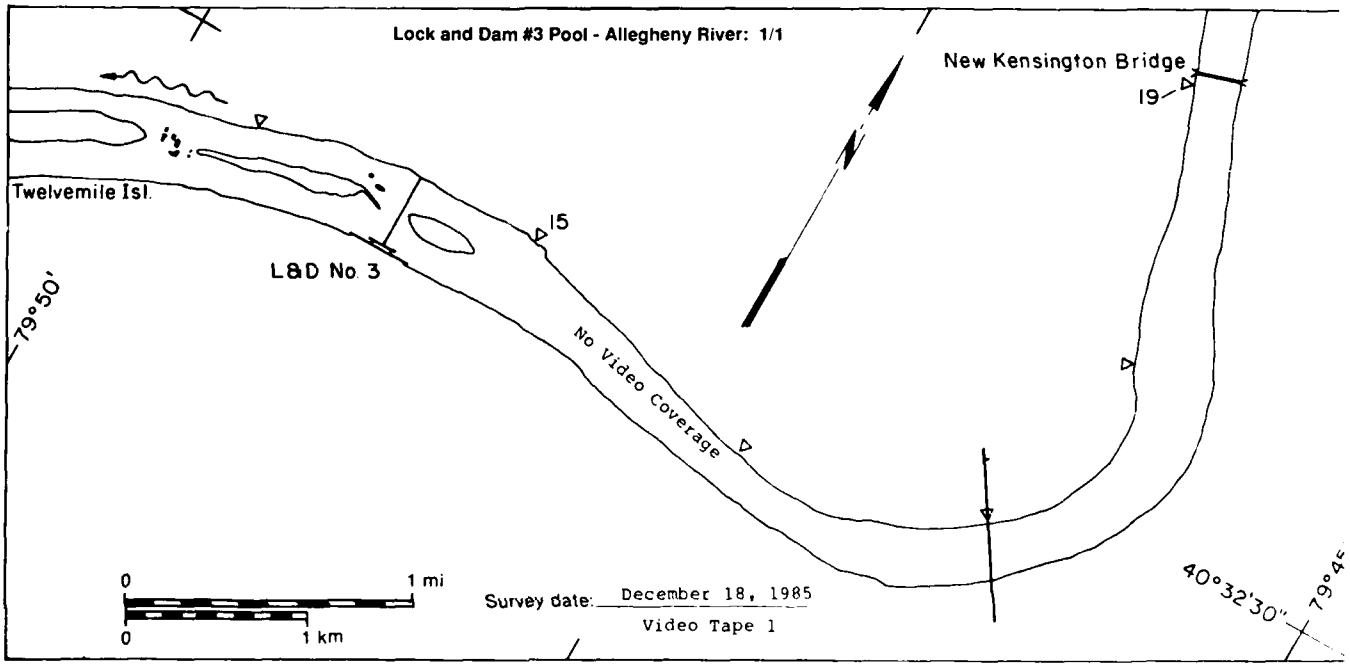
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.90	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.02*	

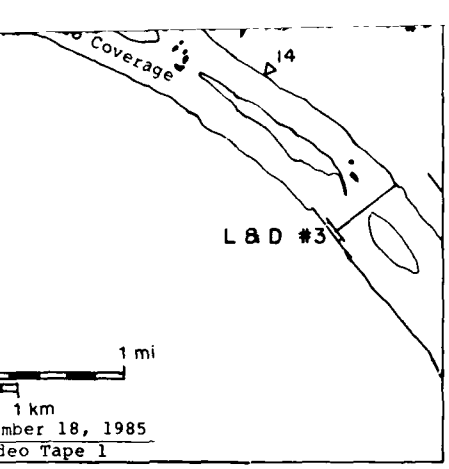
* Includes 2.12×10^6 of no video coverage

Lock and Dam #3 Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA

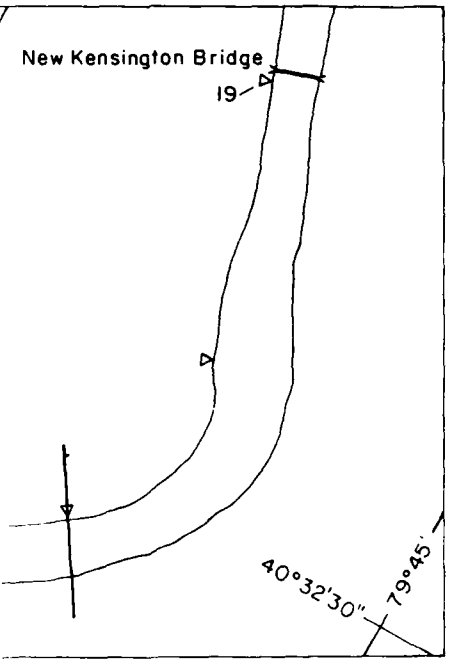

No Video Coverage
Sycamore Isl.
10
Ninemile Isl.
79°50'
14
L & D #3
0
1 mi
0
1 km
Survey date: December 18, 1985
Video Tape 1


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No. 3
79°50'
No Video Coverage
0
1 mi
0
1 km
Survey date: December 18, 1985
Video Tape 1
40°32'30"



MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.02*	

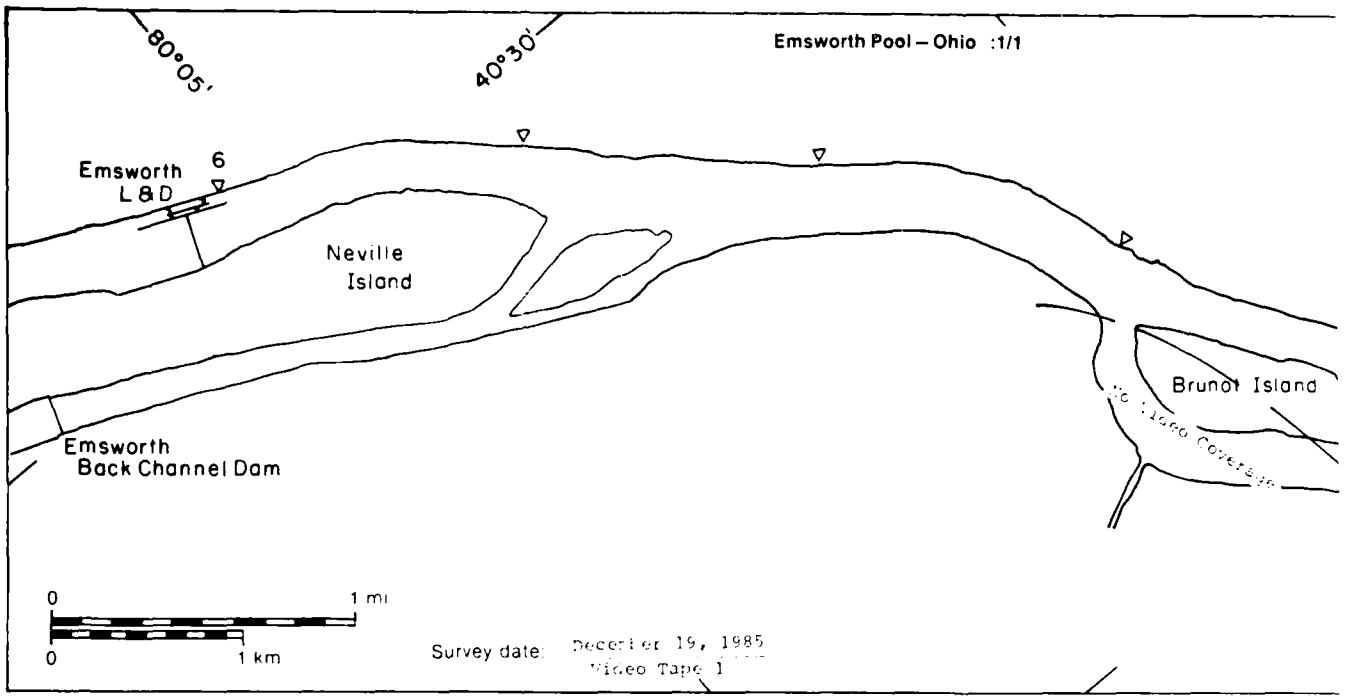
* Includes 2.12×10^6 of no video coverage



Lock and Dam #3 Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	1.14*	

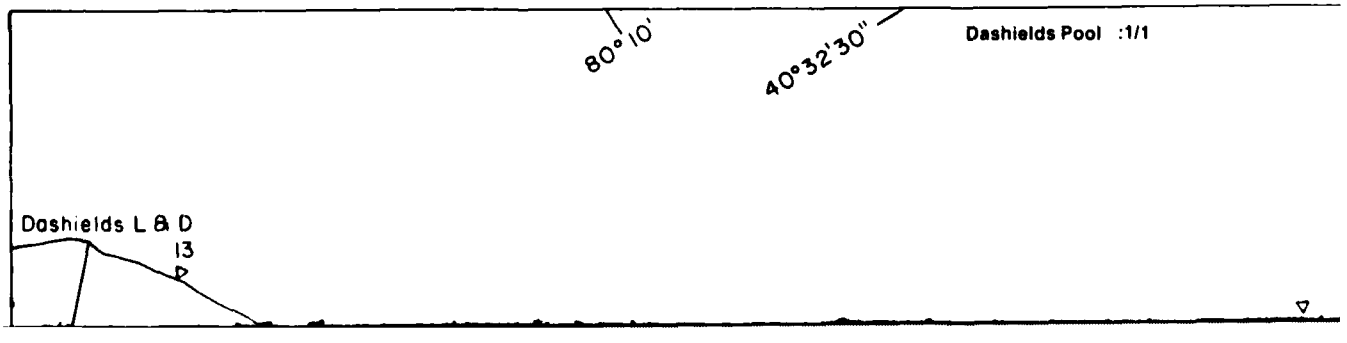
* Includes 1.14×10^6 of no video coverage



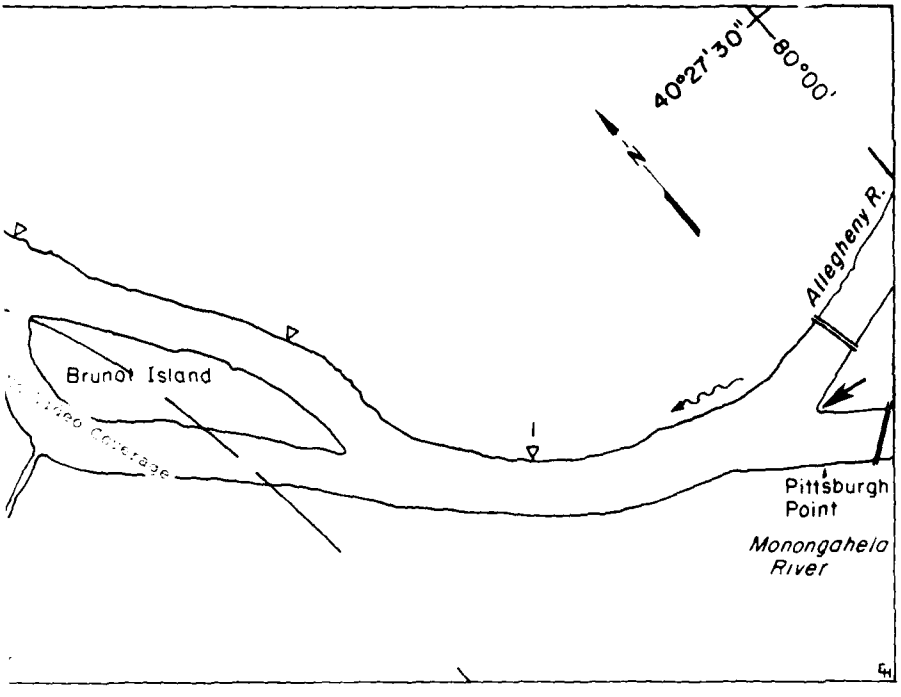
Emsworth Pool – Ohio

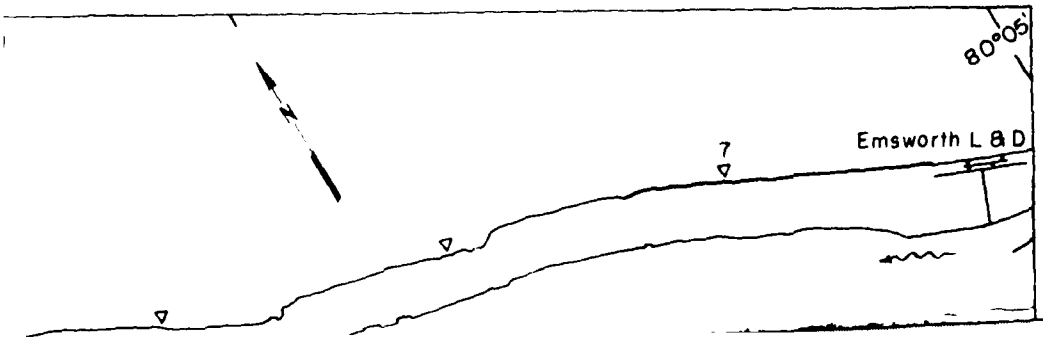
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.01	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.49*	

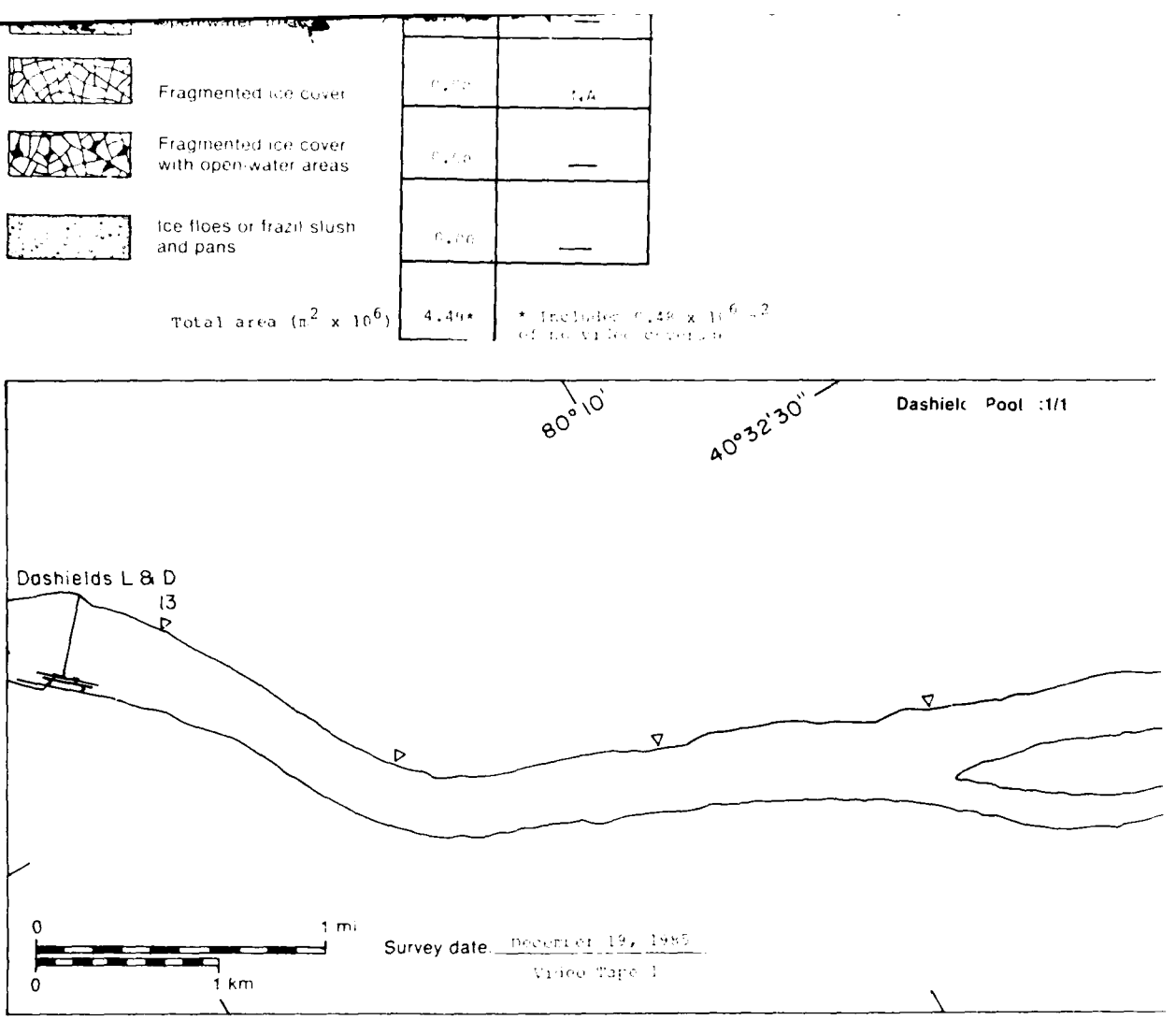
* Includes 0.48 x 10^6 m^2 of no video coverage

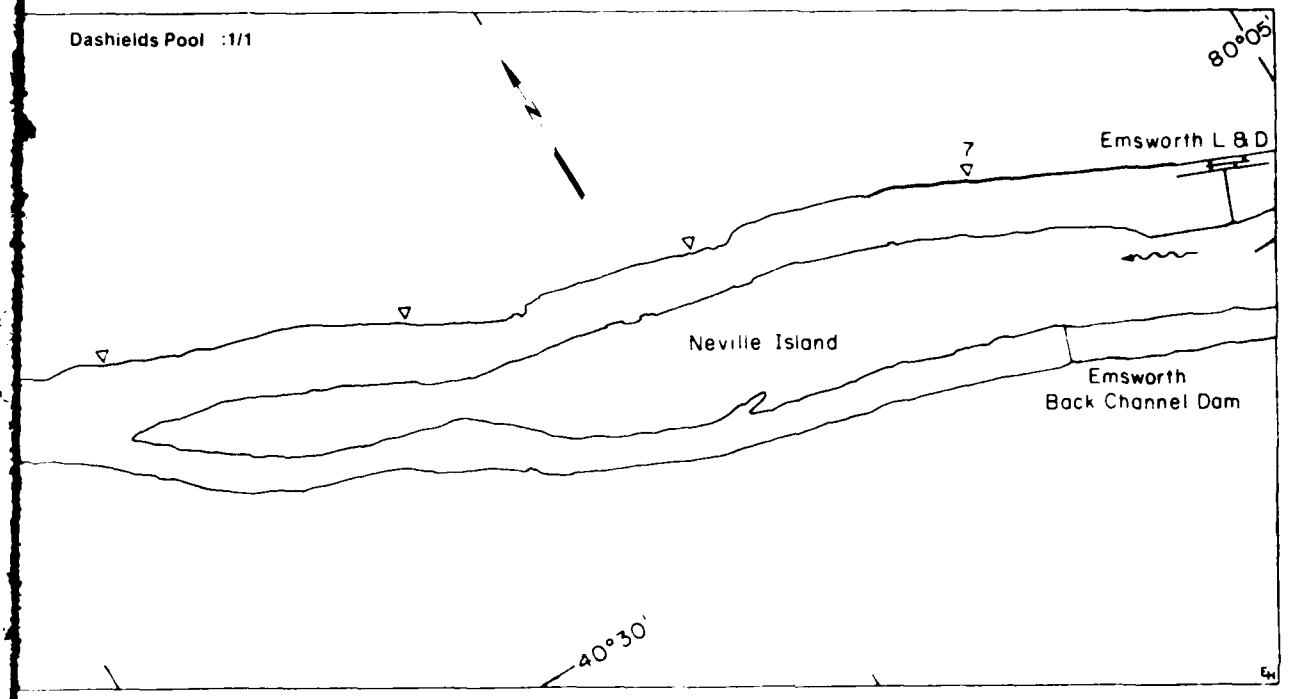


19 December 1985

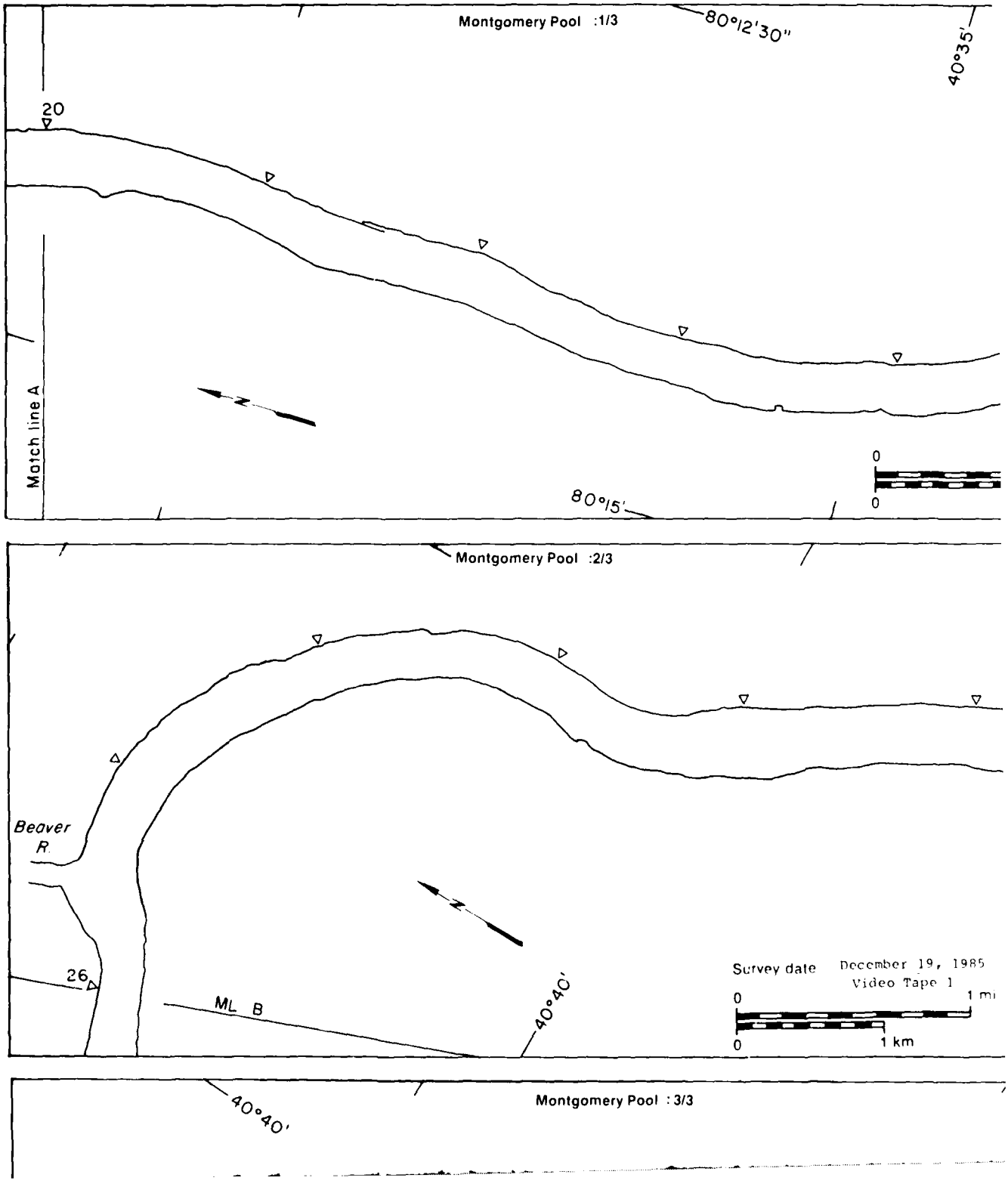


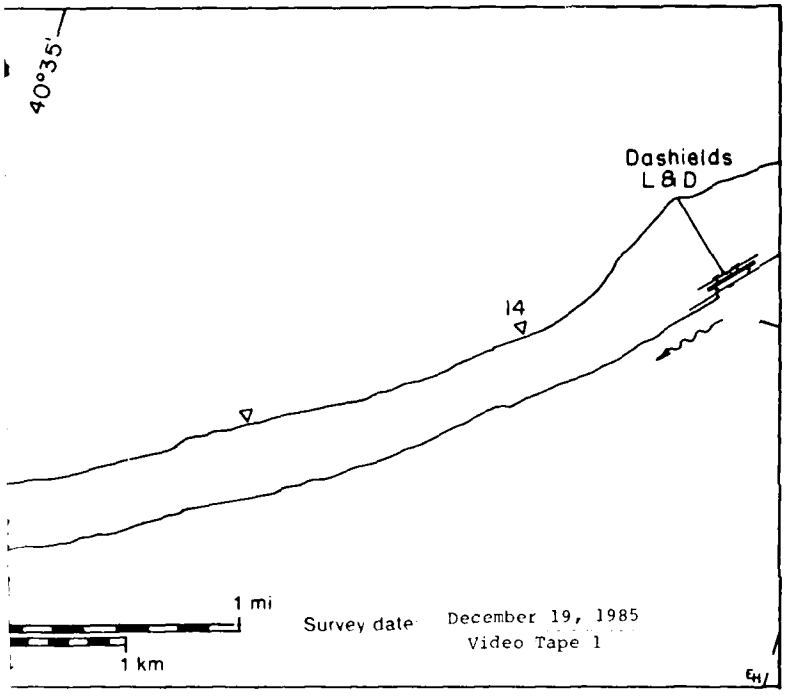


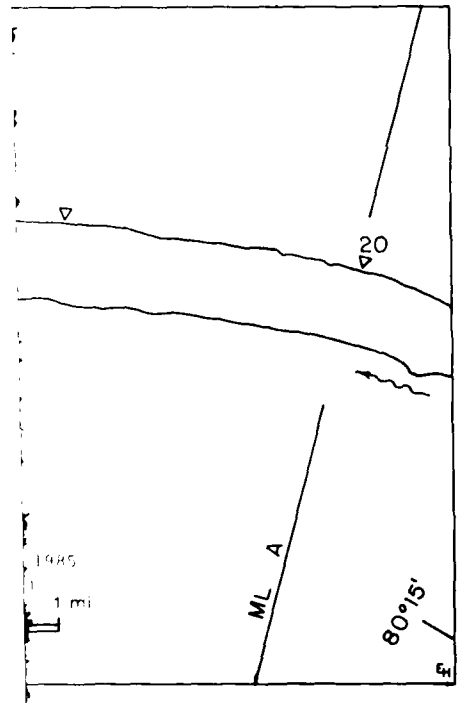

Fragmented ice cover
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans
Total area ($n^2 \times 10^6$)
4.44*
80°10'
40°32'30"
Dashielc Pool :1/1
Doshields L & D
13
0
1 mi
0
1 km
Survey date. December 19, 1985
Video Tape 1
Dashields Pool
MAP UNITS
Surface concentration
Open water
5.60
NA
Solid ice cover
0.00
NA
Solid ice cover with open-water areas
Fragmented ice cover
NA
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans
Total area

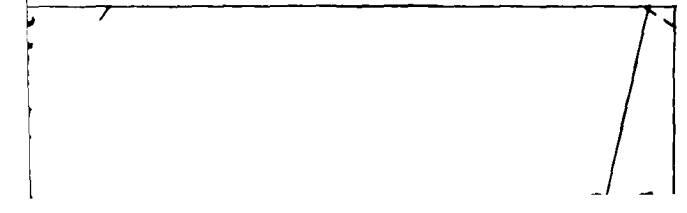

Dashields Pool :1/1
80°05'
Emsworth L & D
7
Neville Island
Emsworth
Back Channel Dam
40°30'

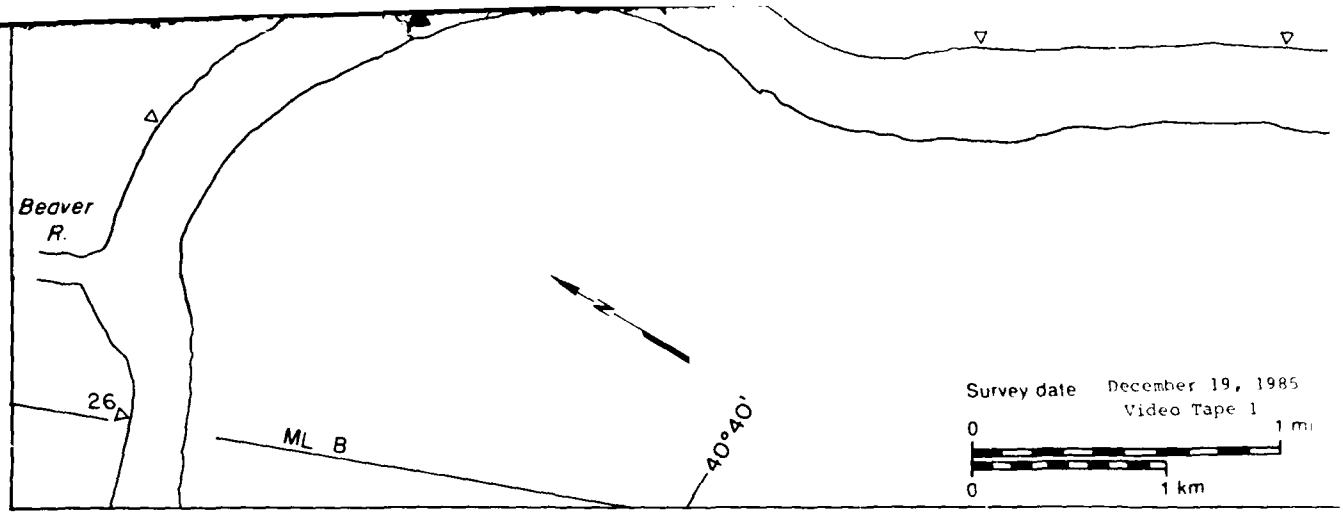
19 December 1985

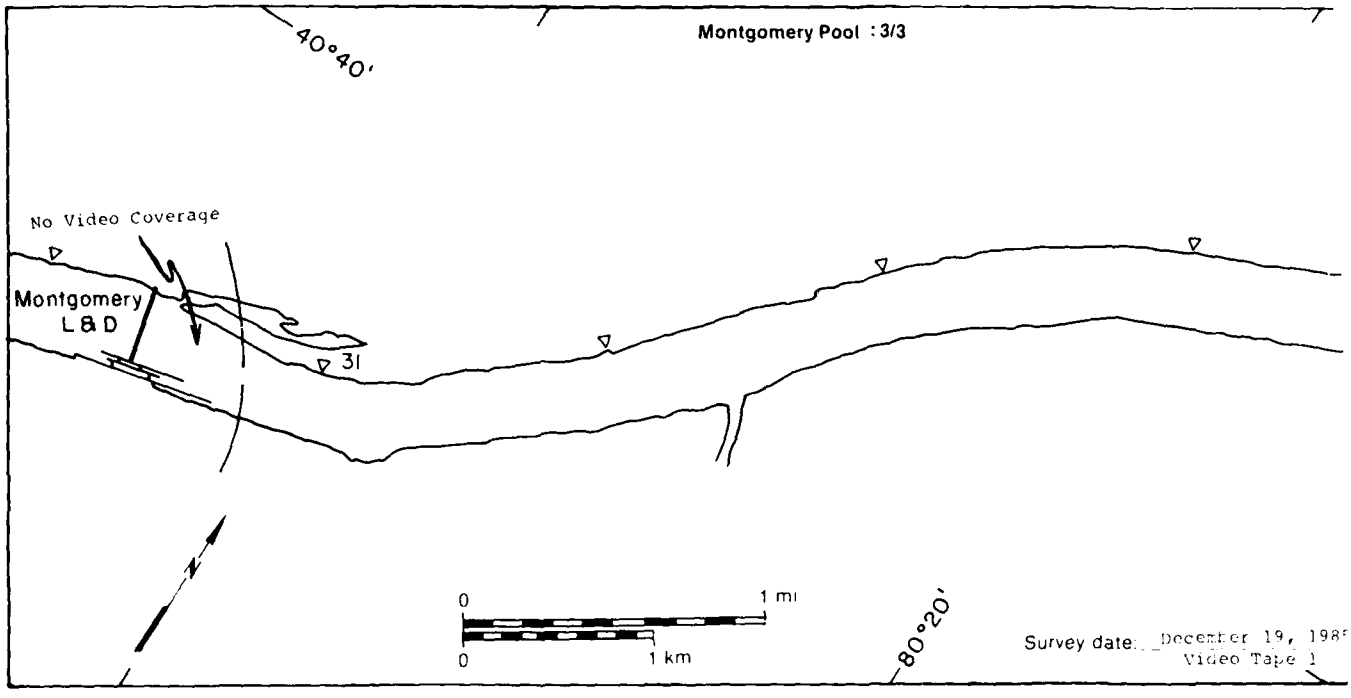



40°35'
Dashields
L&D
14
1 mi
1 km
Survey date December 19, 1985
Video Tape 1


20
1985
1 mi
ML A
80°15'



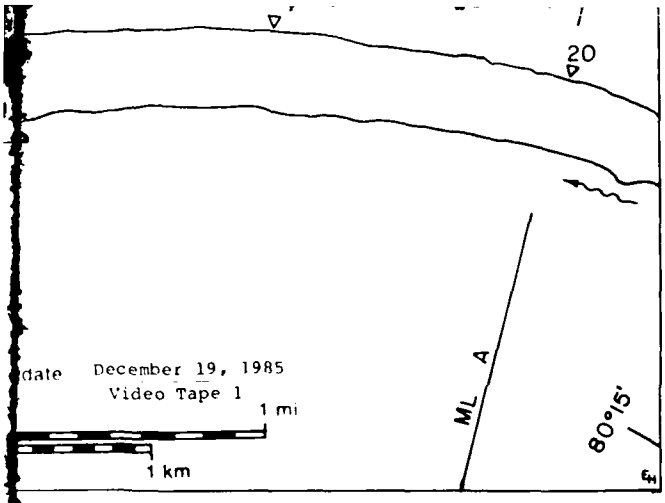


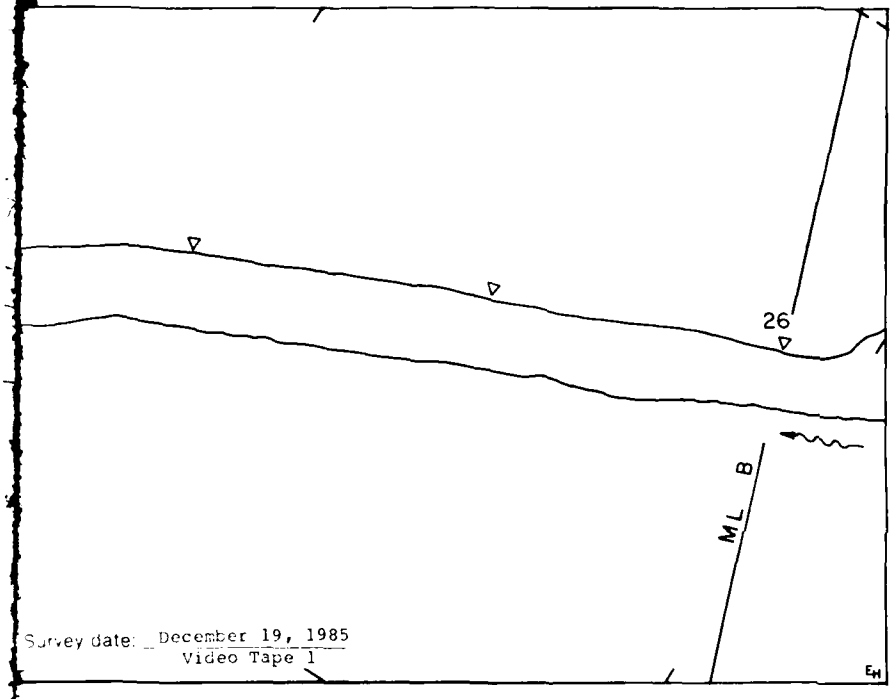


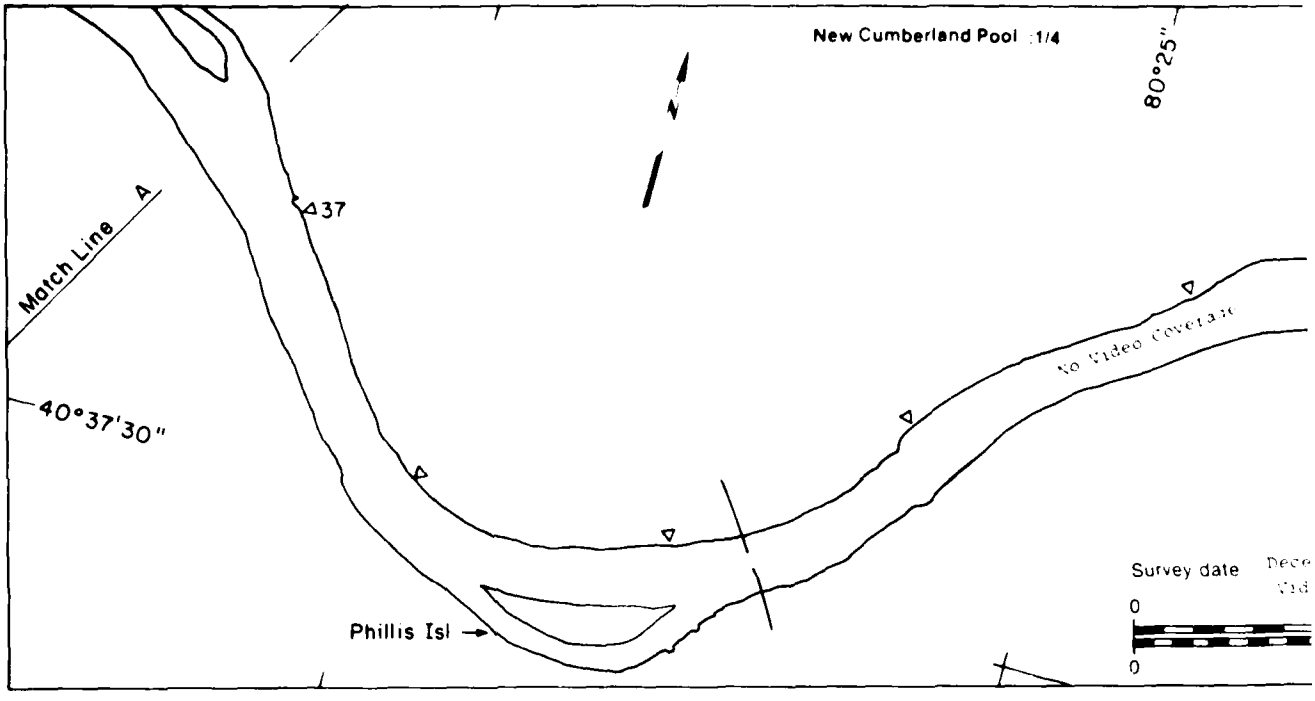
Montgomery Pool

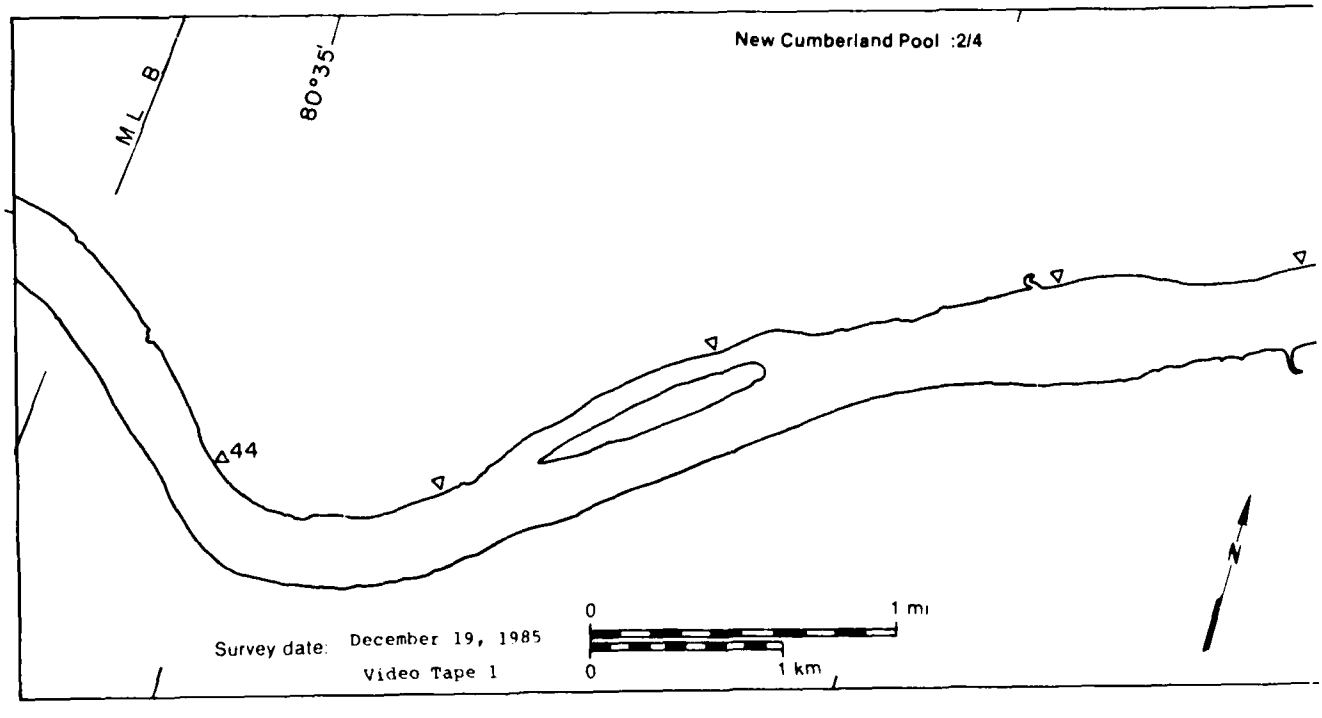
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.99	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.27*	

* Includes 0.28 x 10^6 m^2 of no video coverage

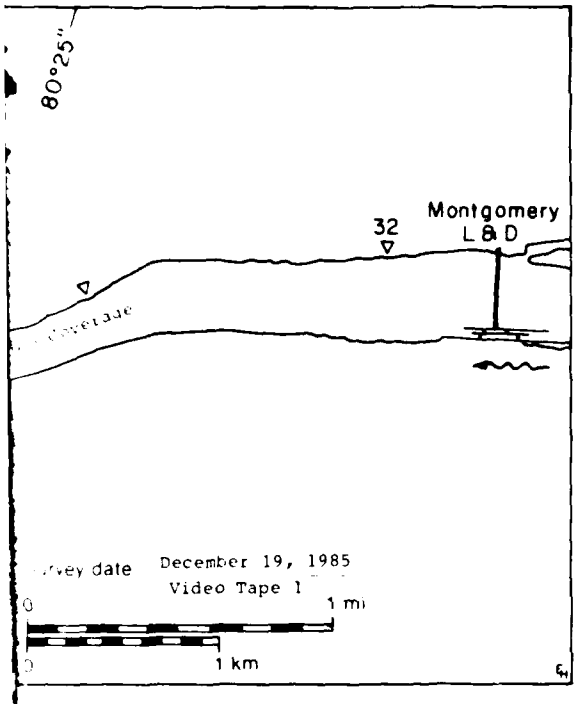

20
date December 19, 1985
Video Tape 1
1 mi
1 km
ML A
80°15'
EH

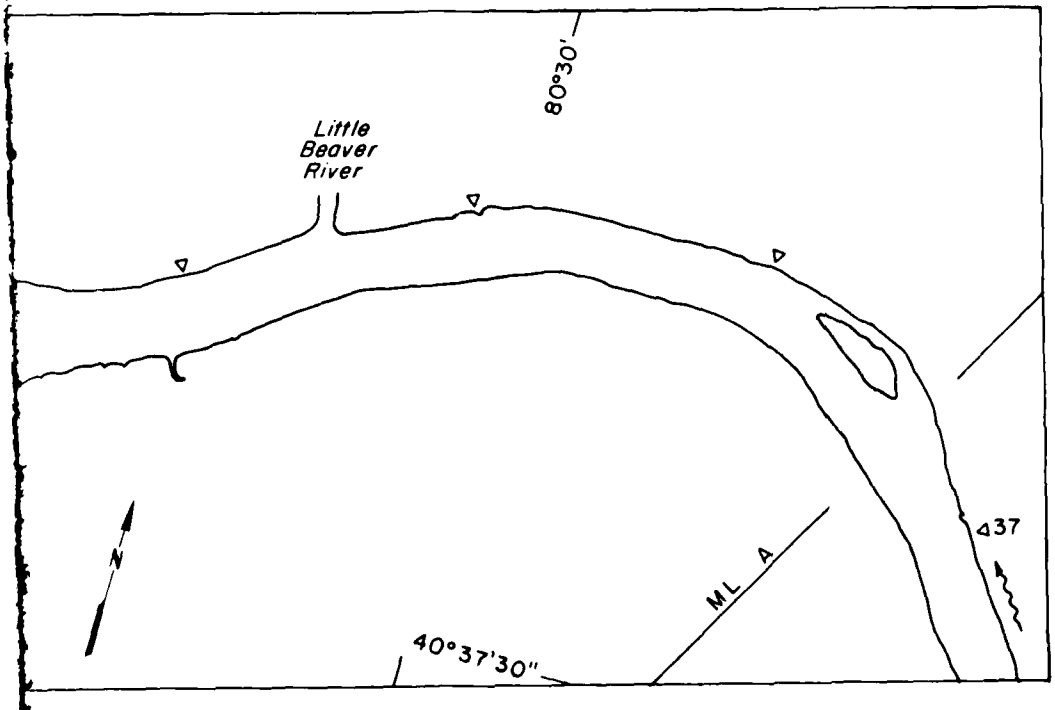

26
ML B
Survey date: December 19, 1985
Video Tape 1
EH

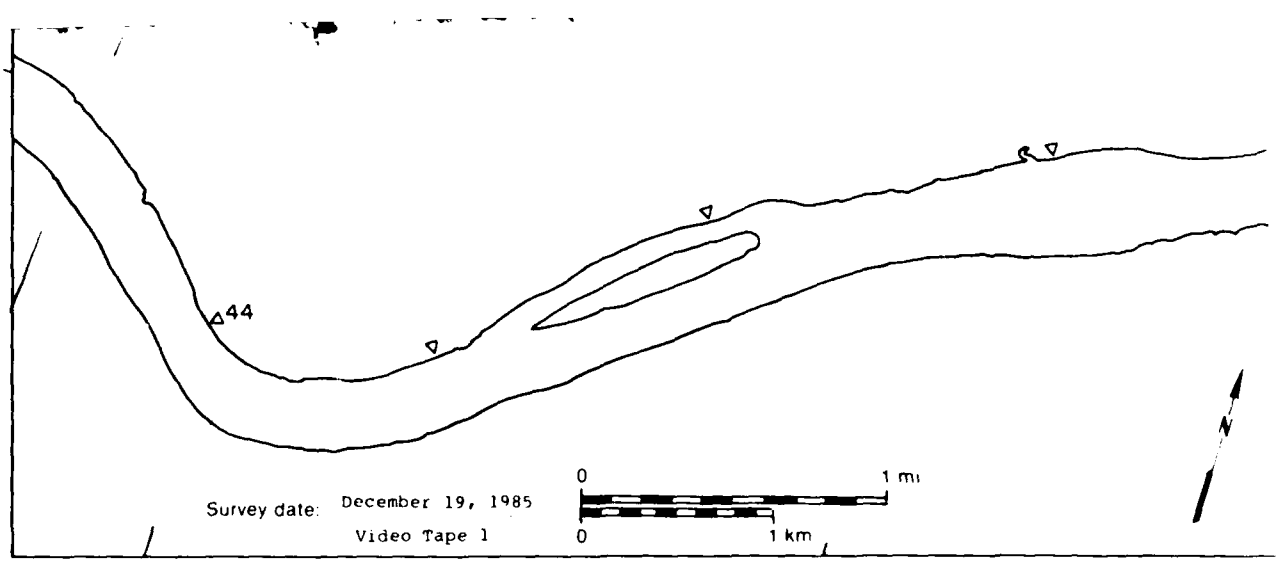

New Cumberland Pool :1/4
80°25"
Match Line A
37
40°37'30"
No Video Coverage
Phillis Isl
Survey date
0
0

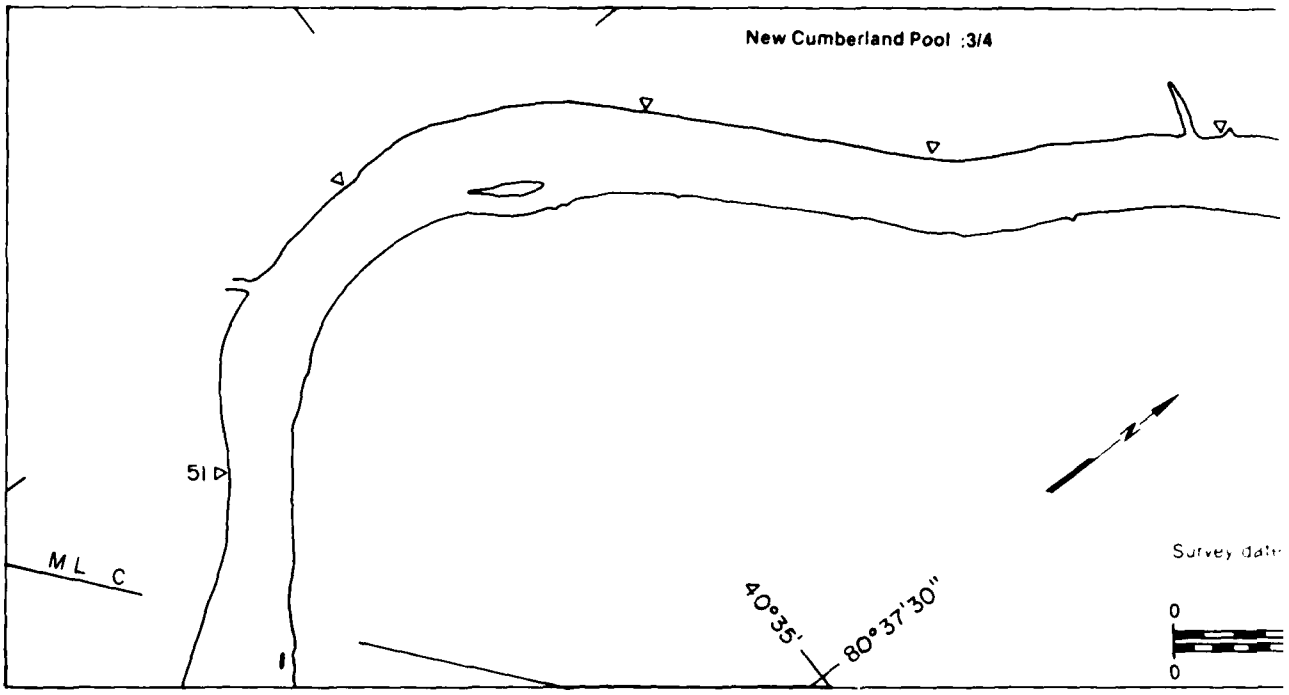

New Cumberland Pool :2/4
80°35'
M L B
44
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 1

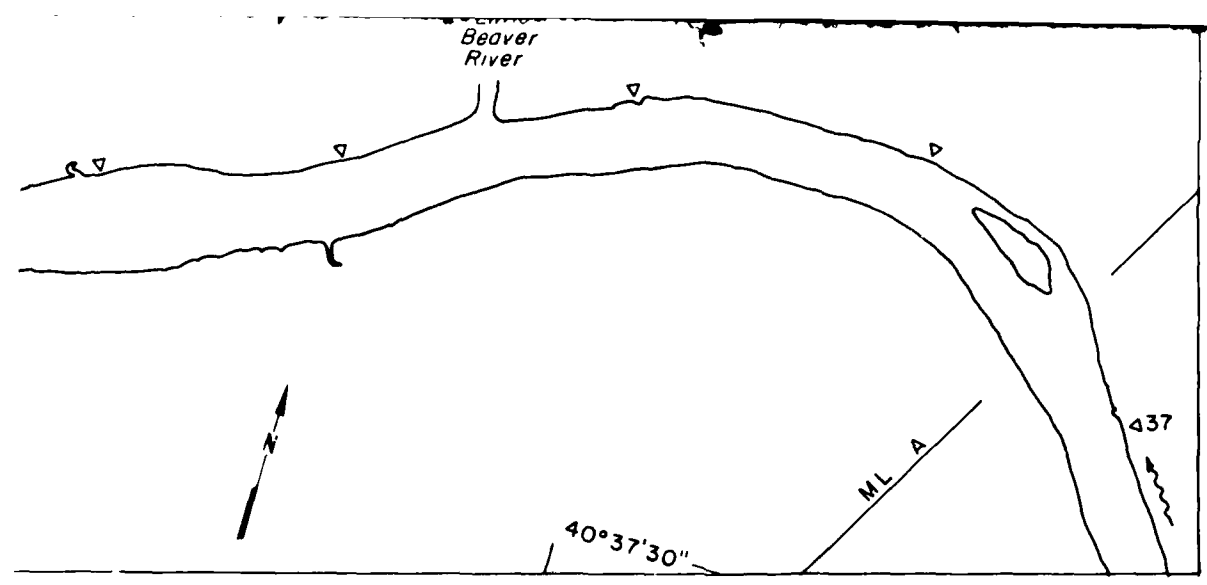
19 December 1985

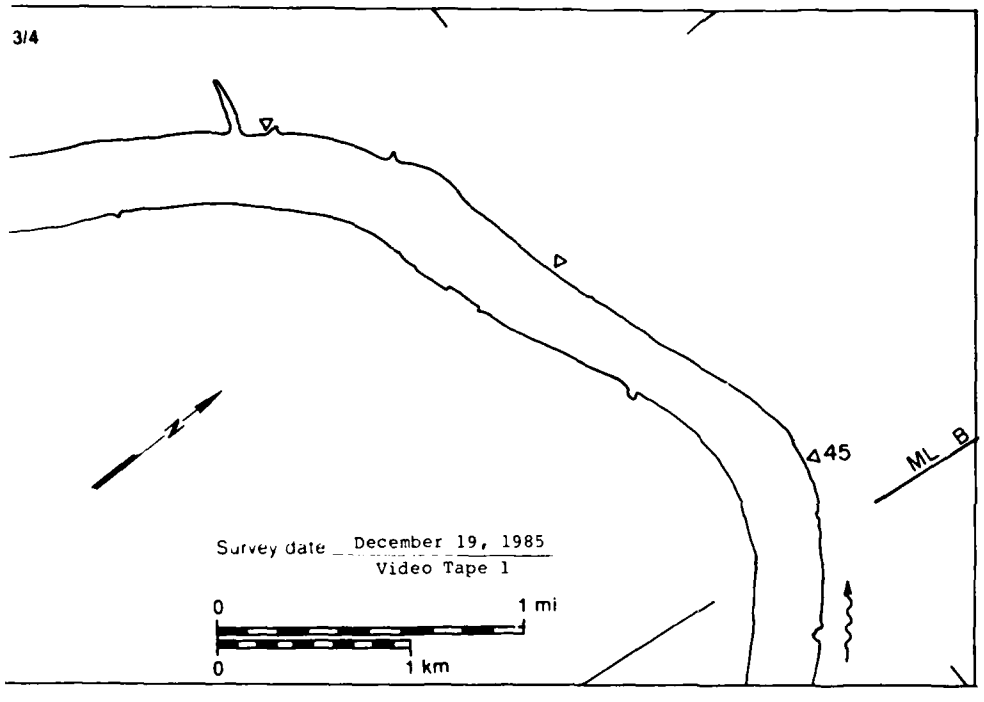




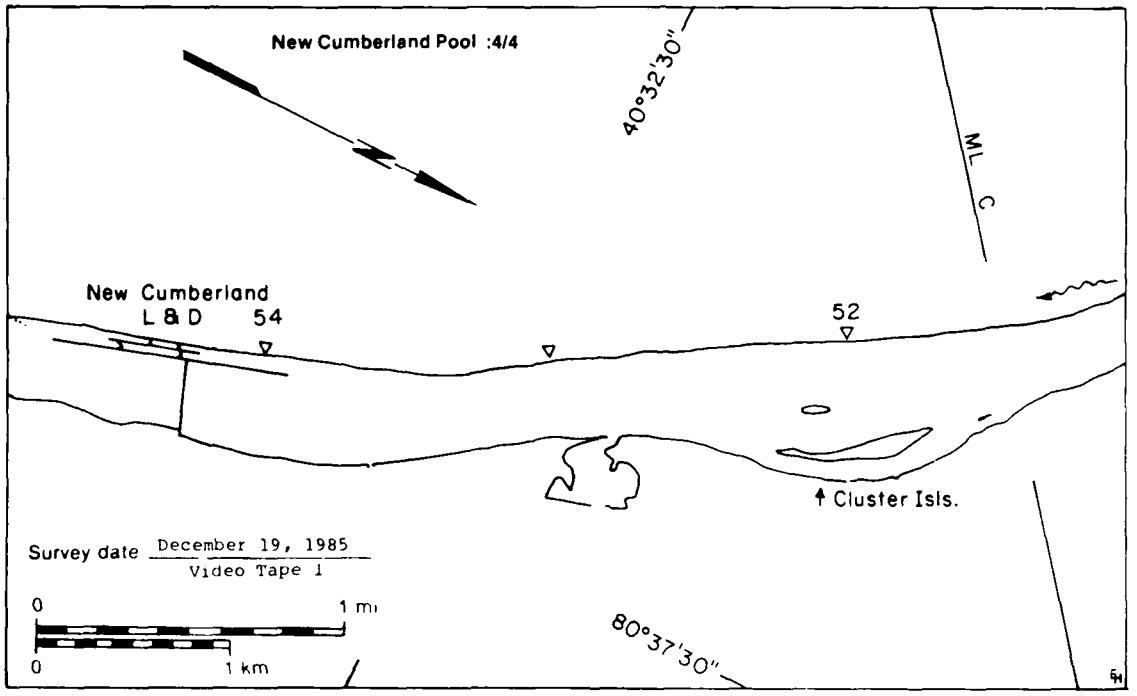

44
Survey date: December 19, 1985
Video Tape 1
0
1 mi
0
1 km

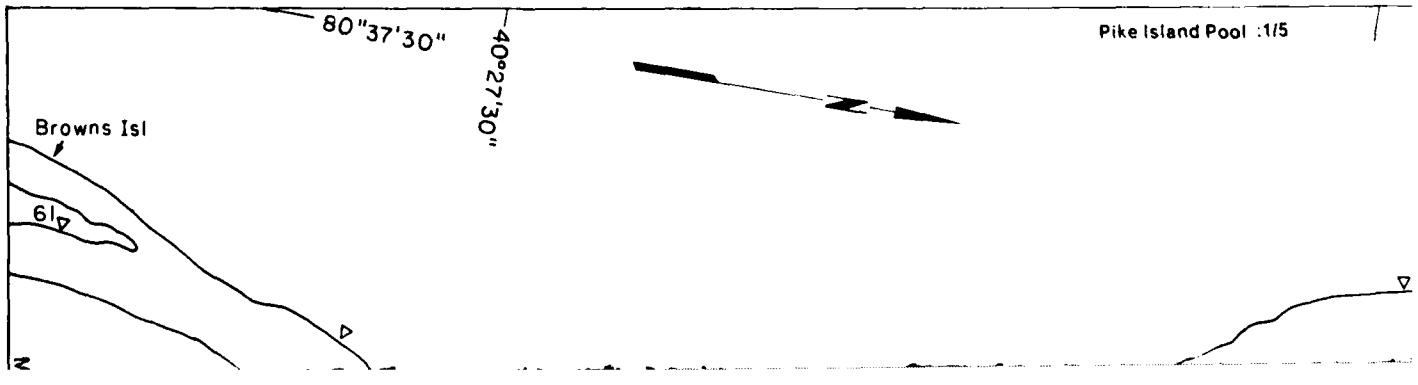

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0


Beaver
River
N
ML A
40°37'30"
37


3/4
N
45
ML B
Survey date December 19, 1985
Video Tape 1
0
1 mi
0
1 km

19 December 1985

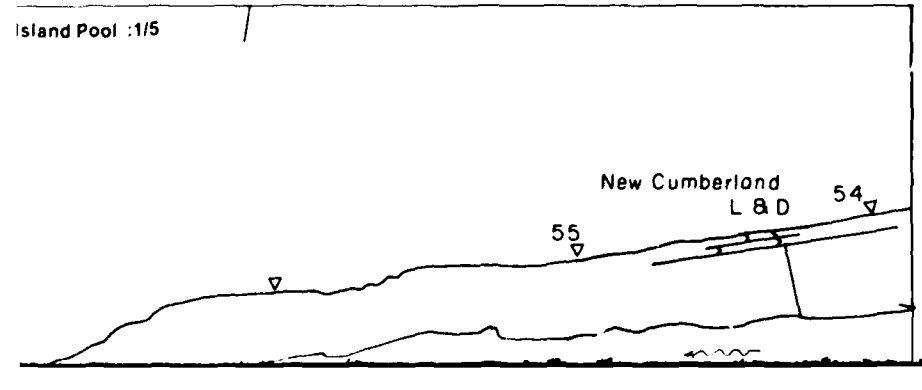


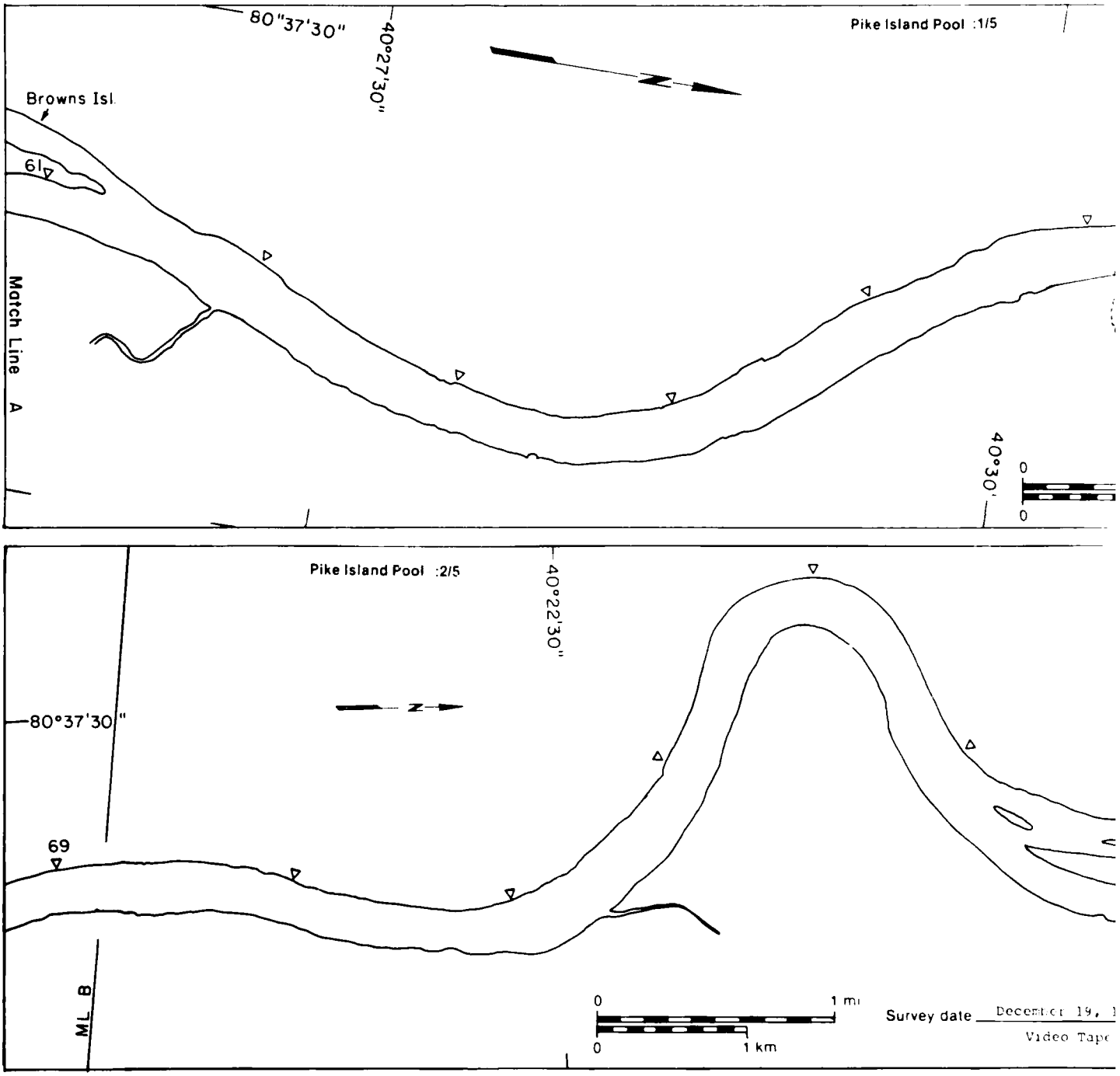


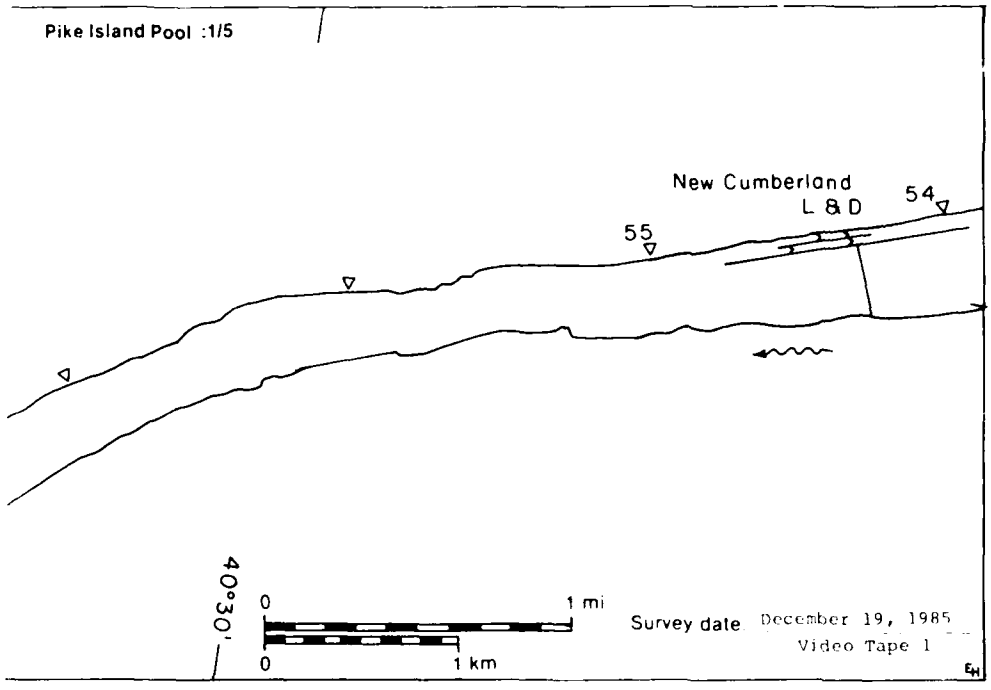
New Cumberland Pool

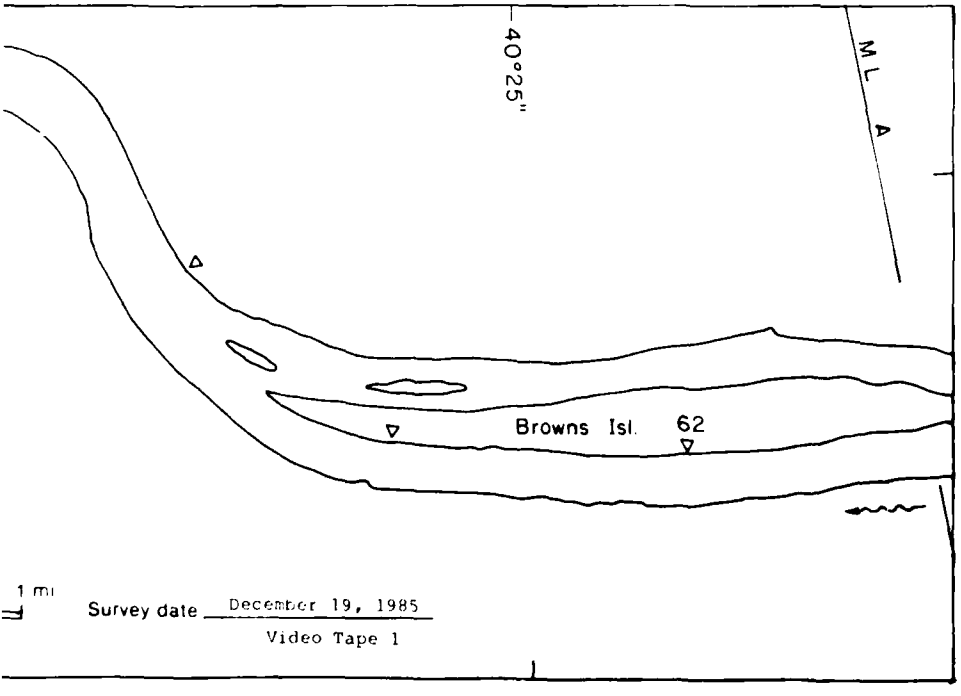
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	13.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	14.87*	

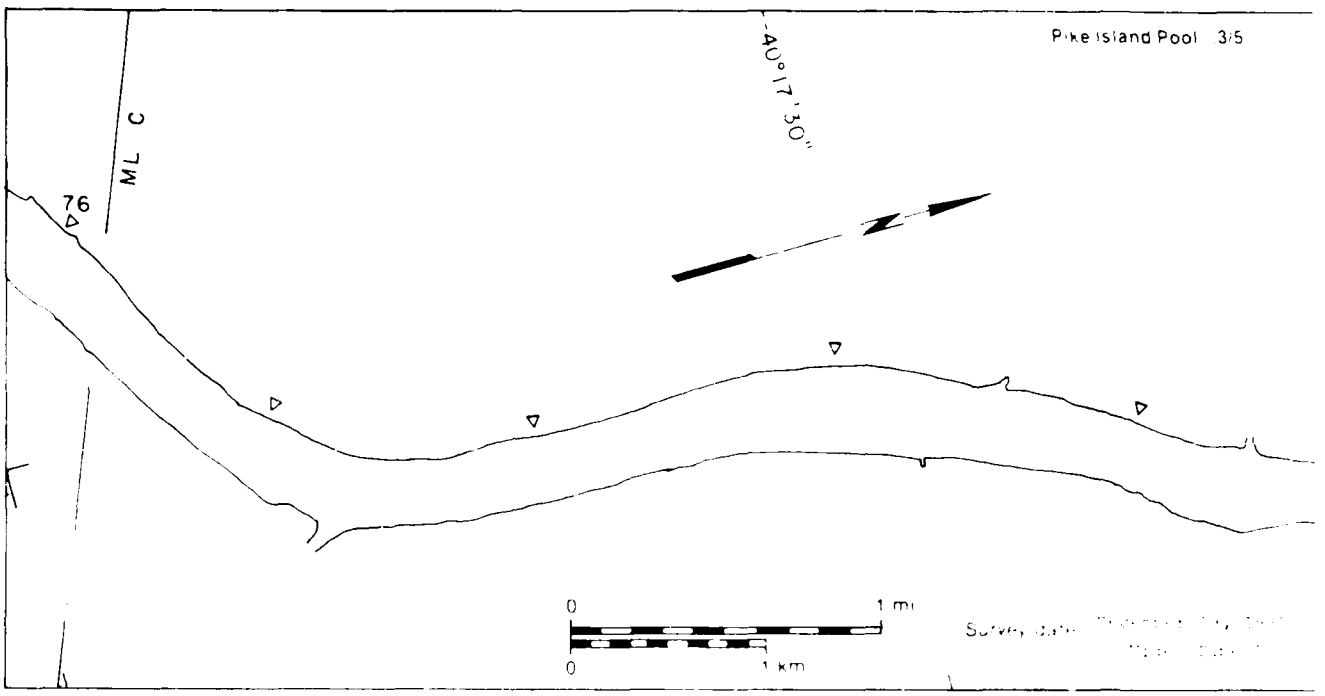
* Includes 1.71×10^6 m^2 of no video coverage

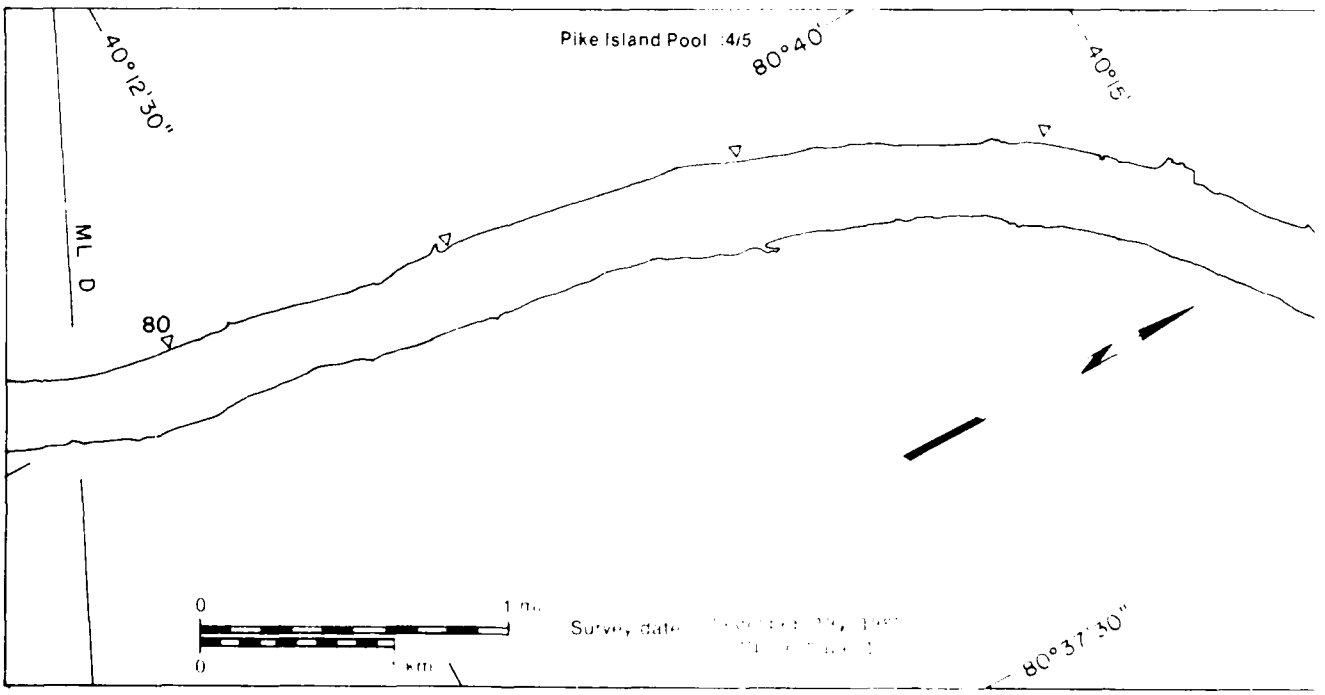


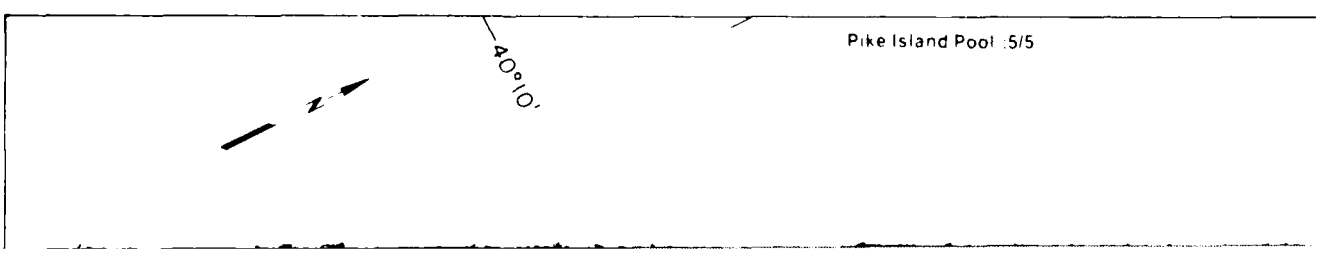

80°37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl.
61
Match Line A
40°30'
0
0
Pike Island Pool :2/5
40°22'30"
80°37'30"
N
69
ML B
0
1 mi
0
1 km
Survey date December 19,
Video Tape

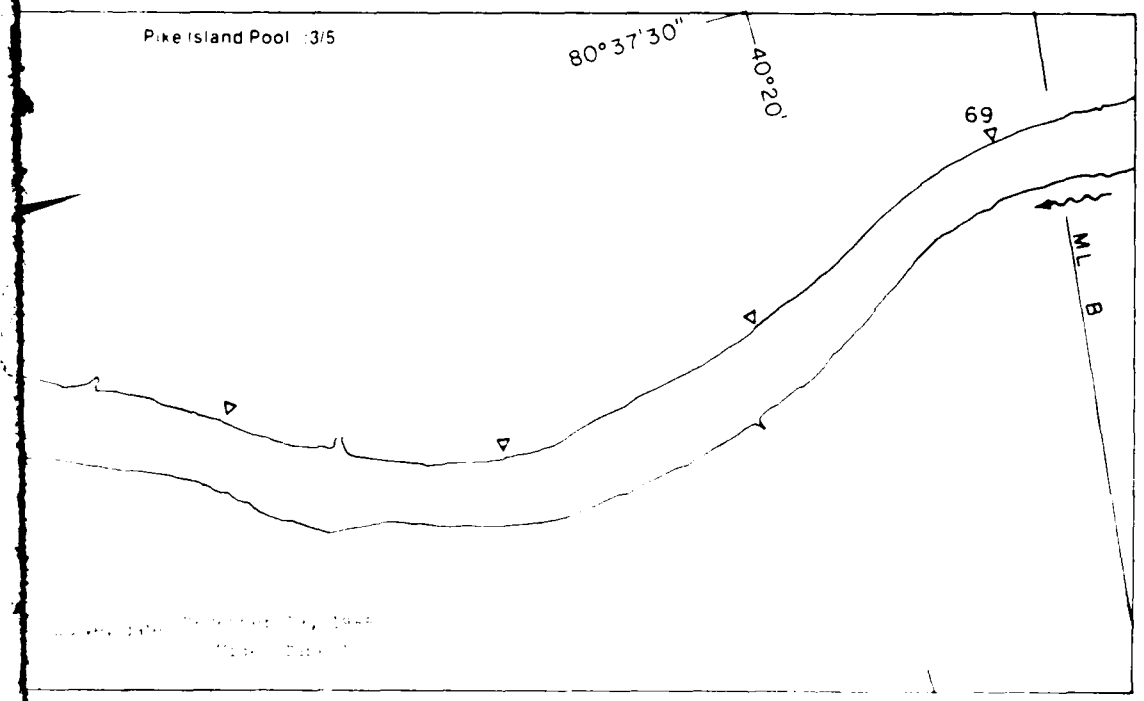

Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 1

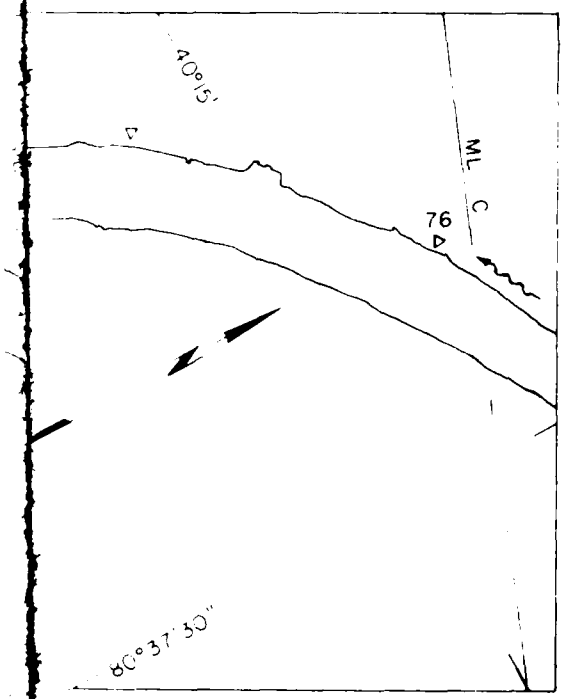

40°25"
M L A
Browns Isl.
62
1 mi
Survey date December 19, 1985
Video Tape 1

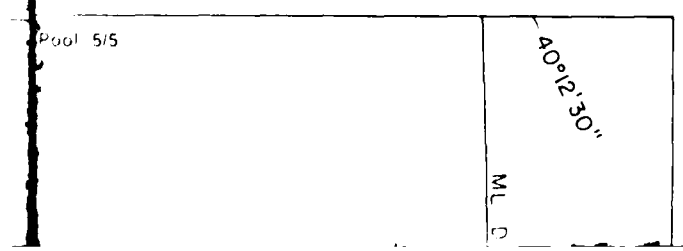

Pike Island Pool 3/5
40°17'30"
ML C
76
0
1 mi
0
1 km

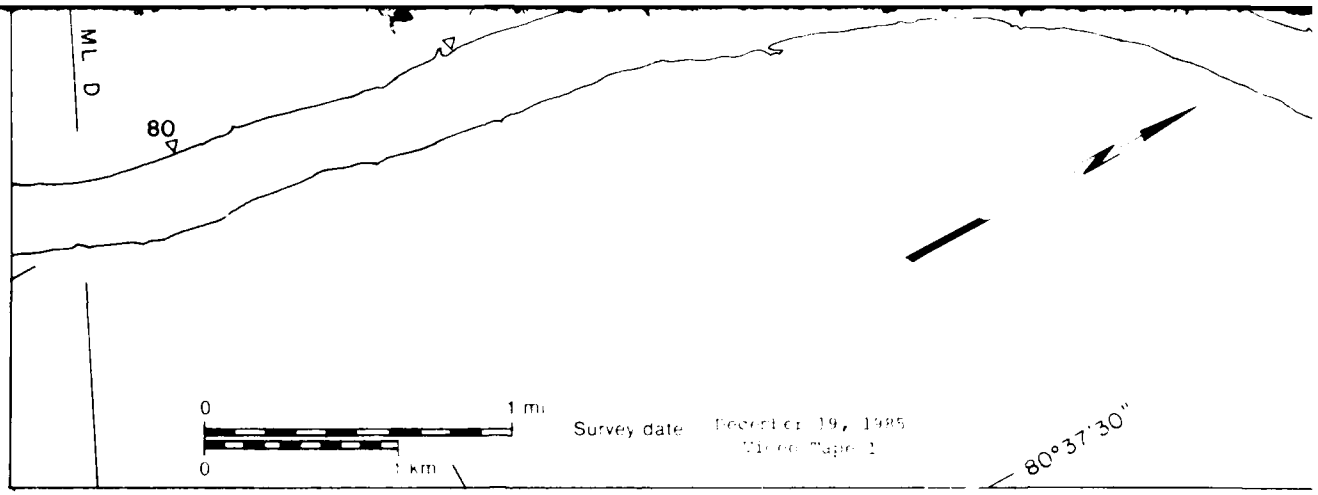

Pike Island Pool 4/5
80°40'
40°15'
40°12'30"
ML D
80
0
1 mi
0
1 km
80°37'30"

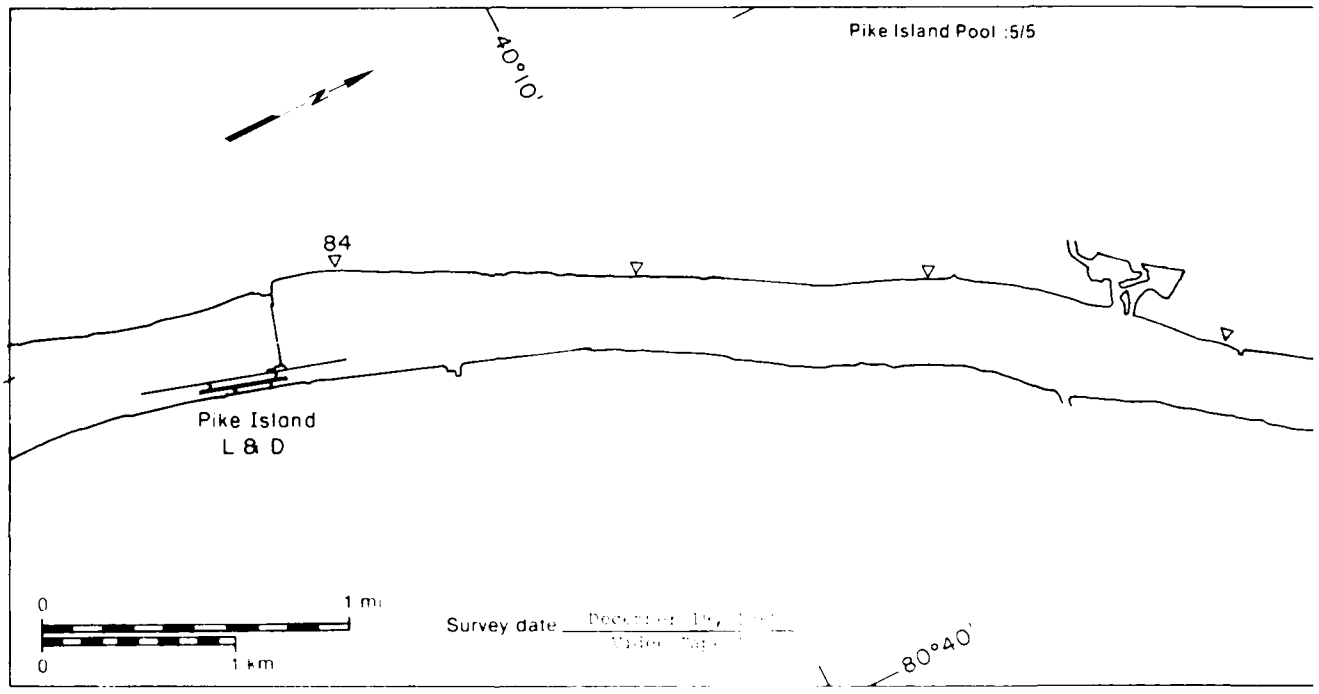

Pike Island Pool 5/5
40°10'


Pike Island Pool 3/5
80°37'30"
40°20'
69
ML B


40°15'
ML C
76
80°37'30"

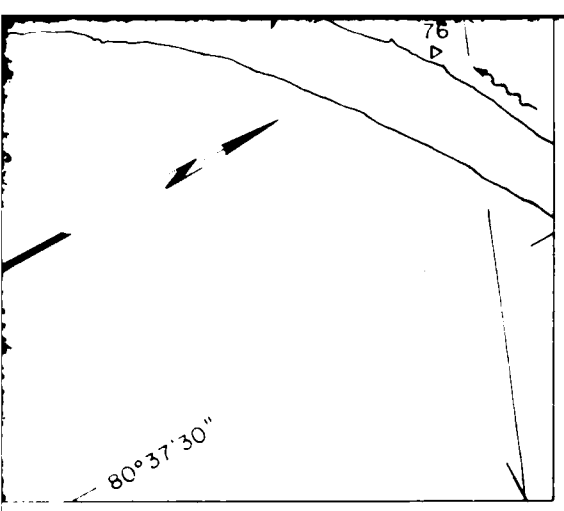

Pool 5/5
40°12'30"
ML D

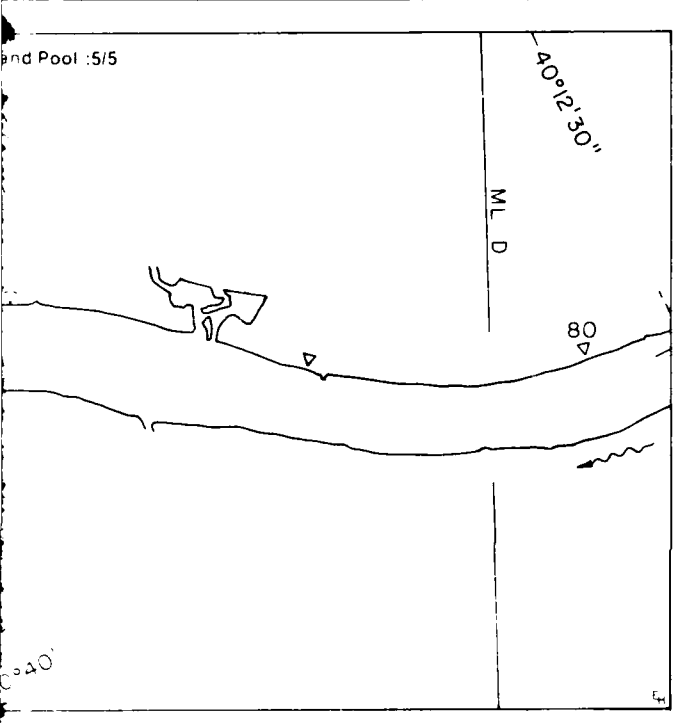




Pike Island Pool

MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	18.92	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	18.92	


76
80°37'30"


nd Pool :5/5
40°12'30"
ML D
80

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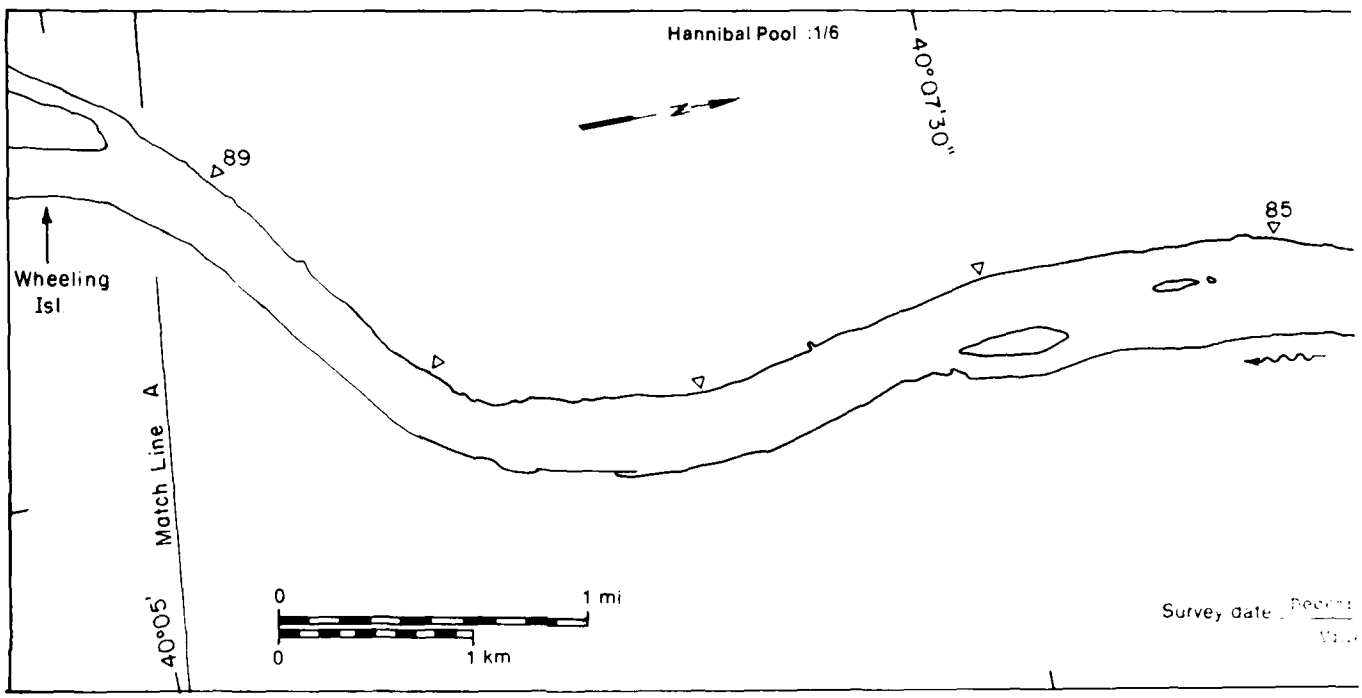
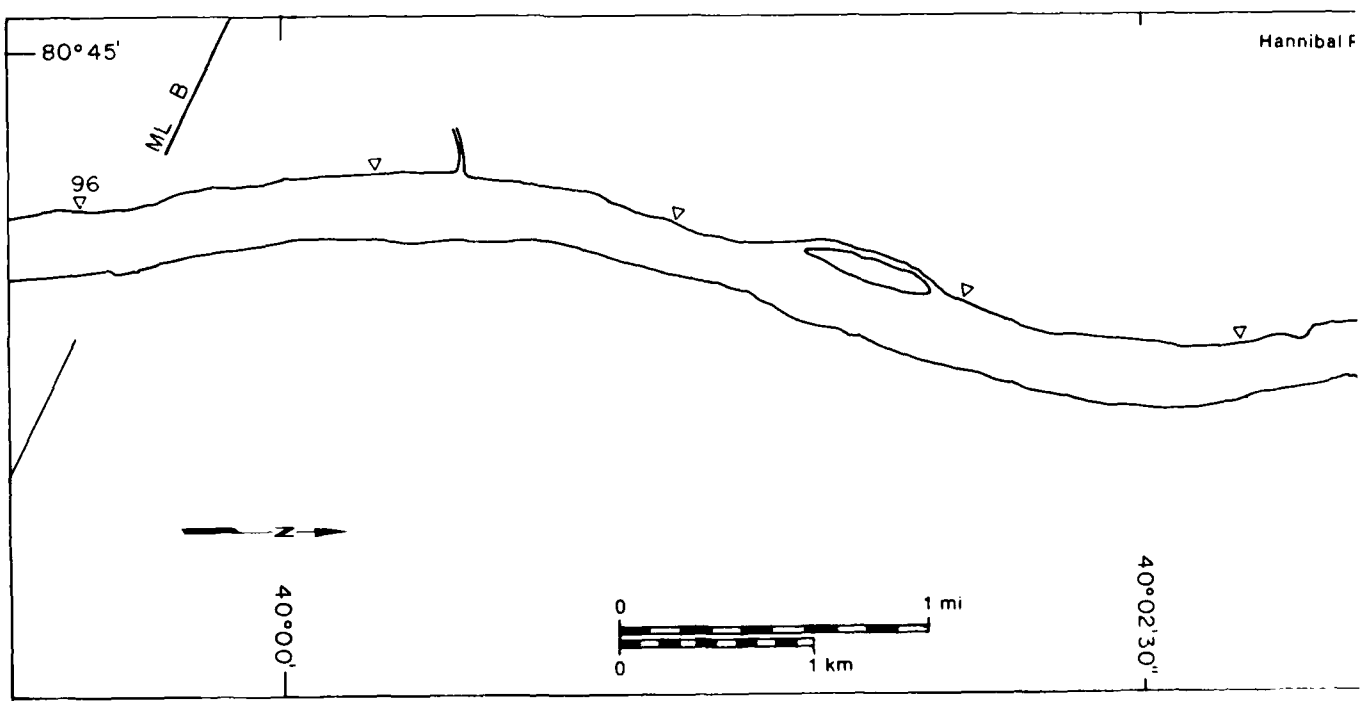
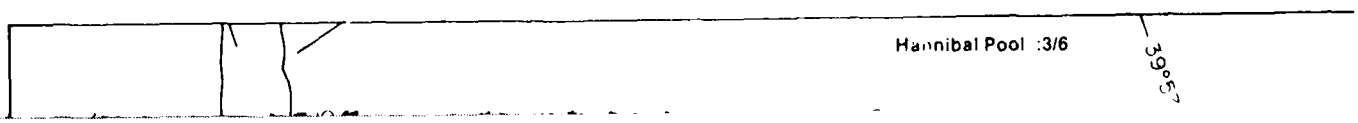
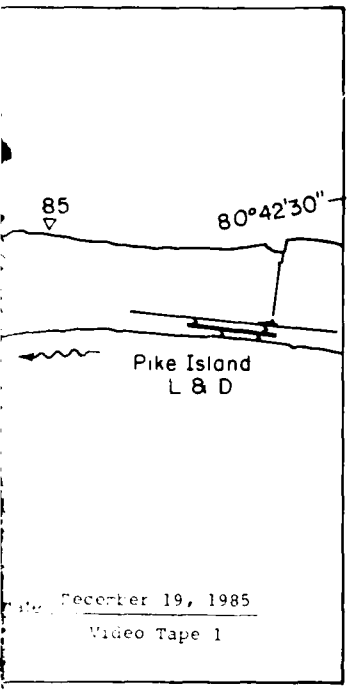
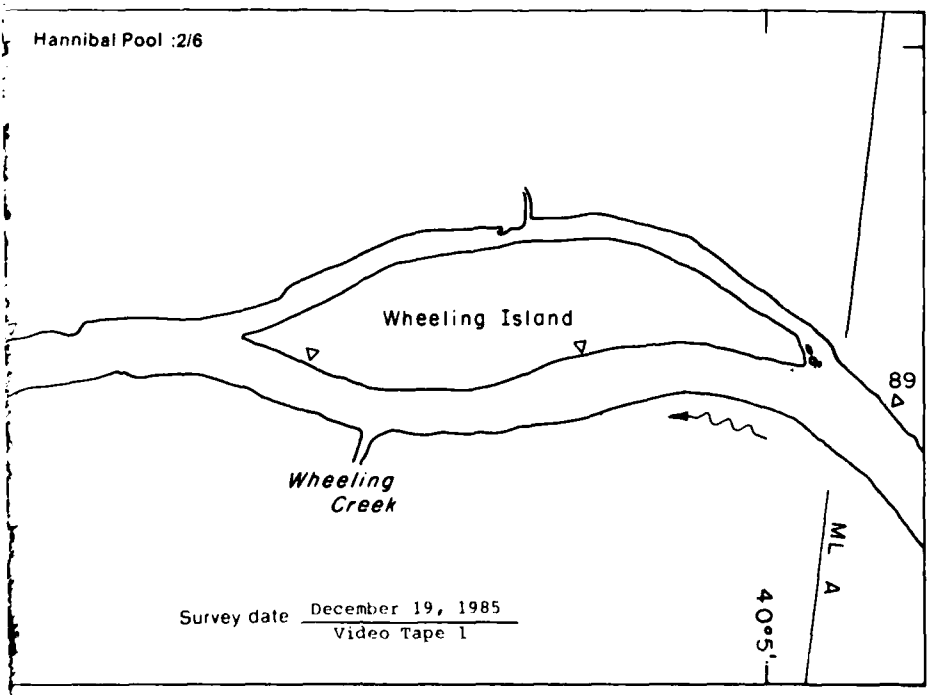
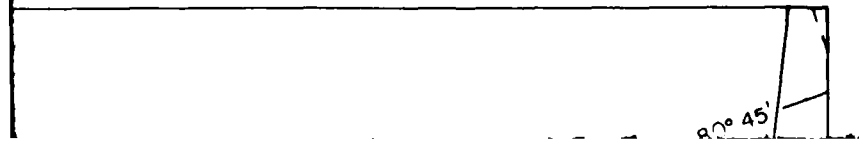


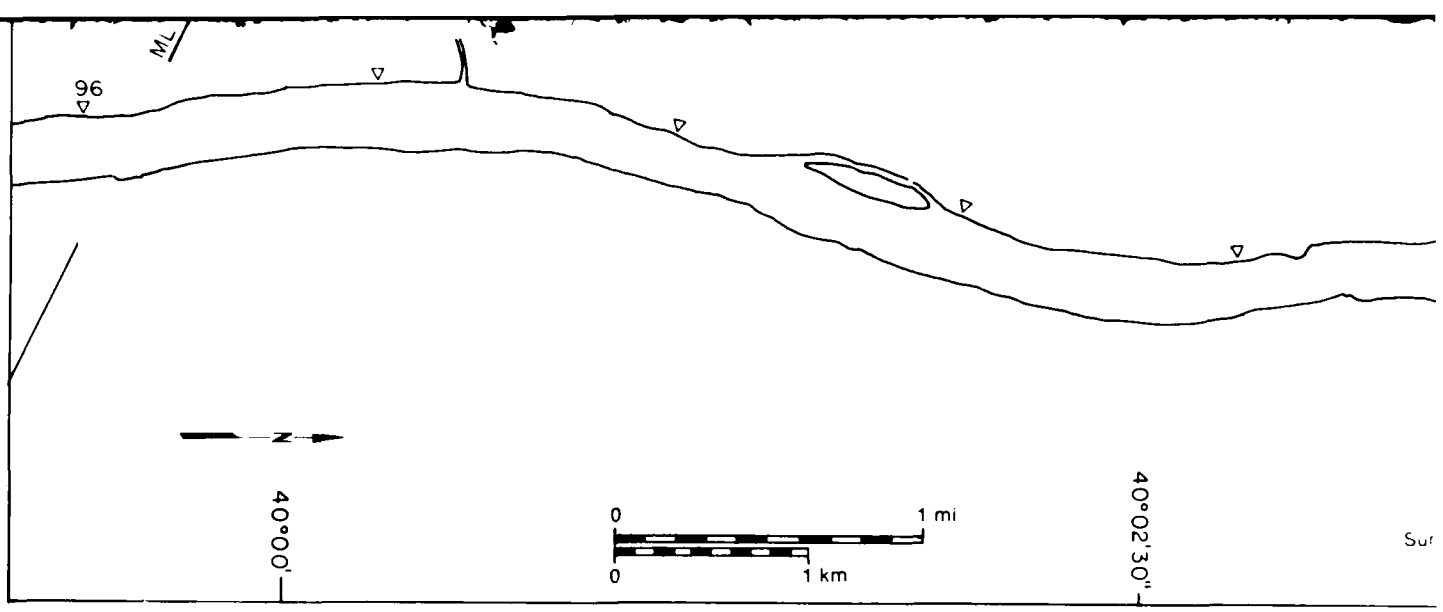


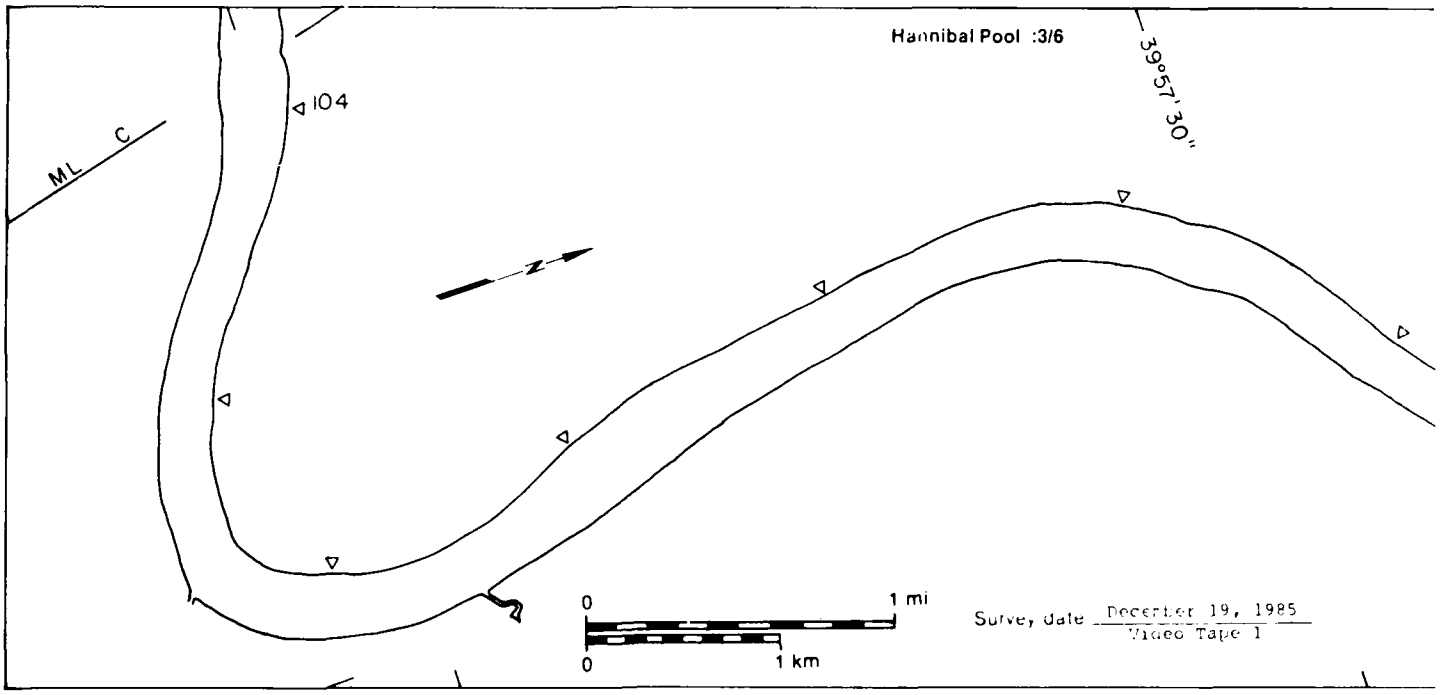


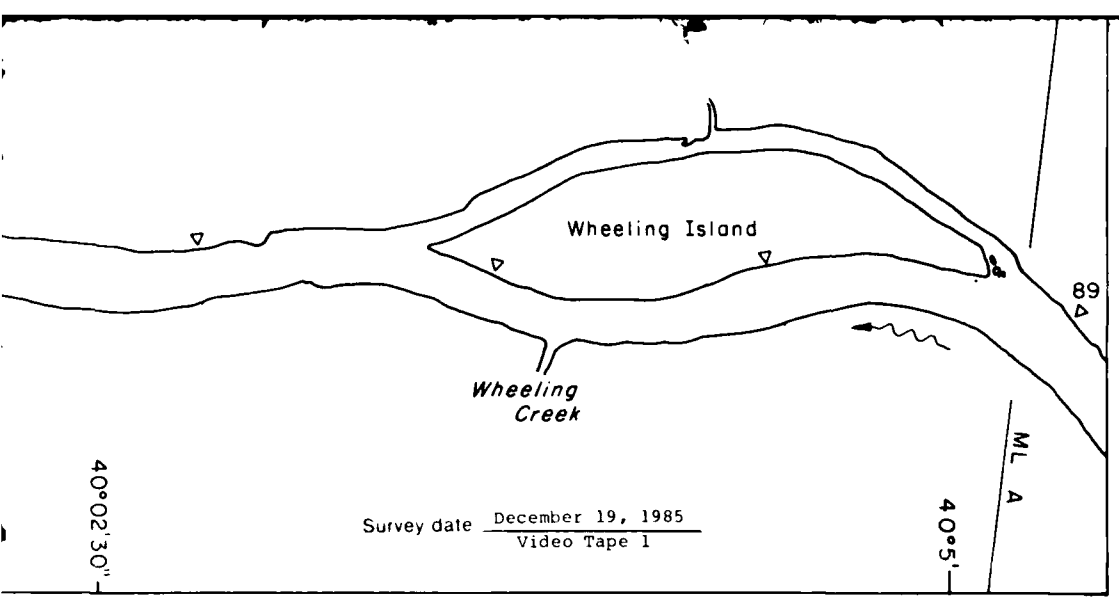

85
80°42'30"
Pike Island
L & D
December 19, 1985
Video Tape 1

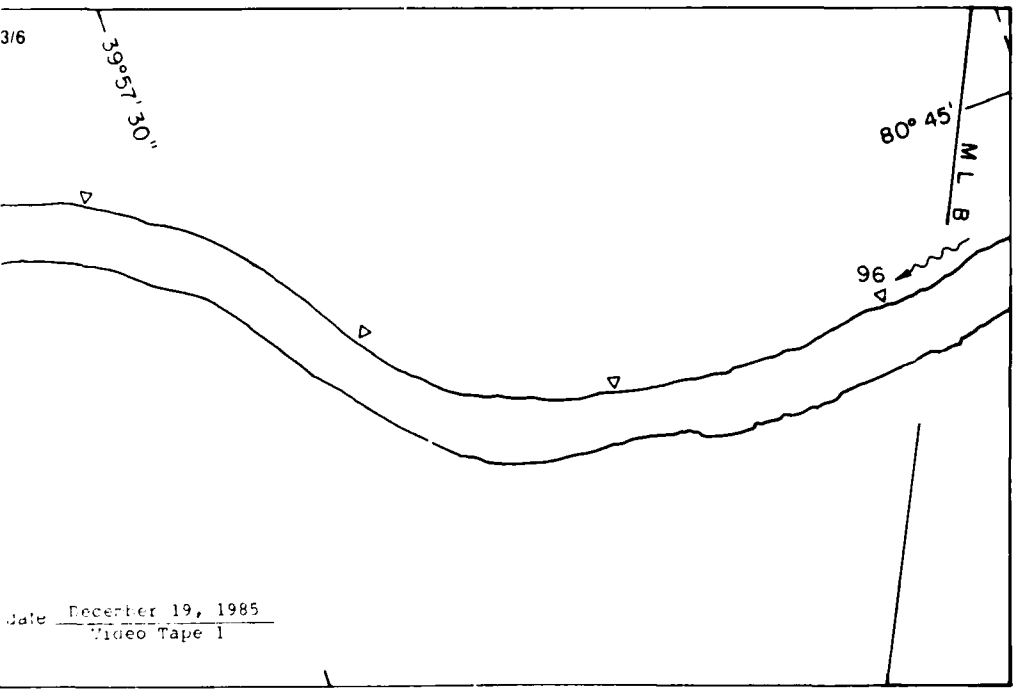

Hannibal Pool :2/6
Wheeling Island
89
Wheeling
Creek
ML A
40°5'
Survey date December 19, 1985
Video Tape 1

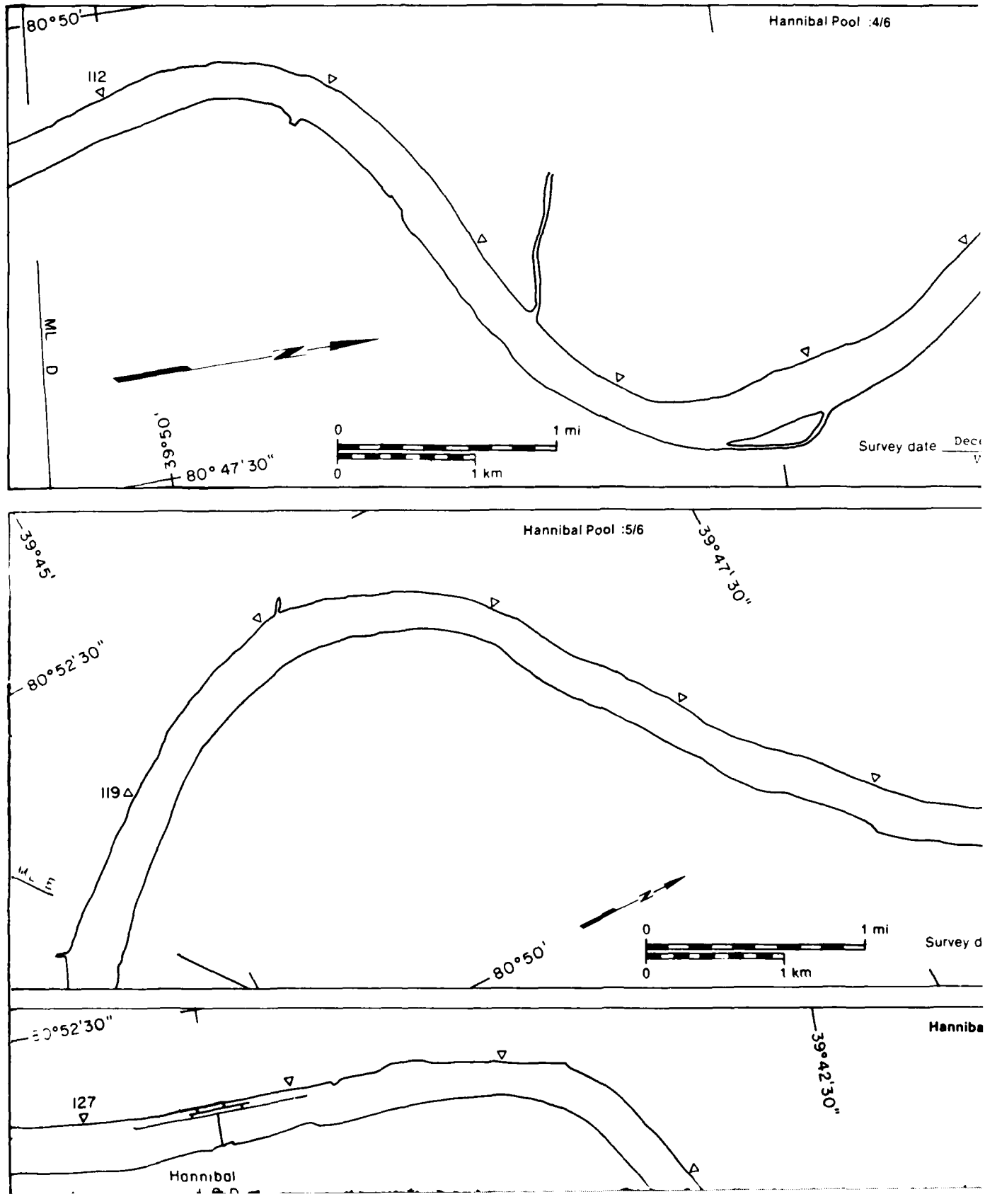

80° 45'


ML
96
N
40°00'
0
1 mi
0
1 km
40°02'30"

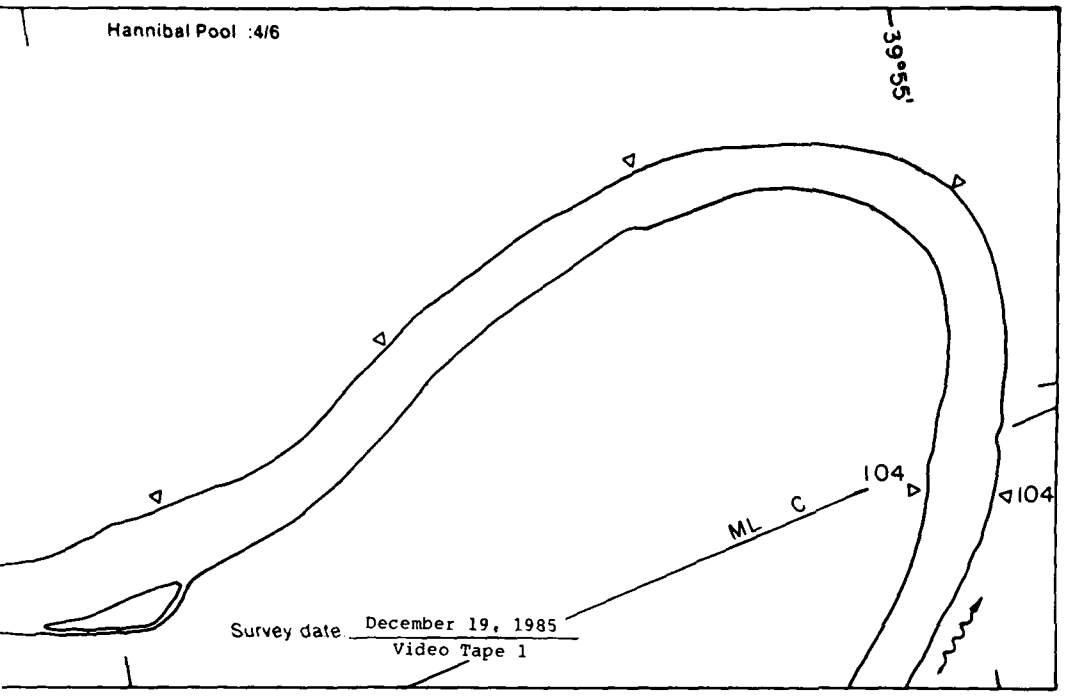

Hannibal Pool :3/6
39°57'30"
104
ML C
N
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 1

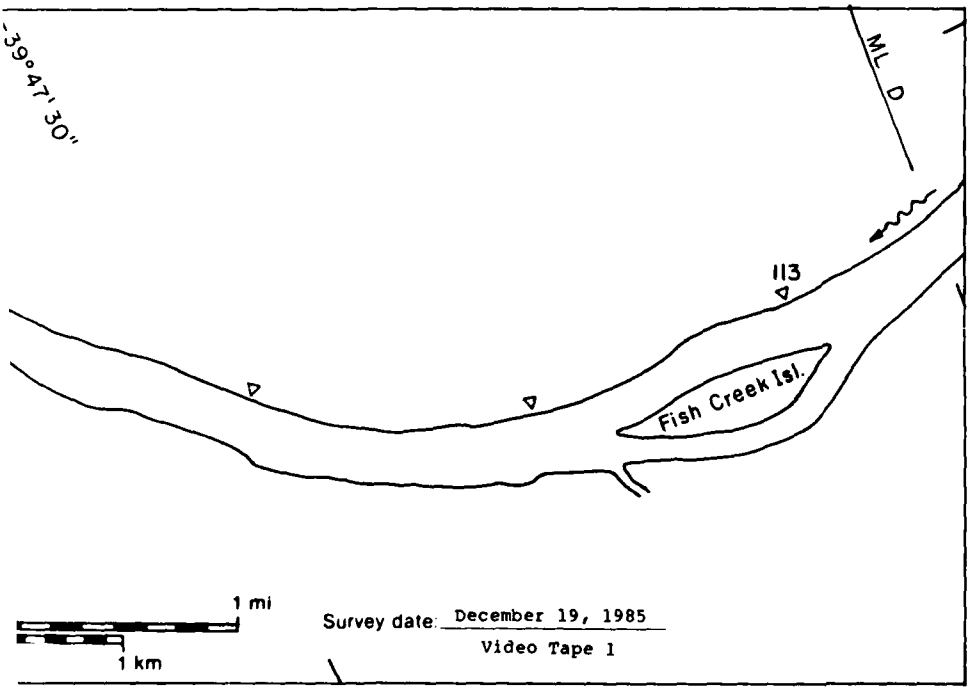

Wheeling Island
89
Wheeling
Creek
40°02'30"
ML A
40°5'
Survey date December 19, 1985
Video Tape 1

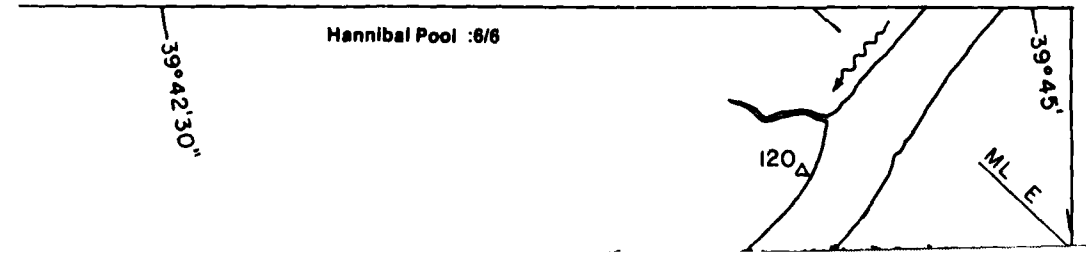

3/6
39°57'30"
80° 45'
ML B
96
Date December 19, 1985
Video Tape 1

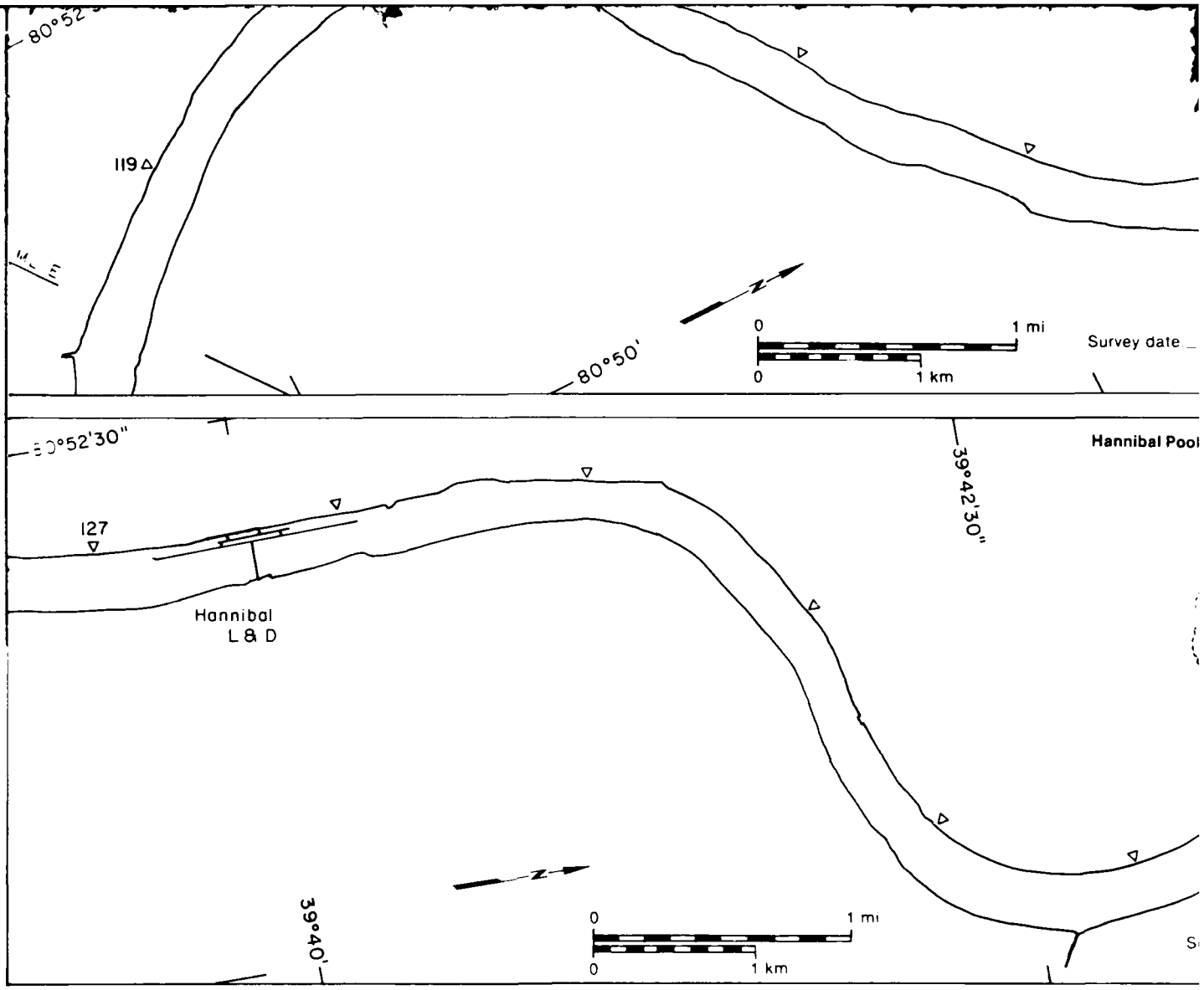

80°50'
Hannibal Pool :4/6
112
ML 0
39°50'
80° 47' 30"
0
1 mi
0
1 km
Survey date
39°45'
Hannibal Pool :5/6
39°47'30"
80°52'30"
119
80°50'
0
1 mi
0
1 km
Survey d
80°52'30"
39°42'30"
Hanniba
127
Hannibal

19 December 1985



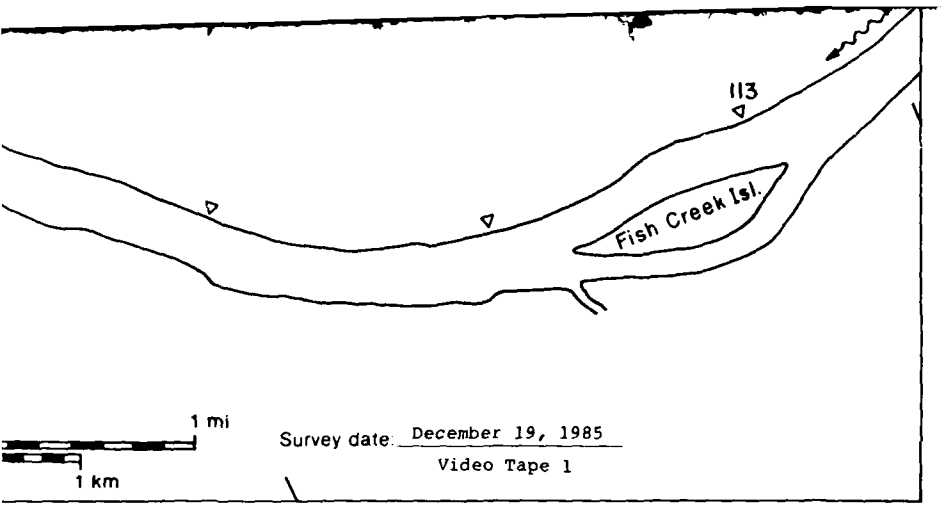


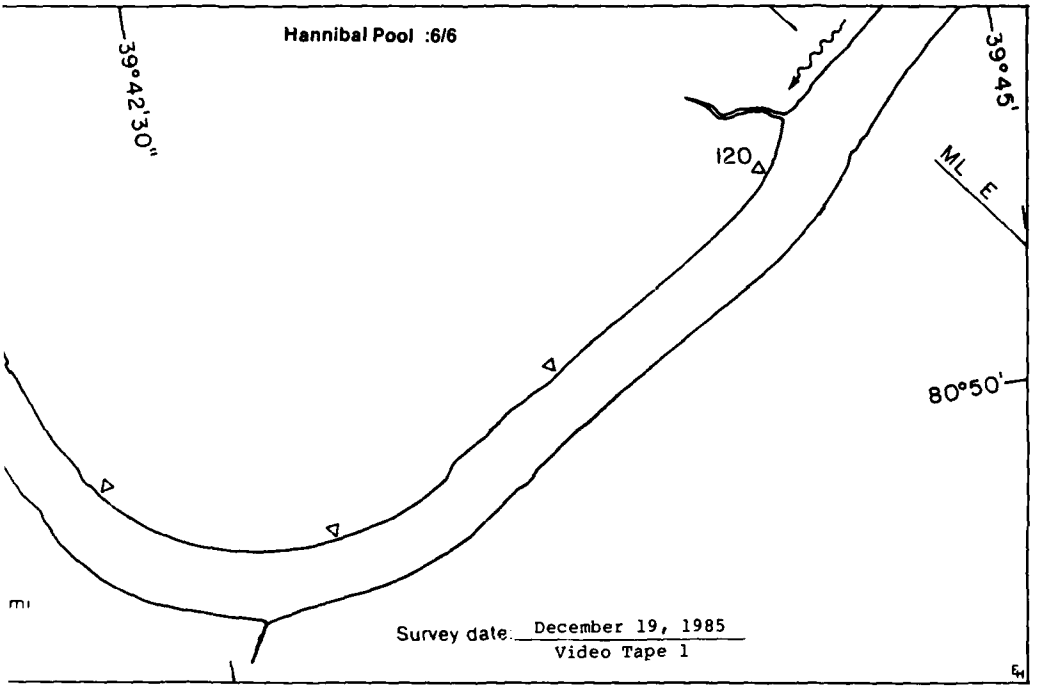




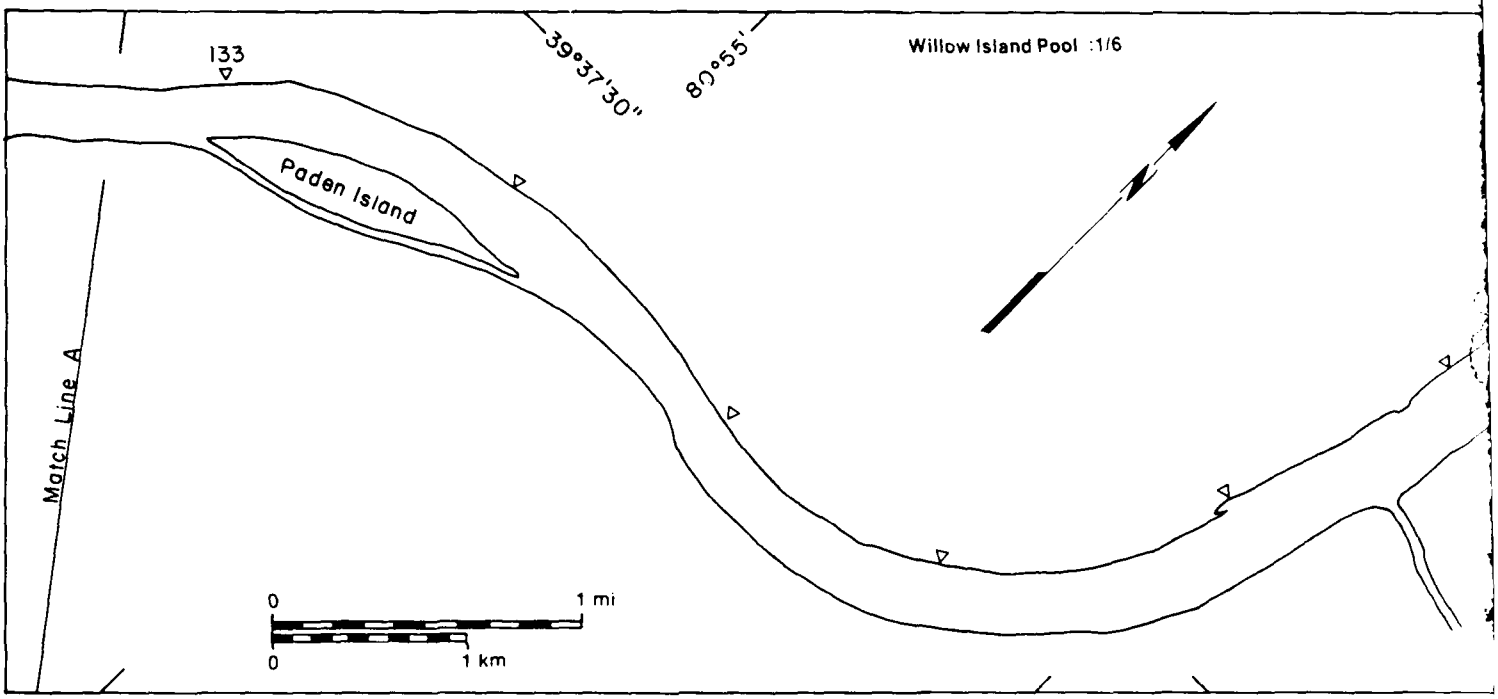
Hannibal Pool

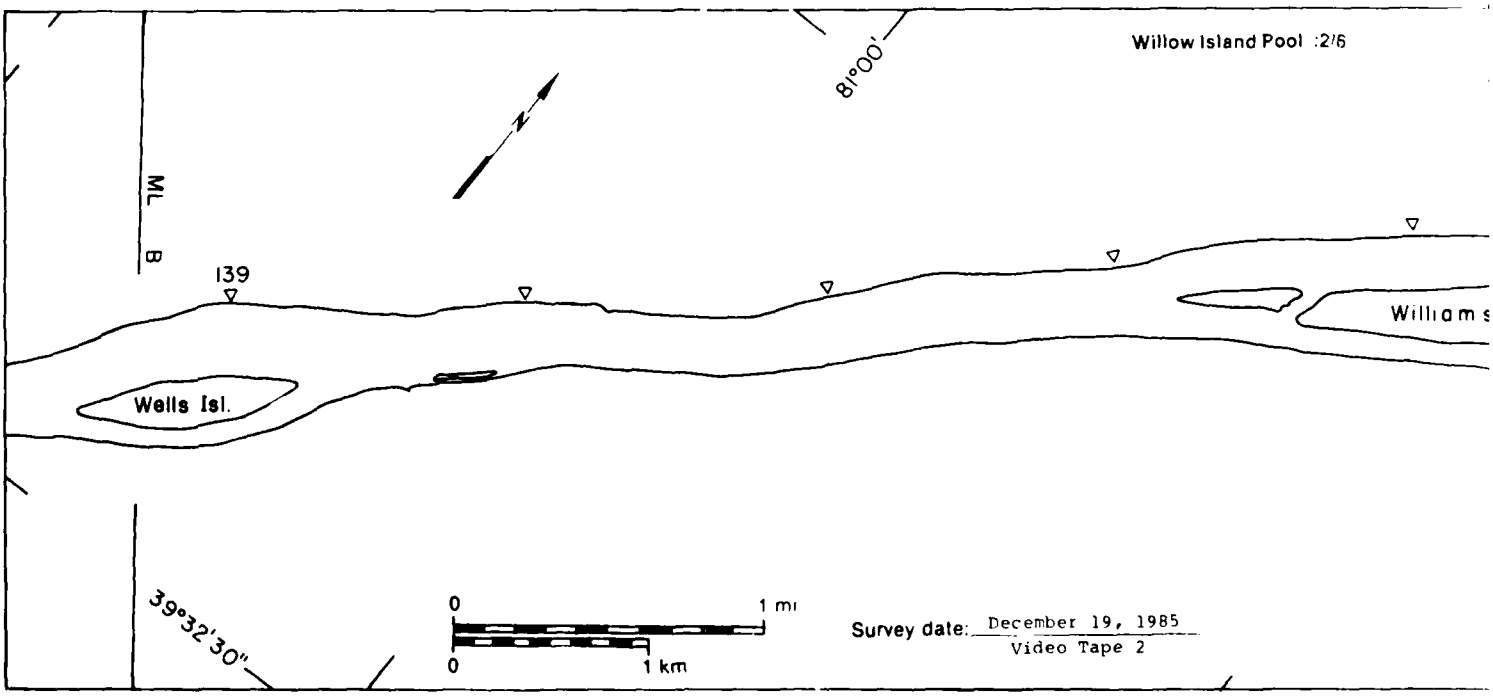
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	22.46	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	22.46	

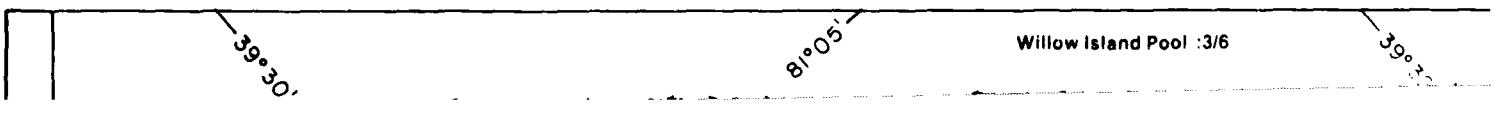

113
Fish Creek Isl.
1 mi
1 km
Survey date: December 19, 1985
Video Tape 1

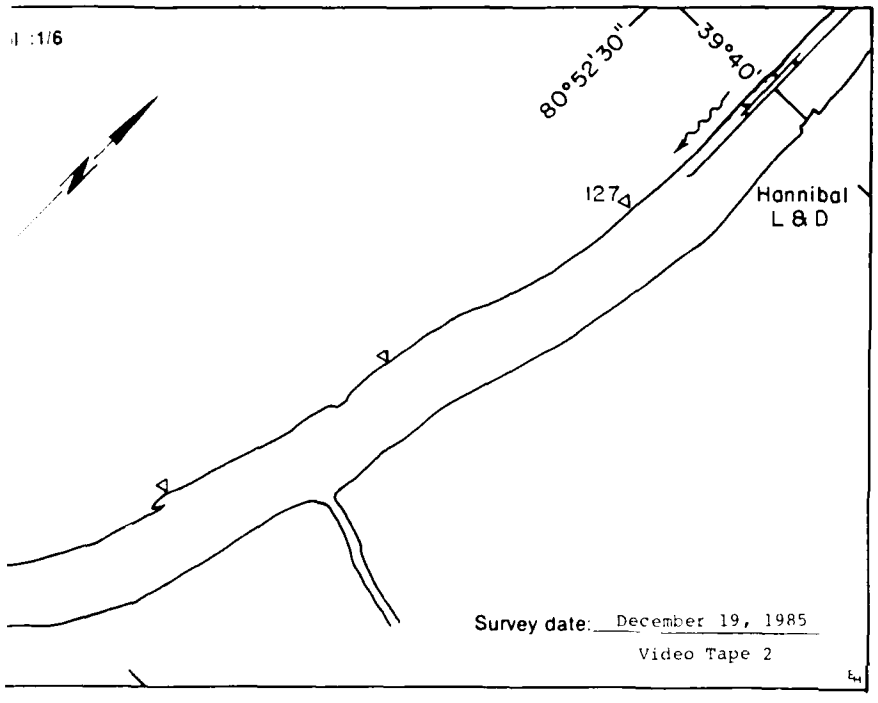

Hannibal Pool :6/6
39°42'30"
39°45'
120
ML E
80°50'
mi
Survey date: December 19, 1985
Video Tape 1

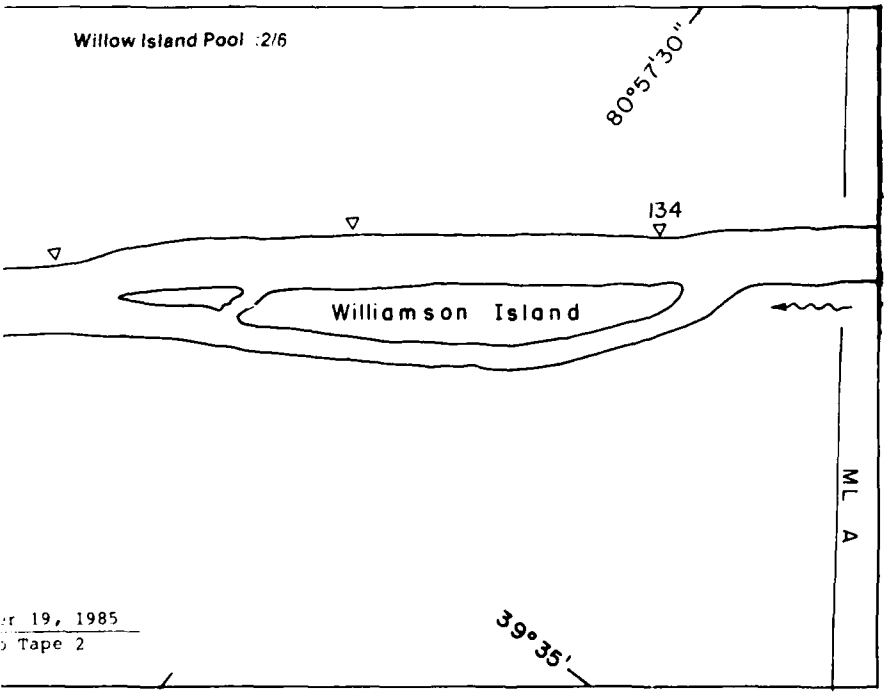
19 December 1985

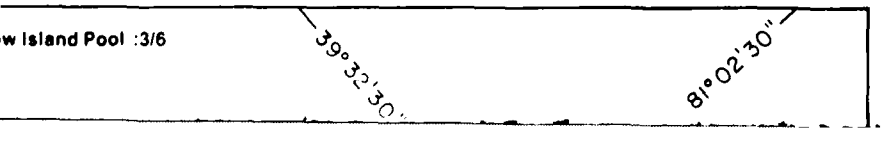


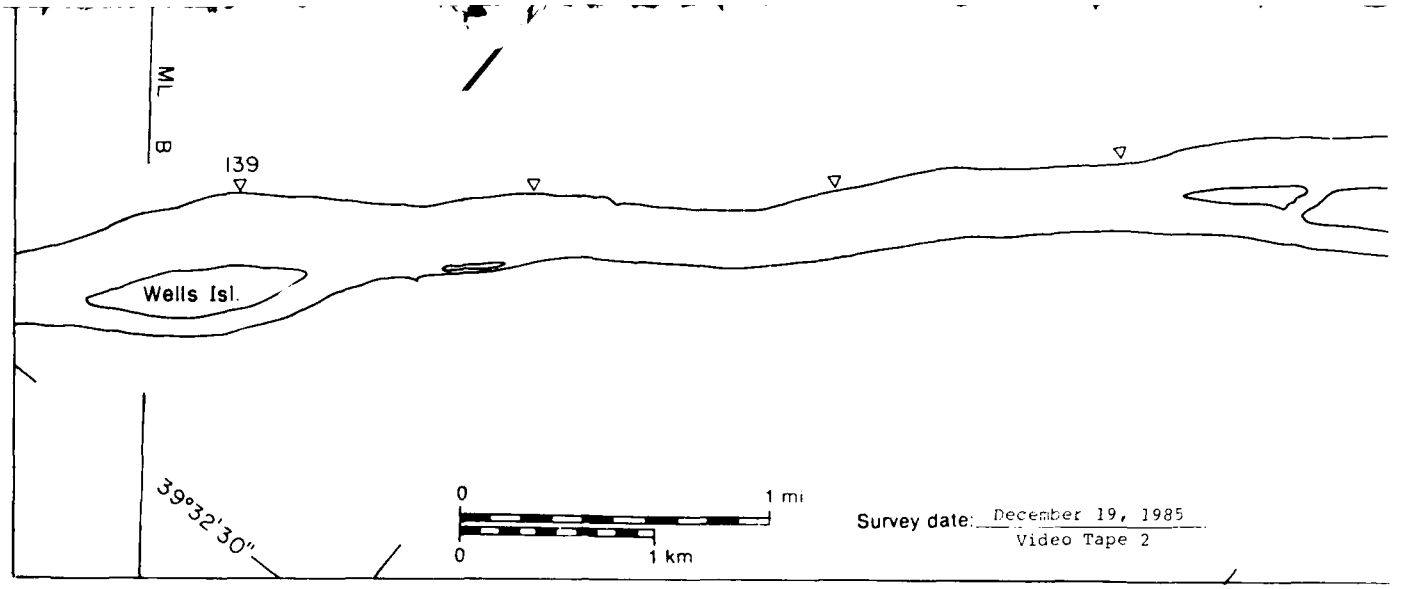


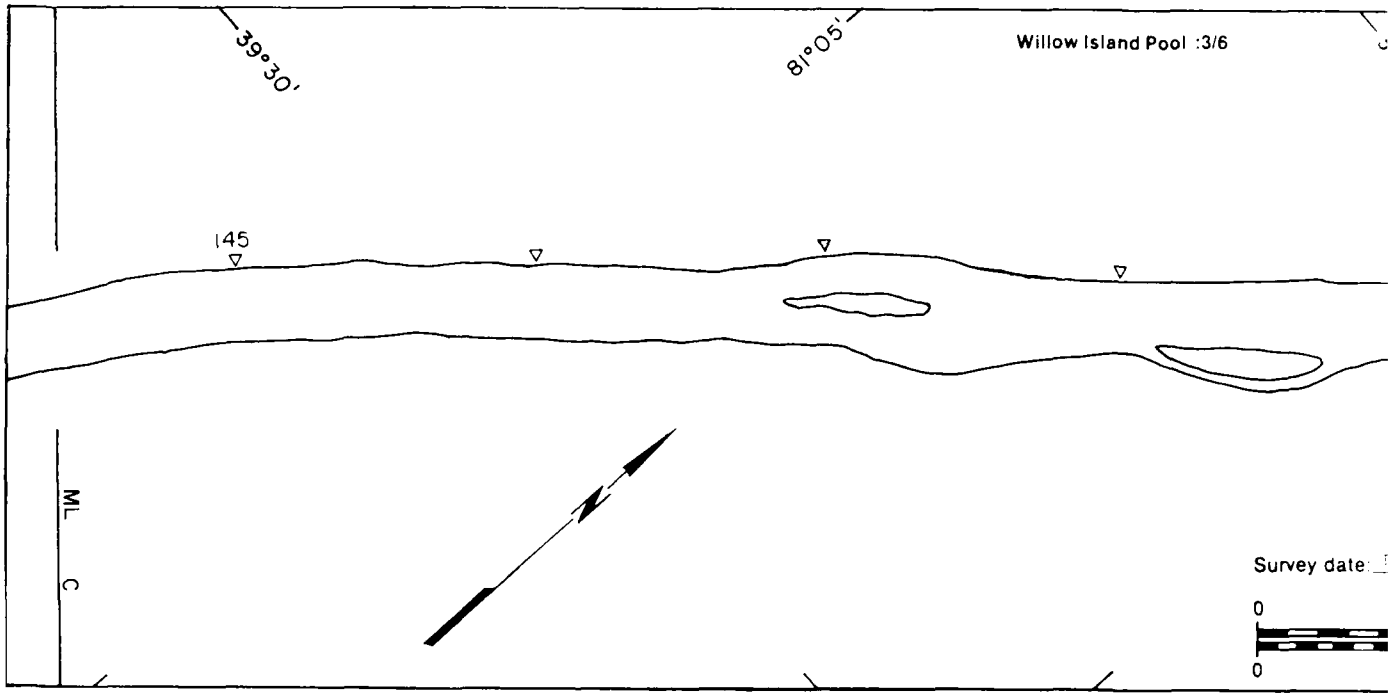


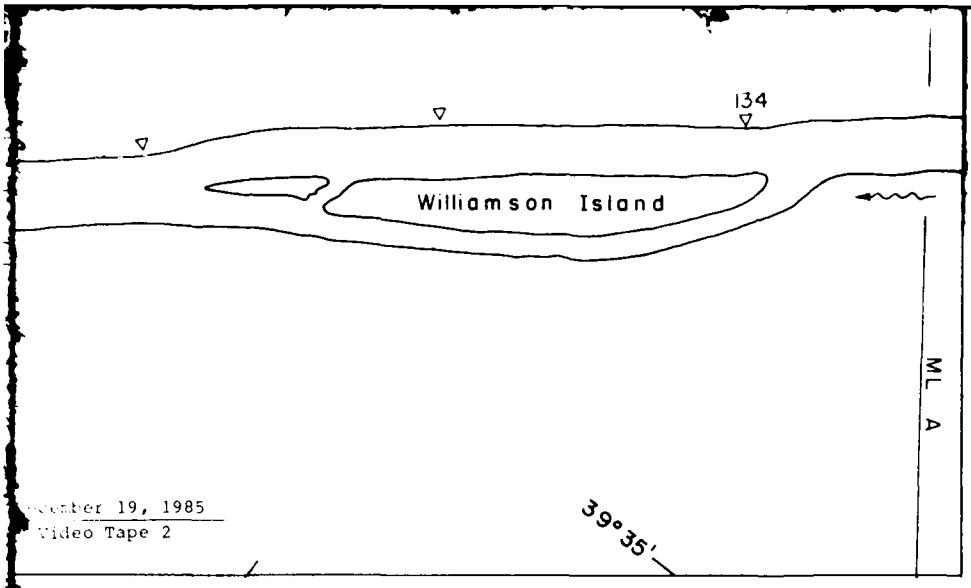

:1/6
80°52'30"
39°40'
127
Hannibal
L & D
Survey date: December 19, 1985
Video Tape 2

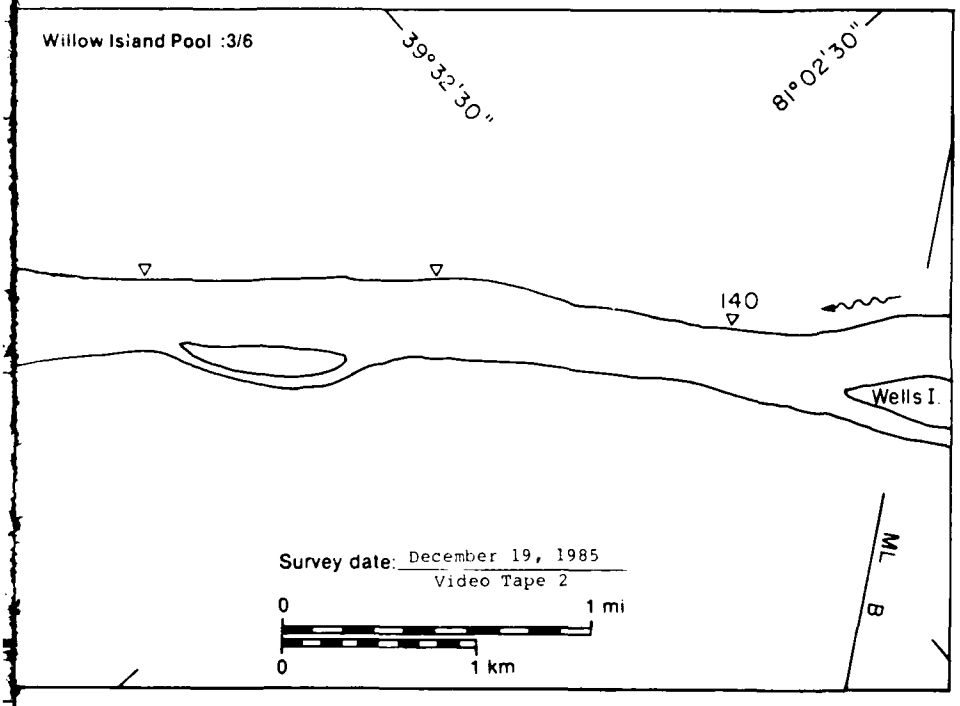

Willow Island Pool :2/6
80°57'30"
134
Williamson Island
ML A
39°35'
r 19, 1985
Tape 2

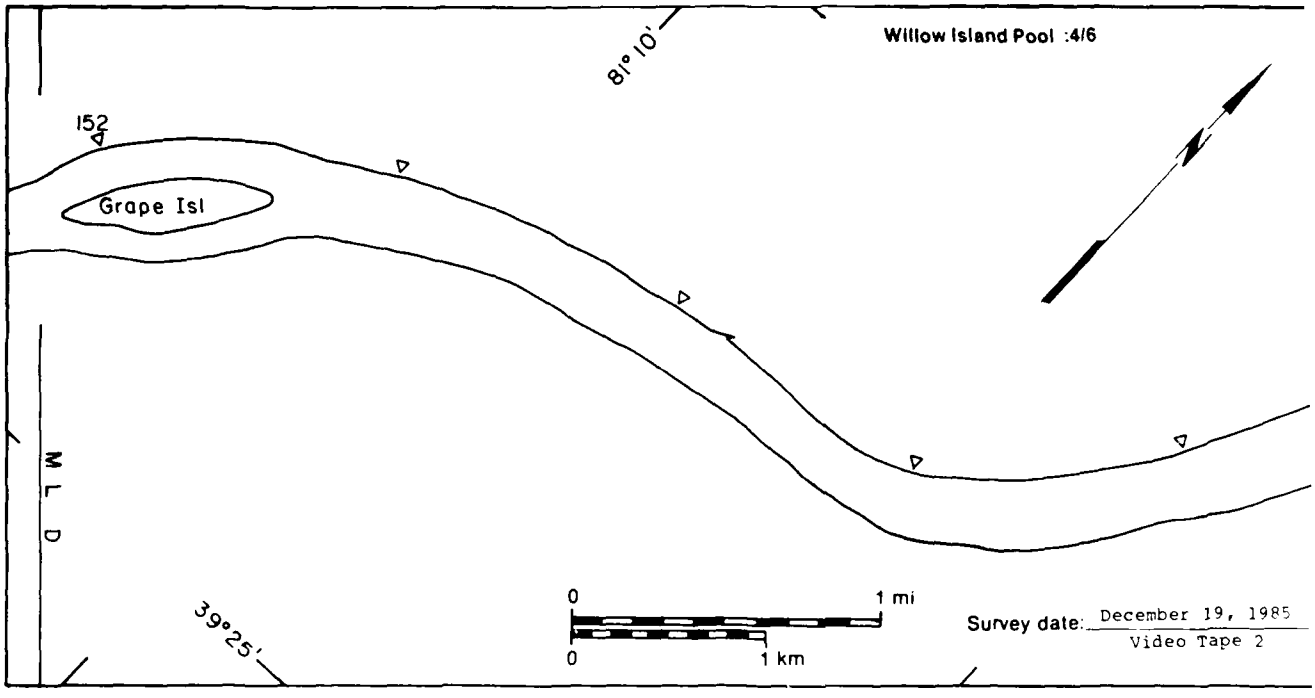

w Island Pool :3/6
39°32'30"
81°02'30"

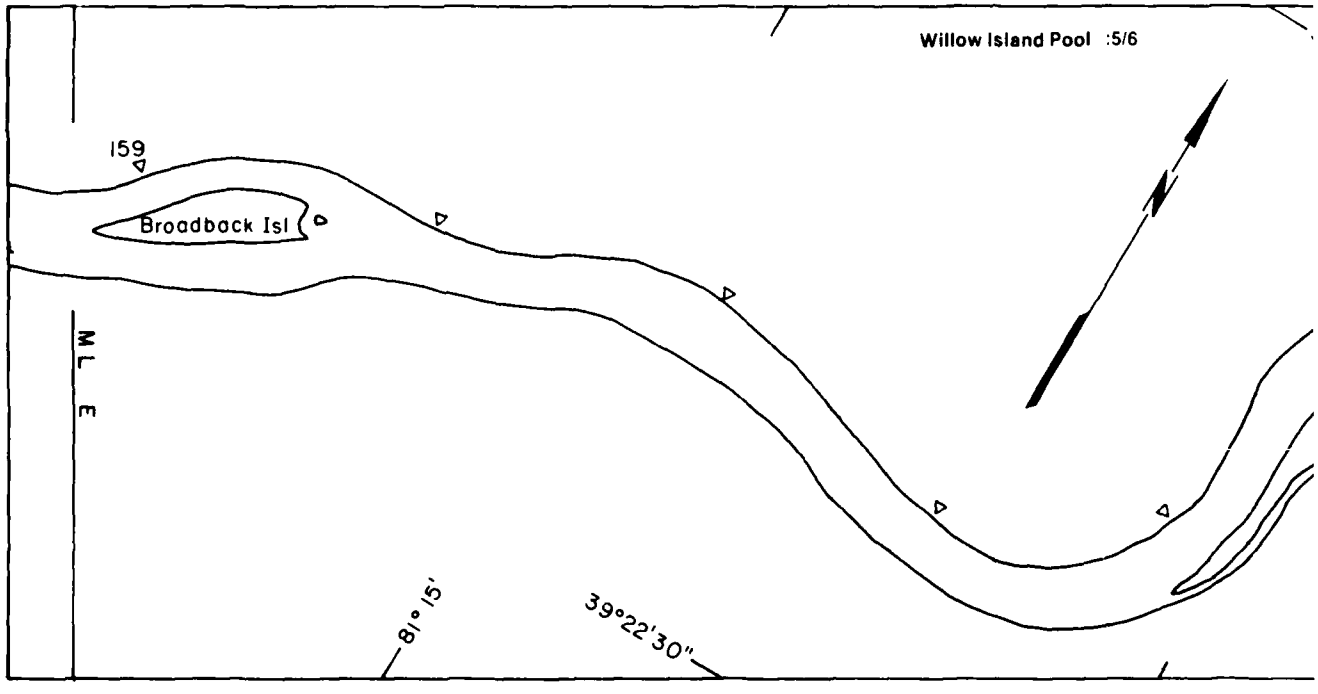

ML B
139
Wells Isl.
39°32'30"
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 2

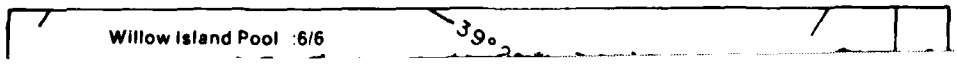

39°30'
81°05'
Willow Island Pool :3/6
145
ML C
Survey date:
0
0


134
Williamson Island
ML A
39°35'
December 19, 1985
Video Tape 2


Willow Island Pool :3/6
39°32'30"
81°02'30"
140
Wells I.
ML B
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km







Willow Island Poo

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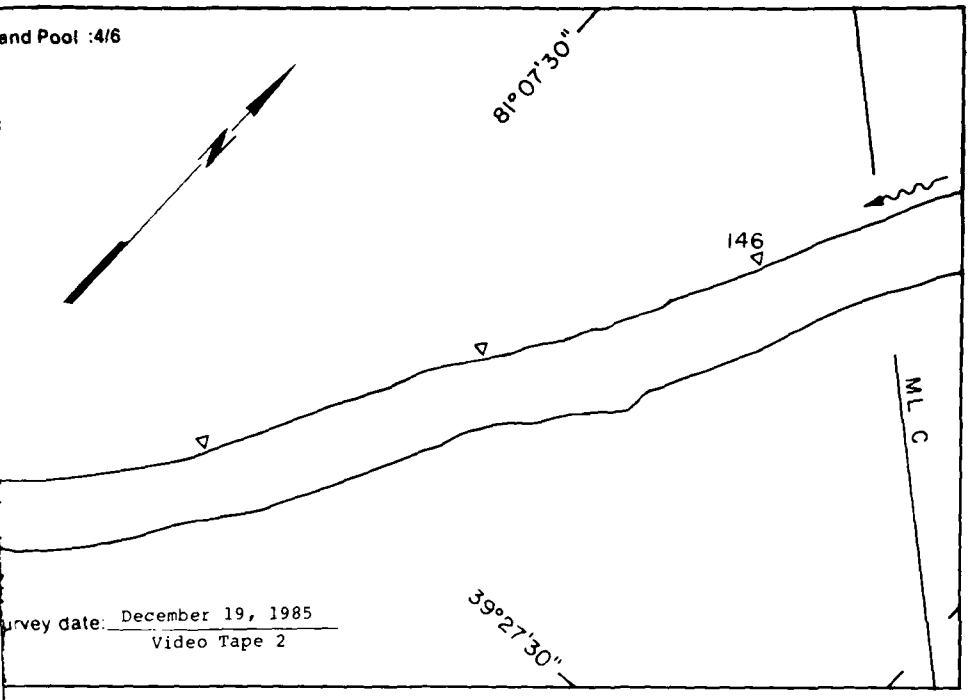
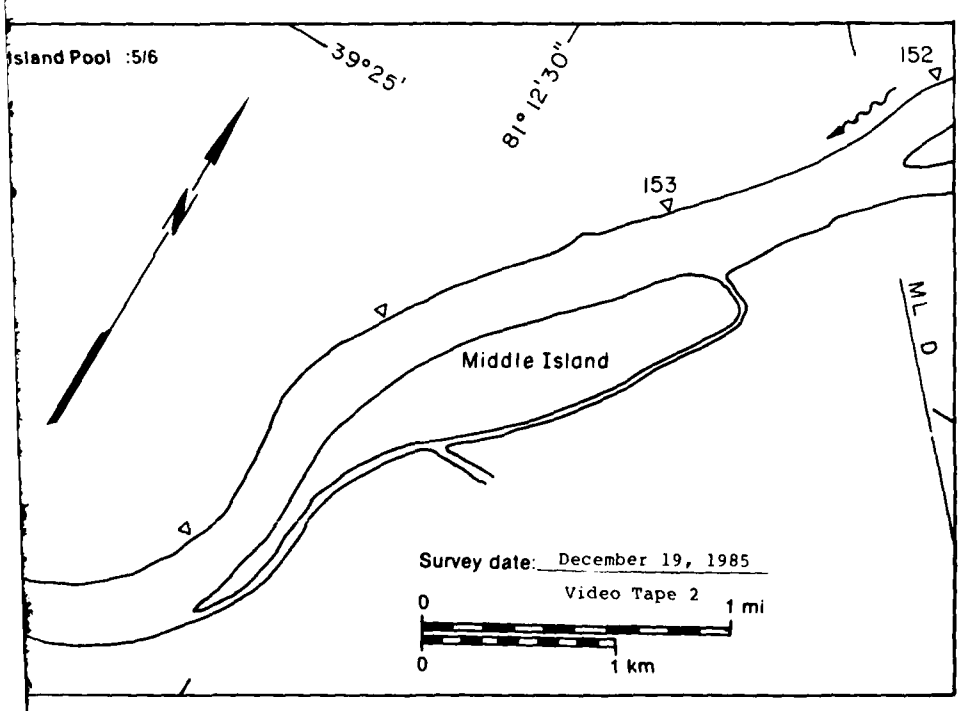
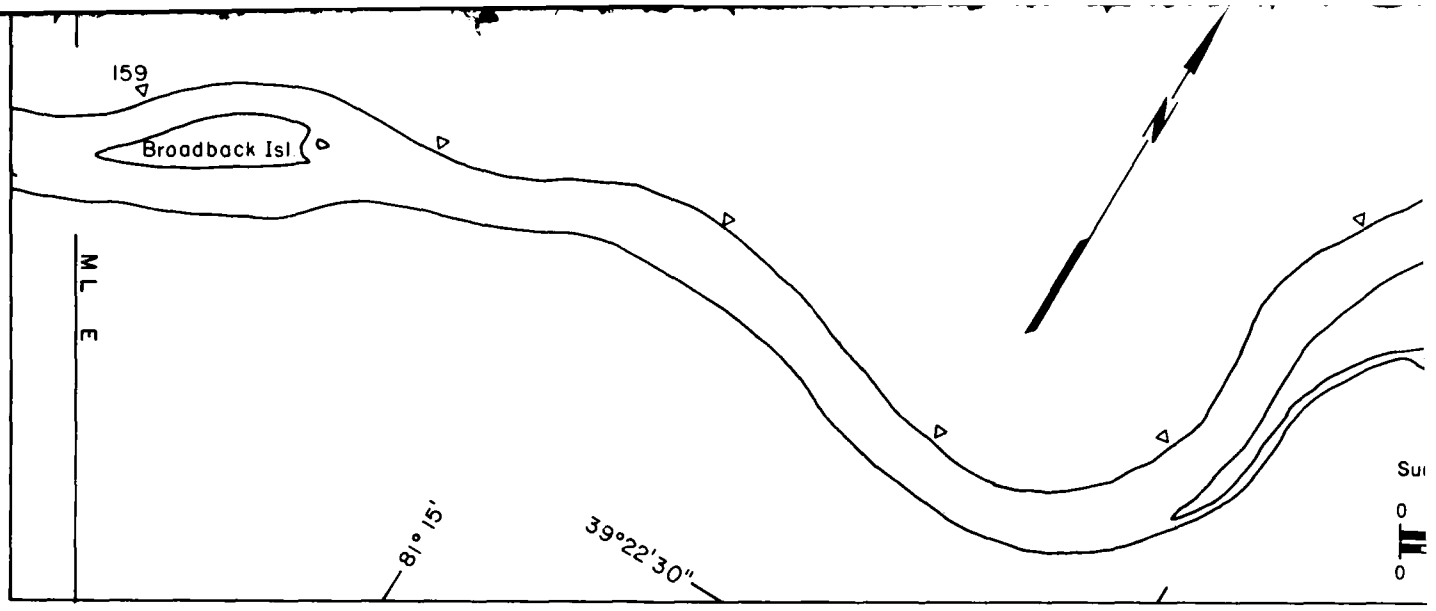
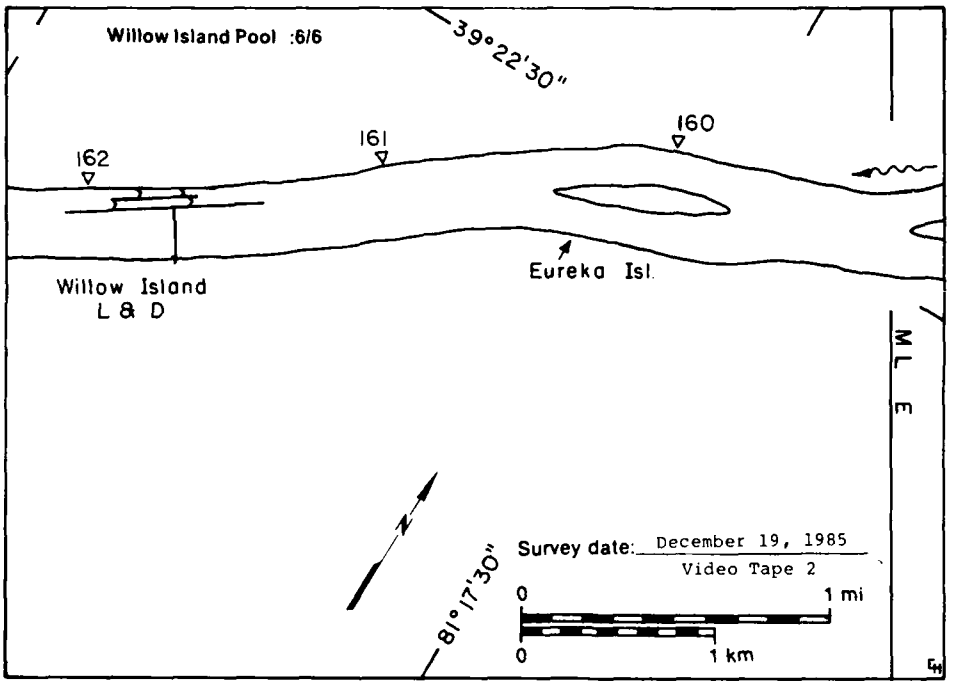




Willow Island Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)



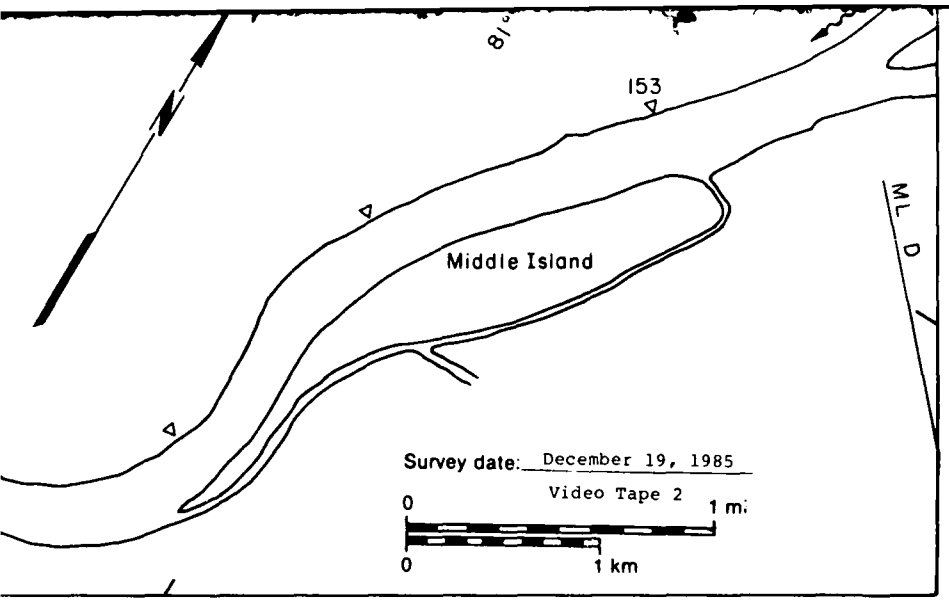


Willow Island Pool

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

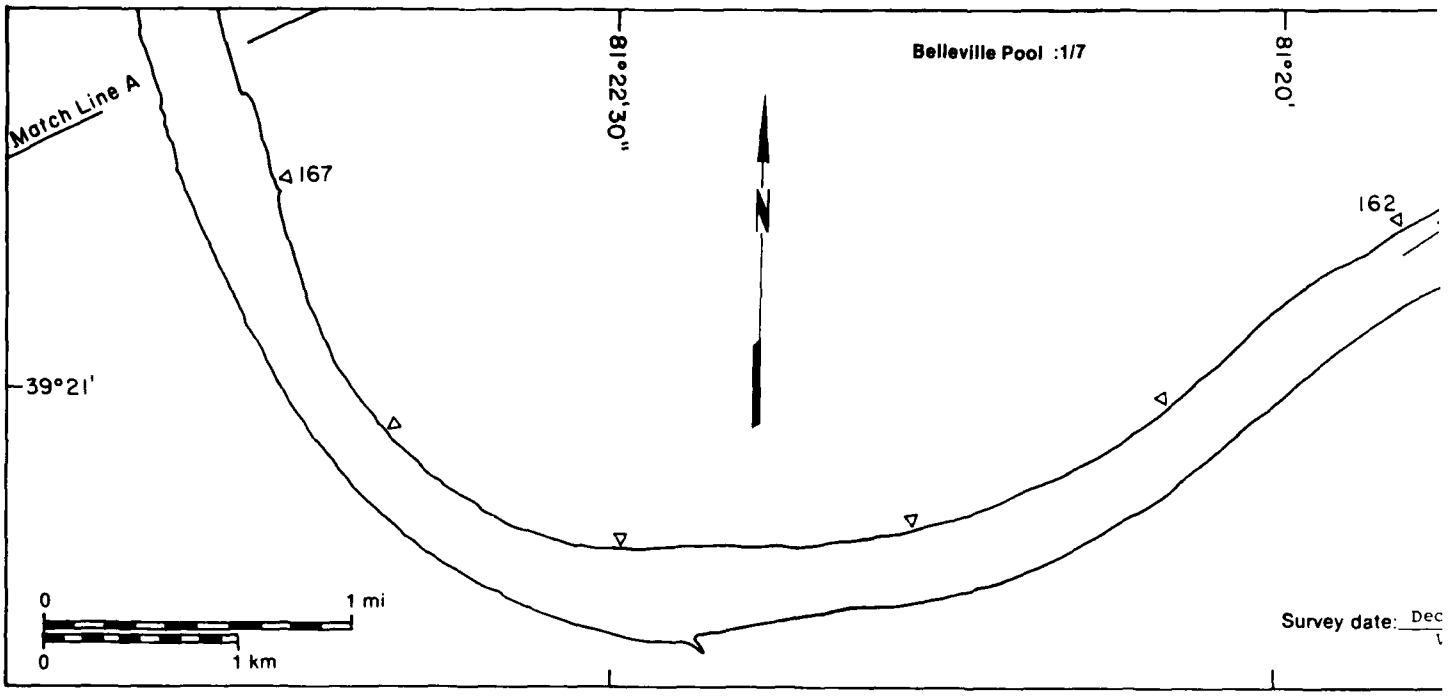
Total area ($m^2 \times 10^6$)

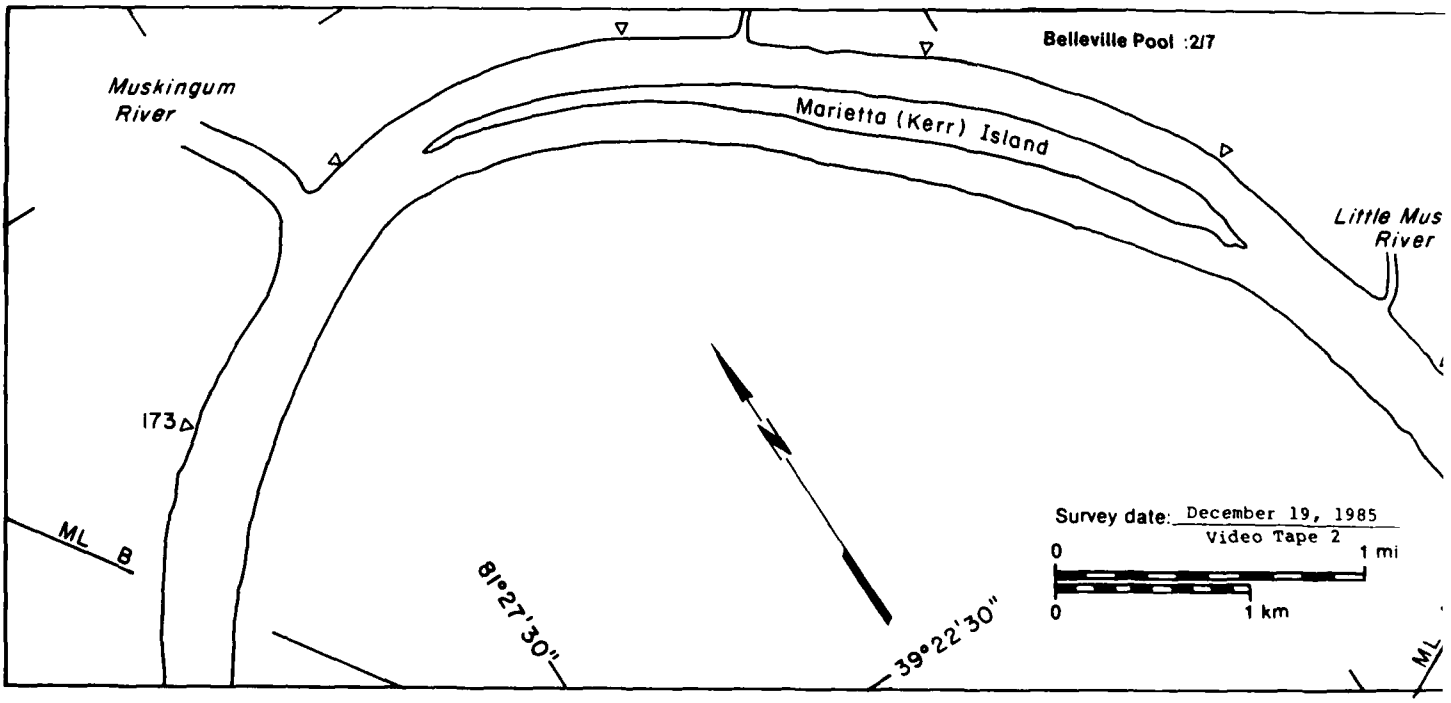


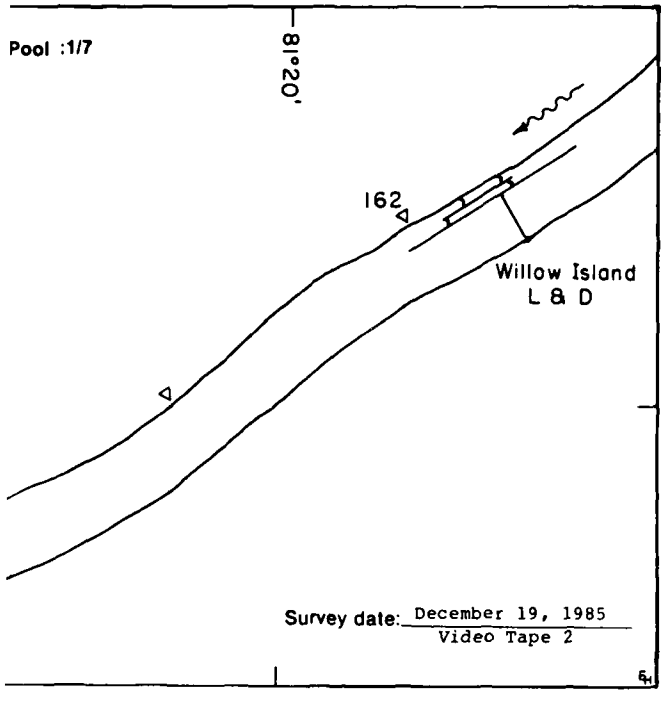
Willow Island Pool

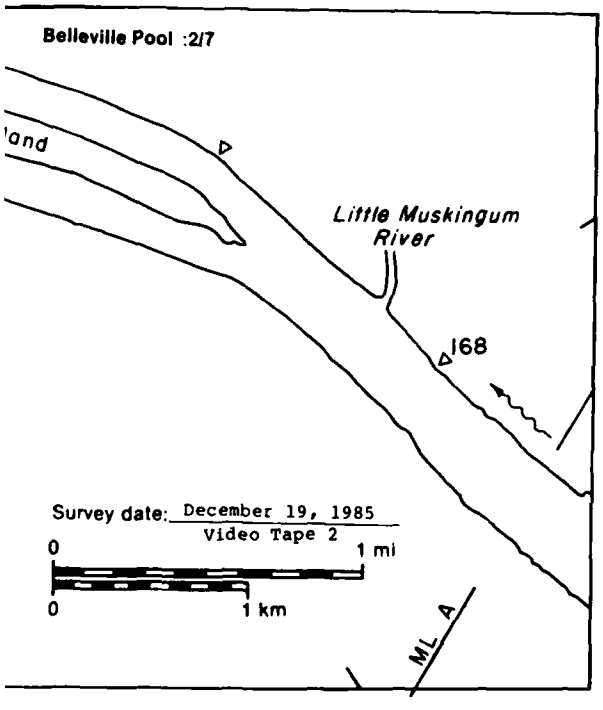
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	21.24	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	21.24	

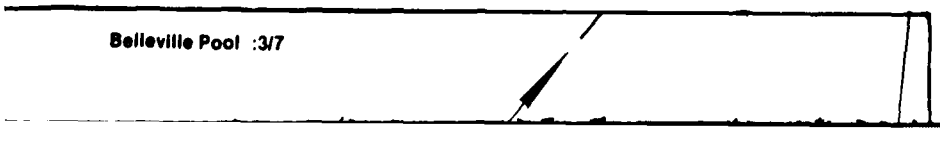
19 December 1985

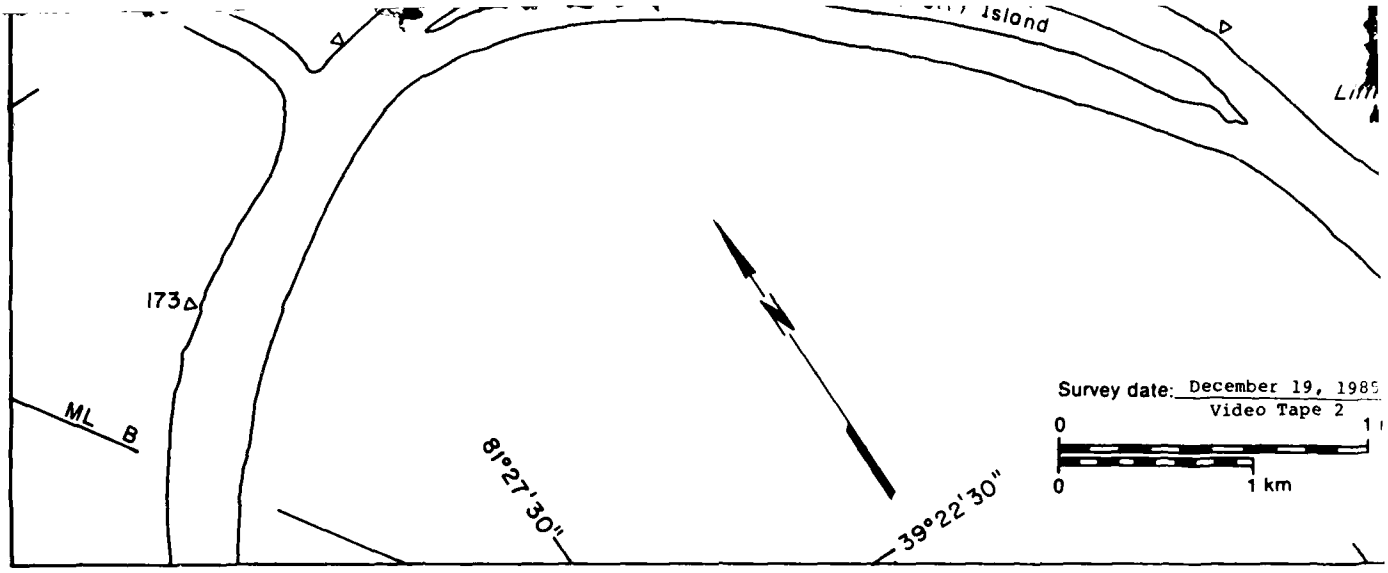


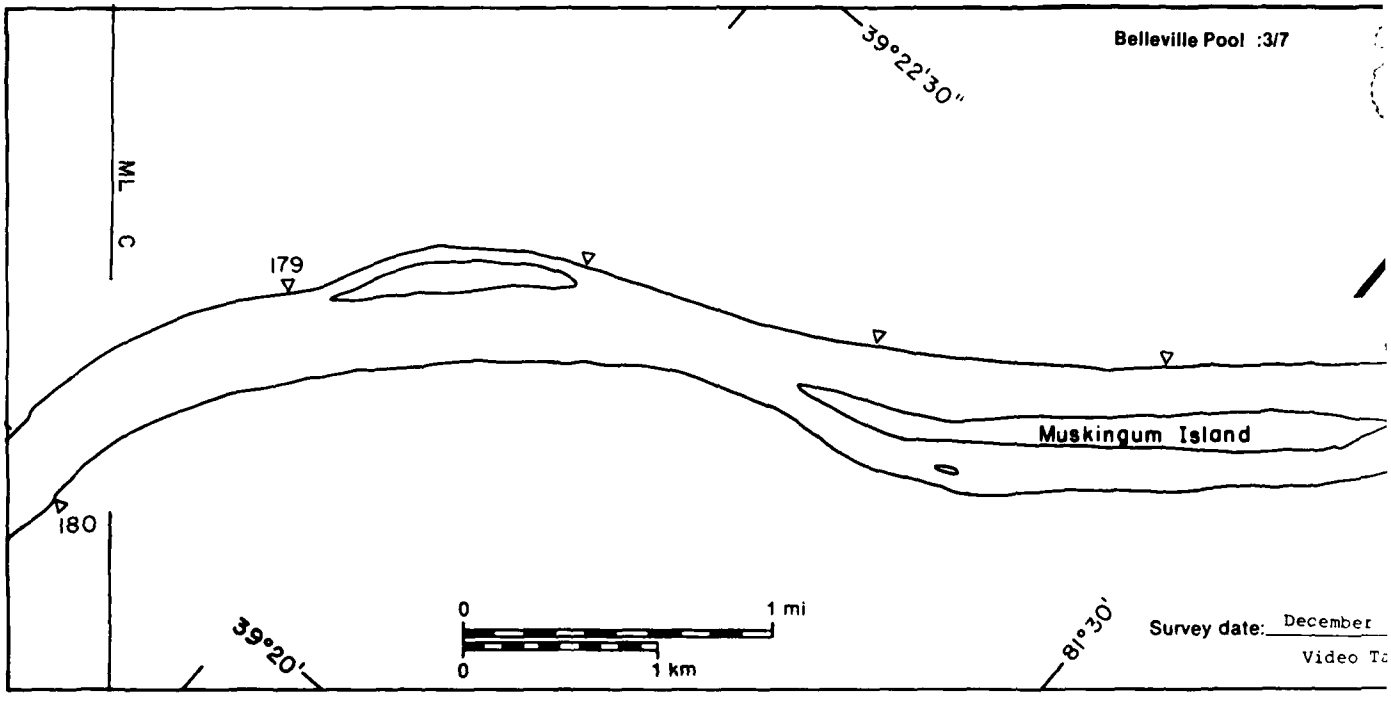


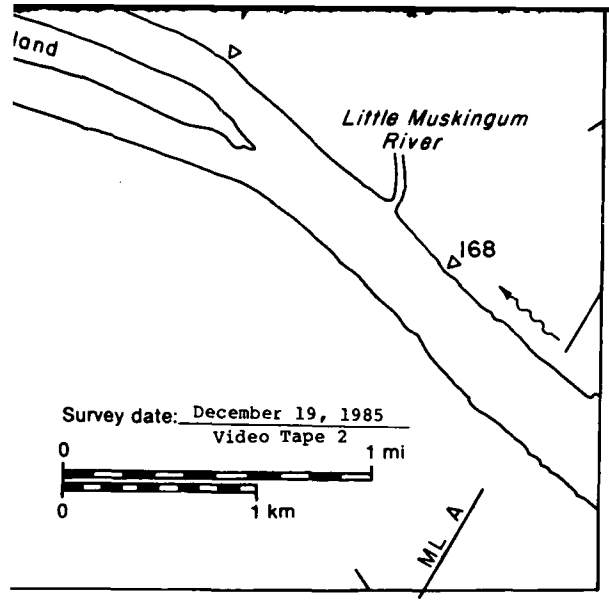

Pool :1/7
81°20'
162
Willow Island
L & D
Survey date: December 19, 1985
Video Tape 2

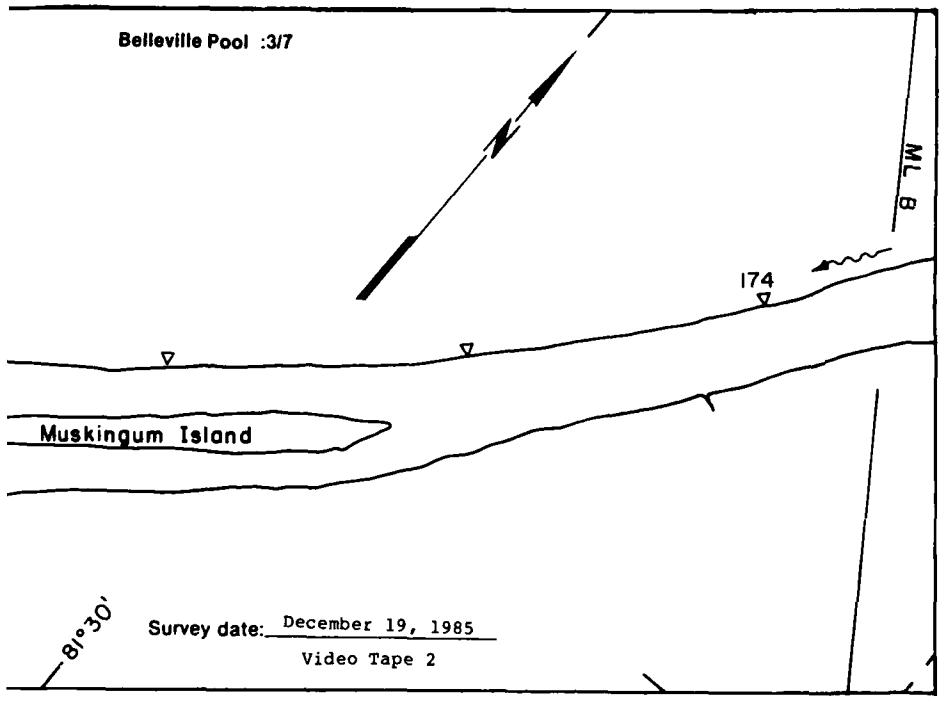

Belleville Pool :2/7
Little Muskingum
River
168
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km
ML A

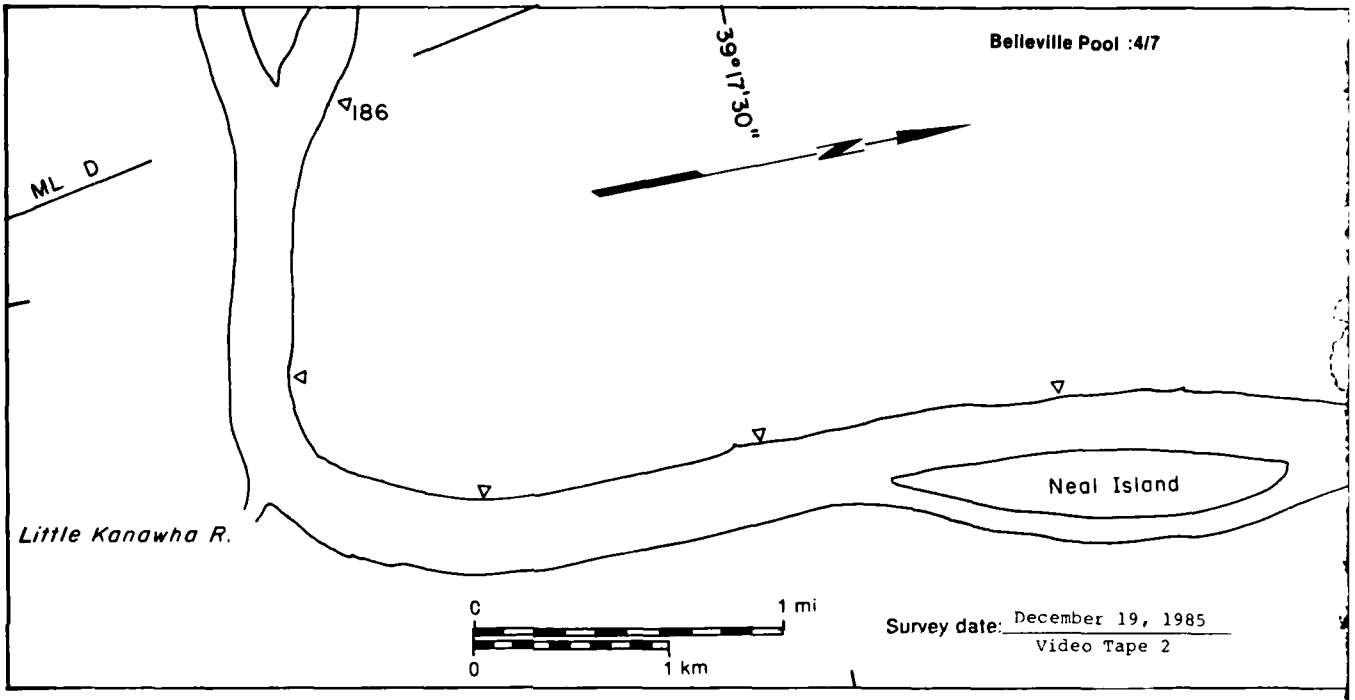

Belleville Pool :3/7

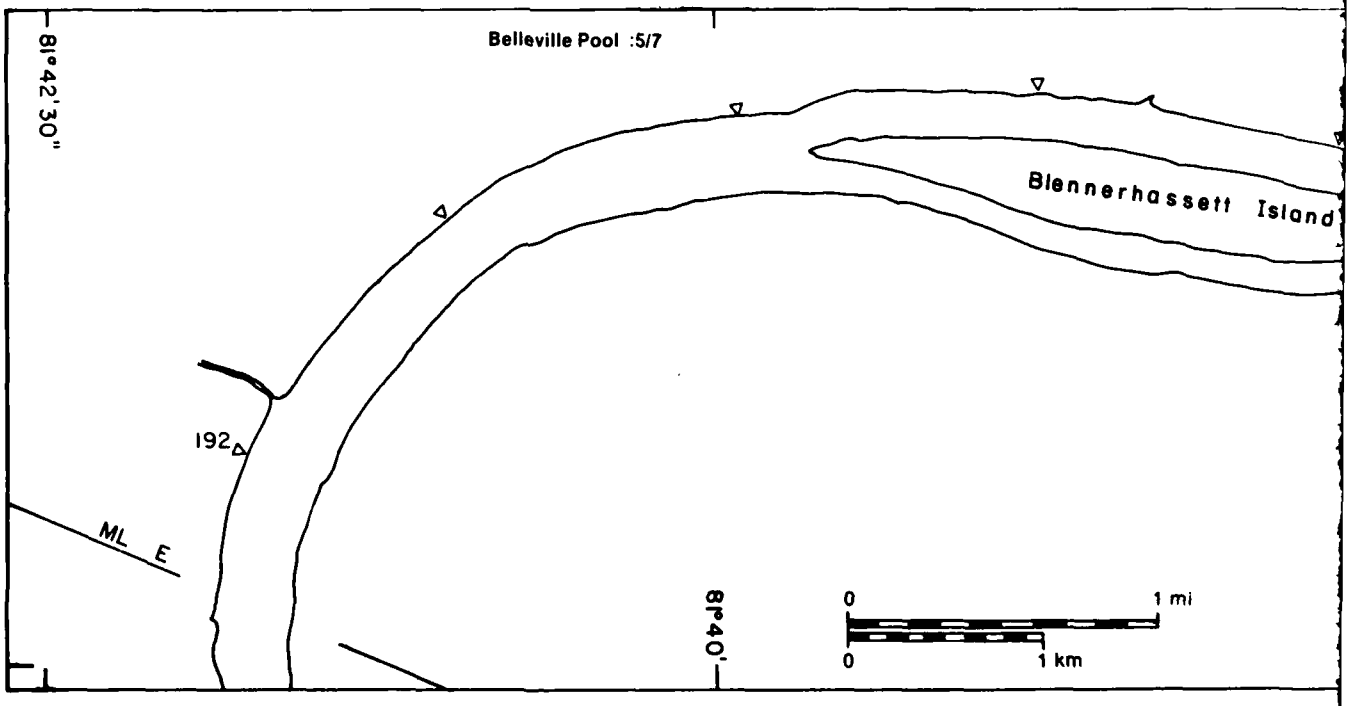

Island
173
ML B
81°27'30"
39°22'30"
Survey date: December 19, 1985
Video Tape 2
0
1 km

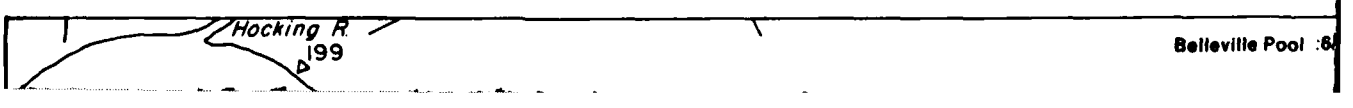

Belleville Pool :3/7
39°22'30"
ML C
179
Muskingum Island
180
0
1 mi
0
1 km
39°20'
81°30'
Survey date: December
Video Ta

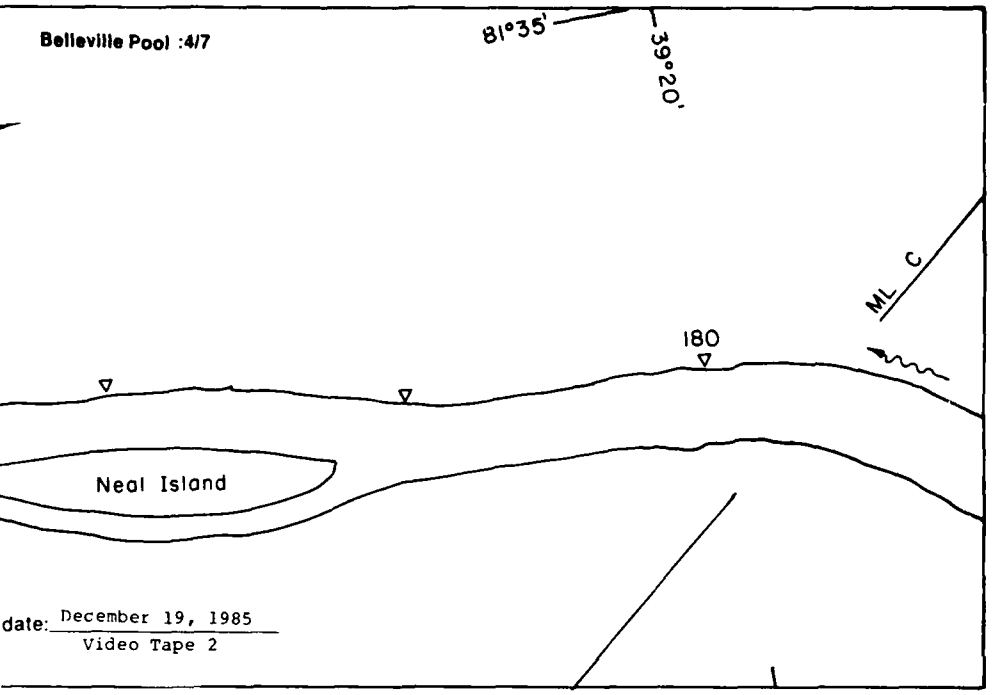

land
Little Muskingum River
168
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km
ML A

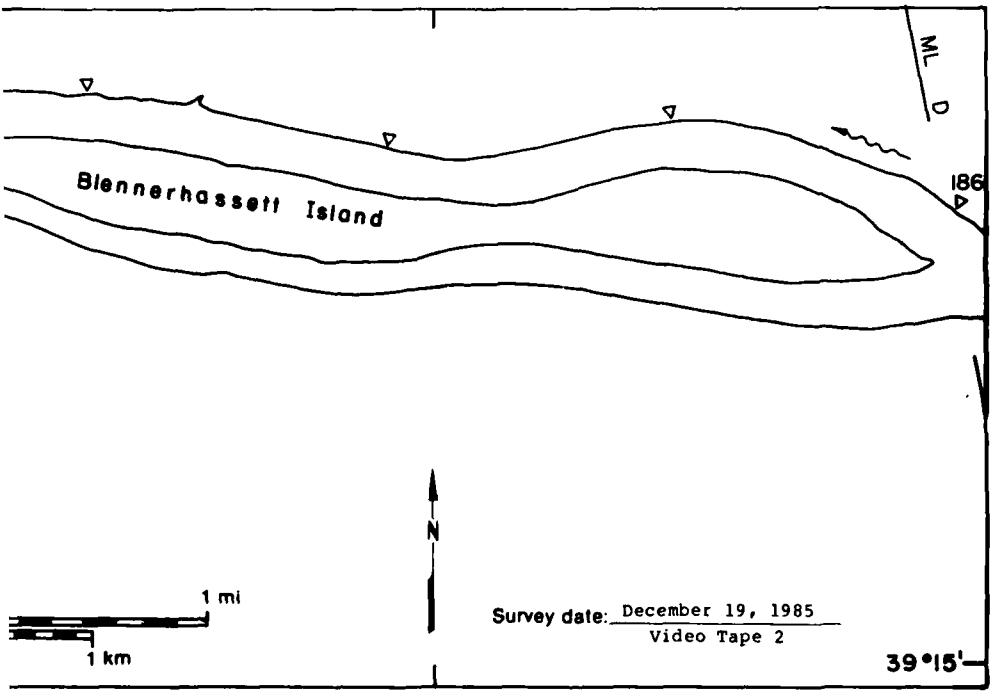

Belleville Pool :3/7
ML B
174
Muskingum Island
81°30'
Survey date: December 19, 1985
Video Tape 2

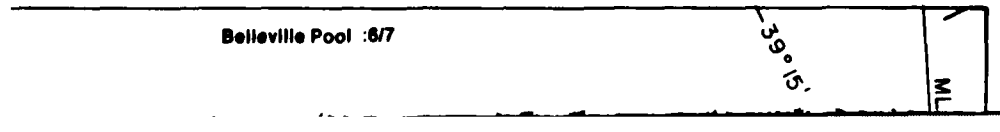

Belleville Pool :4/7
39°17'30"
186
ML D
Neal Island
Little Kanawha R.
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 2

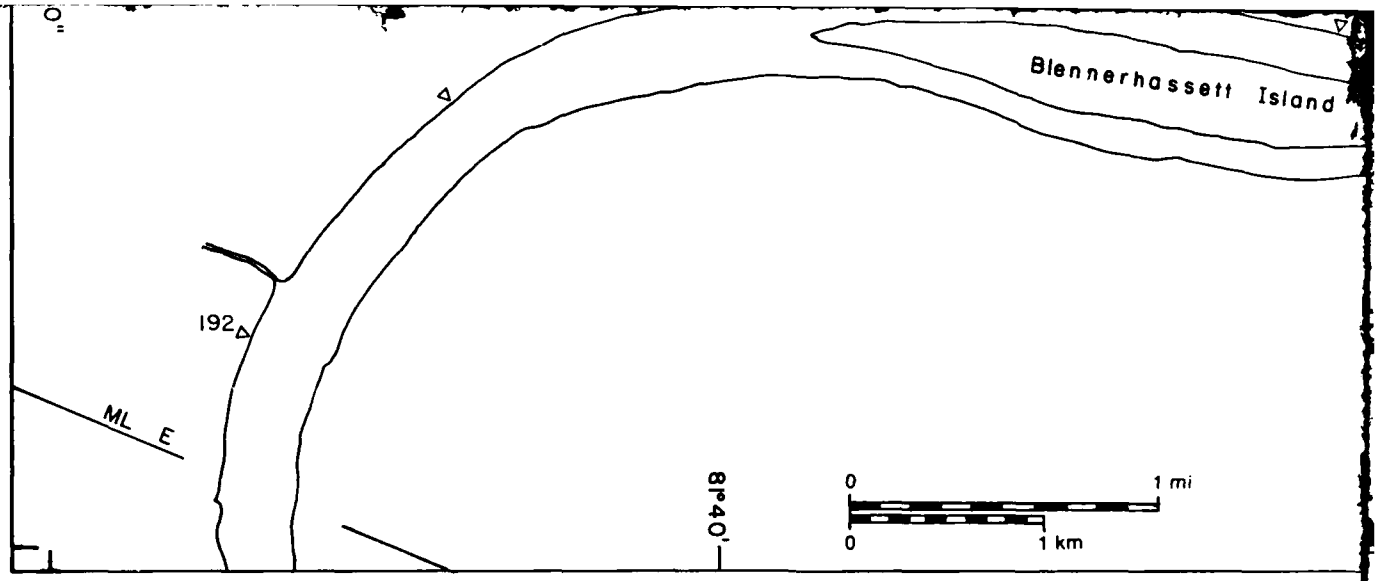

Belleville Pool :5/7
81°42'30"
Blennerhassett Island
192
ML E
81°40'
0
1 mi
0
1 km

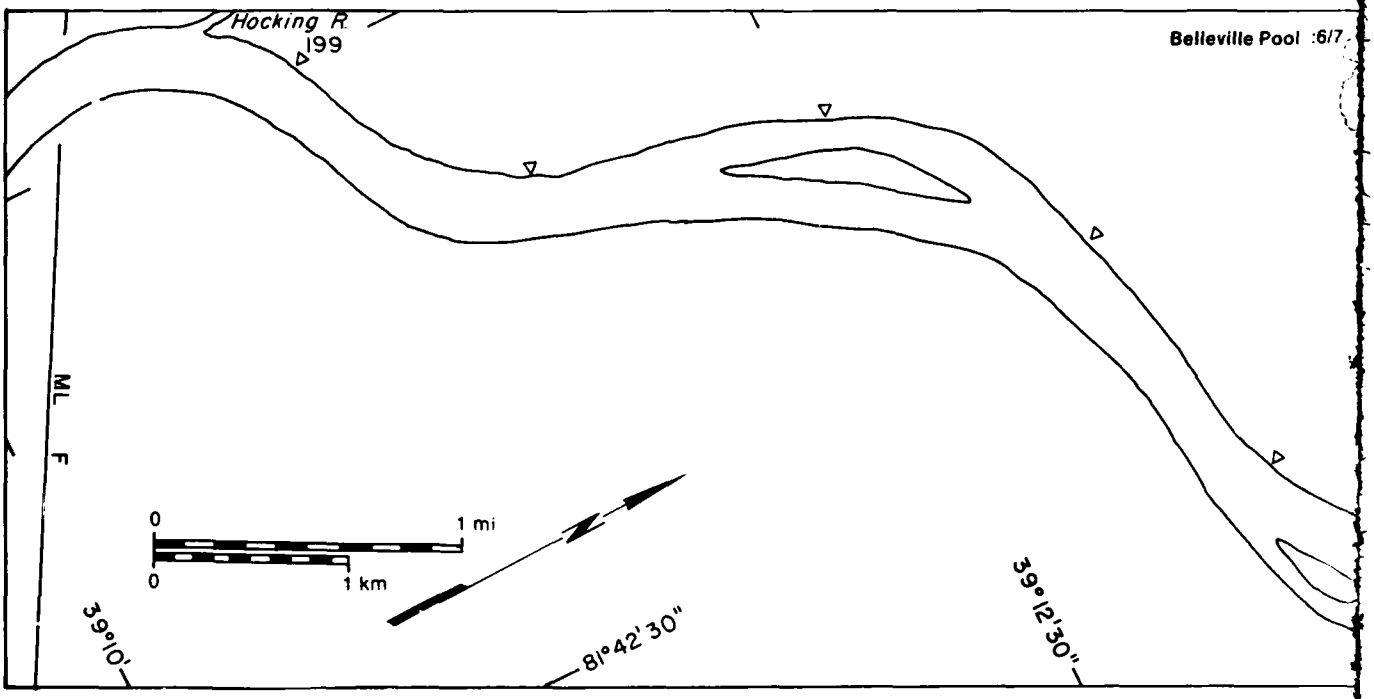

Hocking R.
199
Belleville Pool :6

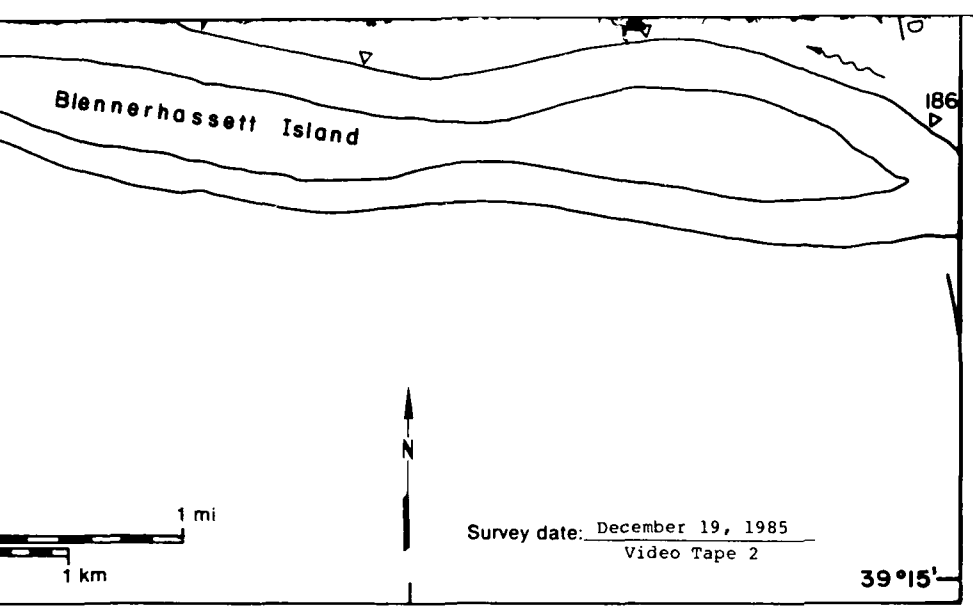

Belleville Pool :4/7
81°35'
39°20'
ML C
180
Neal Island
date: December 19, 1985
Video Tape 2

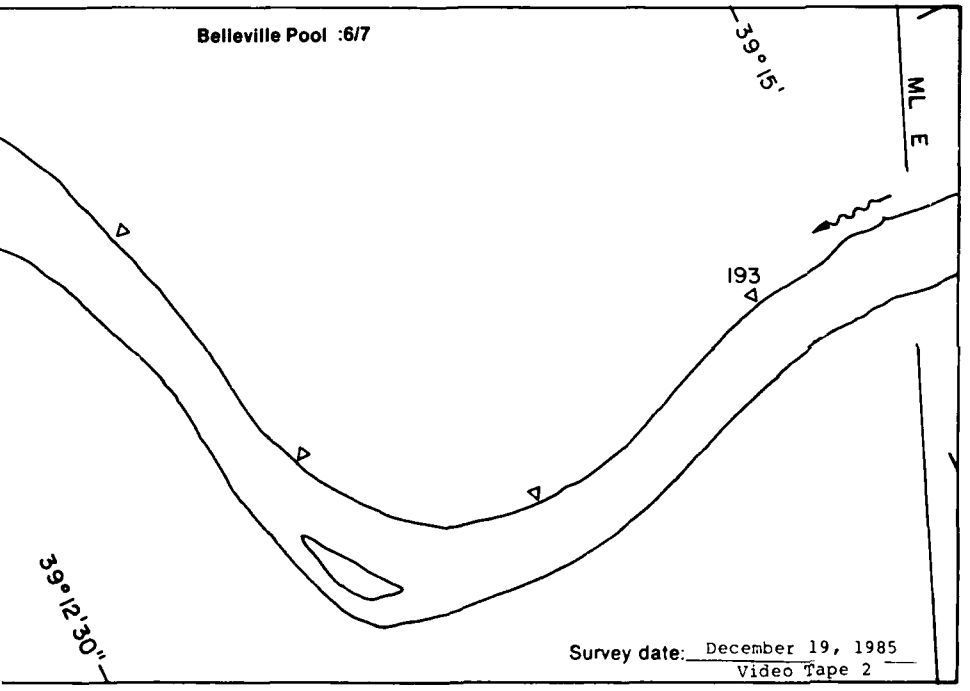

ML D
186
Blennerhassett Island
N
1 mi
1 km
Survey date: December 19, 1985
Video Tape 2
39°15'


Belleville Pool :6/7
39°15'
ML

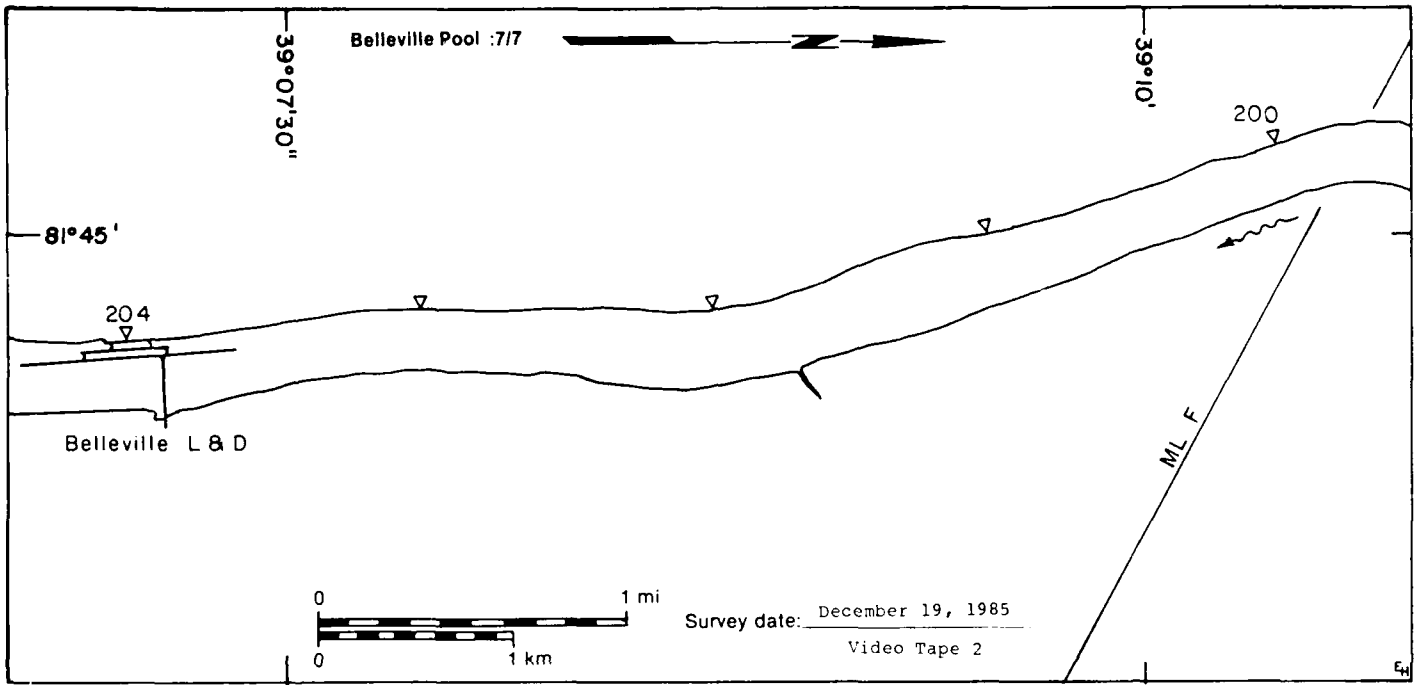

Blennerhassett Island
192
ML E
81°40'
0
1 mi
0
1 km


Hocking R.
199
Belleville Pool :6/7
ML F
0
1 mi
0
1 km
39°10'
81°42'30"
39°12'30"


Blennerhassett Island
186
N
1 mi
1 km
Survey date: December 19, 1985
Video Tape 2
39°15'

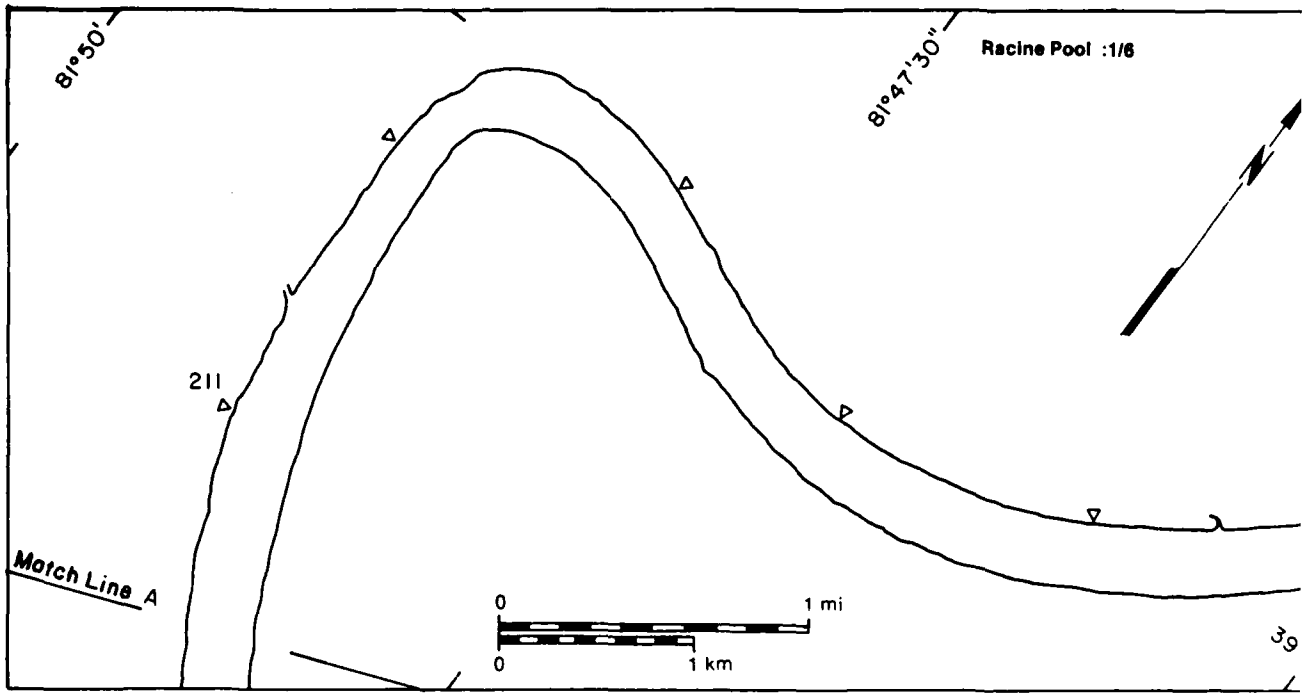

Belleville Pool :6/7
39° 15'
ML E
193
39°12'30"
Survey date: December 19, 1985
Video Tape 2

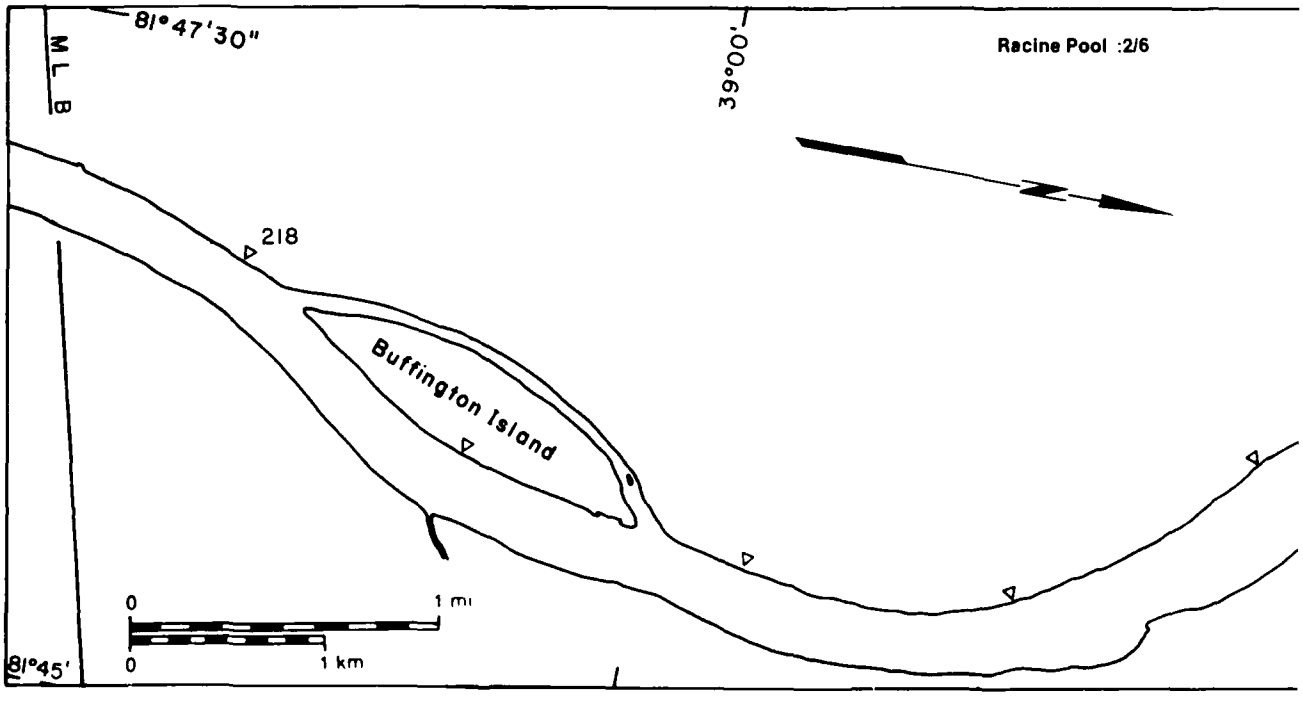
19 December 1985



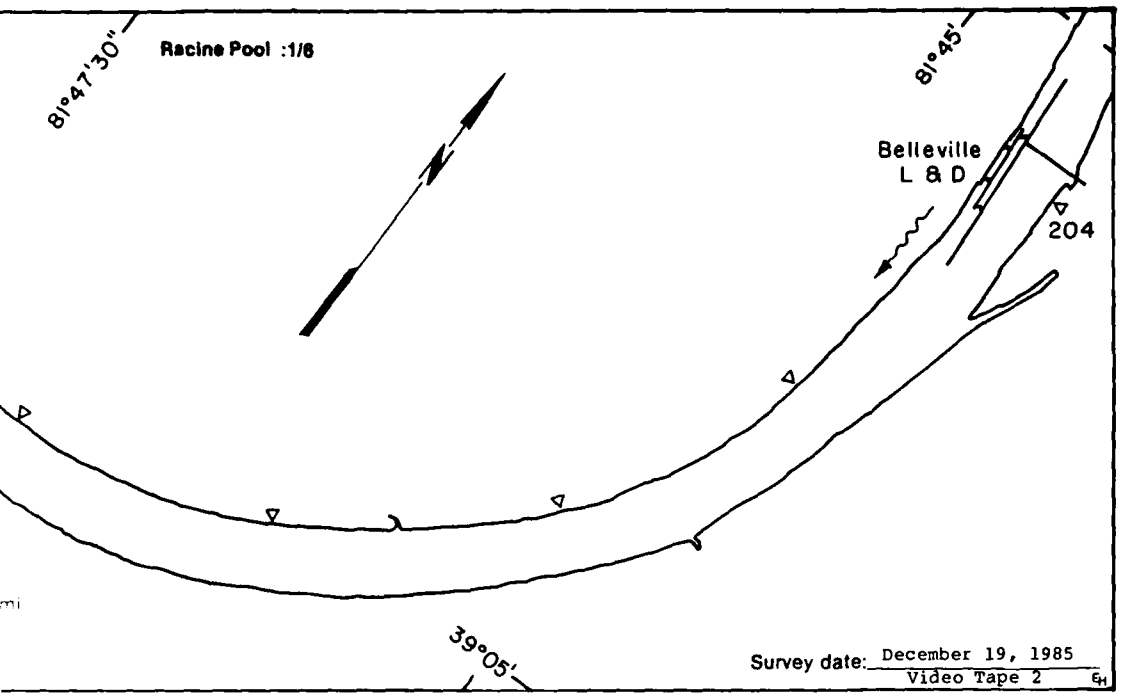
Belleville Pool

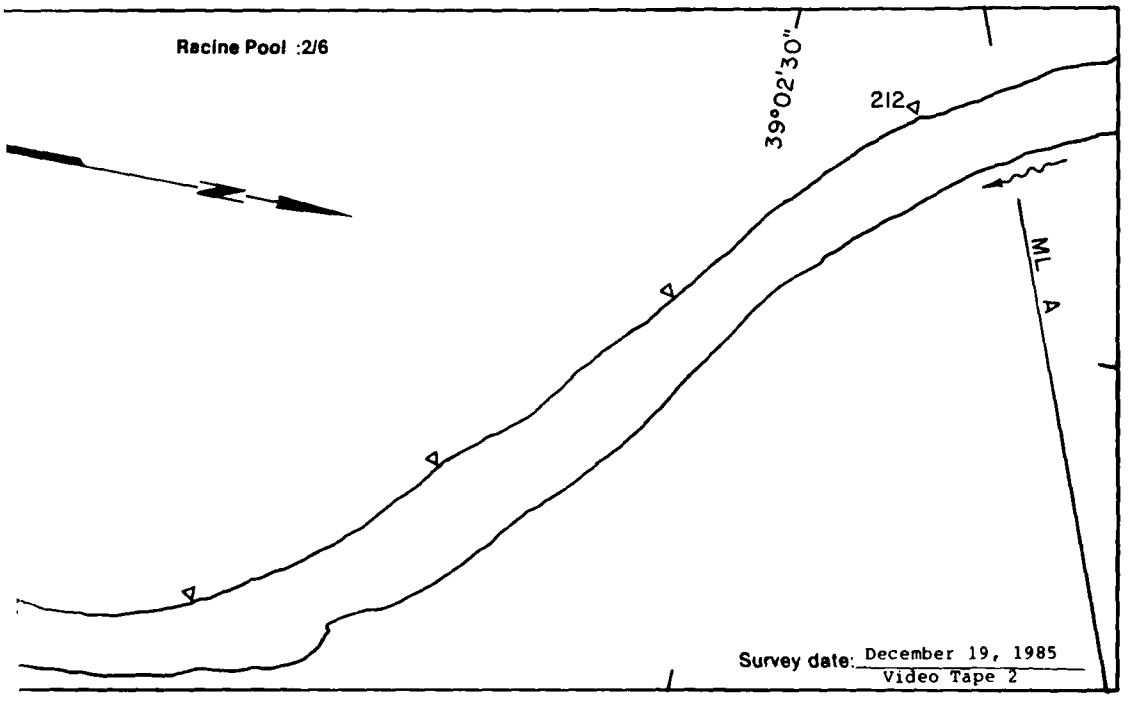
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (—)
Open water	27.28	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	27.28	

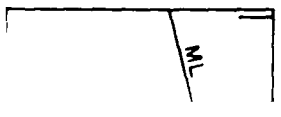

81°50'
81°47'30"
Racine Pool :1/6
211
Match Line A
0
1 mi
0
1 km
39

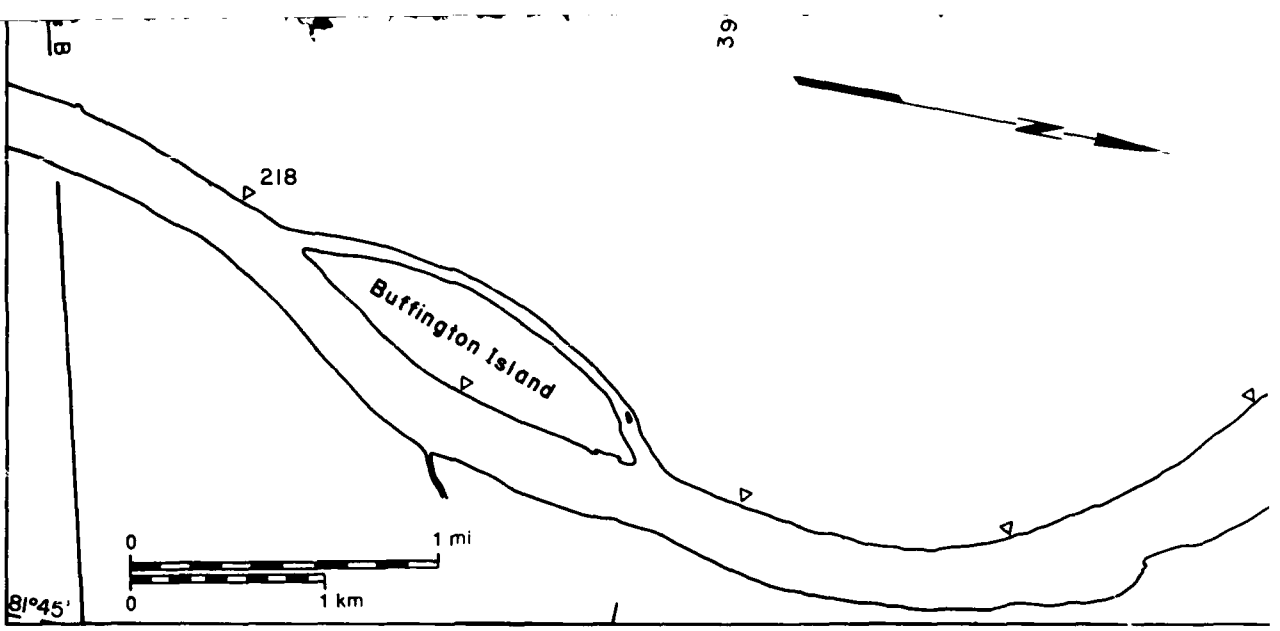

81°47'30"
39°00'
Racine Pool :2/6
218
Buffington Island
0
1 mi
0
1 km
81°45'

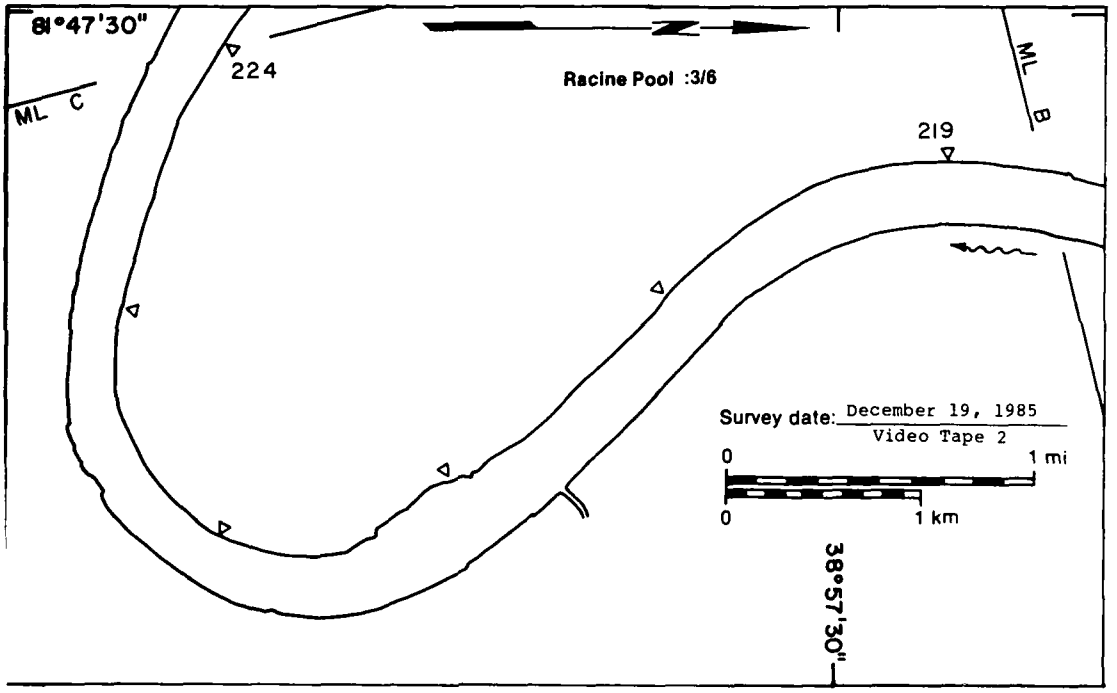
19 December 1985

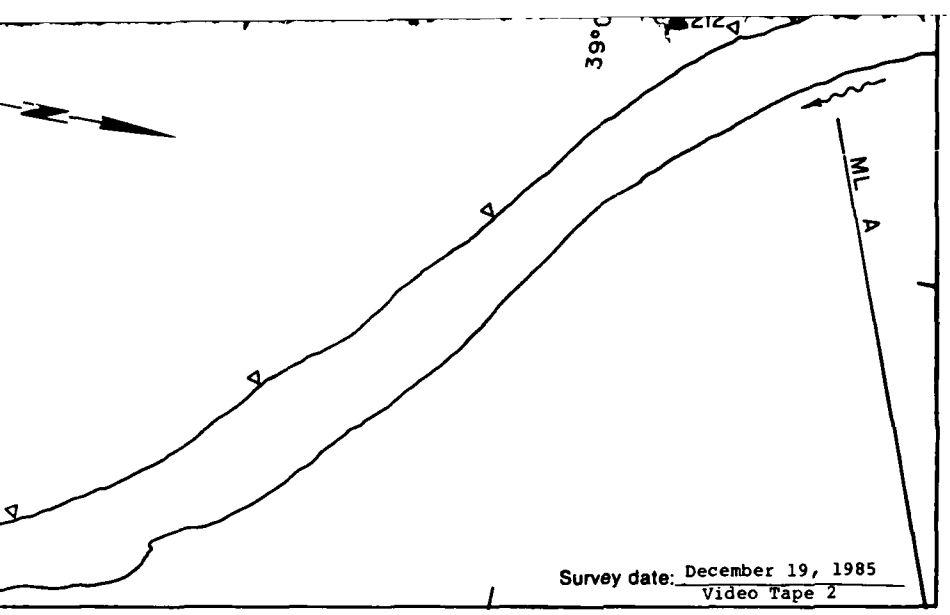






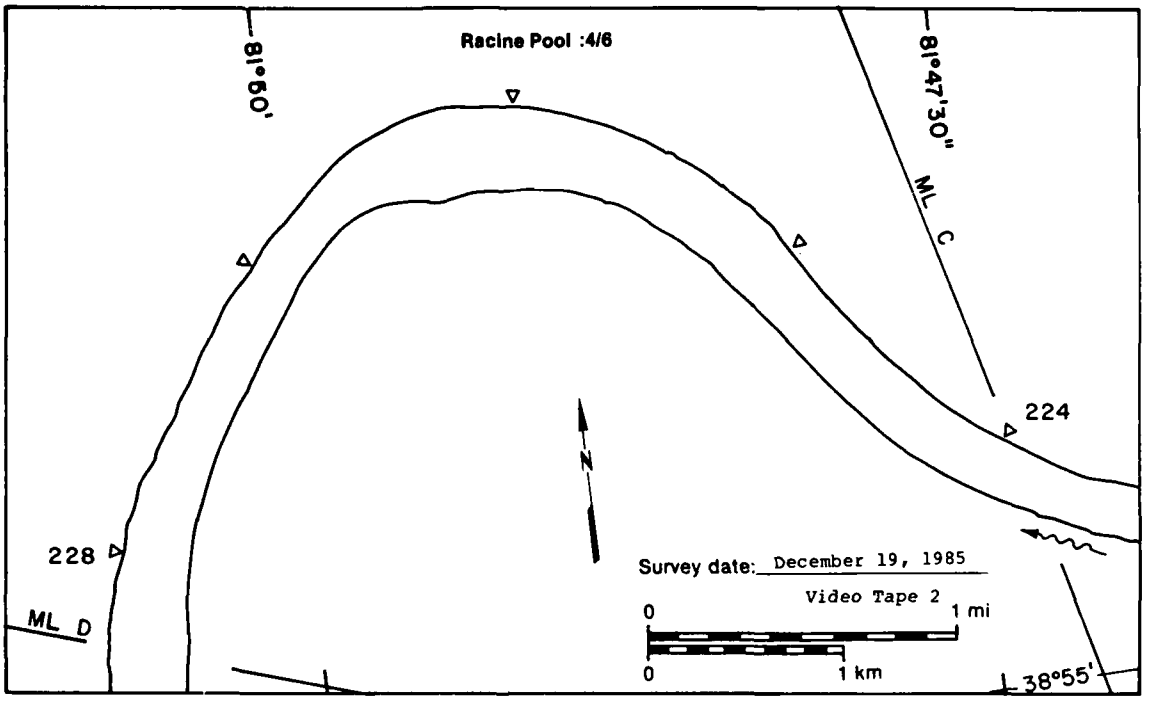

218
Buffington Island
0
1 mi
0
1 km
81°45'

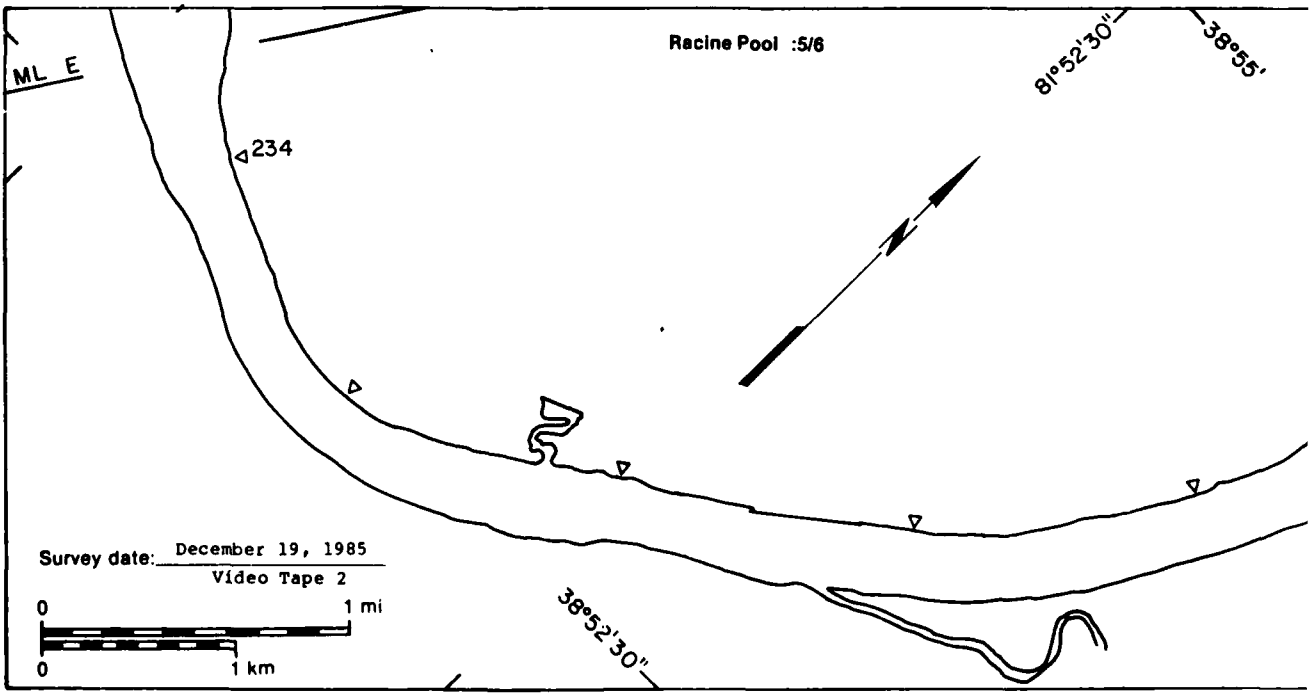

81°47'30"
224
Racine Pool :3/6
ML C
ML B
219
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km
38°57'30"

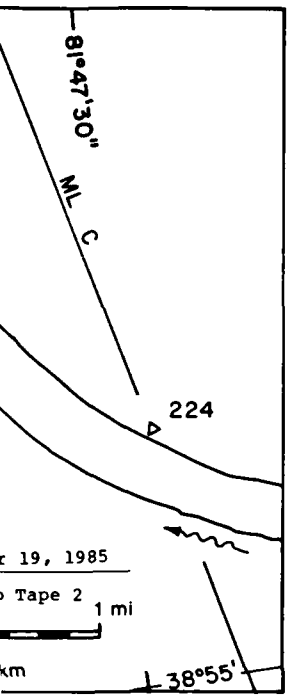

39°C
ML A
Survey date: December 19, 1985
Video Tape 2

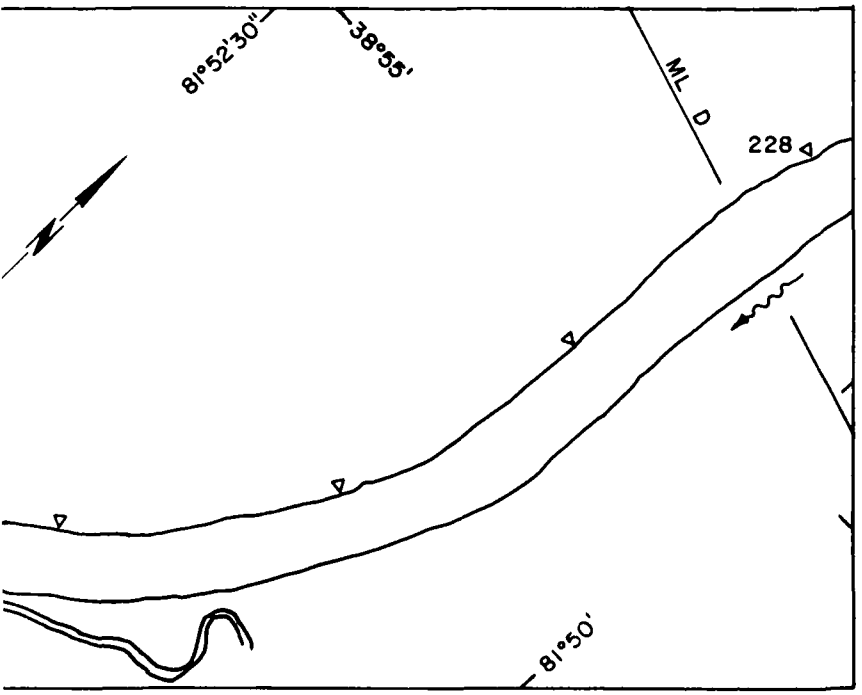
ML B
1985
2
1 mi

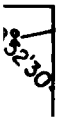
19 December 1985





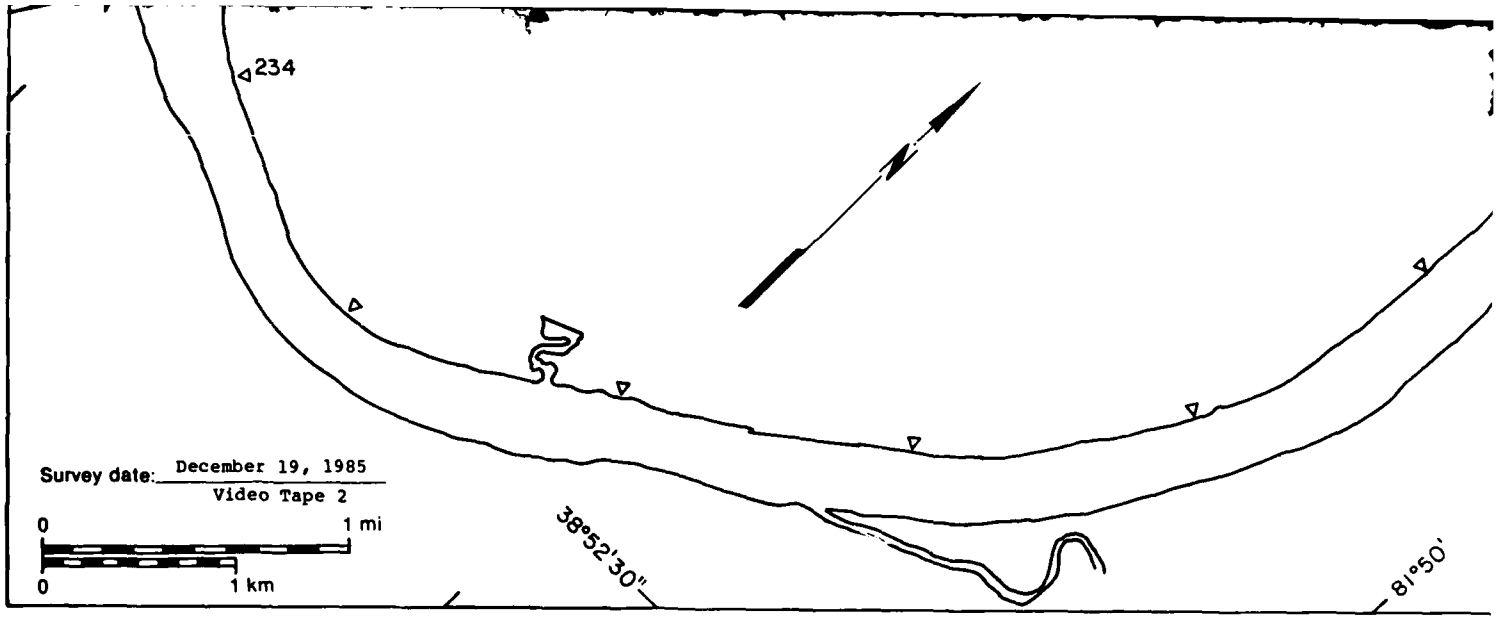


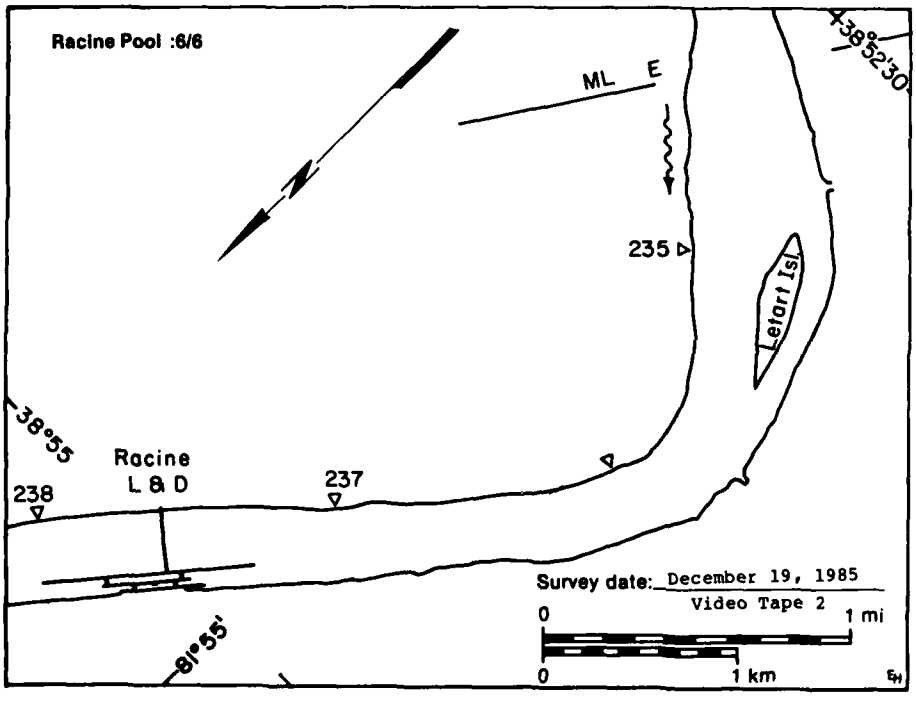




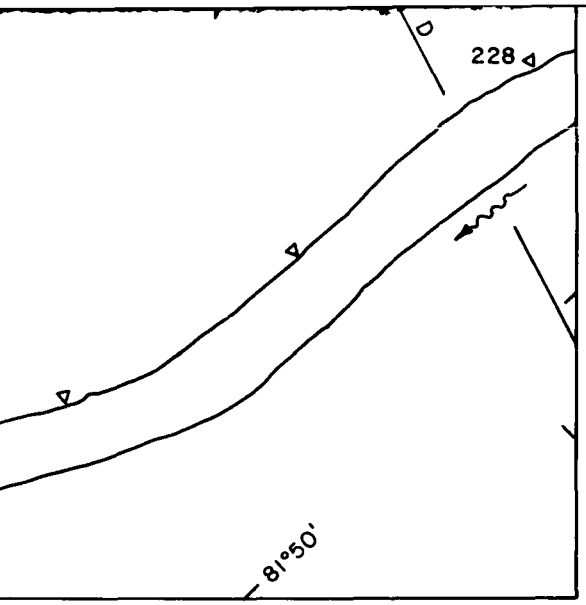
Racine Pool

MAP UNITS	Area $m^2 \times 10^6$	Surface concentration



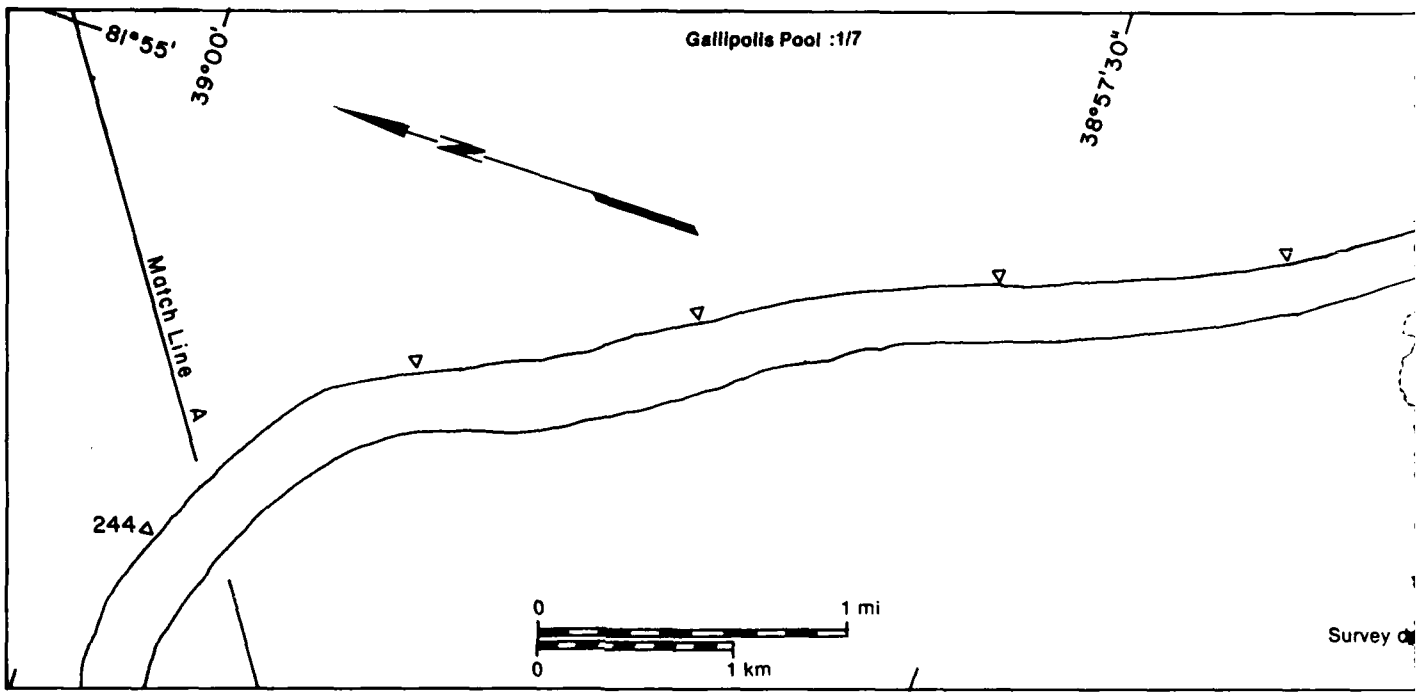


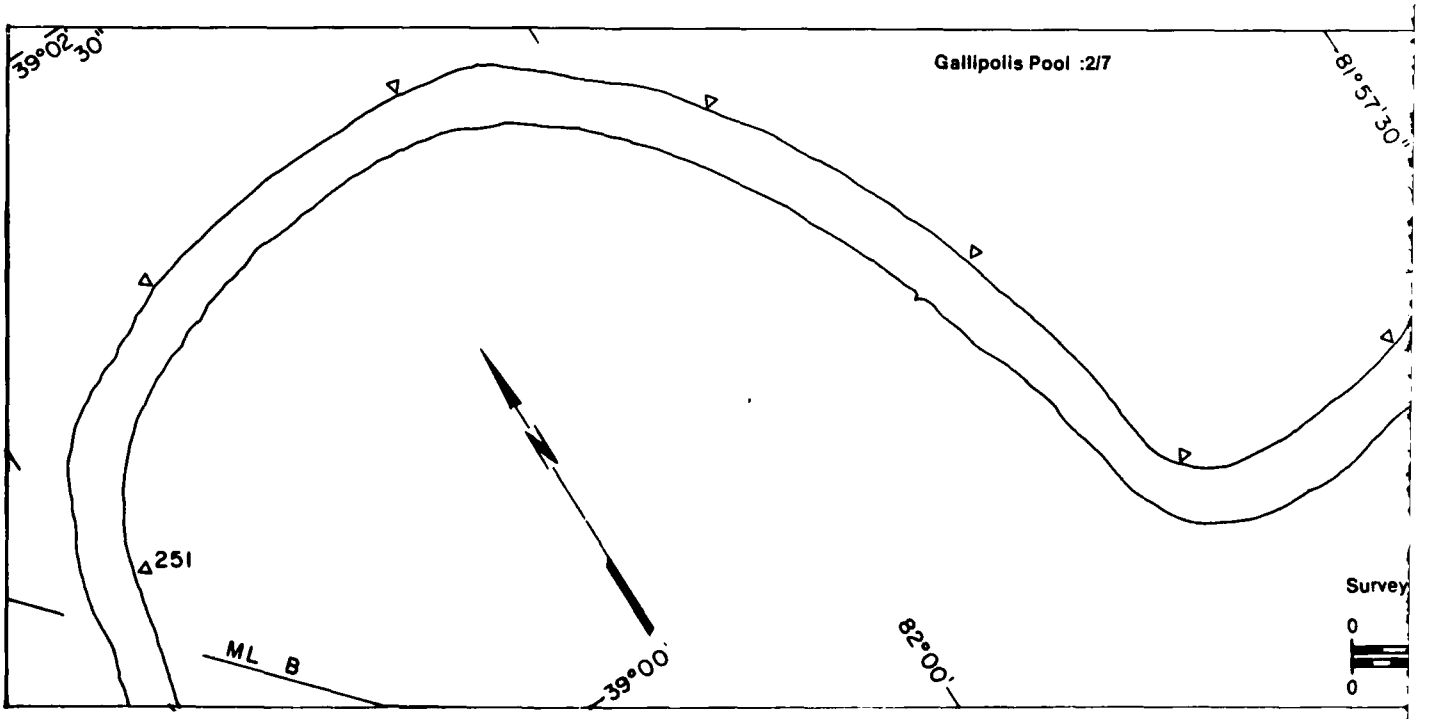
Racine Pool MAP UNITS	Area (m^2 x 10^6)
Open water	19.89
Solid ice cover	0.00
Solid ice cover with open-water areas	0.00
Fragmented ice cover	0.00
Fragmented ice cover with open-water areas	0.00
Ice floes or frazil slush and pans	0.00
Total area (m^2 x 10^6)	19.89



Racine Pool

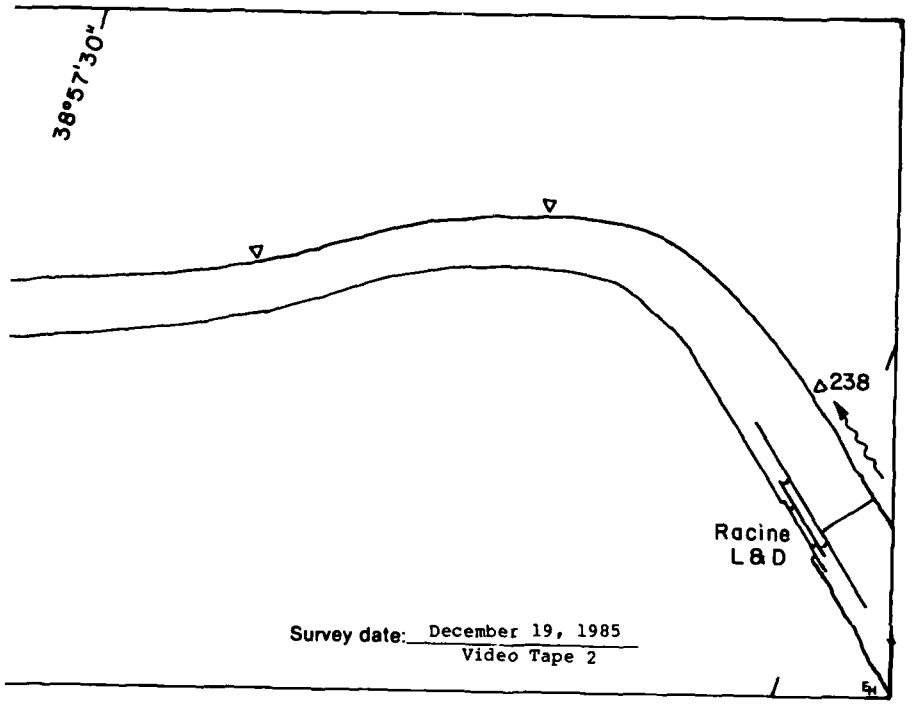
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	19.89	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	19.89	

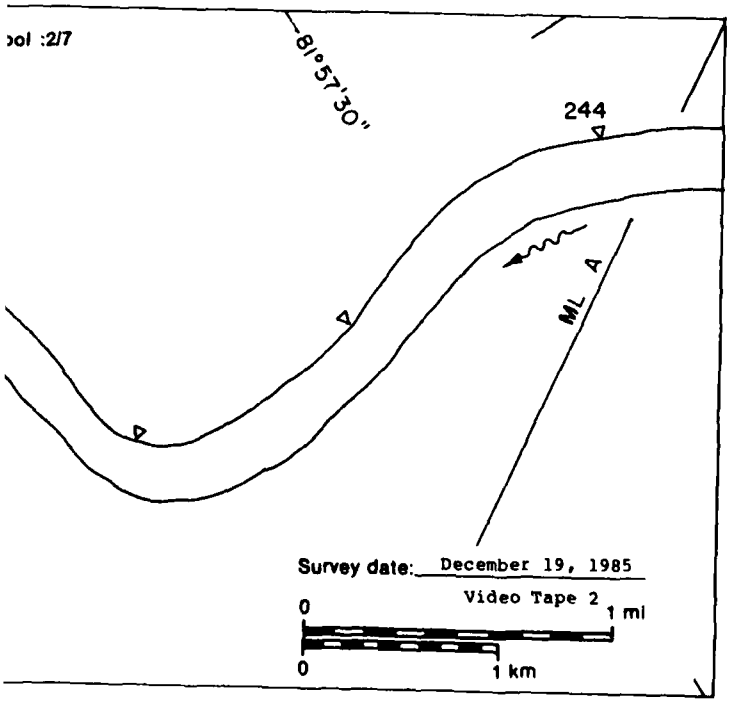

Gallipolis Pool :1/7
81°55'
39°00'
38°57'30"
Match Line A
244
0
1 mi
0
1 km
Survey d

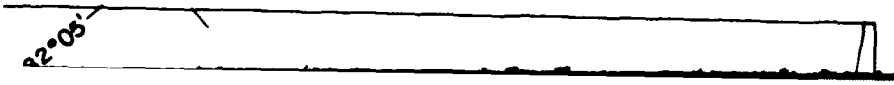

Gallipolis Pool :2/7
39°02'30"
81°57'30"
251
ML B
39°00'
82°00'
Survey
0
0

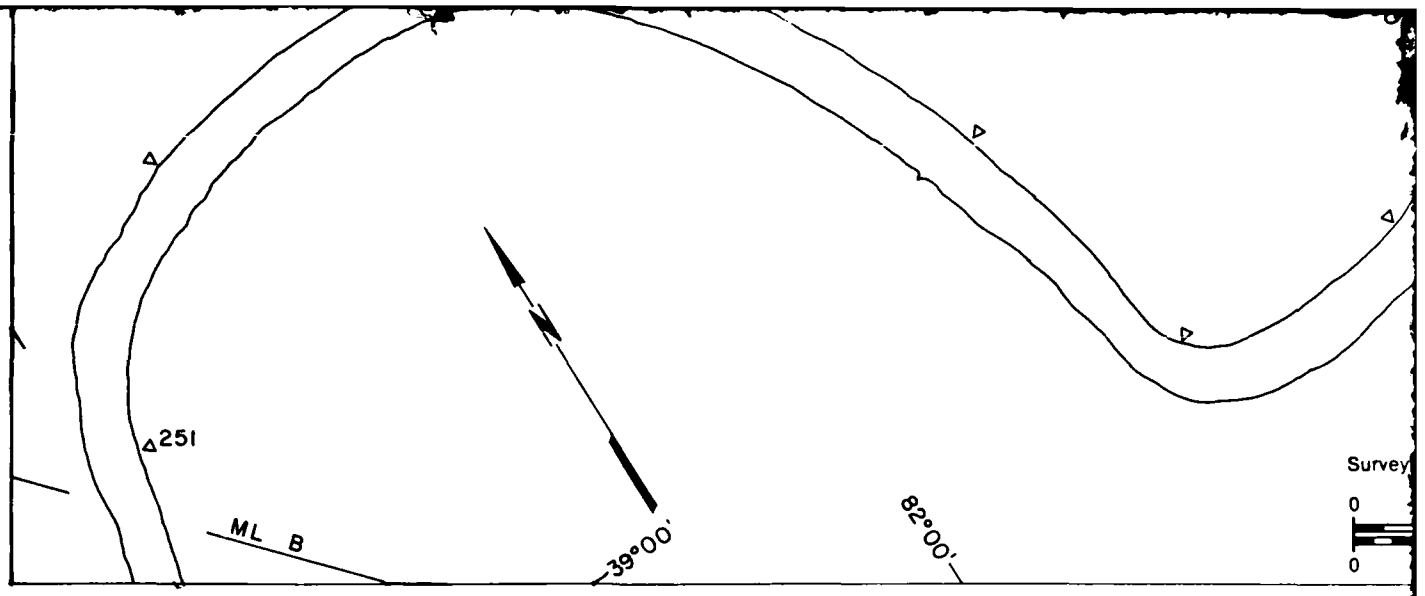
Gallipolis Pool :3/7
38°57'
82°05'

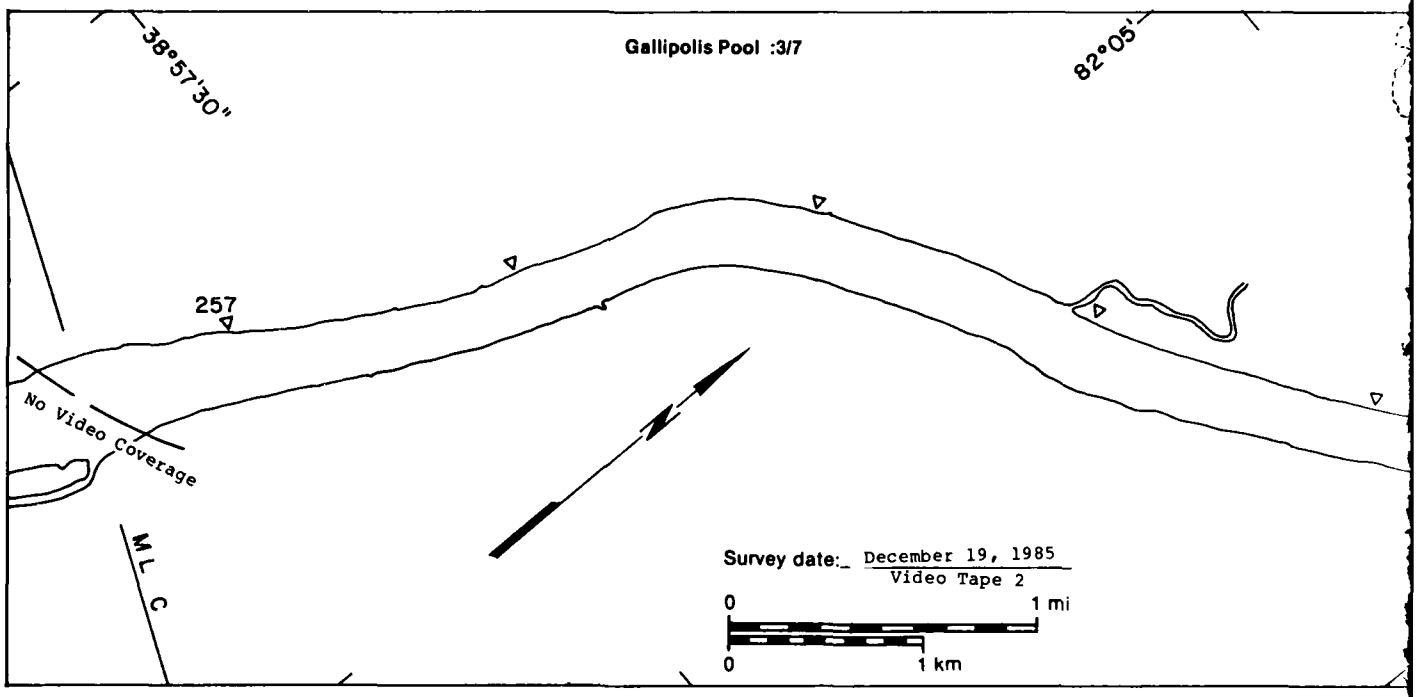
19 December 1985

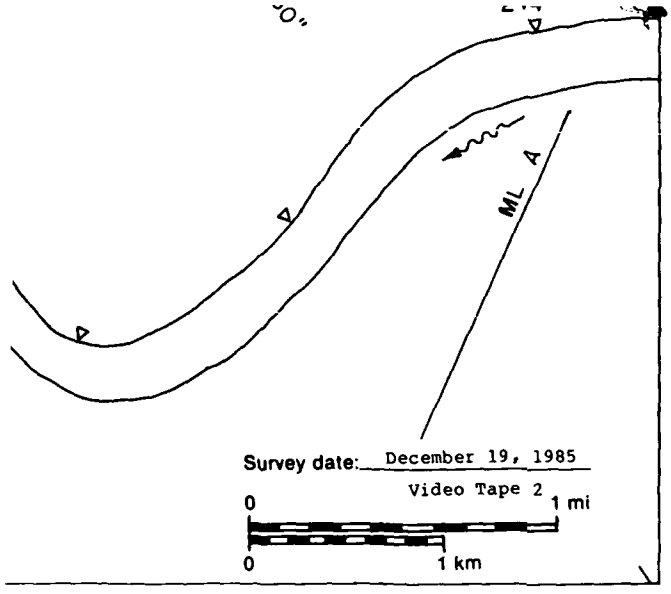


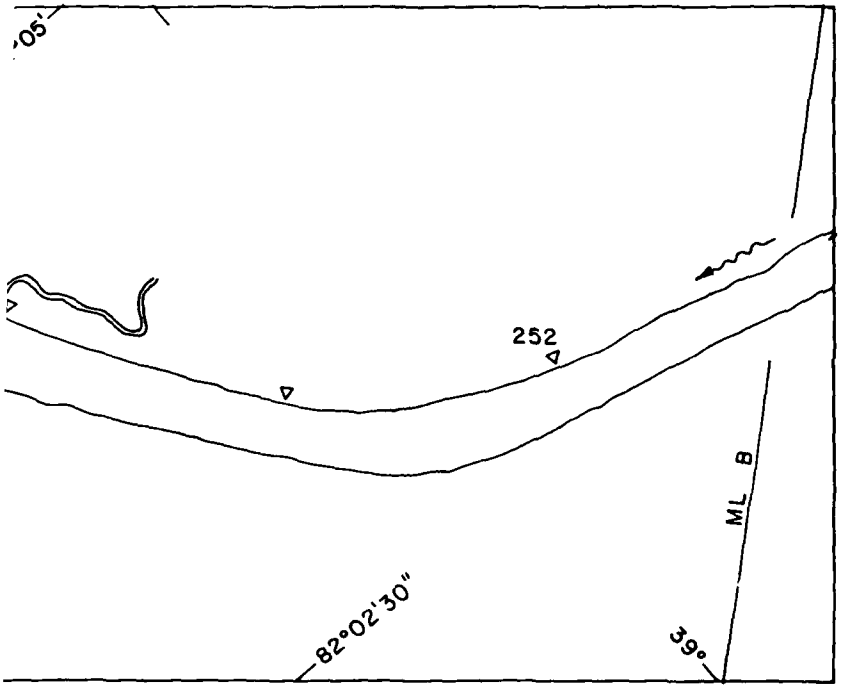




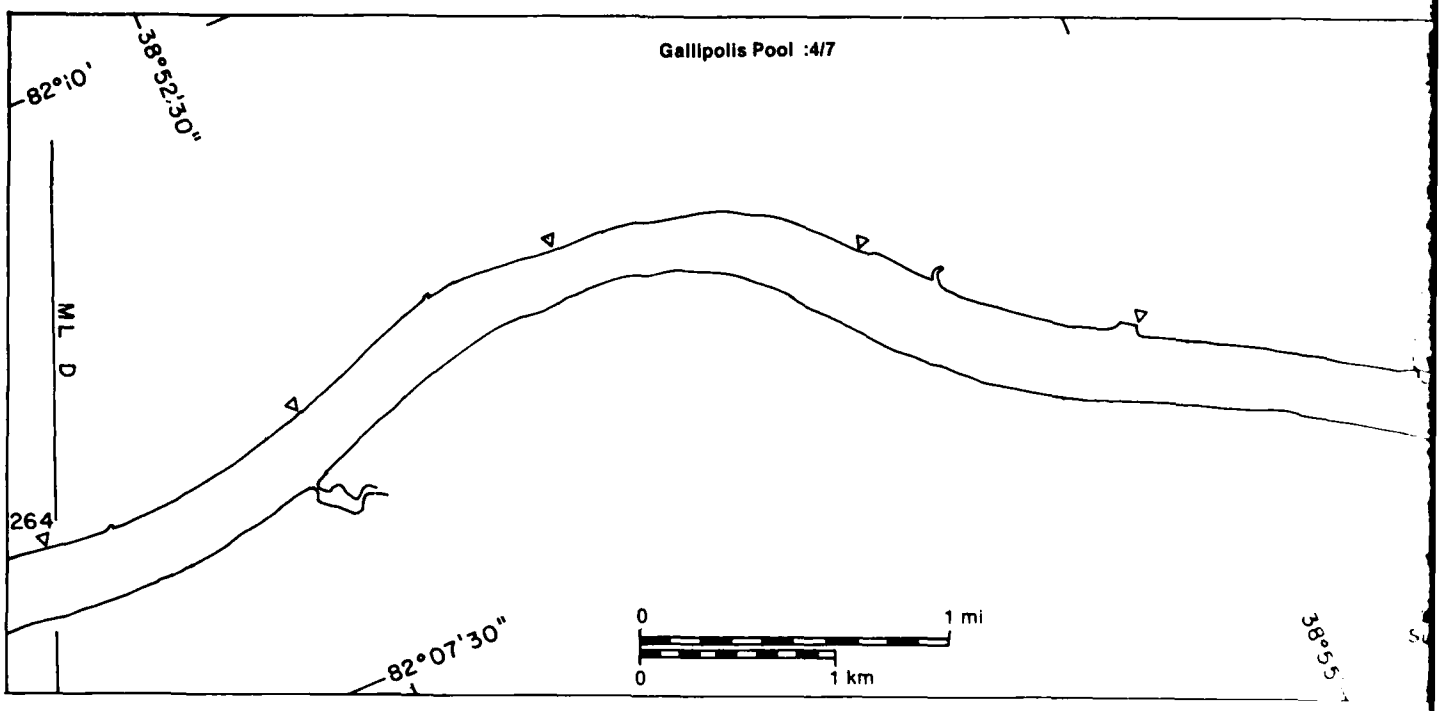

251
ML B
39°00'
82°00'
Survey
0
0

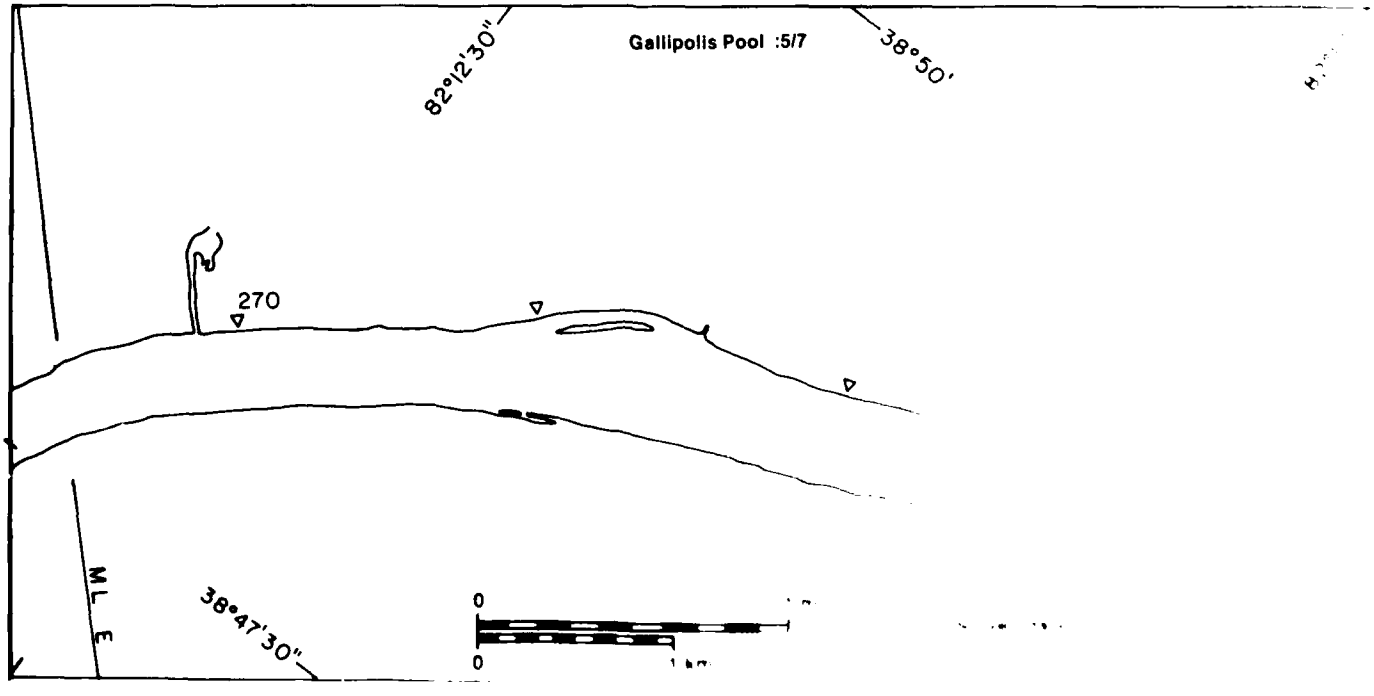

Gallipolis Pool :3/7
38°57'30"
82°05'
257
No Video Coverage
ML C
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km


ML A
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km


252
ML B
82°02'30"
39°

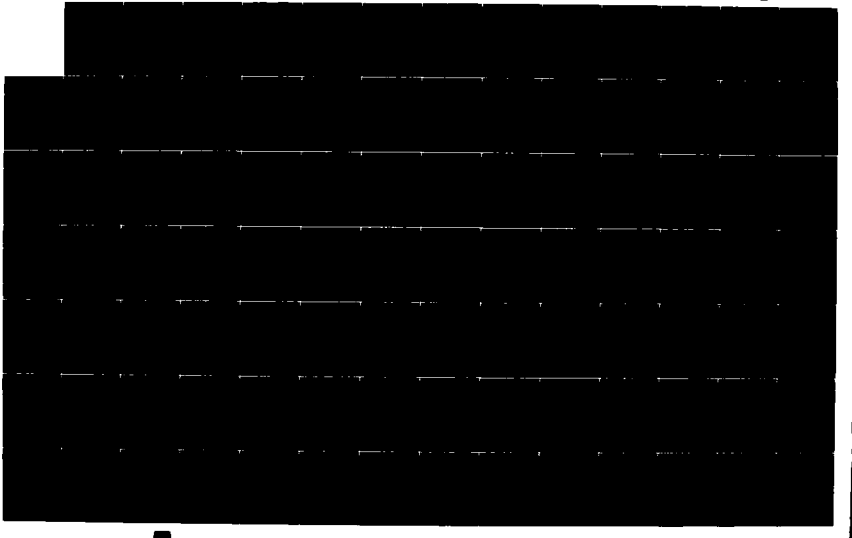
19 December 1985

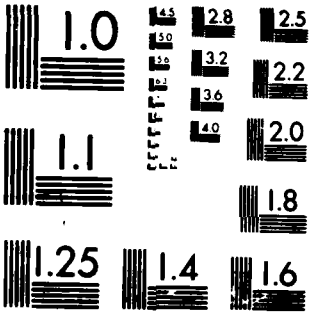


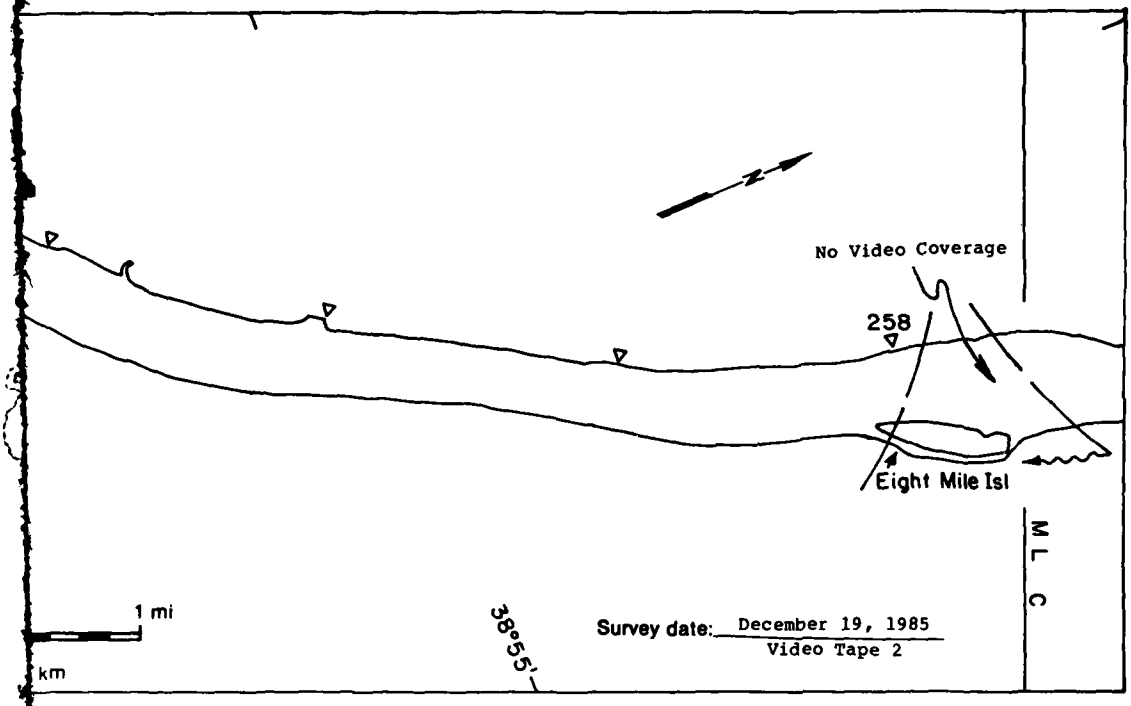


AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 2/14

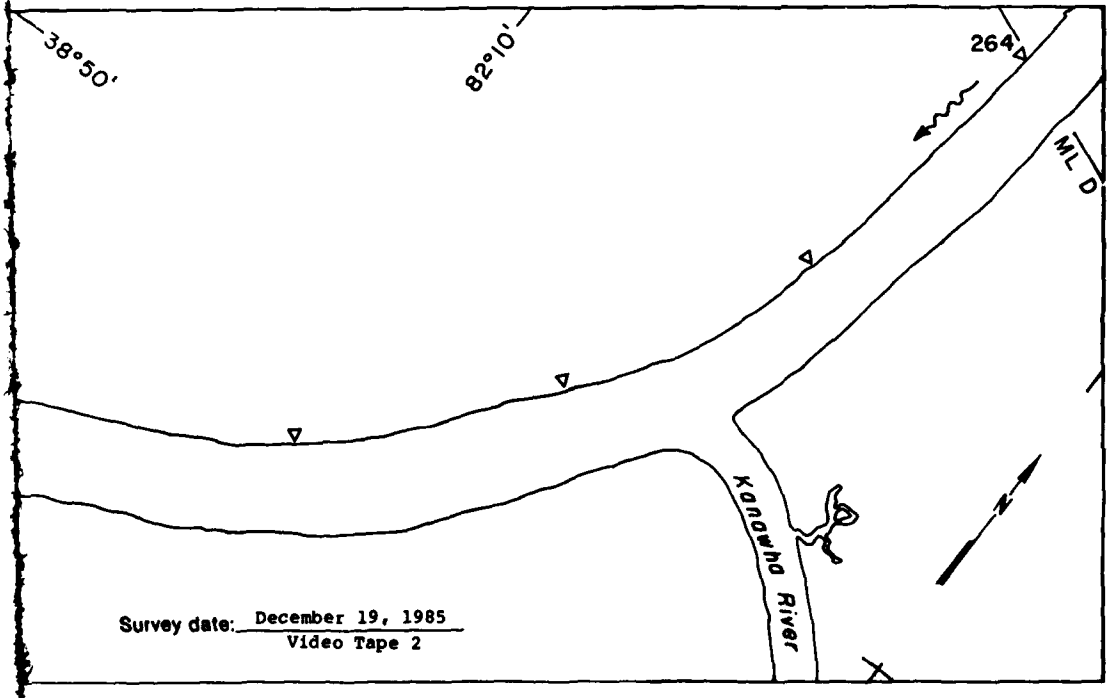
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

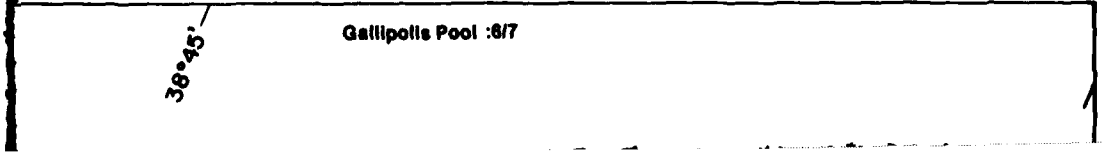


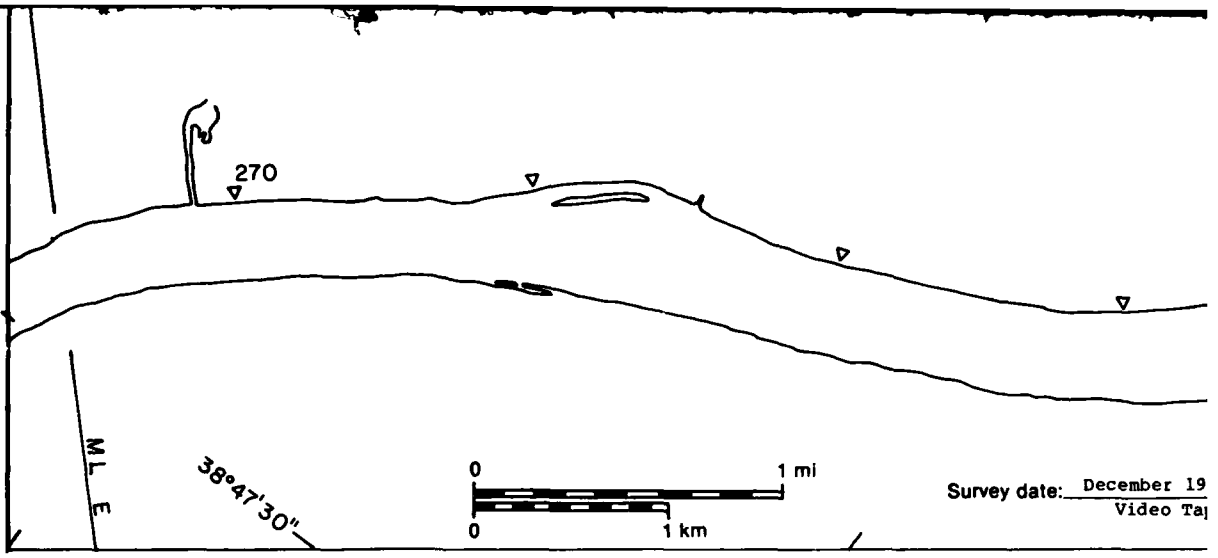

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

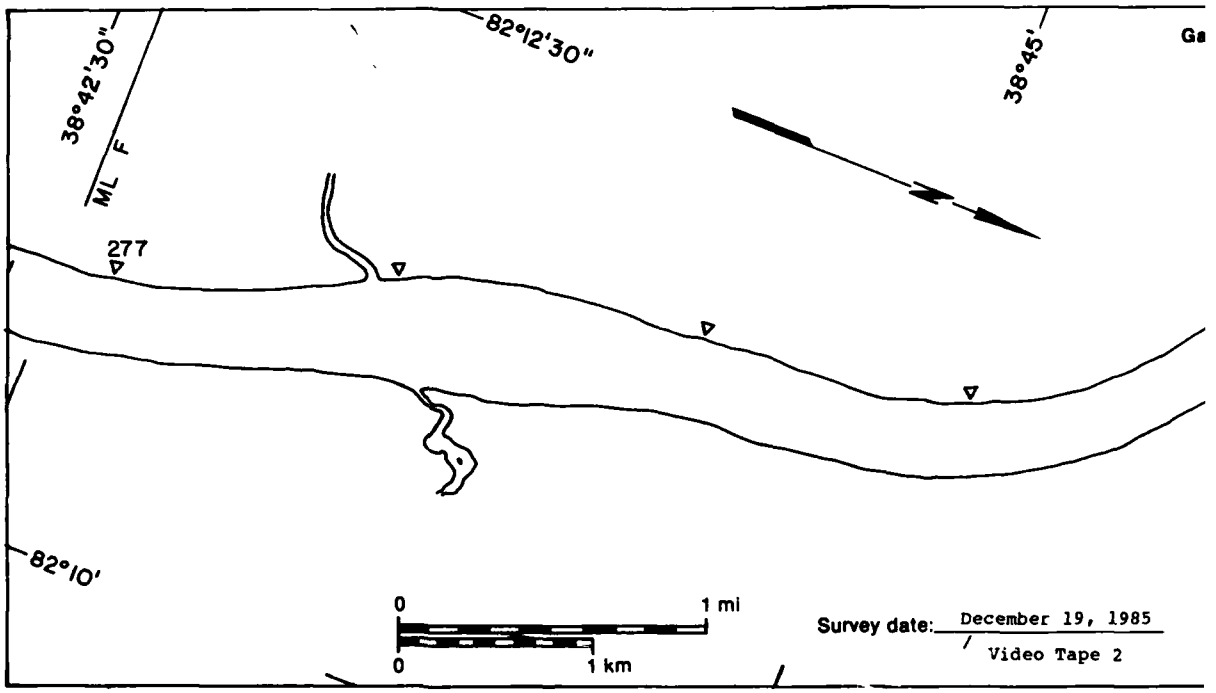

No Video Coverage
258
Eight Mile Isl
M L C
1 mi
km
38°55'
Survey date: December 19, 1985
Video Tape 2

B

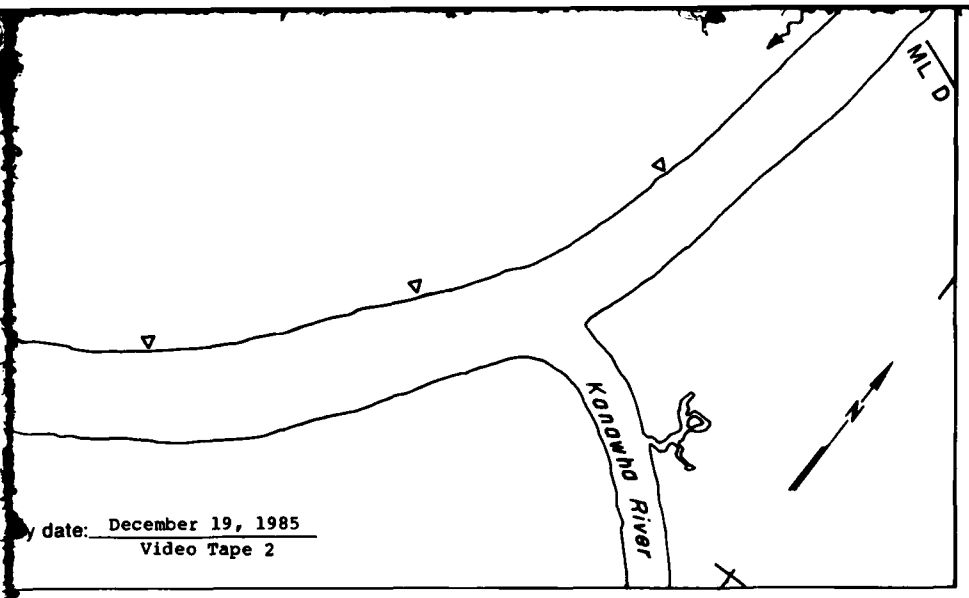

38°50'
82°10'
264
M L D
Kanawha River
Survey date: December 19, 1985
Video Tape 2


38°45'
Gallipolis Pool :6/7


270
ML E
38°47'30"
0
1 mi
0
1 km
Survey date: December 19
Video Ta

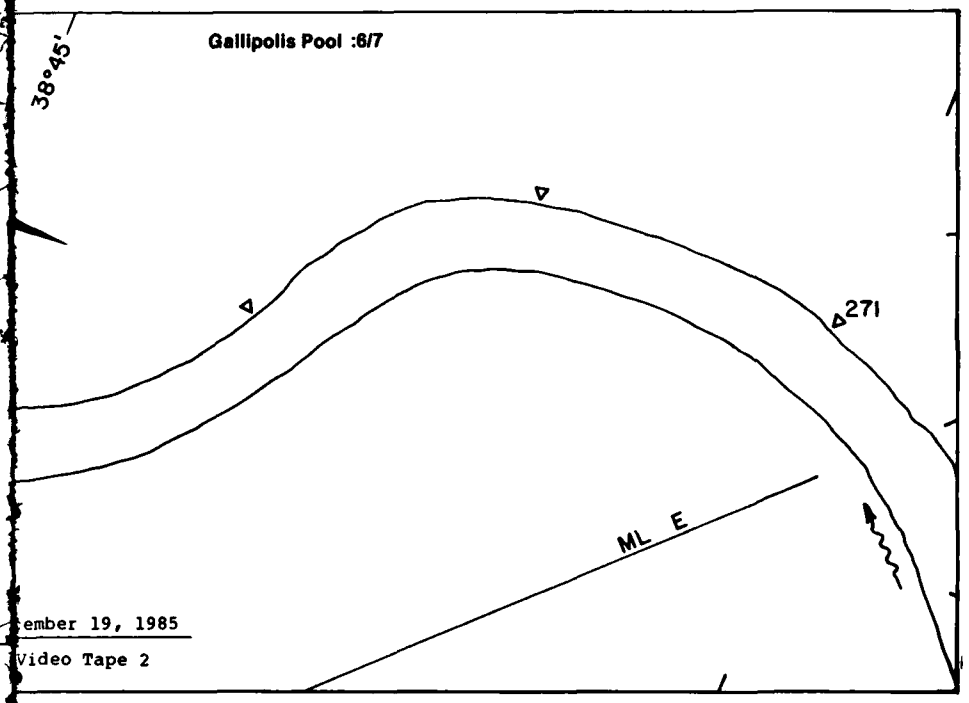

38°42'30"
ML F
82°12'30"
38°45'
Ga
277
82°10'
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 2

C



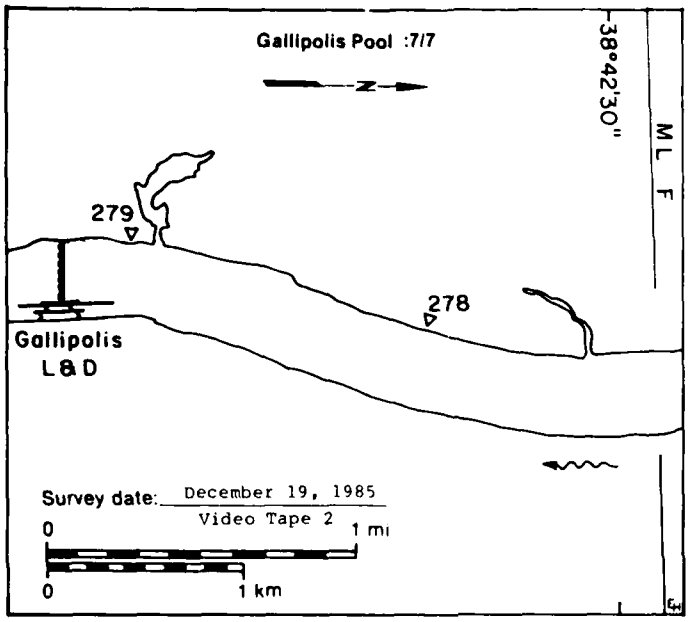
y date: December 19, 1985
Video Tape 2

s Pool :



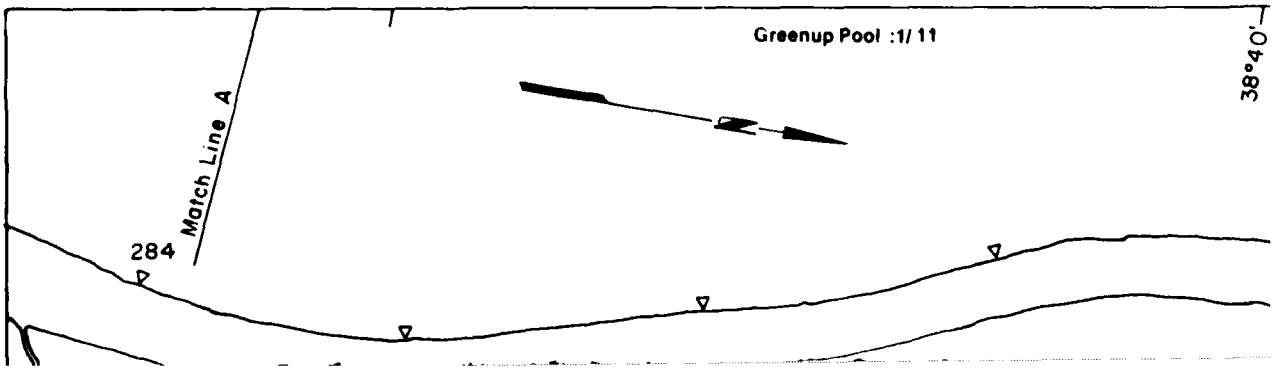
ember 19, 1985
Video Tape 2

D



Gallipolis Pool

MAP UNITS	Area ($m^2 \times 10^6$)
Open water	24.26
Solid ice cover	0.00
Solid ice cover with open-water areas	0.00
Fragmented ice cover	0.00
Fragmented ice cover with open-water areas	0.00
Ice floes or frazil slush and pans	0.00
Total area ($m^2 \times 10^6$)	24.65*

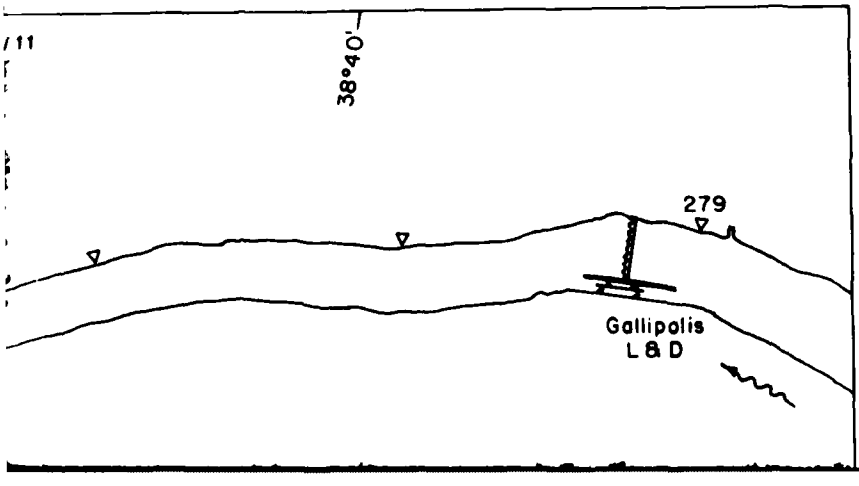


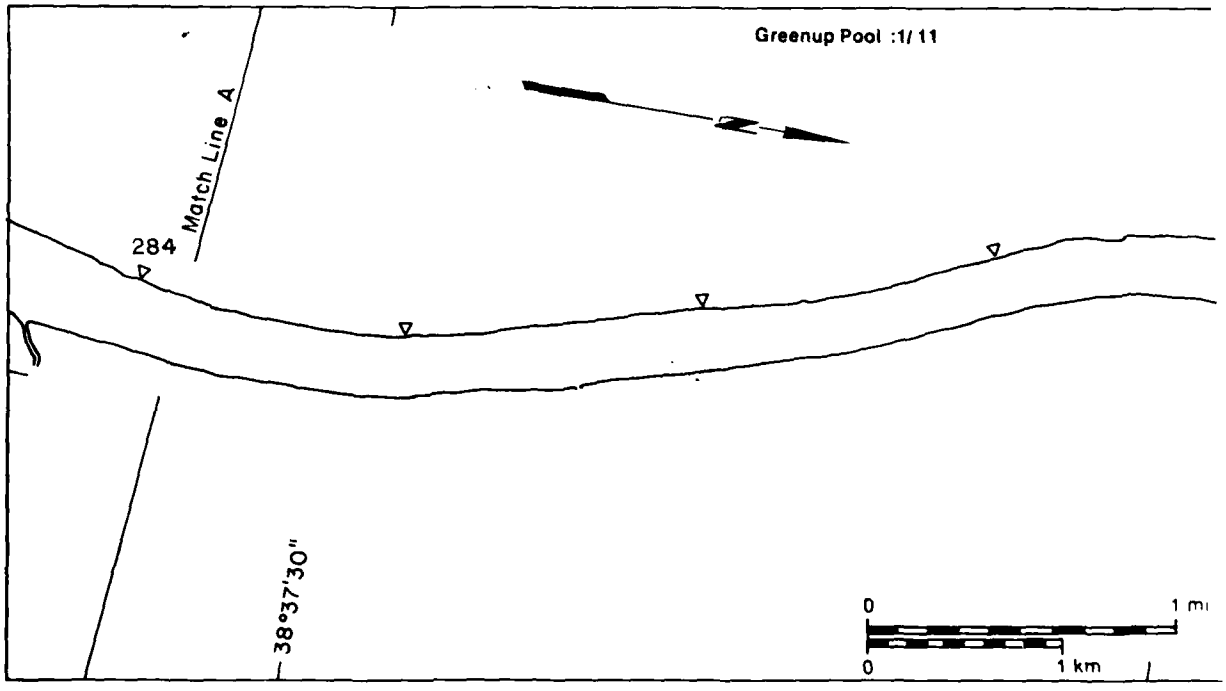
12

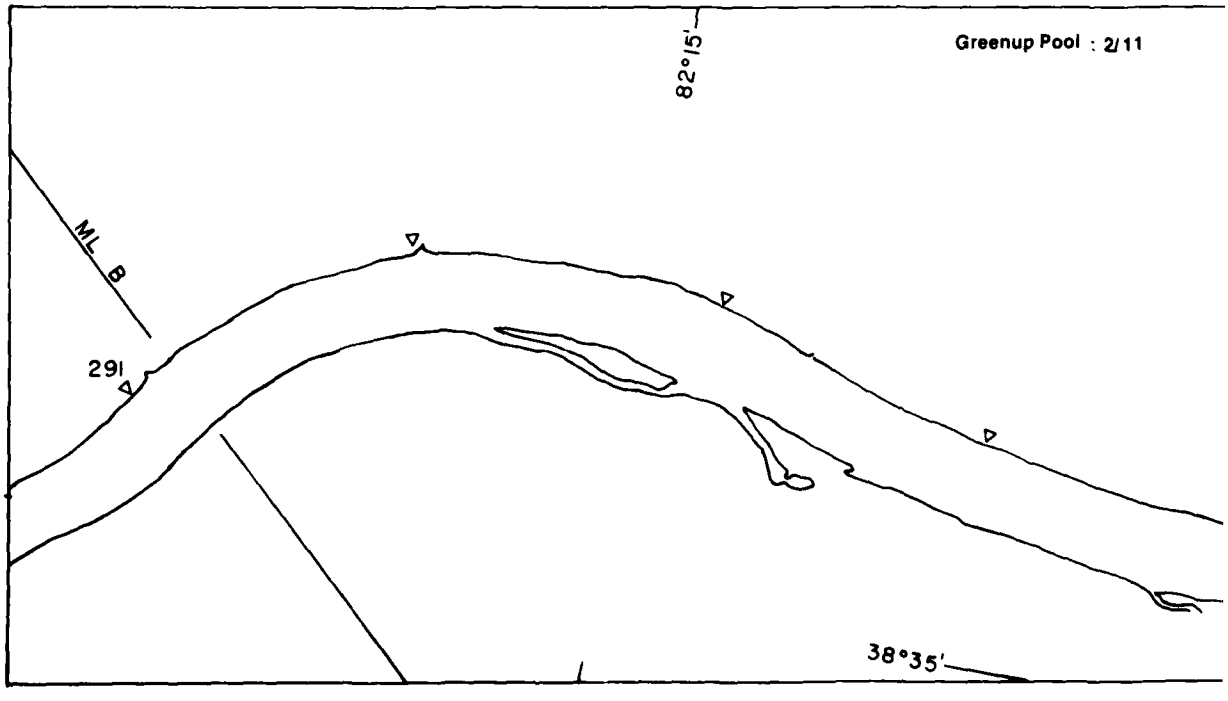
19 December 1985

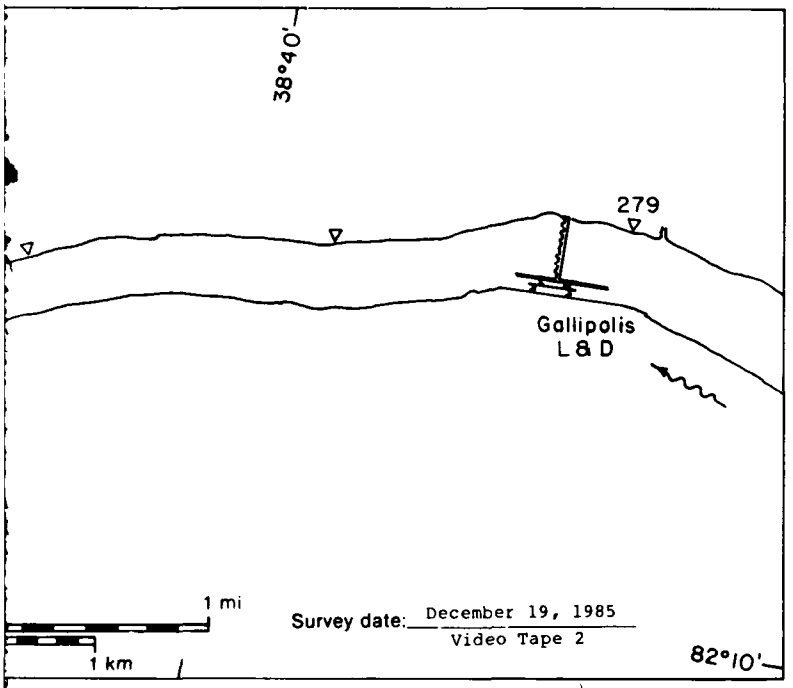
allipolis Pool

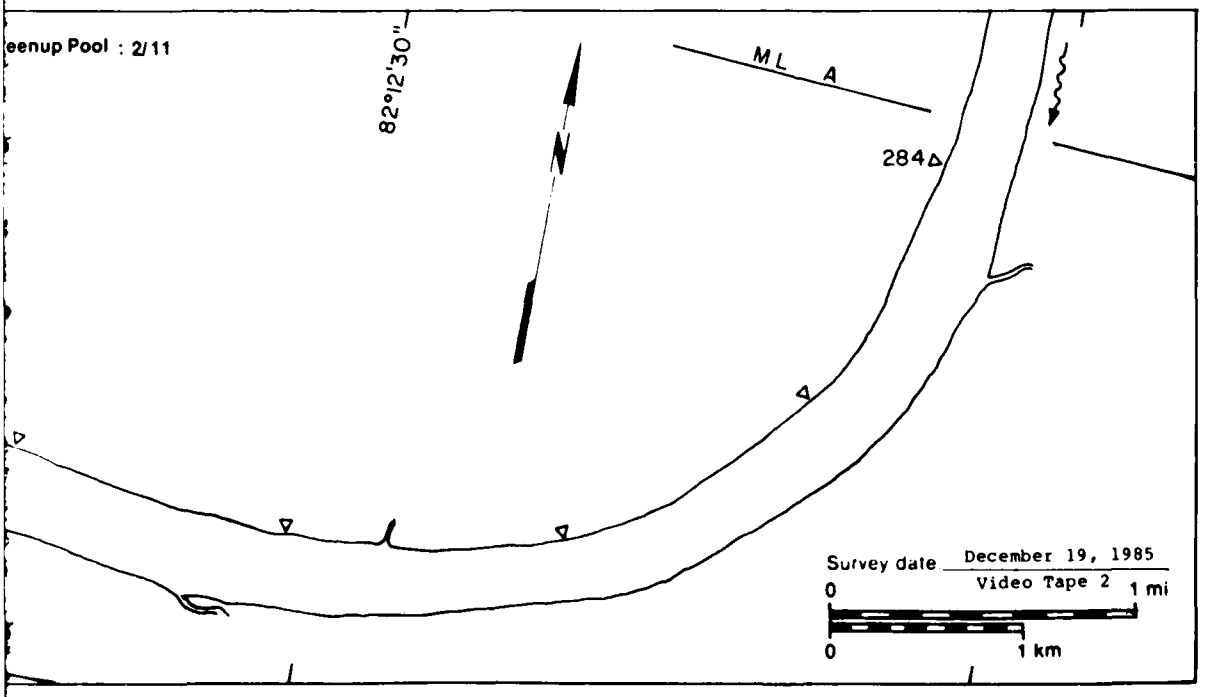
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	24.26	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	24.65*	* Includes 0.39 x 10^6 m^2 of no video coverage



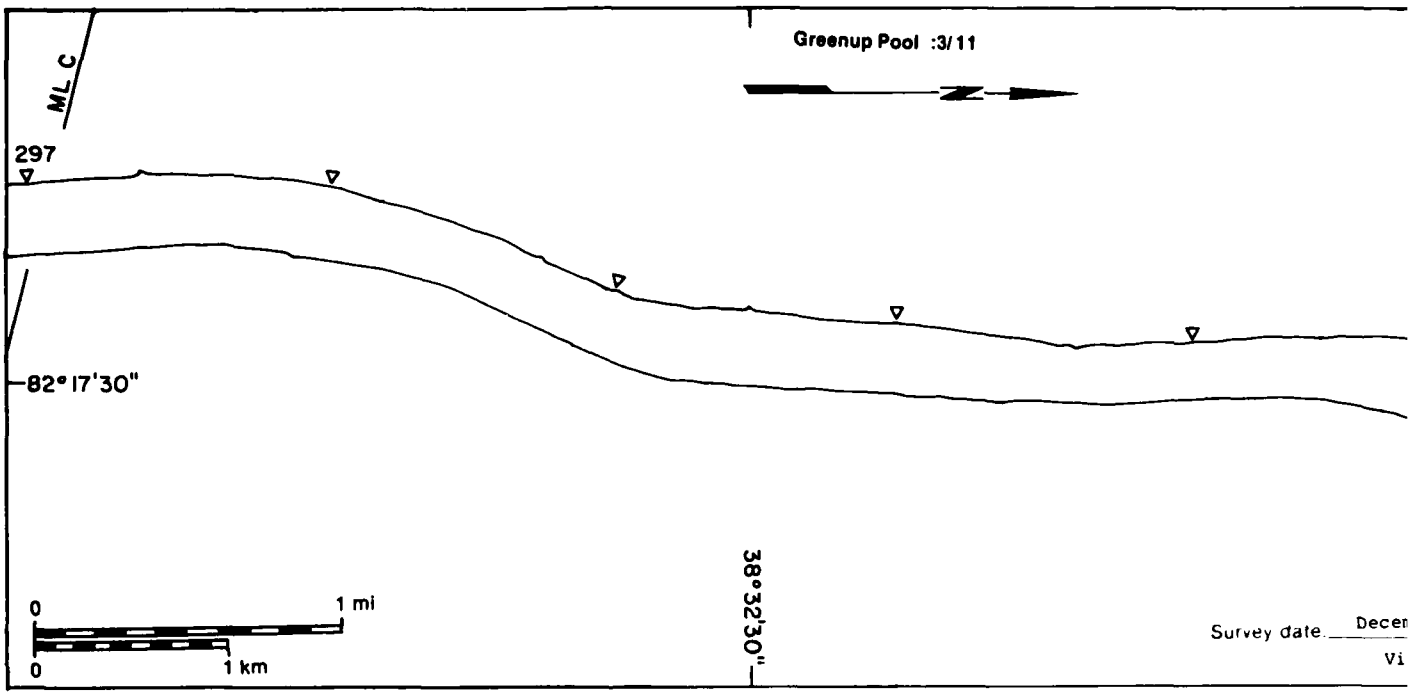

Greenup Pool :1/ 11
Match Line A
284
38°37'30"
0
1 mi
0
1 km

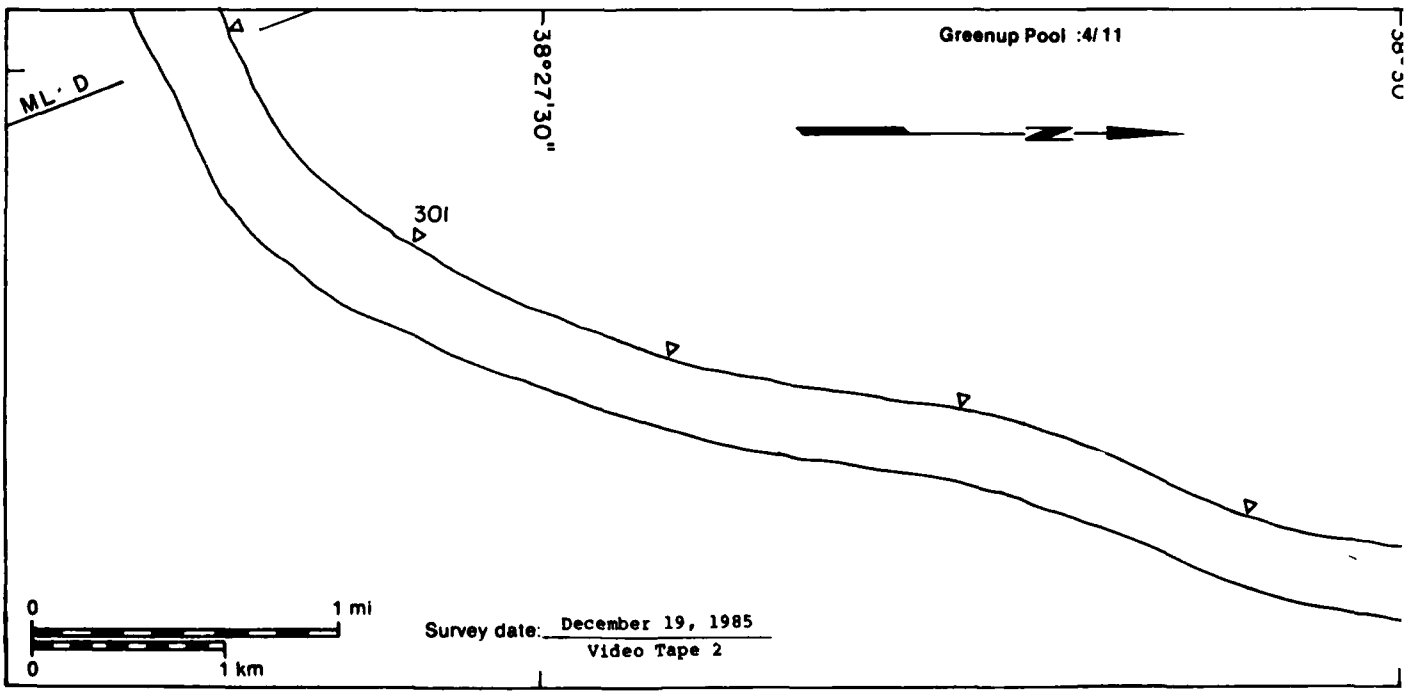

82°15'
Greenup Pool : 2/11
ML B
291
38°35'

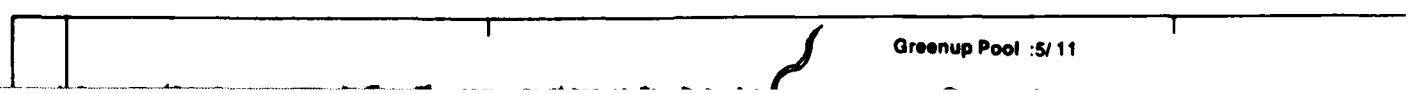

38°40'
279
Gallipolis
L&D
1 mi
1 km
Survey date: December 19, 1985
Video Tape 2
82°10'

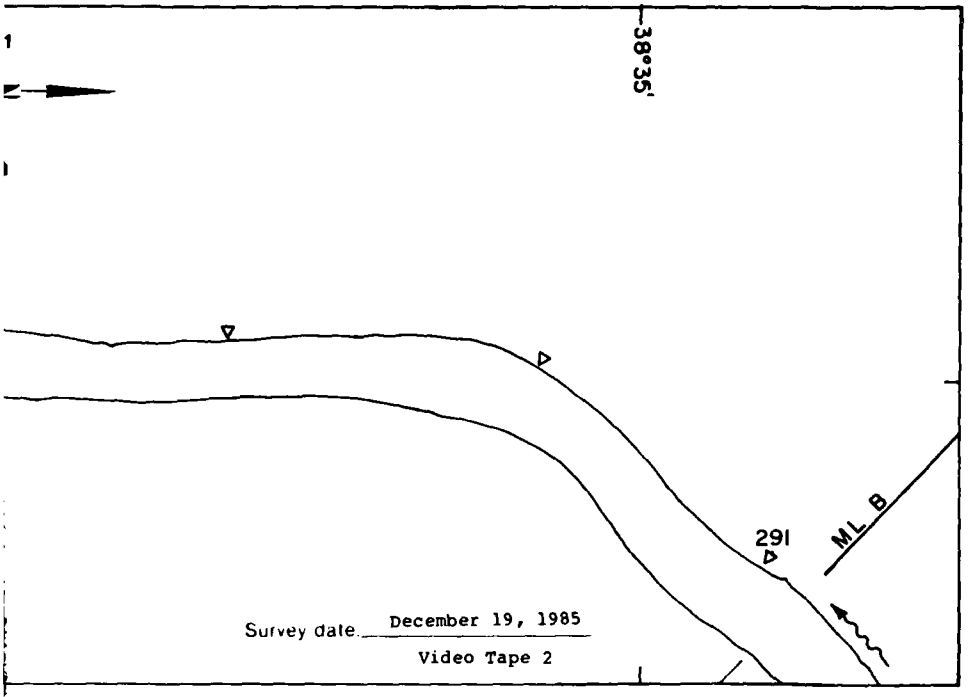

eenup Pool : 2/11
82°12'30"
ML A
284
Survey date December 19, 1985
Video Tape 2
0
1 mi
0
1 km

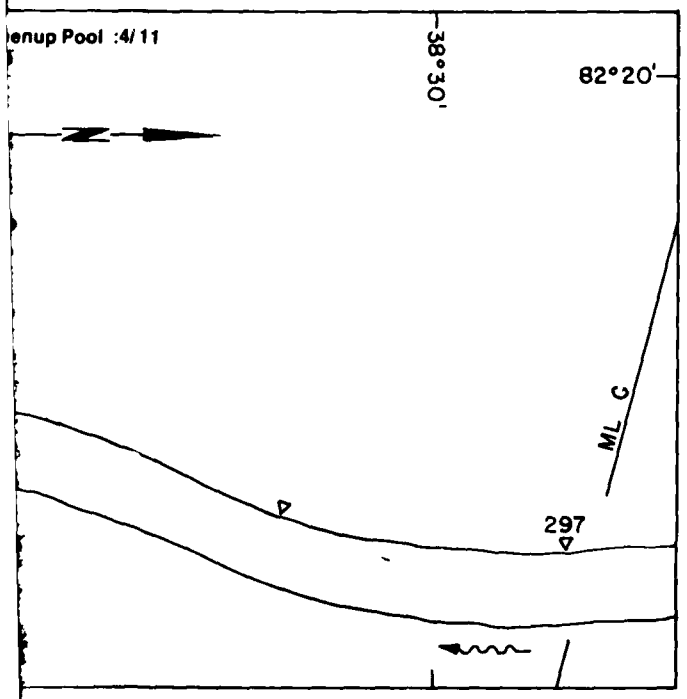
19 December 1985



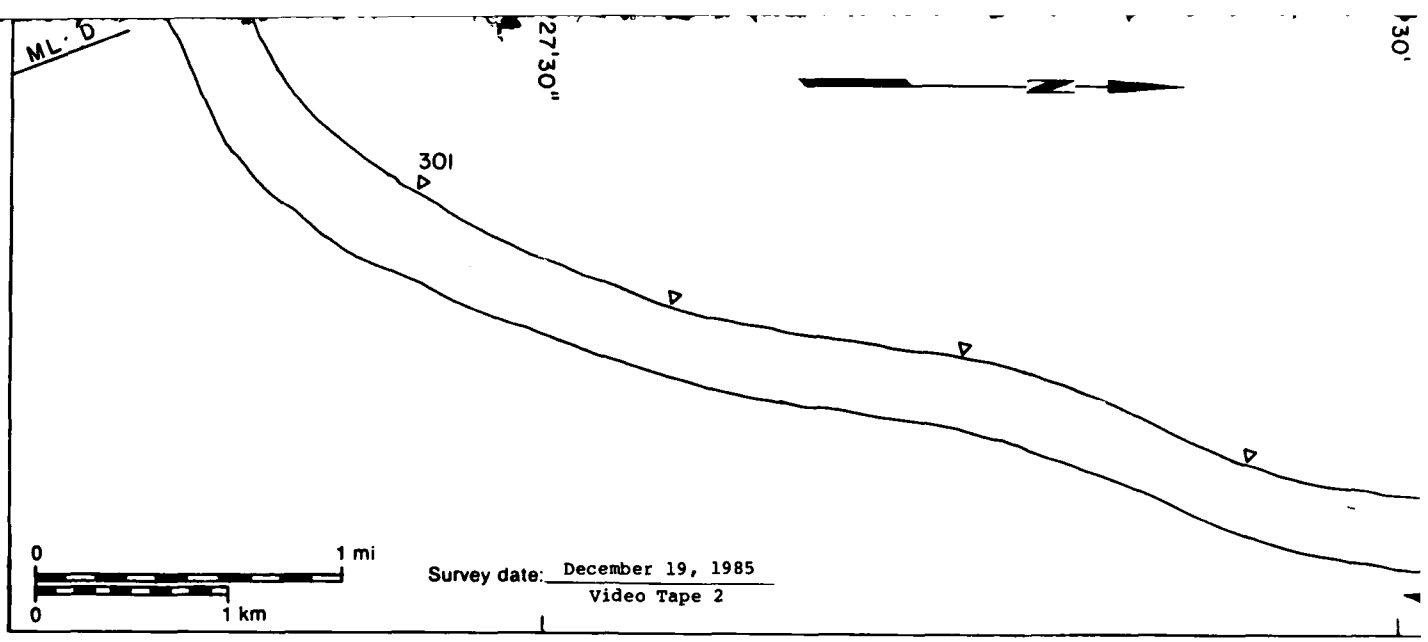


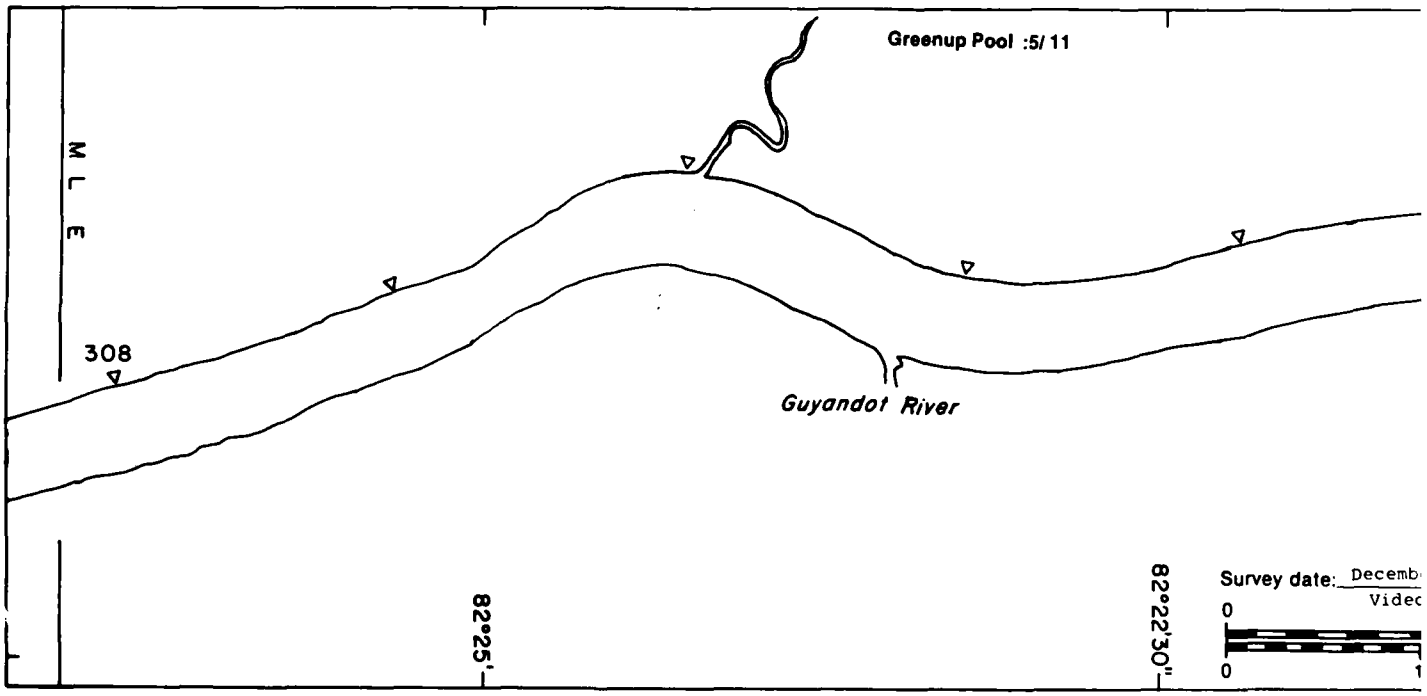


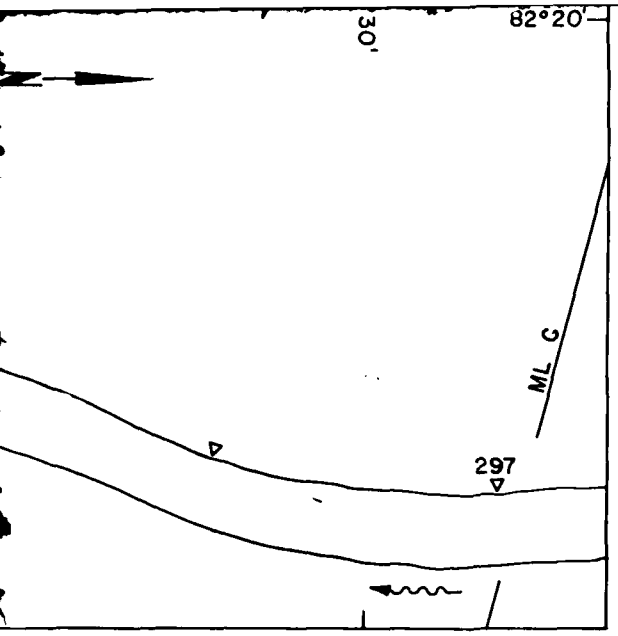

1
38°35'
291
ML B
Survey date. December 19, 1985
Video Tape 2

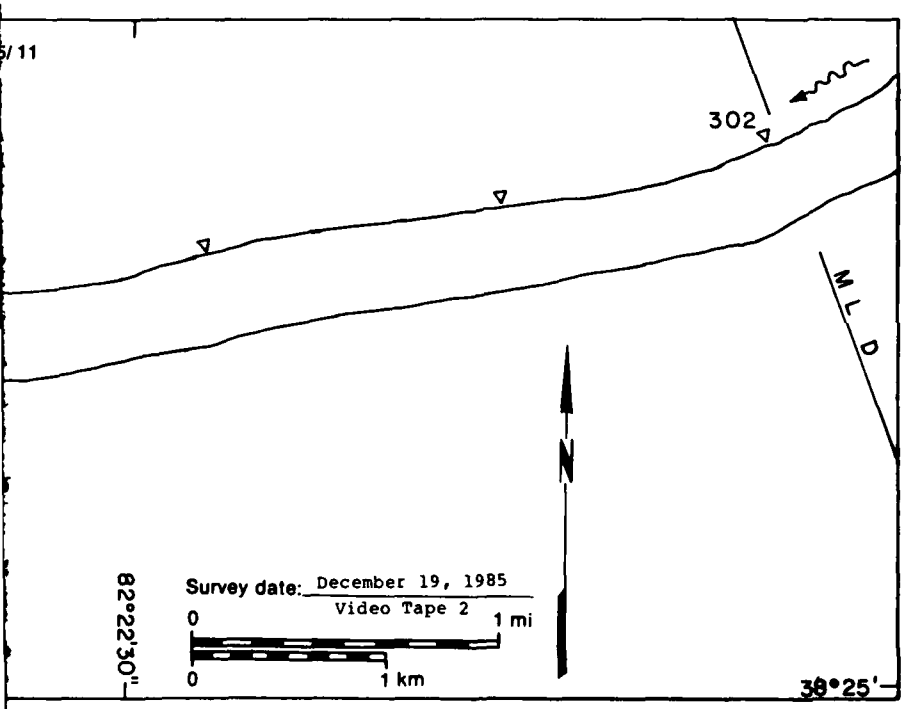

enup Pool :4/ 11
38°30'
82°20'
ML C
297

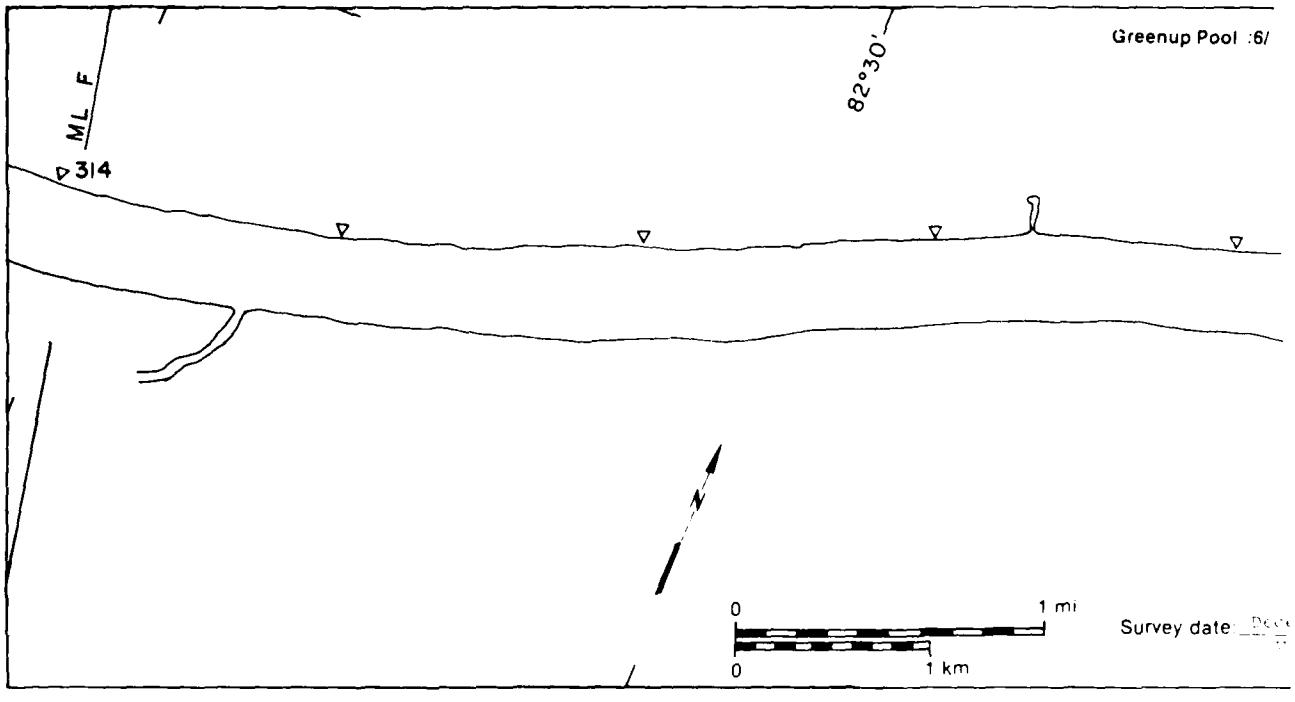
ol :5/ 11
302

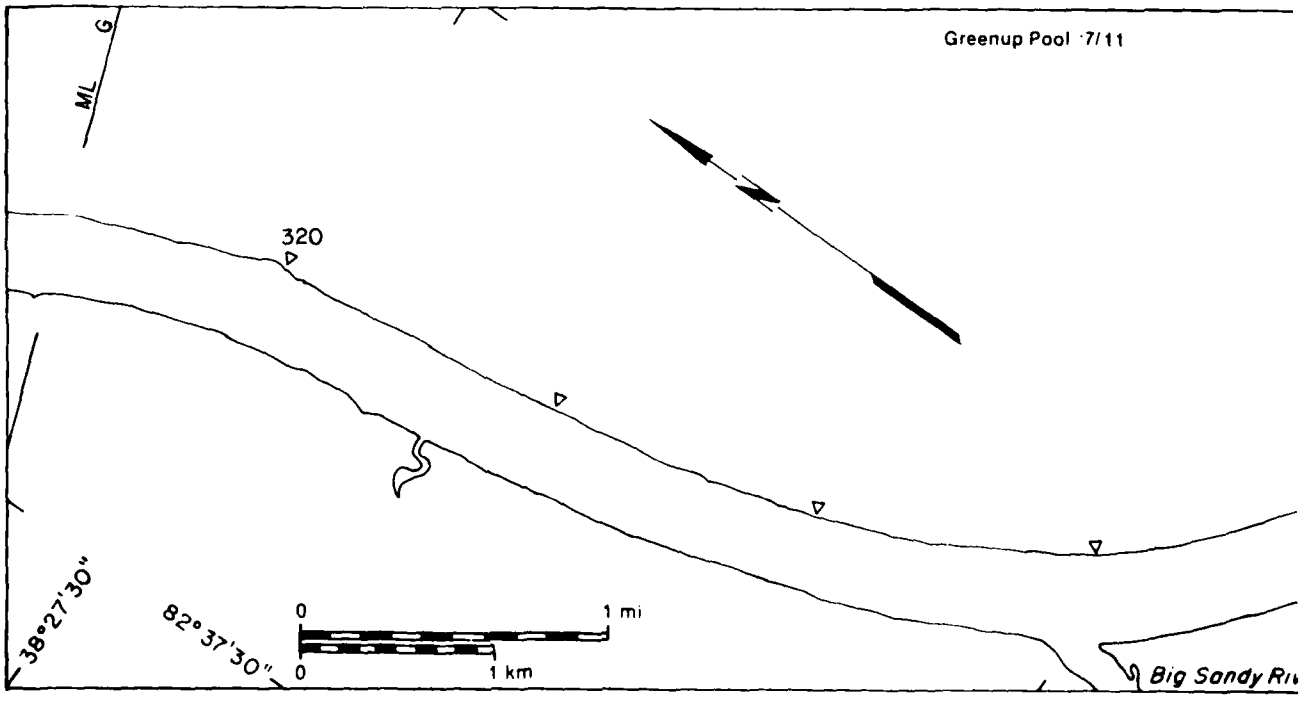

ML D
27'30"
301
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 2


Greenup Pool :5/ 11
M L E
308
Guyandot River
82°25'
82°22'30"
Survey date: Decemb
Videc
0
0


30'
82°20'
ML C
297

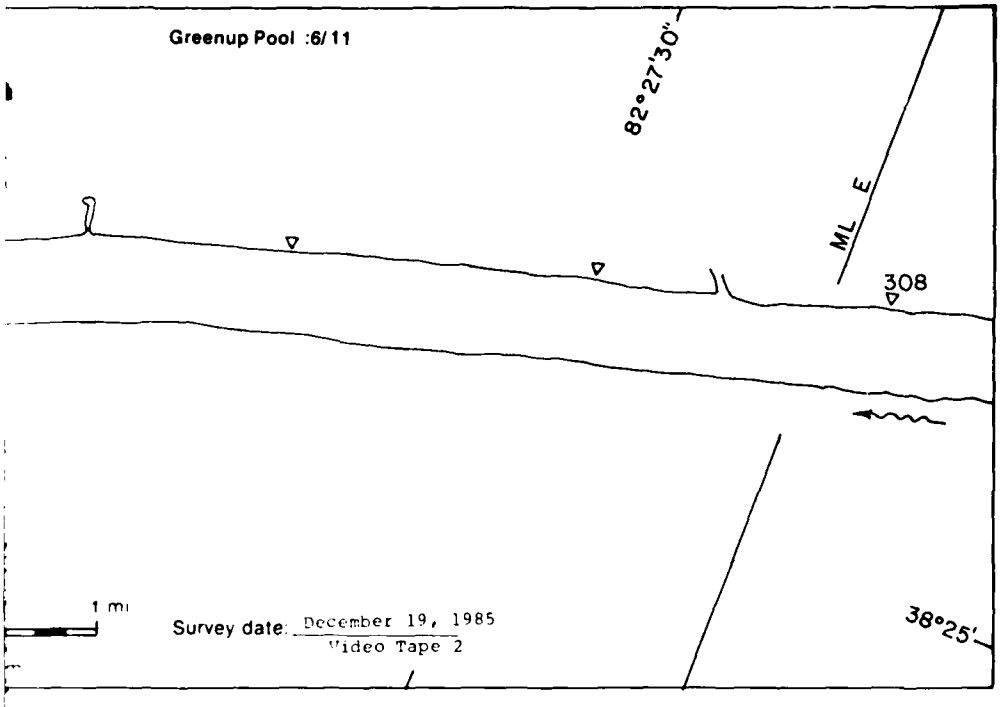

5/11
302
ML D
N
Survey date: December 19, 1985
Video Tape 2
0
1 mi
0
1 km
82°22'30"
38°25'

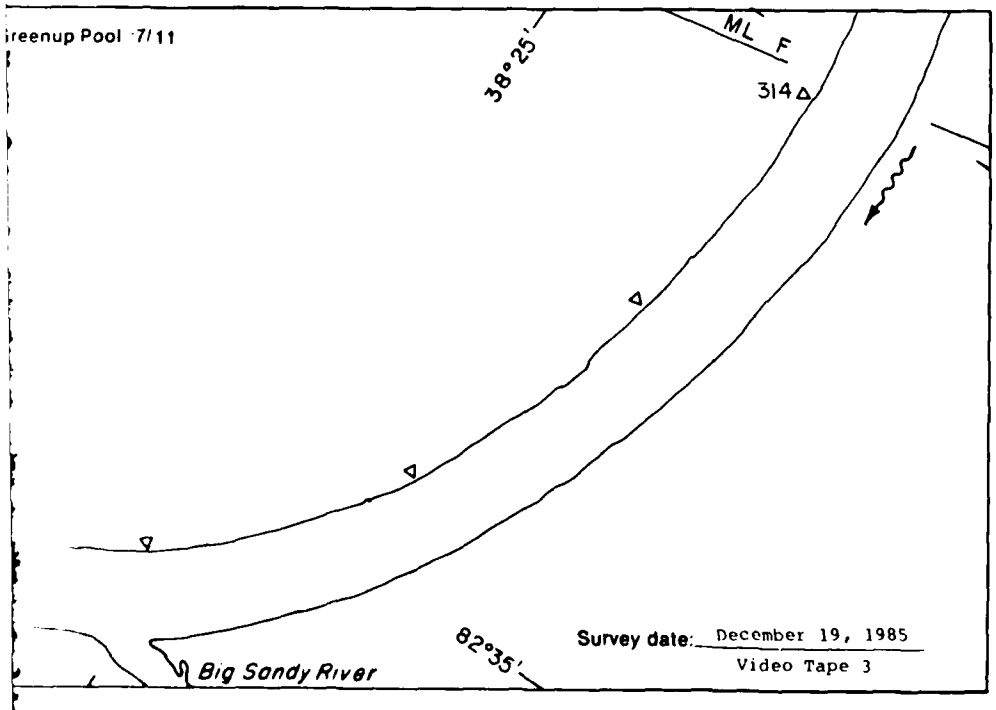

Greenup Pool :6/
82°30'
ML F
314
0
1 mi
0
1 km
Survey date:

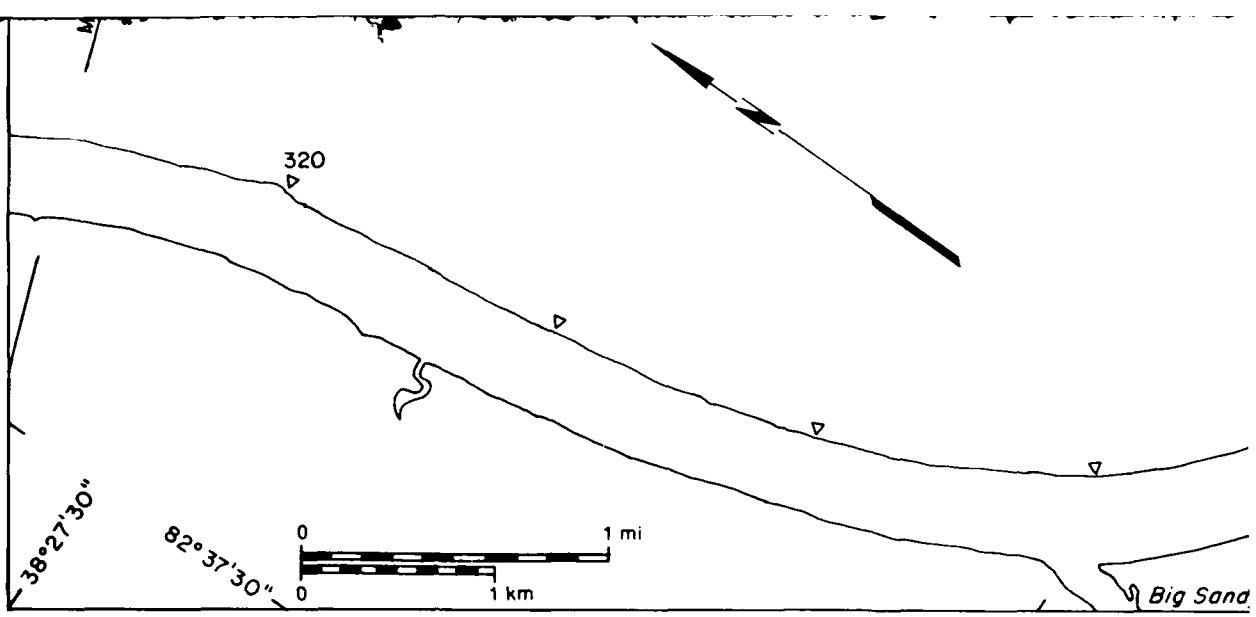

Greenup Pool :7/11
ML G
320
38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sandy Ri

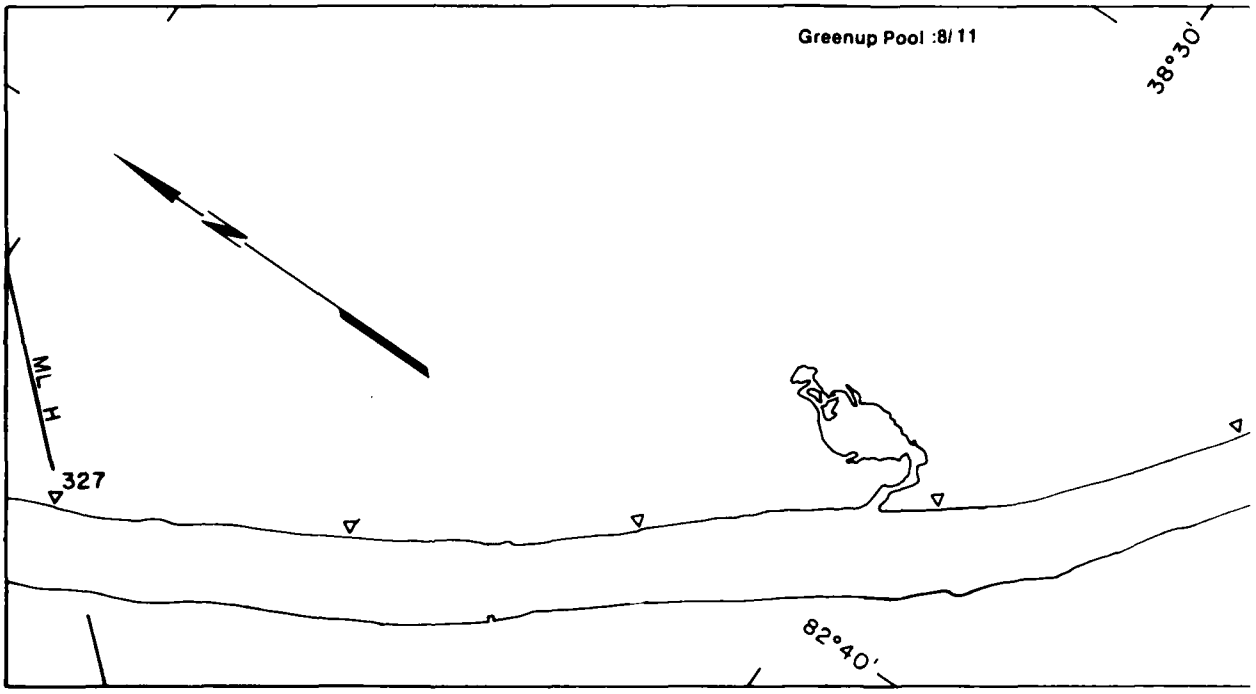
Greenup Pool :8/11
30'

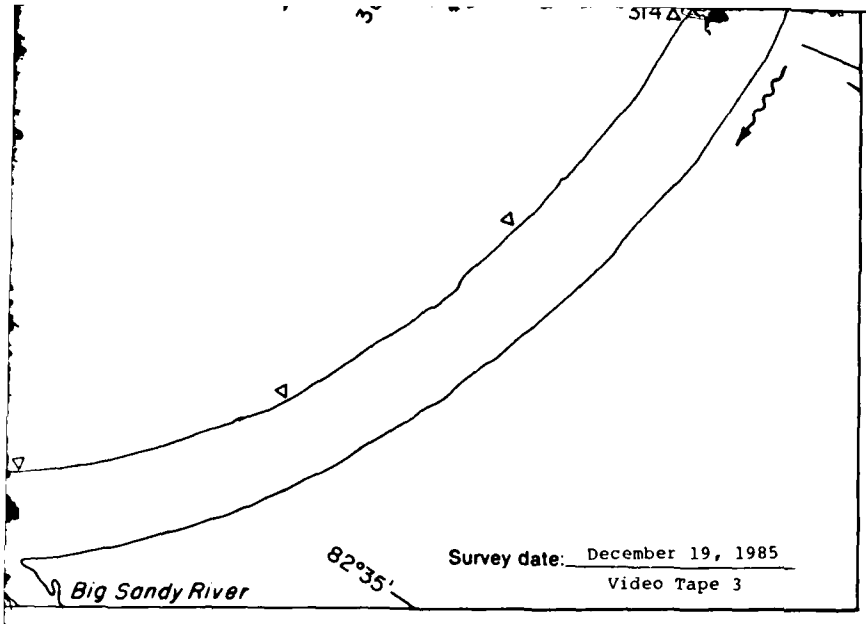
19 December 1985

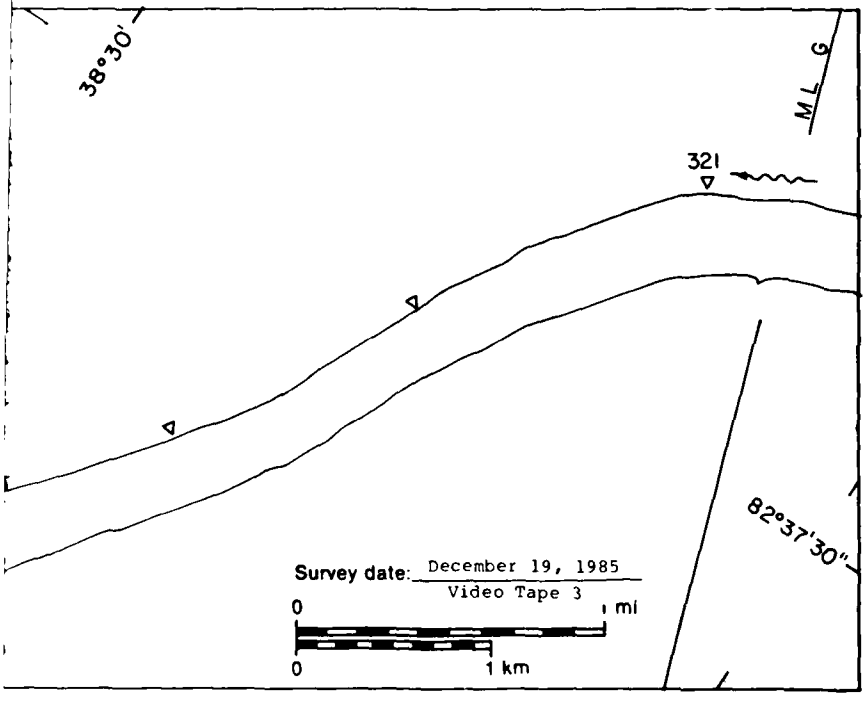




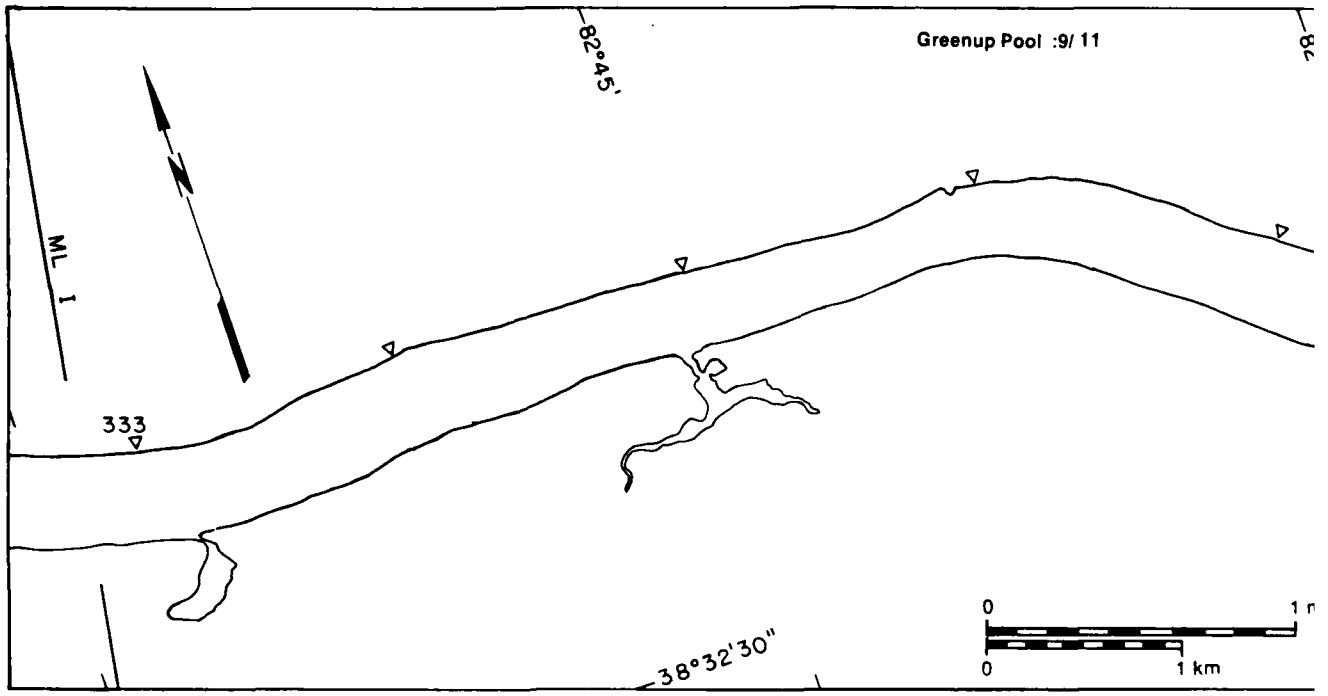

320
38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sand

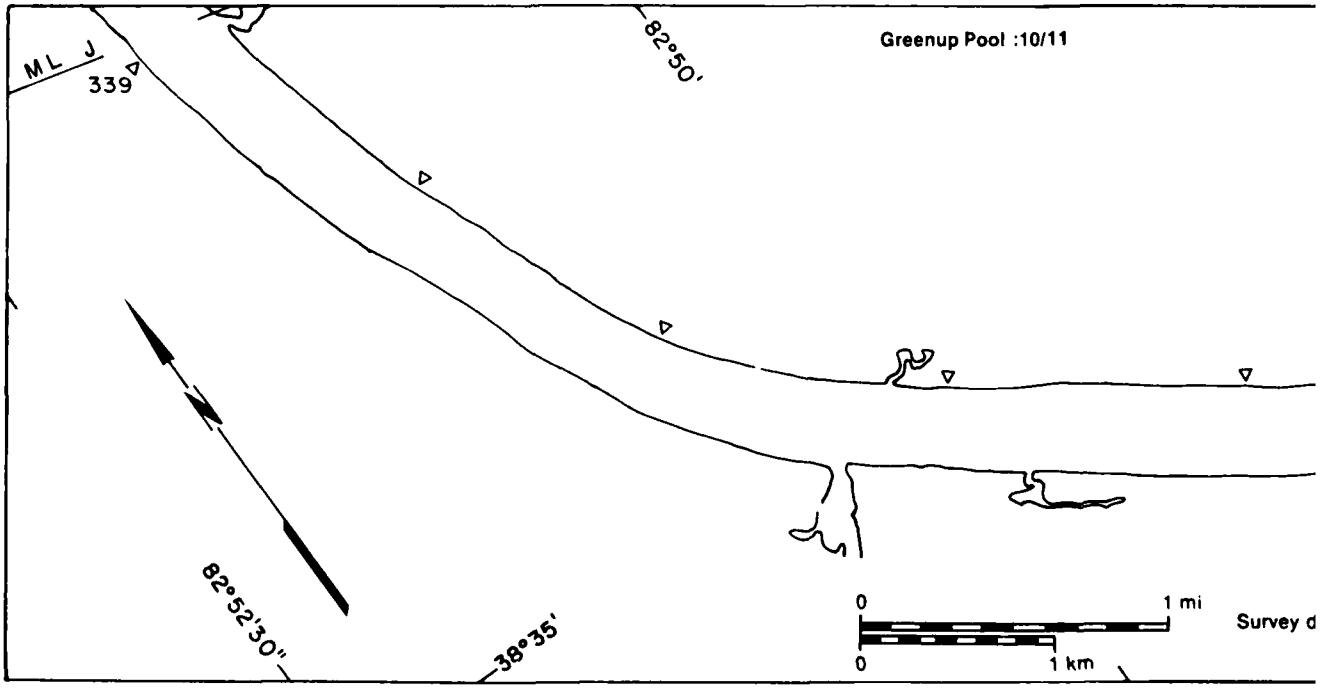

Greenup Pool :8/ 11
38°30'
MLH
327
82°40'

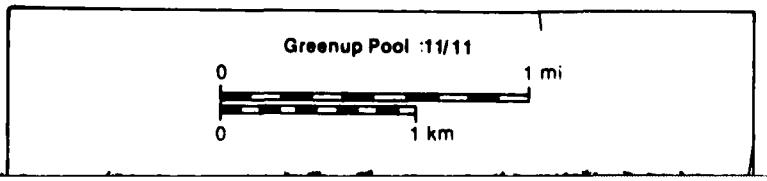

Big Sandy River
82°35'
Survey date: December 19, 1985
Video Tape 3


38°30'
M L G
321
82°37'30"
Survey date: December 19, 1985
Video Tape 3
0
1 mi
0
1 km

19 December 1985

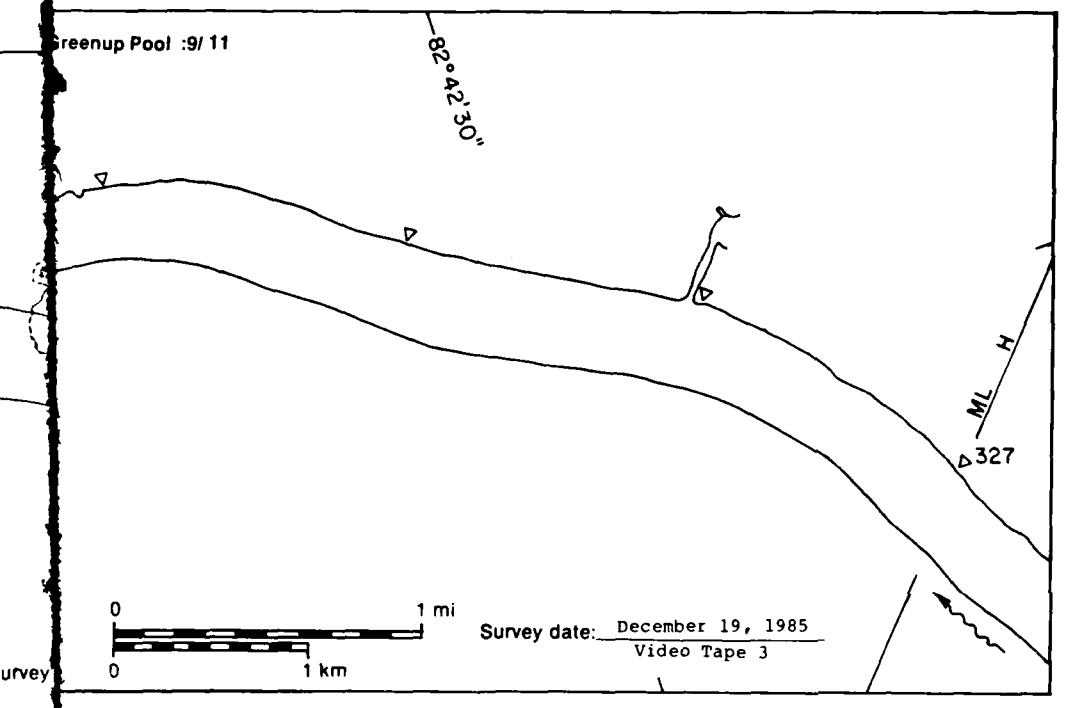


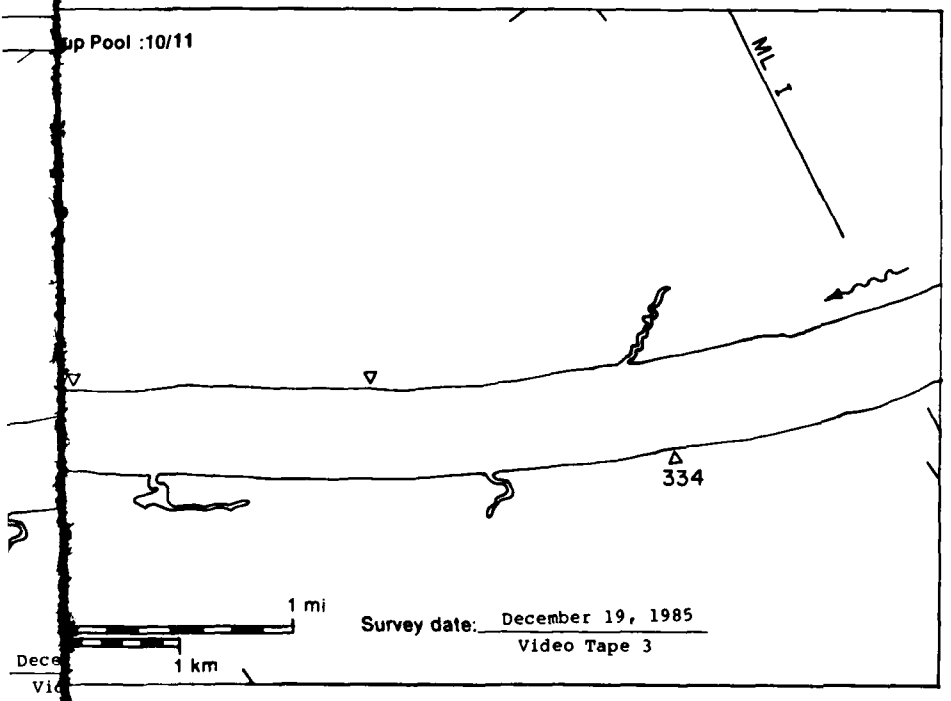




Greenup Pool

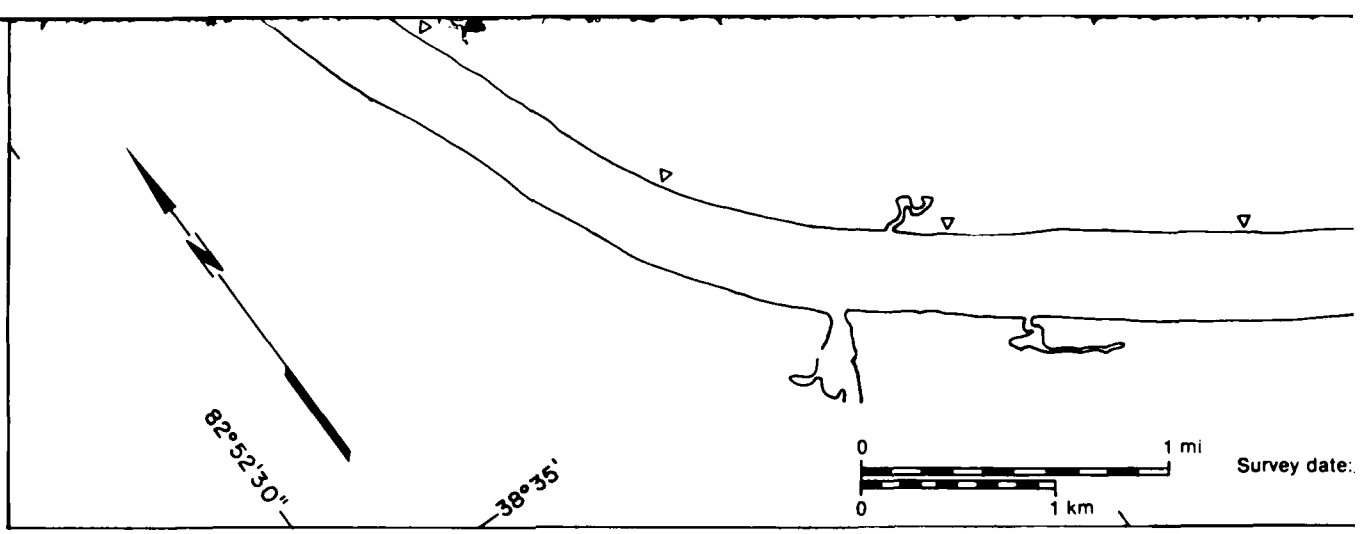
MAP UNITS

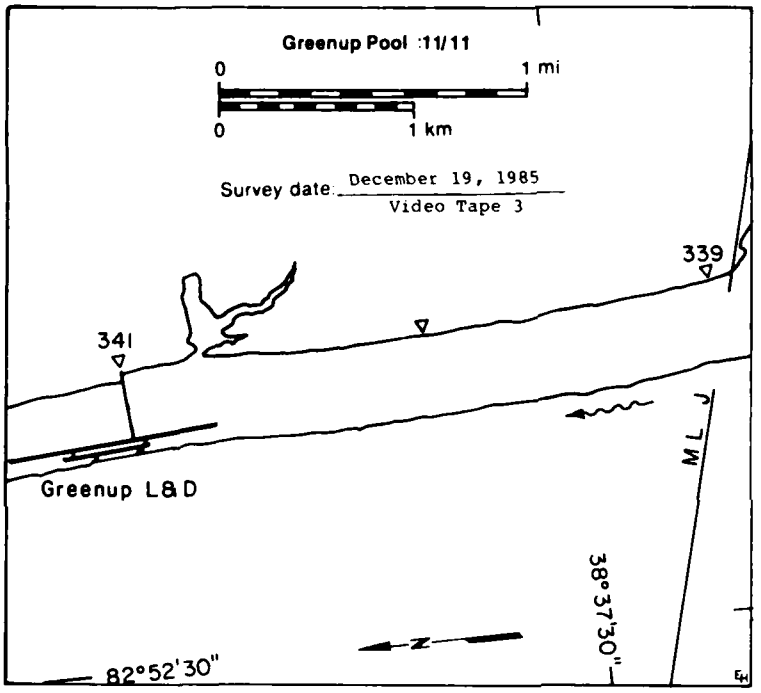




Greenup Pool

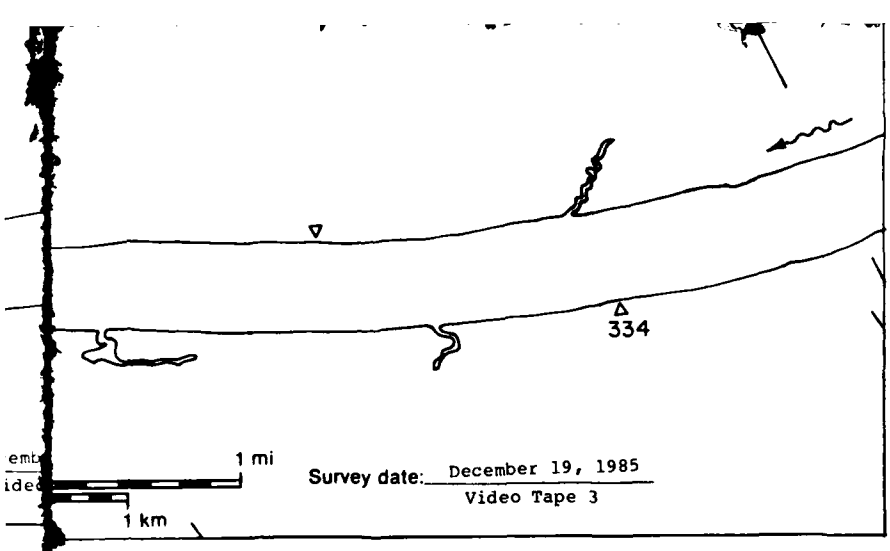
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	41.19	NA





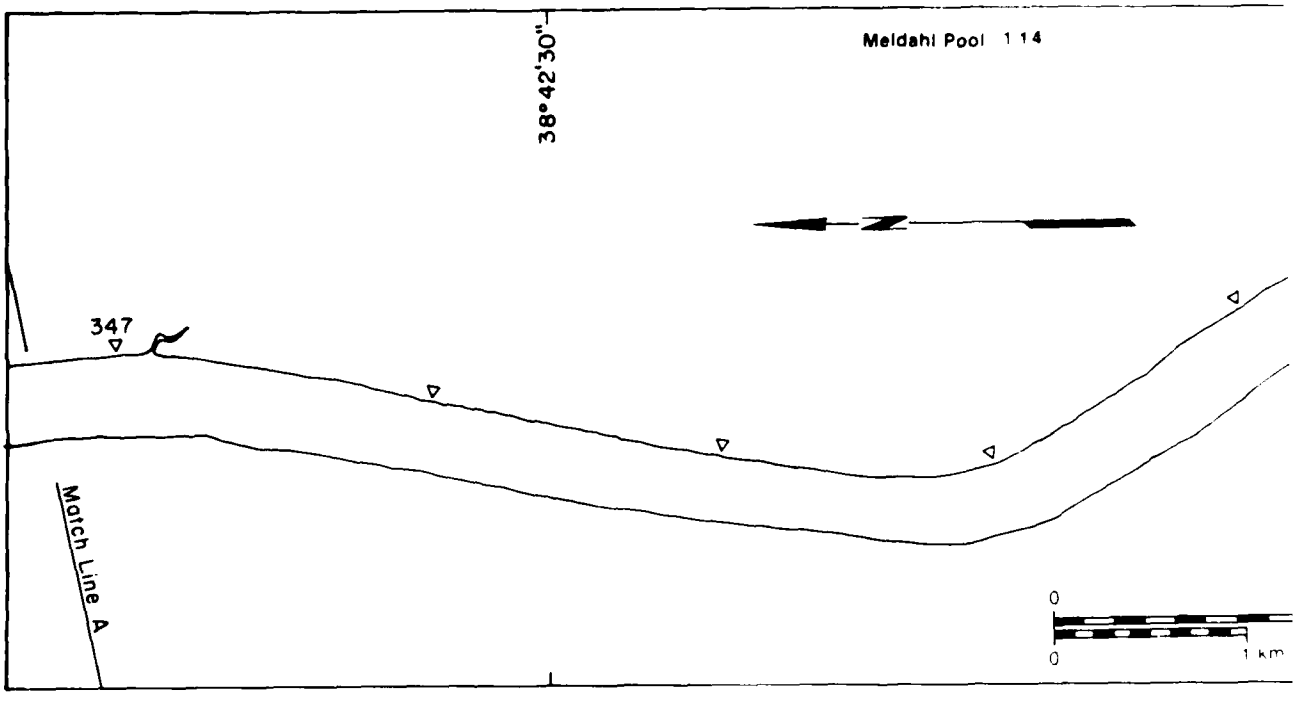
Greenup Pool

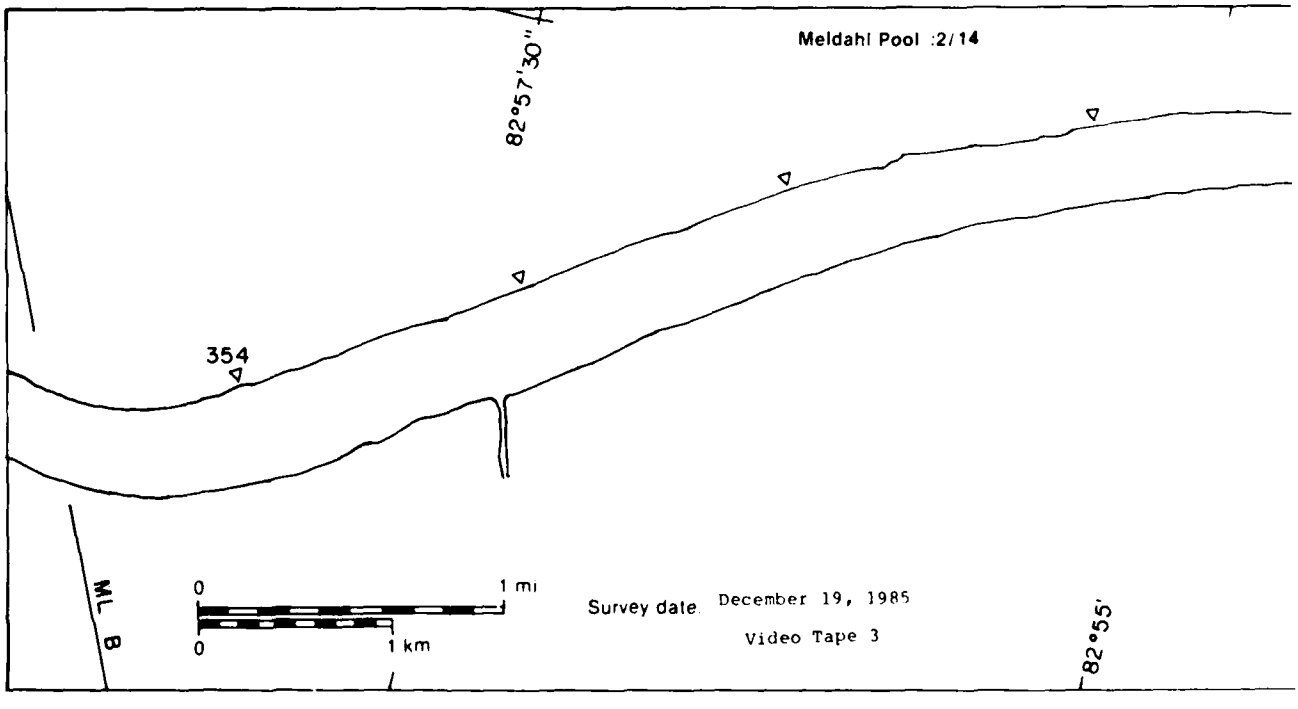
MAP UNITS		Area (m^2 x 10^6)
	Open water	41.19
	Solid ice cover	0.00
	Solid ice cover with open-water areas	0.00
	Fragmented ice cover	0.00
	Fragmented ice cover with open-water areas	0.00
	Ice floes or frazil slush and pans	0.00
	Total area (m^2 x 10^6)	41.19

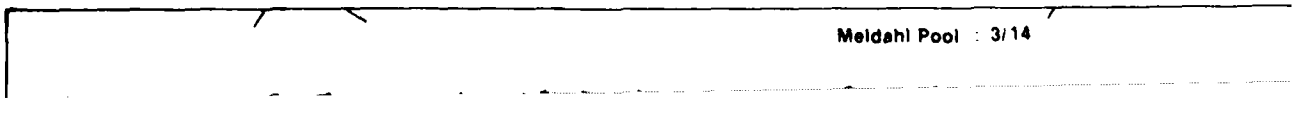


Greenup Pool

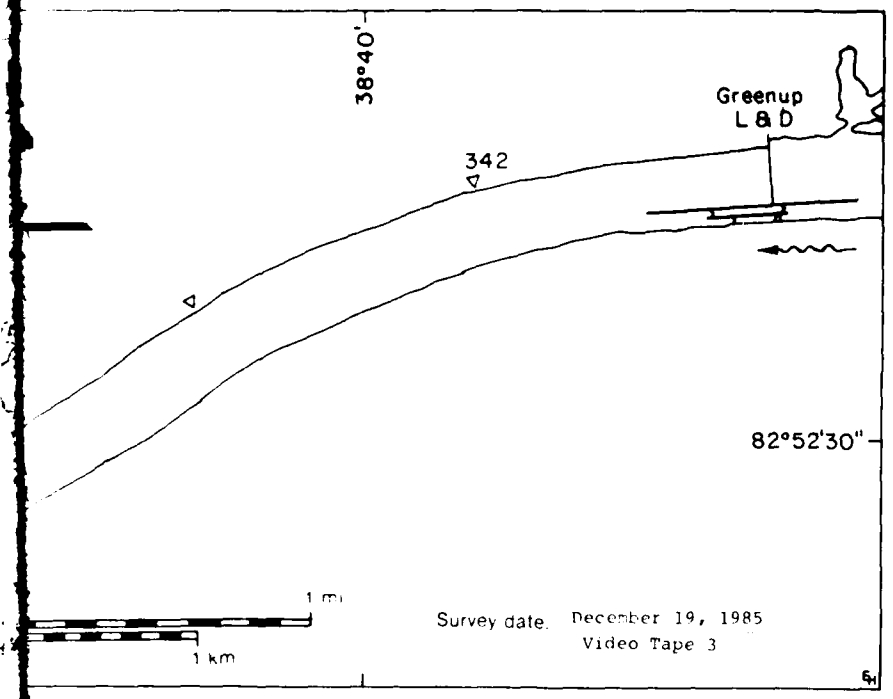
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	41.19	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	41.19	

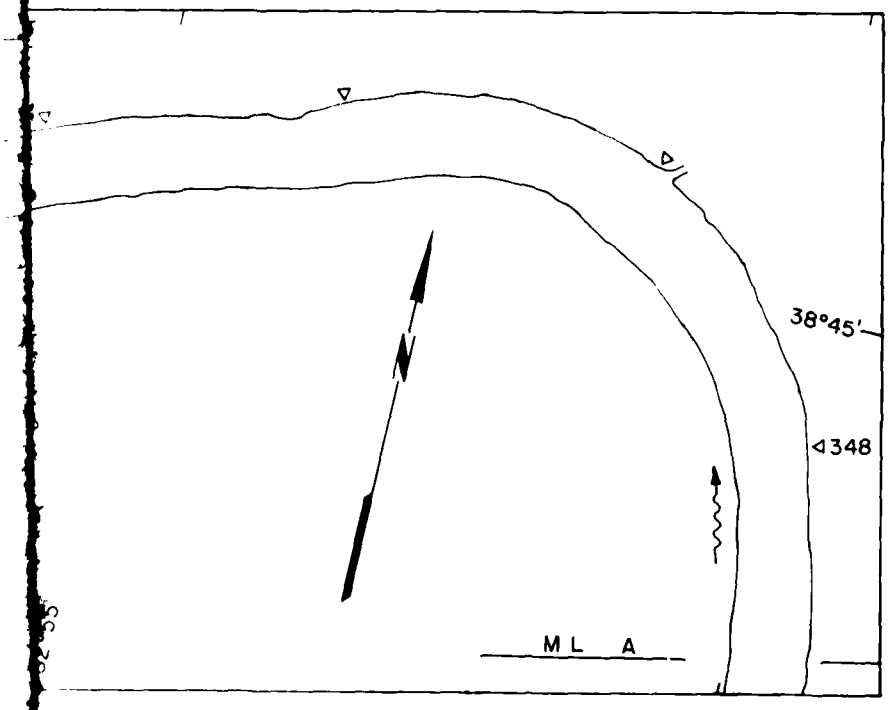

Meldahl Pool 1 14
38°42'30"
347
Match Line A
0
0
1 km

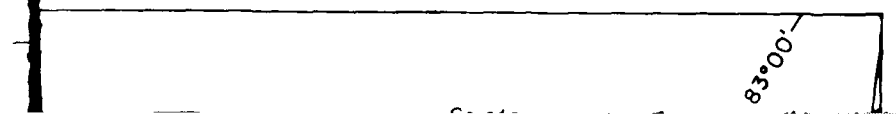

Meldahl Pool :2/14
82°57'30"
354
ML B
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 3
82°55'

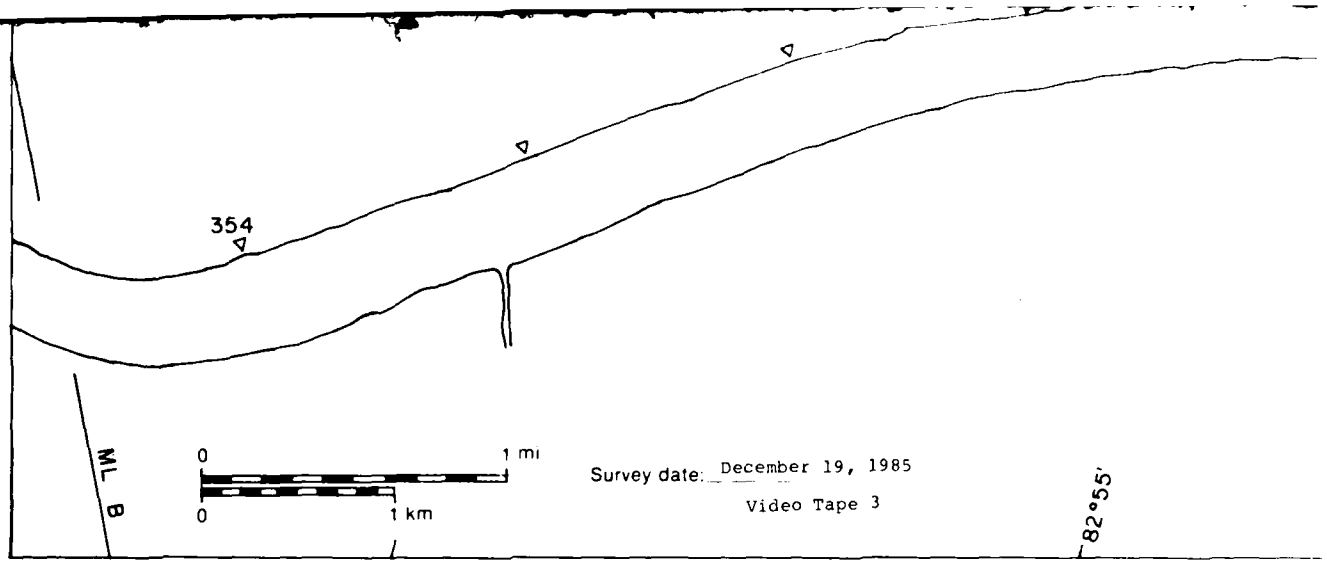

Meldahl Pool : 3/14

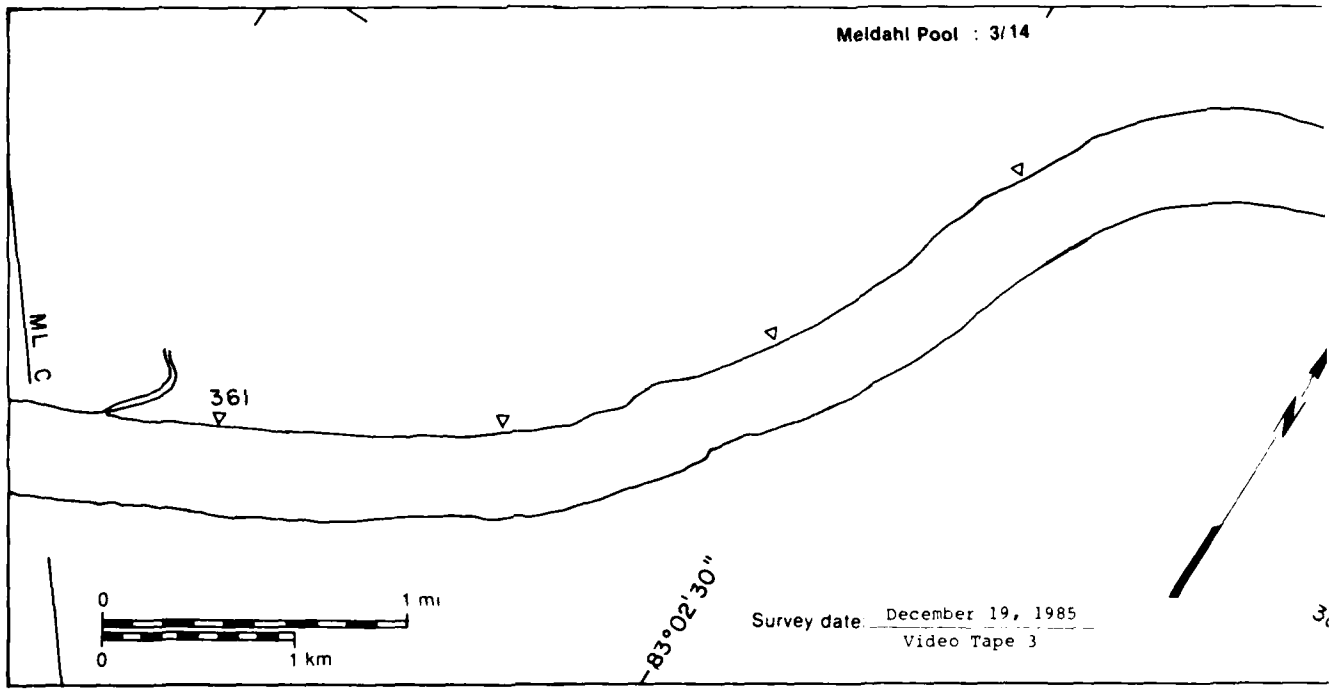
19 December 1985

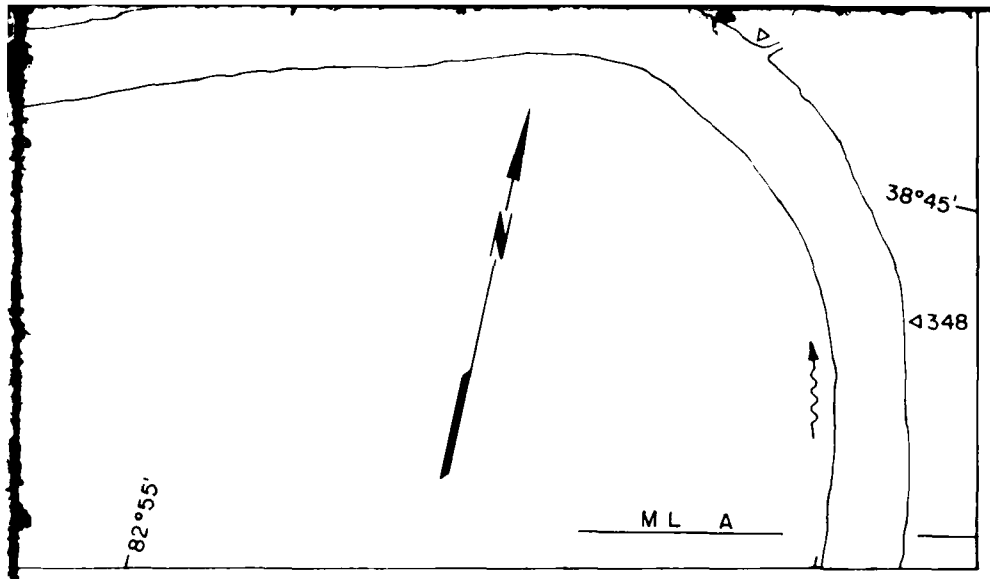


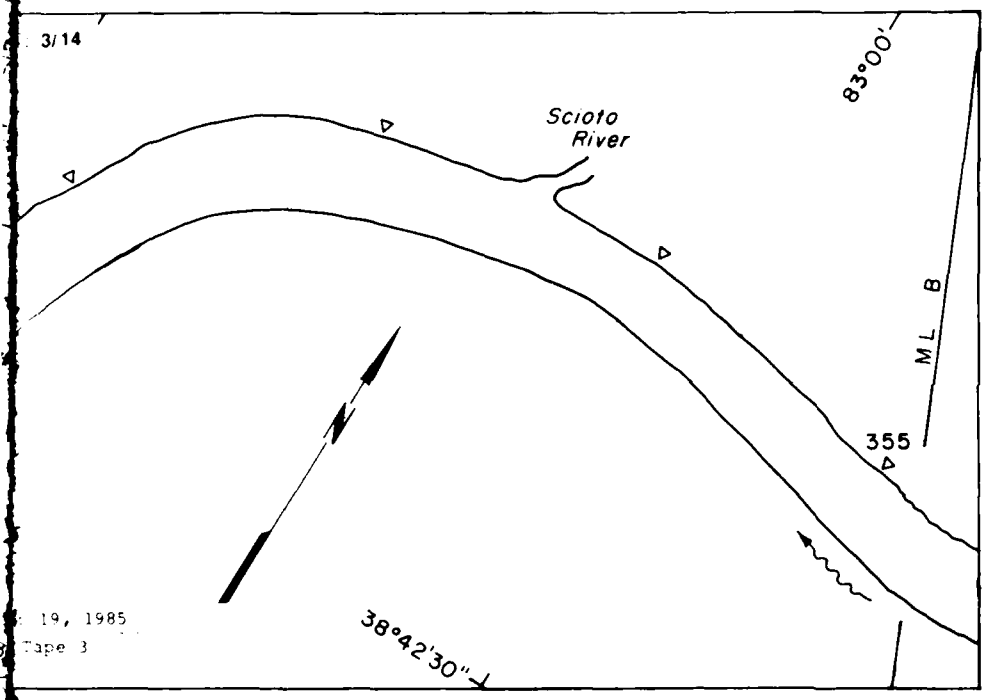





354
ML B
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 3
82°55'

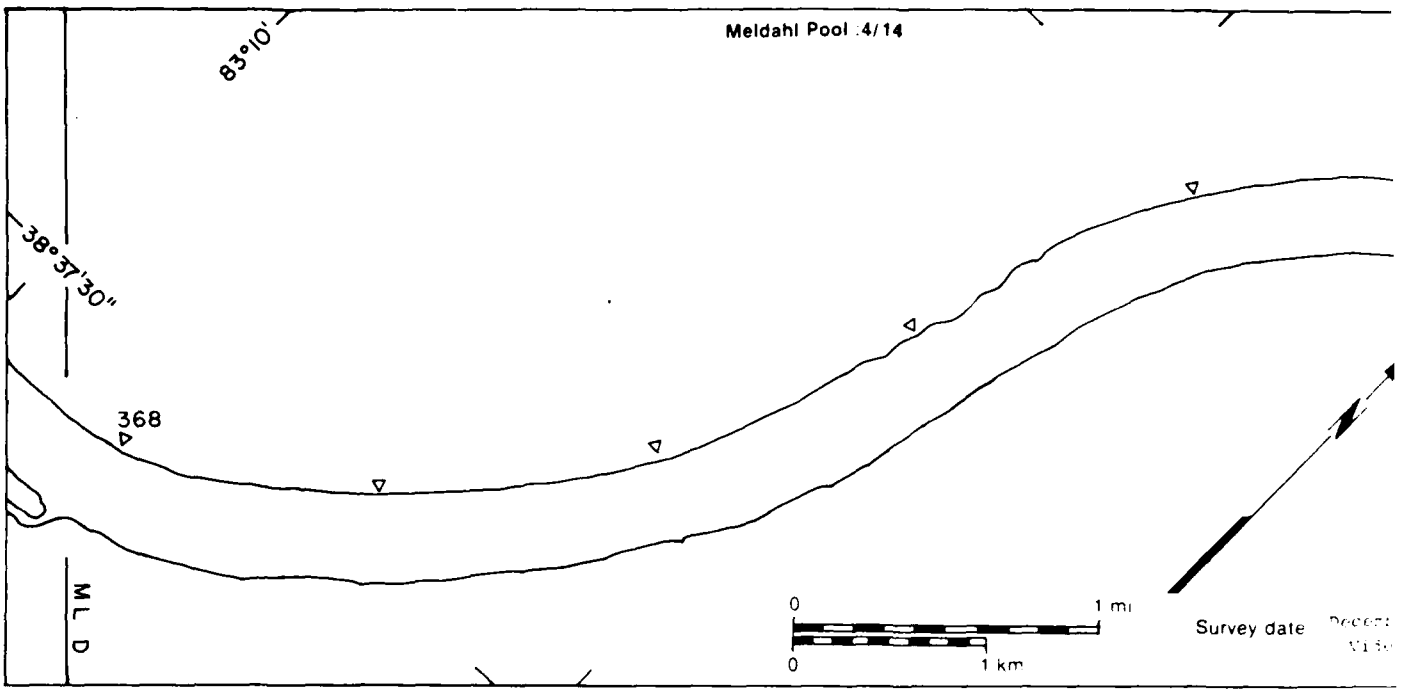

Meldahl Pool : 3/14
ML C
361
0
1 mi
0
1 km
83°02'30"
Survey date: December 19, 1985
Video Tape 3

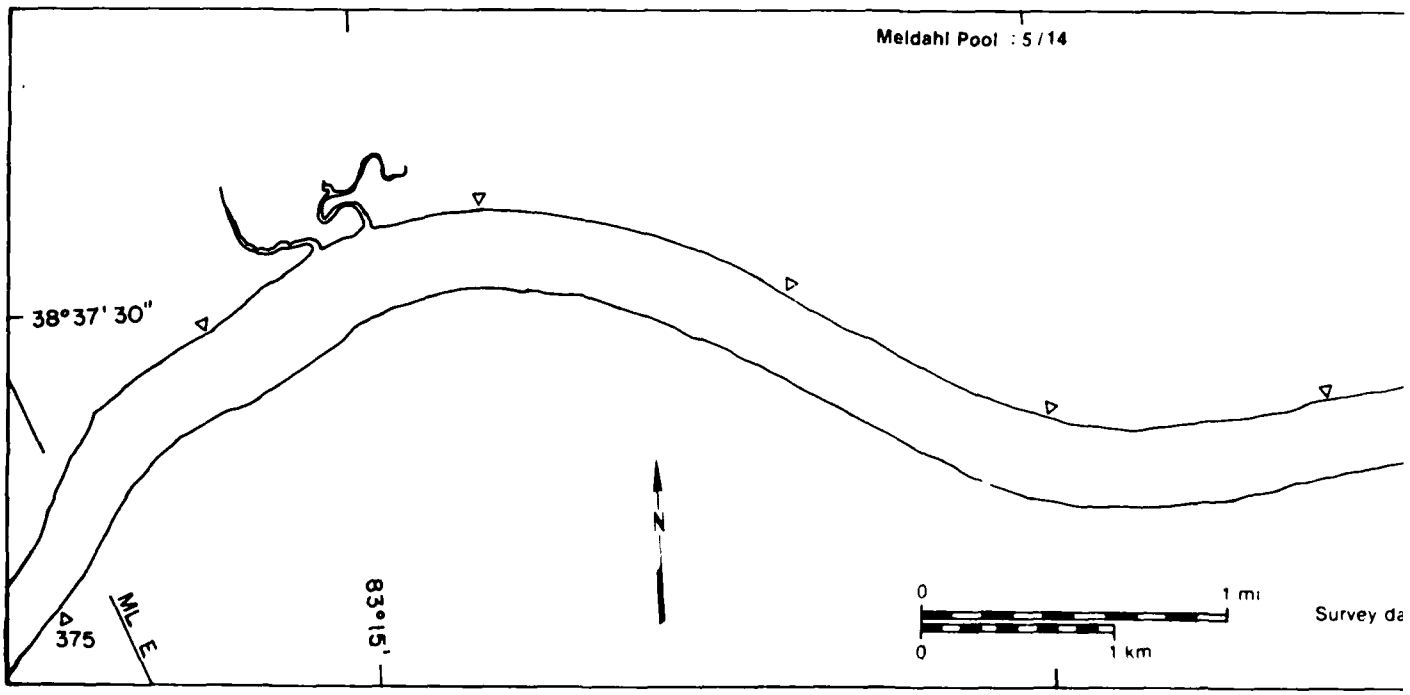


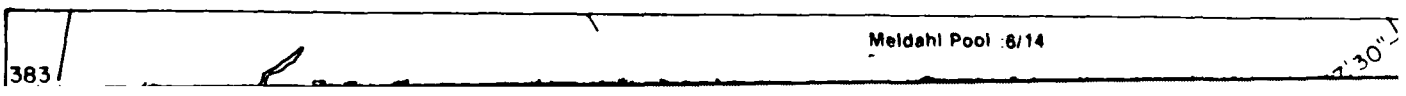


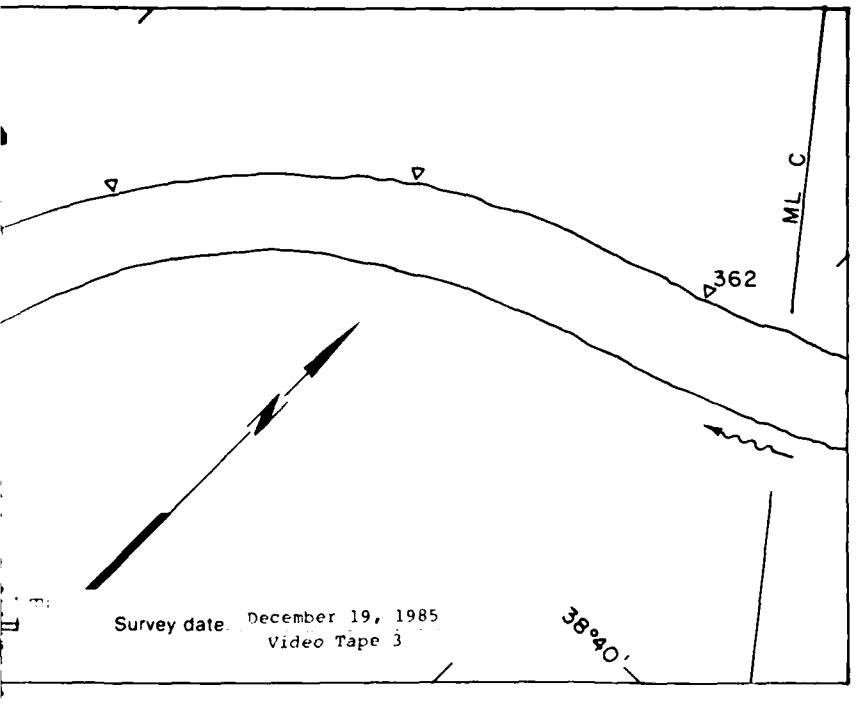
19, 1985
Tape 3

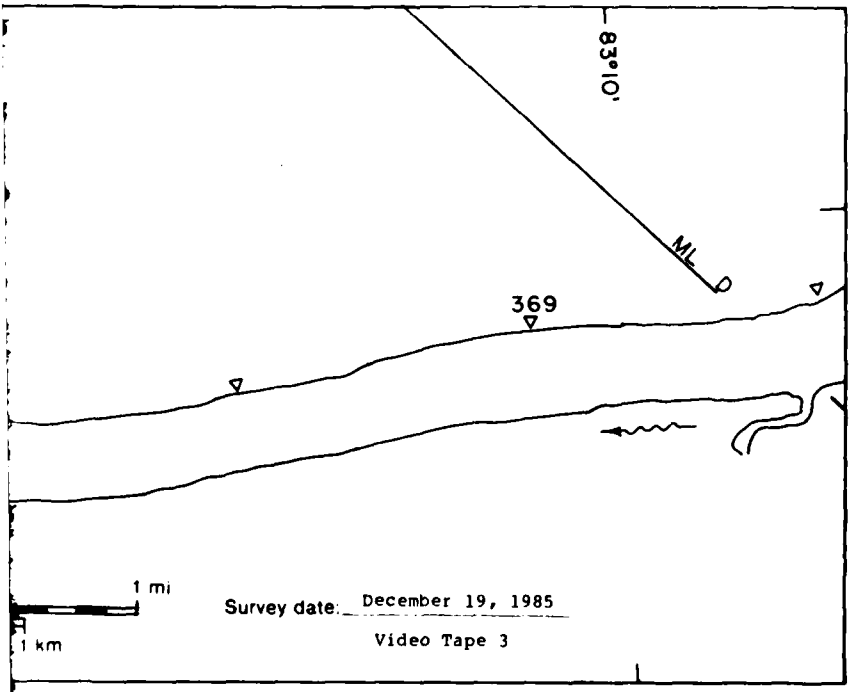
19 December 1985

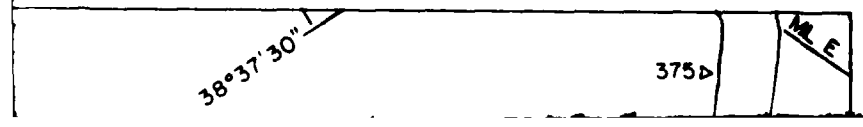


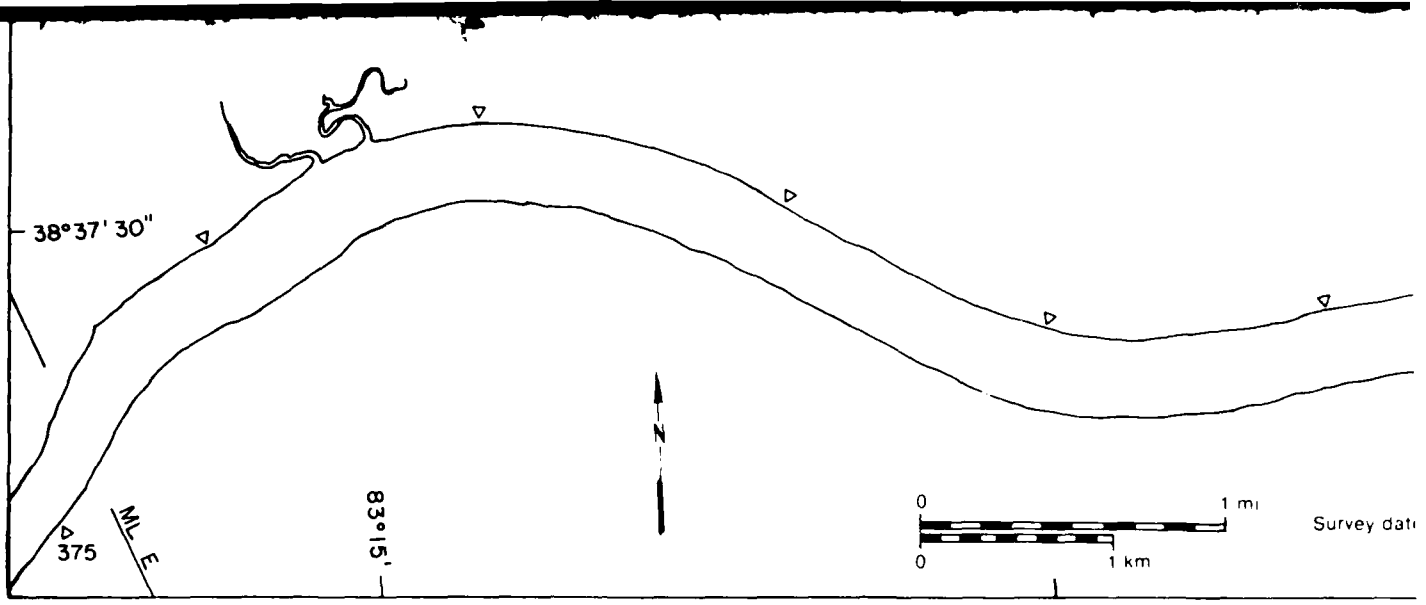


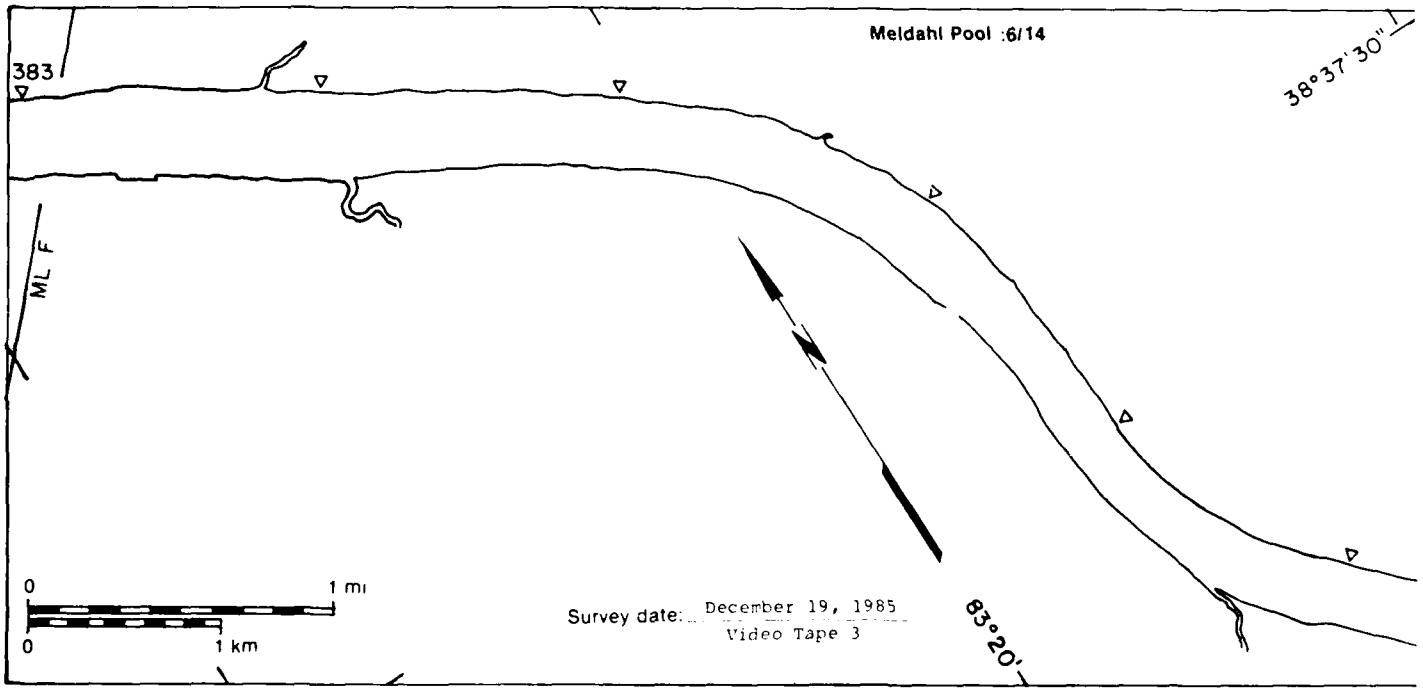


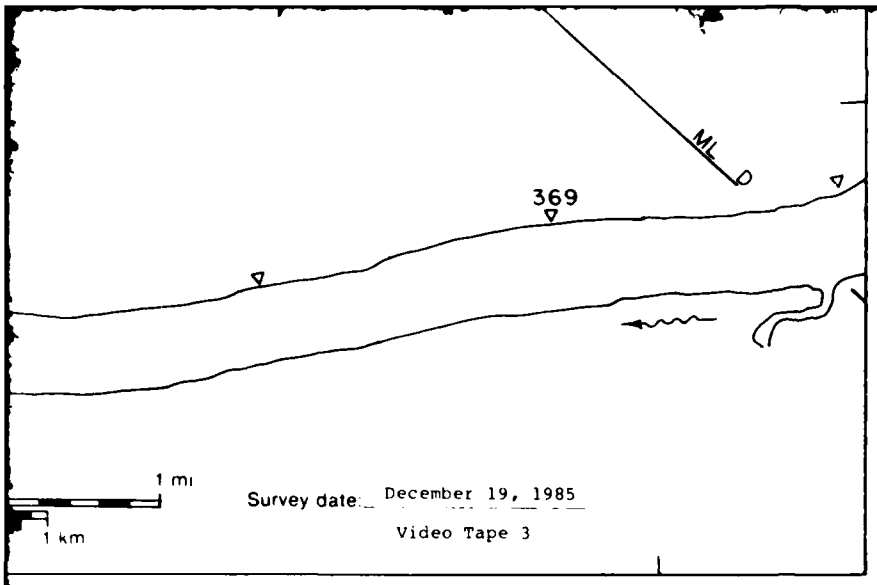

ML C
362
Survey date: December 19, 1985
Video Tape 3
38°40'

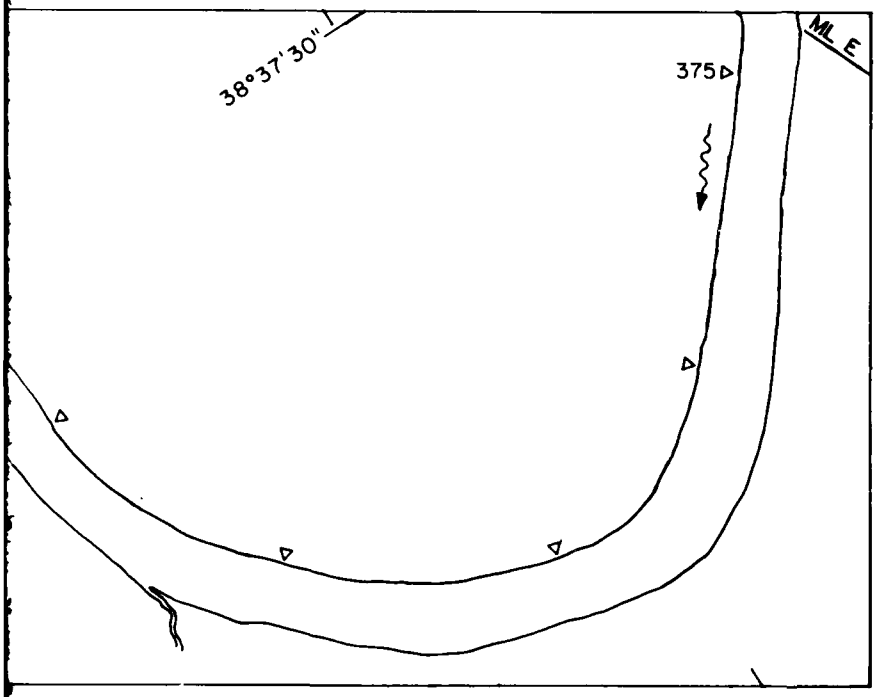

83°10'
ML
369
1 mi
1 km
Survey date: December 19, 1985
Video Tape 3

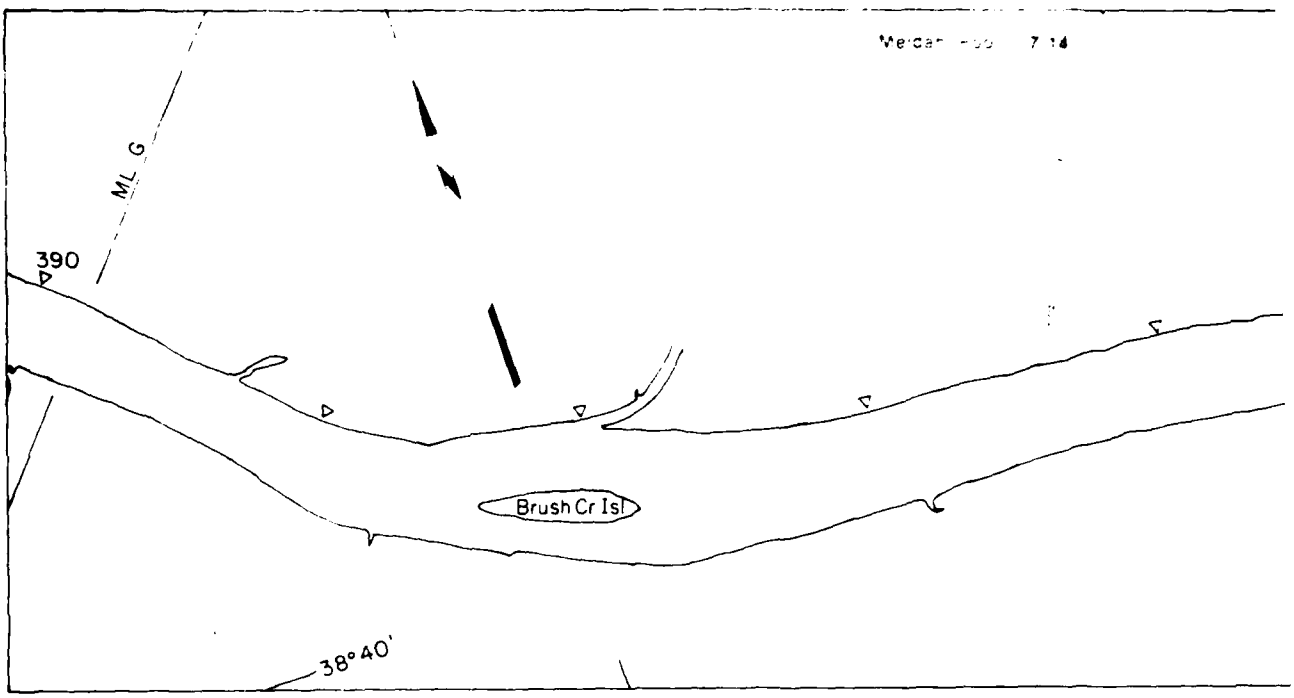

38°37'30"
375
ML E

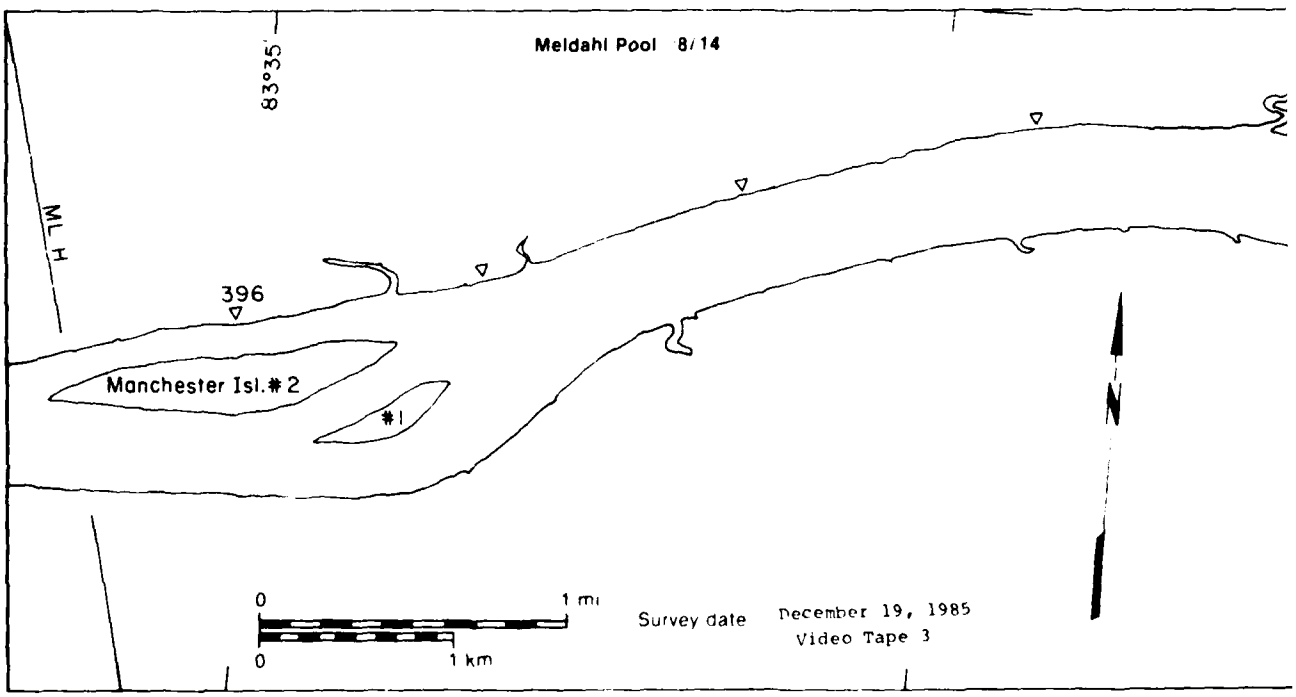

38°37' 30"
375
ML E
83°15'
N
0
1 mi
0
1 km
Survey dat

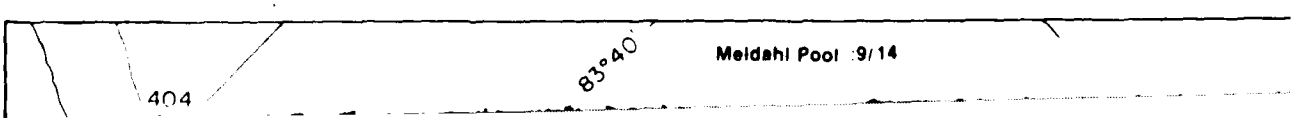

Meldahl Pool :6/14
383
38°37' 30"
ML F
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 3
83°20'


ML
369
1 mi
1 km
Survey date: December 19, 1985
Video Tape 3

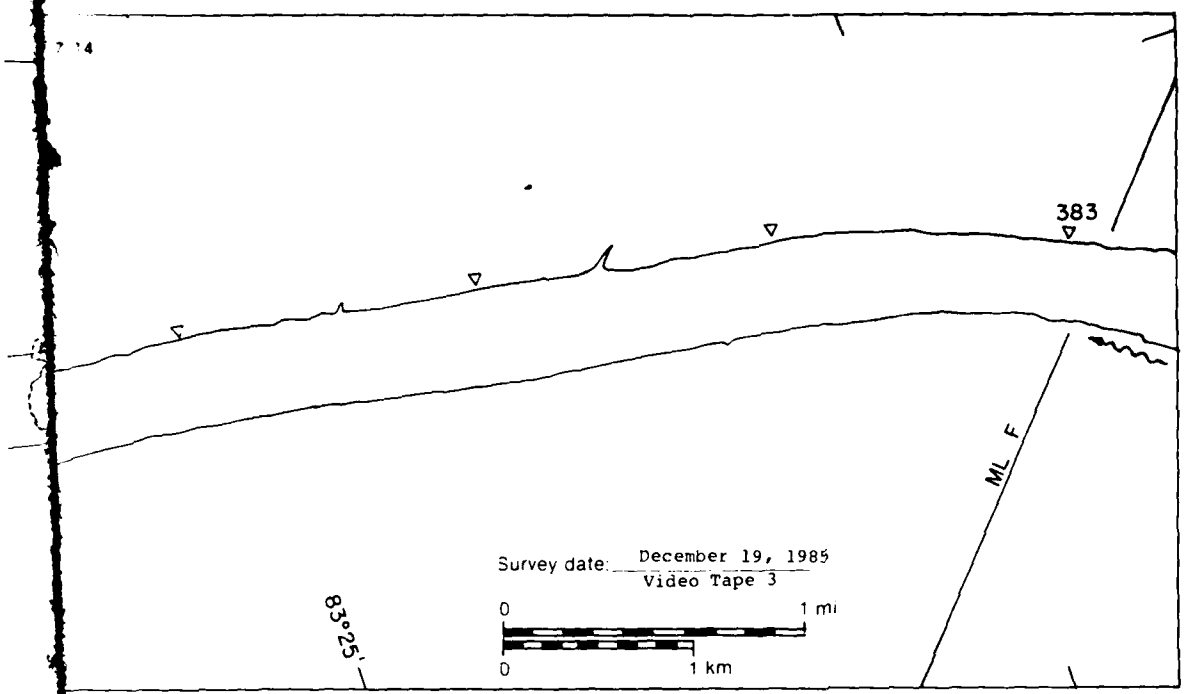

38°37'30"
375
ML E

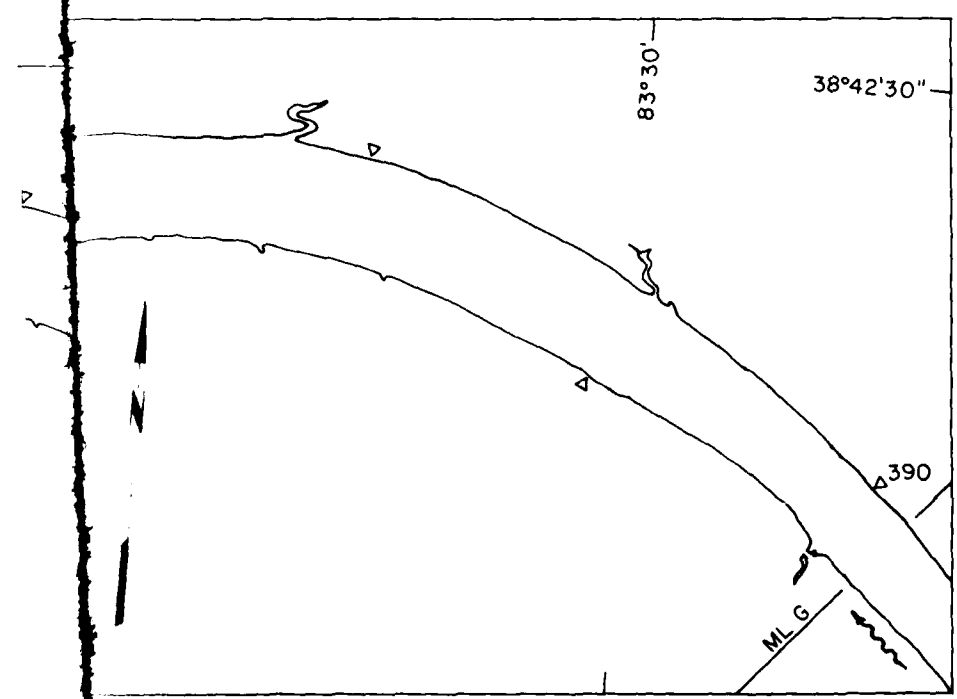

ML G
390
Brush Cr Isl
38°40'

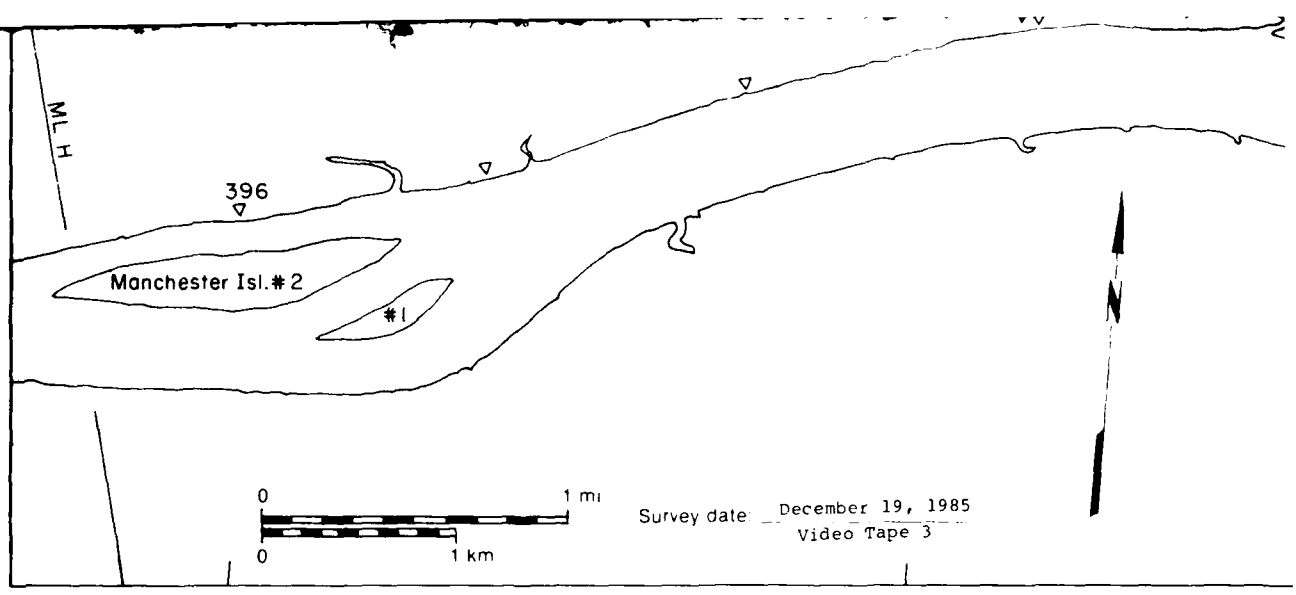

Meldahl Pool 8/14
83°35'
ML H
396
Manchester Isl.#2
#1
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 3

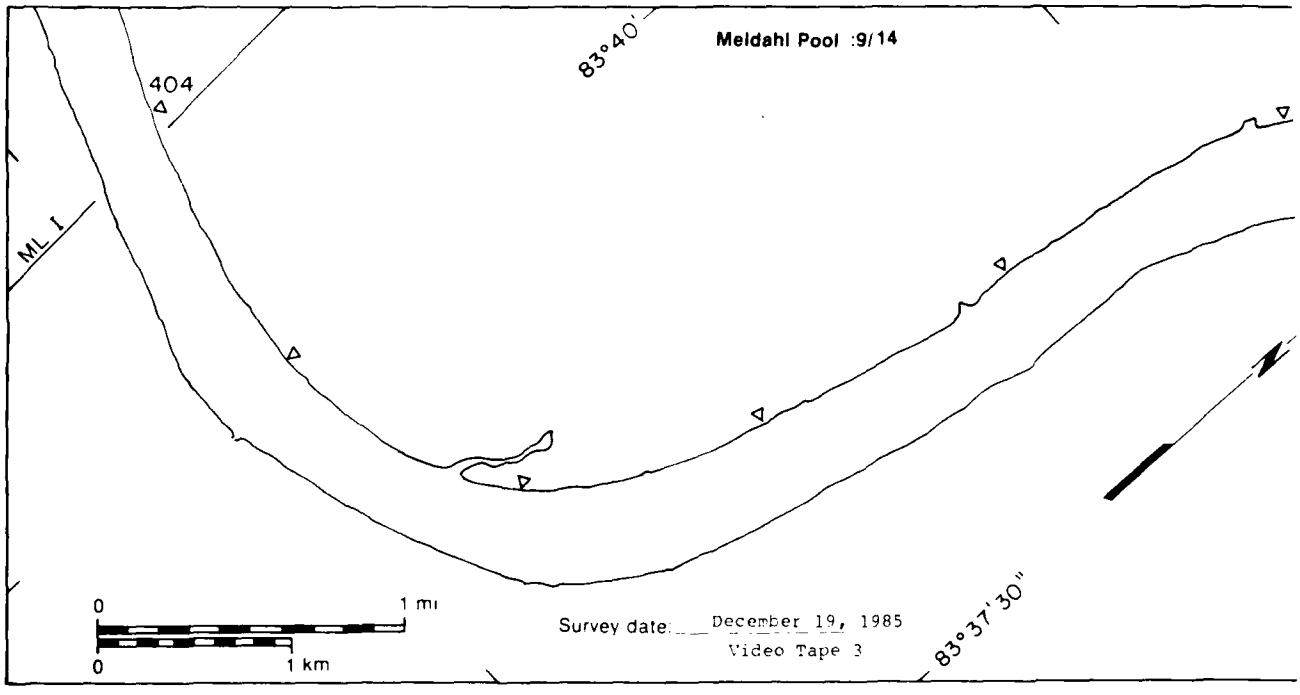

Meldahl Pool 9/14
83°40'
404

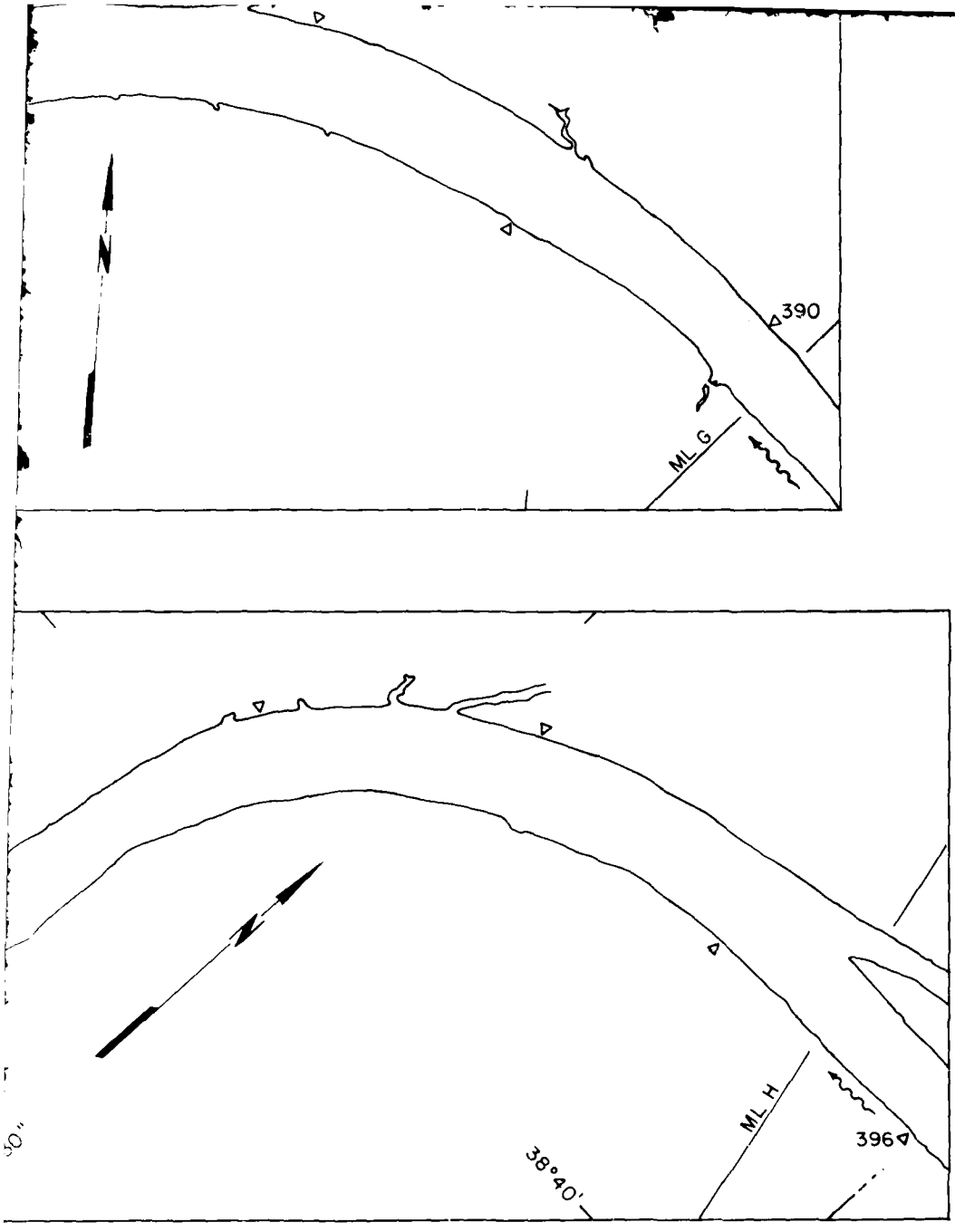
19 December 1985



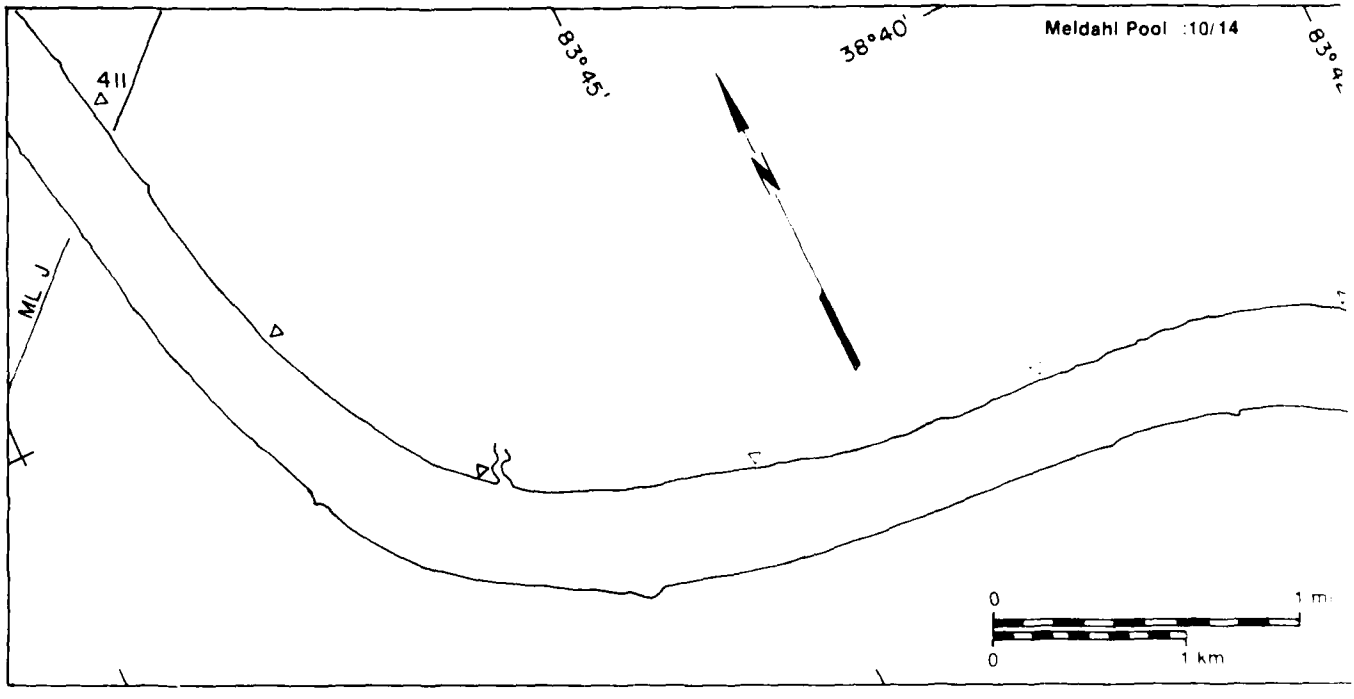


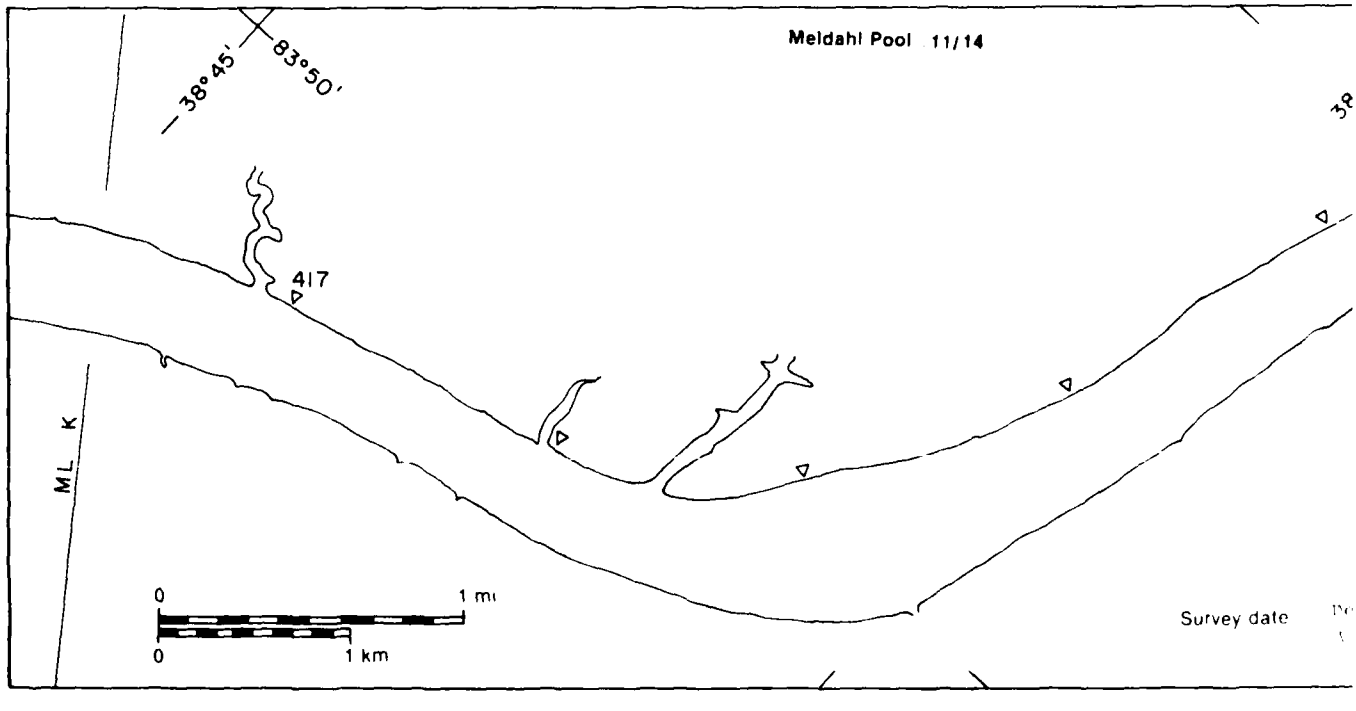

ML H
396
Manchester Isl.# 2
#1
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 3

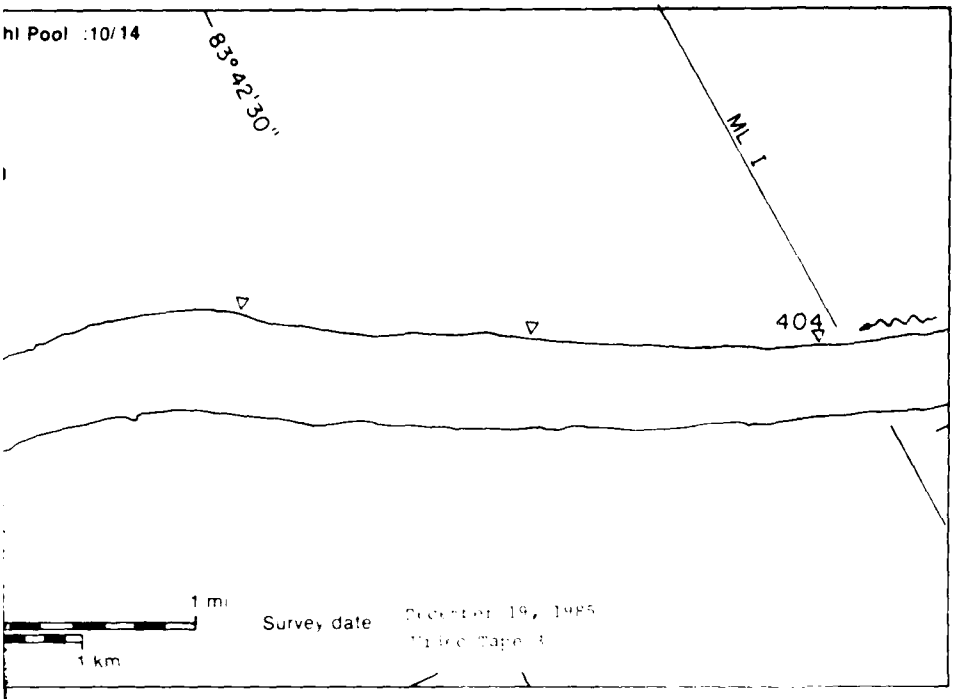

83°40'
Meldahl Pool :9/14
404
ML I
0
1 mi
0
1 km
Survey date: December 19, 1985
Video Tape 3
83°37'30"

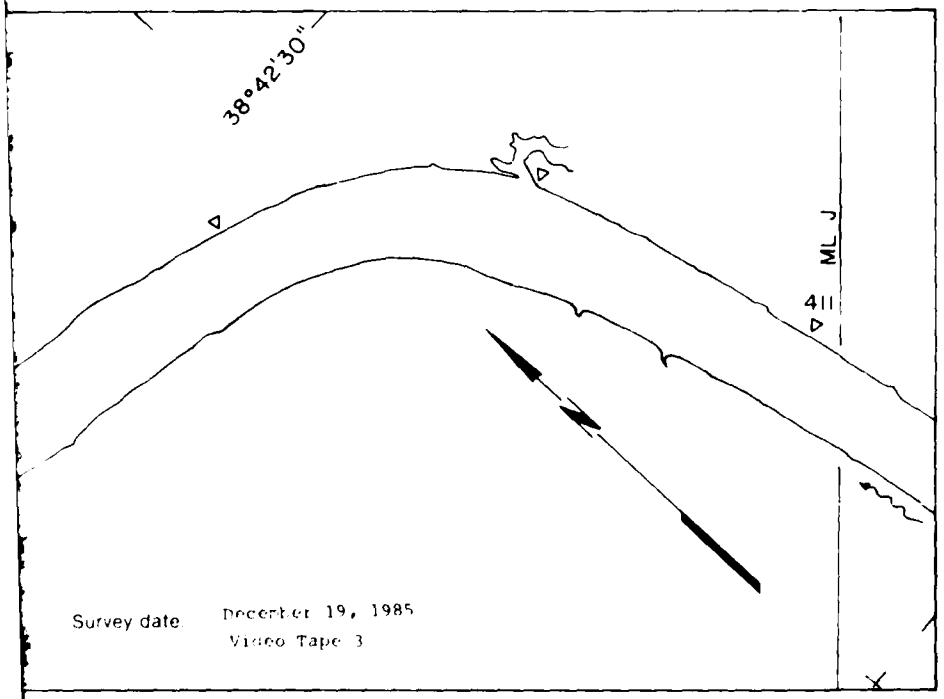

390
ML G
ML H
396
38°40'

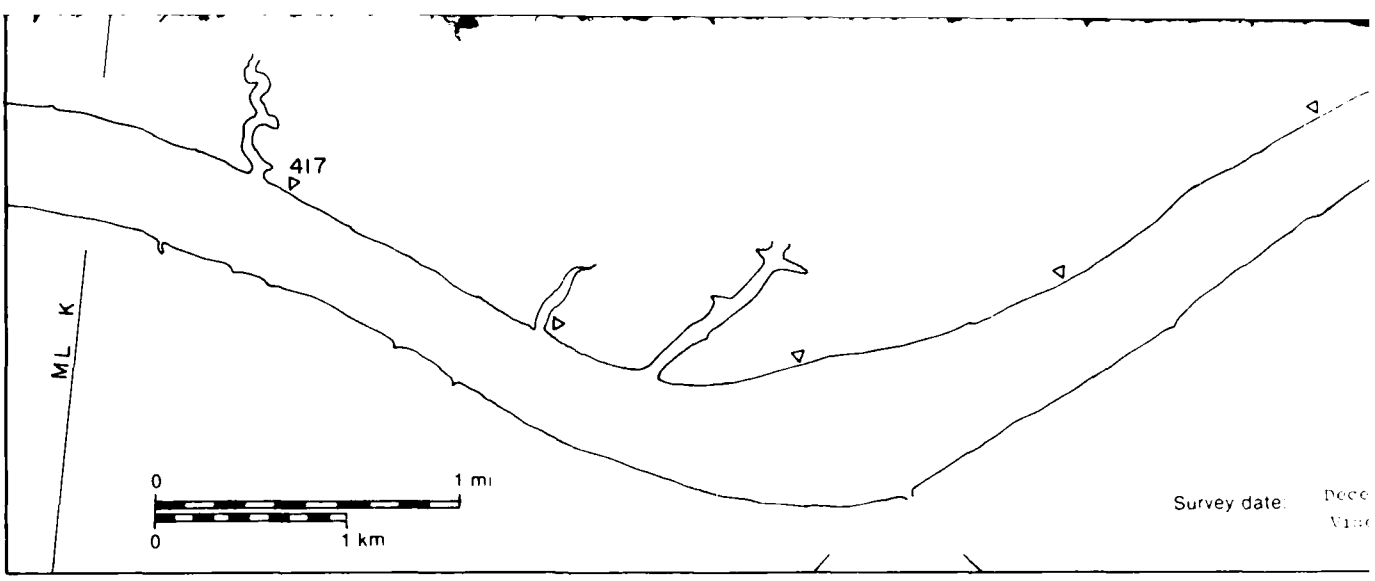
19 December 1985

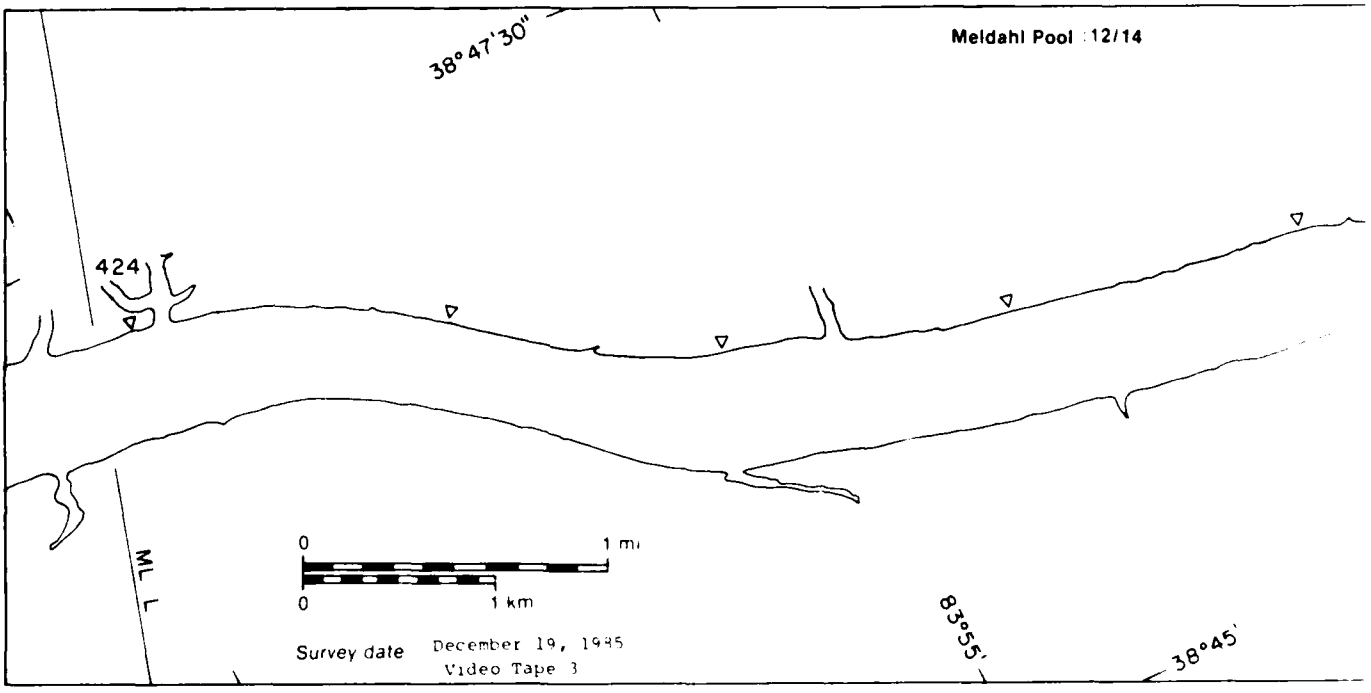


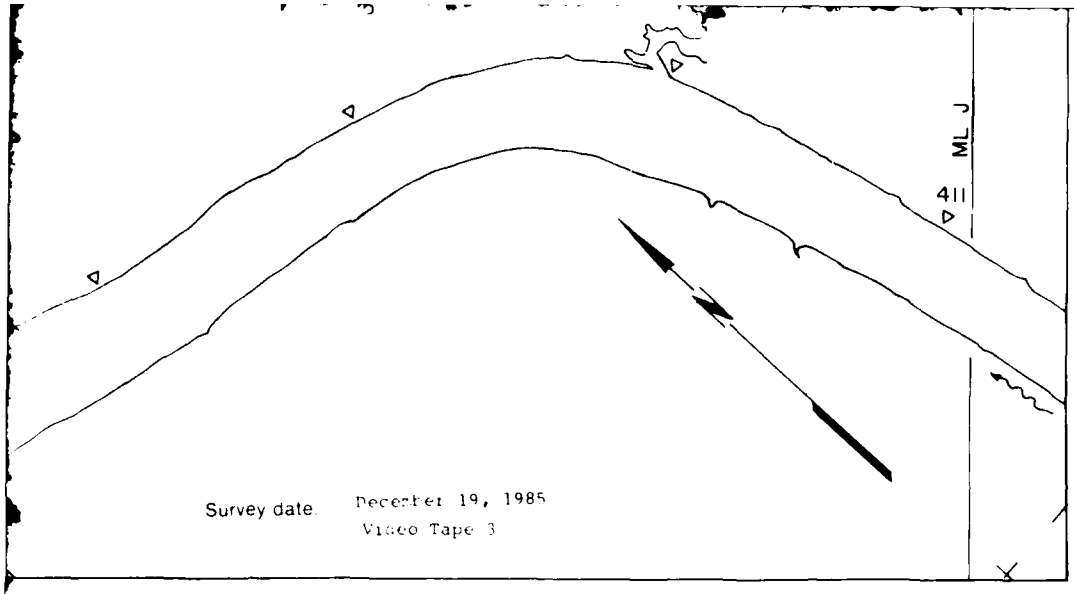


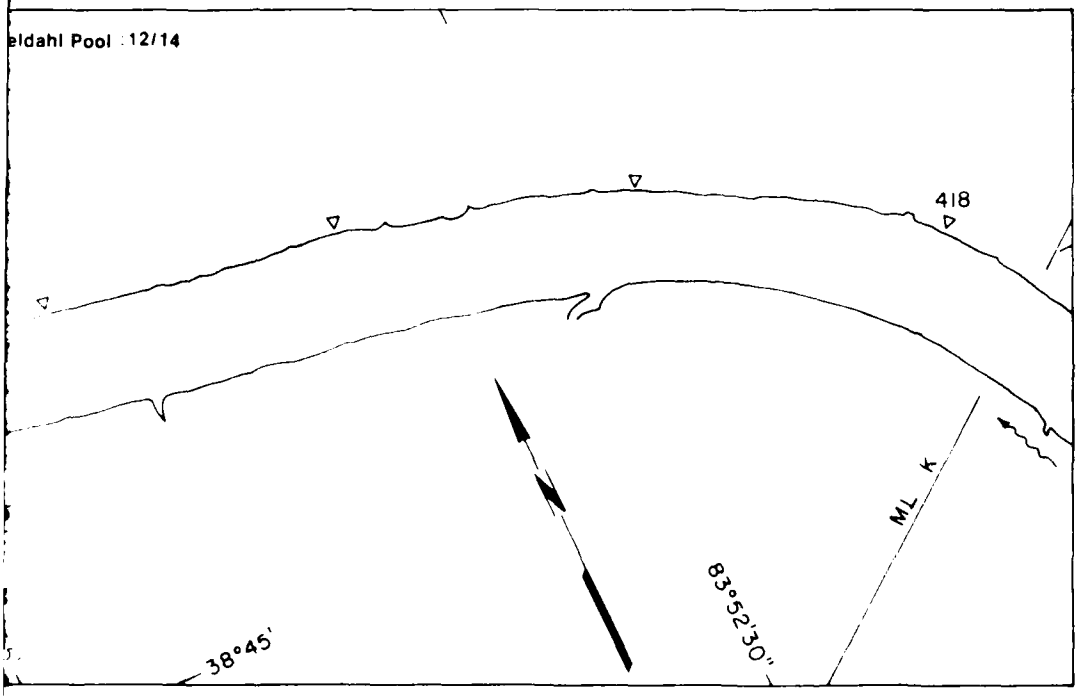

hl Pool :10/14
83°42'30"
ML I
404
1 mi
1 km
Survey date

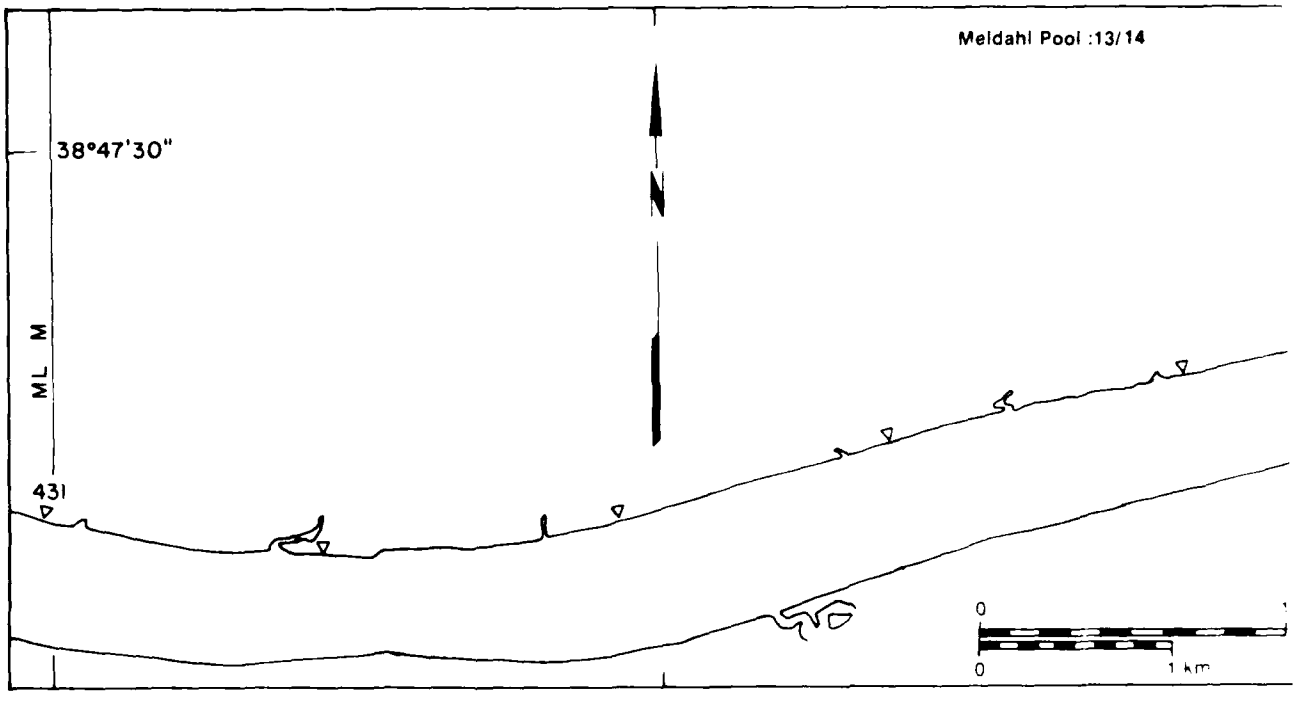

38°42'30"
ML J
411
Survey date
December 19, 1985
Video Tape 3

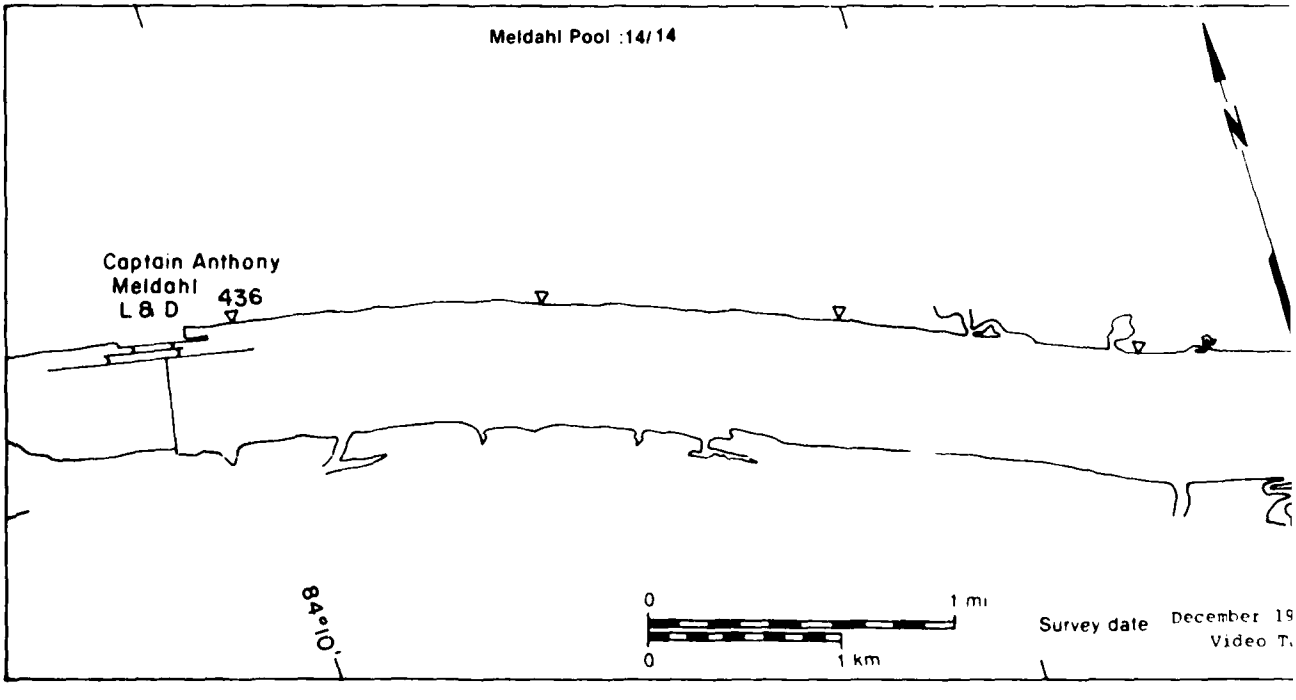

417
ML K
0
1 mi
0
1 km
Survey date:


38°47'30"
Meldahl Pool :12/14
424
ML L
0
1 mi
0
1 km
Survey date December 19, 1985
Video Tape 3
83°55'
38°45'


ML J
411
Survey date December 19, 1985
Video Tape 3


eldahl Pool 12/14
418
ML K
83°52'30"
38°45'



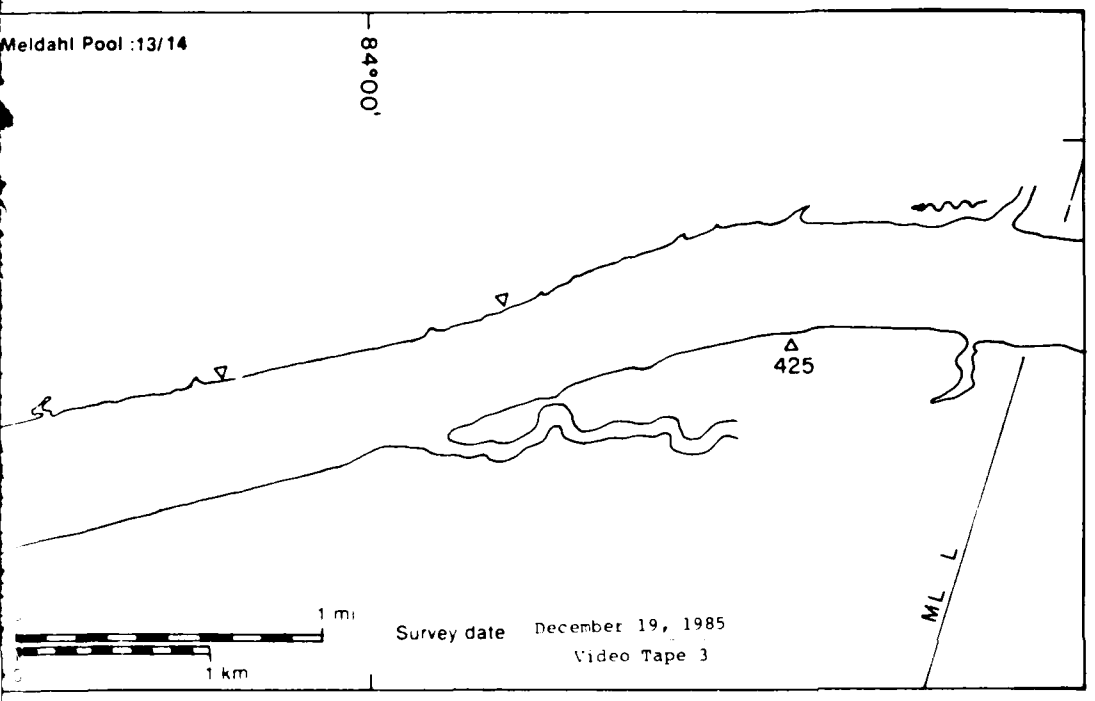


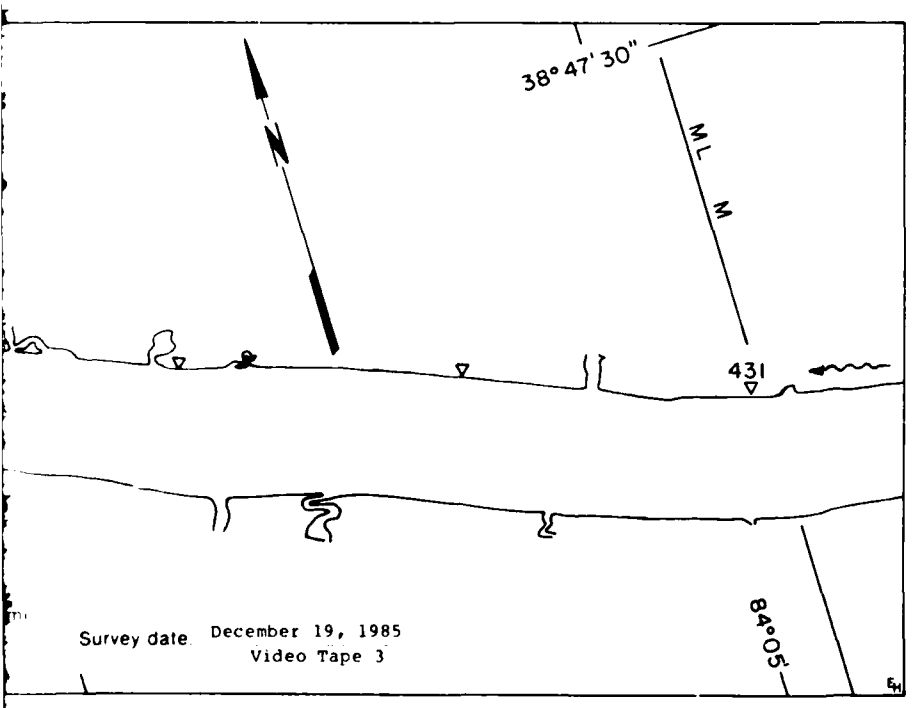
Meldahl Pool

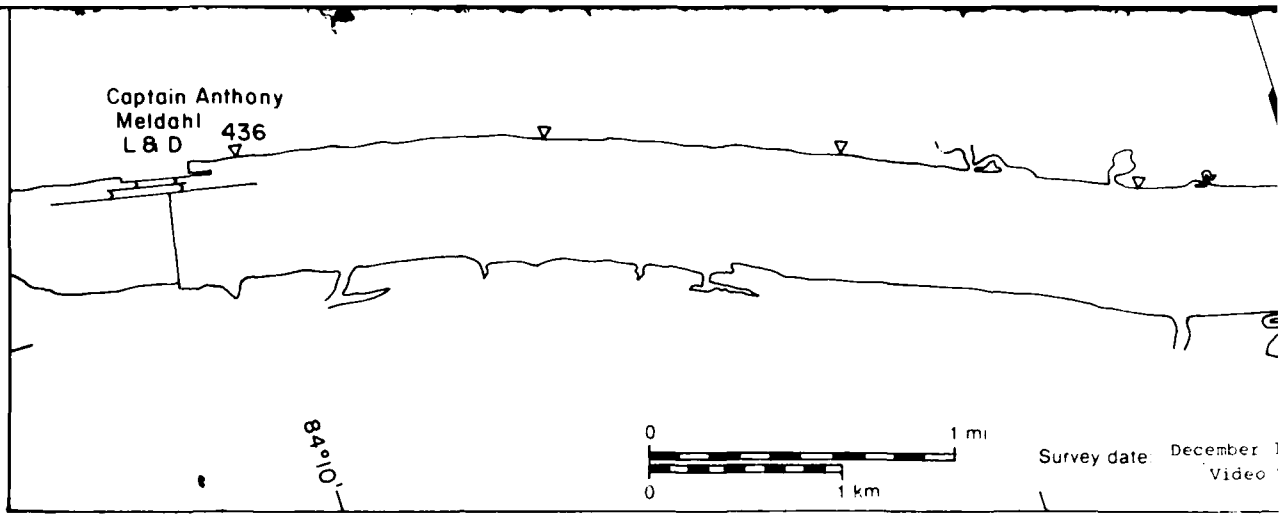
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	73.77	NA

19 December 1985

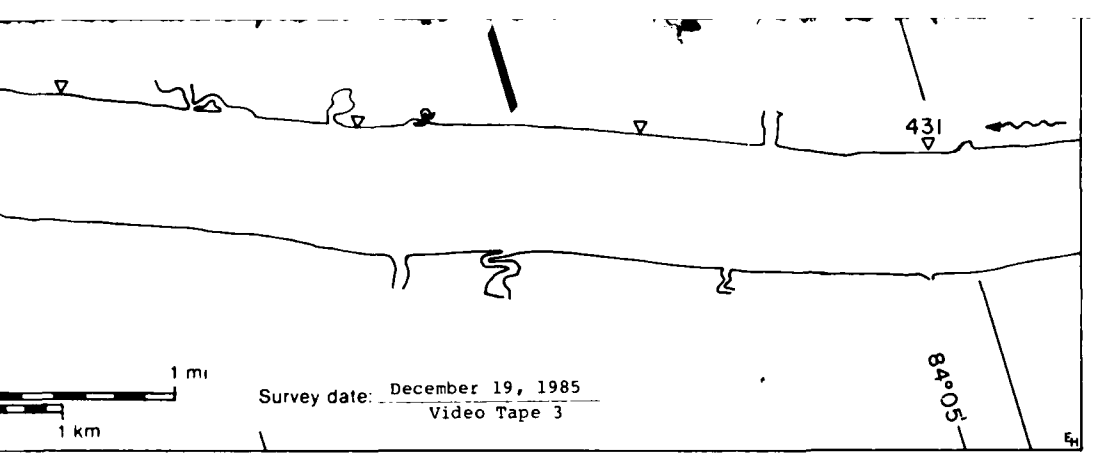


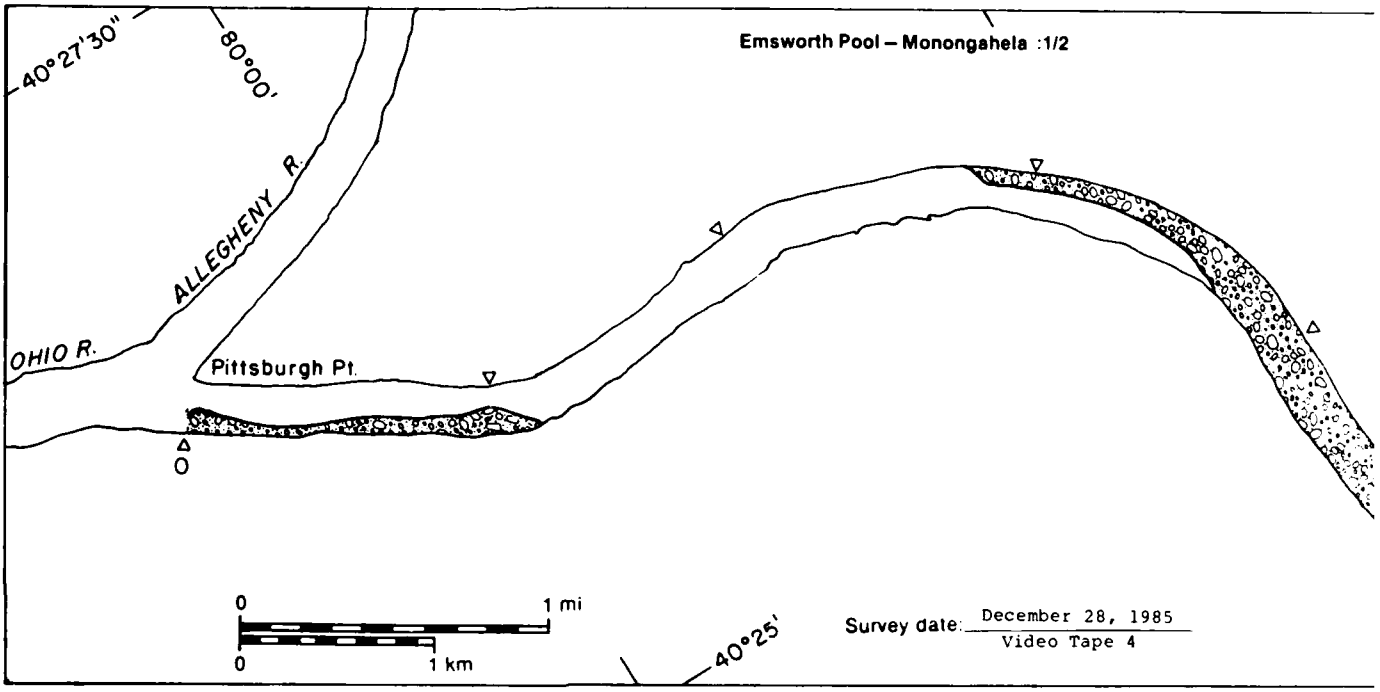


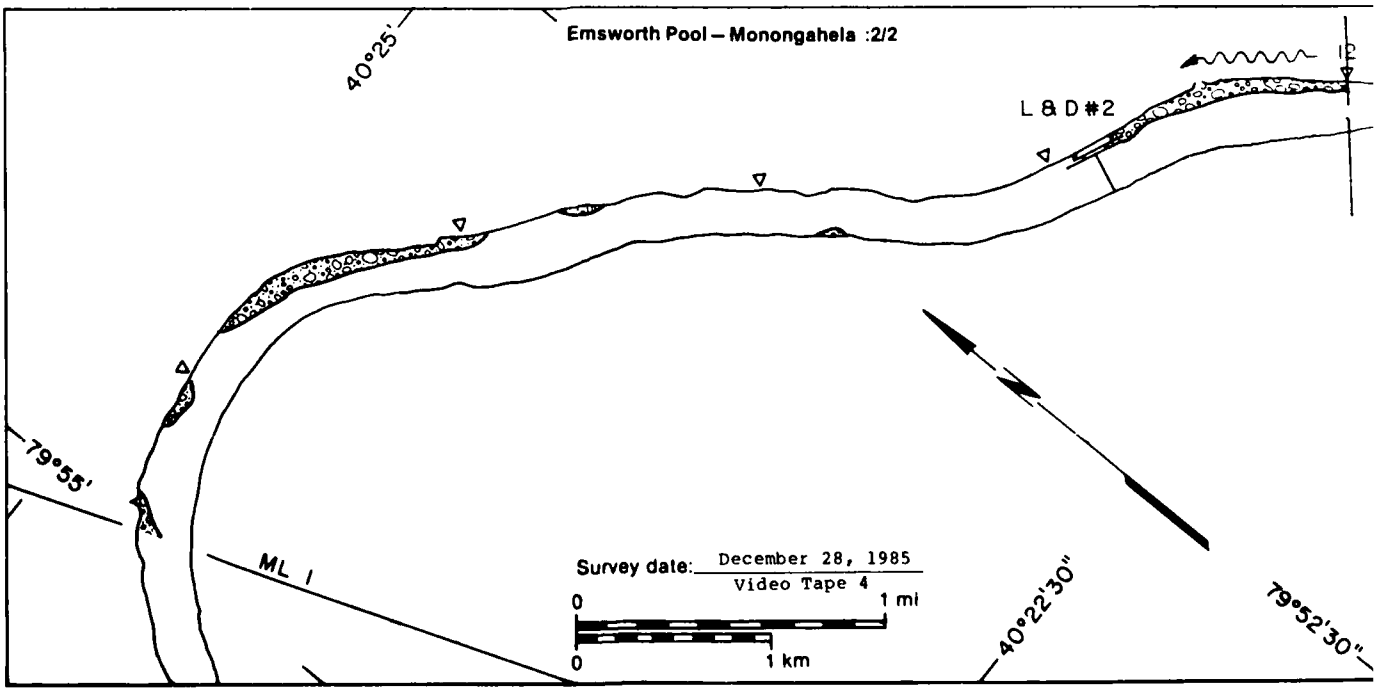


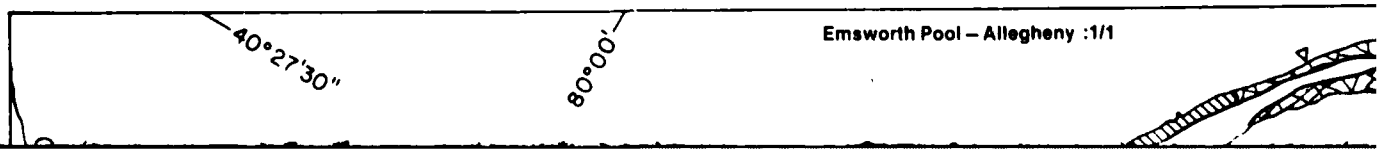
Meldahl Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	73.77	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	73.77	

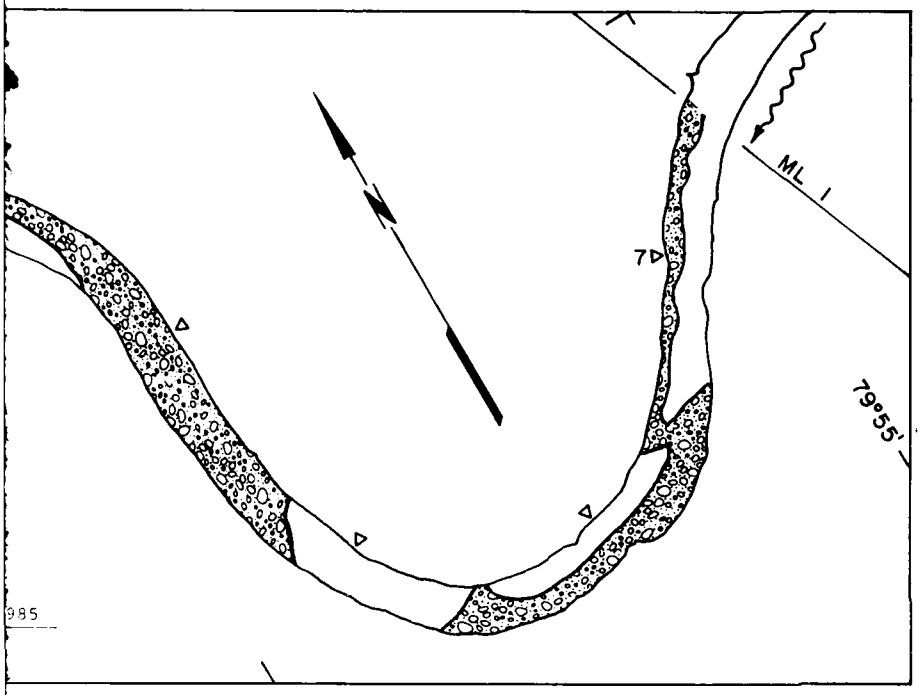

431
1 mi
1 km
Survey date: December 19, 1985
Video Tape 3
84°05'

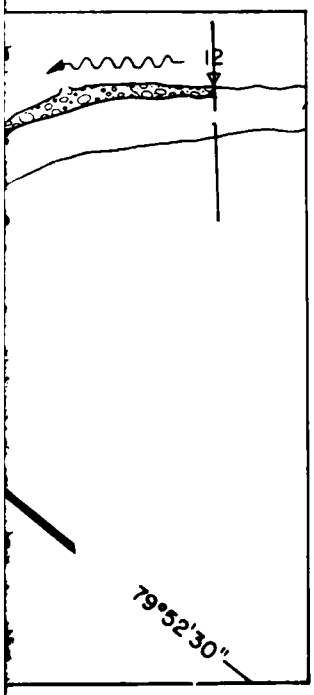

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: December 28, 1985
Video Tape 4


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: December 28, 1985
Video Tape 4
0
1 mi
0
1 km
40°22'30"
79°52'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'

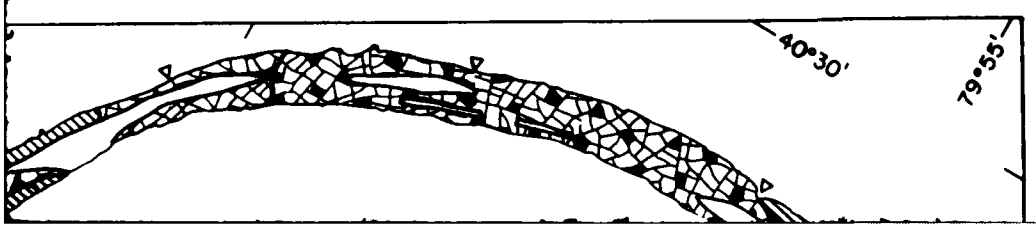
28 December 1985

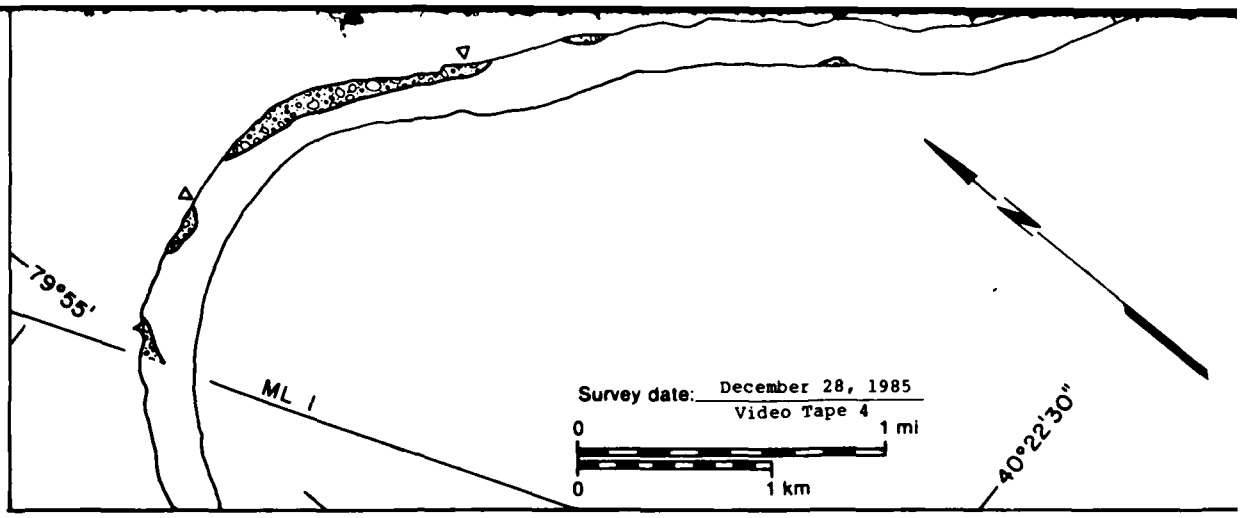


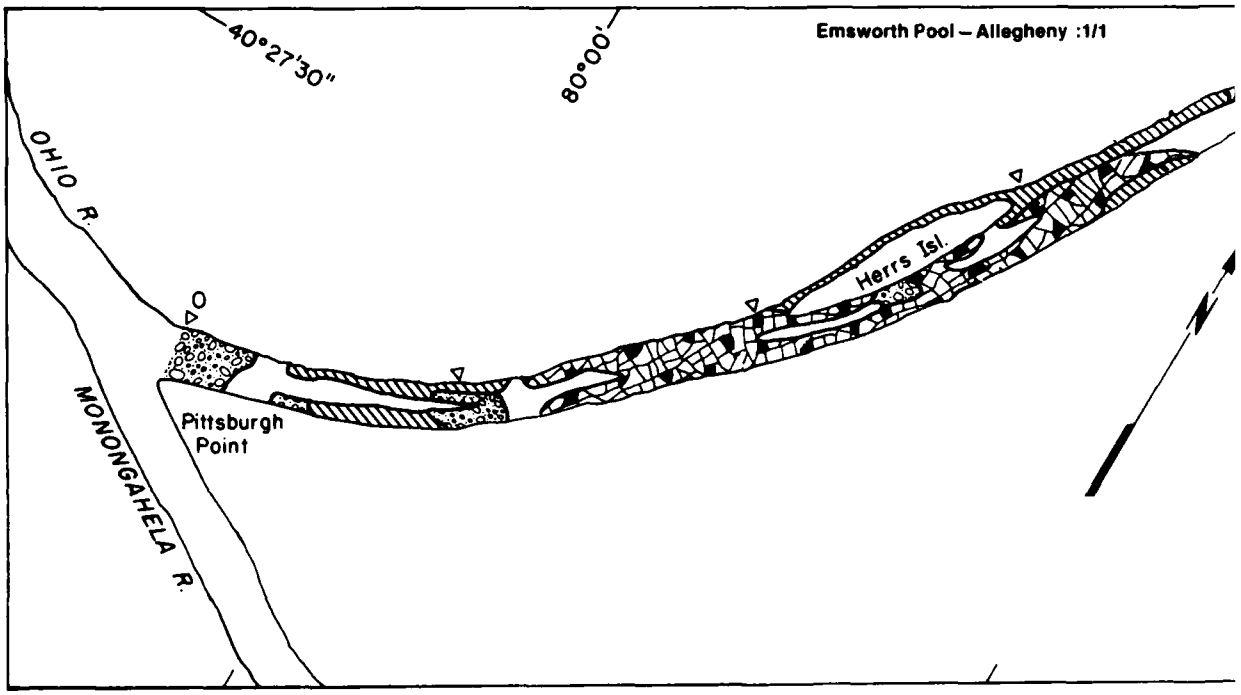


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	3.15	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	2.01	40
Total area (m^2 x 10^6)	5.16	

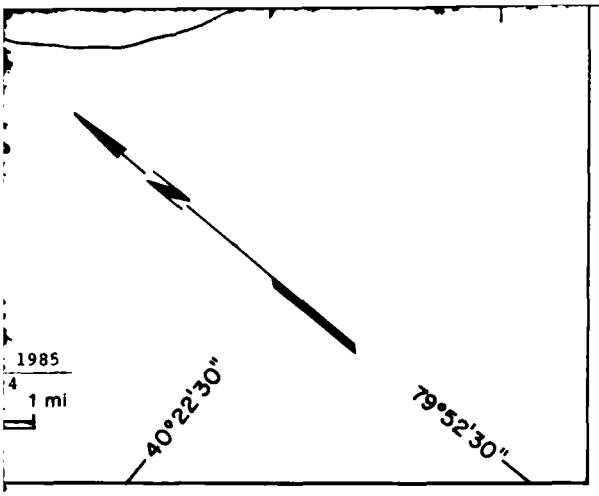






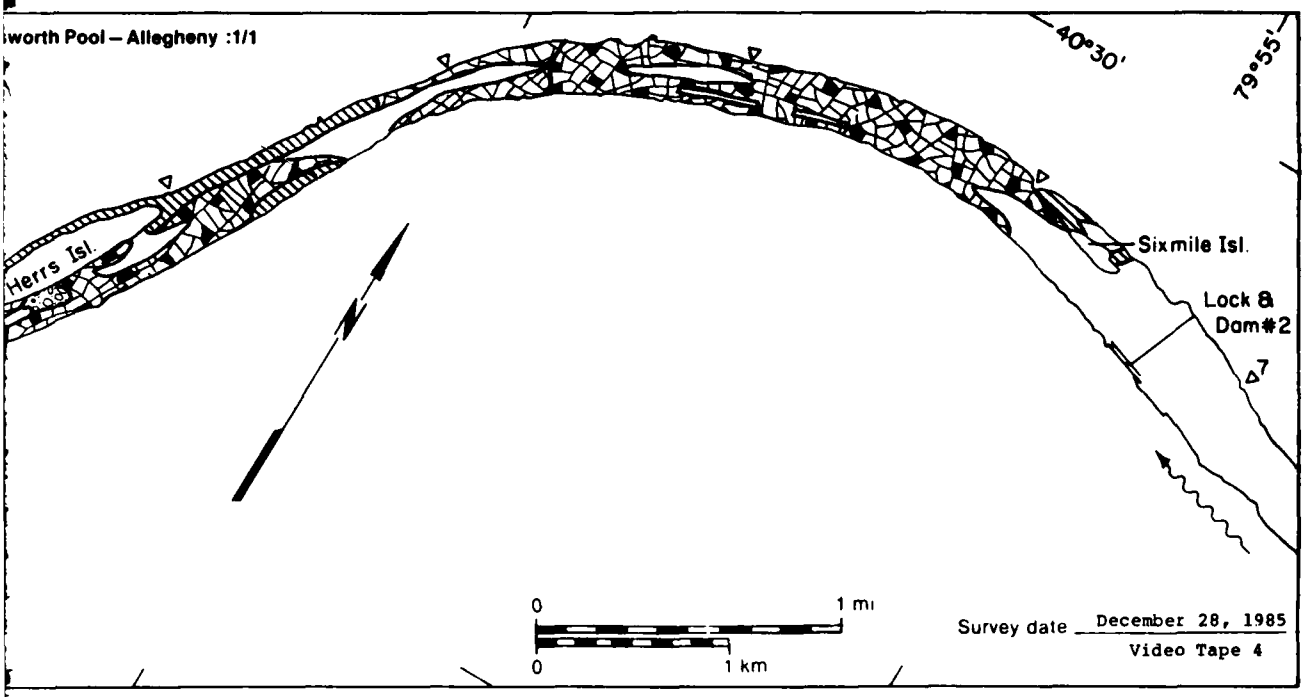
Emsworth Pool – Allegheny

MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	0.91	NA
Solid ice cover	0.41	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.16	NA
Fragmented ice cover with open water areas	1.45	80
Ice floes or frazil slush and pans	0.14	20
Total area (m^2 x 10^6)	3.07	

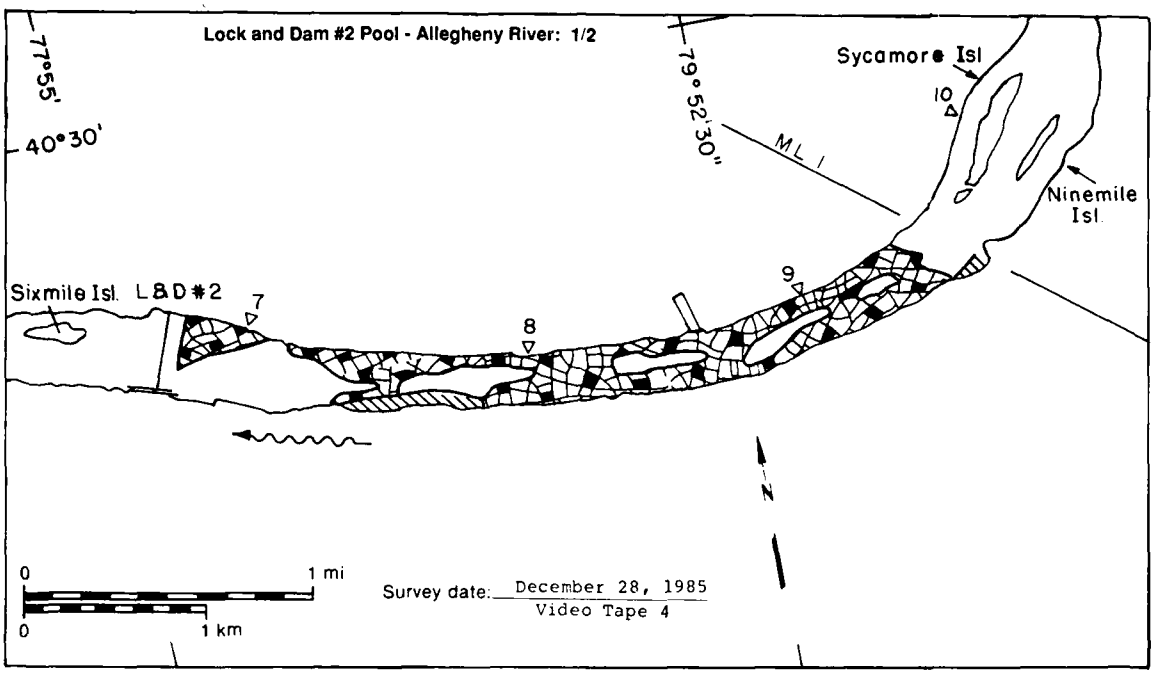


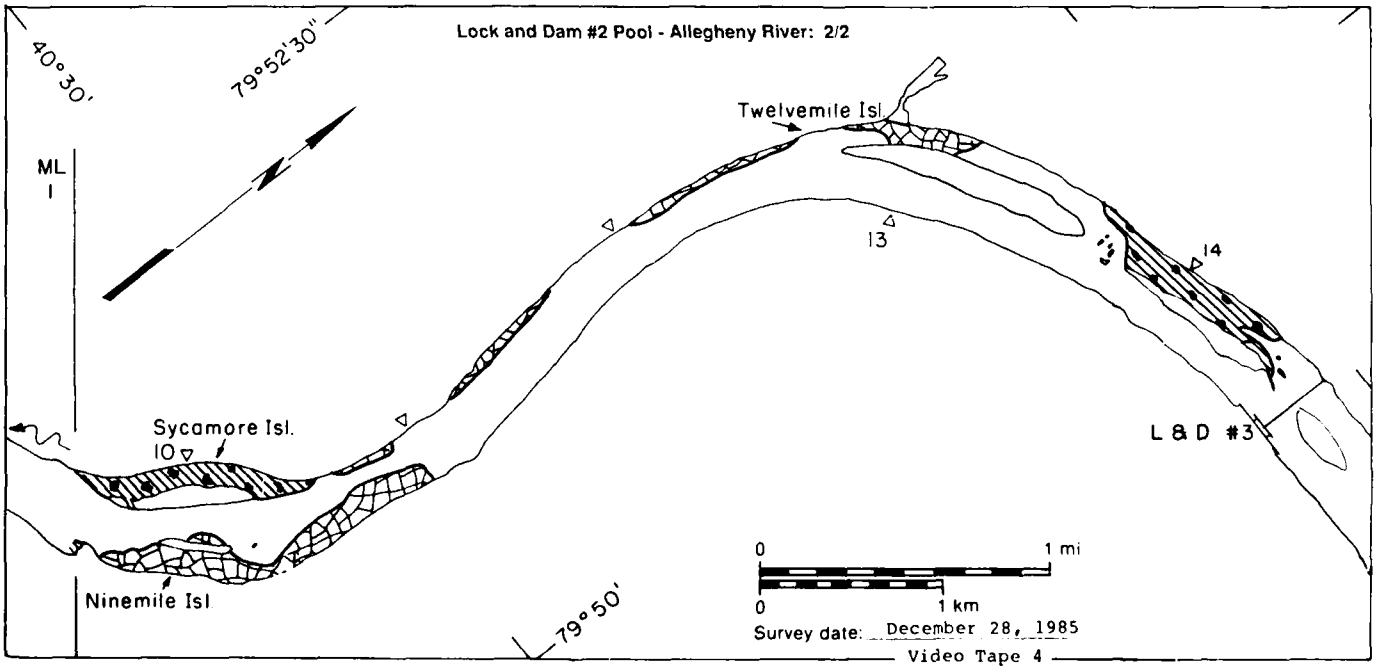
Emsworth Pool – Monongahela

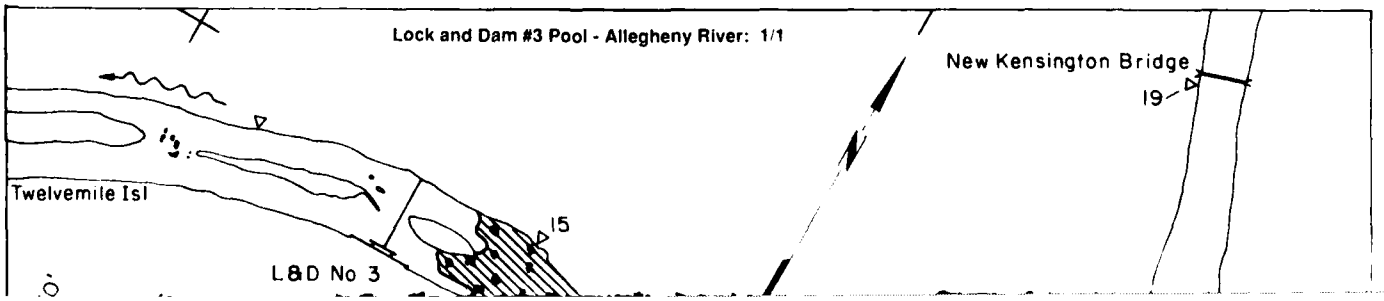
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	3.15	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	2.01	40
Total area (m^2 x 10^6)	5.16	

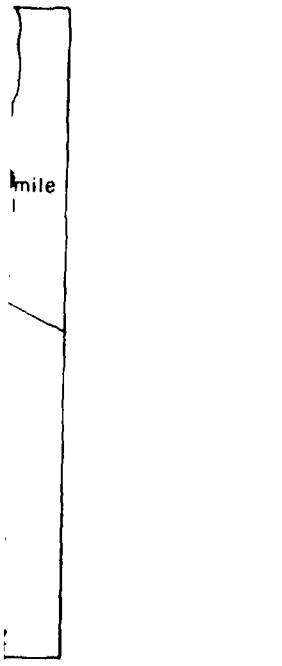


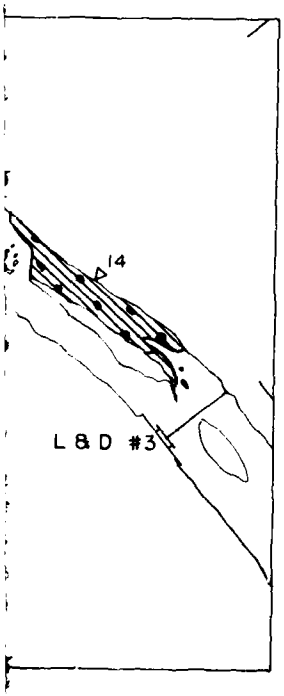
28 December 1985





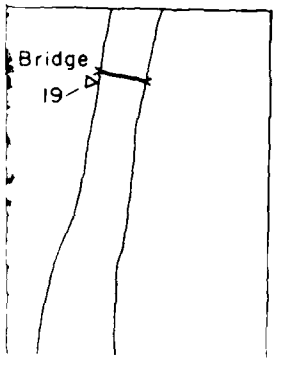






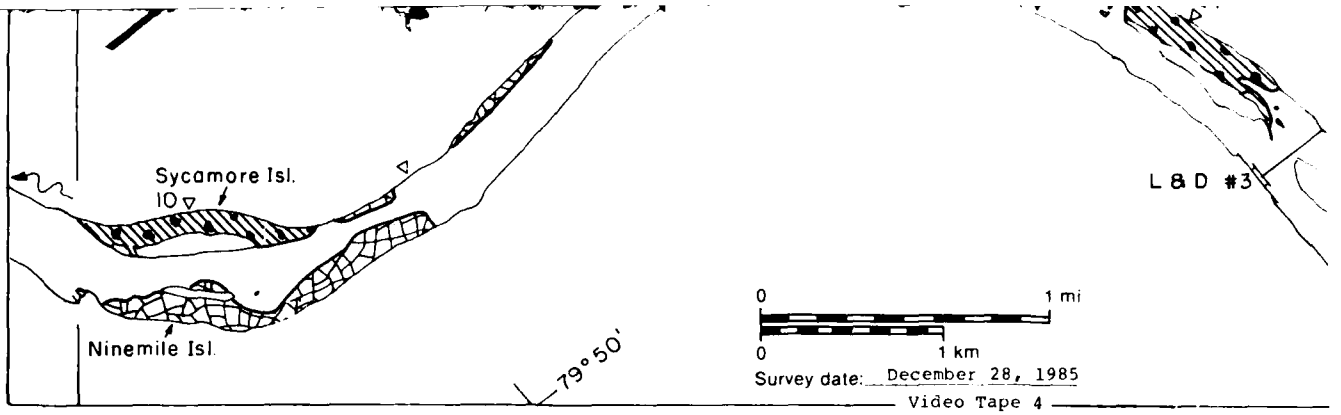
Lock and Dam #2 Pool

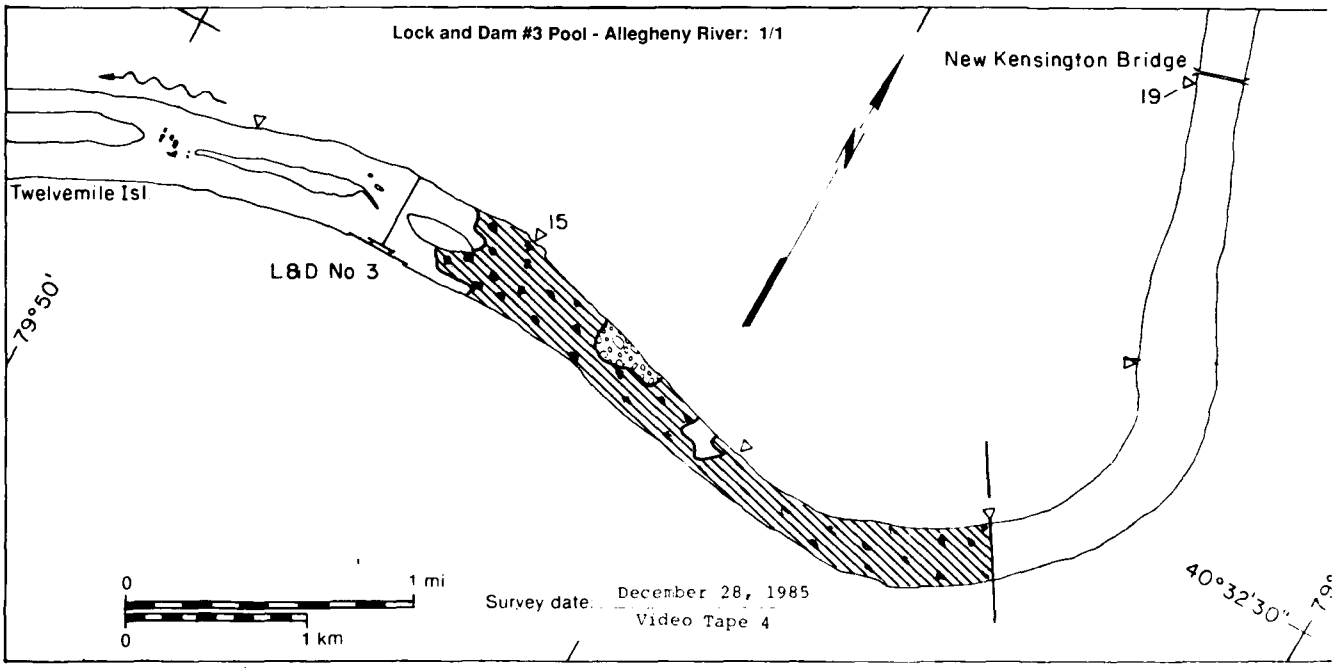
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.47	NA
Solid ice cover	0.09	NA
Solid ice cover with open-water areas	0.28	90
Fragmented ice cover	0.44	NA
Fragmented ice cover with open-water areas	0.74	80
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.02	

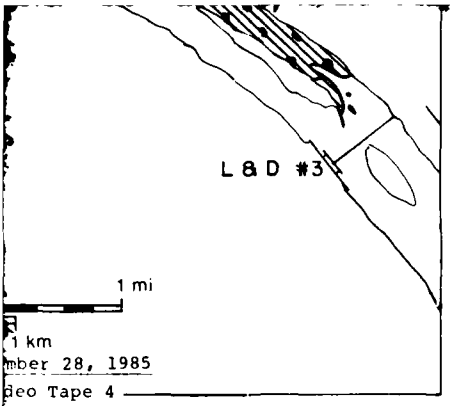


Lock and Dam #3 Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.17	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.93	80

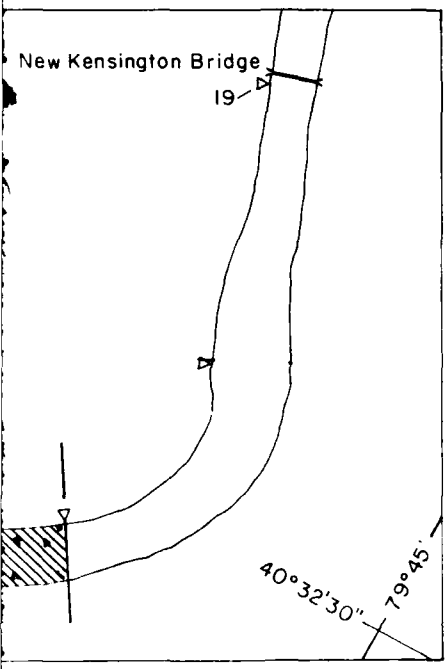

Sycamore Isl.
10
Ninemile Isl.
79°50'
L & D #3
0
1 mi
0
1 km
Survey date: December 28, 1985
Video Tape 4


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: December 28, 1985
Video Tape 4
40°32'30"



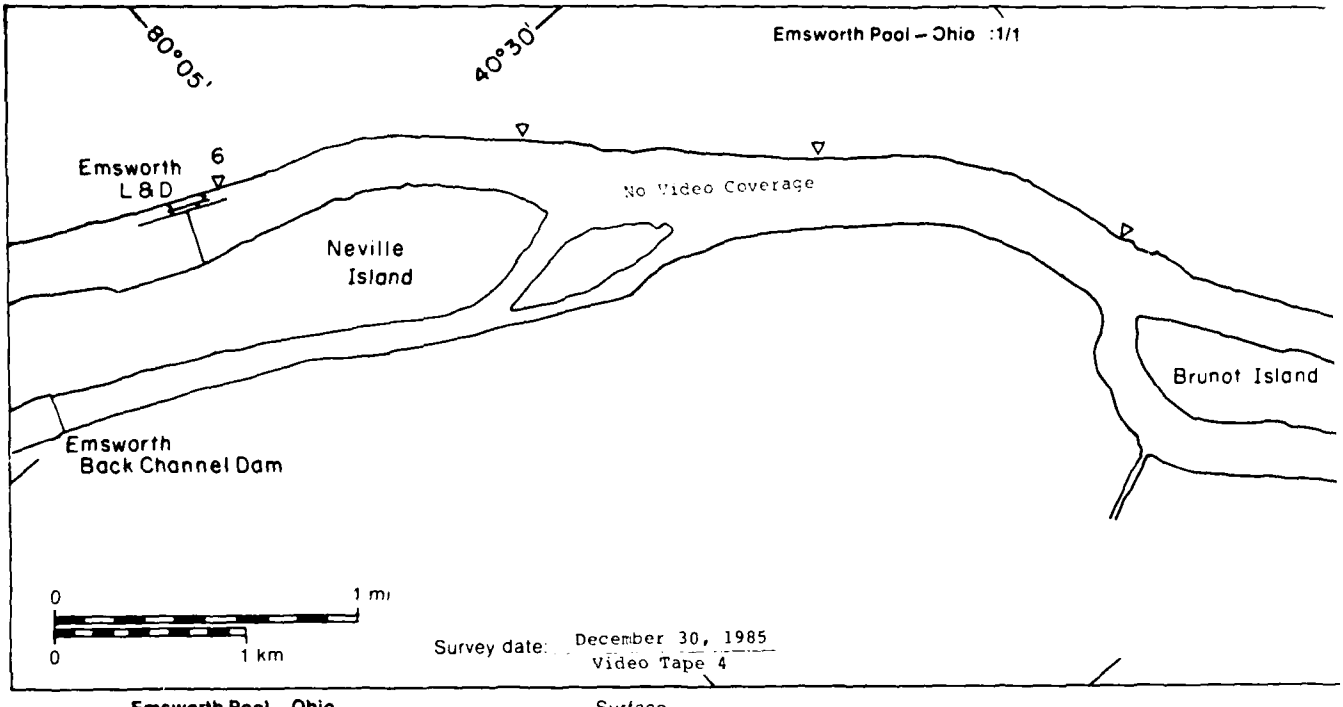
mber 28, 1985
deo Tape 4

		Area (m^2 x 10^6)	Surface concentration (%)
	Solid ice cover with open-water areas	0.28	90
	Fragmented ice cover	0.44	NA
	Fragmented ice cover with open-water areas	0.74	80
	Ice floes or frazil slush and pans	0.00	—
	Total area (m^2 x 10^6)	4.02	



Lock and Dam #3 Pool

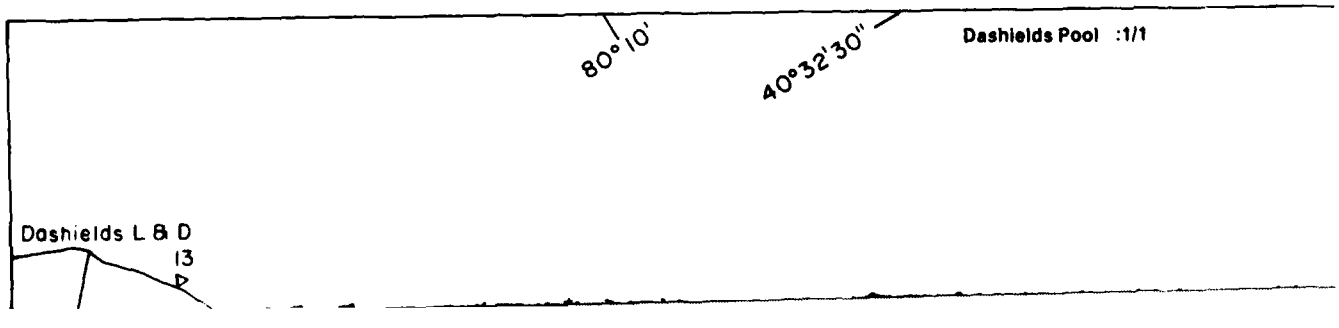
MAP UNITS		Area (m^2 x 10^6)	Surface concentration (%)
	Open water	0.17	NA
	Solid ice cover	0.00	NA
	Solid ice cover with open-water areas	0.93	80
	Fragmented ice cover	0.00	NA
	Fragmented ice cover with open-water areas	0.00	—
	Ice floes or frazil slush and pans	0.04	10
	Total area (m^2 x 10^6)	1.14	



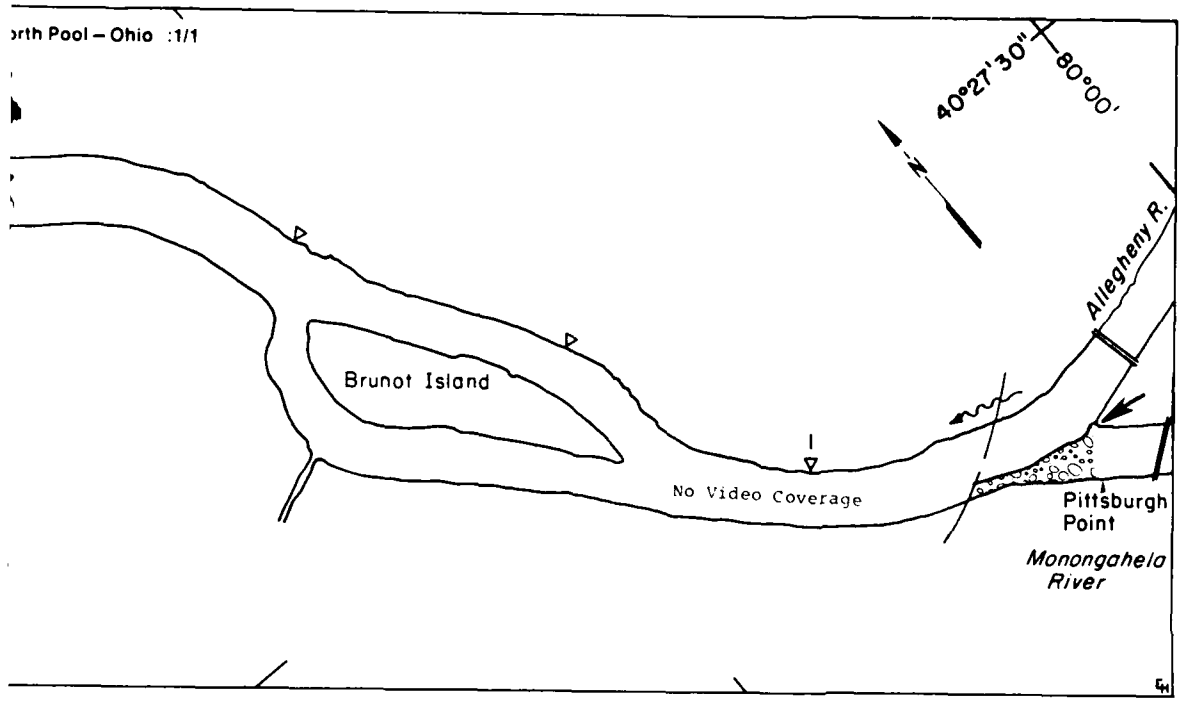
Emsworth Pool – Ohio

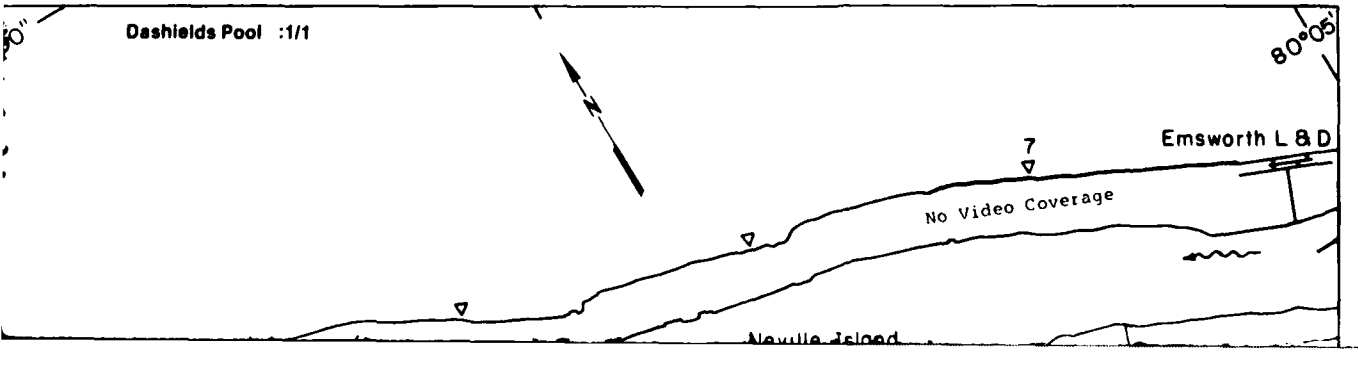
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.10	1
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 4.23×10^6 m^2 of no video coverage

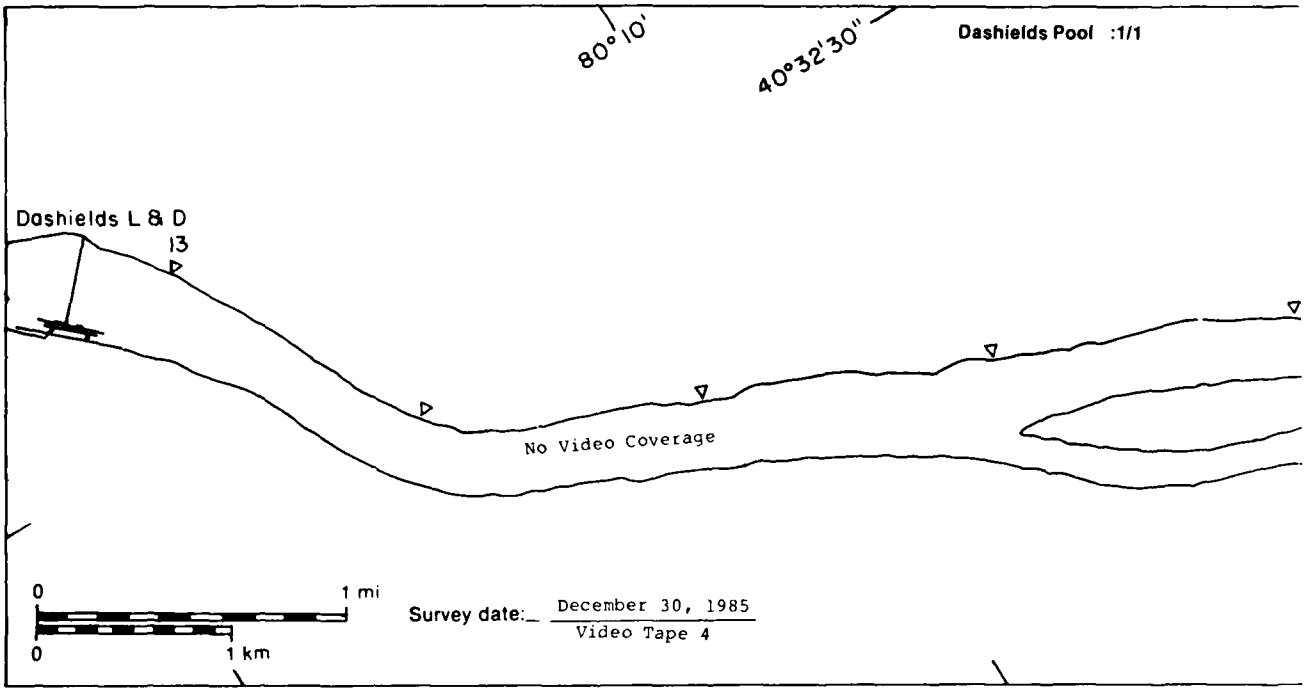


30 December 1985





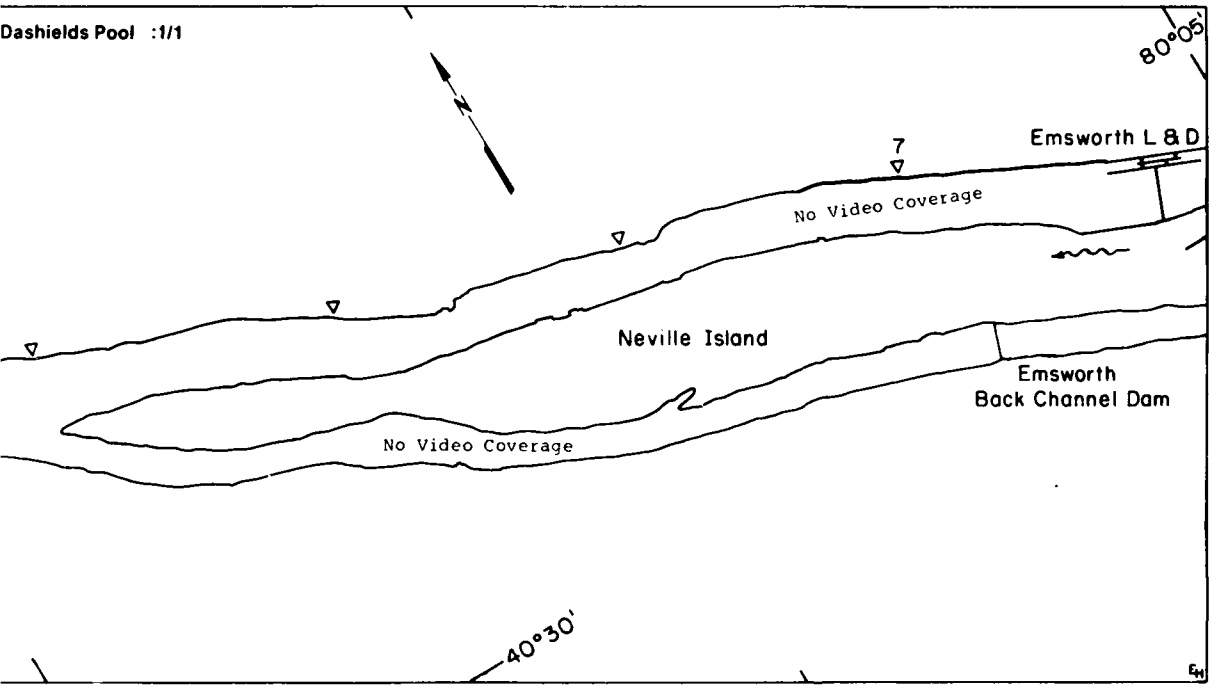
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.10	1
Total area ($m^2 \times 10^6$)	4.49*	* Includes 4.23×10^6 m^2 of no video coverage



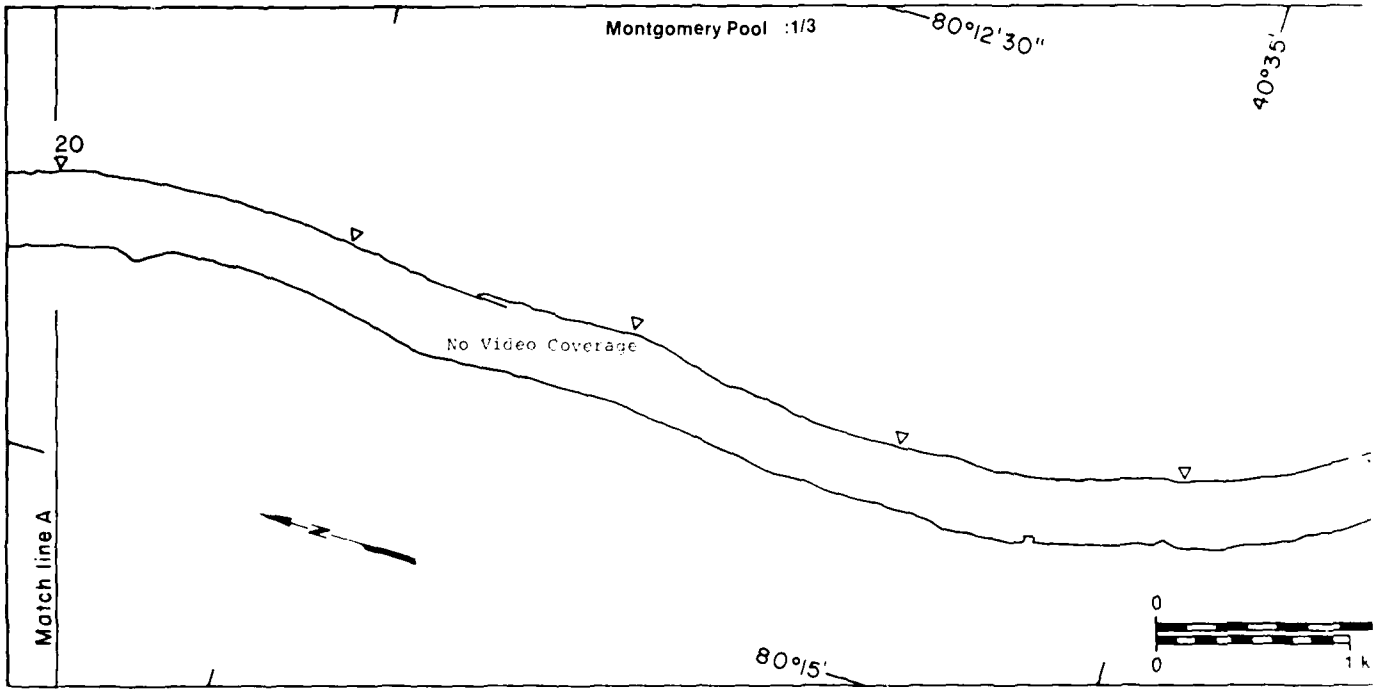
Dashields Pool

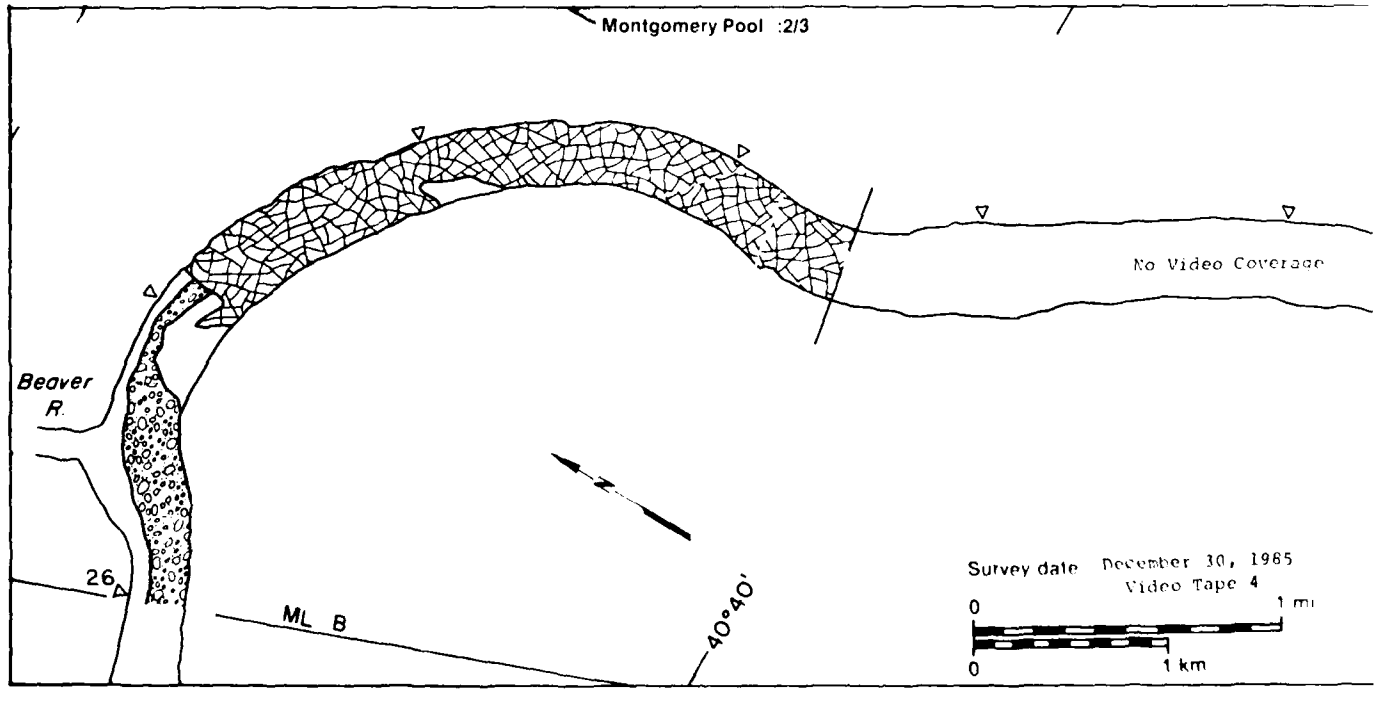
MAP UNITS

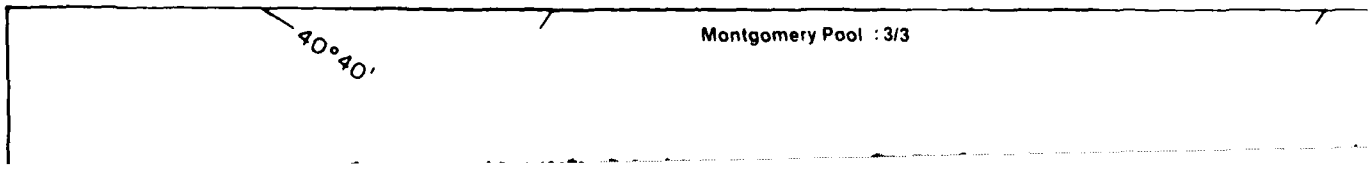
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.00*	* Includes 5.00×10^6 m^2 of no video coverage

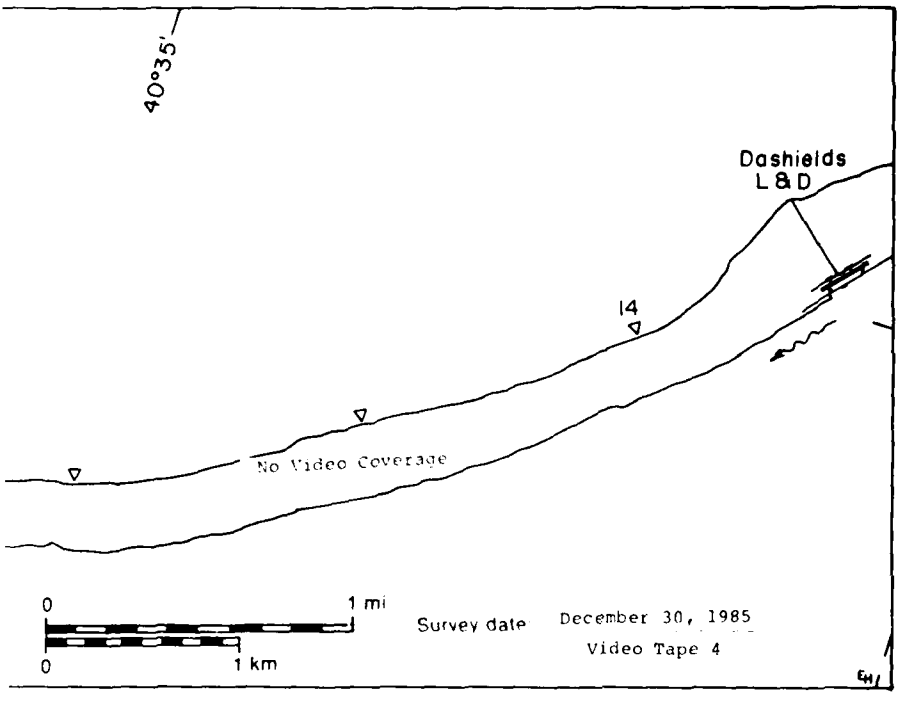

Dashields Pool :1/1
80°05'
N
7
Emsworth L & D
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

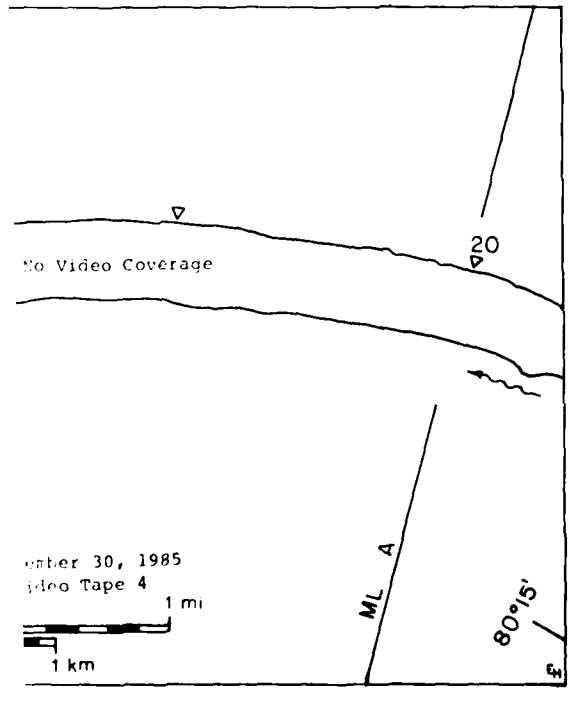
30 December 1985

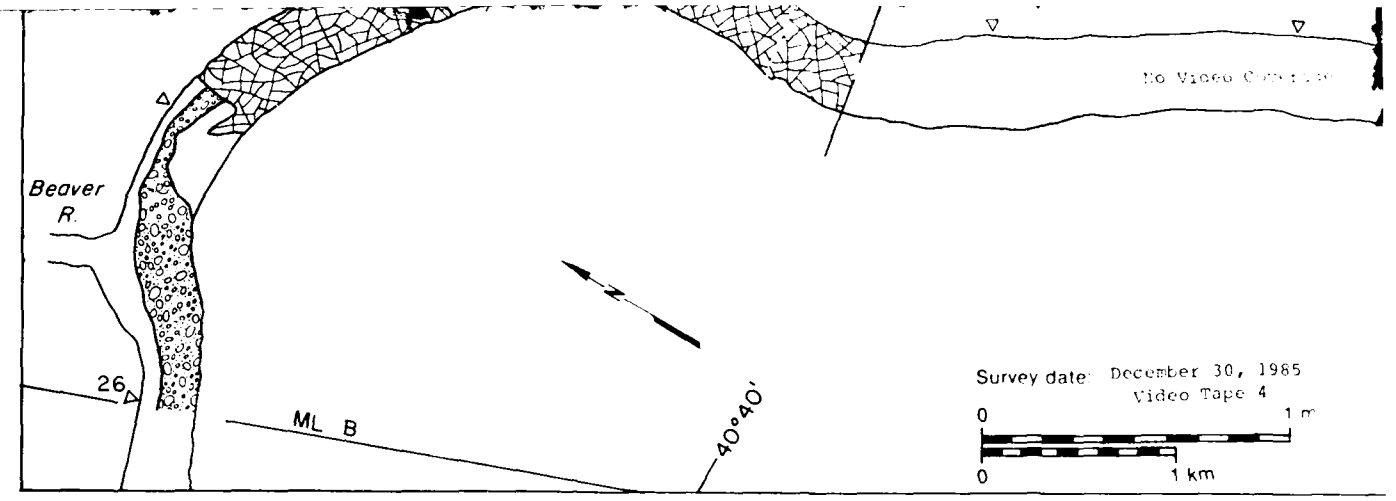


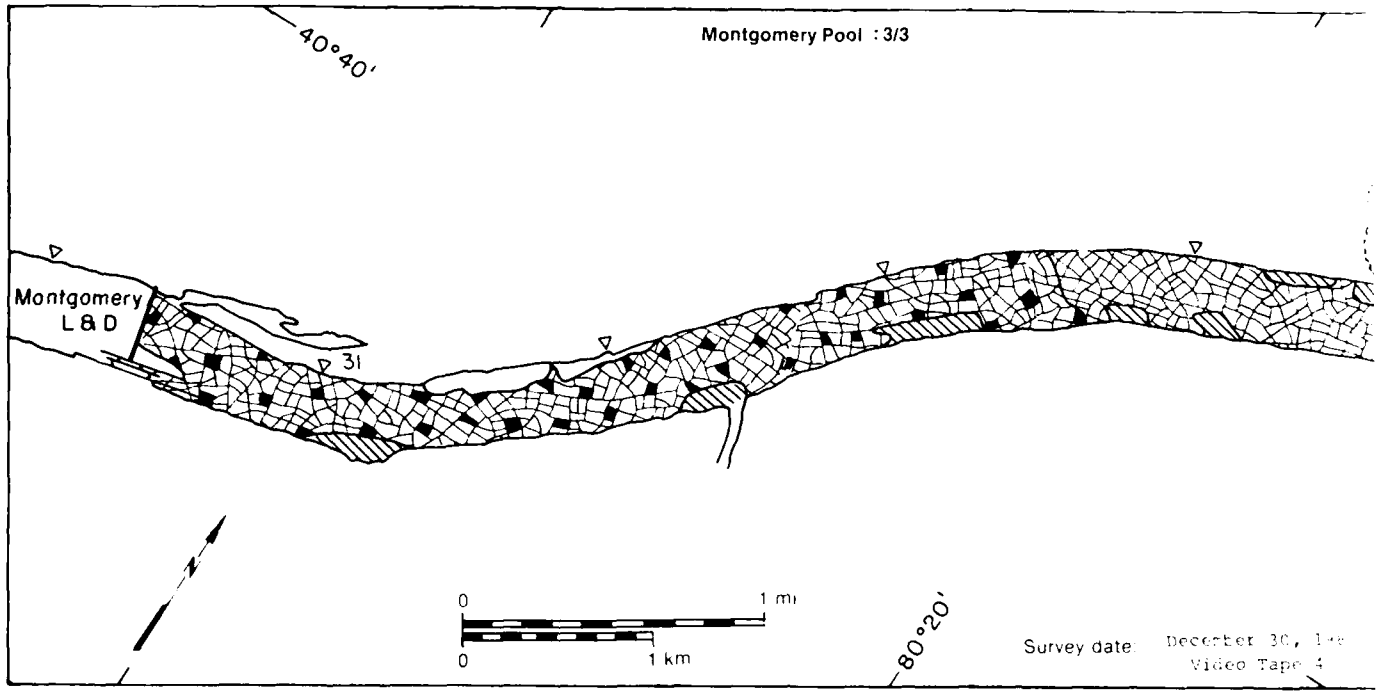





40°35'
Dashields
L&D
14
No Video Coverage
0
1 mi
0
1 km
Survey date December 30, 1985
Video Tape 4


20
No Video Coverage
ML A
80°15'
1 mi
1 km

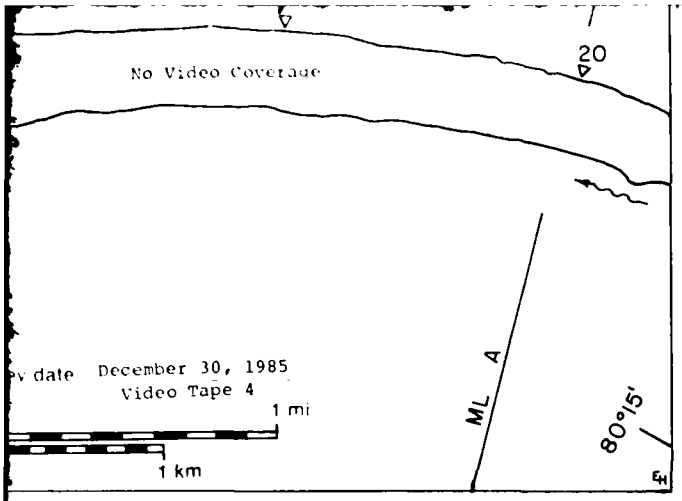


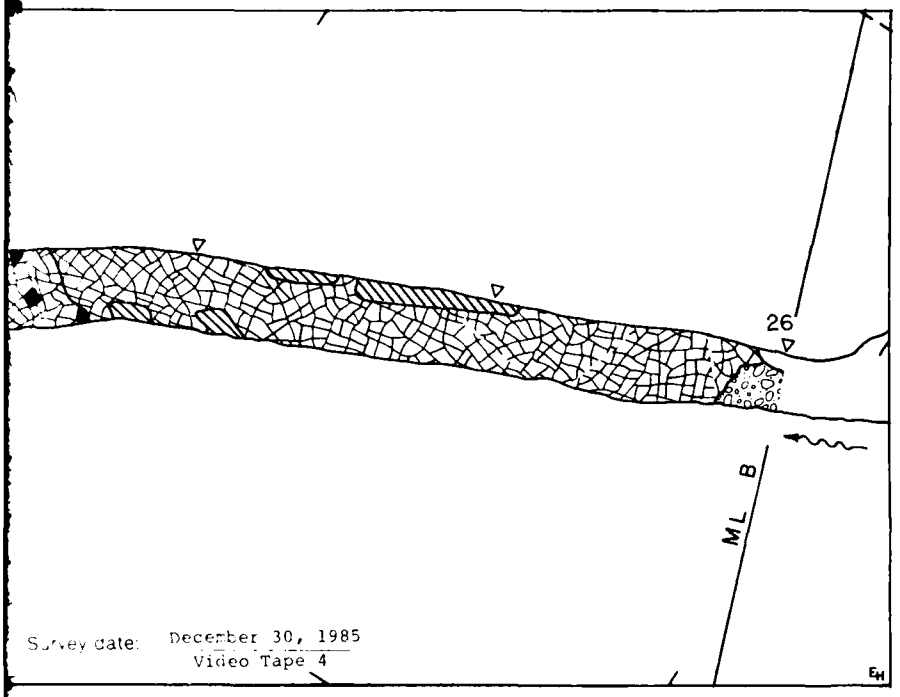


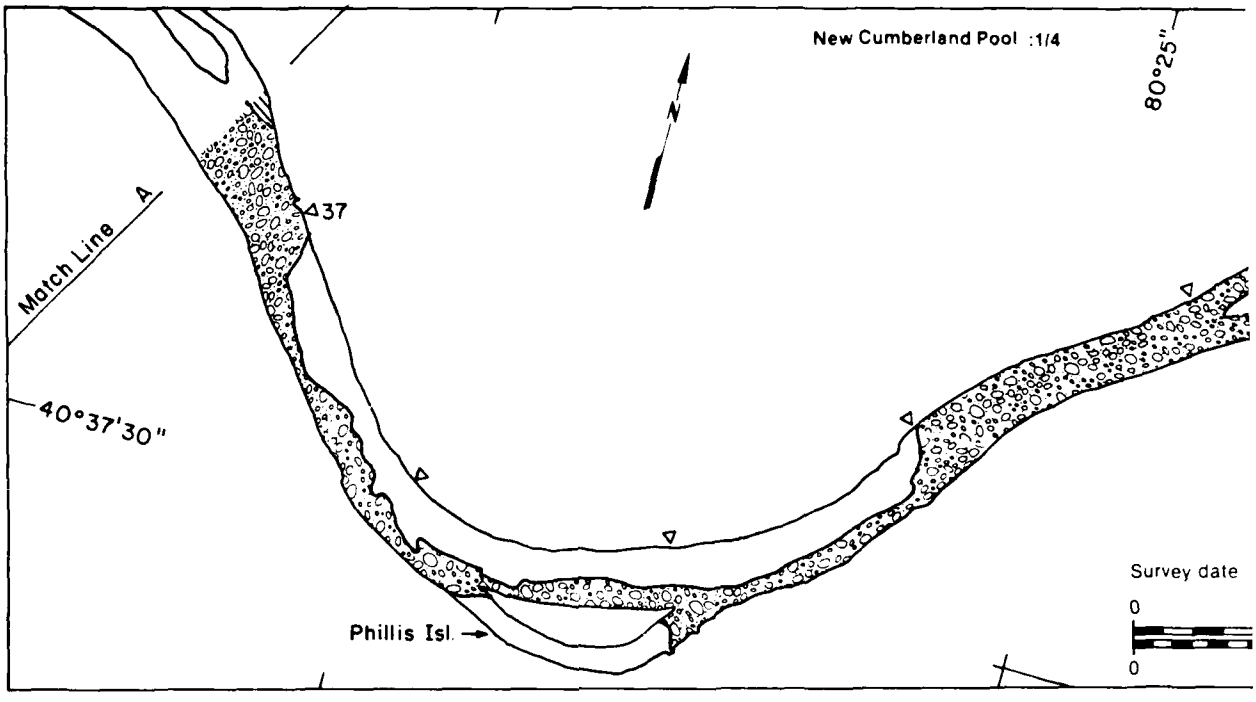
Montgomery Pool

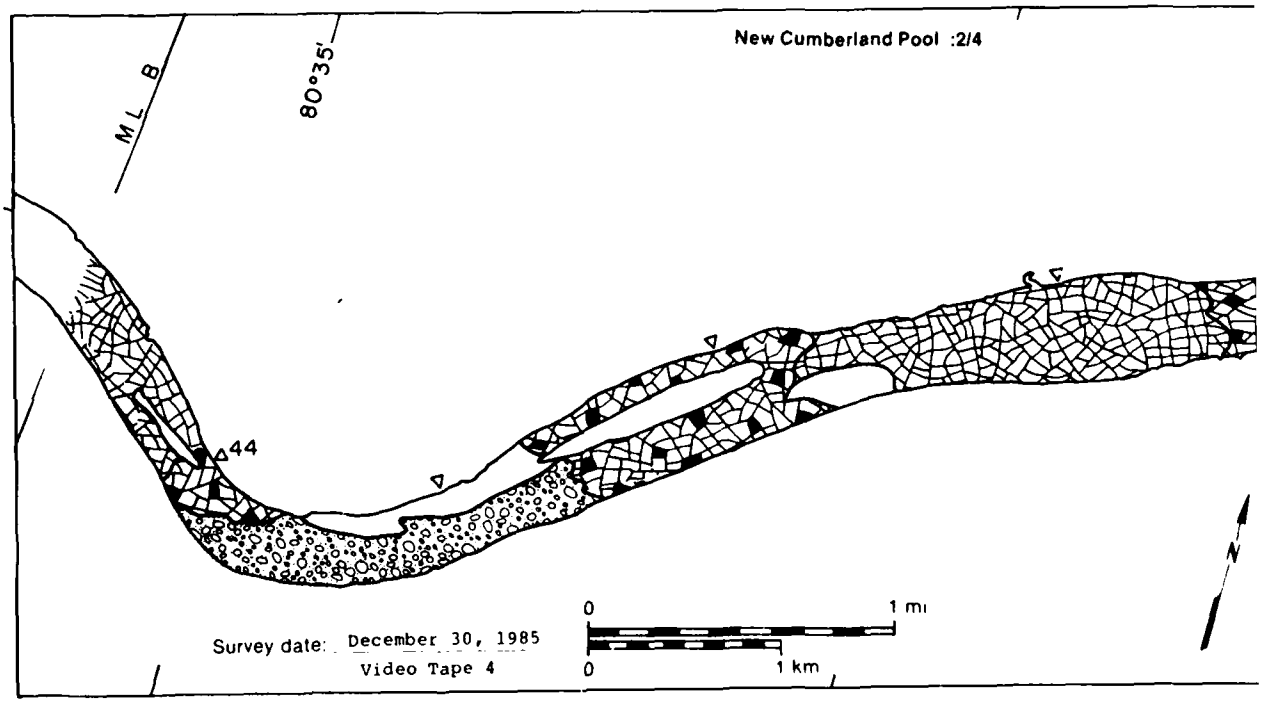
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (g/m^2)
Open water	0.53	NA
Solid ice cover	0.28	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	2.74	NA
Fragmented ice cover with open-water areas	1.73	80
Ice floes or frazil slush and pans	0.43	40
Total area ($m^2 \times 10^6$)	11.27*	

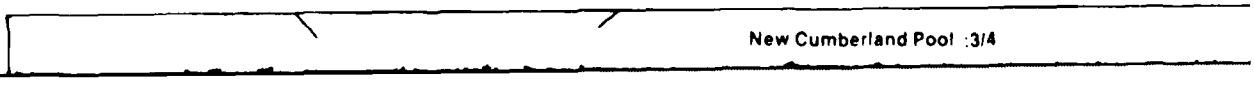
* Includes 5.56×10^6 m^2 of no video coverage


No Video Coverage
20
ML A
80°15'
Survey date December 30, 1985
Video Tape 4
1 mi
1 km

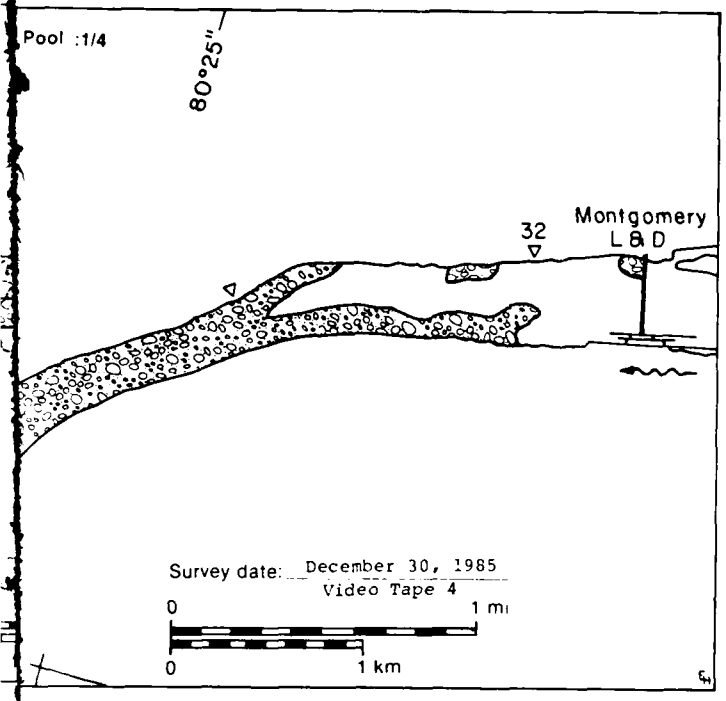

26
ML B
Survey date: December 30, 1985
Video Tape 4

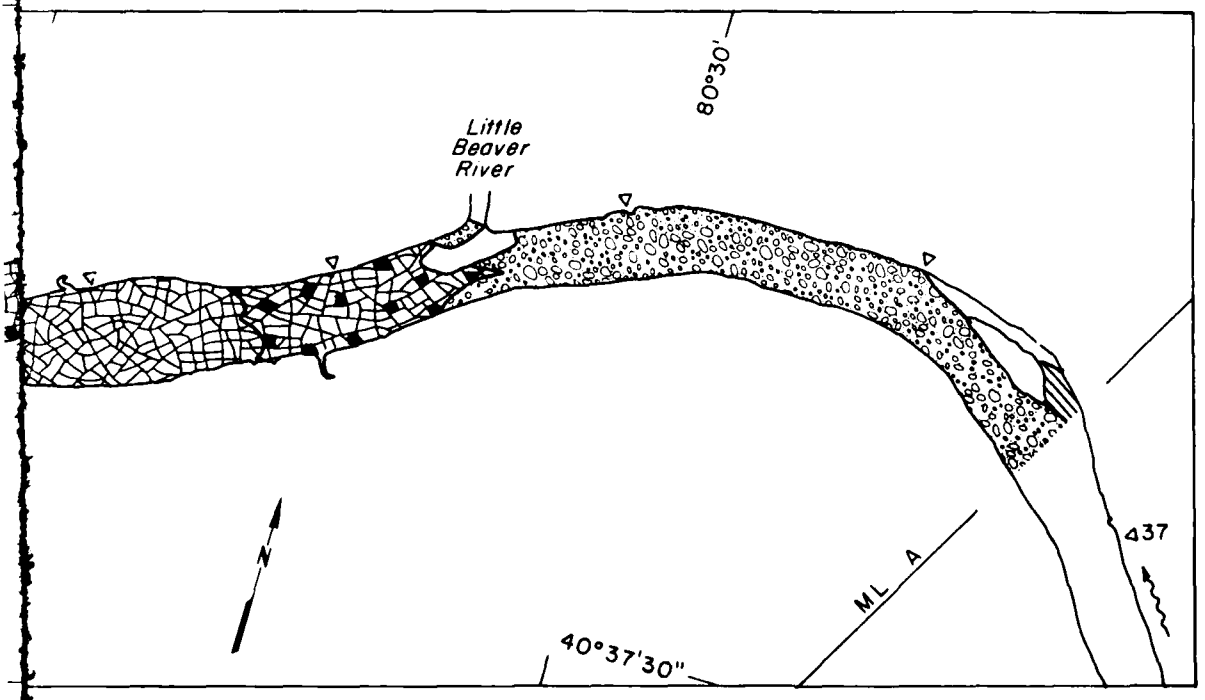

New Cumberland Pool :1/4
80°25"
Match Line A
37
40°37'30"
Phillis Isl.
Survey date
0
0

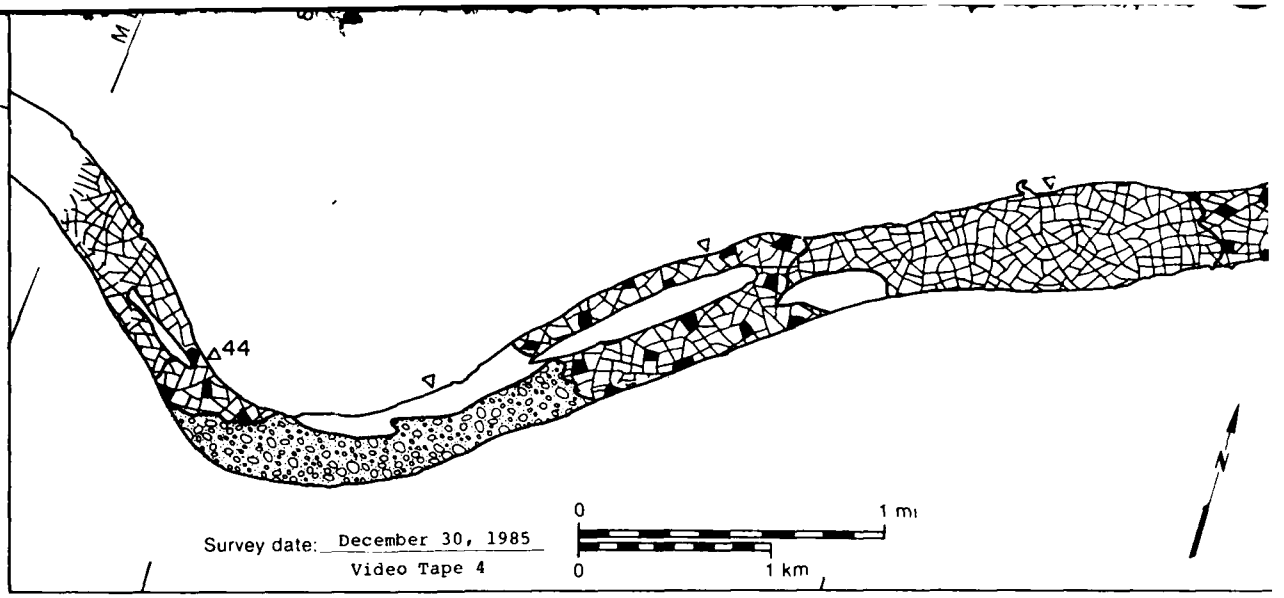

New Cumberland Pool :2/4
80°35'
M L B
44
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 4

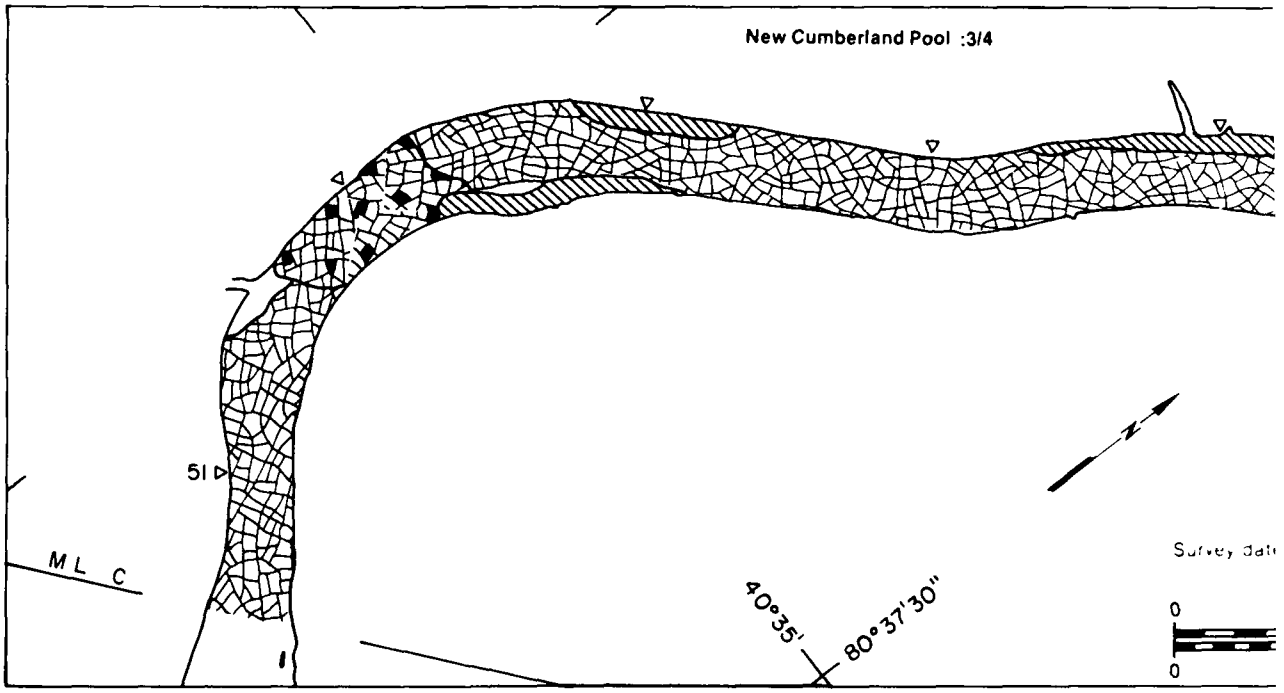

New Cumberland Pool :3/4

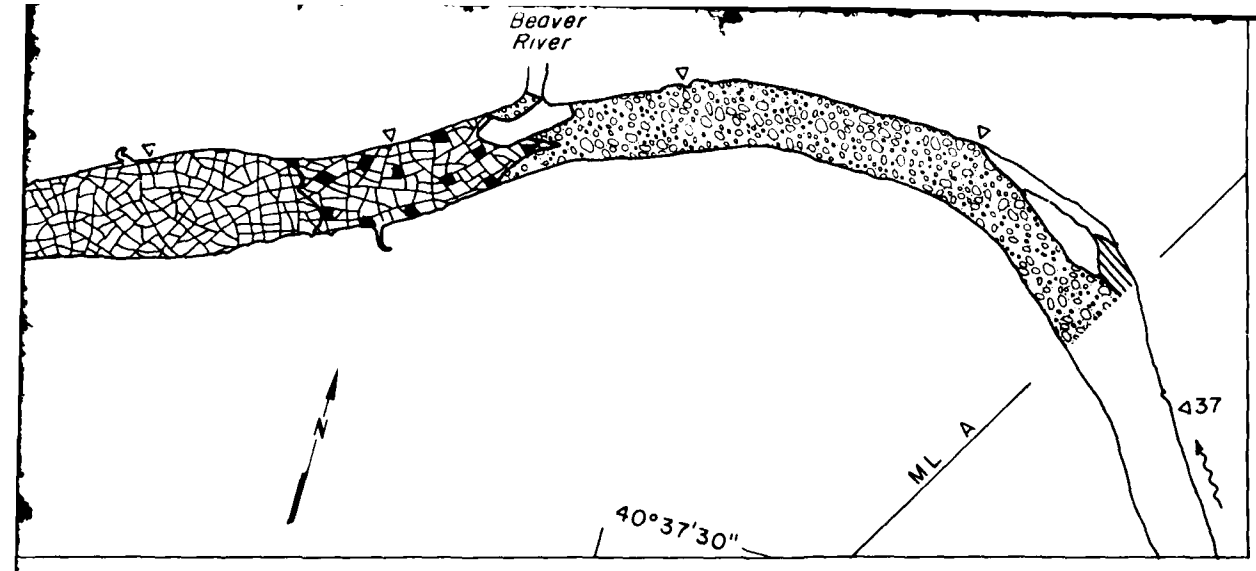
30 December 1985

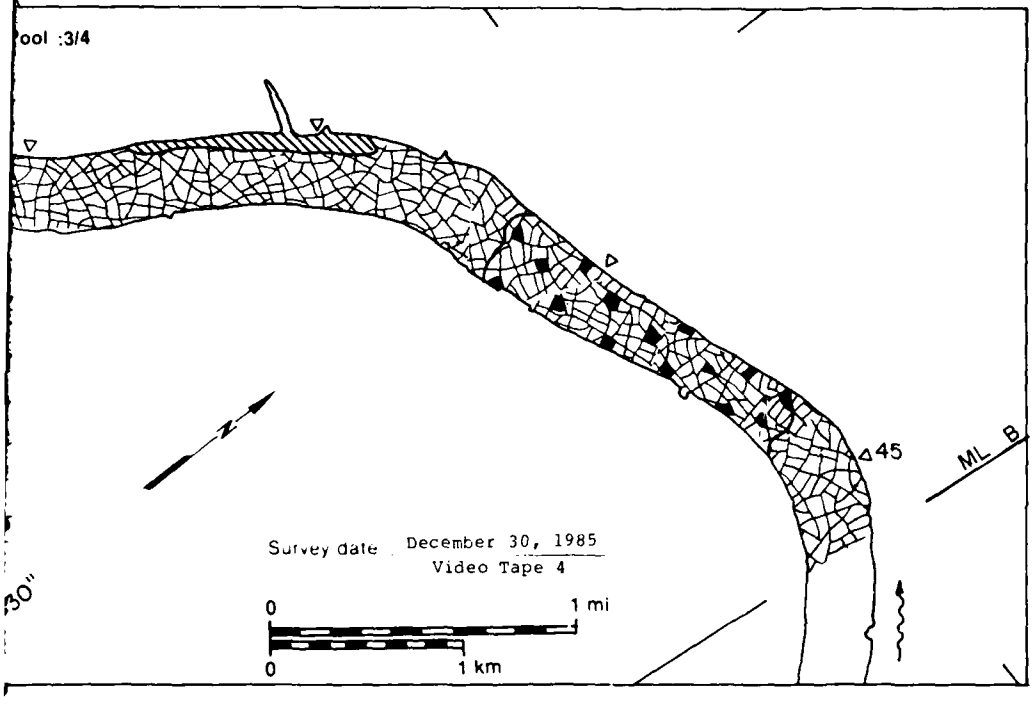




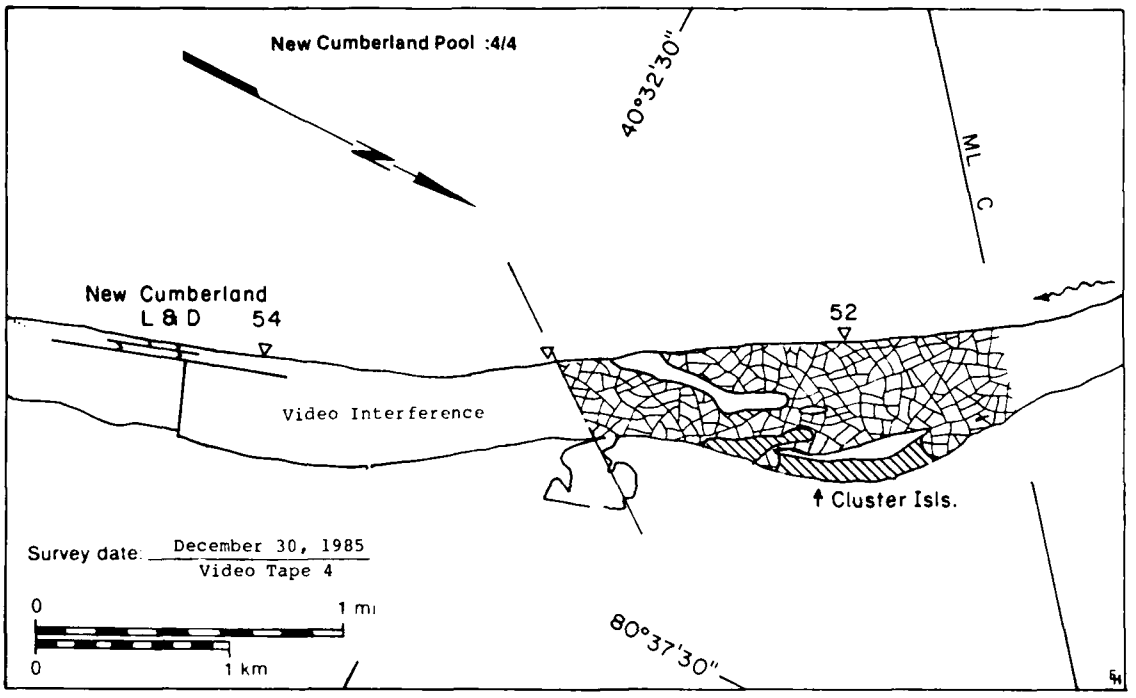

44
0
1 mi
Survey date: December 30, 1985
Video Tape 4
0
1 km

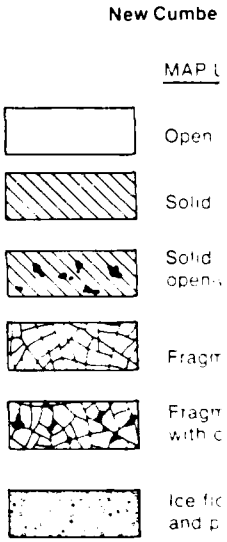

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0

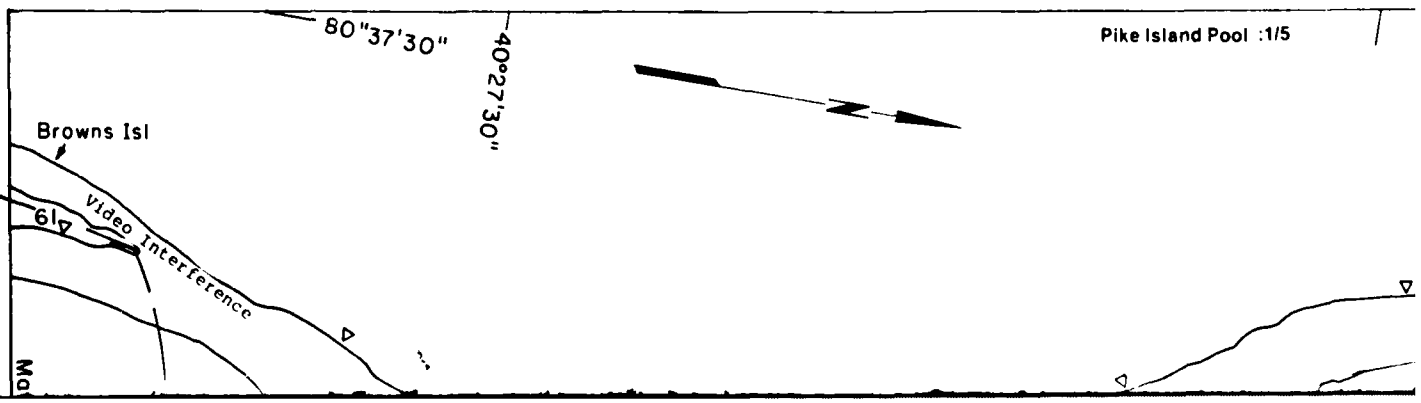

Beaver
River
N
ML A
40°37'30"
37


ool :3/4
N
45
ML B
Survey date December 30, 1985
Video Tape 4
0
1 mi
0
1 km

30 December 1985



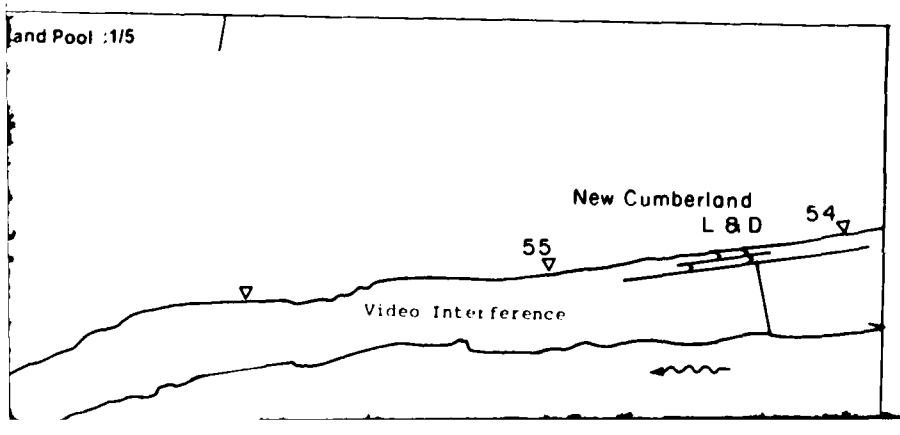


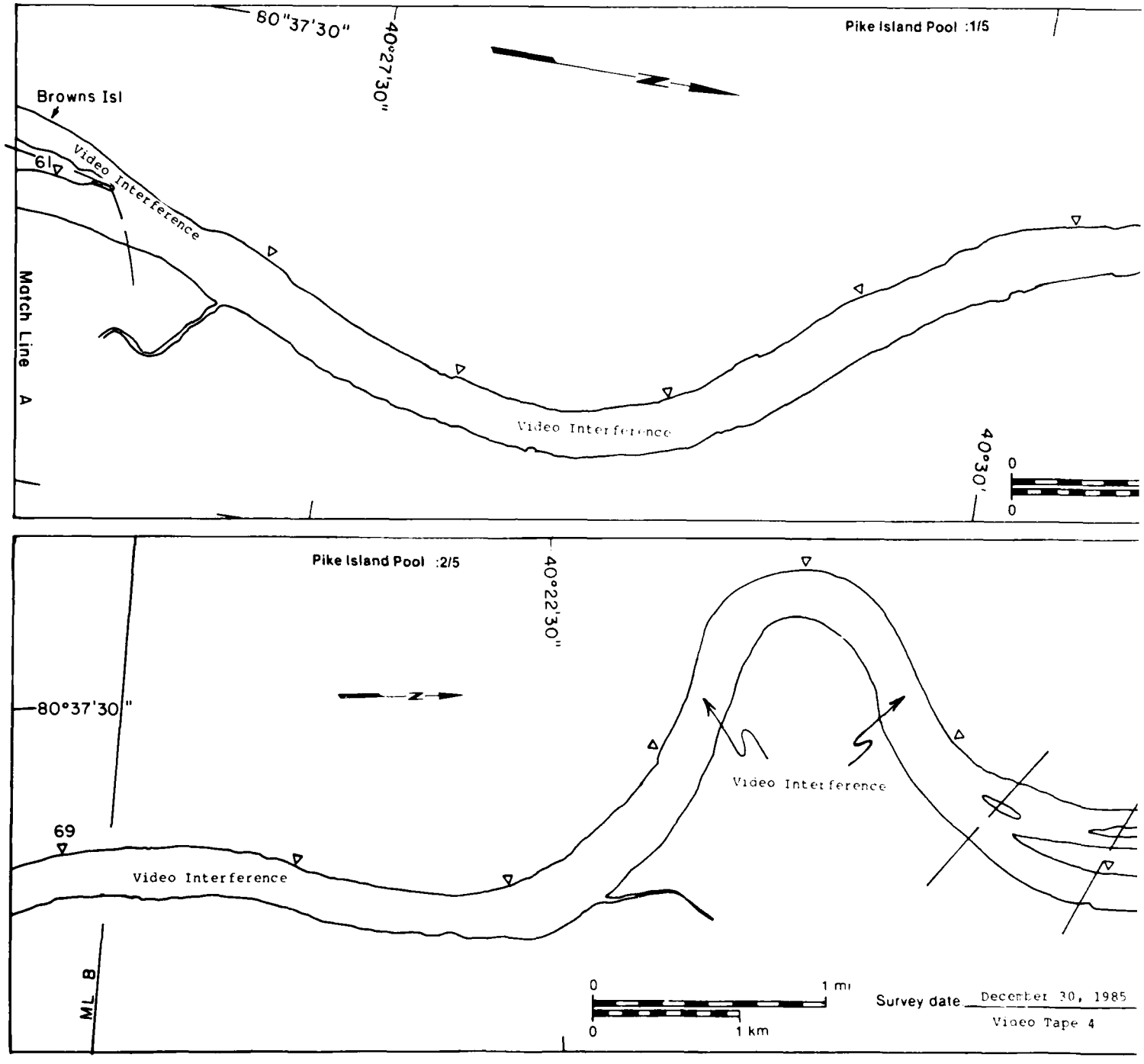


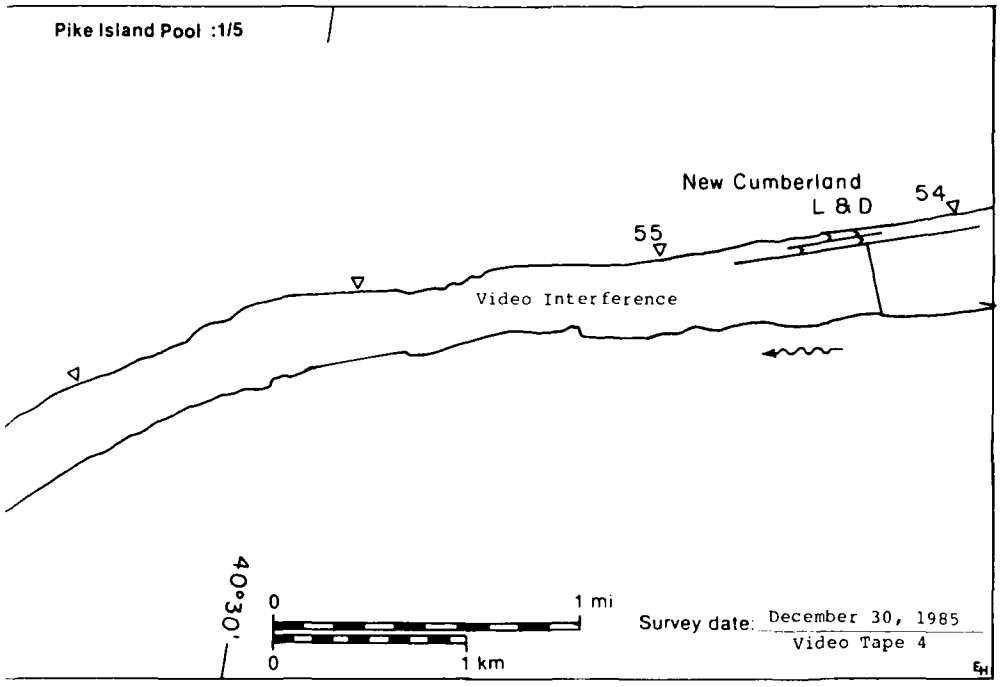
New Cumberland Pool

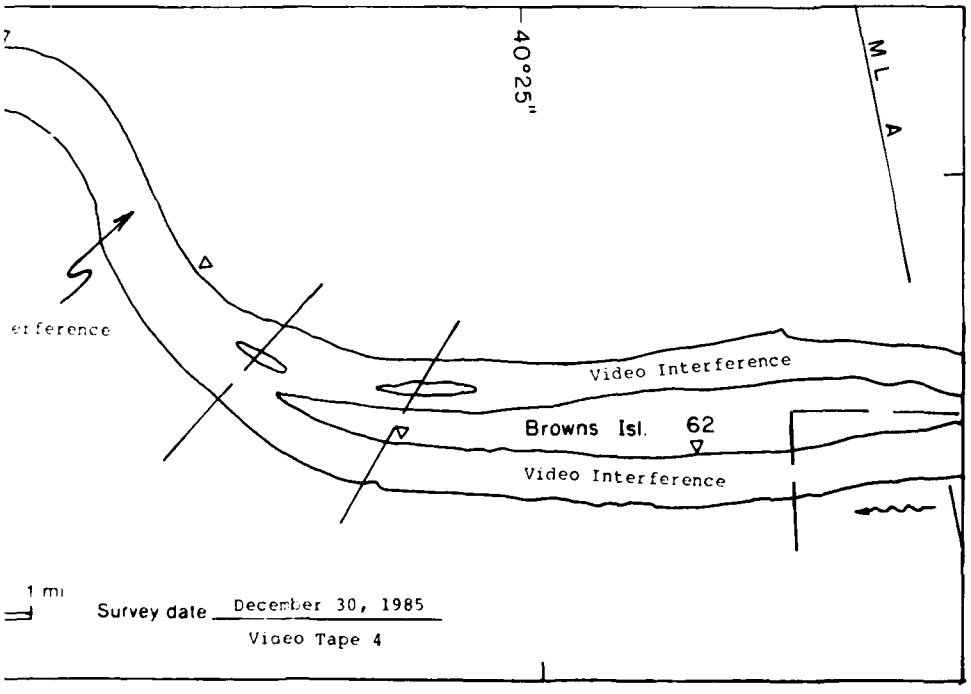
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.19	NA
Solid ice cover	0.46	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	5.83	NA
Fragmented ice cover with open-water areas	2.17	90
Ice floes or frazil slush and pans	3.18	30
Total area ($m^2 \times 10^6$)	14.87*	

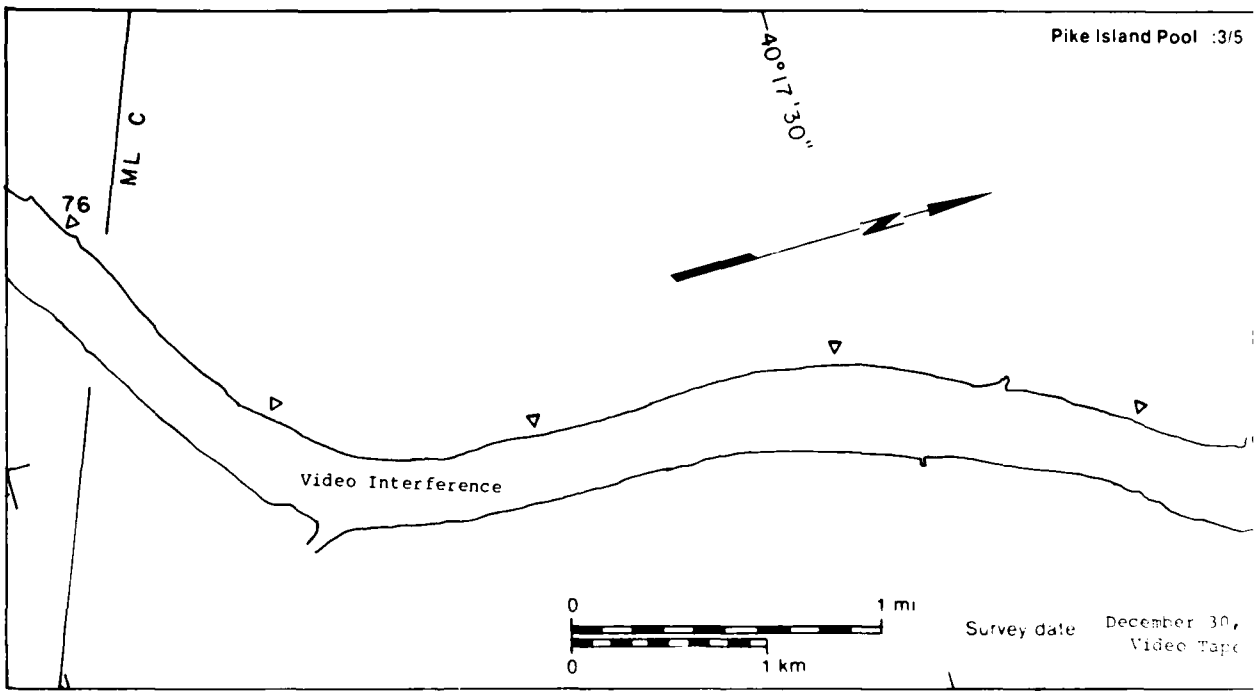
* Includes 1.04×10^6 m^2 of Video Interference

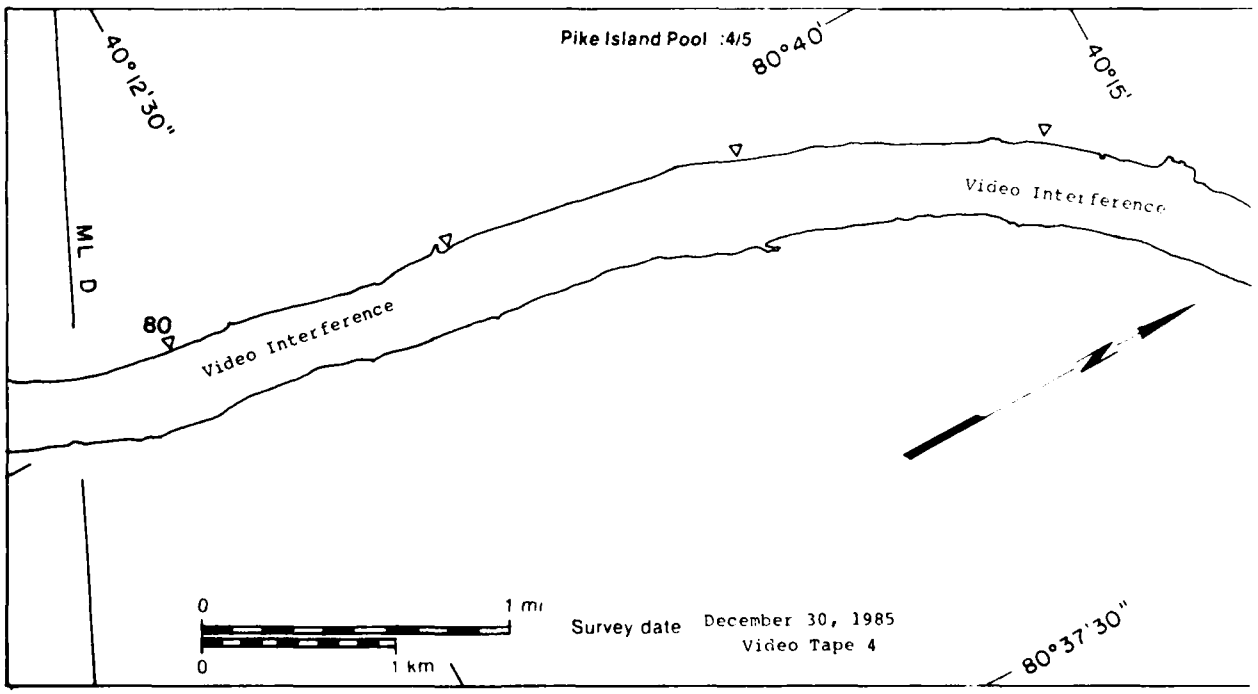


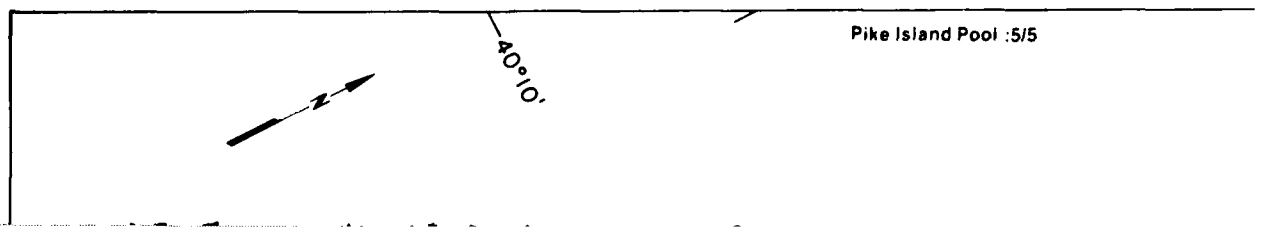

80°37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl
61
Video Interference
Match Line A
Video Interference
40°30'
0
0
Pike Island Pool :2/5
40°22'30"
80°37'30"
Video Interference
69
Video Interference
ML B
0
1 mi
0
1 km
Survey date December 30, 1985
Video Tape 4


Pike Island Pool :1/5
New Cumberland
L & D
54
55
Video Interference
40°30'
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 4

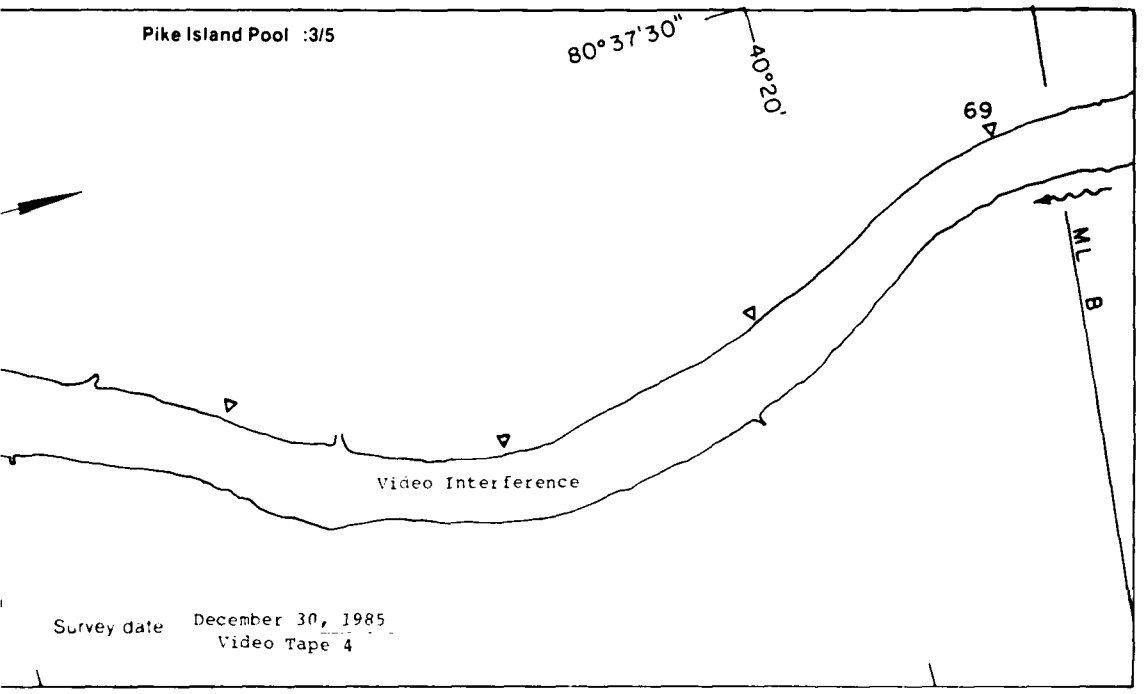

40°25"
M L A
erference
Video Interference
Browns Isl.
62
Video Interference
1 mi
Survey date December 30, 1985
Video Tape 4

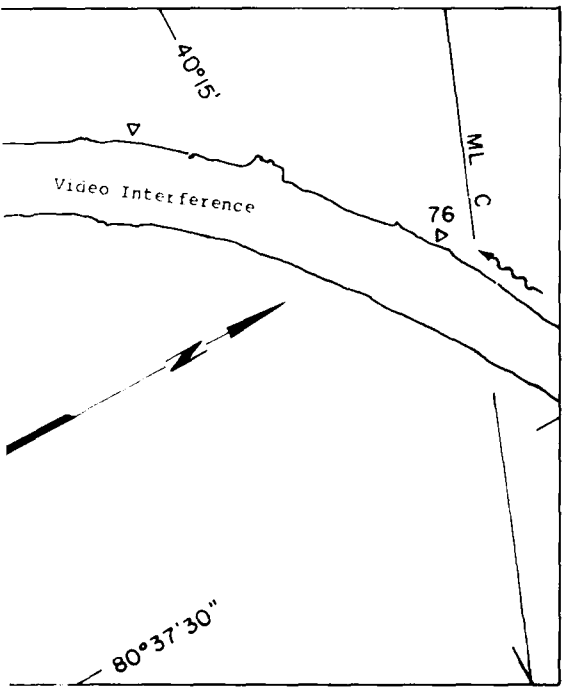

Pike Island Pool :3/5
40°17'30"
ML C
76
Video Interference
0
1 mi
0
1 km
Survey date December 30,
Video Tape

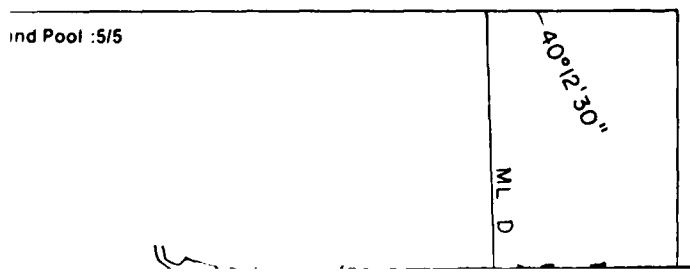

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
Video Interference
Video Interference
0
1 mi
0
1 km
Survey date December 30, 1985
Video Tape 4
80°37'30"

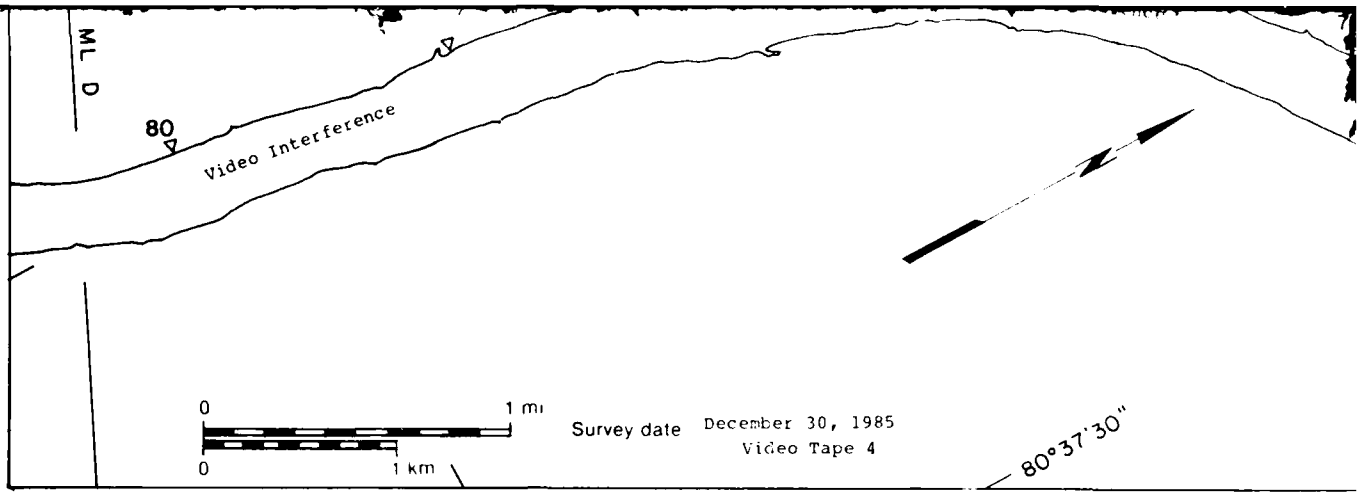

Pike Island Pool :5/5
40°10'

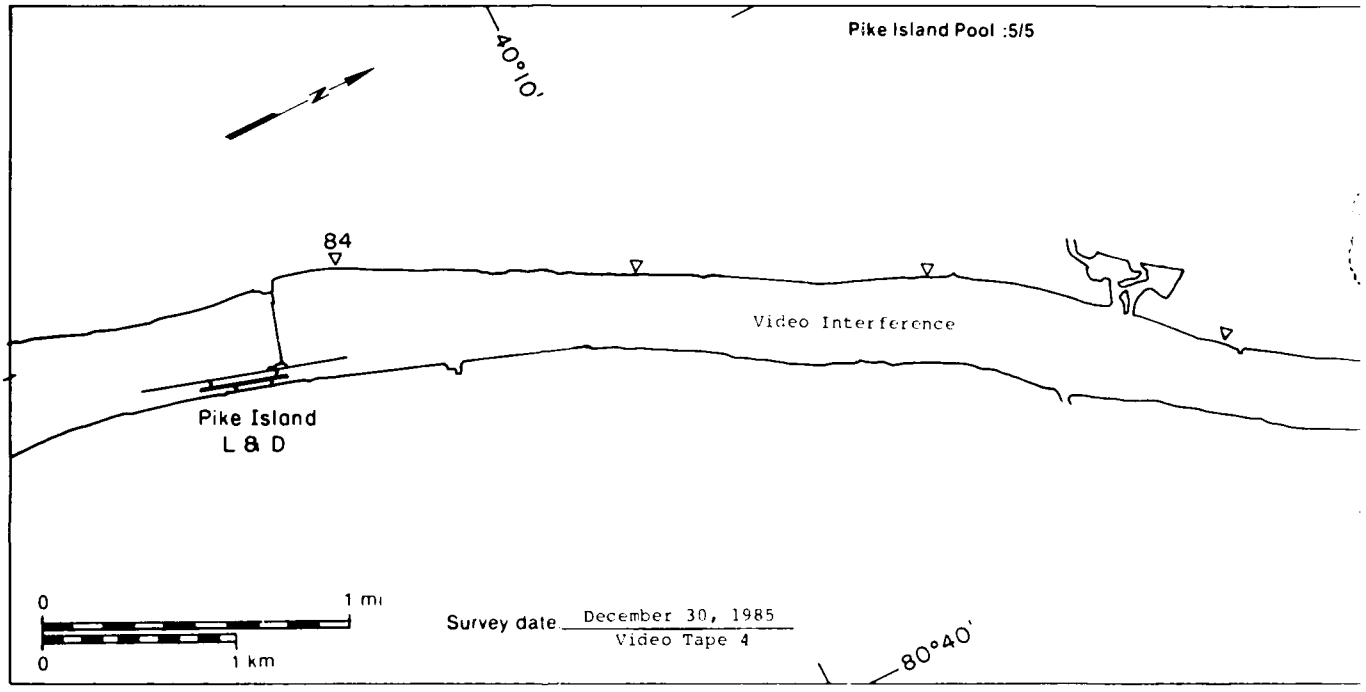
30 December 1985







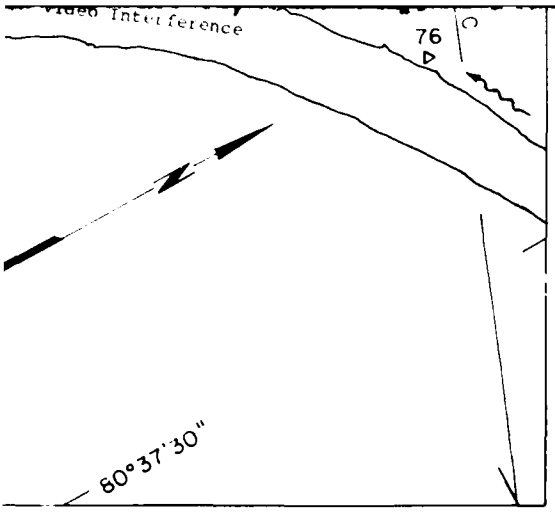


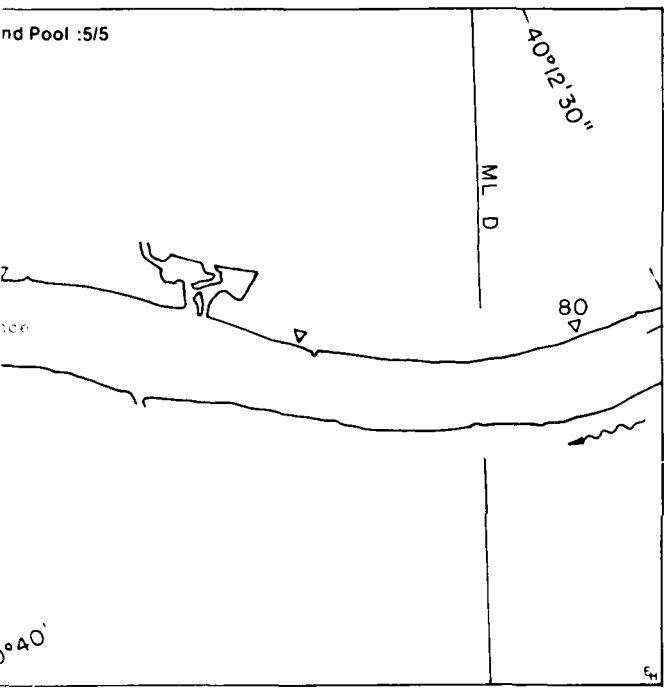


Pike Island Pool

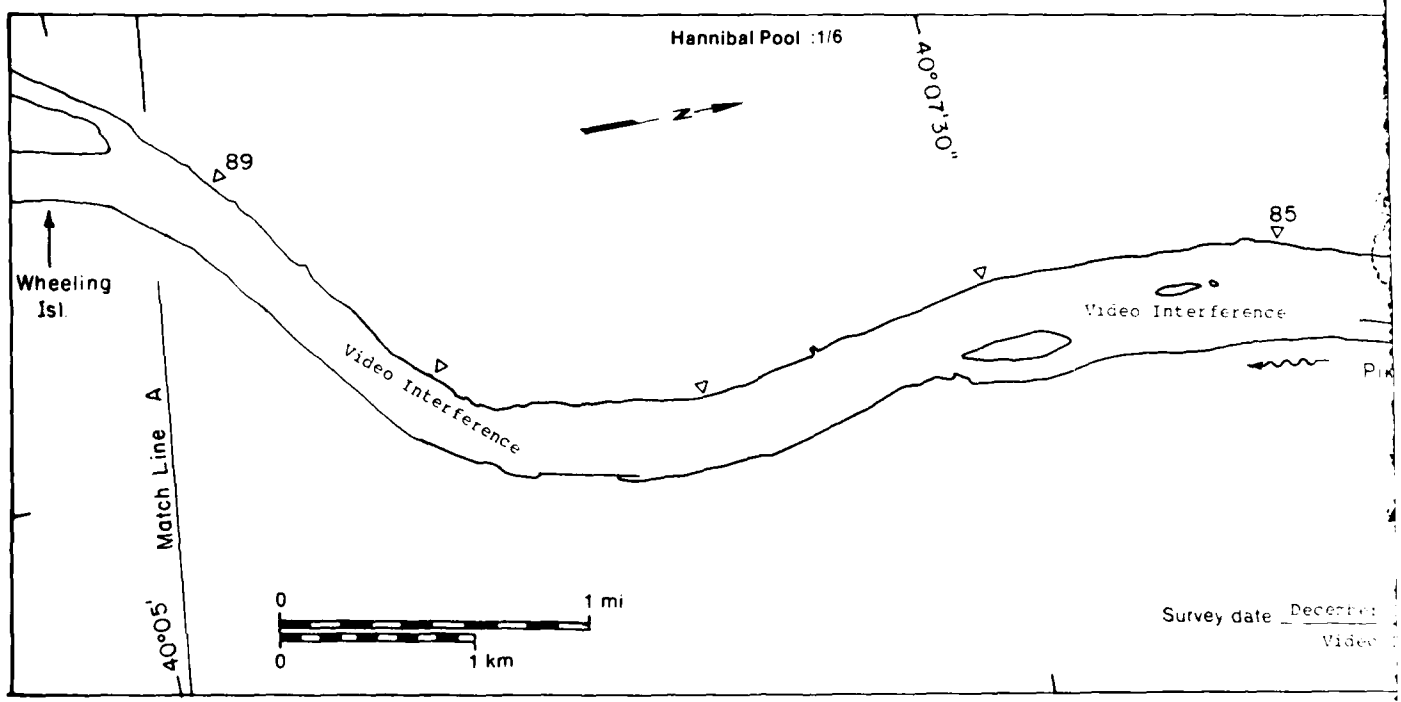
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (tenths)
Open water	0.90	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	18.92*	

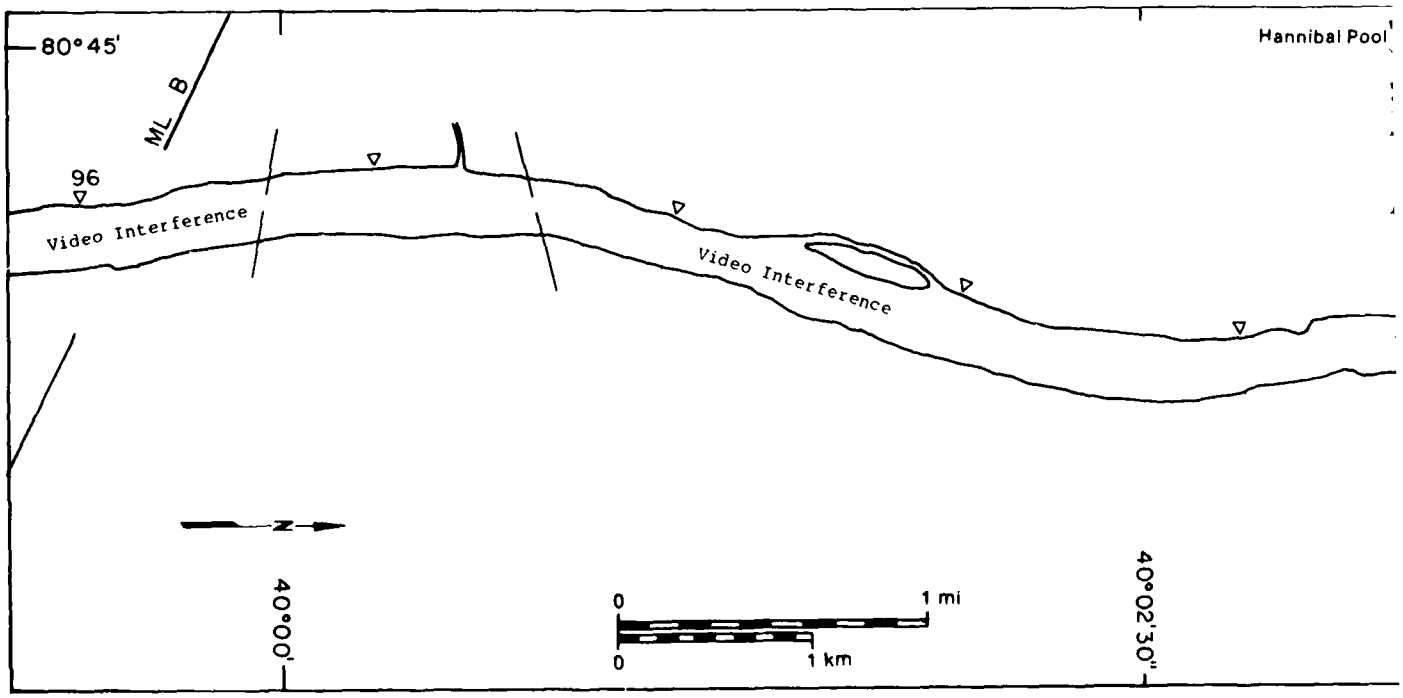
* Includes 18.02 x 10^6 m^2 of Video Interference

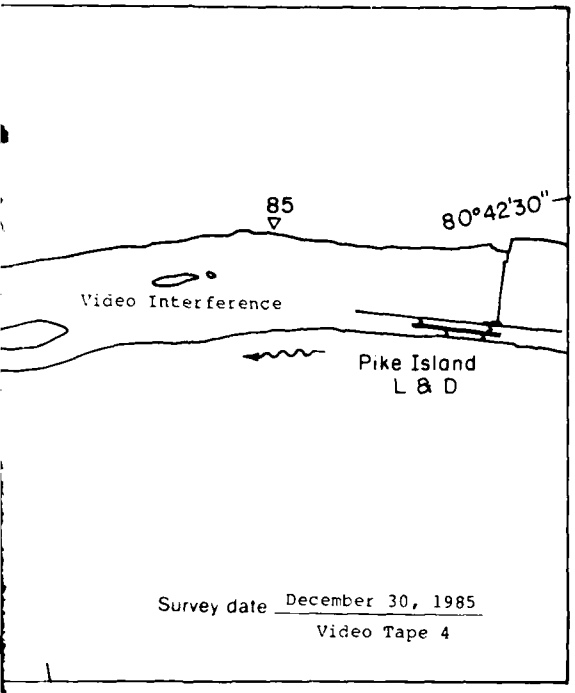

Video Interference
76
80°37'30"

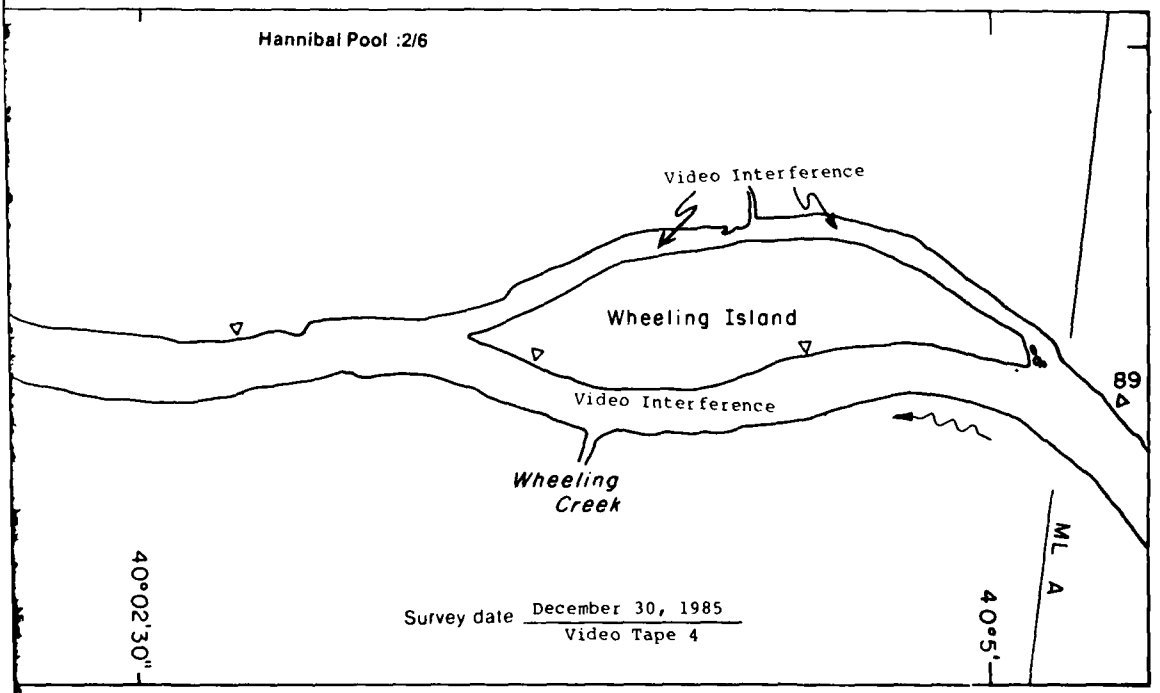

nd Pool :5/5
40°12'30"
ML D
80

30 December 1985

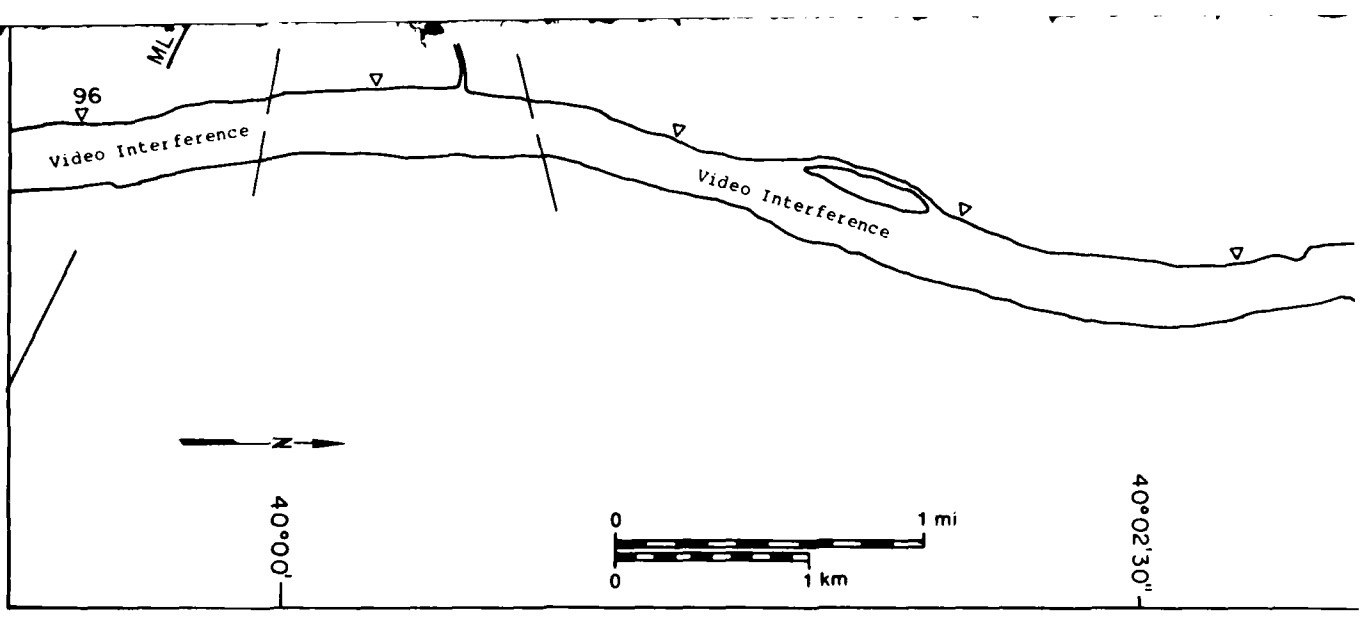


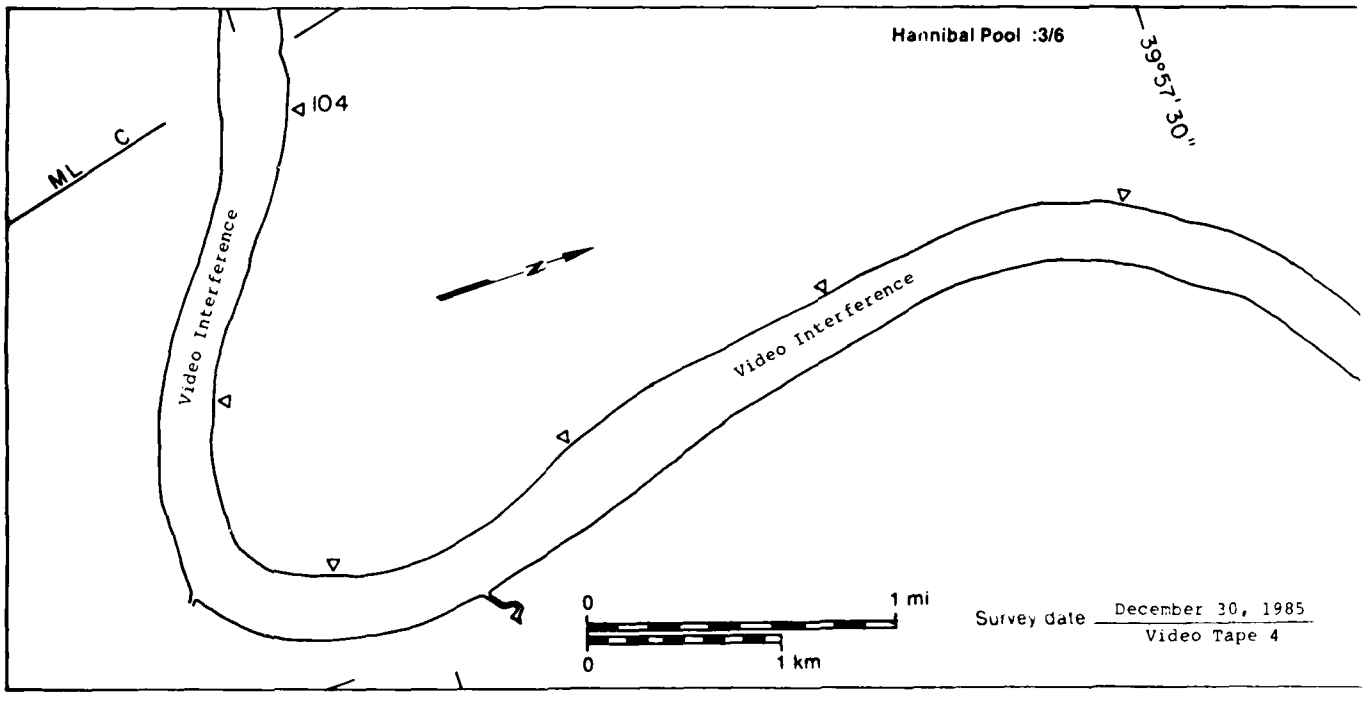


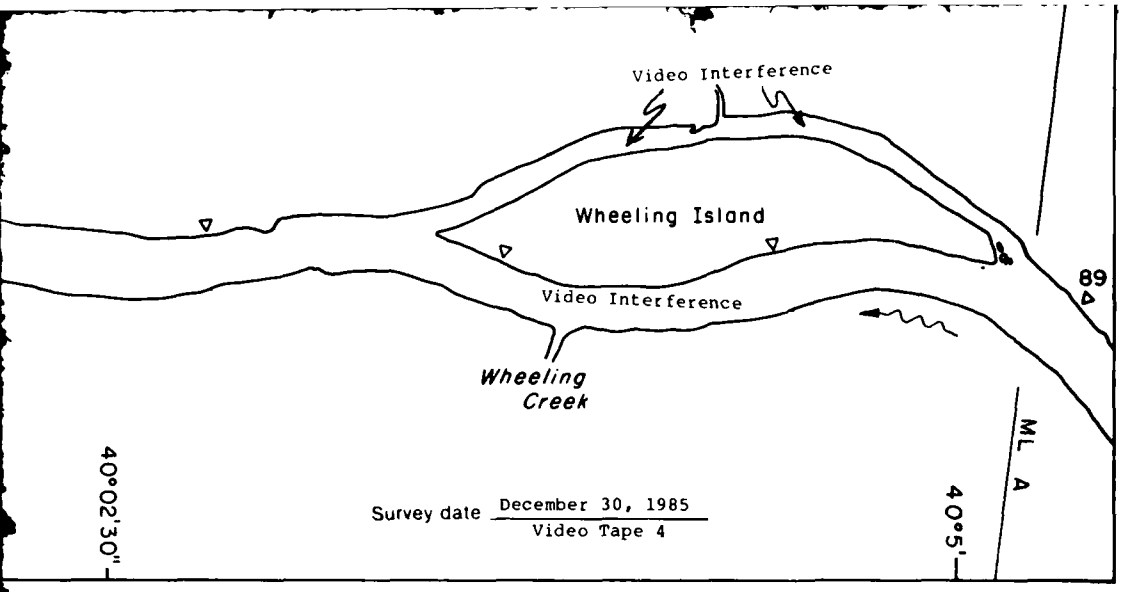

85
80°42'30"
Video Interference
Pike Island
L & D
Survey date December 30, 1985
Video Tape 4

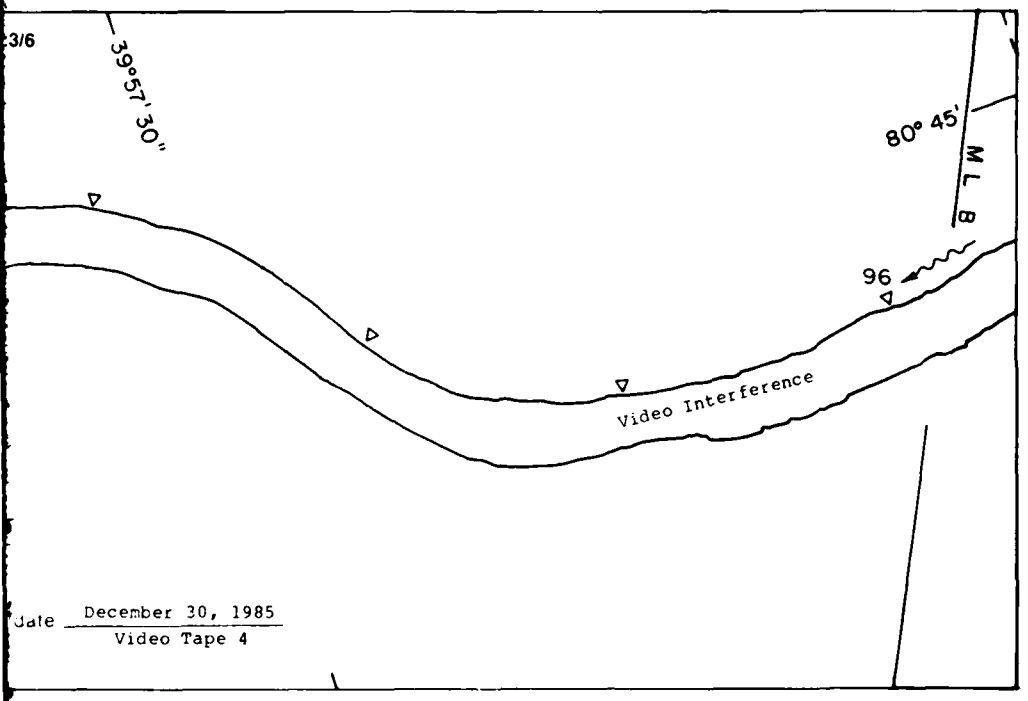

Hannibal Pool :2/6
Video Interference
Wheeling Island
89
Video Interference
Wheeling
Creek
40°02'30"
Survey date December 30, 1985
Video Tape 4
40°5'
ML A

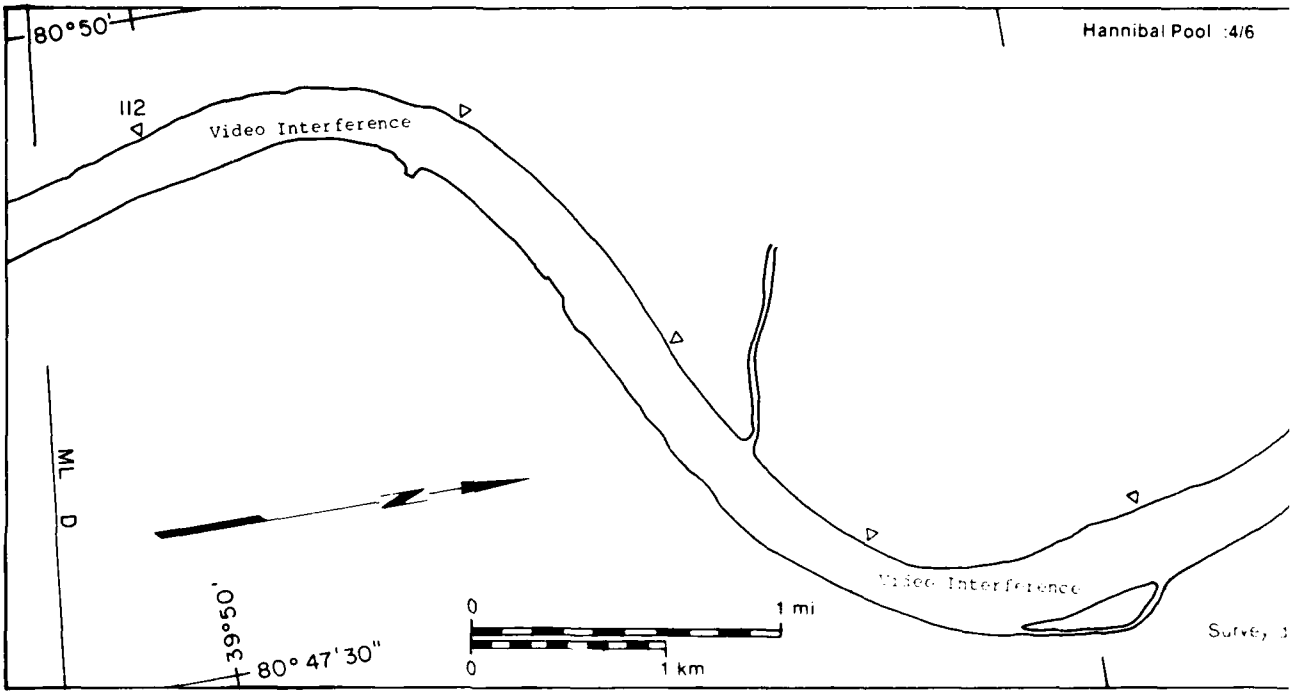
:3/6
39°57'

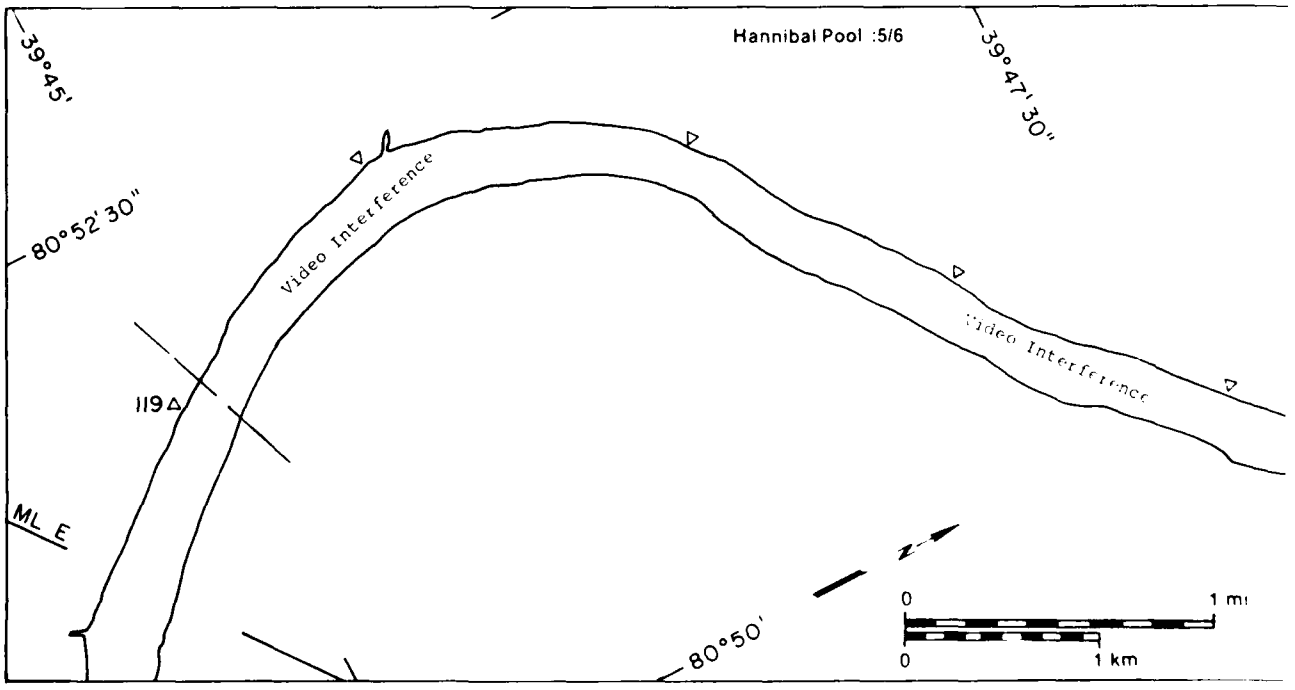

ML
96
Video Interference
Video Interference
N
40°00'
0
1 mi
0
1 km
40°02'30"

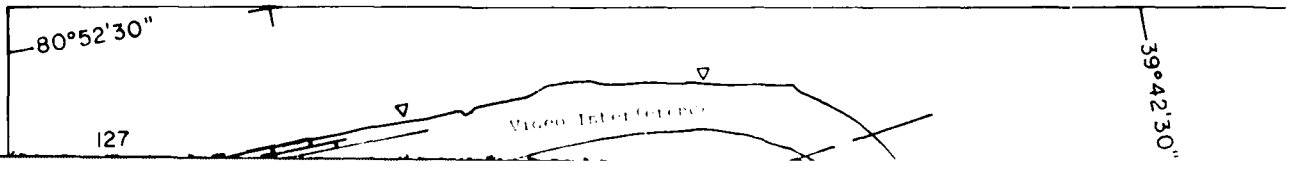

Hannibal Pool :3/6
39°57'30"
104
ML C
Video Interference
Video Interference
N
0
1 mi
0
1 km
Survey date December 30, 1985
Video Tape 4


Video Interference
Wheeling Island
89
Video Interference
Wheeling
Creek
40°02'30"
ML A
40°5'
Survey date December 30, 1985
Video Tape 4

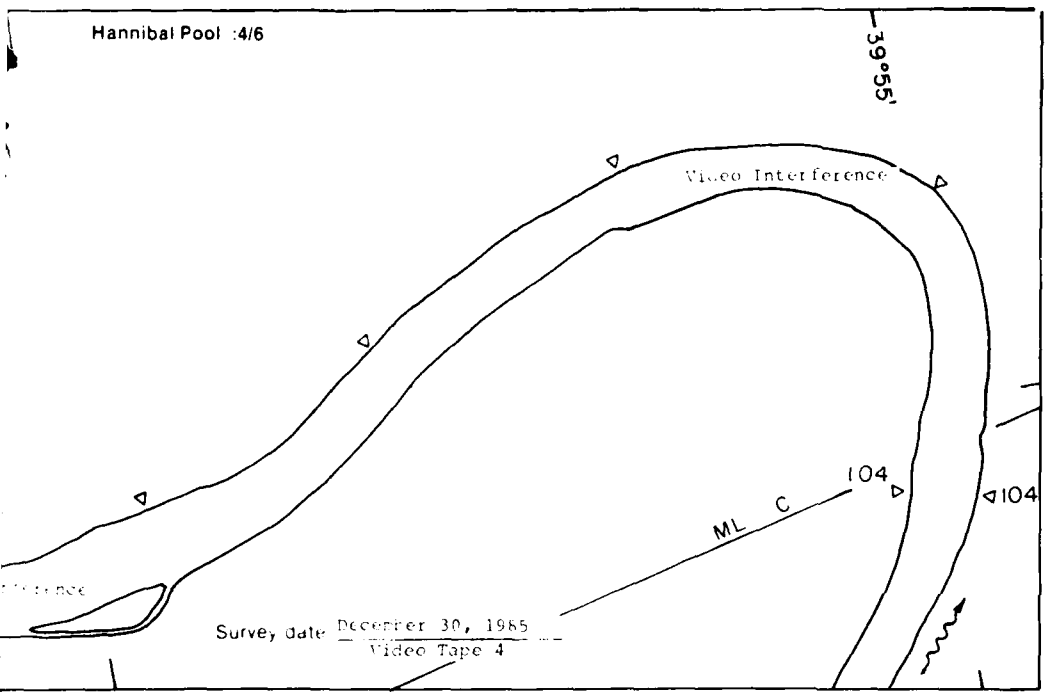

3/6
39°57'30"
80° 45'
ML B
96
Video Interference
Date December 30, 1985
Video Tape 4

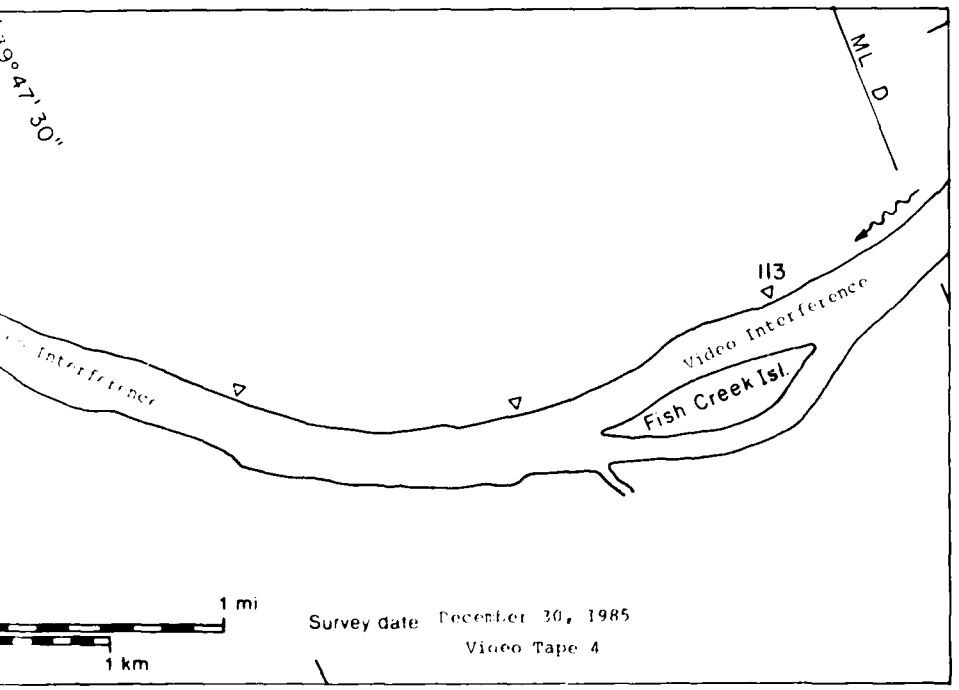

80°50'
Hannibal Pool :4/6
112
Video Interference
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km
Video Interference

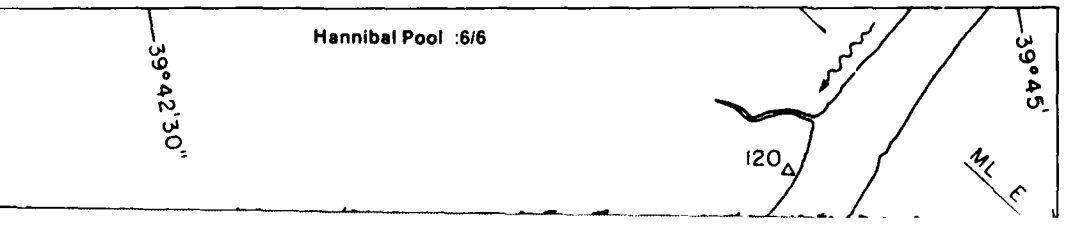

Hannibal Pool :5/6
39°45'
39°47'30"
80°52'30"
Video Interference
119
ML E
80°50'
0
1 mi
0
1 km
Video Interference

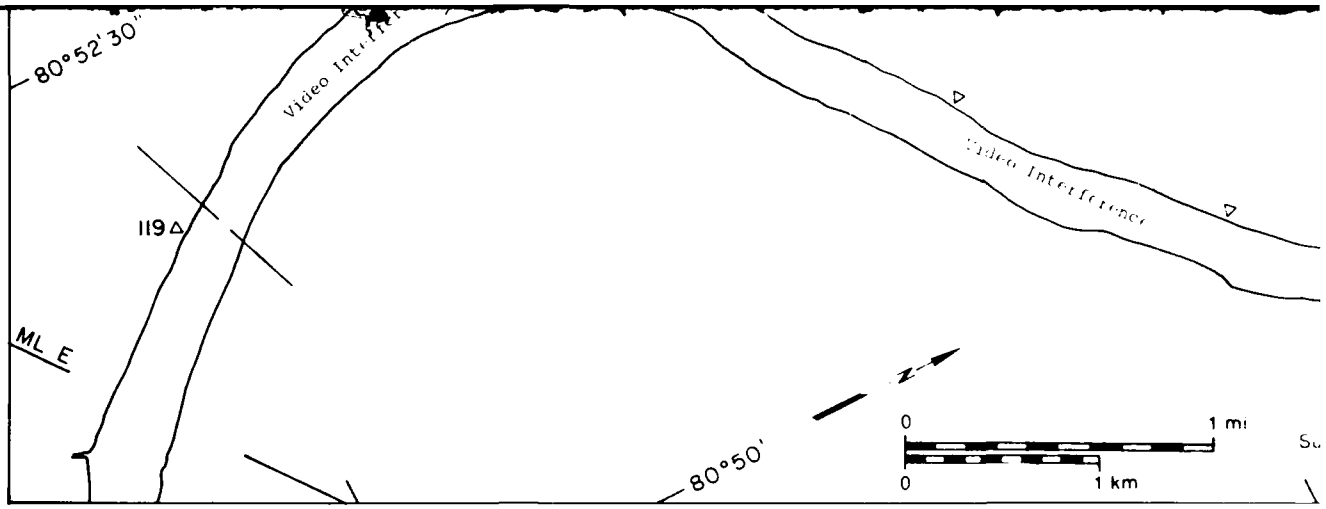

80°52'30"
39°42'30"
127
Video Interference

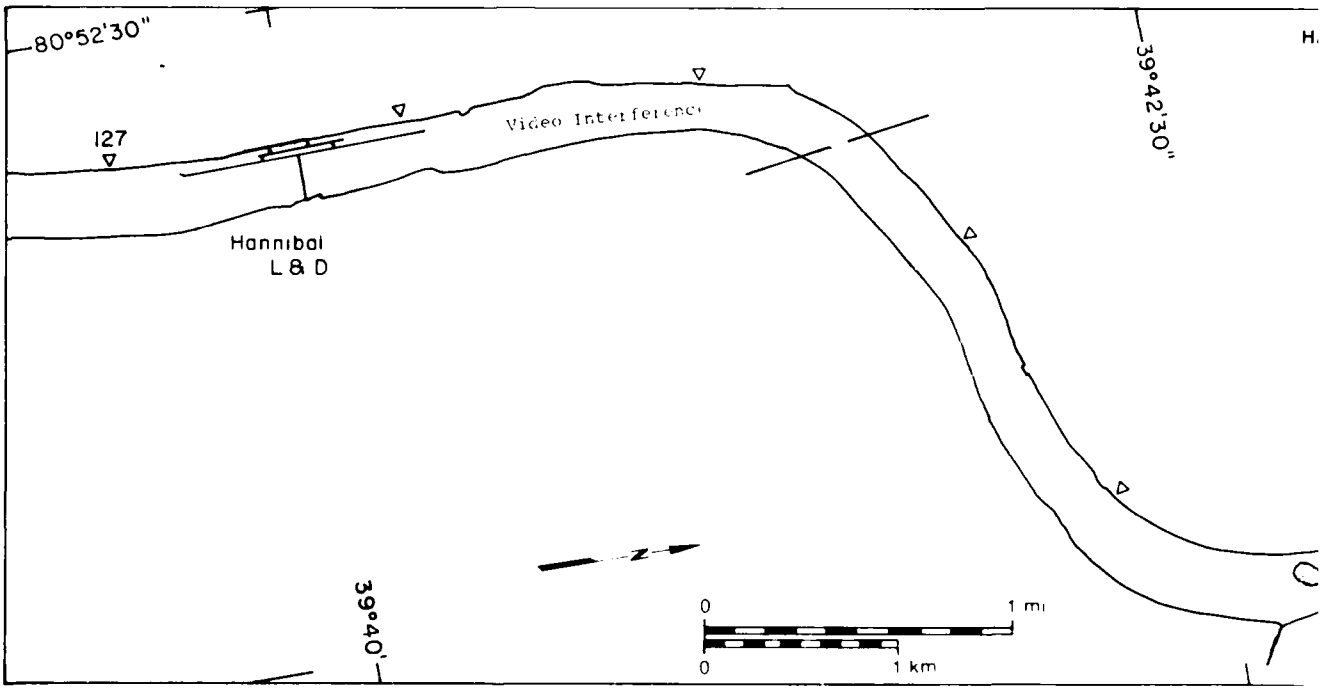
30 December 1985







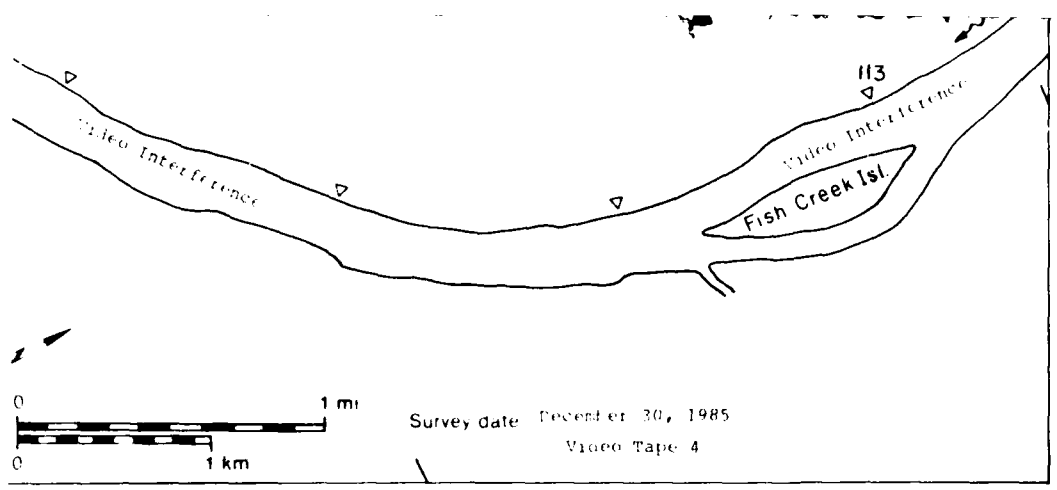


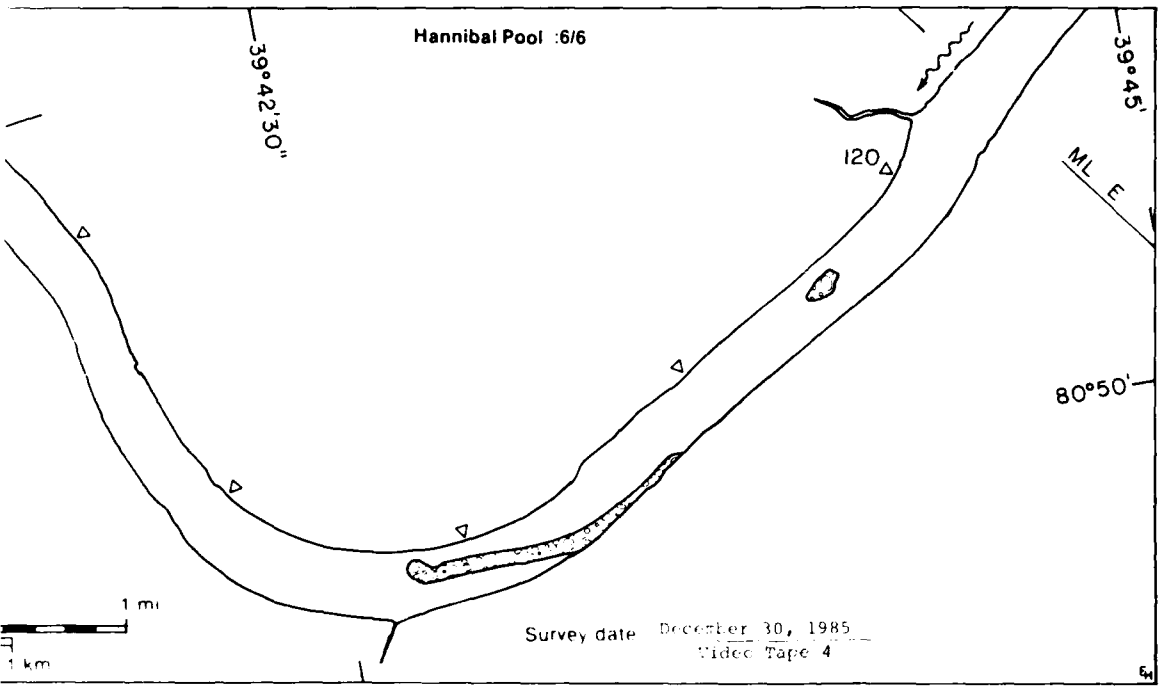


Hannibal Pool

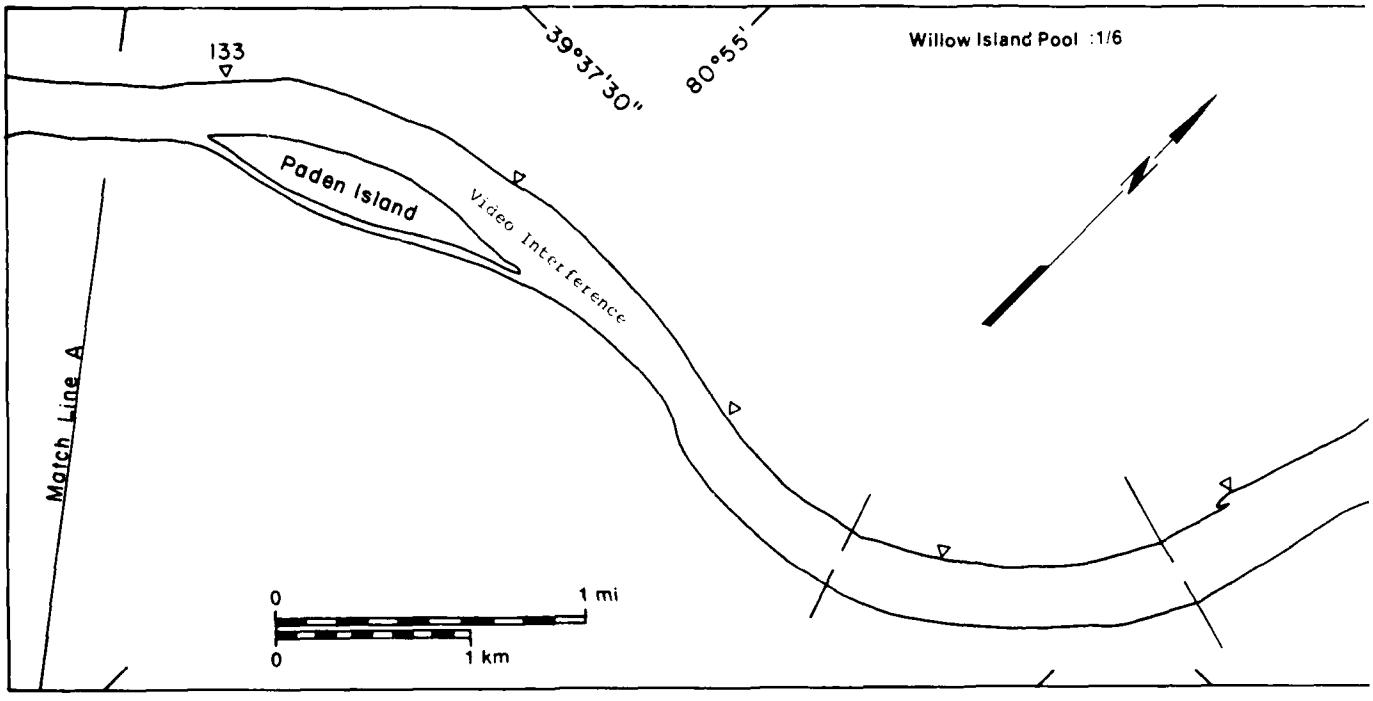
MAP UNITS	Area ($m^2 \times 10^6$)	Stage (ft)
Open water	3.34	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.12	20
Total area ($m^2 \times 10^6$)	22.46*	

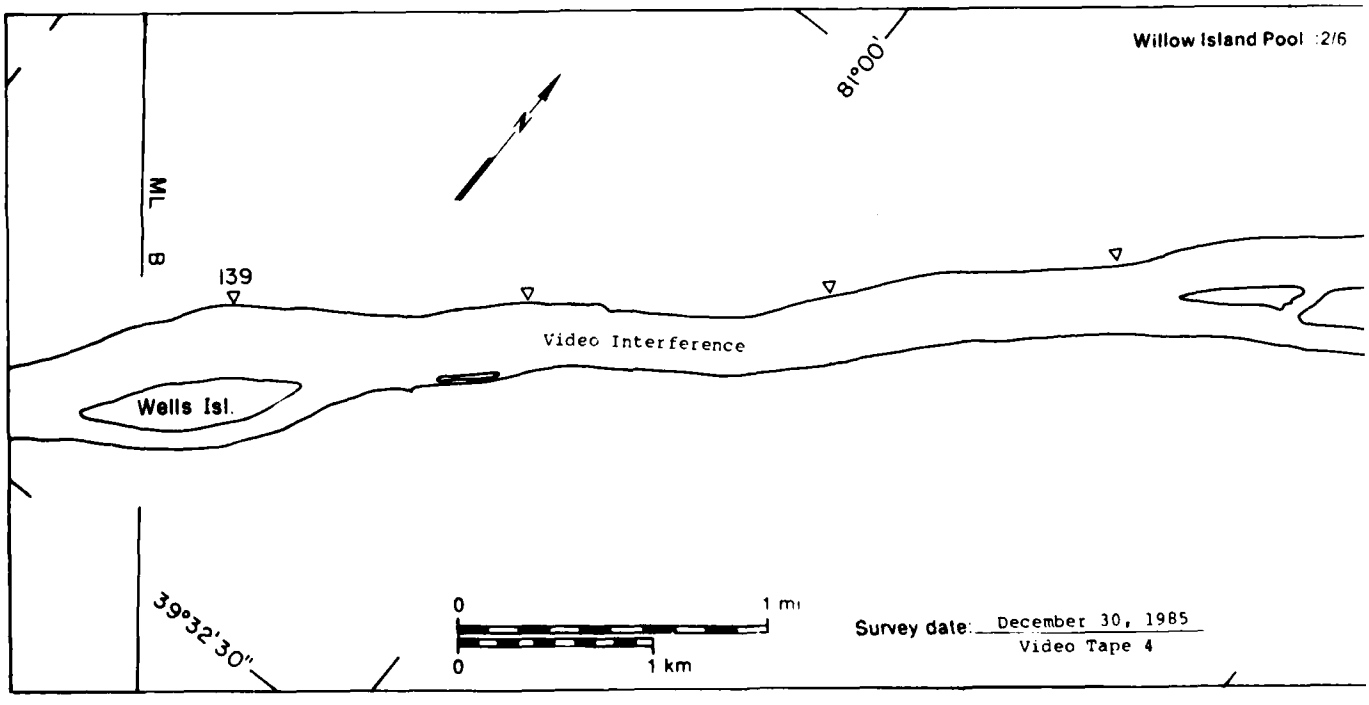
* Includes 19.00 x 10^6 m^2 of Video Interference

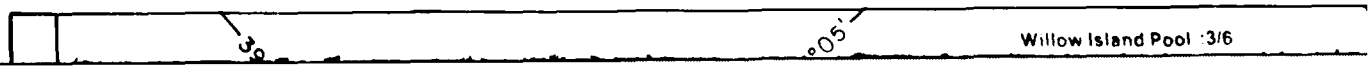

113
Video Interference
Video Interference
Fish Creek Isl.
0
1 mi
0
1 km
Survey date December 30, 1985
Video Tape 4

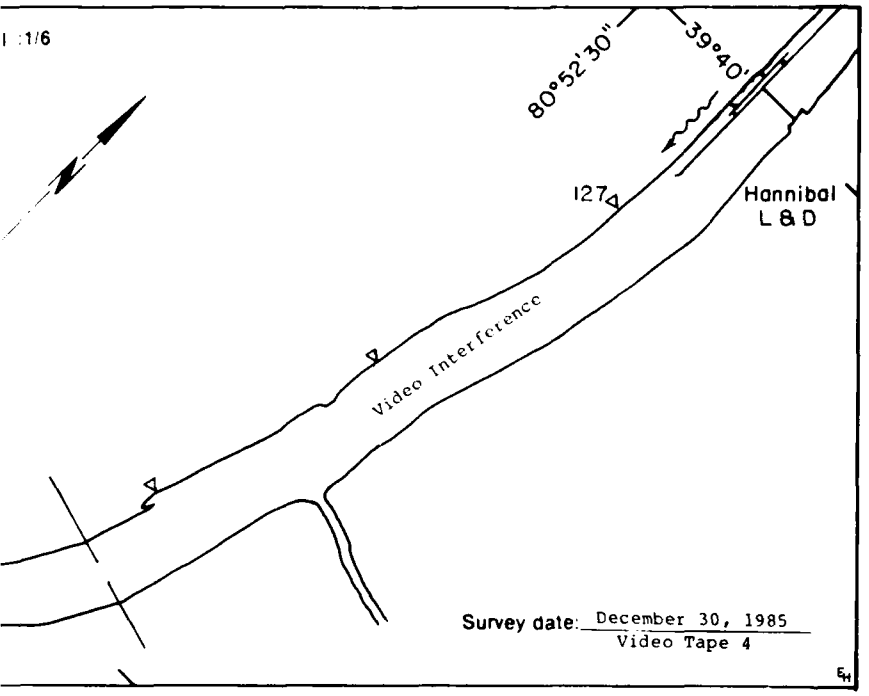

Hannibal Pool :6/6
39°42'30"
120
39°45'
ML E
80°50'
1 mi
1 km
Survey date December 30, 1985
Video Tape 4

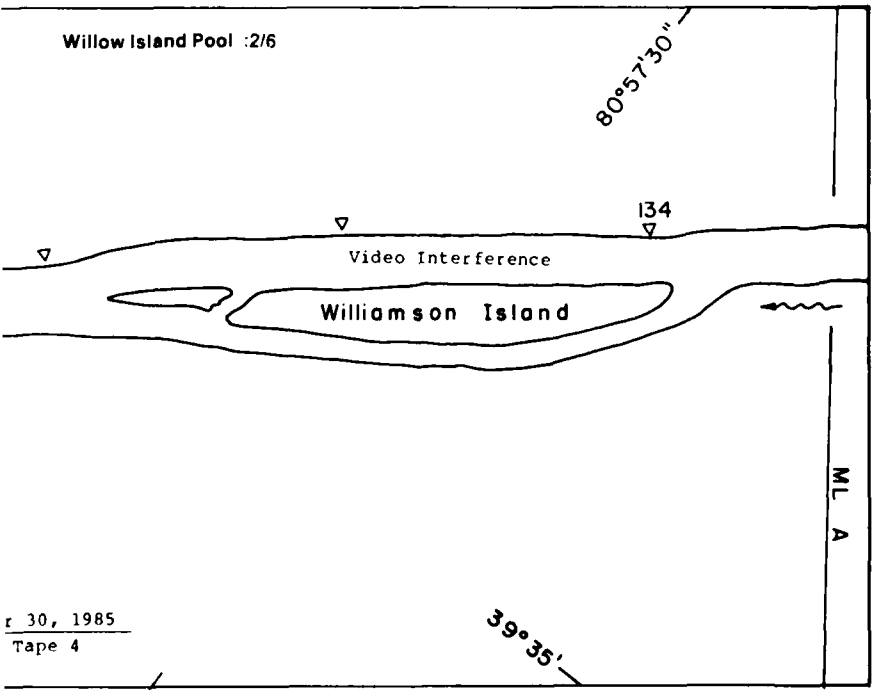
30 December 1985

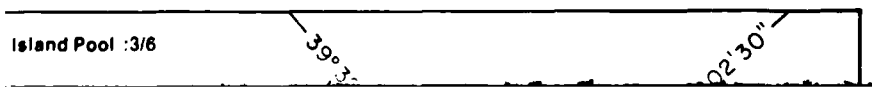


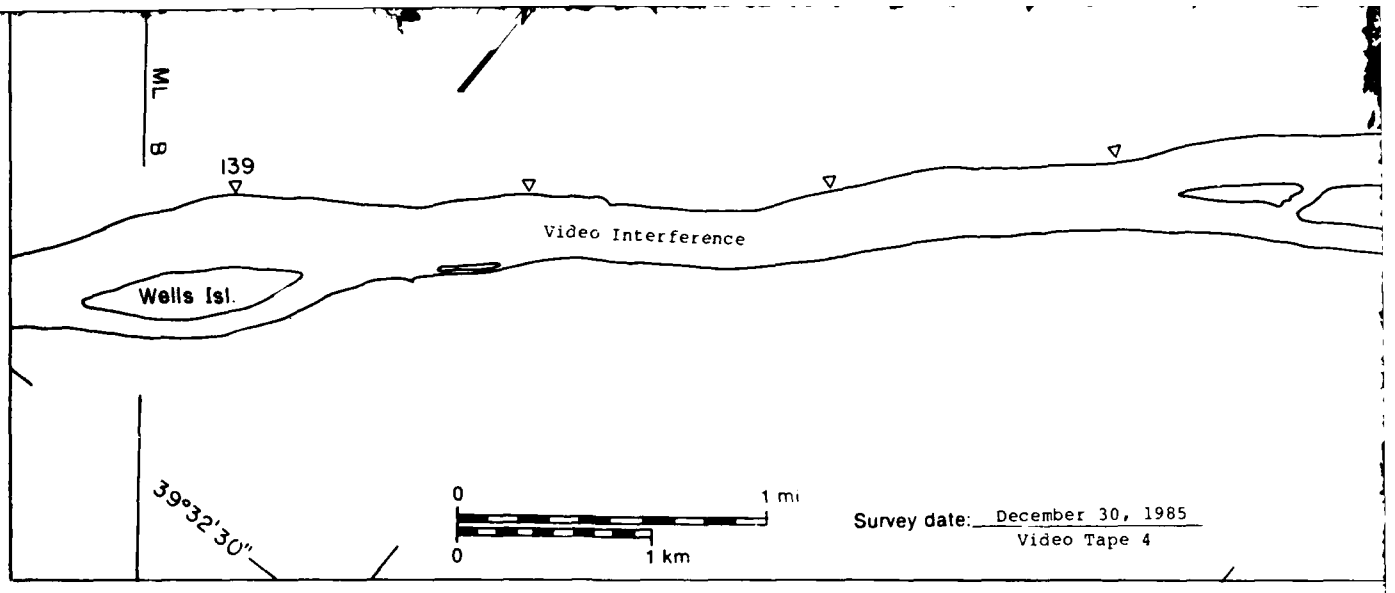


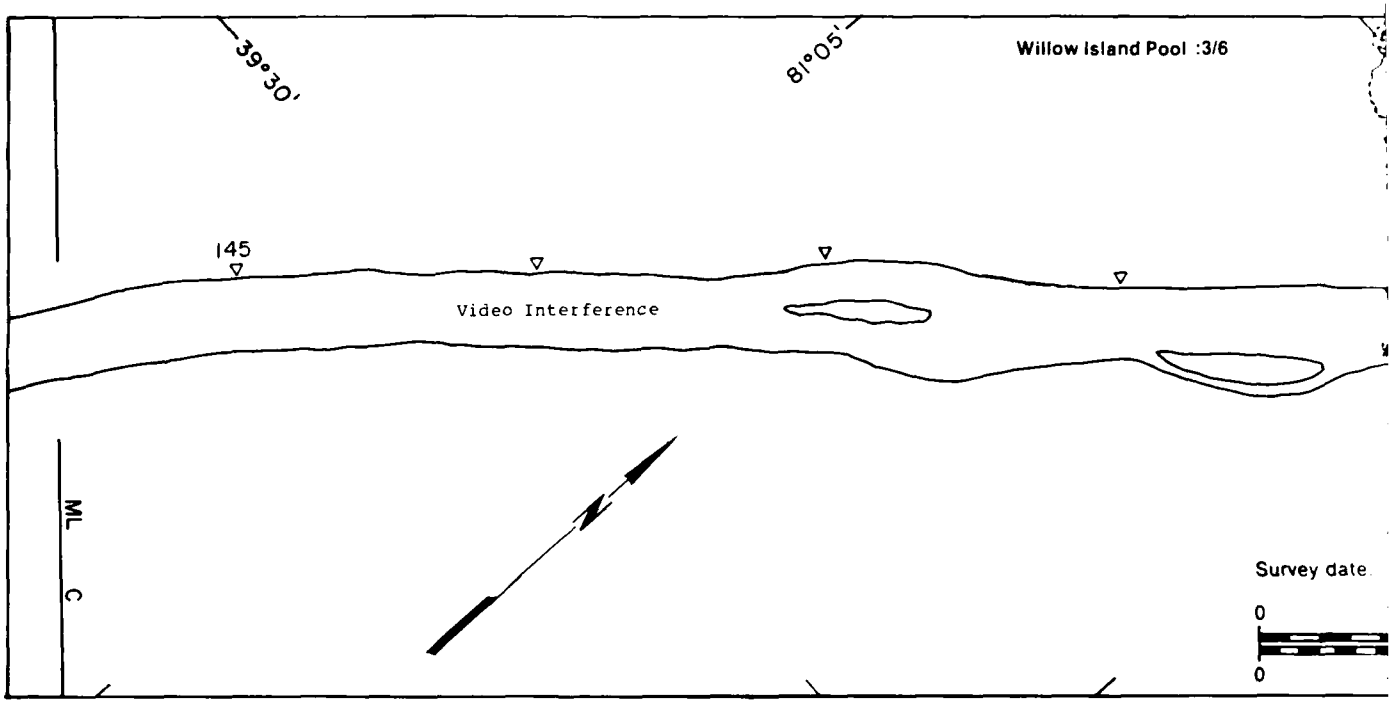


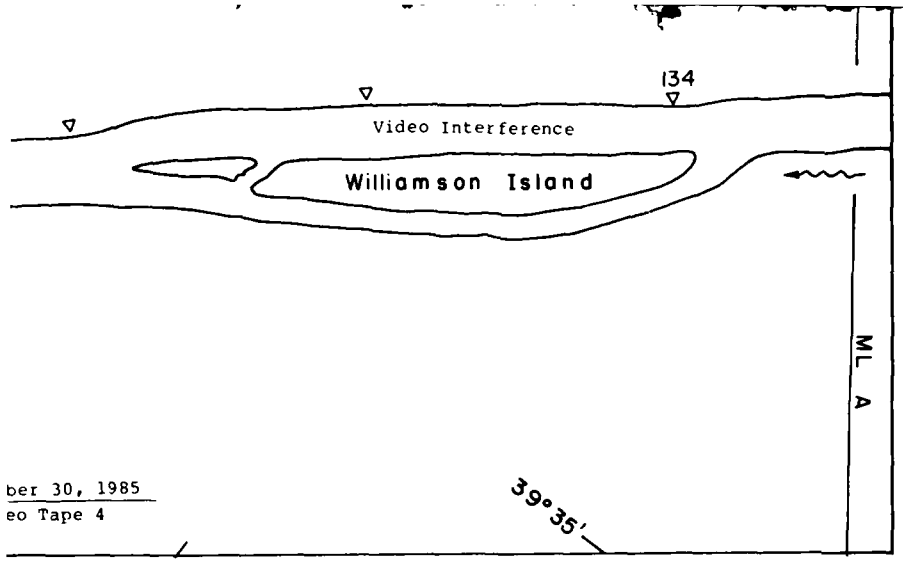

1 :1/6
80°52'30"
39°40'
127
Hannibal
L&D
Video Interference
Survey date: December 30, 1985
Video Tape 4


Willow Island Pool :2/6
80°57'30"
134
Video Interference
Williamson Island
ML A
39°35'
r 30, 1985
Tape 4

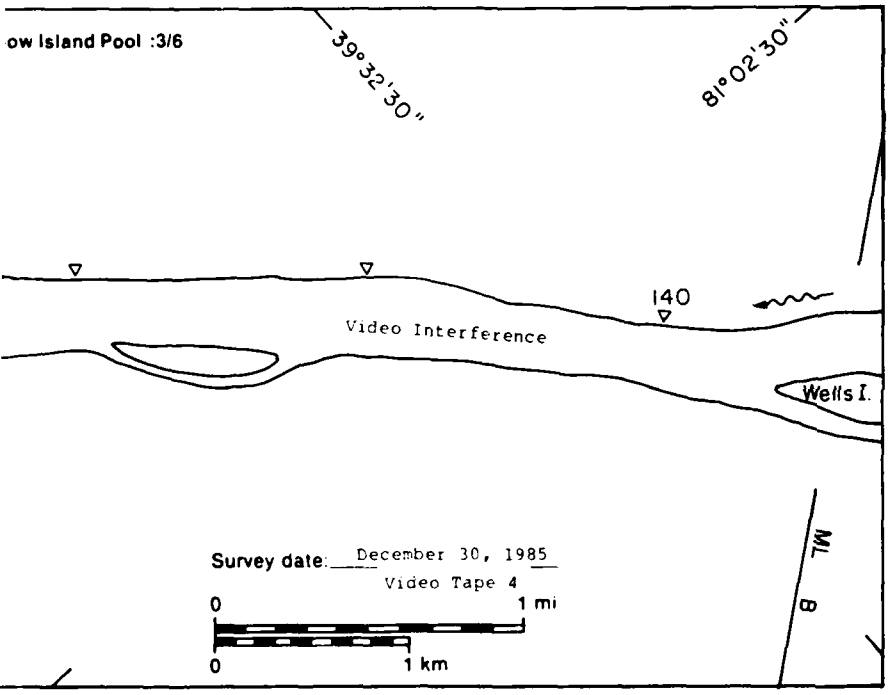

Island Pool :3/6
39°3
02'30"

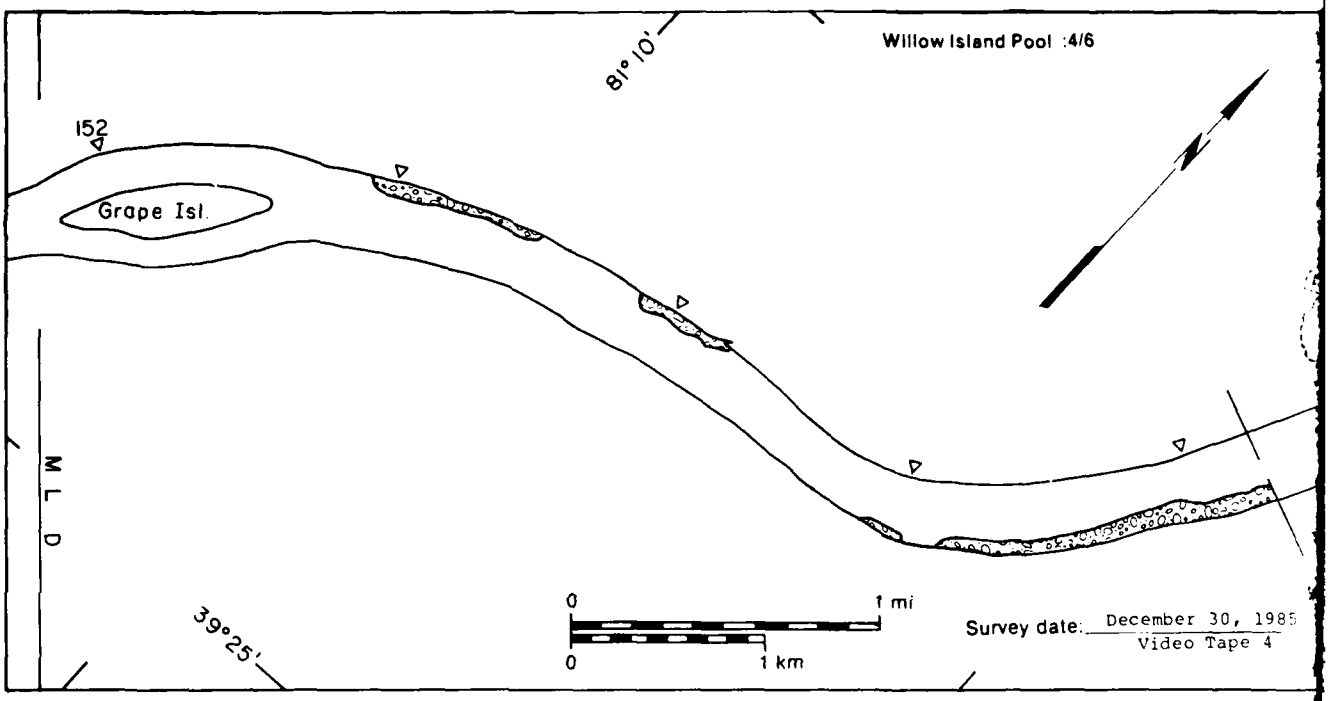

ML B
139
Video Interference
Wells Isl.
39°32'30"
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 4

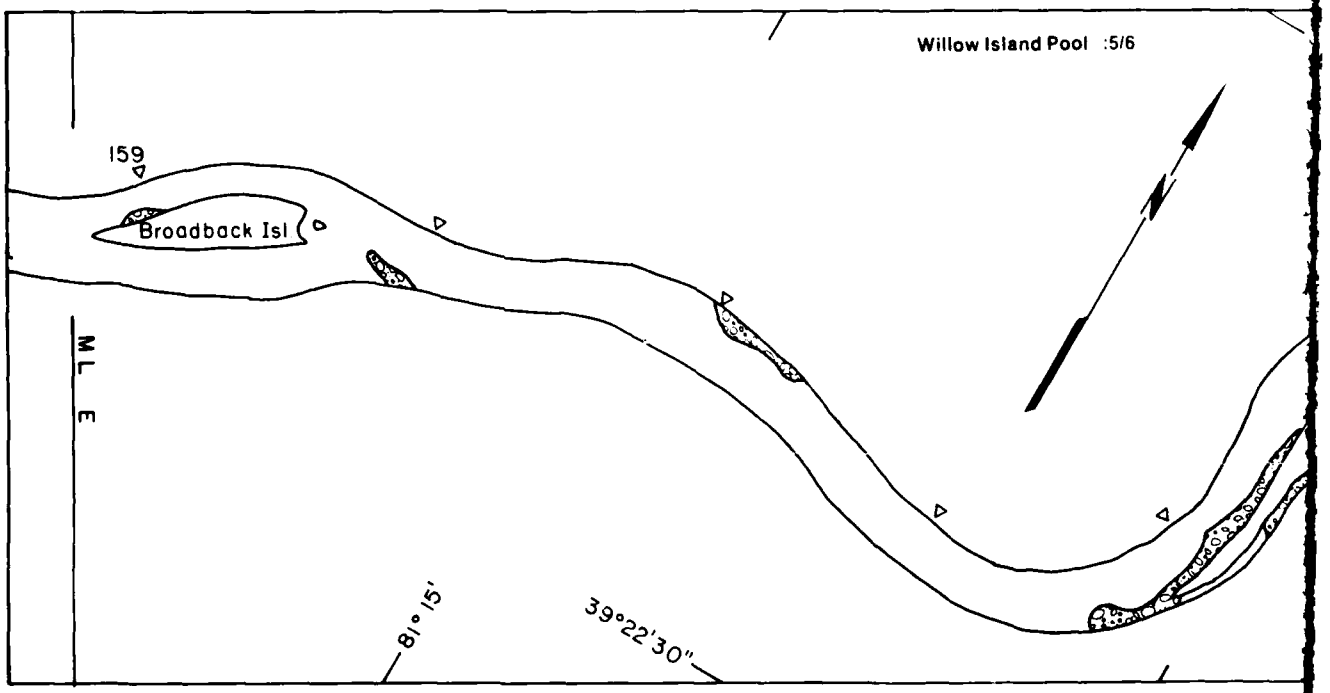

39°30'
81°05'
Willow Island Pool :3/6
145
Video Interference
ML C
Survey date
0
0

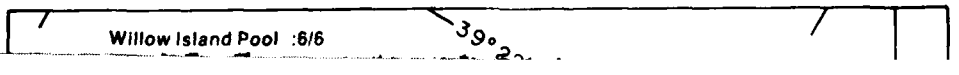


ber 30, 1985
eo Tape 4

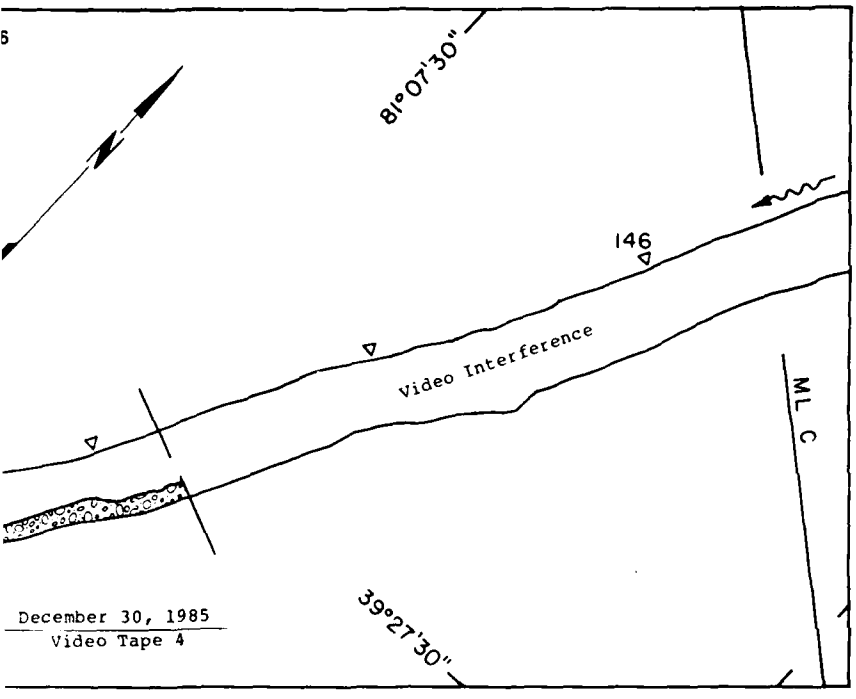


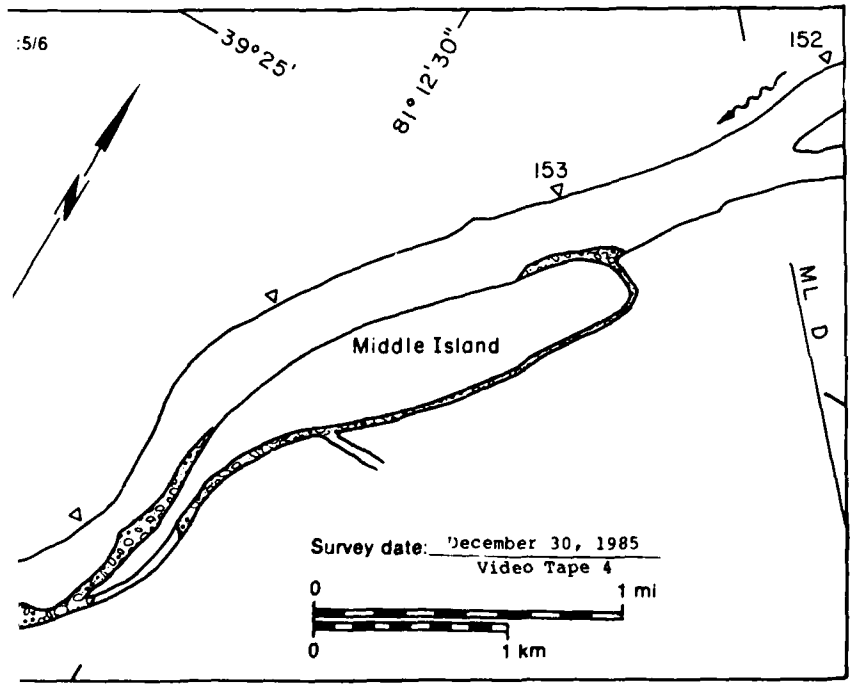

Willow Island Pool :4/6
81° 10'
152
Grape Isl.
M L D
39°25'
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 4


Willow Island Pool :5/6
159
Broadback Isl
M L E
81° 15'
39°22'30"


Willow Island Pool :6/6
Willow Island Po

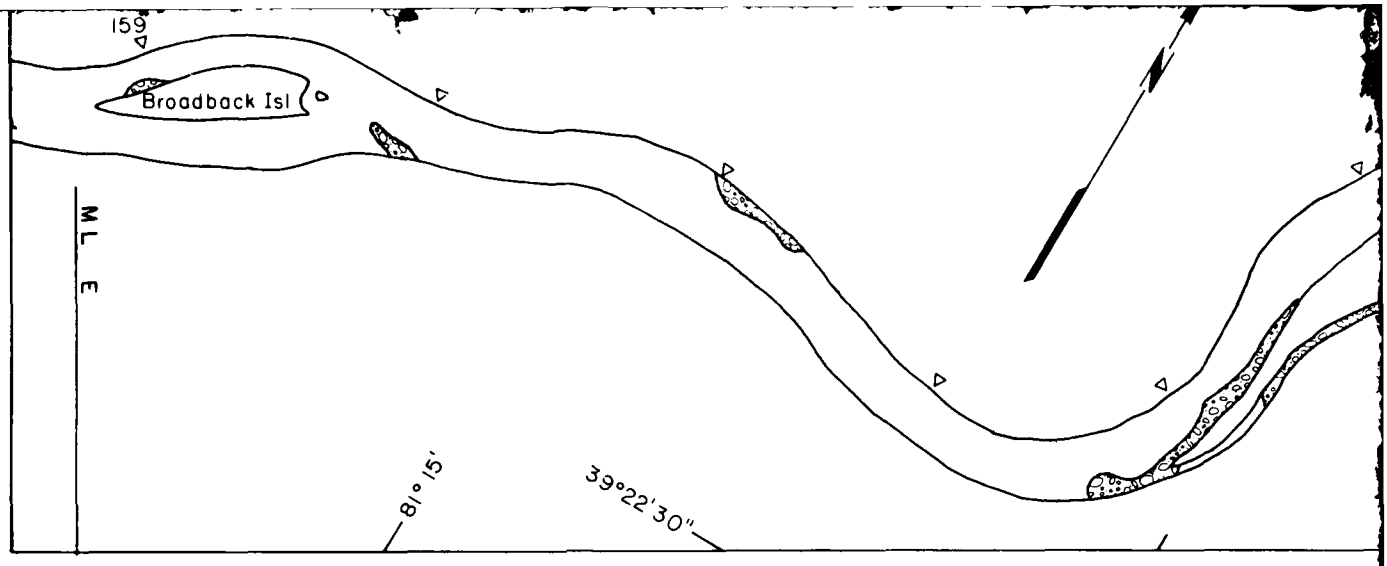
30 December 1985

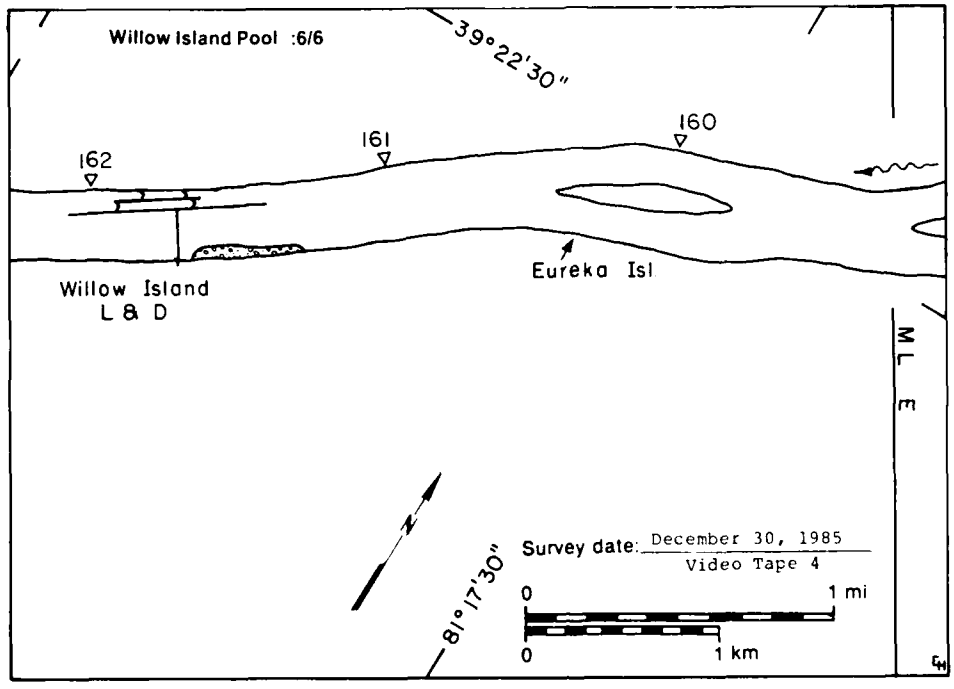


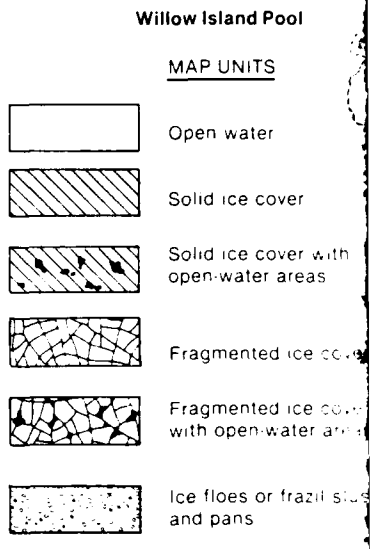


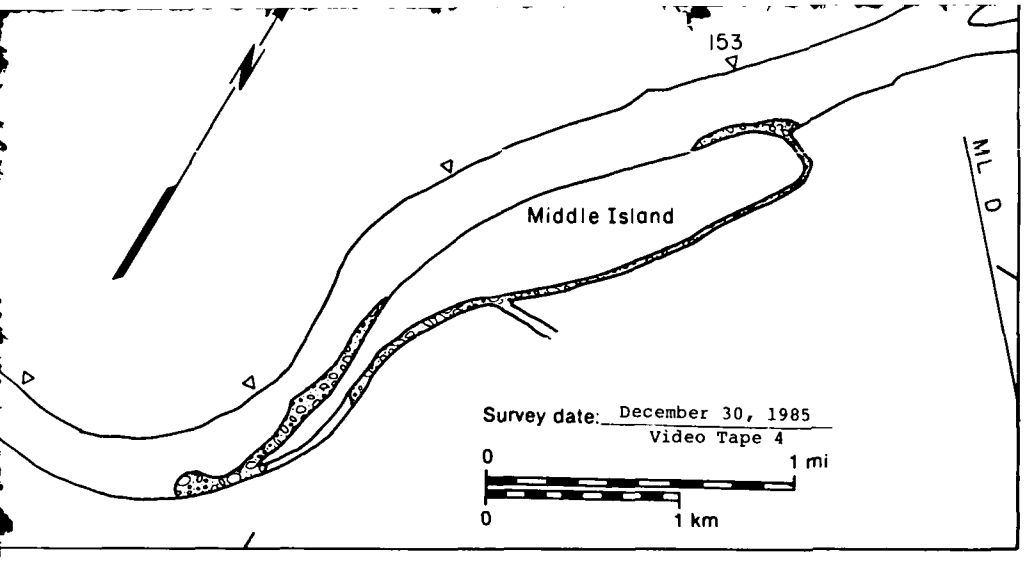
Willow Island Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)


159
Broadback Isl
WLE
81°15'
39°22'30"


Willow Island Pool :6/6
39°22'30"
160
161
162
Eureka Isl
Willow Island
L & D
WLE
81°17'30"
Survey date: December 30, 1985
Video Tape 4
0
1 mi
0
1 km


Willow Island Pool
MAP UNITS
Open water
Solid ice cover
Solid ice cover with open-water areas
Fragmented ice cover
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans
Total area (mi² x

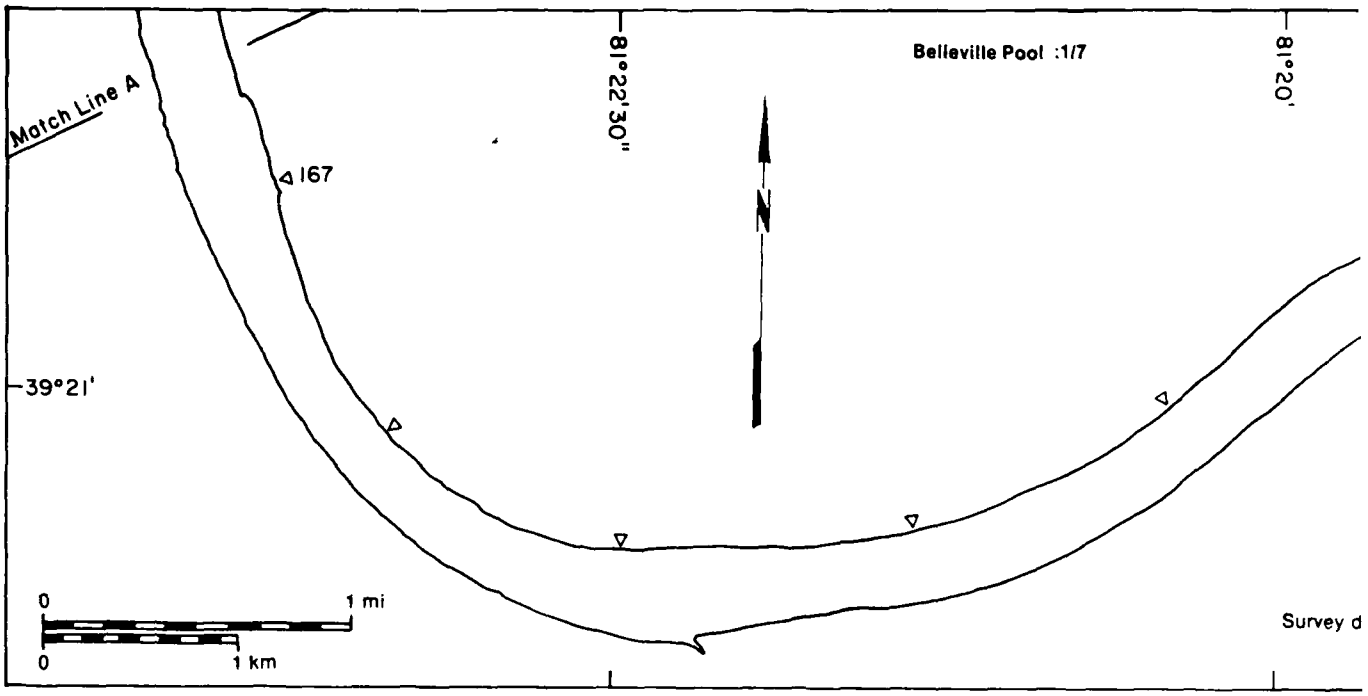


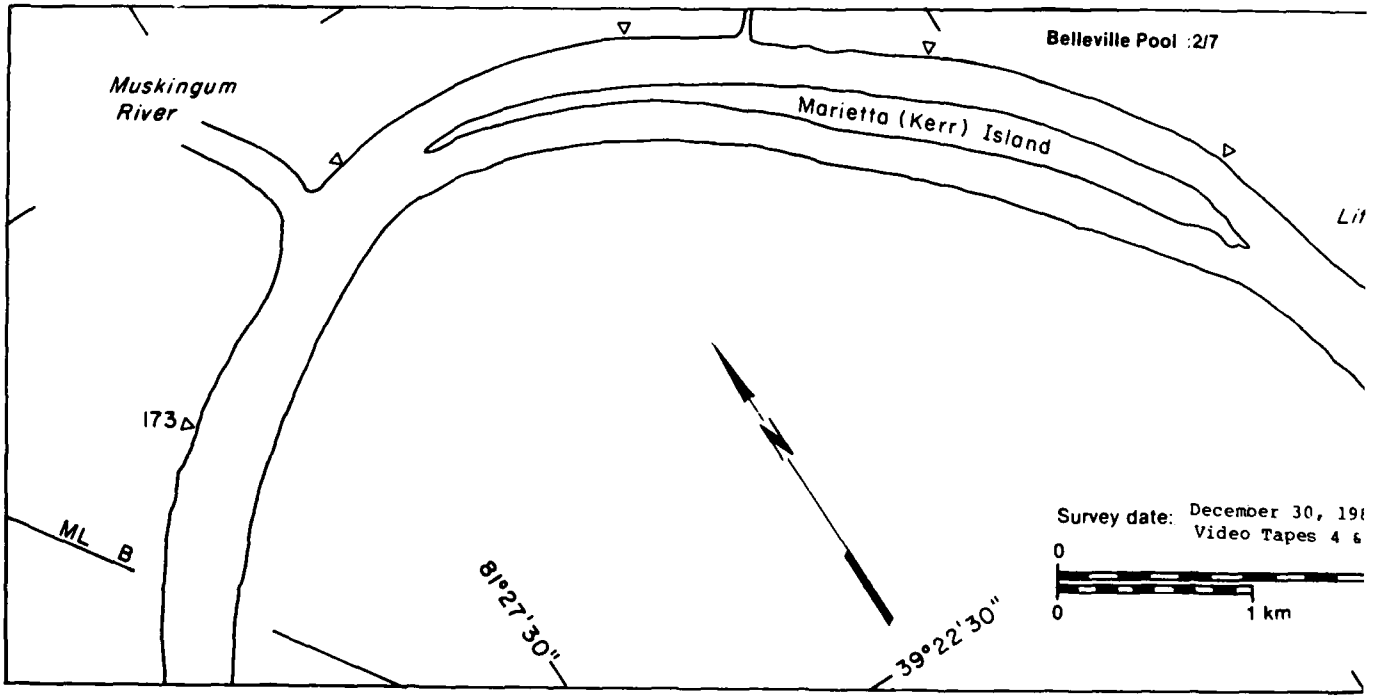
Willow Island Pool

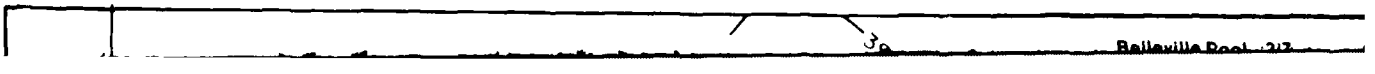
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.08	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.66	10
Total area ($m^2 \times 10^6$)	21.24*	

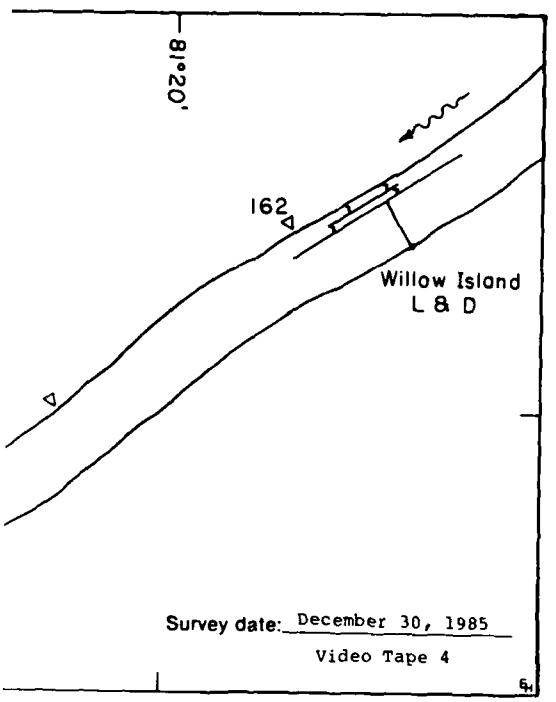
* Includes 12.50×10^6 m^2 of Video Interference

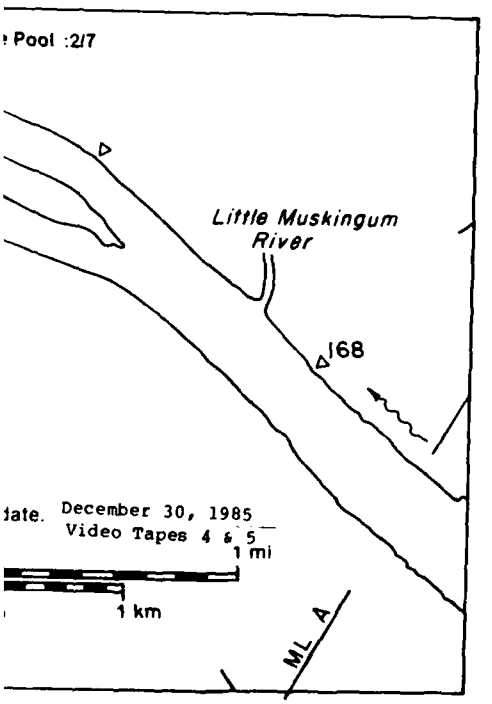
30 December 1985

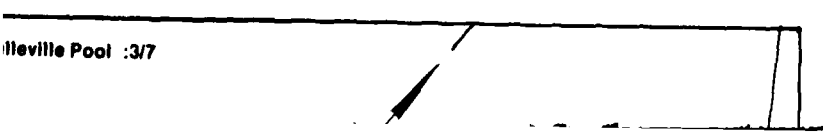


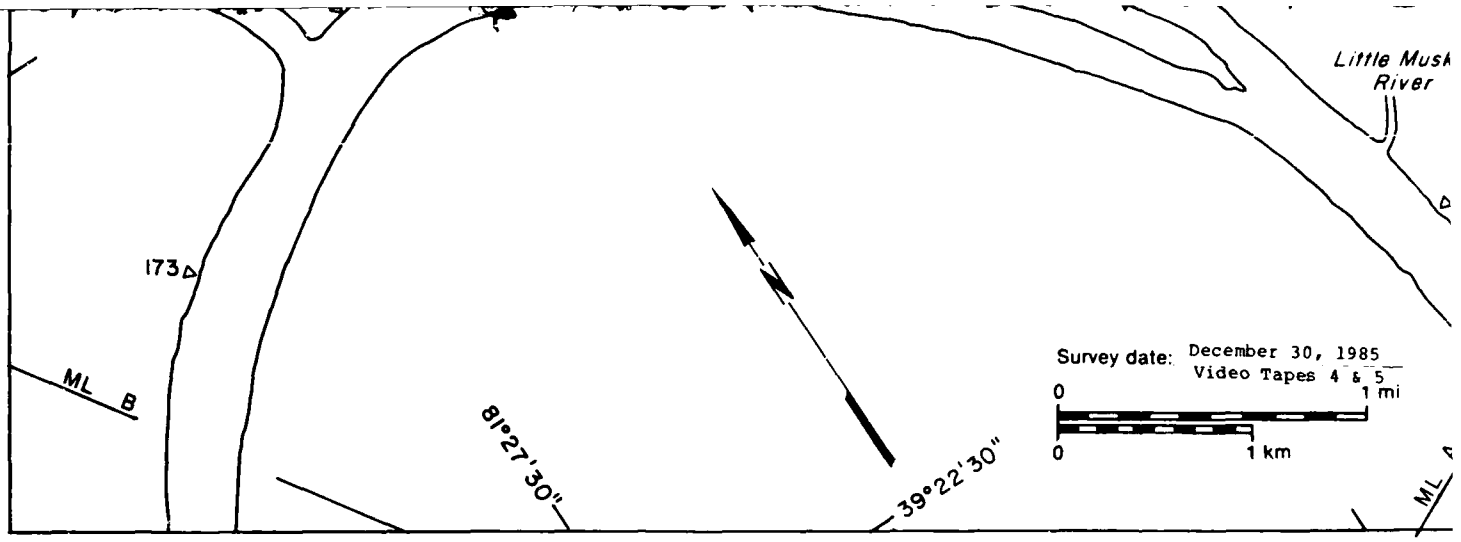


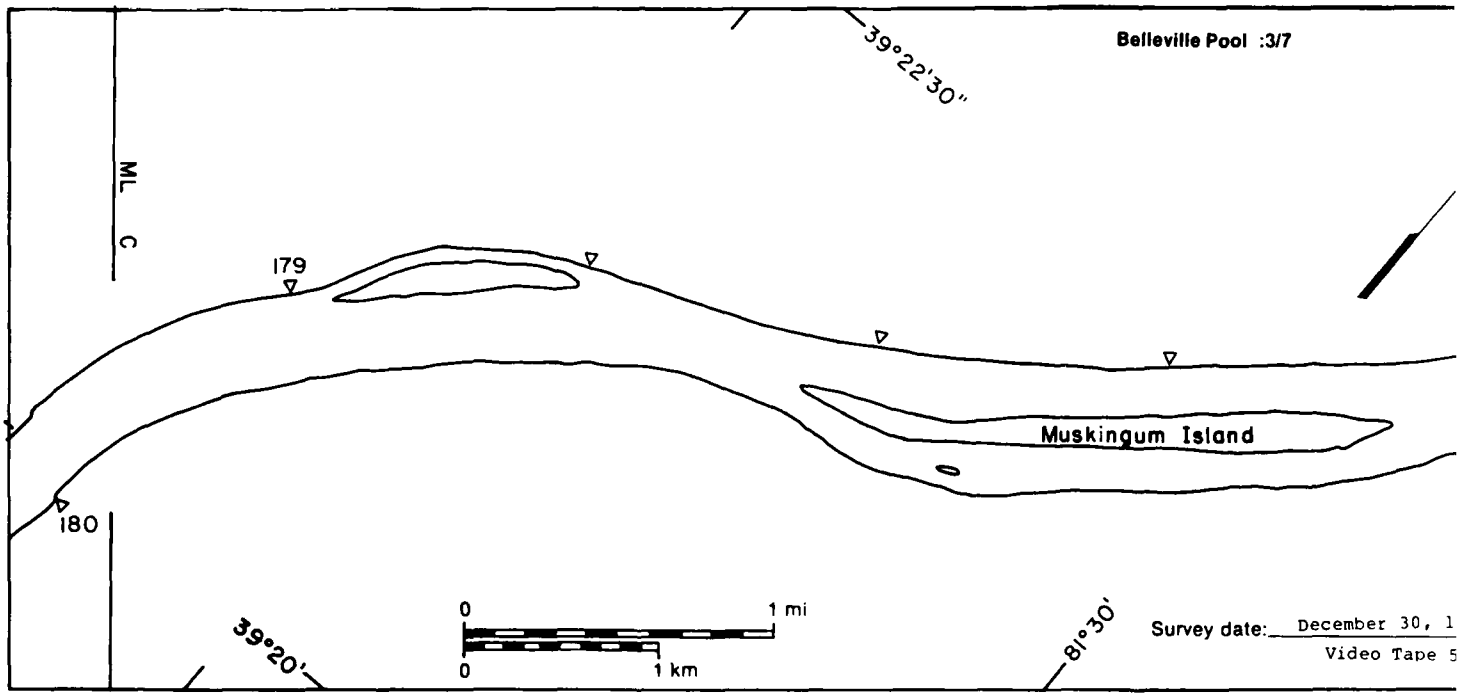


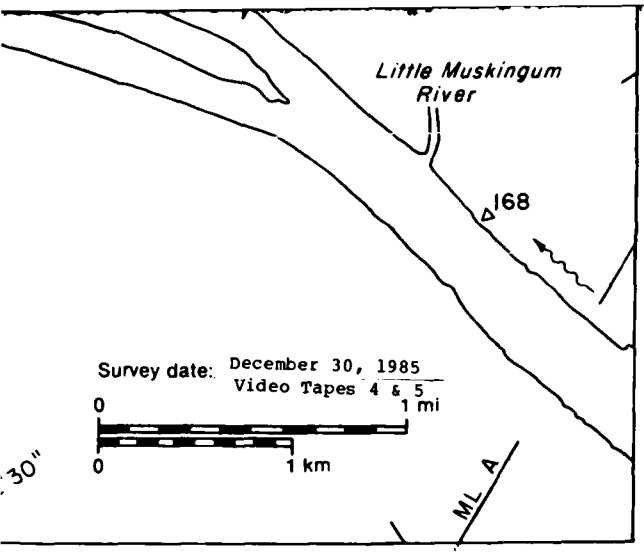

81°20'
162
Willow Island
L & D
Survey date: December 30, 1985
Video Tape 4

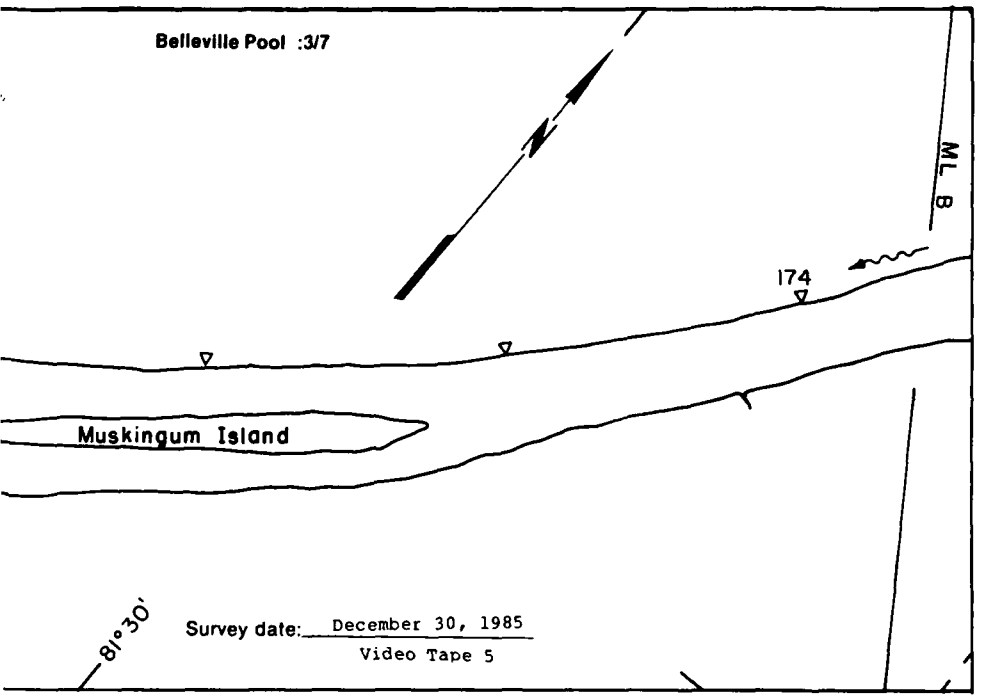

Pool :2/7
Little Muskingum
River
168
date. December 30, 1985
Video Tapes 4 & 5
1 mi
1 km
ML A

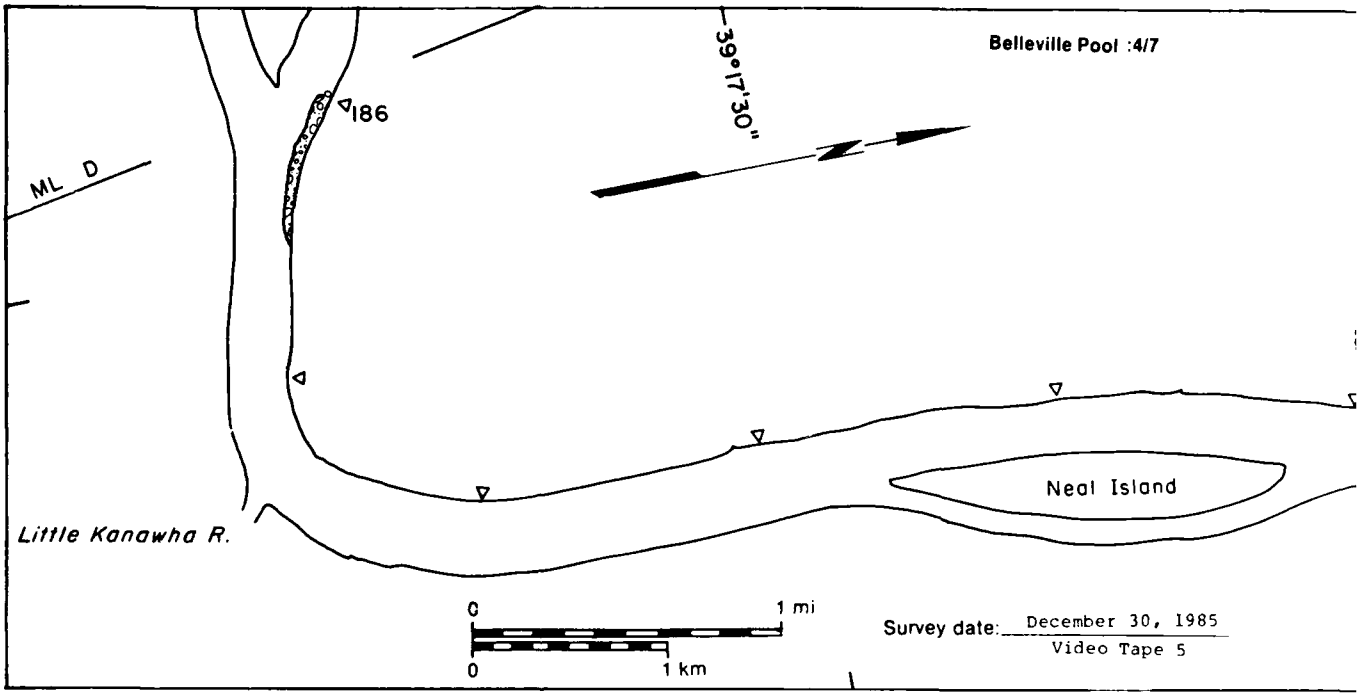

lleville Pool :3/7

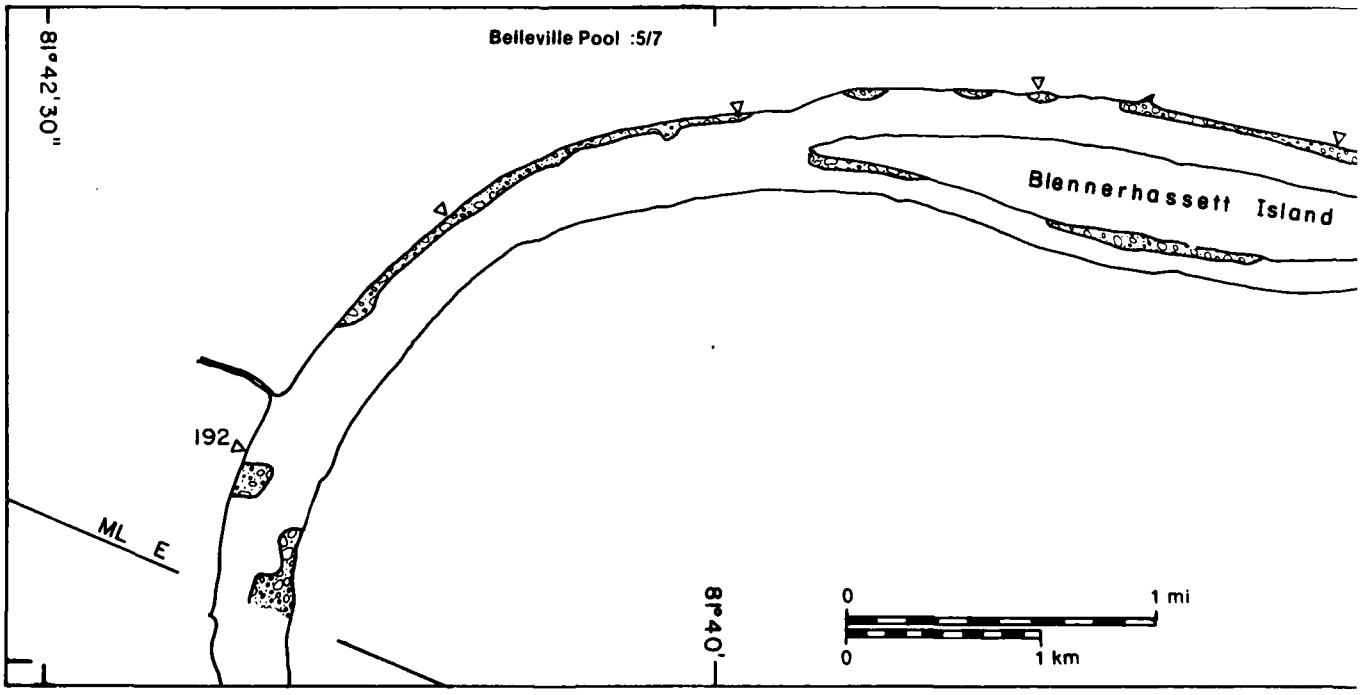

Little Musk
River
173
ML B
81°27'30"
39°22'30"
Survey date: December 30, 1985
Video Tapes 4 & 5
0
1 mi
0
1 km
ML

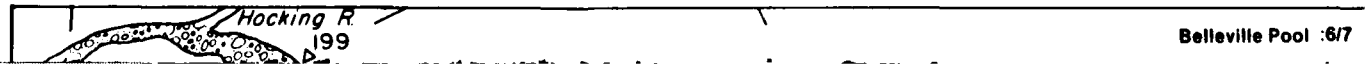

Belleville Pool :3/7
39°22'30"
ML C
179
Muskingum Island
180
39°20'
81°30'
0
1 mi
0
1 km
Survey date: December 30, 1
Video Tape 5


Little Muskingum River
168
Survey date: December 30, 1985
Video Tapes 4 & 5
0
1 mi
0
1 km
ML A

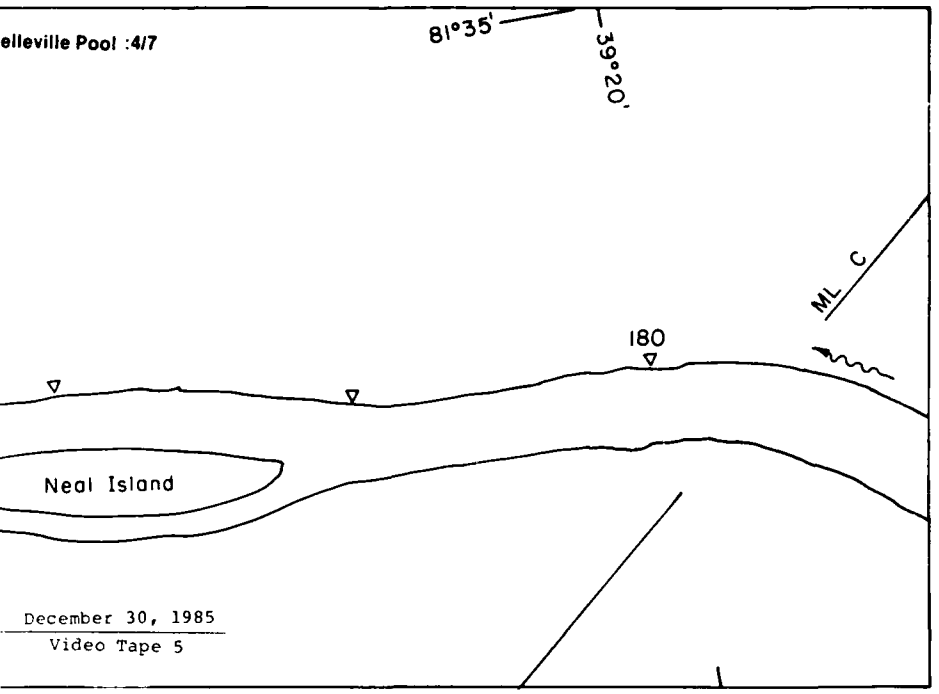

Belleville Pool :3/7
ML B
174
Muskingum Island
81°30'
Survey date: December 30, 1985
Video Tape 5

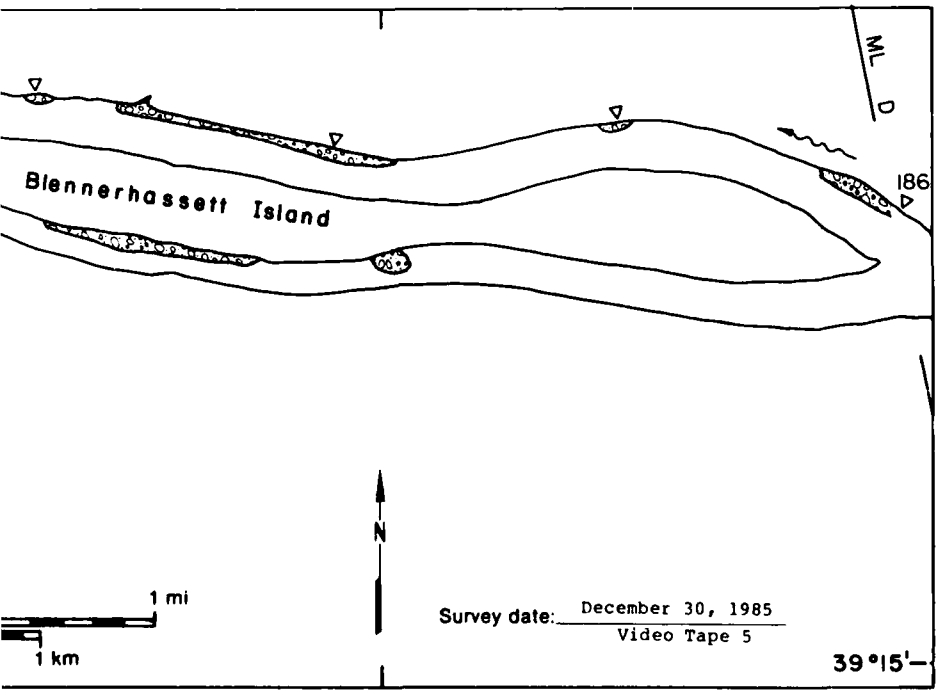

Belleville Pool :4/7
39°17'30"
186
ML D
Neal Island
Little Kanawha R.
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5

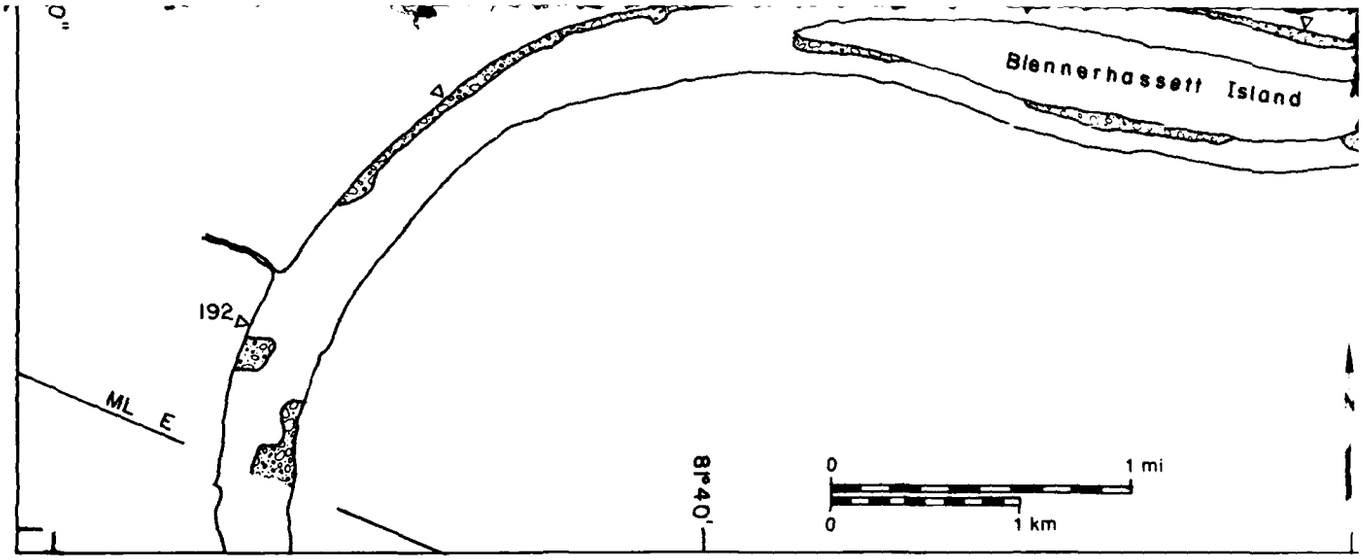

Belleville Pool :5/7
81°42'30"
Blennerhassett Island
192
ML E
8°40'
0
1 mi
0
1 km

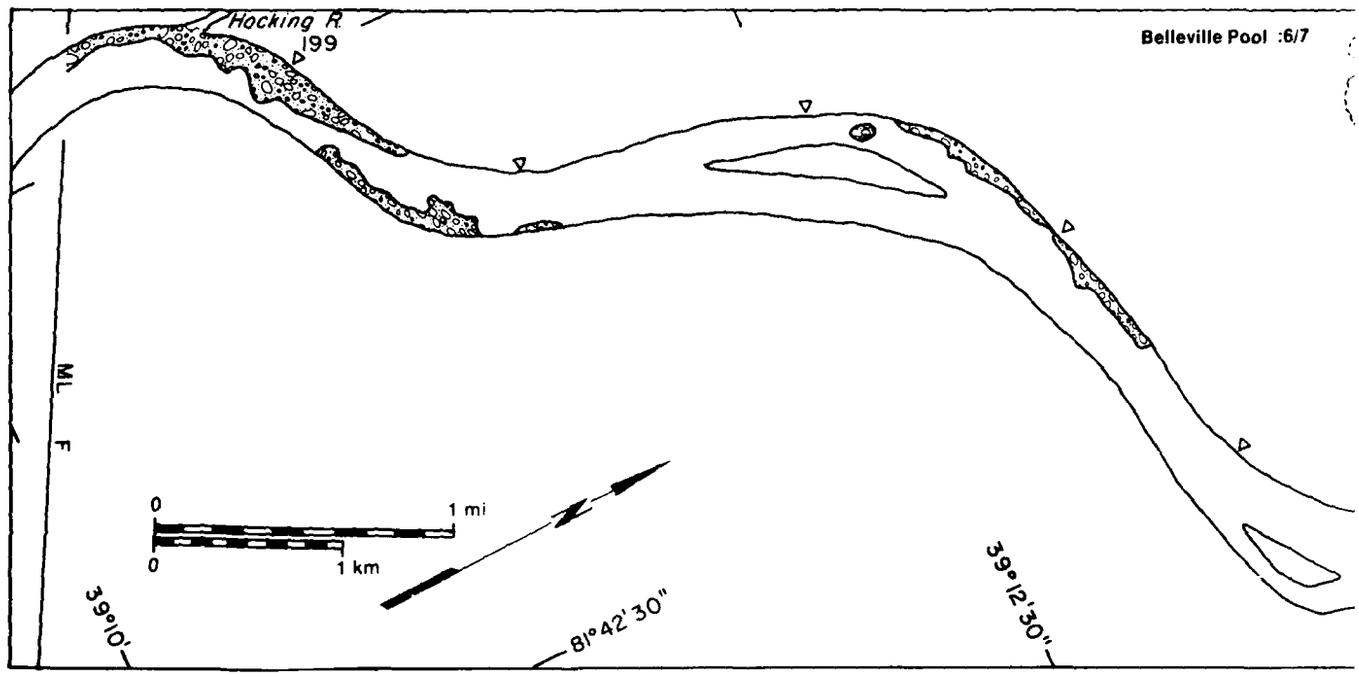

Hocking R.
199
Belleville Pool :6/7

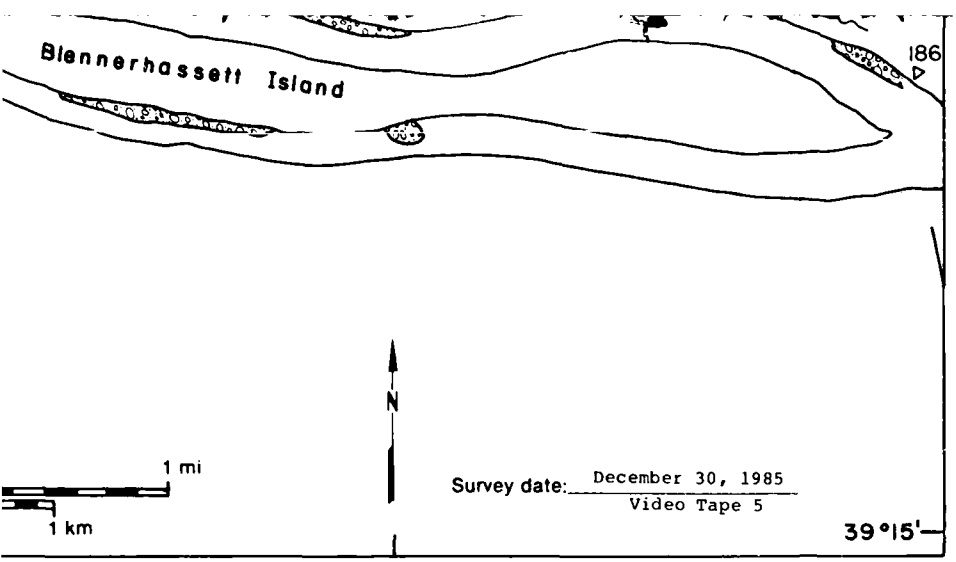
30 December 1985

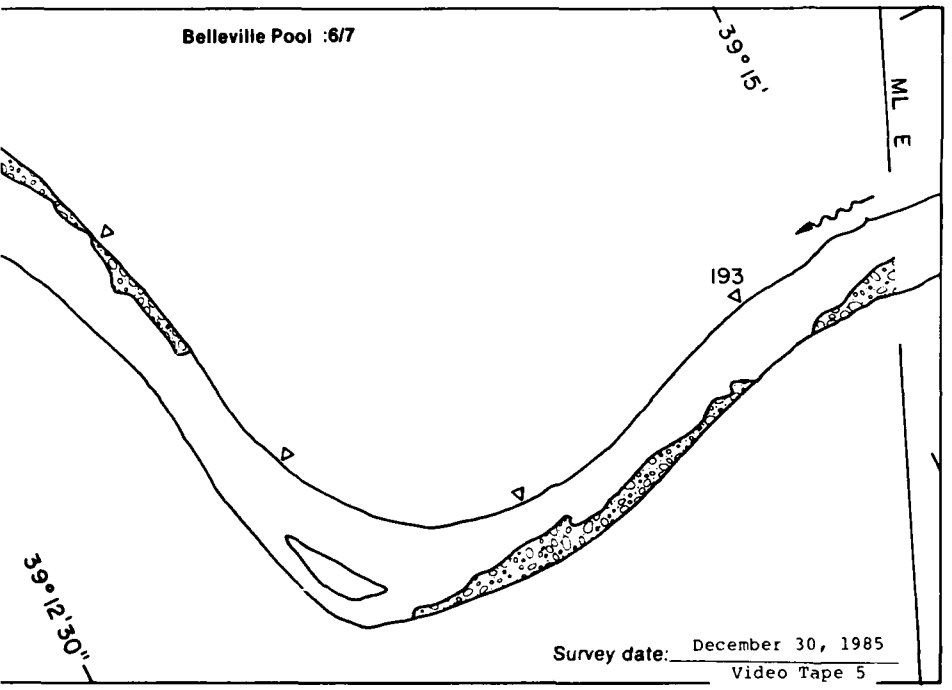




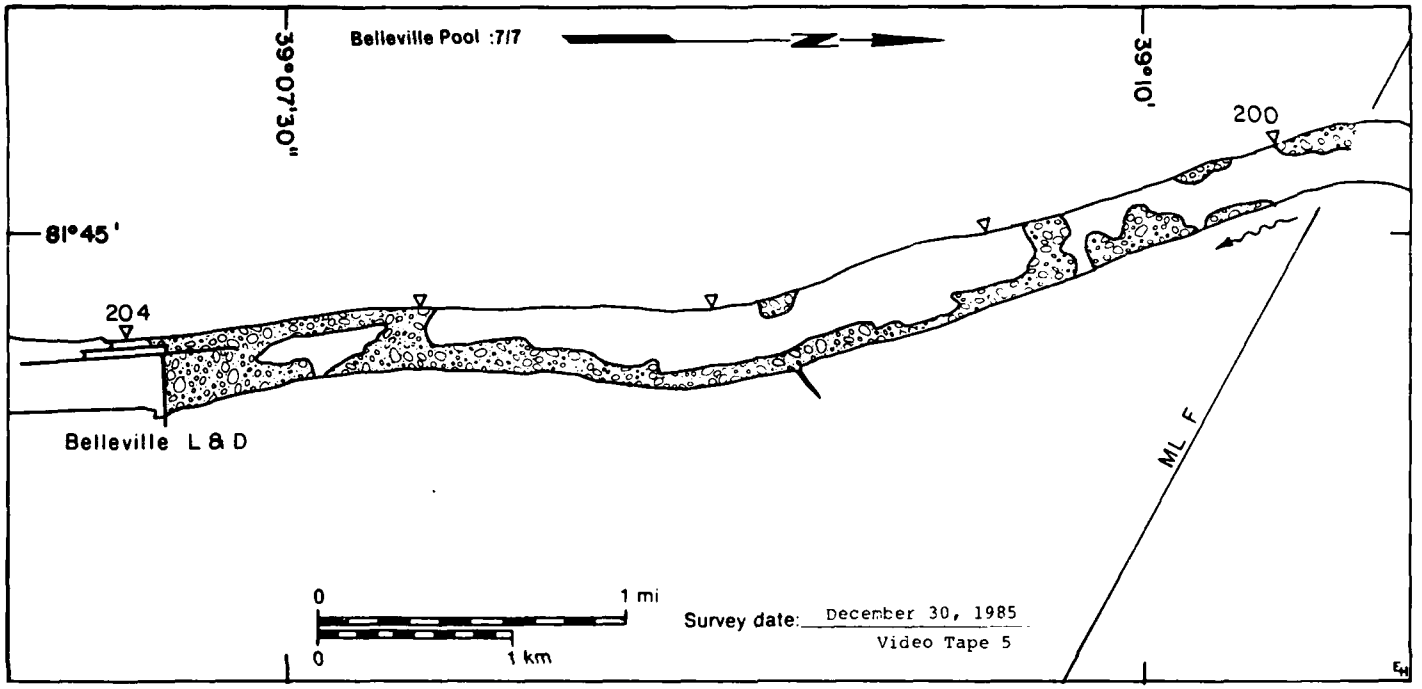

Blennerhassett Island
192
ML E
8°40'
0
1 mi
0
1 km


Hocking R.
199
Belleville Pool :6/7
ML F
0
1 mi
0
1 km
39°10'
81°42'30"
39°12'30"


Blennerhassett Island
186
N
1 mi
1 km
Survey date: December 30, 1985
Video Tape 5
39°15'

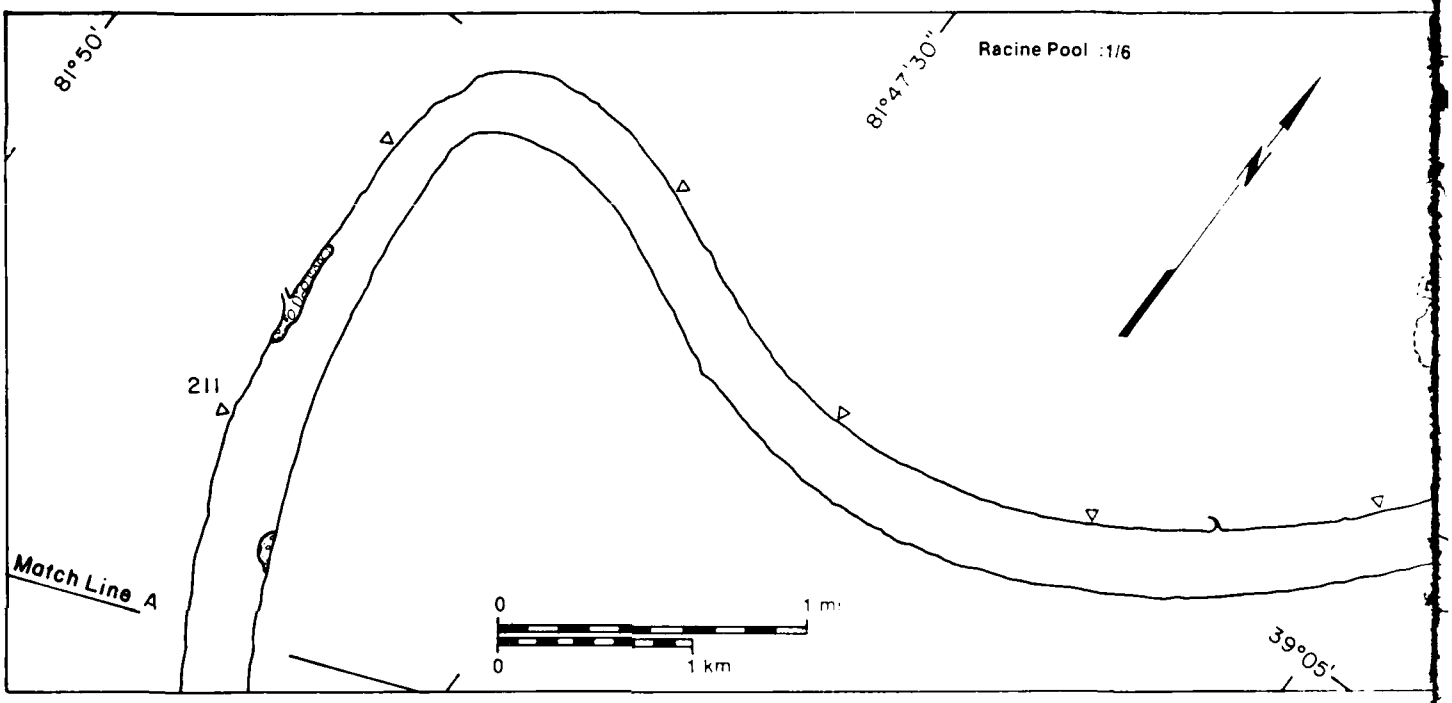

Belleville Pool :6/7
39°15'
ML E
193
39°12'30"
Survey date: December 30, 1985
Video Tape 5

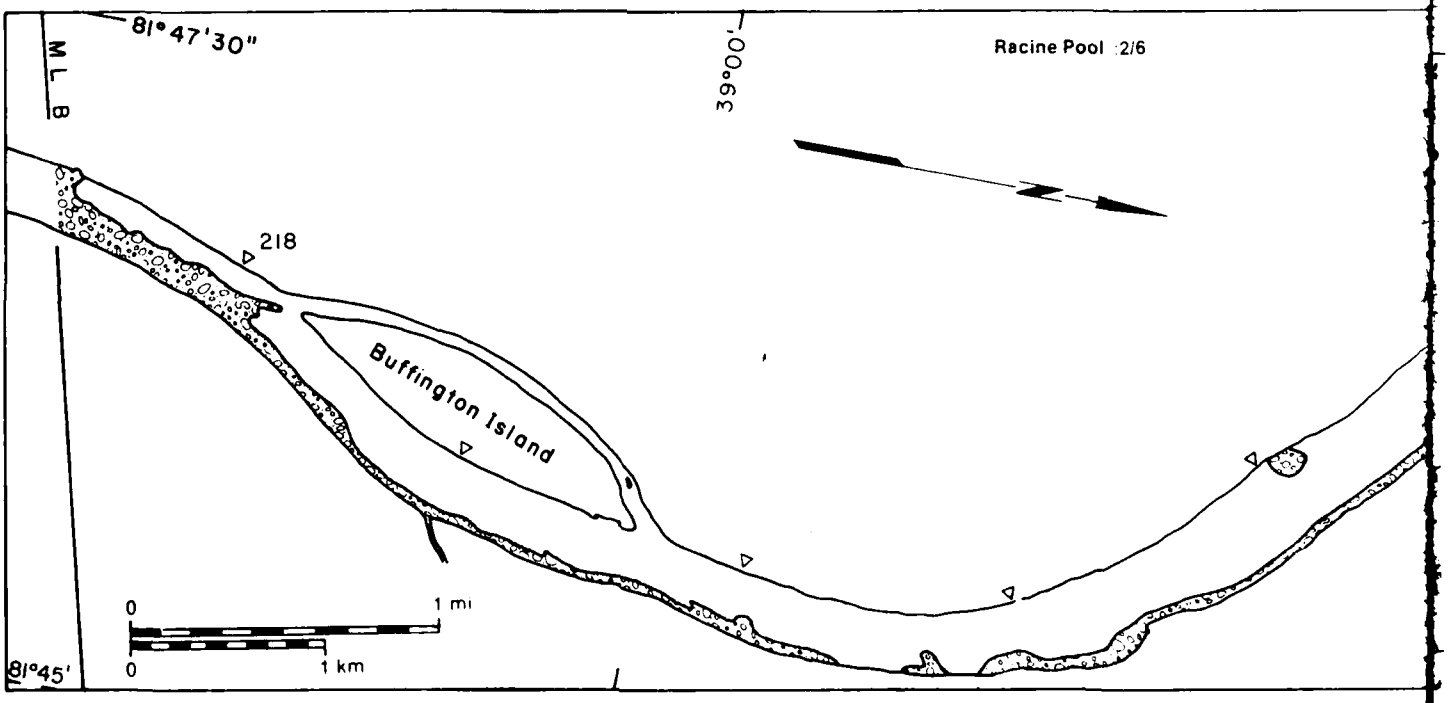
30 December 1985



Belleville Pool

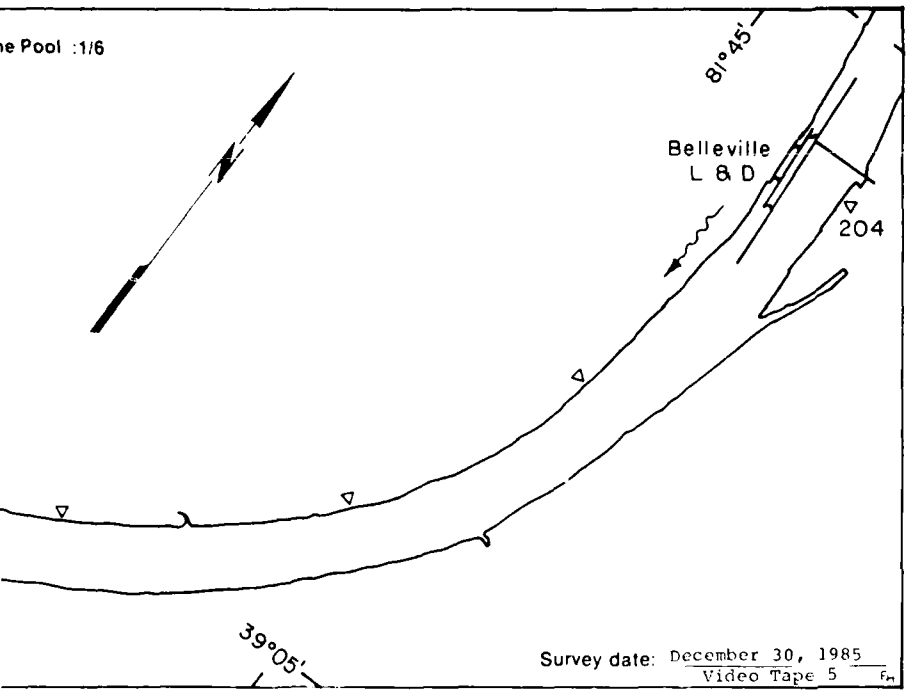
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	25.01	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.27	10
Total area ($m^2 \times 10^6$)	27.28	

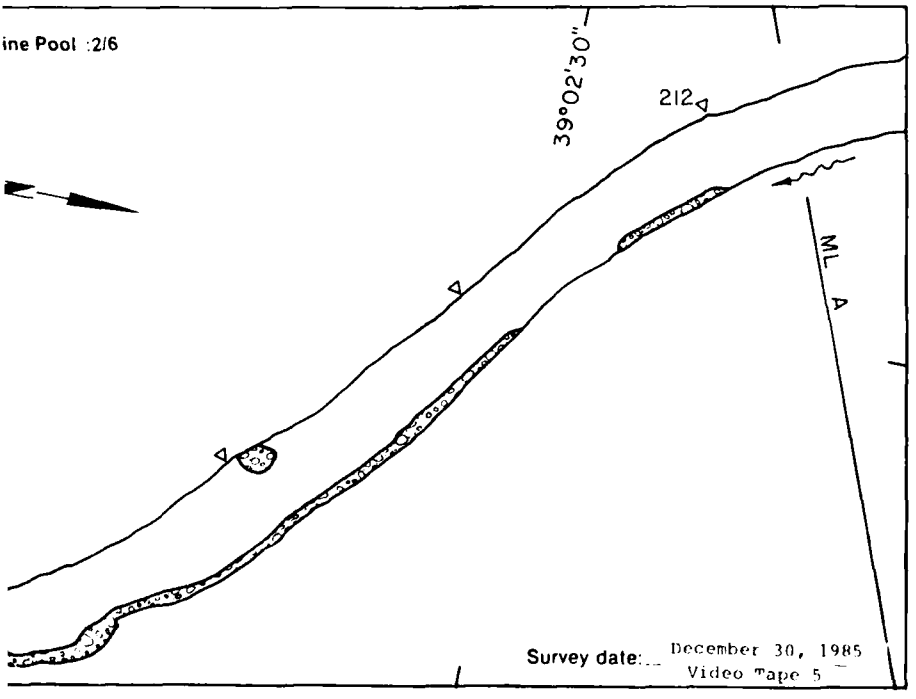

81°50'
81°47'30"
Racine Pool :1/6
211
Match Line A
0
1 mi
0
1 km
39°05'

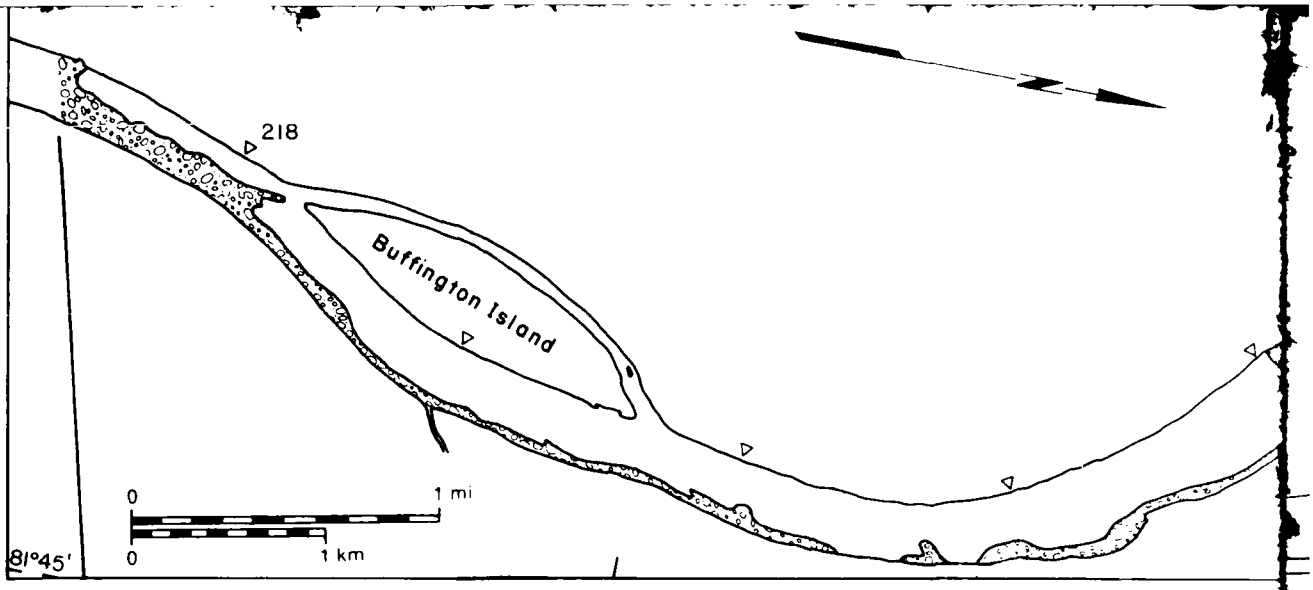

81°47'30"
39°00'
Racine Pool :2/6
218
Buffington Island
0
1 mi
0
1 km
81°45'

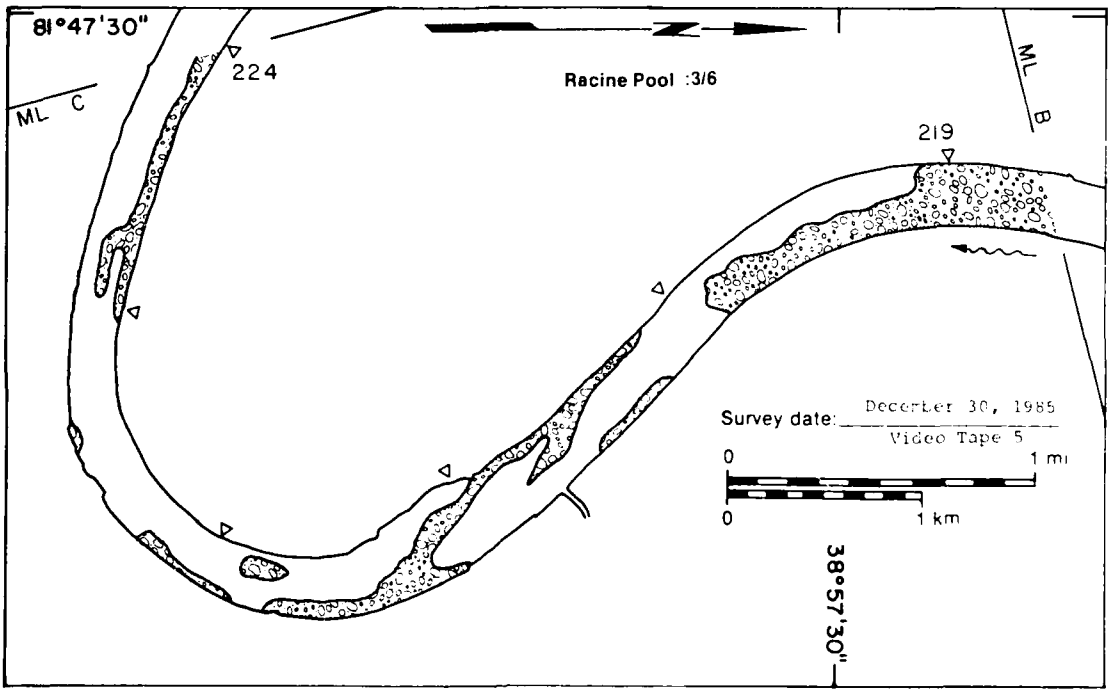
81°47'30"

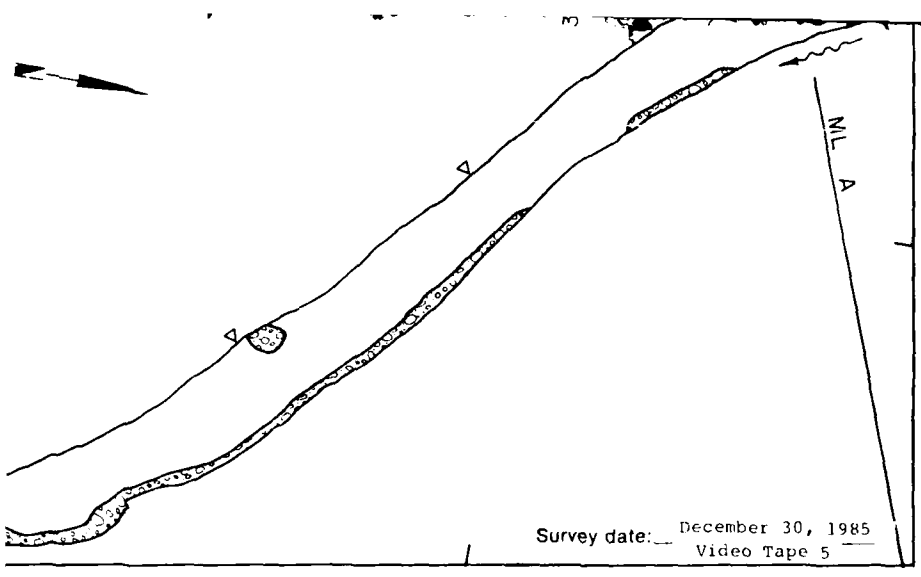
30 December 1985






218
Buffington Island
0
1 mi
0
1 km
81°45'

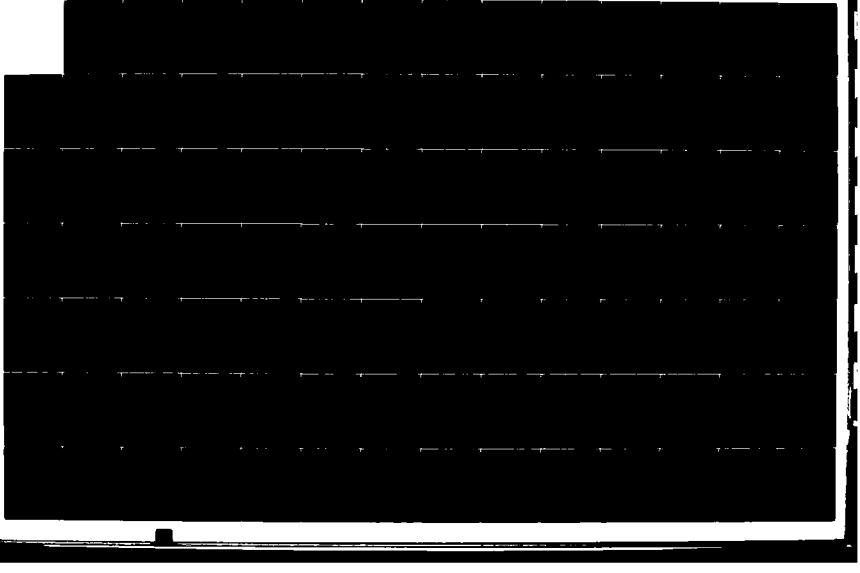

81°47'30"
224
ML C
Racine Pool :3/6
ML B
219
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km
38°57'30"

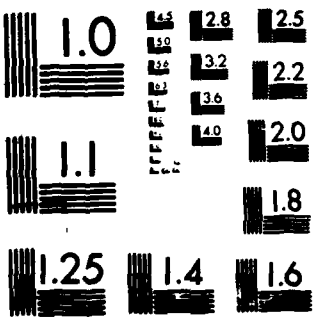

ML A
Survey date: December 30, 1985
Video Tape 5

ML B
1 mi

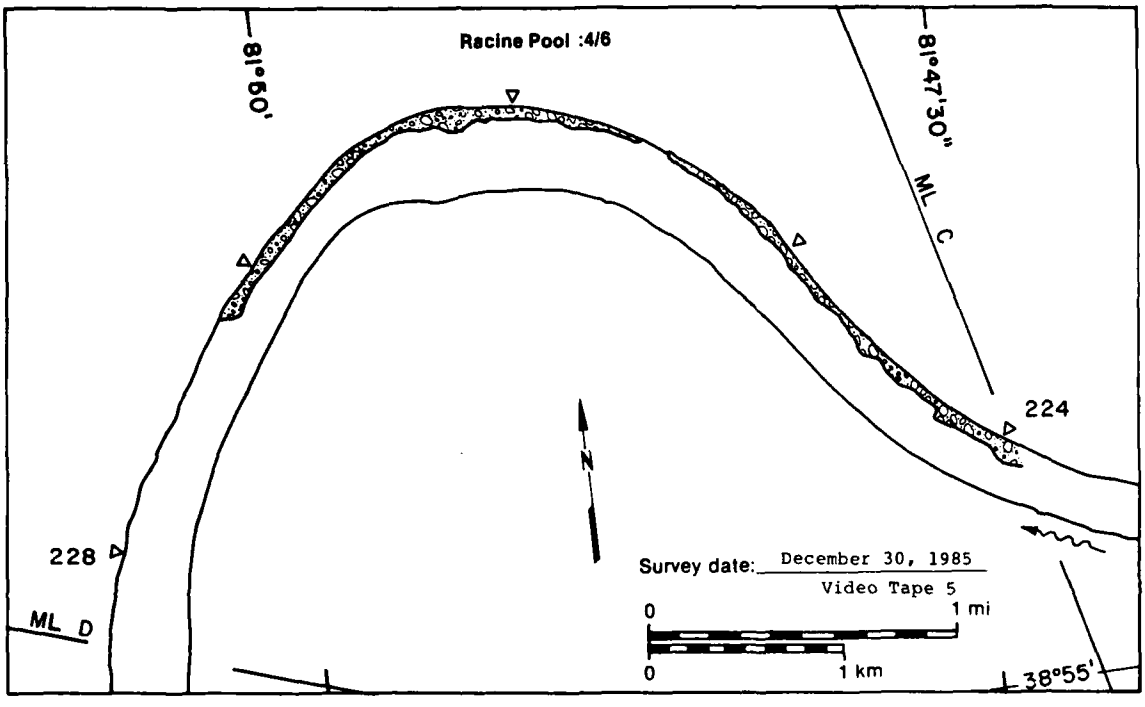
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 3/14

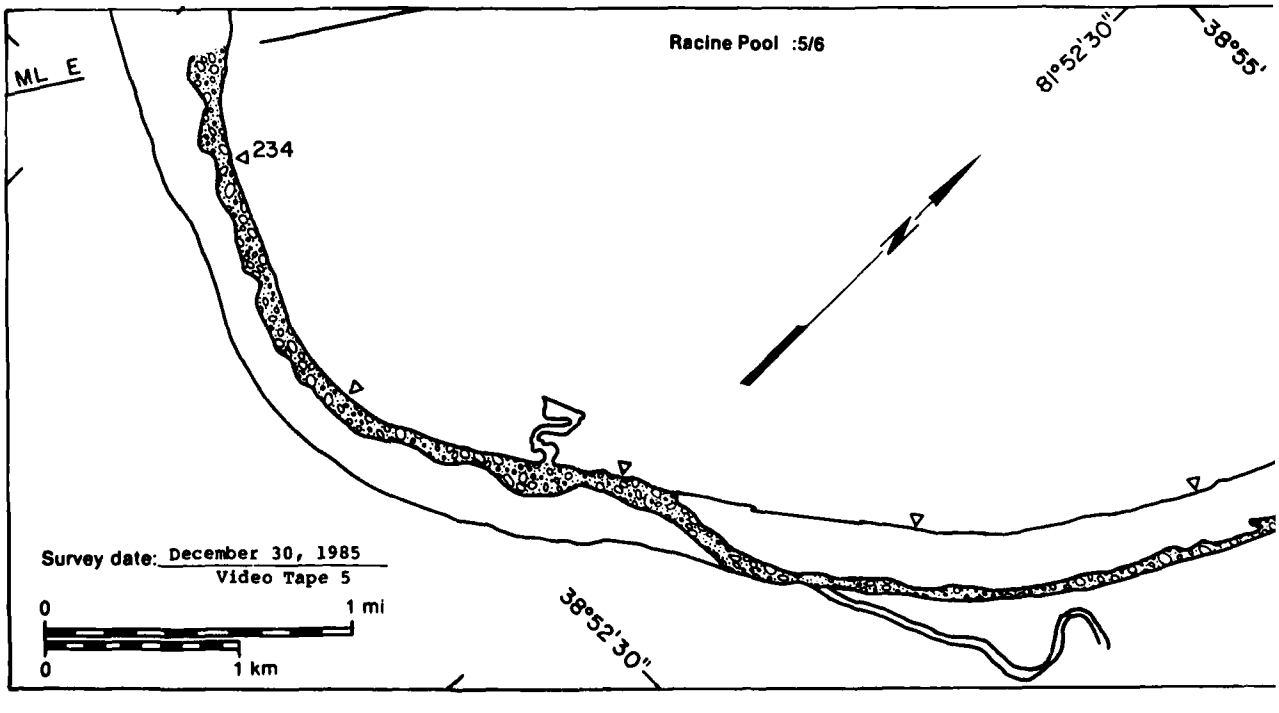
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

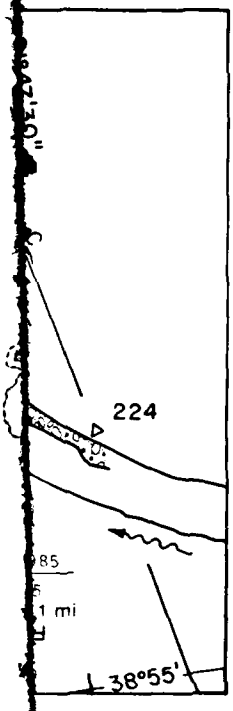


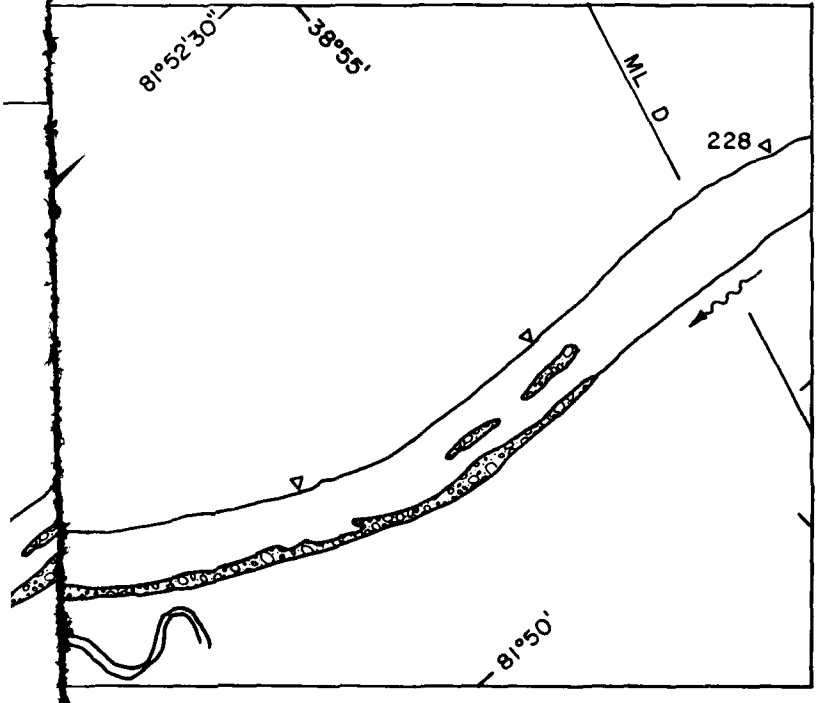

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

30 December 1985



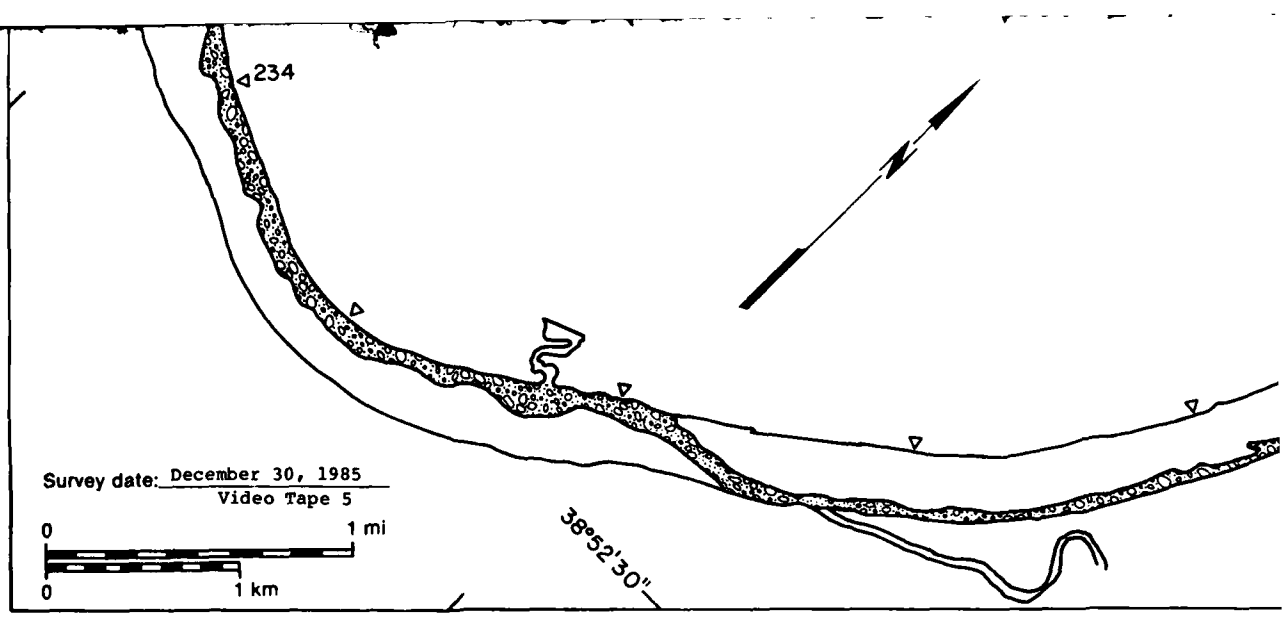


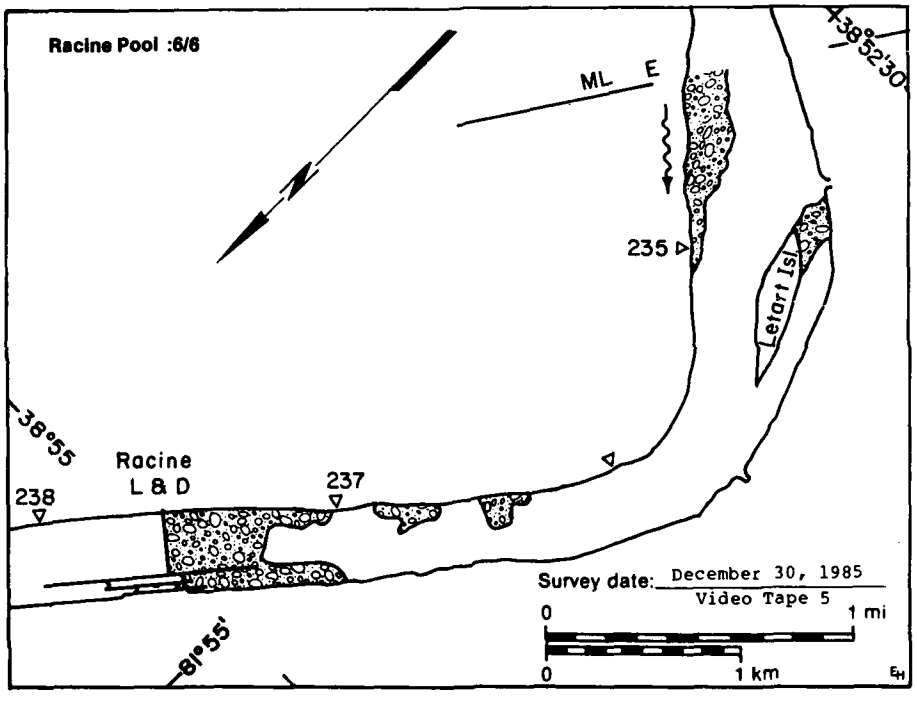




Racine Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)





Racine Pool

MAP UNITS

Open water

Solid ice cover

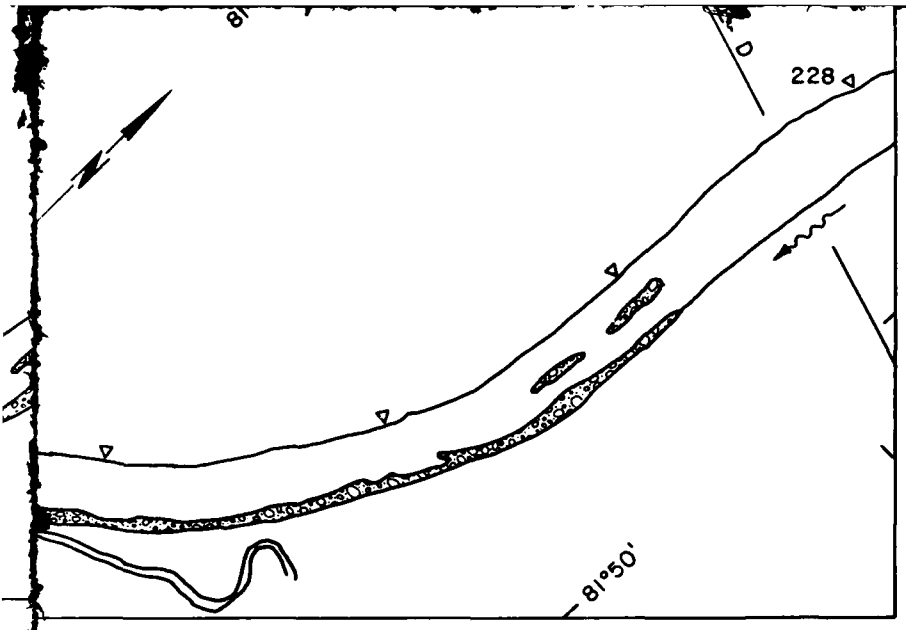
Solid ice cover w
open-water area

Fragmented ice

Fragmented ice
with open-water

Ice floes or frazi
and pans

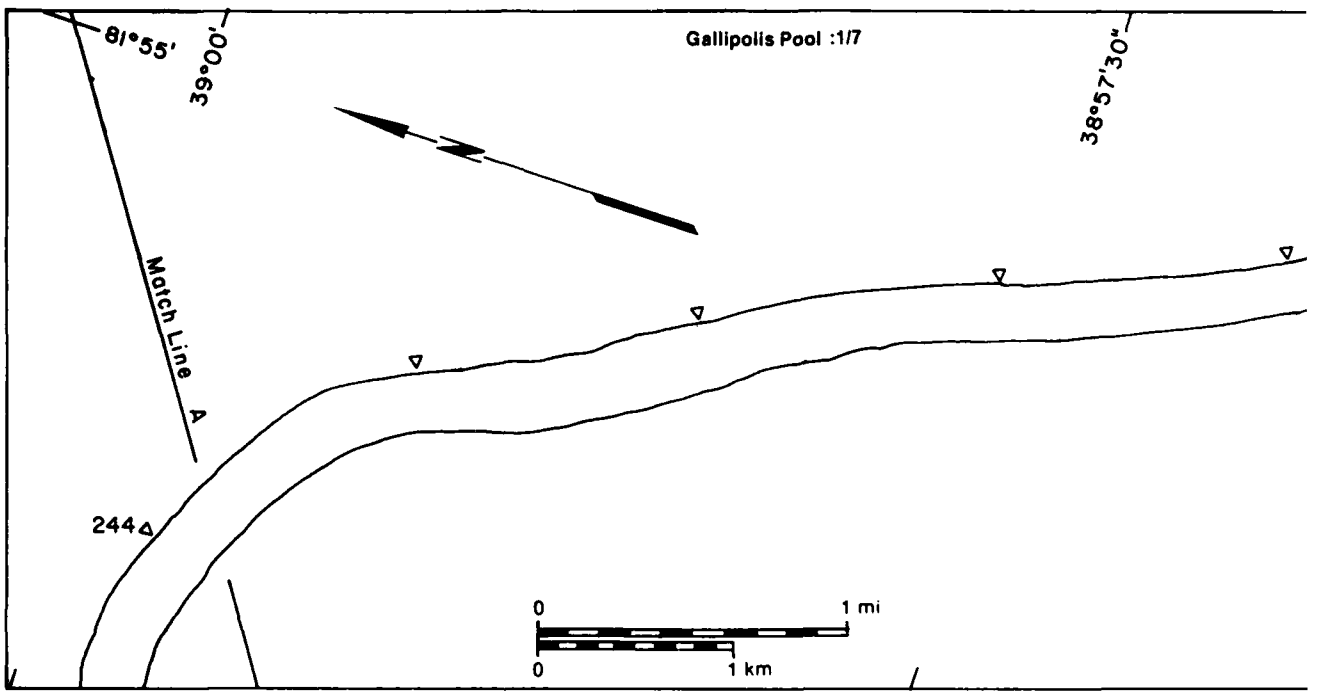
Total area (

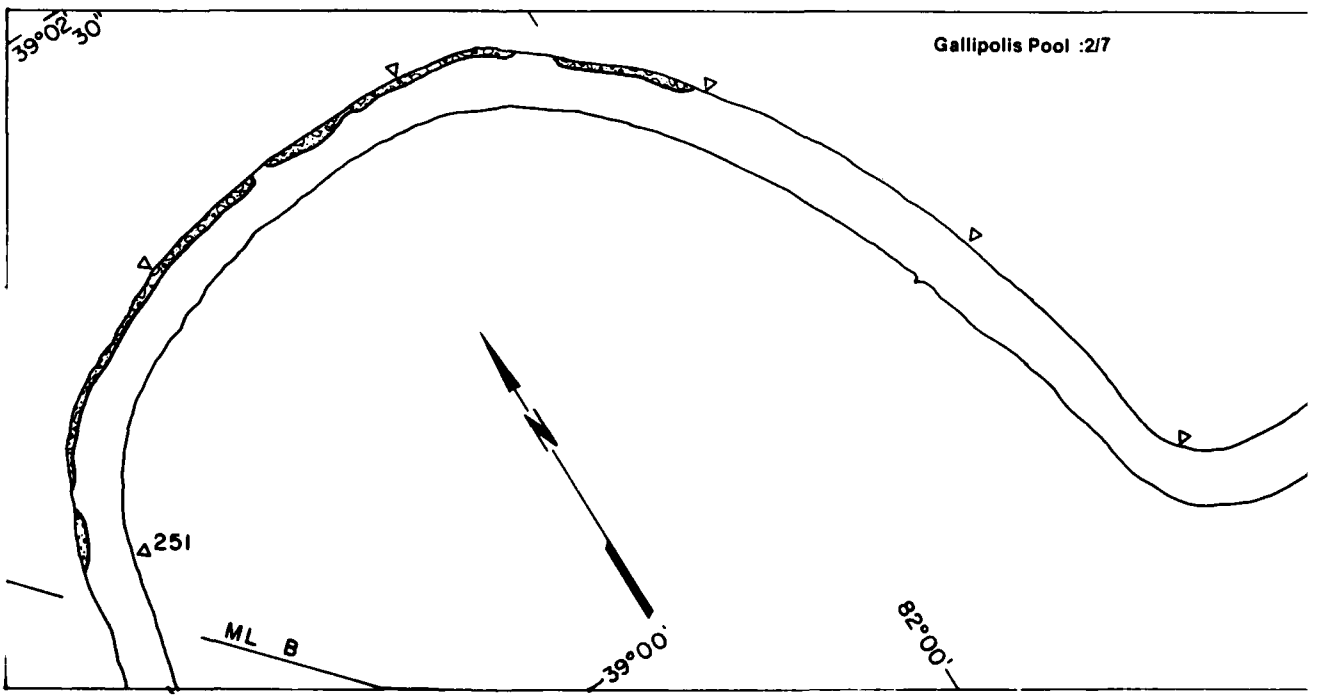


Racine Pool

MAP UNITS

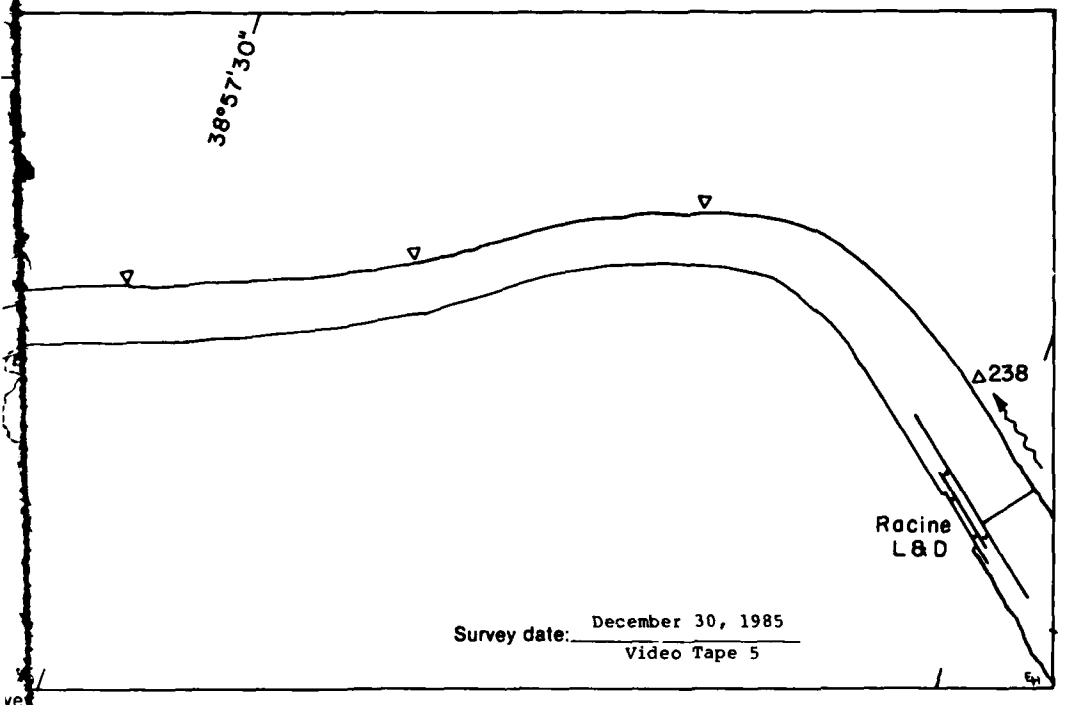
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	16.18	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	3.71	20
Total area ($m^2 \times 10^6$)	19.89	

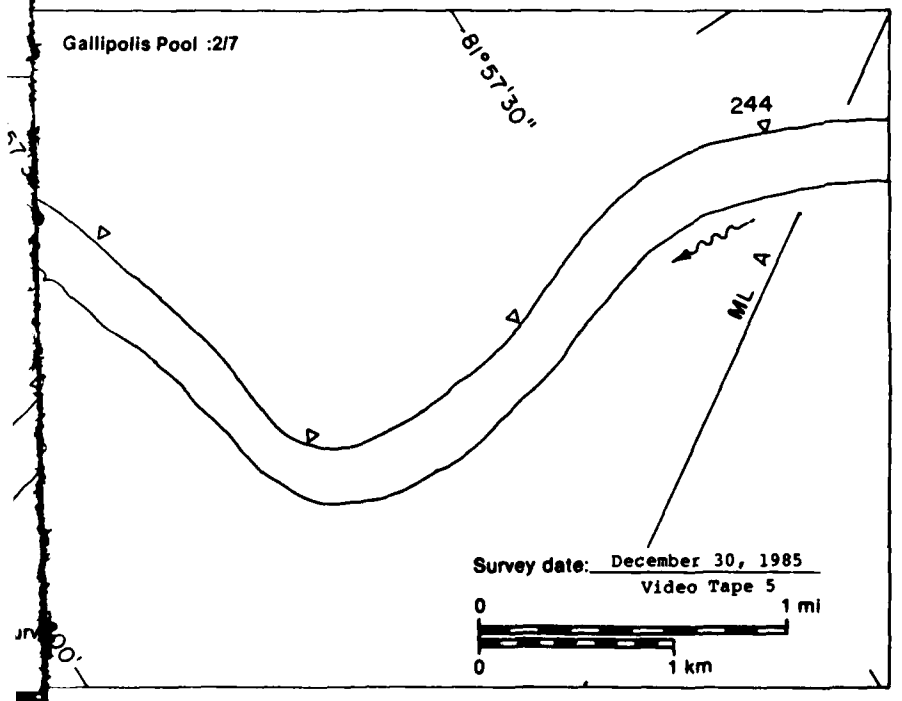

81°55'
39°00'
Gallipolis Pool :1/7
38°57'30"
Match Line A
244
0
1 mi
0
1 km

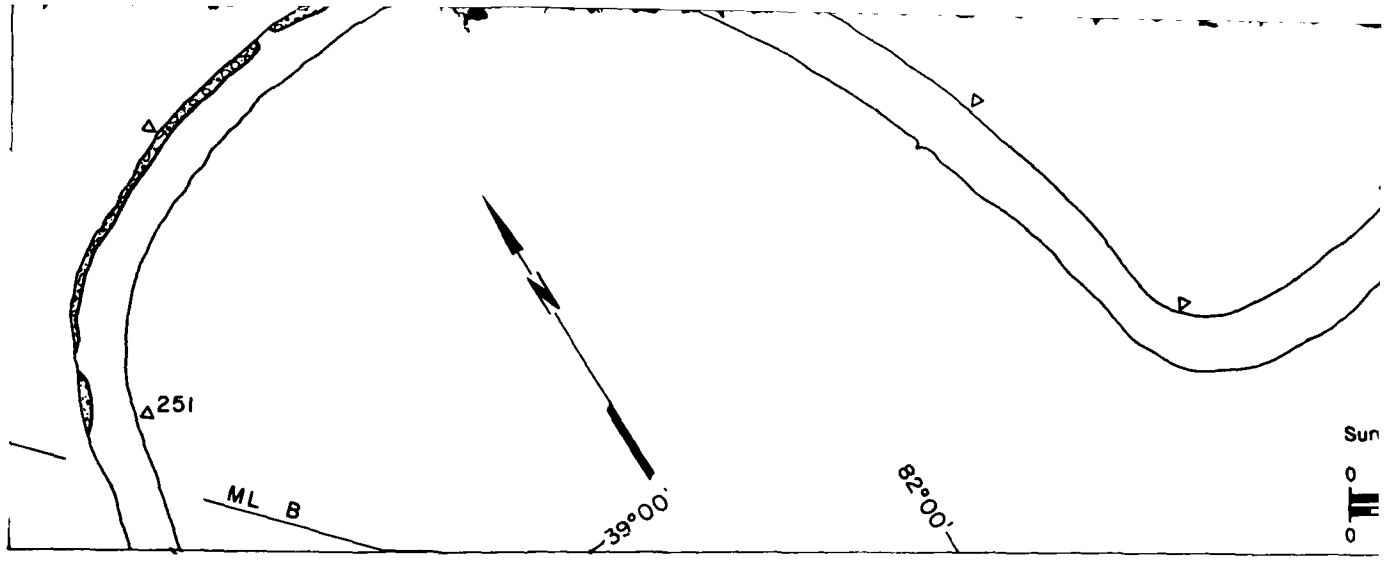

39°02'30"
Gallipolis Pool :2/7
251
ML B
39°00'
82°00'

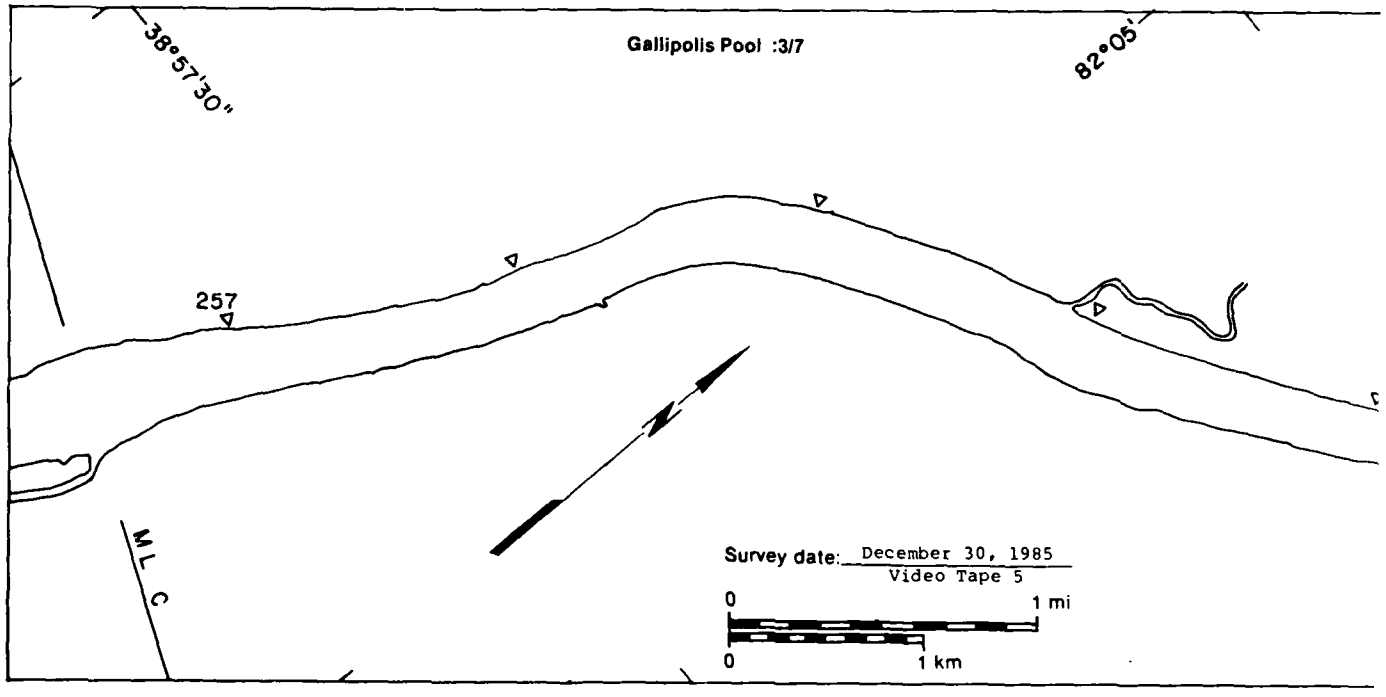
38°5
Gallipolis Pool :3/7
82°05'

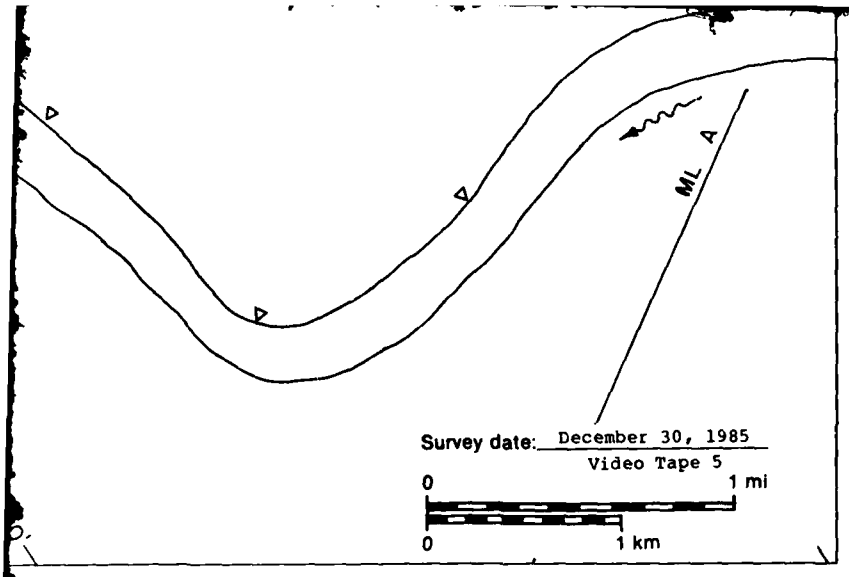
30 December 1985

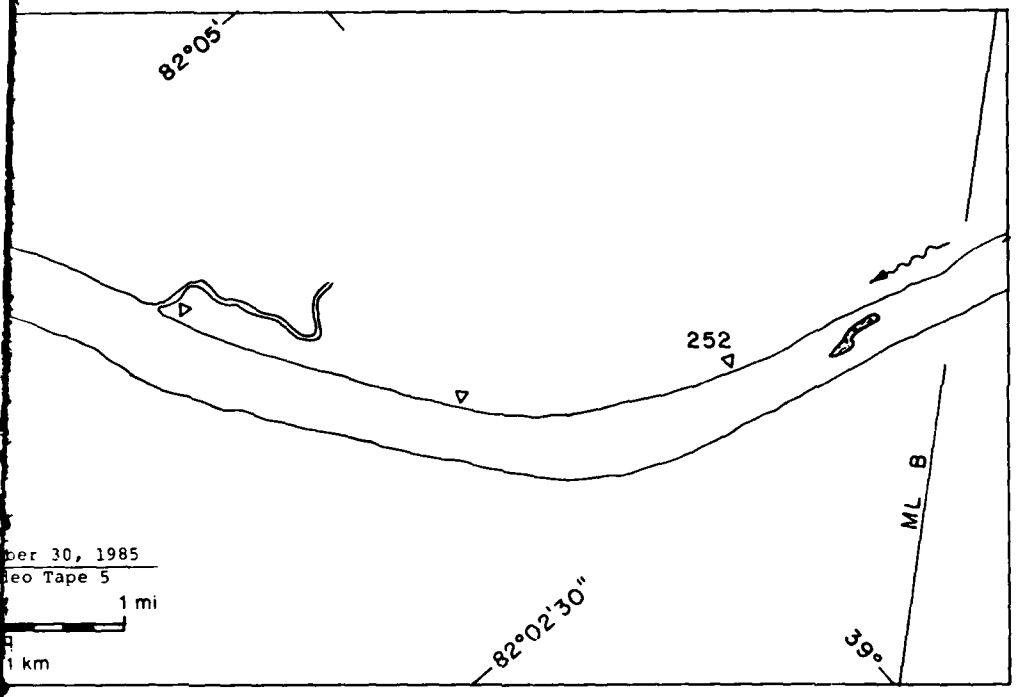




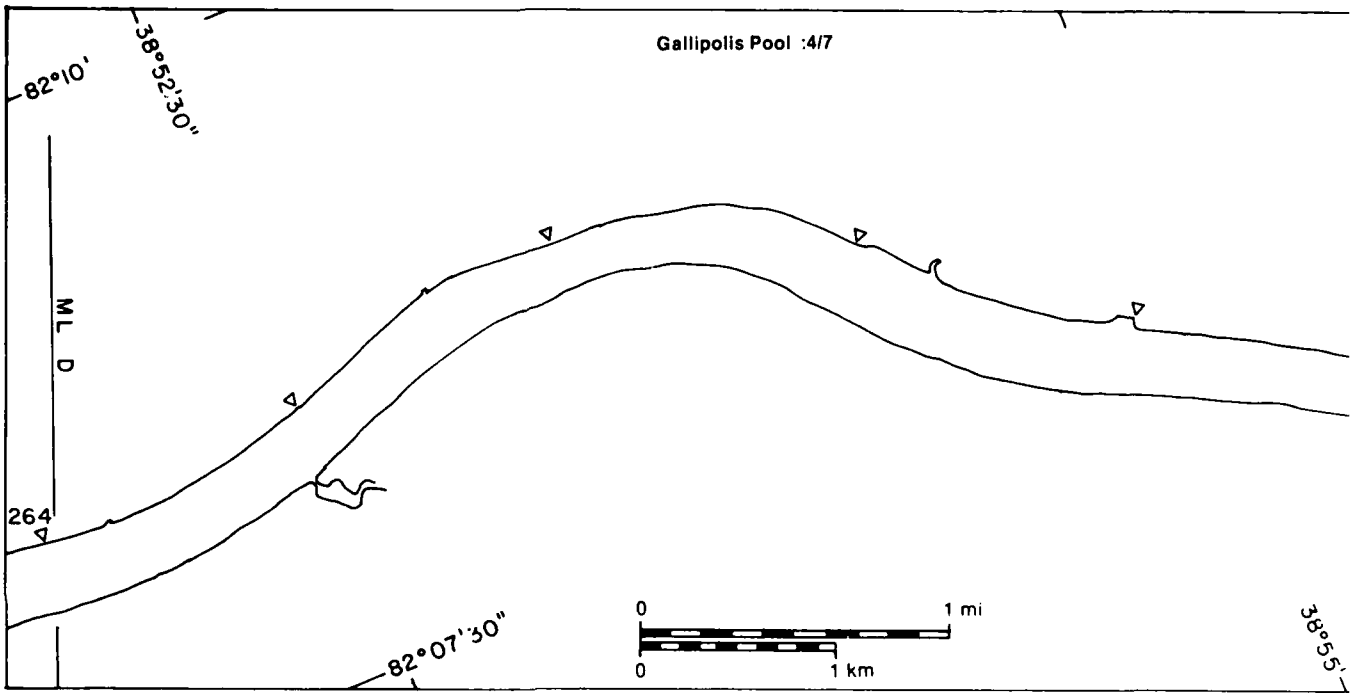

251
ML B
39°00'
82°00'
Sun
0
0

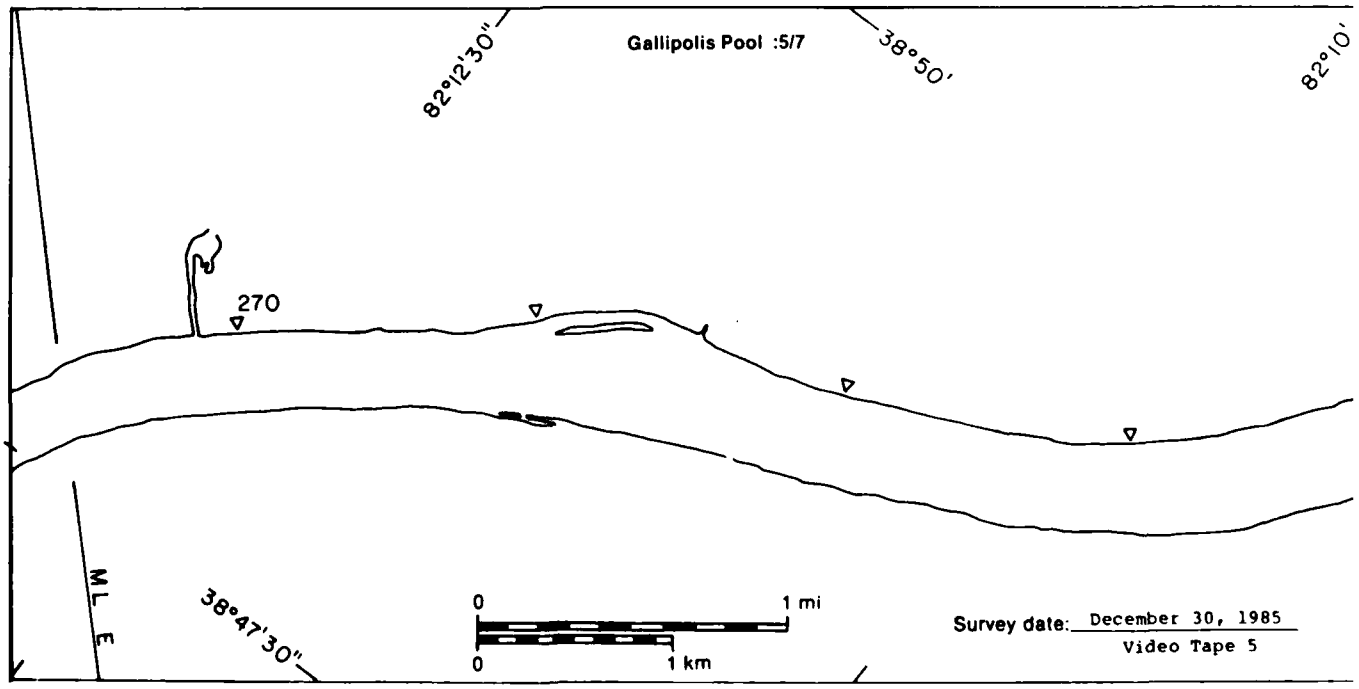

38°57'30"
Gallipolis Pool :3/7
82°05'
257
ML C
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km

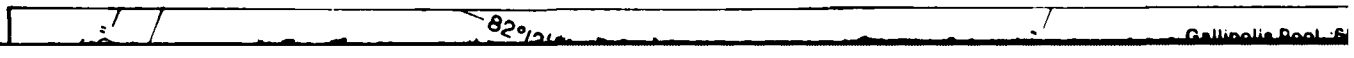

ML A
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km

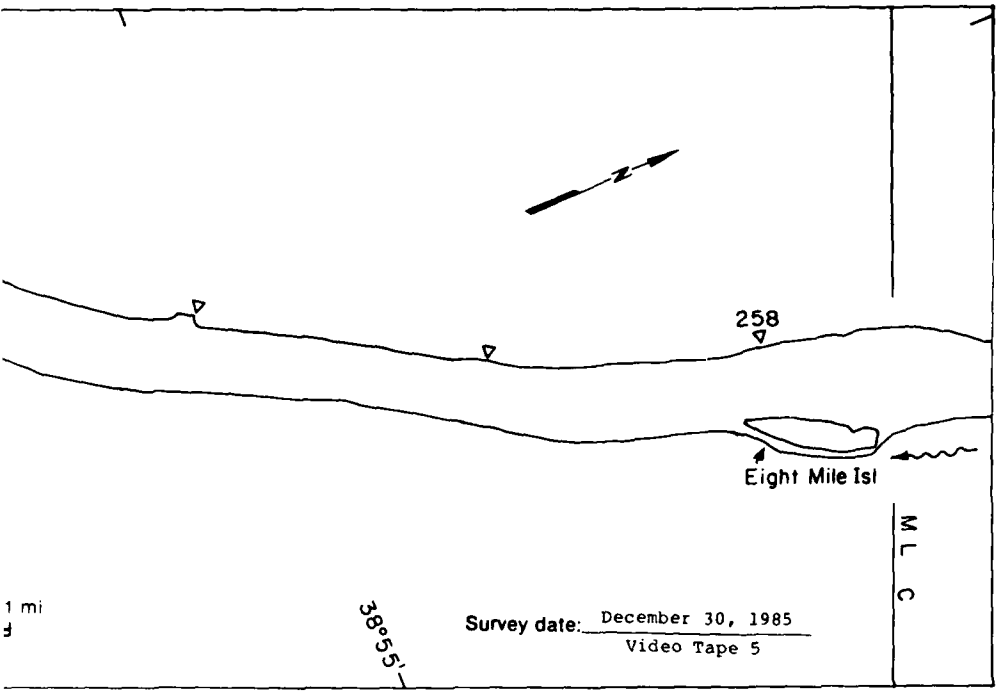

82°05'
252
ML B
ber 30, 1985
deo Tape 5
1 mi
1 km
82°02'30"
39°

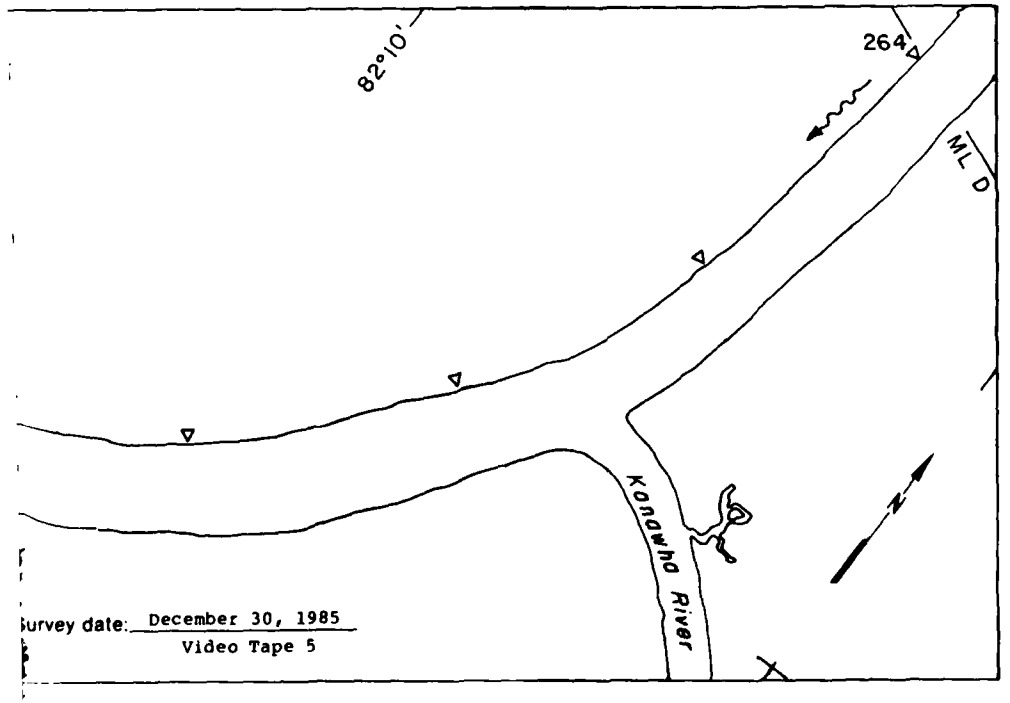
30 December 1985





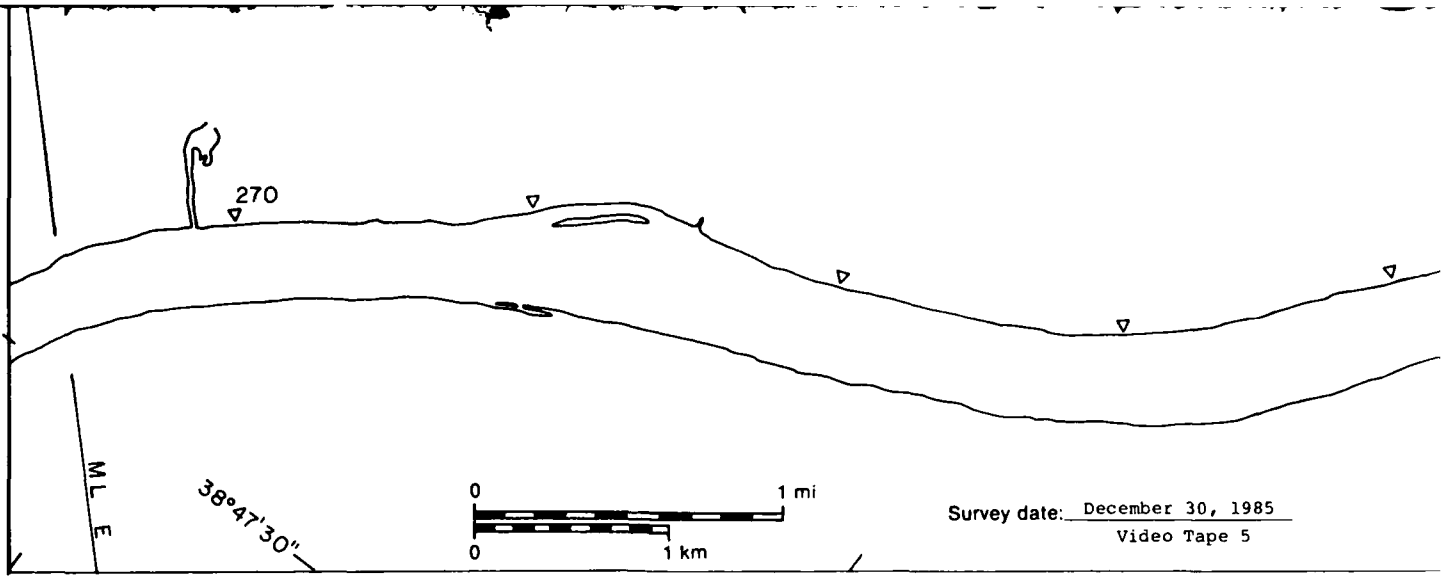


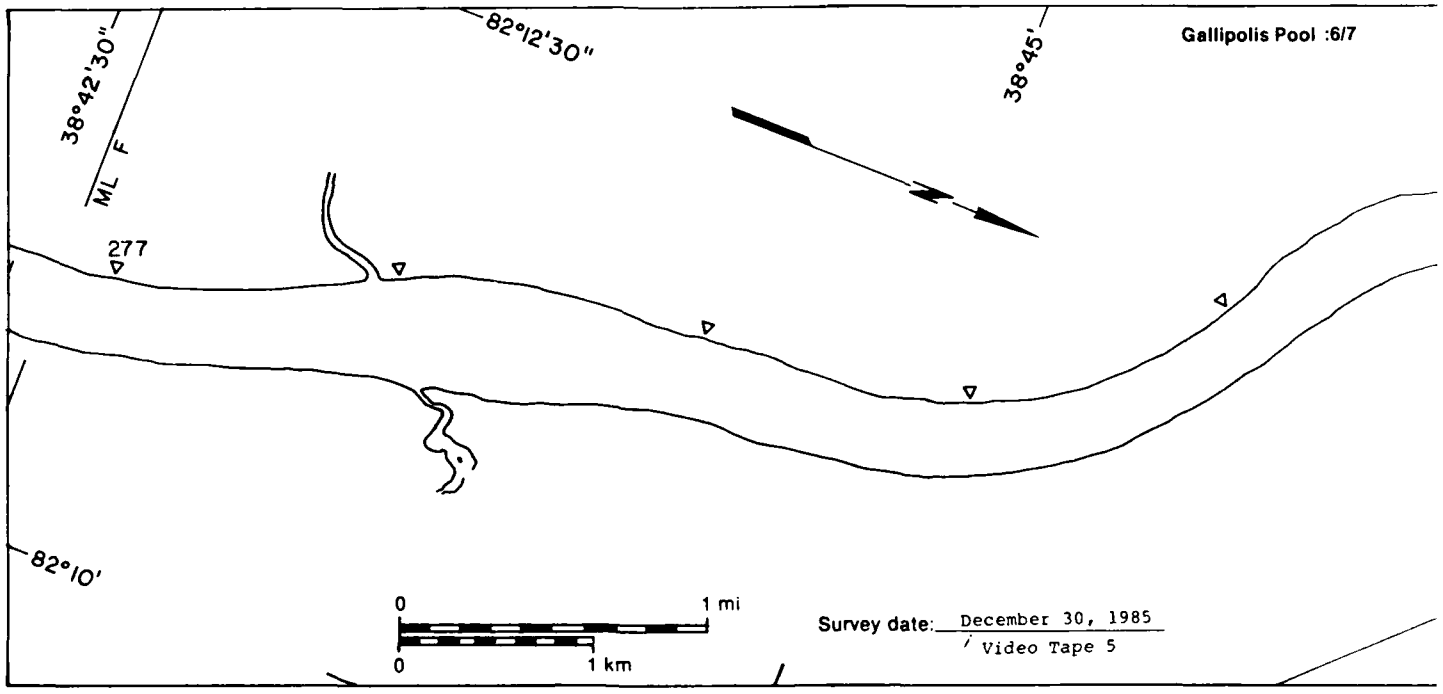


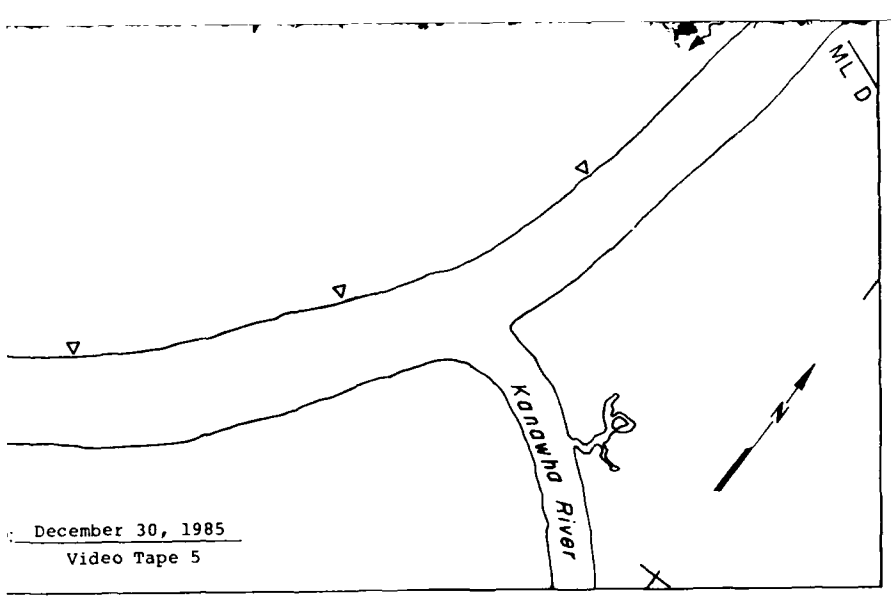


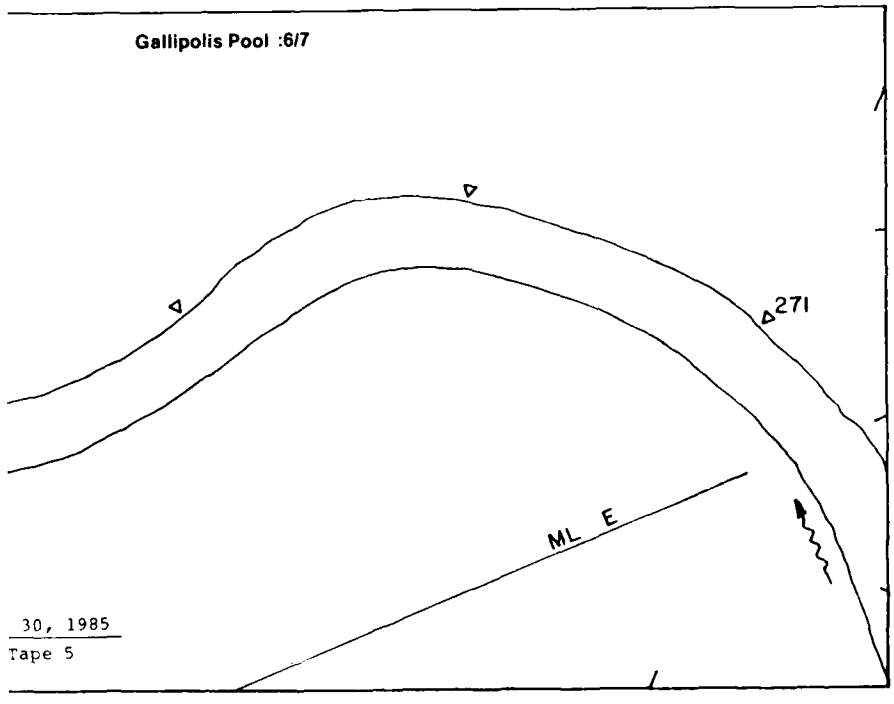
38°45'

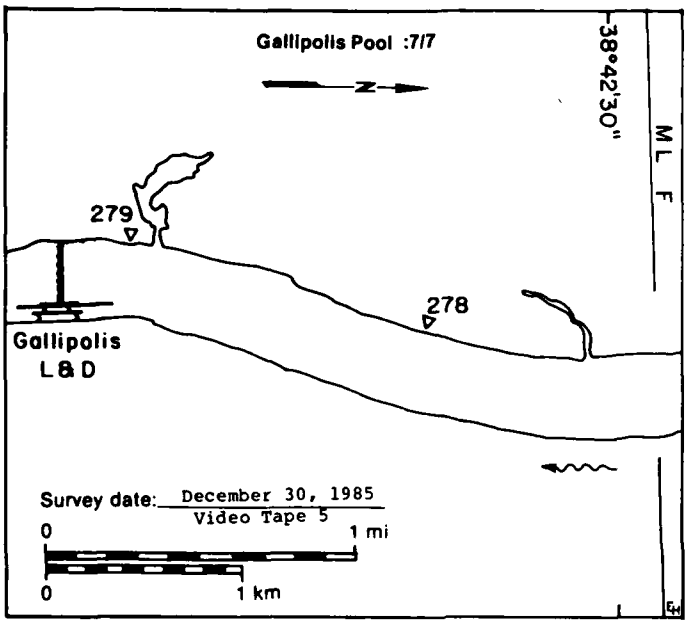
Gallipolis Pool :6/7


270
ML E
38°47'30"
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5


Gallipolis Pool :6/7
38°42'30"
ML F
82°12'30"
38°45'
277
82°10'
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5

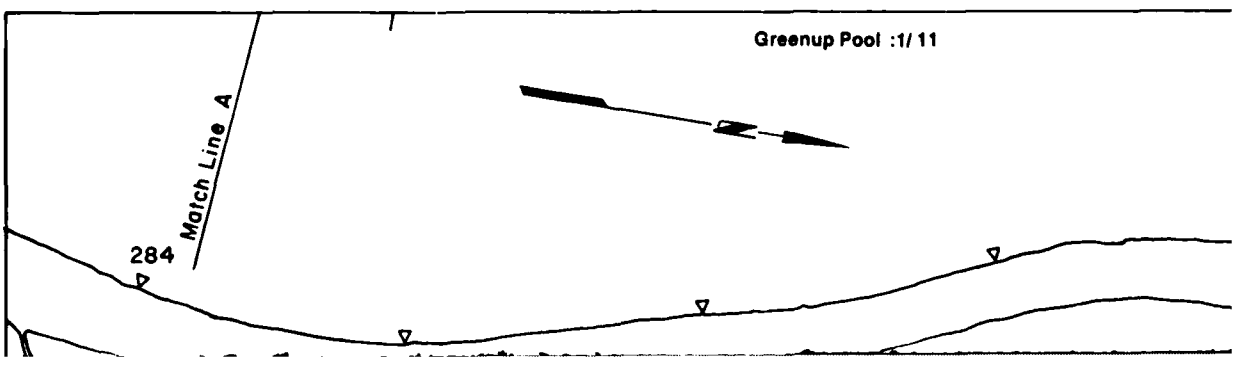

ML D
Kanawha River
N
December 30, 1985
Video Tape 5


Gallipolis Pool :6/7
271
ML E
30, 1985
Tape 5



Gallipolis Pool

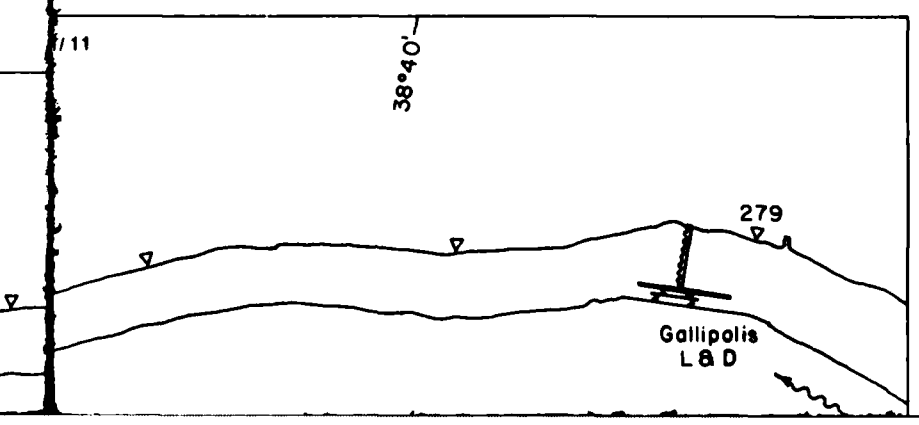
MAP UNITS	Ar (m^2 x
Open water	24.
Solid ice cover	0.
Solid ice cover with open-water areas	0.
Fragmented ice cover	0.
Fragmented ice cover with open-water areas	0.
Ice floes or frazil slush and pans	0.
Total area (m^2 x 10^6)	24.

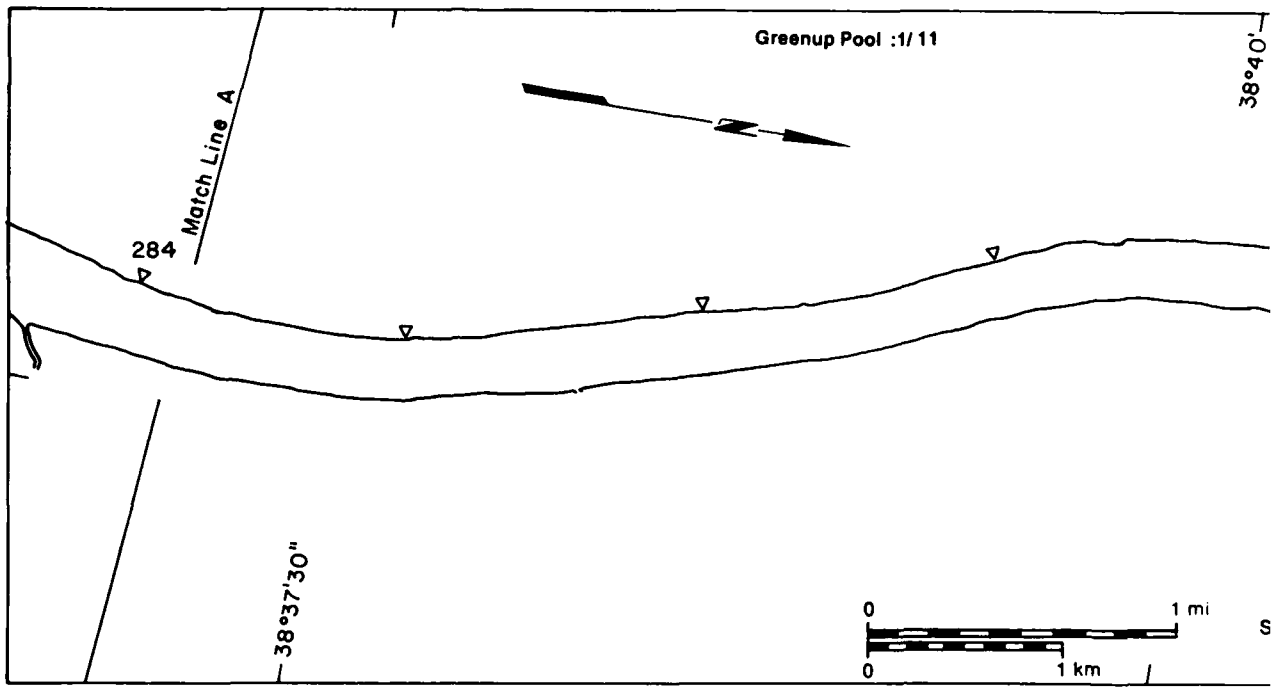


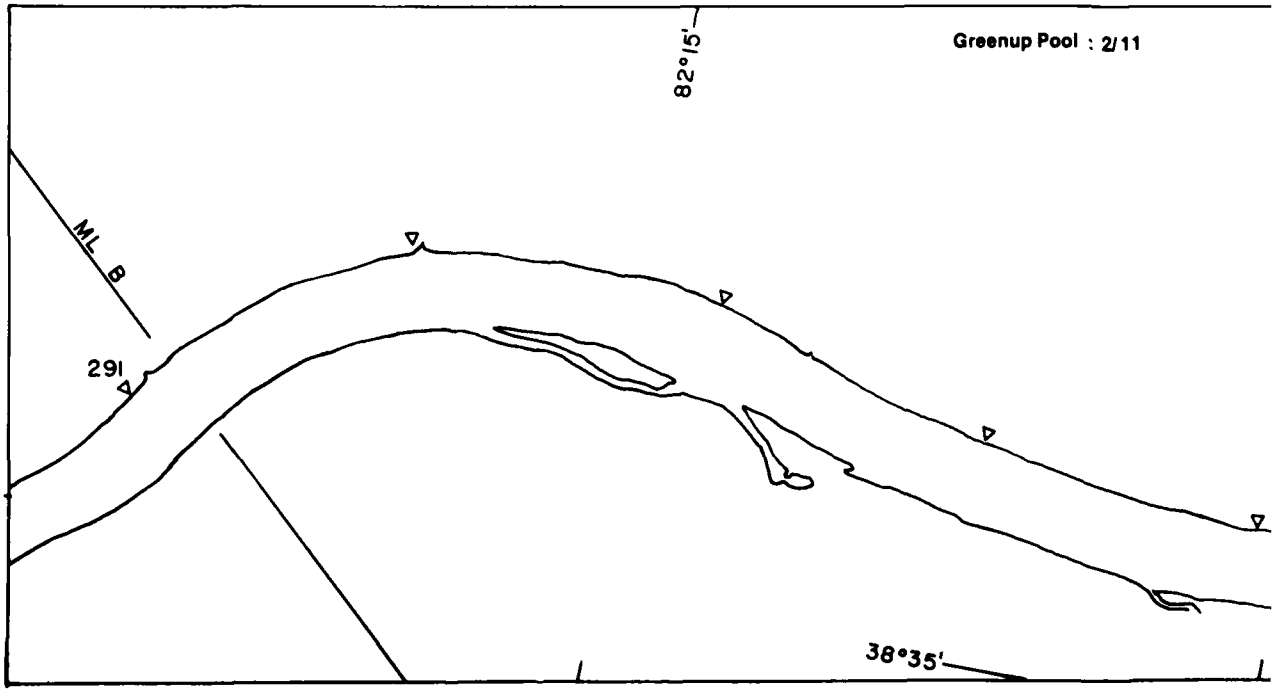
30 December 1985

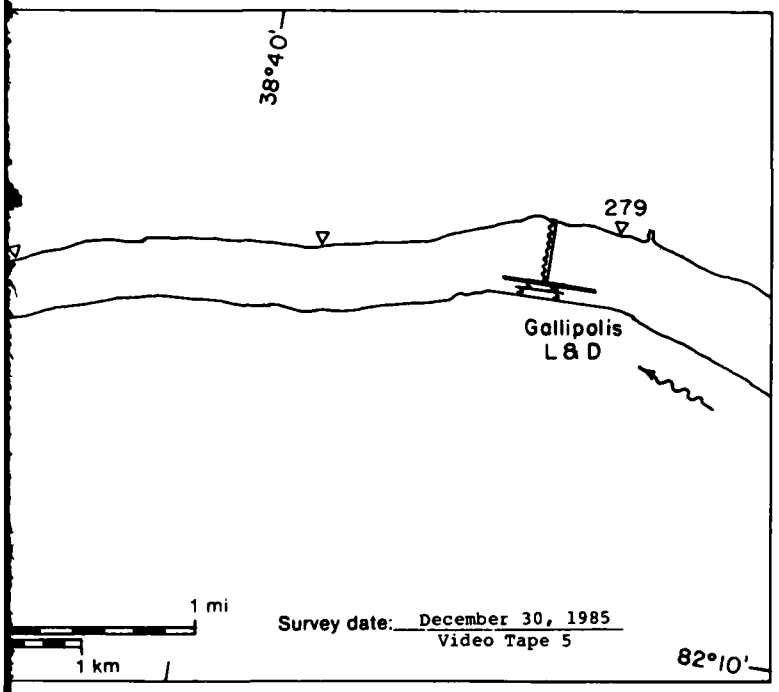
Gallipolis Pool

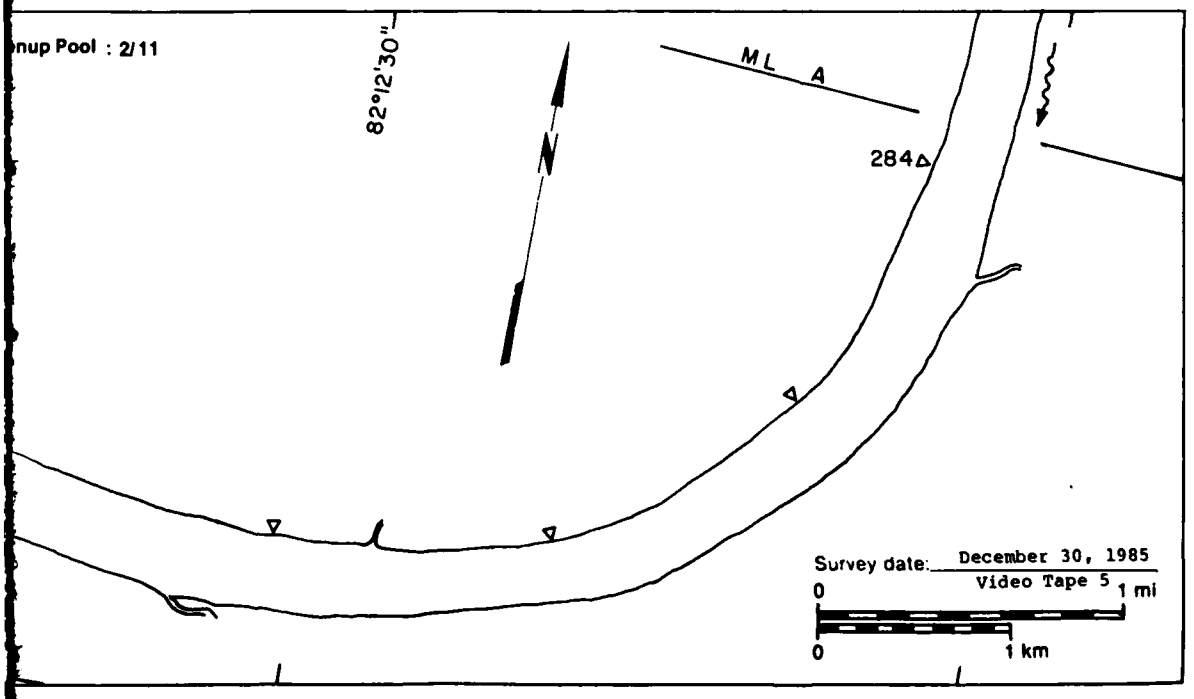
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	24.36	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.29	10
Total area ($m^2 \times 10^6$)	24.65	



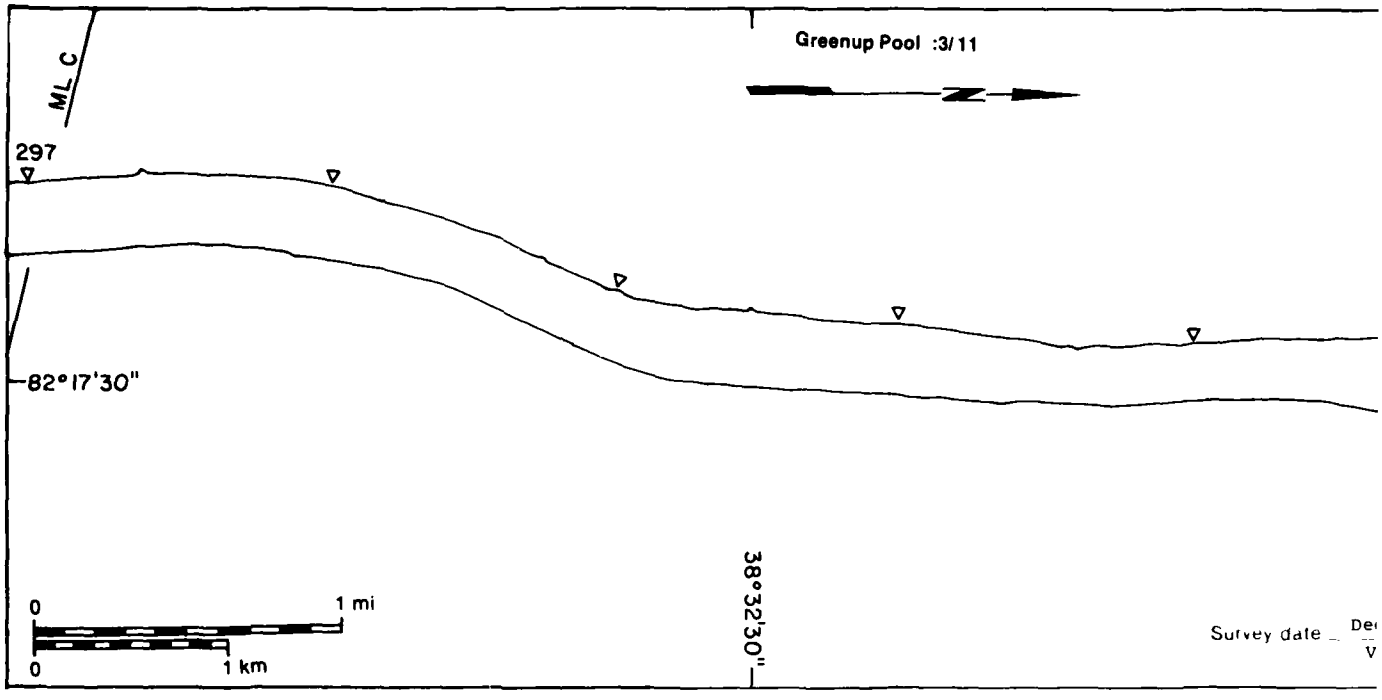

Greenup Pool :1/ 11
38°40'
Match Line A
284
38°37'30"
0
1 mi
0
1 km

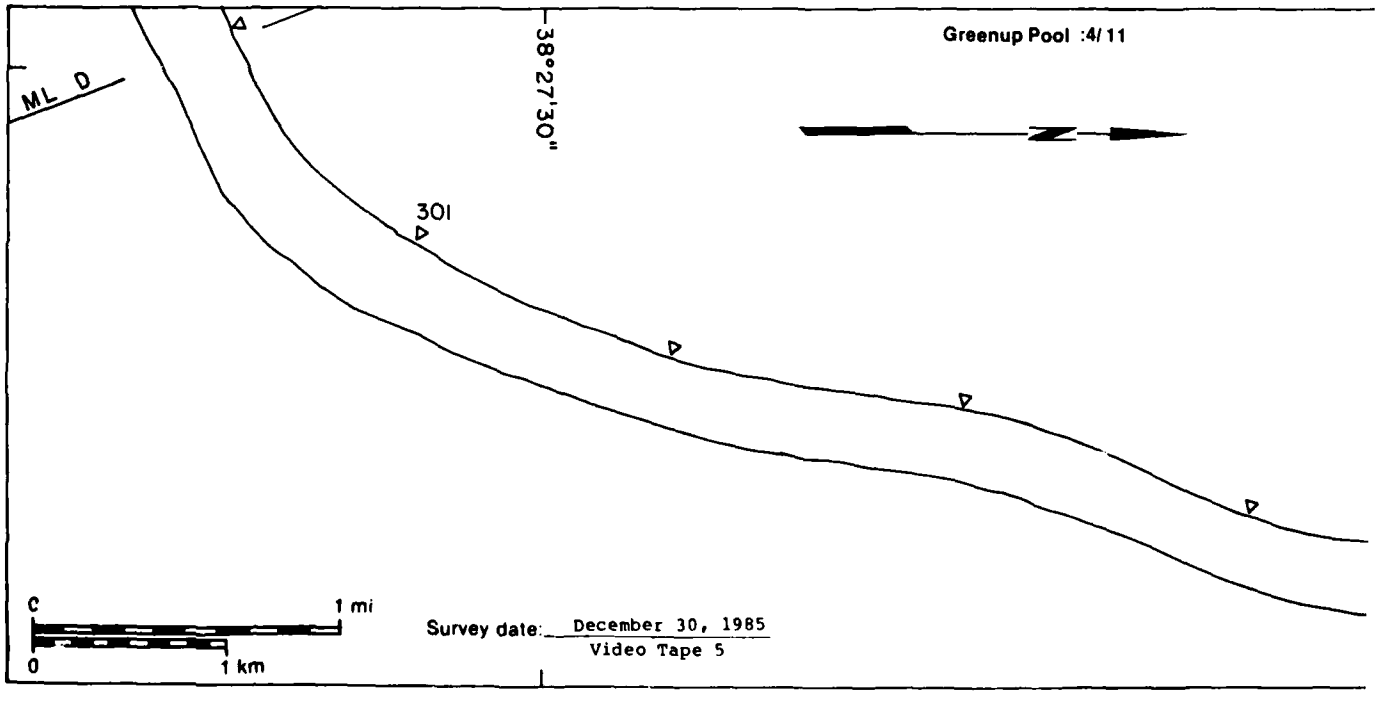

82°15'
Greenup Pool : 2/11
ML B
291
38°35'

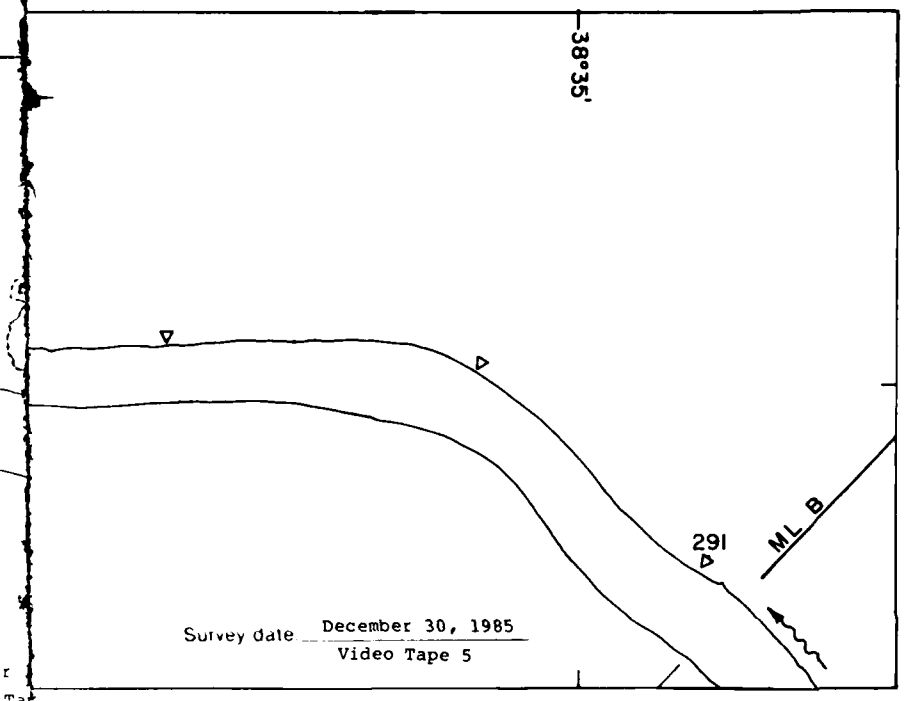

38°40'
279
Gallipolis
L&D
1 mi
1 km
Survey date: December 30, 1985
Video Tape 5
82°10'

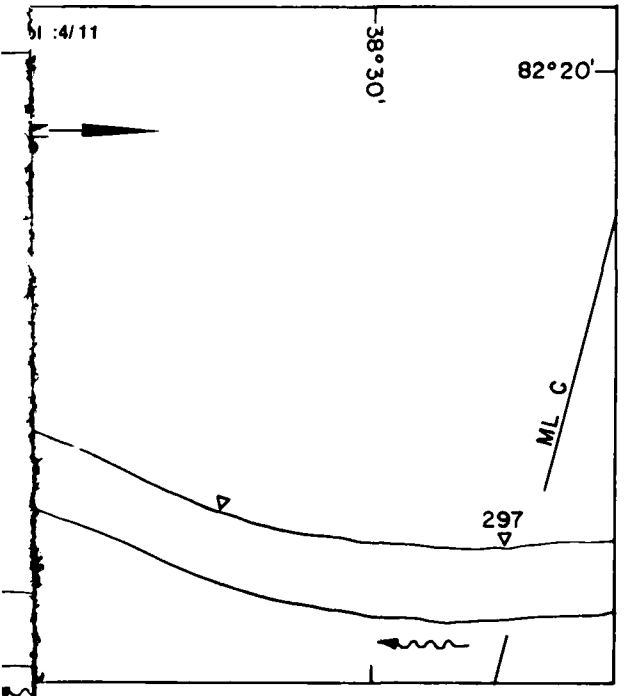

nup Pool : 2/11
82°12'30"
ML A
284
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km

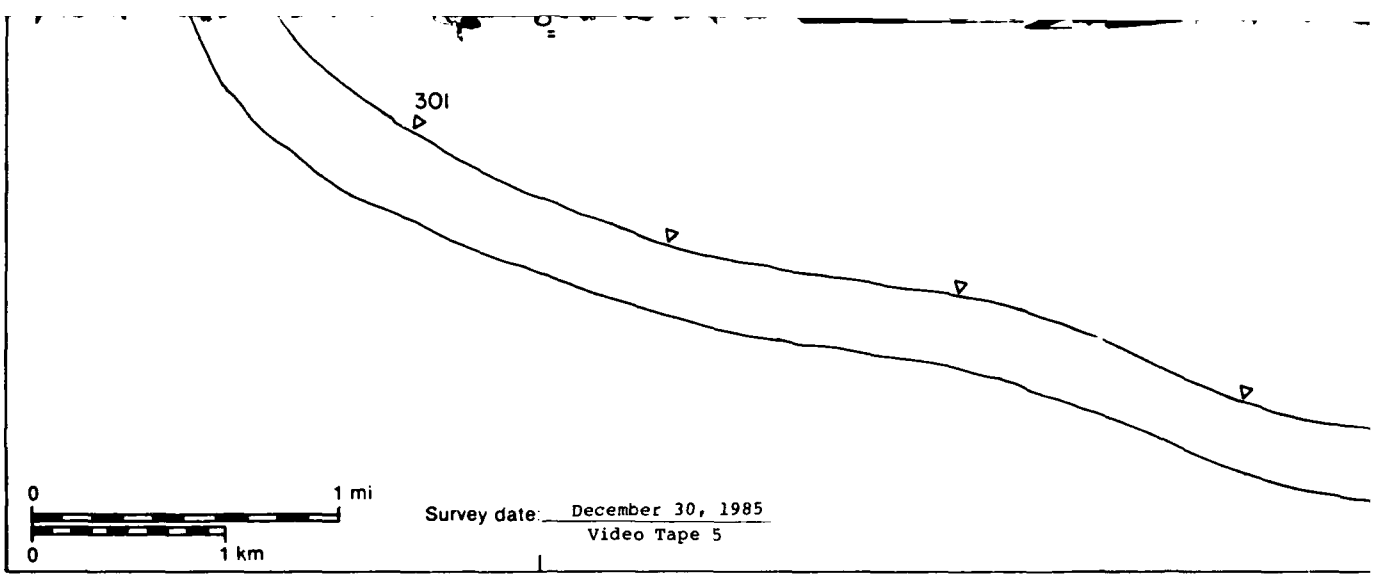
30 December 1985

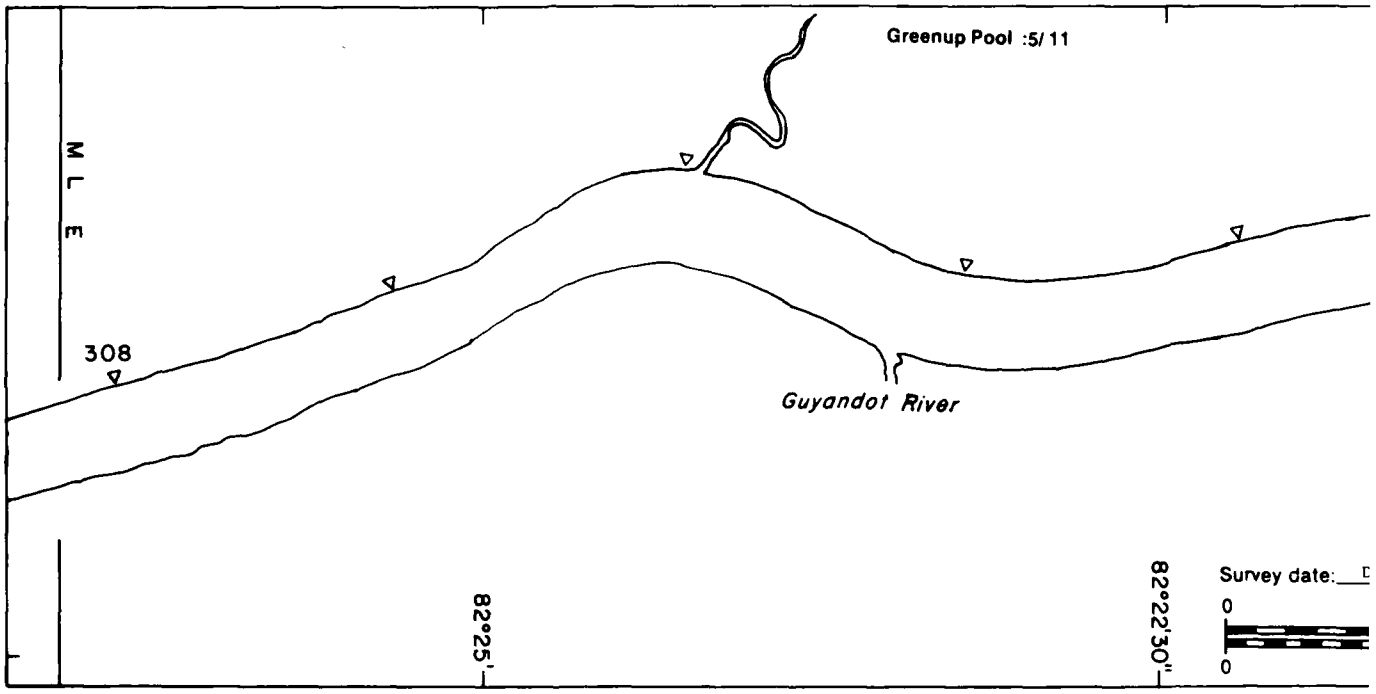


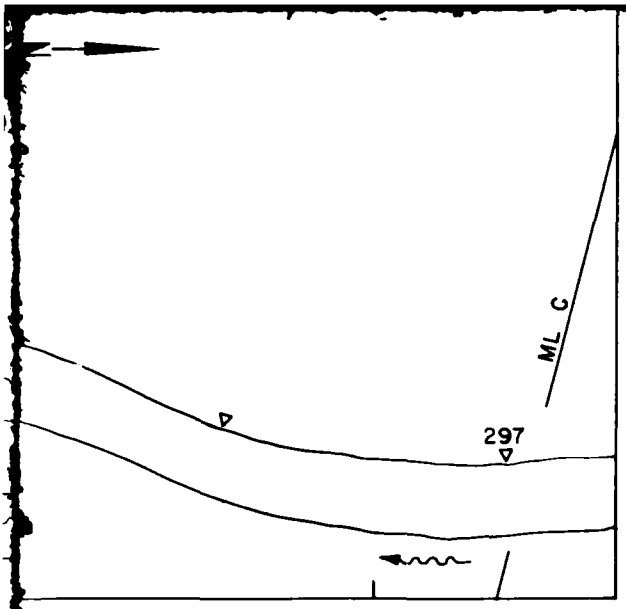


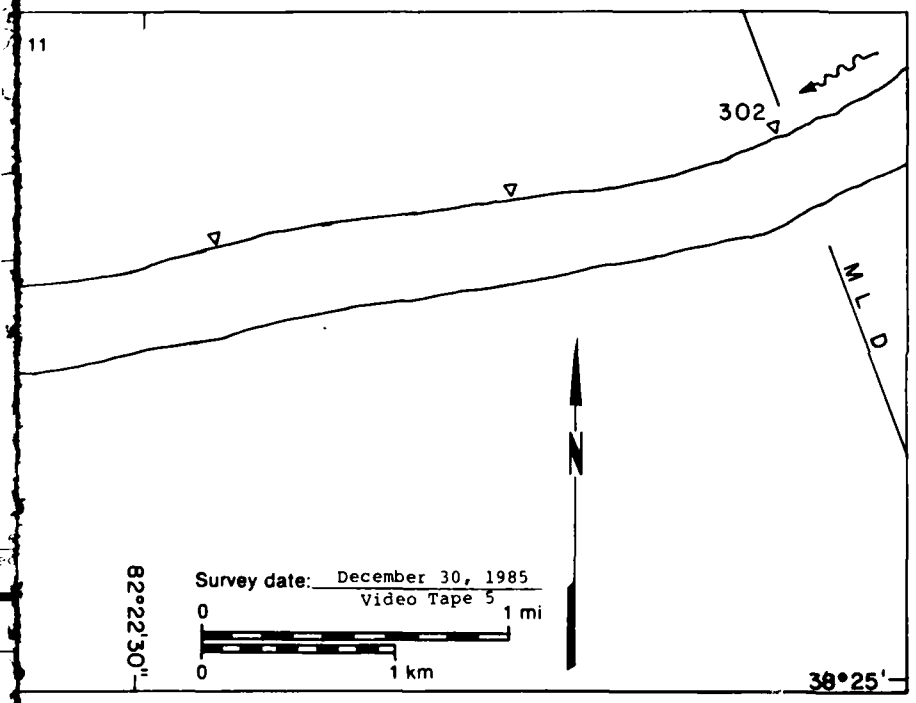

38°35'
291
ML B
Survey date December 30, 1985
Video Tape 5

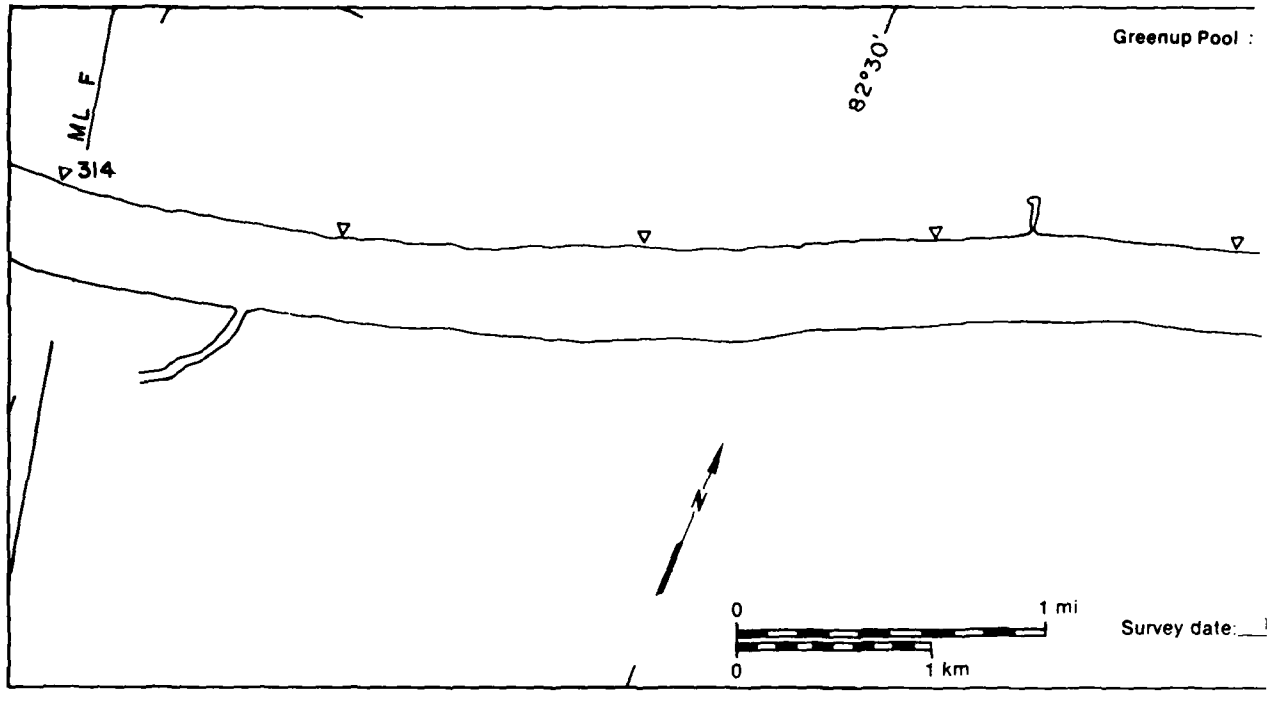

38°30'
82°20'
ML C
297

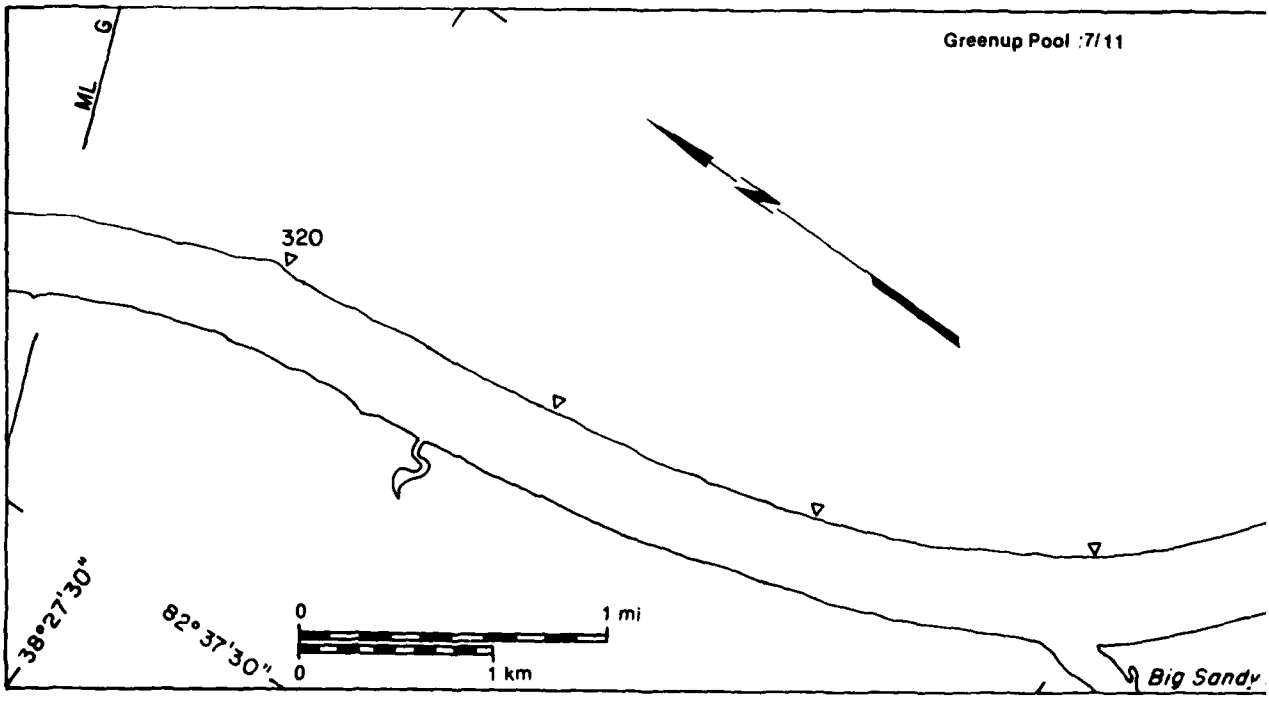

301
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5


Greenup Pool :5/ 11
M L E
308
Guyandot River
82°25'
82°22'30"
Survey date:
0
0

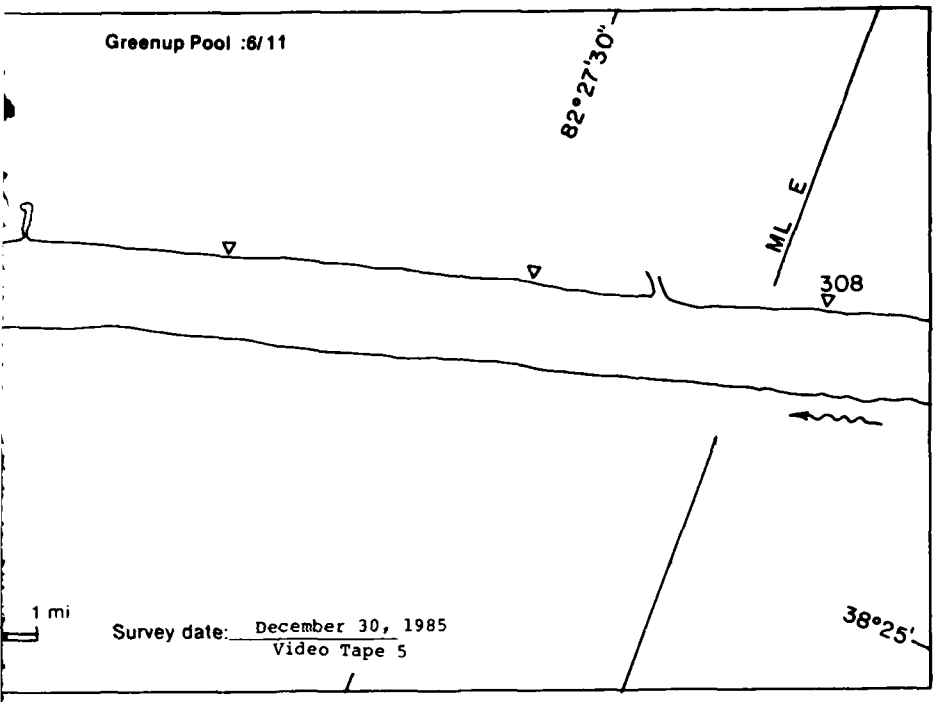

ML C
297

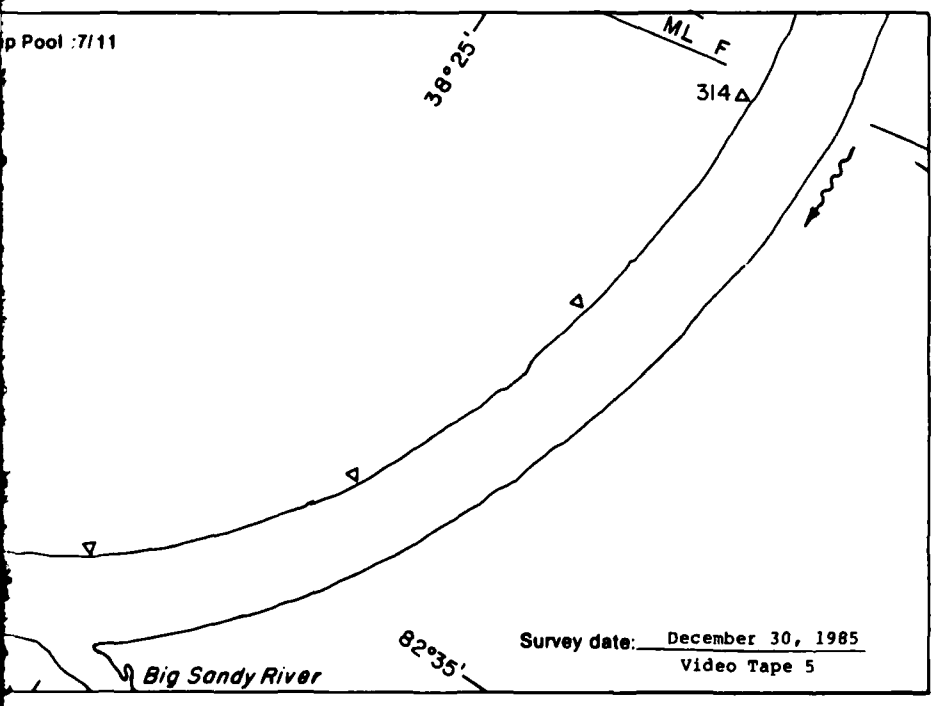

11
302
ML D
N
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km
82°22'30"
38°25'

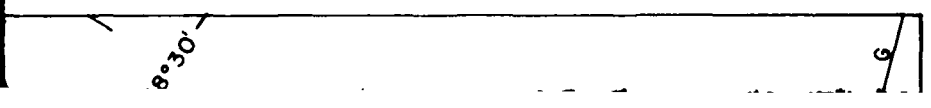

Greenup Pool :
82°30'
ML F
314
N
0
1 mi
0
1 km
Survey date:

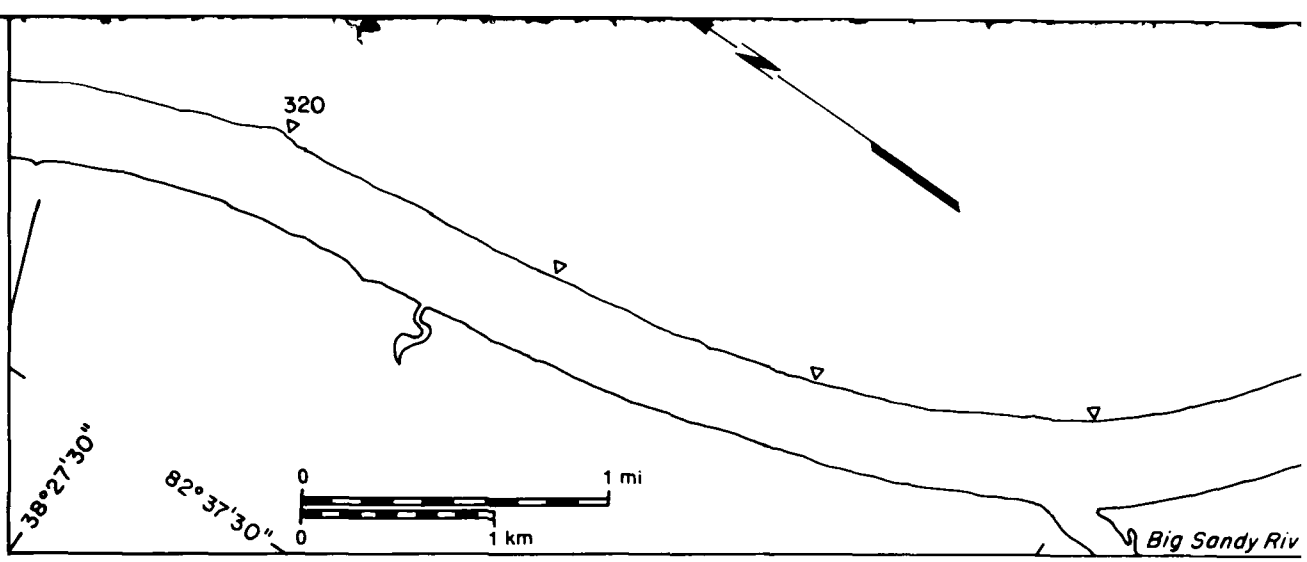

Greenup Pool :7/11
ML G
320
38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sandy

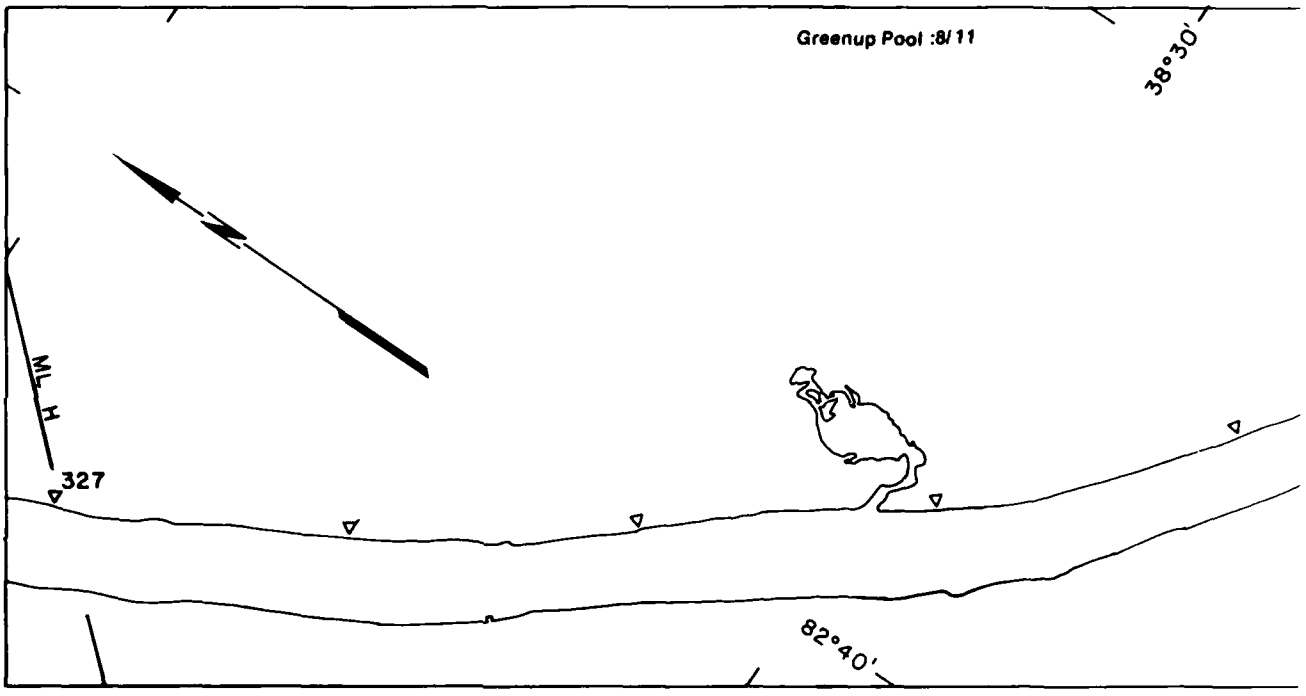
30 December 1985

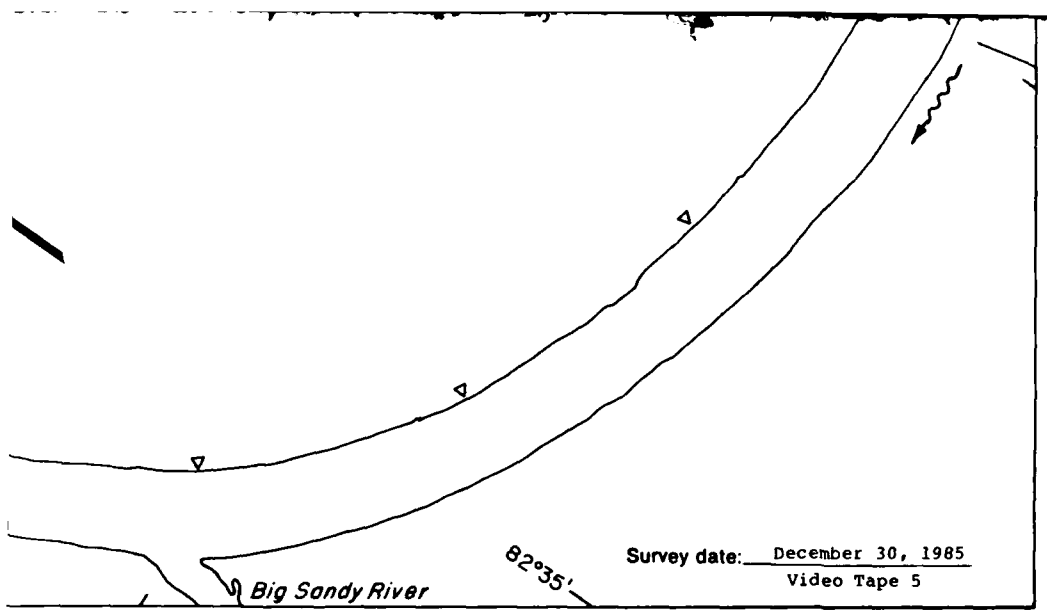


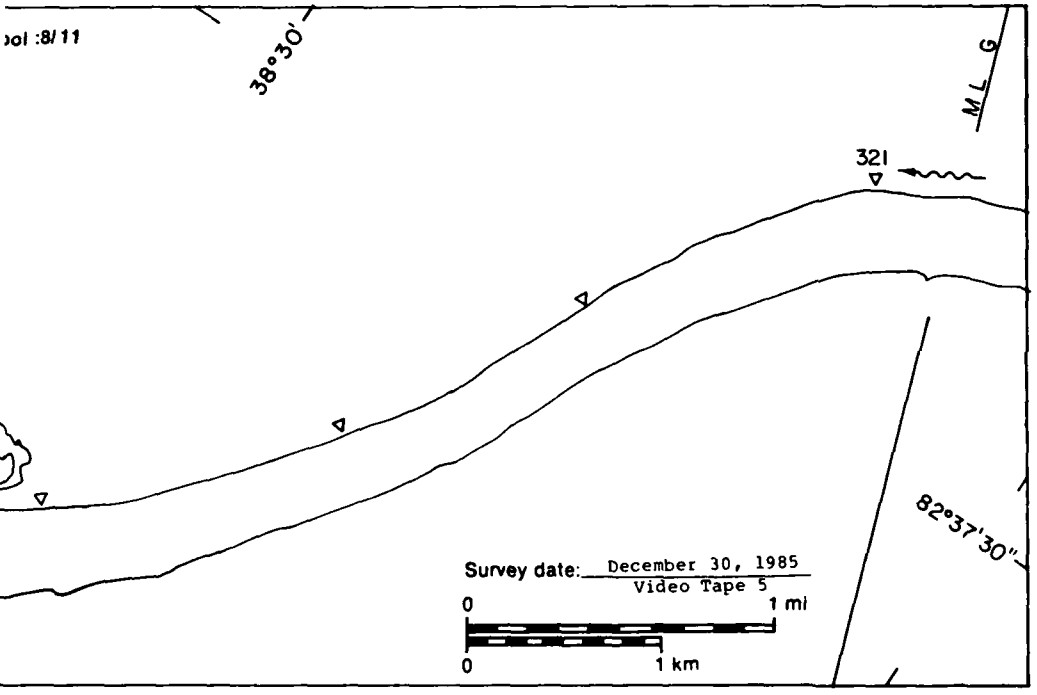




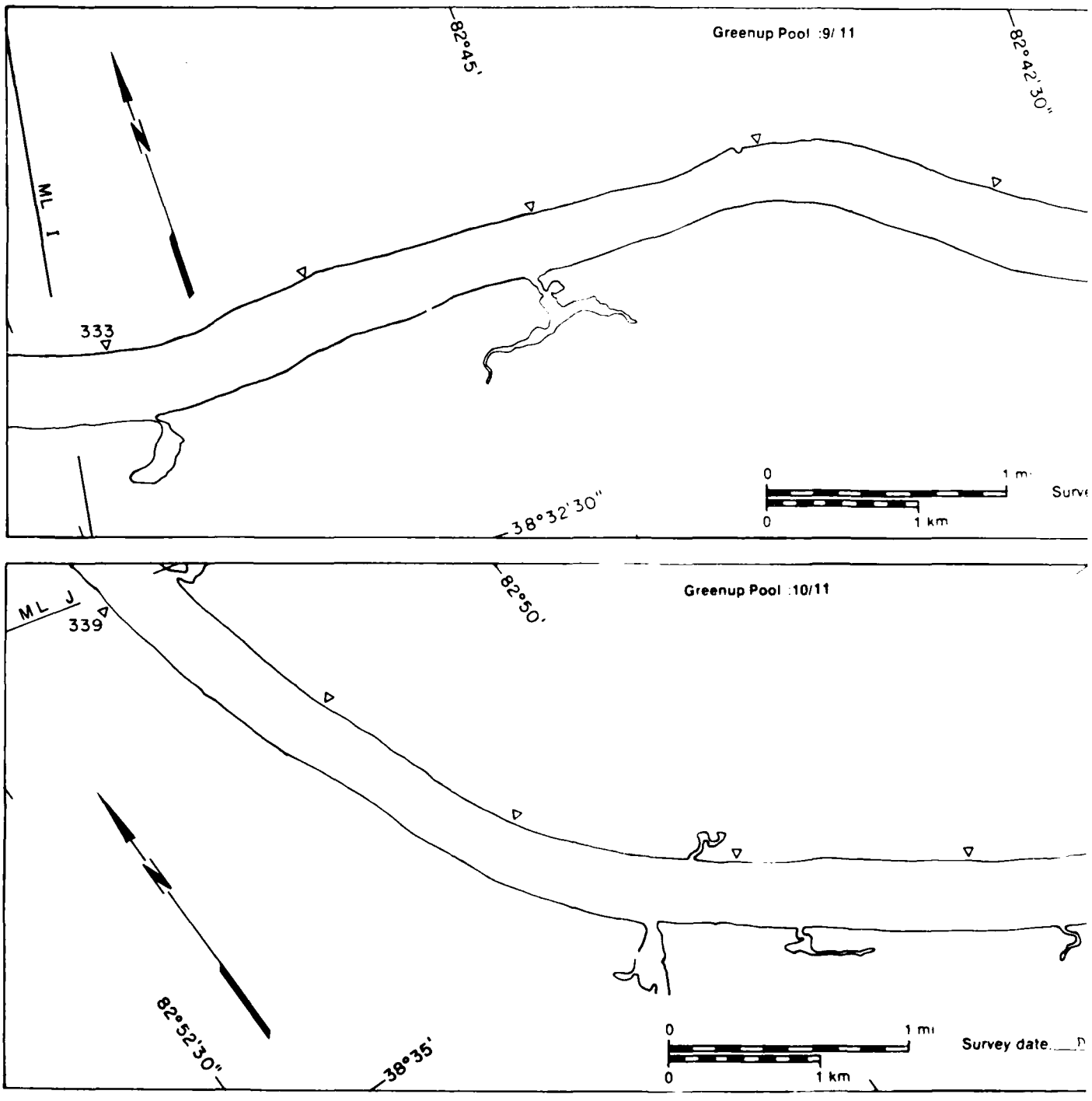

320
38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sandy Riv

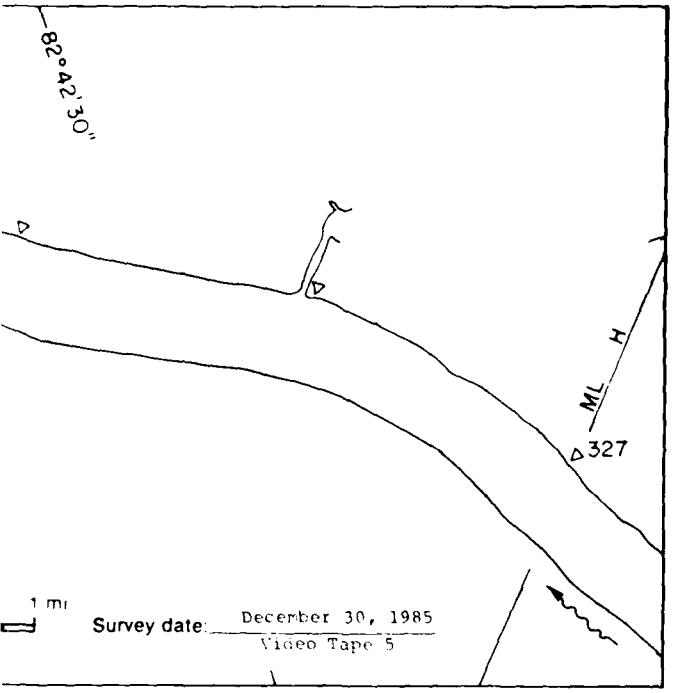

Greenup Pool :8/11
38°30'
MLH
327
82°40'

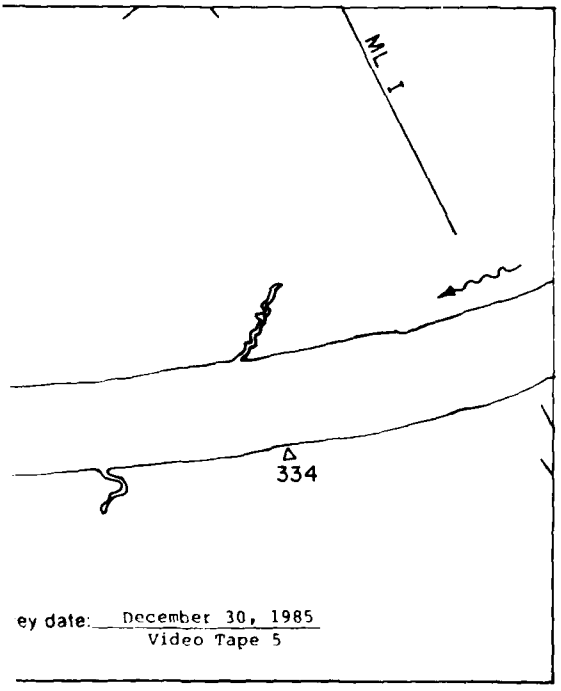

82°35'
Big Sandy River
Survey date: December 30, 1985
Video Tape 5


38°30'
M L G
321
82°37'30"
Survey date: December 30, 1985
Video Tape 5
0
1 mi
0
1 km

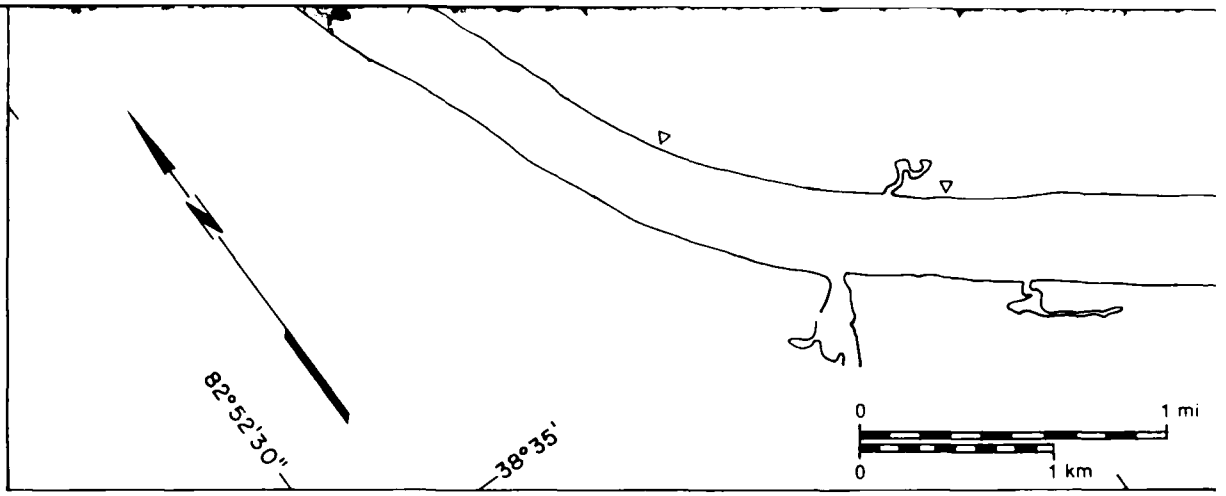
30 December 1985

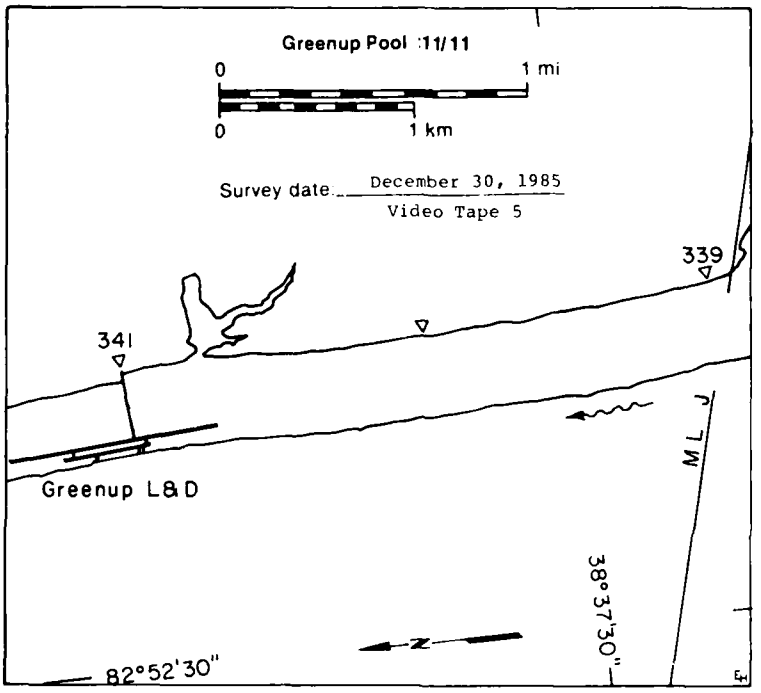






Area ($m^2 \times 10^6$)	Surface concentration (%)
41.19	NA



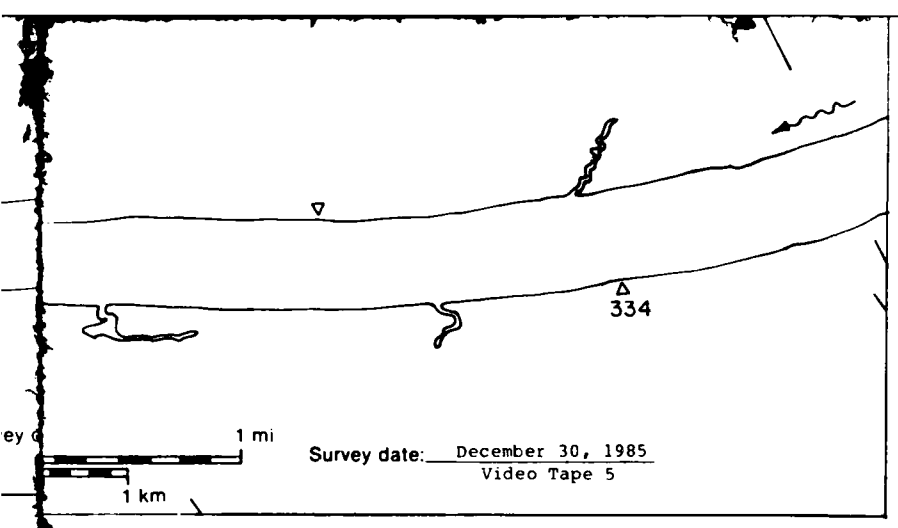


Greenup Pool

MAP UNITS

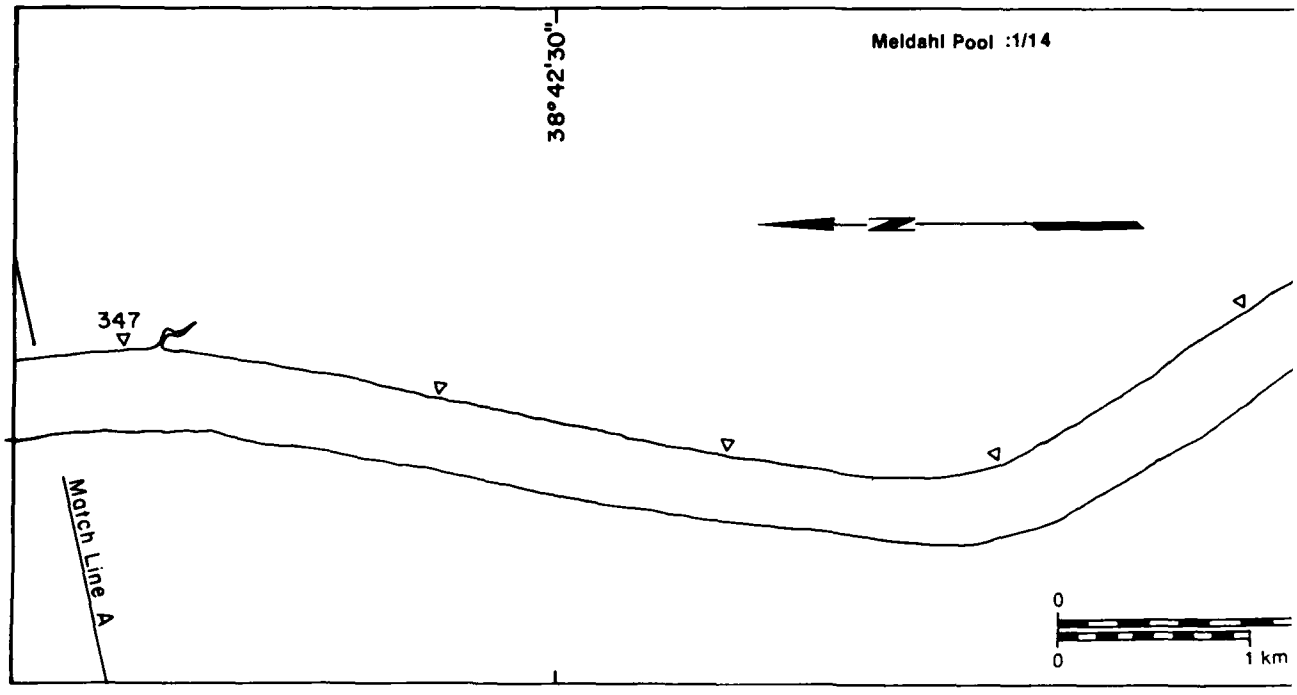
- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

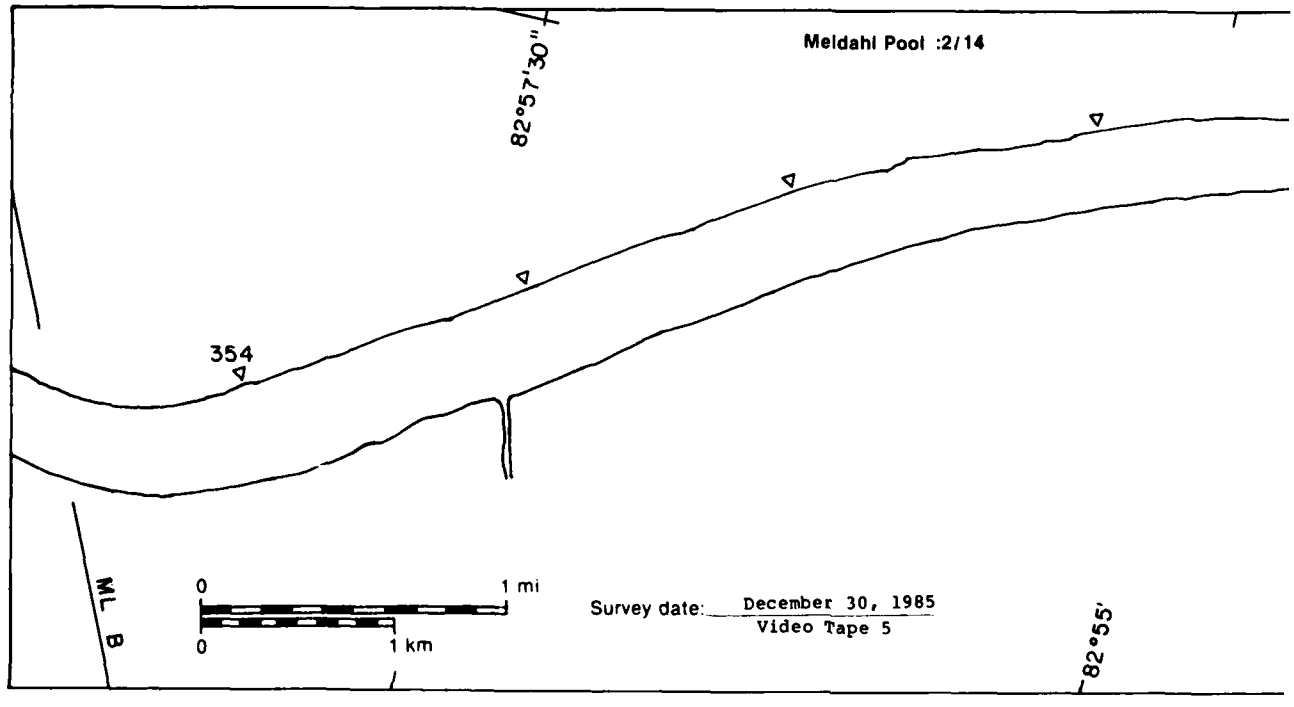
Total area (m^2 x

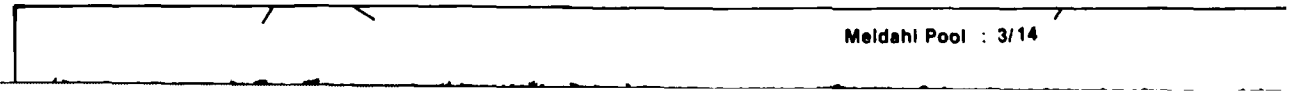


Greenup Pool

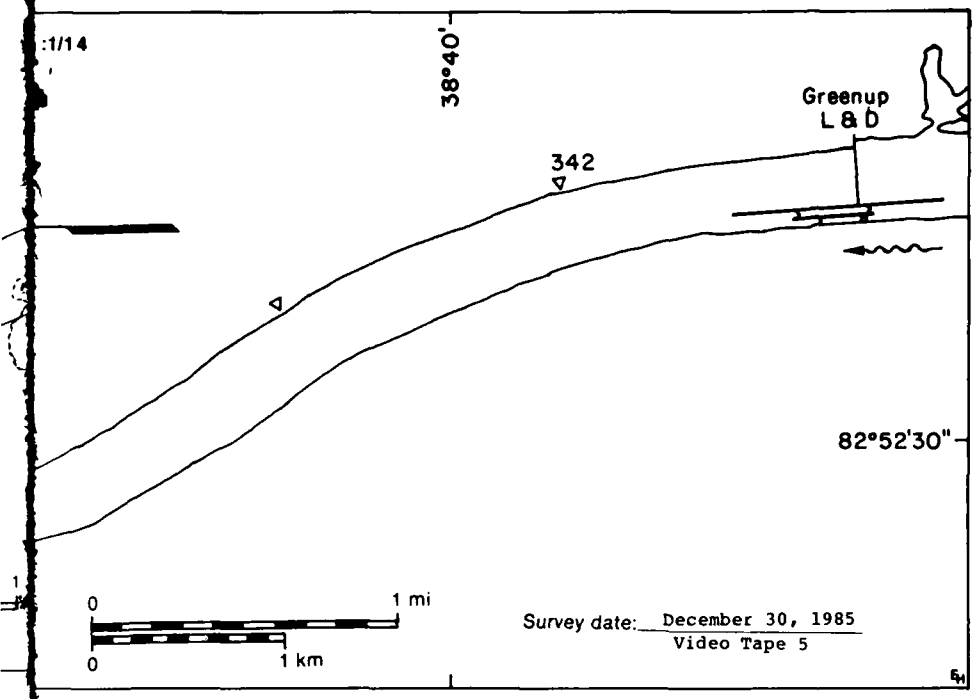
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (°/oo)
Open water	41.19	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	41.19	

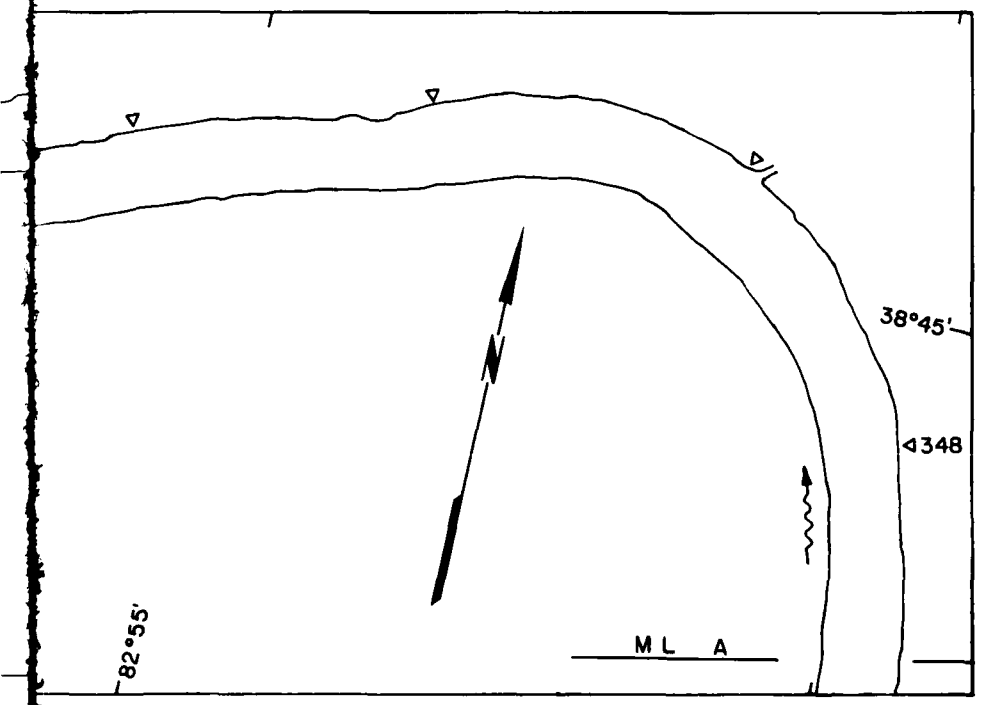

Meldahl Pool :1/14
38°42'30"
347
Match Line A
0
0
1 km

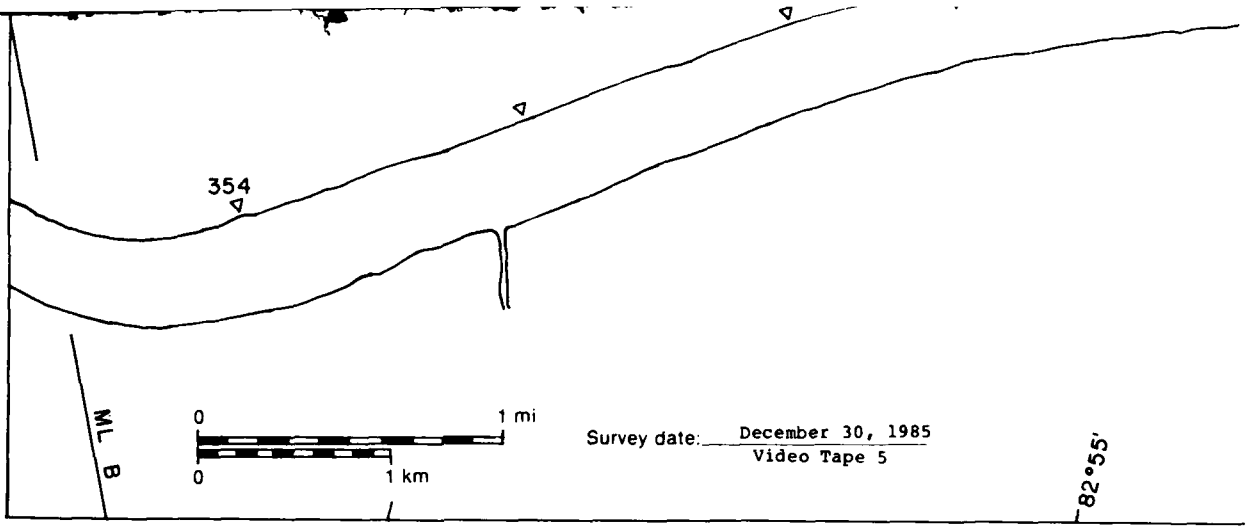

Meldahl Pool :2/14
82°57'30"
354
ML B
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5
82°55'

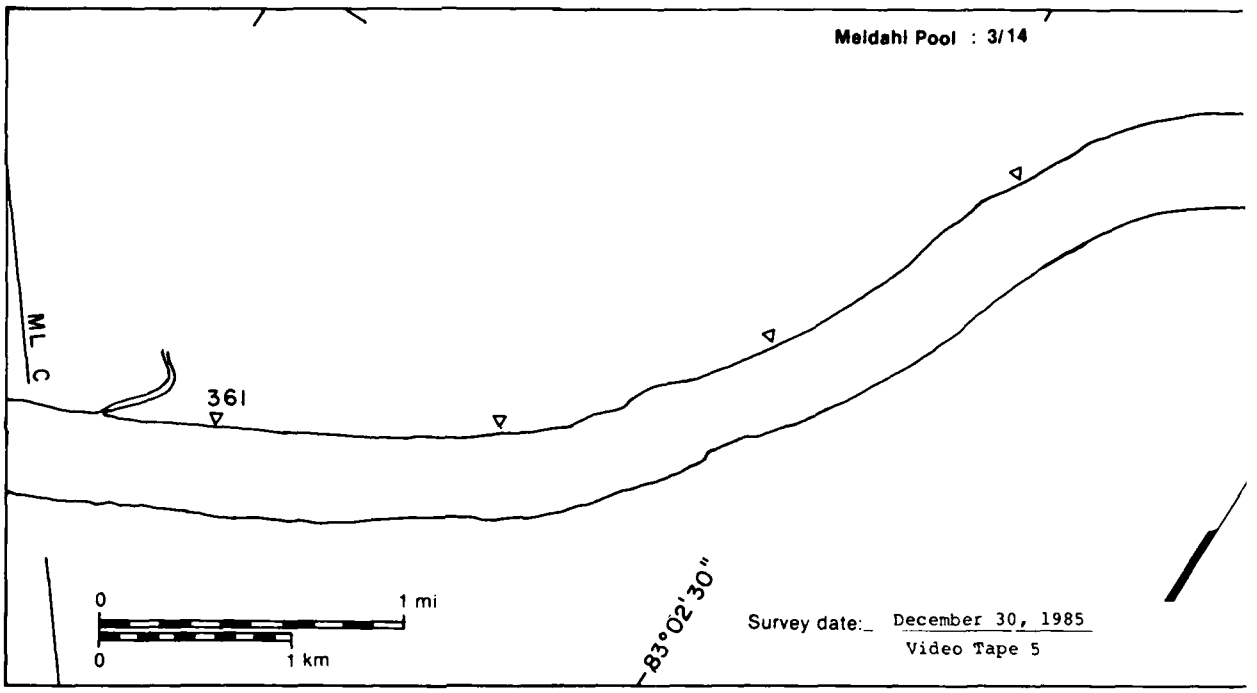

Meldahl Pool : 3/14

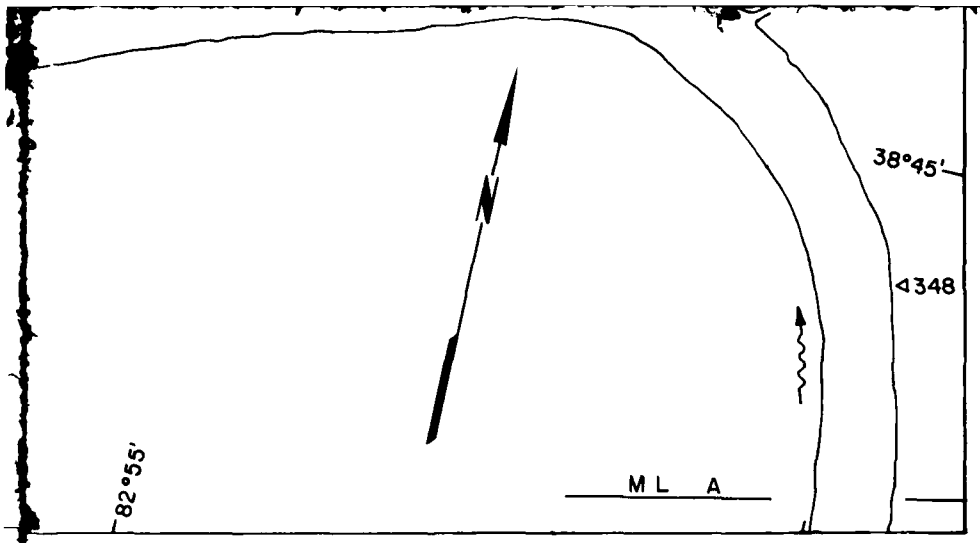
30 December 1985

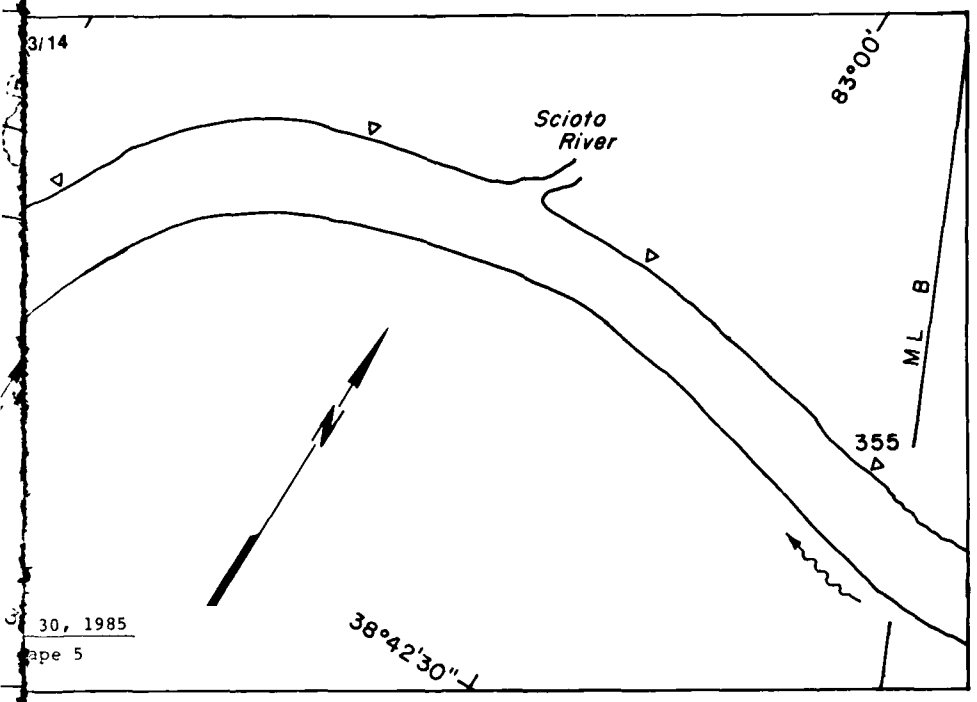





354
ML B
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 5
82°55'

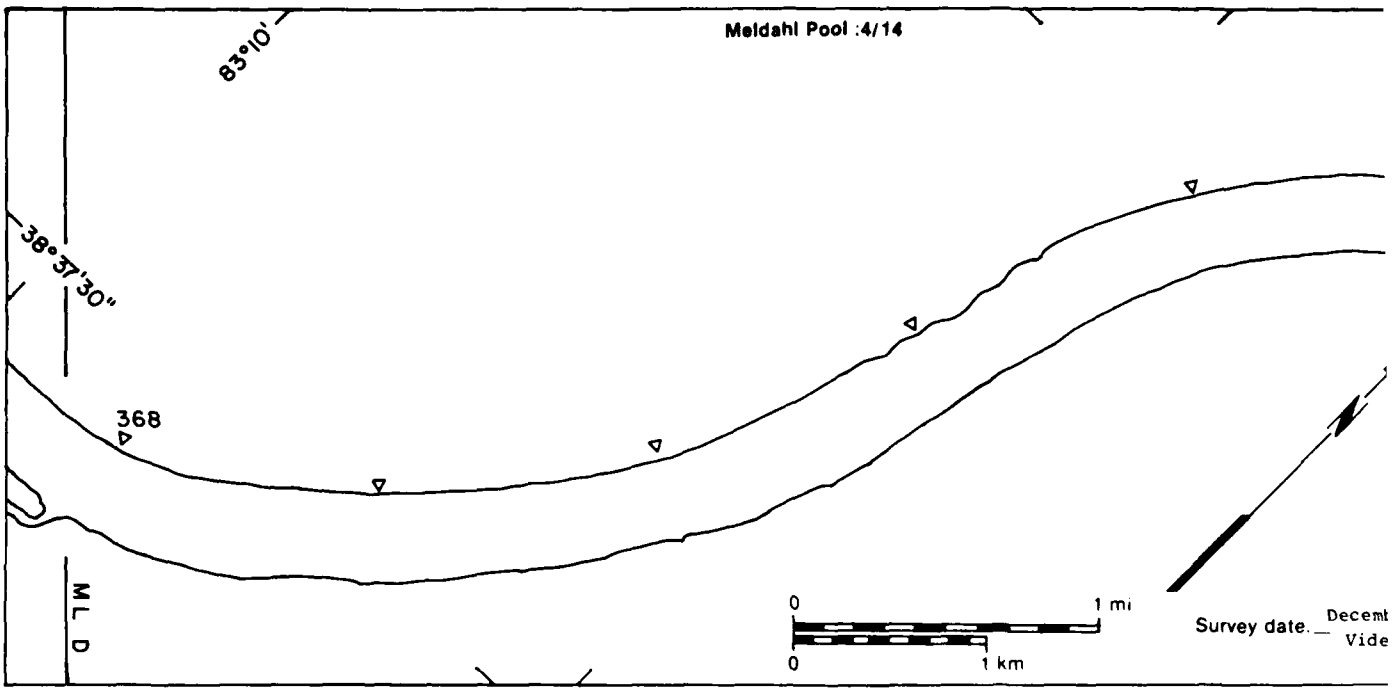

Meldahl Pool : 3/14
ML C
361
0
1 mi
0
1 km
83°02'30"
Survey date: December 30, 1985
Video Tape 5

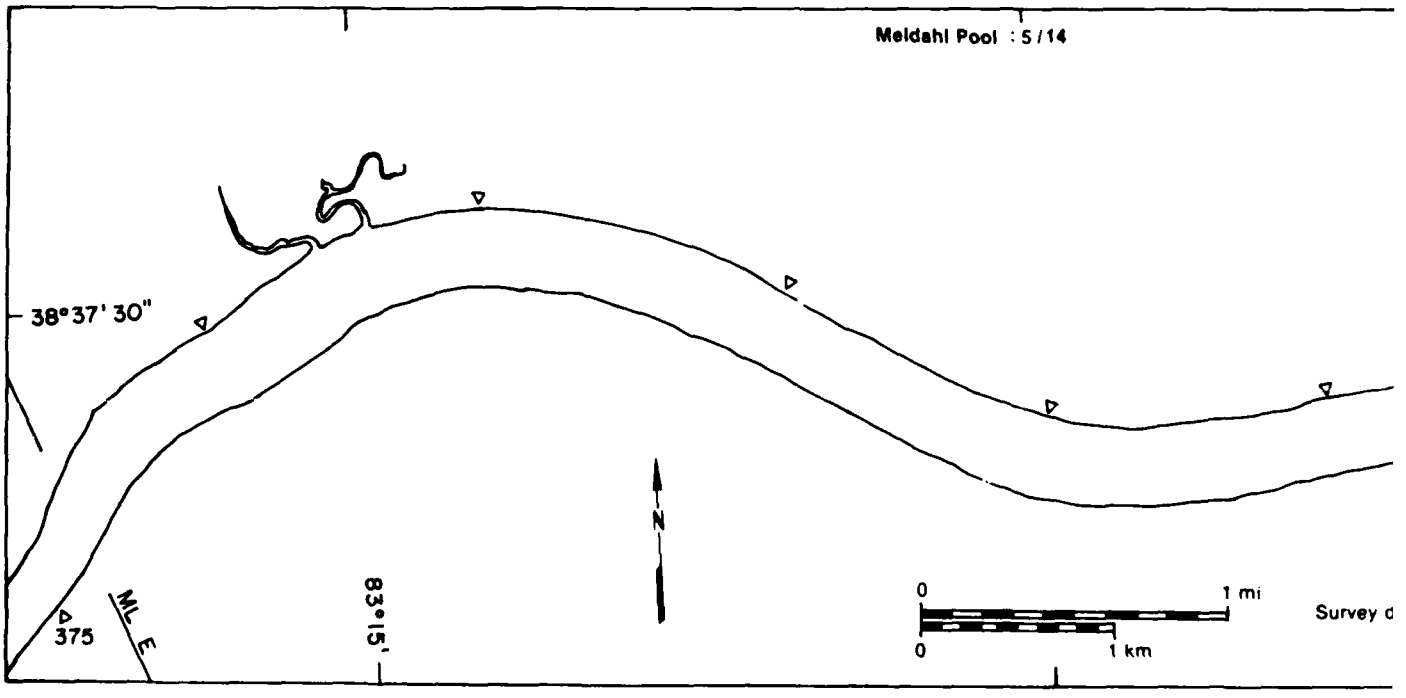


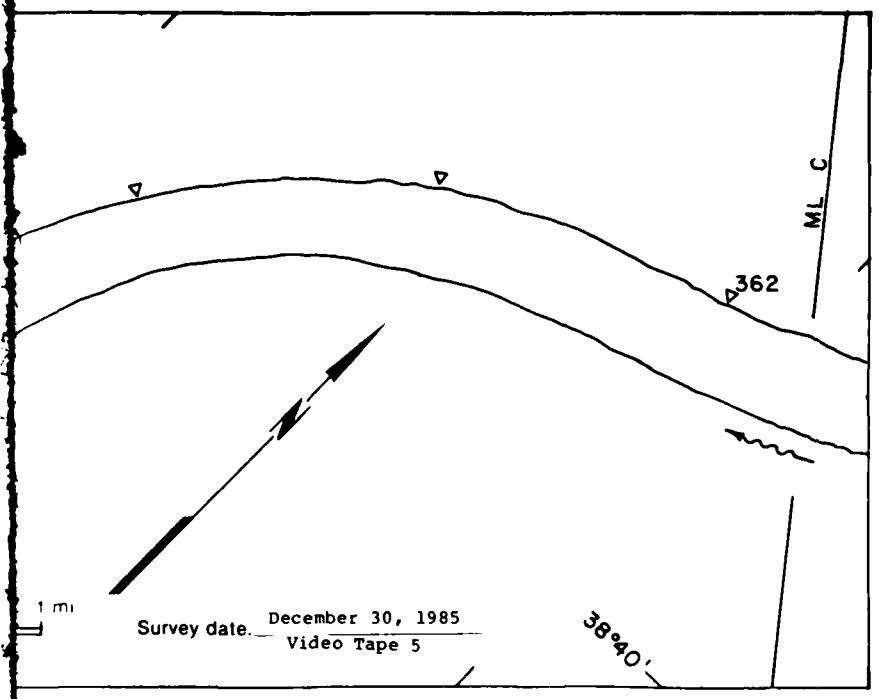


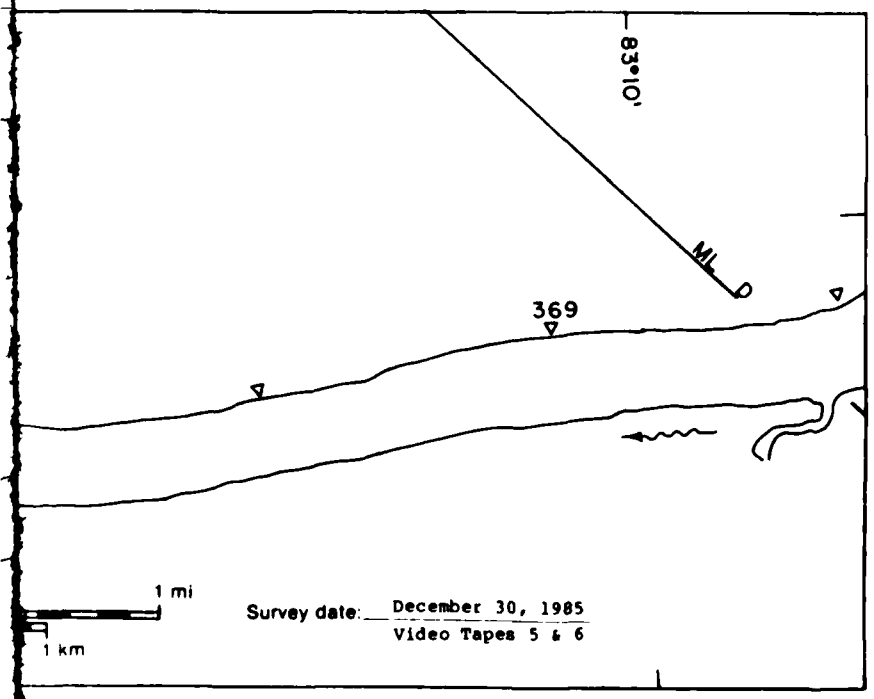
30, 1985
ape 5

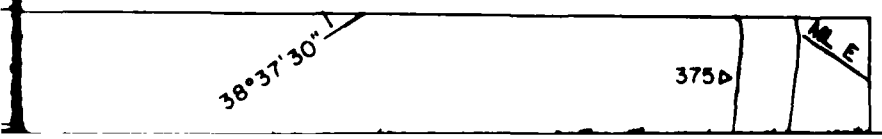
30 December 1985

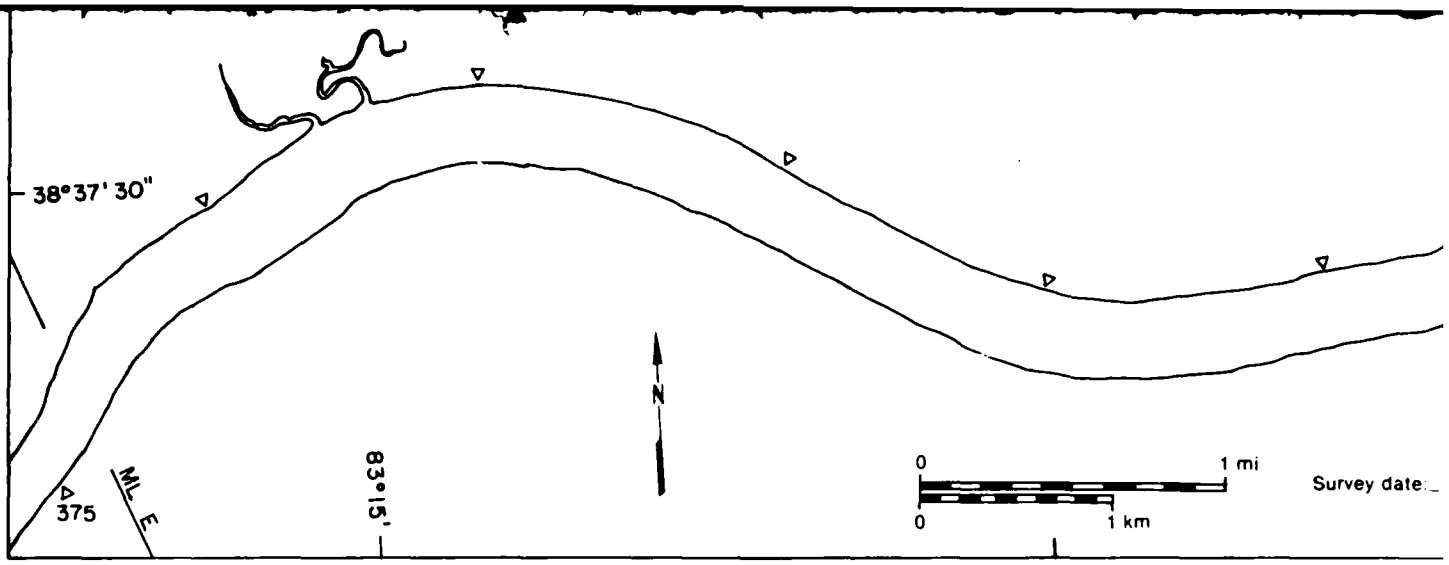


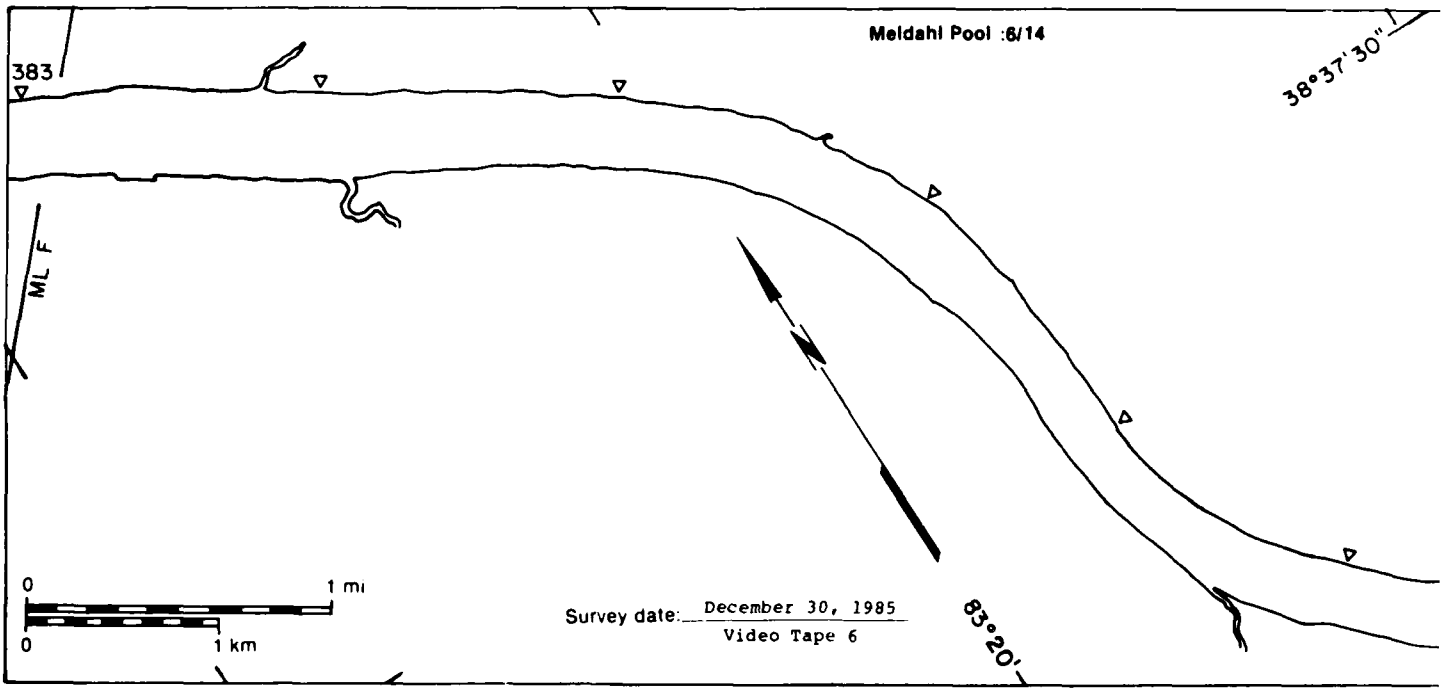


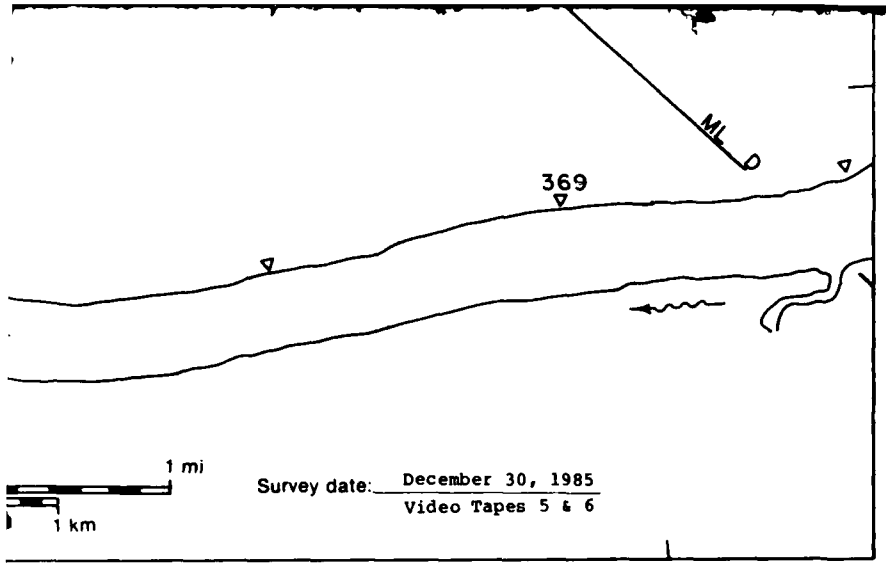

ML C
362
1 mi
Survey date: December 30, 1985
Video Tape 5
38°40'

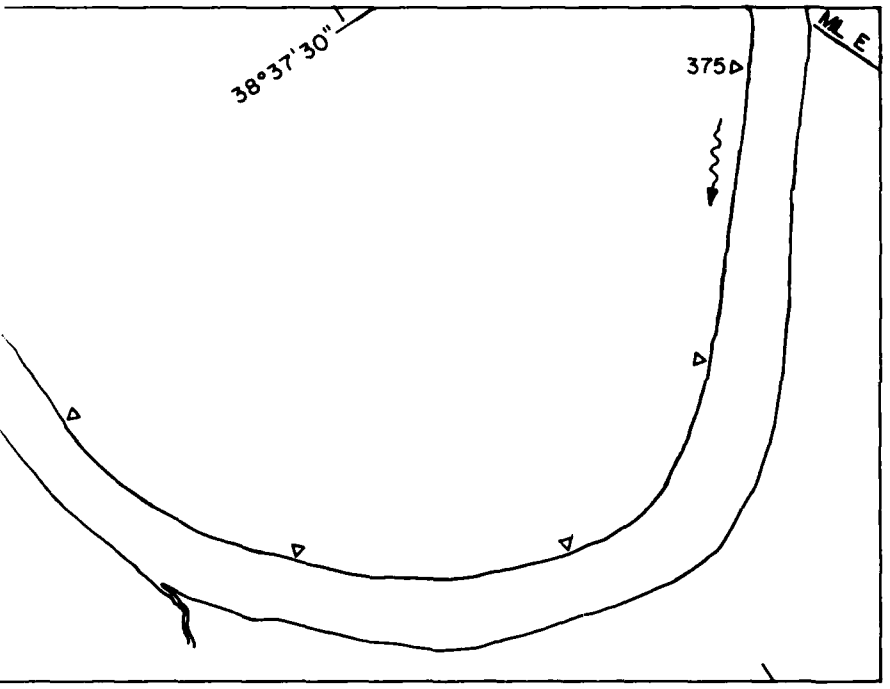

83°10'
ML D
369
1 mi
1 km
Survey date: December 30, 1985
Video Tapes 5 & 6

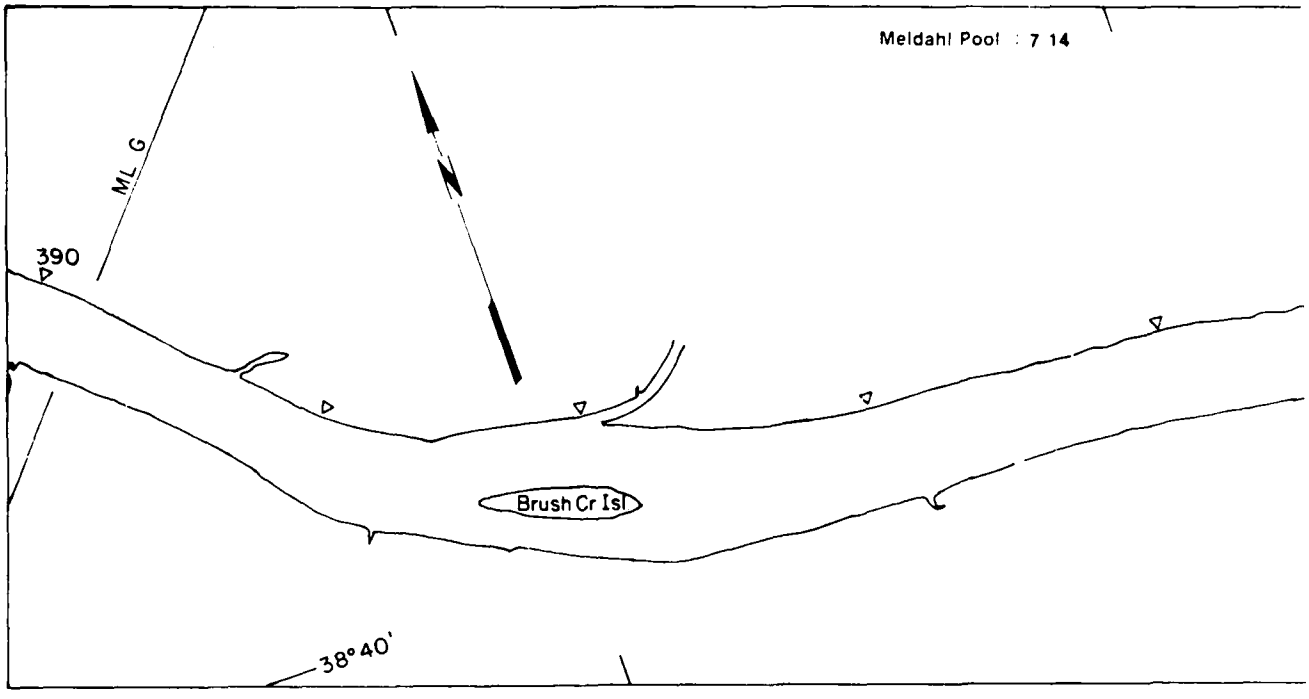

38°37'30"
375
ML E

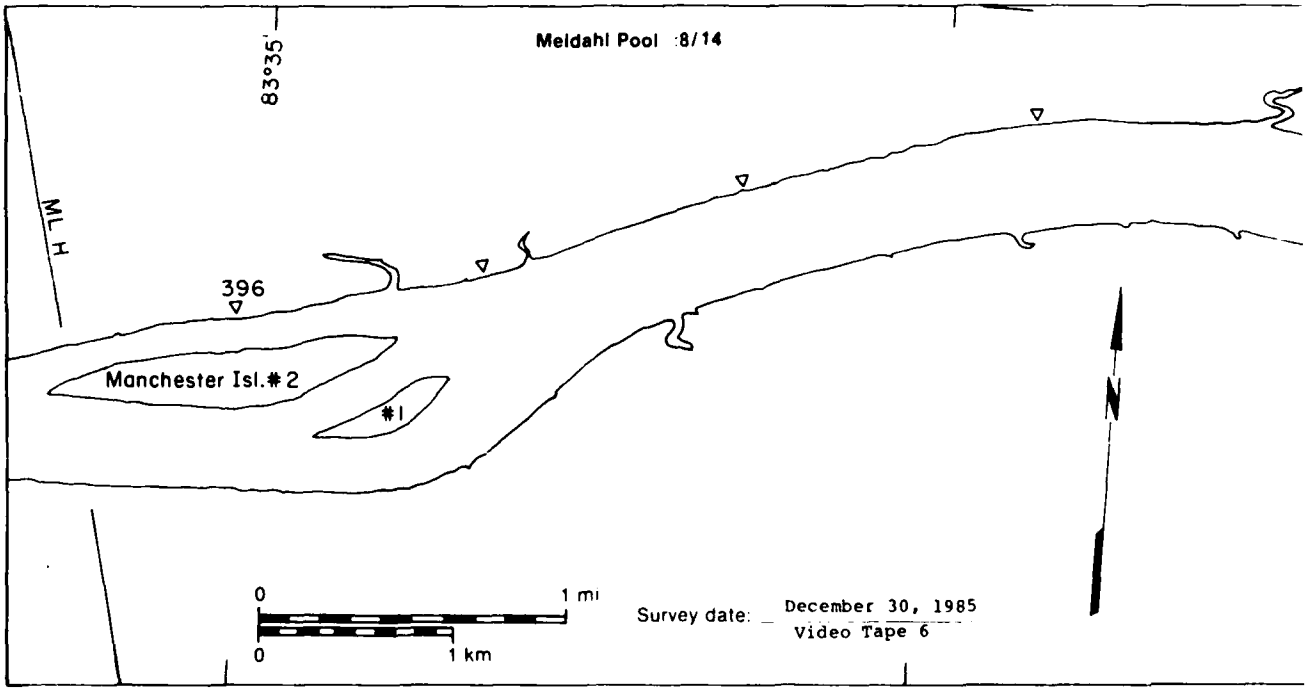

38°37'30"
375
ML E
83°15'
N
0
1 mi
0
1 km
Survey date:

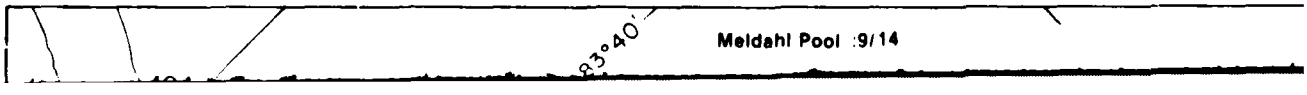

Meldahl Pool :6/14
383
38°37'30"
ML F
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6
83°20'


ML
369
1 mi
1 km
Survey date: December 30, 1985
Video Tapes 5 & 6

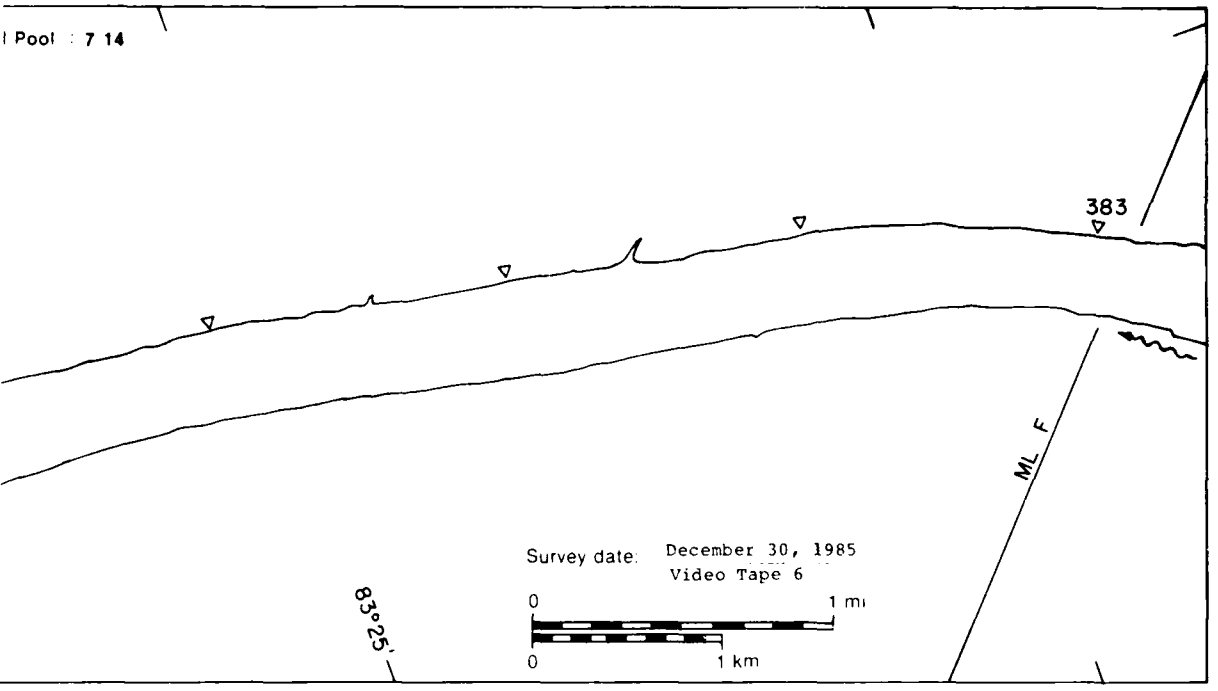

38°37'30"
375
ML E

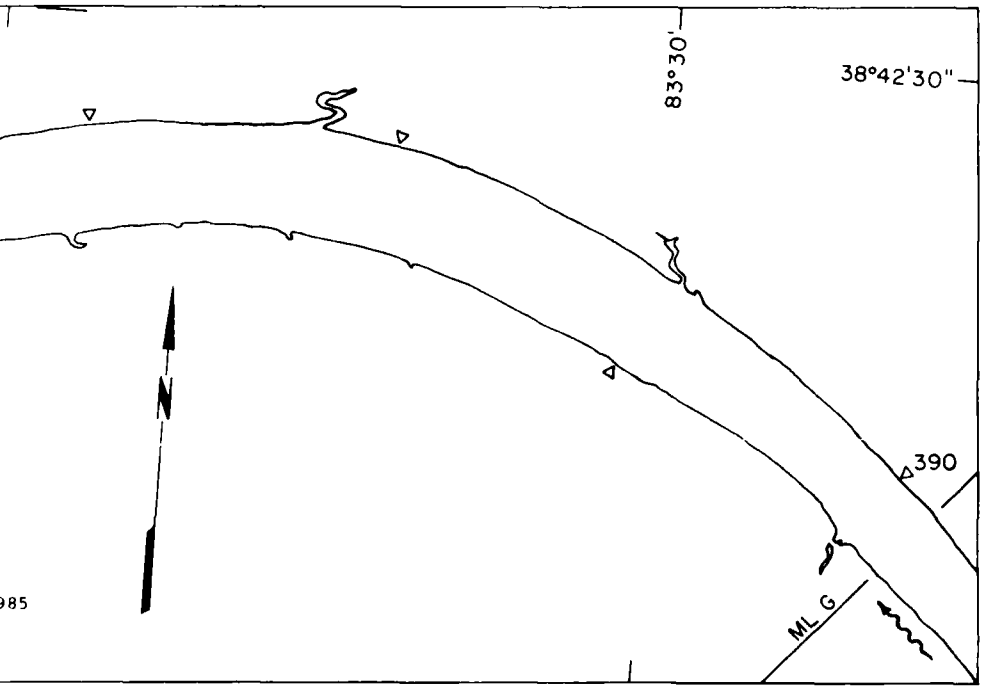

Meldahl Pool : 7 14
ML G
390
Brush Cr Isl
38°40'

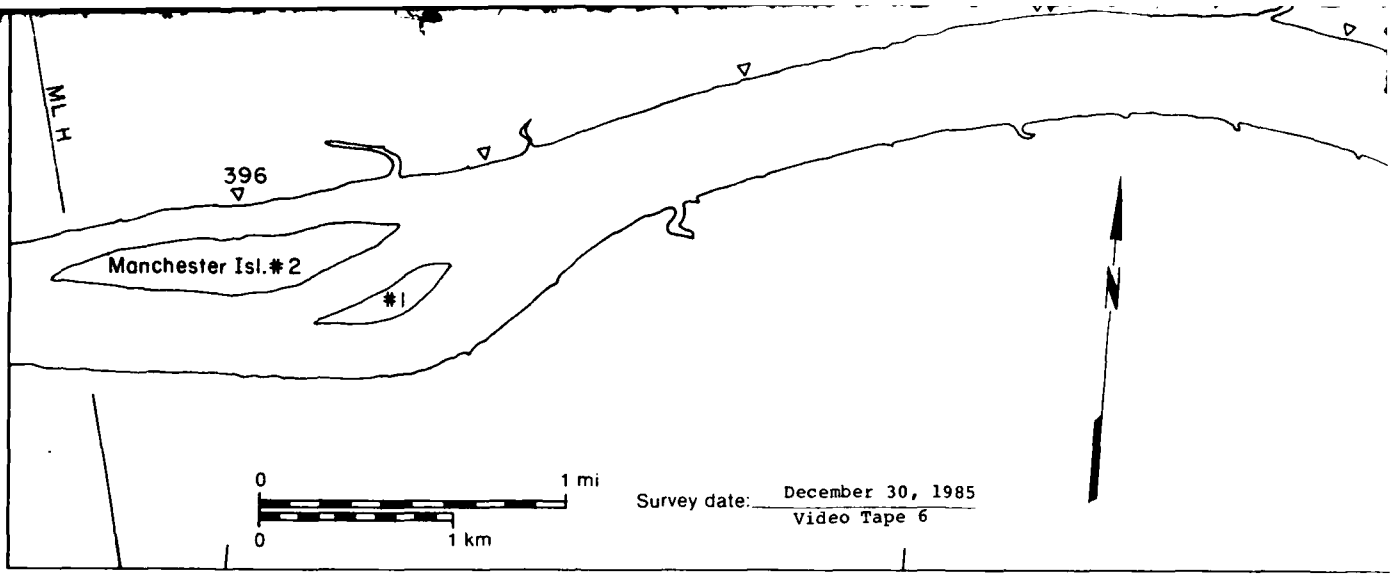

Meldahl Pool :8/14
83°35'
ML H
396
Manchester Isl.#2
#1
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6

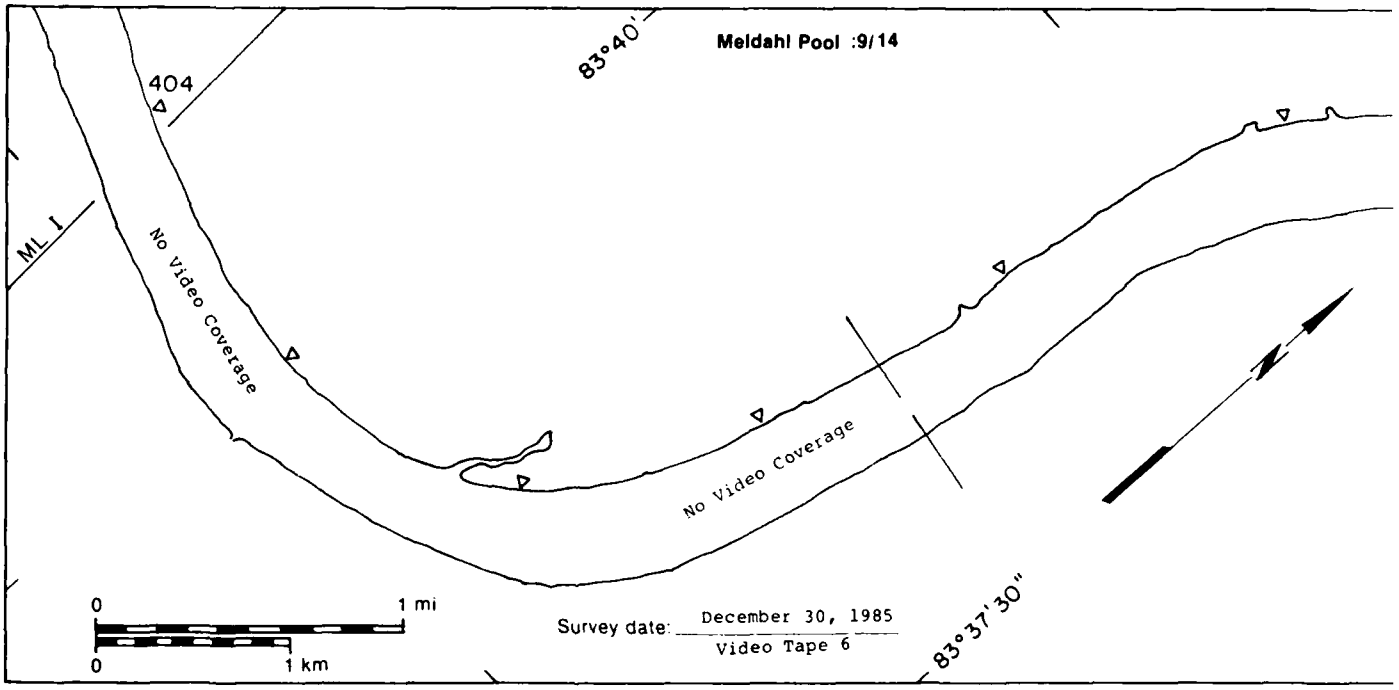

Meldahl Pool :9/14
83°40'

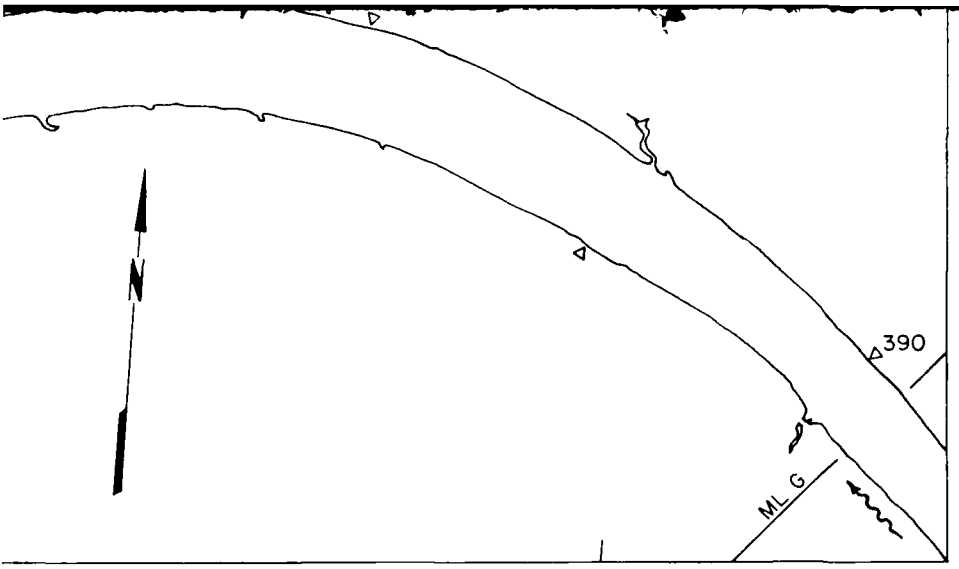
30 December 1985

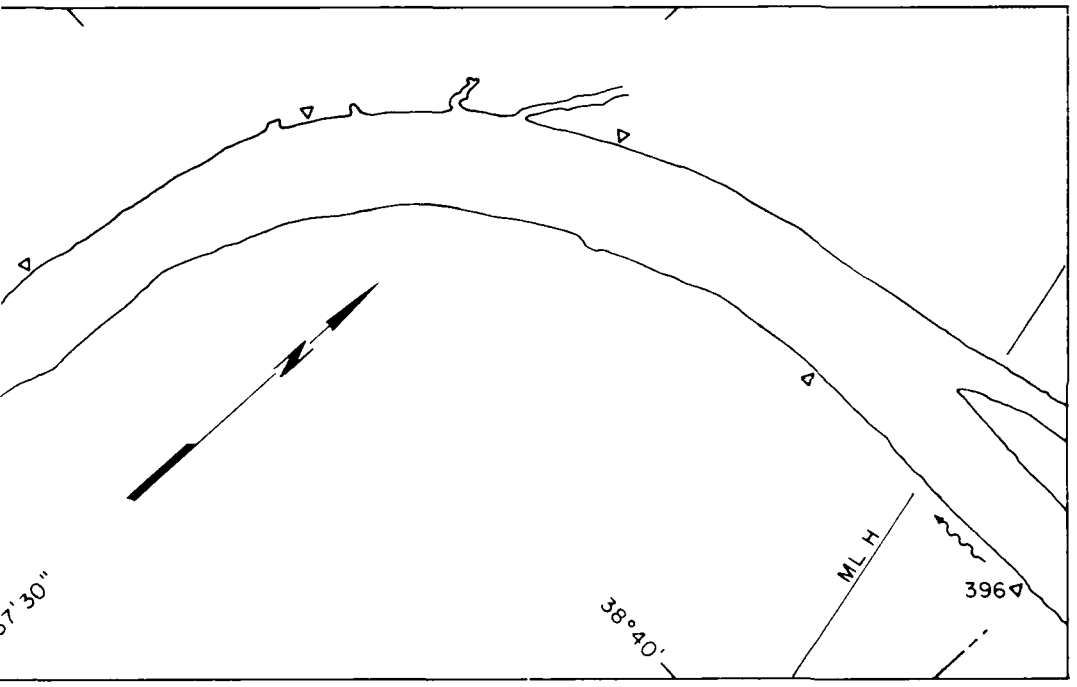




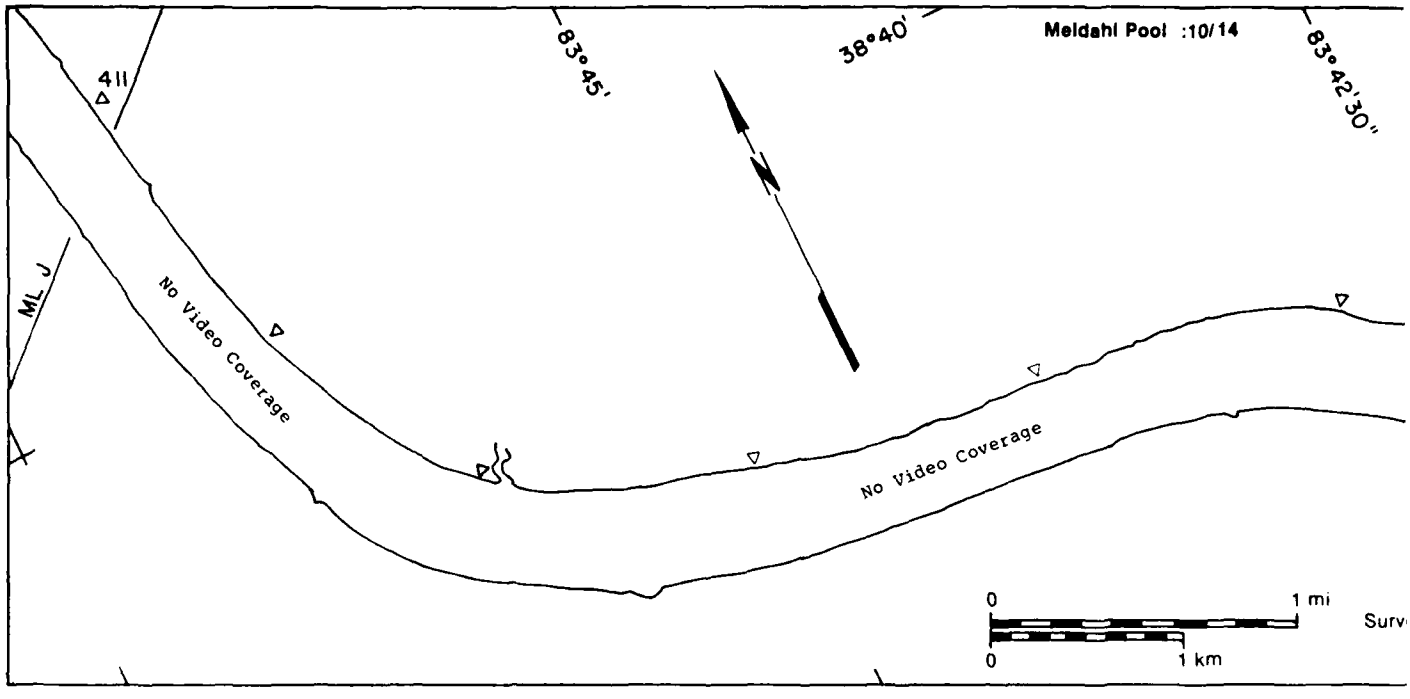

ML H
396
Manchester Isl.#2
#1
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6

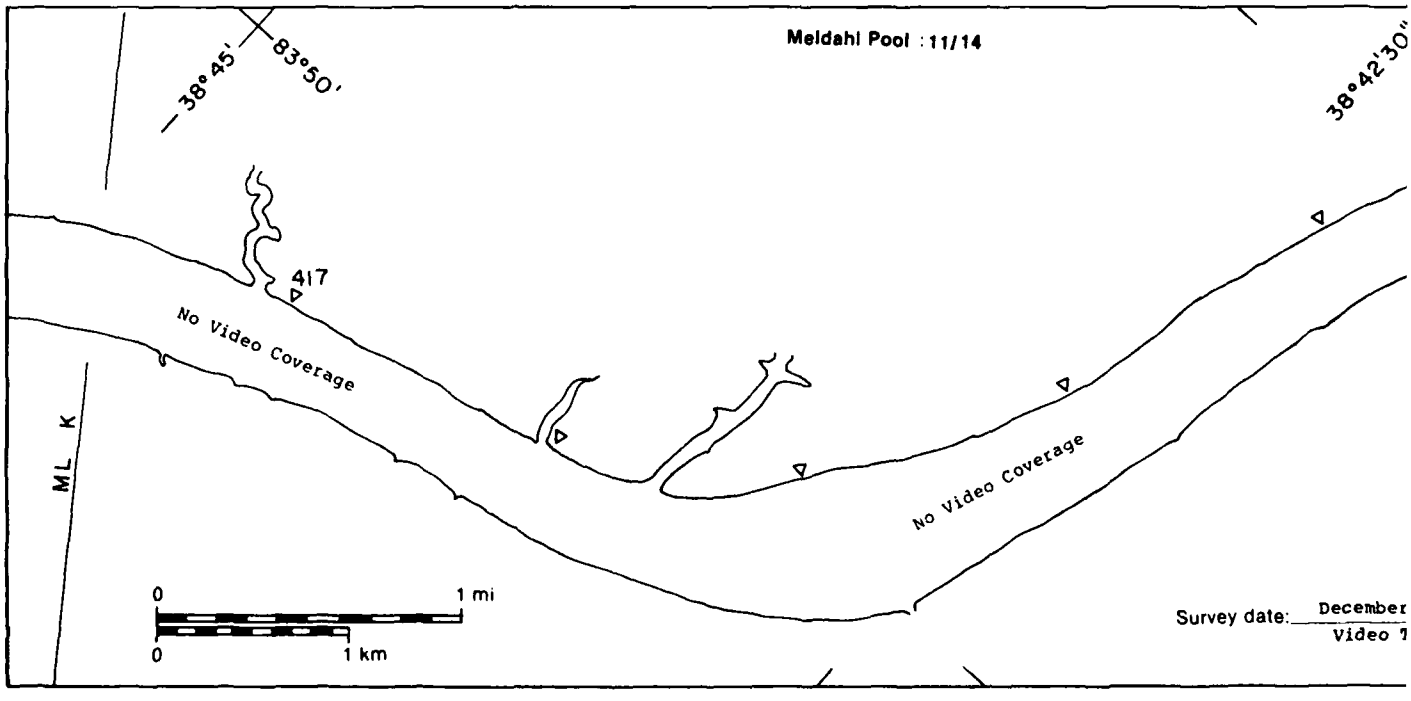

83°40'
Meldahl Pool :9/14
404
ML I
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6
83°37'30"

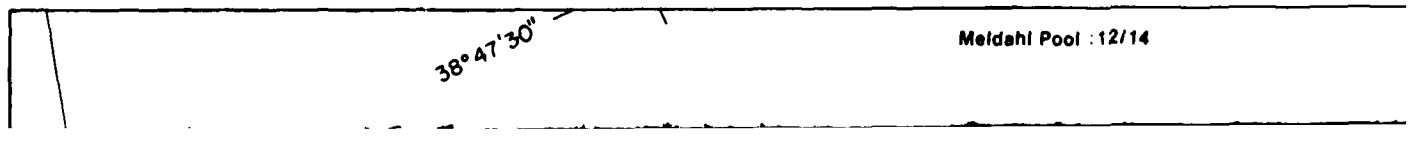

N
390
ML G

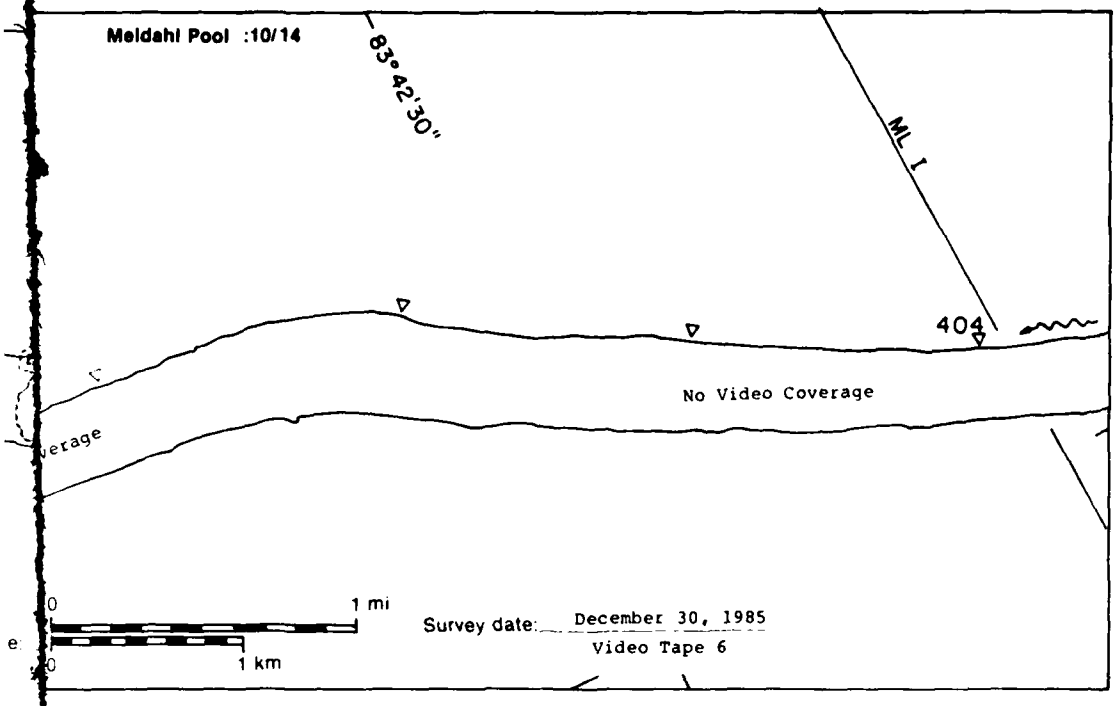

57' 30"
38°40'
ML H
396

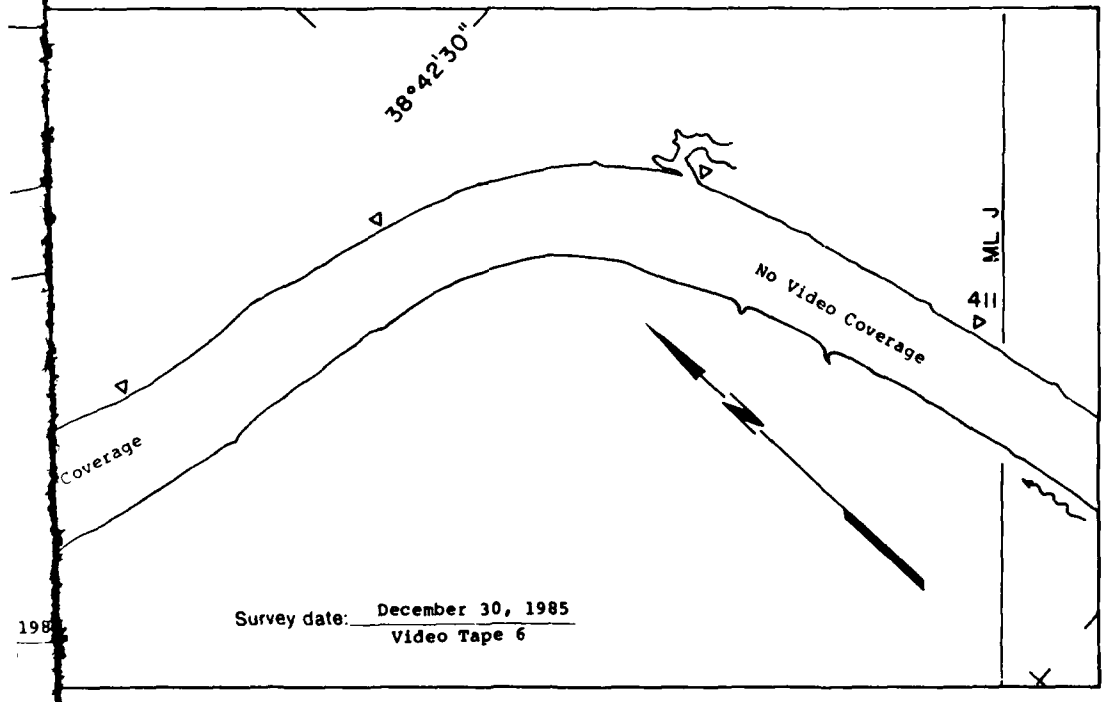
30 December 1985



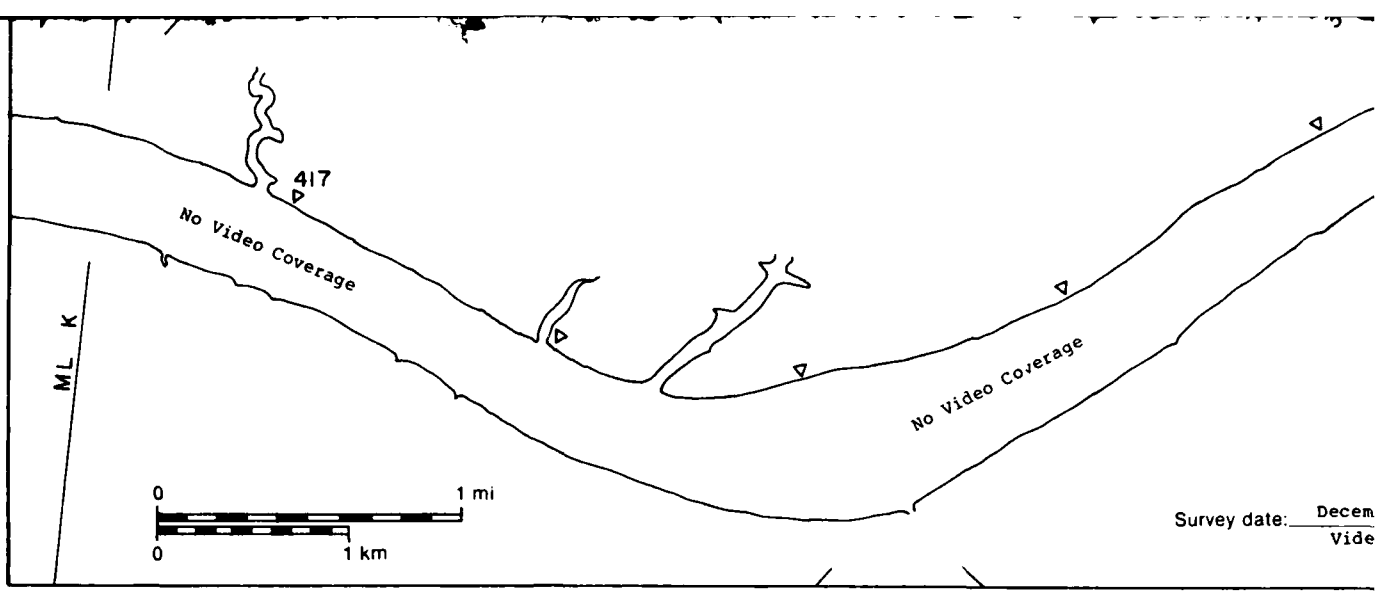


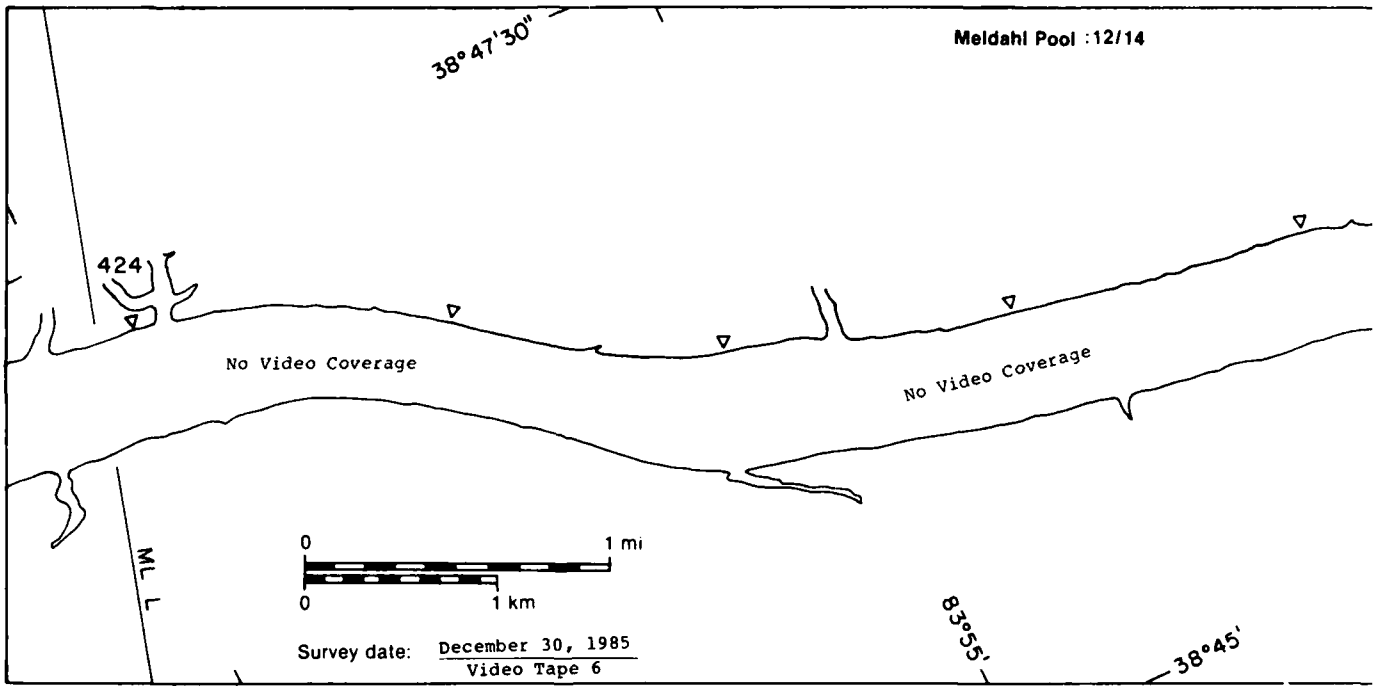


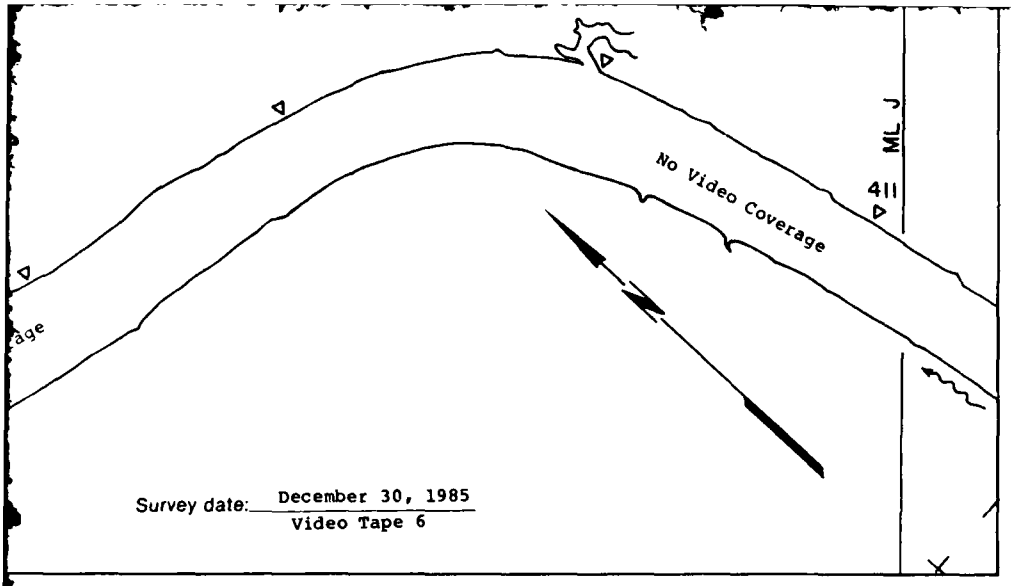

Meldahl Pool :10/14
83°42'30"
ML I
404
No Video Coverage
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6

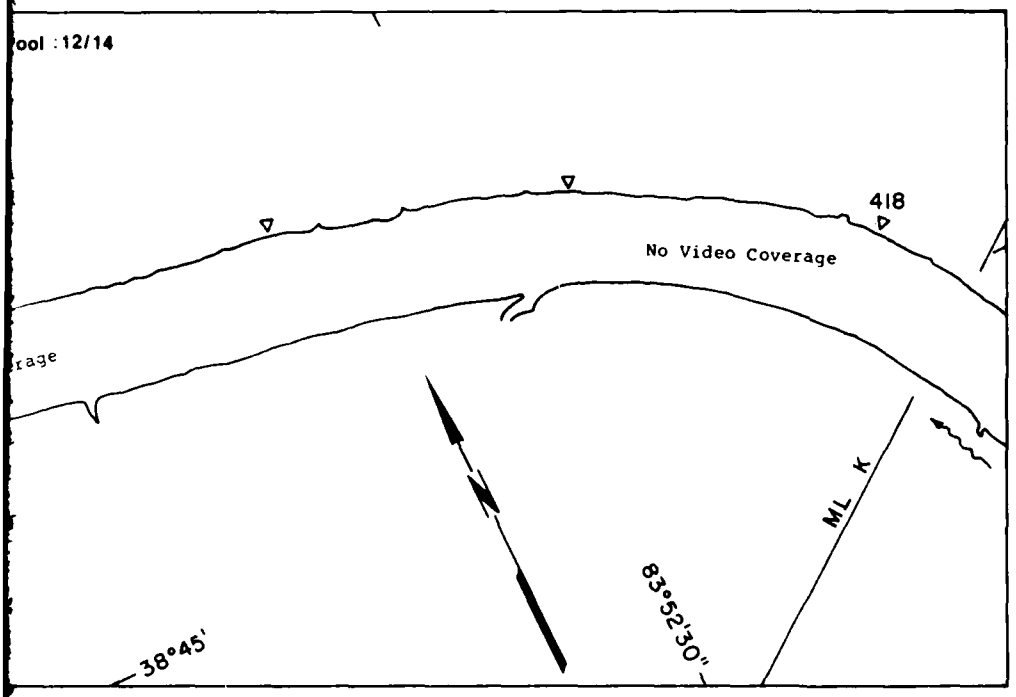

38°42'30"
ML J
411
No Video Coverage
Coverage
Survey date: December 30, 1985
Video Tape 6

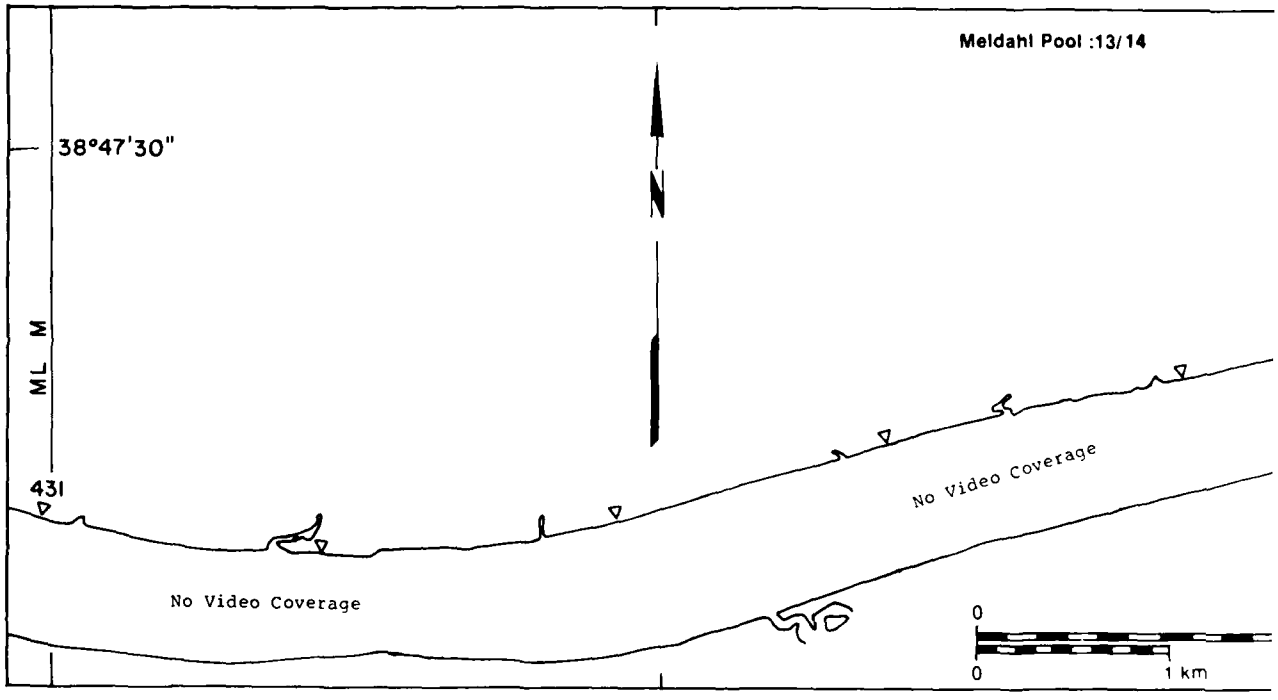
hl Pool :12/14

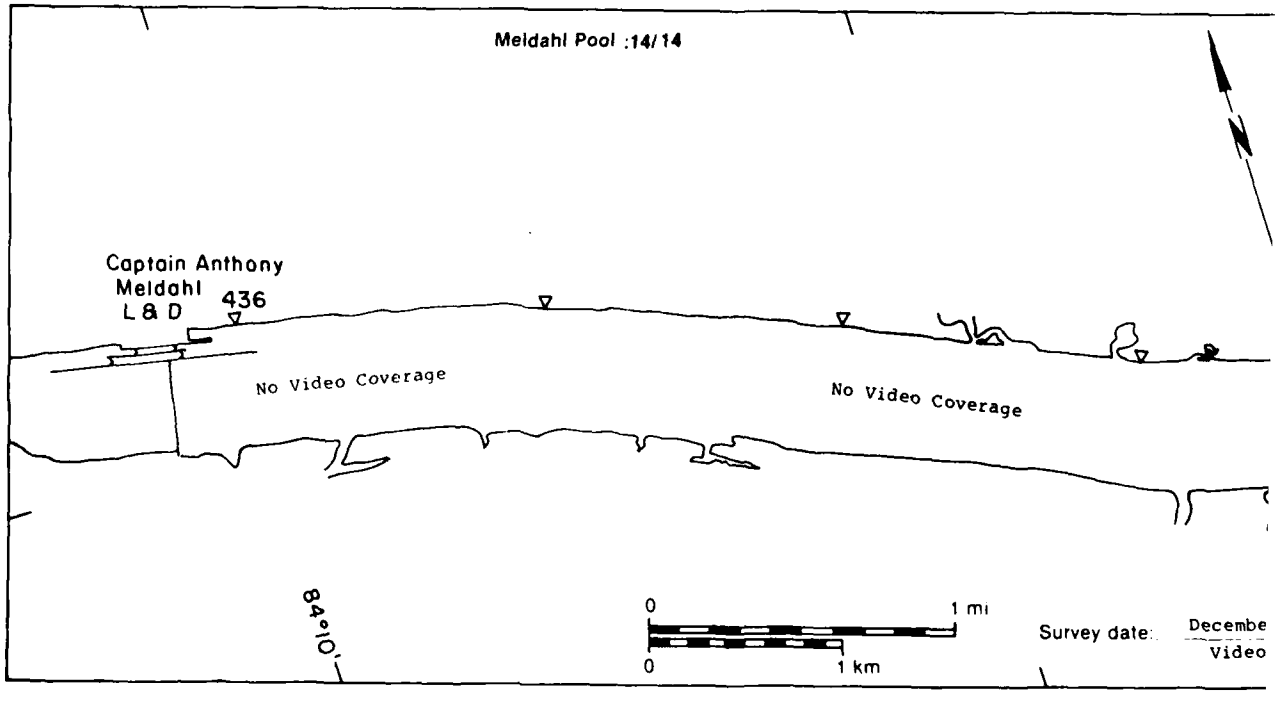

417
No Video Coverage
ML K
No Video Coverage
0
1 mi
0
1 km
Survey date: Decem
Vide


38°47'30"
Meldahl Pool :12/14
424
No Video Coverage
No Video Coverage
ML L
0
1 mi
0
1 km
Survey date: December 30, 1985
Video Tape 6
83°55'
38°45'


ML J
411
No Video Coverage
Survey date: December 30, 1985
Video Tape 6


ool :12/14
418
No Video Coverage
ML K
83°52'30"
38°45'

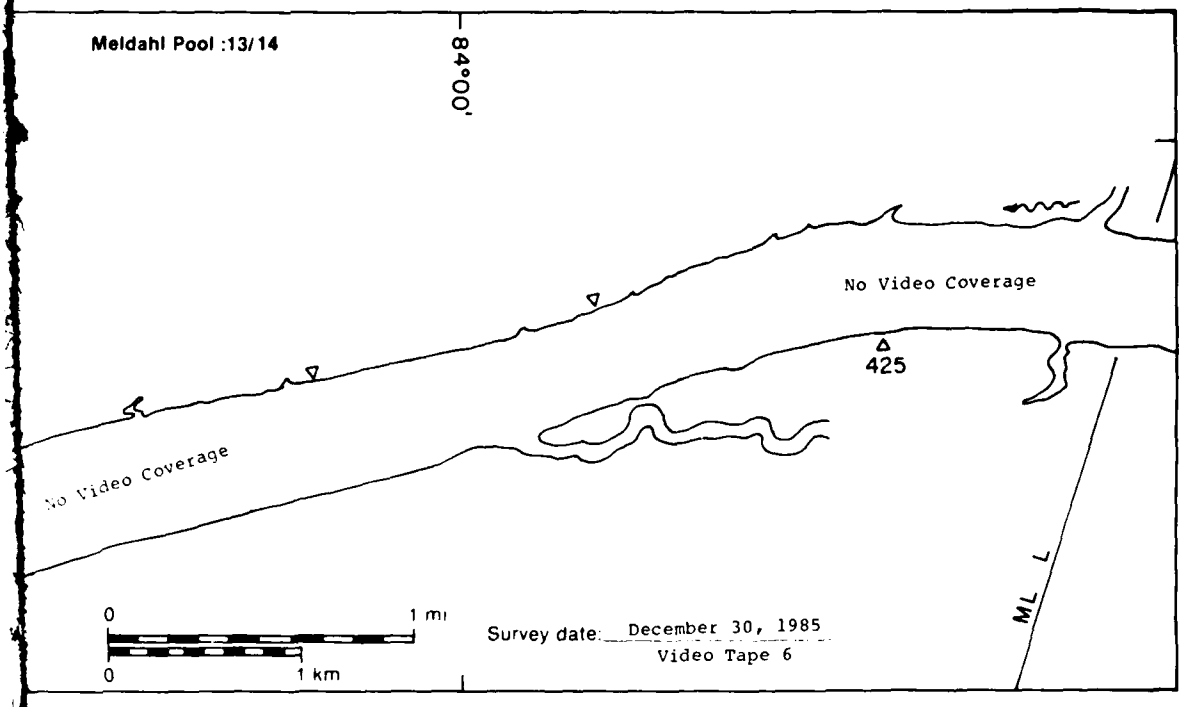


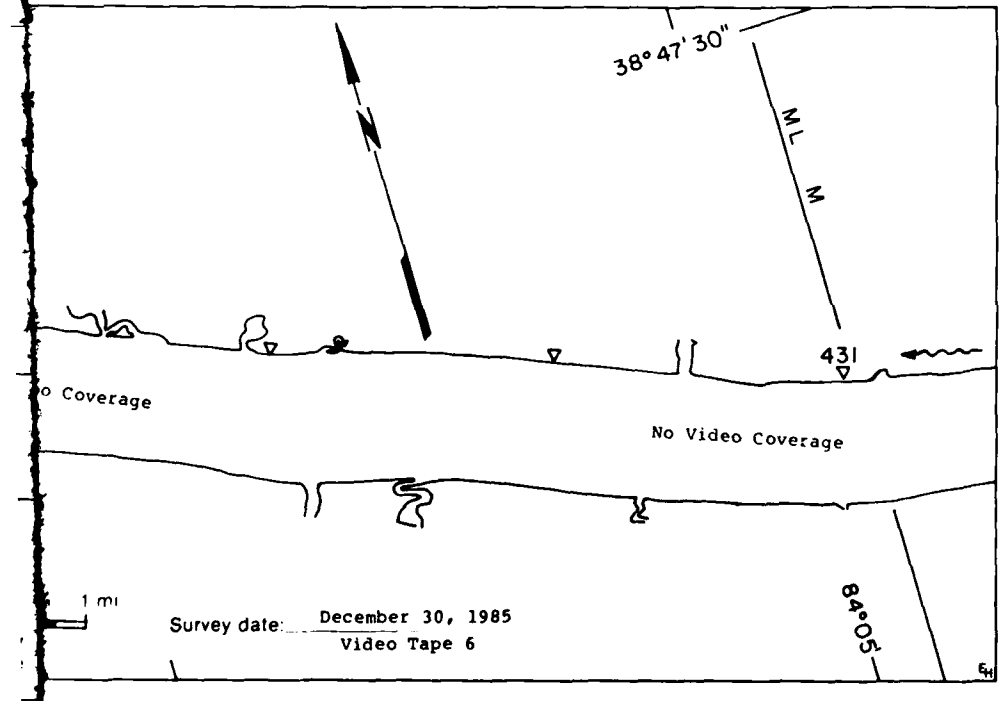


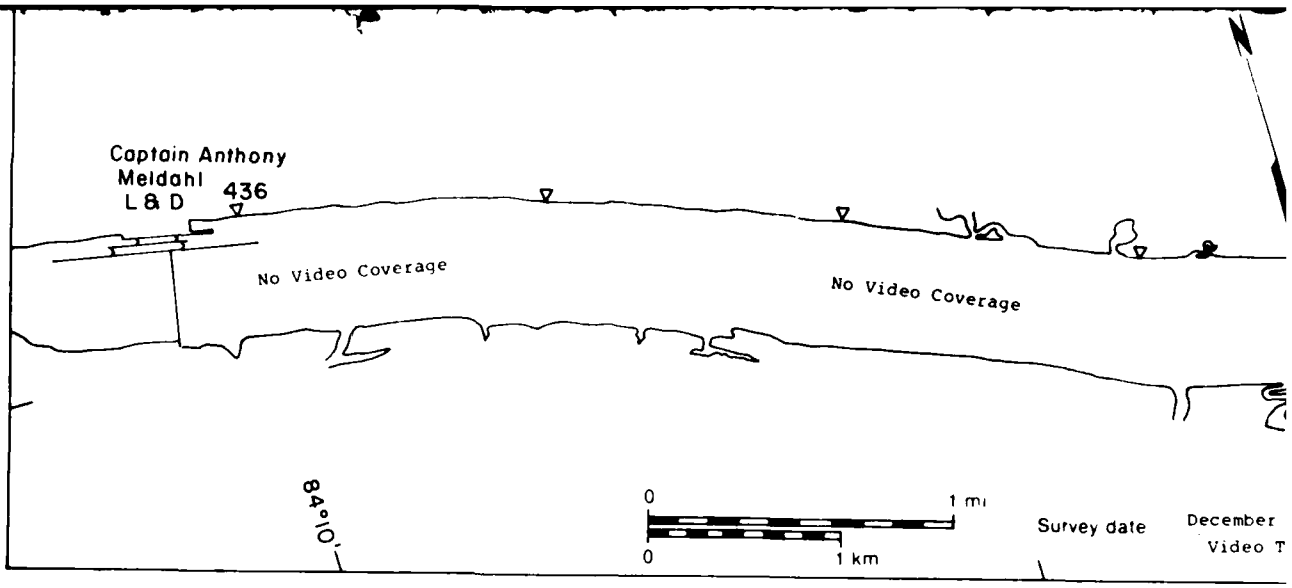
Meldahl Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	43.44	NA

30 December 1985



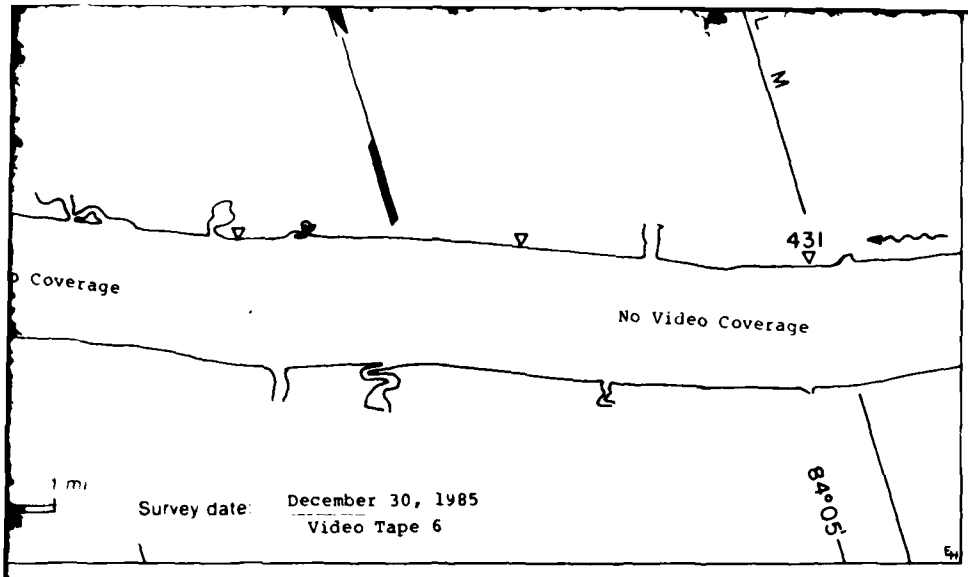


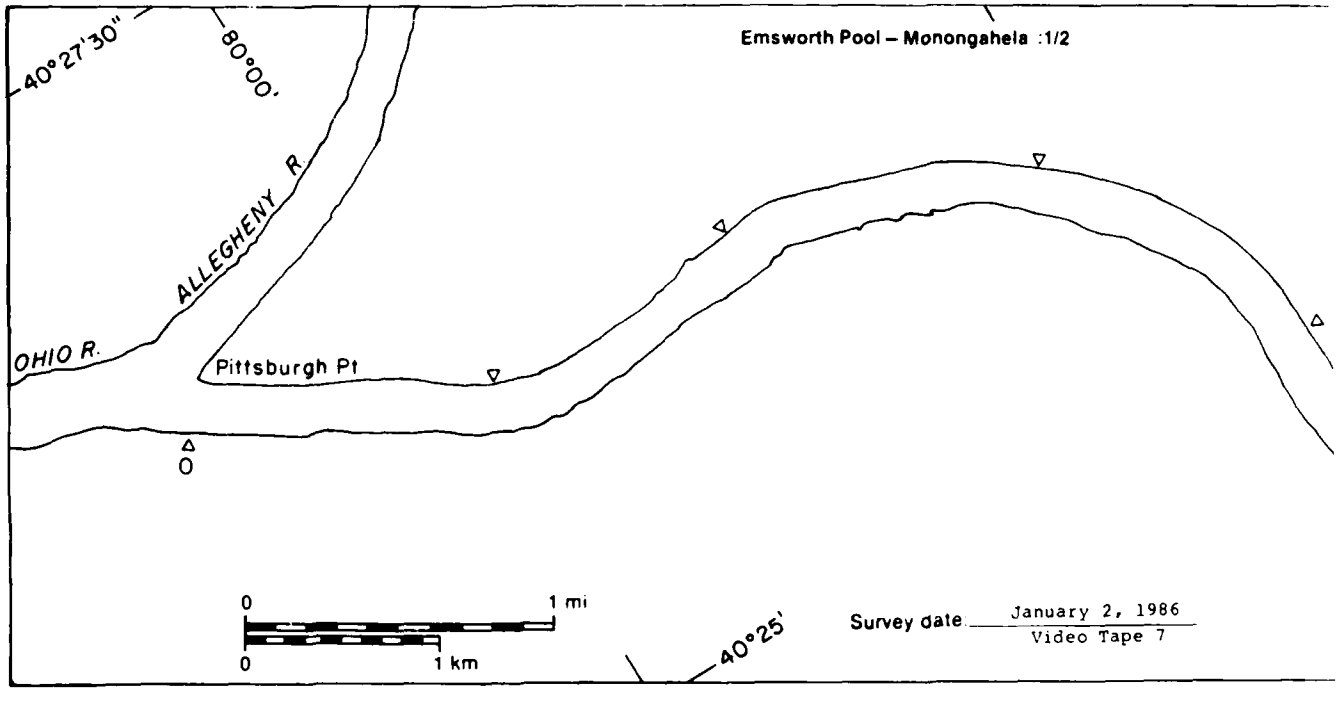


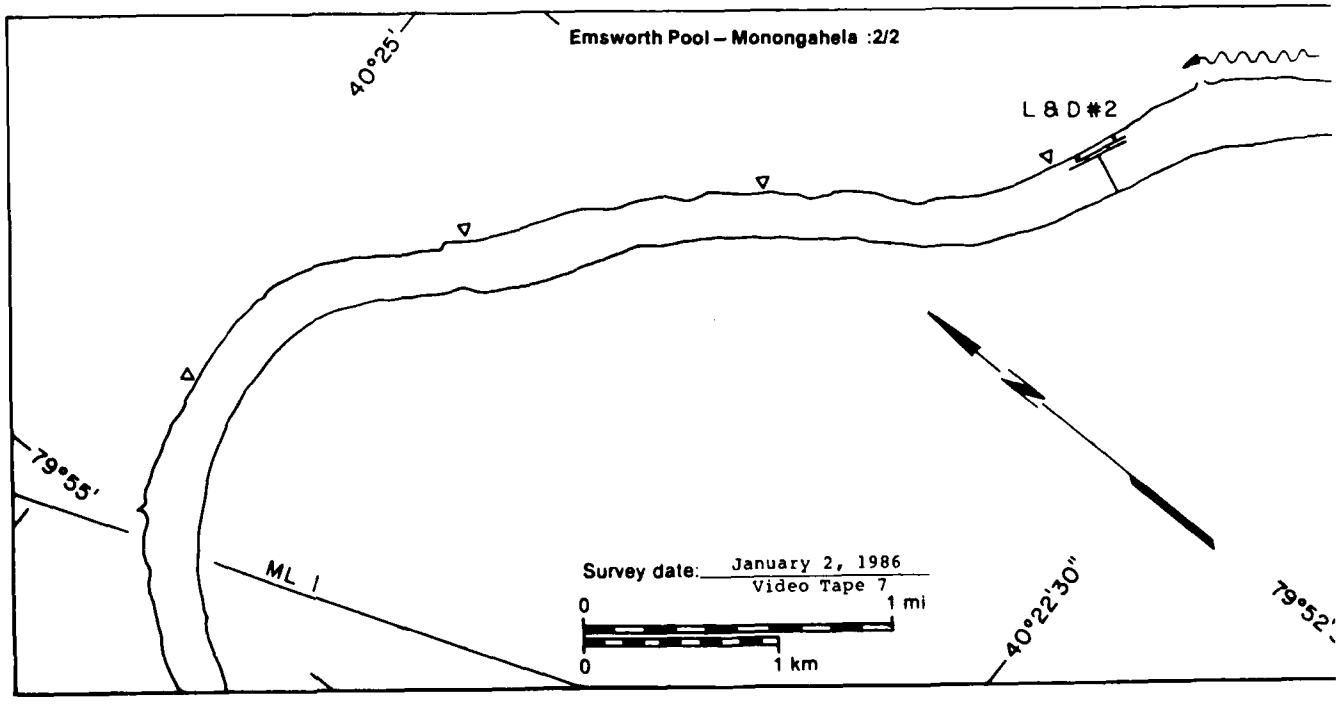
Meldahl Pool

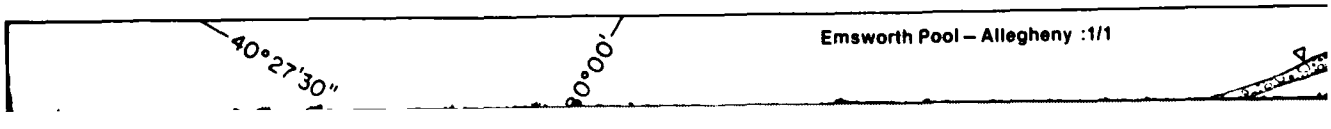
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration ( )
Open water	43.44	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover *with open-water areas*	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	73.77*	

* Includes 30.33 x 10^6 m^2 of no video coverage

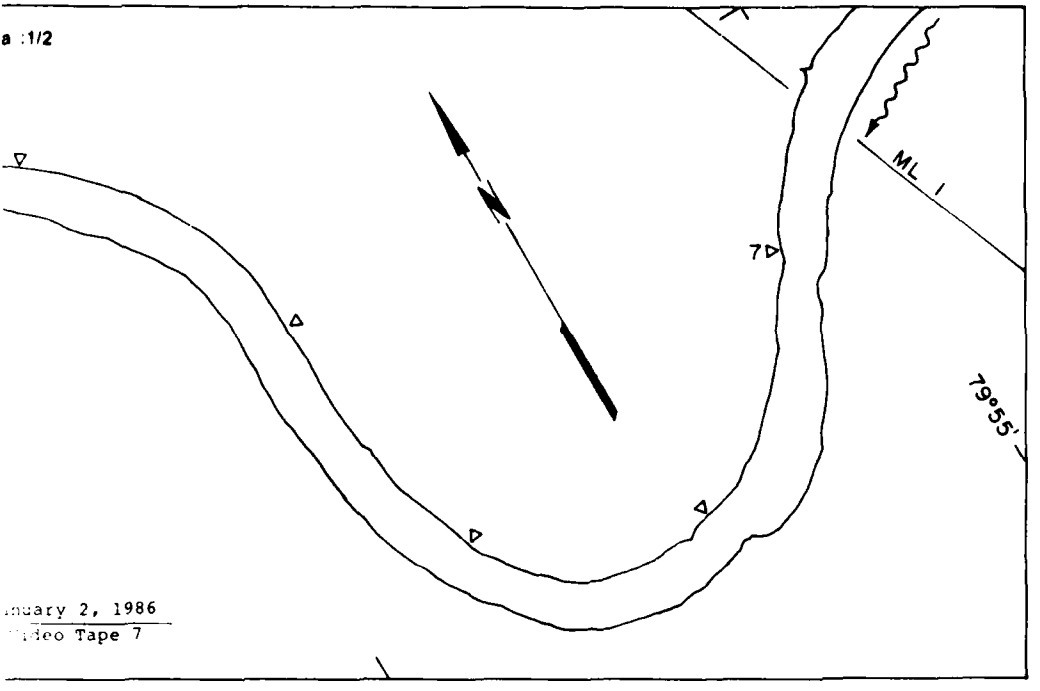

N
431
Coverage
No Video Coverage
1 mi
Survey date: December 30, 1985
Video Tape 6
84°05'

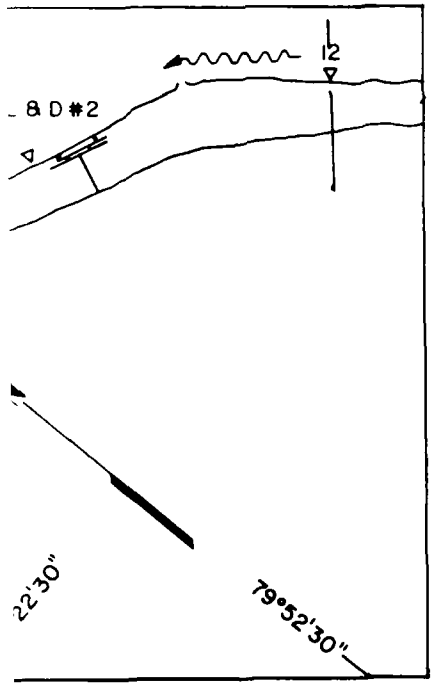

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt
0
0
1 mi
0
1 km
40°25'
Survey date January 2, 1986
Video Tape 7


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 2, 1986
Video Tape 7
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'

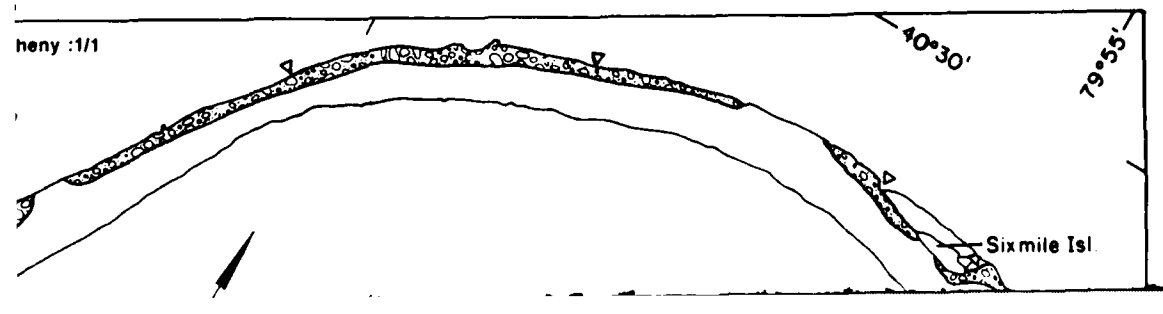
2 January 1986

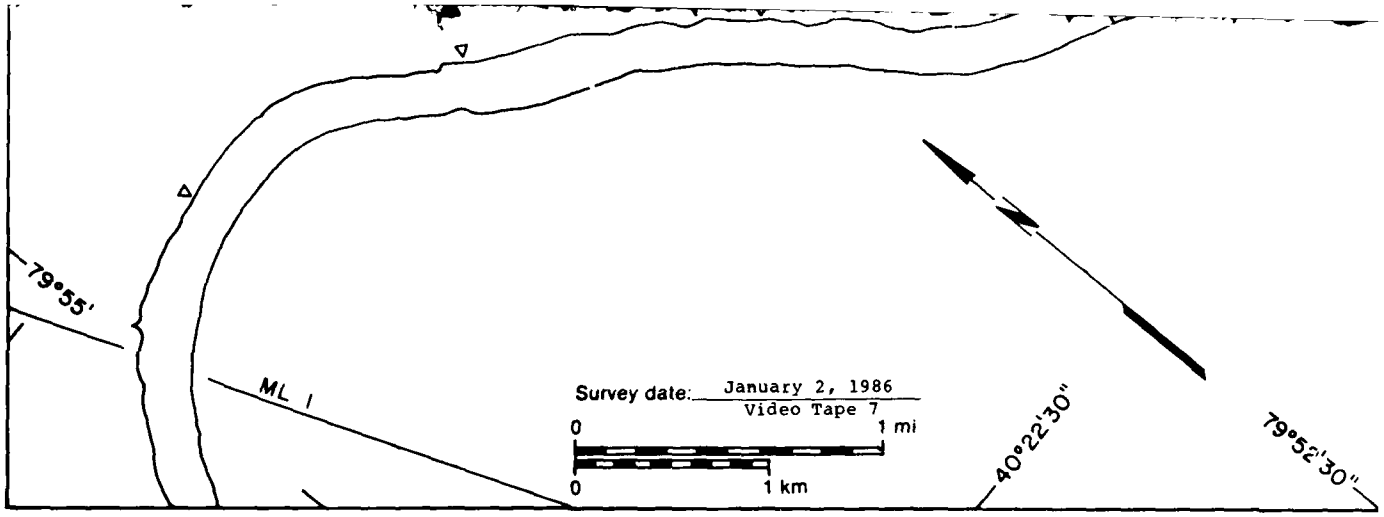


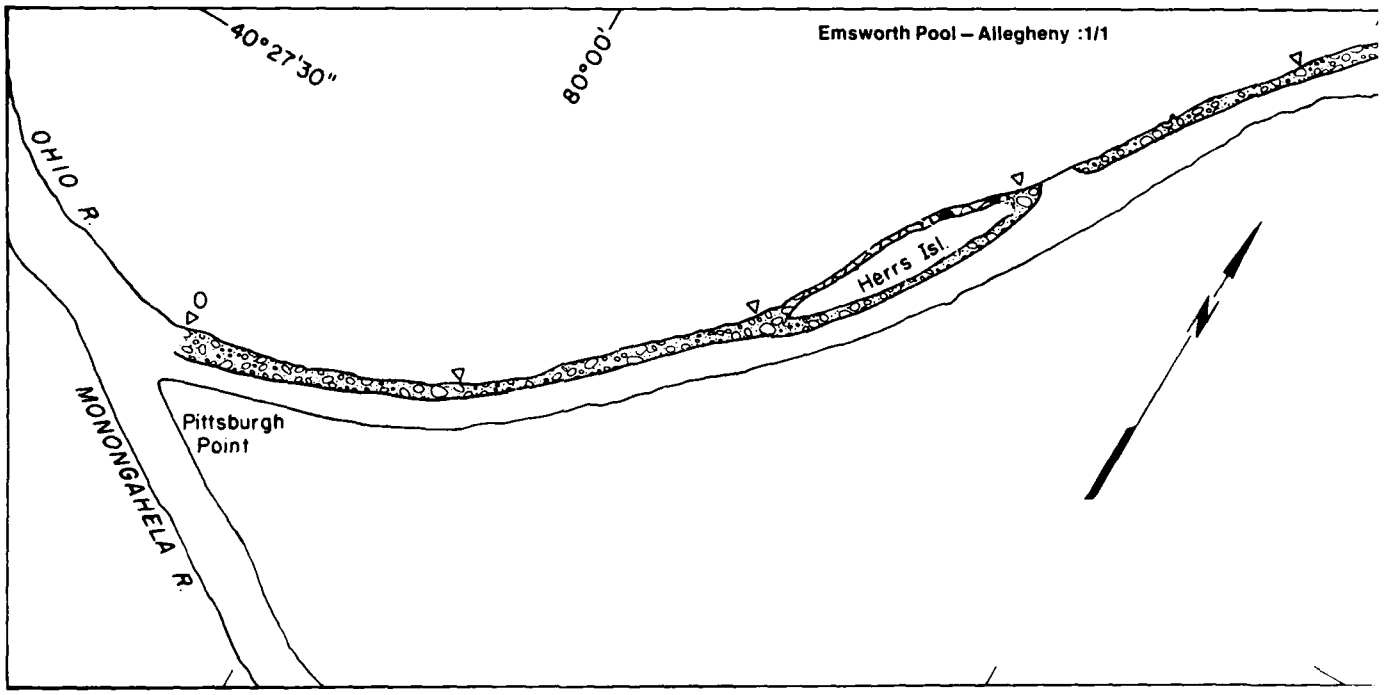


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (-)
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	

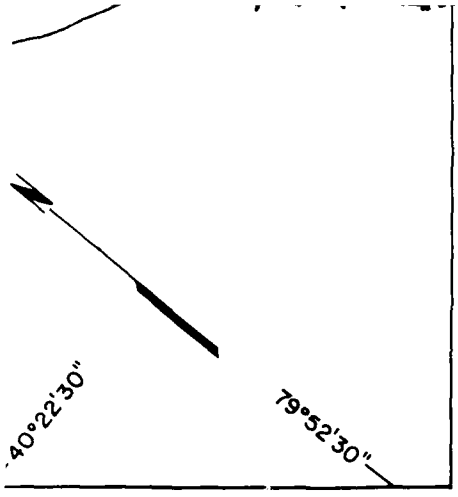






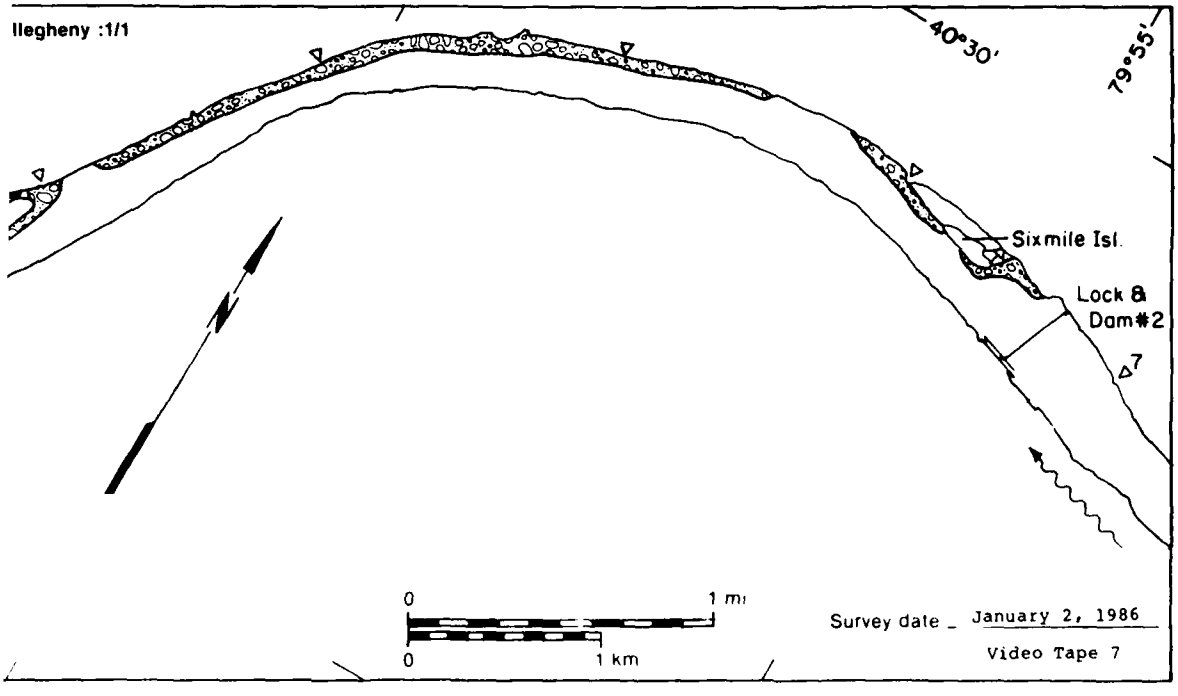
Emsworth Pool – Allegheny

MAP UNITS	Area (m^2 x 10^6)	Surface water fraction
Open water	2.23	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.04	NA
Fragmented ice cover with open water areas	0.03	50
Ice floes of frazil slush and pans	0.77	10
Total area (m^2 x 10^6)	3.07	

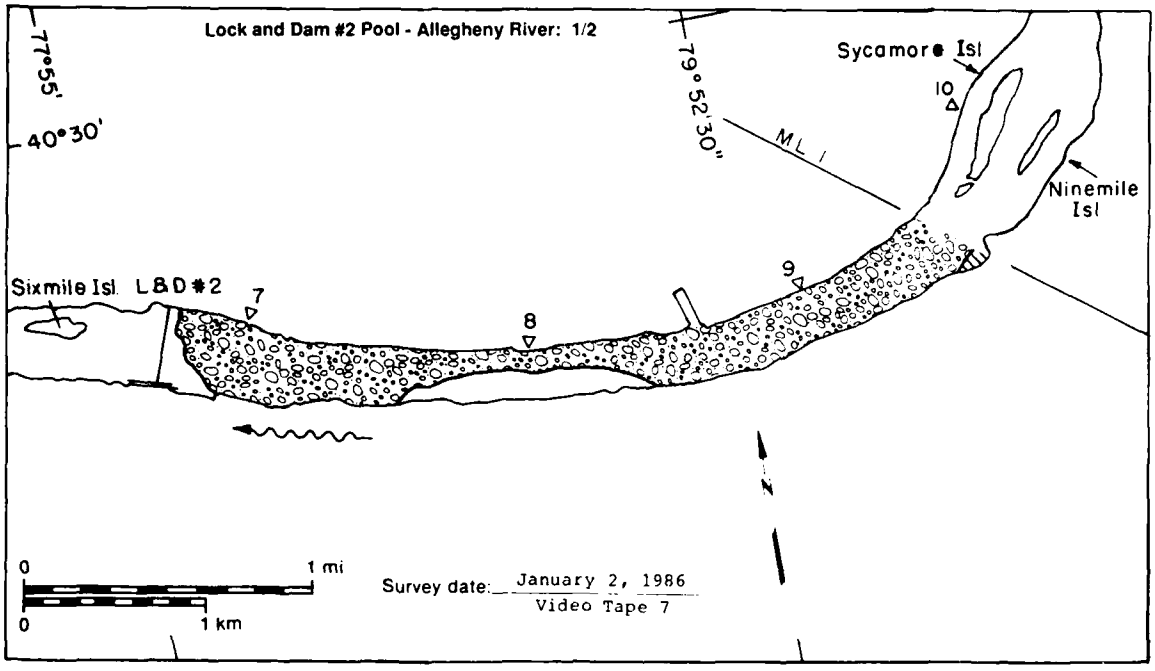


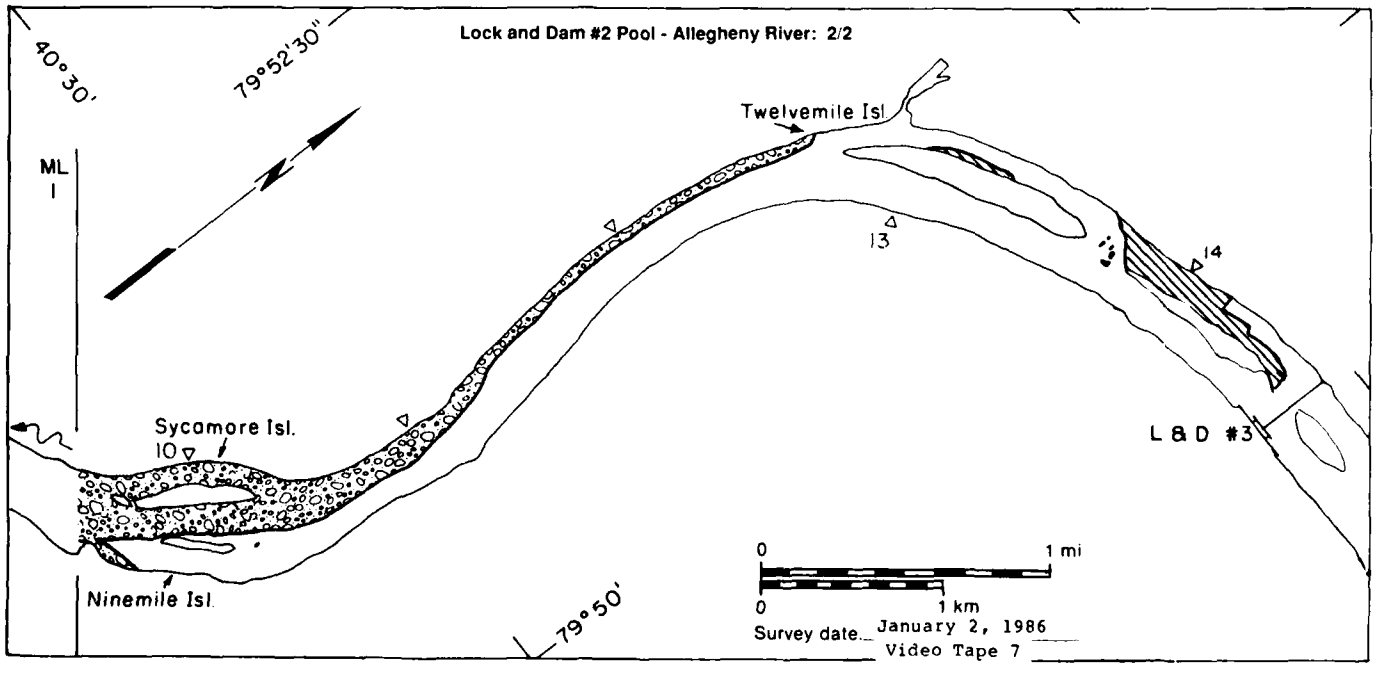
Emsworth Pool – Monongahela

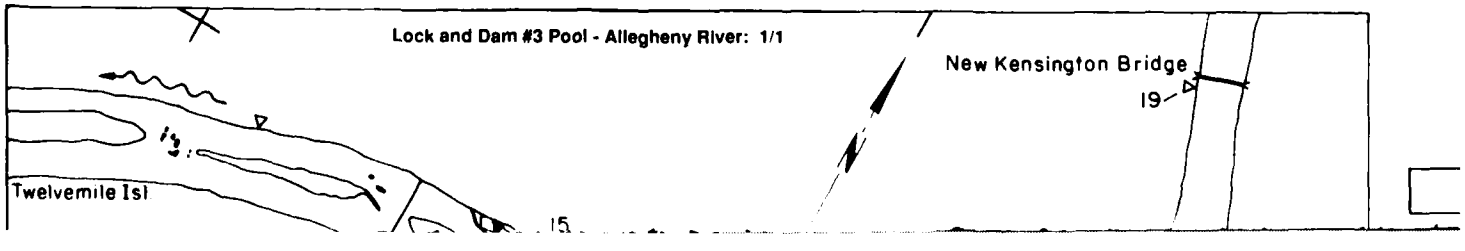
MAP UNITS	Area (m^2 x 10^6)	Surface water fraction
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	

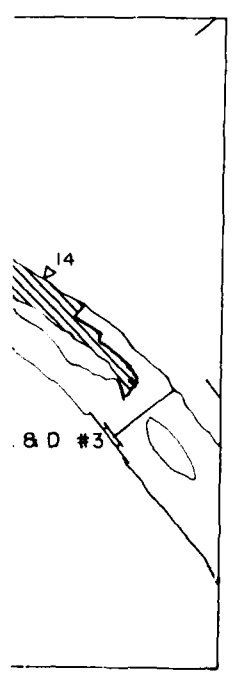


2 January 1986



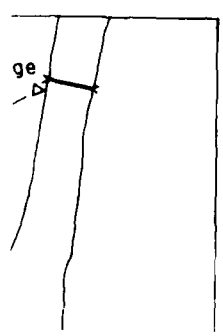






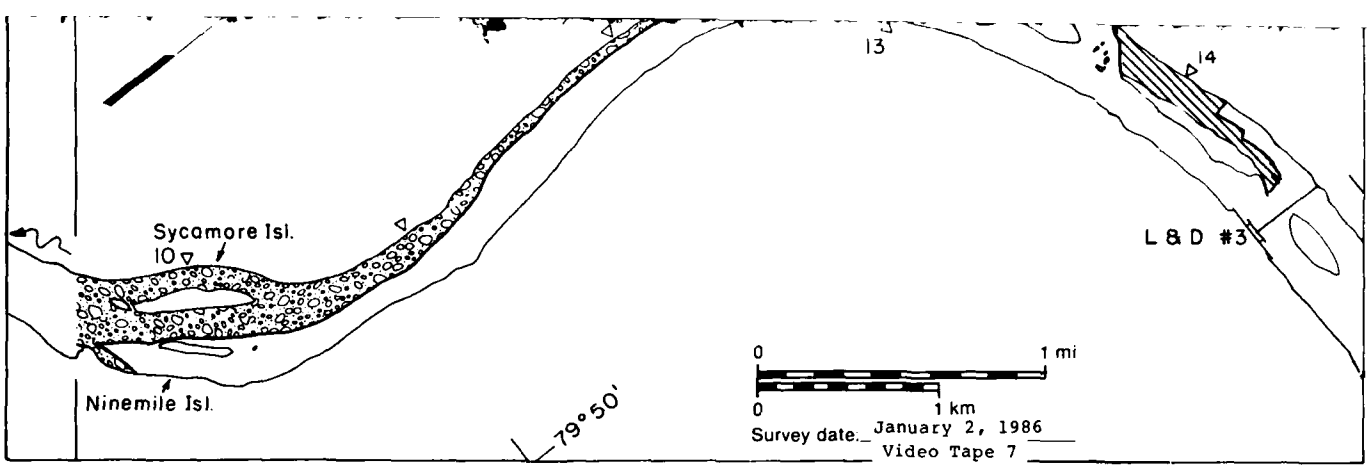
Lock and Dam #2 Pool

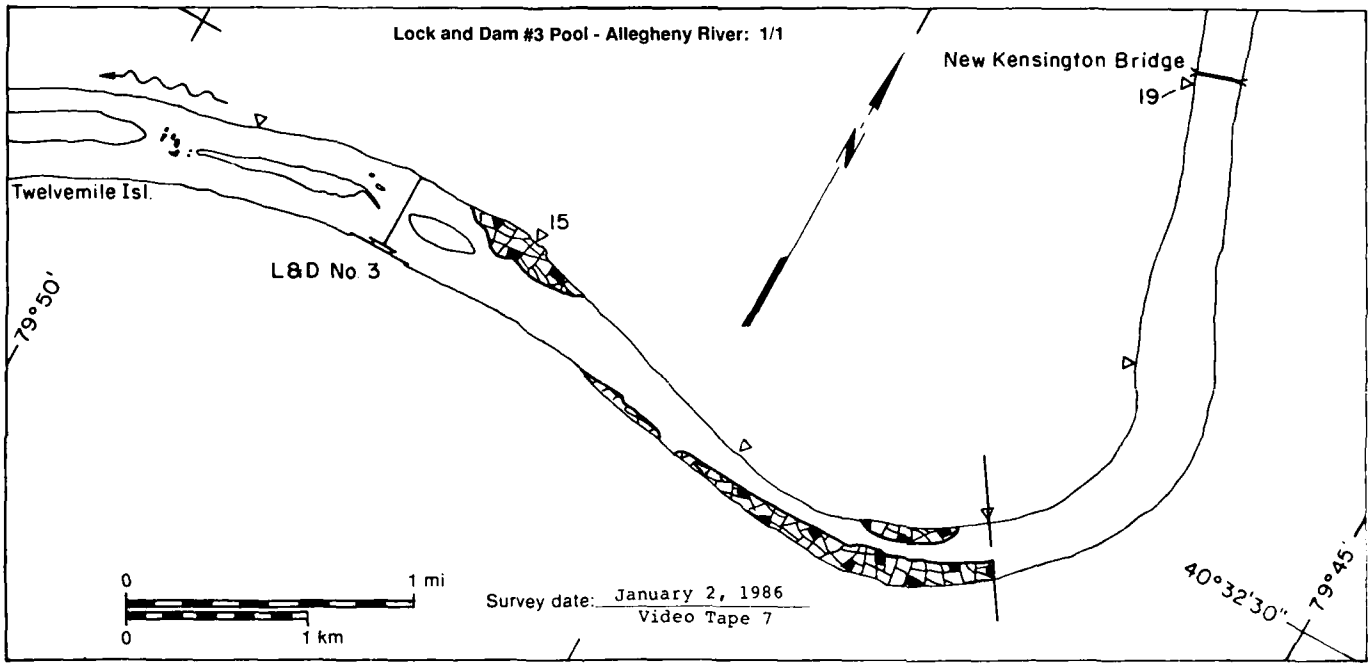
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.02	NA
Solid ice cover	0.16	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.84	40
Total area ($m^2 \times 10^6$)	4.02	

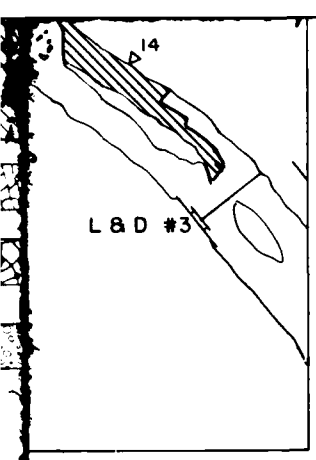


Lock and Dam #3 Pool

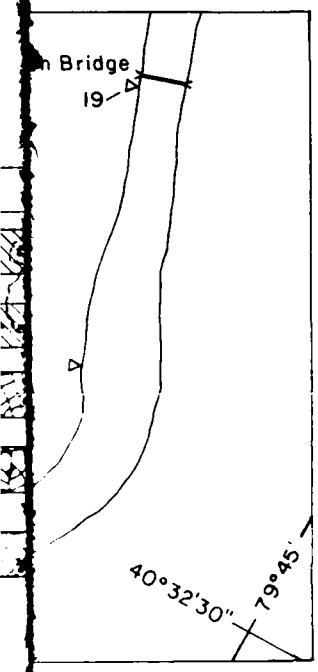
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.75	NA
Solid ice cover	0.00	NA
Solid ice cover with		


13
14
Sycamore Isl.
10
L & D #3
Ninemile Isl.
79°50'
0
1 mi
0
1 km
Survey date: January 2, 1986
Video Tape 7


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 2, 1986
Video Tape 7
40°32'30"
79°45'

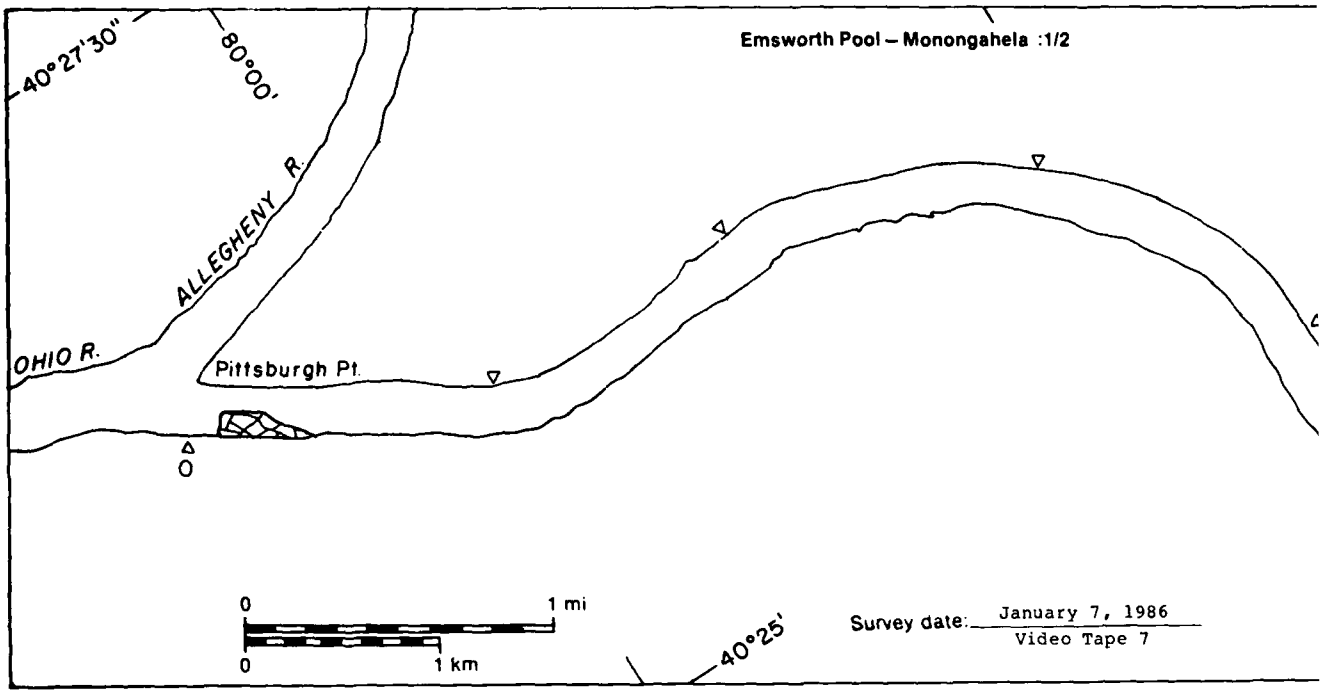


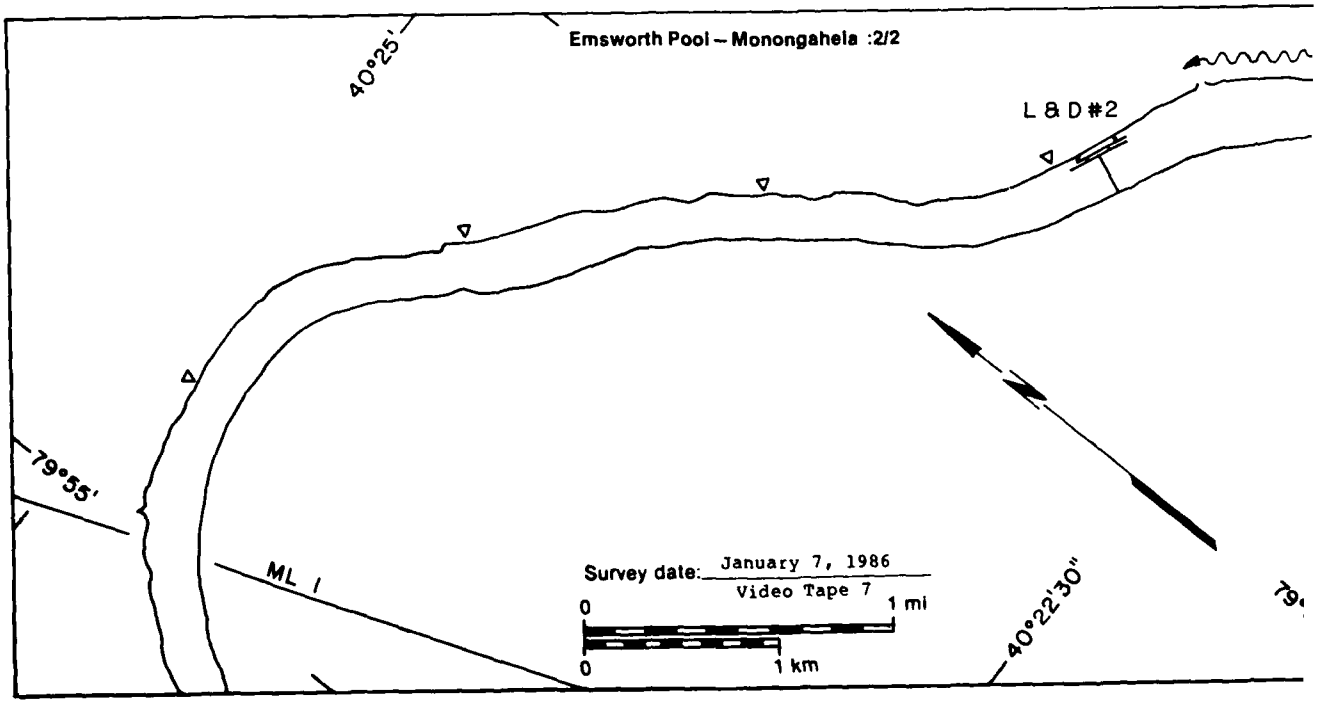
	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover	0.16	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.84	40
Total area (m^2 x 10^6)	4.02	

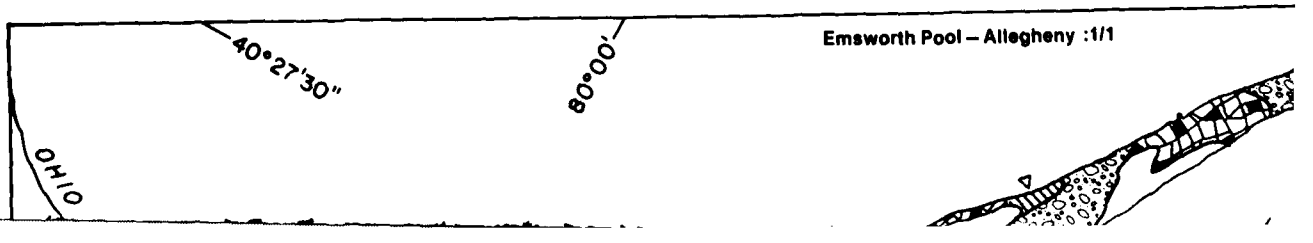


Lock and Dam #3 Pool

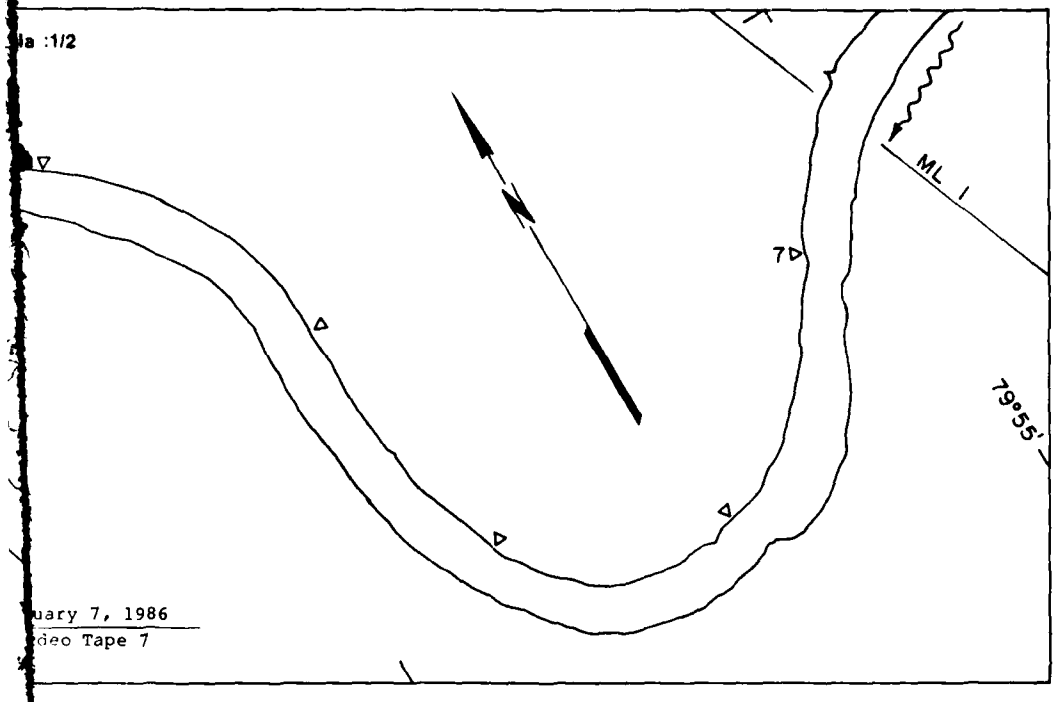
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.75	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.36	60
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	1.14	


Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: January 7, 1986
Video Tape 7

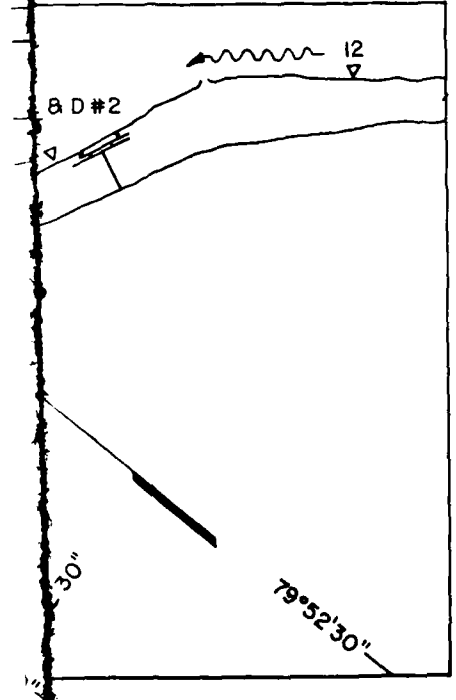

Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 7, 1986
Video Tape 7
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'
OHIO

7 January 1986

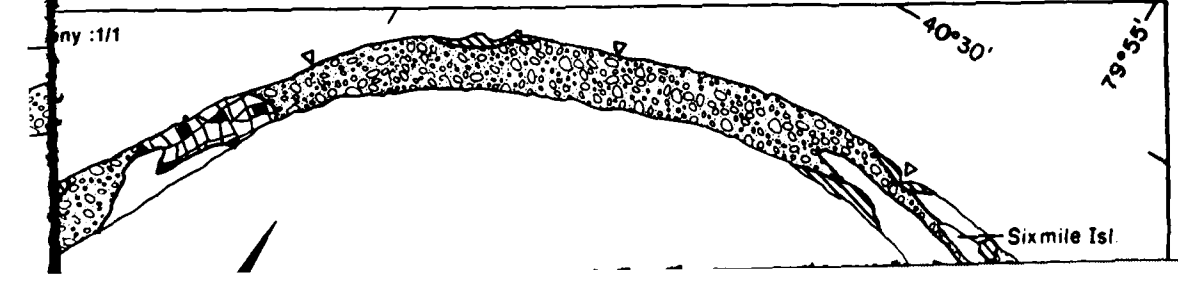


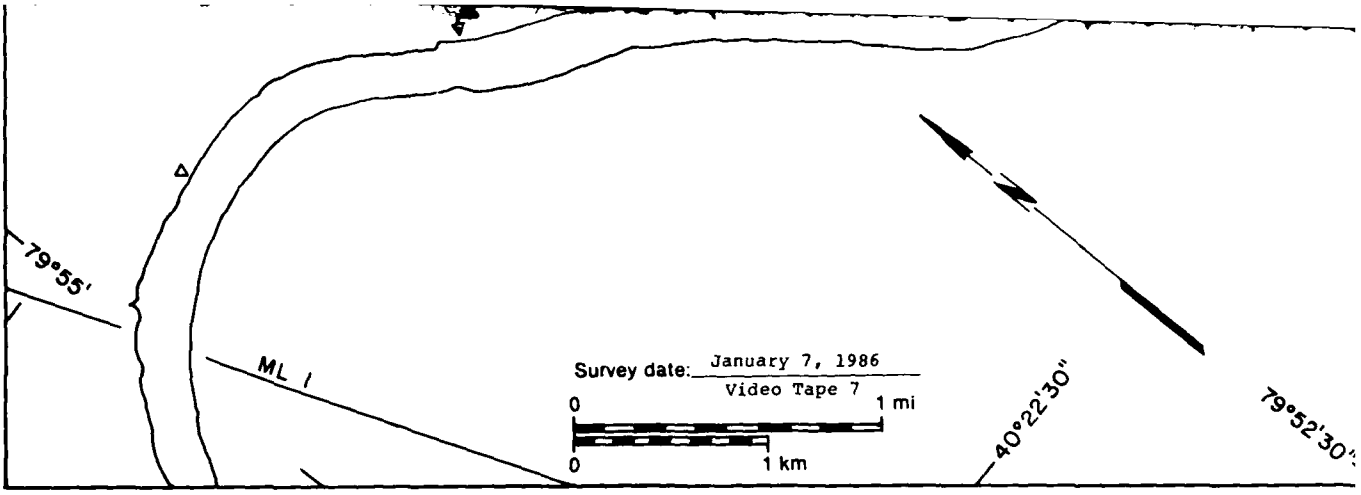
uary 7, 1986
deo Tape 7

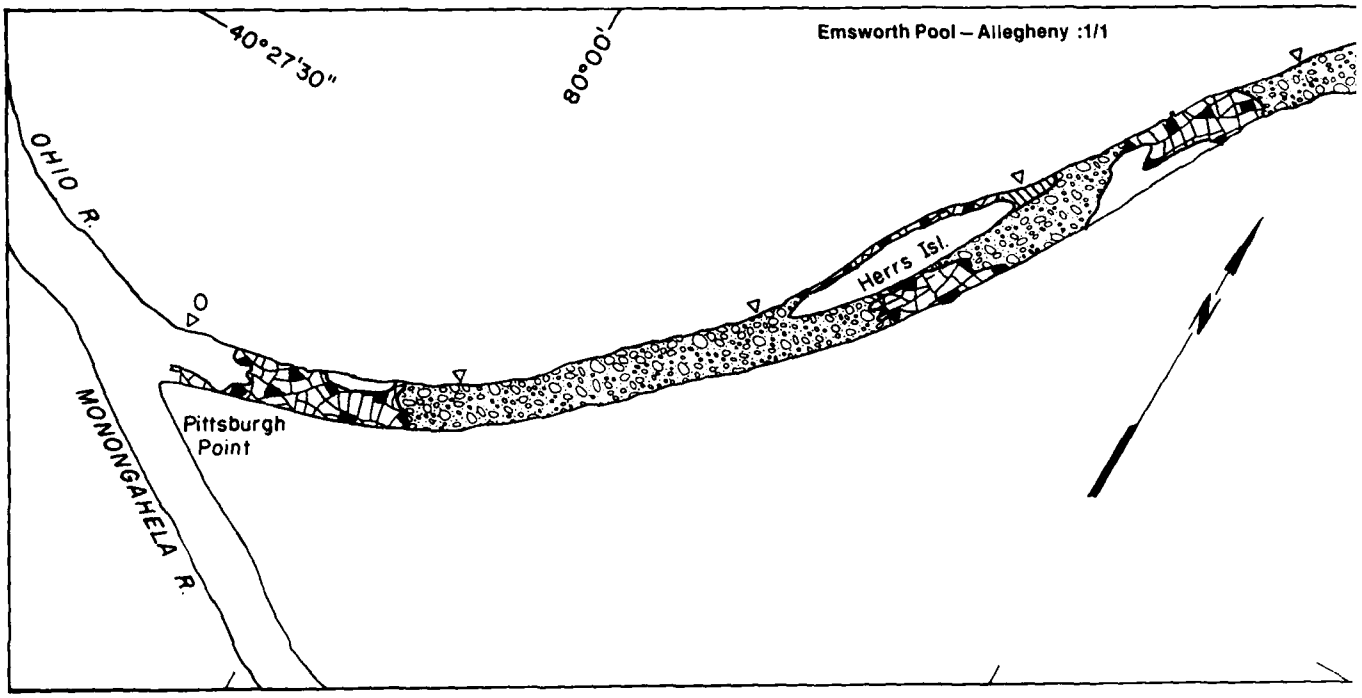


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (-)
Open water	5.11	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.05	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	

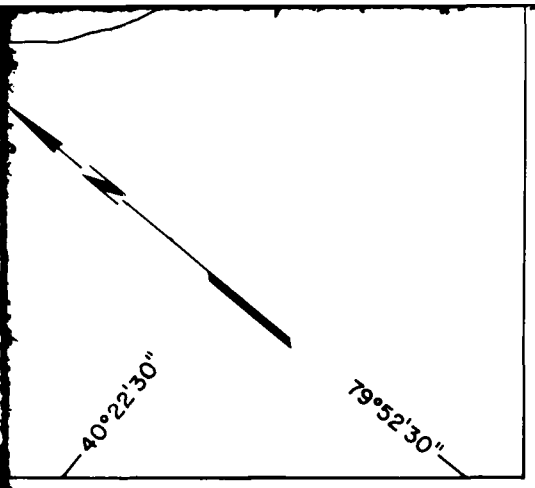






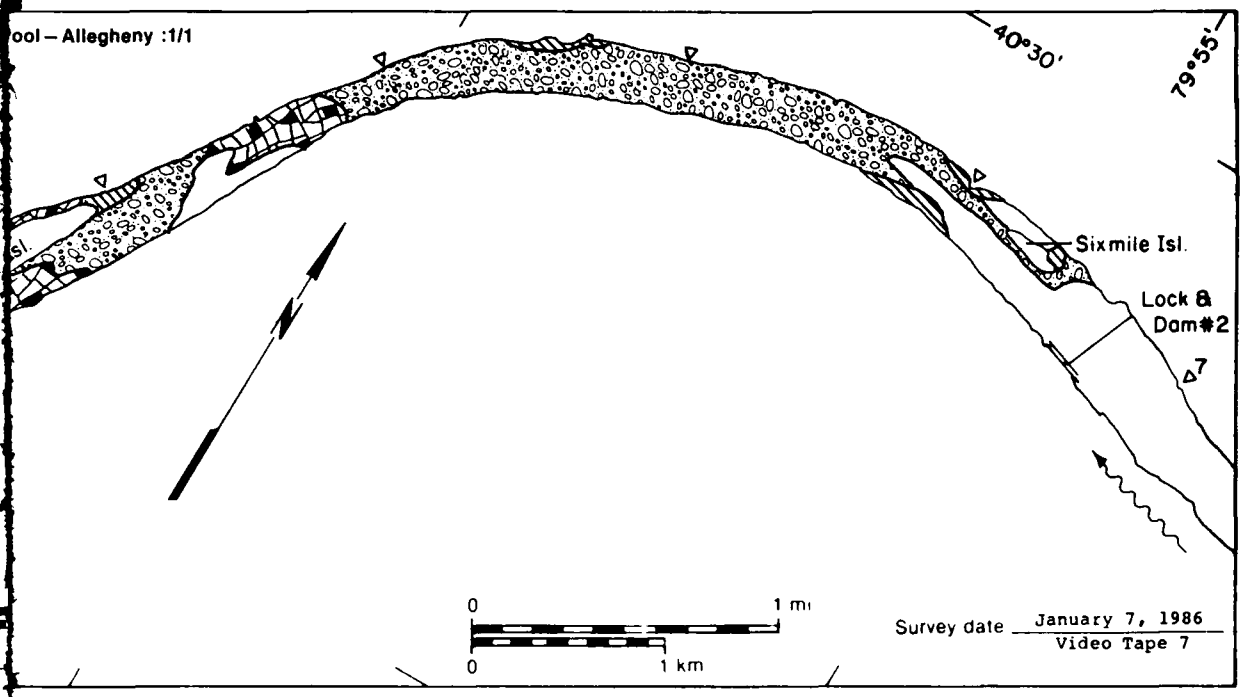
Emsworth Pool – Allegheny

MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	0.58	NA
Solid ice cover	0.06	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.02	NA
Fragmented ice cover with open water areas	0.47	70
Ice floes of frazil slush and pans	1.94	40
Total area (m^2 x 10^6)	3.07	

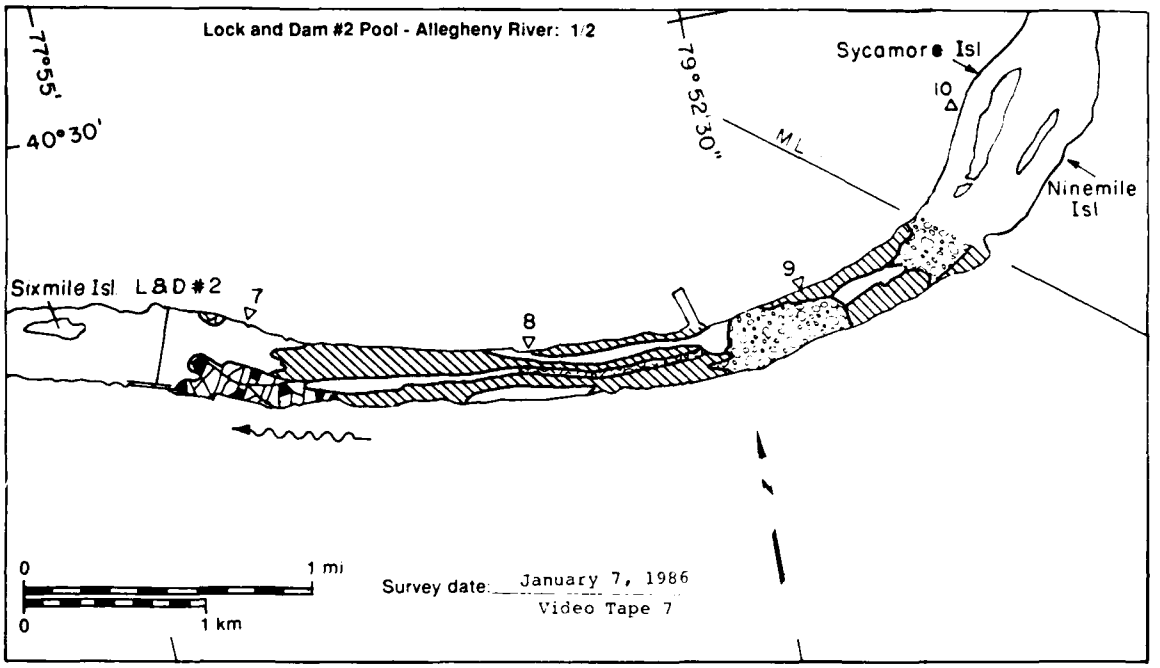


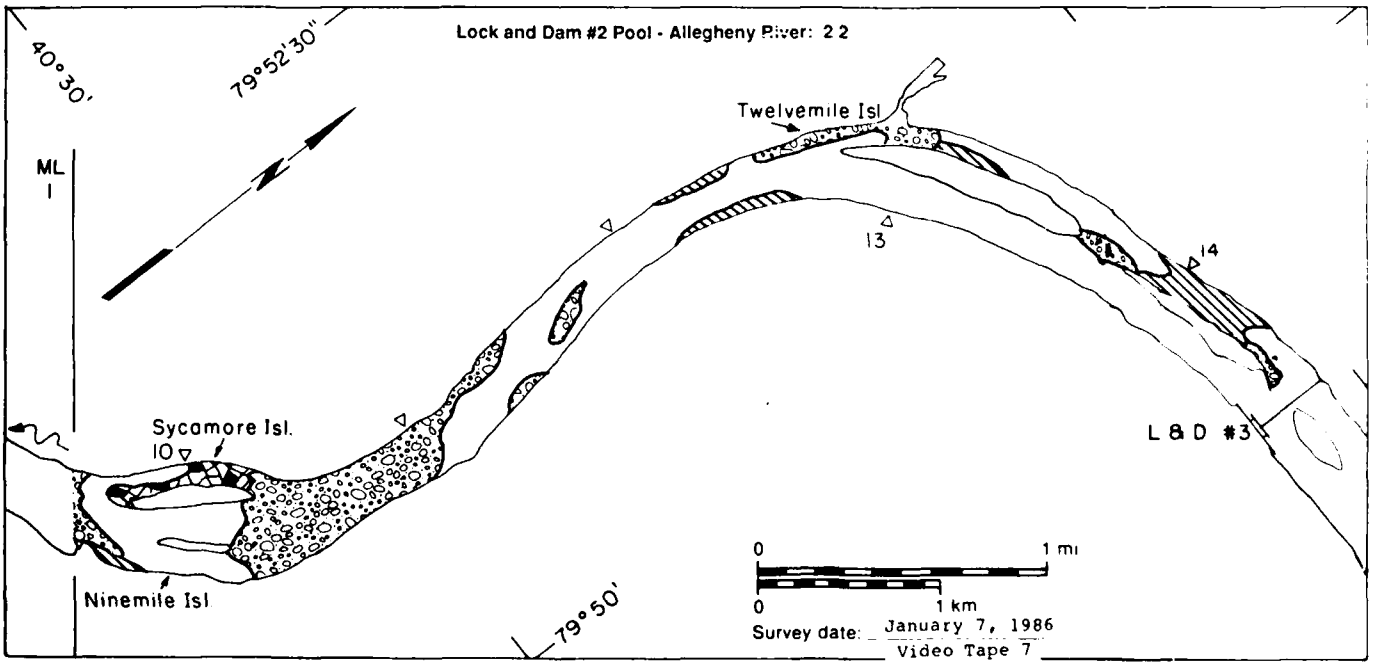
Emsworth Pool – Monongahela

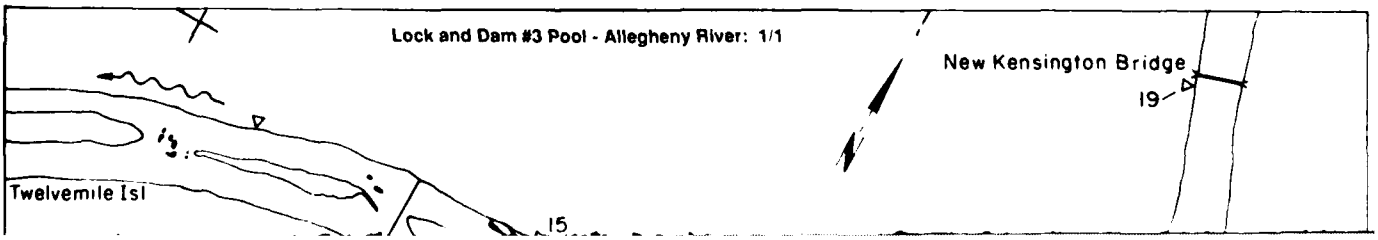
MAP UNIT		Area (m^2 x 10^6)	Surface concentration
	Open water	5.11	NA
	Solid ice cover	0.00	NA
	Solid ice cover with open water areas	0.00	—
	Fragmented ice cover	0.05	NA
	Fragmented ice cover with open water areas	0.00	—
	Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)		5.16	

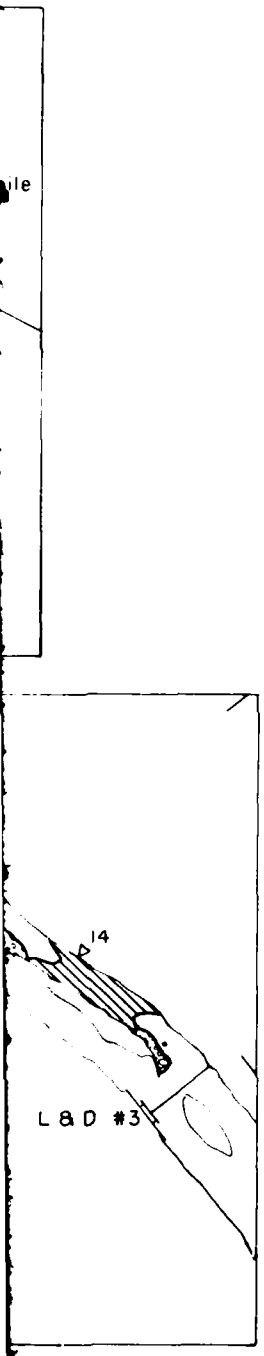


7 January 1986



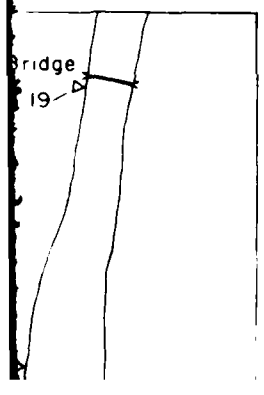






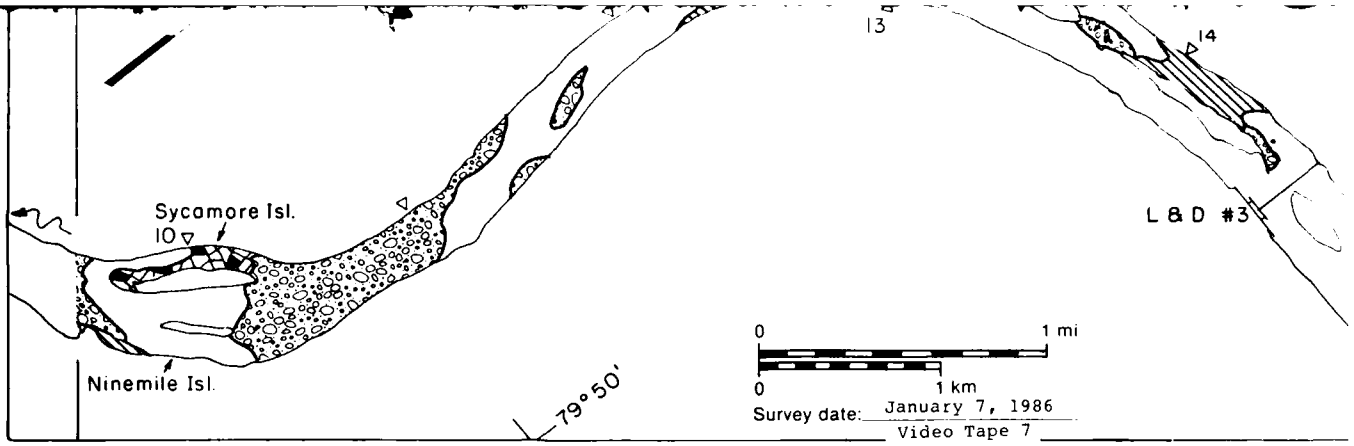
Lock and Dam #2 Pool

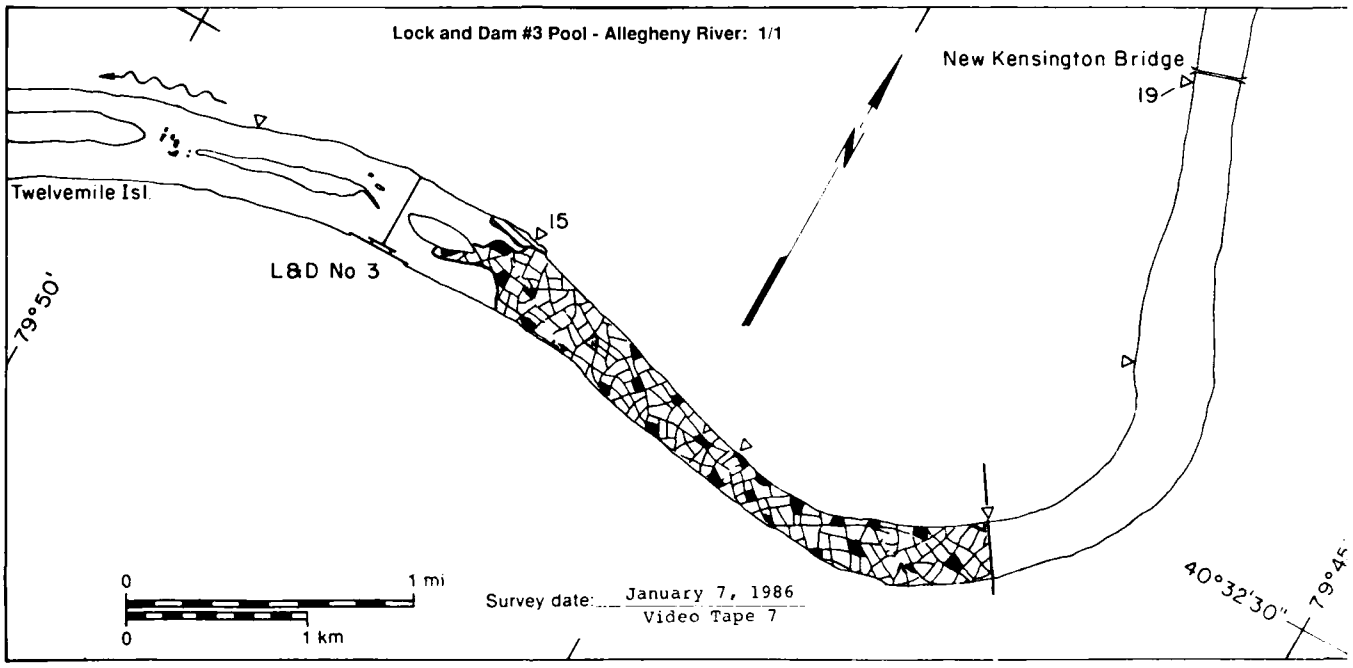
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (°c)
Open water	2.02	NA
Solid ice cover	0.82	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.20	70
Ice floes or frazil slush and pans	0.95	40
Total area ($m^2 \times 10^6$)	4.02	

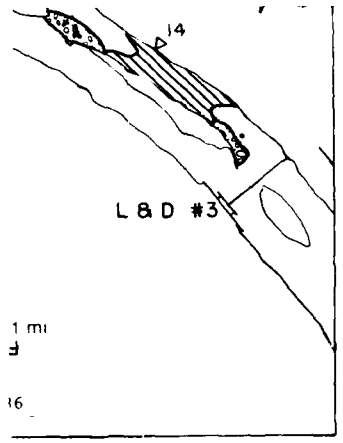


Lock and Dam #3 Pool

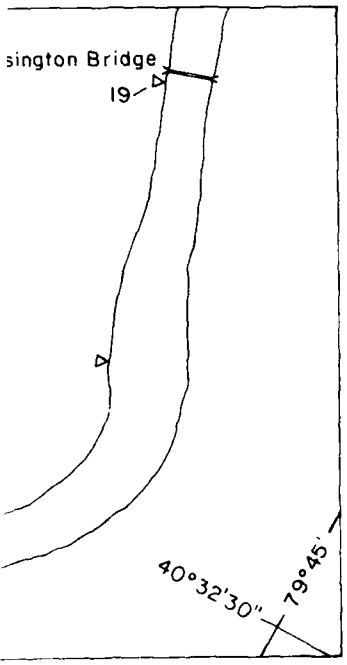
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.20	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—


13
14
Sycamore Isl.
10
L&D #3
Ninemile Isl.
79°50'
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 7


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 7
40°32'30"
79°45

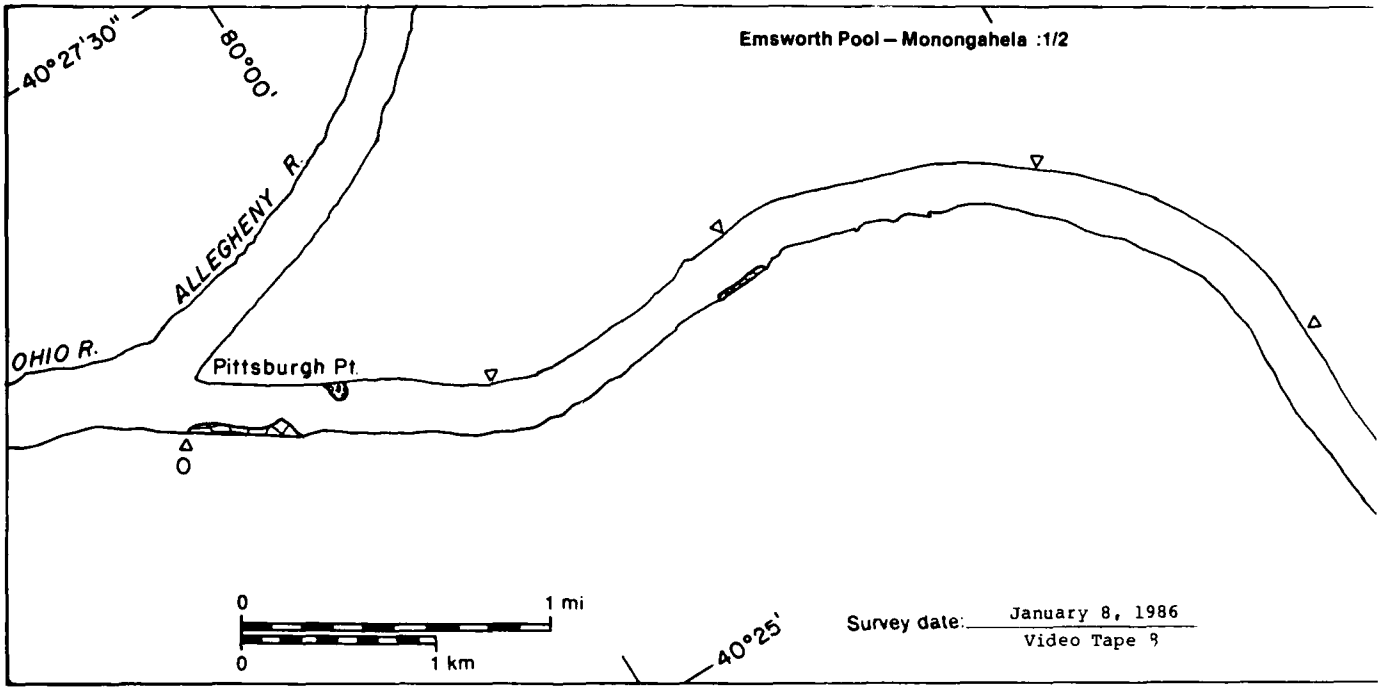


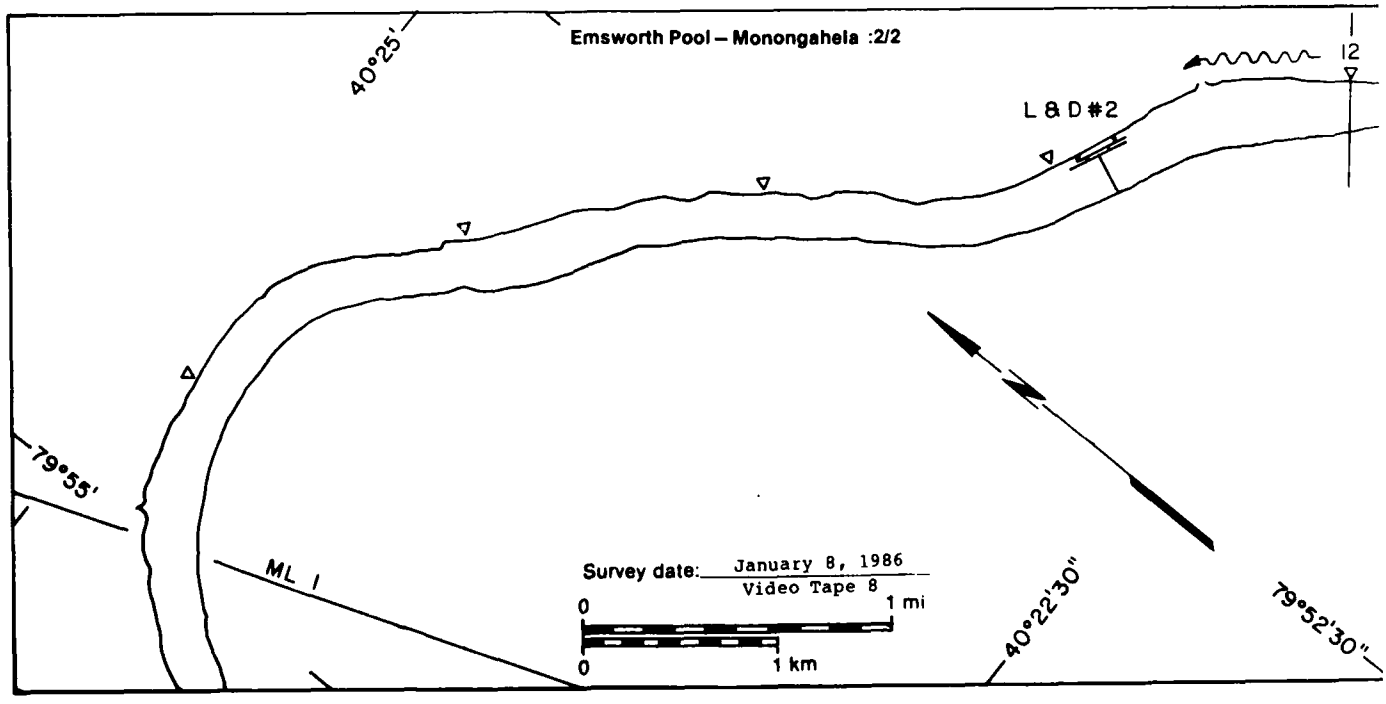
	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover	0.82	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.20	70
Ice floes or frazil slush and pans	0.95	40
Total area (m^2 x 10^6)	4.02	

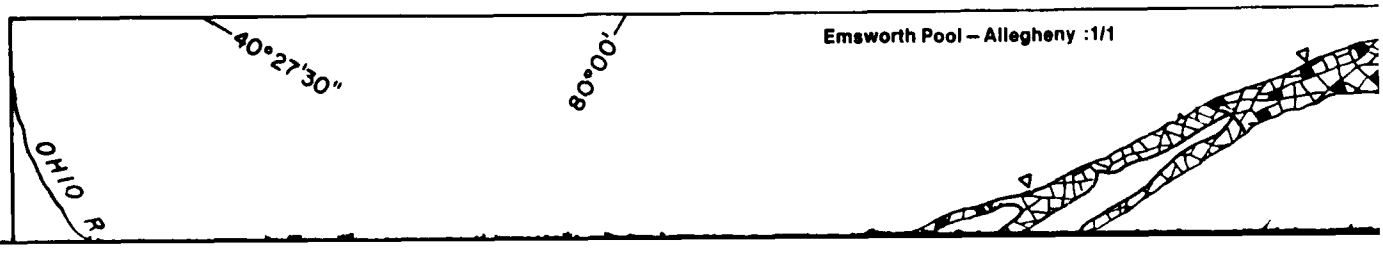


Lock and Dam #3 Pool

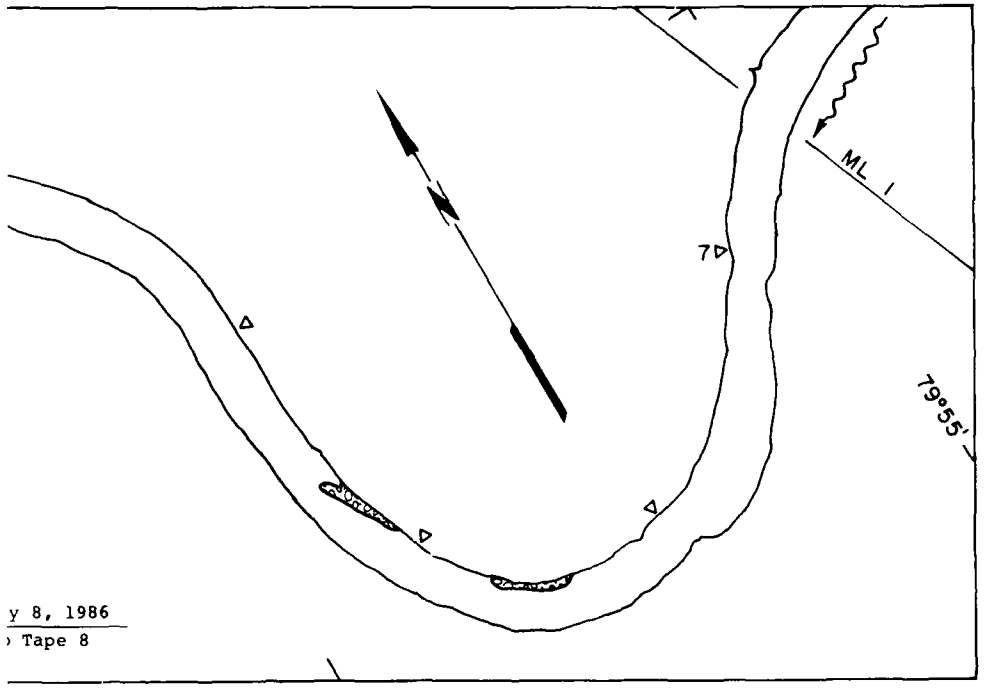
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.20	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.90	90
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	1.14	

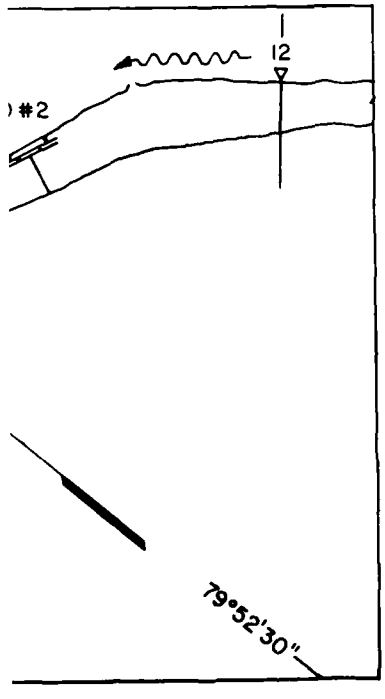

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: January 8, 1986
Video Tape 8


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
12
79°55'
ML 1
Survey date: January 8, 1986
Video Tape 8
0
1 mi
0
1 km
40°22'30"
79°52'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'
OHIO R.

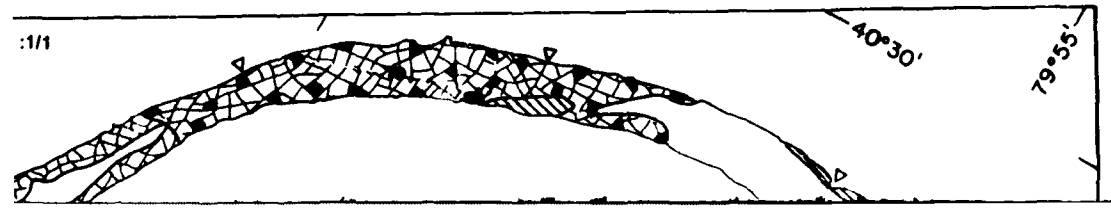
8 January 1986

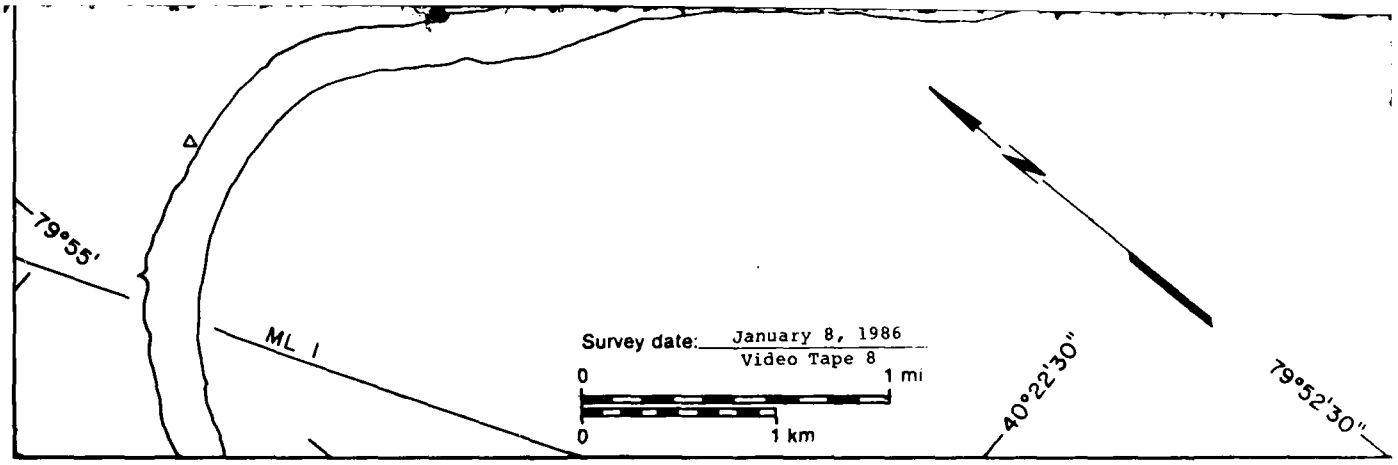


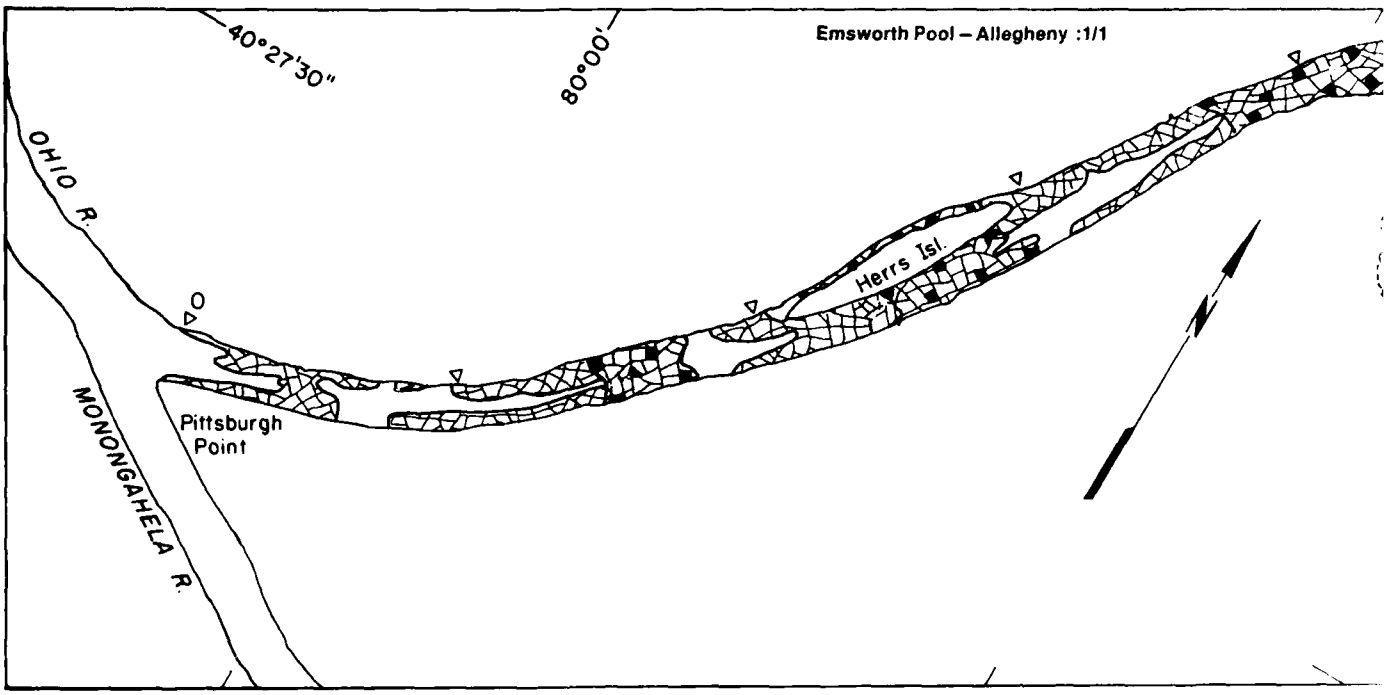


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (tenths)
Open water	5.06	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.07	5
Total area (m^2 x 10^6)	5.16	

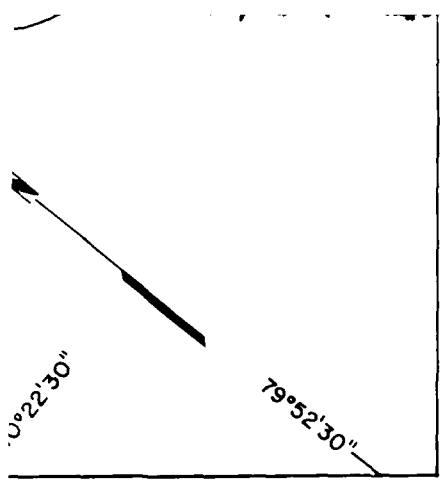






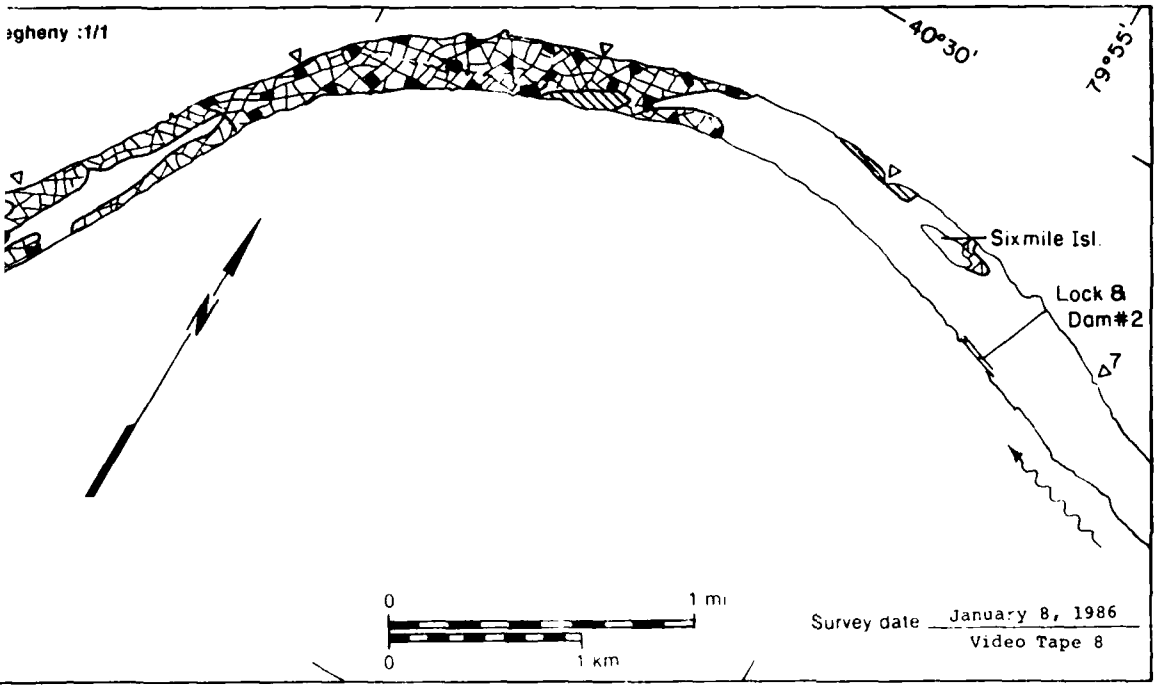
Emsworth Pool – Allegheny

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	1.20	NA
Solid ice cover	0.08	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.78	NA
Fragmented ice cover with open water areas	1.01	90
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	3.07	

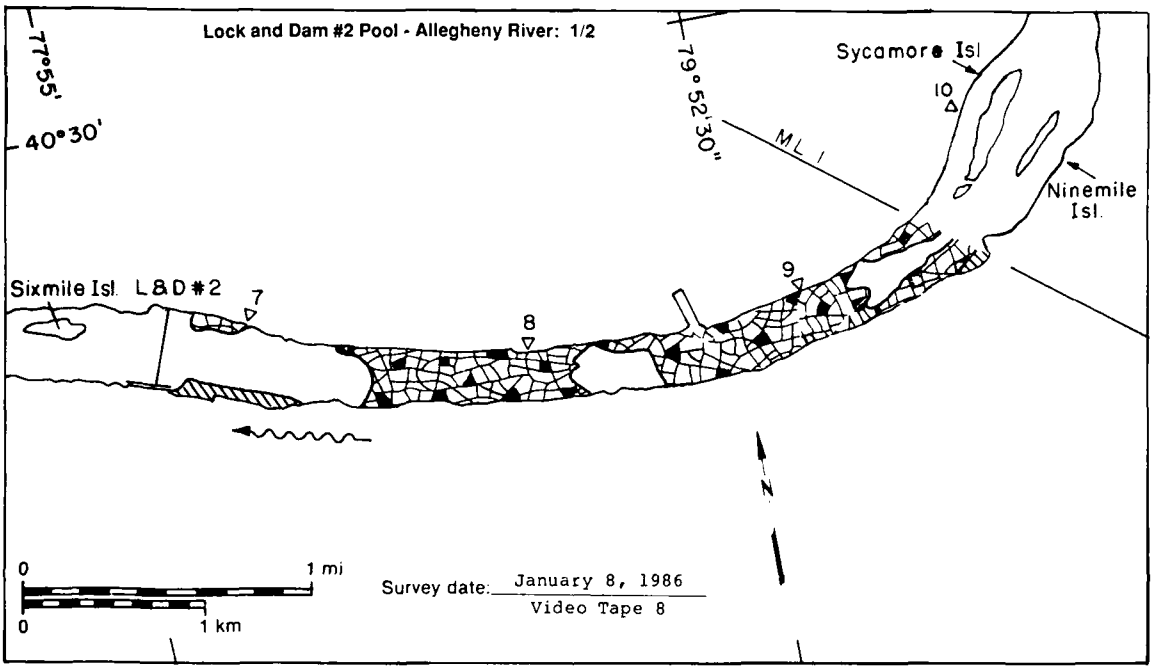


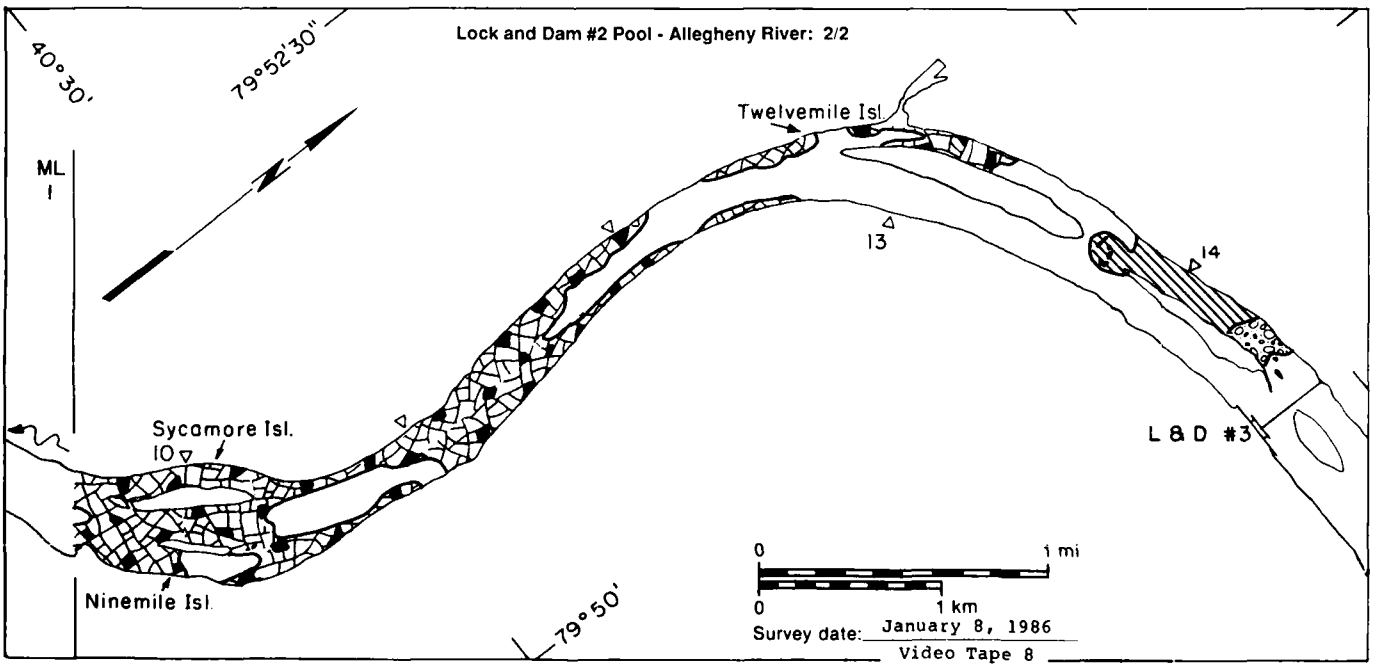
Emsworth Pool – Monongahela

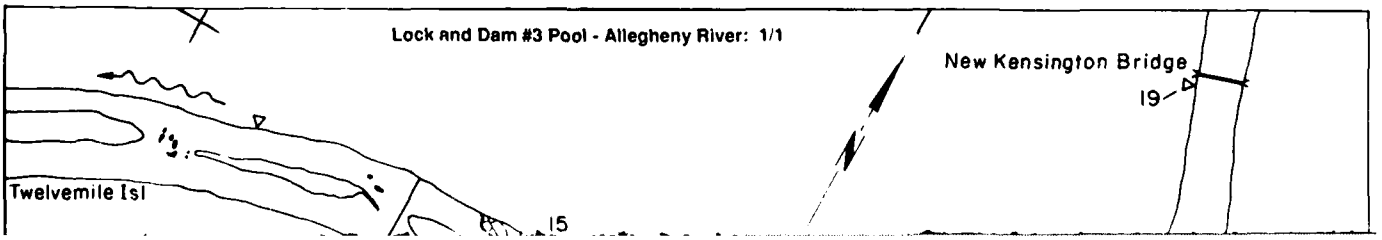
	Area (m^2 x 10^6)	
Open water	5.06	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open water areas	0.00	—
Ice along shore, marsh and banks	0.07	5
Total area (m^2 x 10^6)	5.16	

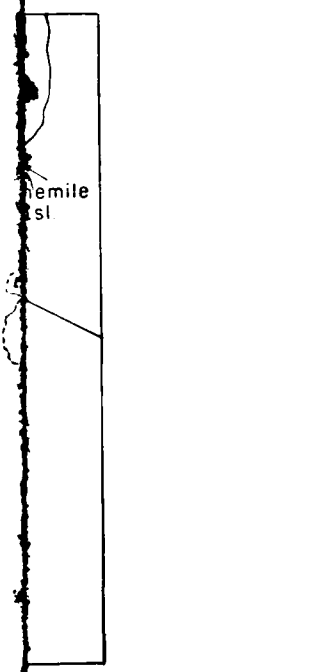


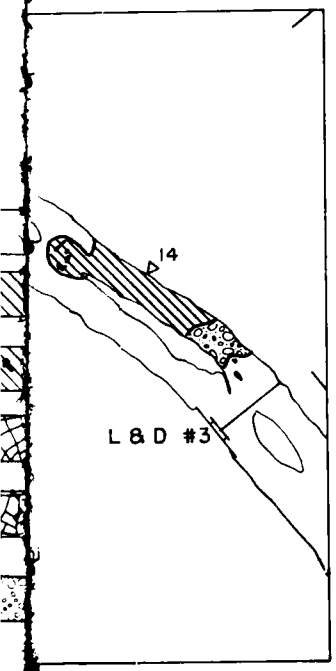
8 January 1986





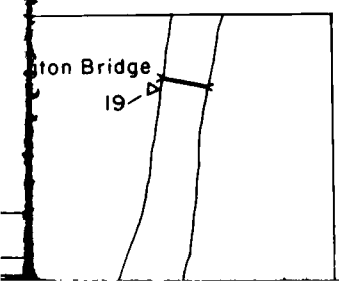






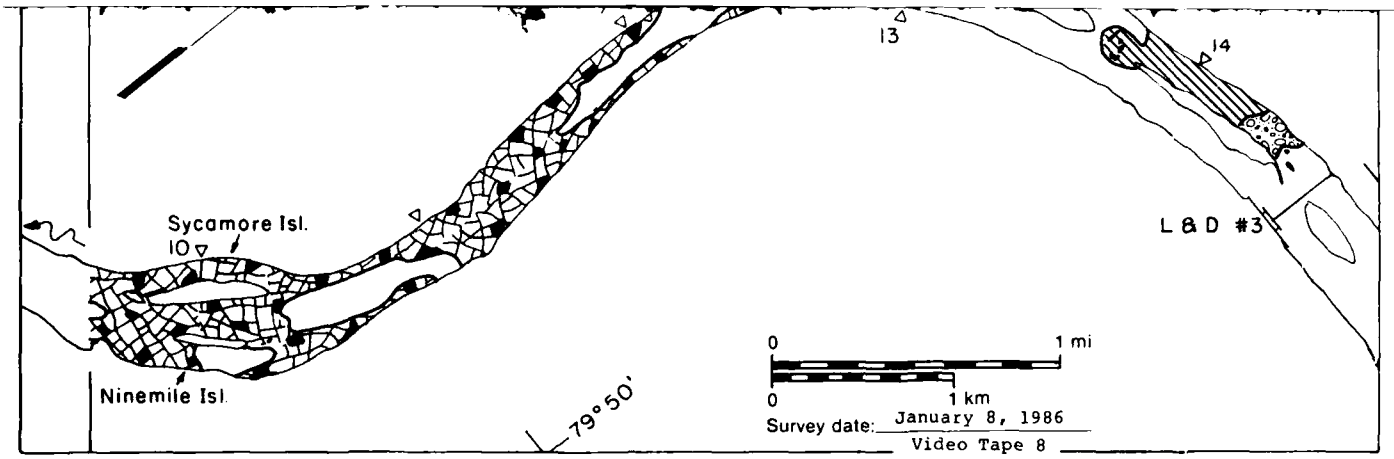
Lock and Dam #2 Pool

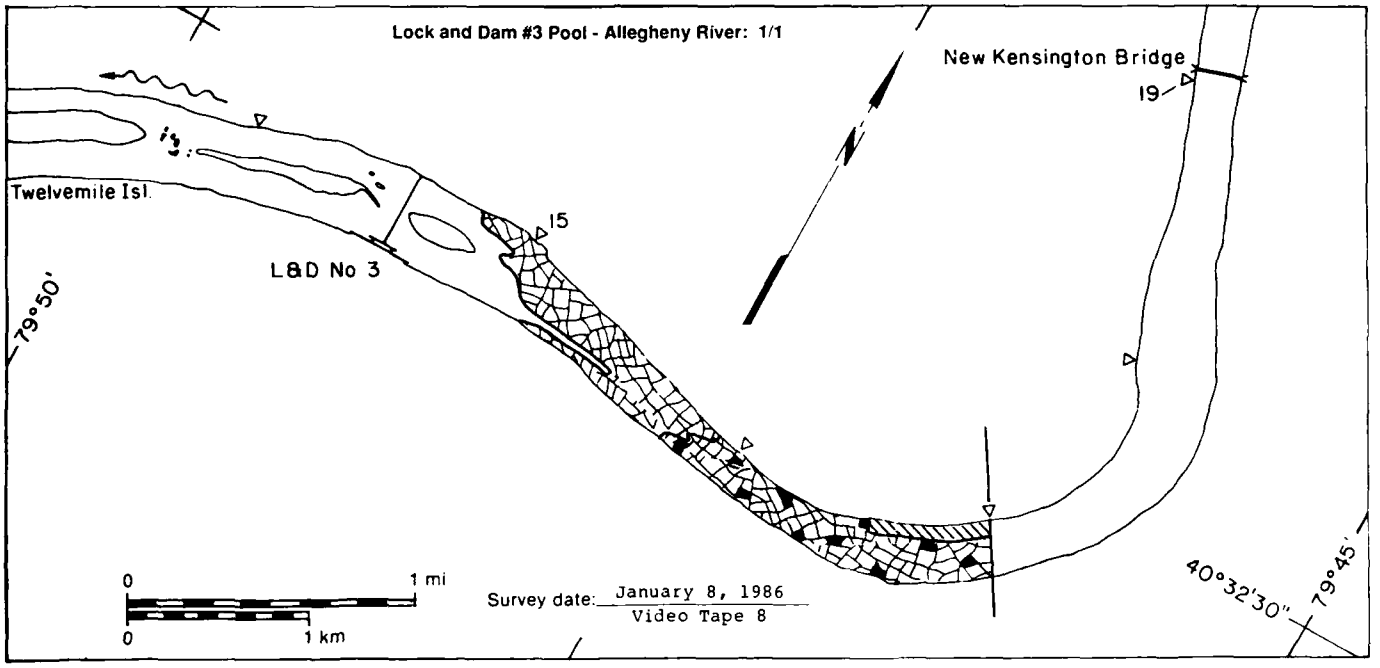
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.83	NA
Solid ice cover	0.23	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.09	NA
Fragmented ice cover with open-water areas	1.82	90
Ice floes or frazil slush and pans	0.05	50
Total area ($m^2 \times 10^6$)	4.02	

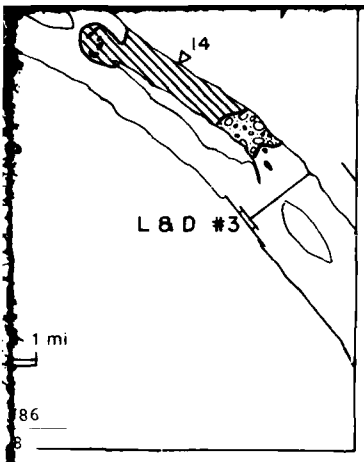


Lock and Dam #3 Pool

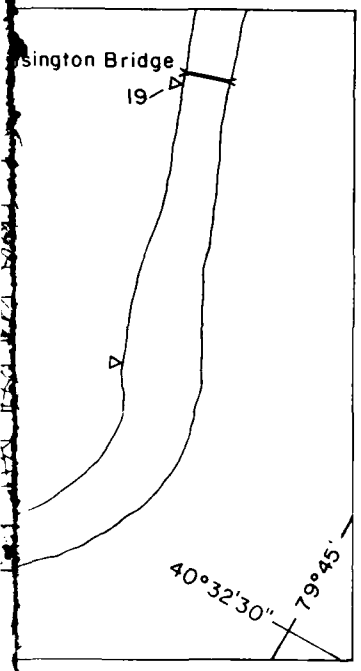
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.30	NA
Solid ice cover	0.04	NA


13
14
Sycamore Isl.
10
L & D #3
Ninemile Isl.
79°50'
0
1 mi
0
1 km
Survey date: January 8, 1986
Video Tape 8


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 8, 1986
Video Tape 8
40°32'30"
79°45'

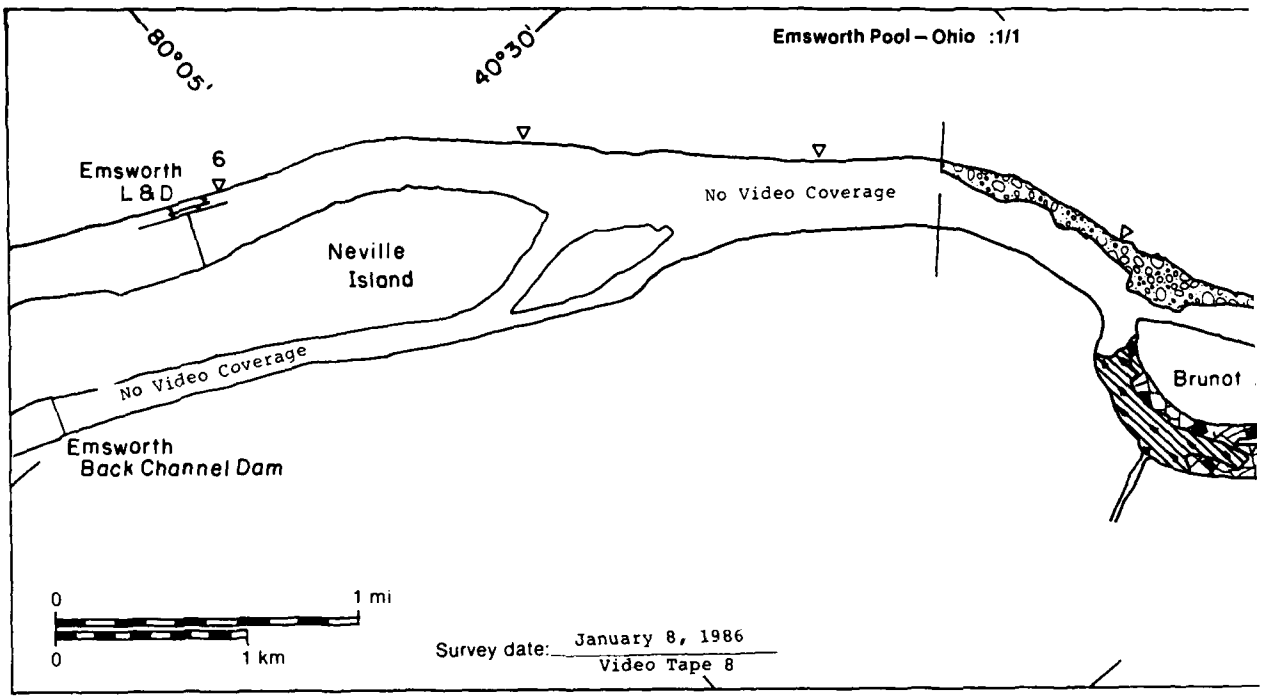


	Area ($m^2 \times 10^6$)	Surface concentration (%)
Solid ice cover	0.23	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.09	NA
Fragmented ice cover with open-water areas	1.82	90
Ice floes or frazil slush and pans	0.05	50
Total area ($m^2 \times 10^6$)	4.02	



Lock and Dam #3 Pool

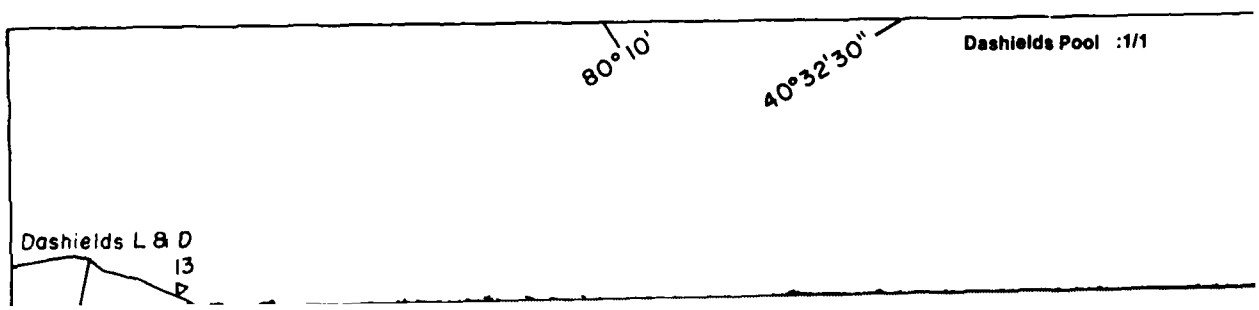
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.30	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.38	NA
Fragmented ice cover with open-water areas	0.42	95
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	1.14	



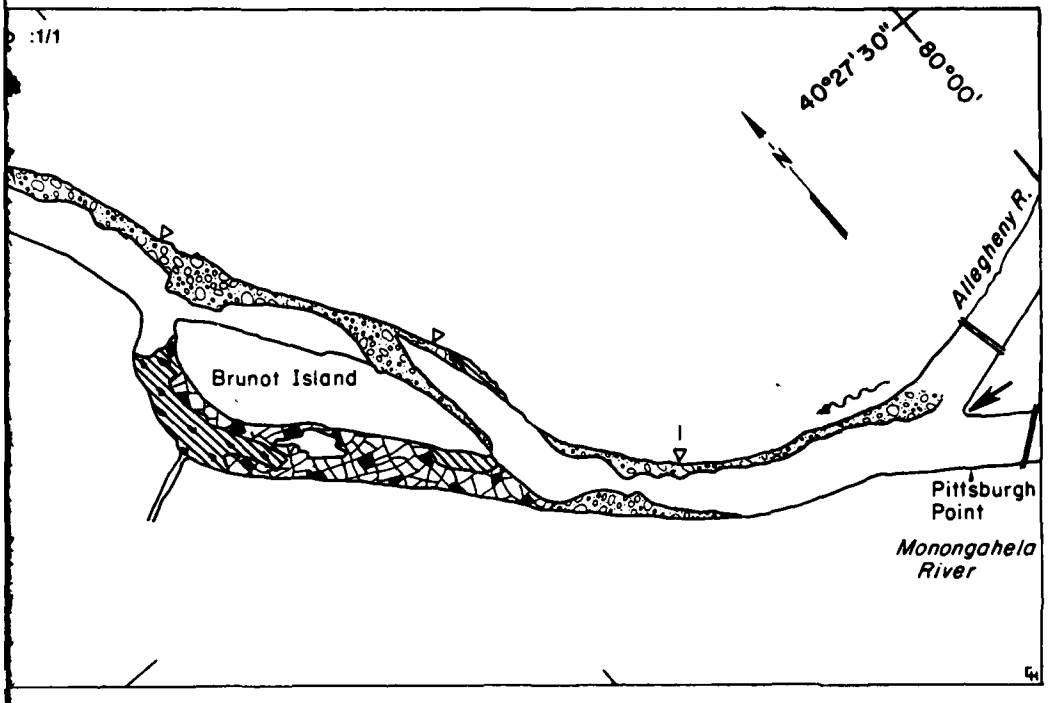
Emsworth Pool – Ohio

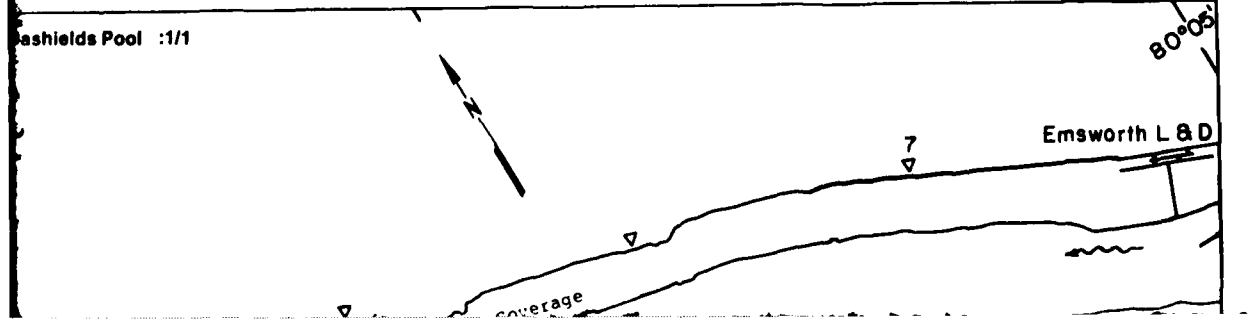
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.20	NA
Solid ice cover	0.07	NA
Solid ice cover with open-water areas	0.15	90
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.39	80
Ice floes or frazil slush and pans	0.65	40
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 2.03×10^6 m^2 of no video coverage

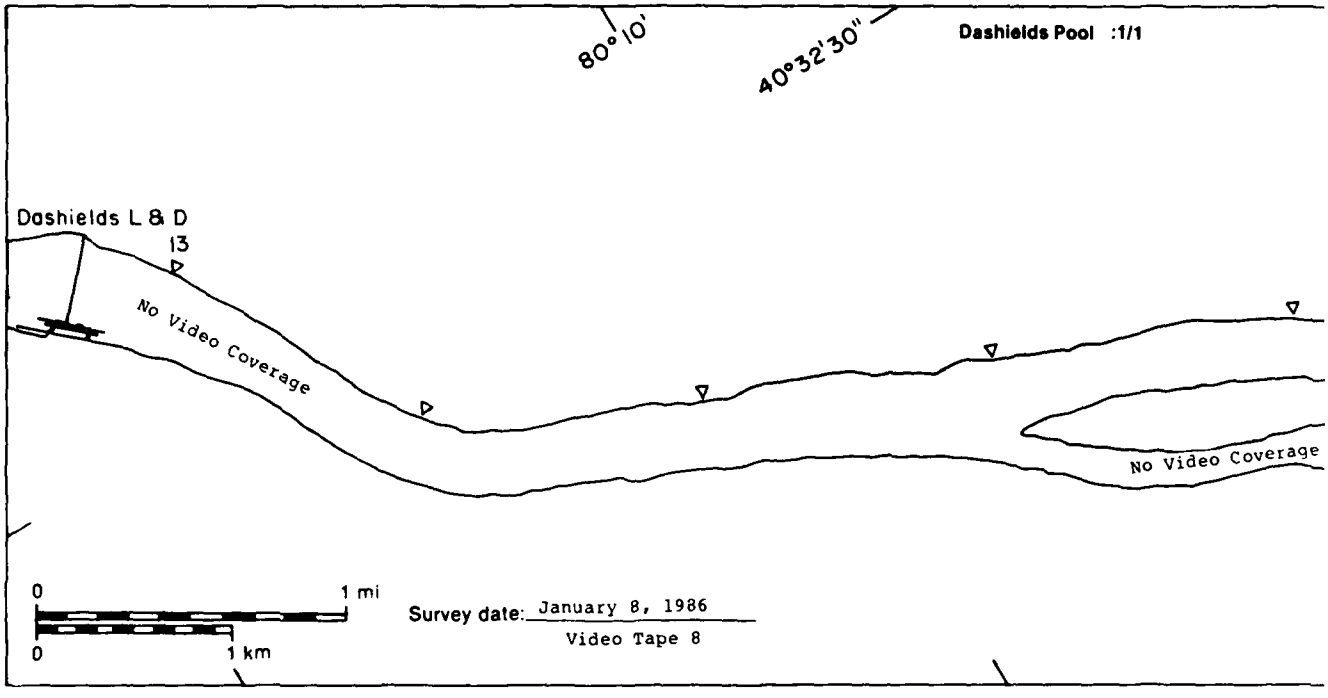


8 January 1986





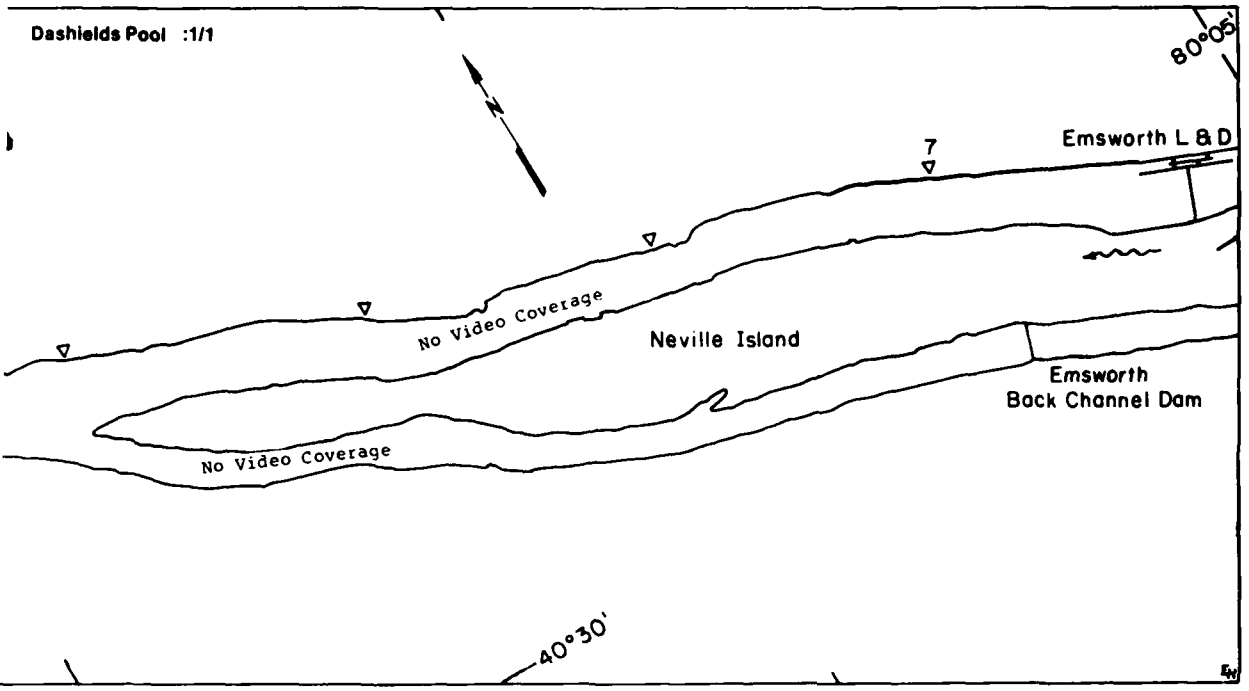
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Solid ice cover with open-water areas	0.15	90
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.39	80
Ice floes or frazil slush and pans	0.65	40
Total area ($m^2 \times 10^6$)	4.49*	* Includes 2.03×10^6 m^2 of no video coverage

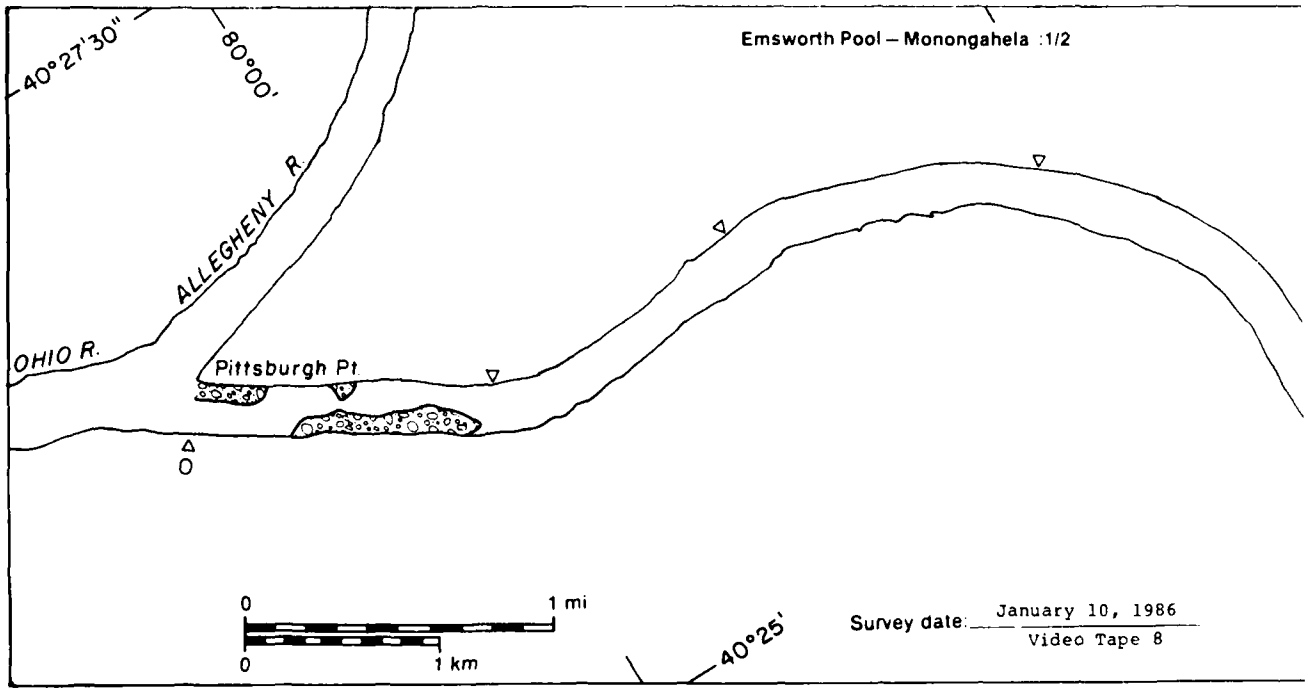


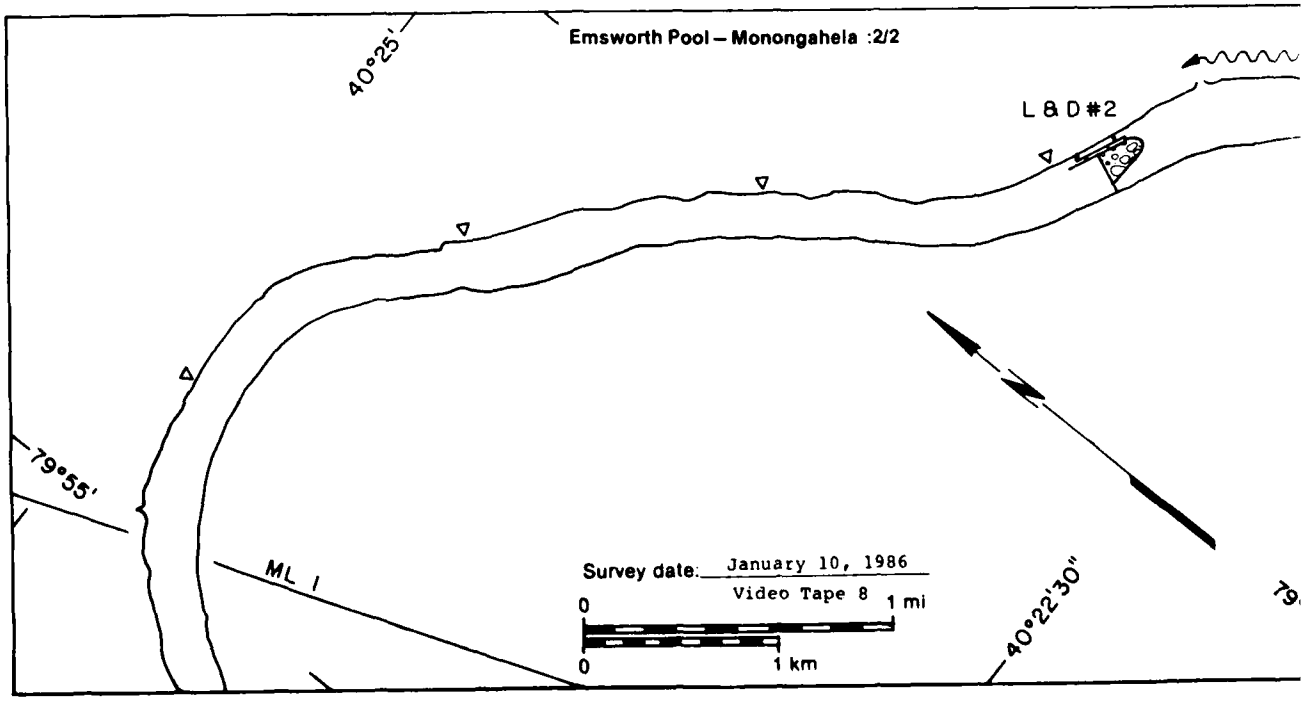
Dashields Pool

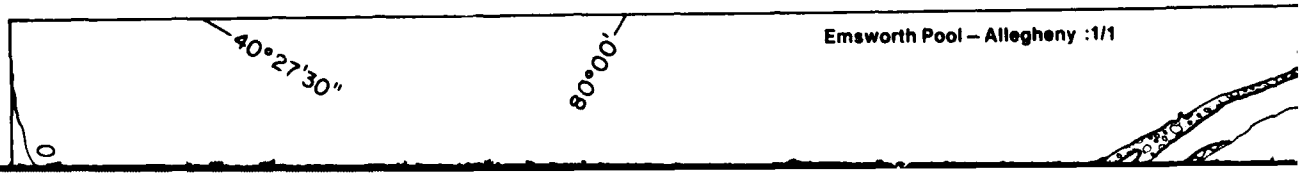
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.00*	* Includes 5.00×10^6 m^2 of no video coverage

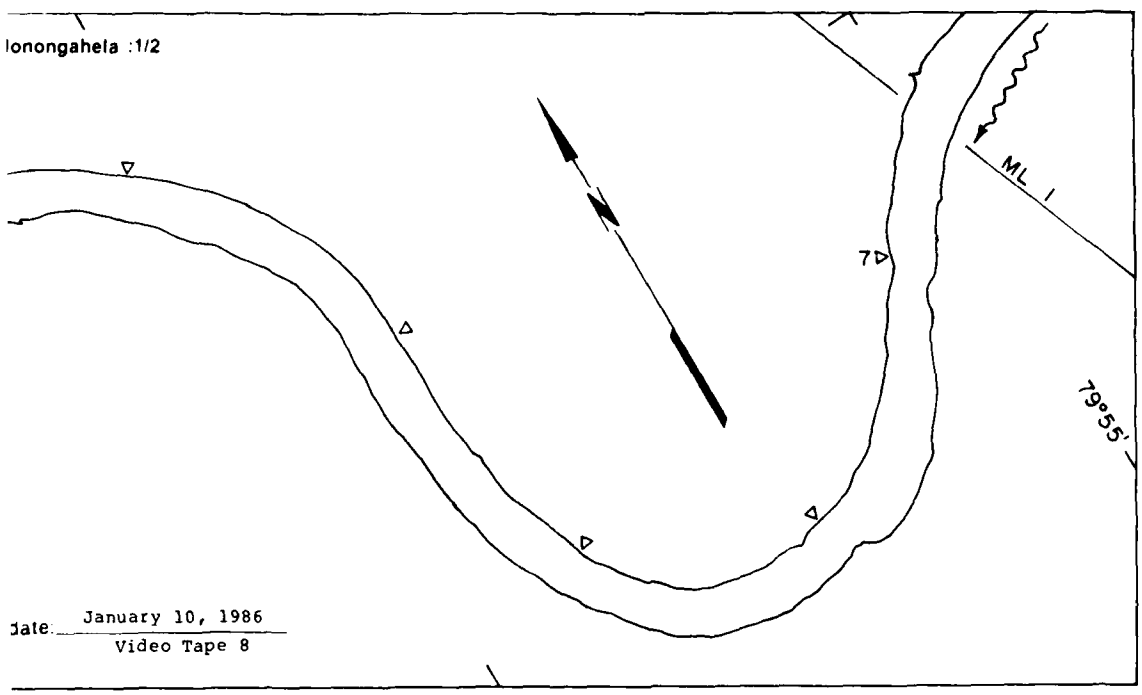

Dashields Pool :1/1
80°05'
Emsworth L & D
7
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

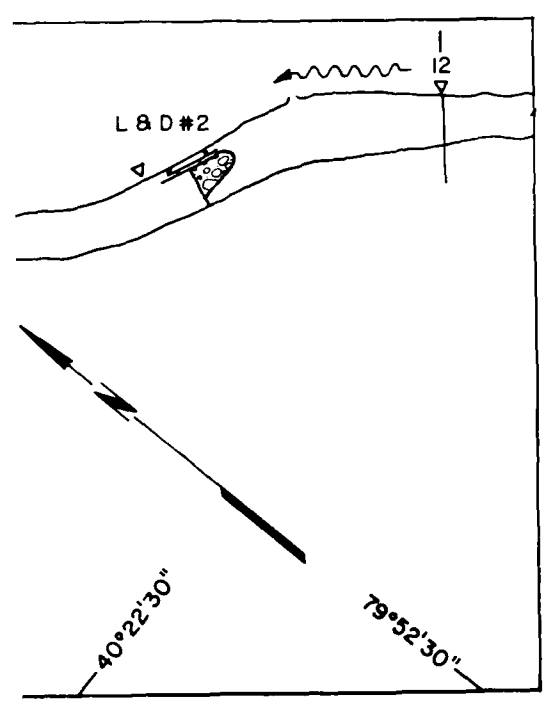

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt
0
0
1 mi
0
1 km
40°25'
Survey date: January 10, 1986
Video Tape 8


Emsworth Pool – Monongahela :2/2
40°25'
L&D#2
79°55'
ML 1
Survey date: January 10, 1986
Video Tape 8
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'

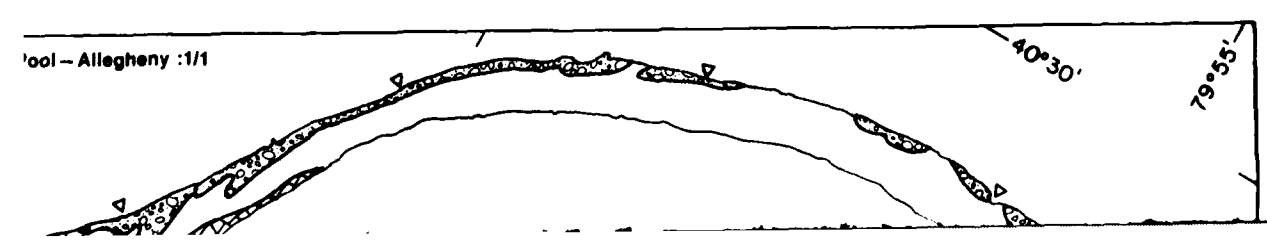
10 January 1986

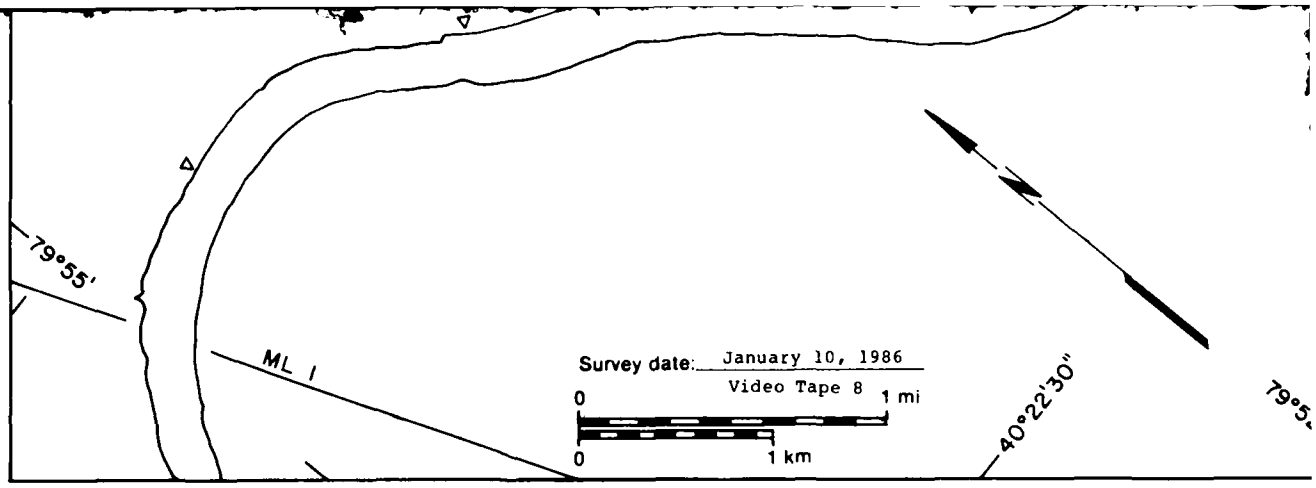


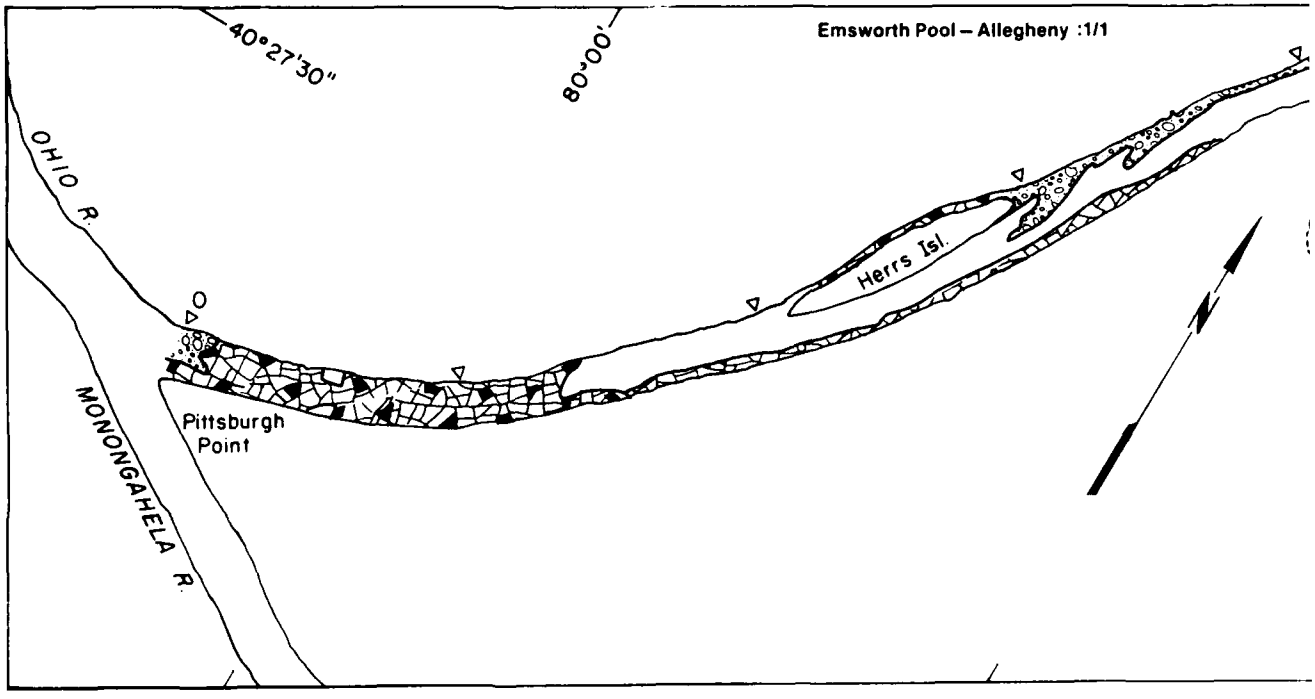


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface coverage fraction
Open water	4.95	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.21	60
Total area (m^2 x 10^6)	5.16	

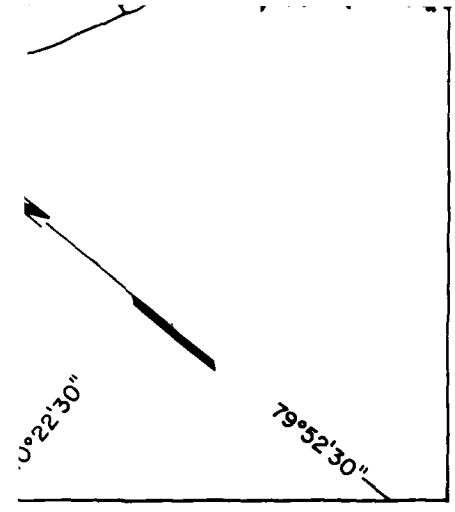






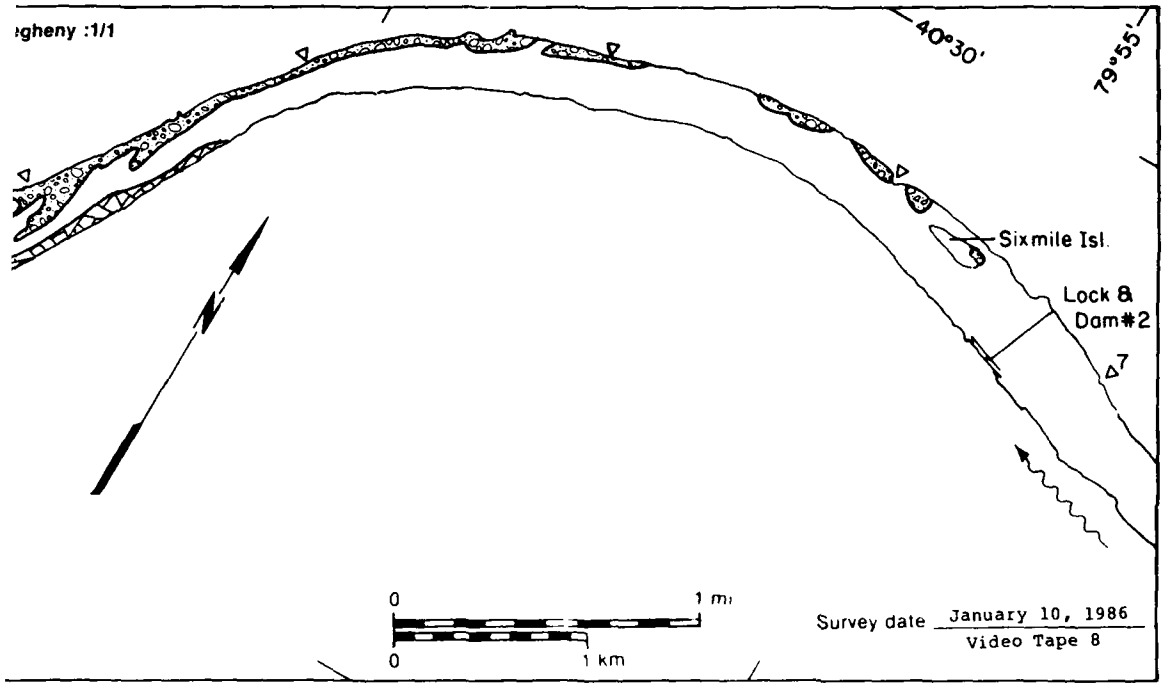
Emsworth Pool – Allegheny

MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	2.02	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.16	NA
Fragmented ice cover with open water areas	0.48	90
Ice floes or frazil slush and pans	0.41	60
Total area (m^2 x 10^6)	3.07	

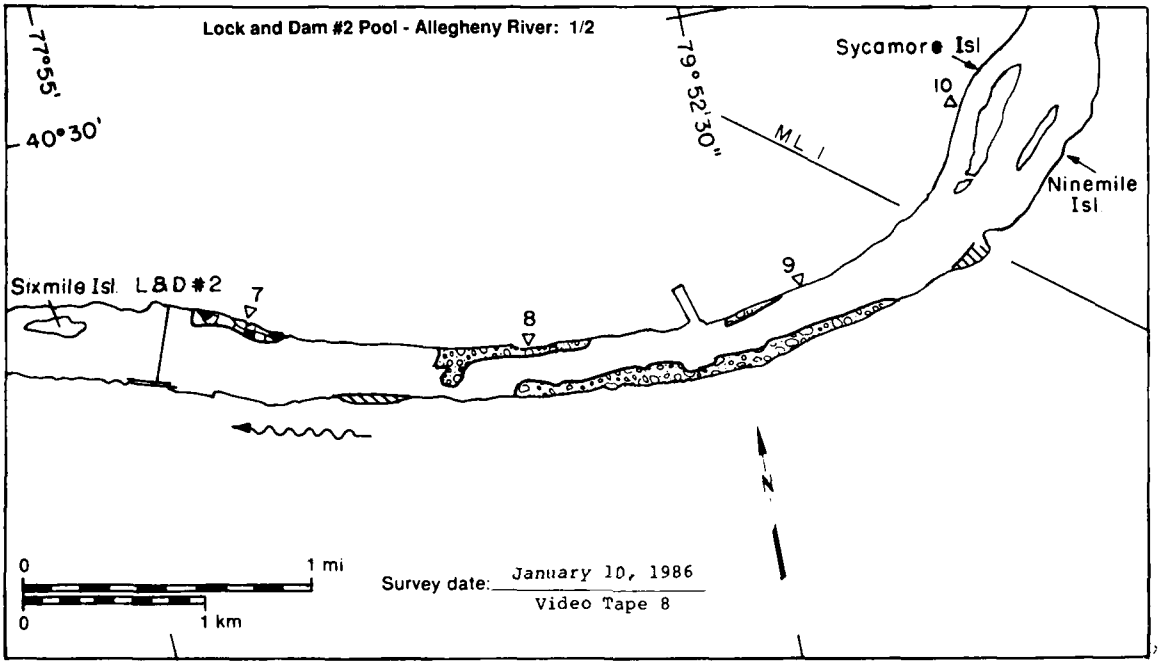


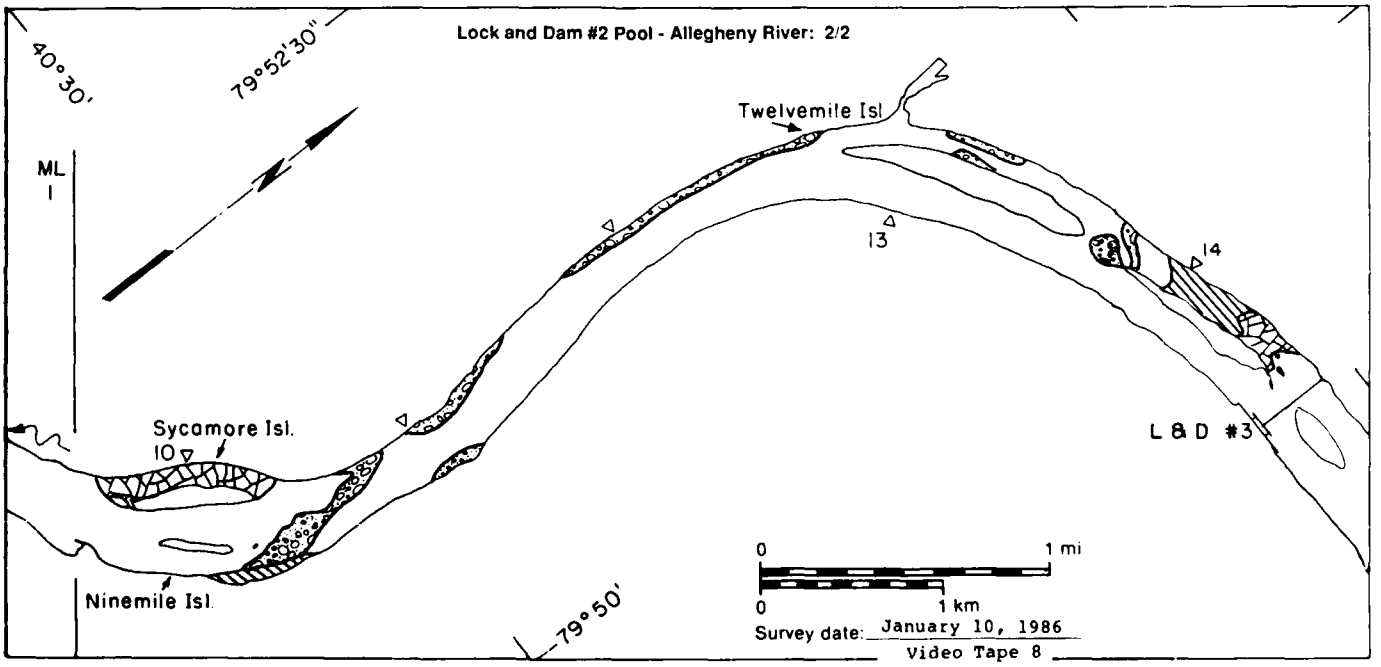
Emsworth Pool – Monongahela

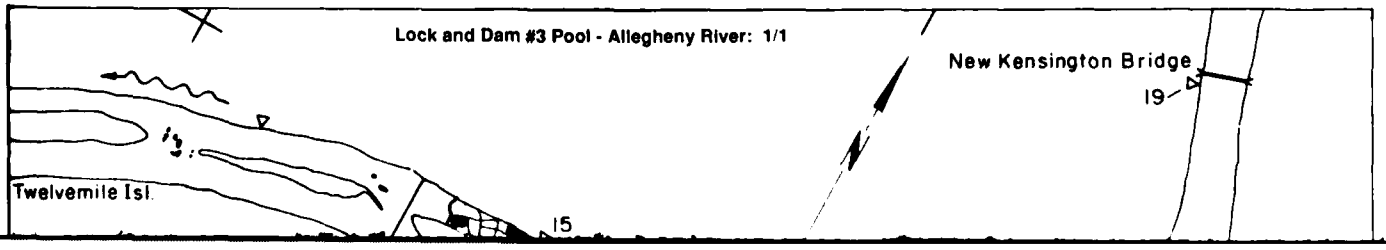
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.95	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.21	60
Total area ($m^2 \times 10^6$)	5.16	



10 January 1986





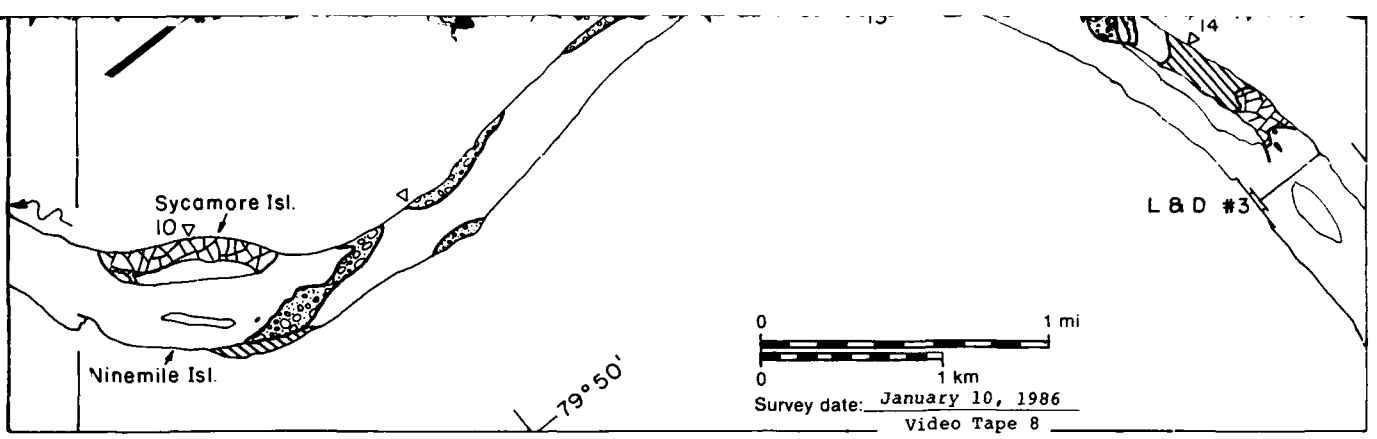


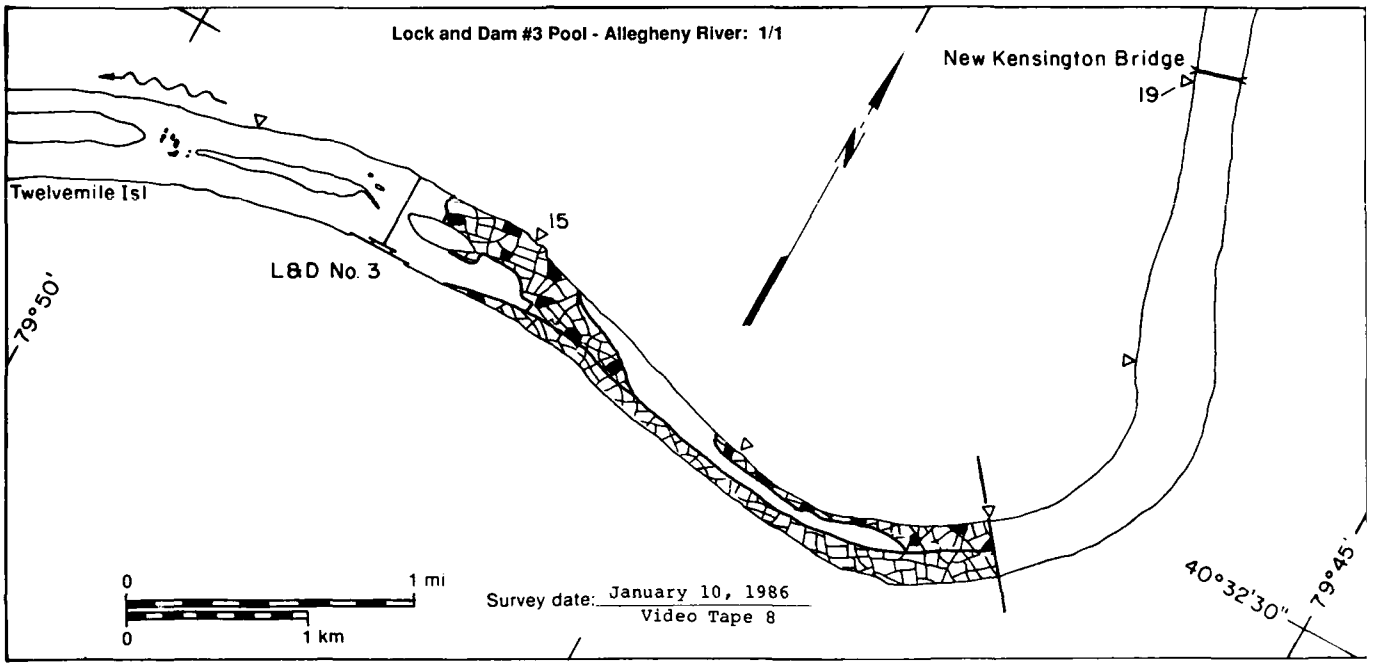
Lock and Dam #2 Pool

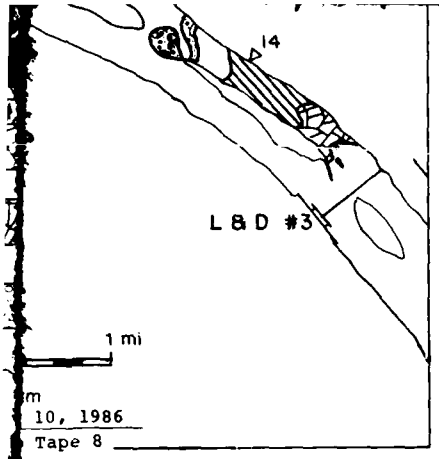
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.07	NA
Solid ice cover	0.14	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.15	NA
Fragmented ice cover with open-water areas	0.05	90
Ice floes or frazil slush and pans	0.61	40
Total area ($m^2 \times 10^6$)	4.02	

Lock and Dam #3 Pool

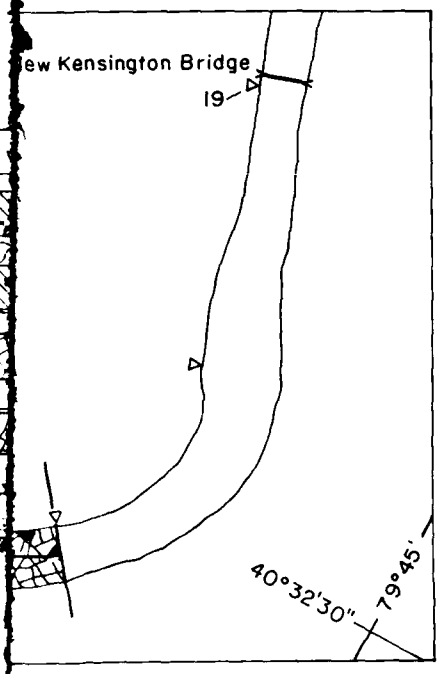
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.39	NA
Solid ice cover	0.00	NA


14
Sycamore Isl.
10
L & D #3
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8
Ninemile Isl.
79°50'


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl
15
L&D No. 3
79°50'
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8
40°32'30"
79°45'

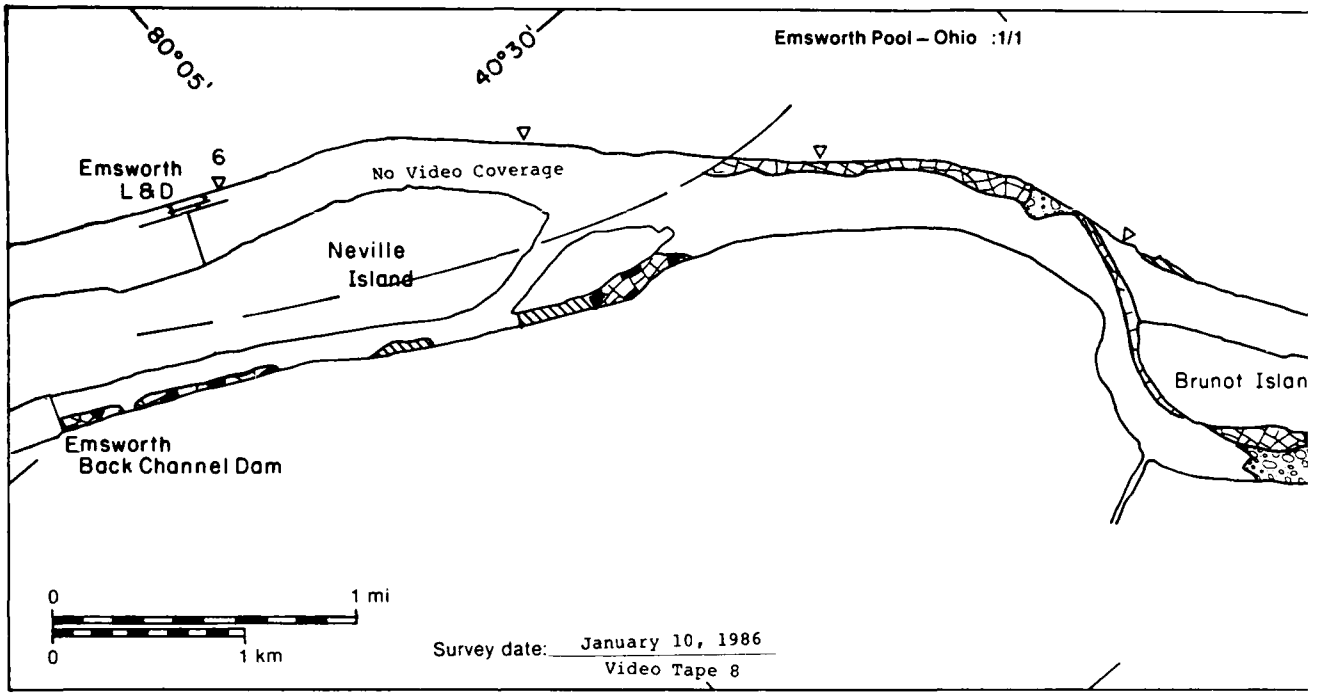


		Area ($m^2 \times 10^6$)	Surface concentration (%)
	Solid ice cover	0.14	NA
	Solid ice cover with open-water areas	0.00	—
	Fragmented ice cover	0.15	NA
	Fragmented ice cover with open-water areas	0.05	90
	Ice floes or frazil slush and pans	0.61	40
Total area ($m^2 \times 10^6$)		4.02	



Lock and Dam #3 Pool

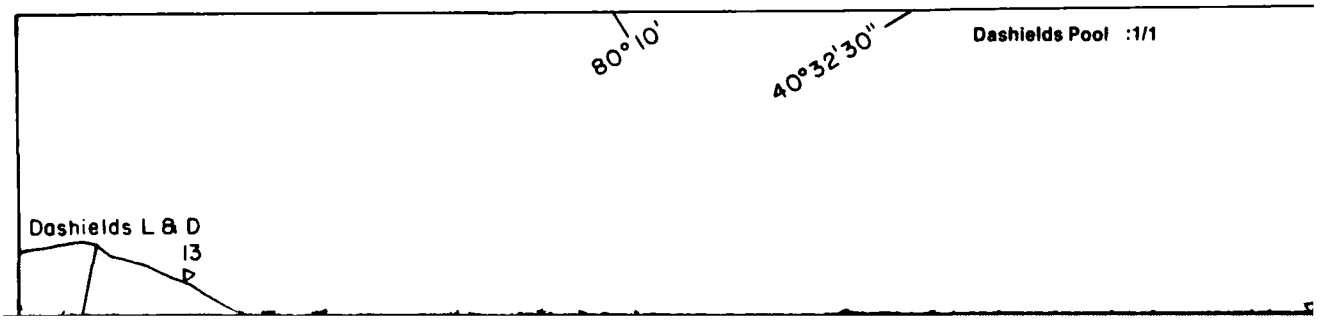
MAP UNITS		Area ($m^2 \times 10^6$)	Surface concentration (%)
	Open water	0.39	NA
	Solid ice cover	0.00	NA
	Solid ice cover with open-water areas	0.00	—
	Fragmented ice cover	0.40	NA
	Fragmented ice cover with open-water areas	0.35	90
	Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)		1.14	



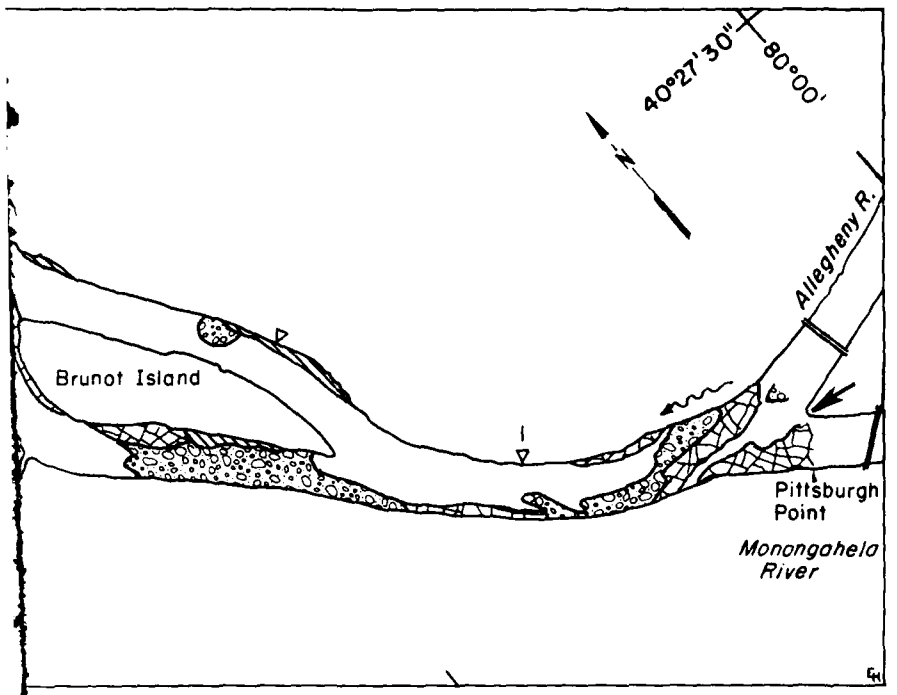
Emsworth Pool – Ohio

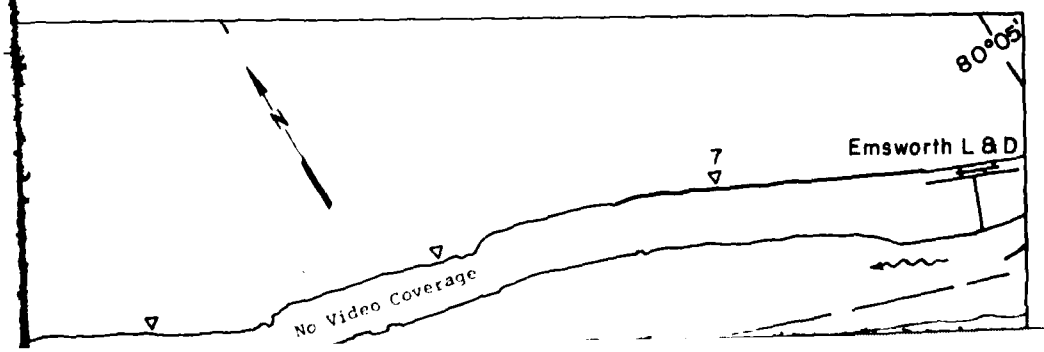
MAP UNITS	Area (m^2)	Surface concentration (%)
Open water	2.53	NA
Solid ice cover	0.14	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.53	NA
Fragmented ice cover with open-water areas	0.06	80
Ice floes or frazil slush and pans	0.38	10
Total area (m^2)	4.49*	

* Includes 0.85×10^6 m^2 of no video coverage

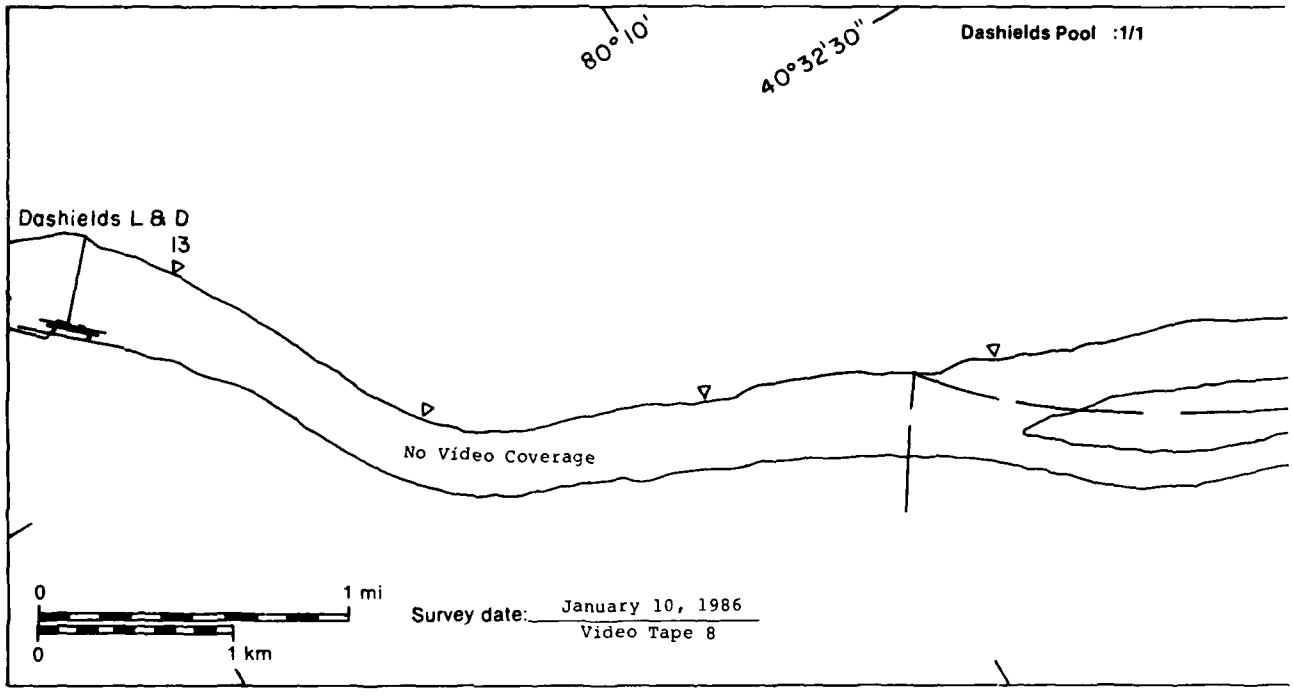


10 January 1986



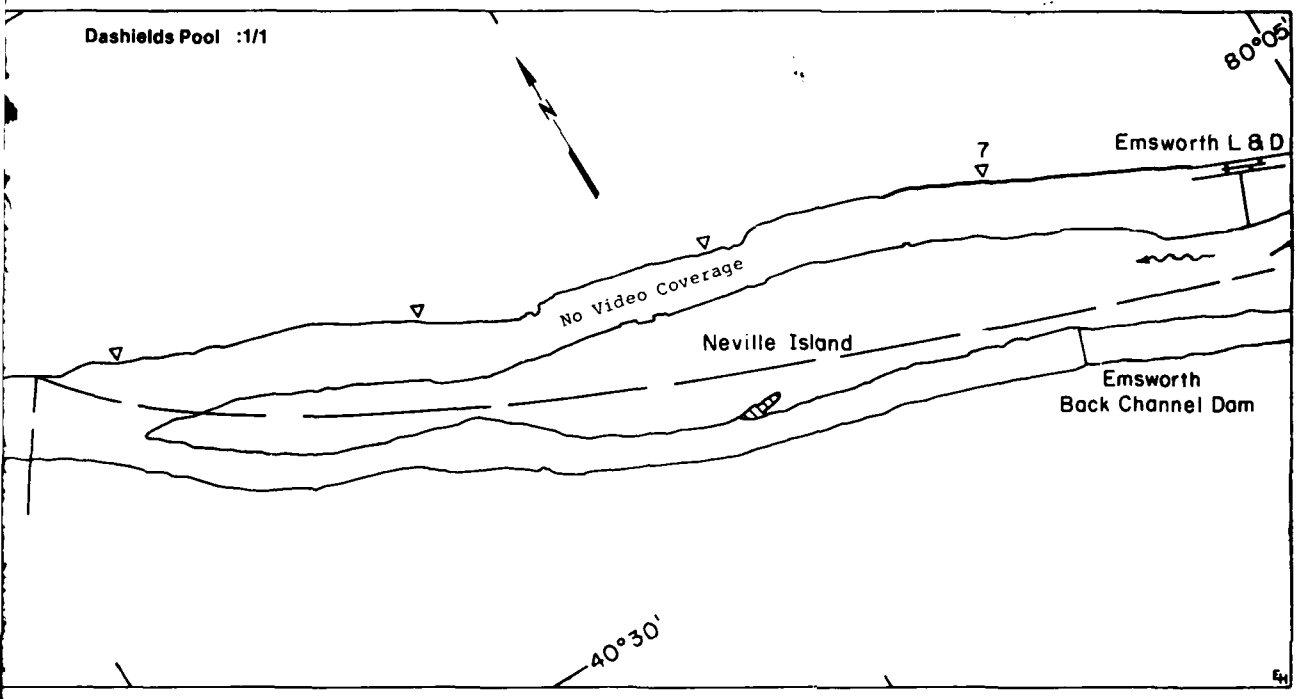


Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.53	NA
Fragmented ice cover with open-water areas	0.06	80
Ice floes or frazil slush and pans	0.38	10
Total area (m^2)	4.49*	* Includes 0.85×10^6 m^2 of no video coverage

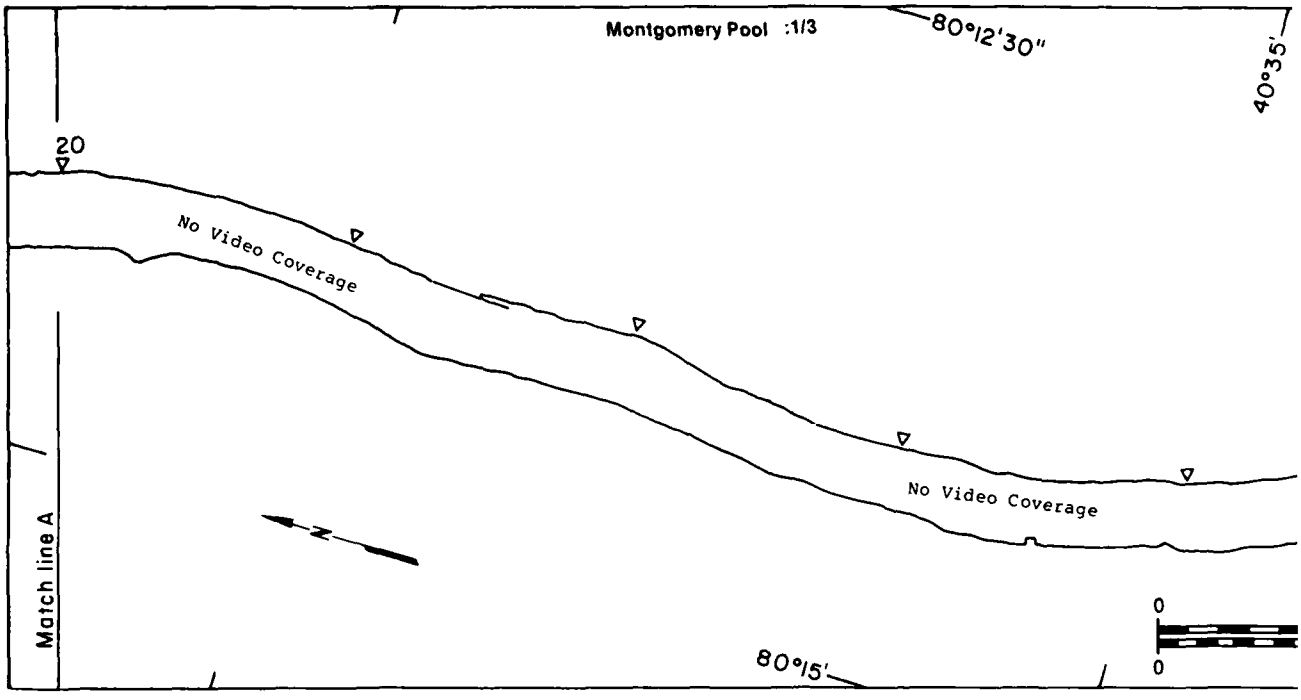


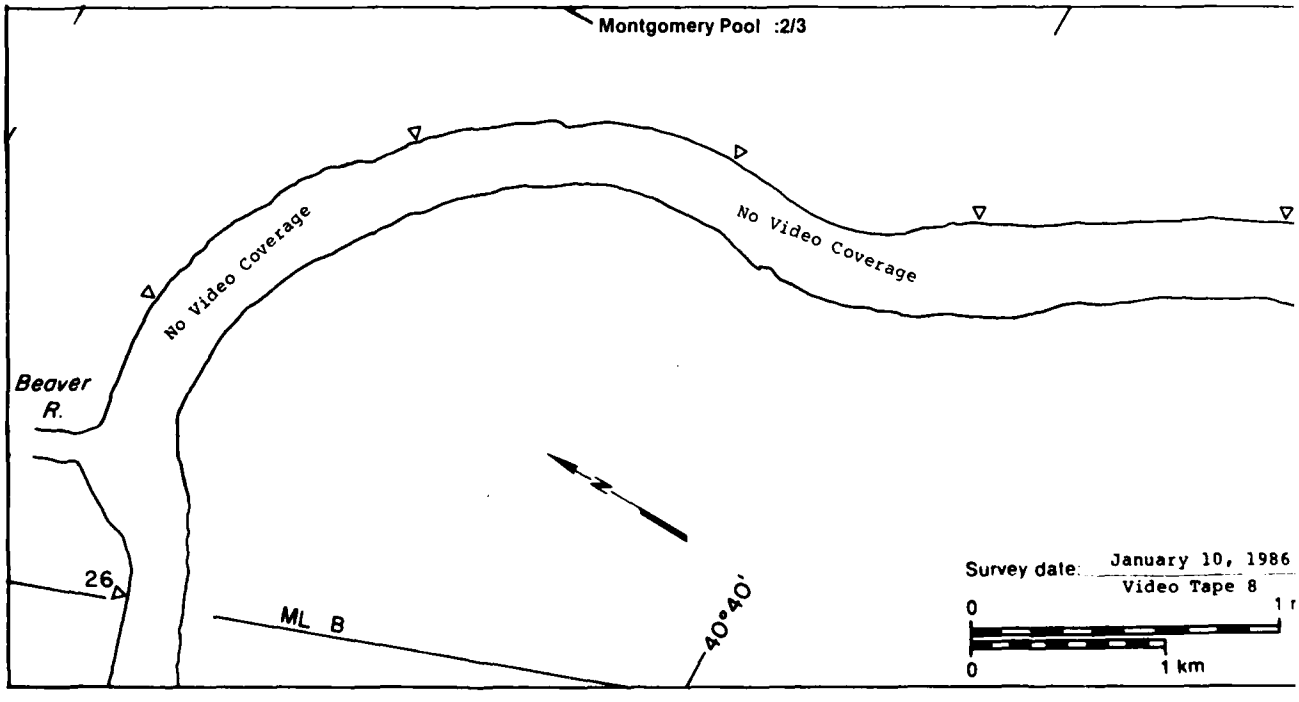
Dashields Pool

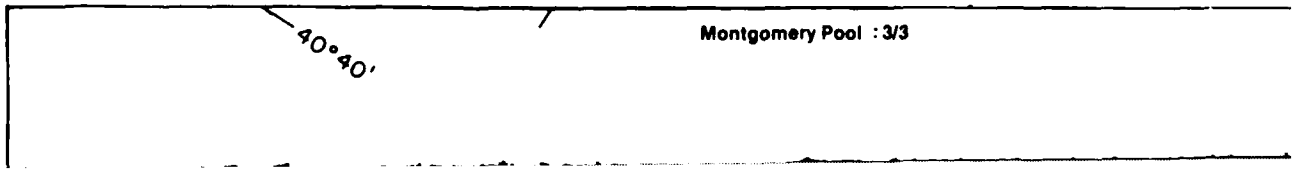
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.24	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.00*	* Includes 3.74×10^6 m^2 of no video coverage

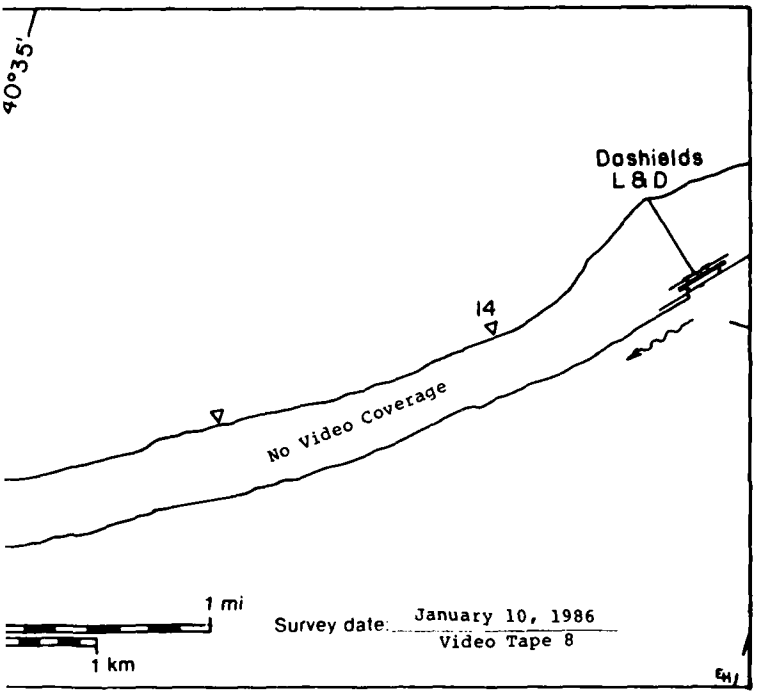

Dashields Pool :1/1
80°05'
N
7
Emsworth L & D
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
40°30'

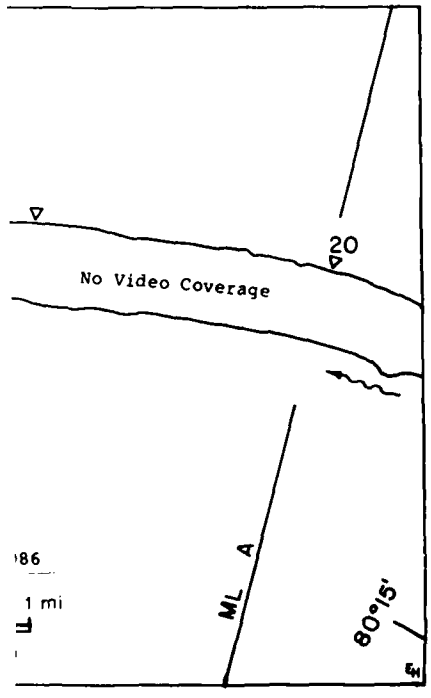
10 January 1986

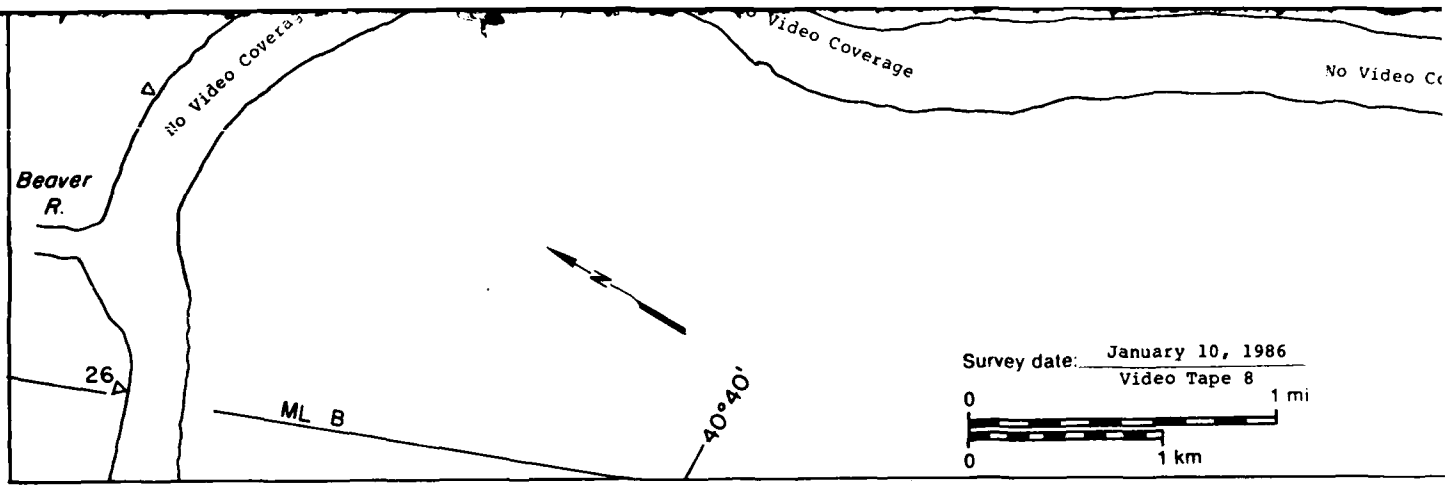


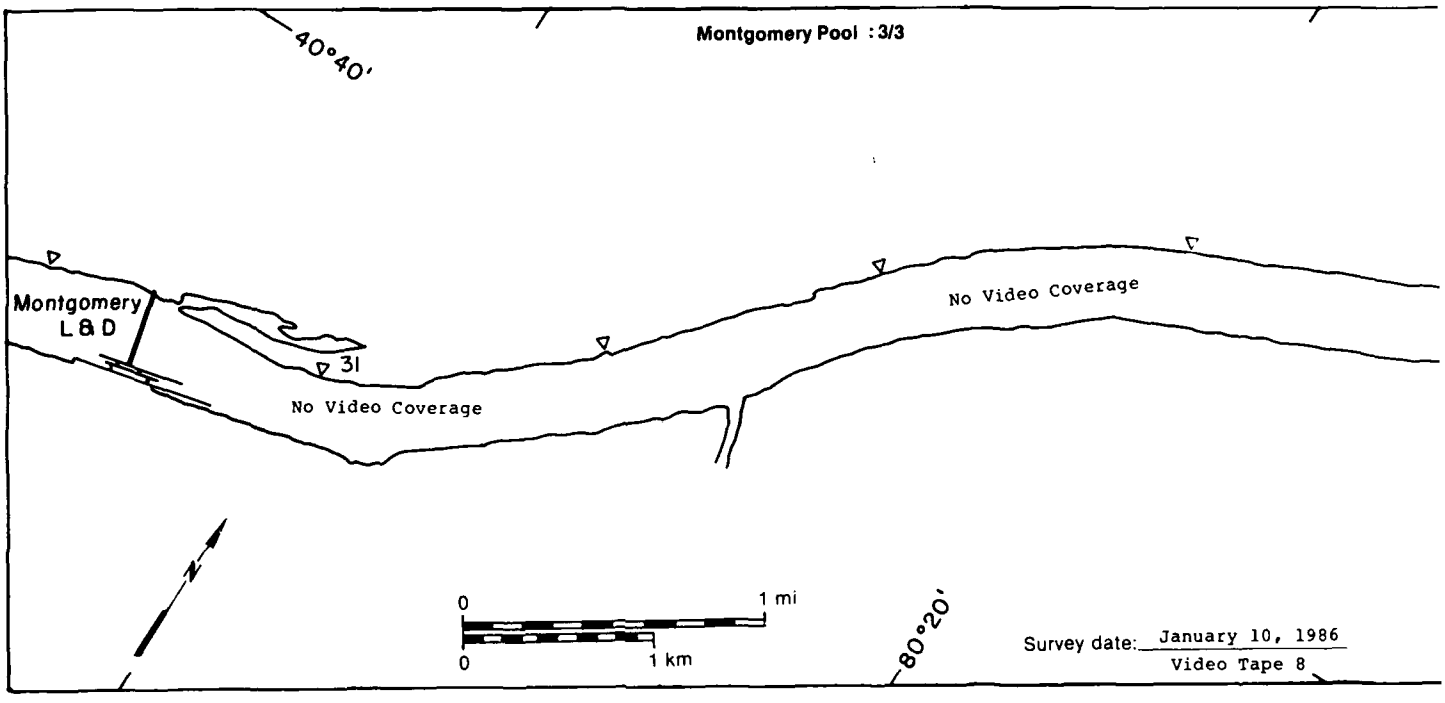





40°35'
Doshields
L&D
14
No Video Coverage
1 mi
1 km
Survey date: January 10, 1986
Video Tape 8


20
No Video Coverage
ML A
80°15'
1 mi

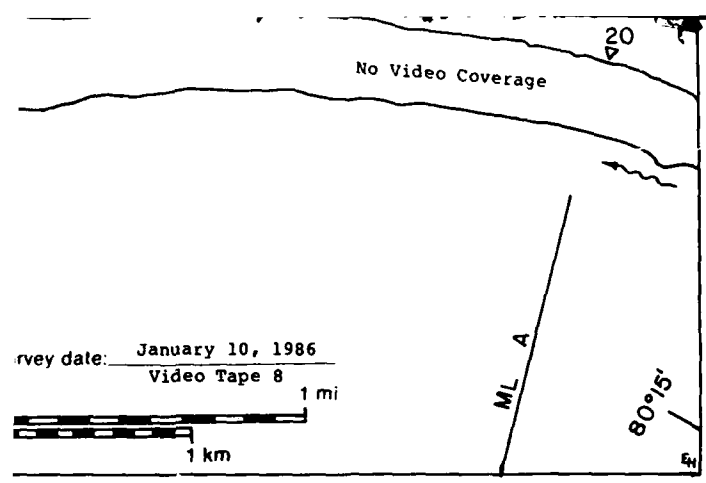


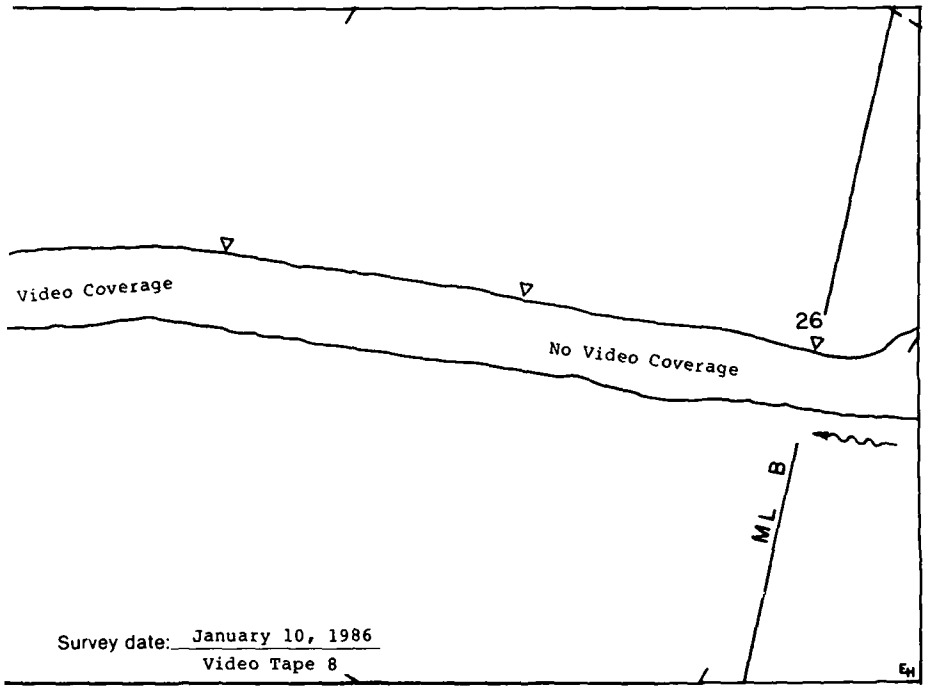


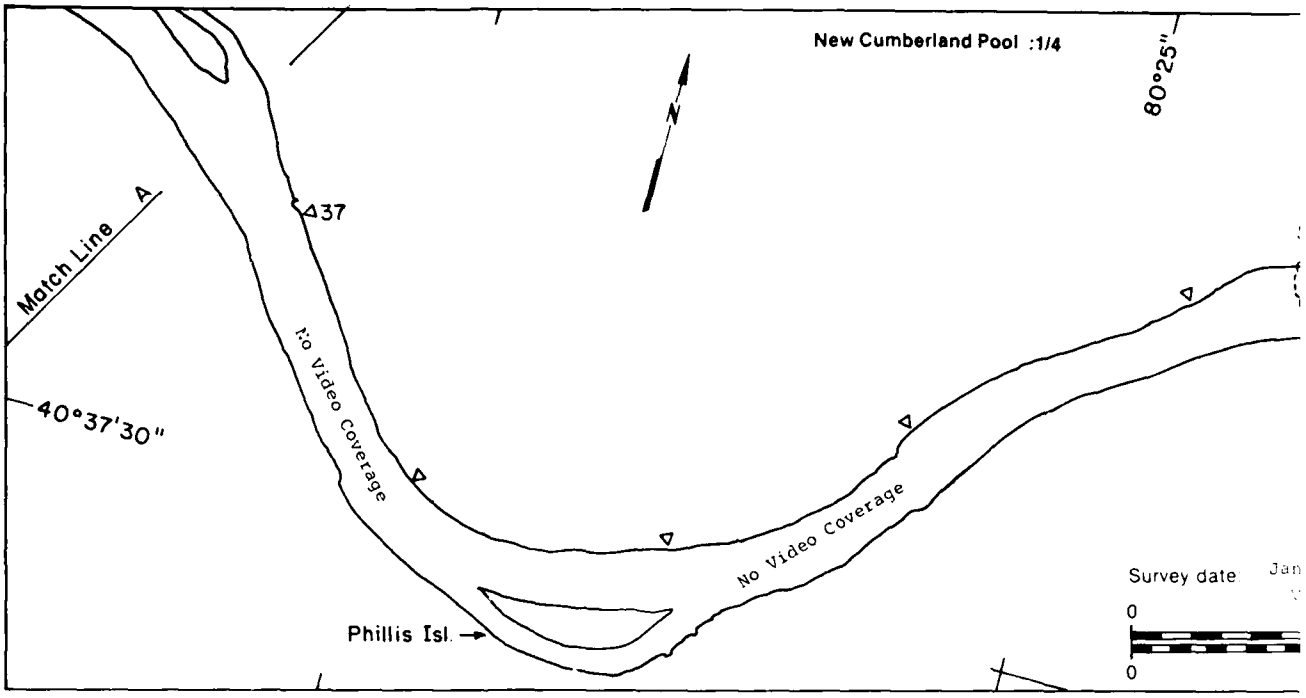
Montgomery Pool

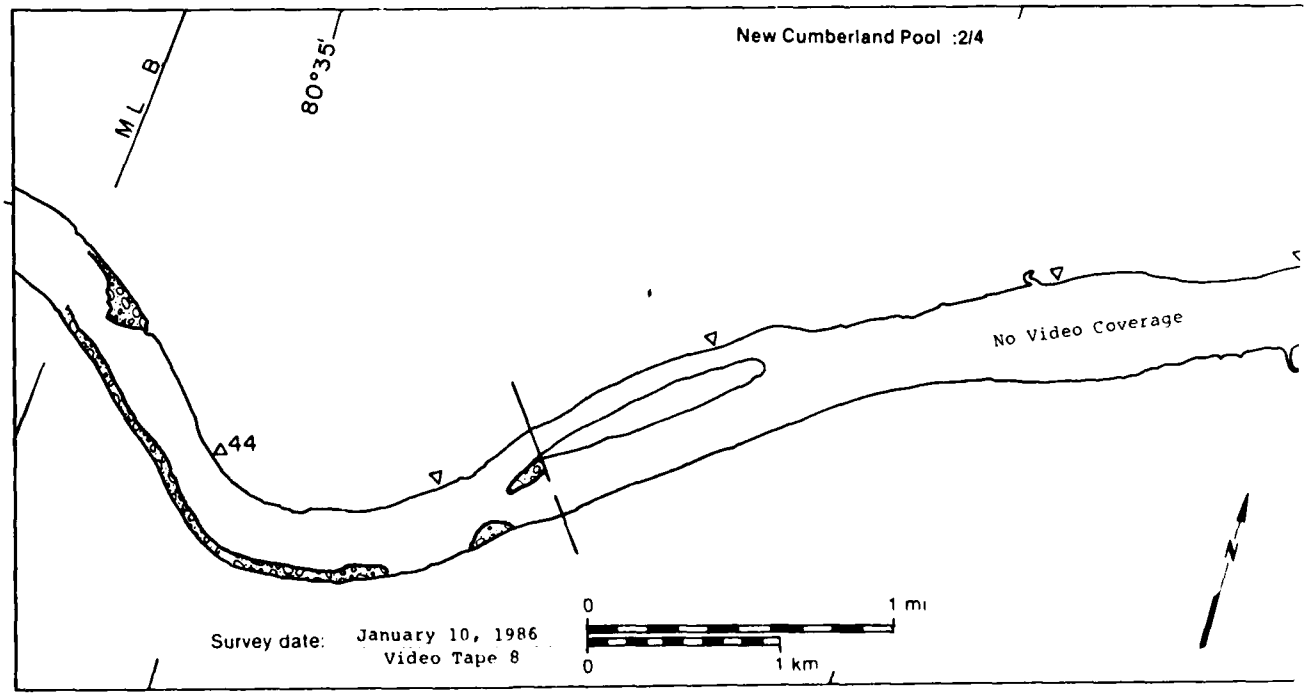
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.27*	

* Includes 11.27×10^6 m^2 of no video coverage

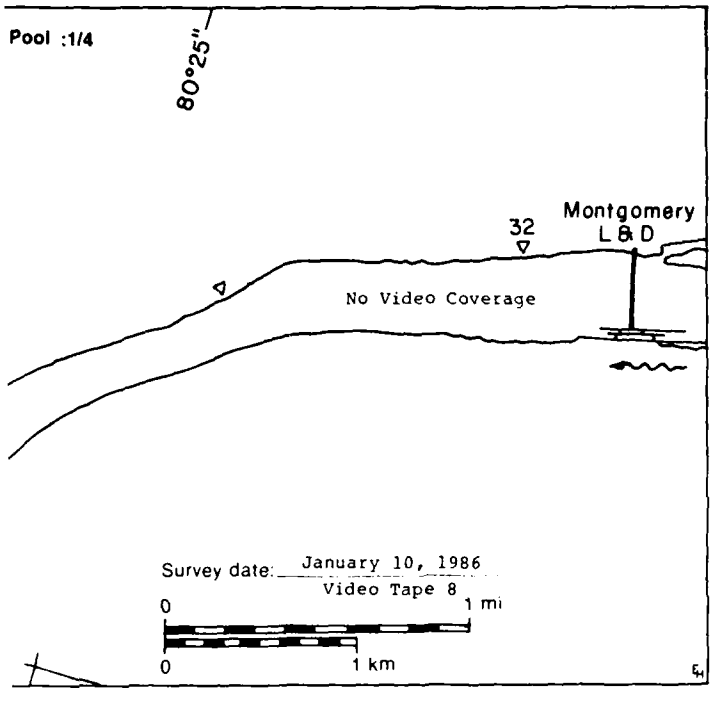

20
No Video Coverage
rvey date: January 10, 1986
Video Tape 8
1 mi
1 km
ML A
80°15'

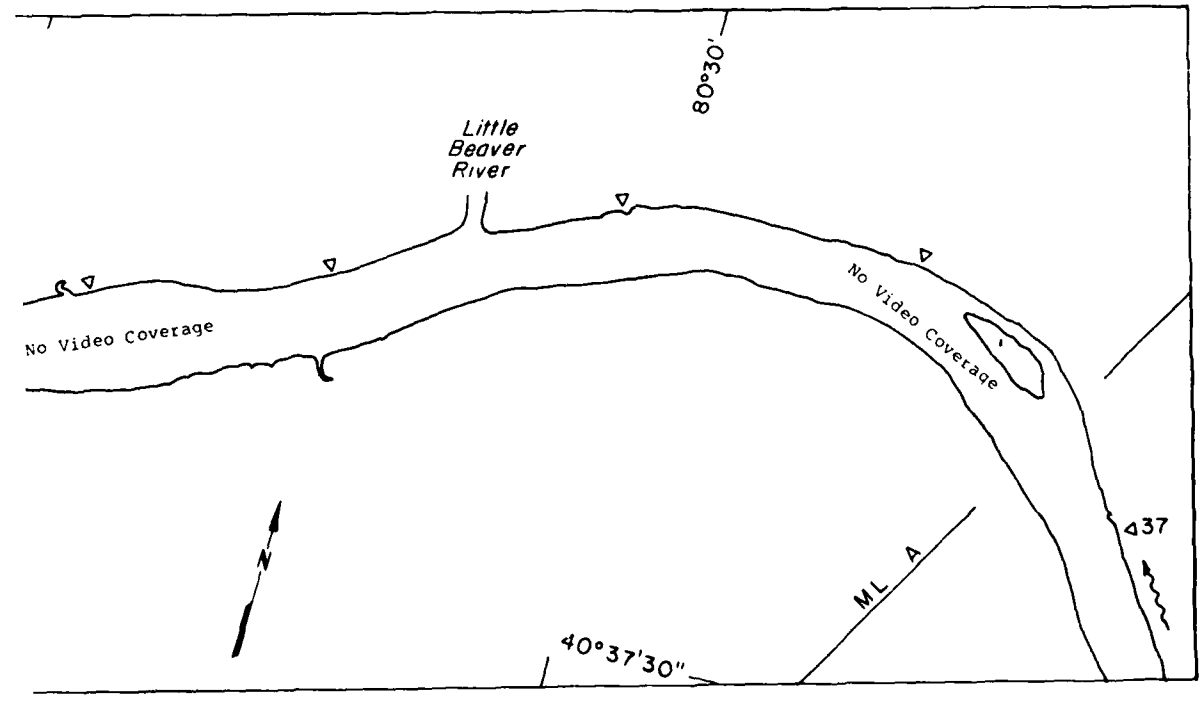

Video Coverage
26
No Video Coverage
ML B
Survey date: January 10, 1986
Video Tape 8

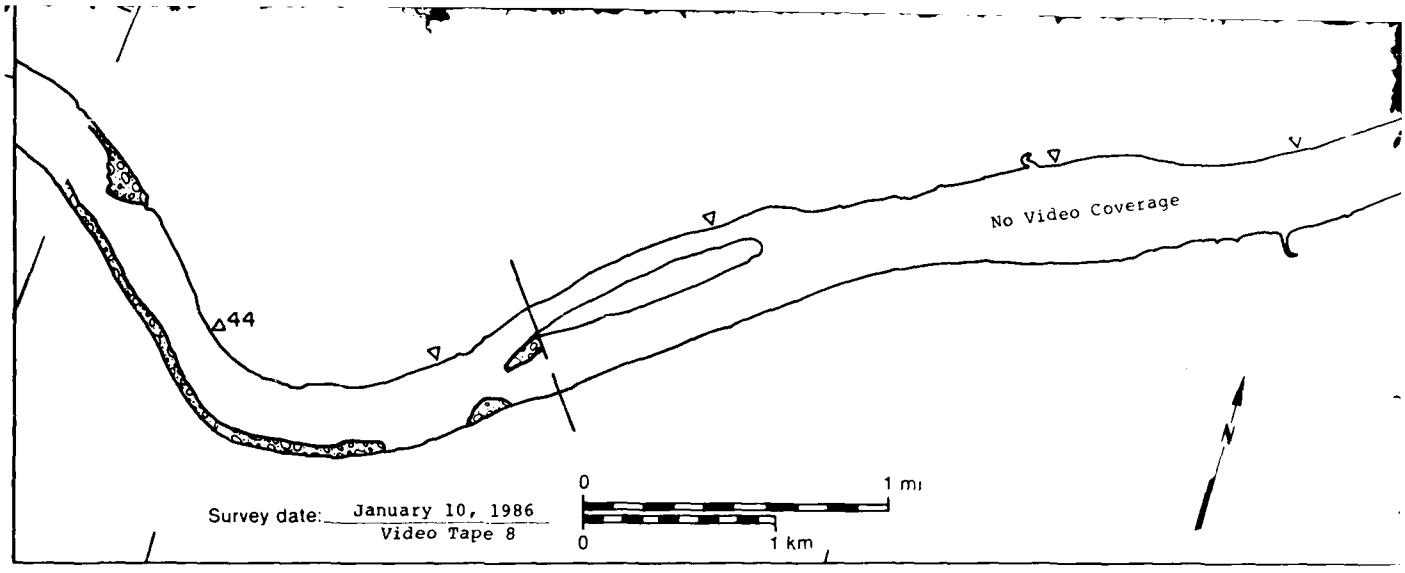

New Cumberland Pool :1/4
80°25"
Match Line A
37
No Video Coverage
40°37'30"
No Video Coverage
Phillis Isl.
Survey date
0
0

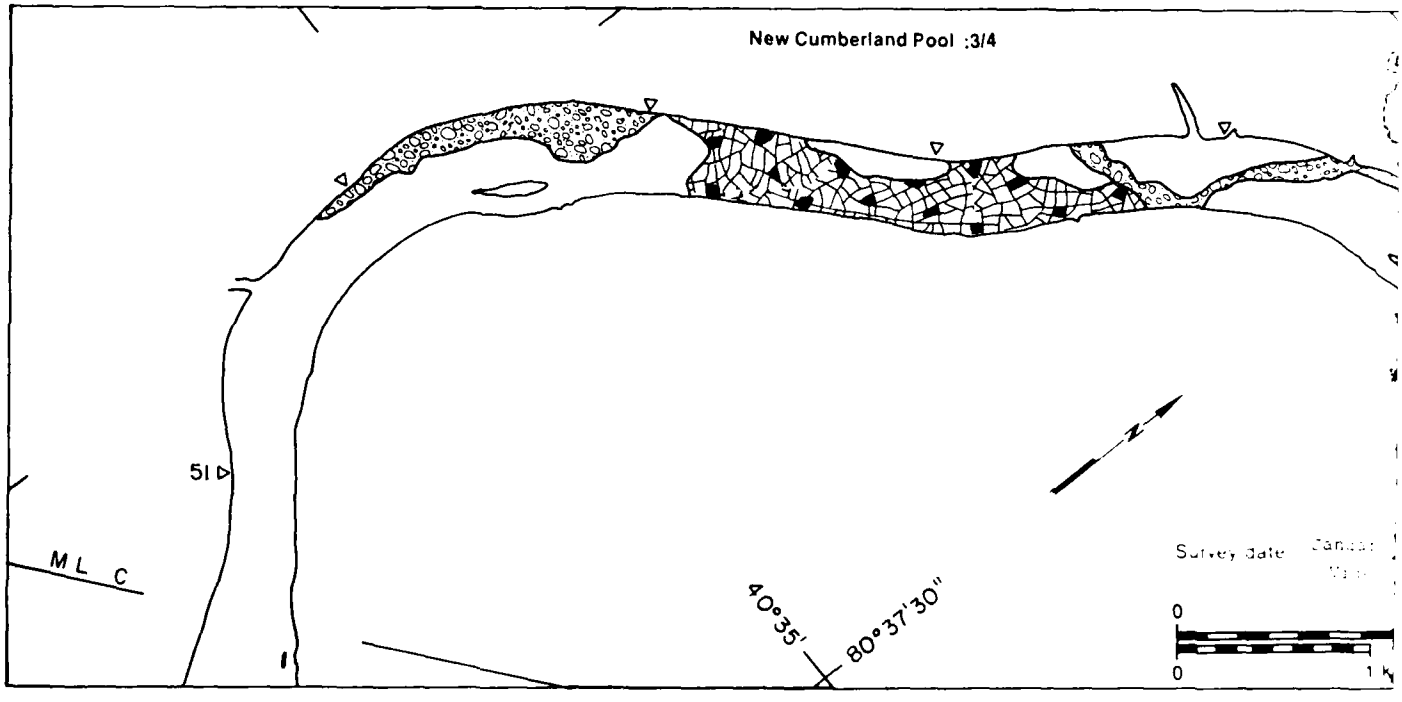

New Cumberland Pool :2/4
80°35'
M L B
No Video Coverage
44
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8

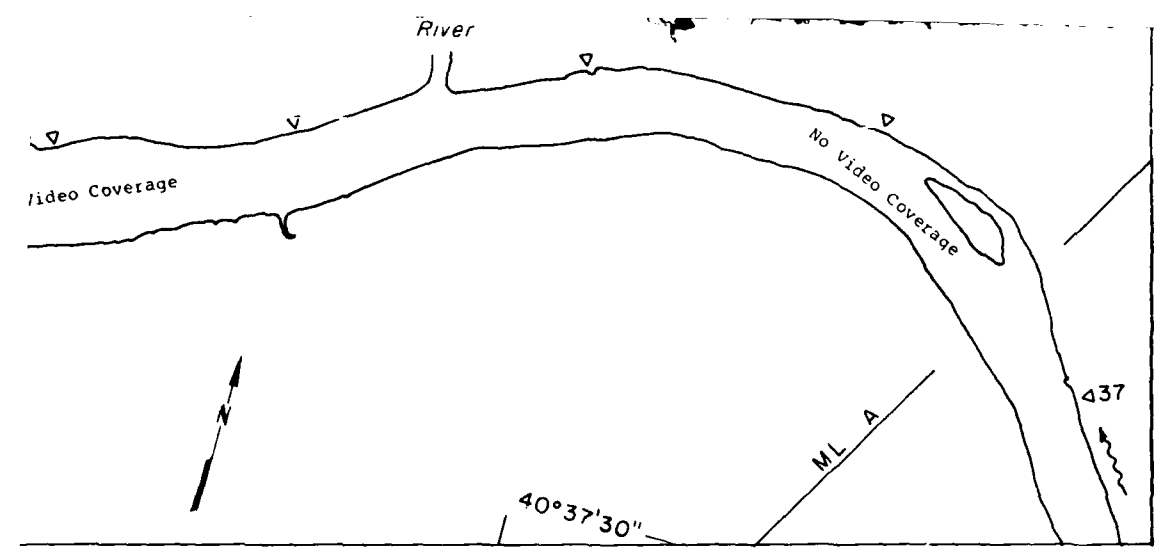
10 January 1986

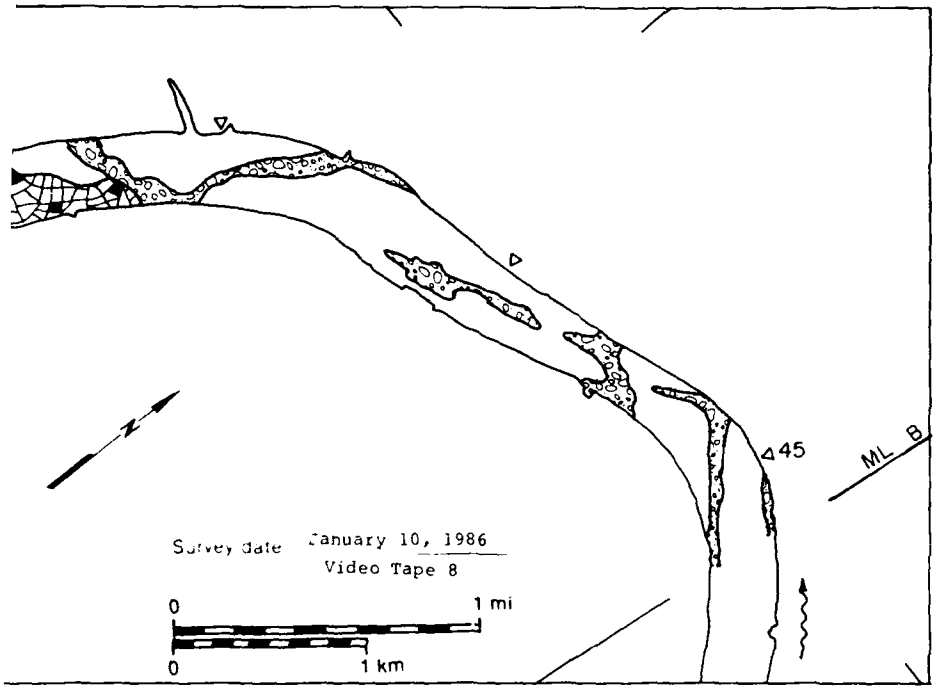





No Video Coverage
44
Survey date: January 10, 1986
Video Tape 8
0
1 mi
0
1 km

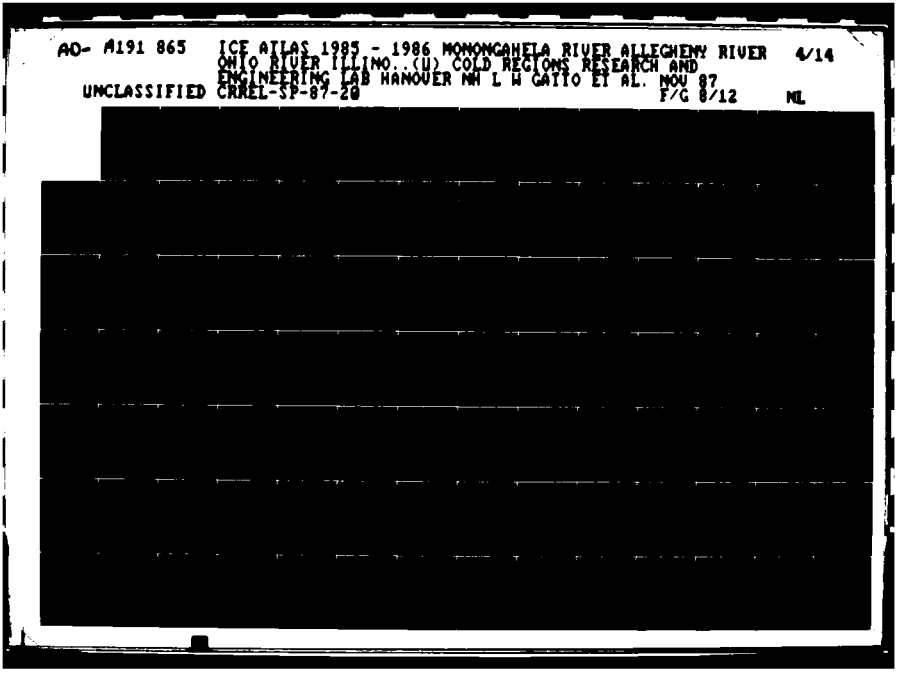

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0

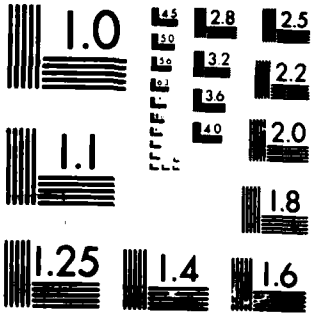

River
Video Coverage
No Video Coverage
N
Δ37
ML A
40°37'30"


N
Δ45
ML B
Survey date January 10, 1986
Video Tape 8
0
1 mi
0
1 km

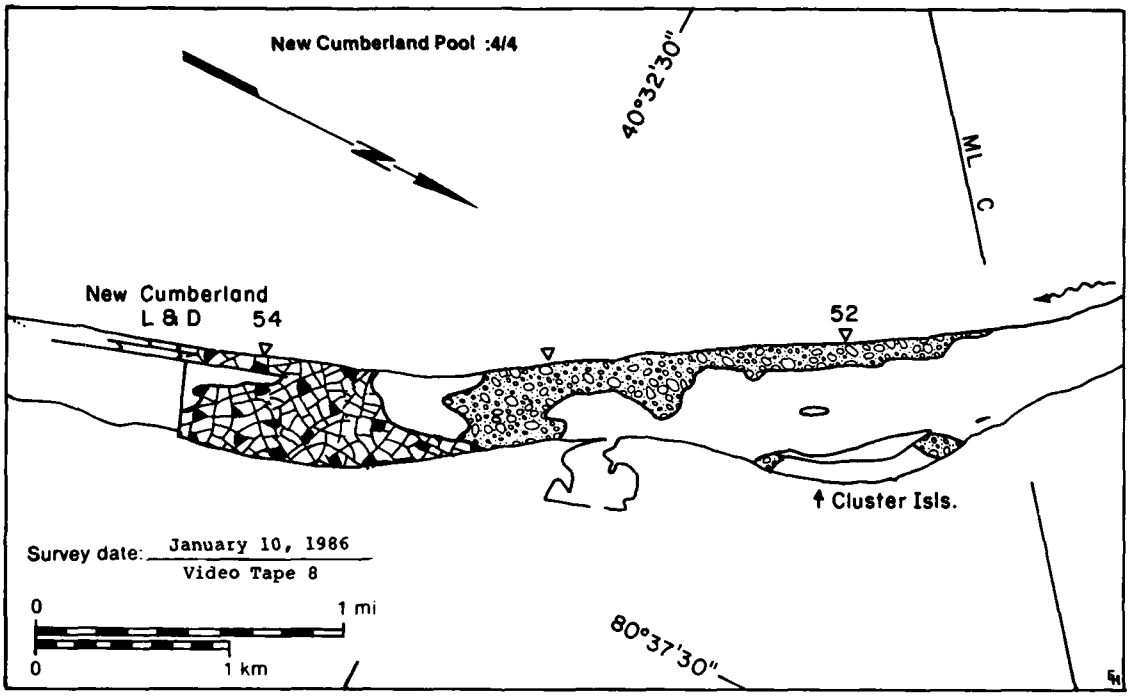
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 4/14

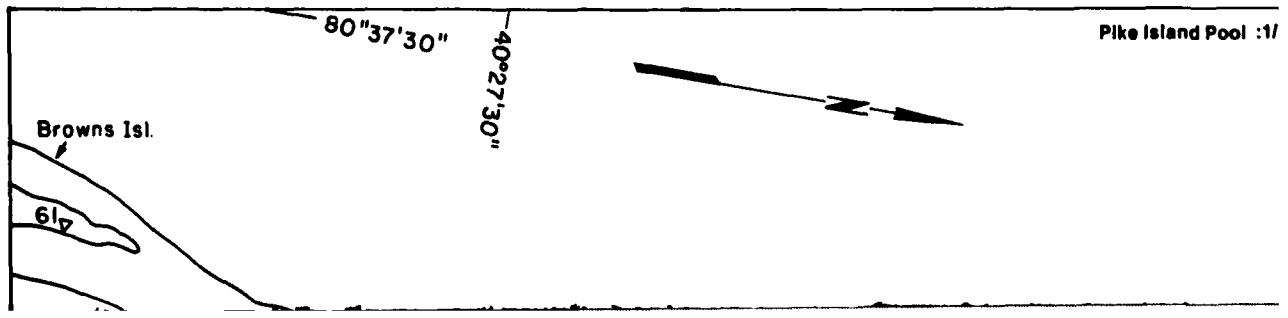
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

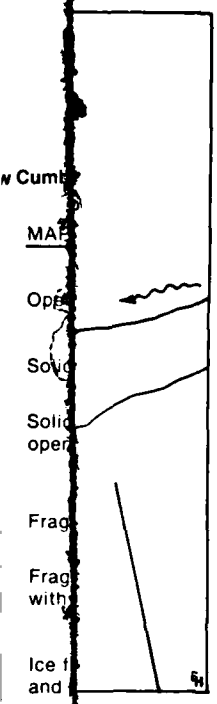



1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
7.1
8.0
9.0
10.0

10 January 1986





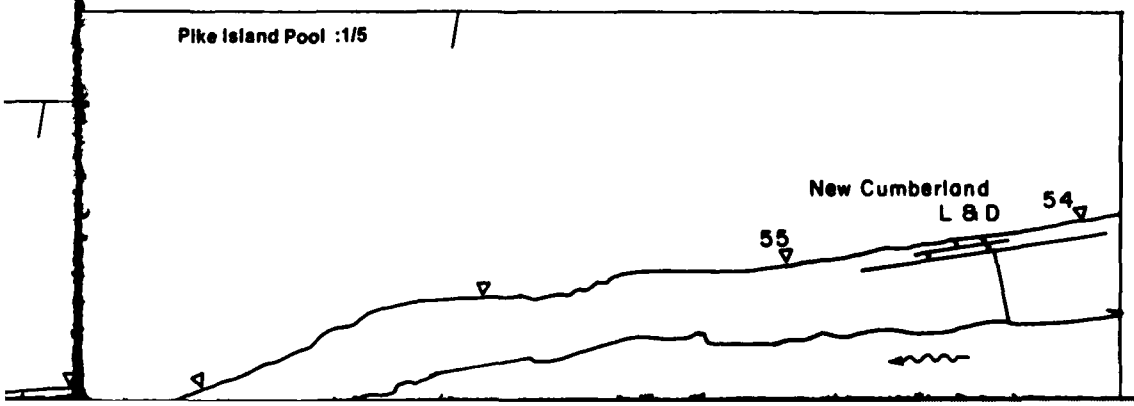


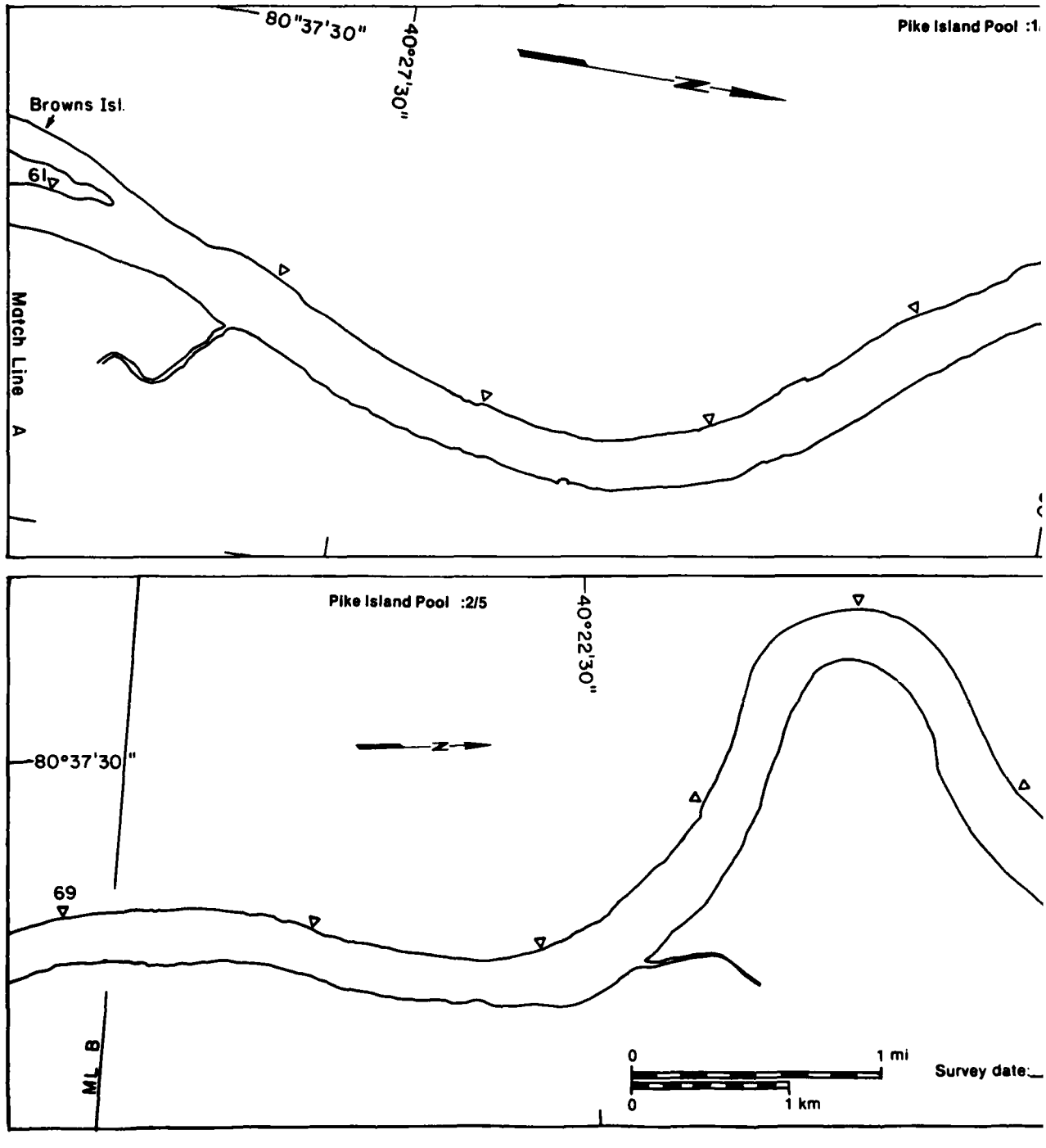
New Cumberland Pool

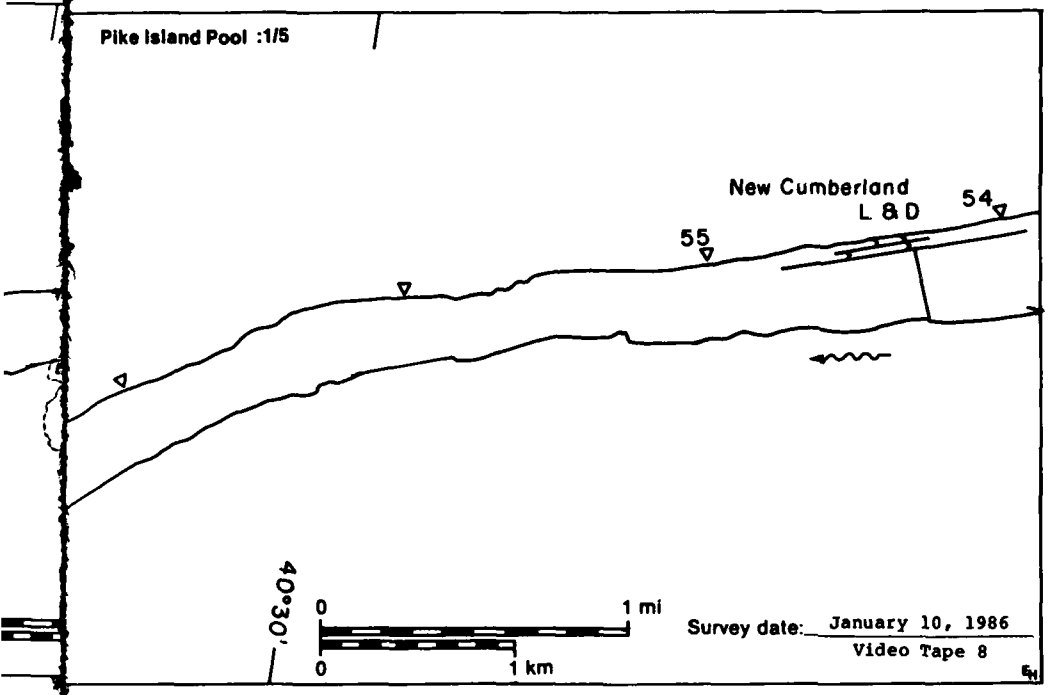
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.37	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	1.32	90
Ice floes or frazil slush and pans	1.43	20
Total area ($m^2 \times 10^6$)	14.87*	

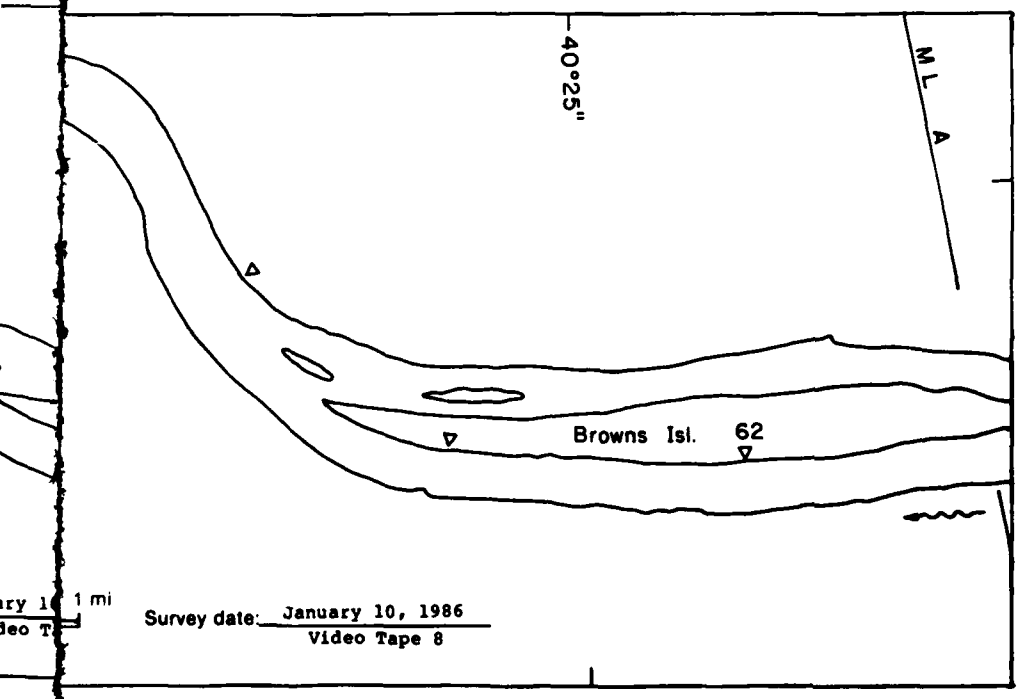
* Includes 6.75×10^6 m^2 of no video coverage

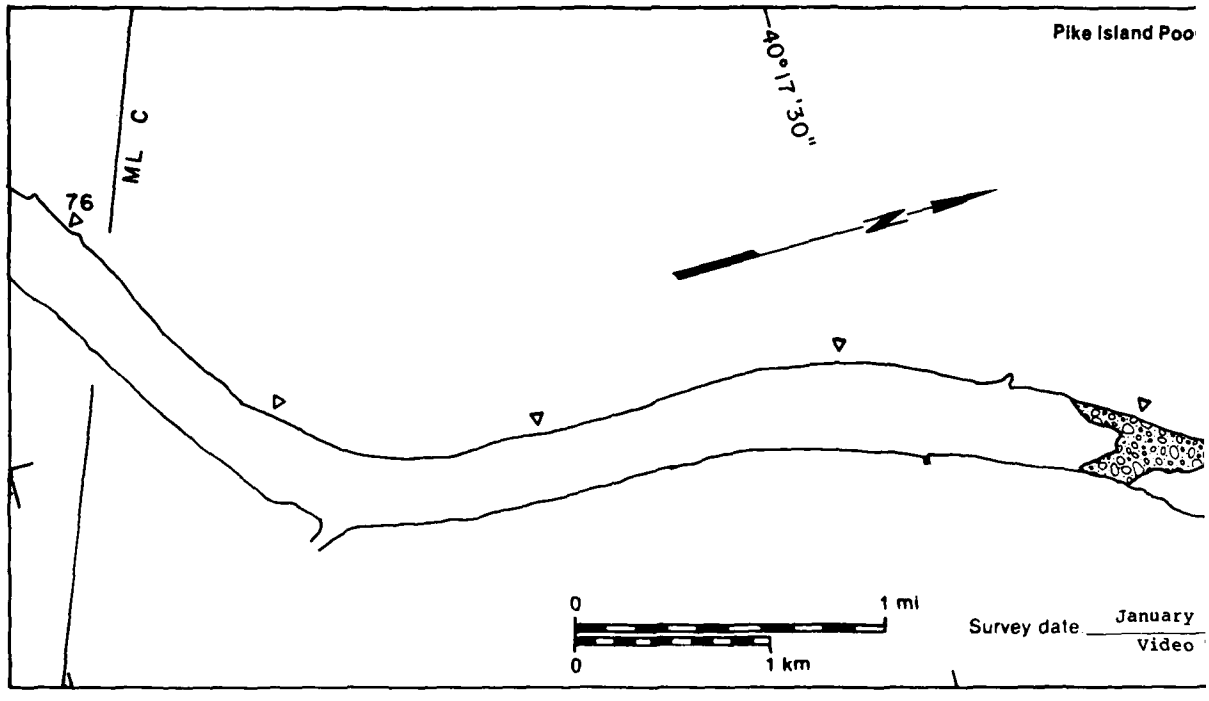
Pike Island Pool :1/5

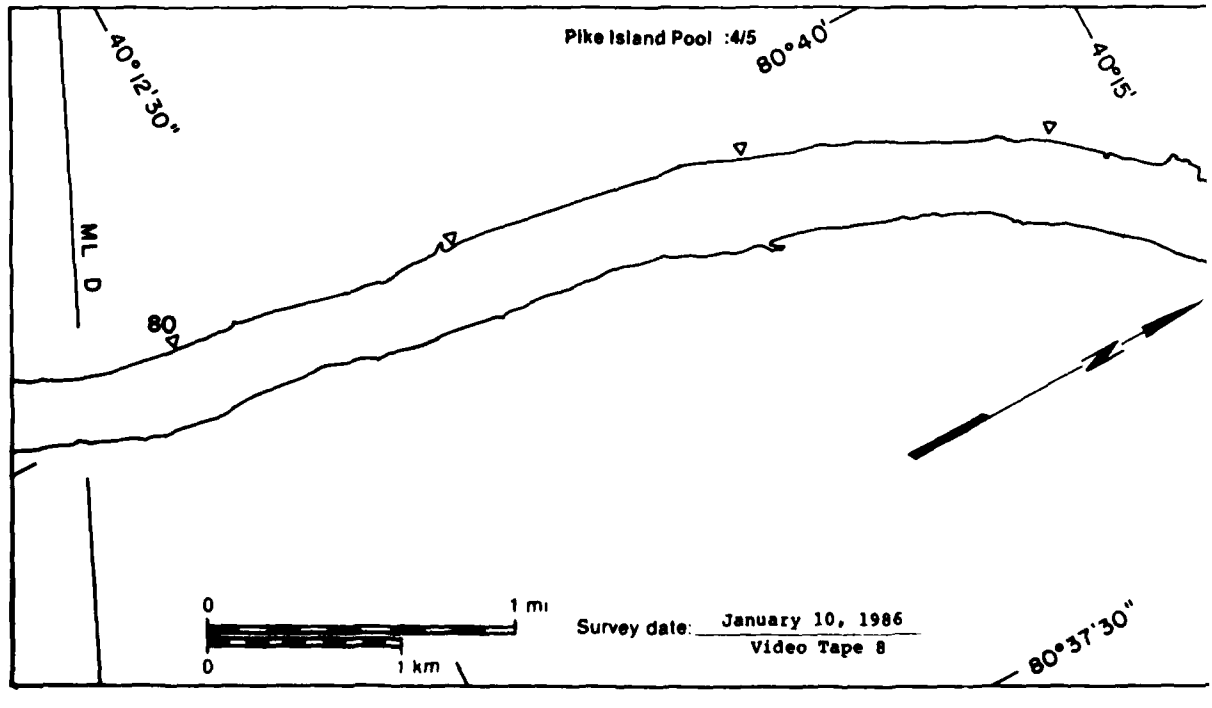



80°37'30"
40°27'30"
Pike Island Pool :1
Browns Isl.
61
Match Line A
Pike Island Pool :2/5
40°22'30"
80°37'30"
69
ML B
0
1 mi
0
1 km
Survey date:


Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8

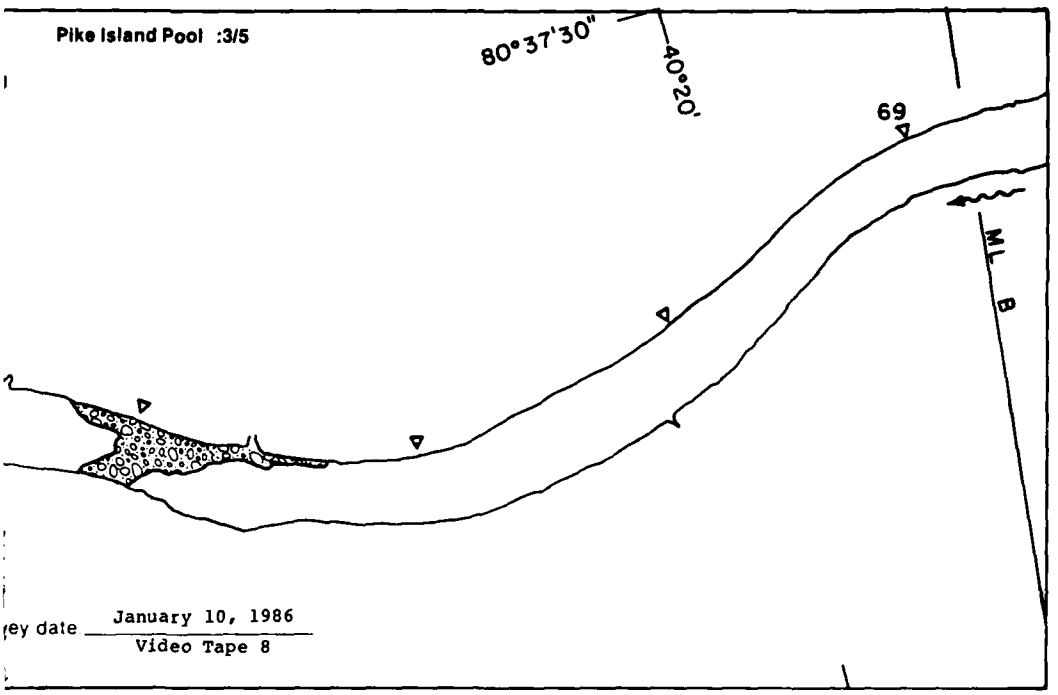

40°25"
M L A
Browns Isl.
62
1 mi
Survey date: January 10, 1986
Video Tape 8

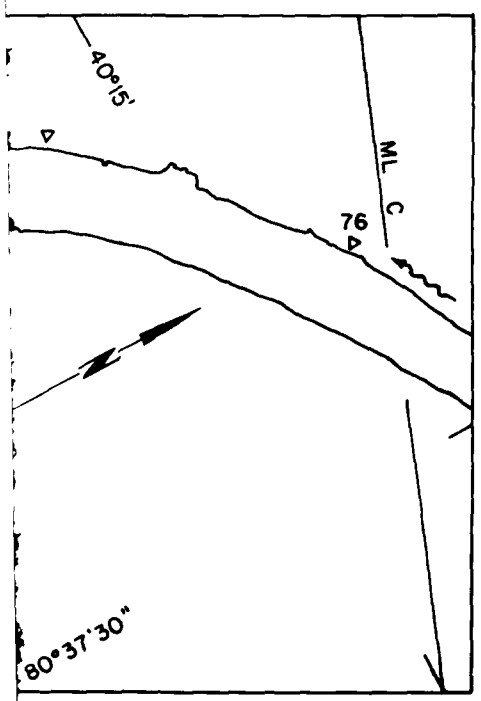

Pike Island Poo
40°17'30"
ML C
76
0
1 mi
0
1 km
Survey date: January
Video

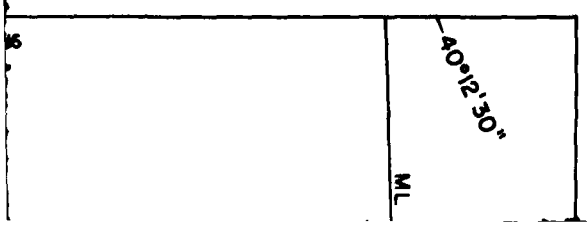

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8
80°37'30"

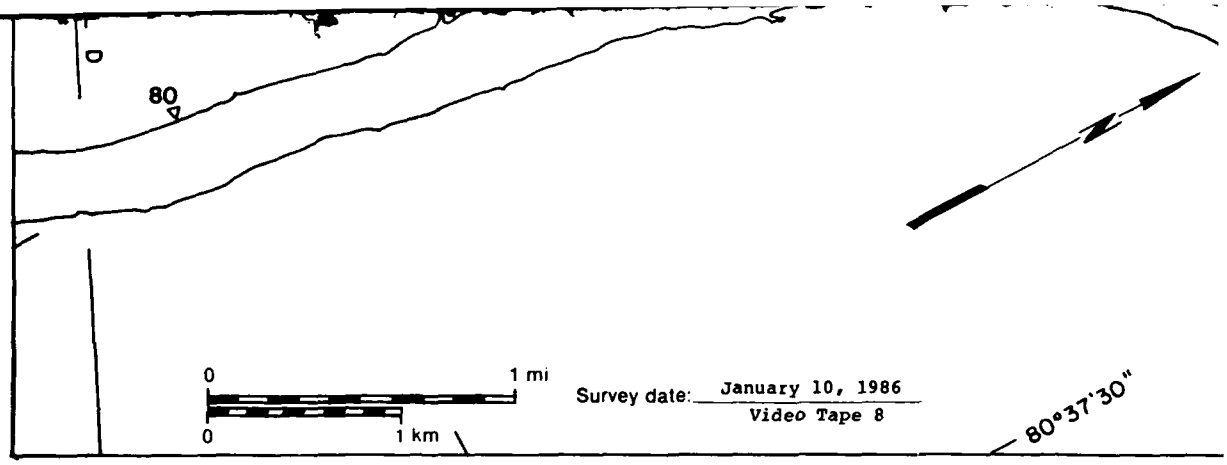
Pike Island Pool :5/5
40°1

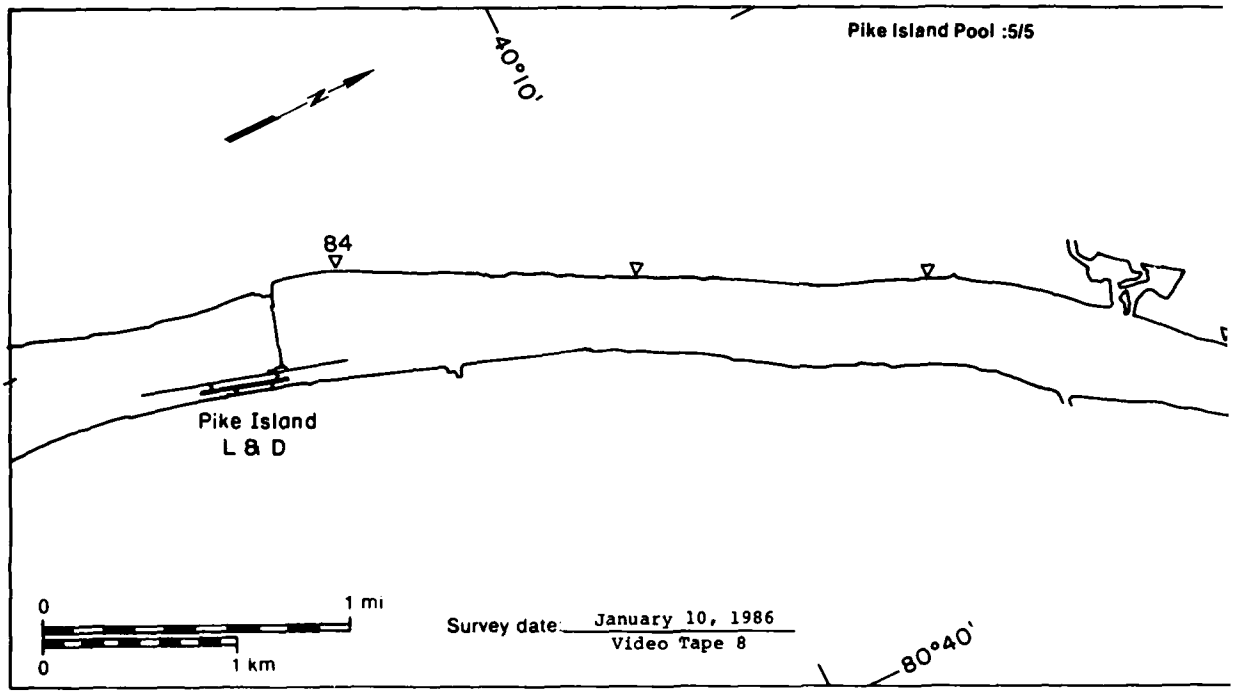
10 January 1986







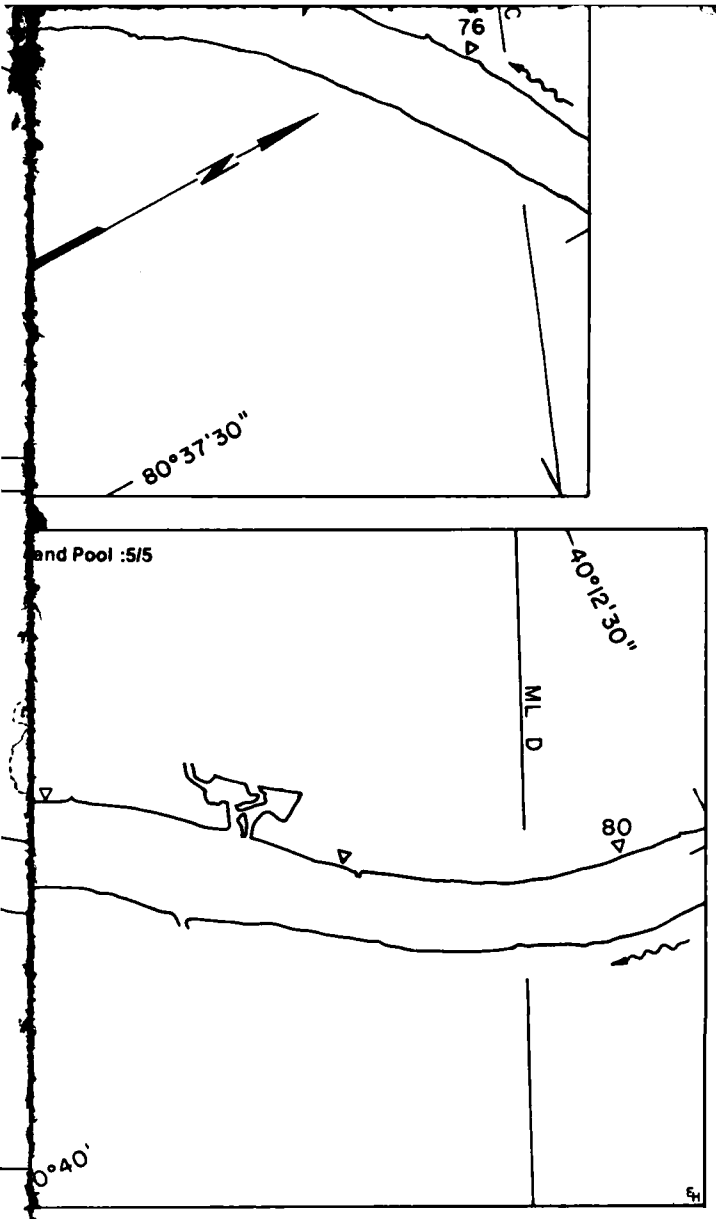




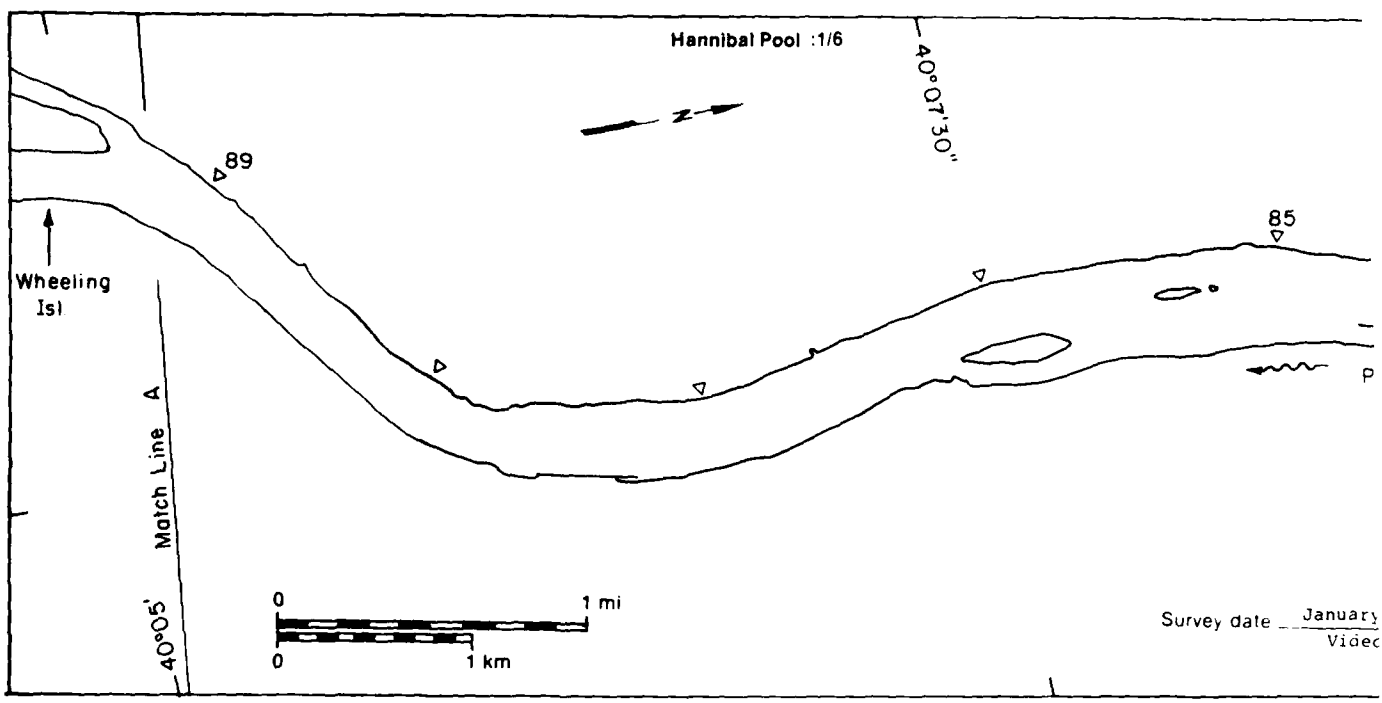
Pike Island Pool

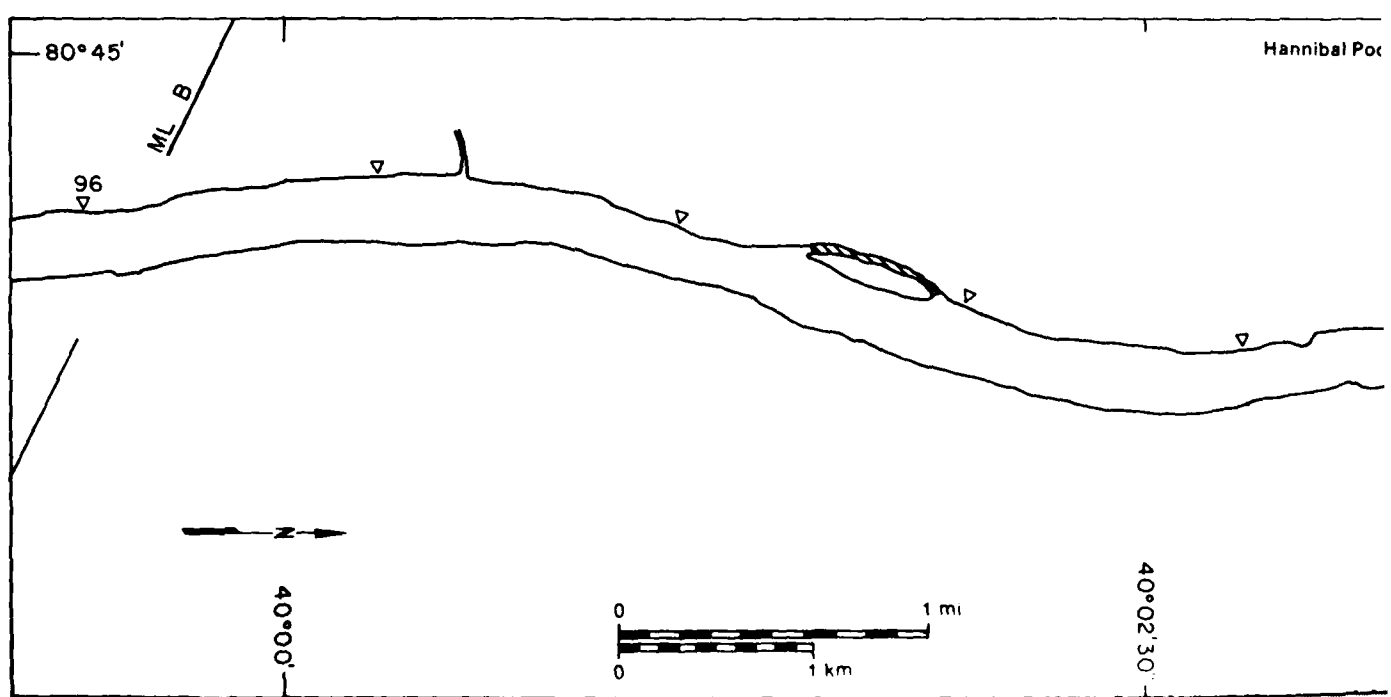
MAP UNITS

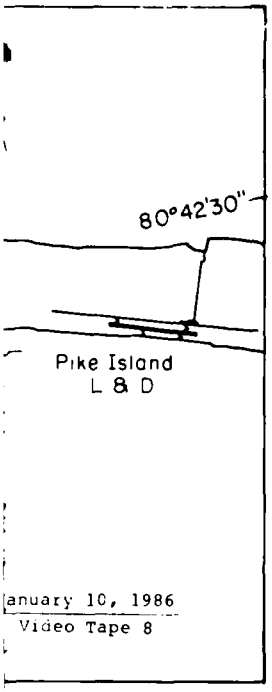
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	18.74	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.18	10
Total area ($m^2 \times 10^6$)	18.92	

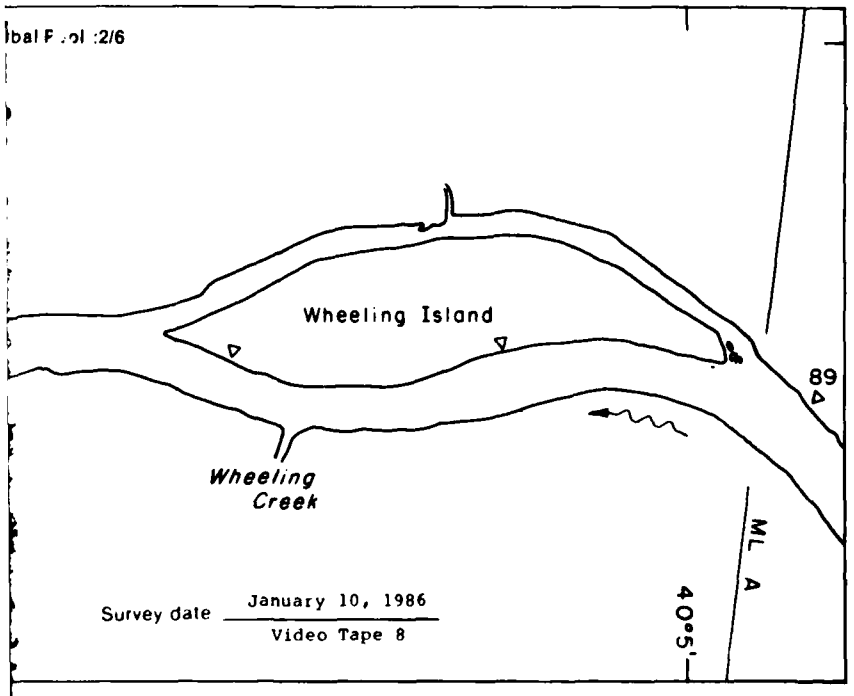

76
80°37'30"
and Pool :5/5
40°12'30"
ML D
80
0°40'

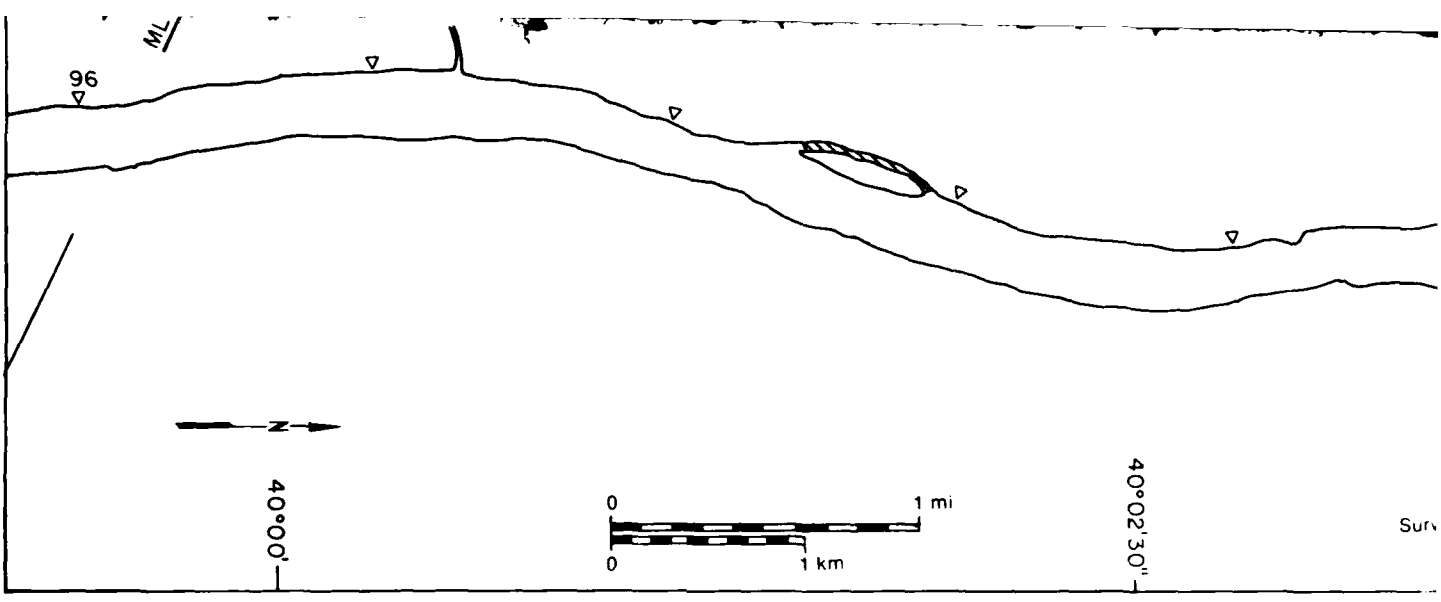
10 January 1986

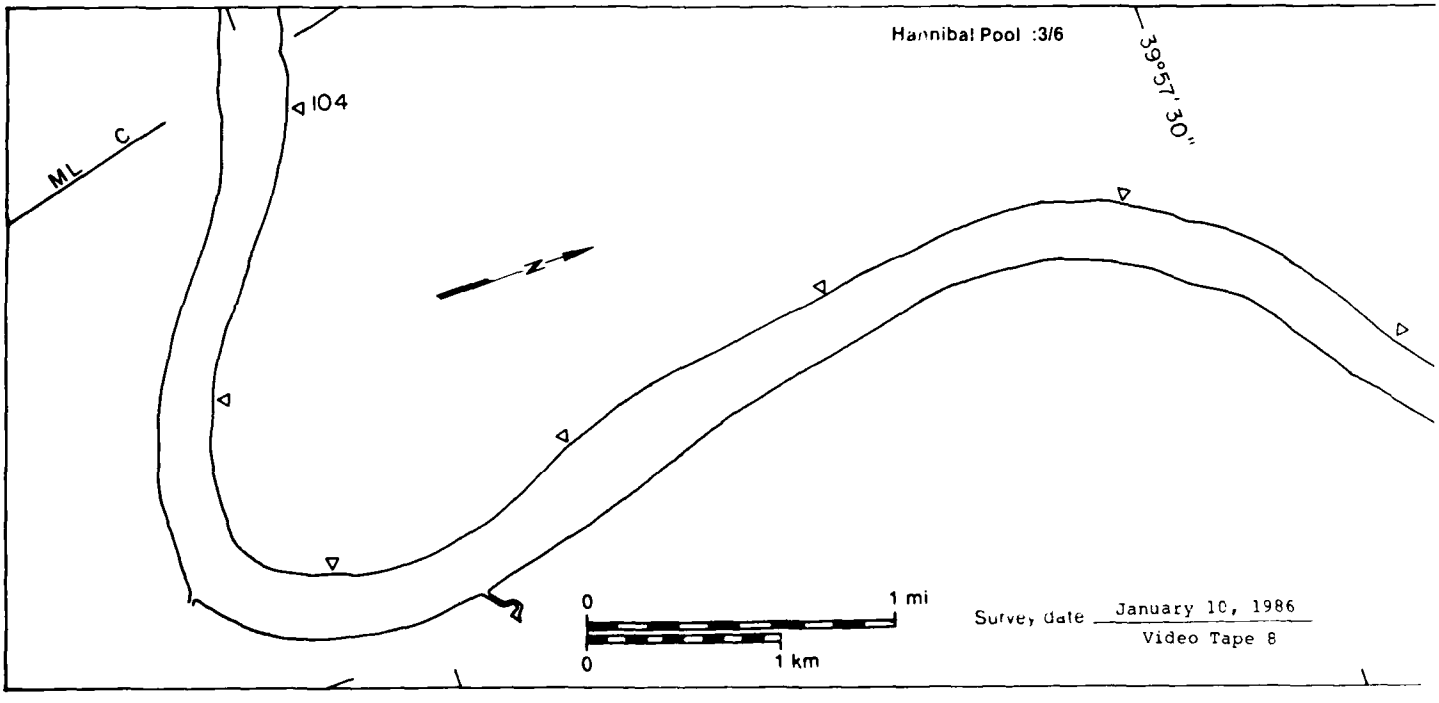


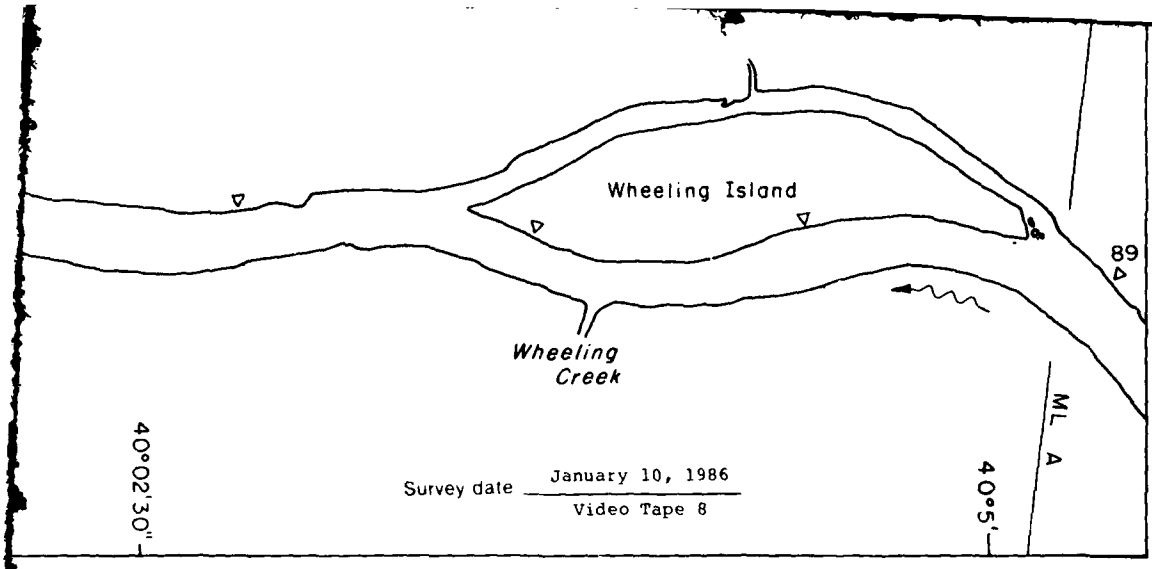


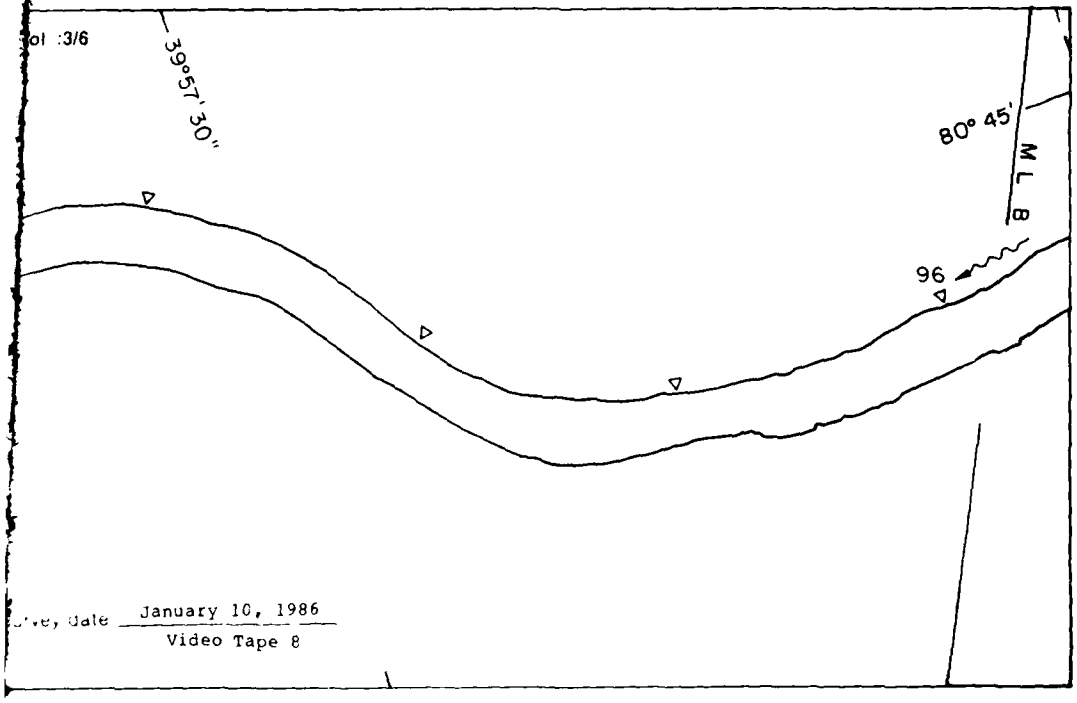

80°42'30"
Pike Island
L & D
anuary 10, 1986
Video Tape 8

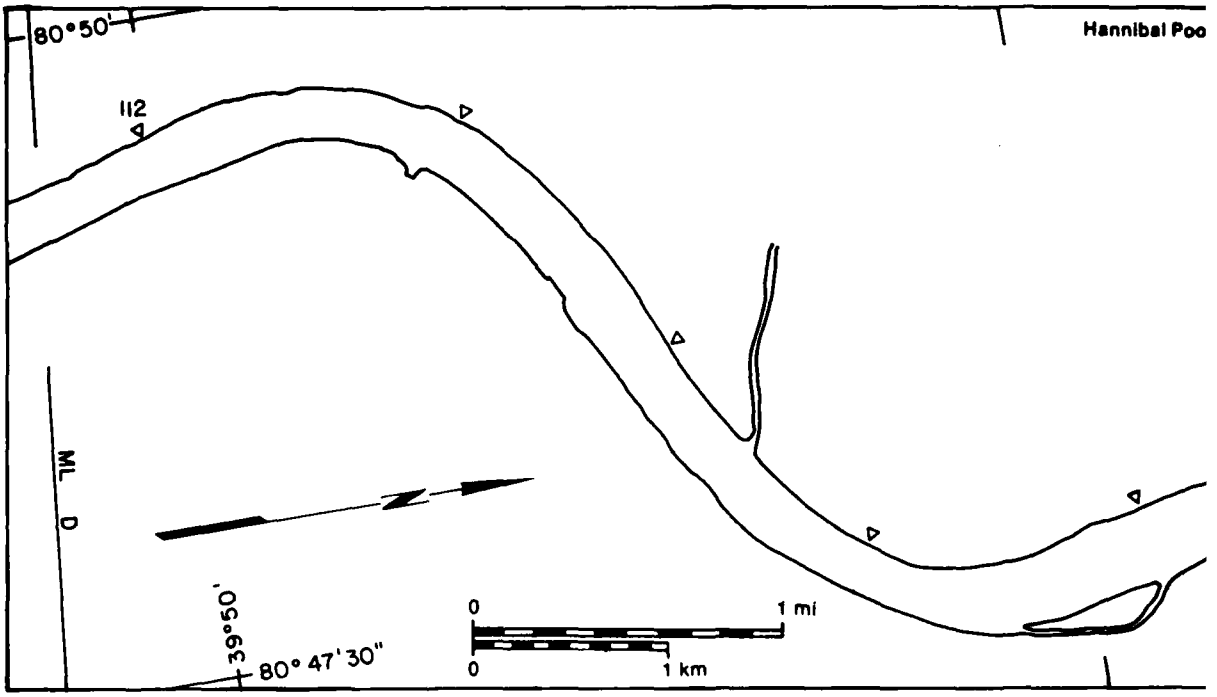

bal F ol :2/6
Wheeling Island
89
Wheeling
Creek
ML A
40°5'
Survey date January 10, 1986
Video Tape 8

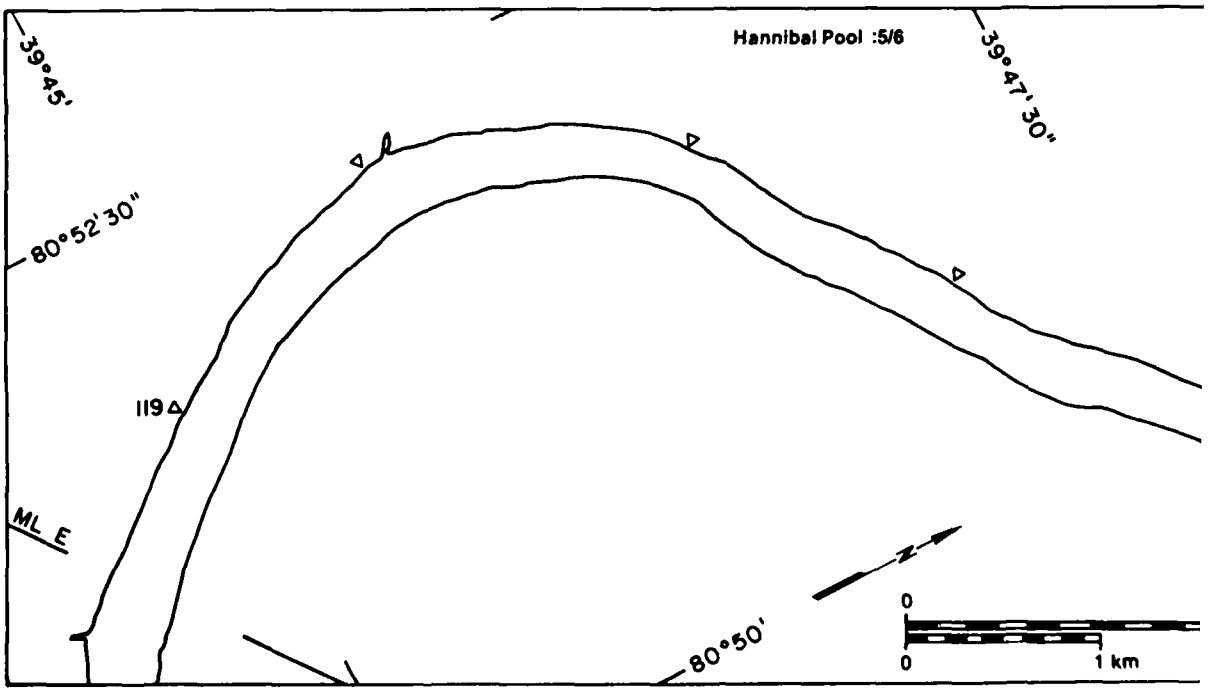

ML
96
N
40°00'
0
1 mi
0
1 km
40°02'30"

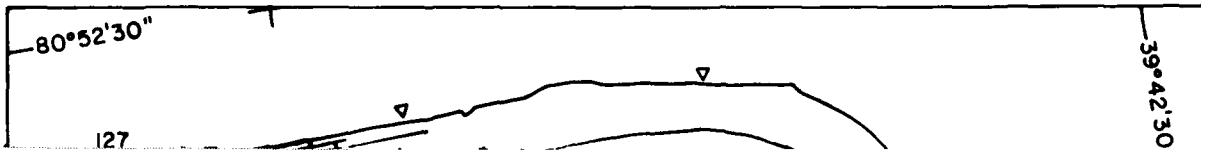

Hannibal Pool :3/6
39°57'30"
104
ML
C
N
0
1 mi
0
1 km
Survey date January 10, 1986
Video Tape 8


Wheeling Island
89
Wheeling
Creek
40°02'30"
ML A
40°5'
Survey date January 10, 1986
Video Tape 8

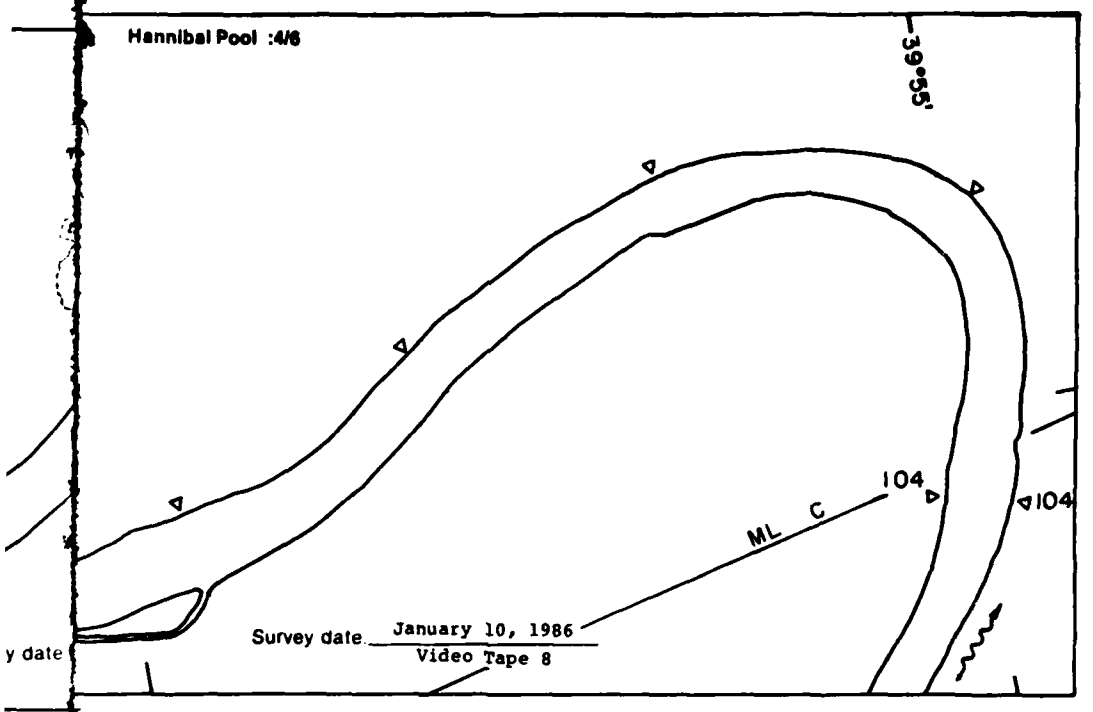

39°57'30"
80° 45'
ML B
96
Survey date January 10, 1986
Video Tape 8

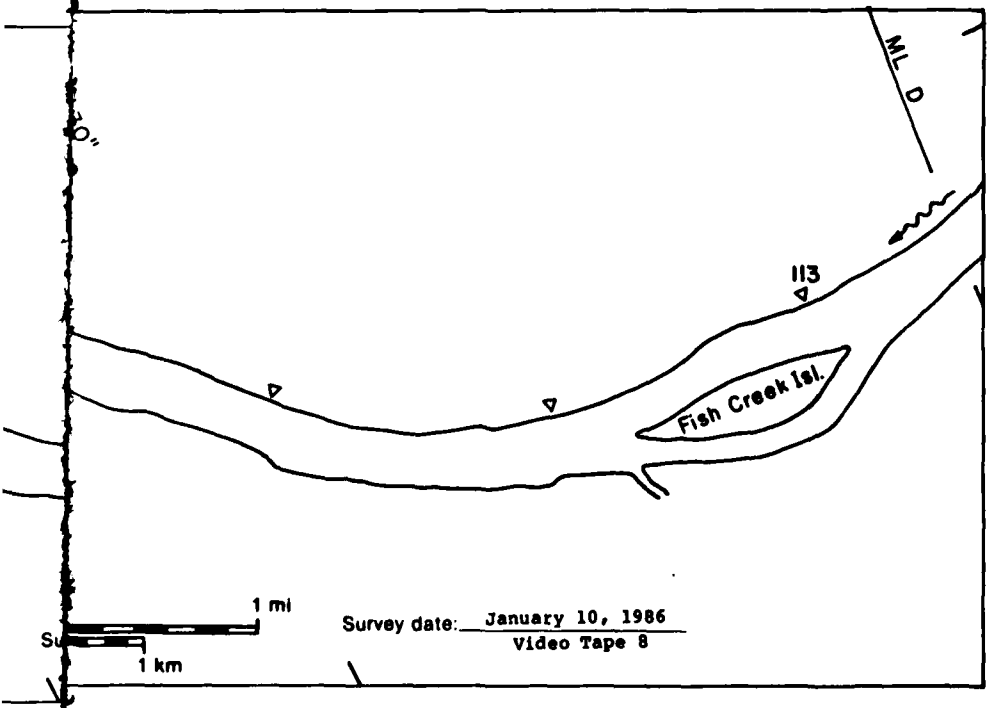

80°50'
Hannibal Poo
112
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km

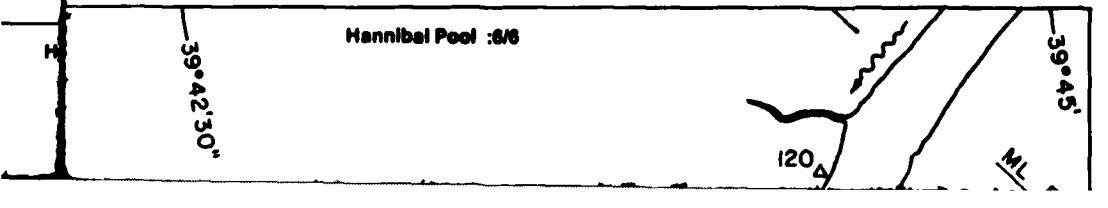

Hannibal Pool :5/6
39°45'
39°47' 30"
80°52'30"
119
ML E
80°50'
0
0
1 km

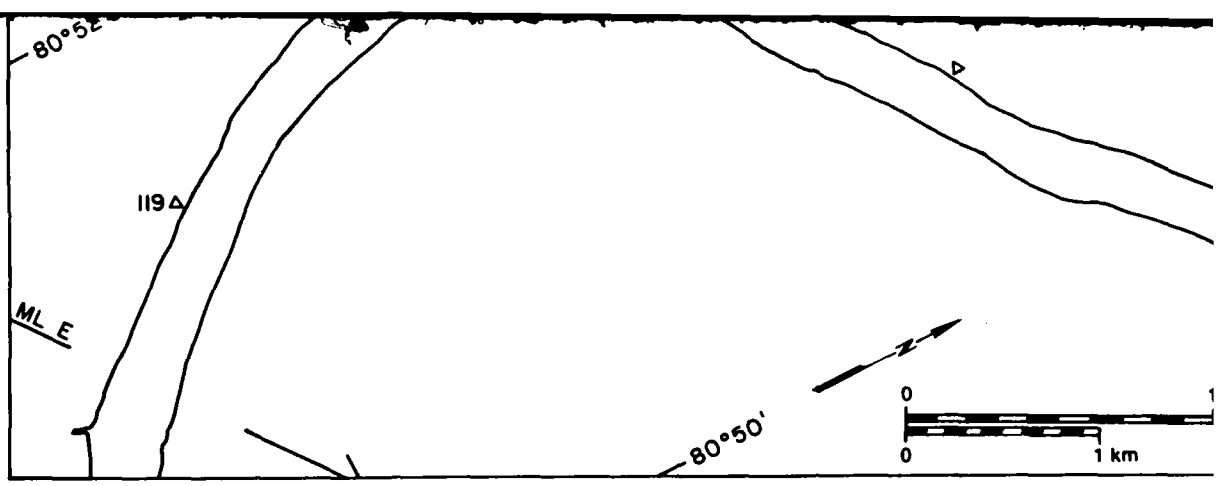

80°52'30"
39°42'30
127

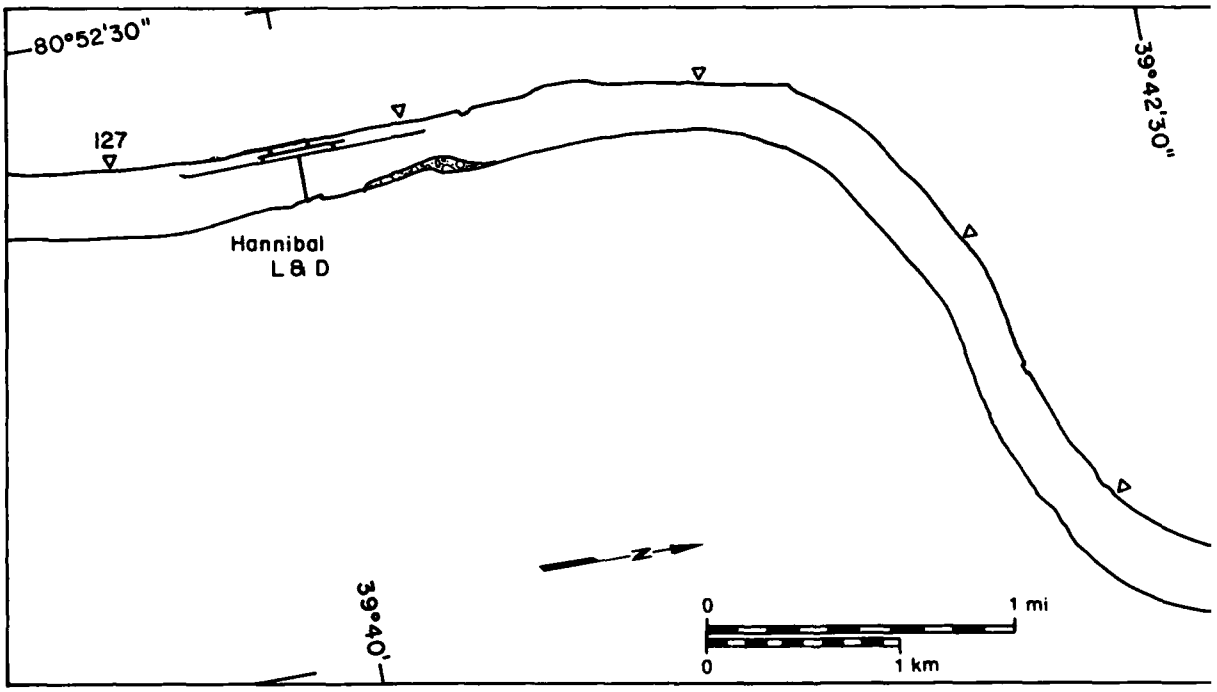
10 January 1986





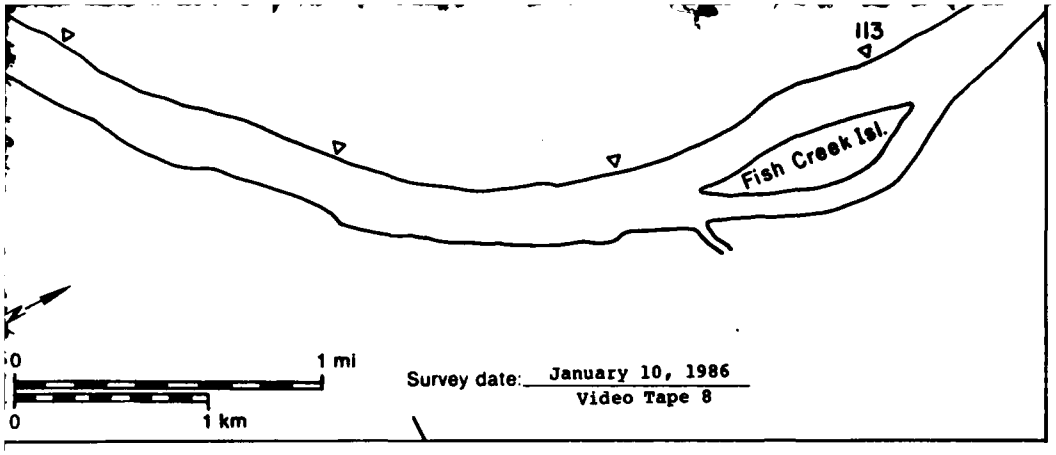


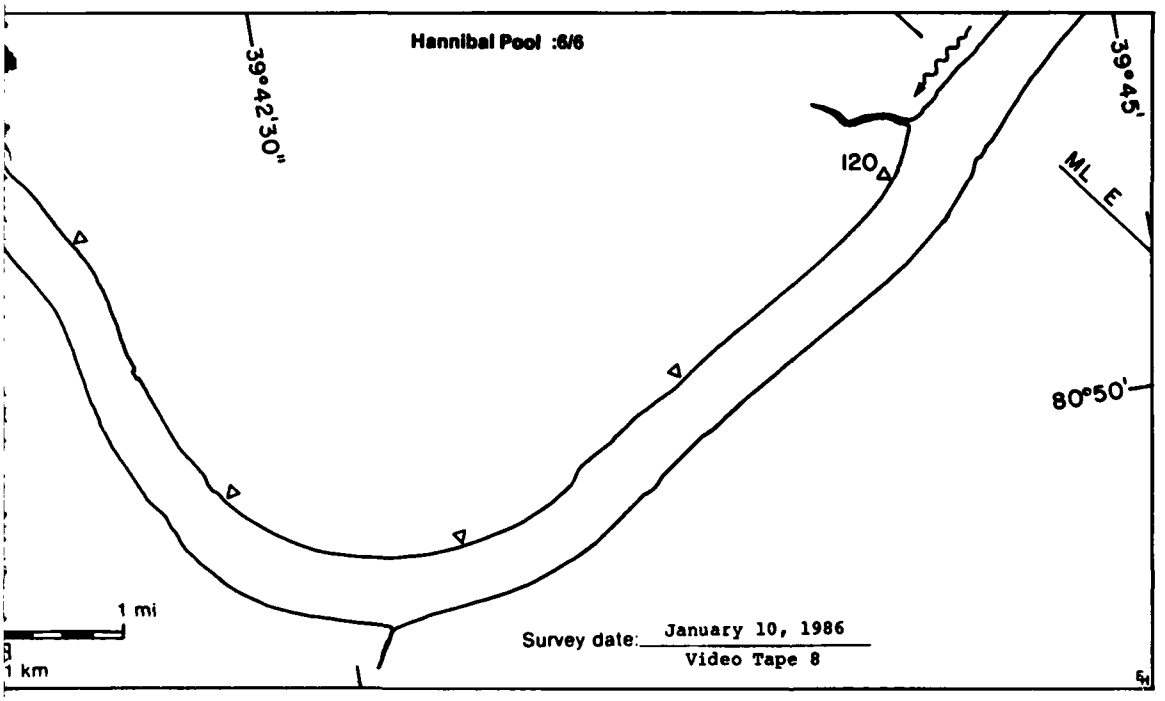


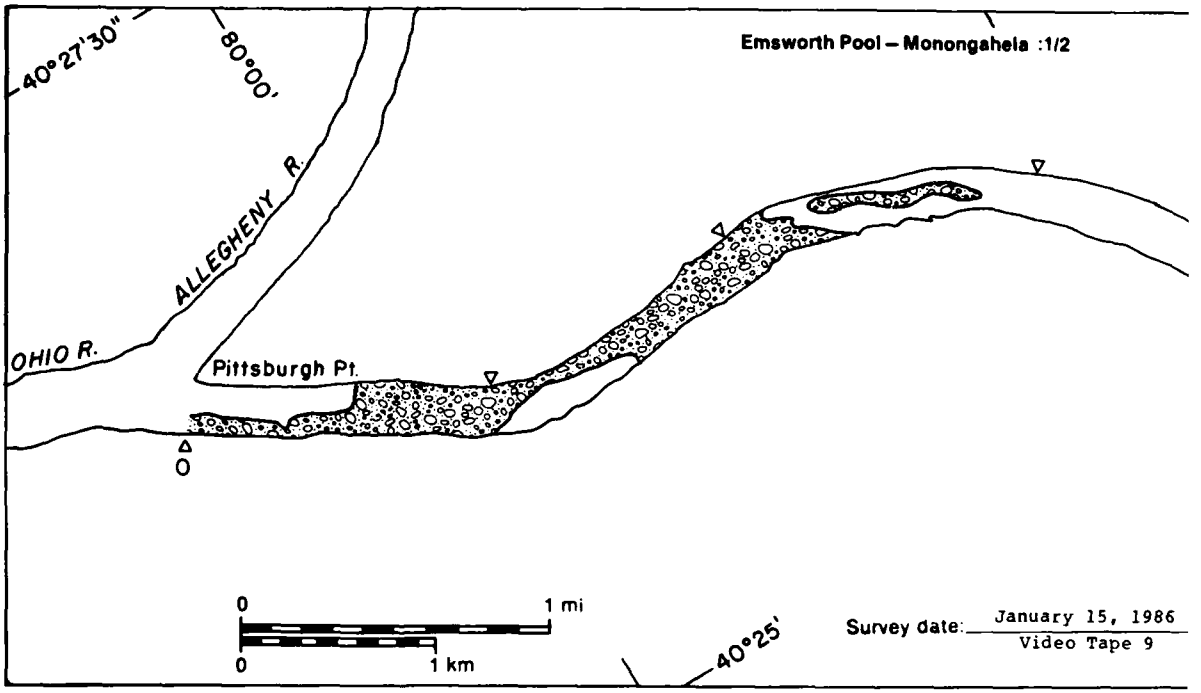


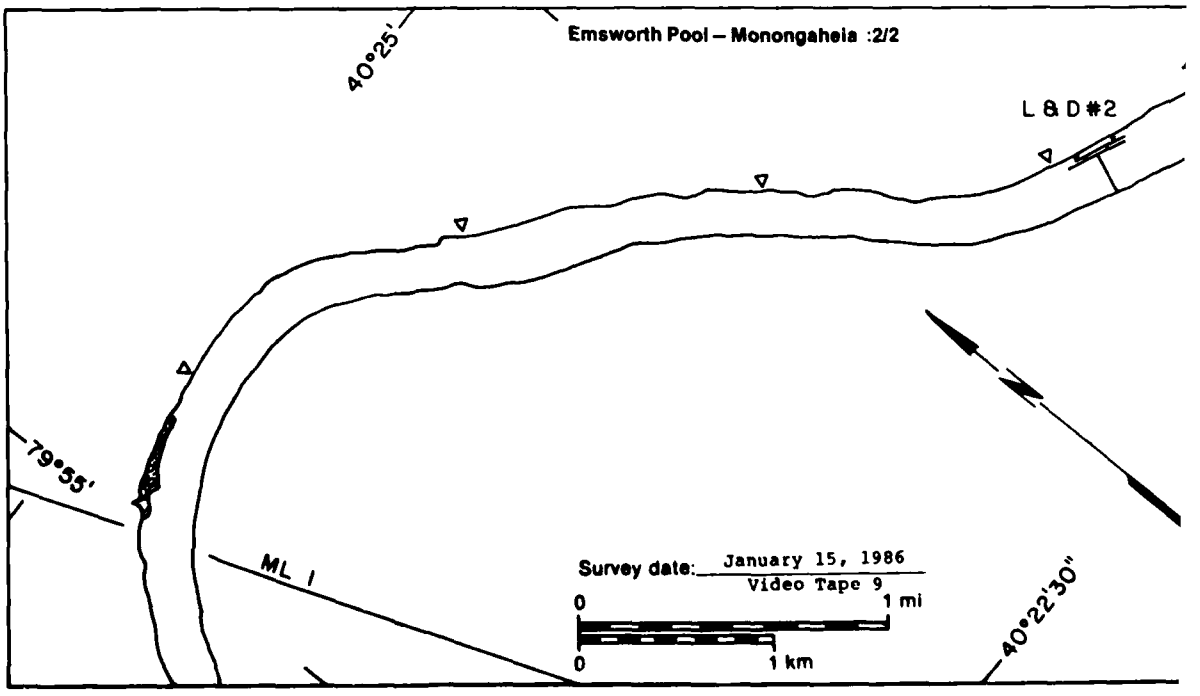
Hannibal Pool

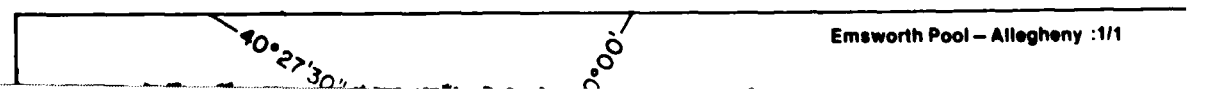
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	22.38	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.04	40
Total area (m^2 x 10^6)	22.46	


113
Fish Creek Isl.
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 8

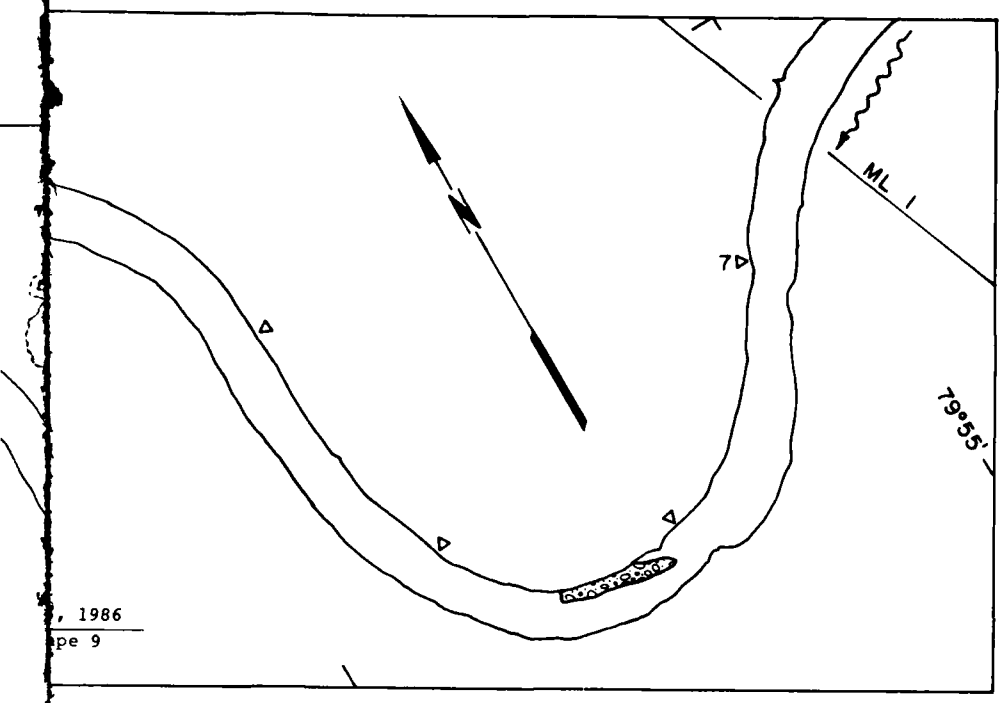

Hannibal Pool :6/6
39°42'30"
120
39°45'
ML E
80°50'
1 mi
1 km
Survey date: January 10, 1986
Video Tape 8


Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: January 15, 1986
Video Tape 9

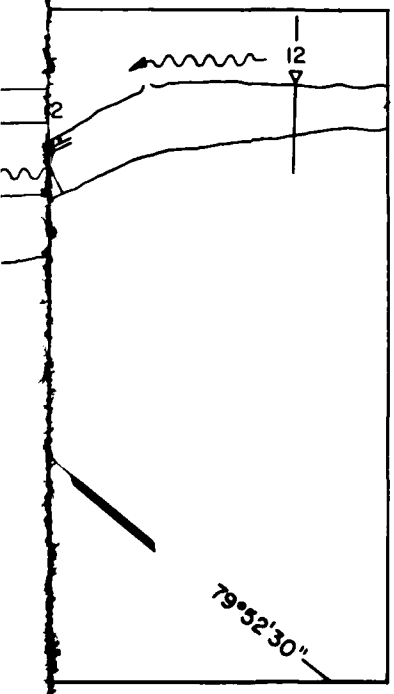

Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 15, 1986
Video Tape 9
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"

15 January 1986

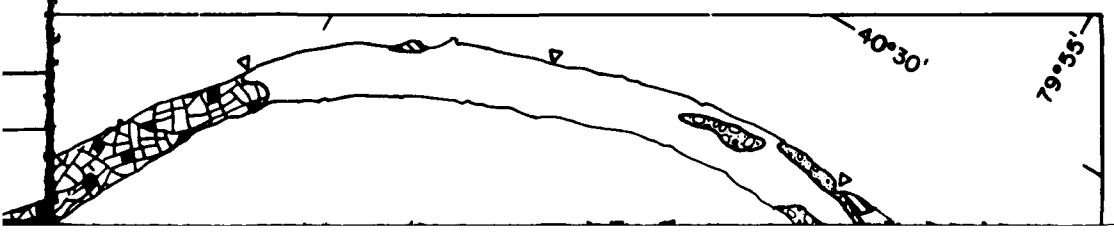


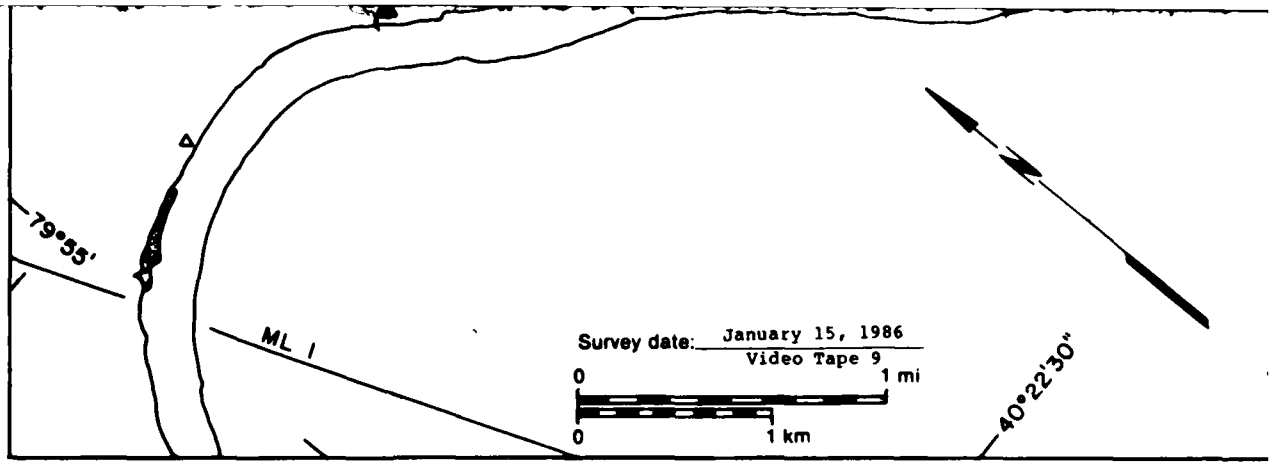
, 1986
pe 9

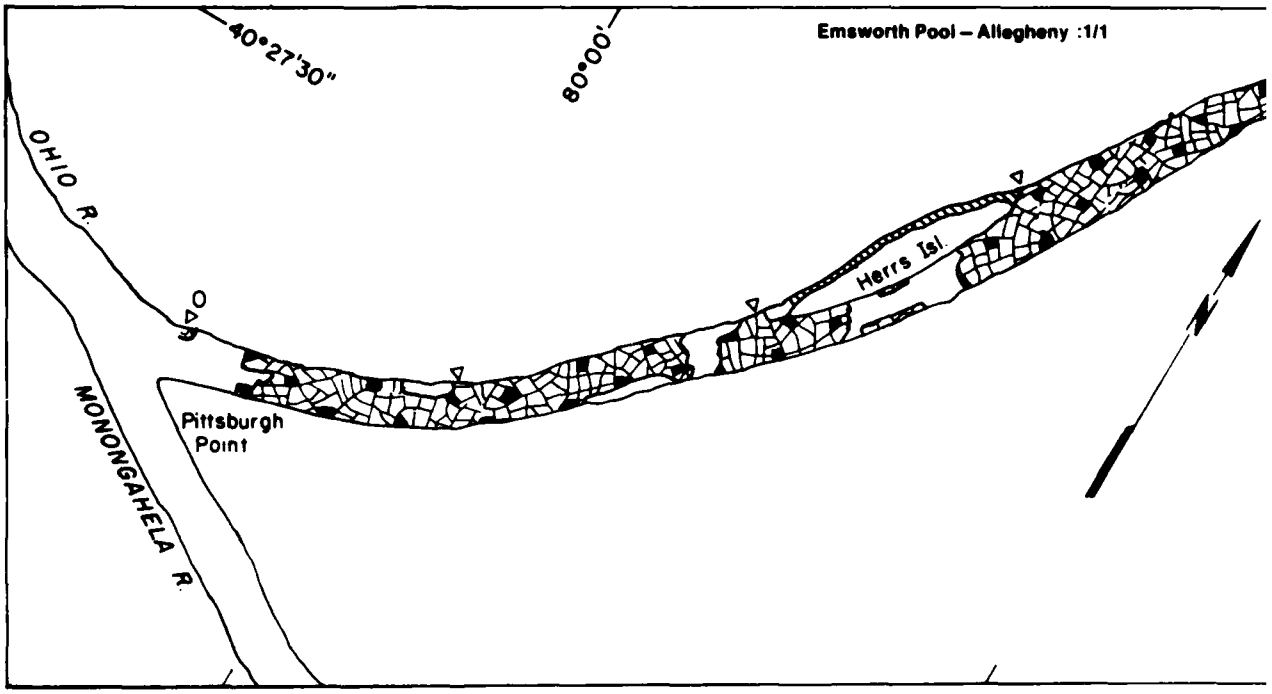


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	4.34	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.82	40
Total area (m^2 x 10^6)	5.16	

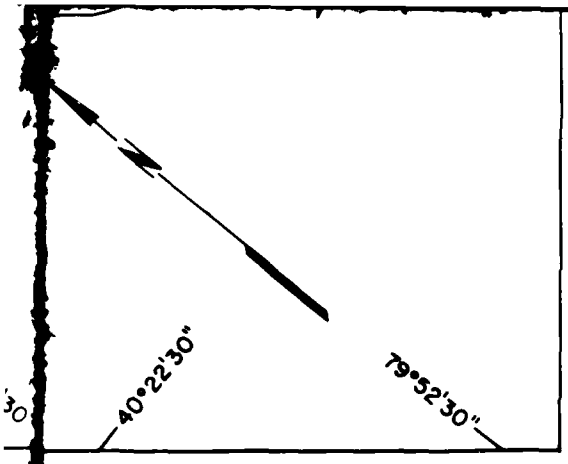




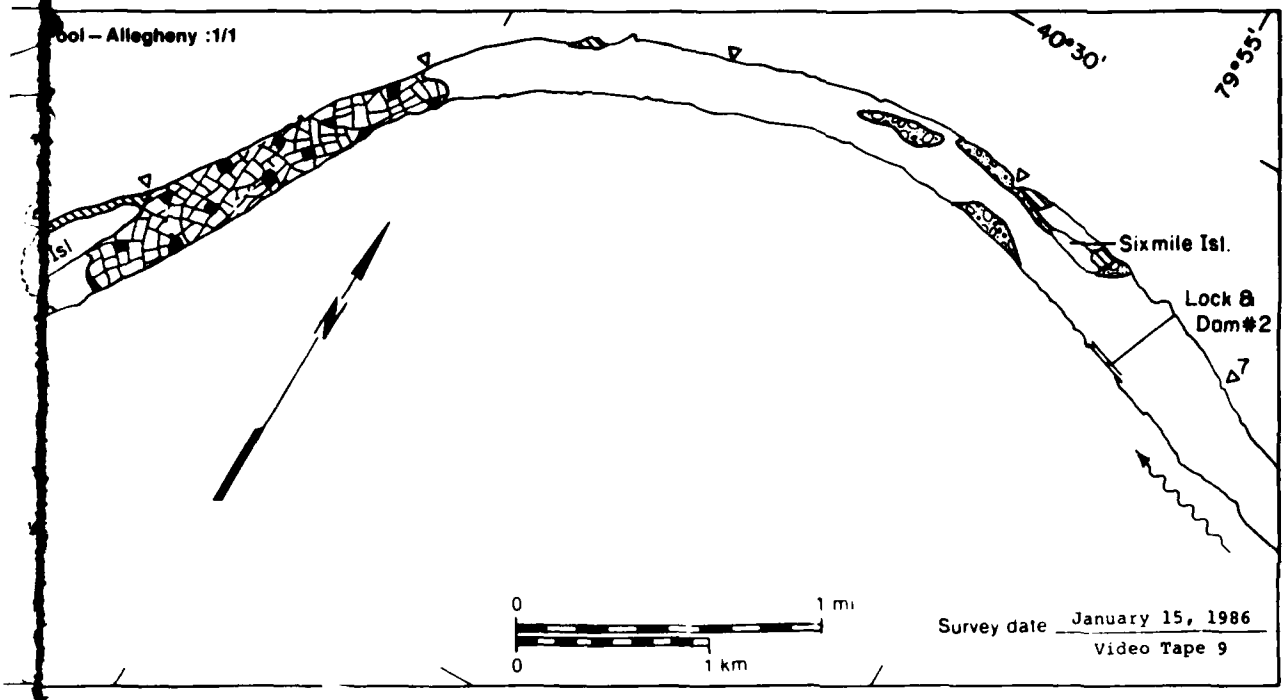


Emsworth Pool – Allegheny

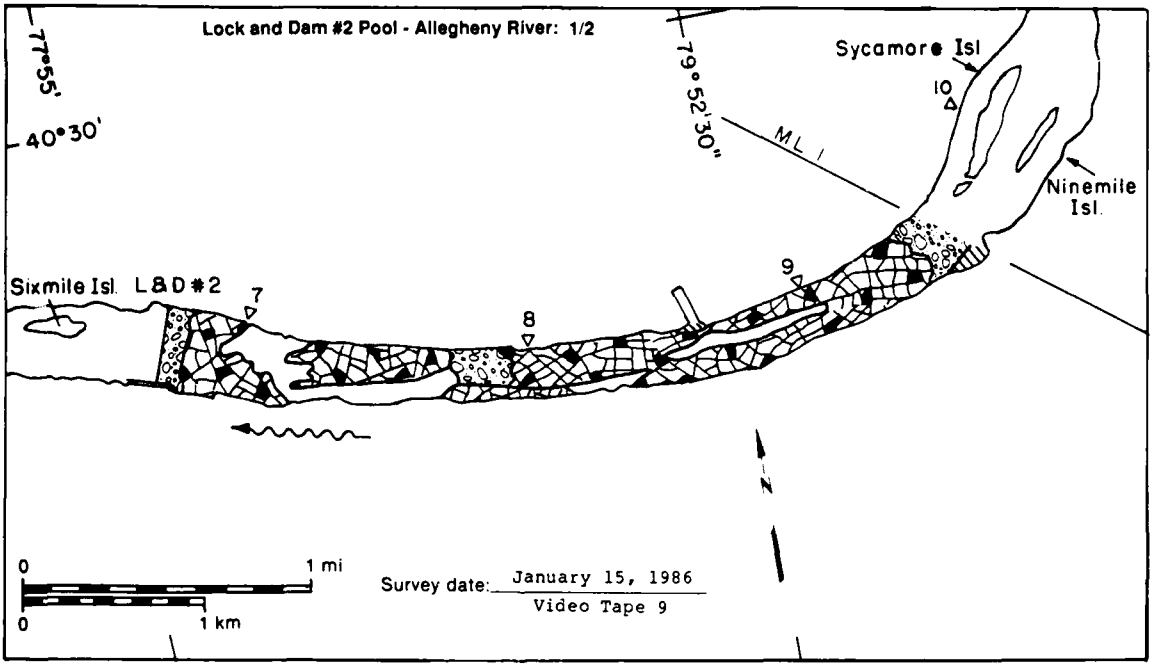
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	1.39	NA
Solid ice cover	0.10	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.02	NA
Fragmented ice cover with open water areas	1.42	80
Ice floes or frazil slush and pans	0.14	10
Total area (m^2 x 10^6)	3.07	

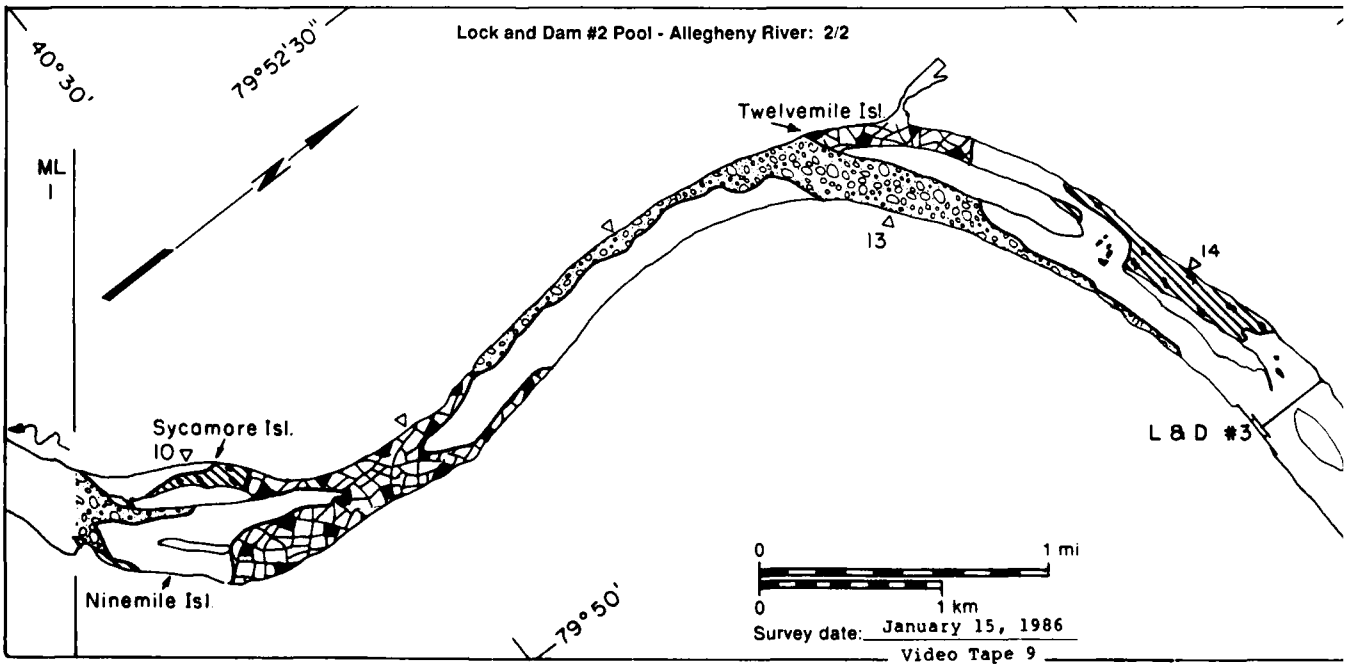


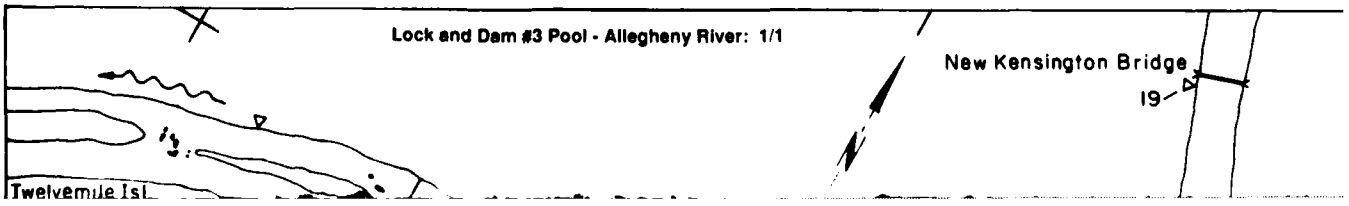
MAP UNITS	Area (m^2 x 10^6)	
Open water	4.34	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.82	40
Total area (m^2 x 10^6)	5.16	

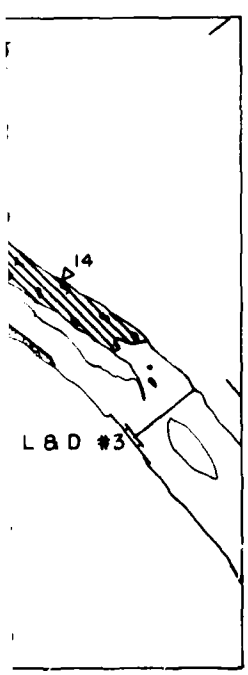


15 January 1986



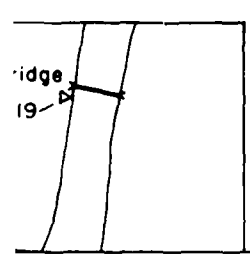






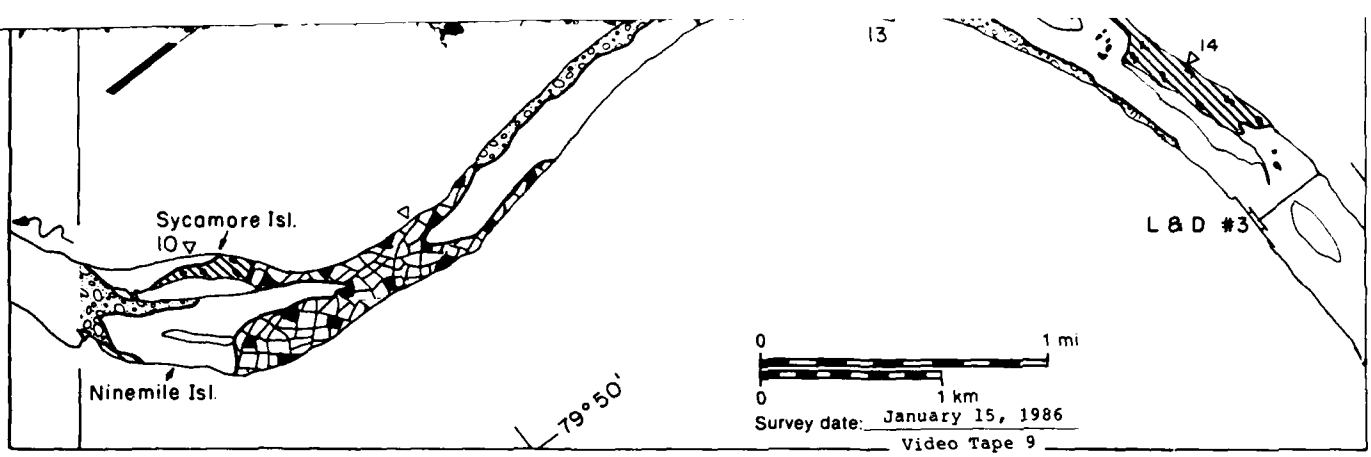
Lock and Dam #2 Pool

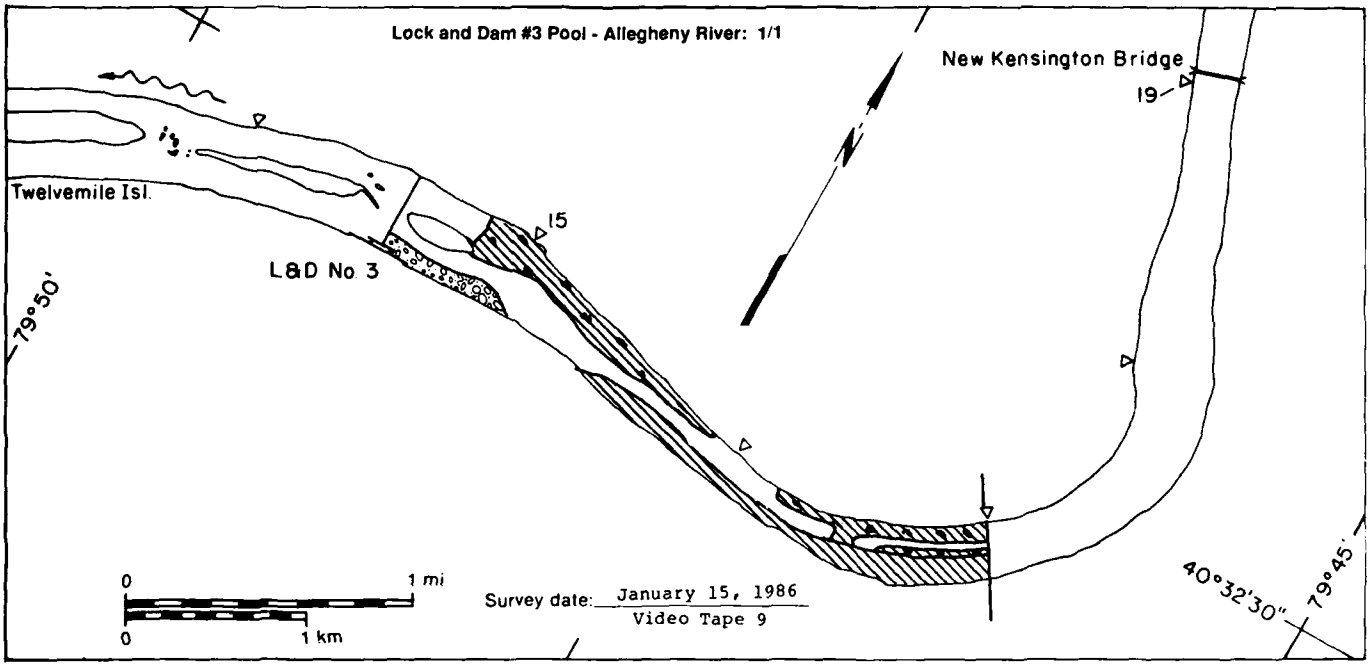
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.51	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.23	80
Fragmented ice cover	0.05	NA
Fragmented ice cover with *open-water areas*	1.42	70
Ice floes or frazil slush and pans	0.78	30
Total area ($m^2 \times 10^6$)	4.02	

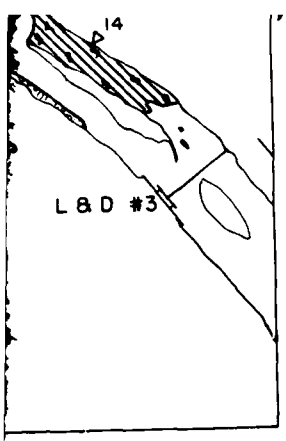


Lock and Dam #3 Pool

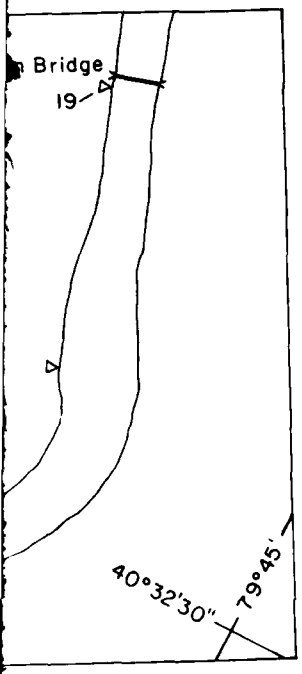
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.49	NA


13
14
Sycamore Isl.
10
L & D #3
Ninemile Isl.
79°50'
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 9


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 9
40°32'30"
79°45'

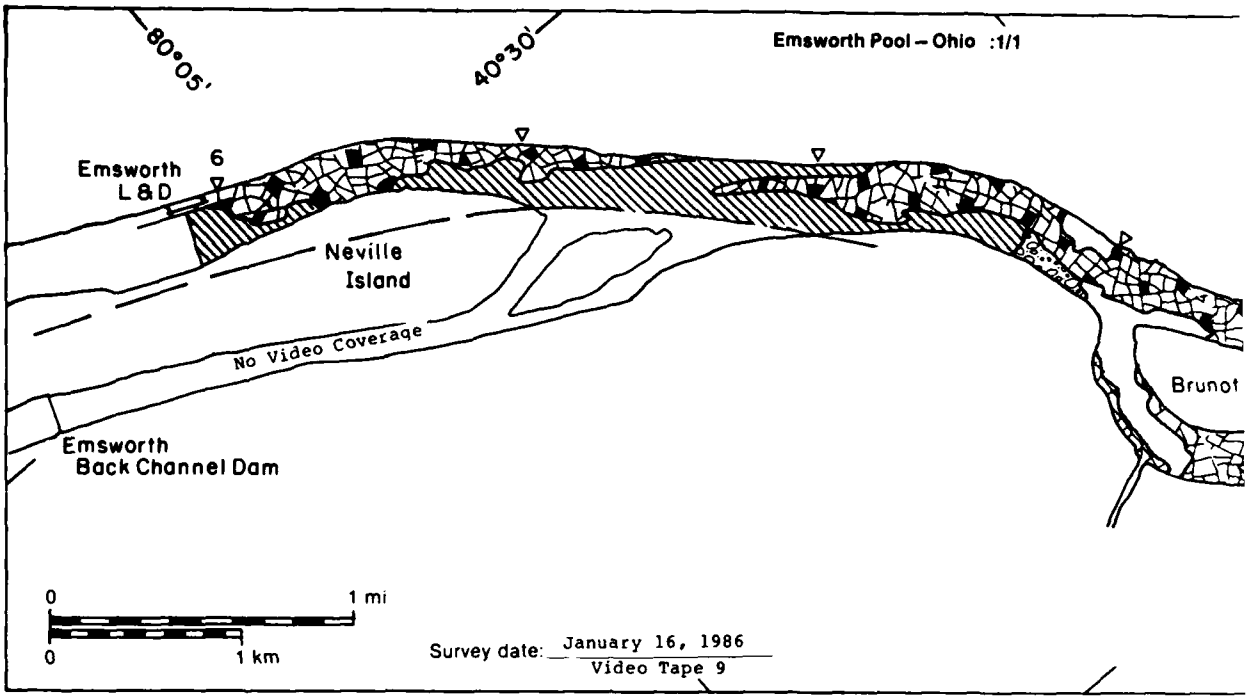


MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover		
Solid ice cover with open-water areas	0.23	80
Fragmented ice cover	0.05	NA
Fragmented ice cover with open-water areas	1.42	70
Ice floes or frazil slush and pans	0.78	30
Total area (m^2 x 10^6)	4.02	



Lock and Dam #3 Pool

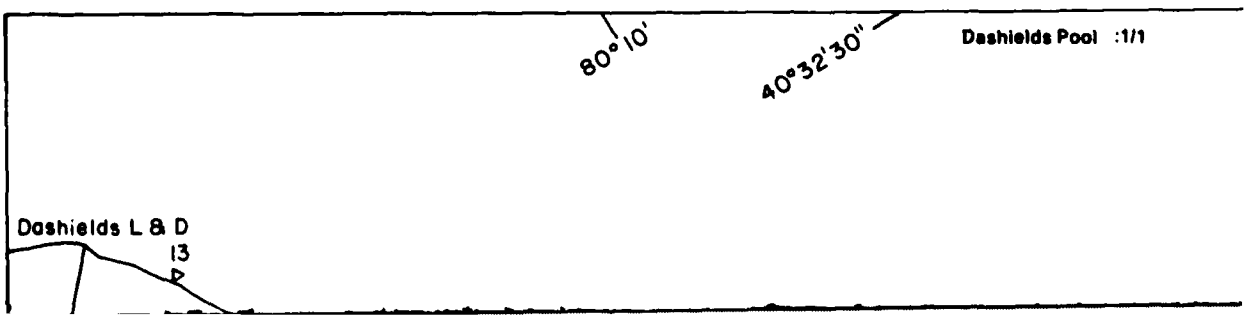
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.49	NA
Solid ice cover	0.28	NA
Solid ice cover with open-water areas	0.30	80
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.07	50
Total area (m^2 x 10^6)	1.14	



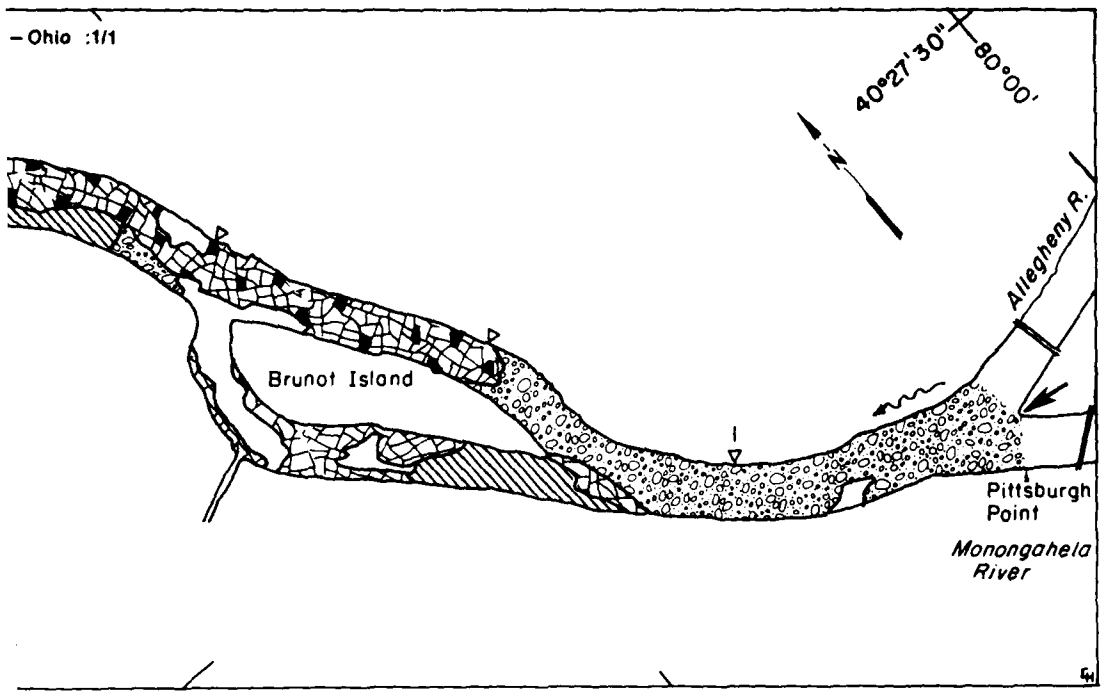
Emsworth Pool – Ohio

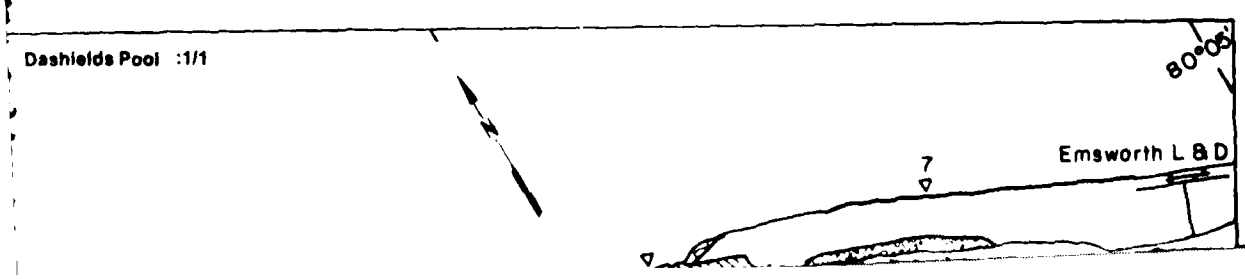
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.30	NA
Solid ice cover	0.99	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.30	NA
Fragmented ice cover with open-water areas	1.20	90
Ice floes or frazil slush and pans	0.86	55
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 0.84×10^6 m^2 of no video coverage

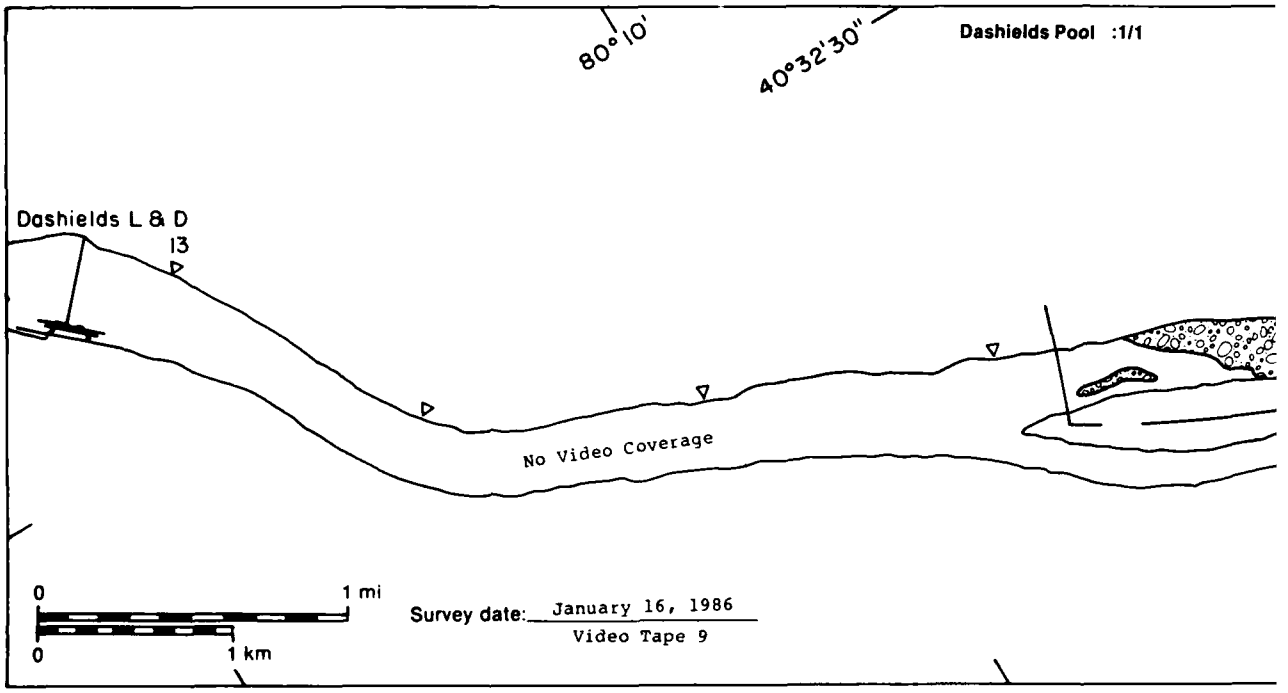


16 January 1986





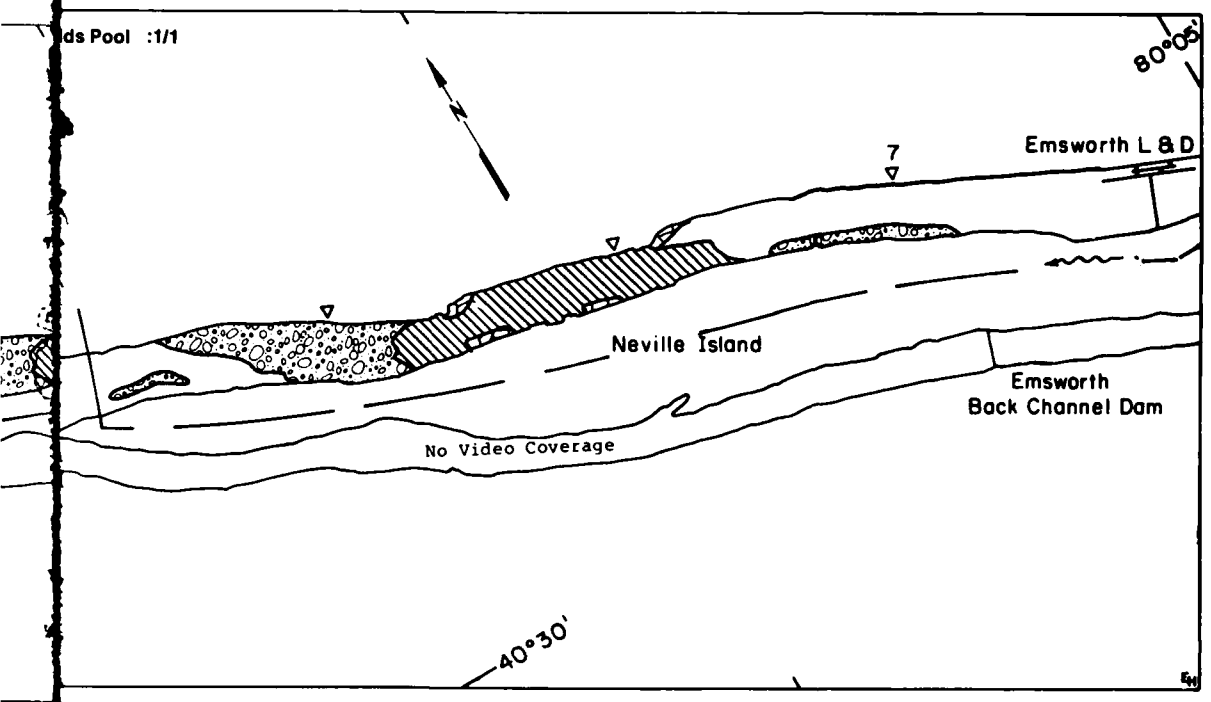
	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.30	NA
Fragmented ice cover with open-water areas	1.20	90
Ice floes or frazil slush and pans	0.86	55
Total area (m^2 x 10^6)	4.49*	* Includes 0.84 x 10^6 m^2 of no video coverage



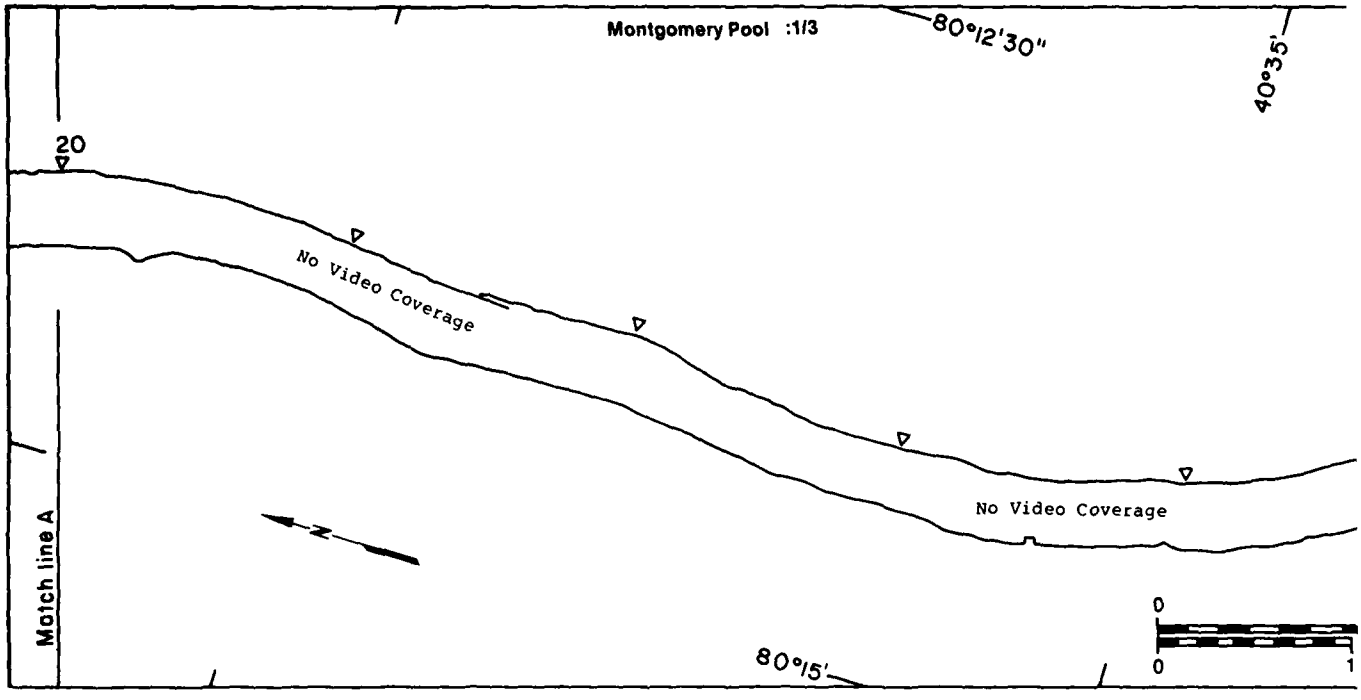
Dashields Pool

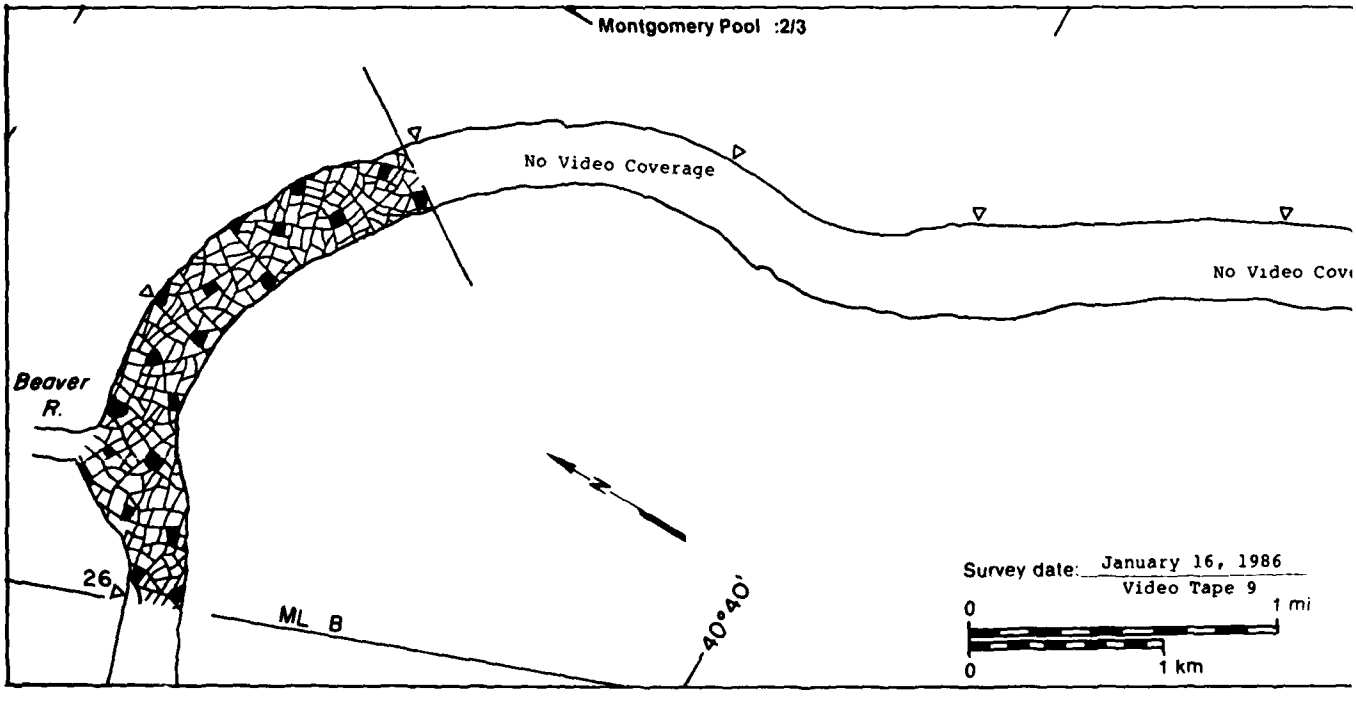
MAP UNITS

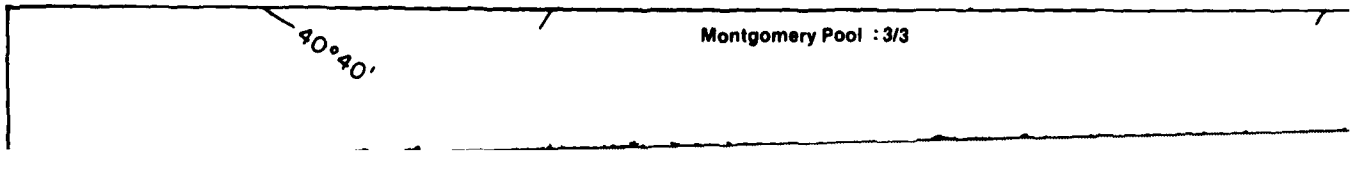
	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.93	NA
Solid ice cover	0.43	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.05	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.41	50
Total area (m^2 x 10^6)	5.00*	* Includes 3.18 x 10^6 m^2 of no video coverage

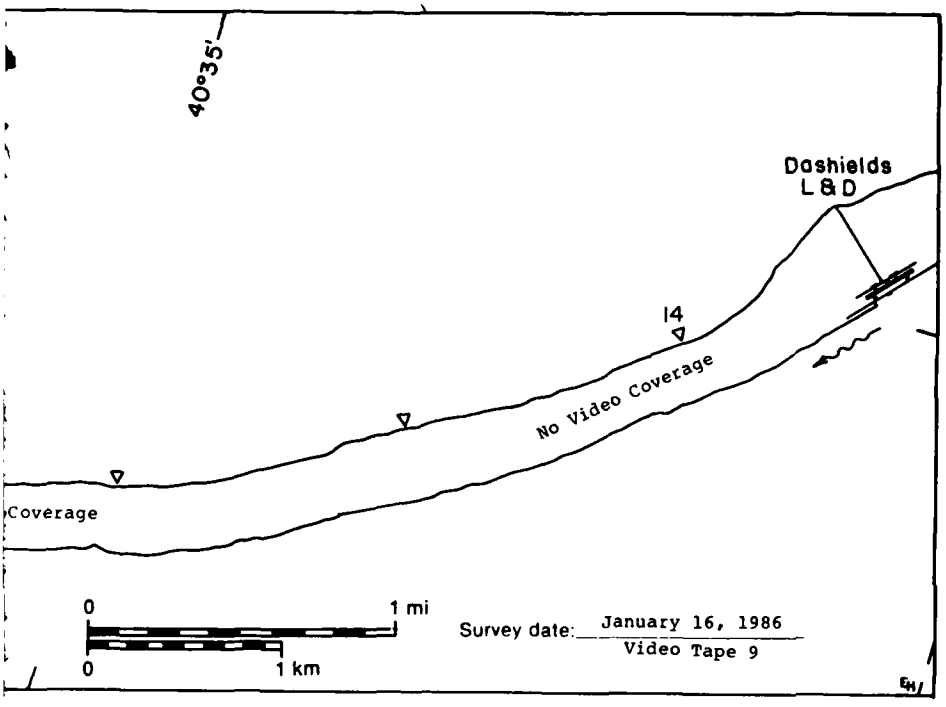

ds Pool :1/1
80°05'
N
7
Emsworth L & D
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

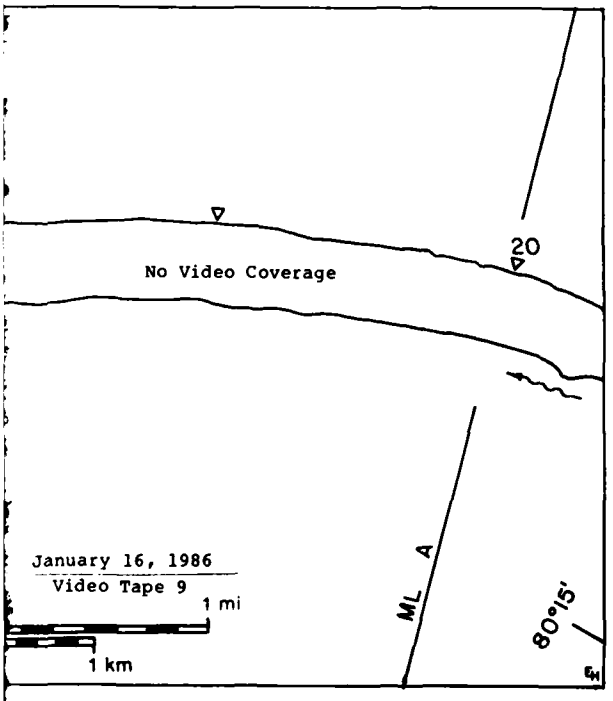
16 January 1986

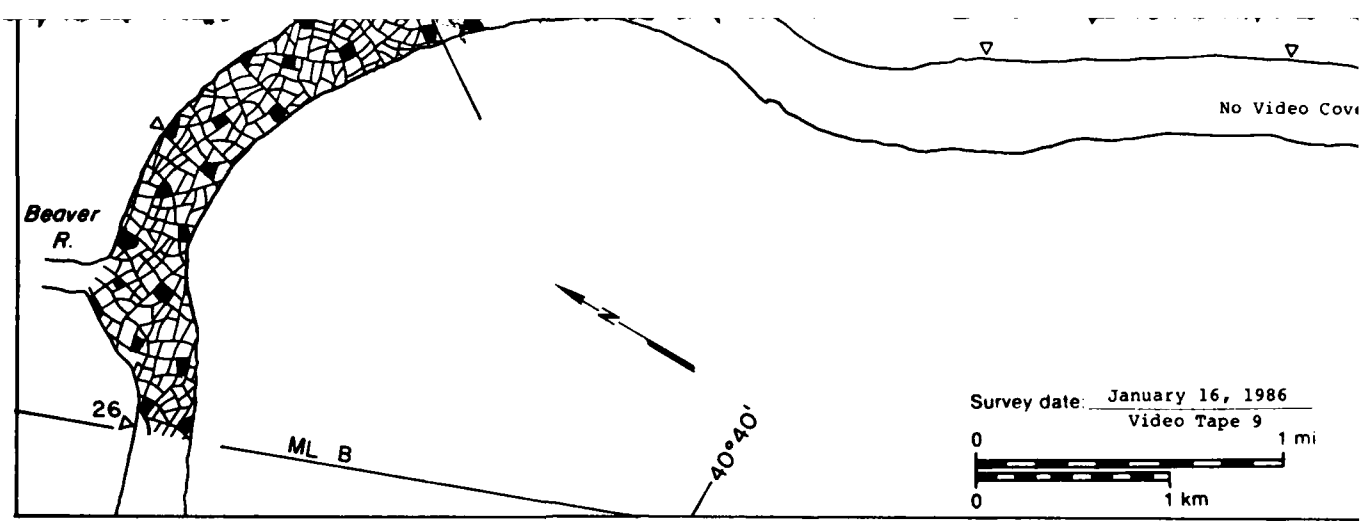


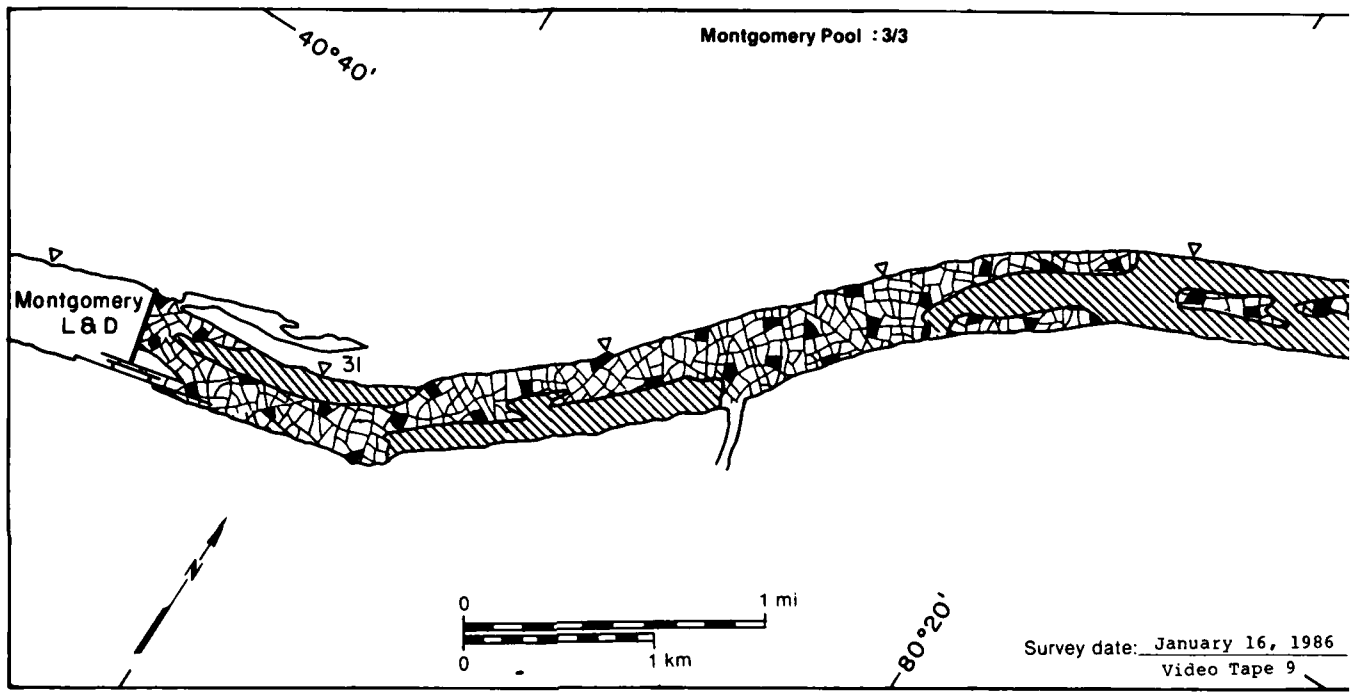





40°35'
Doshields
L&D
14
No Video Coverage
Coverage
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 9


20
No Video Coverage
January 16, 1986
Video Tape 9
1 mi
1 km
ML A
80°15'

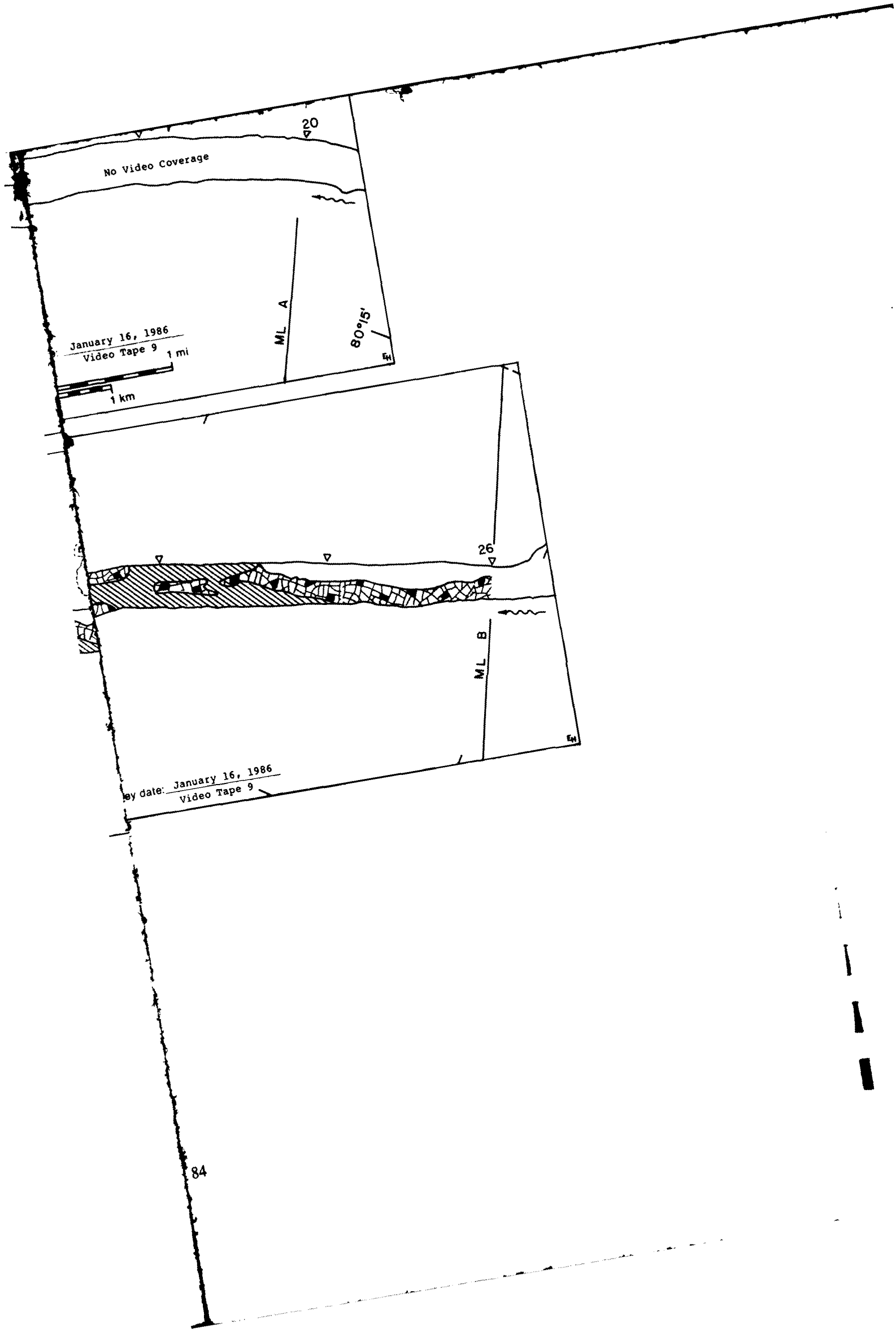


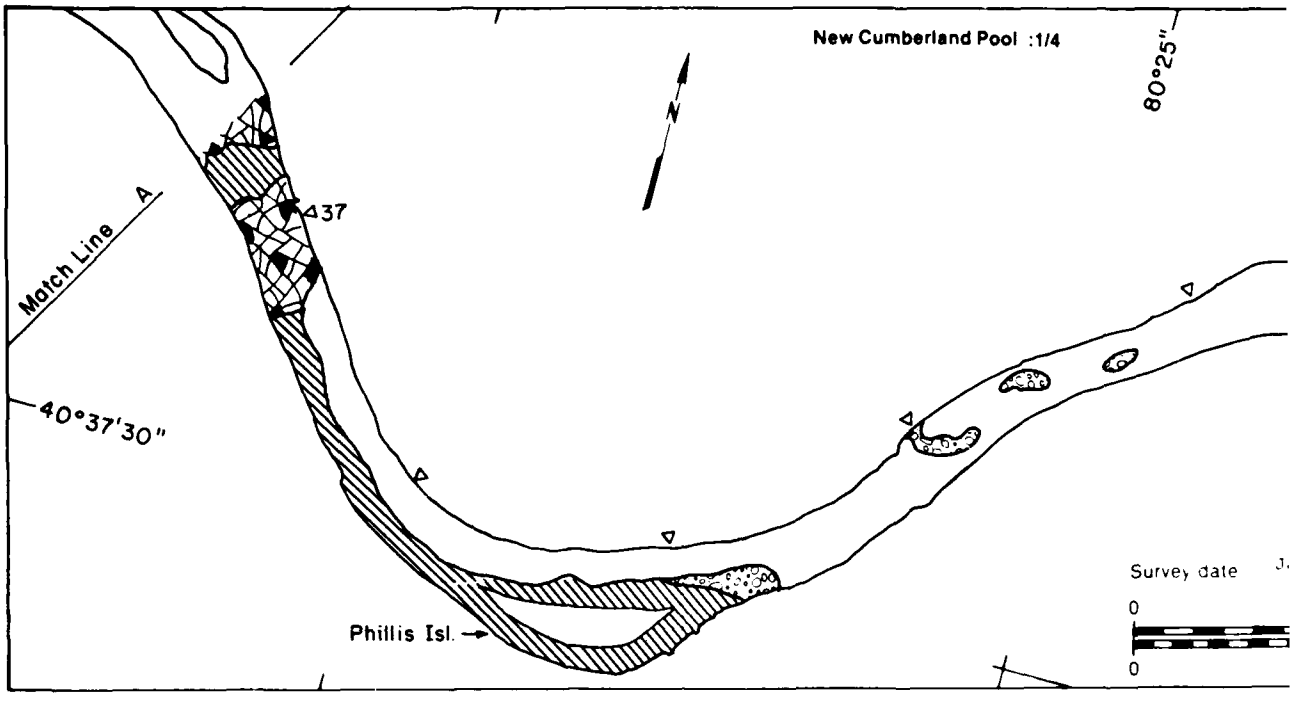


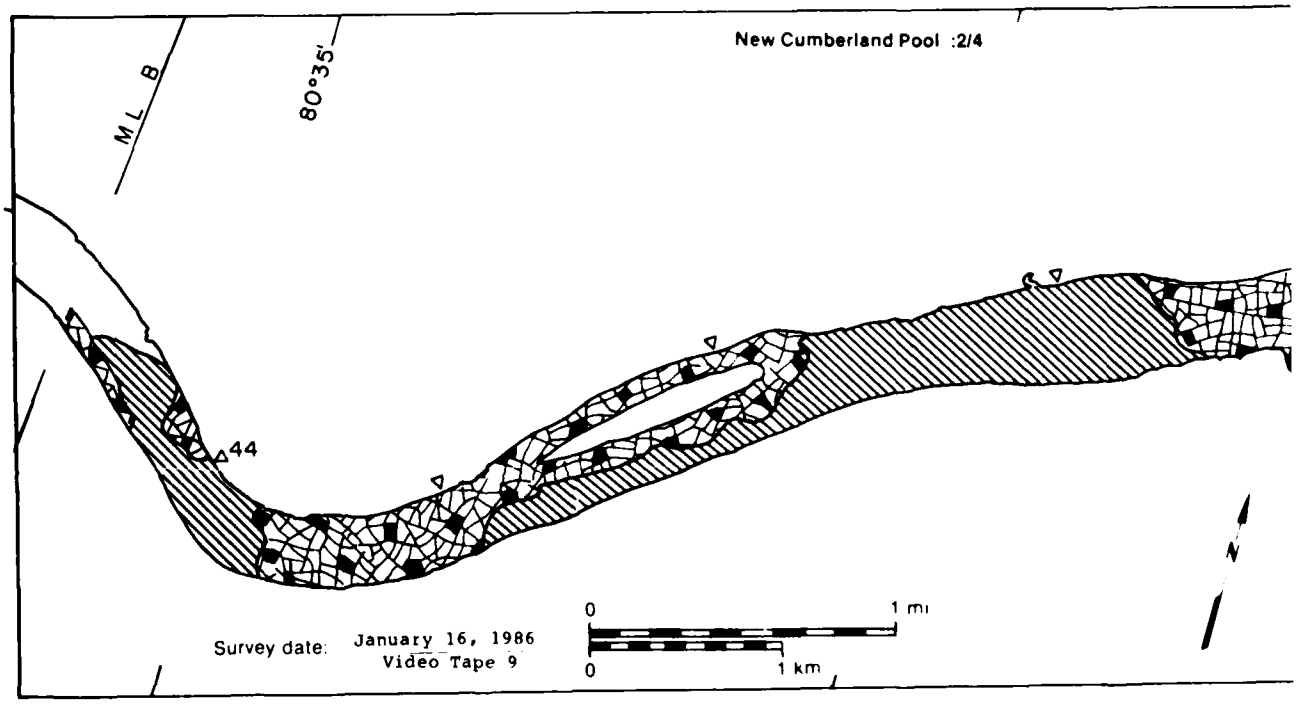
Montgomery Pool

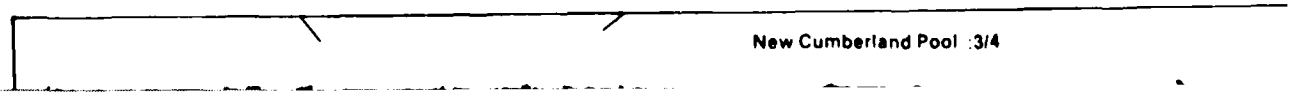
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.38	NA
Solid ice cover	1.14	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	3.20	70
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.27*	

* Includes 6.55×10^6 m^2 of no video coverage

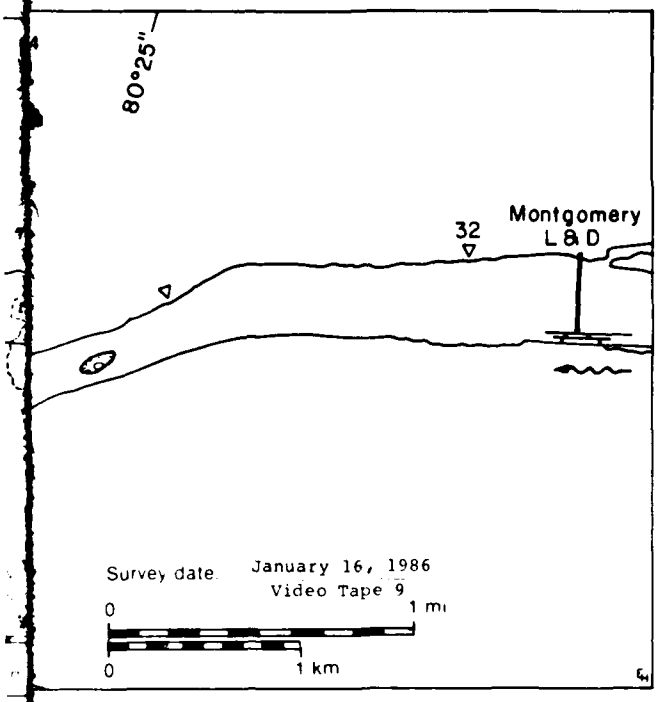

20
No Video Coverage
ML A
80°15'
January 16, 1986
Video Tape 9
1 mi
1 km
26
ML B
ey date: January 16, 1986
Video Tape 9
84

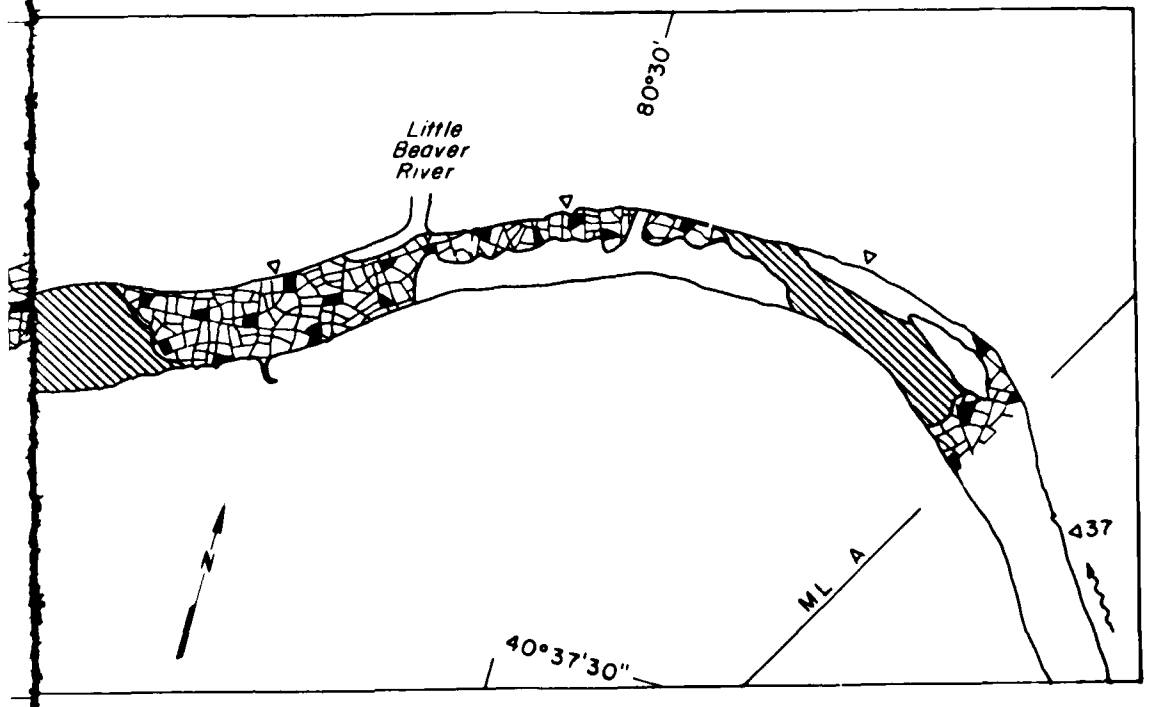

New Cumberland Pool :1/4
80°25"
Match Line A
37
40°37'30"
Phillis Isl.
Survey date
0
0

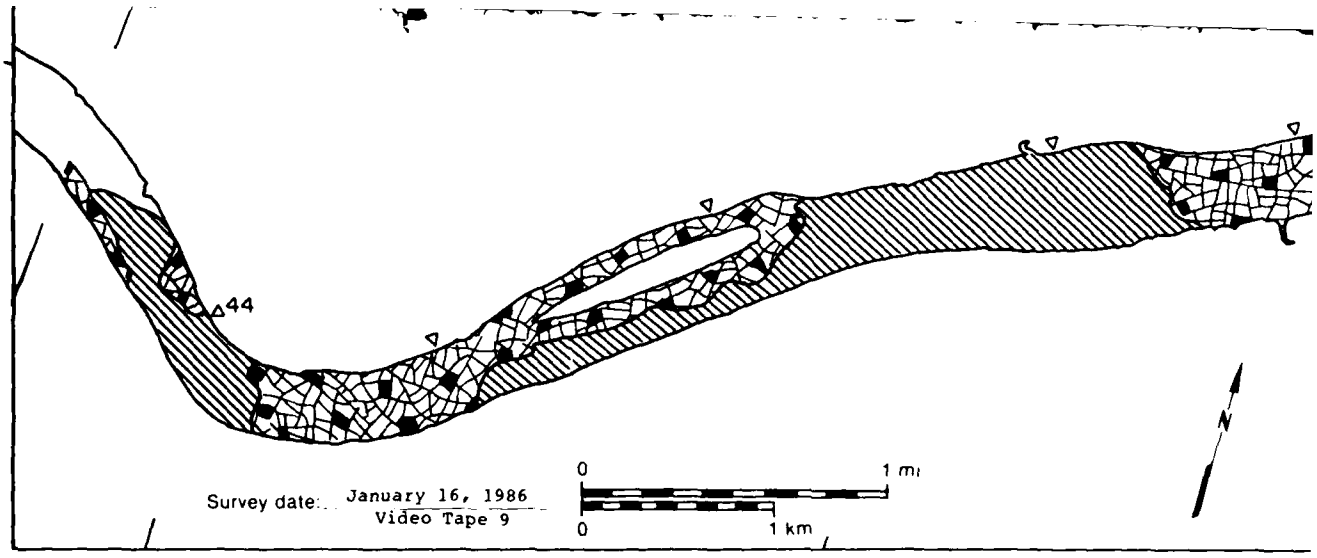

New Cumberland Pool :2/4
M L B
80°35'
44
Survey date: January 16, 1986
Video Tape 9
0
1 mi
0
1 km

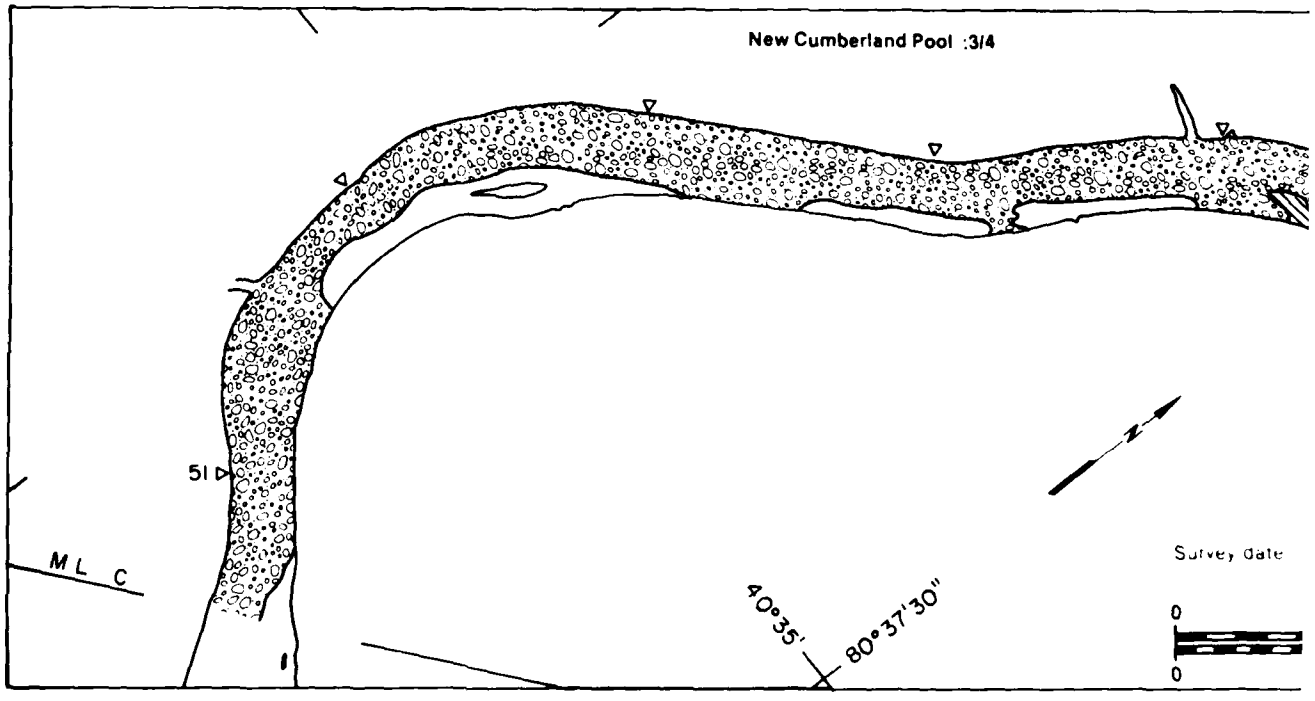

New Cumberland Pool :3/4

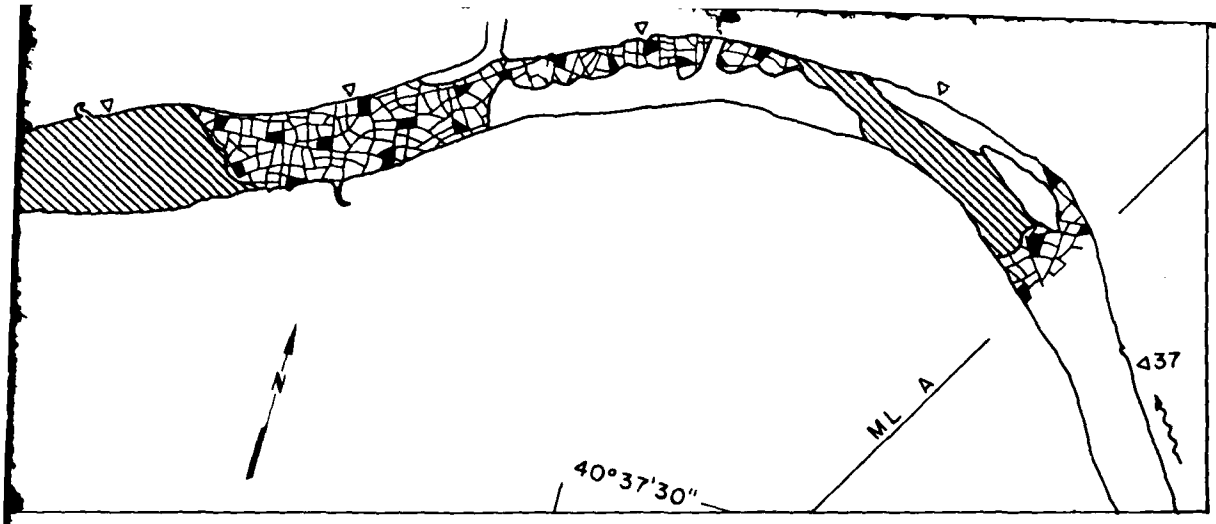
16 January 1986

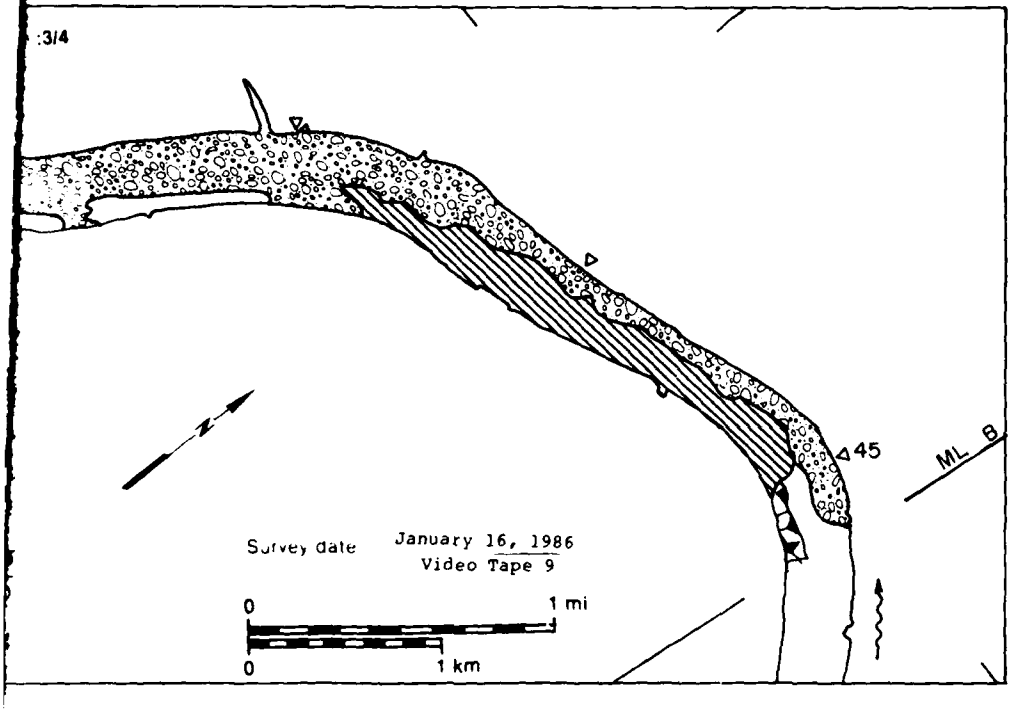




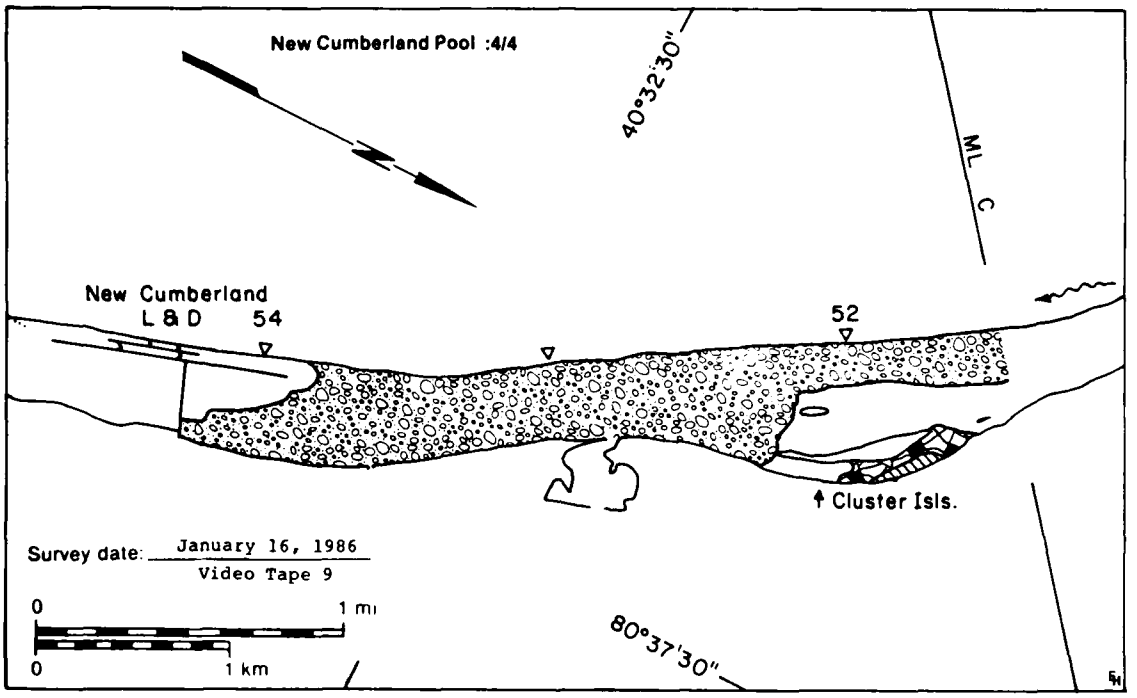

44
Survey date: January 16, 1986
Video Tape 9
0
1 mi
0
1 km
N

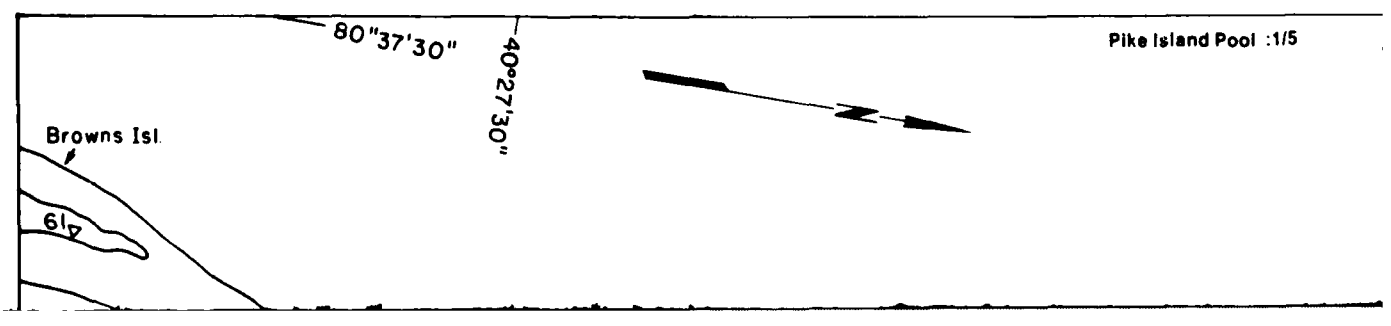

New Cumberland Pool :3/4
51
ML C
40°35'
80°37'30"
Survey date
0
0
N


N
ML A
40°37'30"
37


:3/4
N
45
ML B
Survey date
January 16, 1986
Video Tape 9
0
1 mi
0
1 km

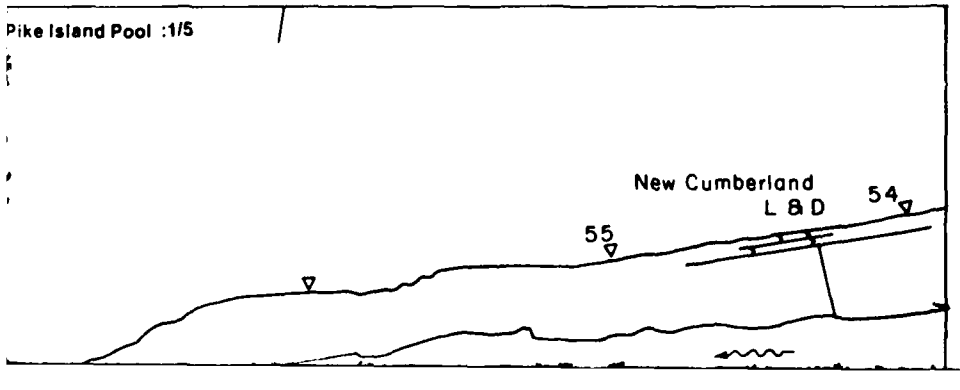
16 January 1986

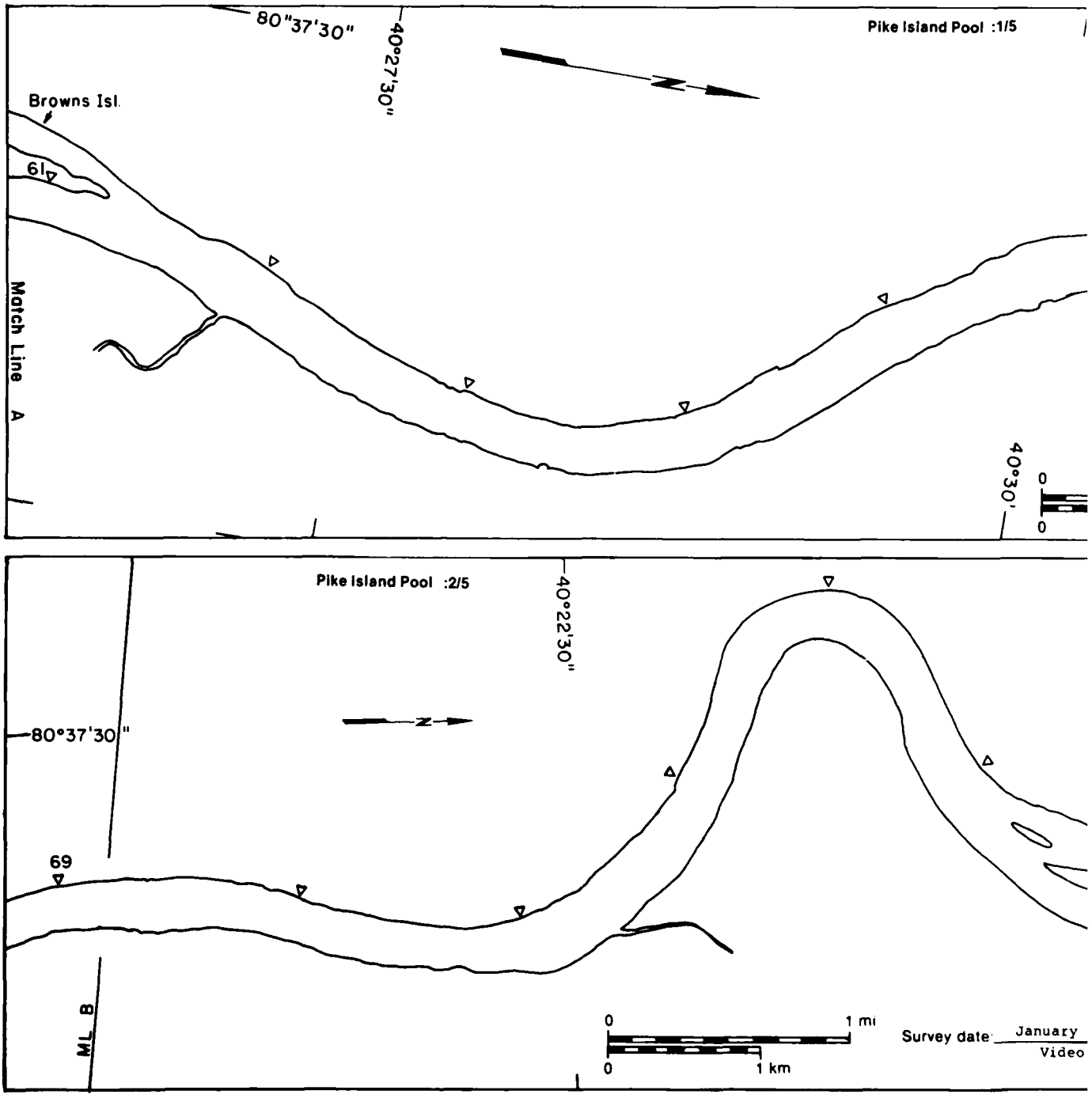


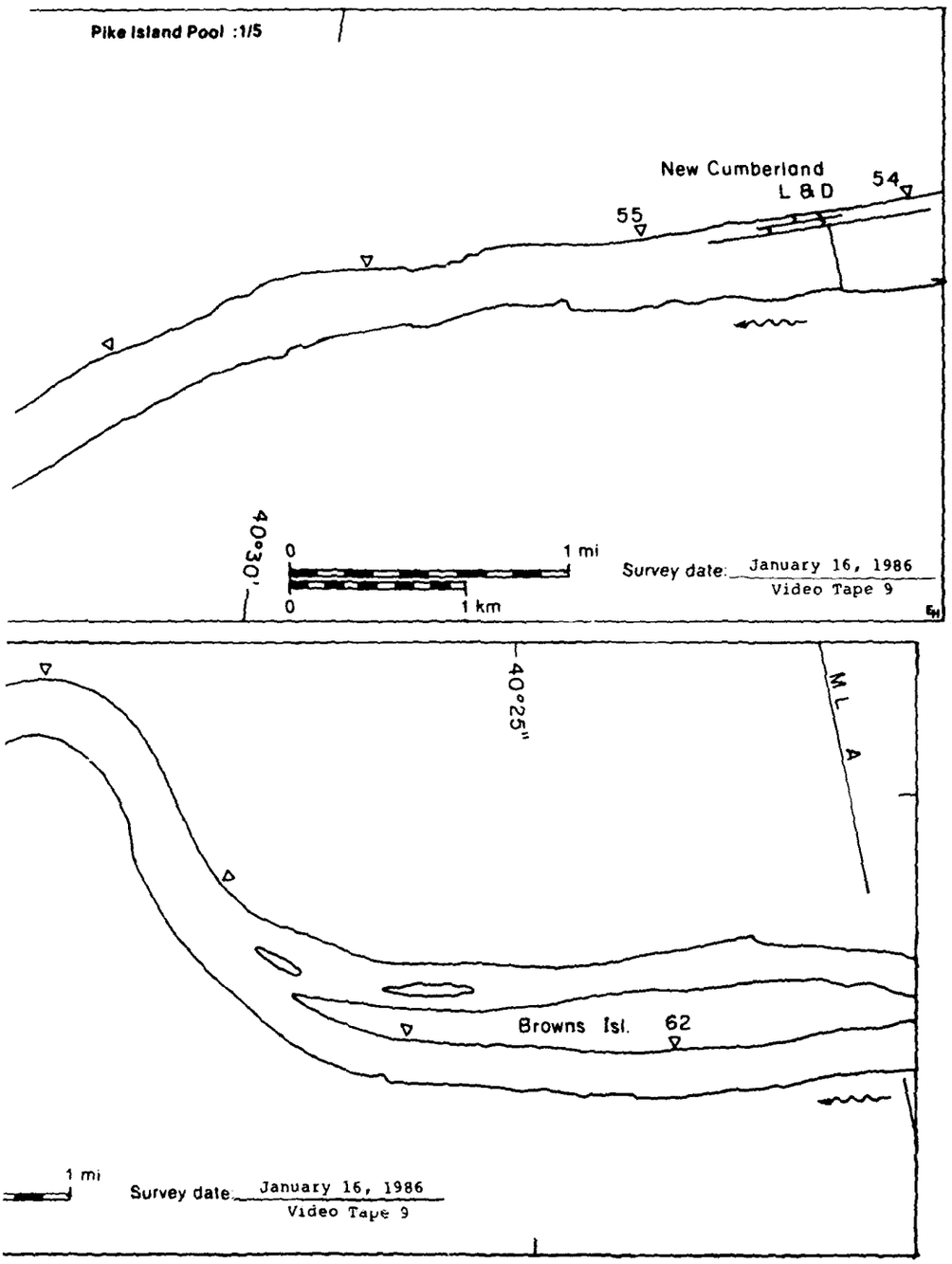


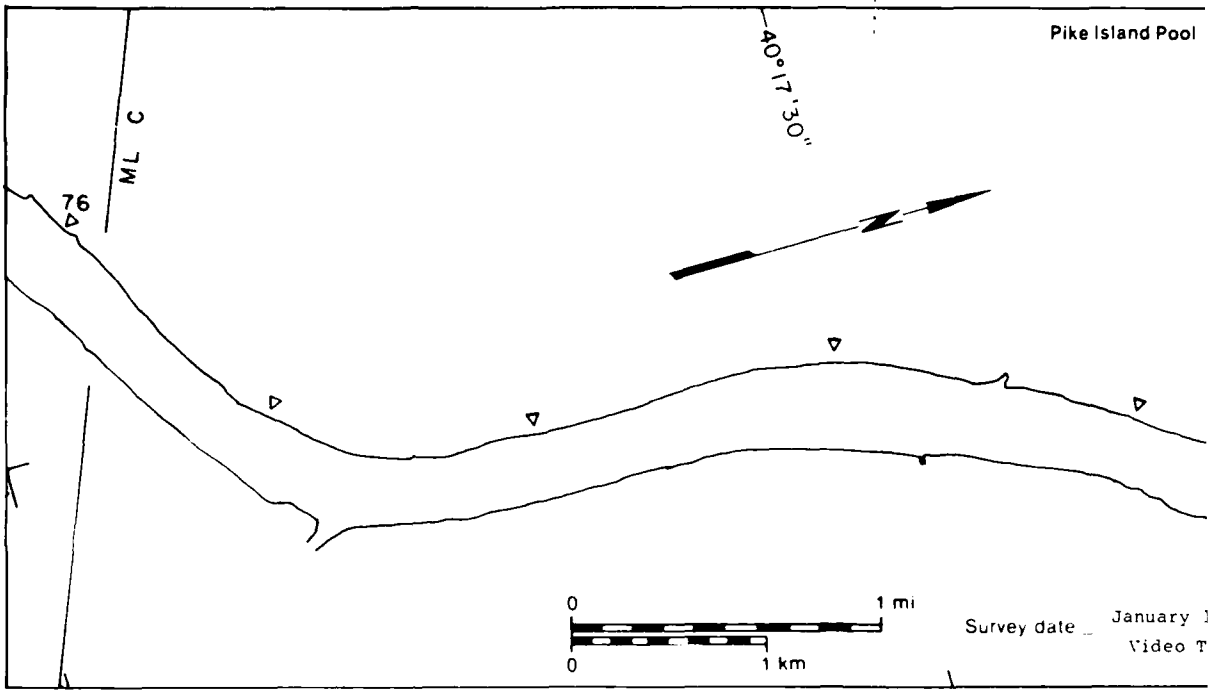
New Cumberland Pool

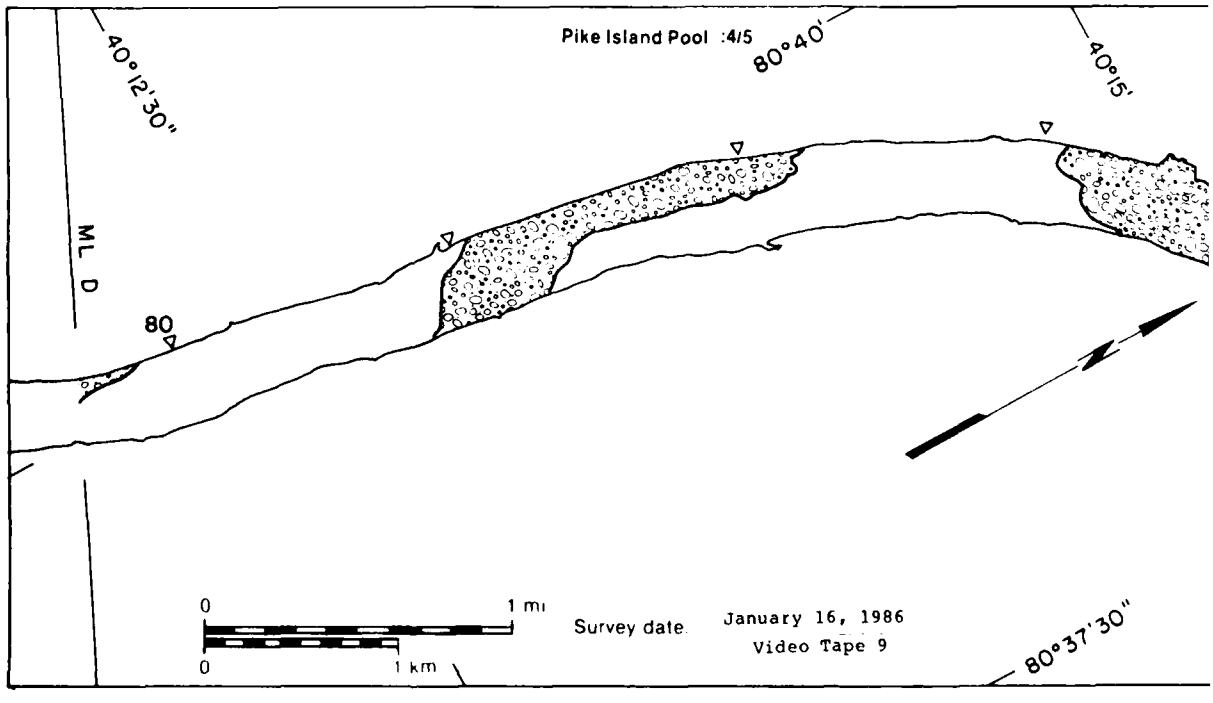
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.61	NA
Solid ice cover	2.86	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	2.42	90
Ice floes or frazil slush and pans	4.98	50
Total area ($m^2 \times 10^6$)	14.87	

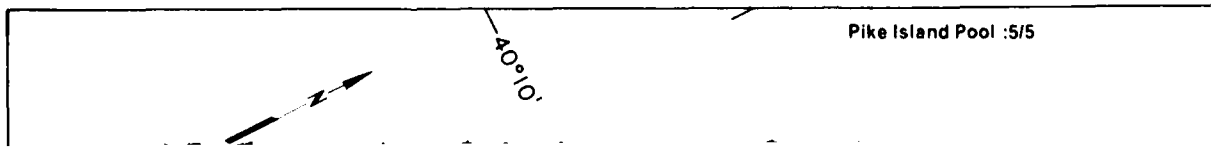



80"37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl.
61
Match Line A
40°30'
0
0
Pike Island Pool :2/5
40°22'30"
80°37'30"
69
MI 8
0
1 mi
0
1 km
Survey date: January
Video

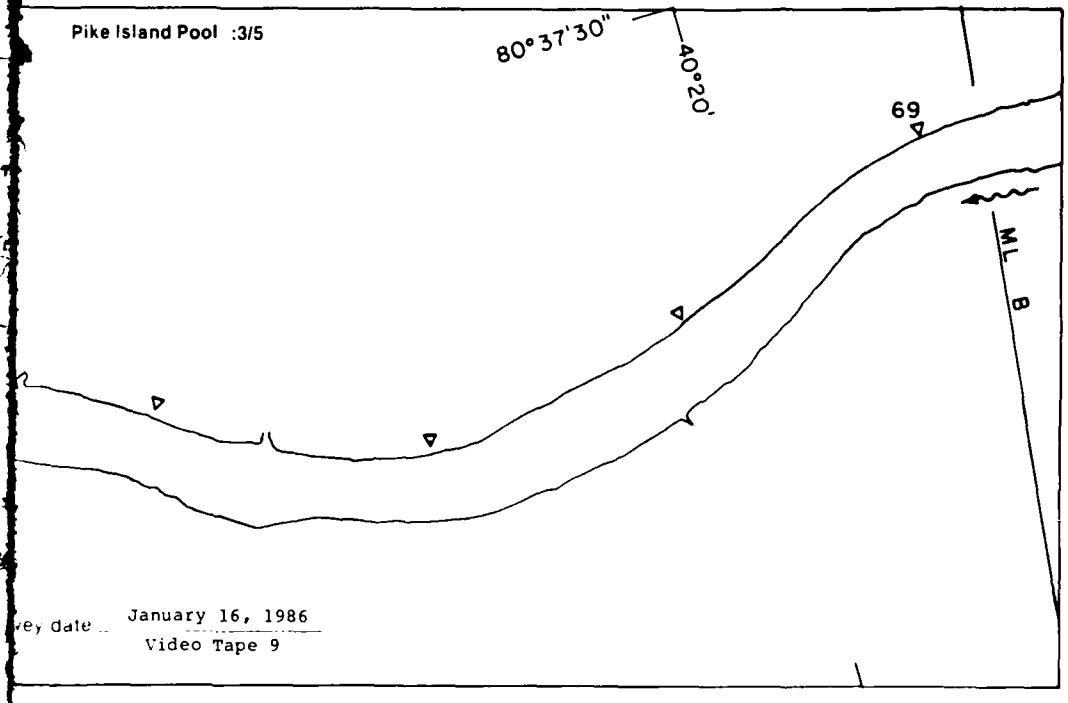

Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 9
40°25"
M L A
Browns Isl.
62
1 mi
Survey date: January 16, 1986
Video Tape 9

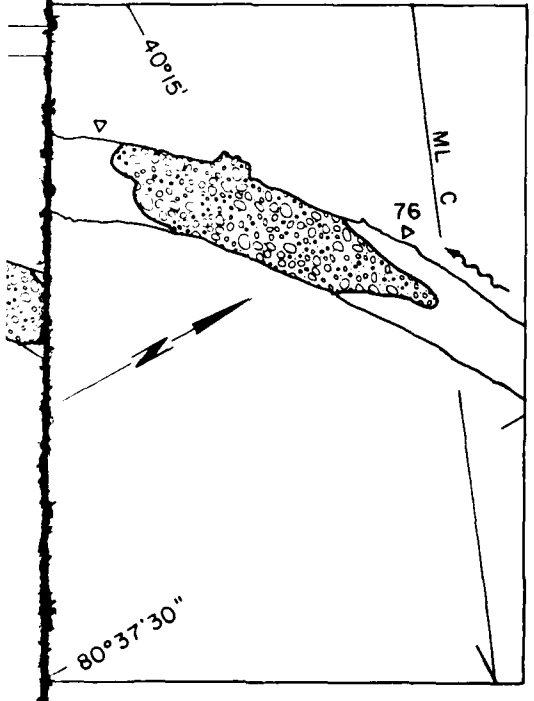

Pike Island Pool
40°17'30"
ML C
76
0
1 mi
0
1 km
Survey date
January 1
Video T

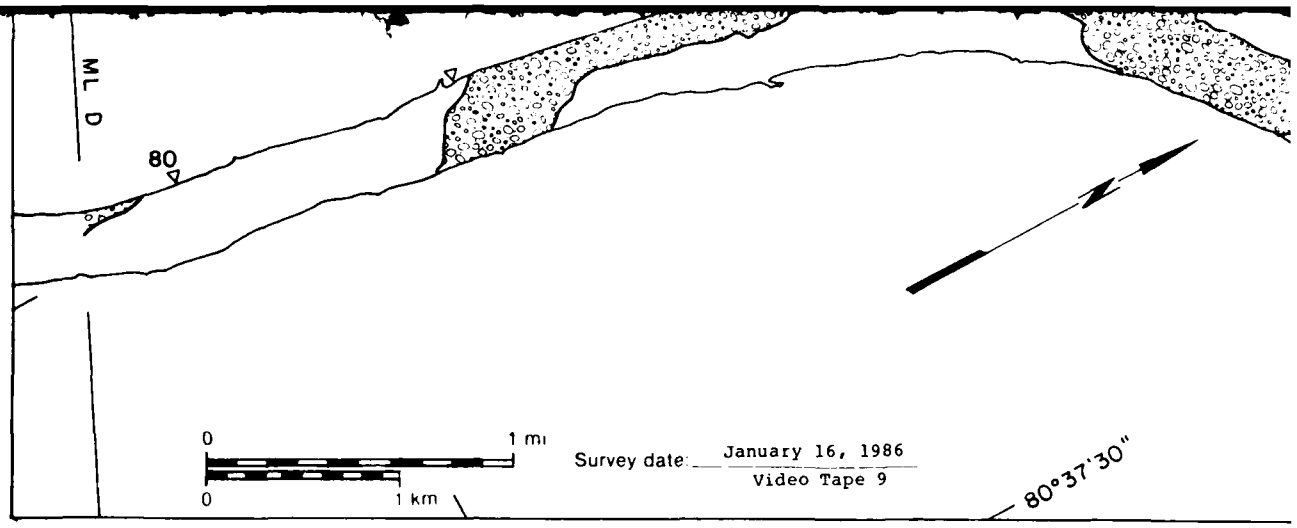

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
0
1 mi
0
1 km
Survey date
January 16, 1986
Video Tape 9
80°37'30"

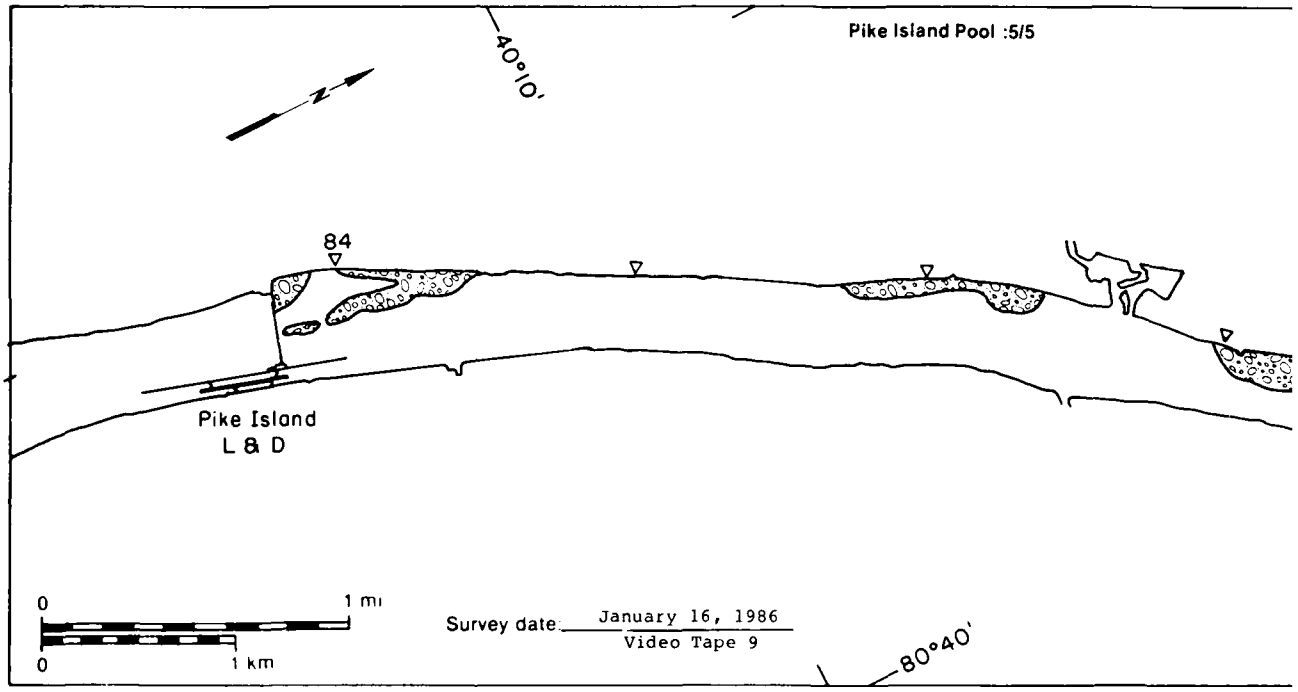

Pike Island Pool :5/5
40°10'

16 January 1986



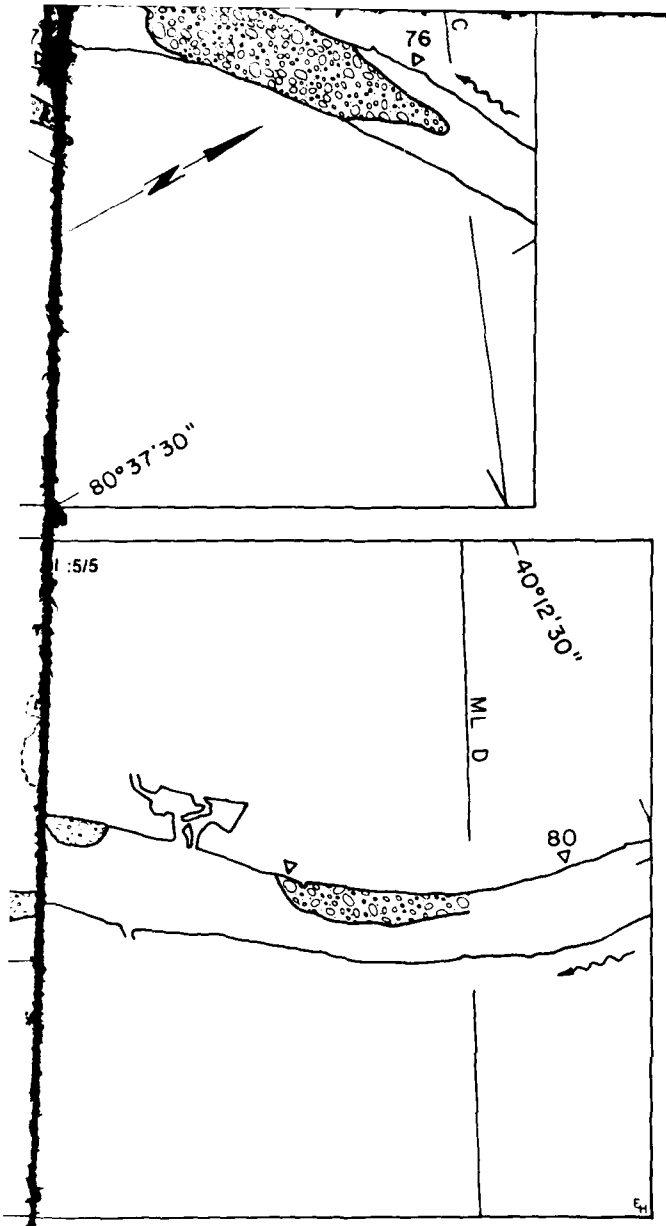




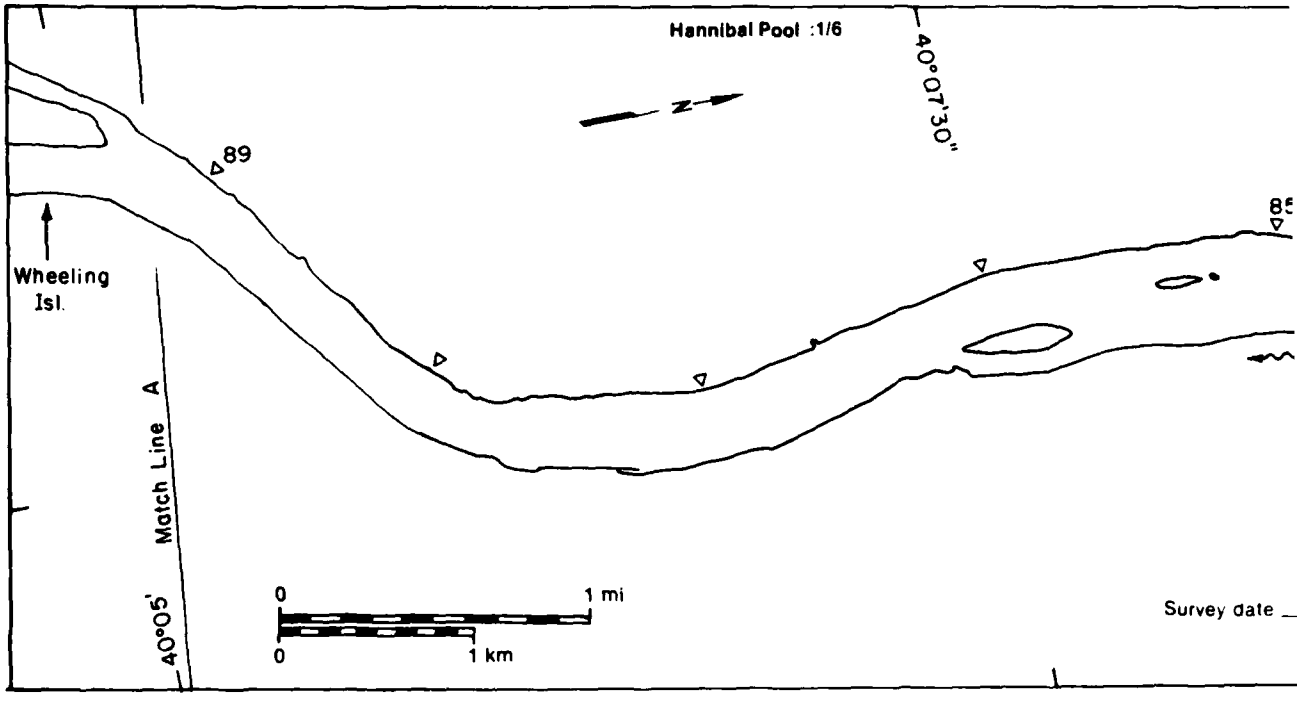


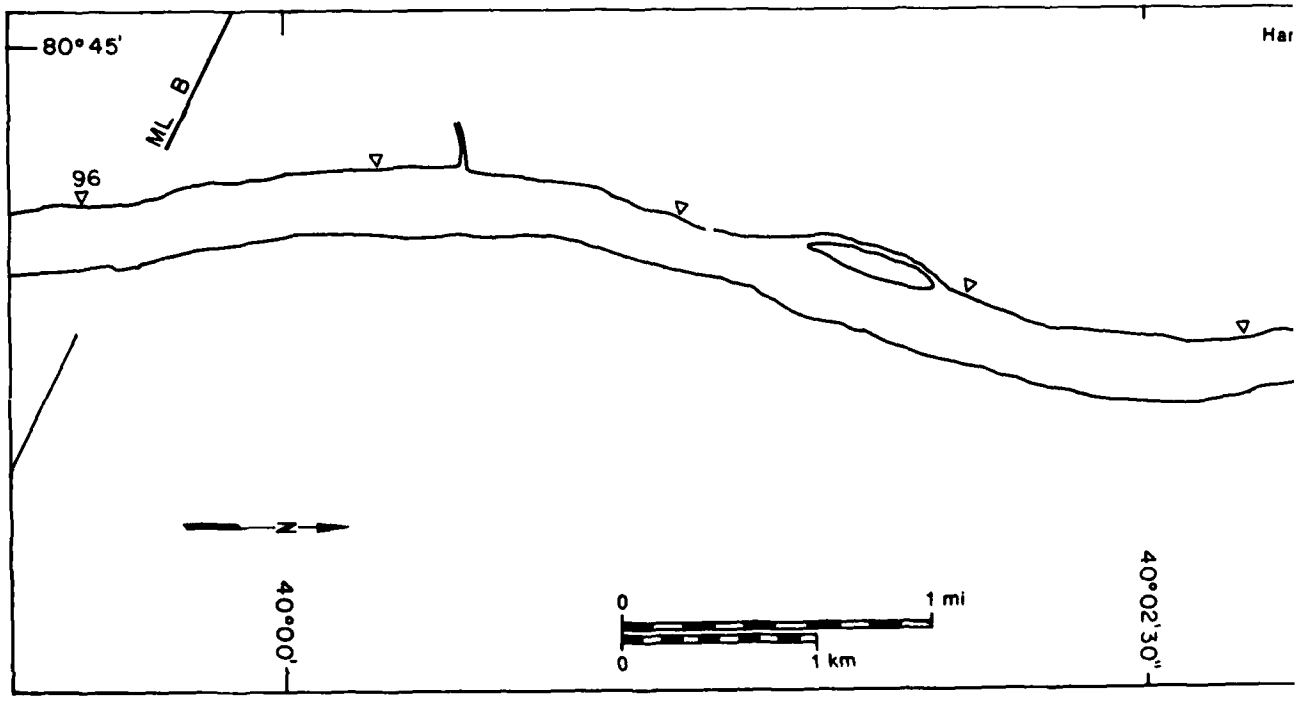
Pike Island Pool

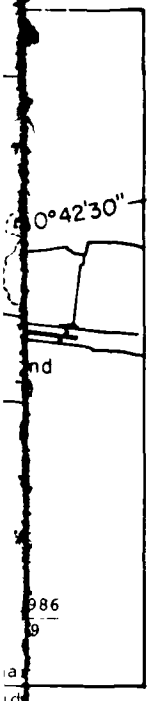
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (tenths)
Open water	17.34	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.58	10
Total area ($m^2 \times 10^6$)	18.92	

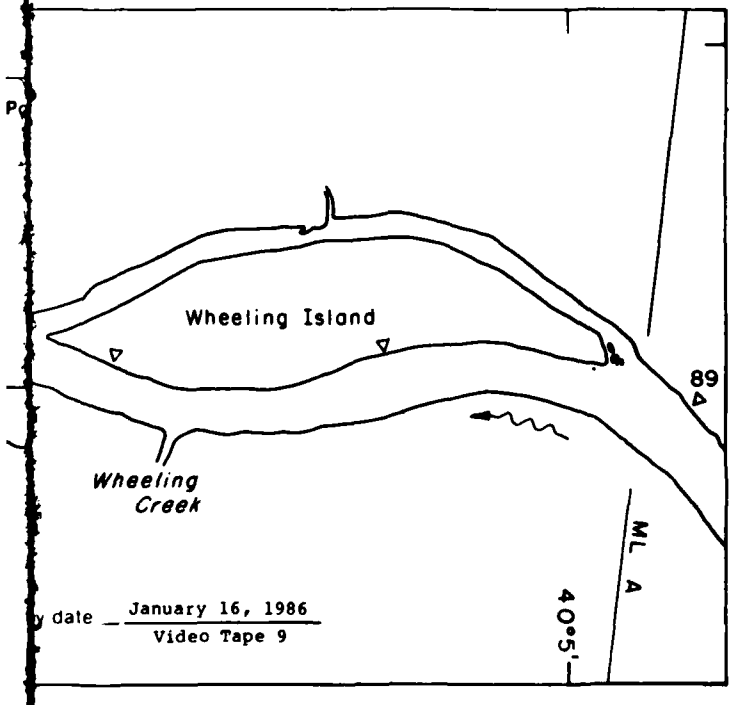

76
C
80°37'30"
1:5/5
40°12'30"
ML D
80

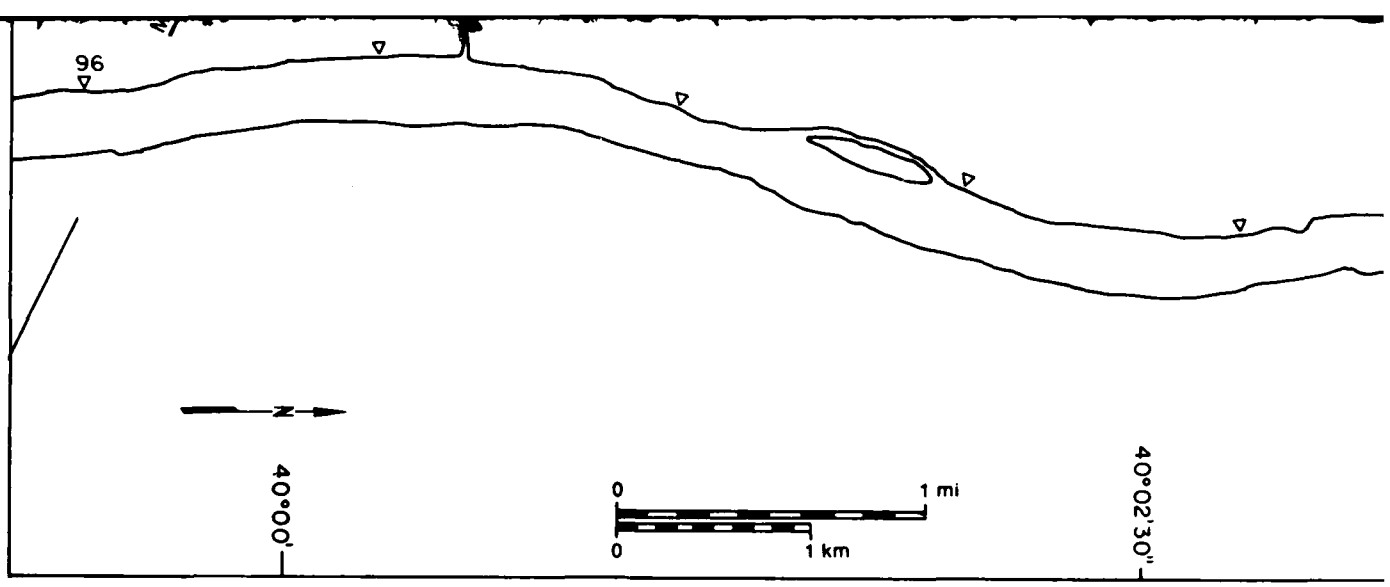
16 January 1986

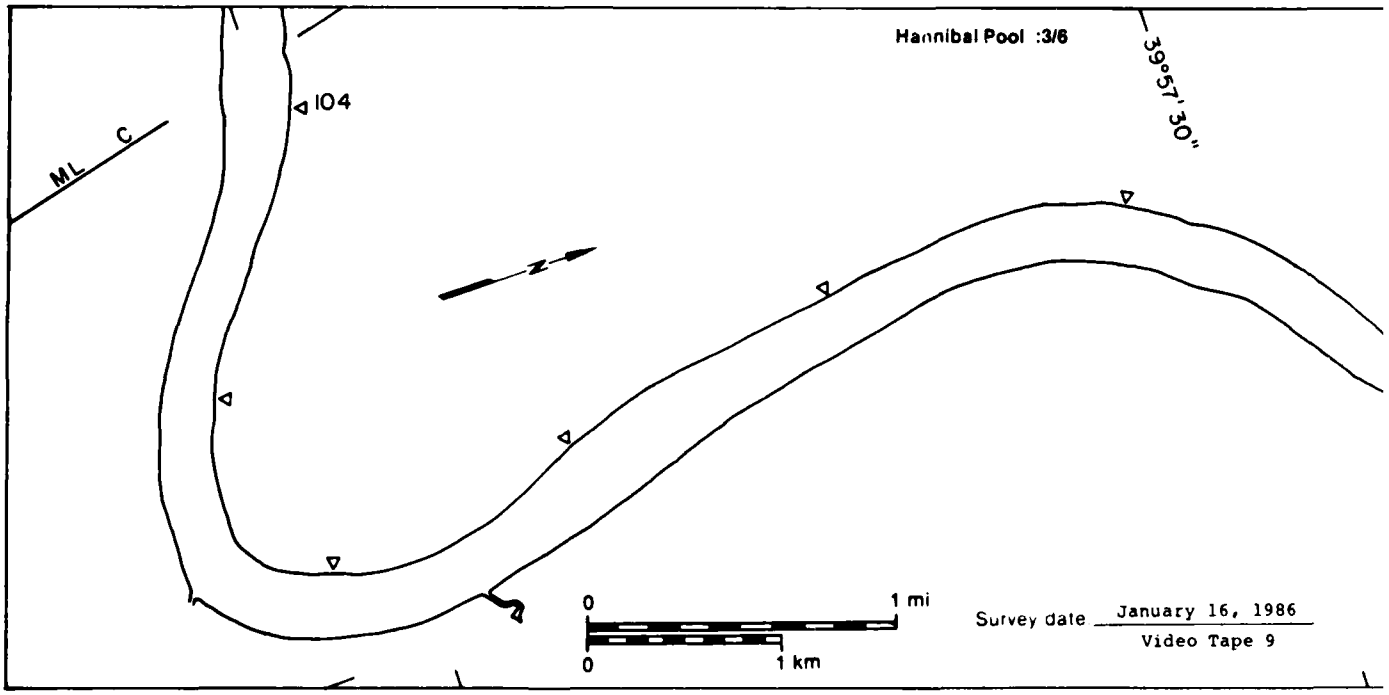


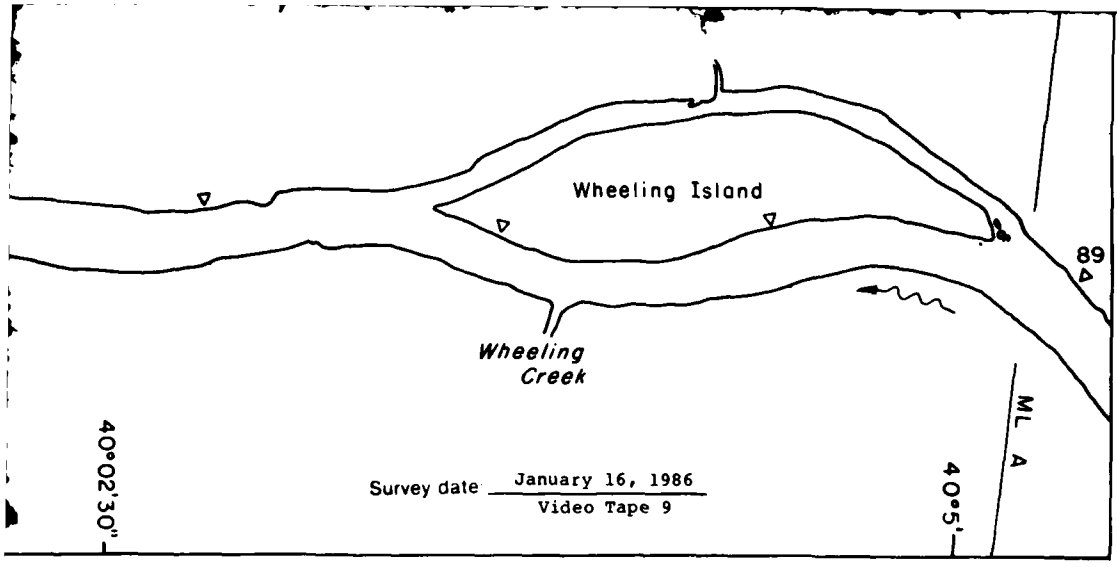


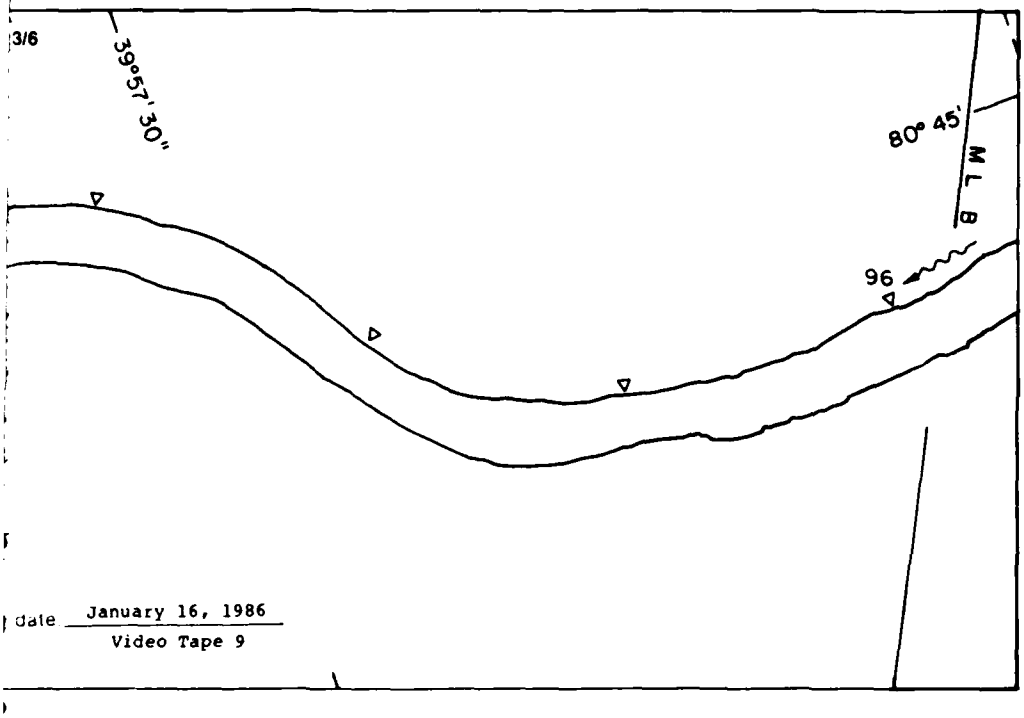

0°42'30"
nd
986
9

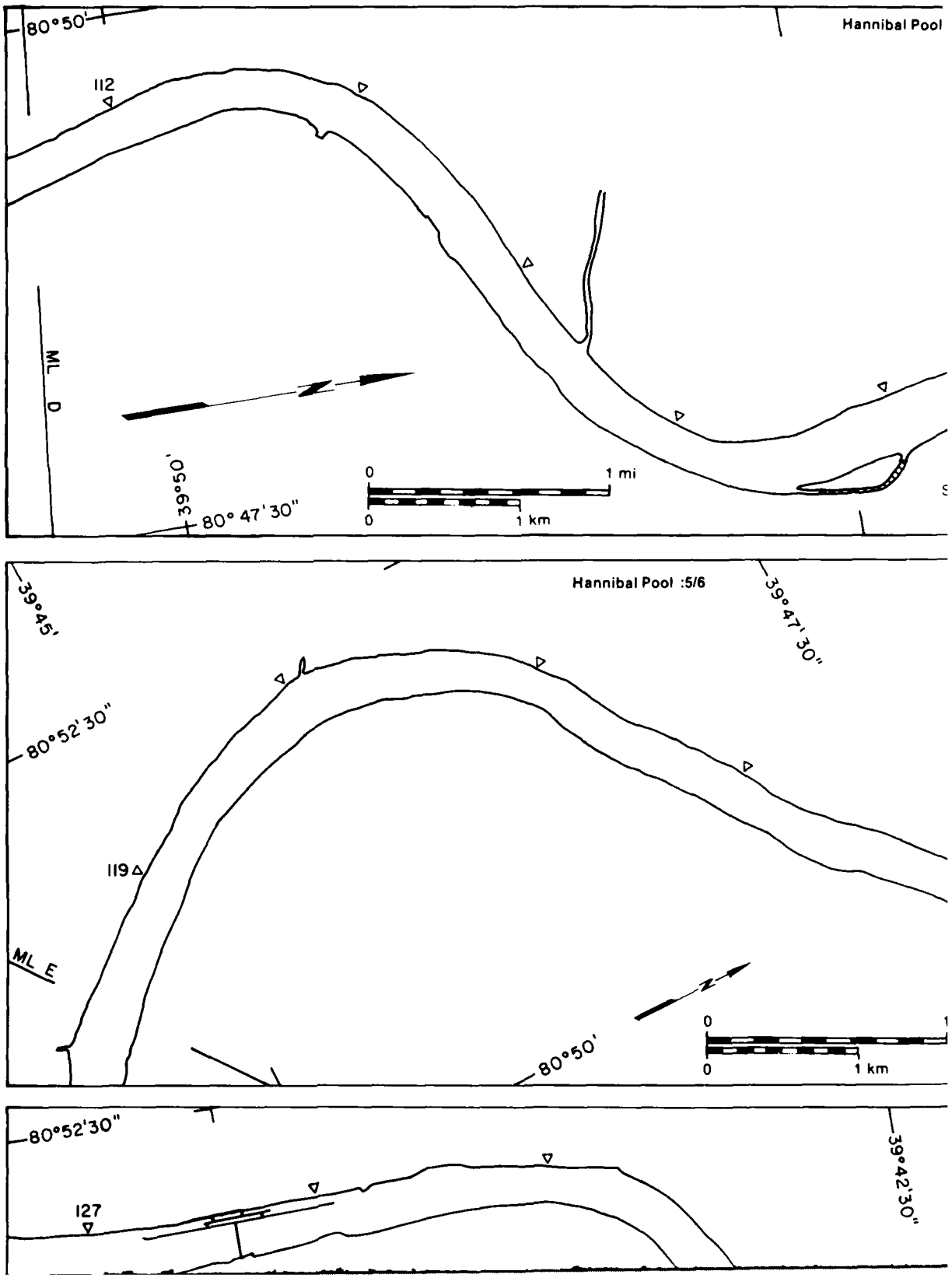

Wheeling Island
89
Wheeling
Creek
ML A
40°5'
date January 16, 1986
Video Tape 9


96
N
40°00'
0
1 mi
0
1 km
40°02'30"

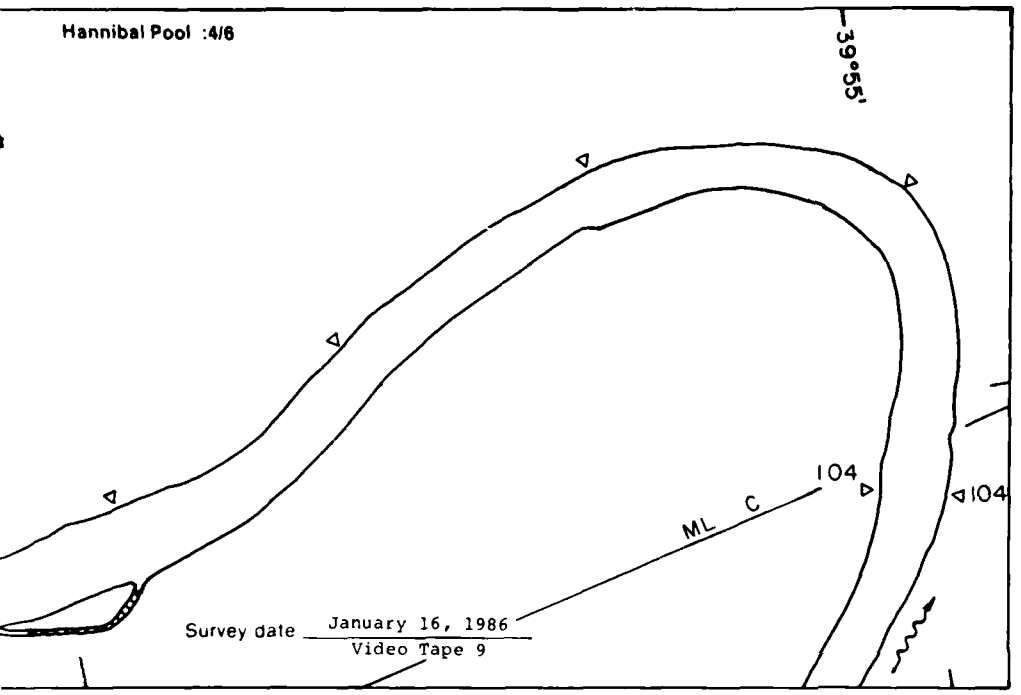

Hannibal Pool :3/6
39°57'30"
104
ML
C
N
0
1 mi
0
1 km
Survey date January 16, 1986
Video Tape 9

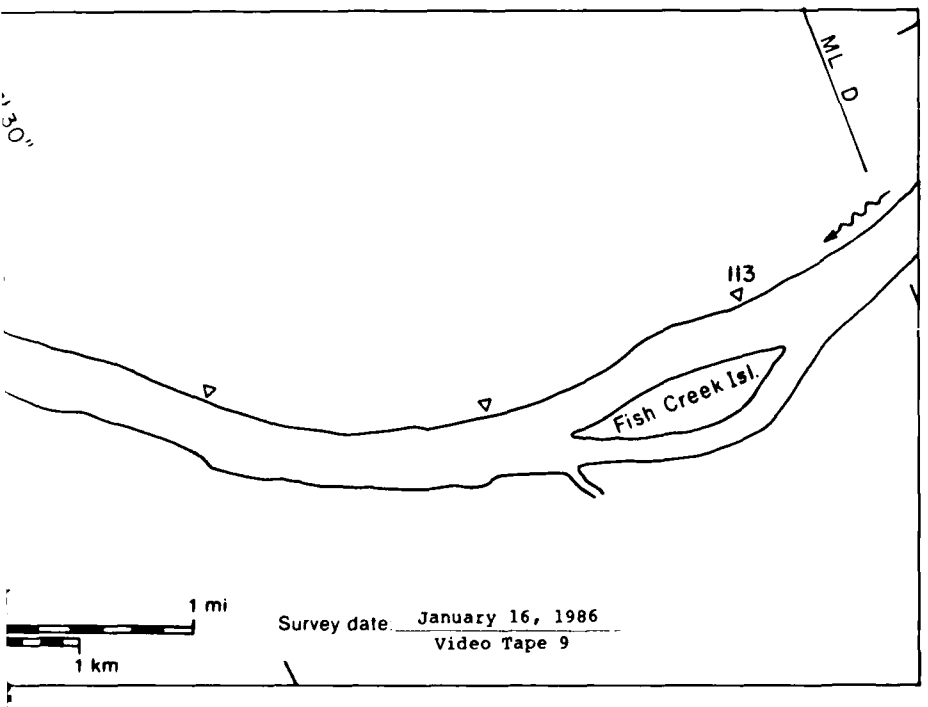

Wheeling Island
89
Wheeling
Creek
40°02'30"
Survey date January 16, 1986
Video Tape 9
40°5'
ML A

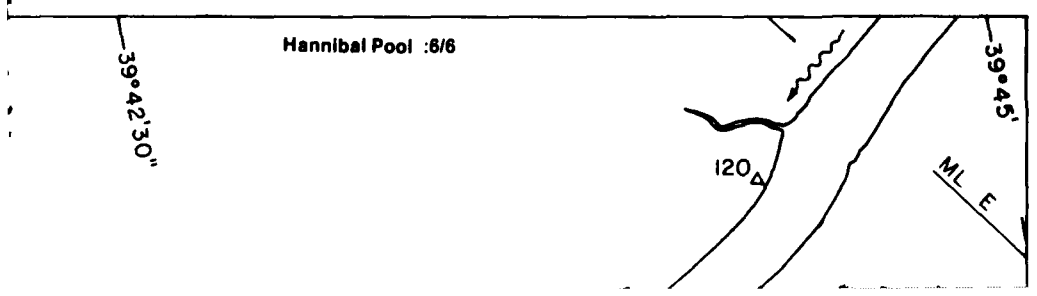

3/6
39°57'30"
80° 45'
ML B
96
date January 16, 1986
Video Tape 9

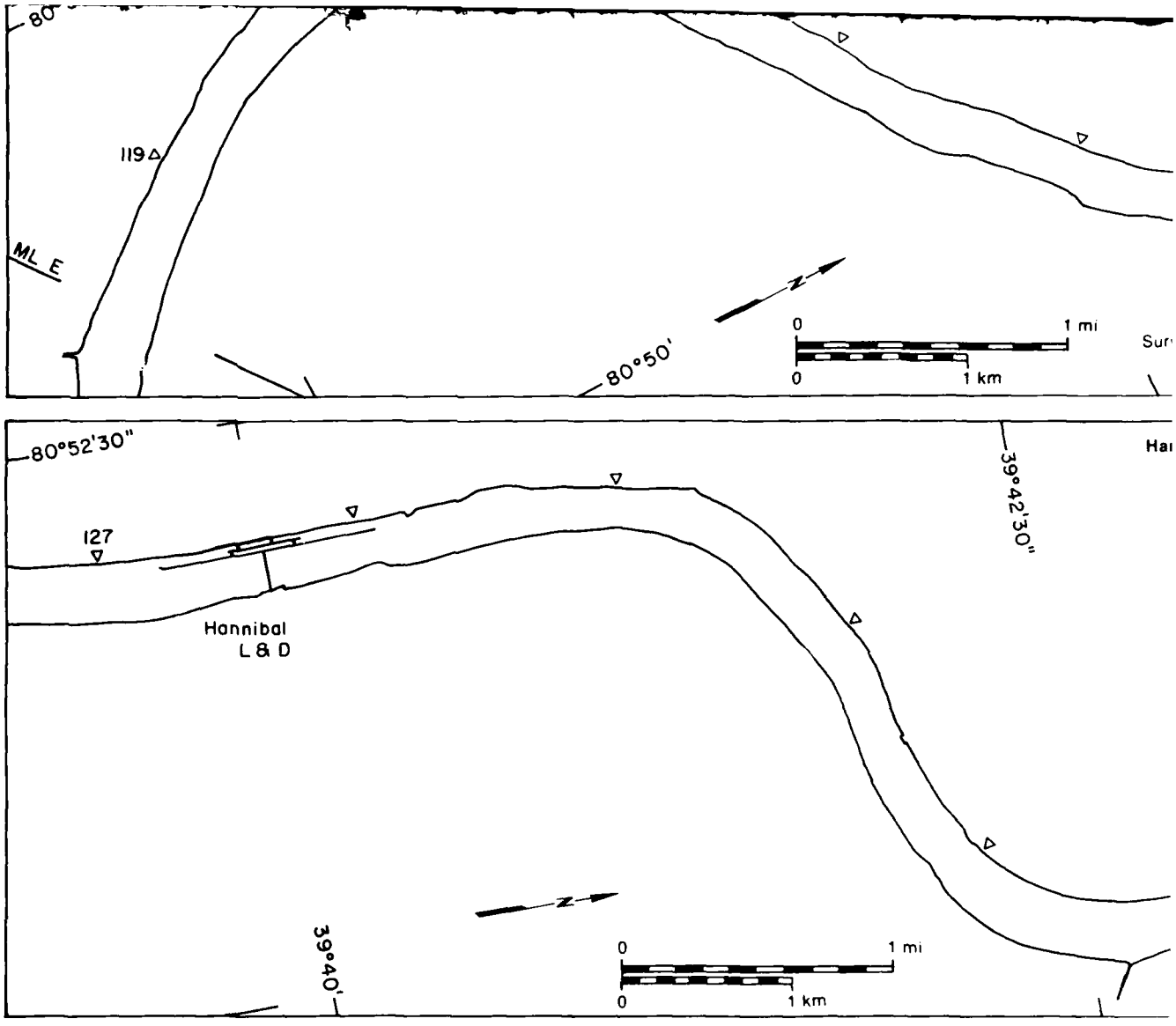

80°50'
Hannibal Pool
112
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km
Hannibal Pool :5/6
39°45'
39°47'30"
80°52'30"
119
ML E
80°50'
0
1 km
80°52'30"
39°42'30"
127

16 January 1986



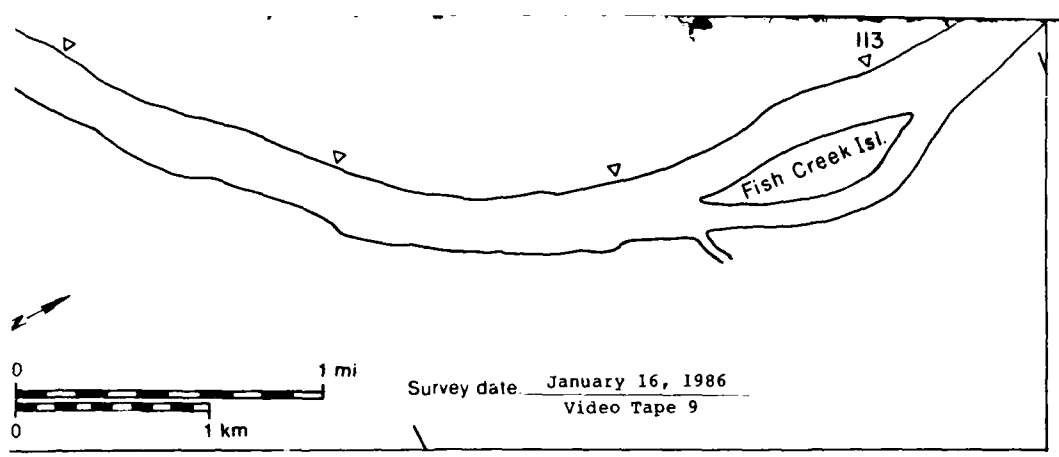


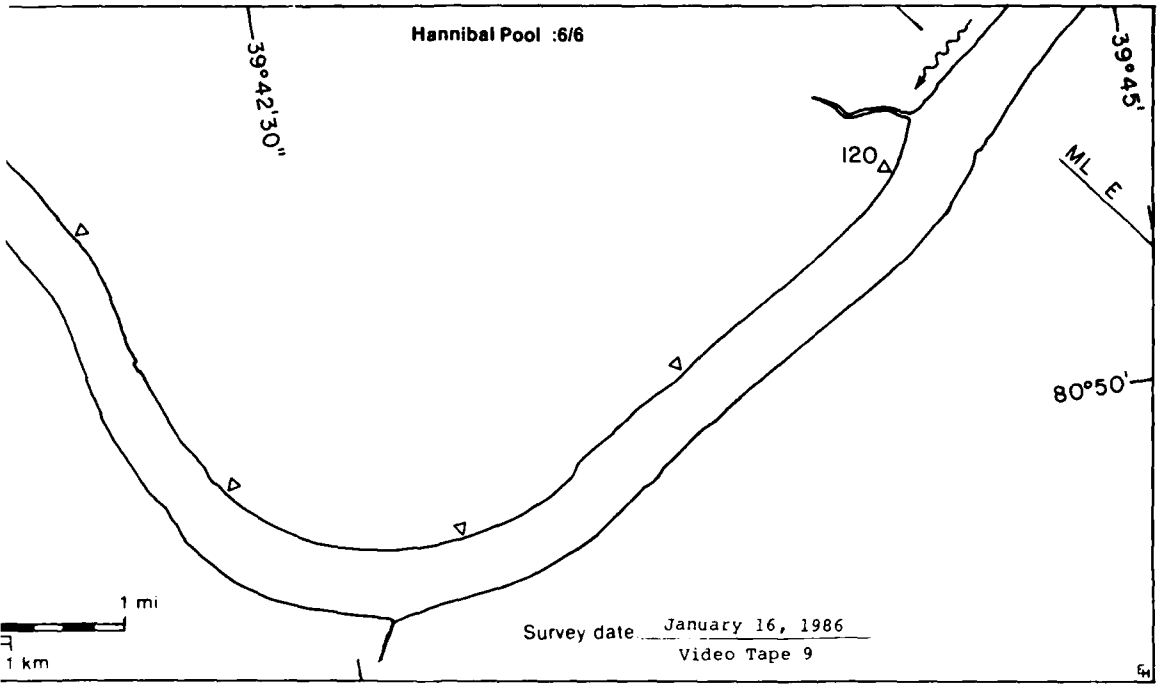




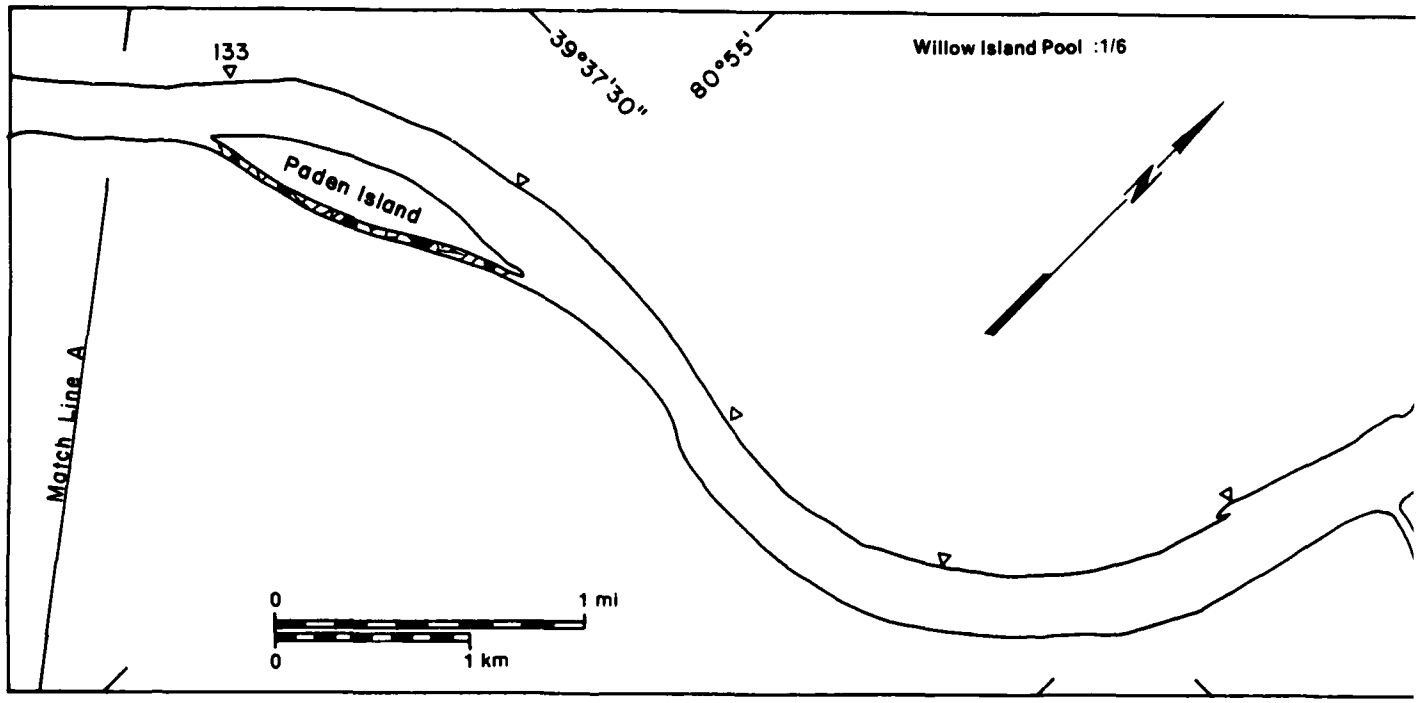
Hannibal Pool

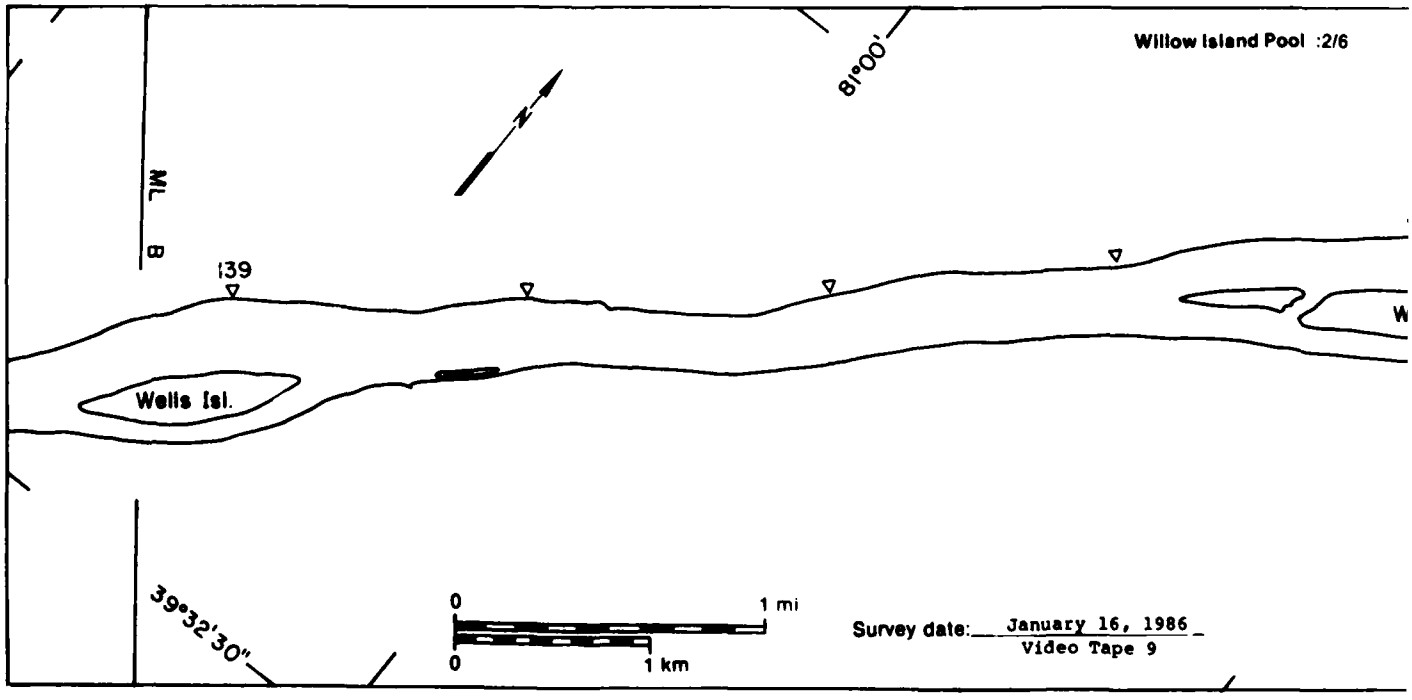
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (‰)
Open water	22.44	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	22.46	

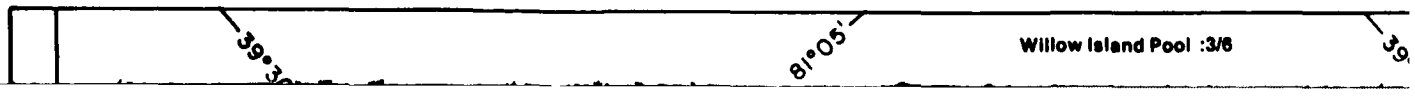

113
Fish Creek Isl.
0
1 mi
0
1 km
Survey date January 16, 1986
Video Tape 9

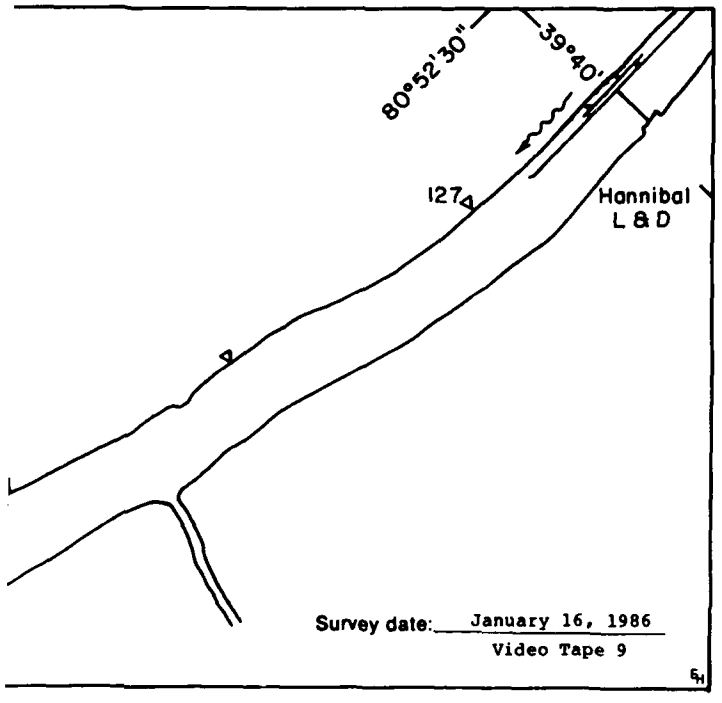

Hannibal Pool :6/6
39°42'30"
120
39°45'
ML E
80°50'
1 mi
1 km
Survey date January 16, 1986
Video Tape 9

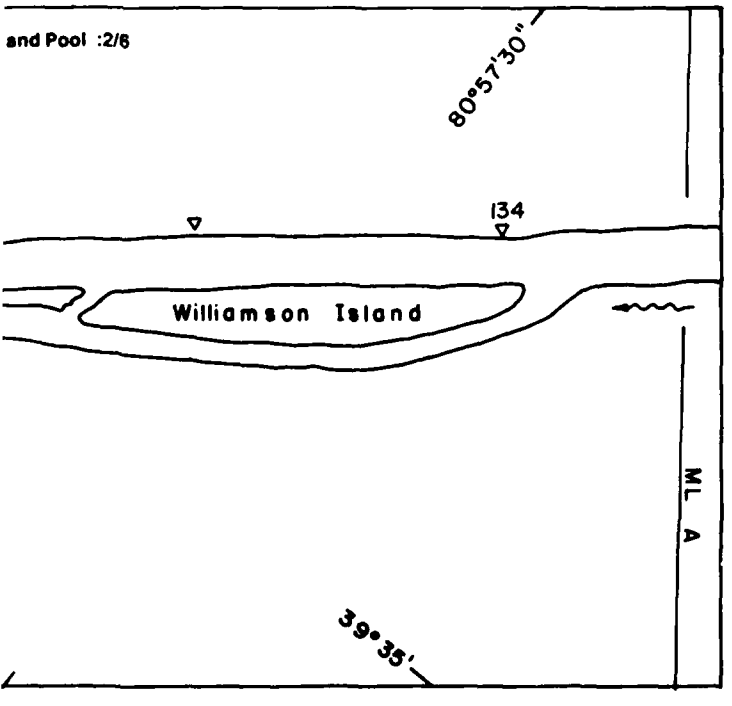
16 January 1986

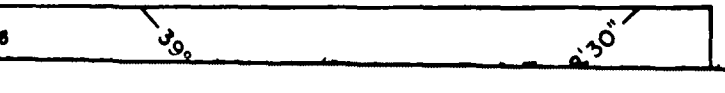


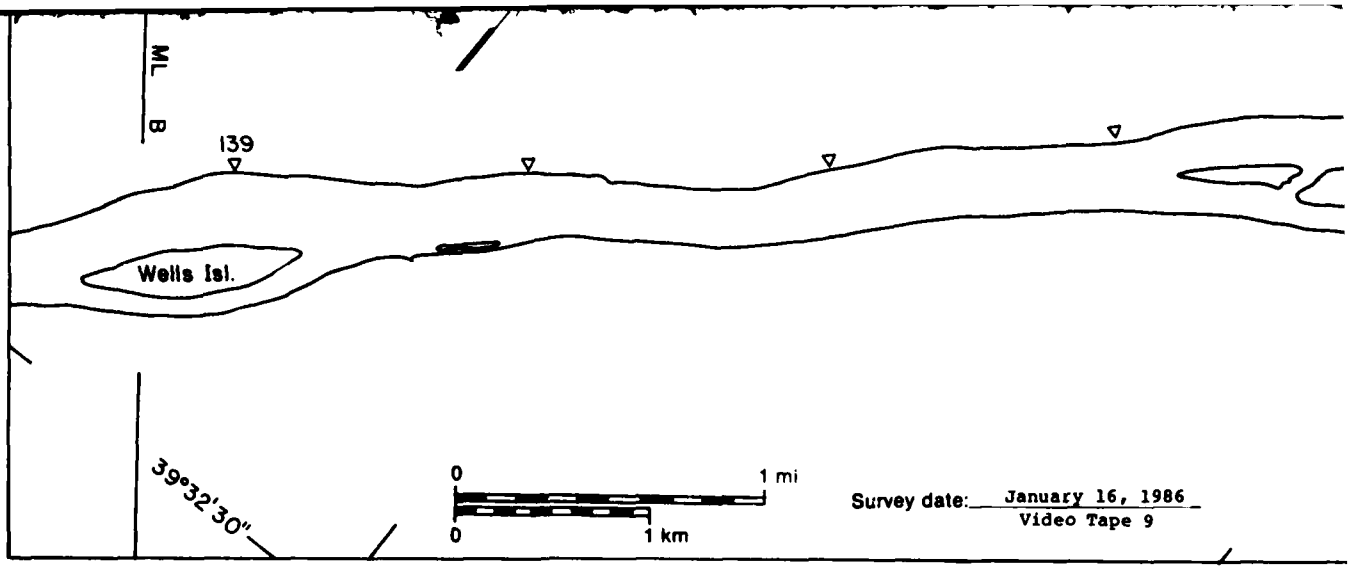


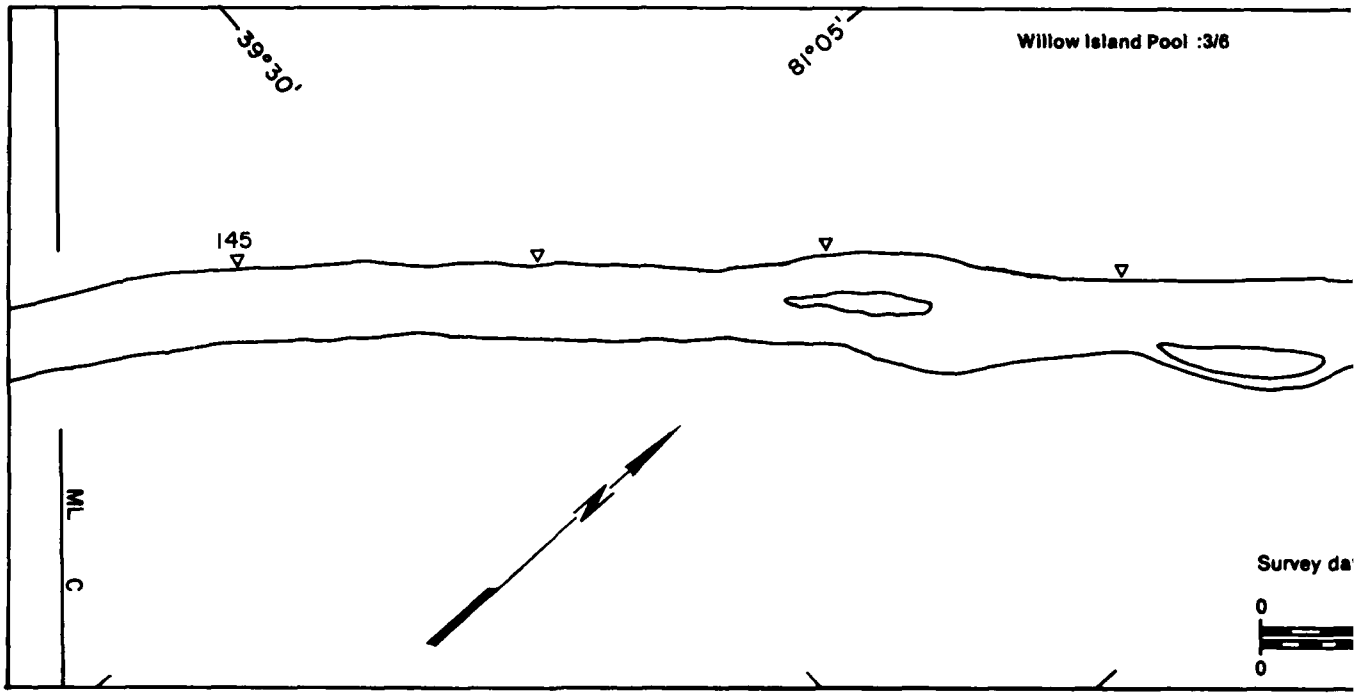


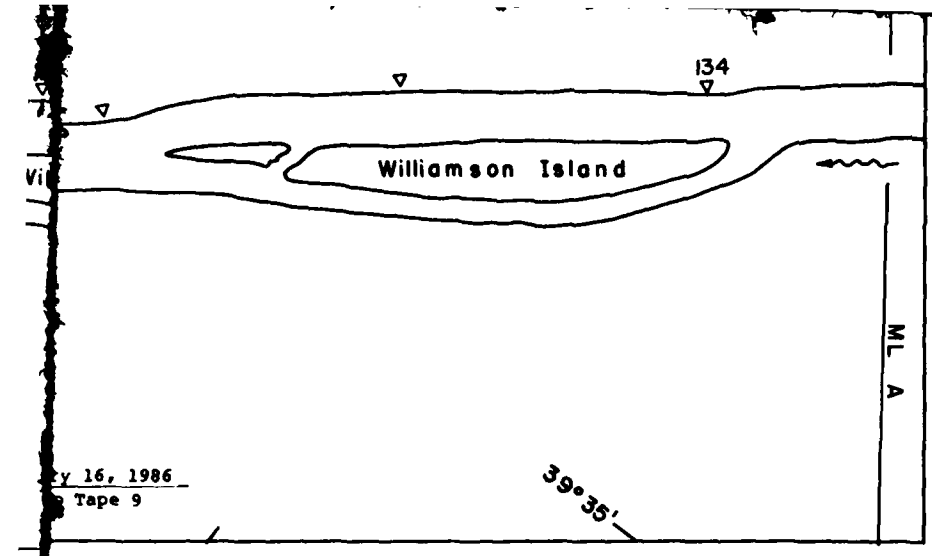

80°52'30"
39°40'
127
Hannibal
L & D
Survey date: January 16, 1986
Video Tape 9


and Pool :2/6
80°57'30"
134
Williamson Island
ML A
39°35'

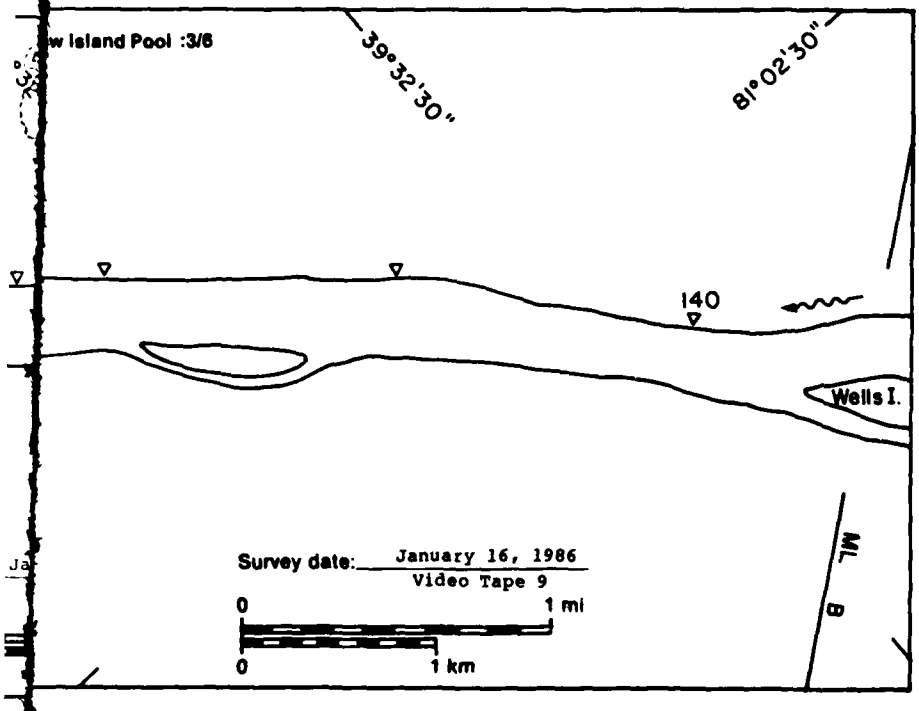

39°
2'30"

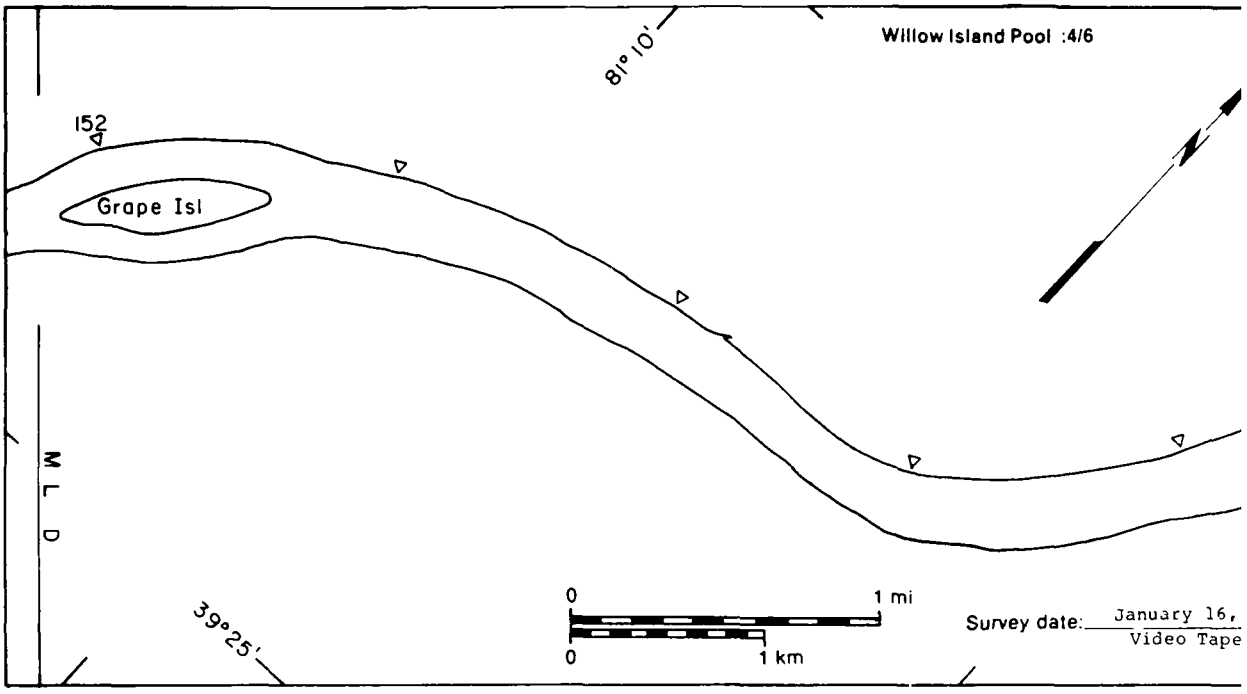

ML B
139
Wells Isl.
39°32'30"
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 9

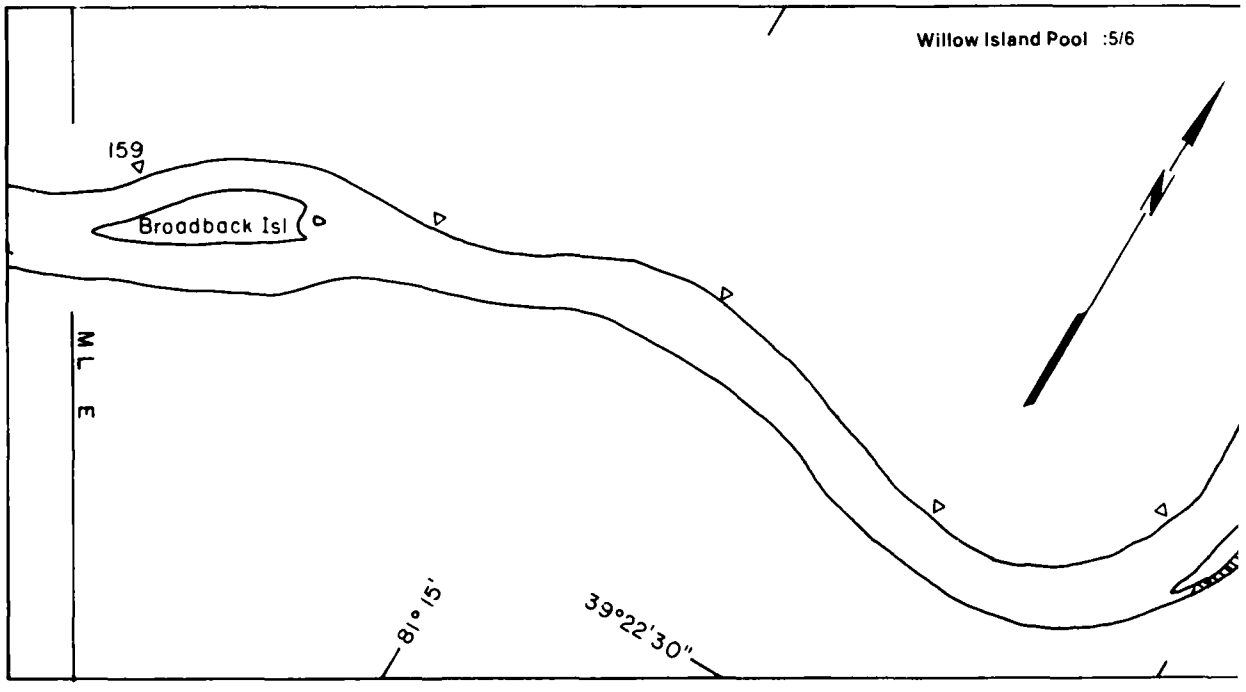

39°30'
81°05'
Willow Island Pool :3/6
145
ML C
Survey da
0
0

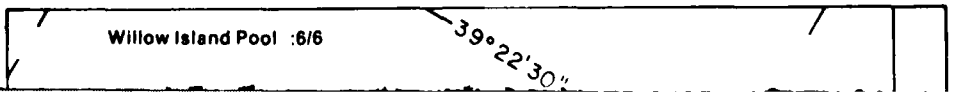


y 16, 1986
Tape 9

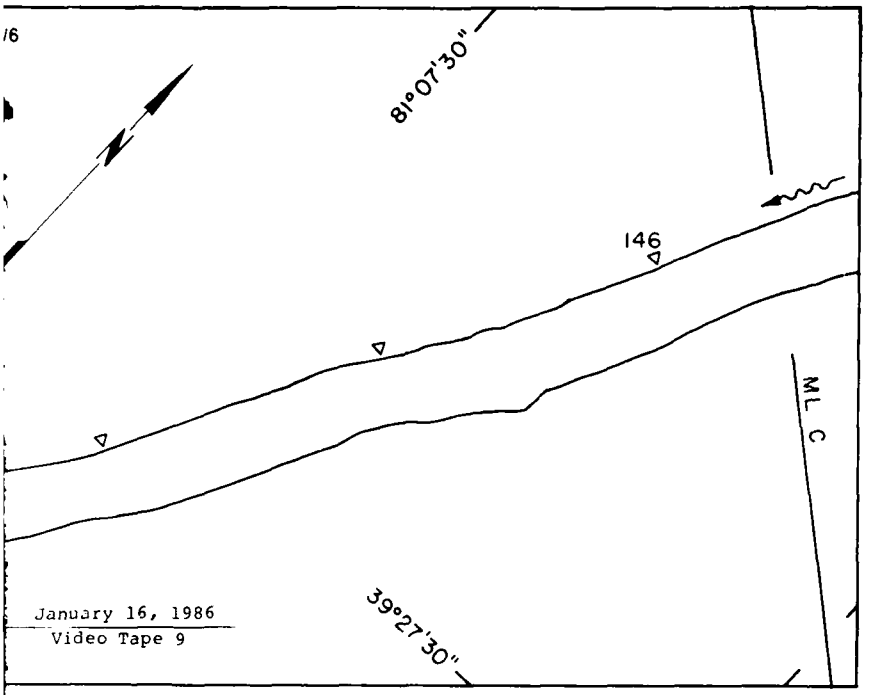


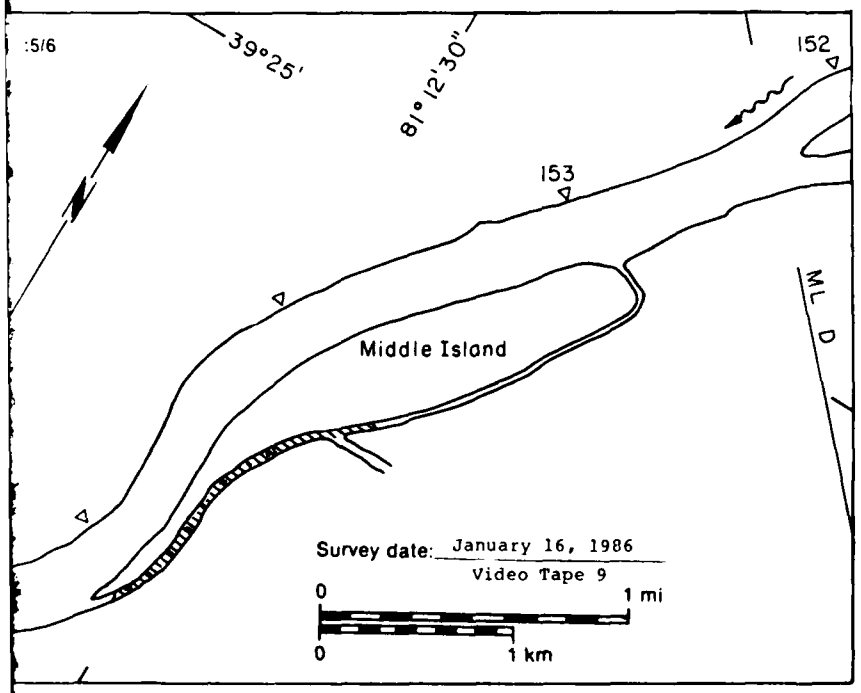

Willow Island Pool :4/6
81°10'
152
Grape Isl
M L D
39°25'
0
1 mi
0
1 km
Survey date: January 16,
Video Tape


Willow Island Pool :5/6
159
Broadback Isl
M L E
81°15'
39°22'30"


Willow Island Pool :6/6
39°22'30"

16 January 1986



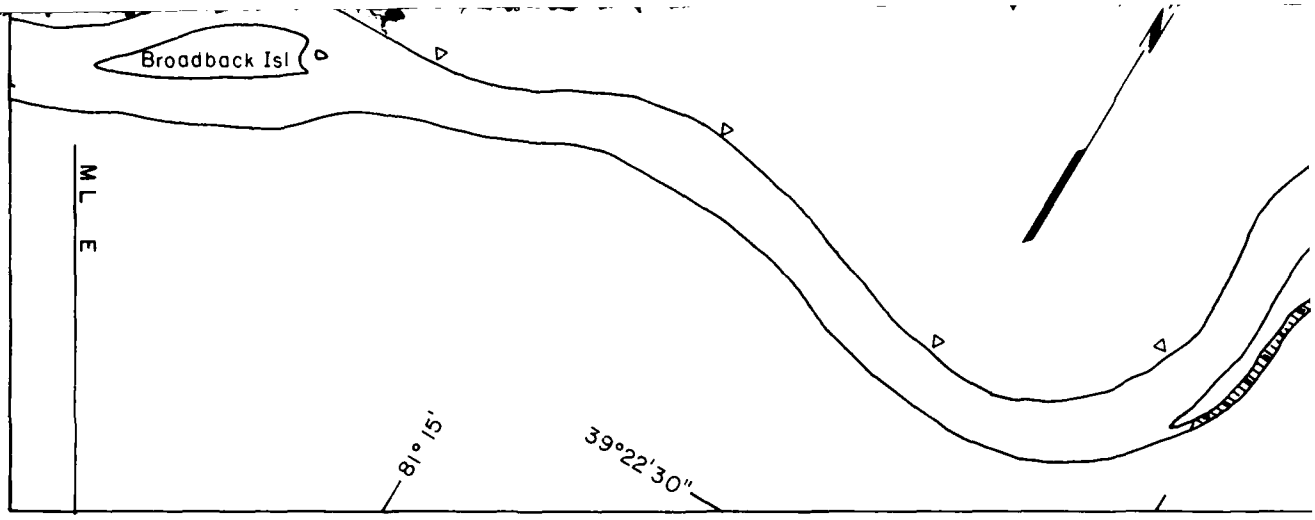


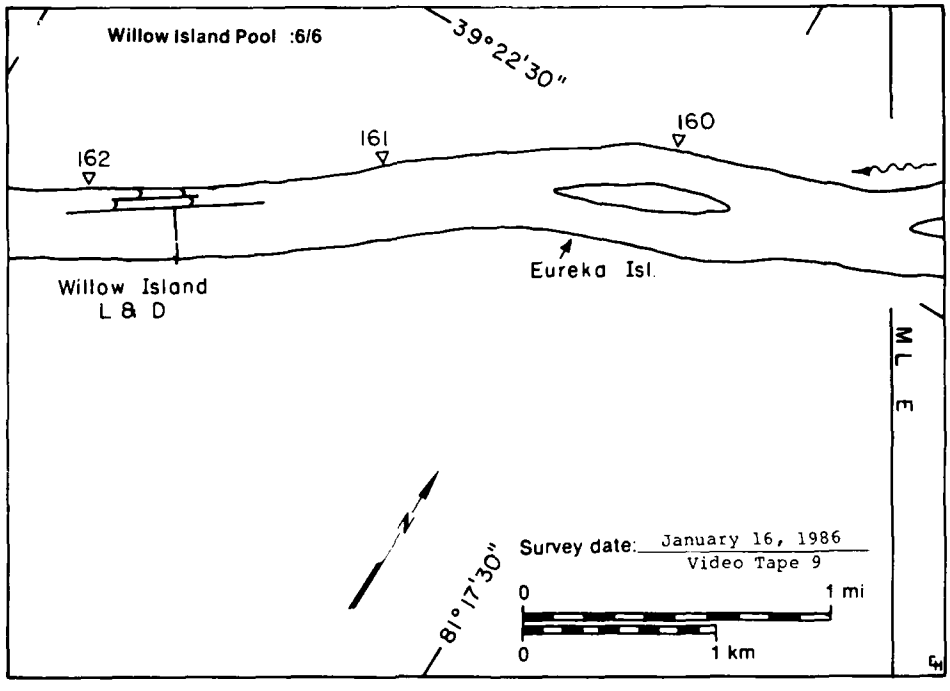
Willow Island Pool

MAP UNITS

Area ($m^2 \times 10^6$)

Surface concentration





Willow Island Poo

MAP UNITS

Open water

Solid ice cover

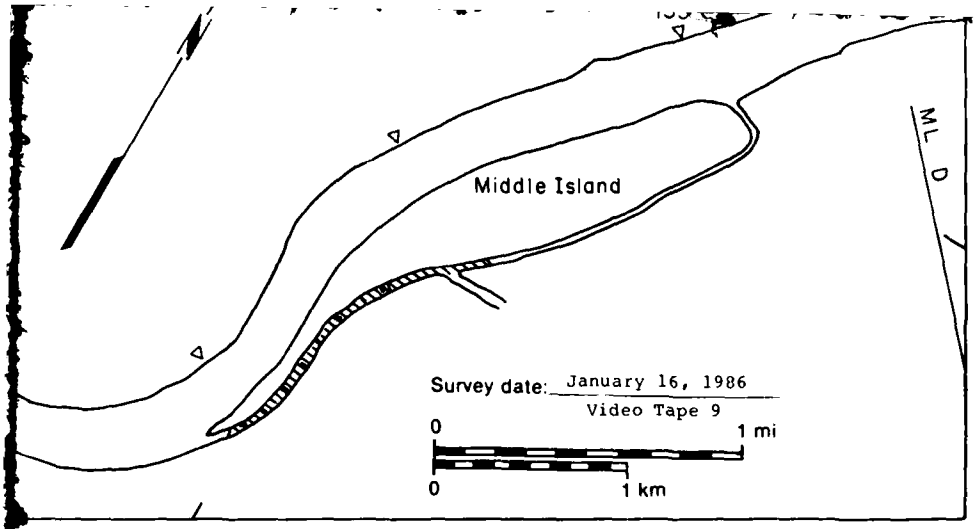
Solid ice cover
open-water are

Fragmented ic

Fragmented ic
with open-wate

Ice floes or fra
and pans

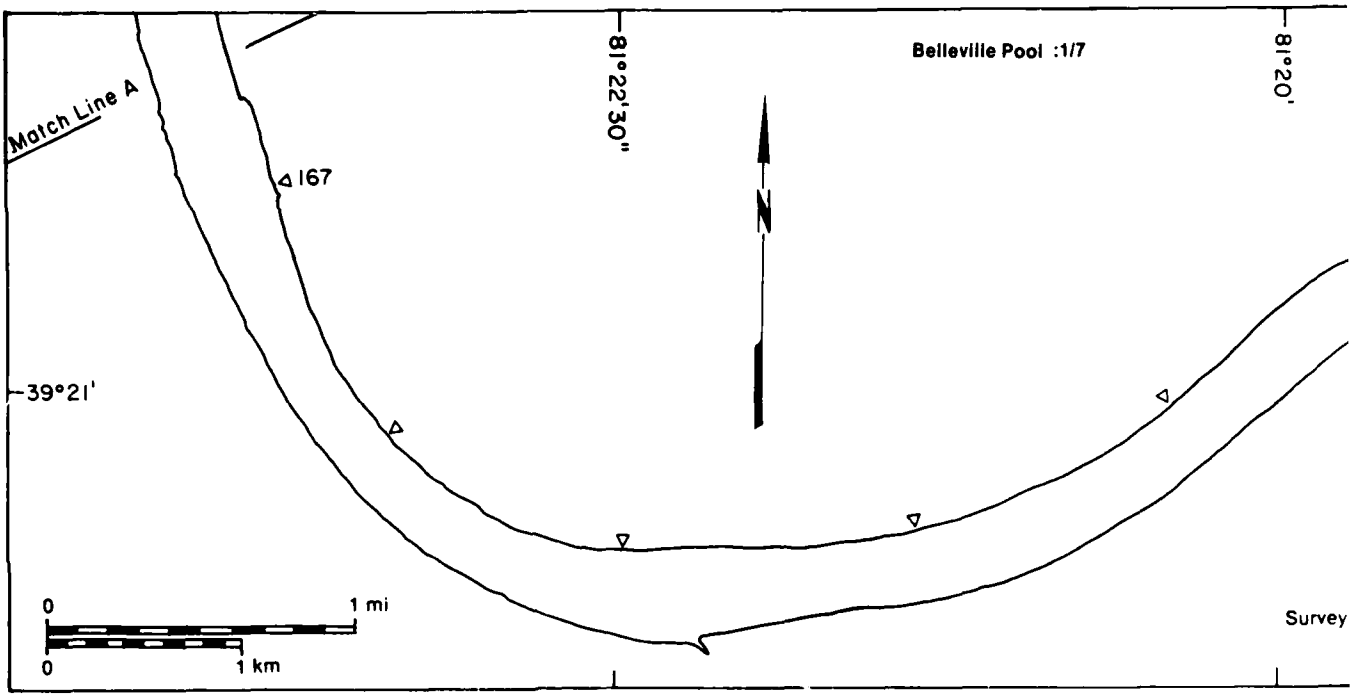
Total area

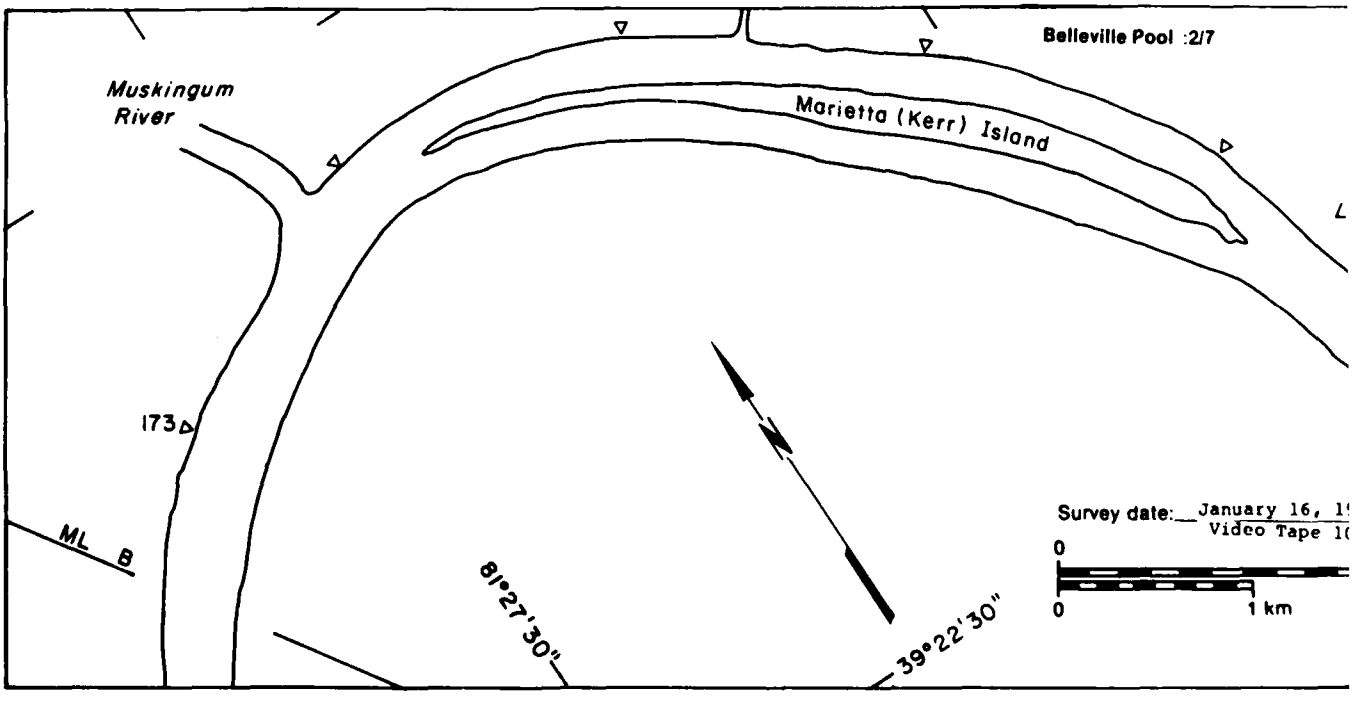


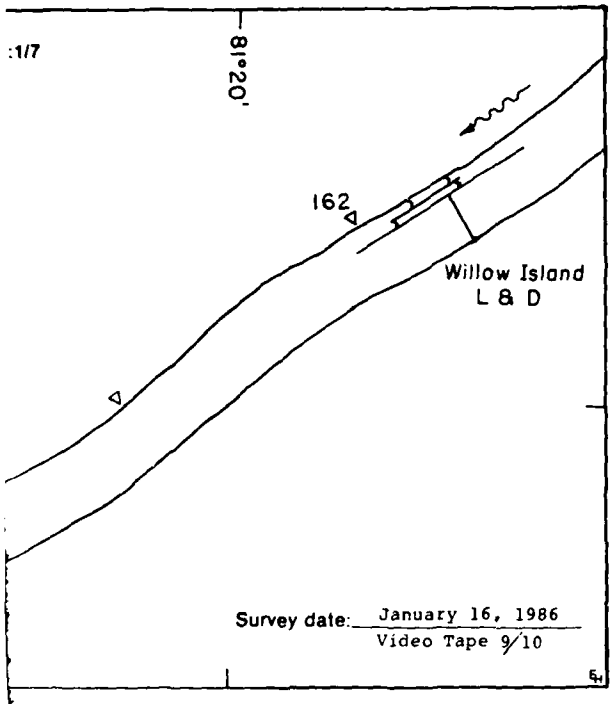
Willow Island Pool

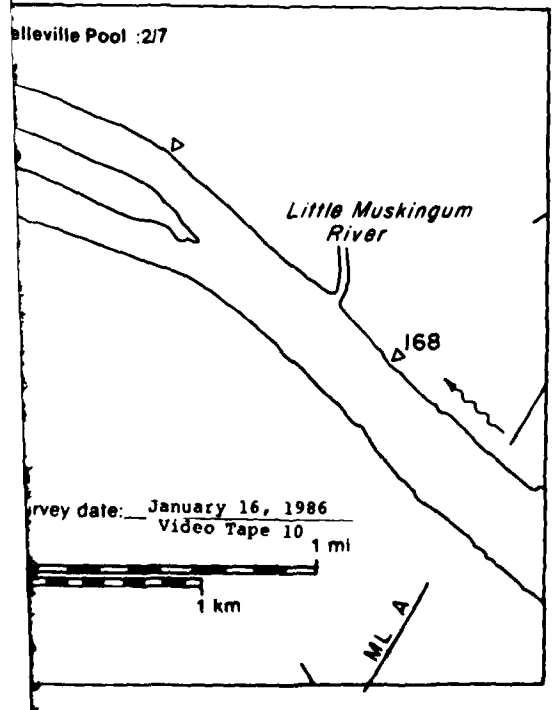
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	21.02	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.09	70
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.10	50
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	21.24	

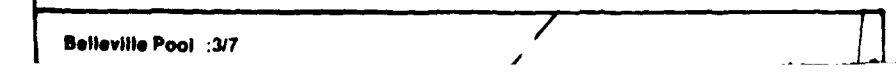
16 January 1986

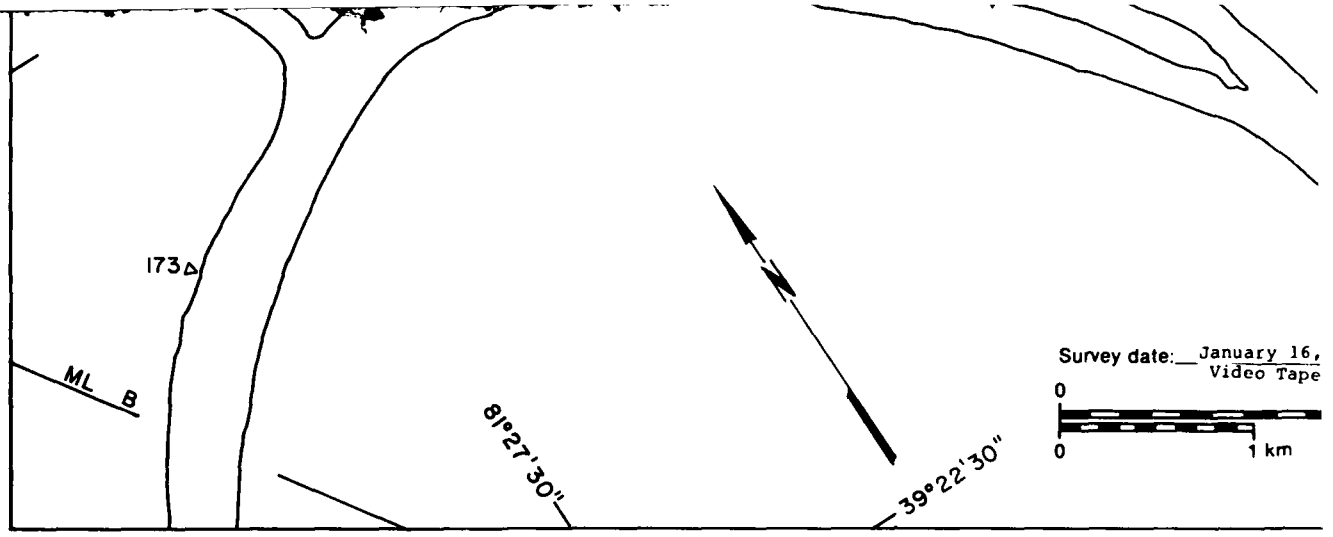


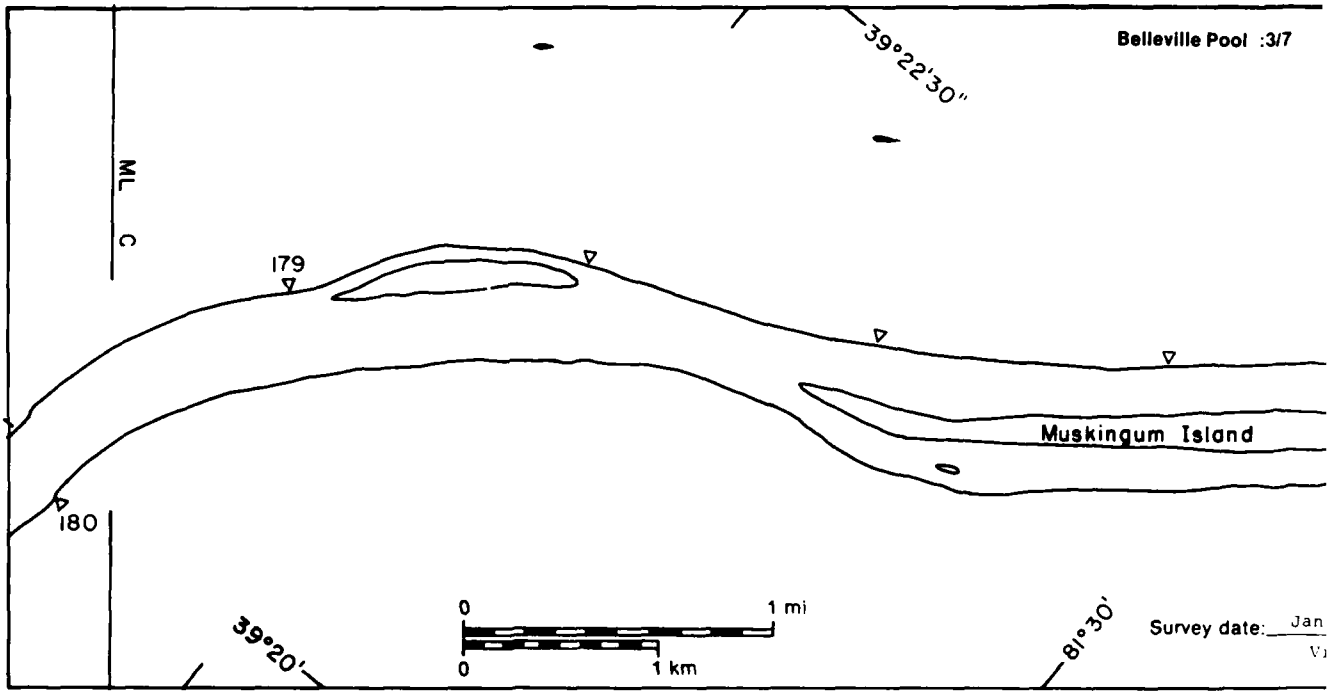


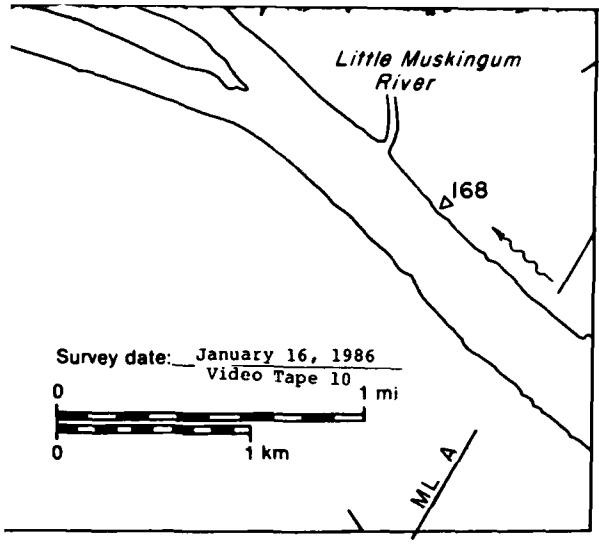

:1/7
81°20'
162
Willow Island
L & D
Survey date: January 16, 1986
Video Tape 9/10

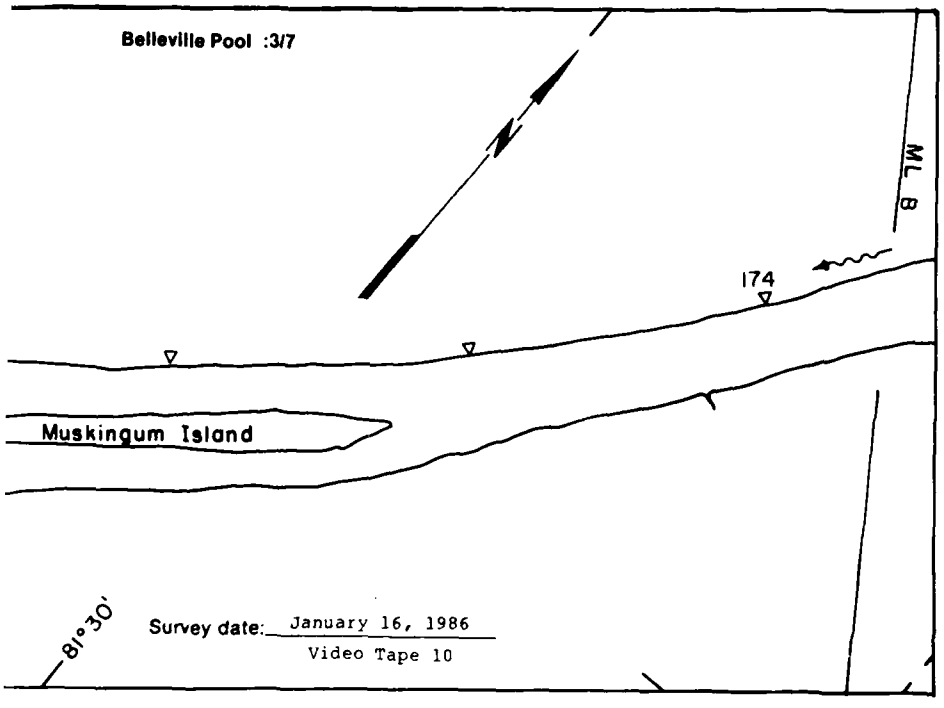

lleville Pool :2/7
Little Muskingum
River
168
rvey date: January 16, 1986
Video Tape 10
1 mi
1 km
ML A

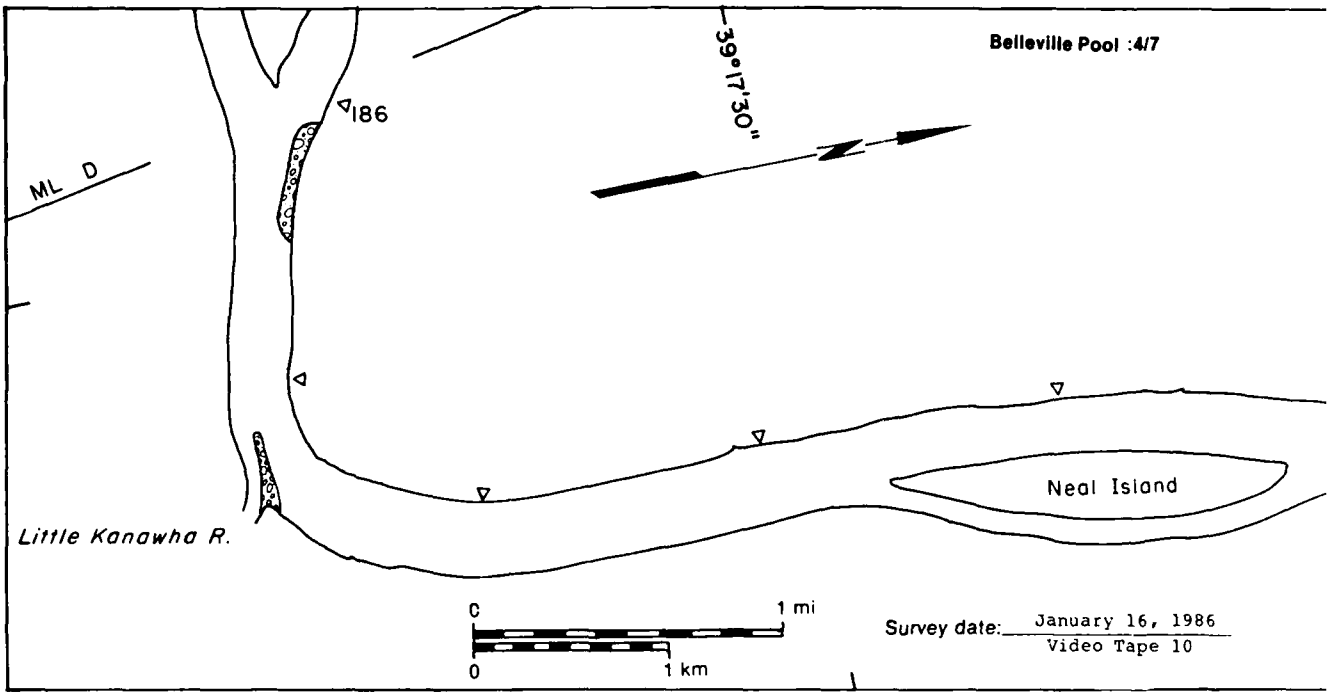

Belleville Pool :3/7

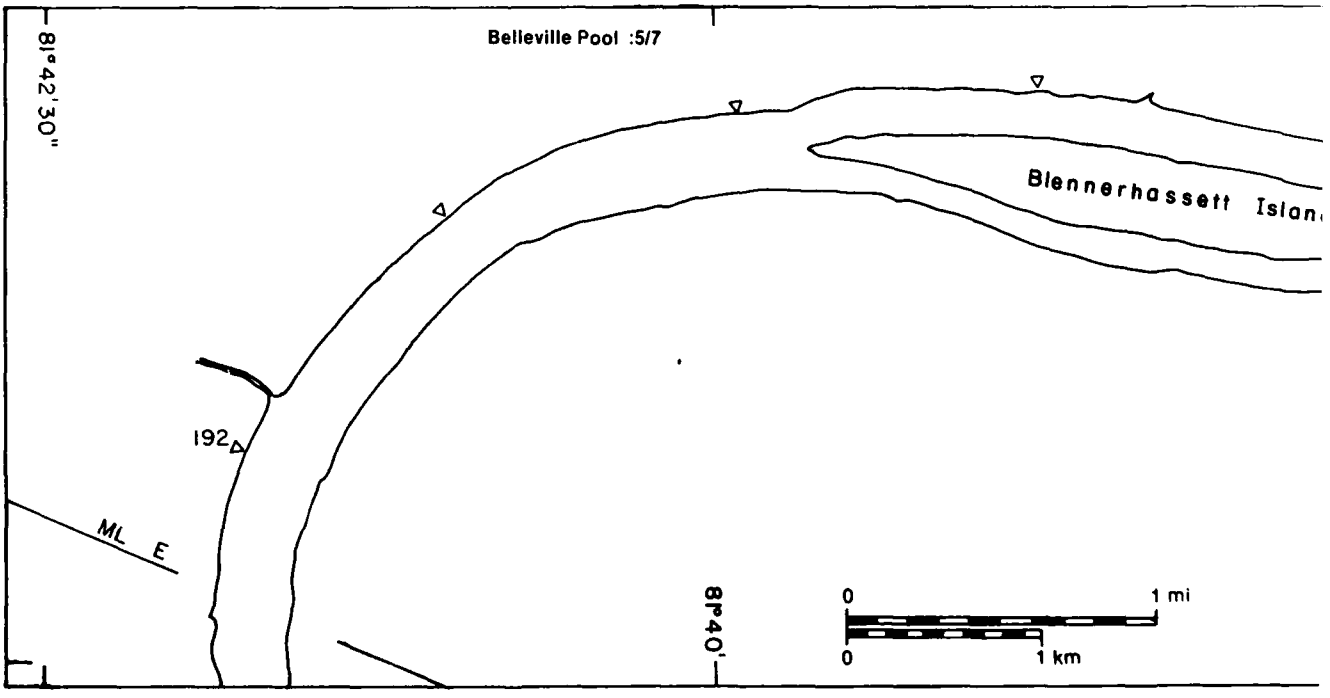

173
ML B
81°27'30"
39°22'30"
Survey date: January 16,
Video Tape
0
0
1 km

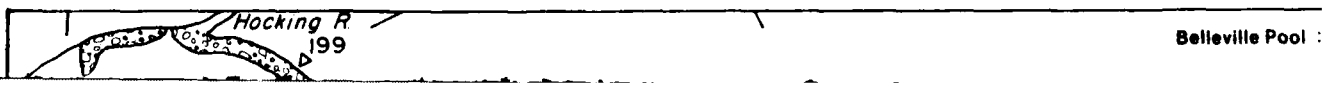

Belleville Pool :3/7
39°22'30"
ML C
179
Muskingum Island
180
0
1 mi
0
1 km
39°20'
81°30'
Survey date: Jan


Little Muskingum River
168
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km
ML A

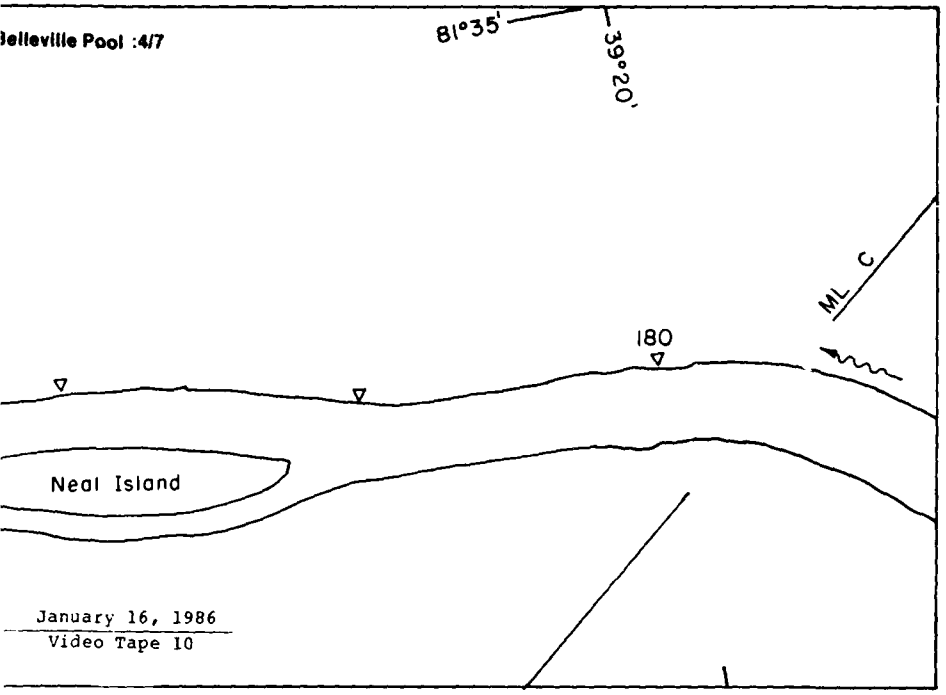

Belleville Pool :3/7
ML B
174
Muskingum Island
81°30'
Survey date: January 16, 1986
Video Tape 10

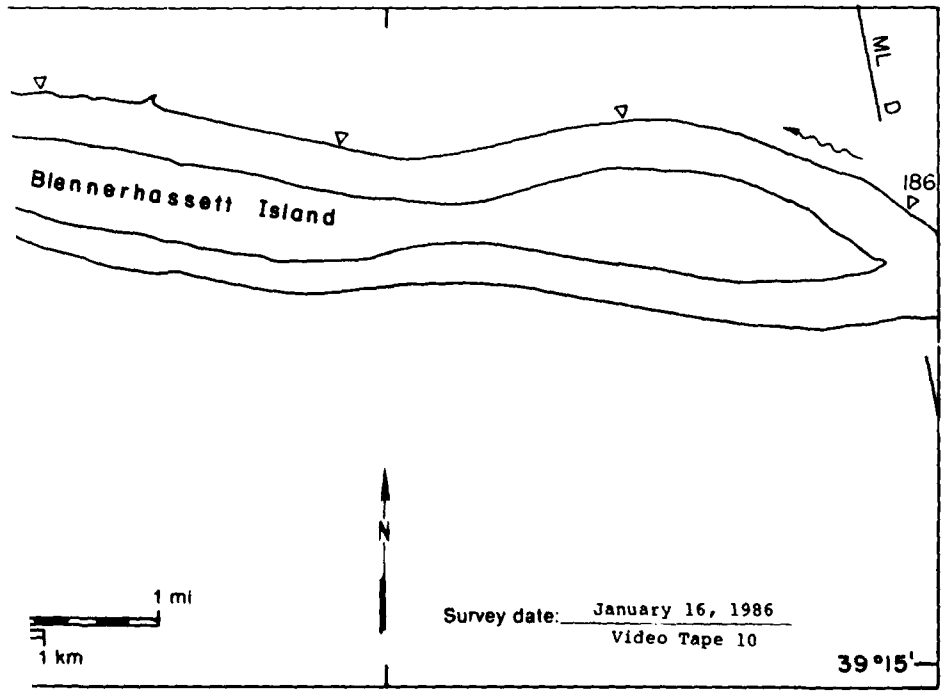

Belleville Pool :4/7
39°17'30"
186
ML D
Neal Island
Little Kanawha R.
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10

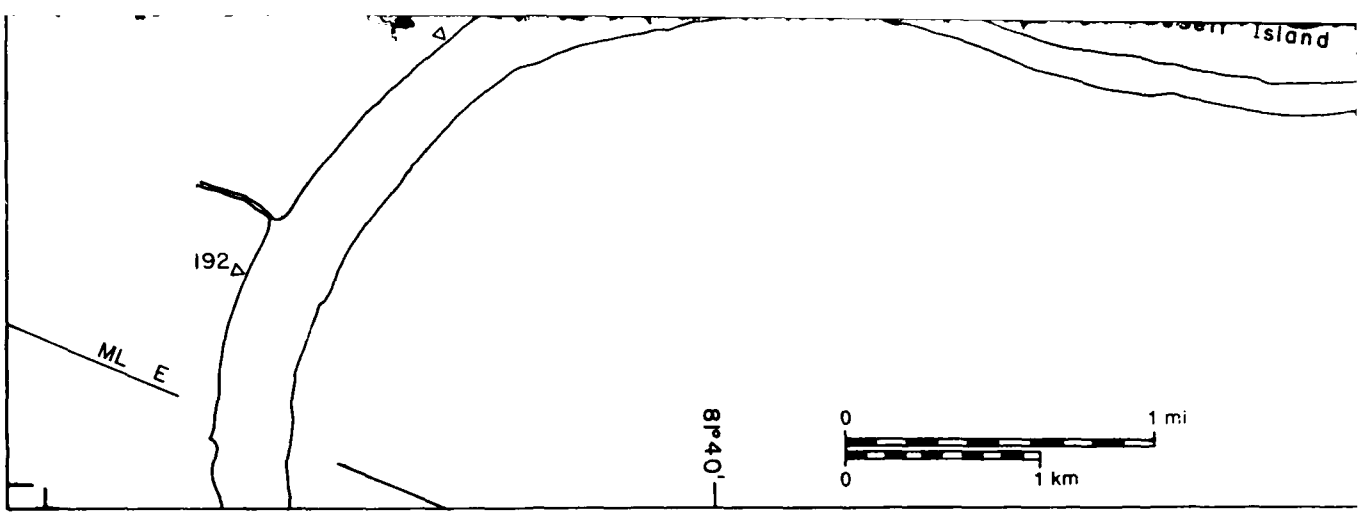

Belleville Pool :5/7
81°42'30"
Blennerhassett Island
192
ML E
8°40'
0
1 mi
0
1 km

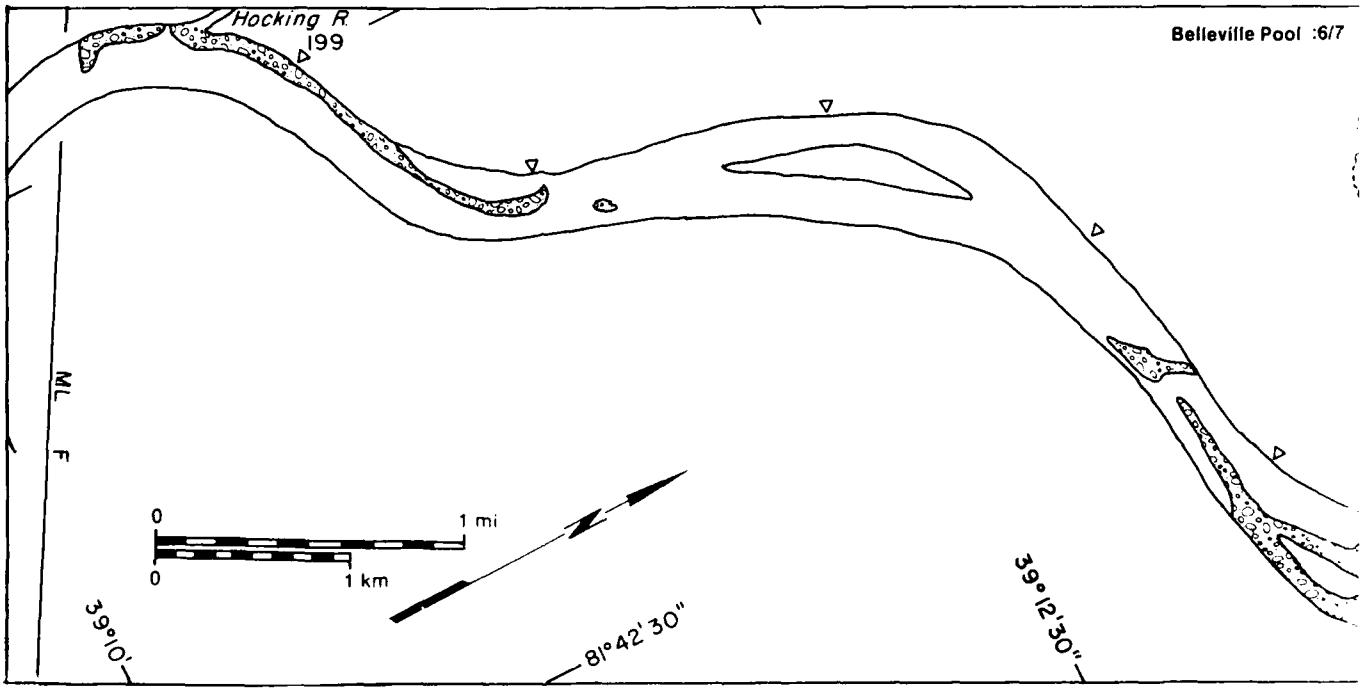

Hocking R
199
Belleville Pool :

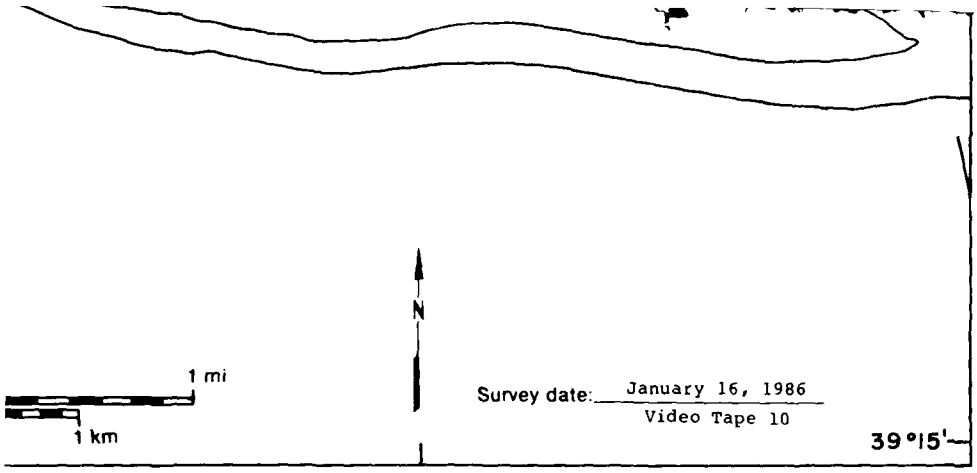
16 January 1986

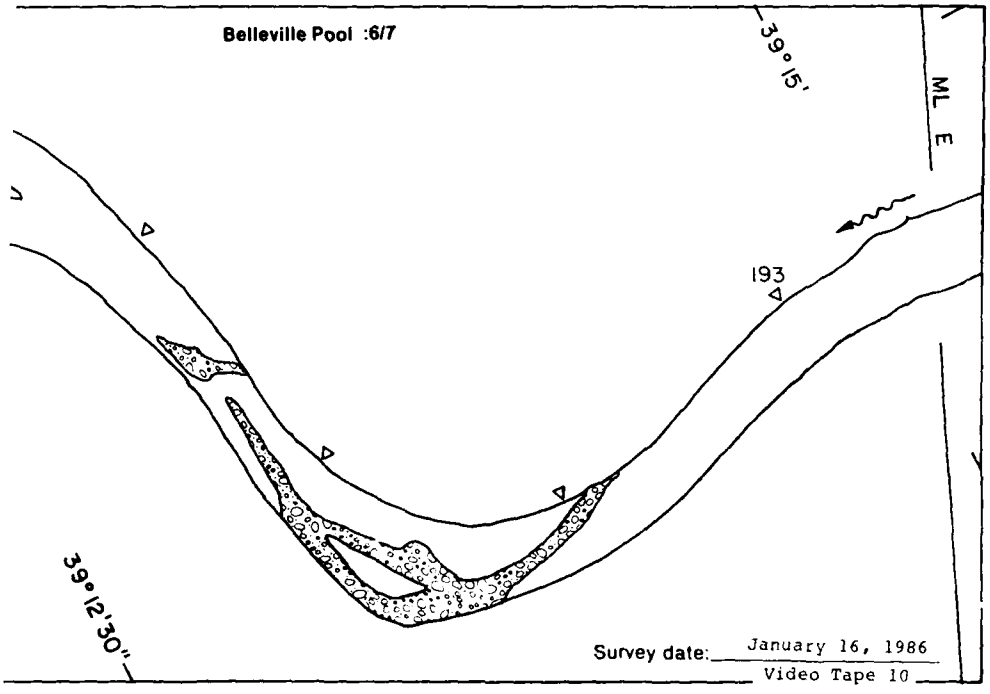




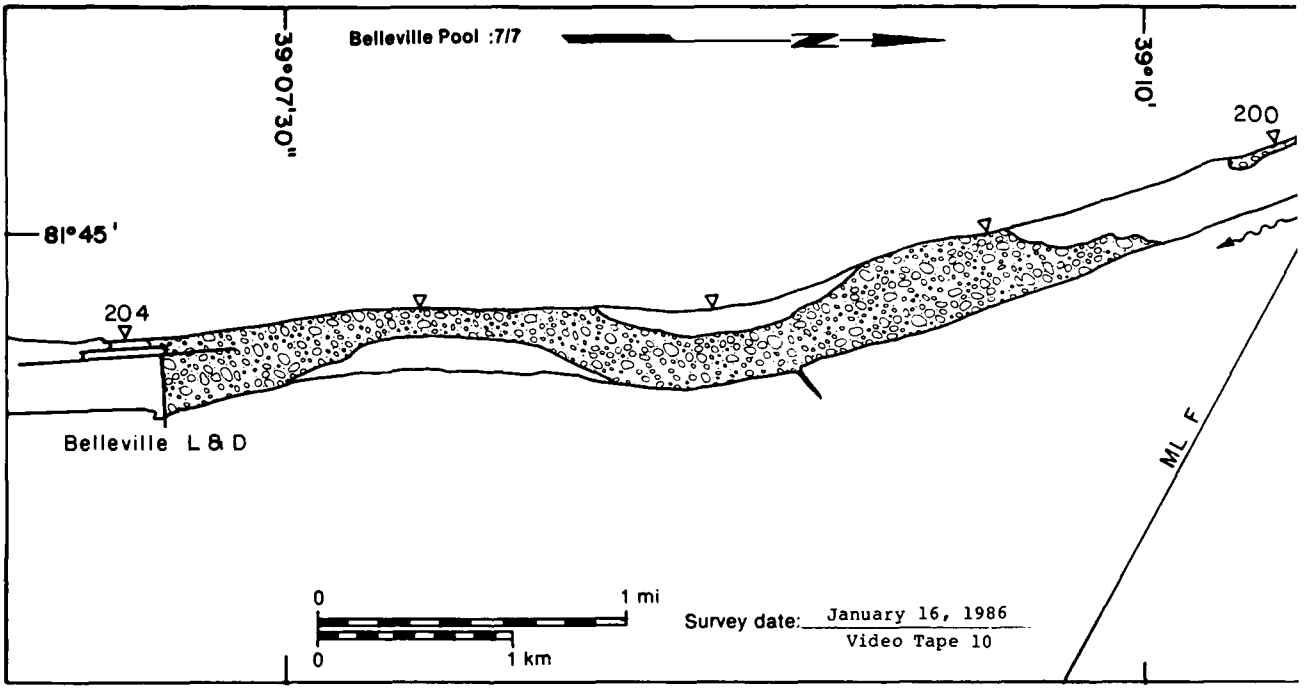

192
ML E
81°40'
0
1 mi
0
1 km


Hocking R.
199
Belleville Pool :6/7
ML F
0
1 mi
0
1 km
39°10'
81°42'30"
39°12'30"


1 mi
1 km
N
Survey date: January 16, 1986
Video Tape 10
39°15'

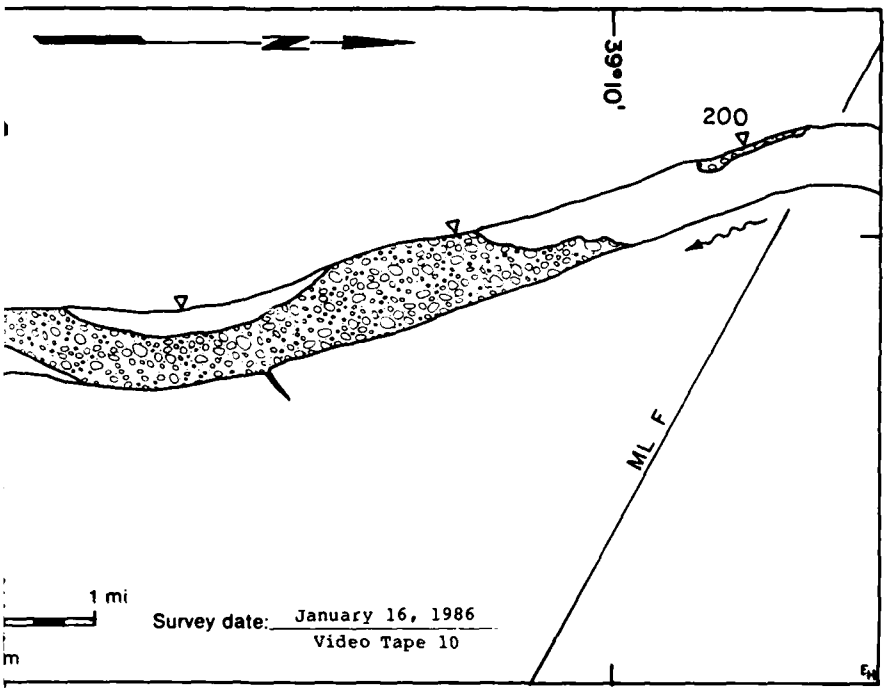

Belleville Pool :6/7
39°15'
ML E
193
39°12'30"
Survey date: January 16, 1986
Video Tape 10

16 January 1986

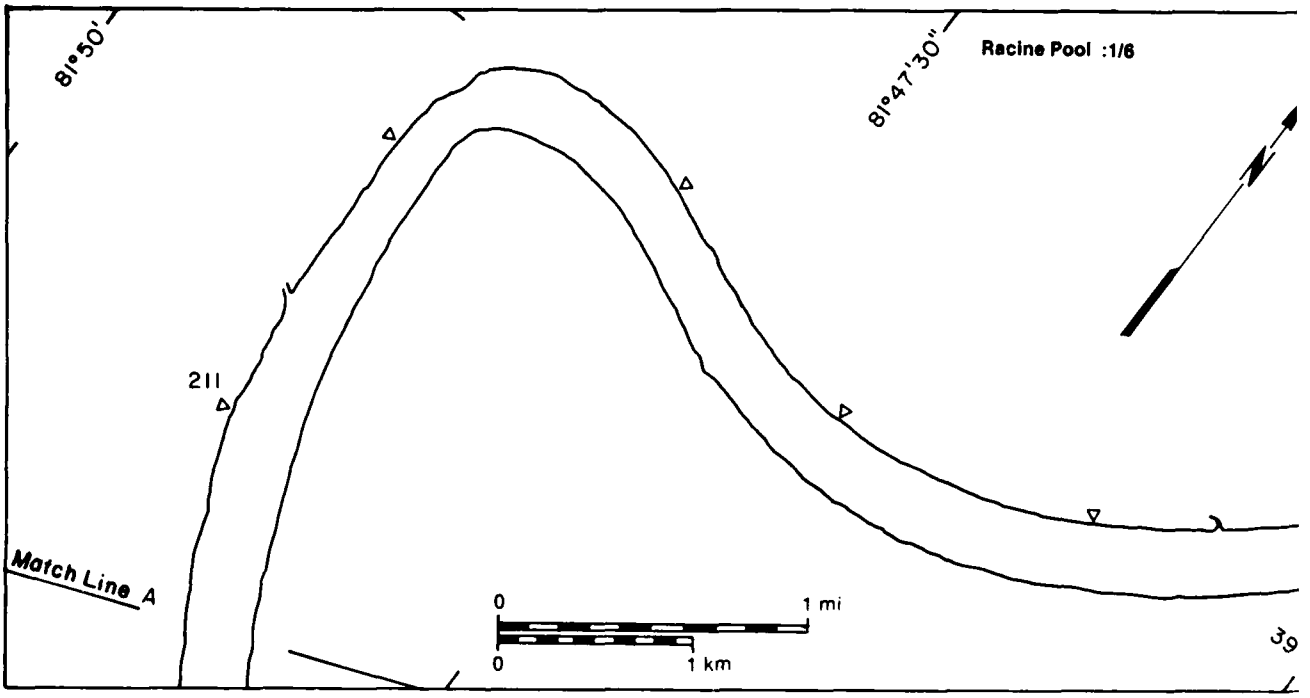


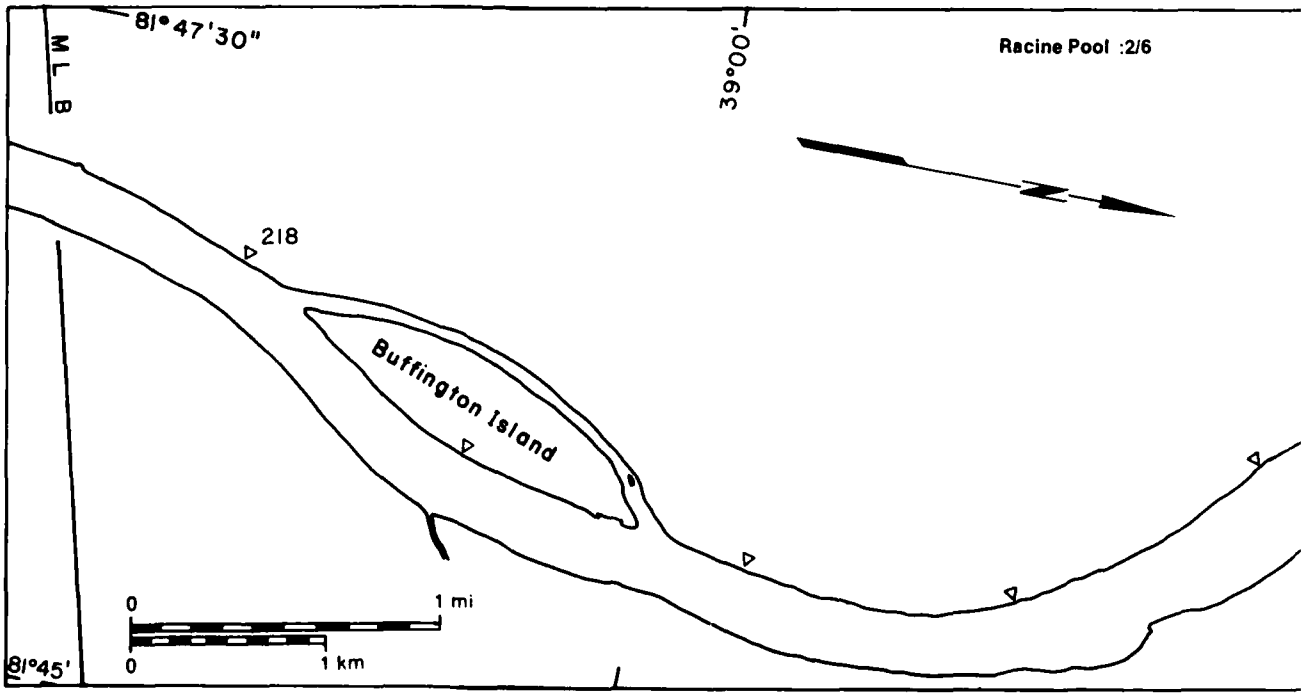
Belleville Pool

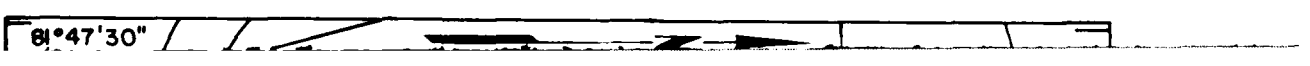
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	24.97	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.31	5
Total area (m^2 x 10^6)	27.28	



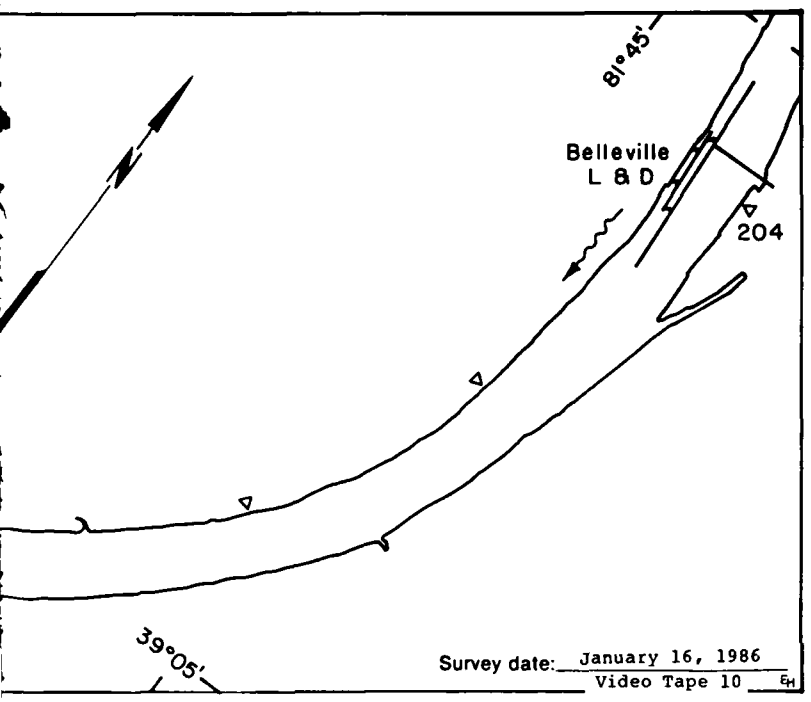
Surface concentration (%)
NA
NA
—
NA
—
5

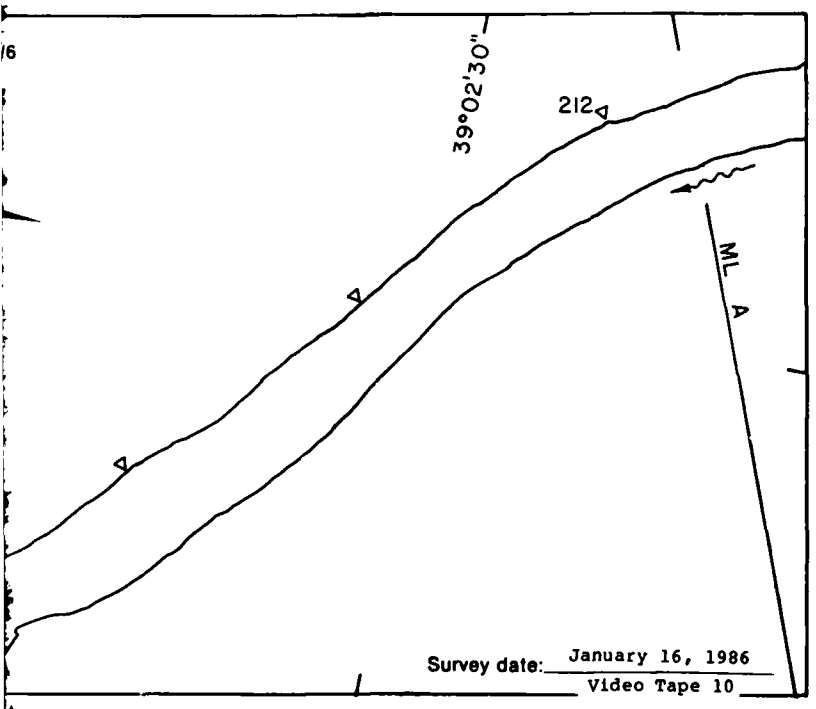

81°50'
81°47'30"
Racine Pool :1/6
211
Match Line A
0
1 mi
0
1 km
39

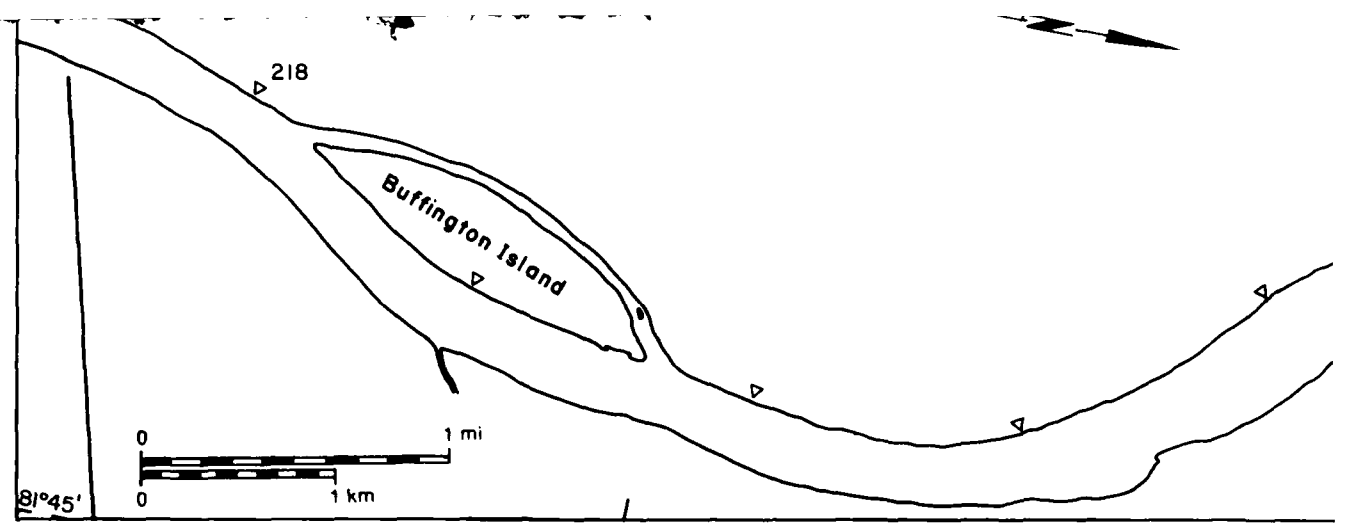

81°47'30"
39°00'
Racine Pool :2/6
218
Buffington Island
0
1 mi
0
1 km
81°45'

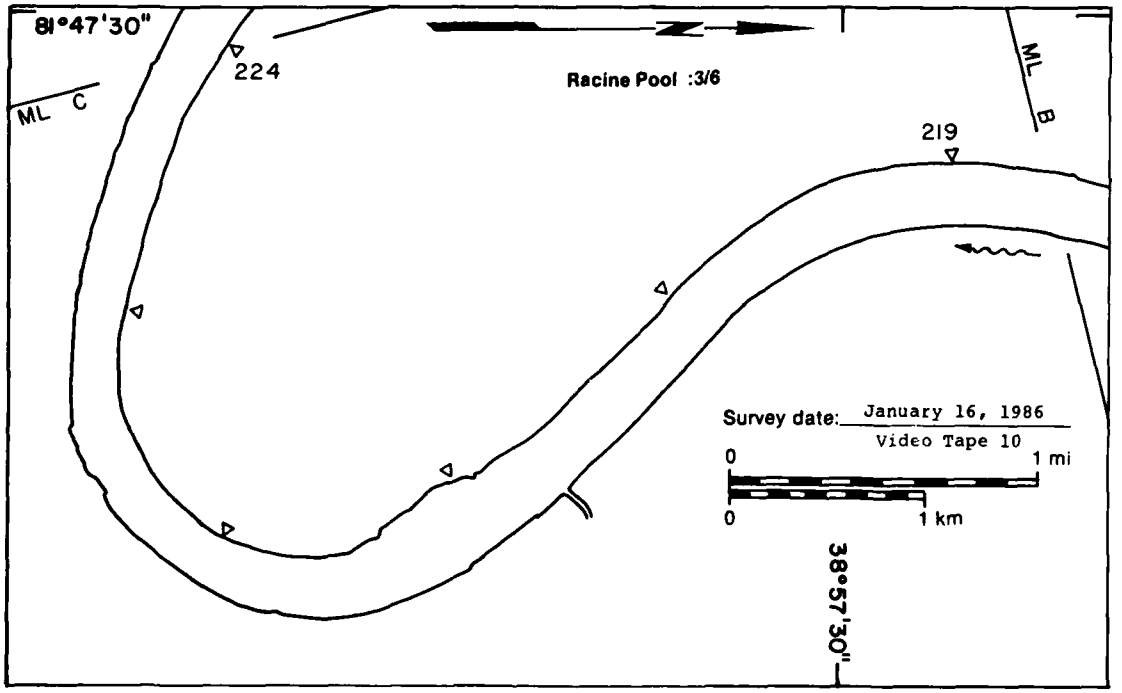

81°47'30"

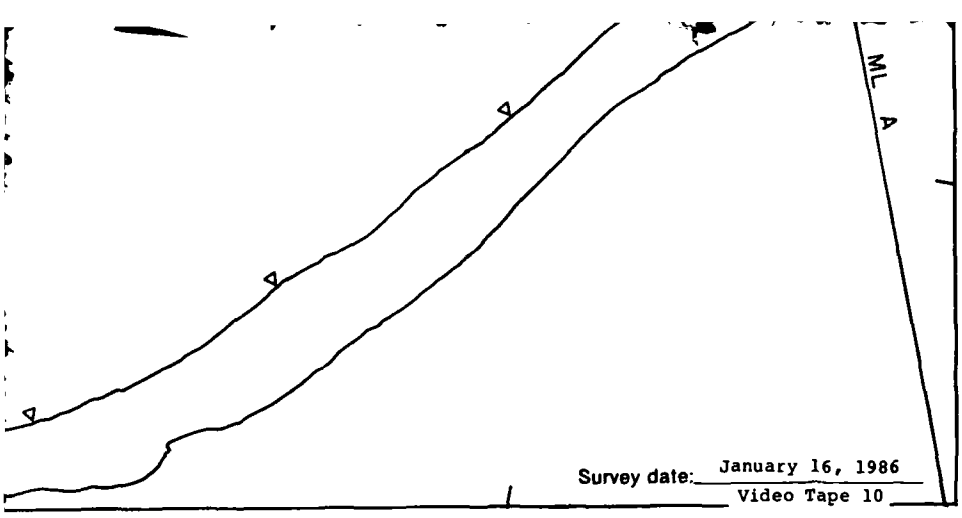
16 January 1986

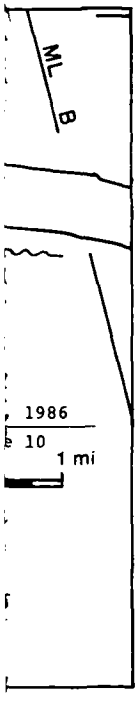




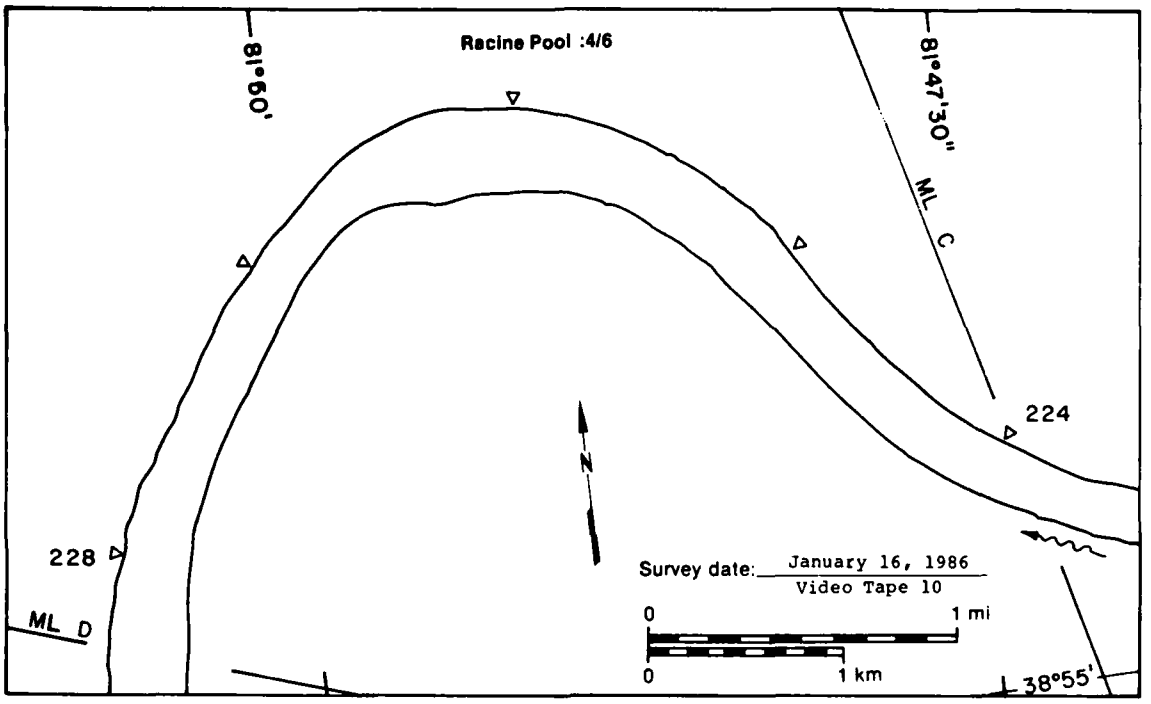

218
Buffington Island
0
1 mi
0
1 km
81°45'

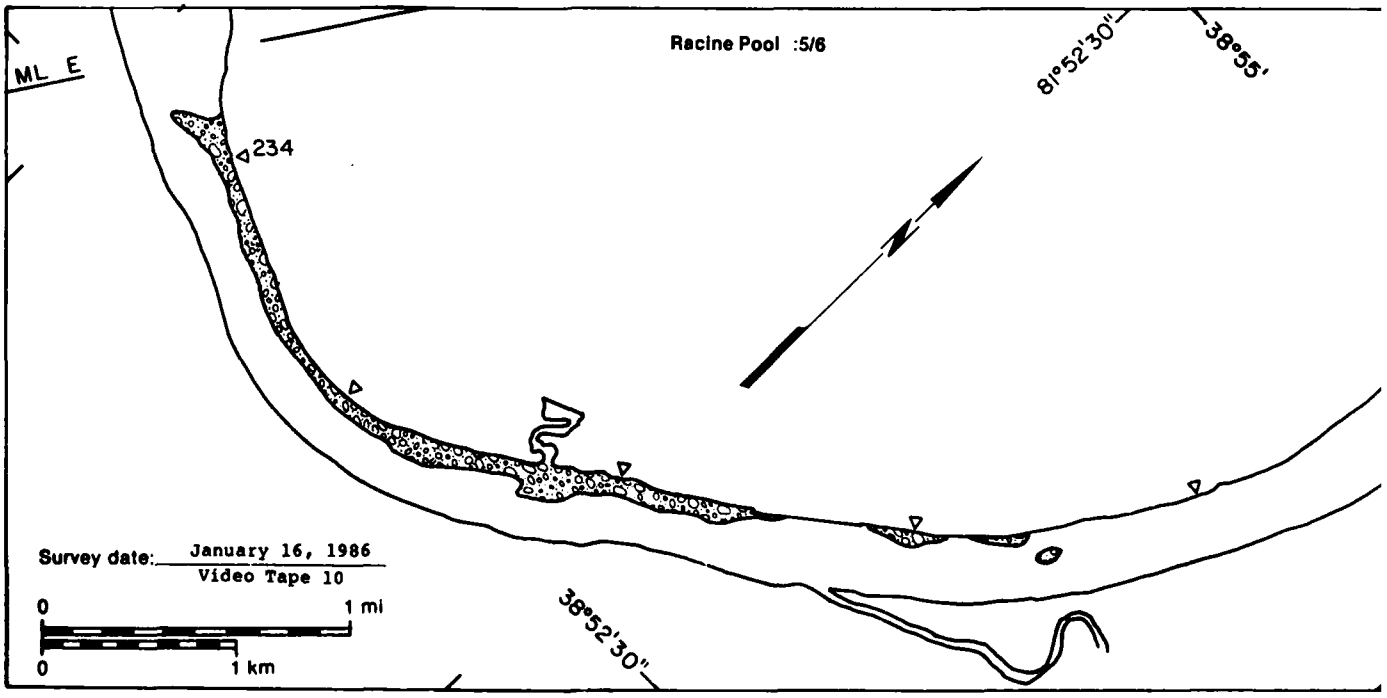

81°47'30"
224
ML C
Racine Pool :3/6
ML B
219
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km
38°57'30"

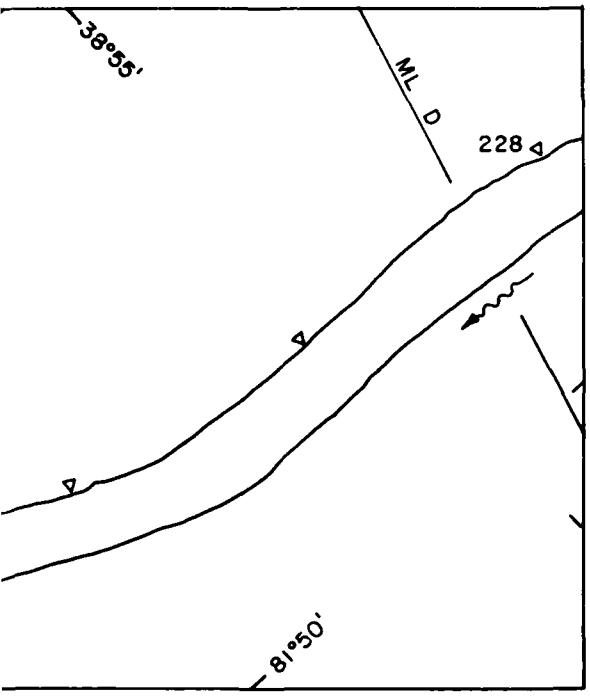

ML A
Survey date: January 16, 1986
Video Tape 10


ML B
1986
10
1 mi

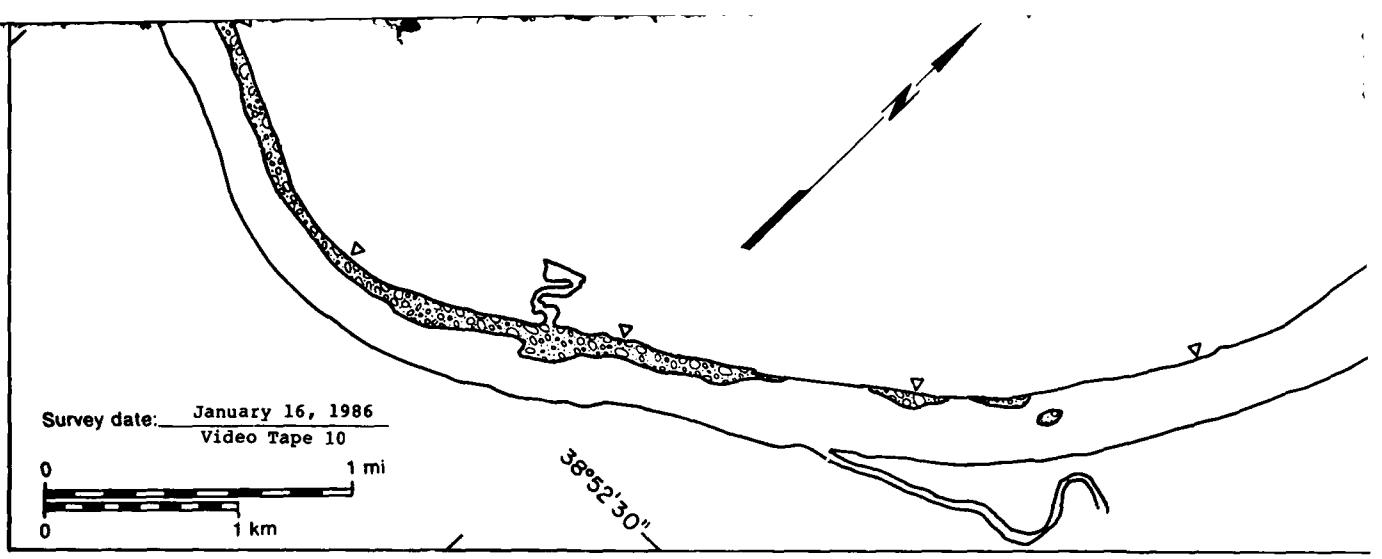
16 January 1986

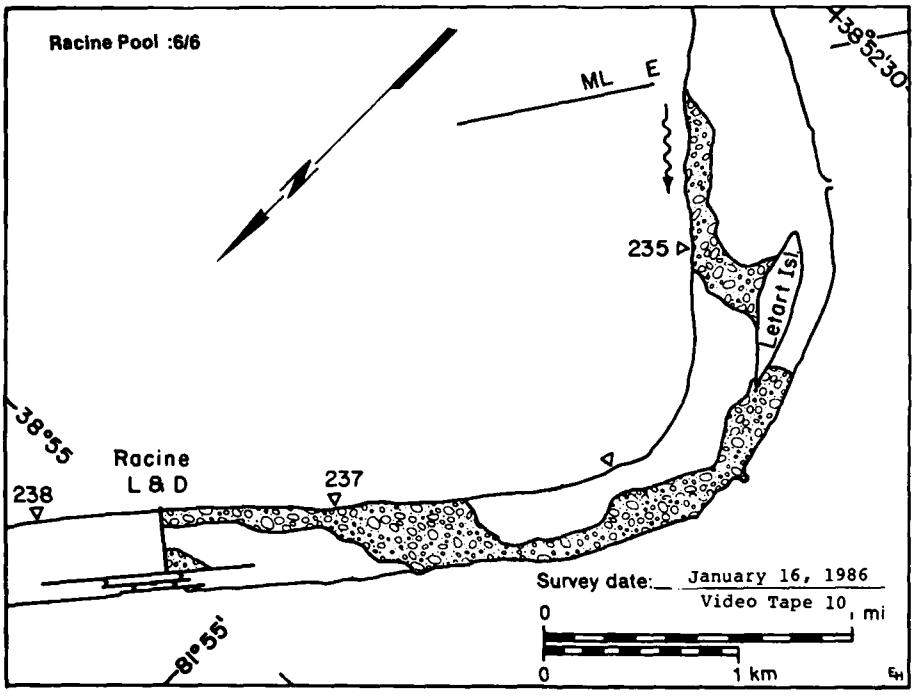






Racine Pool Surface



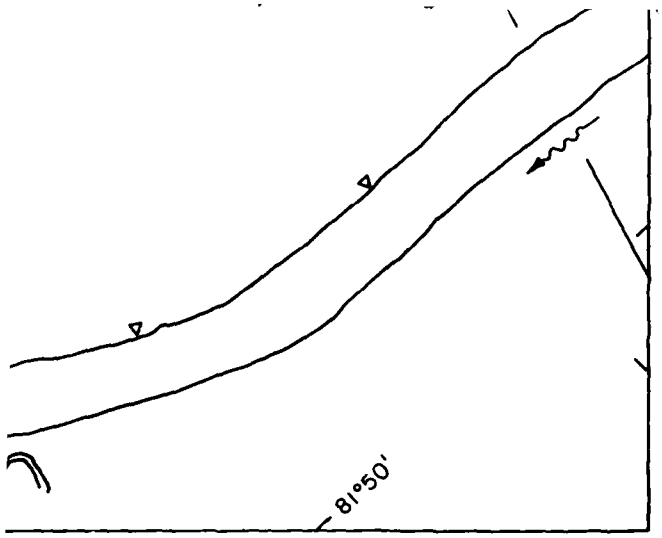


Racine Pool

MAP UNITS

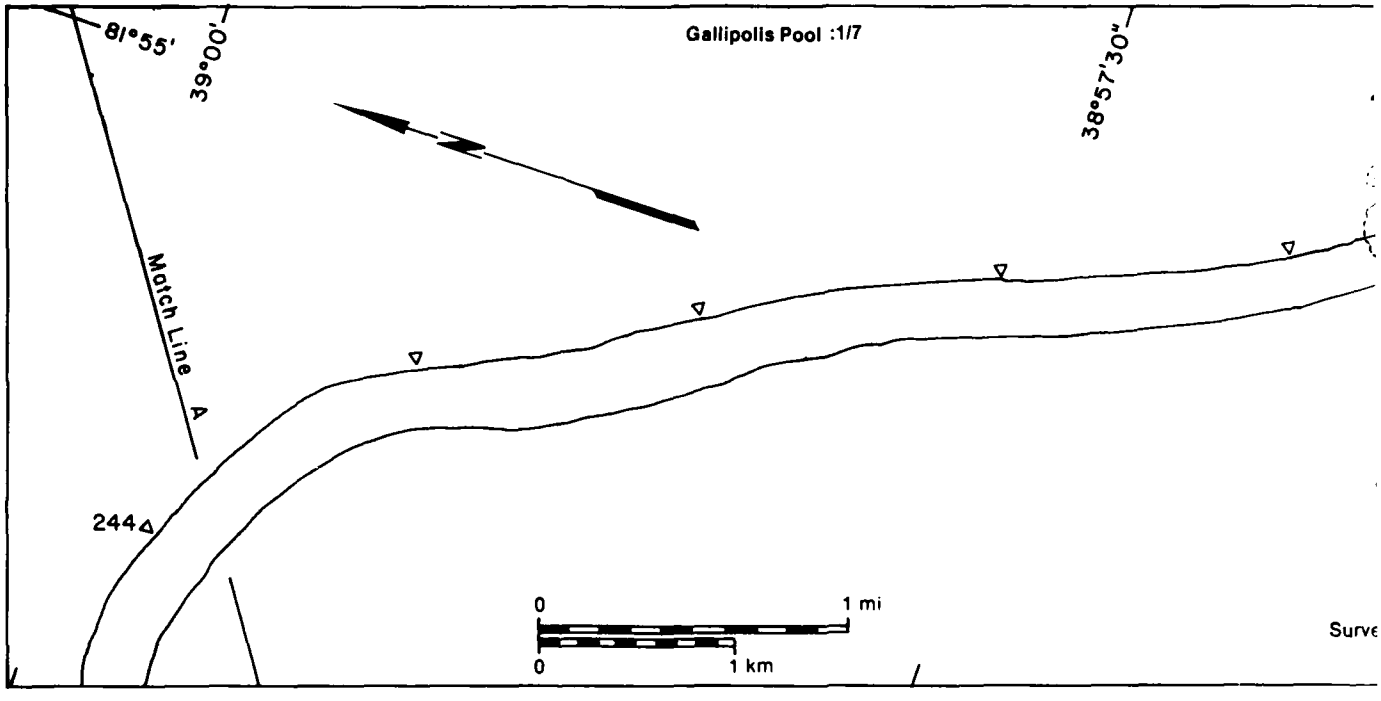
- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

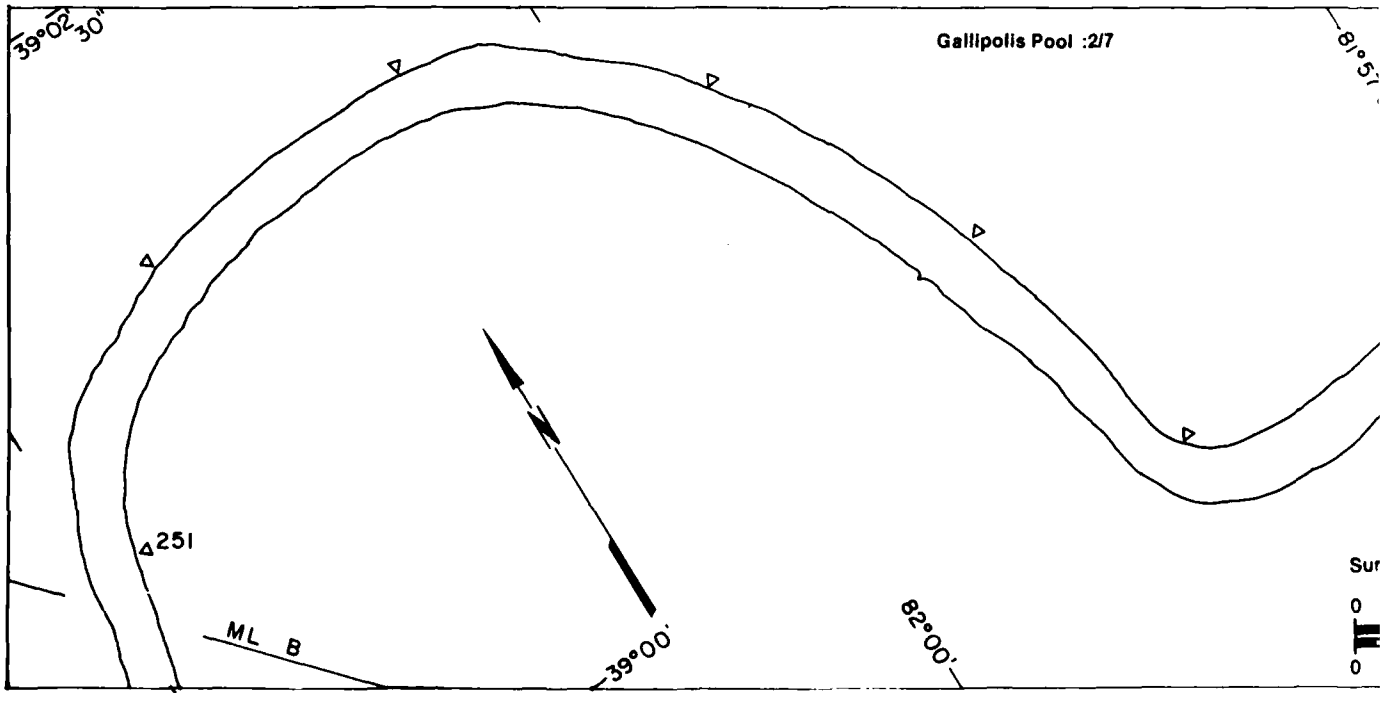
Total area ($m^2 \times 10^6$)



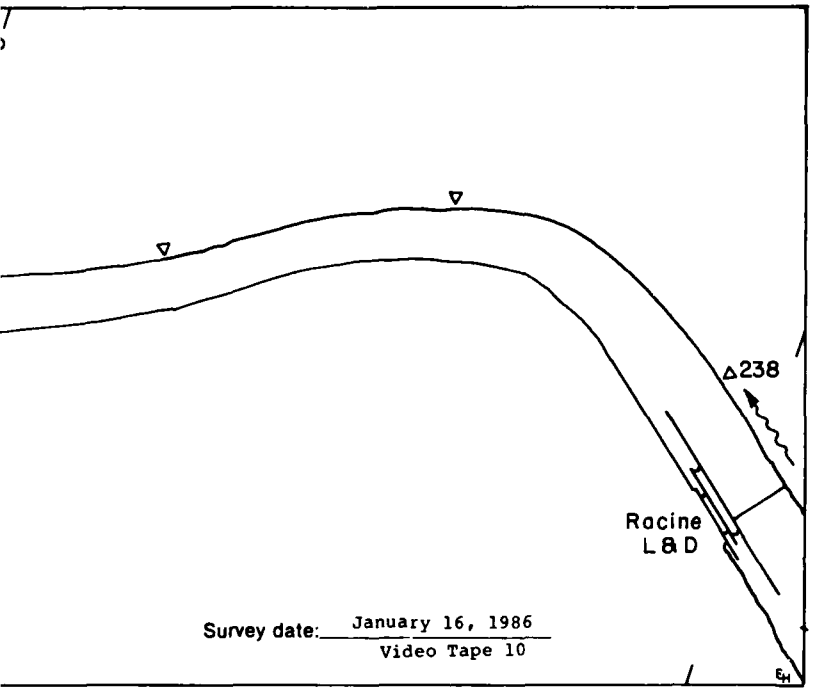
Racine Pool

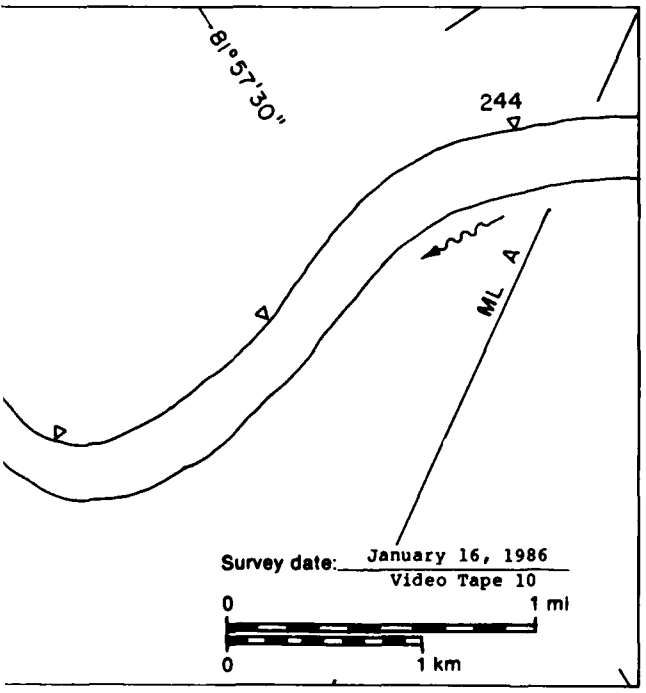
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	18.52	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.37	10
Total area (m^2 x 10^6)	19.89	

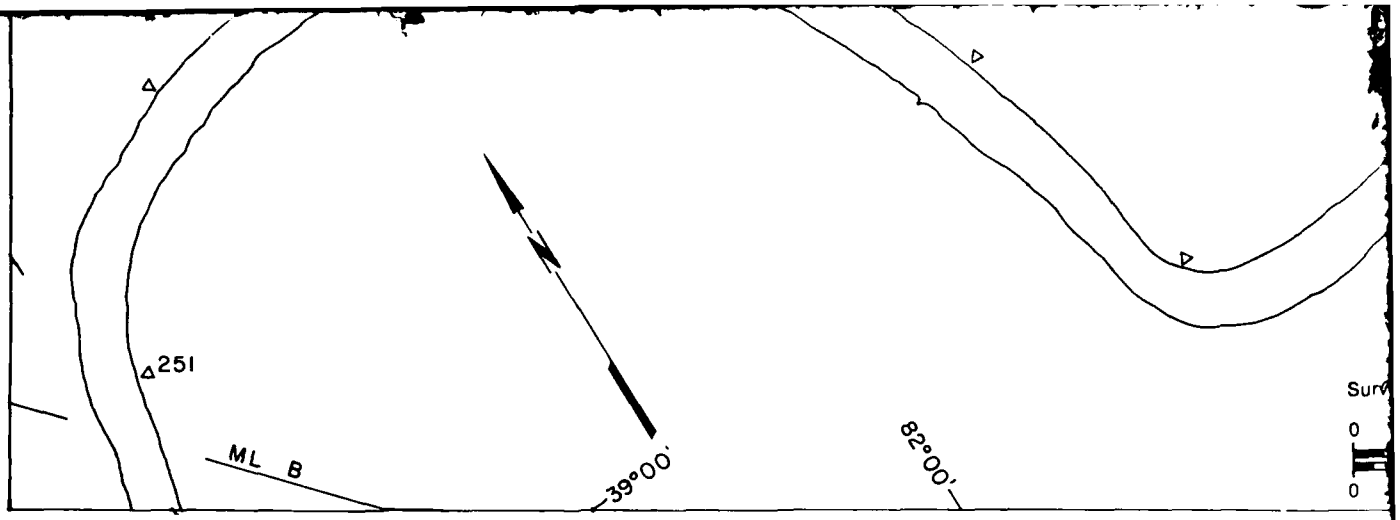

Gallipolis Pool :1/7
81°55'
39°00'
38°57'30"
Match Line A
244
0
1 mi
0
1 km
Surve

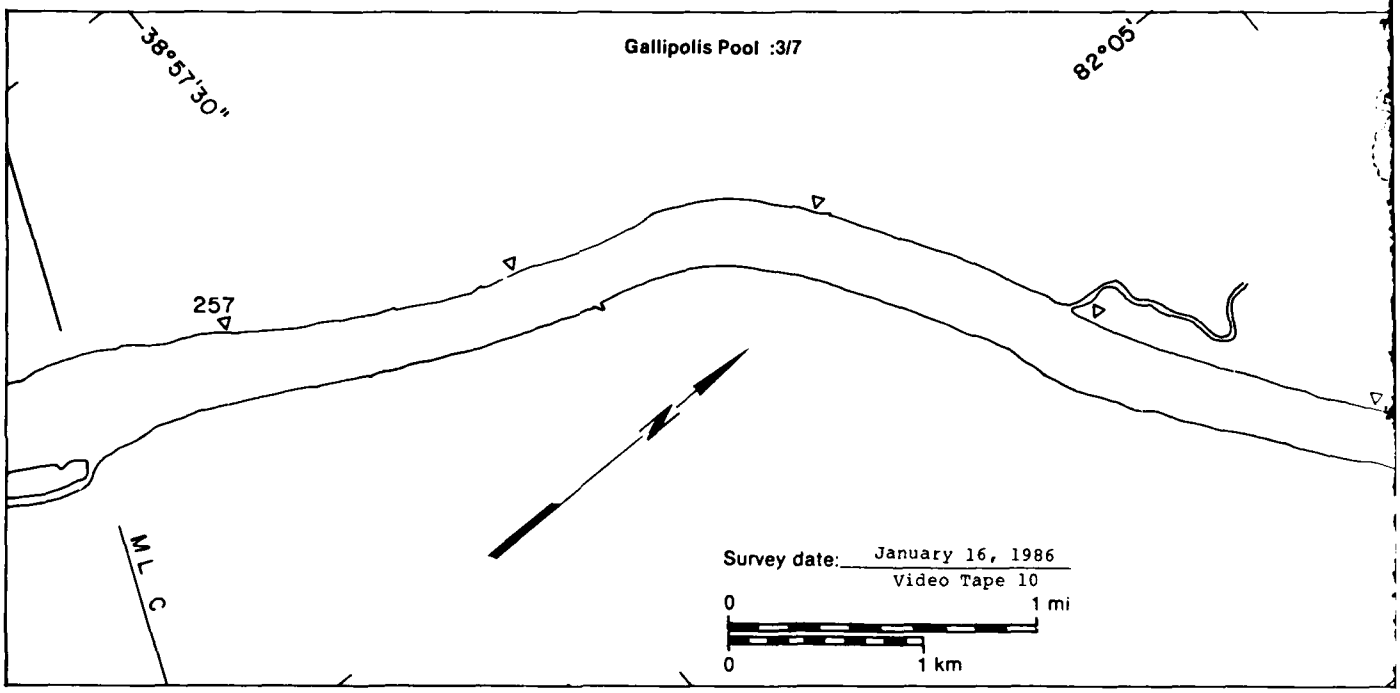

39°02'30"
Gallipolis Pool :2/7
81°5
251
ML B
39°00'
82°00'
Sur
0
0

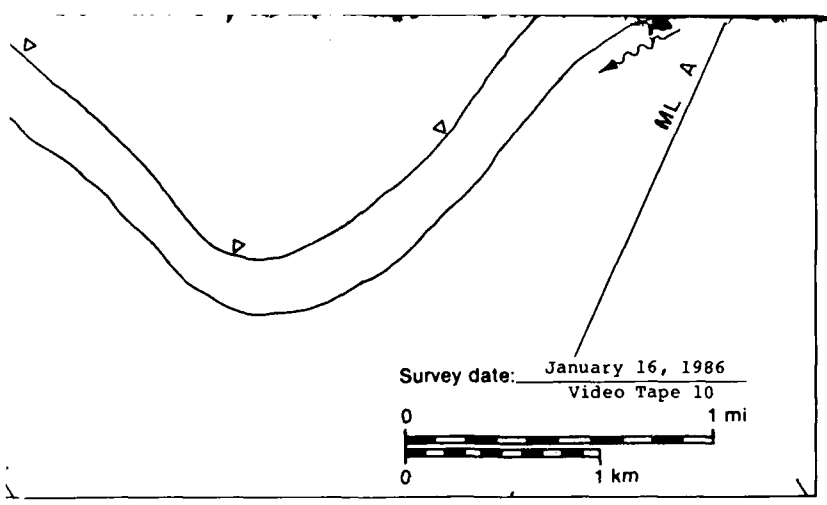
16 January 1986

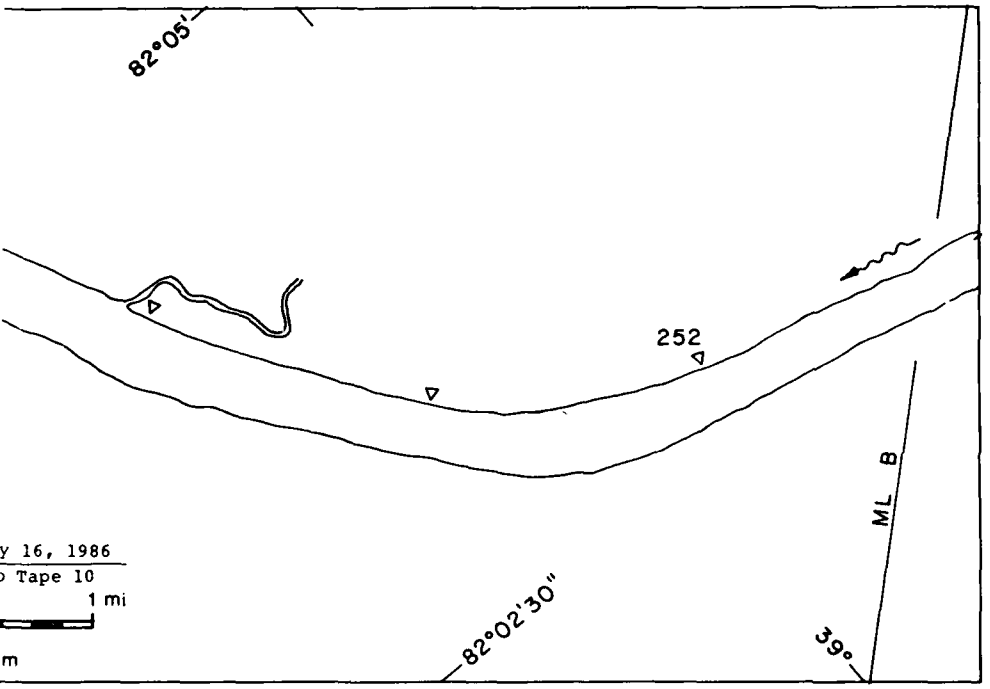




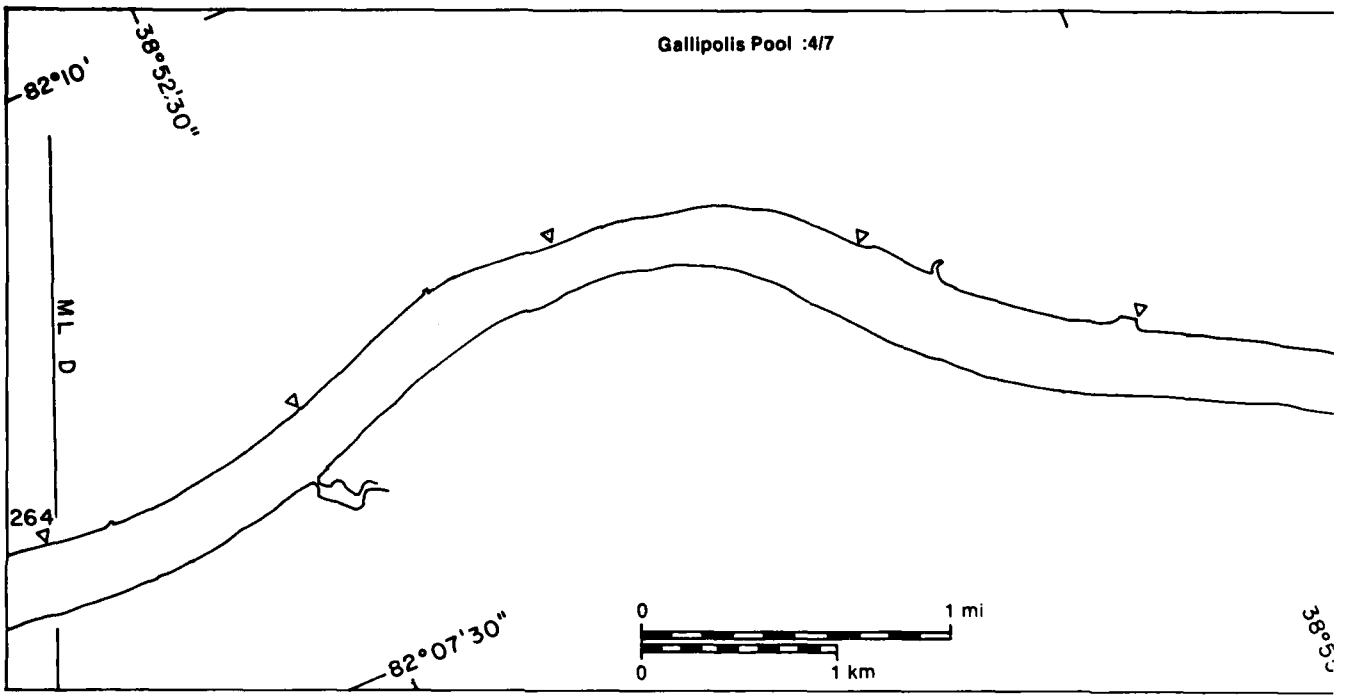

251
ML B
39°00'
82°00'
Sur
0
0

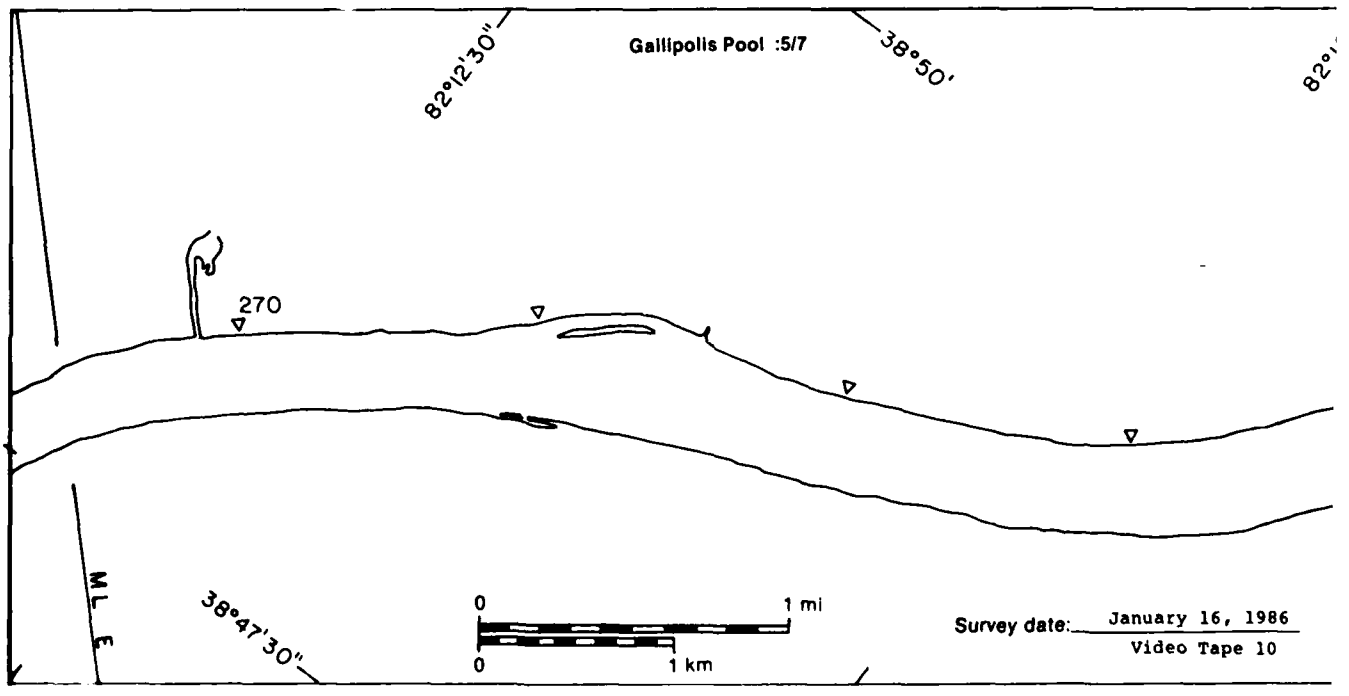

Gallipolis Pool :3/7
38°57'30"
82°05'
257
ML C
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km

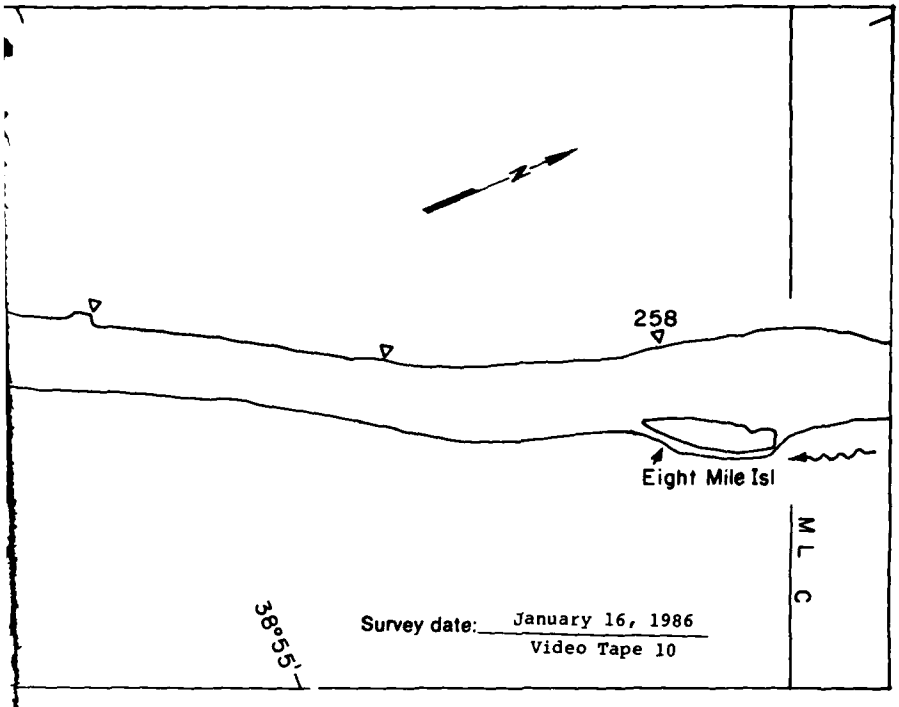

ML A
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km

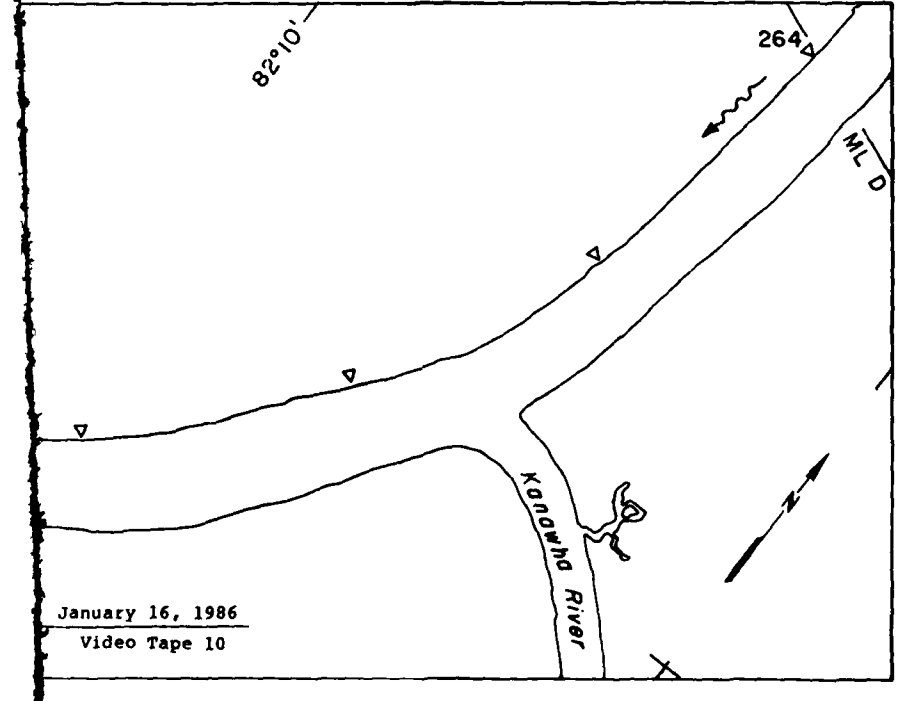

82°05'
252
ML B
82°02'30"
39°
y 16, 1986
o Tape 10
1 mi
m

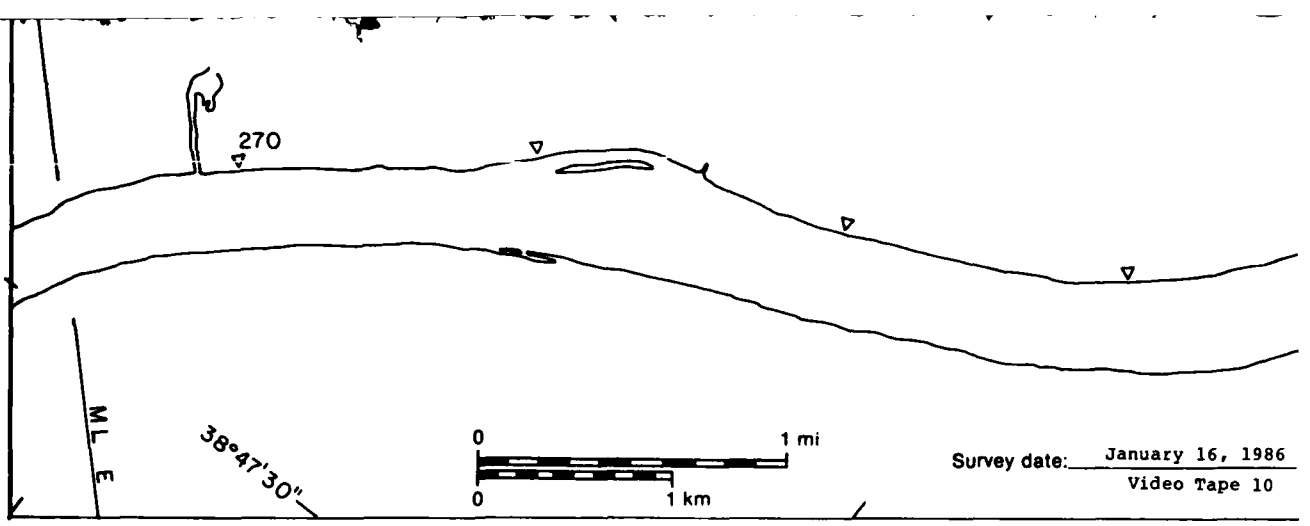
16 January 1986

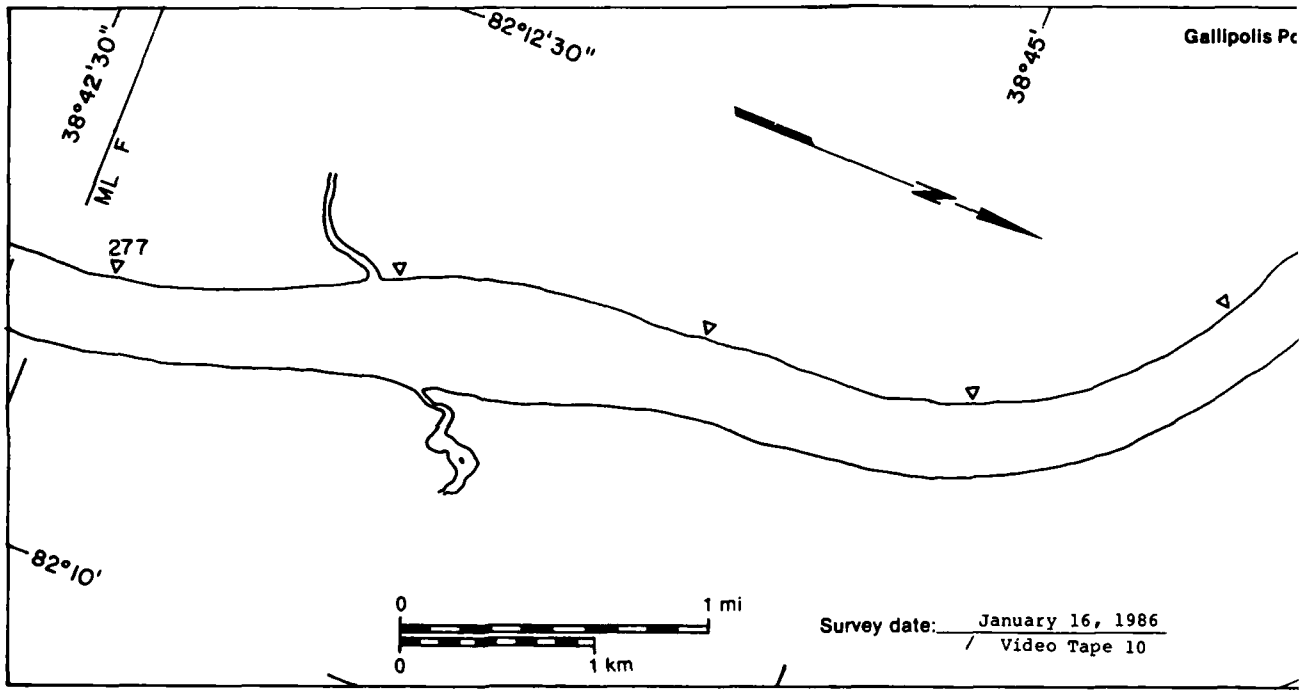


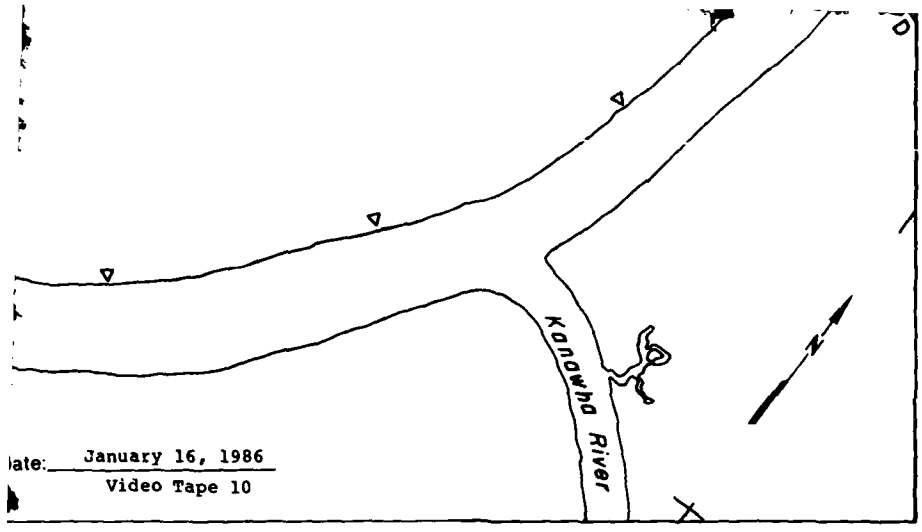


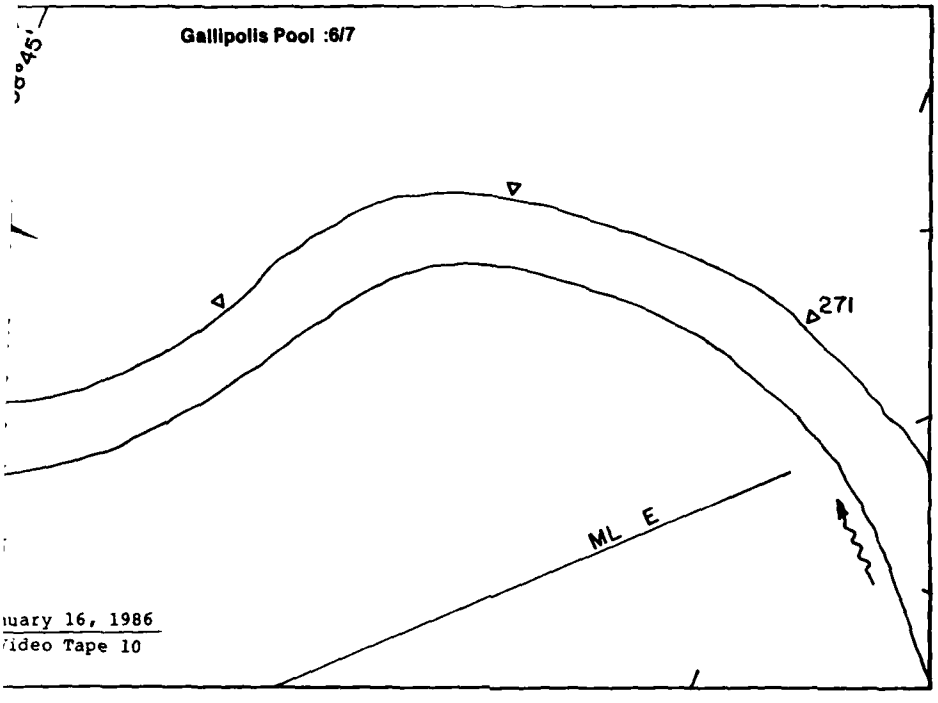

258
Eight Mile Isl
M L C
38°55'
Survey date: January 16, 1986
Video Tape 10

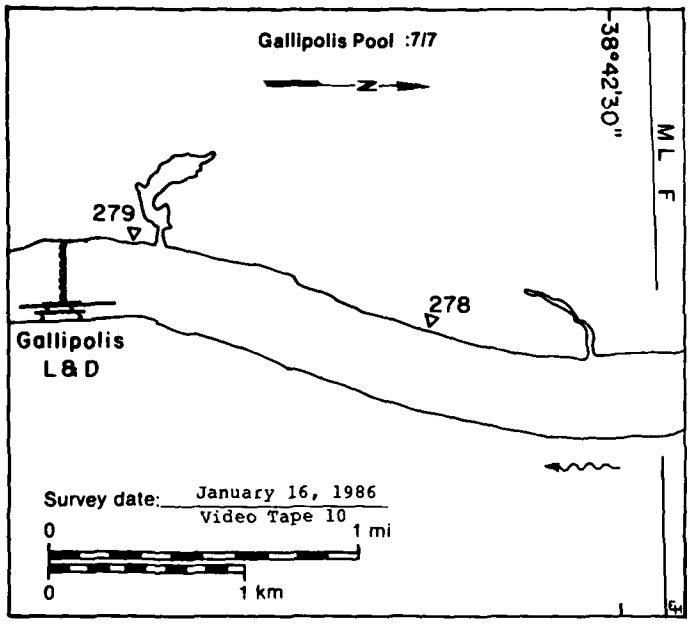

82°10'
264
M L D
Kanawha River
January 16, 1986
Video Tape 10


270
ML E
38°47'30"
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10


38°42'30"
ML F
82°12'30"
38°45'
Gallipolis Pc
277
82°10'
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10

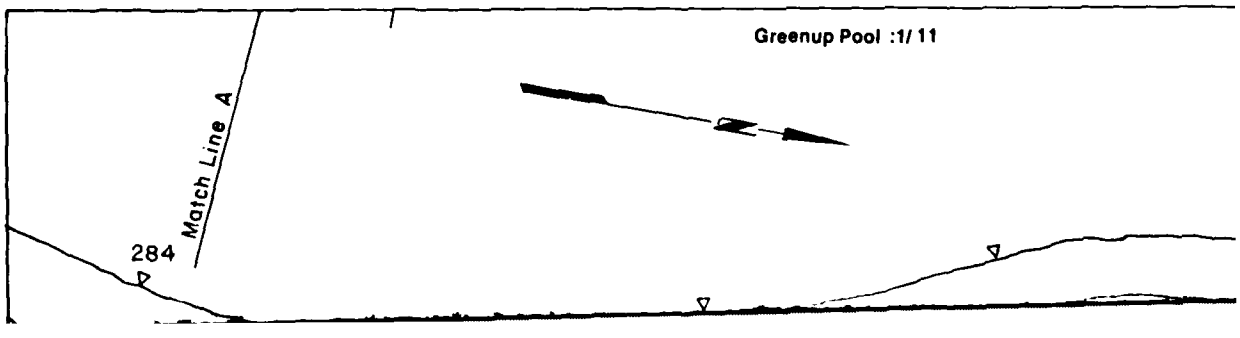

Kanawha River
N
late: January 16, 1986
Video Tape 10


Gallipolis Pool :6/7
271
ML E
uary 16, 1986
ideo Tape 10



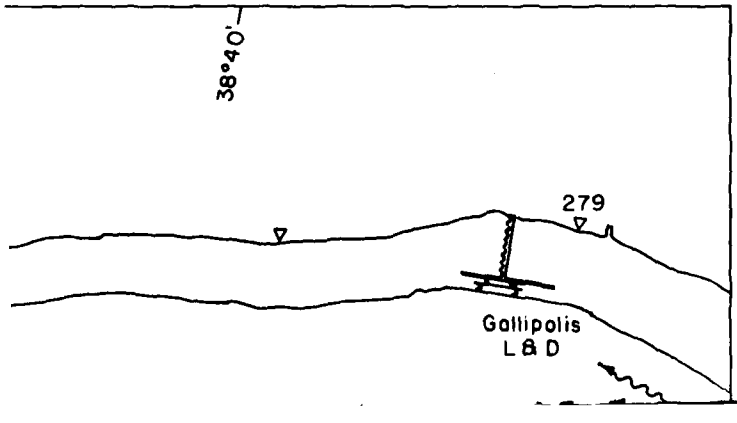
Gallipolis Pool

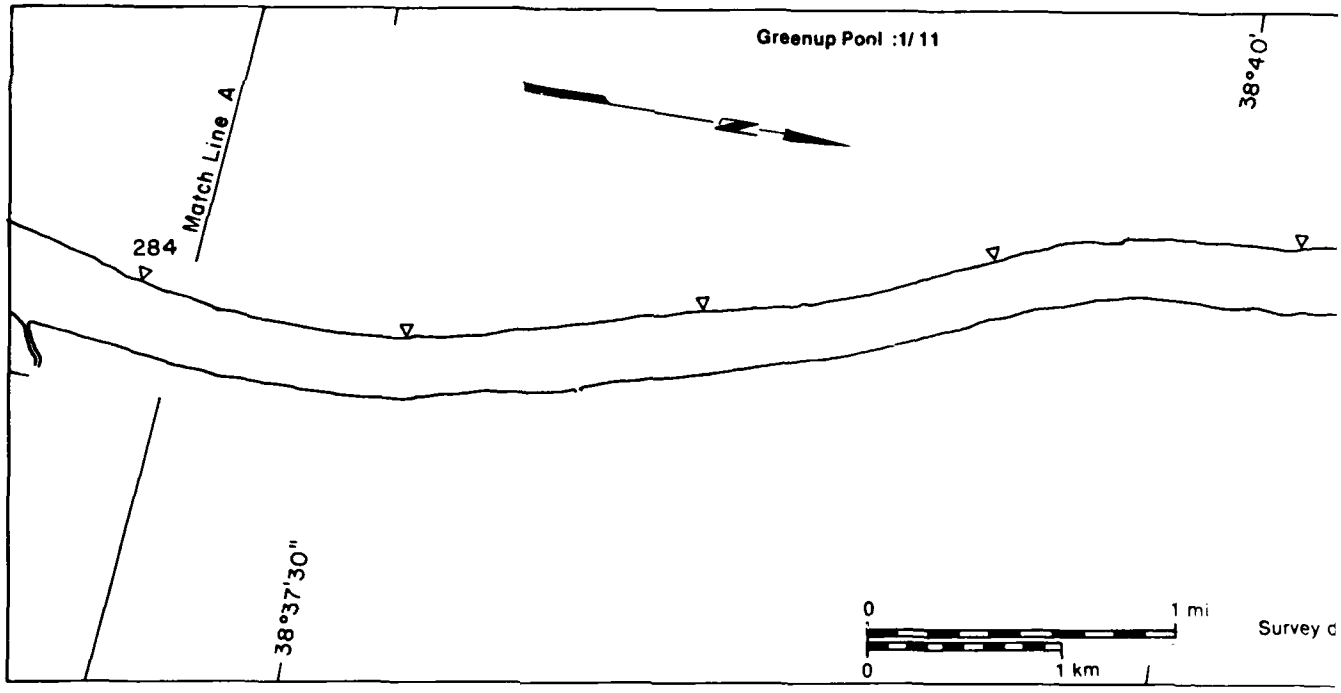
MAP UNITS	(m^2 A)
Open water	24.
Solid ice cover	0
Solid ice cover with open-water areas	0.
Fragmented ice cover	0.
Fragmented ice cover with open-water areas	0.(
Ice floes or frazil slush and pans	0.0
Total area (m^2 x 10^6)	24.6

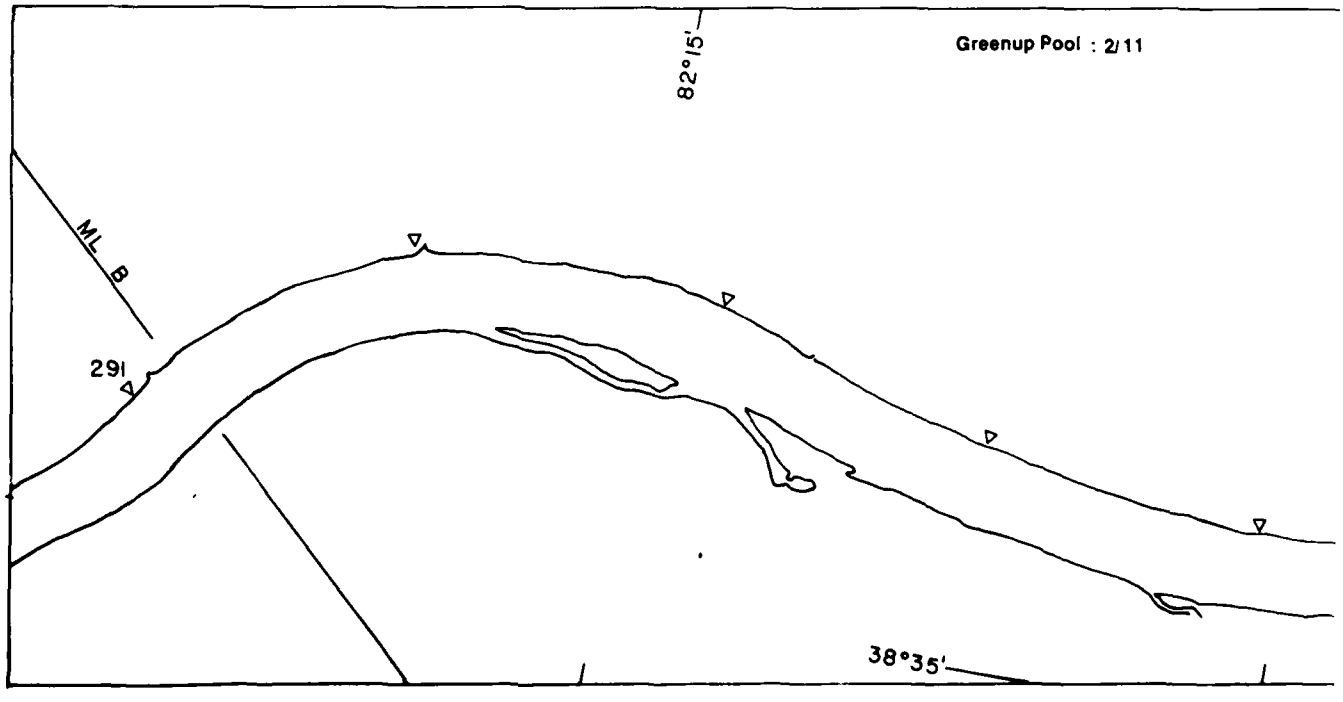


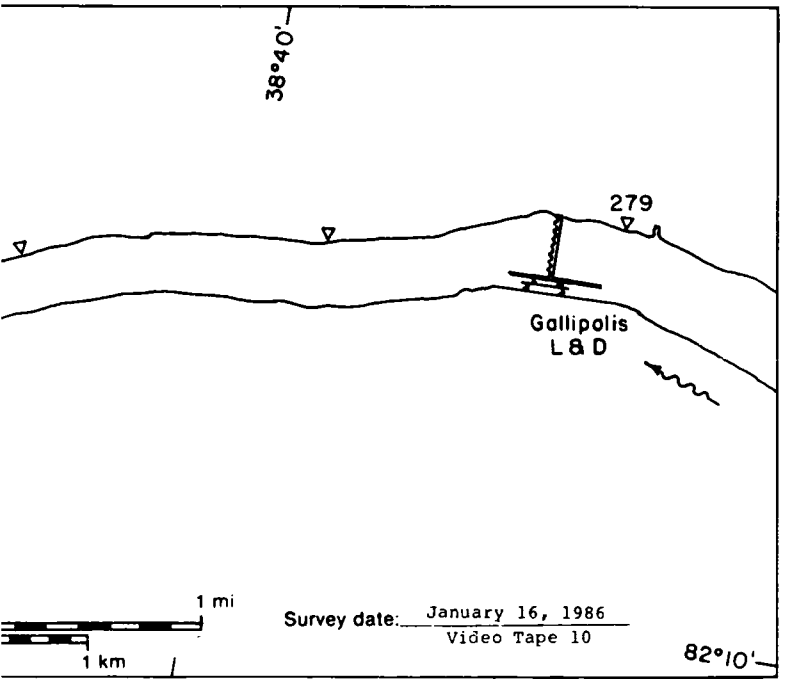
16 January 1986

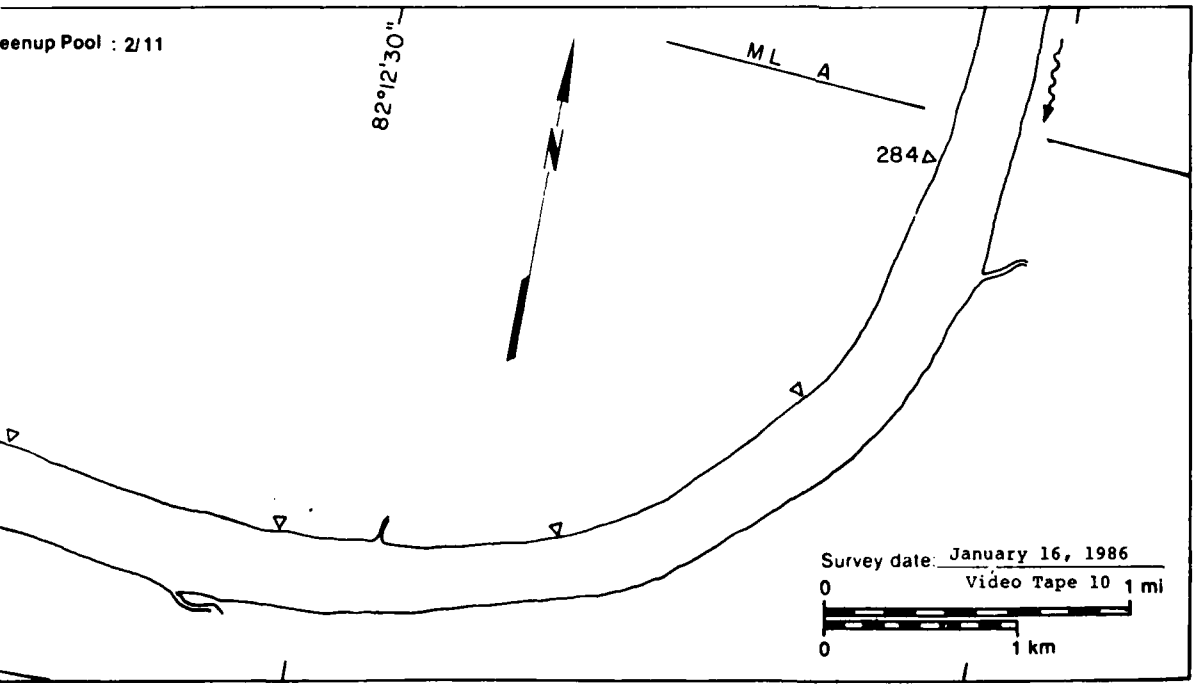
ool TS	Area (m^2 x 10^6)	Surface concentration (%)
er	24.65	NA
cover	0.00	NA
cover with r areas	0.00	—
ed ice cover	0.00	NA
ed ice cover water areas	0.00	—
r frazil slush	0.00	—
rea (m^2 x 10^6)	24.65	



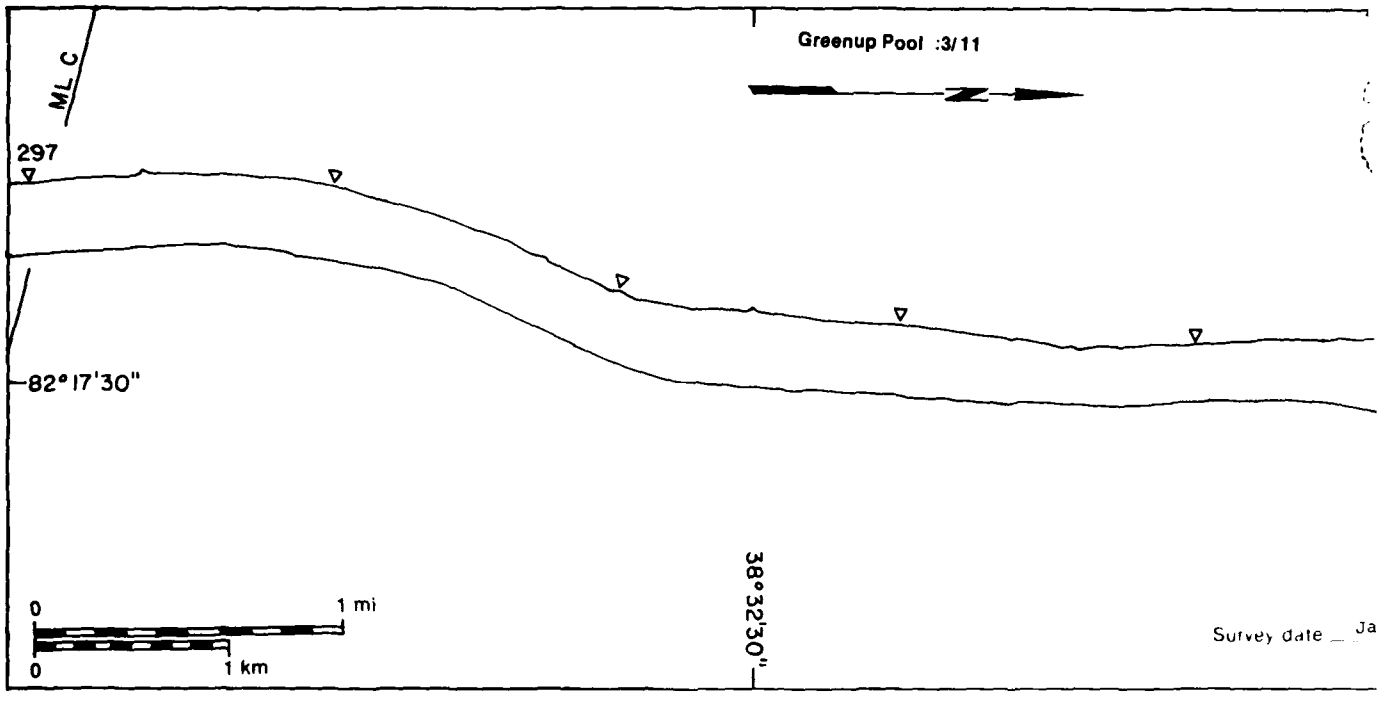

Greenup Ponl :1/ 11
38°40'
Match Line A
284
38°37'30"
0
1 mi
0
1 km
Survey d

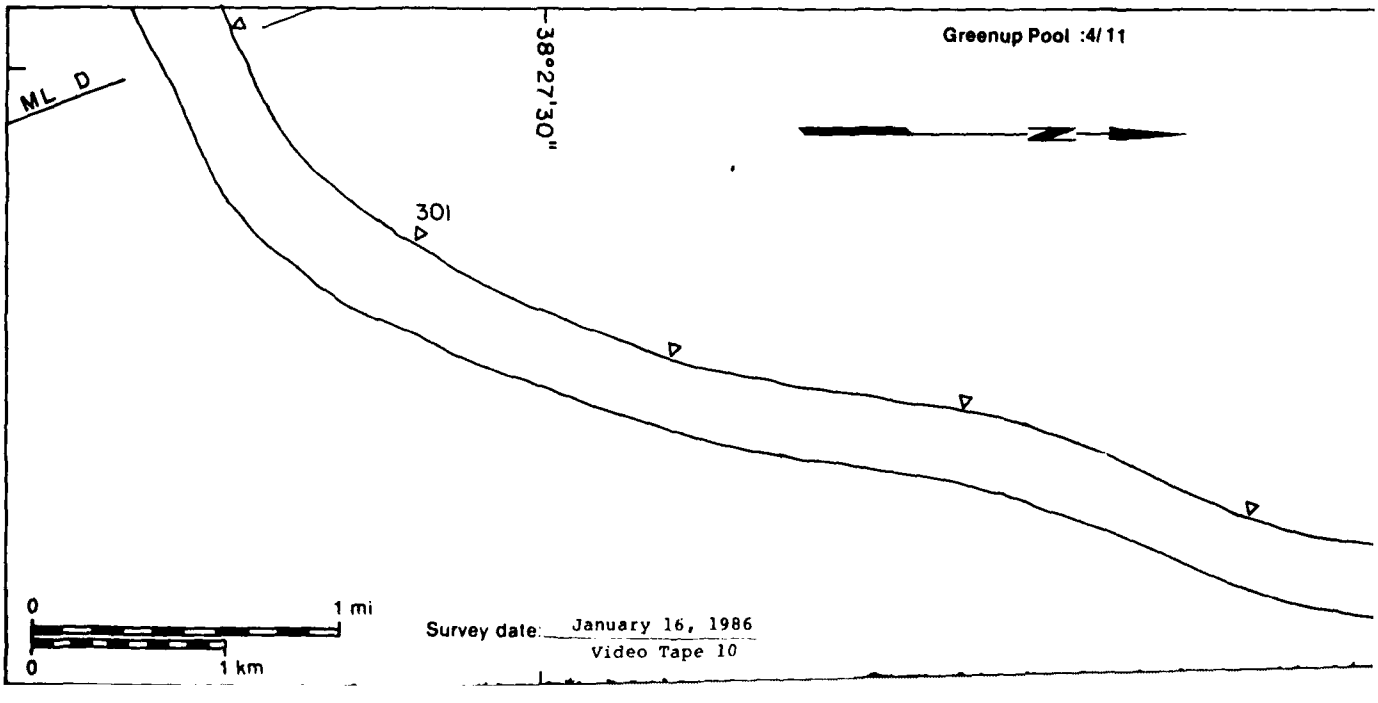

82°15'
Greenup Pool : 2/11
ML B
291
38°35'

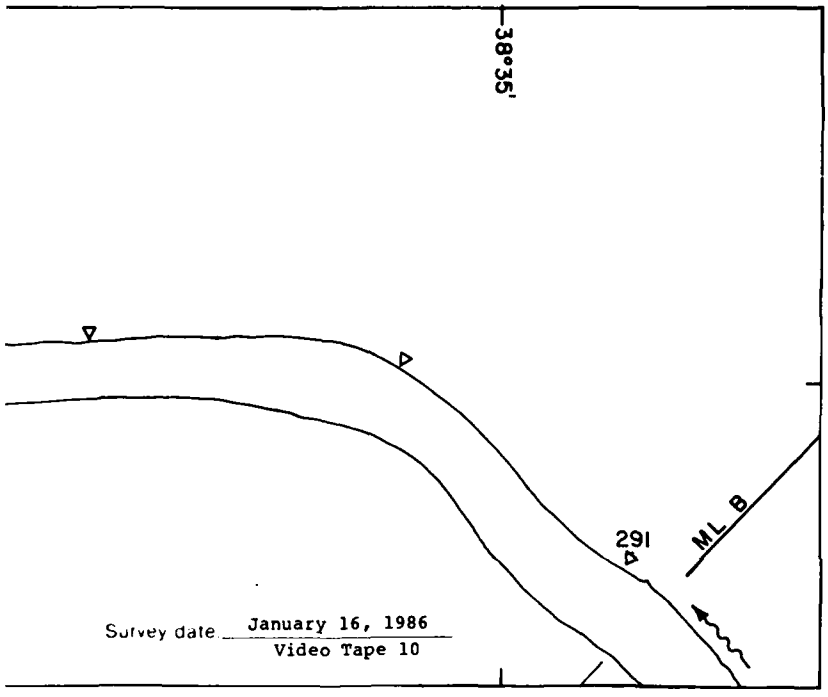

38°40'
279
Gallipolis
L&D
1 mi
1 km
Survey date: January 16, 1986
Video Tape 10
82°10'

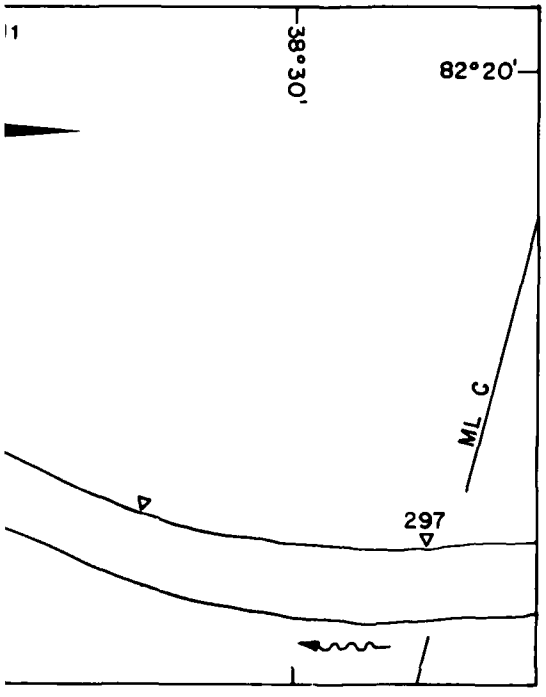

eenup Pool : 2/11
82°12'30"
ML A
284
N
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km

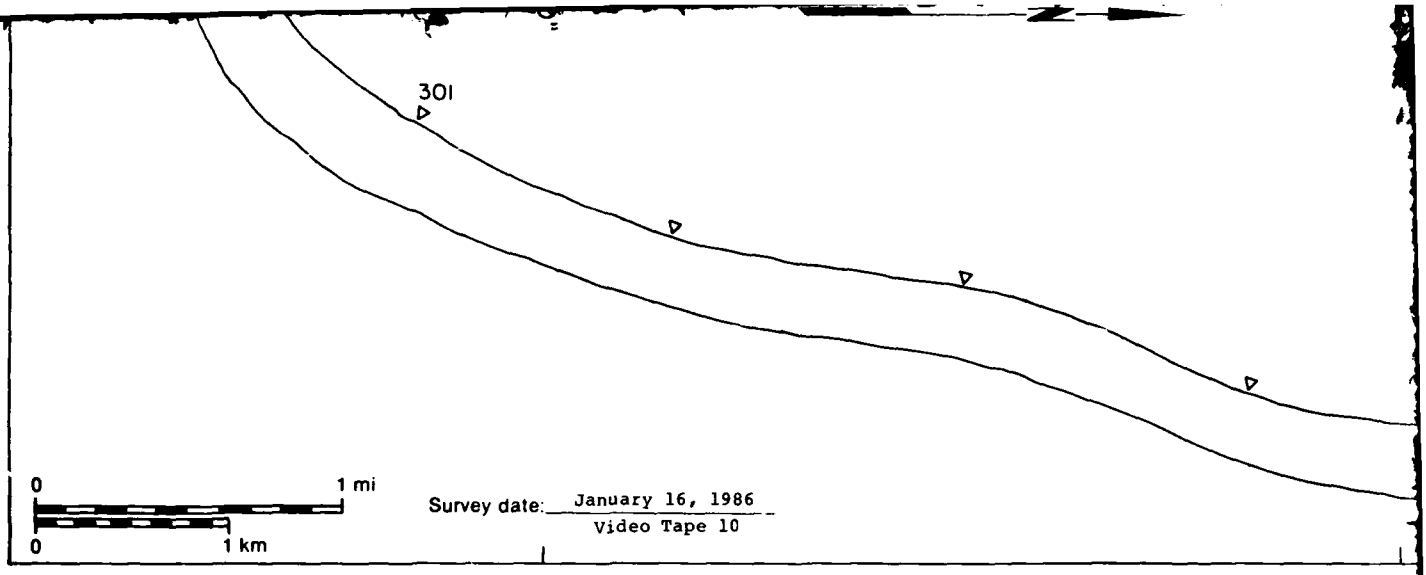
16 January 1986

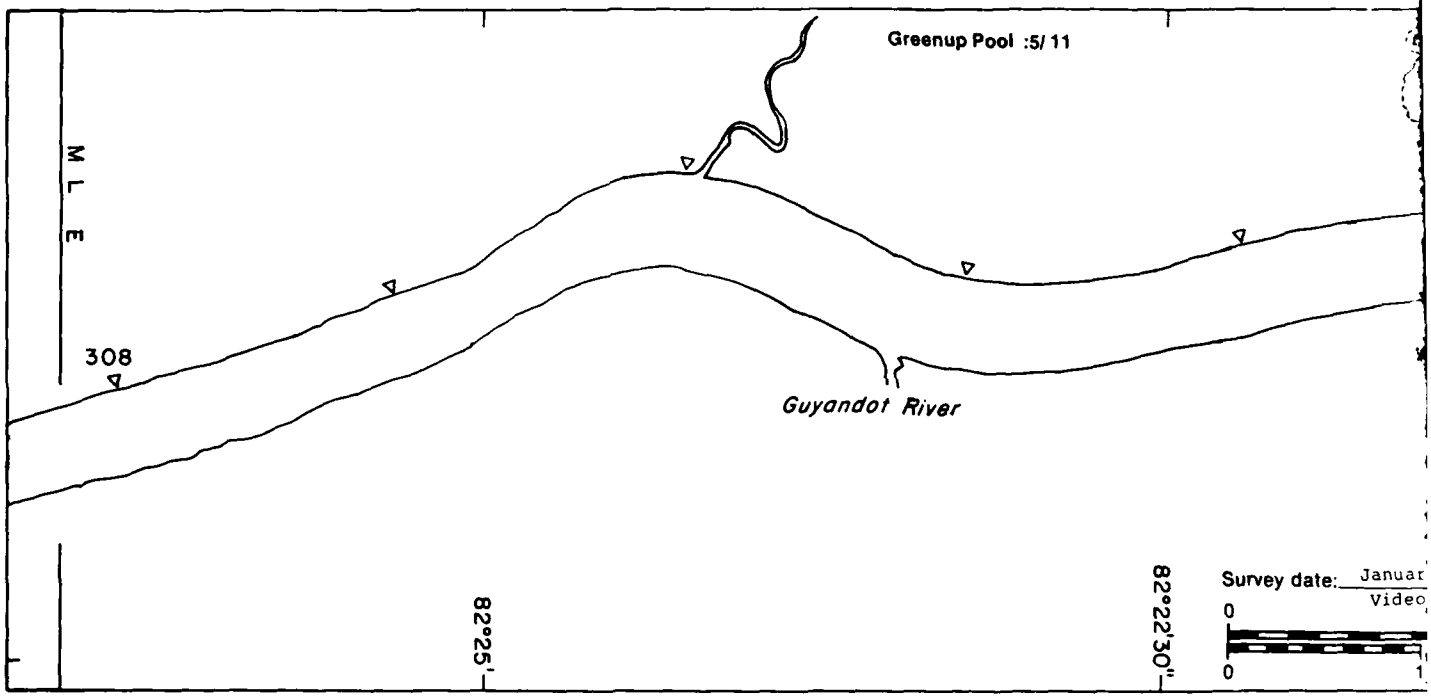


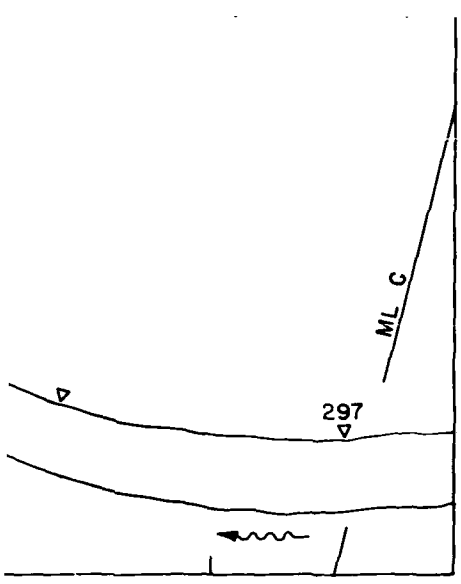


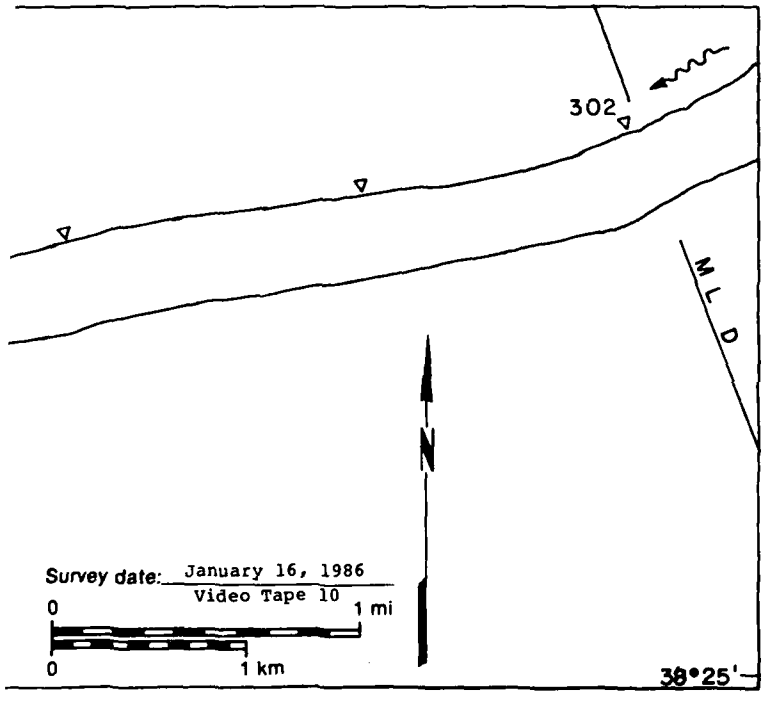

38°35'
291
ML B
Survey date January 16, 1986
Video Tape 10

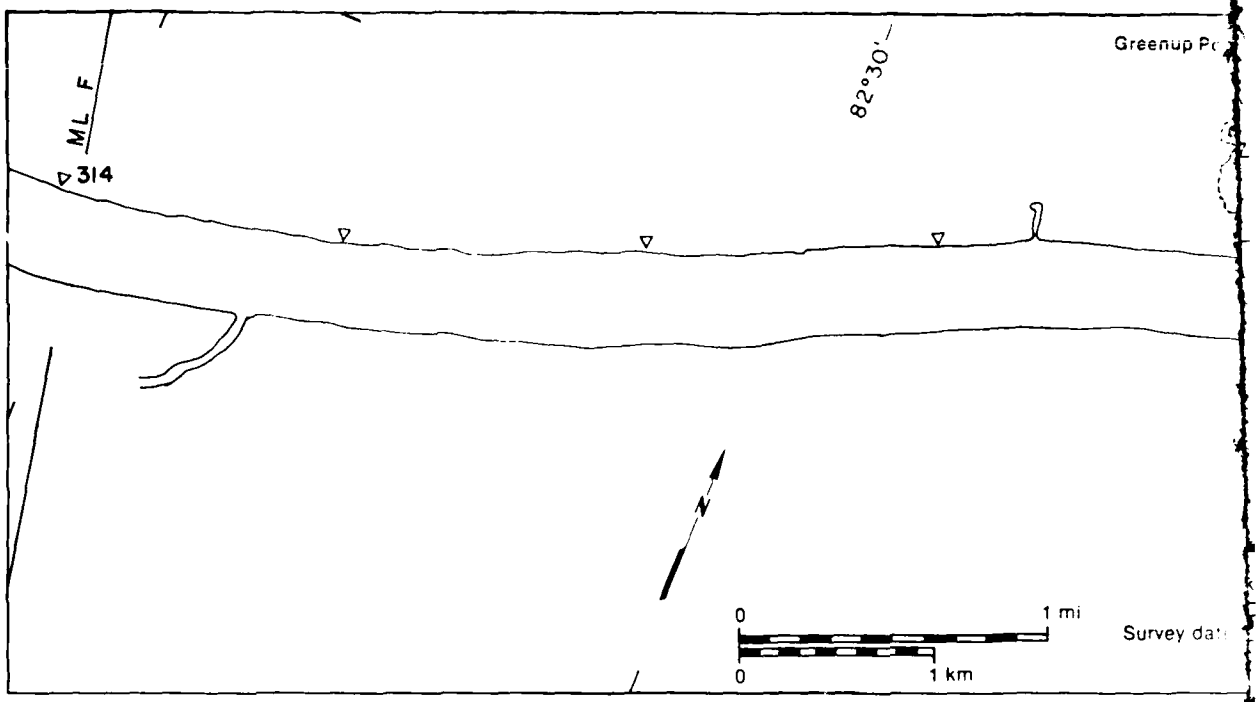

38°30'
82°20'
ML C
297

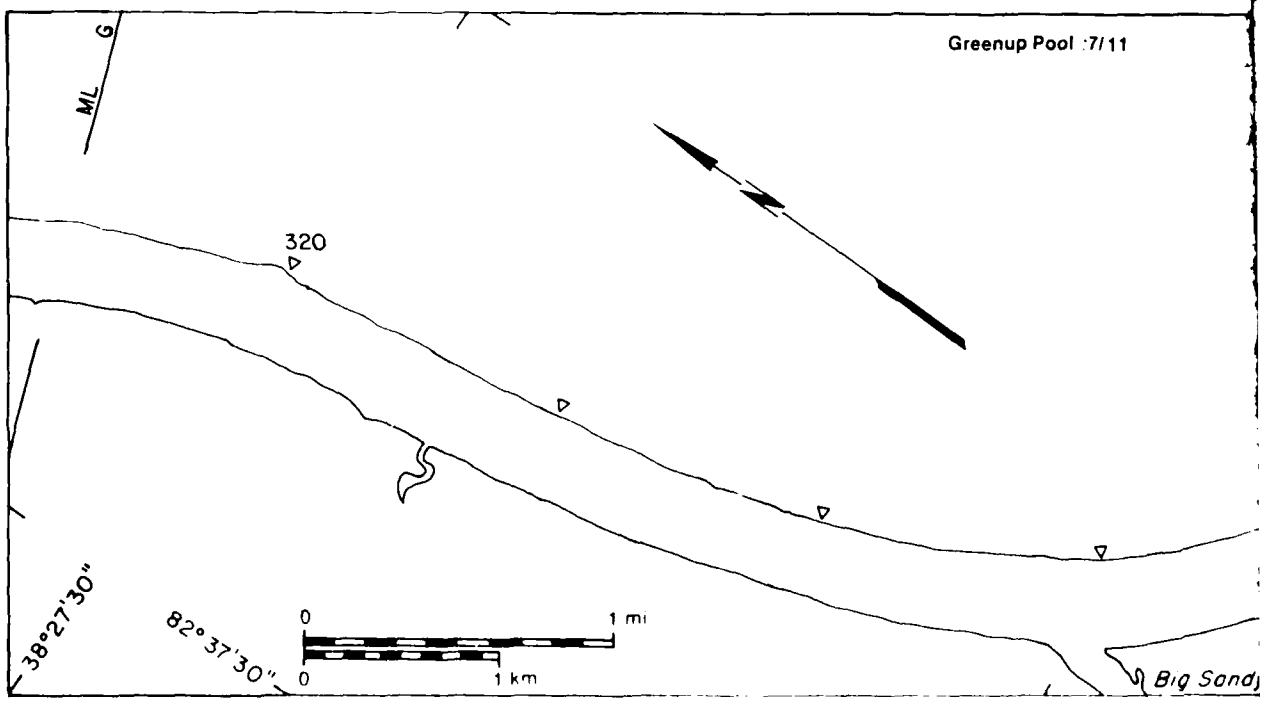

301
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10


Greenup Pool :5/ 11
MILE
308
Guyandot River
82°25'
82°22'30"
Survey date: Januar
Video
0
0
1

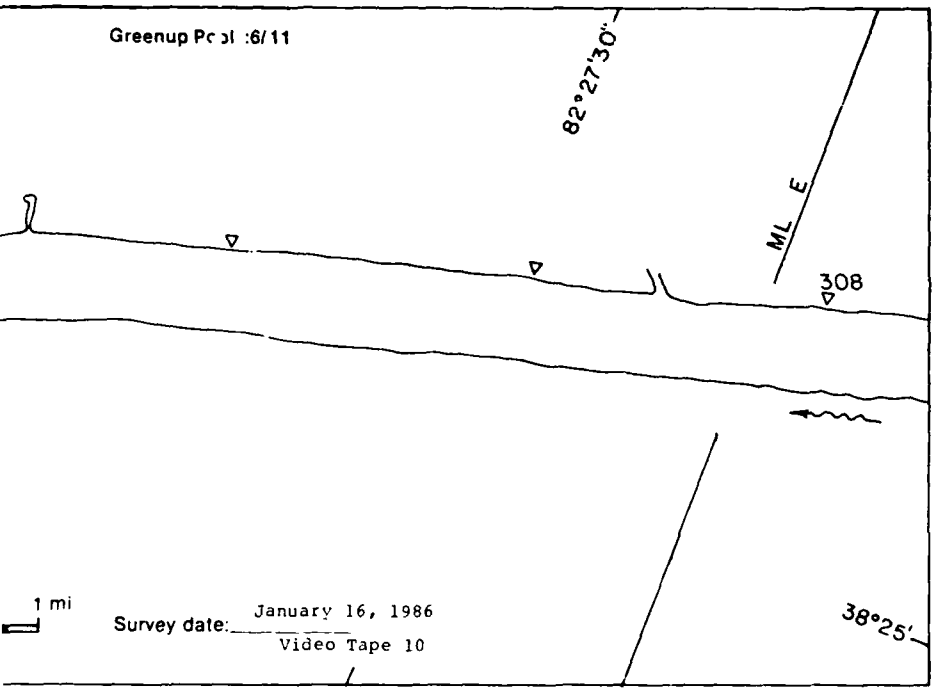

ML C
297

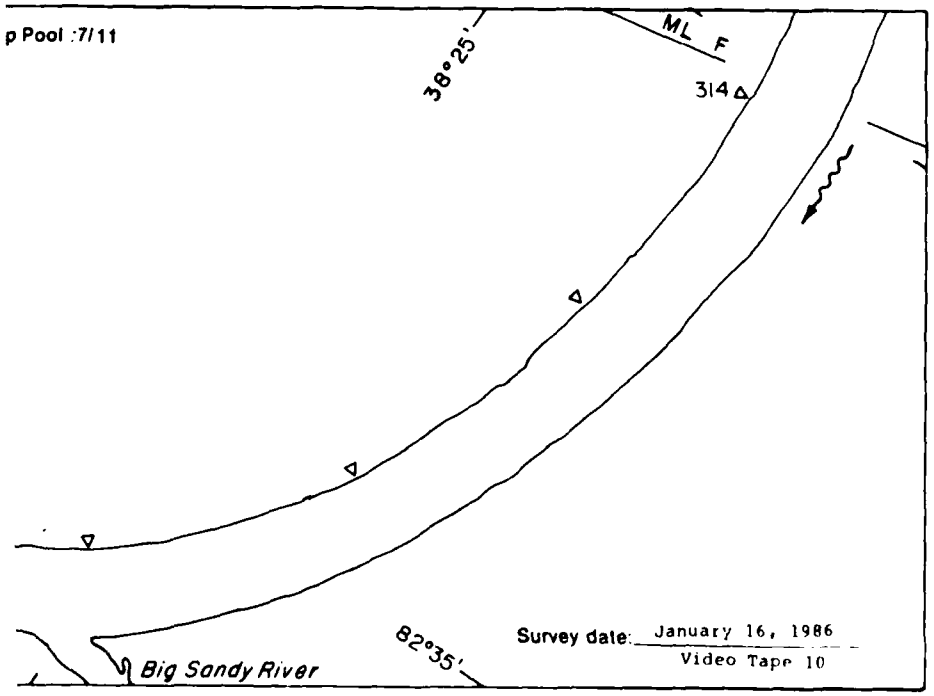

302
ML D
N
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km
38°25'


Greenup Po
82°30'
ML F
314
N
0
1 mi
0
1 km
Survey da


Greenup Pool :7/11
ML G
320
38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sandy

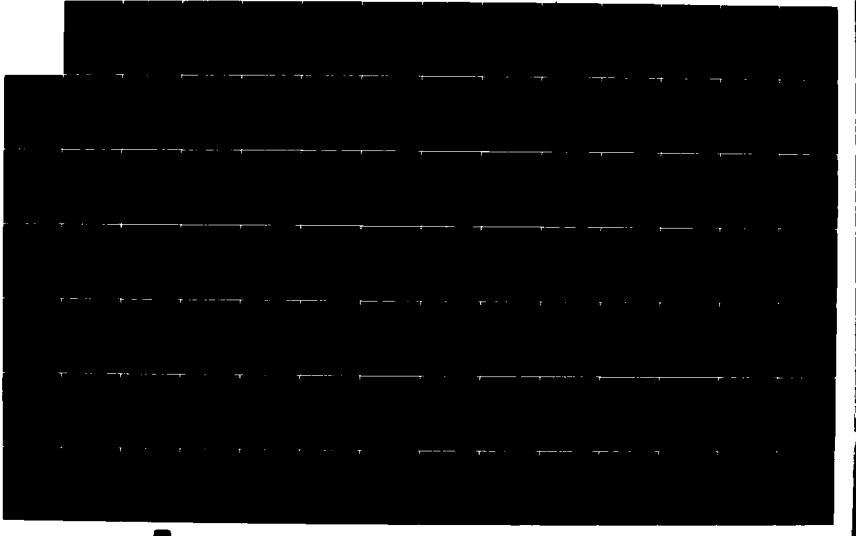
16 January 1986

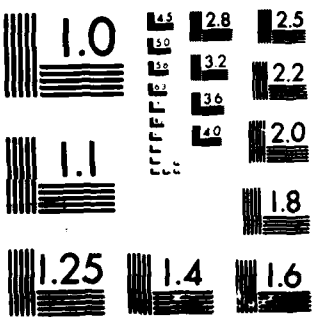




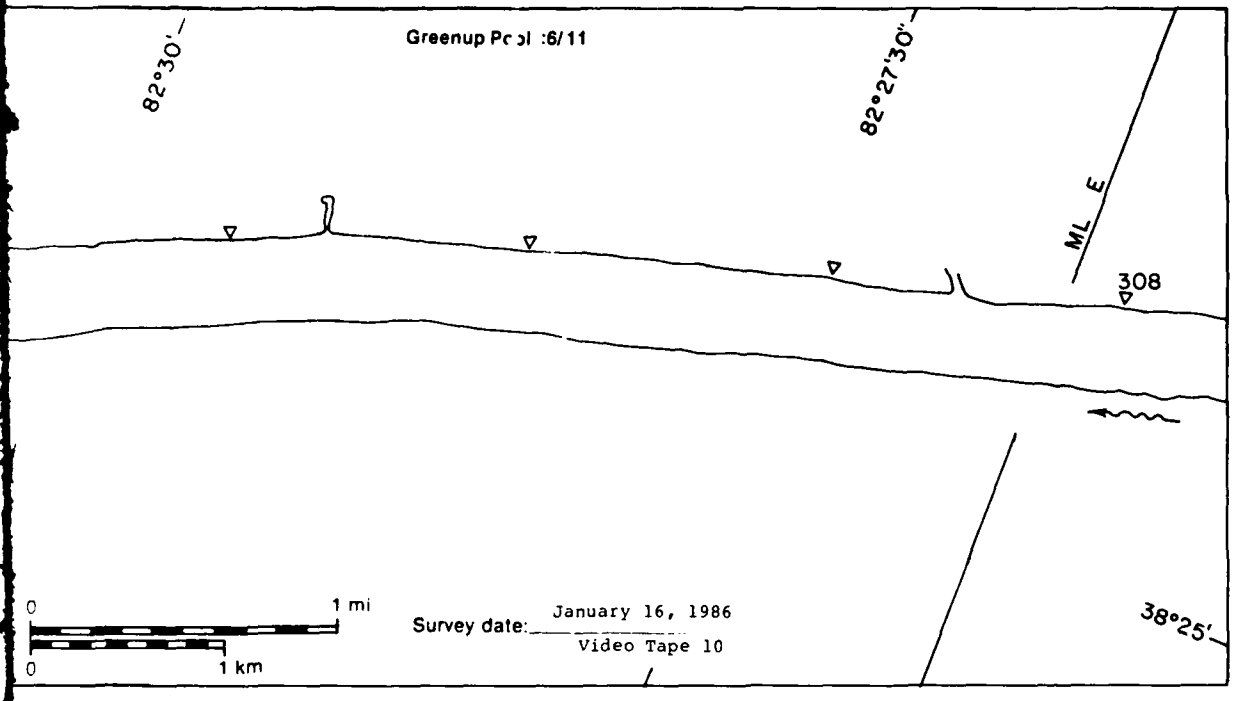
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 5/14

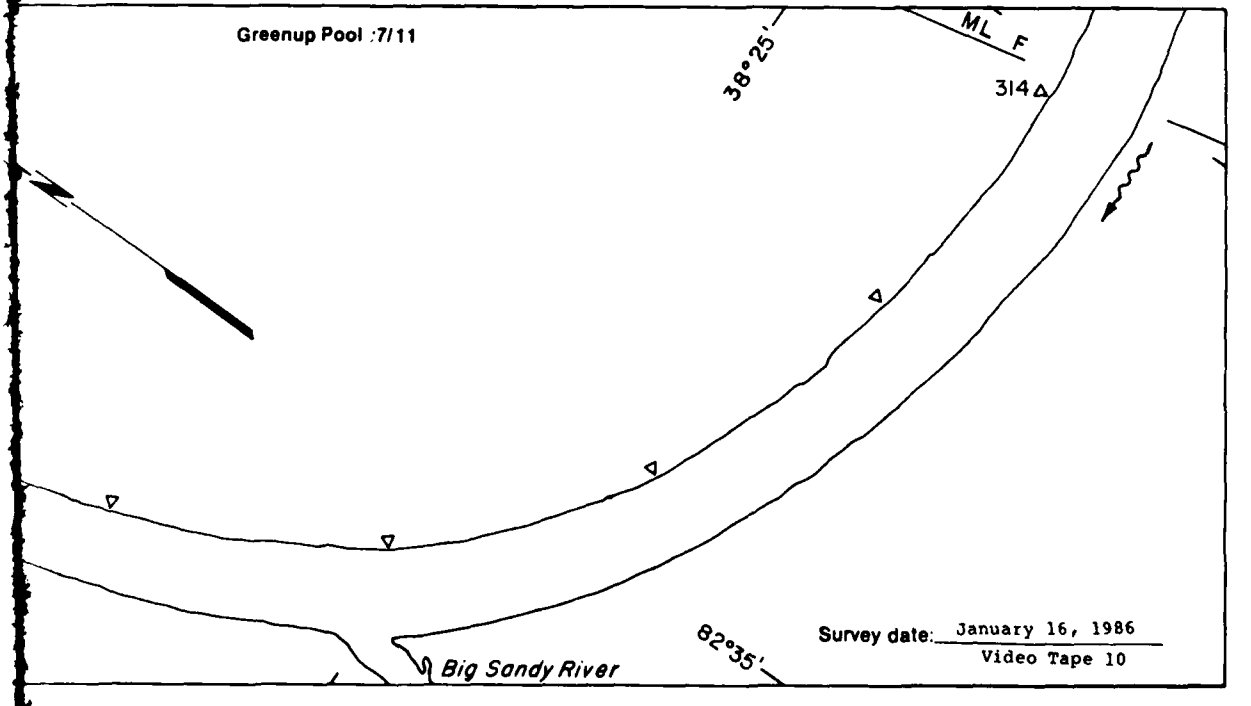
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

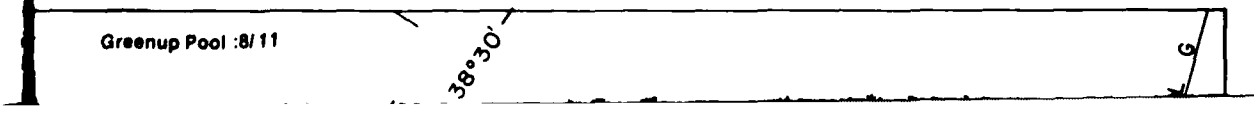


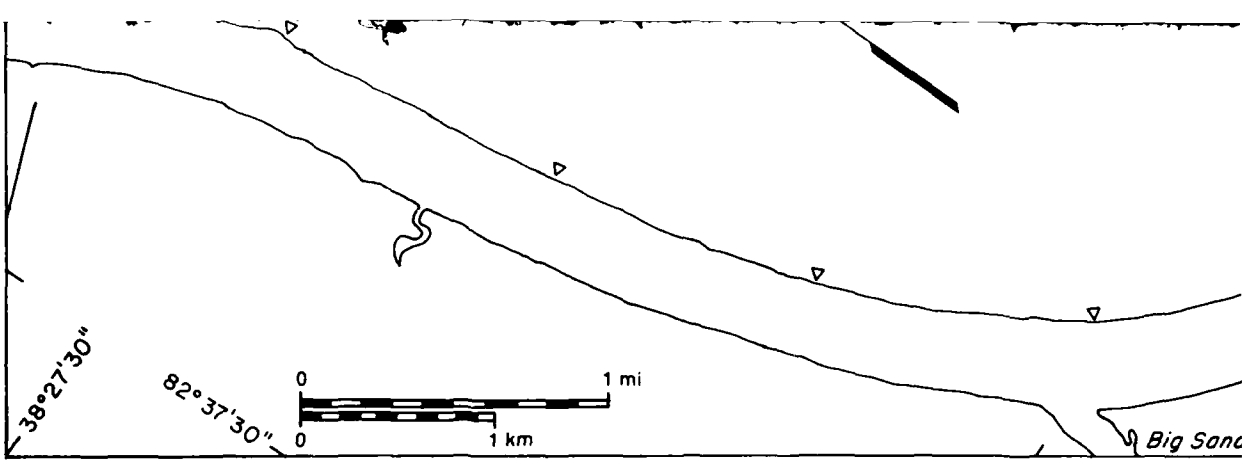

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

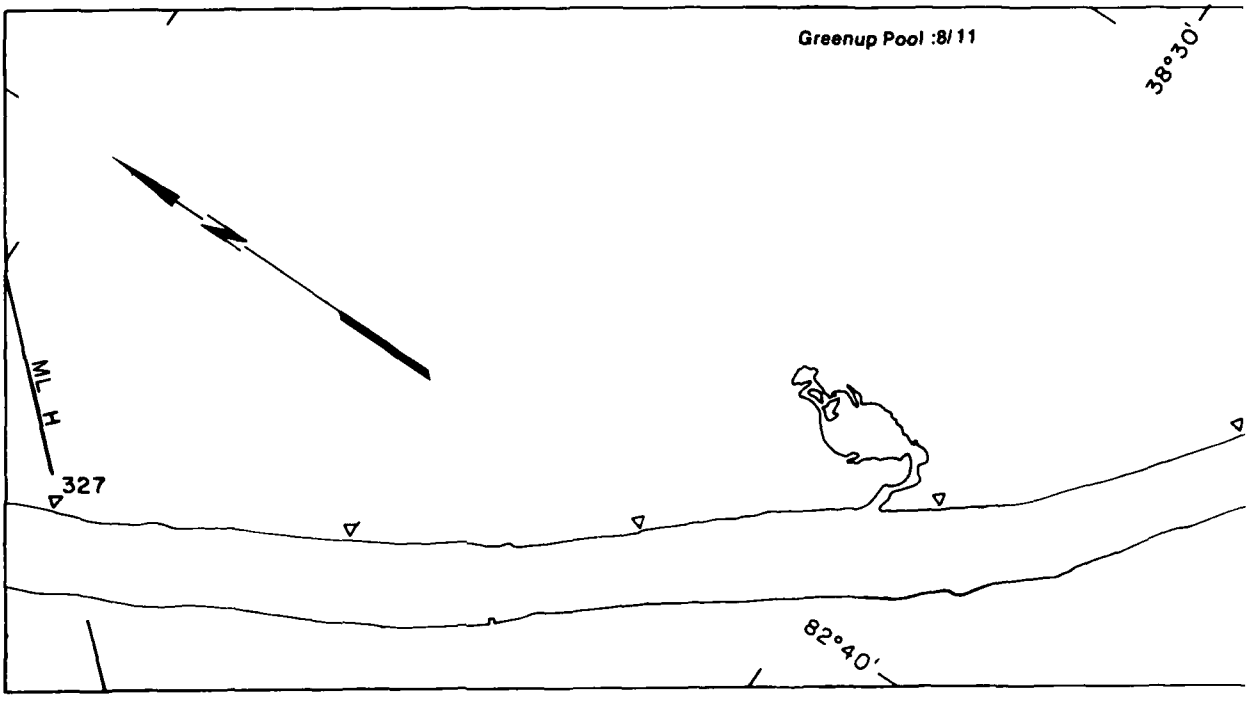
16 January 1986

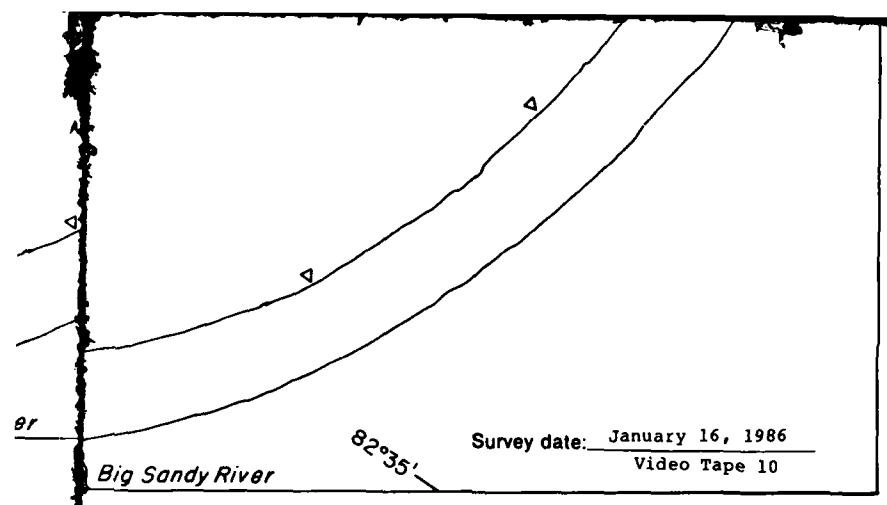


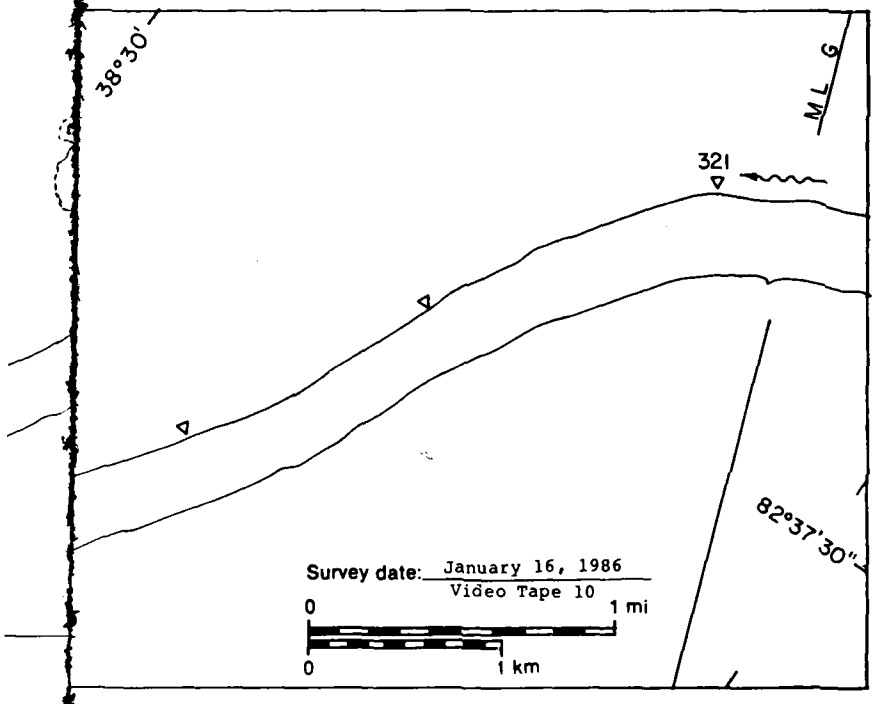





38°27'30"
82°37'30"
0
1 mi
0
1 km
Big Sand

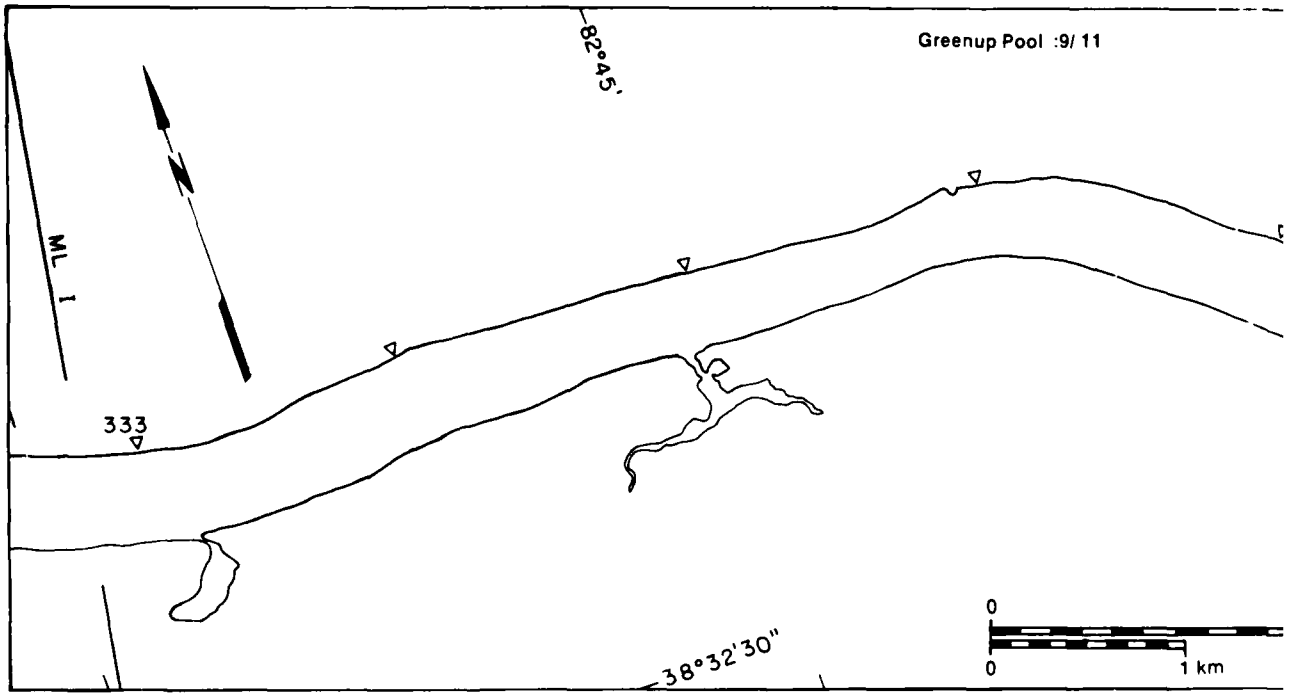

Greenup Pool :8/11
38°30'
MLH
327
82°40'

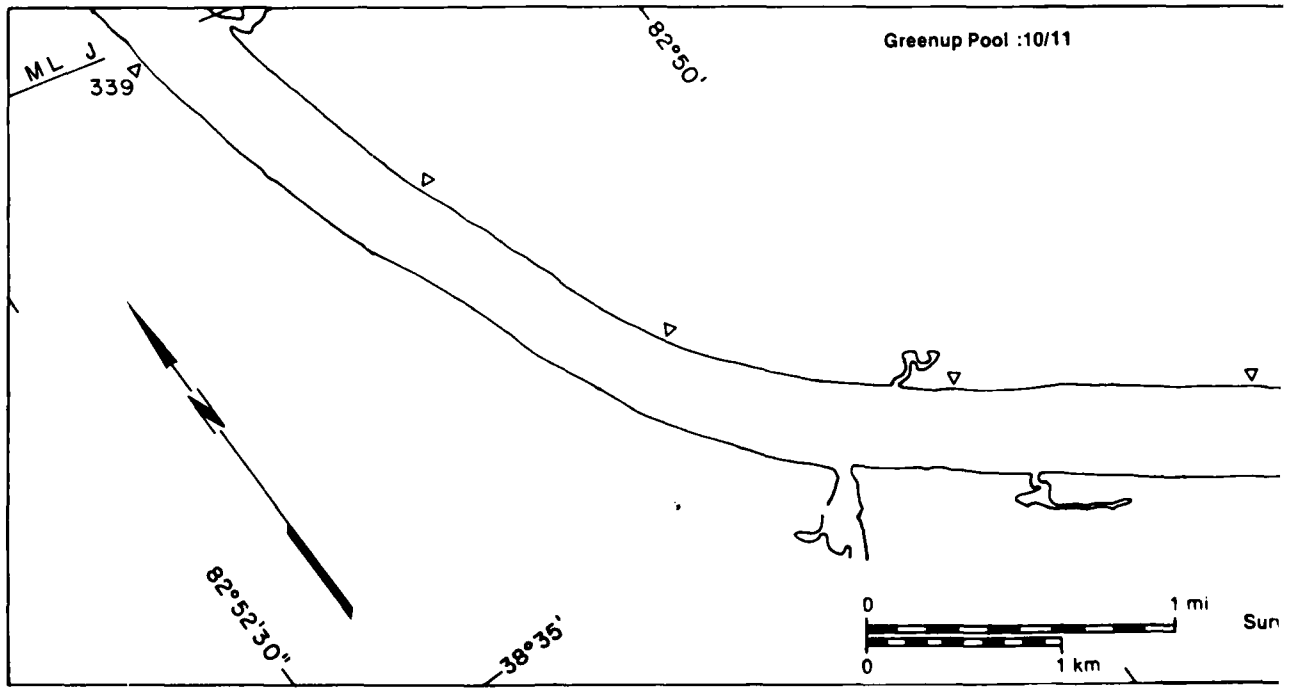

er
Big Sandy River
82°35'
Survey date: January 16, 1986
Video Tape 10

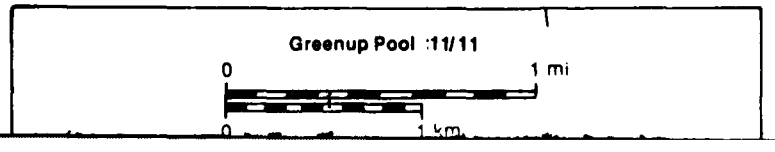

38°30'
M L G
321
82°37'30"
Survey date: January 16, 1986
Video Tape 10
0
1 mi
0
1 km

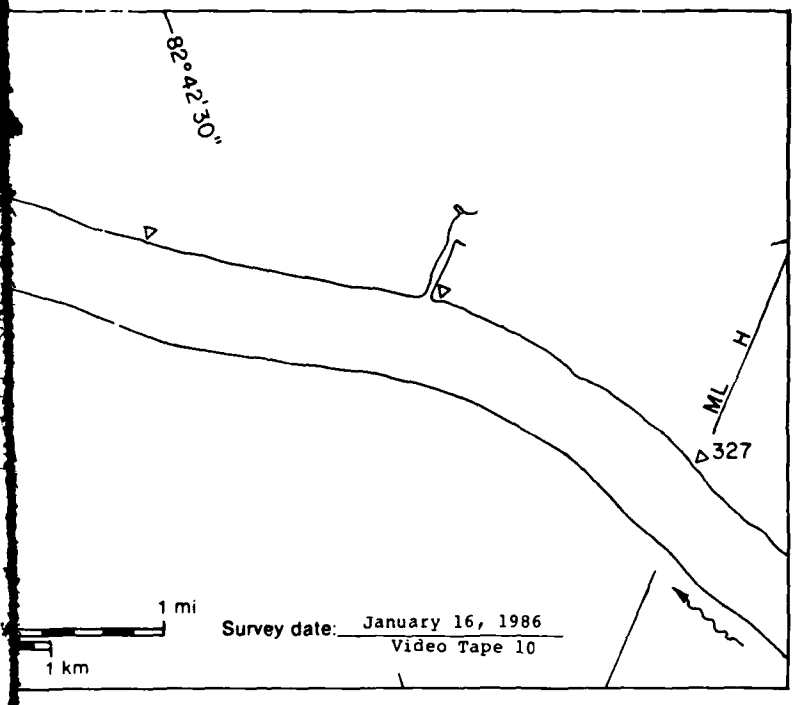
D

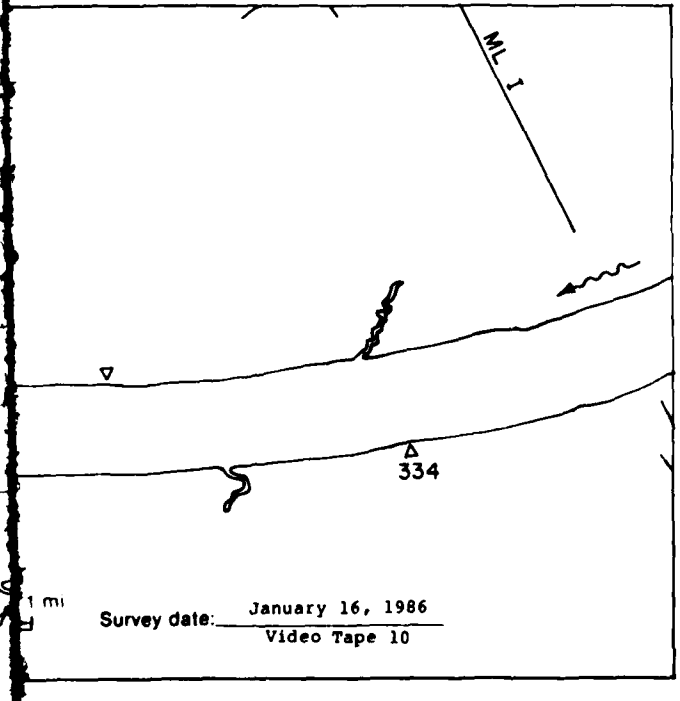
16 January 1986



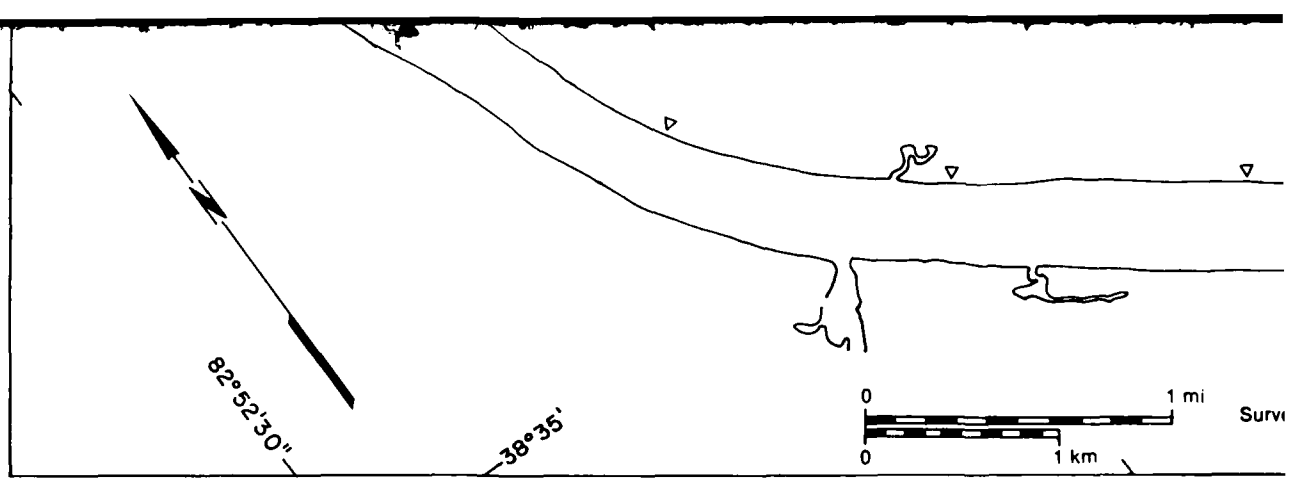


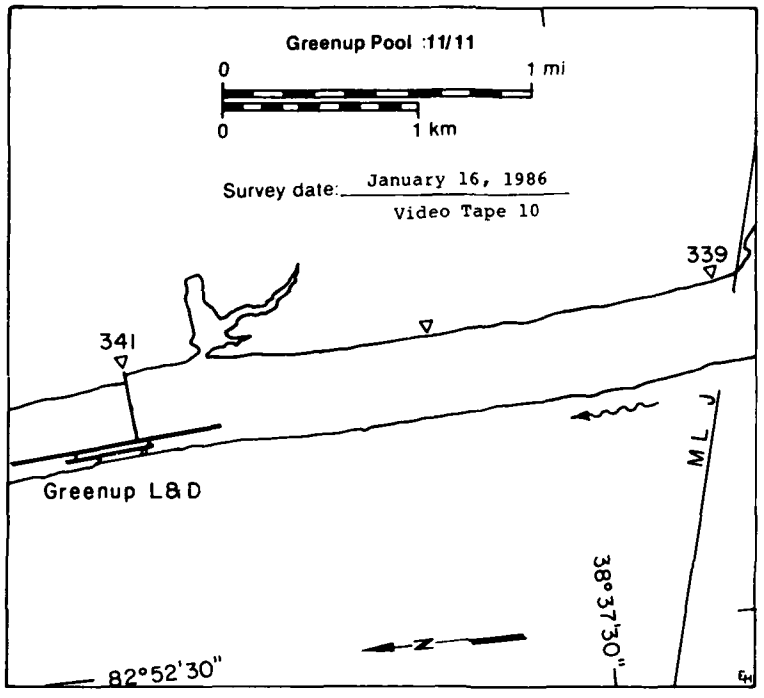


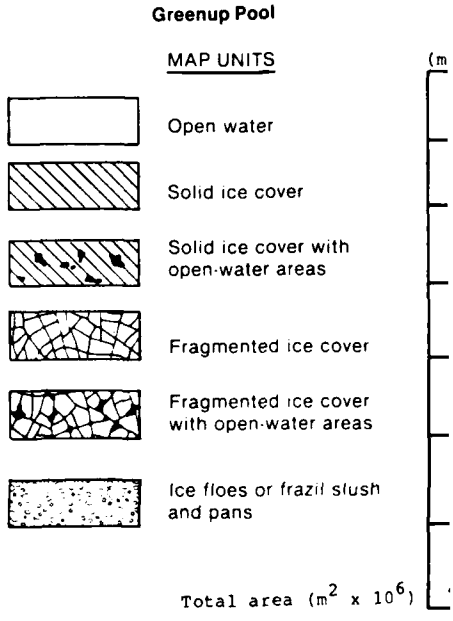


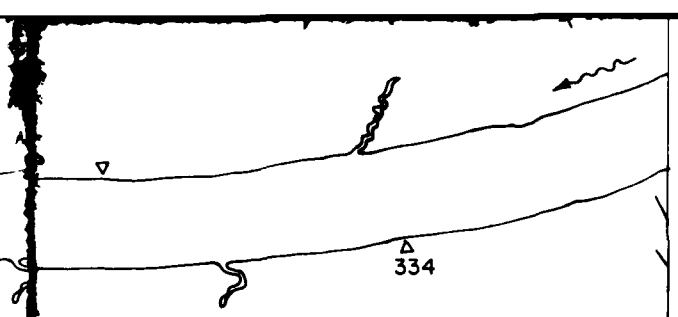


Area ($m^2 \times 10^6$)	Surface concentration (%)
41.19	NA


82°52'30"
38°35'
0
1 mi
0
1 km
Surv

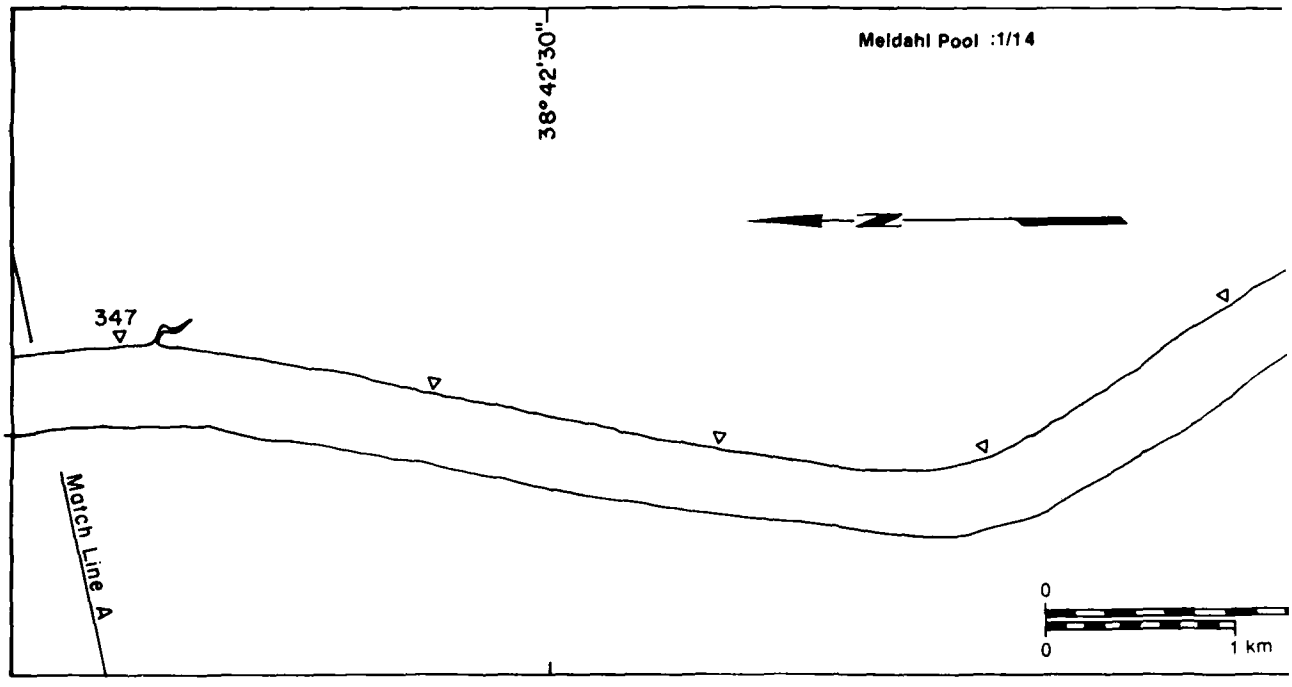

Greenup Pool :11/11
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10
339
341
Greenup L&D
M L J
38°37'30"
82°52'30"

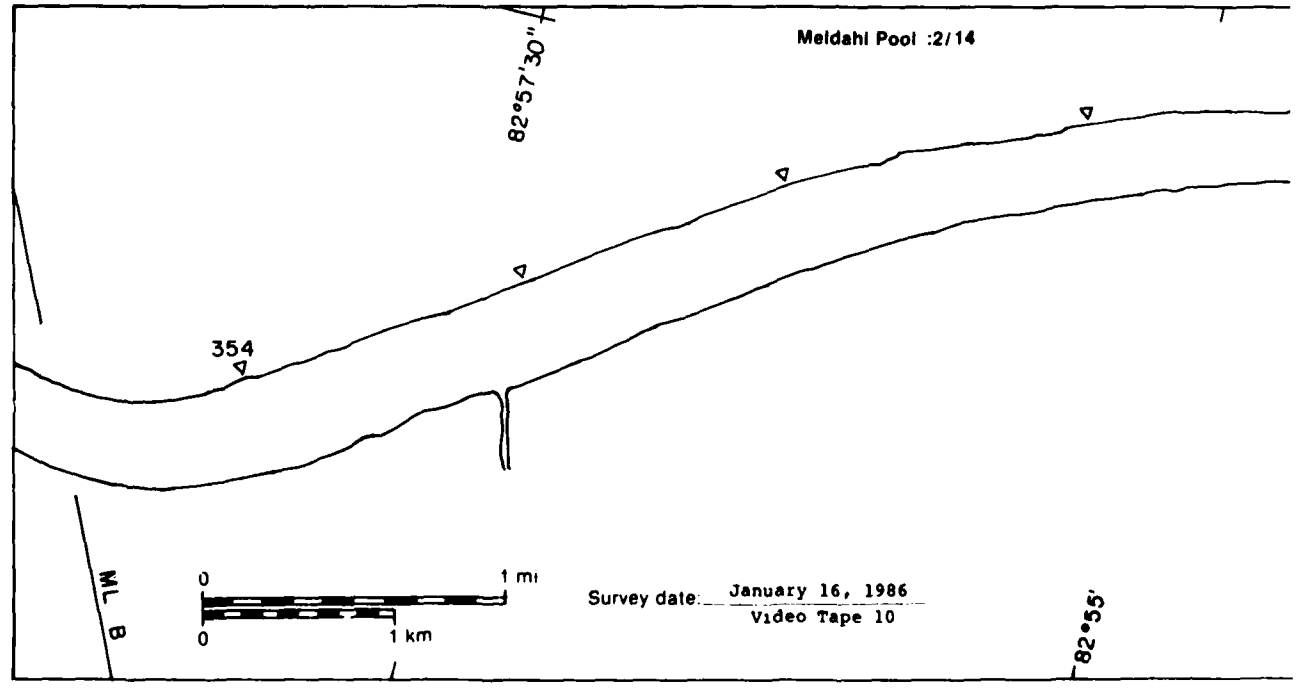

Greenup Pool
MAP UNITS
Open water
Solid ice cover
Solid ice cover with open-water areas
Fragmented ice cover
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans
Total area (m2 x 10^6)



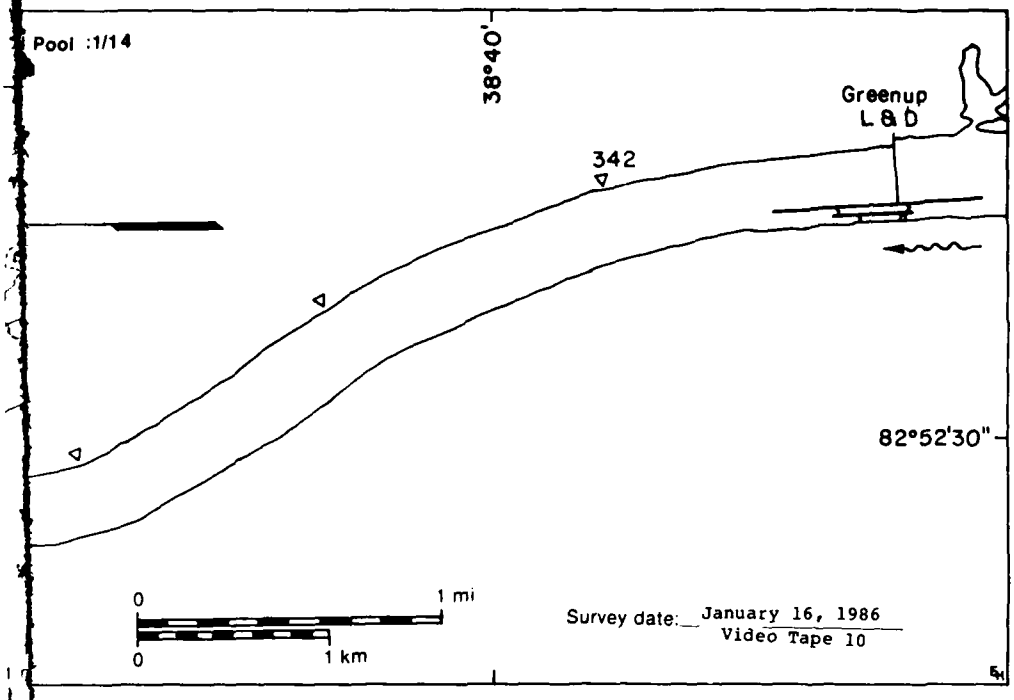
Survey date: January 16, 1986
Video Tape 10

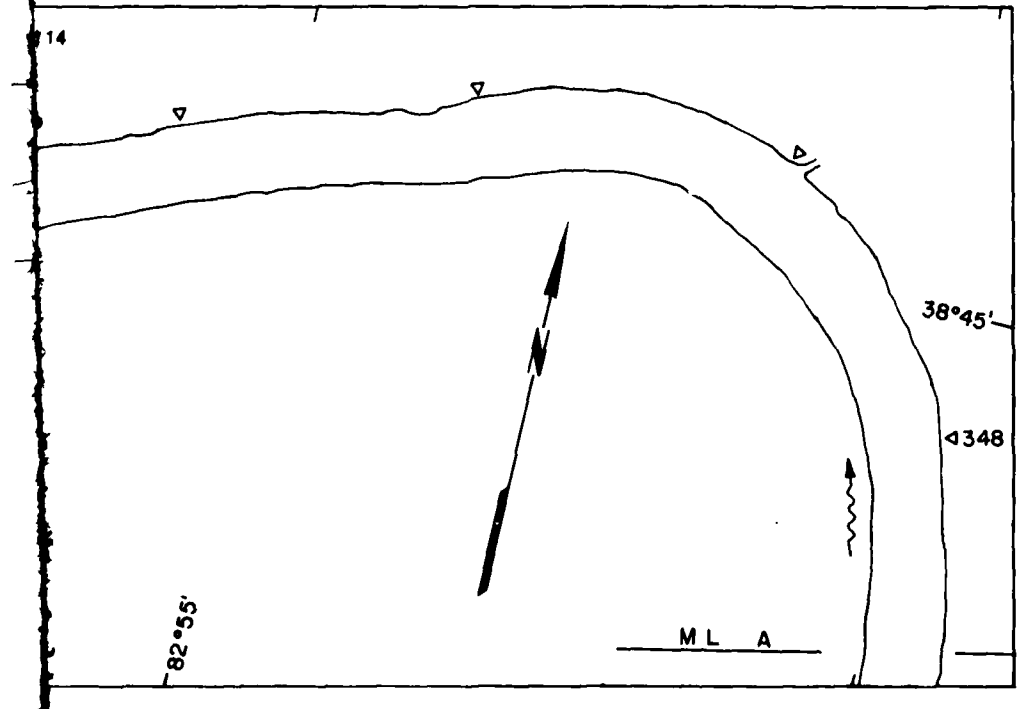
Area ($m^2 \times 10^6$)	Surface concentration (%)
41.19	NA
0.00	NA
0.00	—
0.00	NA
0.00	—
0.00	—
41.19	

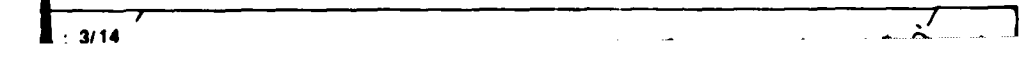

Meldahl Pool :1/14
38°42'30"
347
Match Line A
0
0
1 km

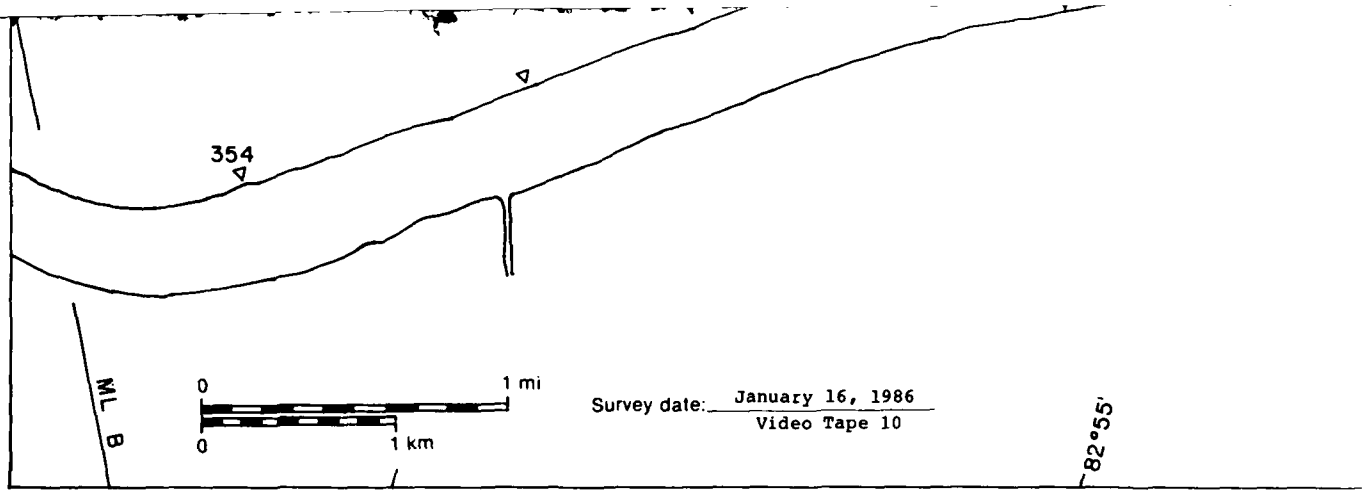

Meldahl Pool :2/14
82°57'30"
354
ML B
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10
82°55'

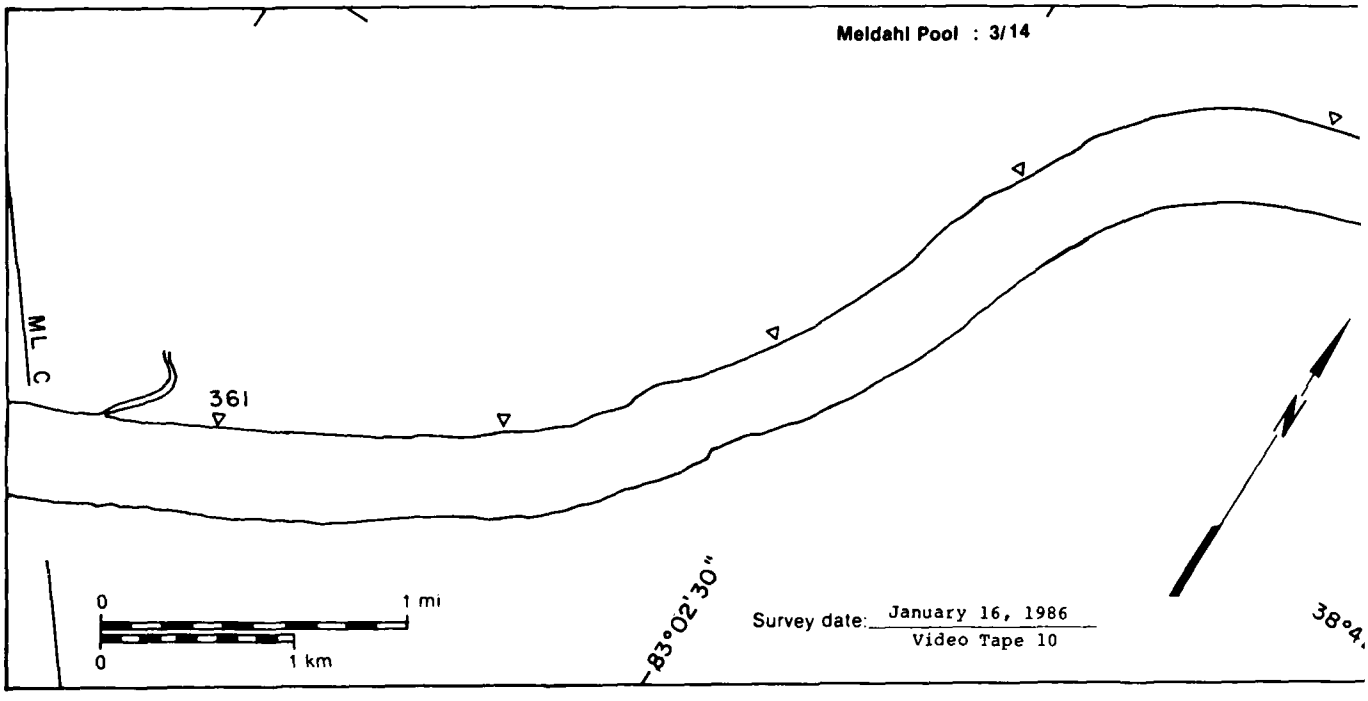
16 January 1986

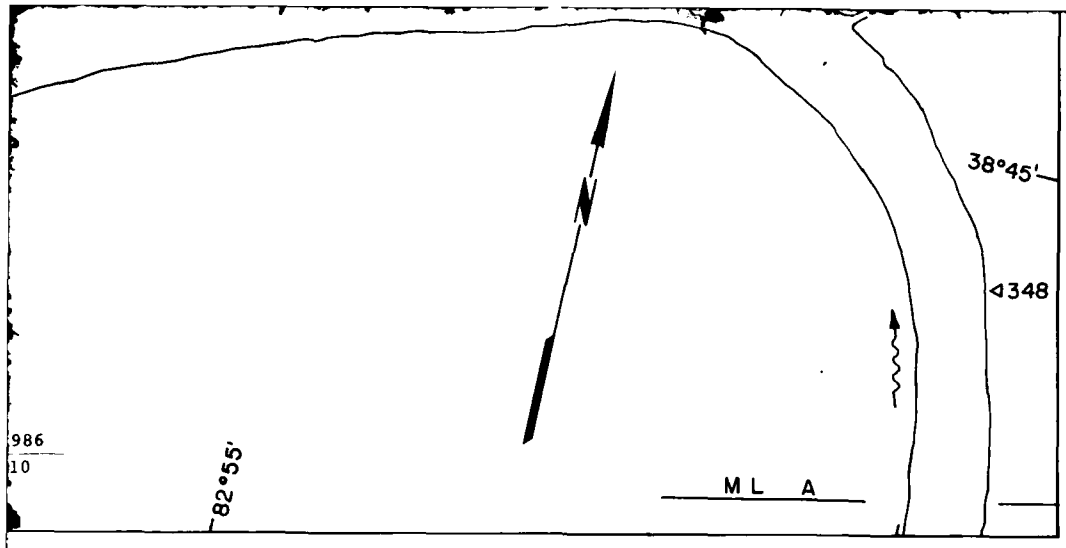


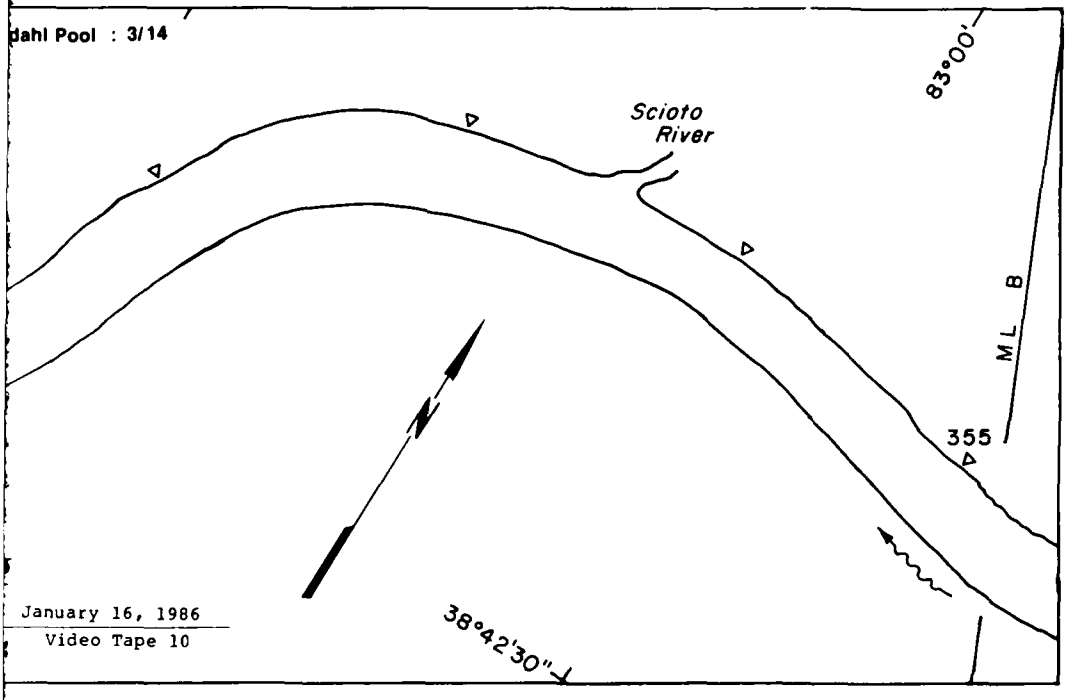




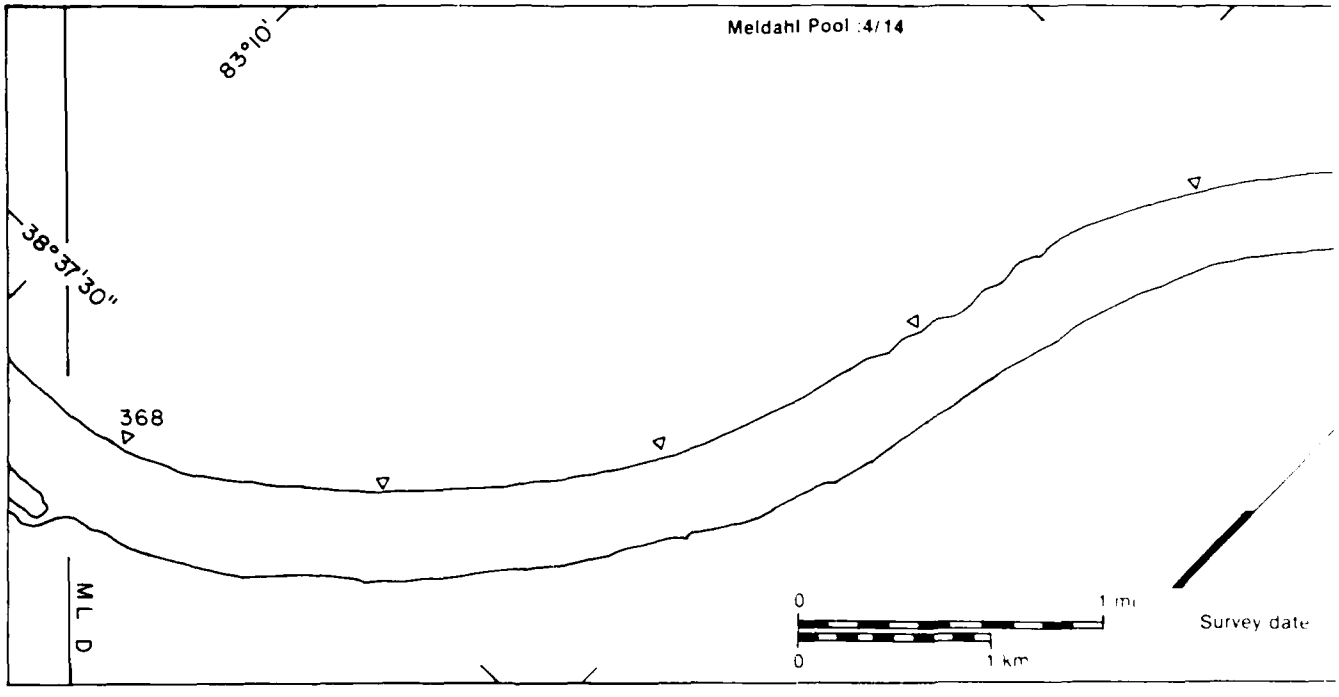

354
ML B
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 10
82°55'

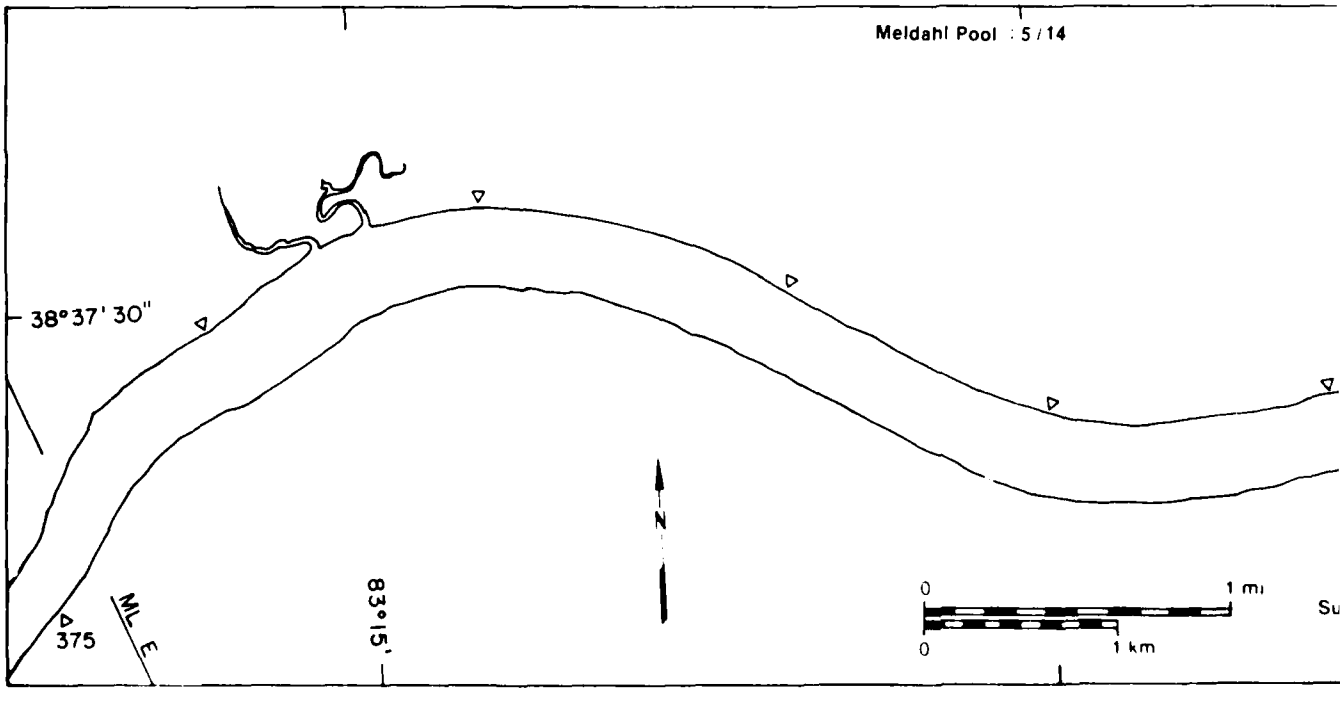

Meldahl Pool : 3/14
ML C
361
0
1 mi
0
1 km
83°02'30"
Survey date: January 16, 1986
Video Tape 10
38°4

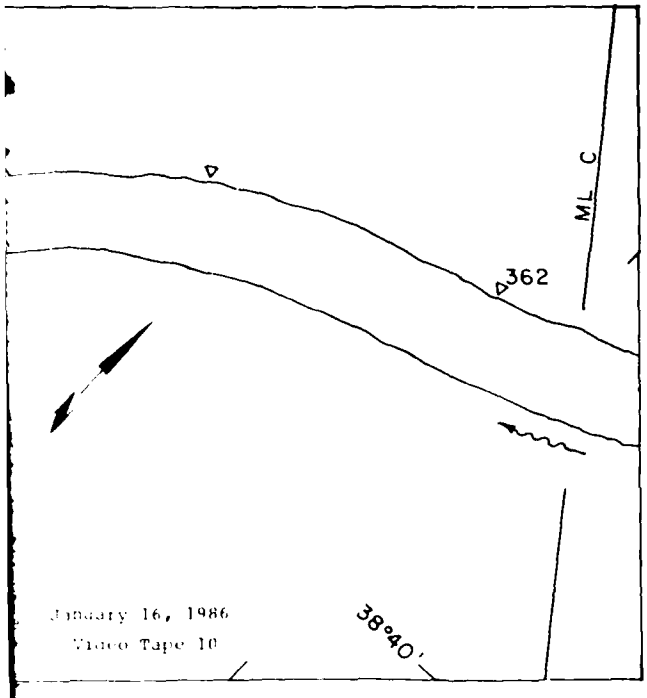

38°45'
348
986
10
82°55'
M L A

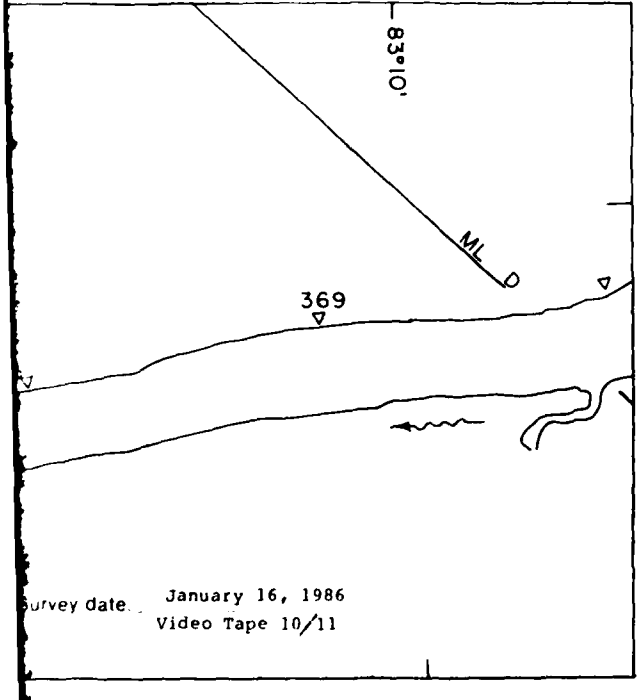

dahl Pool : 3/14
83°00'
Scioto
River
M L B
355
January 16, 1986
Video Tape 10
38°42'30"

16 January 1986

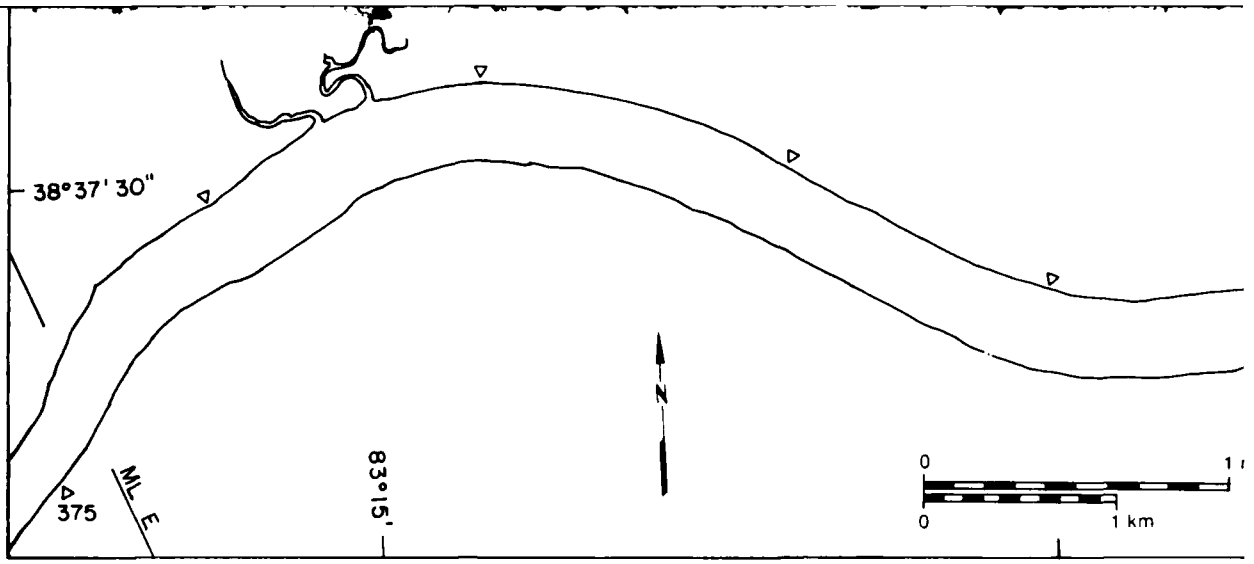


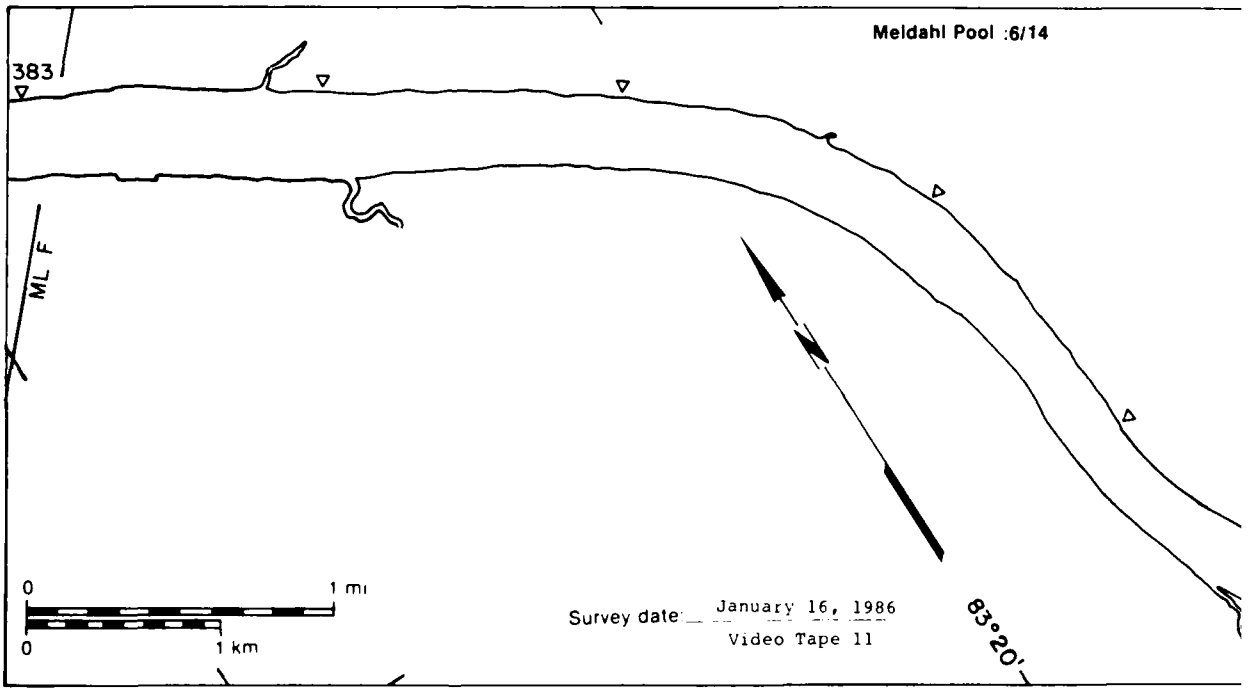


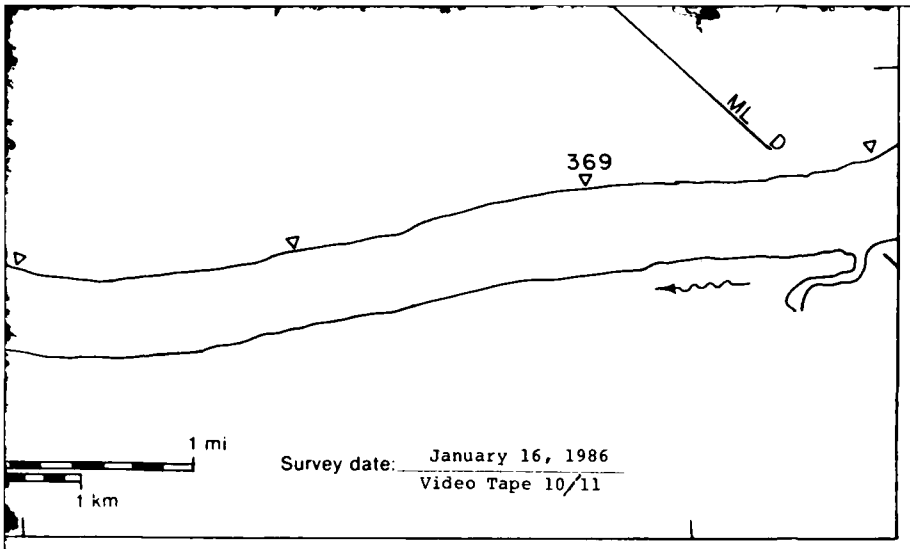

ML C
362
January 16, 1986
Video Tape 10
38°40'

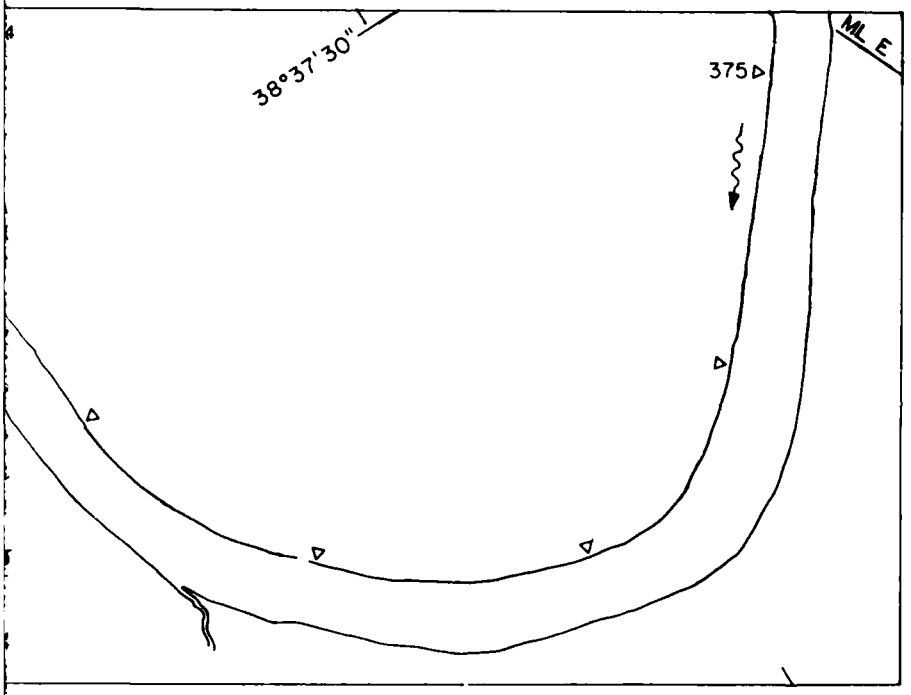

83°10'
ML
369
Survey date. January 16, 1986
Video Tape 10/11

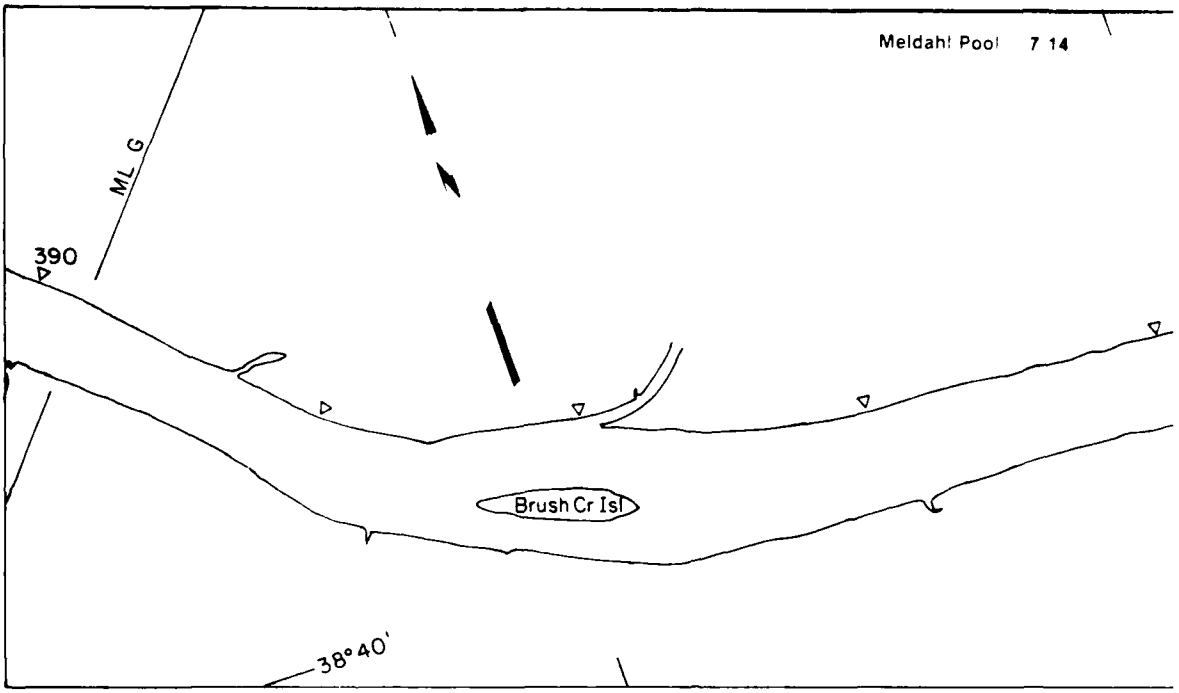
ML E

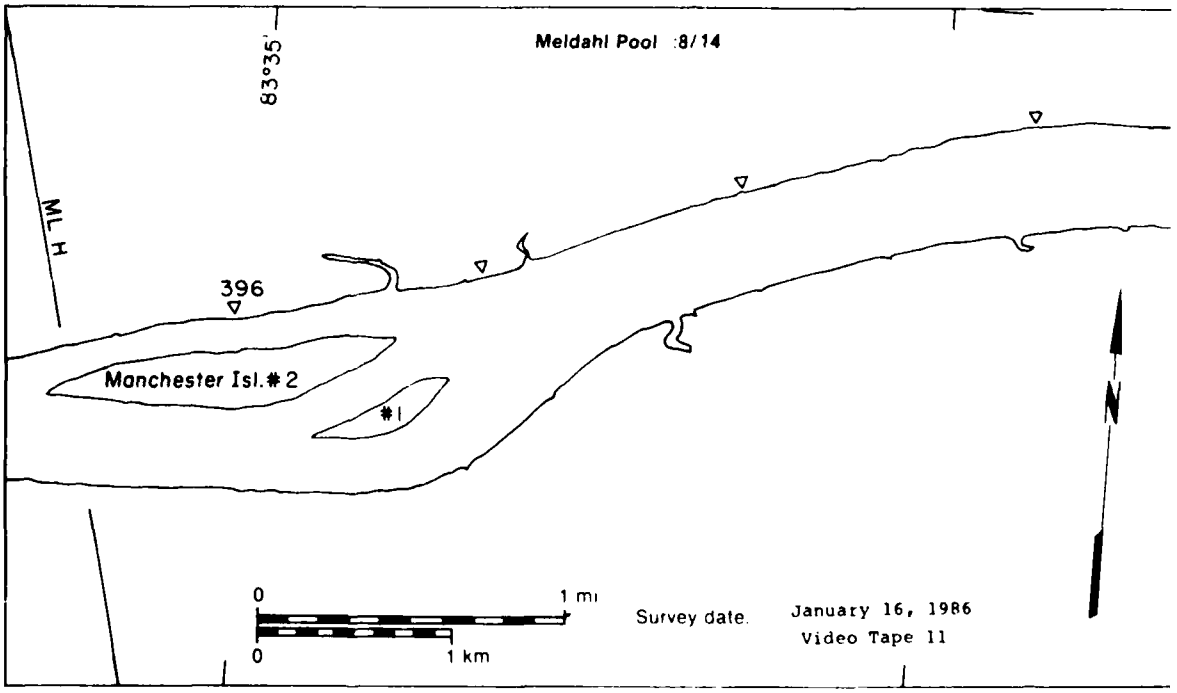

38°37'30"
375
ML E
83°15'
N
0
1 km


Meldahl Pool :6/14
383
ML F
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 11
83°20'

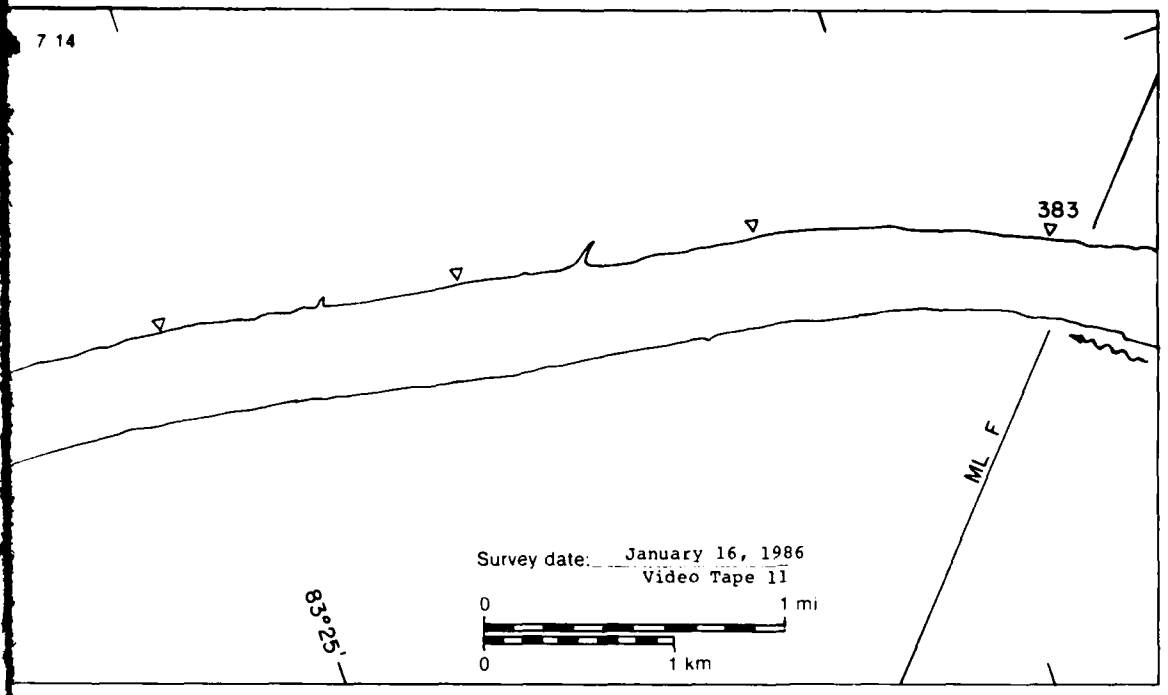

ML
369
1 mi
1 km
Survey date: January 16, 1986
Video Tape 10/11

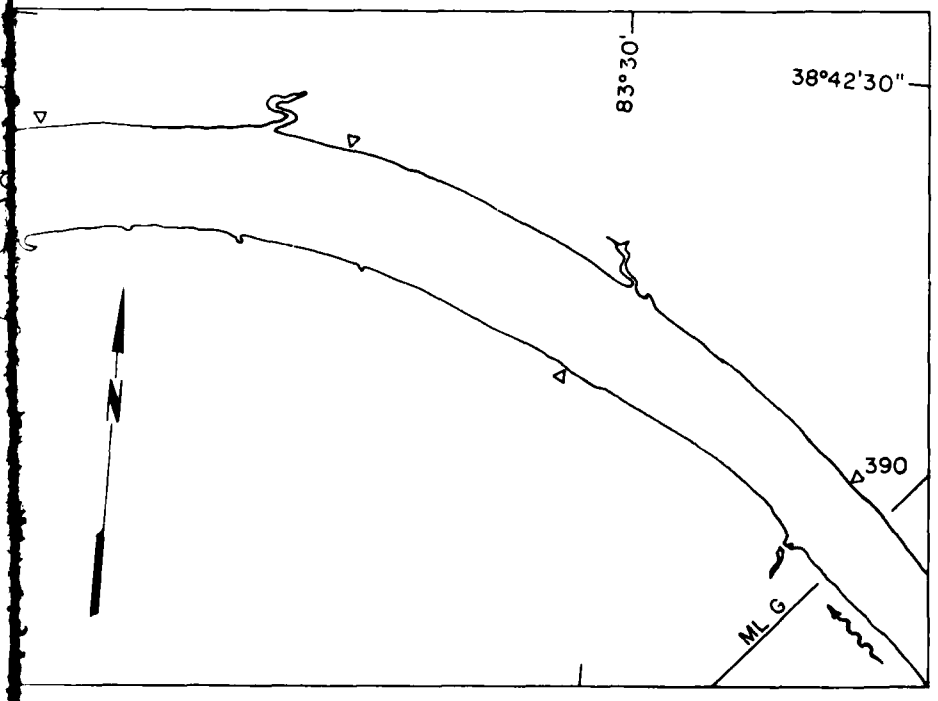

38°37'30"
375
ML E

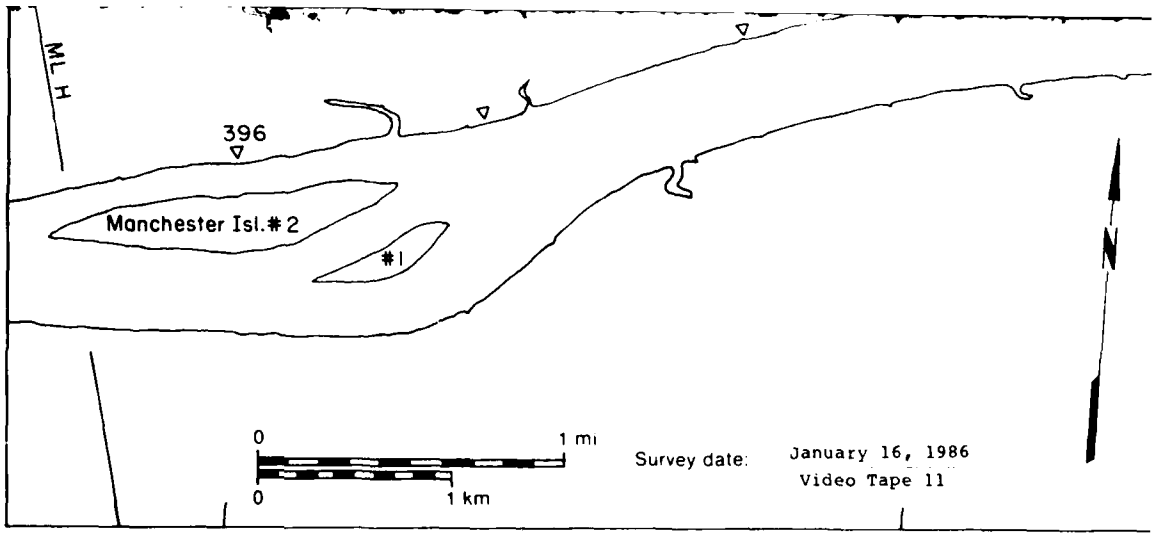

Meldahl Pool 7 14
ML G
390
Brush Cr Isl
38°40'

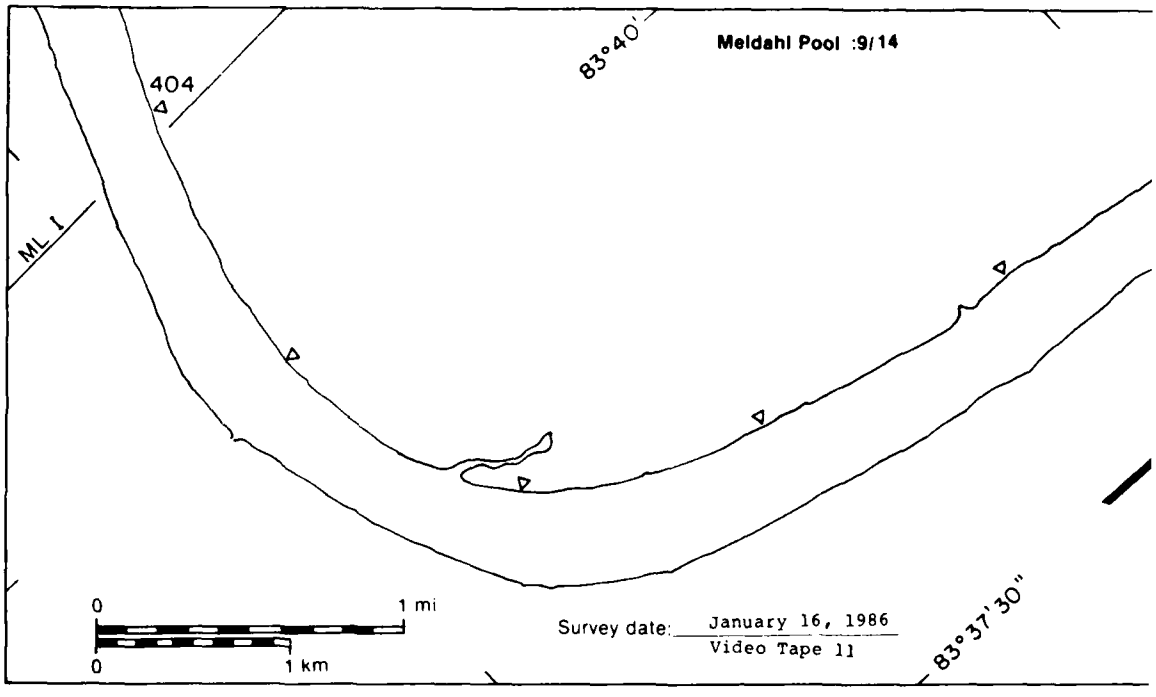

Meldahl Pool :8/14
83°35'
ML H
396
Manchester Isl.# 2
#1
0
1 mi
0
1 km
Survey date. January 16, 1986
Video Tape 11

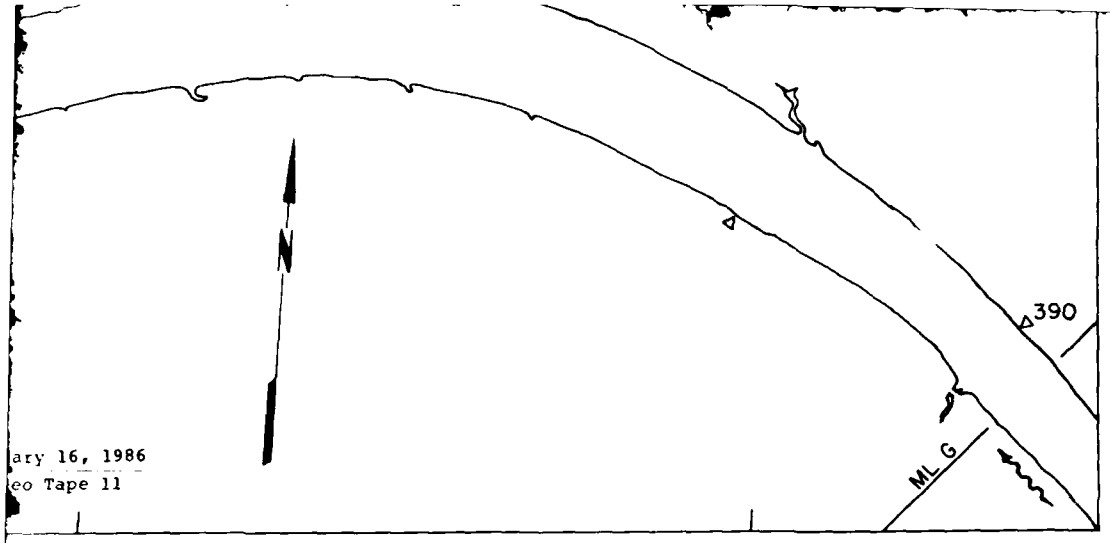
16 January 1986



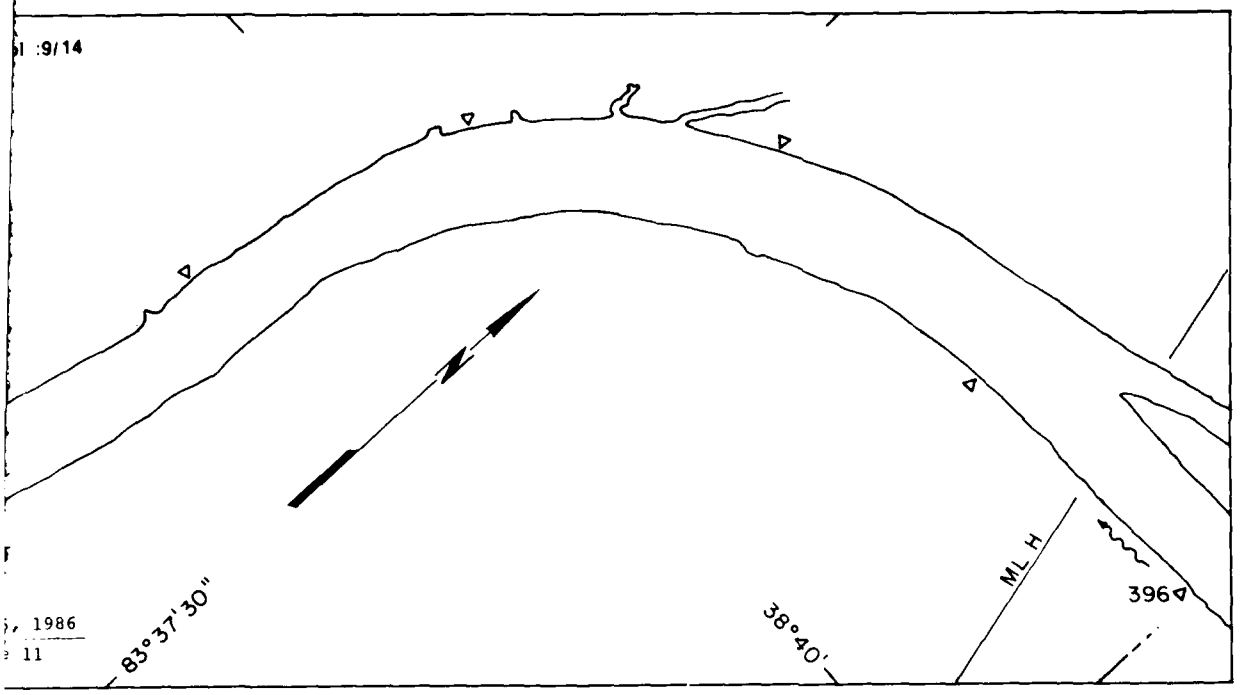



ML H
396
Manchester Isl.# 2
#1
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 11


83°40'
Meldahl Pool :9/14
404
ML I
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 11
83°37'30"



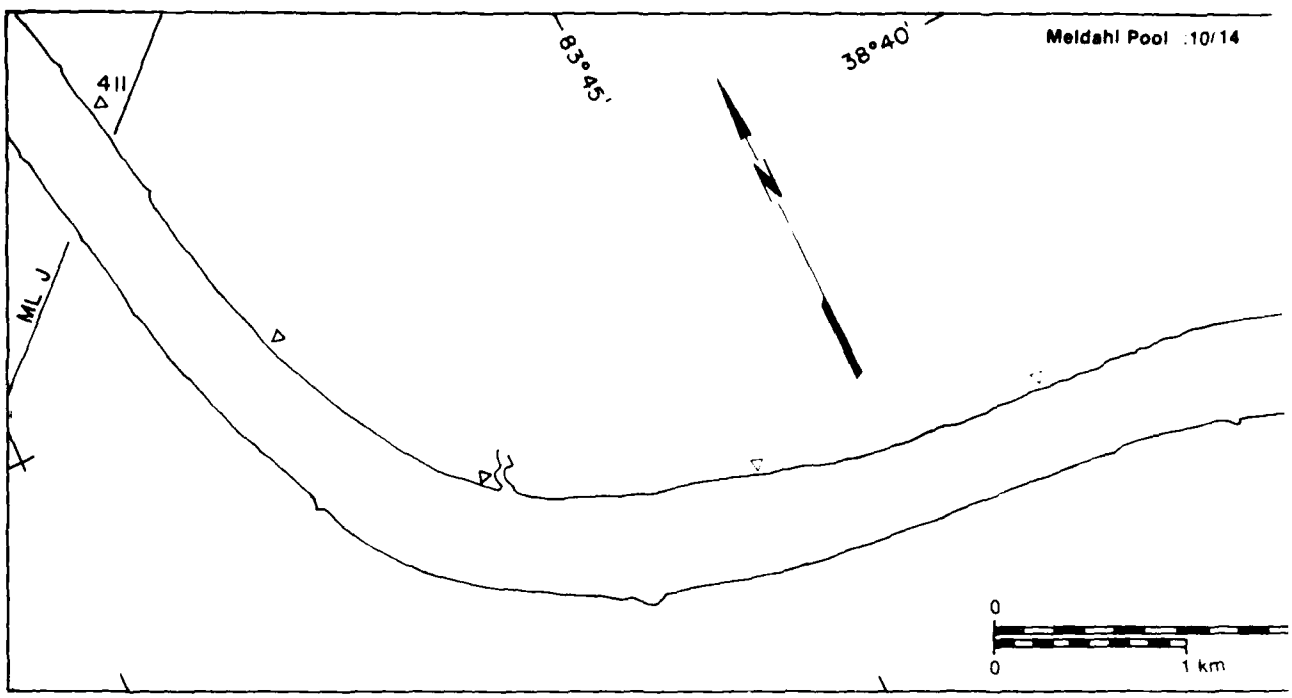
ary 16, 1986
eo Tape 11

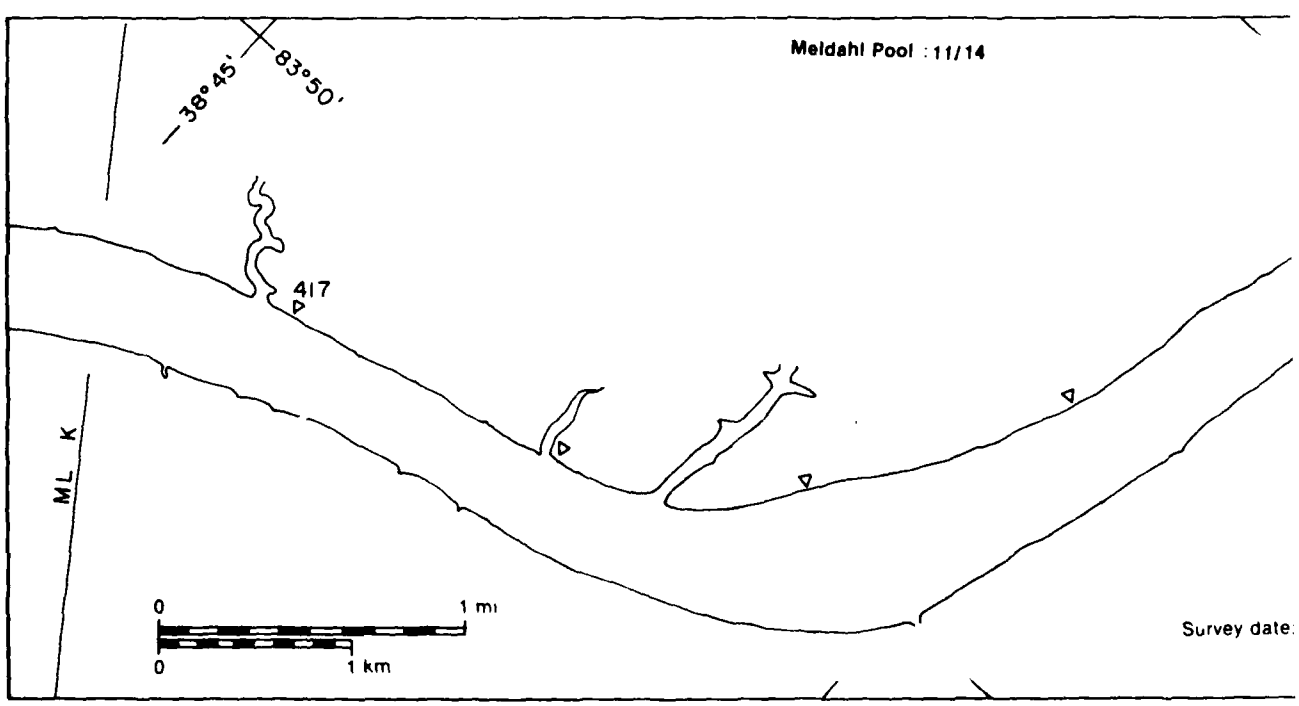


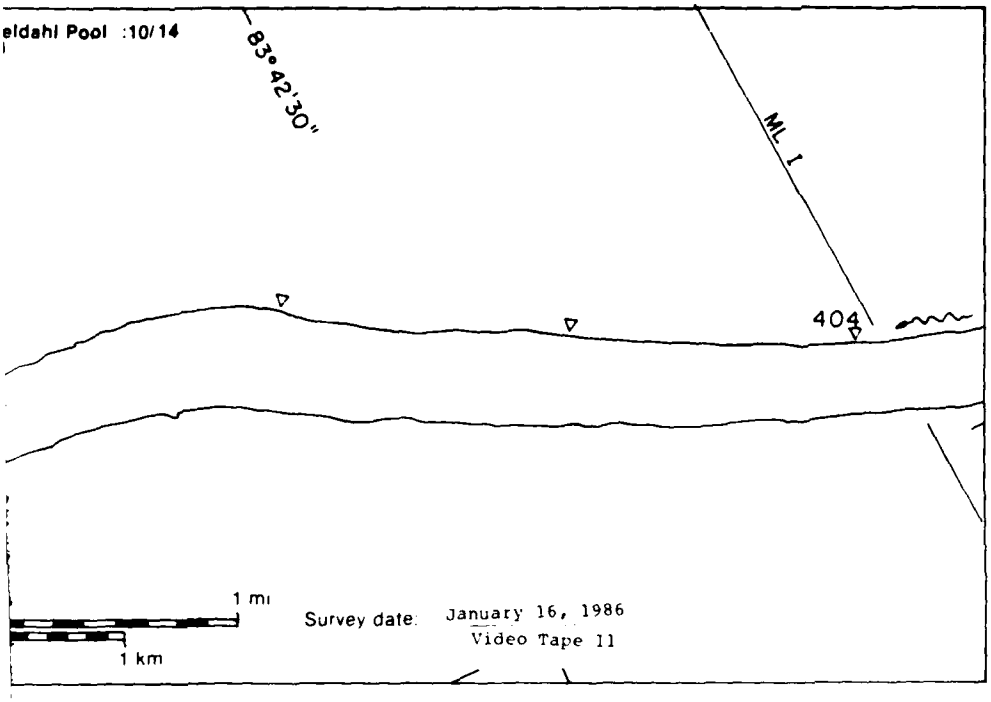
l :9/14

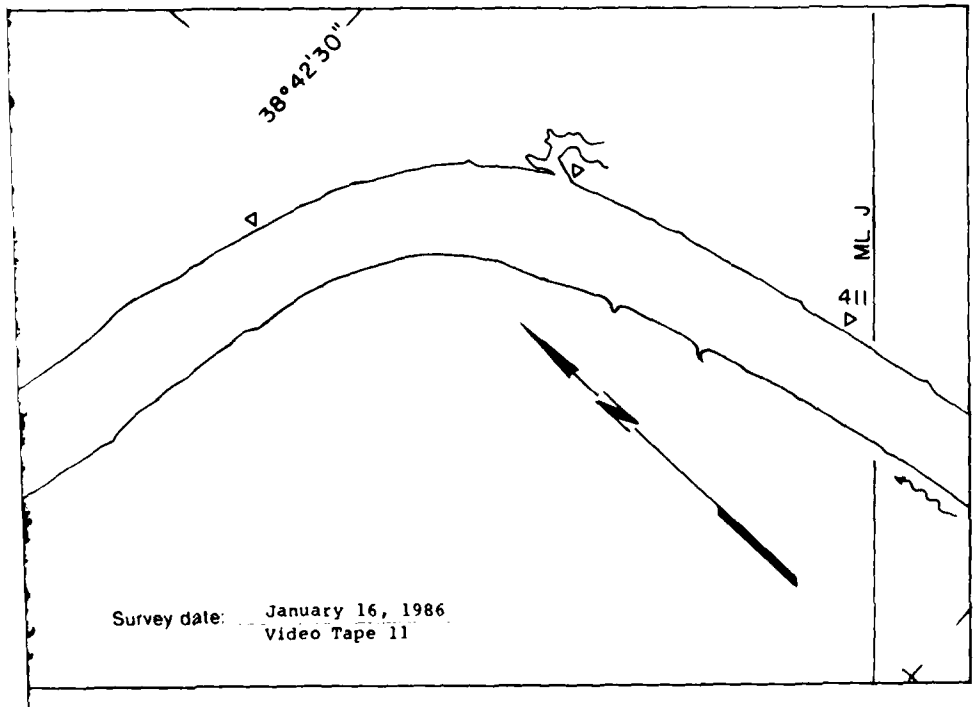
, 1986
11

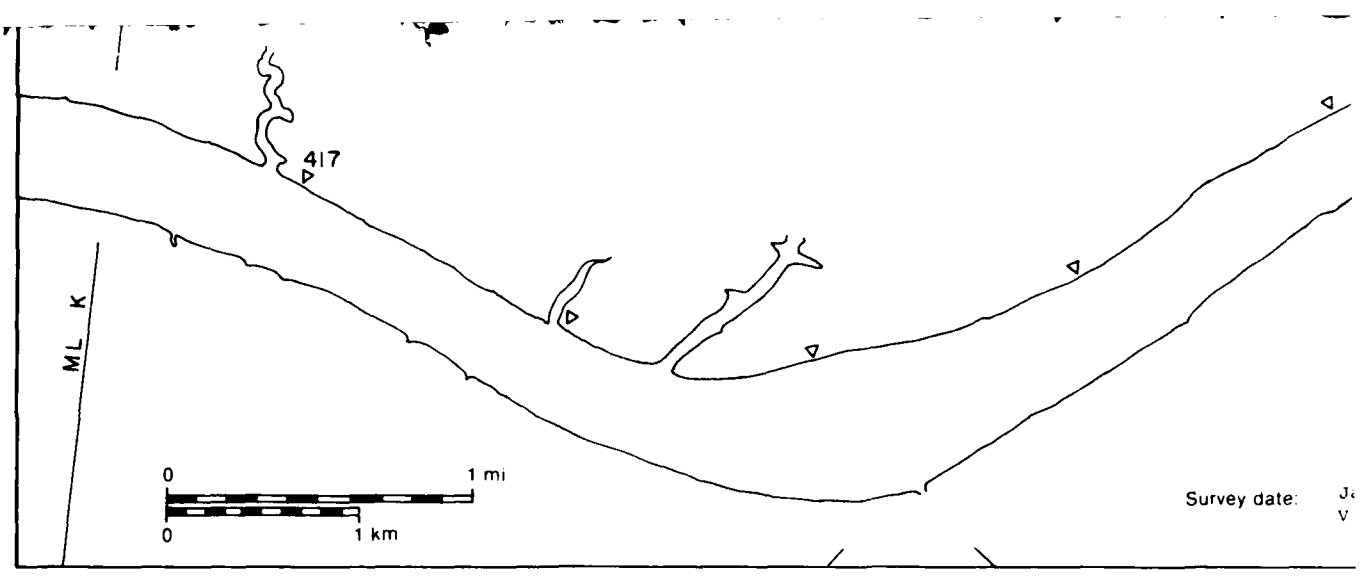
16 January 1986

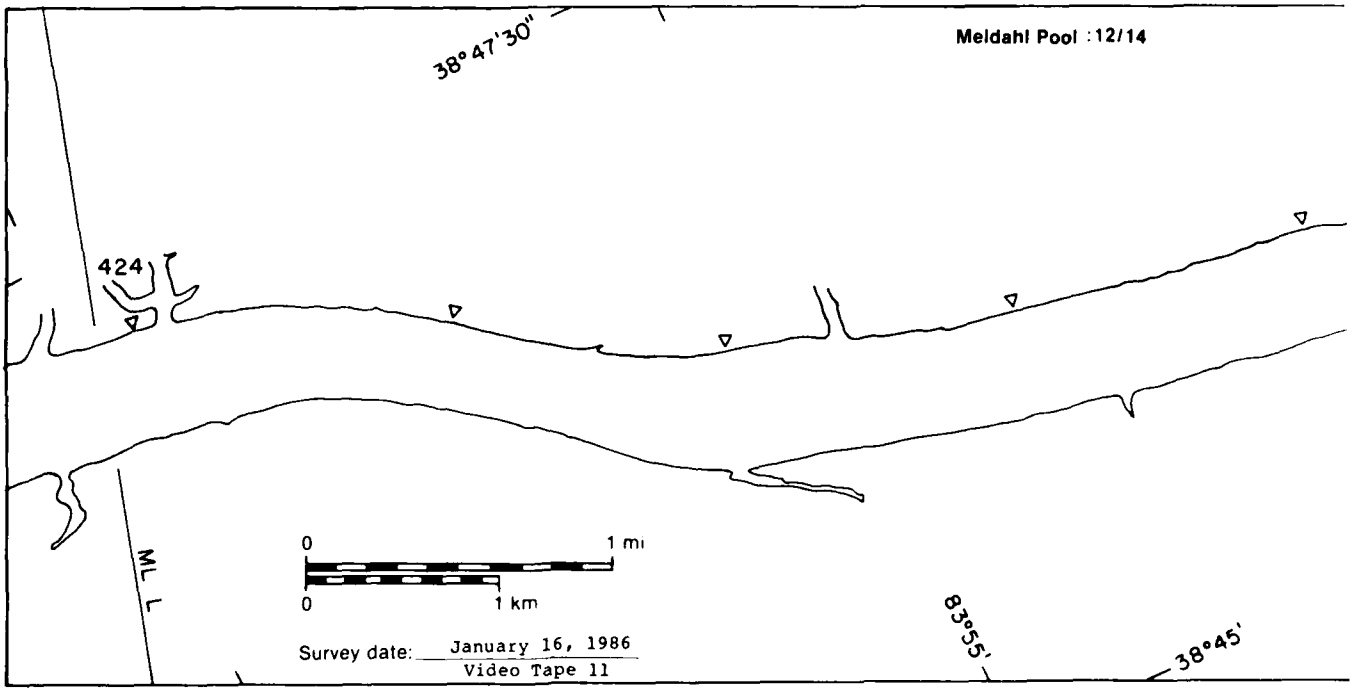


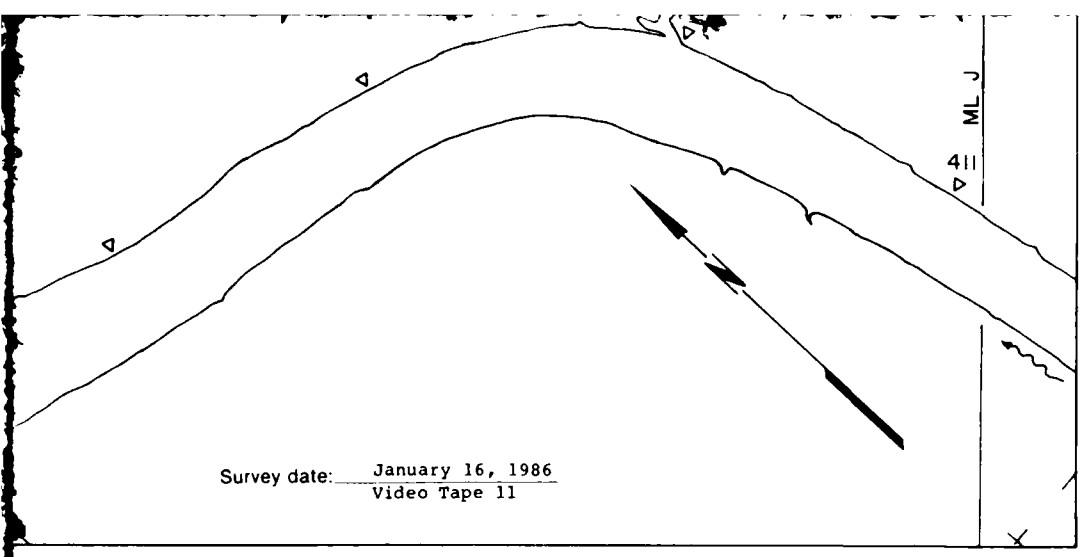


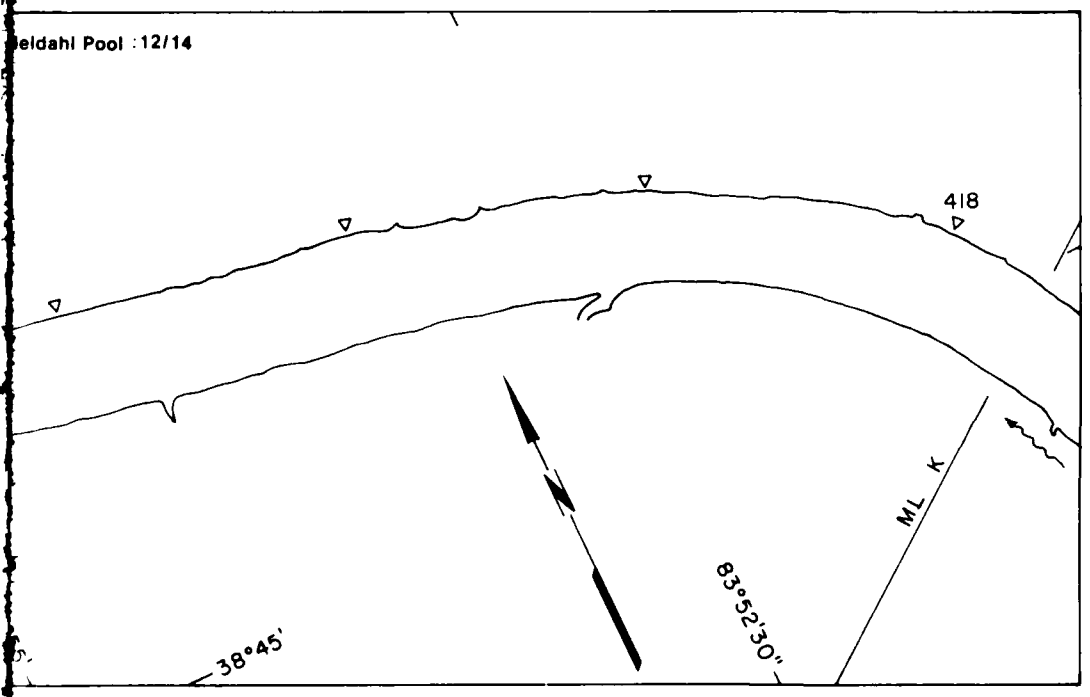

eldahl Pool :10/14
83°42'30"
ML I
404
1 mi
1 km
Survey date: January 16, 1986
Video Tape 11

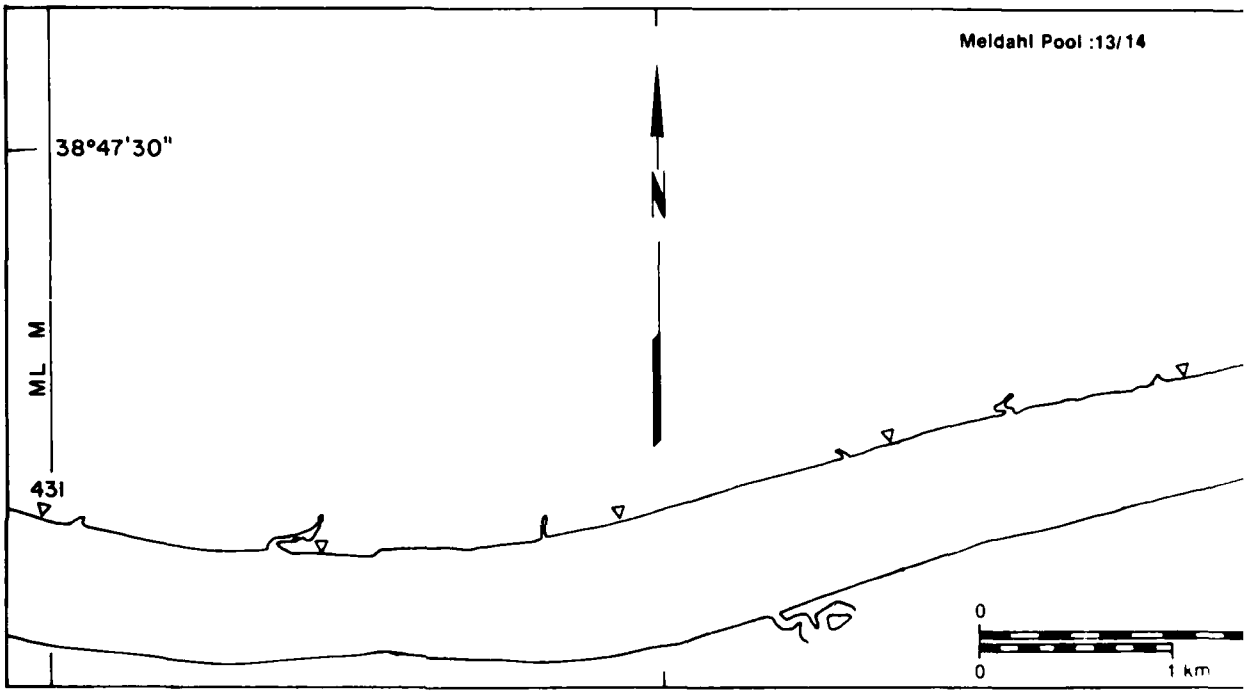

38°42'30"
ML J
411
Survey date: January 16, 1986
Video Tape 11

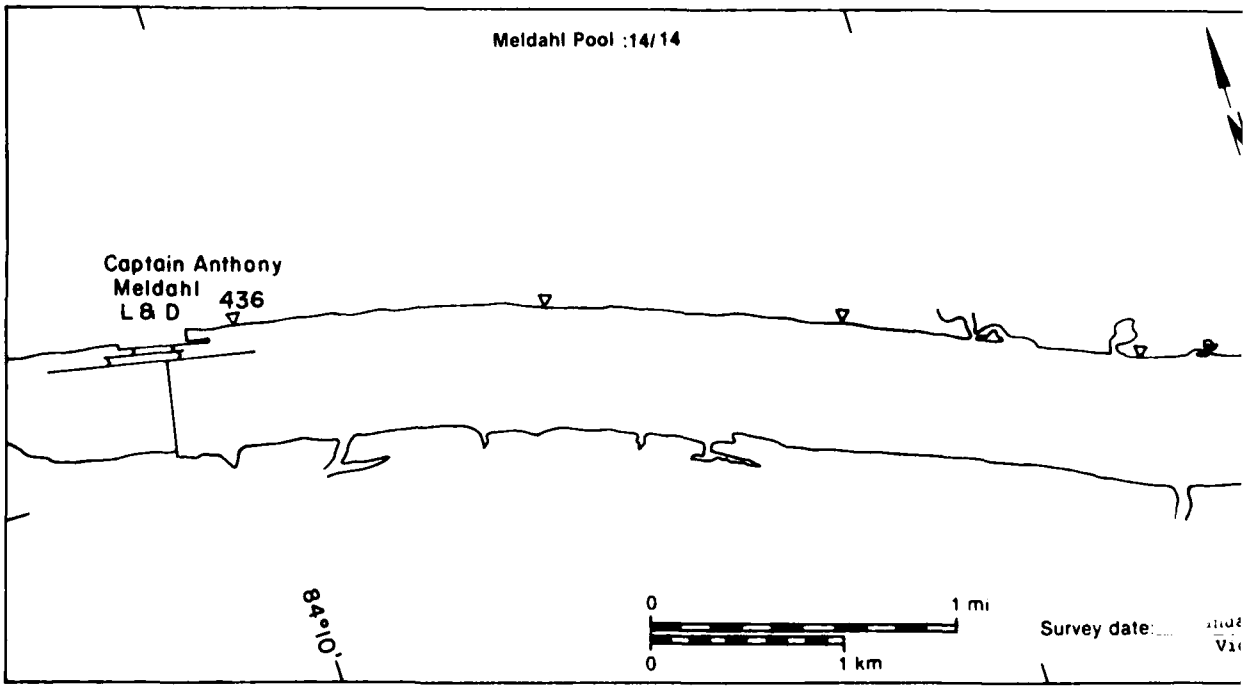

417
ML K
0
1 mi
0
1 km
Survey date:


38°47'30"
Meldahl Pool :12/14
424
ML L
0
1 mi
0
1 km
Survey date: January 16, 1986
Video Tape 11
83°55'
38°45'


ML J
411
Survey date: January 16, 1986
Video Tape 11


eldahl Pool :12/14
418
ML K
83°52'30"
38°45'

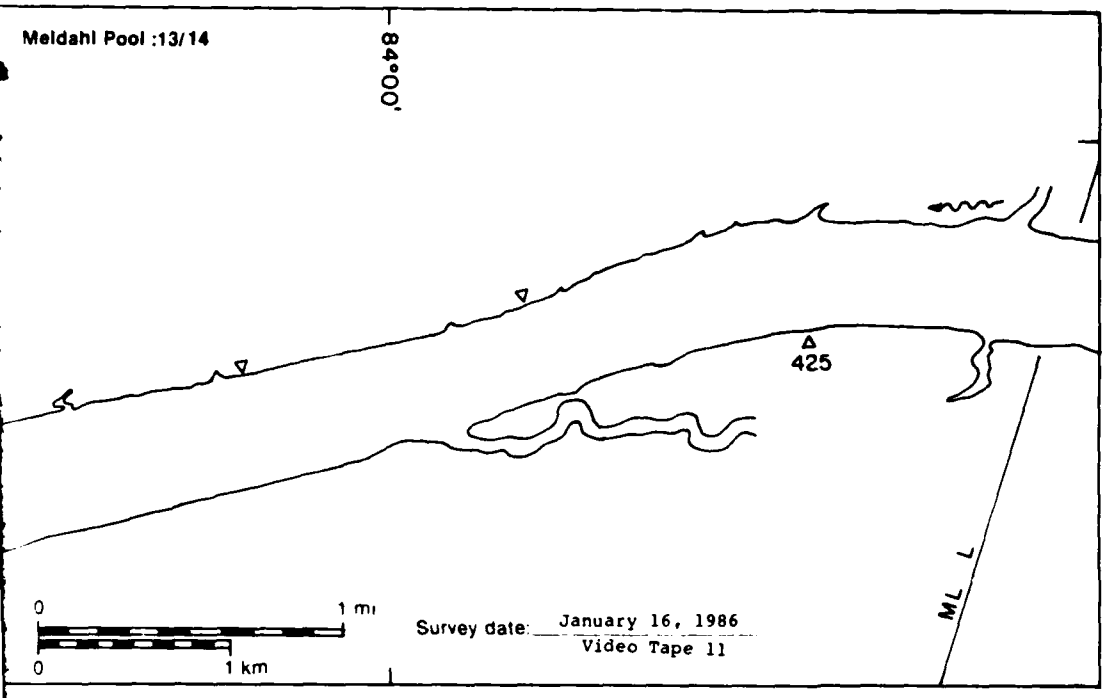


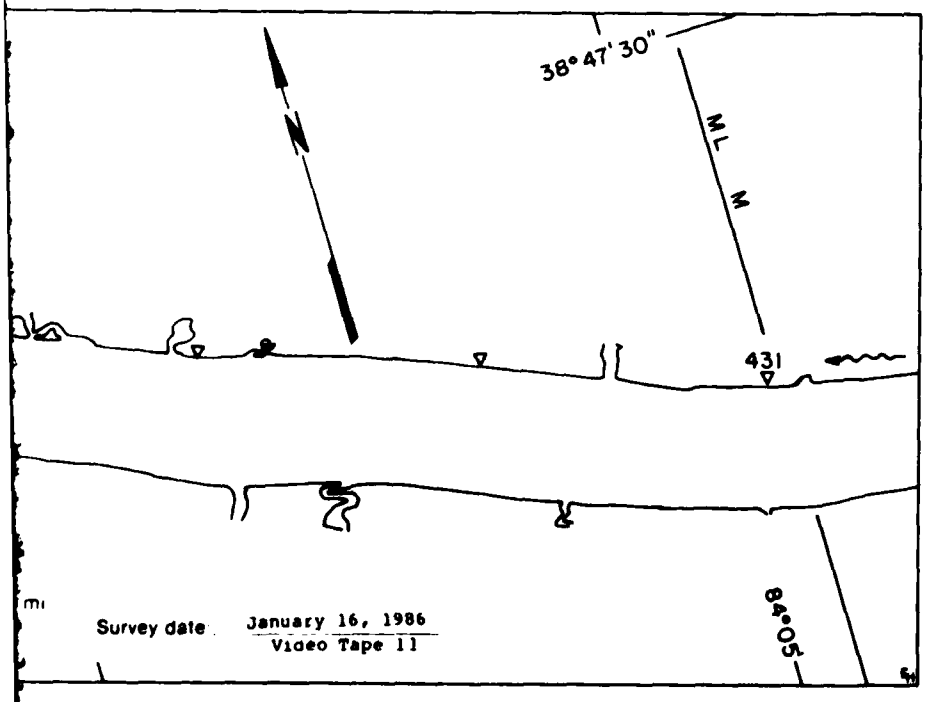


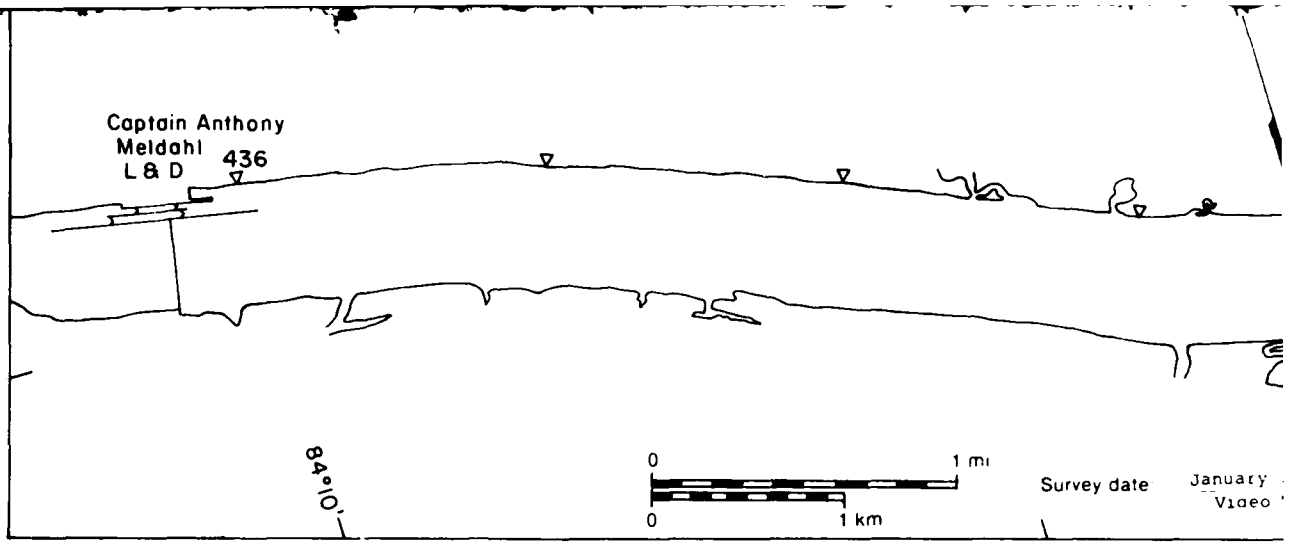
Meldahl Pool

Surface
concentration

16 January 1986

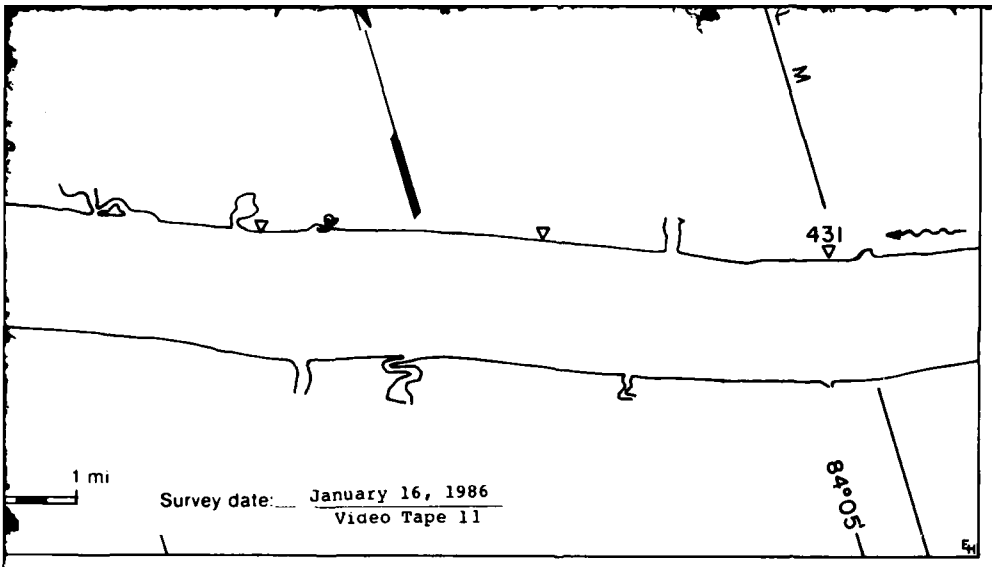


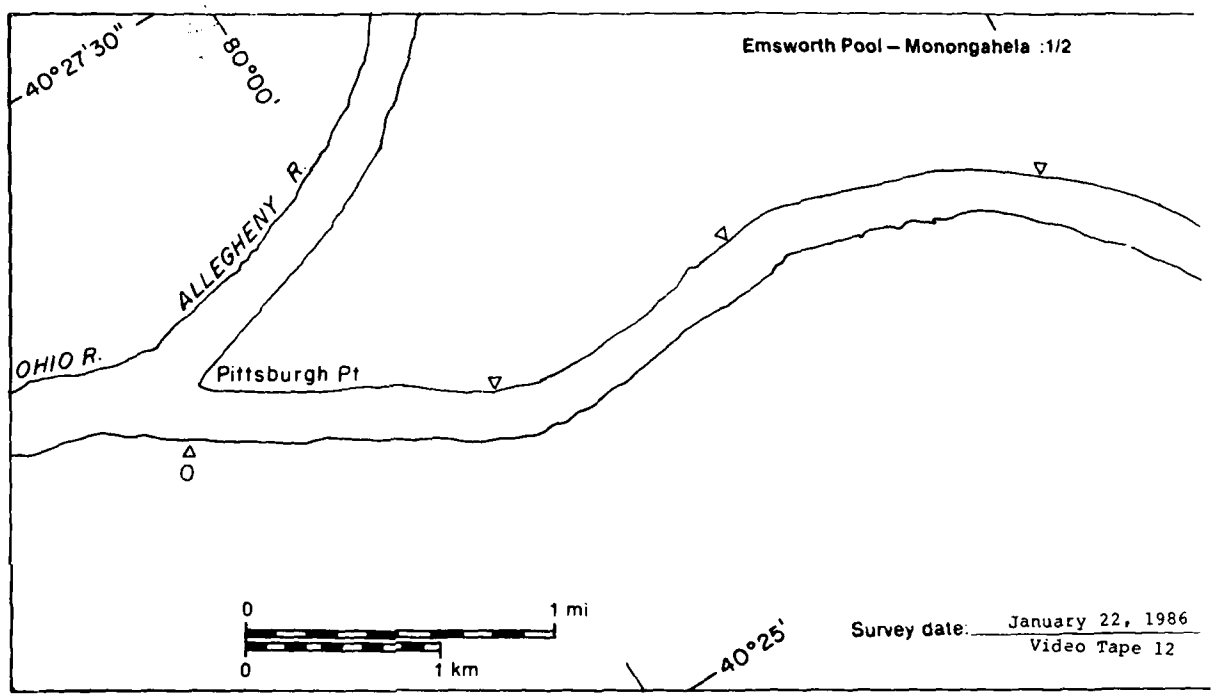


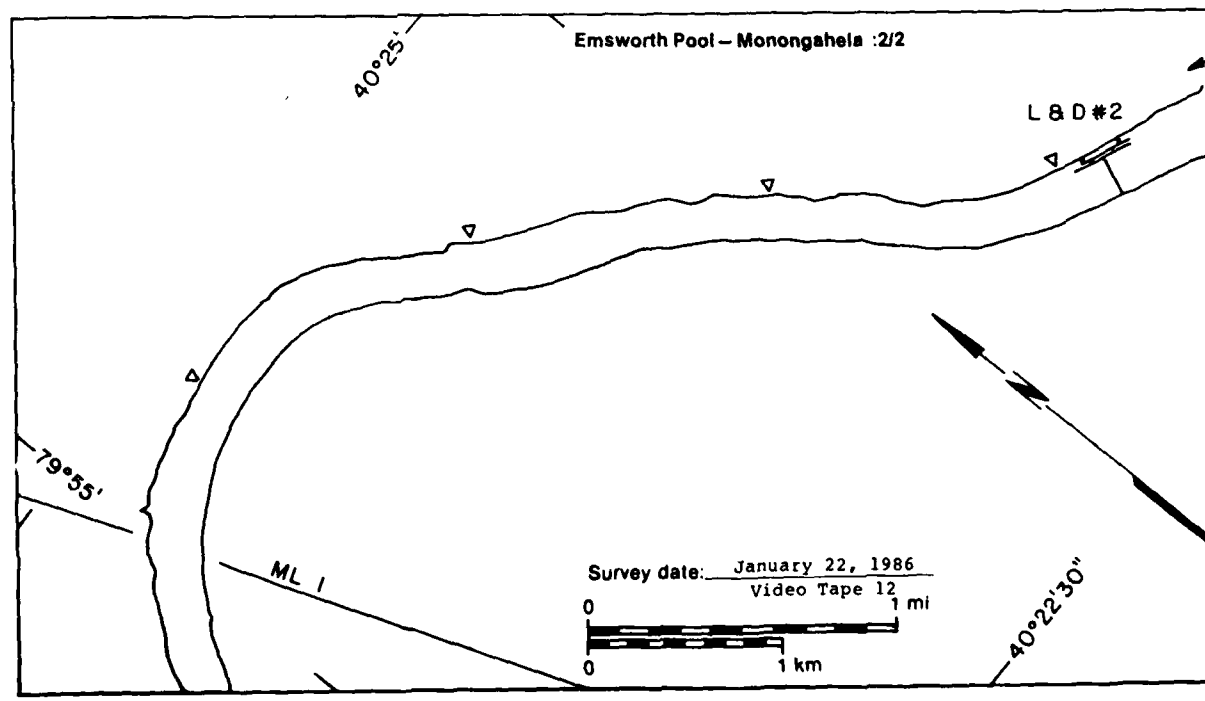


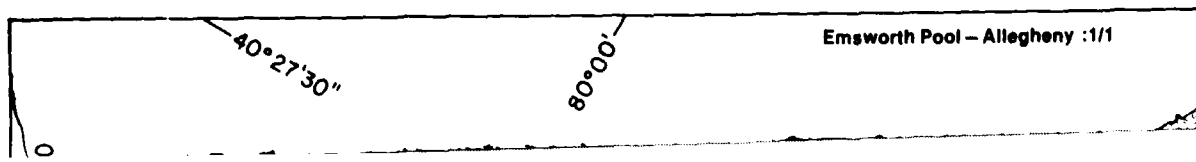
Meldahl Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	73.77	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	73.77	

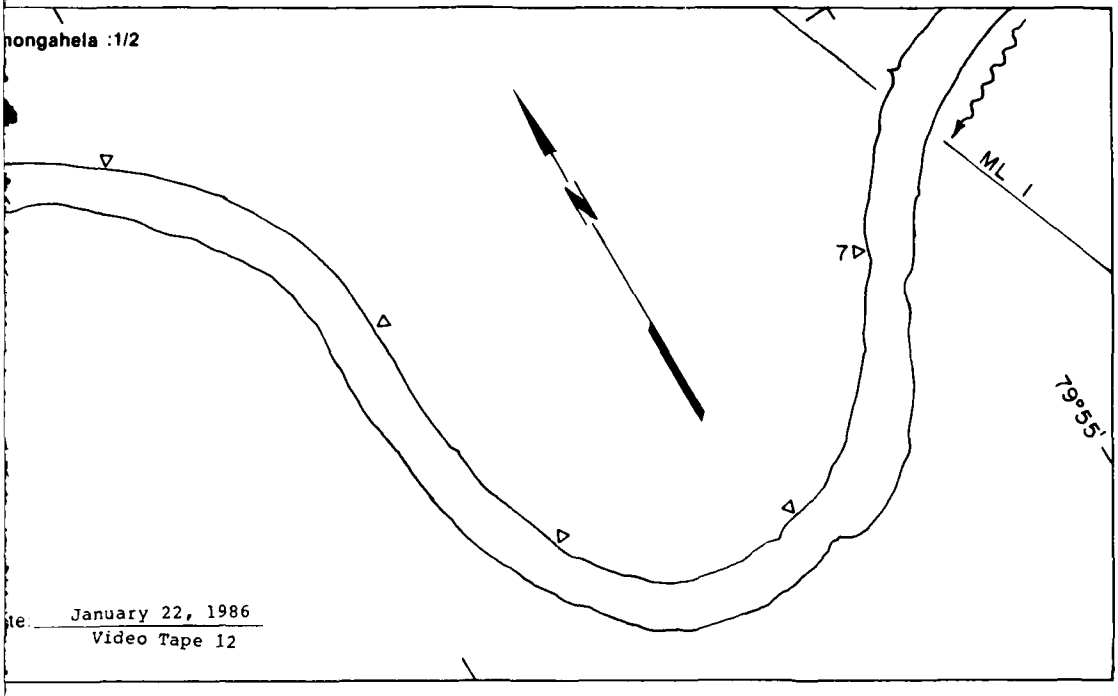

M
431
1 mi
Survey date: January 16, 1986
Video Tape 11
84°05'

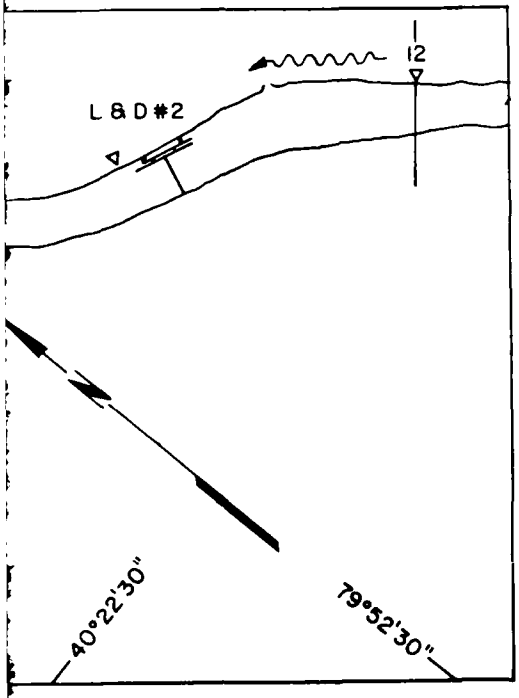

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt
0
0
1 mi
0
1 km
40°25'
Survey date: January 22, 1986
Video Tape 12


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 22, 1986
Video Tape 12
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'
0

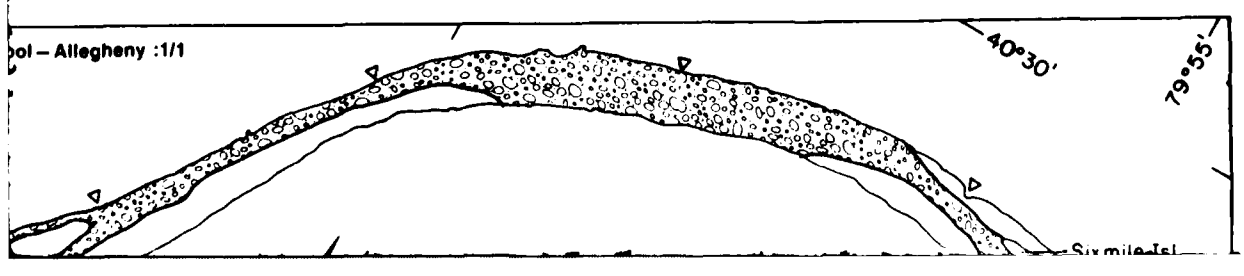
22 January 1986

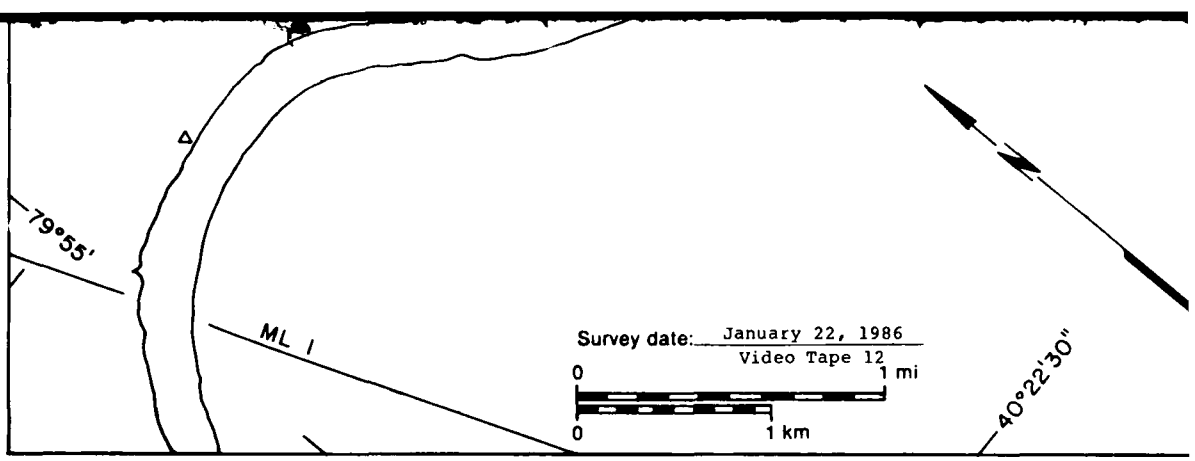


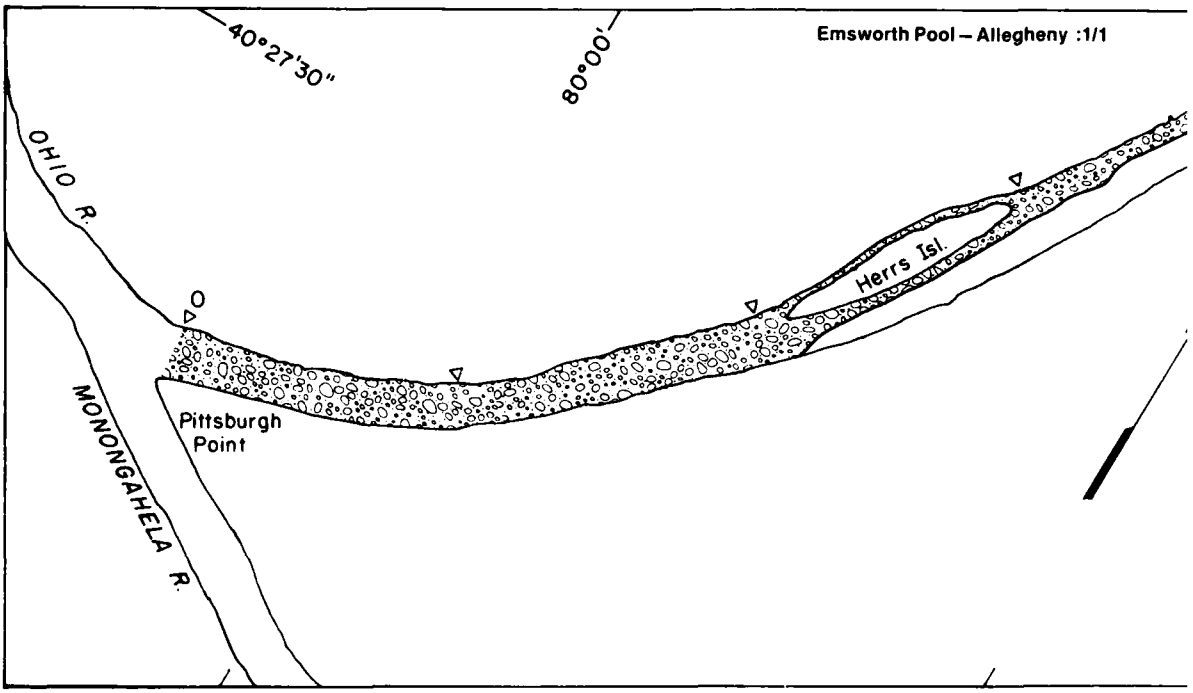


Emsworth Pool – Monongahela

MAP UNITS	Area ($m^2 \times 10^6$)	Surface orientation
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.16	

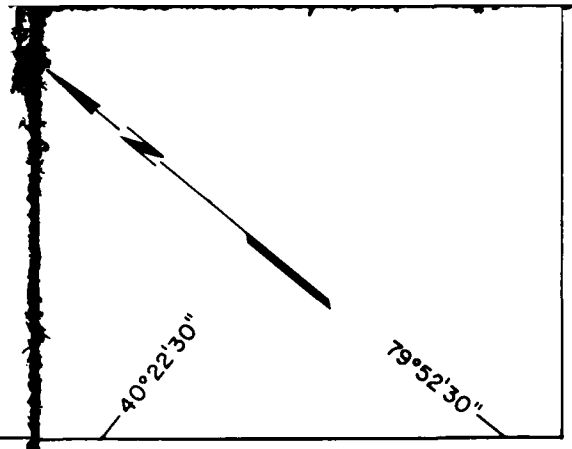




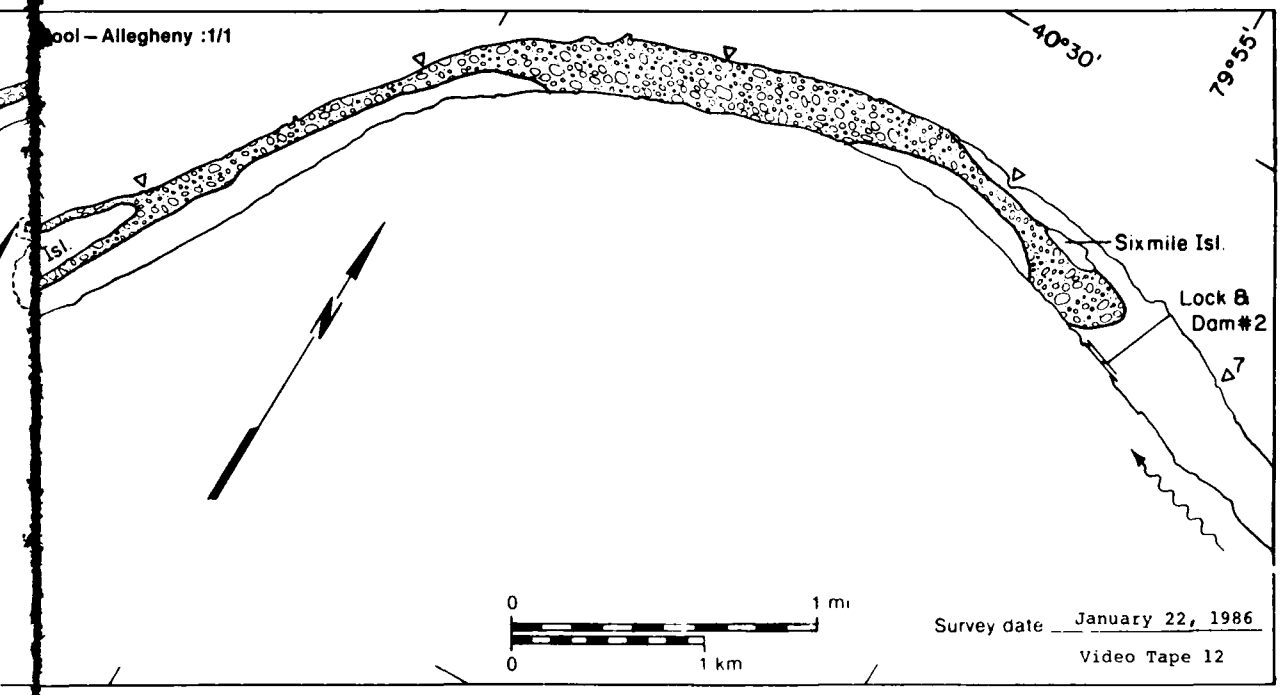


Emsworth Pool – Allegheny

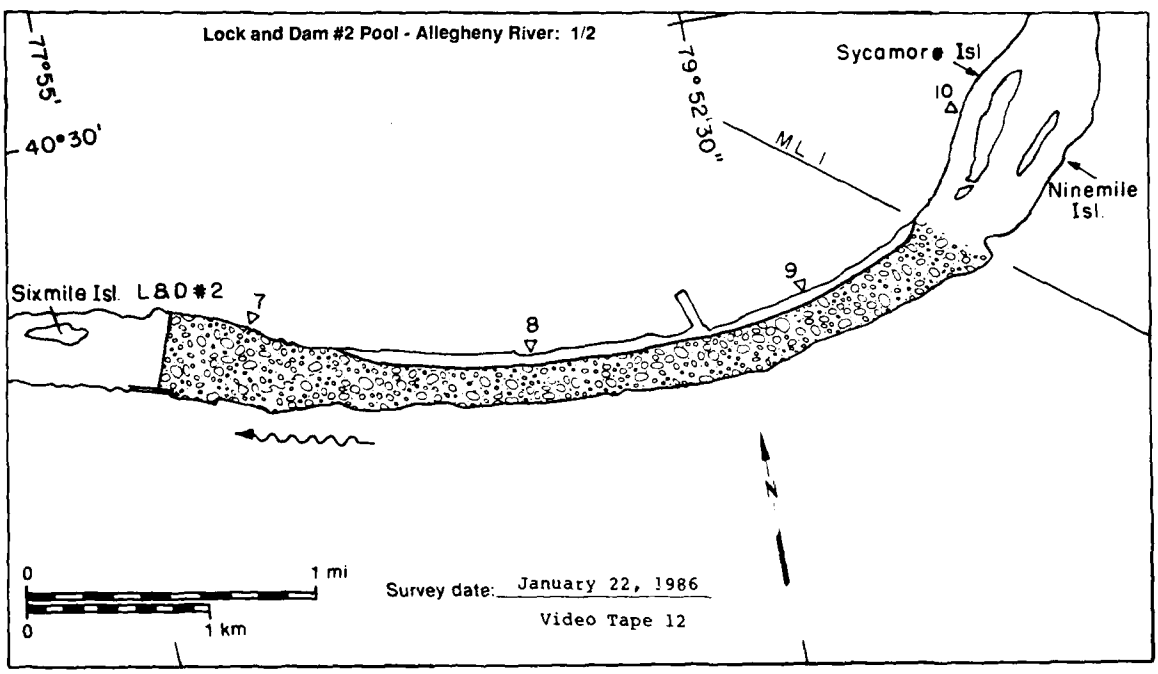
MAP UNITS	Area (m^2 x 10^6)	Surface/volume flux ratio
Open water	0.80	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes of frazil slush and pans	2.27	10
Total area (m^2 x 10^6)	3.07	

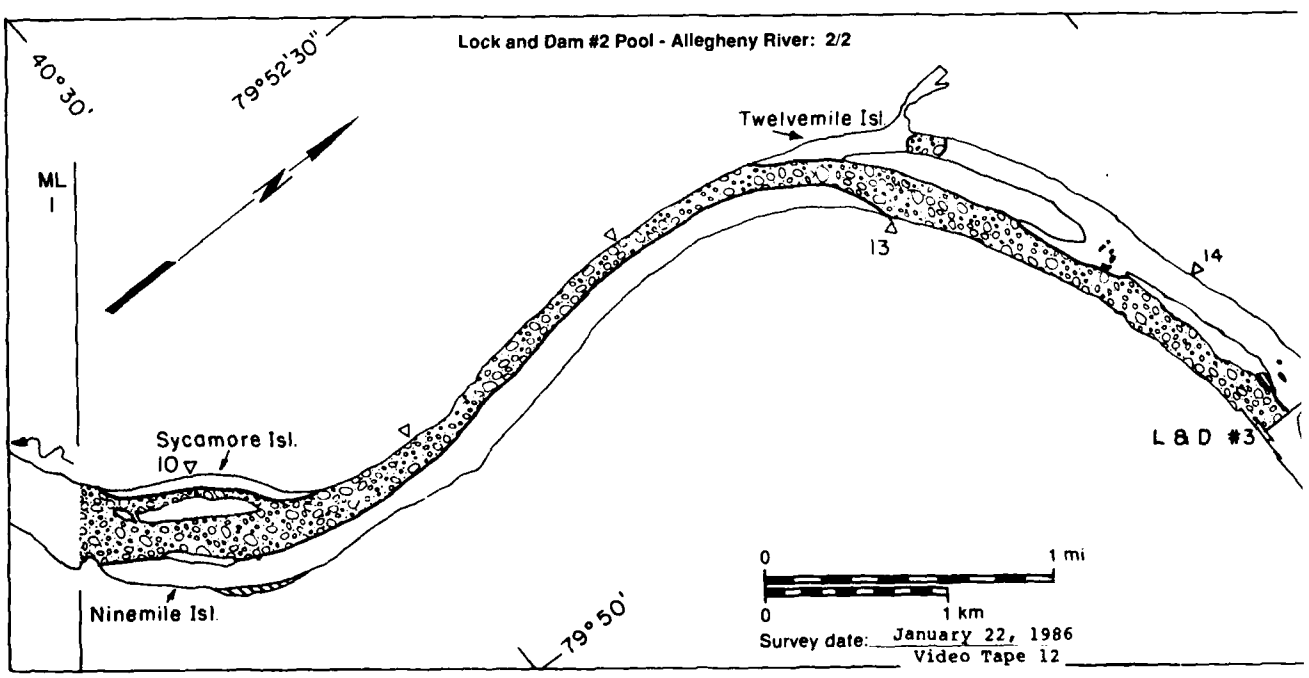


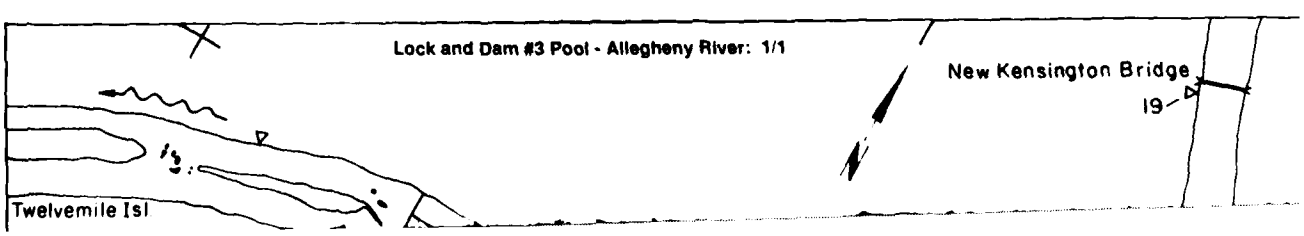
Material	Area ($m^2 \times 10^6$)	
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.16	

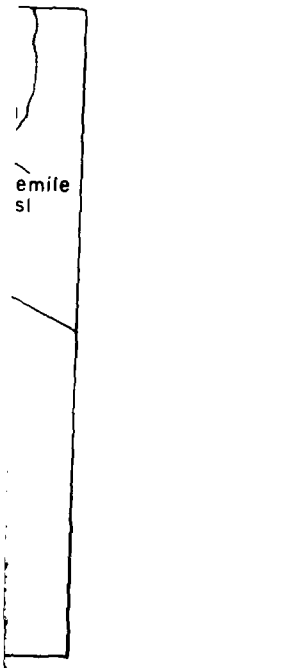


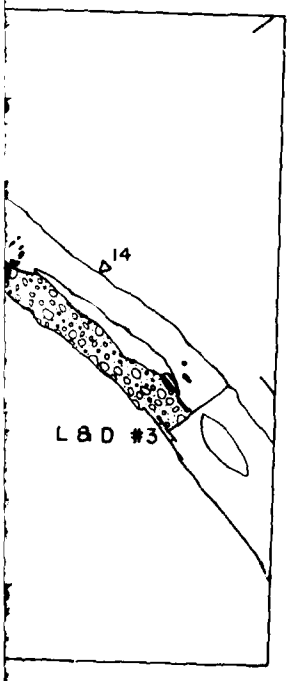
22 January 1986

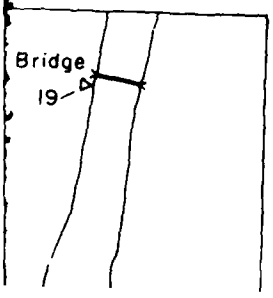










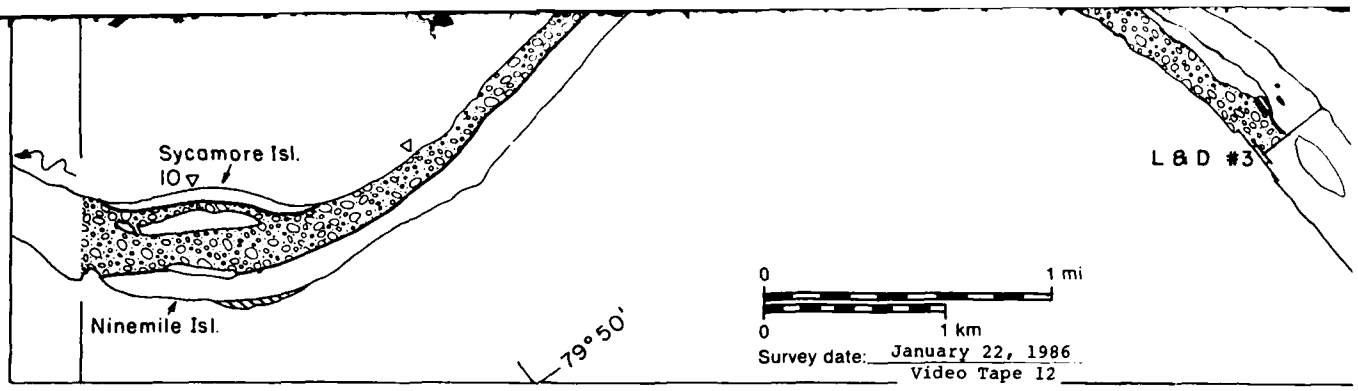


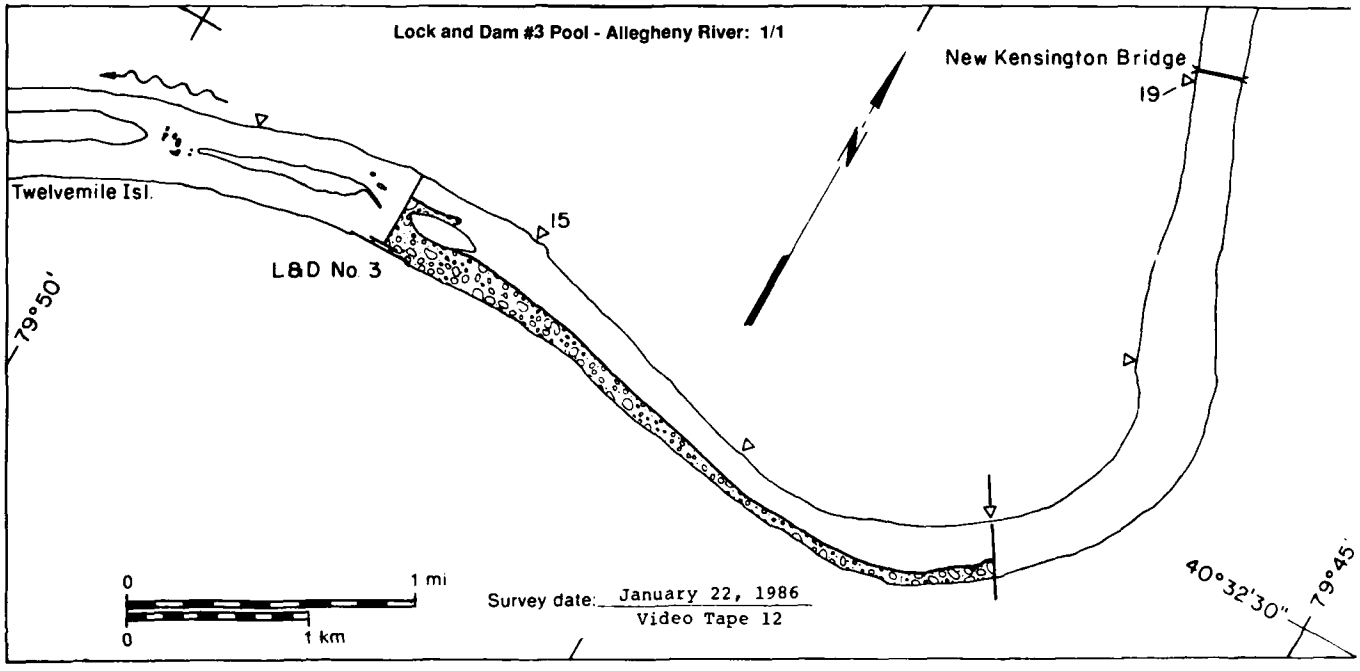
Lock and Dam #2 Pool

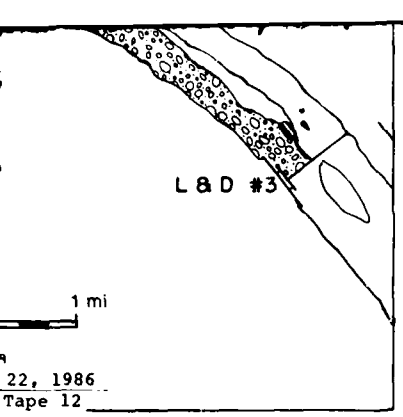
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.50	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.49	5
Total area ($m^2 \times 10^6$)	4.02	

Lock and Dam #3 Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.69	NA
Solid ice cover	0.00	NA

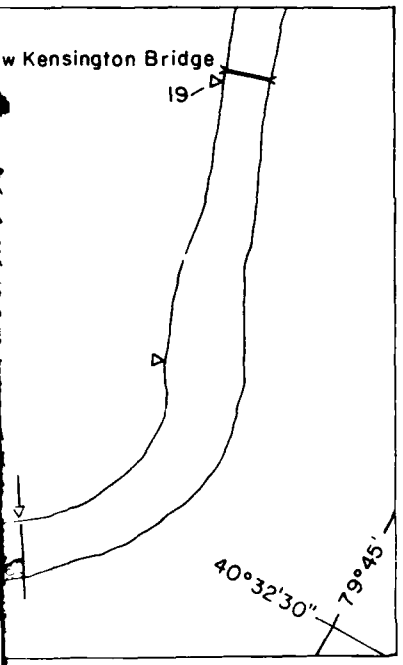

Sycamore Isl.
10
Ninemile Isl.
79°50'
L&D #3
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12
40°32'30"
79°45'



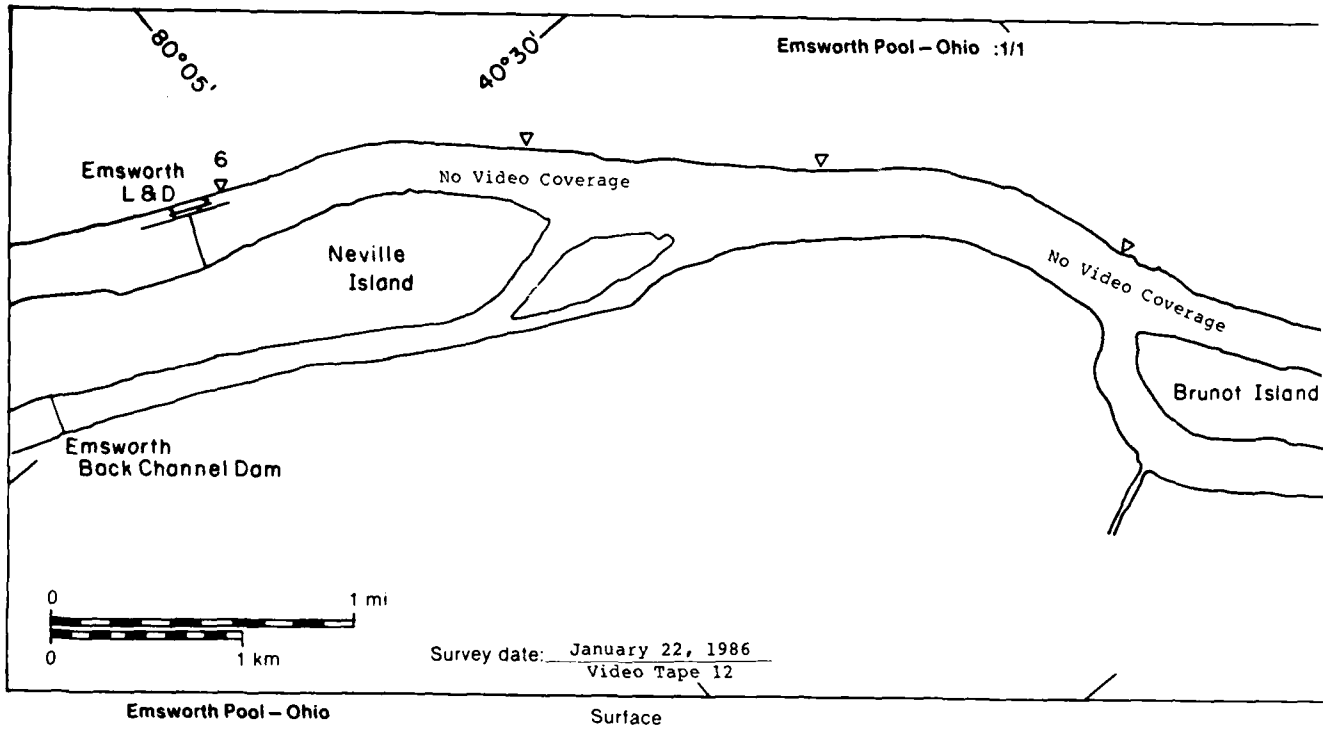
22, 1986
Tape 12

	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.49	5
Total area (m^2 x 10^6)	4.02	



Lock and Dam #3 Pool

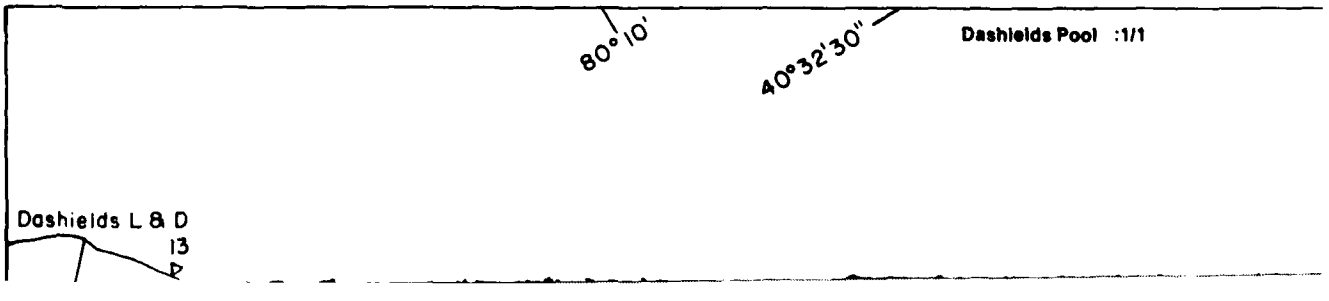
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.69	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.45	10
Total area (m^2 x 10^6)	1.14	



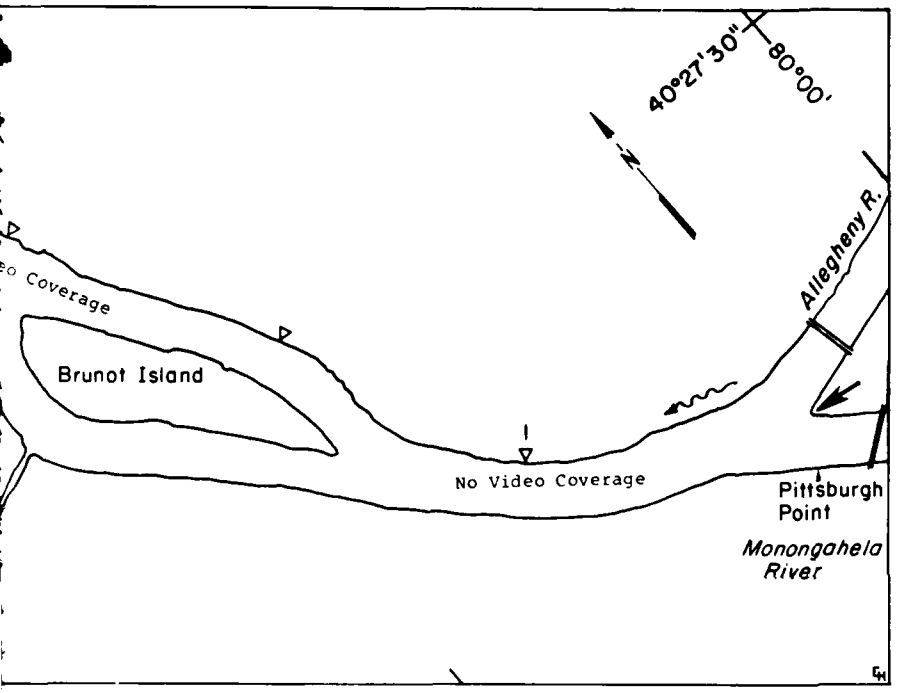
Emsworth Pool – Ohio

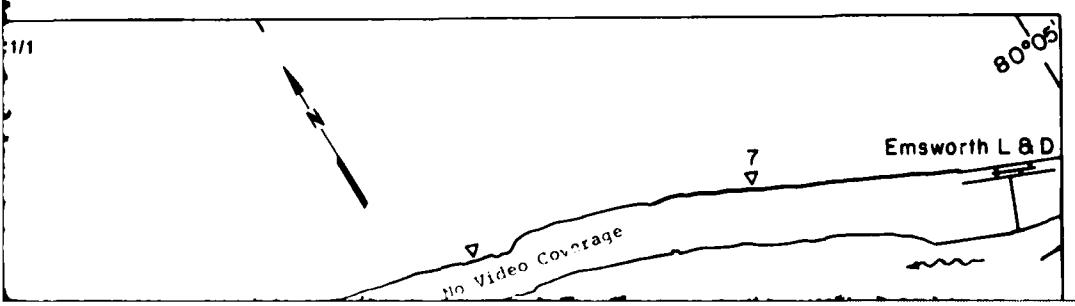
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 4.49×10^6 m^2 of no video coverage

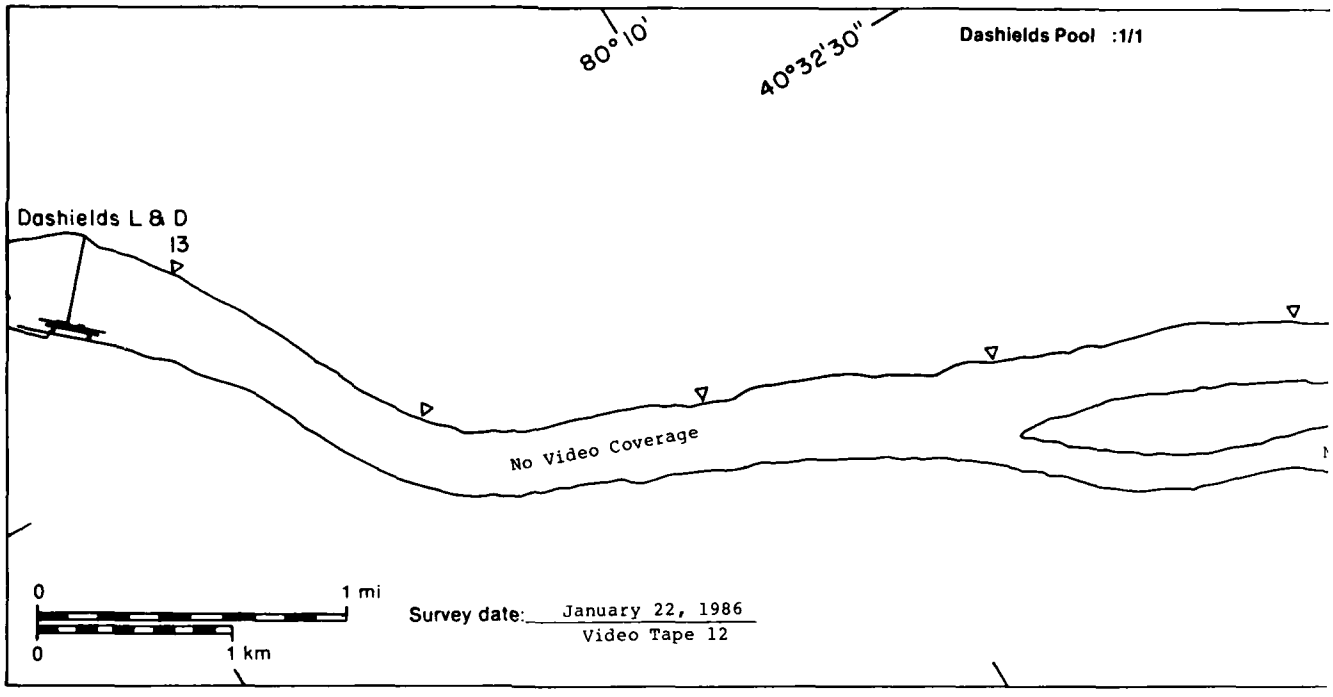


22 January 1986





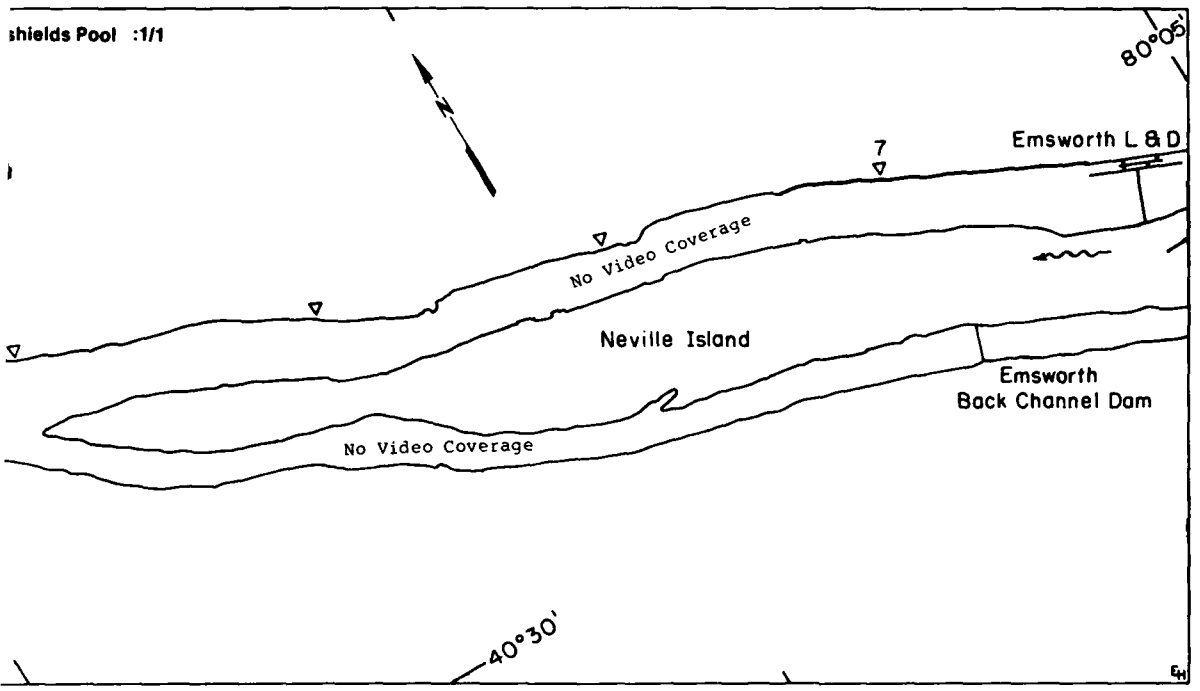
	Area (m^2 x 10^6)	Surface concentration (%)
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	4.49*	* Includes 4.49 x 10^6 m^2 of no video coverage



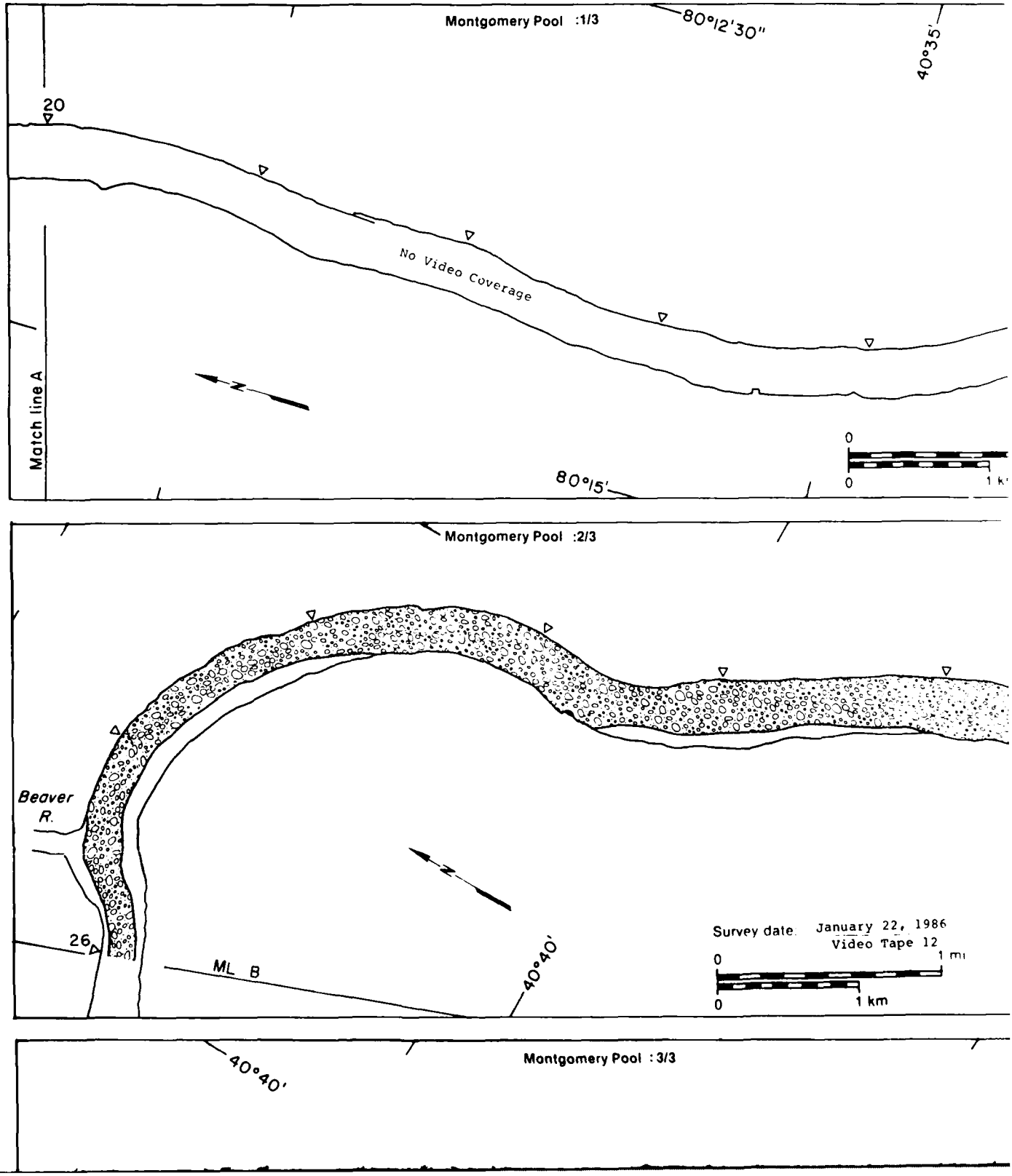
Dashields Pool

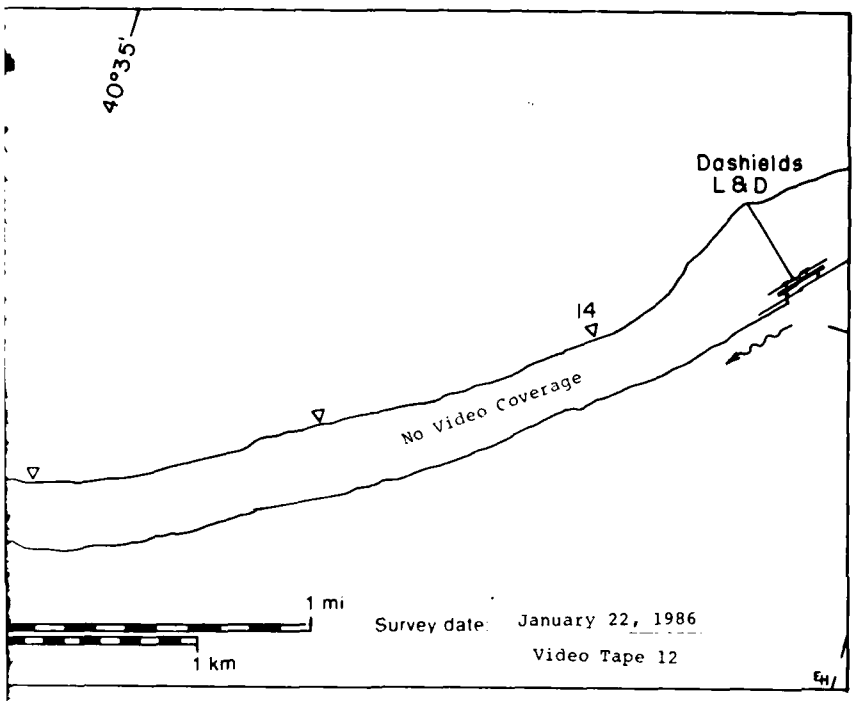
MAP UNITS

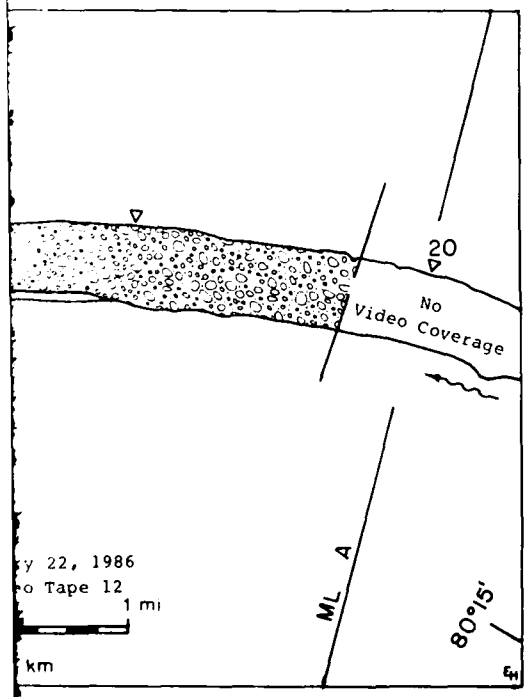
	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.00*	* Includes 5.00 x 10^6 m^2 of no video coverage

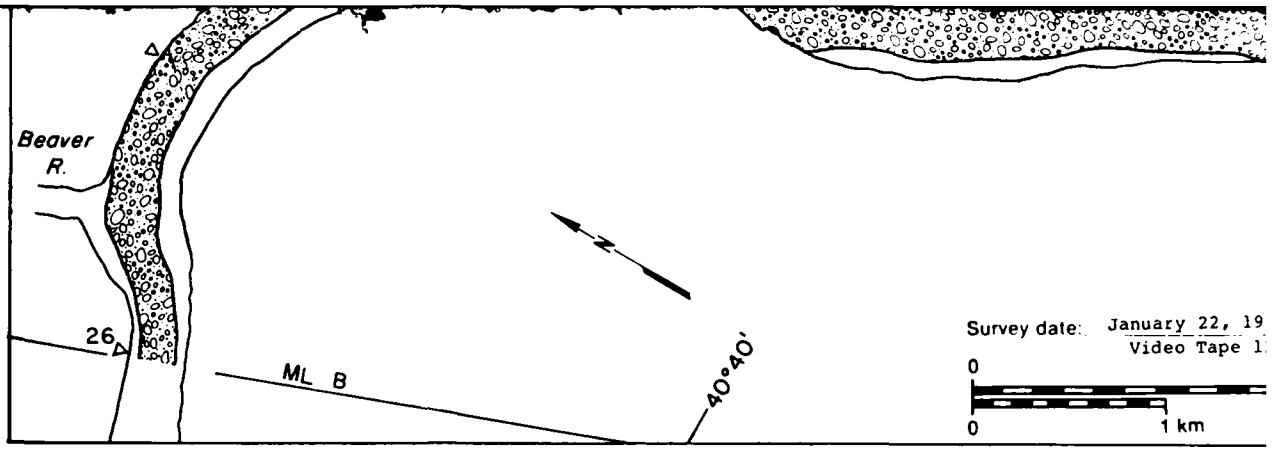

shields Pool :1/1
80°05'
N
7
Emsworth L & D
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

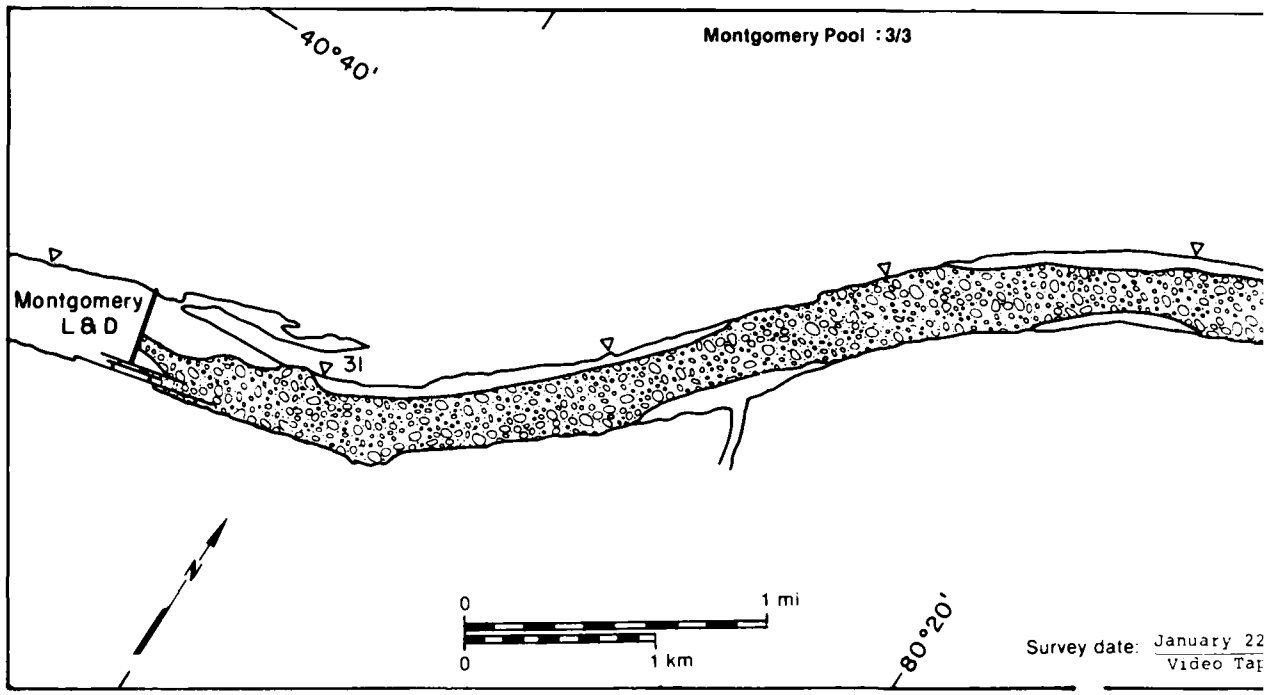
22 January 1986




40°35'
Dashields
L&D
14
No Video Coverage
1 mi
1 km
Survey date: January 22, 1986
Video Tape 12


20
No
Video Coverage
ML 4
80°15'
1 mi
km

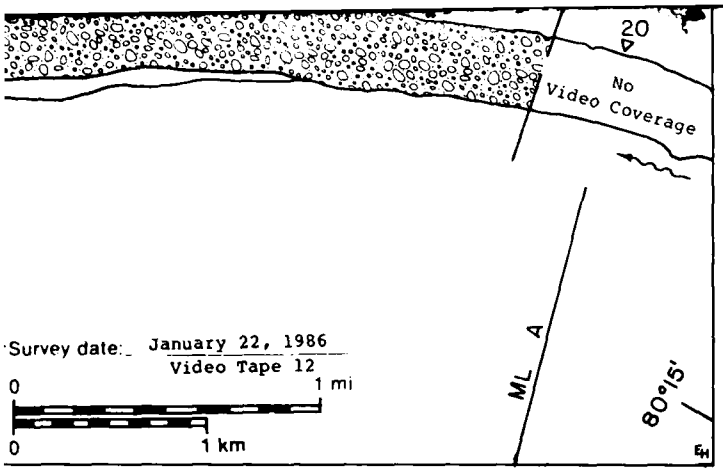


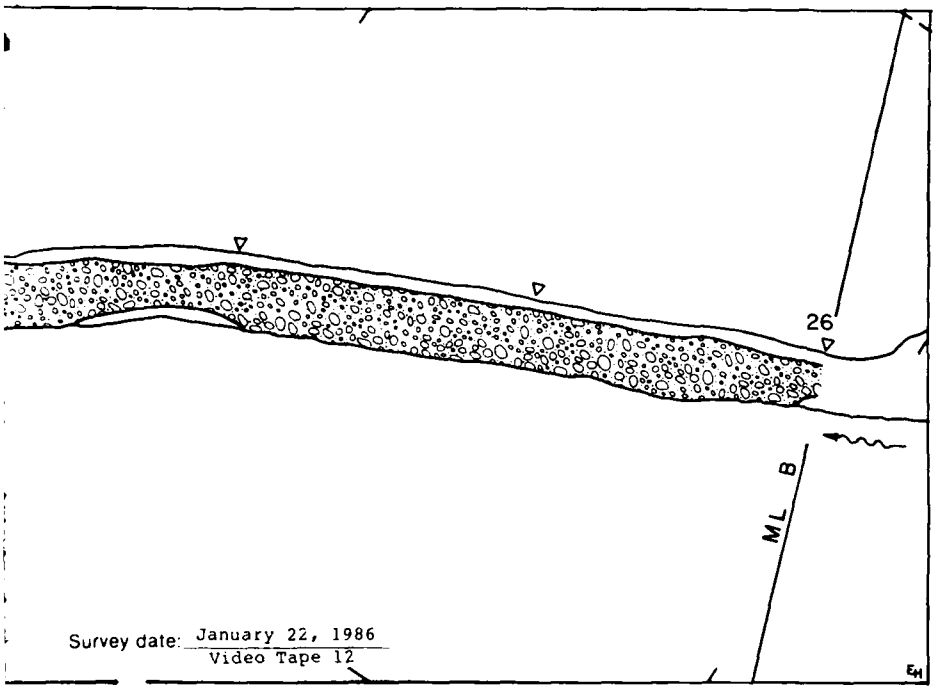


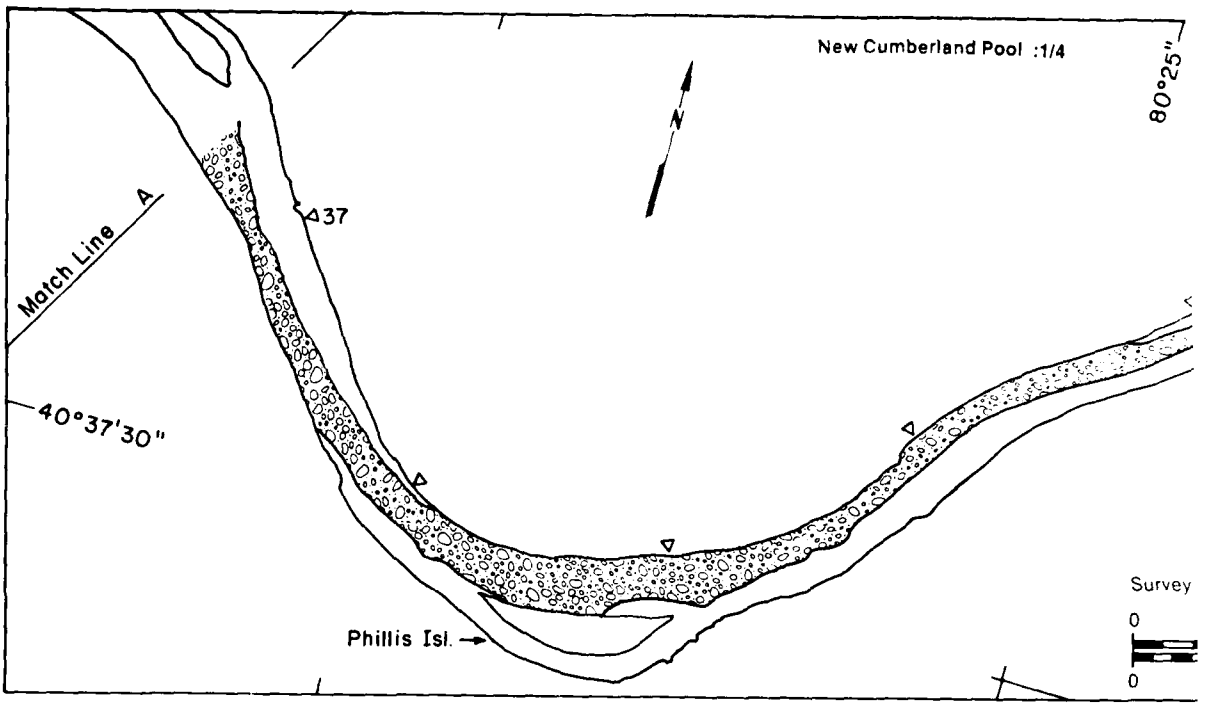
Montgomery Pool

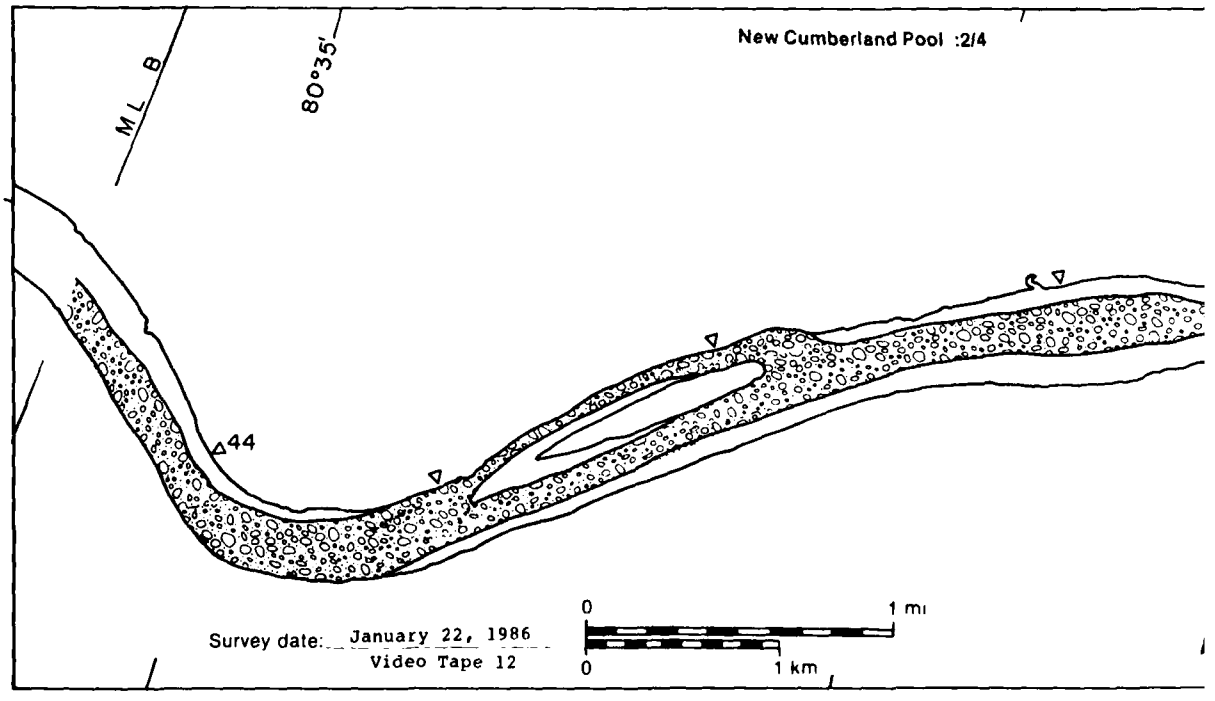
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (°/oo)
Open water	1.43	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	5.82	80
Total area ($m^2 \times 10^6$)	11.27*	

* Includes 4.02×10^6 m^2 of no video coverage

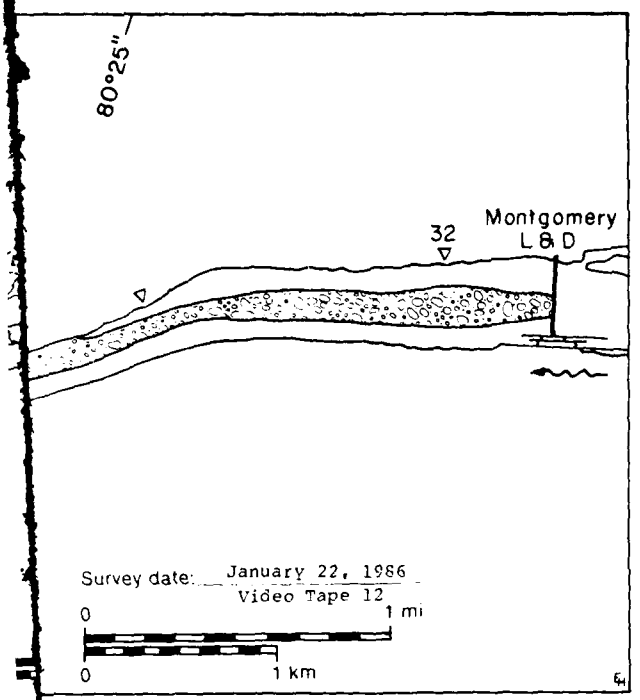

20
No
Video Coverage
Survey date: January 22, 1986
Video Tape 12
0
1 mi
0
1 km
ML A
80°15'
EH

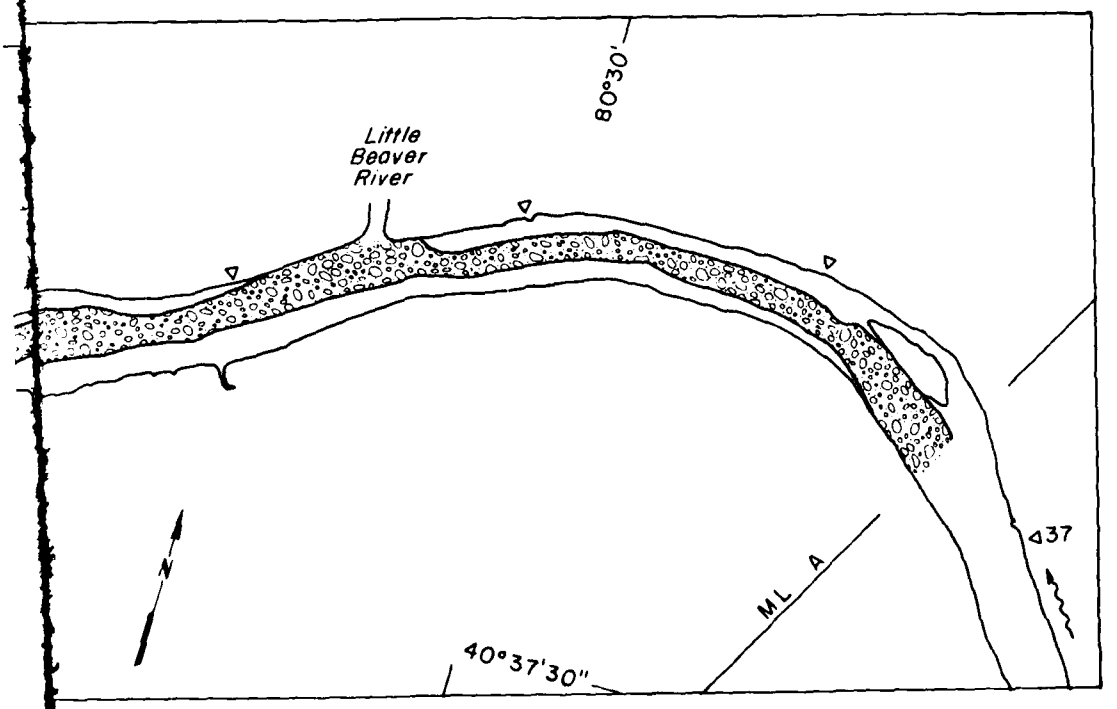

26
ML B
Survey date: January 22, 1986
Video Tape 12
EH

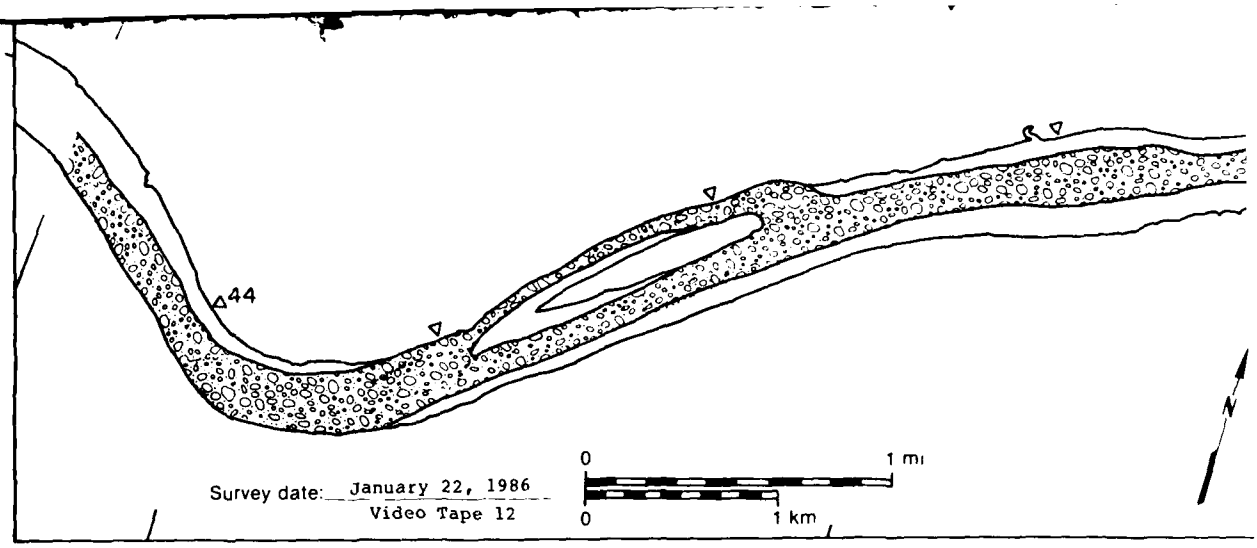

New Cumberland Pool :1/4
80°25"
Match Line A
37
40°37'30"
Phillis Isl.
Survey
0
0

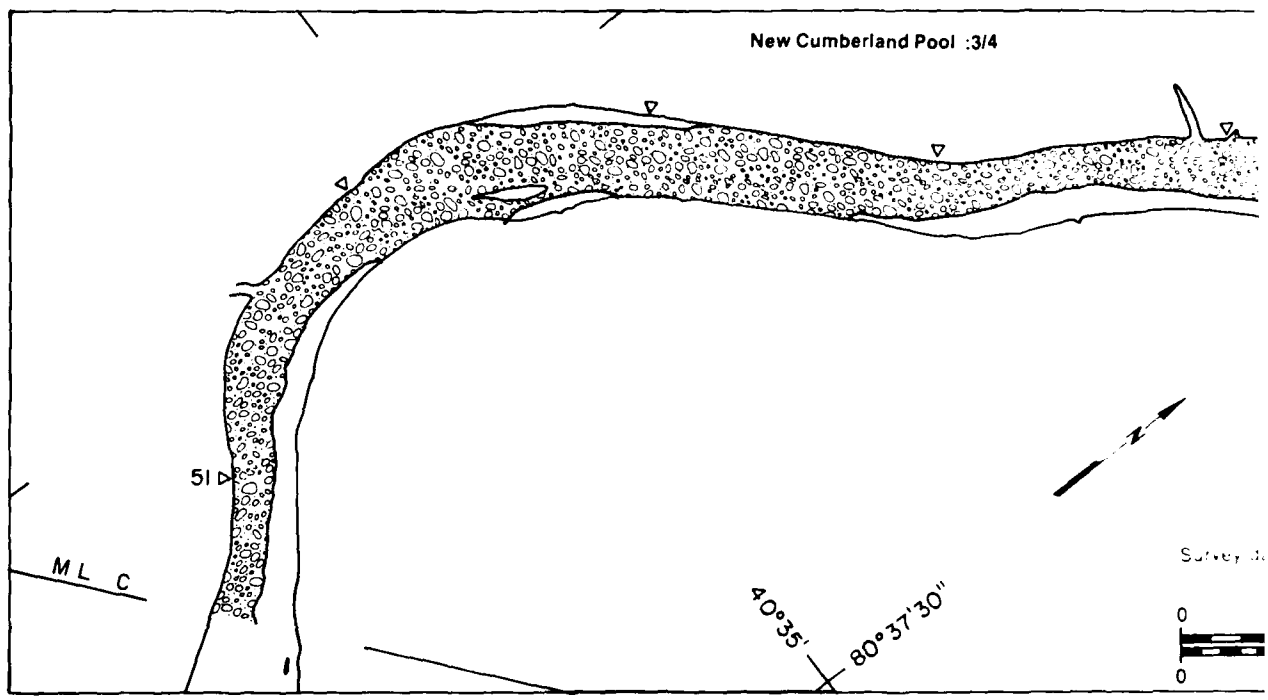

New Cumberland Pool :2/4
ML B
80°35'
44
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12

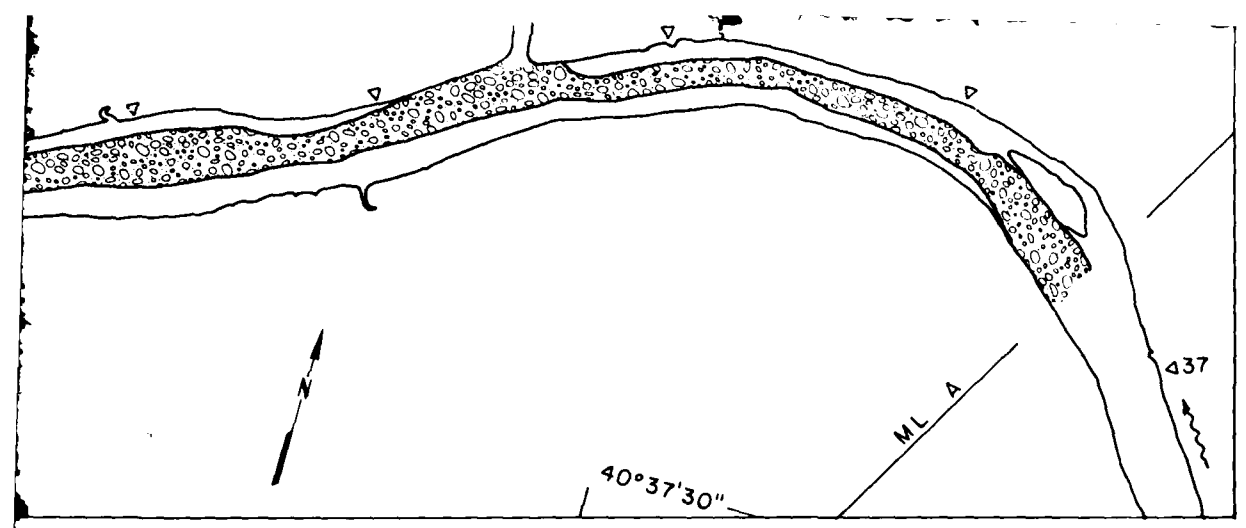
22 January 1986

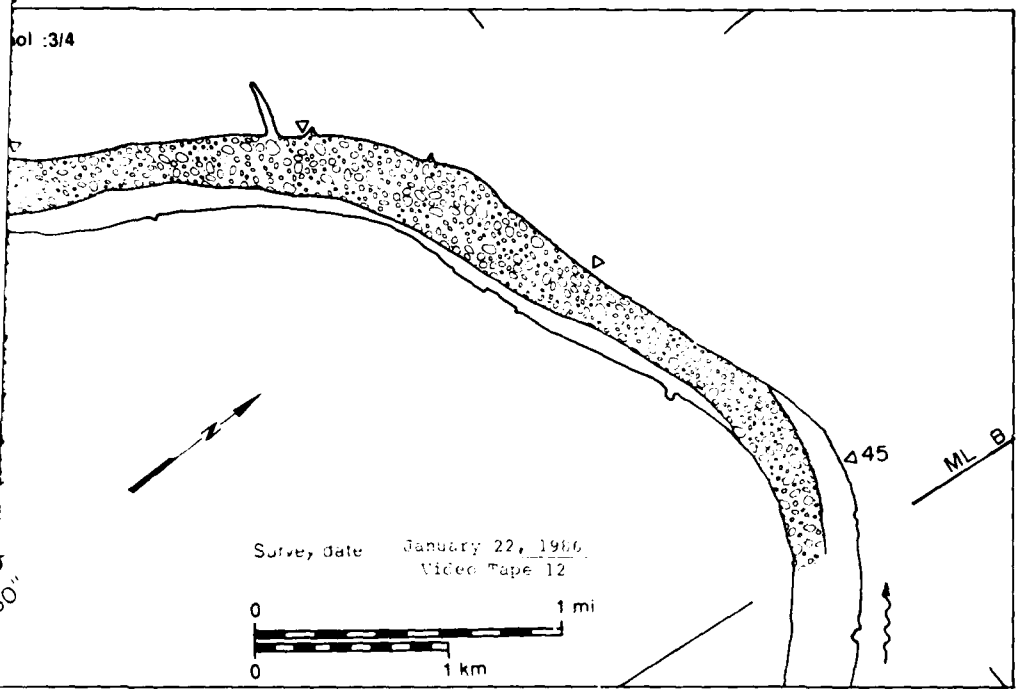




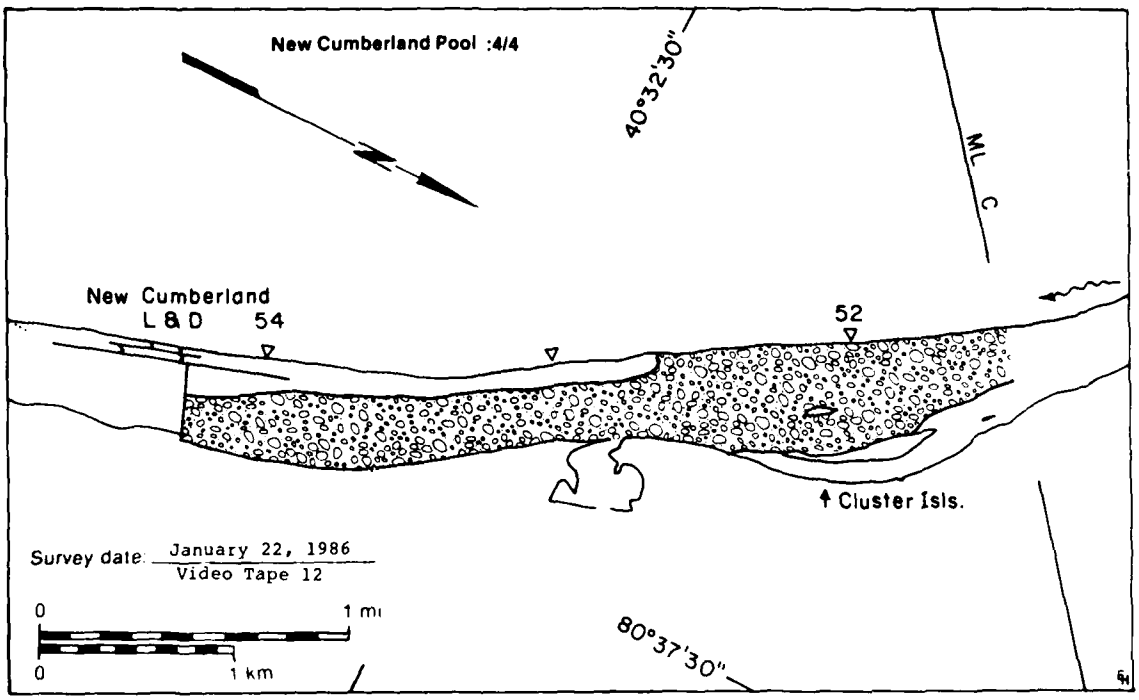

44
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12

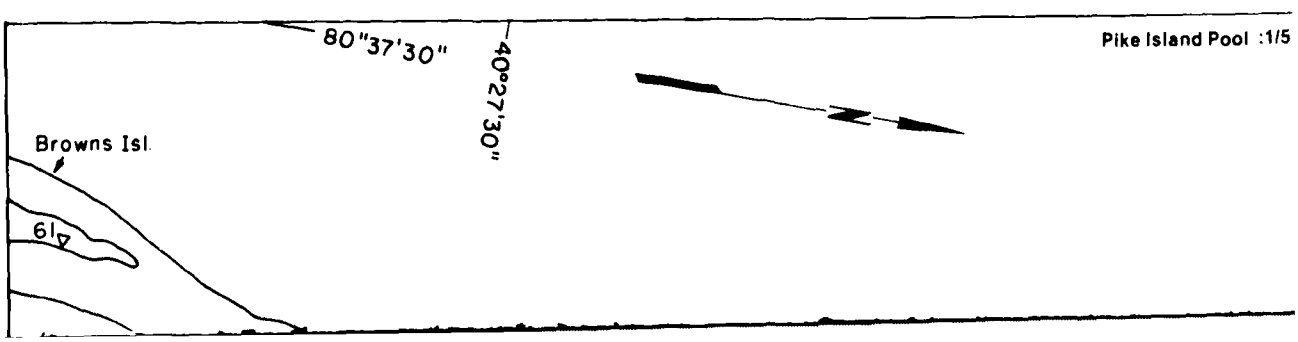

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0


N
ML A
40°37'30"
Δ37


ol :3/4
N
Δ45
ML B
Survey Date January 22, 1986
Video Tape 12
0
1 mi
0
1 km

22 January 1986

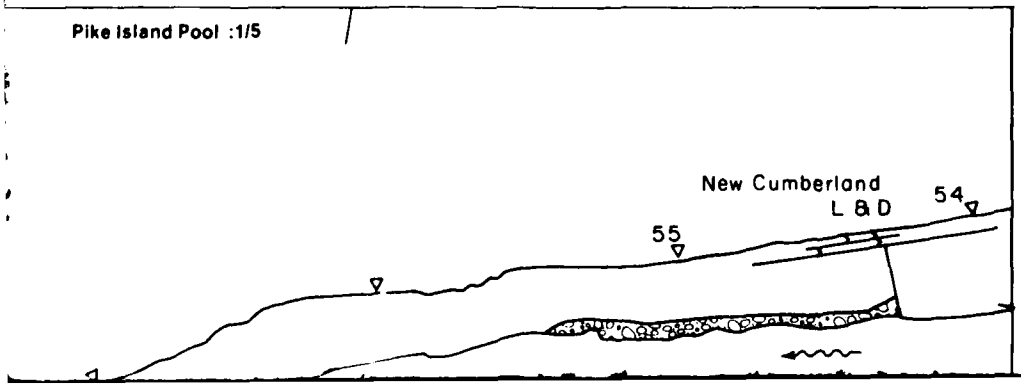


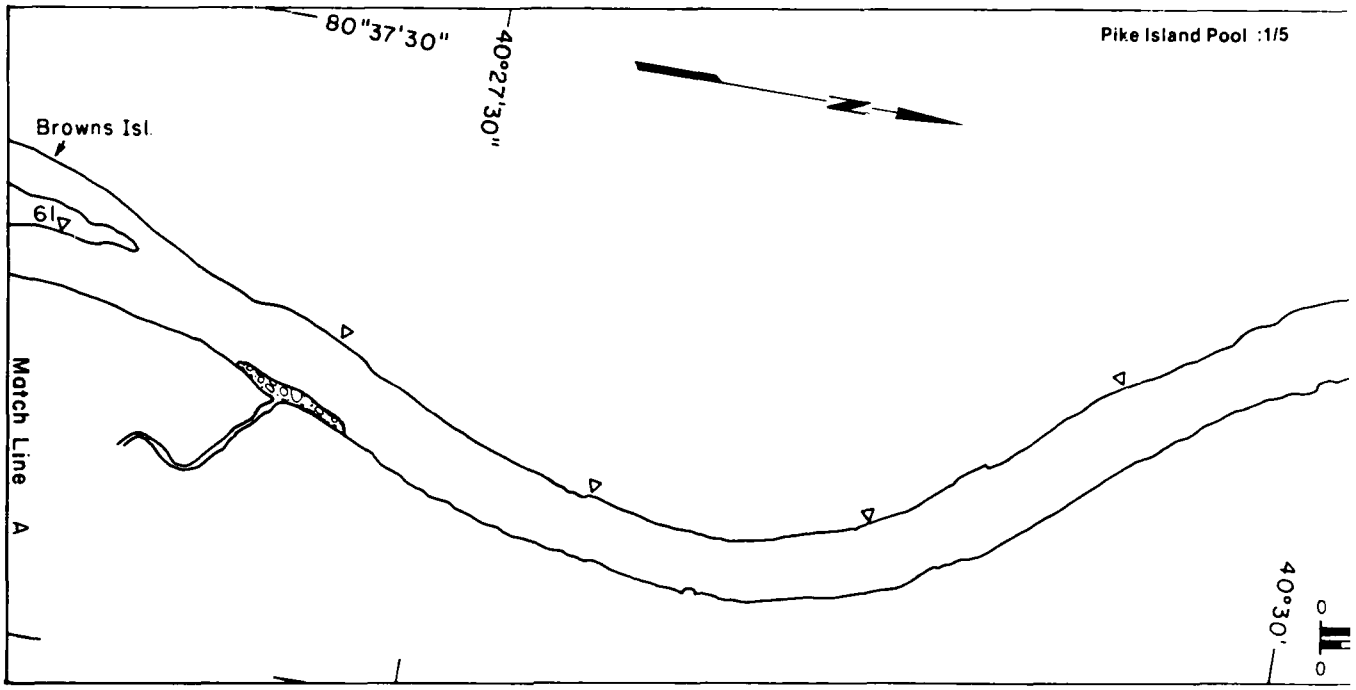


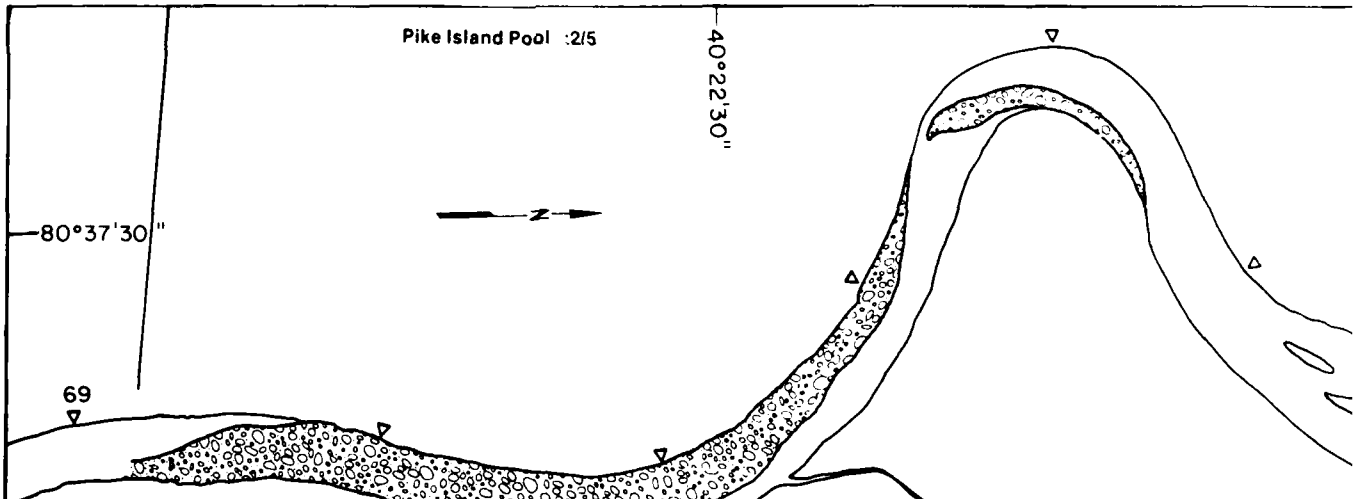
New Cumberland Pool

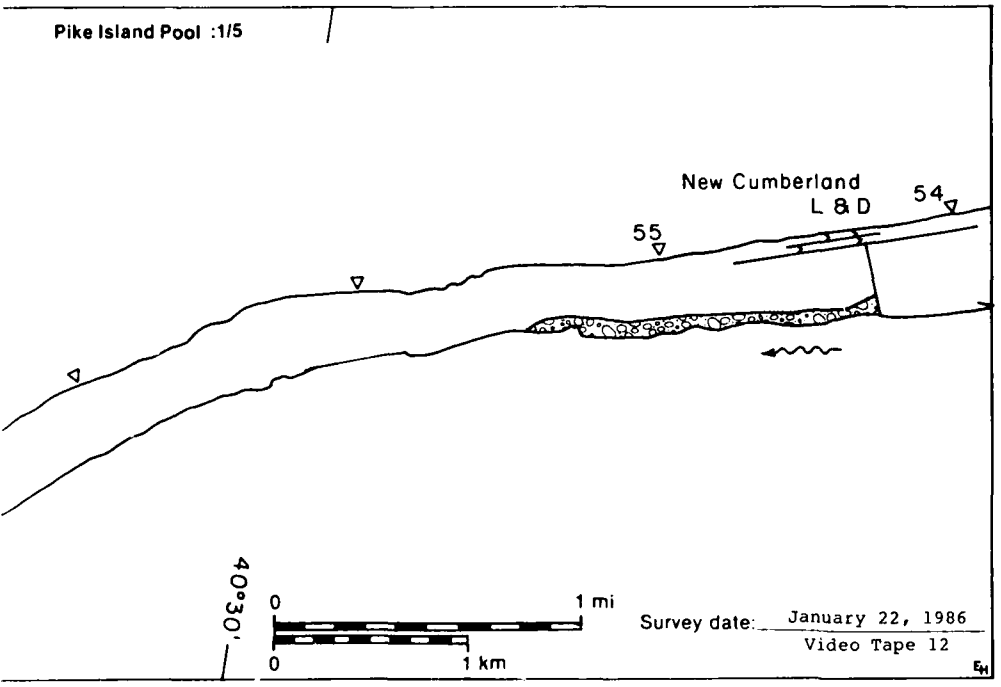
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.13	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	9.74	20
Total area ($m^2 \times 10^6$)	14.87	

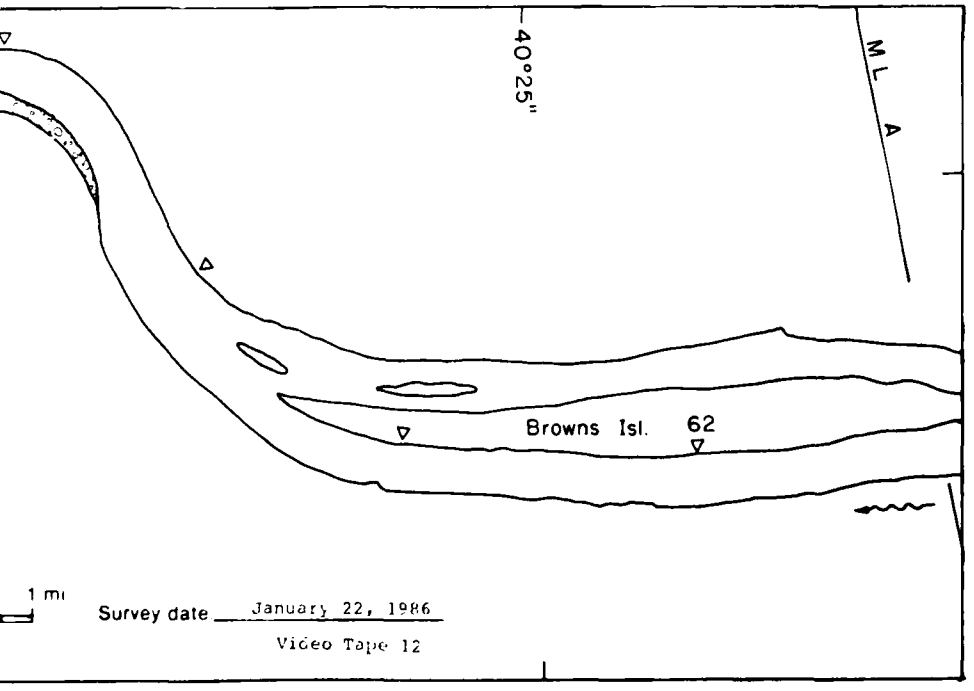
Pike Island Pool :1/5

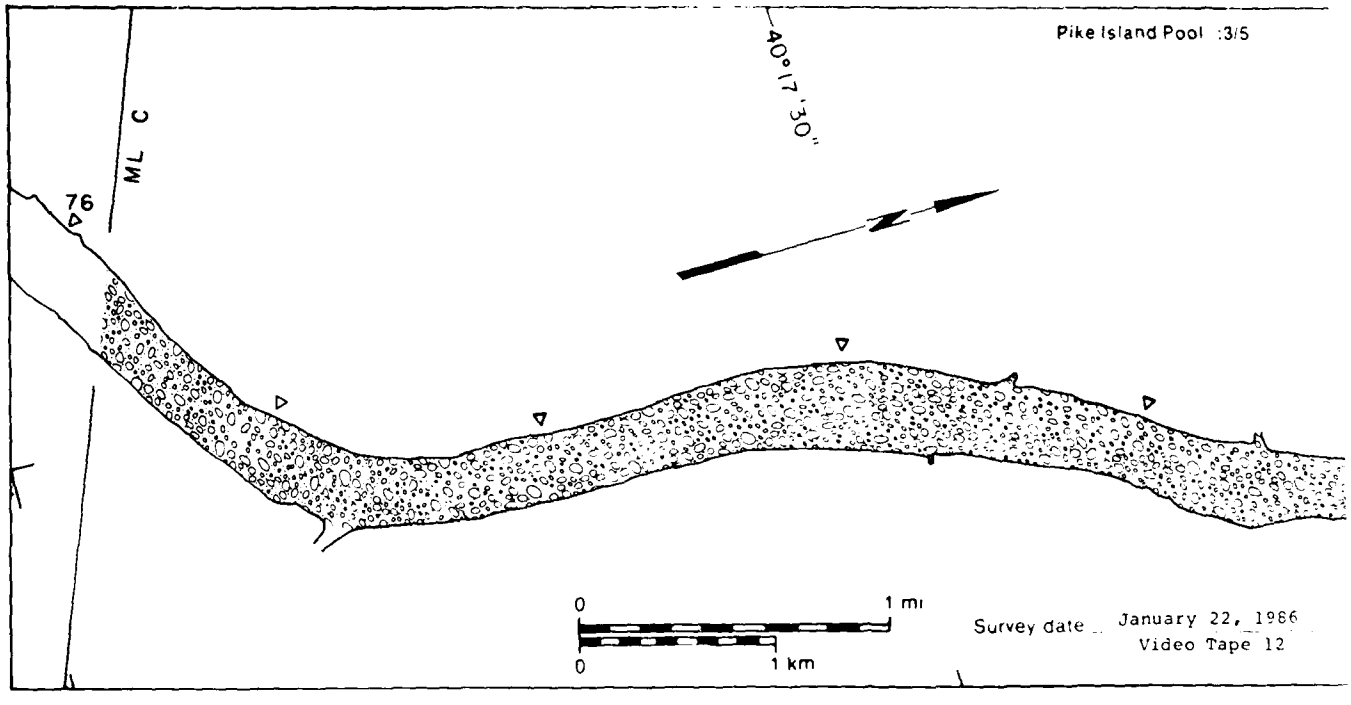


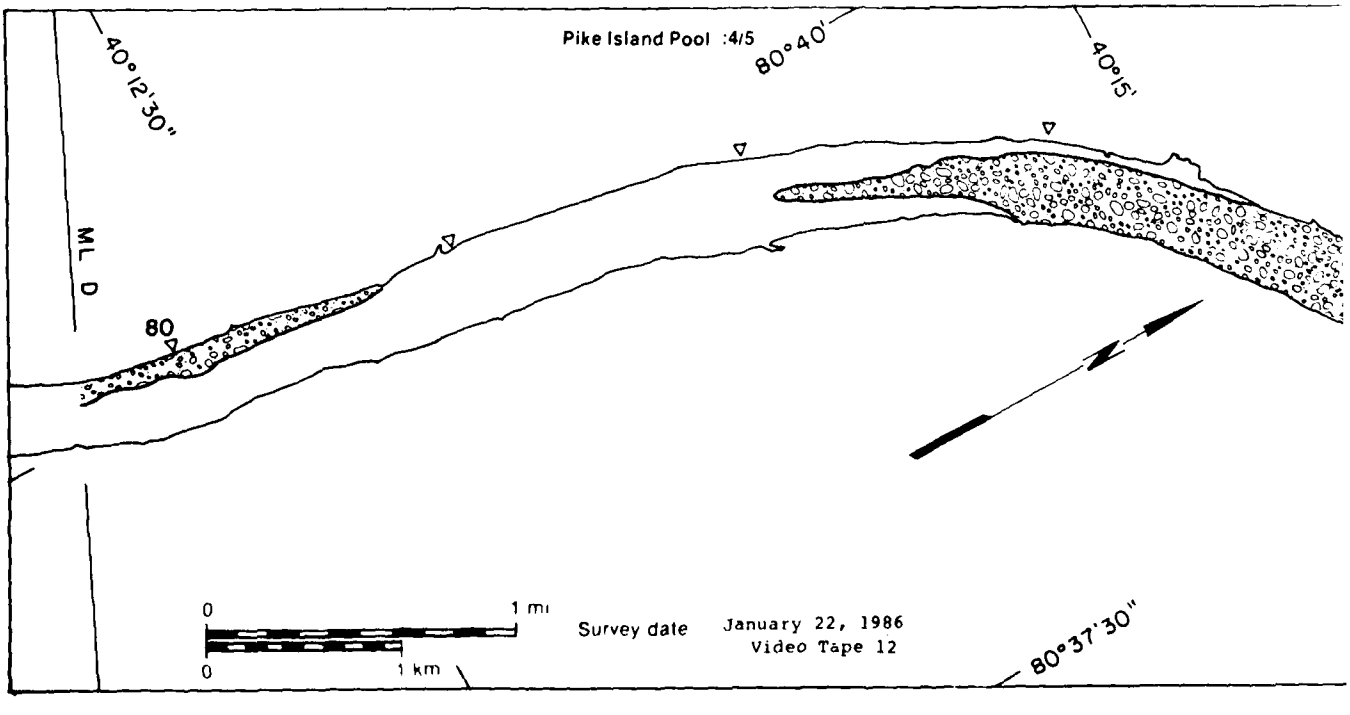

80°37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl.
61
Match Line A
40°30'
0
0

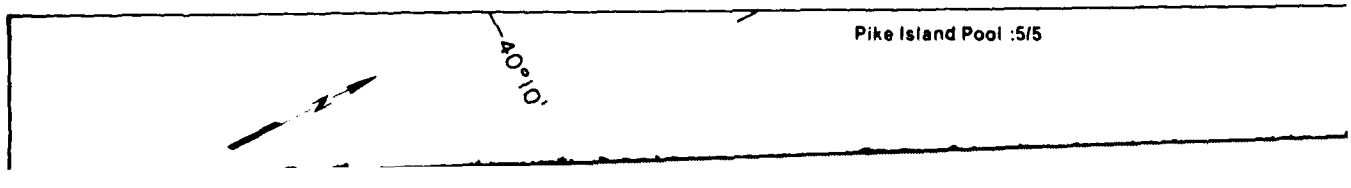

Pike Island Pool :2/5
40°22'30"
80°37'30"
69
ML B
0
1 mi
0
1 km
Survey date


Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12

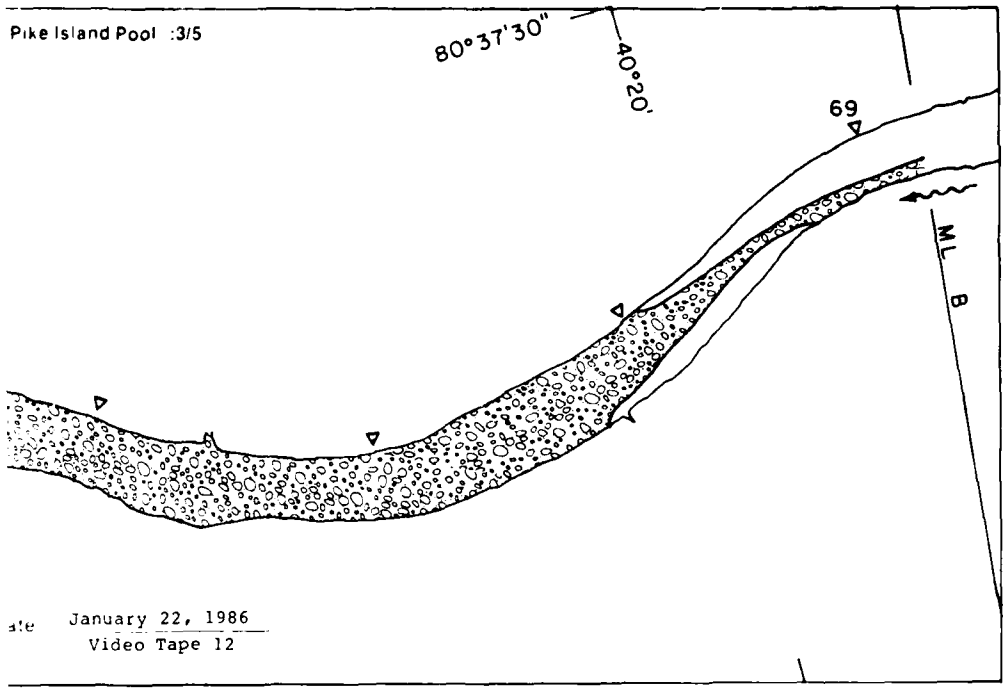

40°25"
M L A
Browns Isl.
62
1 mi
Survey date January 22, 1986
Video Tape 12

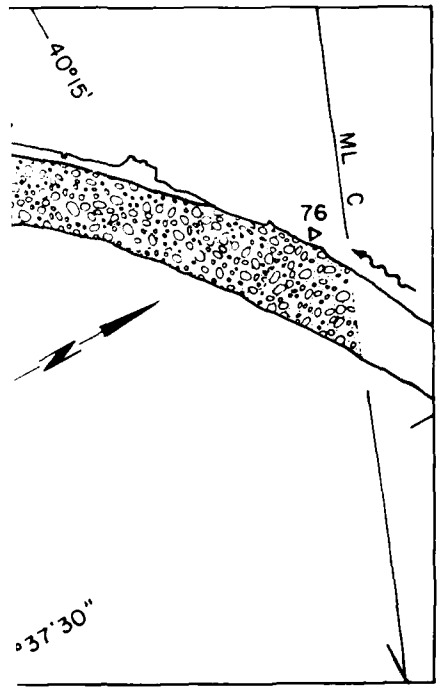

Pike Island Pool :3/5
40°17'30"
ML C
76
0
1 mi
0
1 km
Survey date January 22, 1986
Video Tape 12

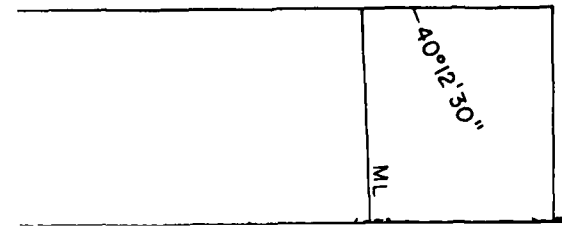

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
0
1 mi
0
1 km
Survey date January 22, 1986
Video Tape 12
80°37'30"

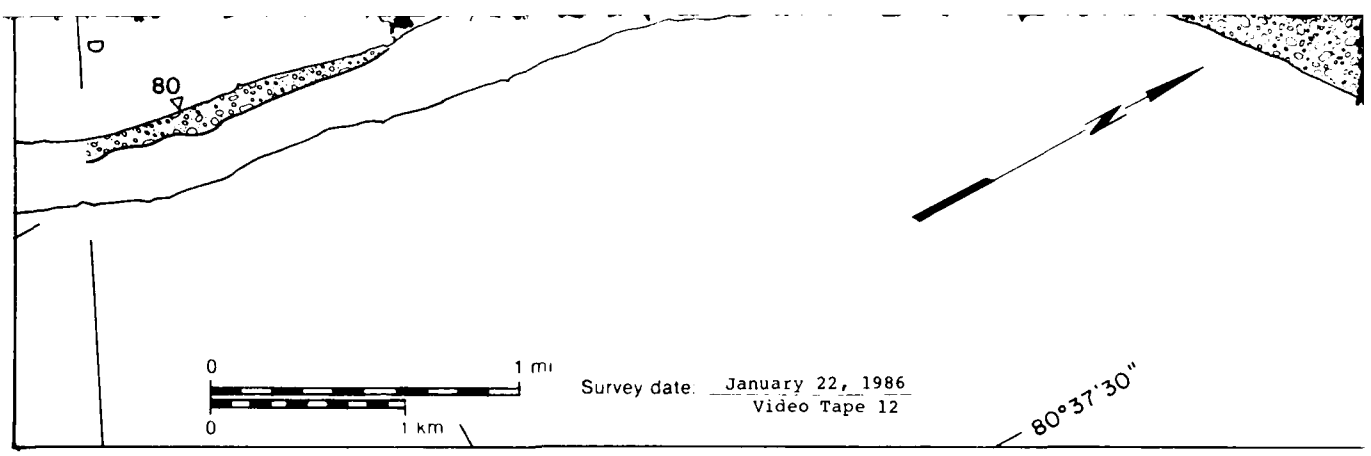

Pike Island Pool :5/5
40°10'

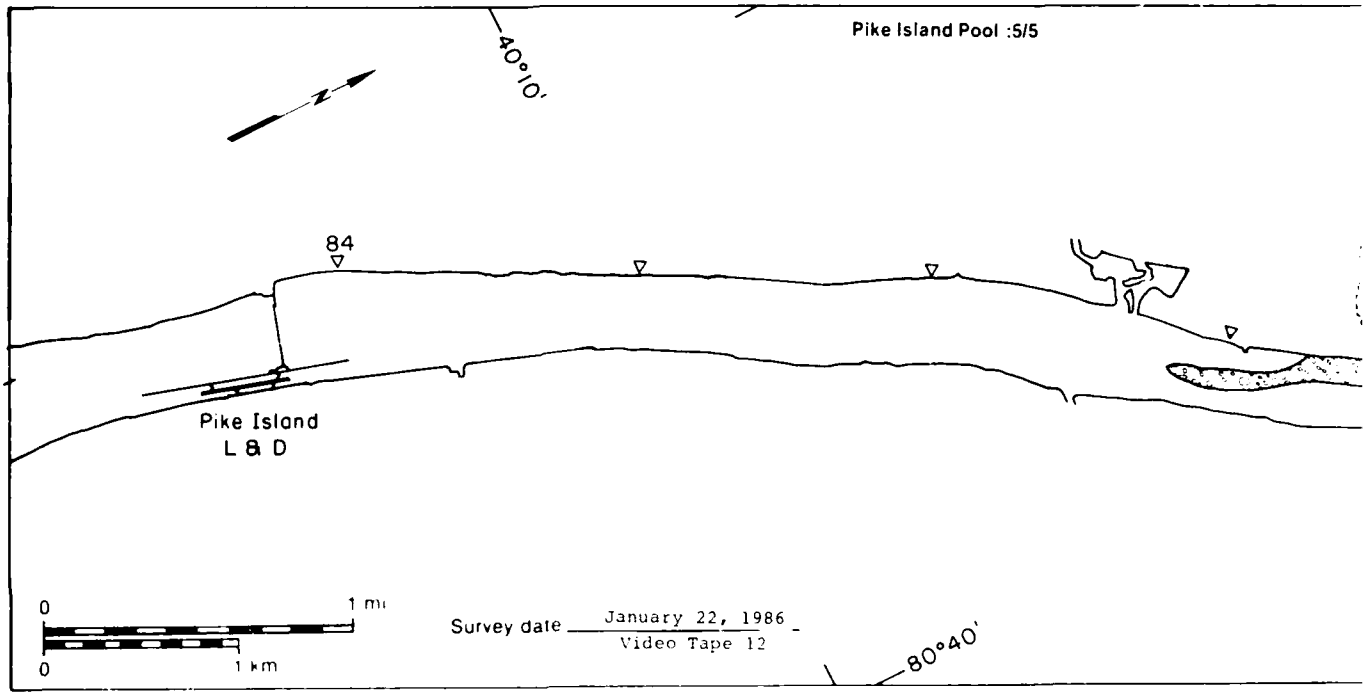
22 January 1986





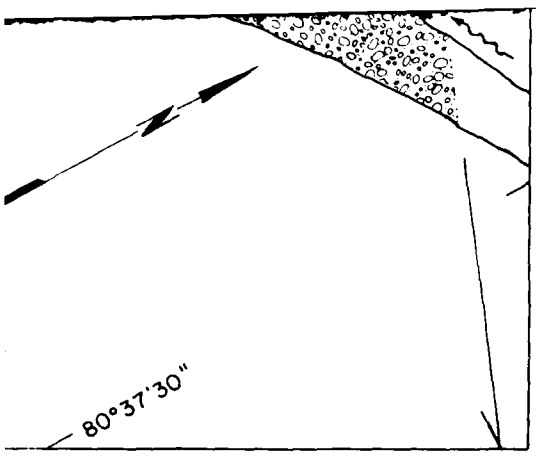


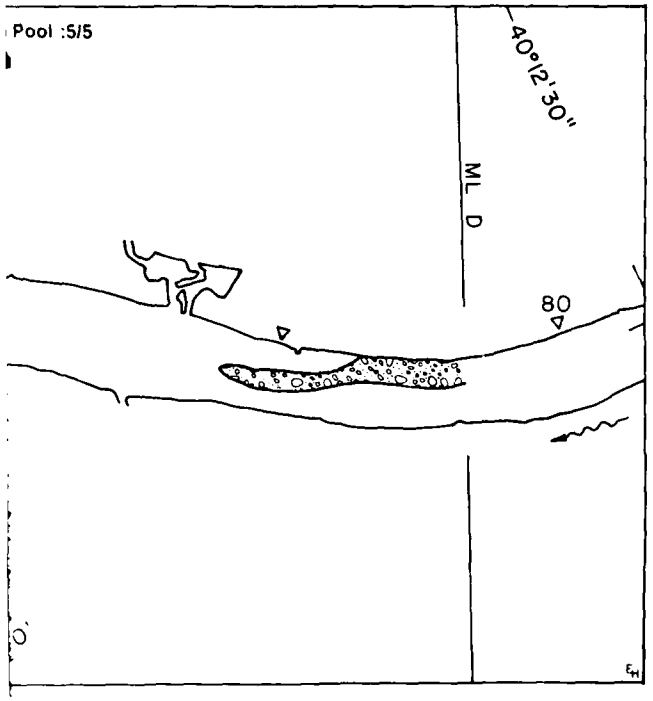




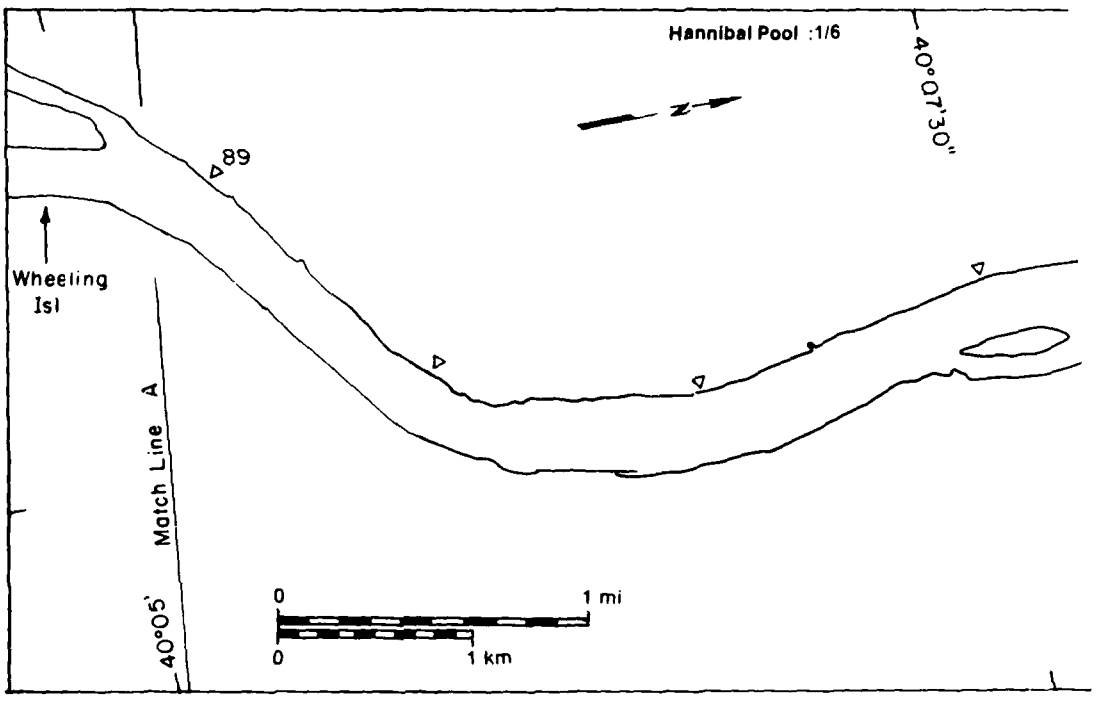
Pike Island Pool

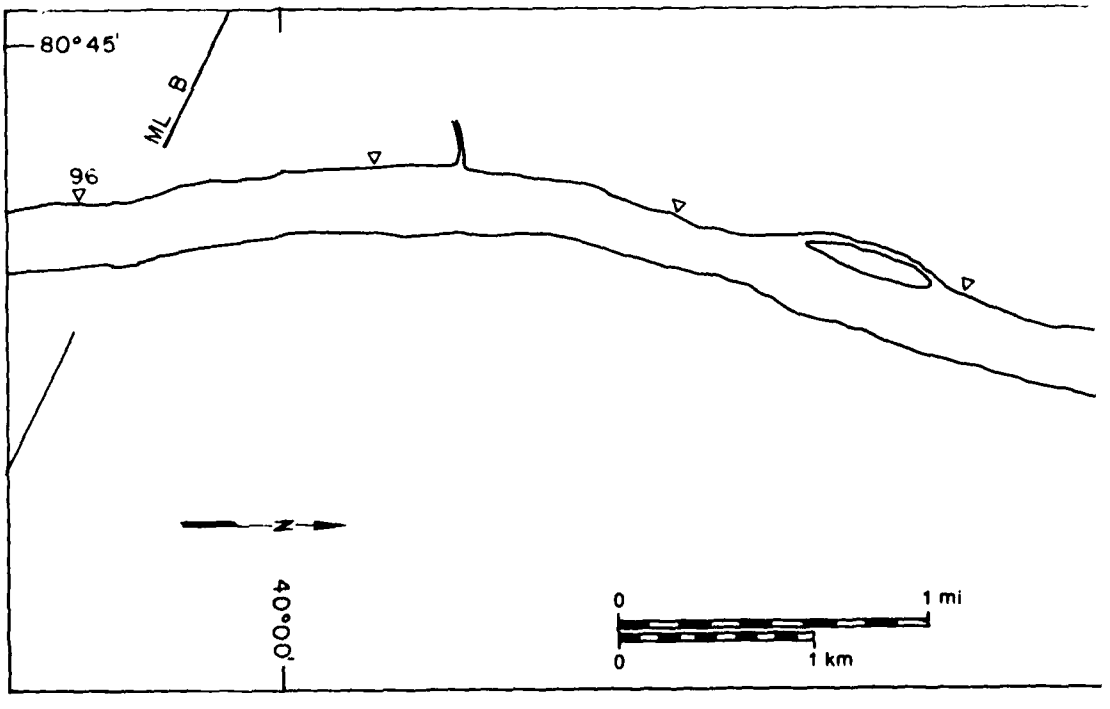
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	12.21	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	6.71	10
Total area ($m^2 \times 10^6$)	18.92	

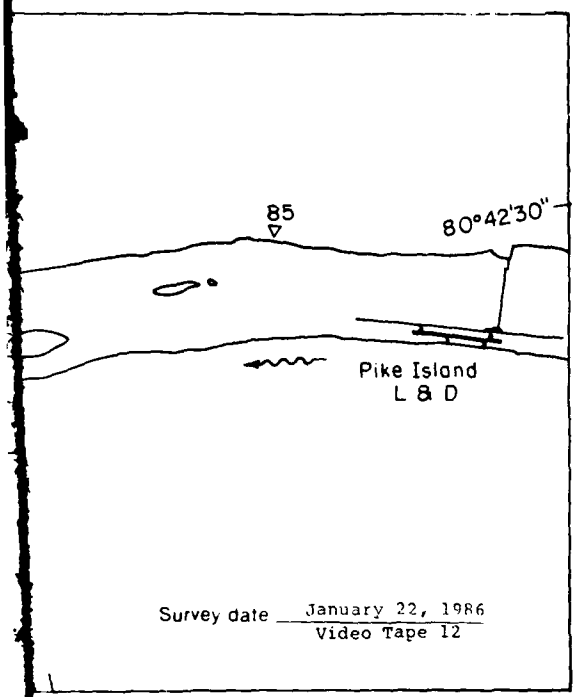

80°37'30"

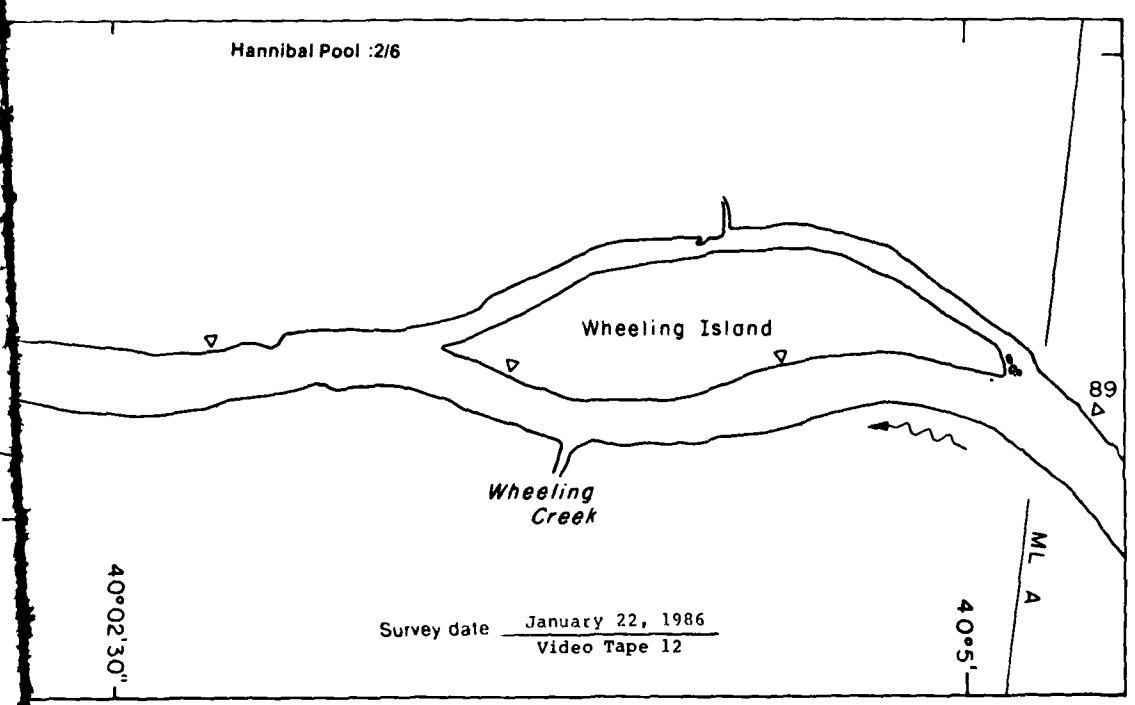

Pool :5/5
40°12'30"
ML D
80

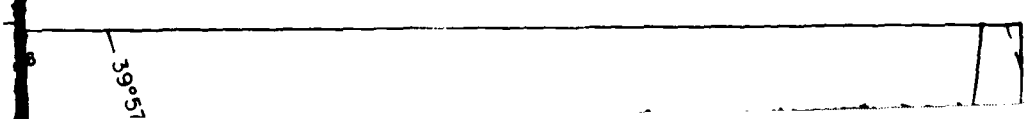
22 January 1986

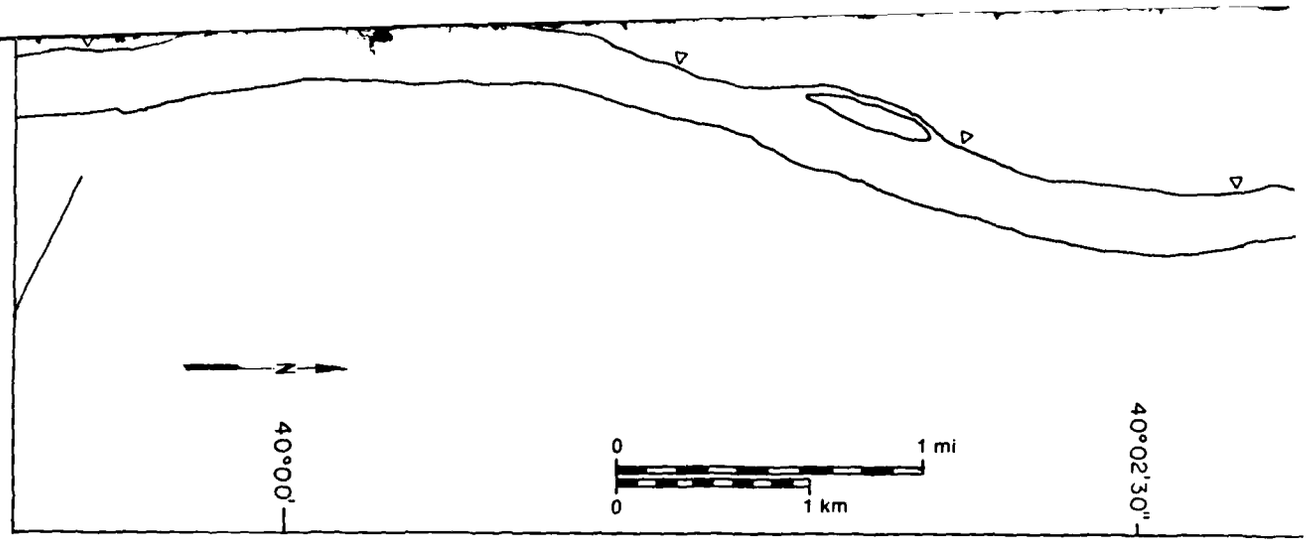


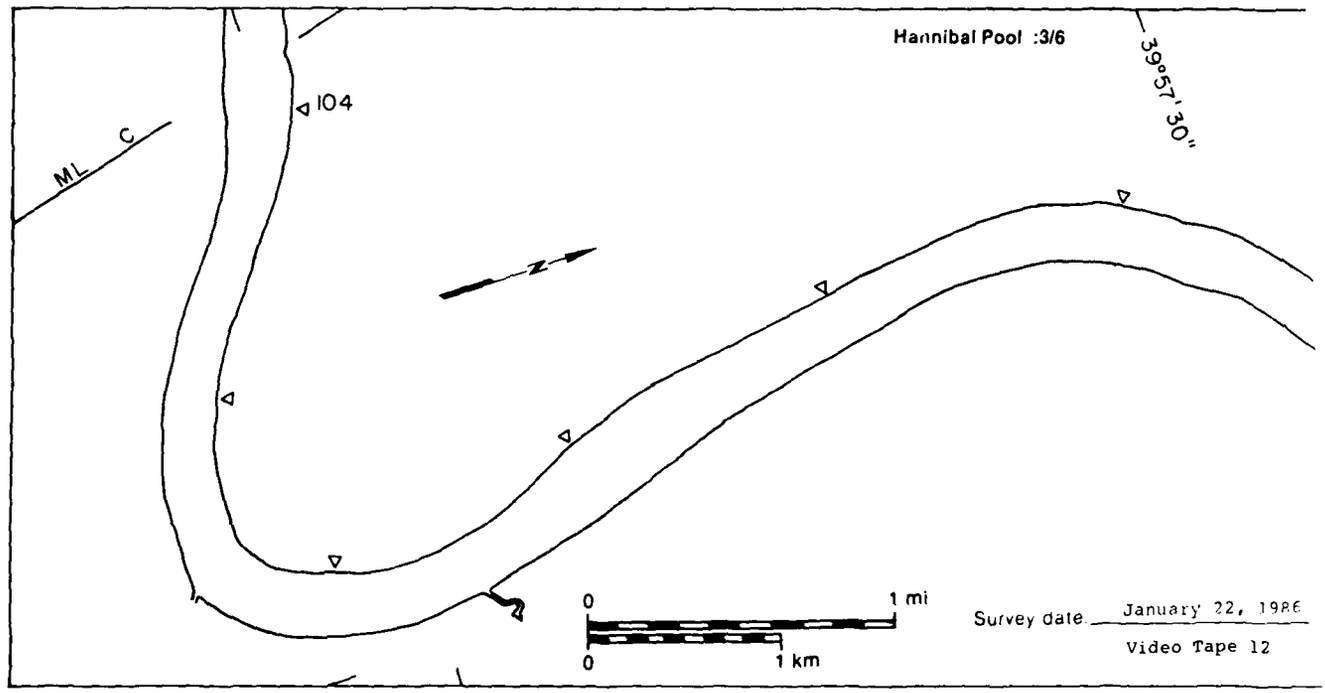


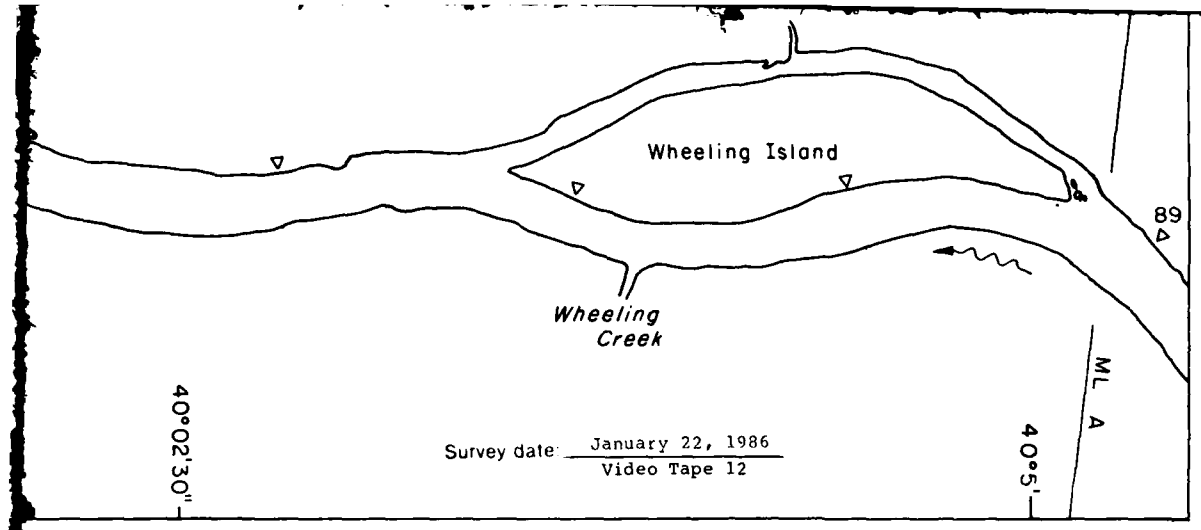

85
80°42'30"
Pike Island
L & D
Survey date January 22, 1986
Video Tape 12

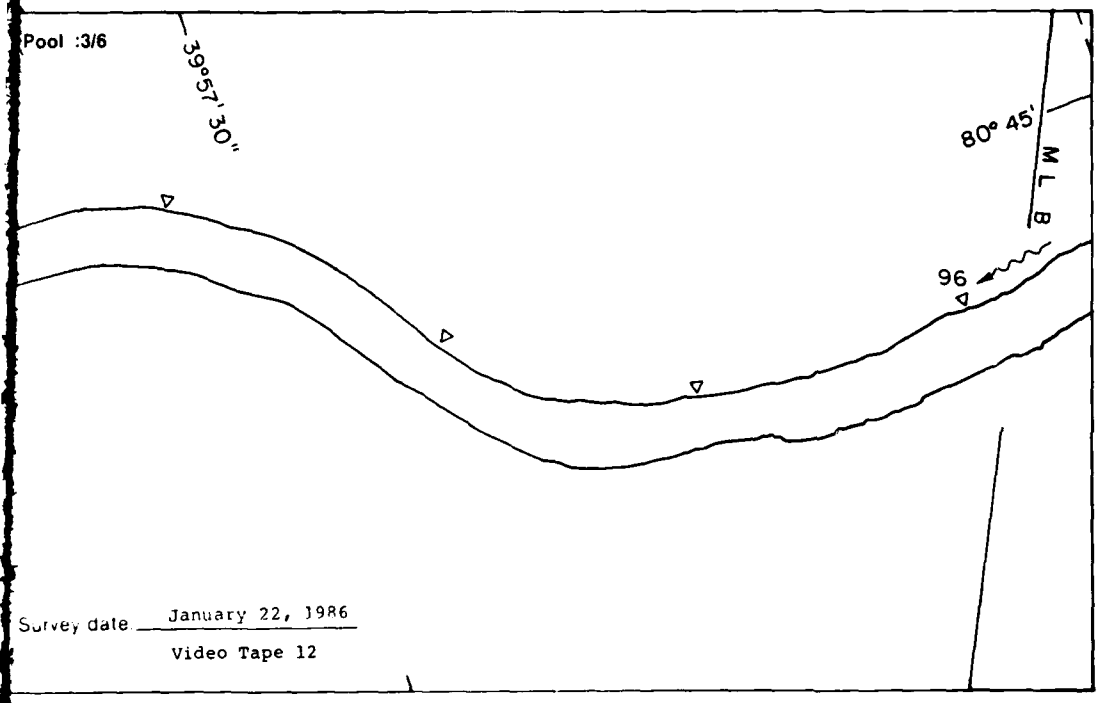

Hannibal Pool :2/6
Wheeling Island
89
Wheeling
Creek
ML A
40°02'30"
40°5'
Survey date January 22, 1986
Video Tape 12

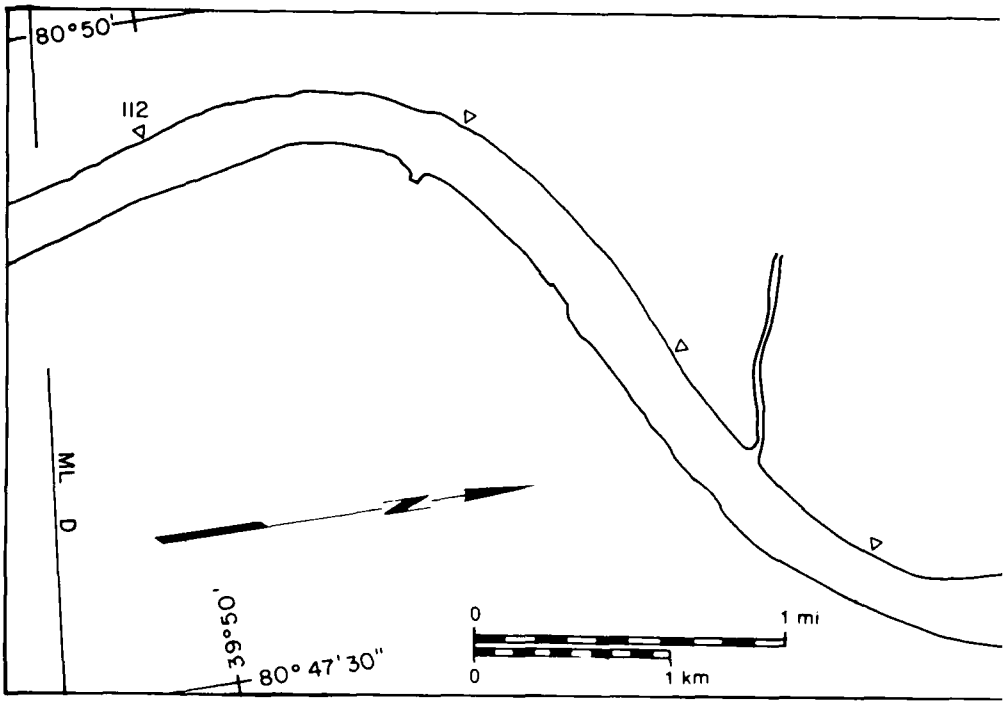

39°57'

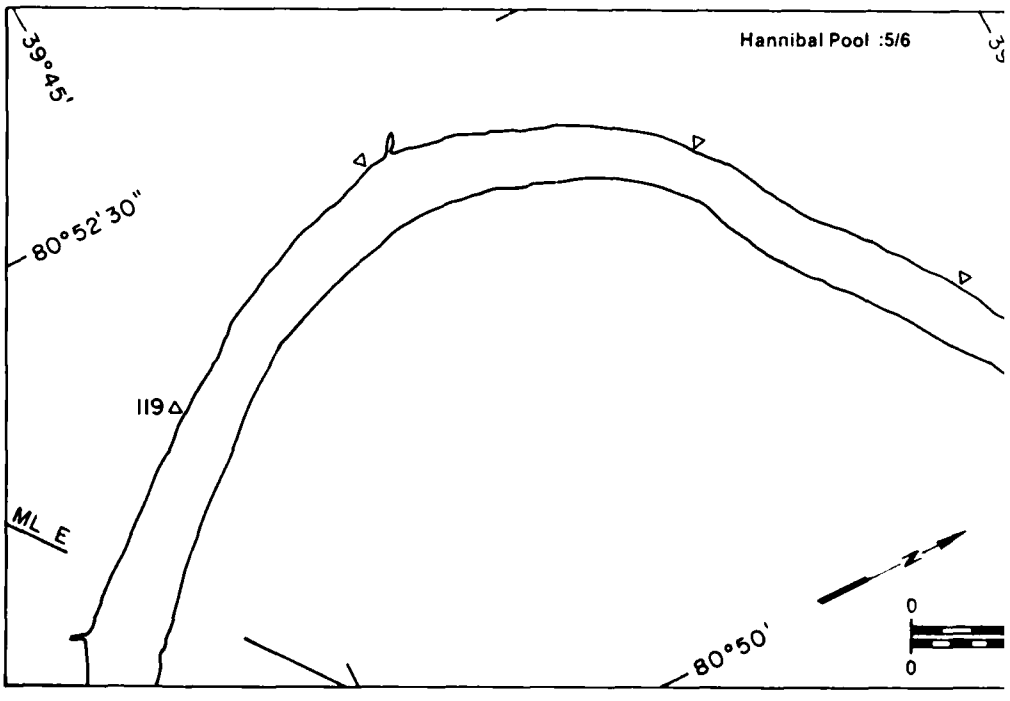

N
40°00'
0
1 mi
0
1 km
40°02'30"

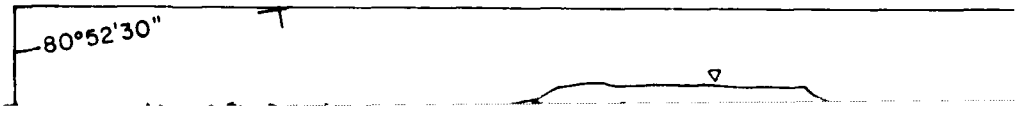

Hannibal Pool :3/6
39°57'30"
104
ML C
N
0
1 mi
0
1 km
Survey date January 22, 1986
Video Tape 12


Wheeling Island
89
Wheeling
Creek
40°02'30"
Survey date: January 22, 1986
Video Tape 12
40°5'
ML A

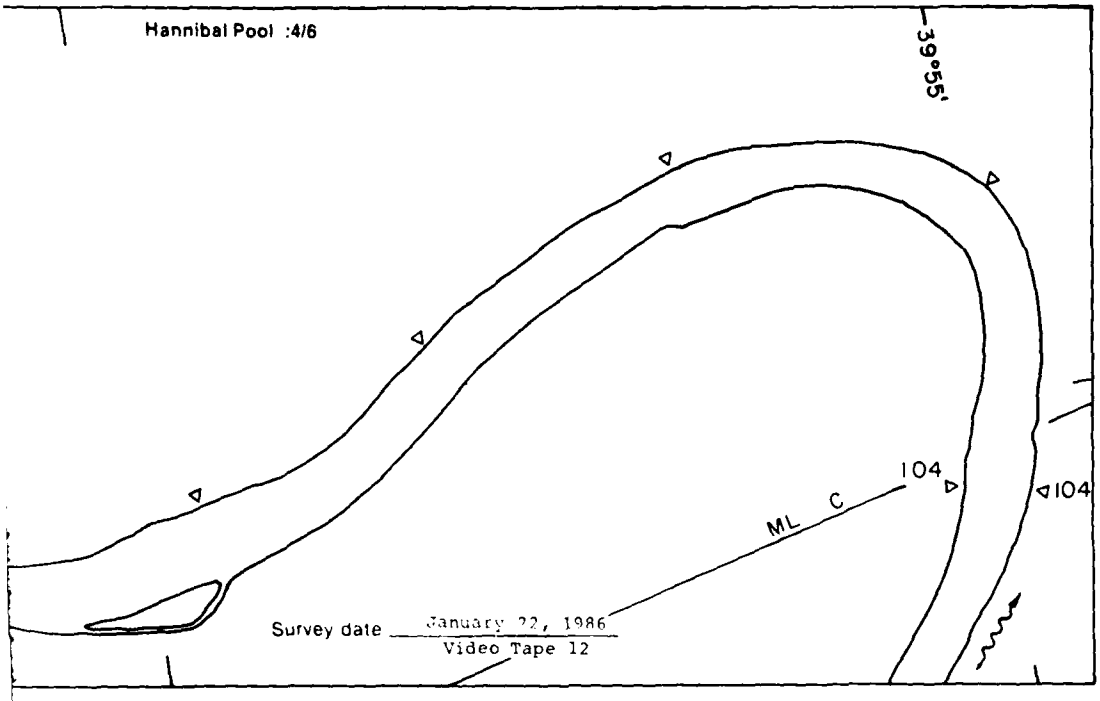

Pool :3/6
39°57'30"
80° 45'
ML B
96
Survey date: January 22, 1986
Video Tape 12

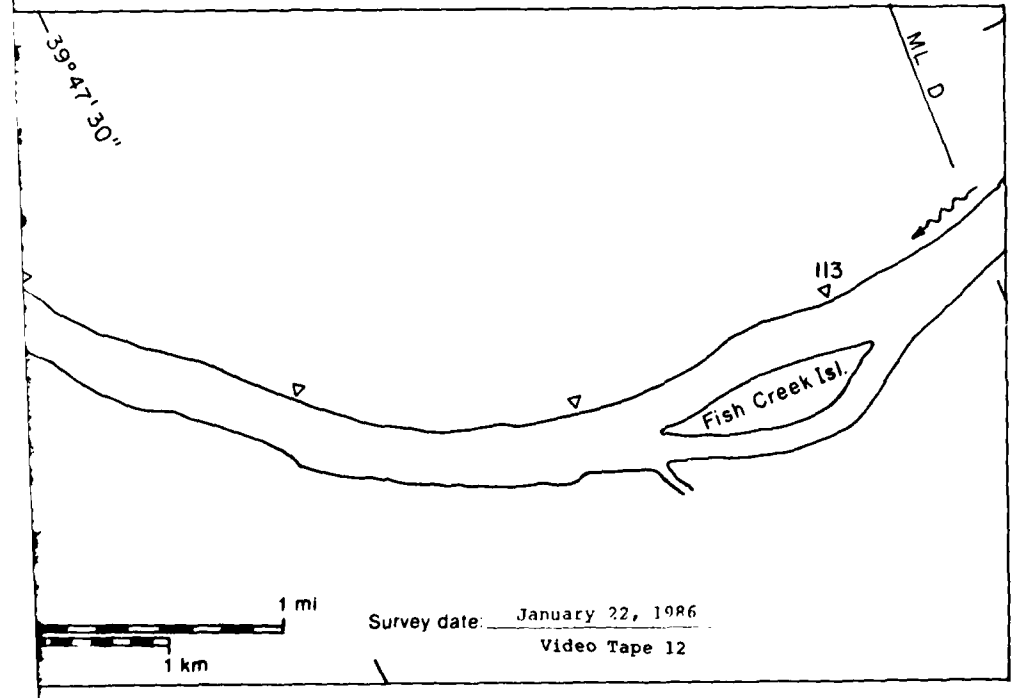

80°50'
112
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km

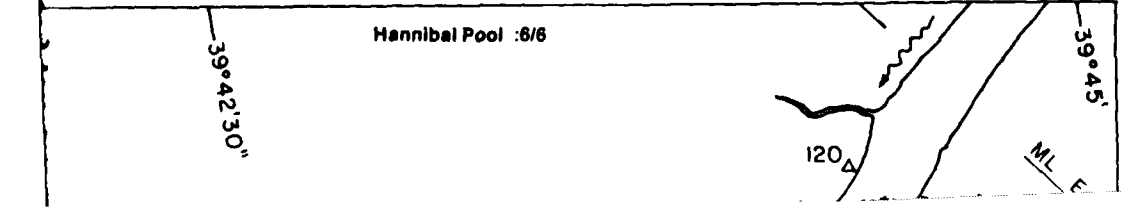

Hannibal Pool :5/6
39°45'
80°52'30"
119
ML E
80°50'
0
0

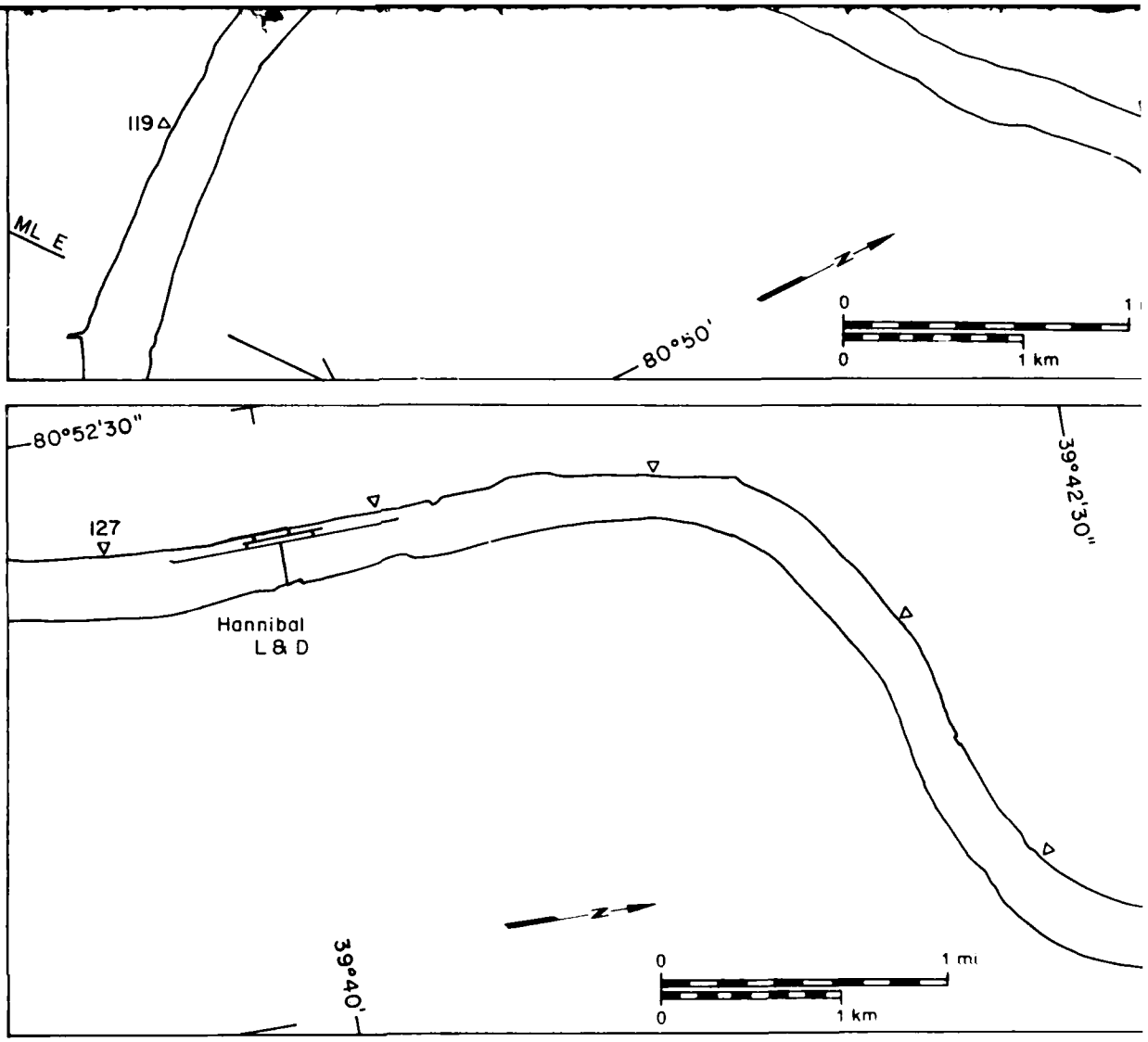

80°52'30"

22 January 1986



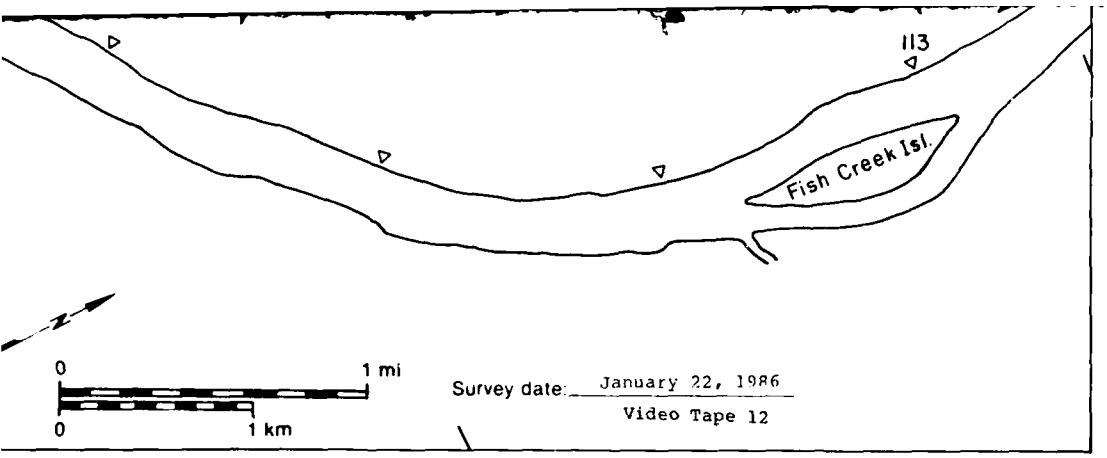


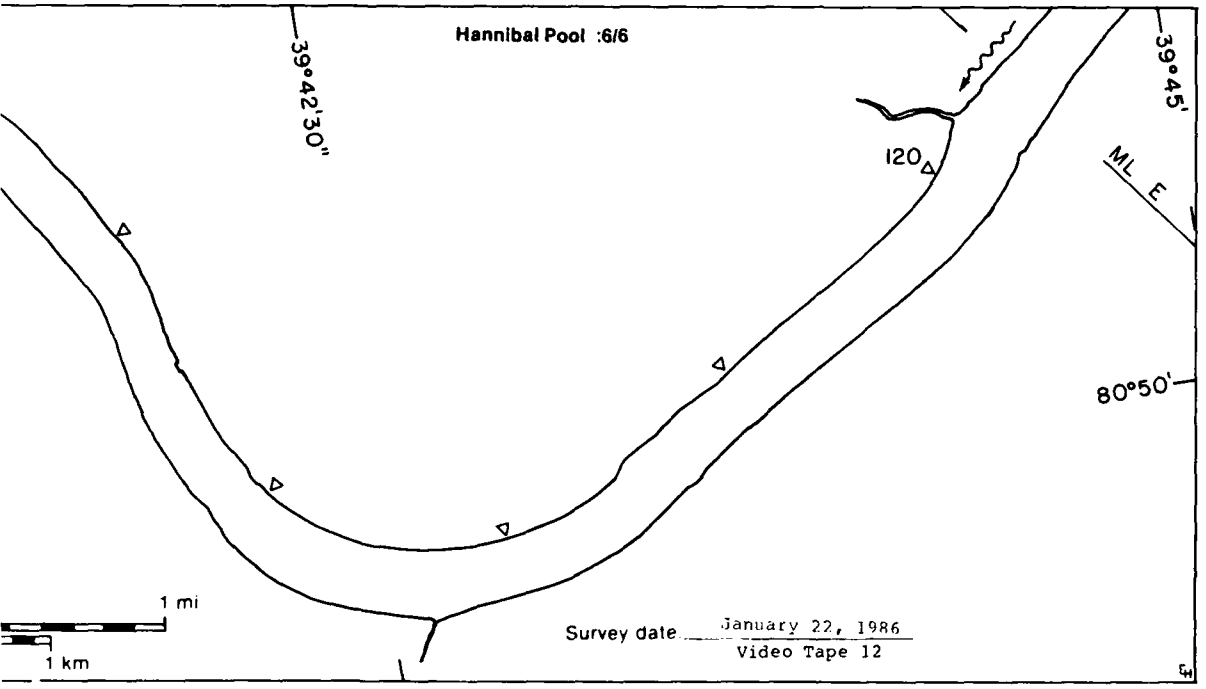


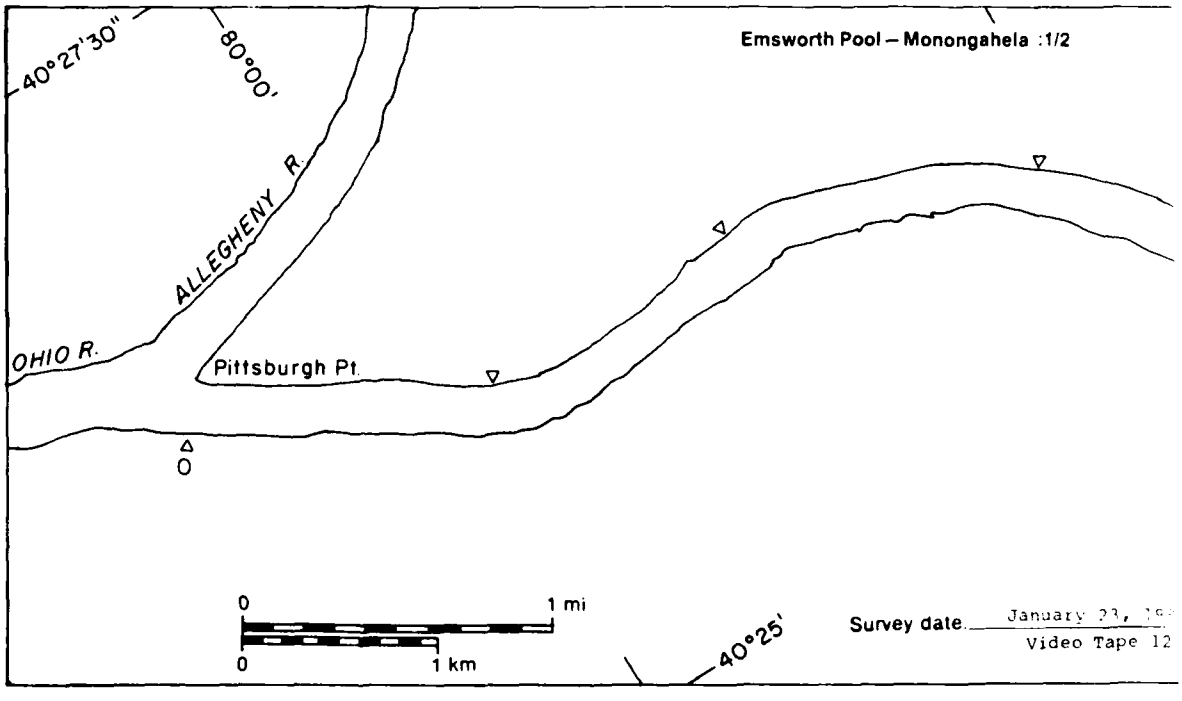


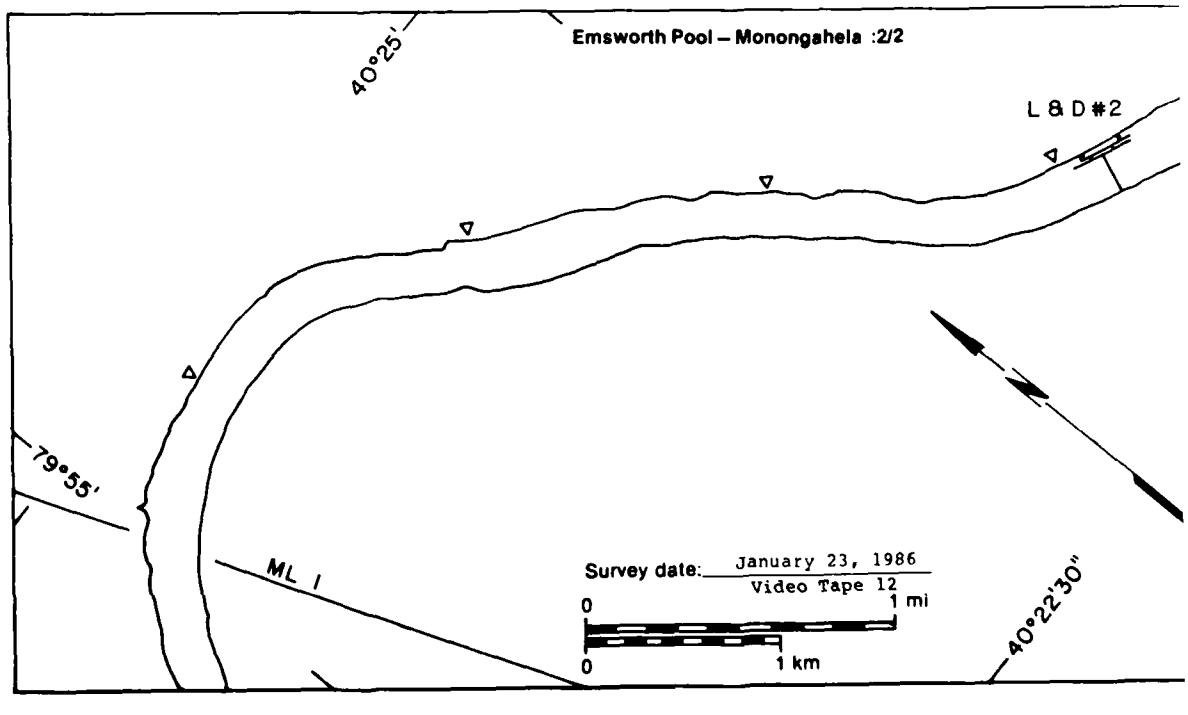
Hannibal Pool

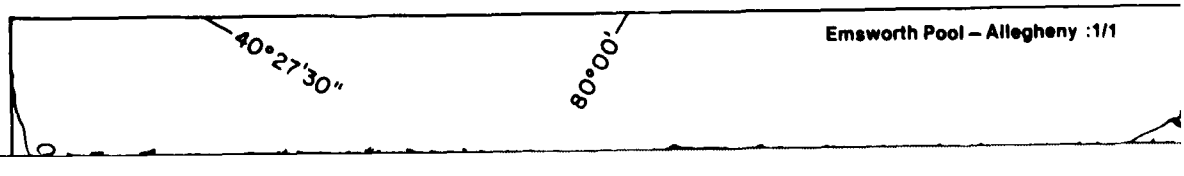
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	22.46	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	22.46	


113
Fish Creek Isl.
0
1 mi
0
1 km
Survey date: January 22, 1986
Video Tape 12

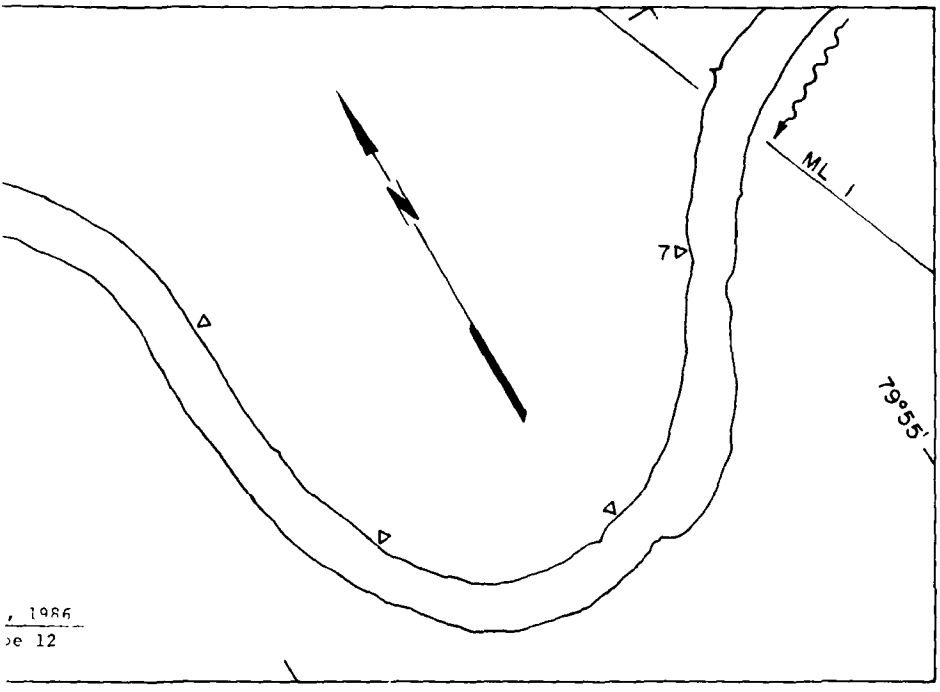

Hannibal Pool :6/6
39°42'30"
120
39°45'
ML E
80°50'
1 mi
1 km
Survey date January 22, 1986
Video Tape 12

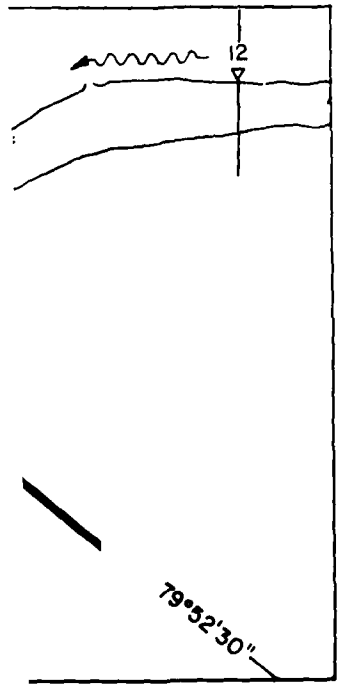

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
1 mi
0
1 km
40°25'
Survey date: January 23, 19
Video Tape 12


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 23, 1986
Video Tape 12
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'

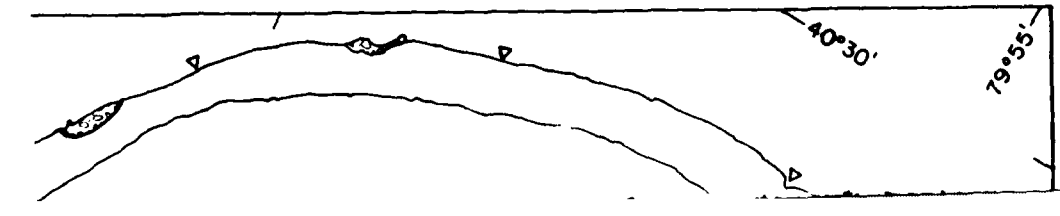
23 January 1986

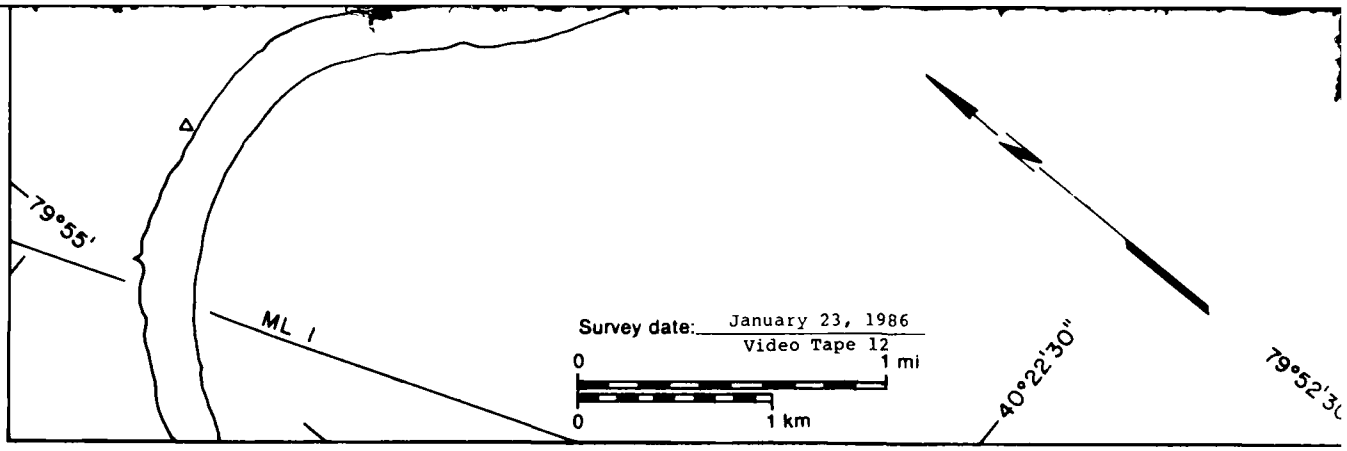


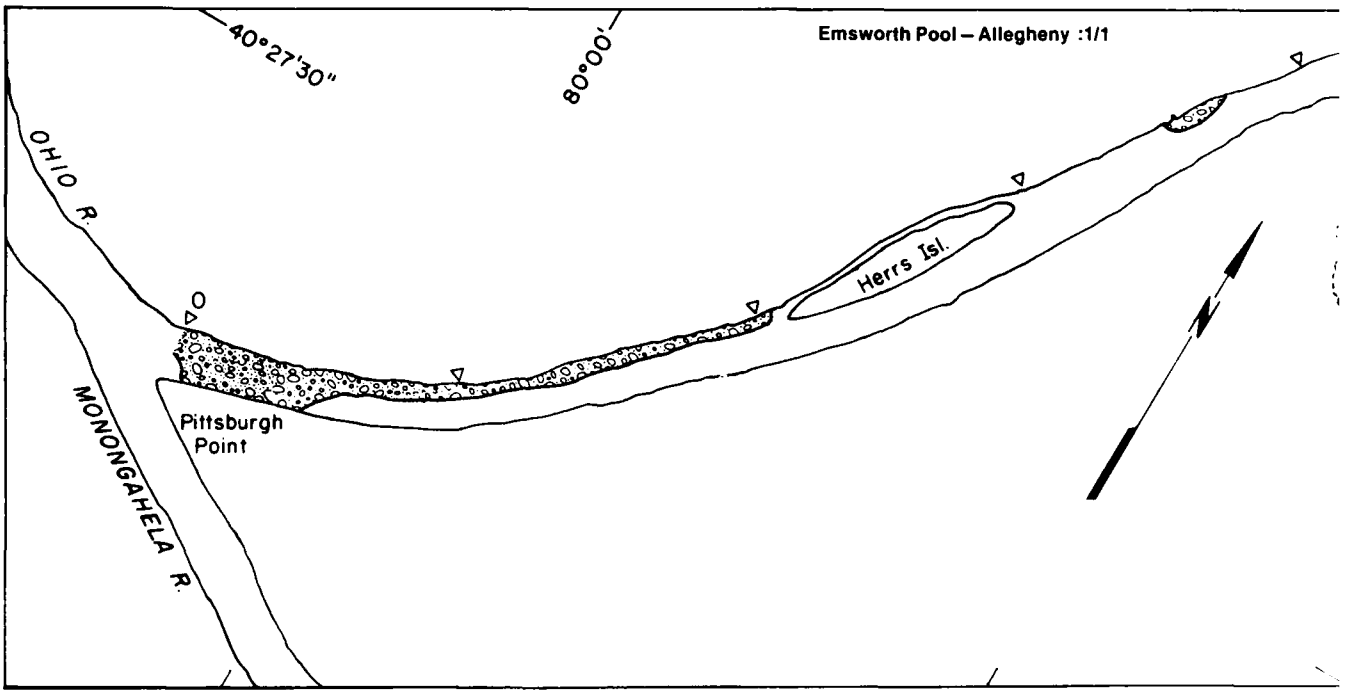


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration of [illegible] (tenths)
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice holes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	

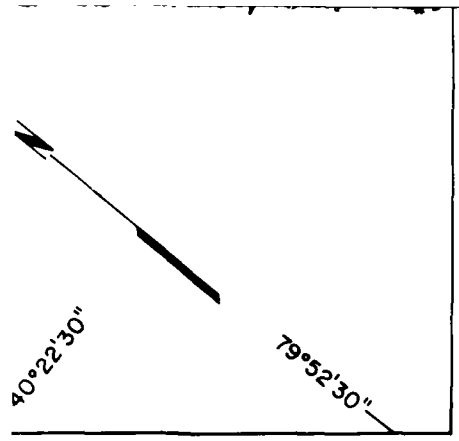




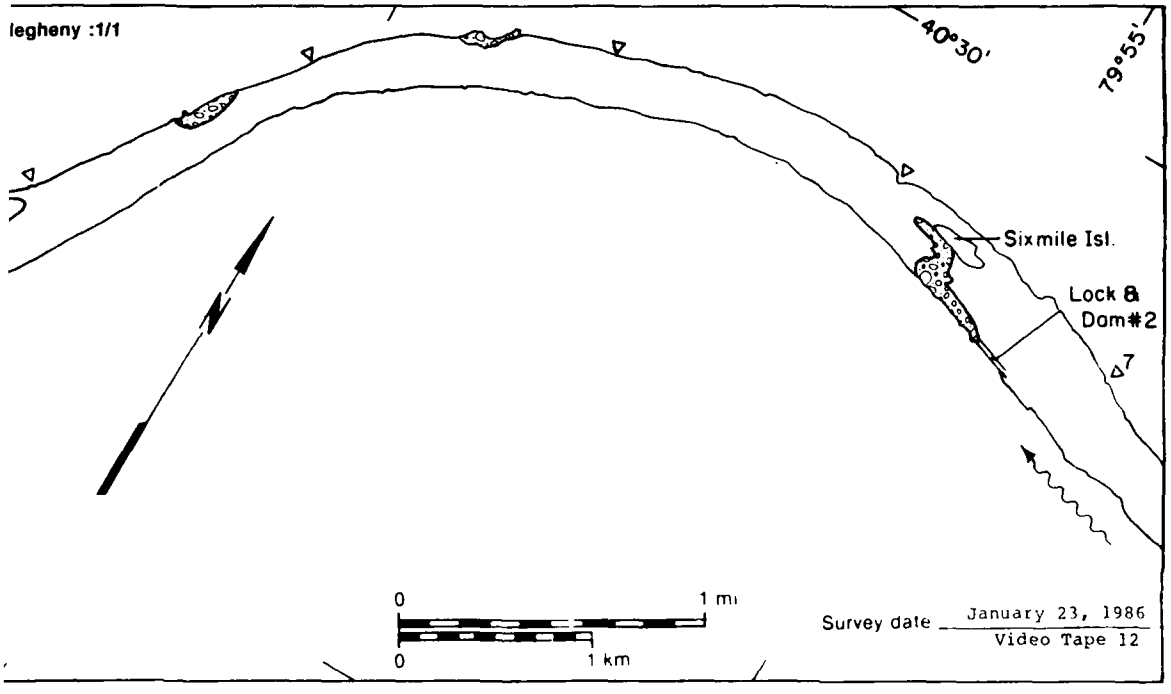


Emsworth Pool – Allegheny

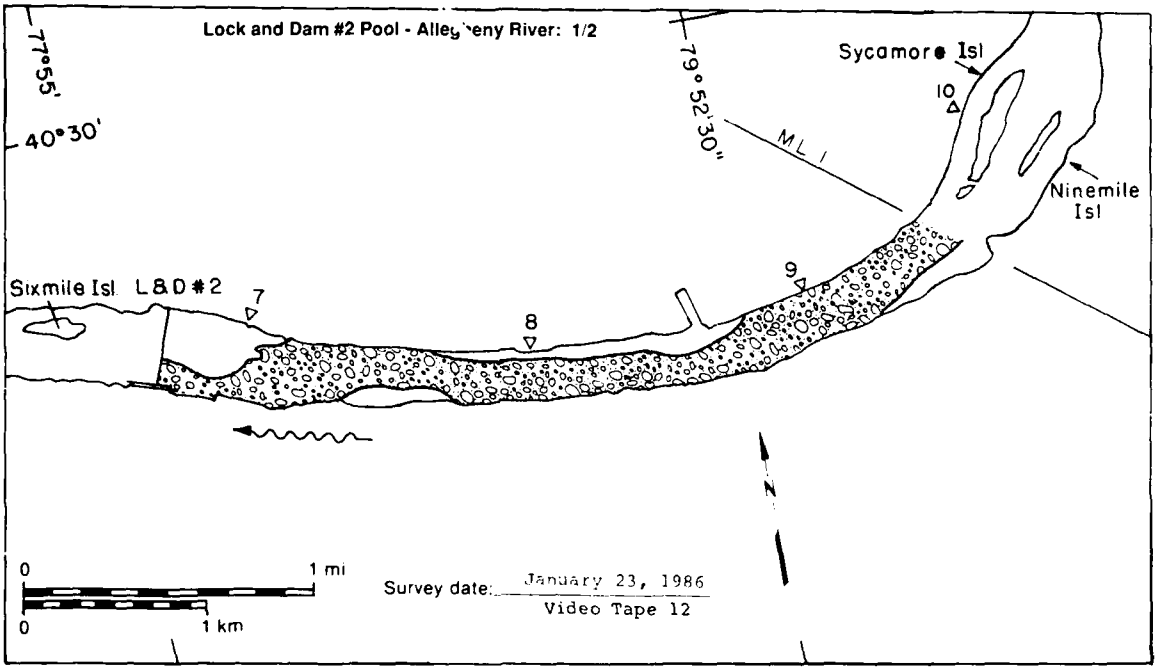
MAP UNITS	Area (m^2 x 10^6)	Surface cover that of [illegible]
Open water	2.54	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.53	5
Total area (m^2 x 10^6)	3.07	

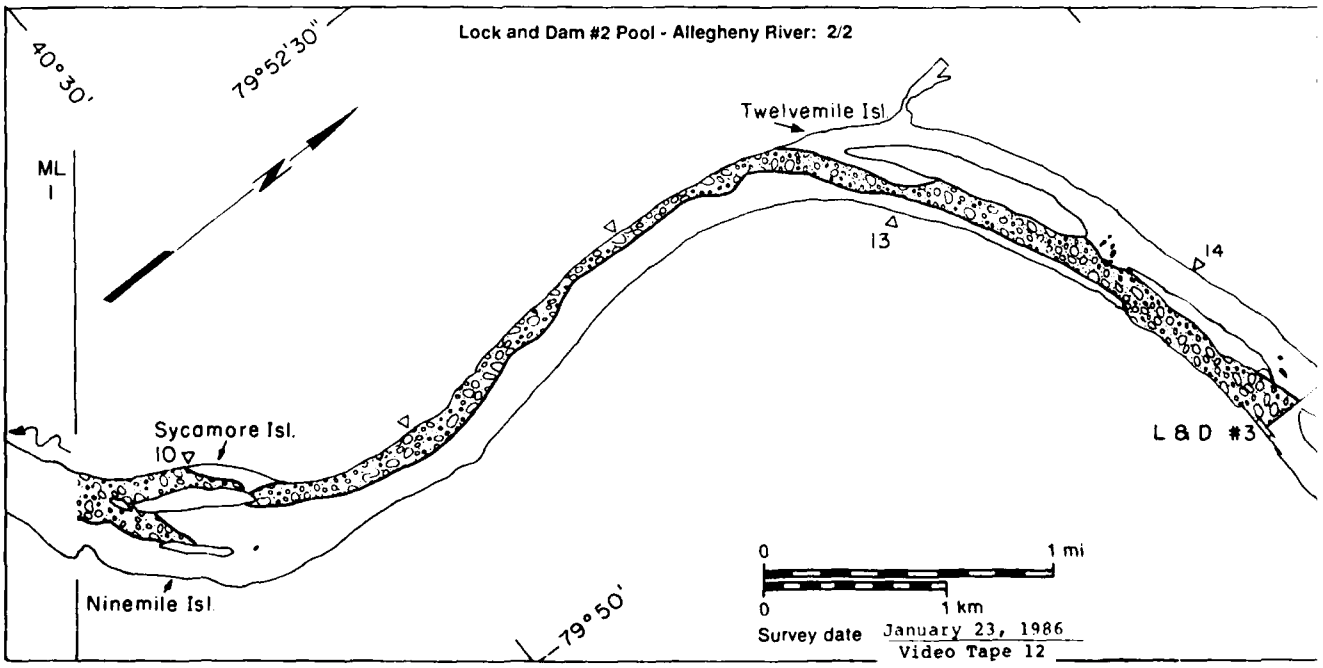


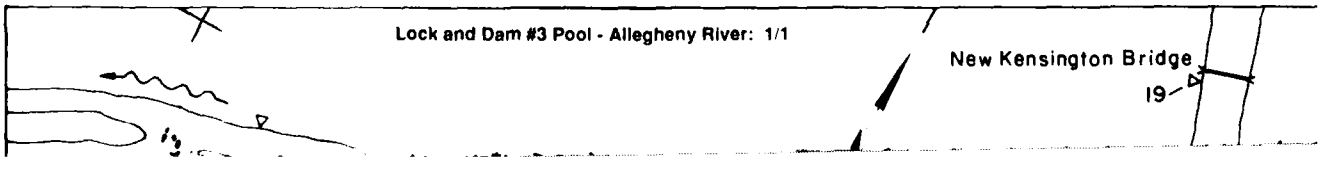
MAP UNITS	Area (m^2 x 10^6)	
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	



23 January 1986





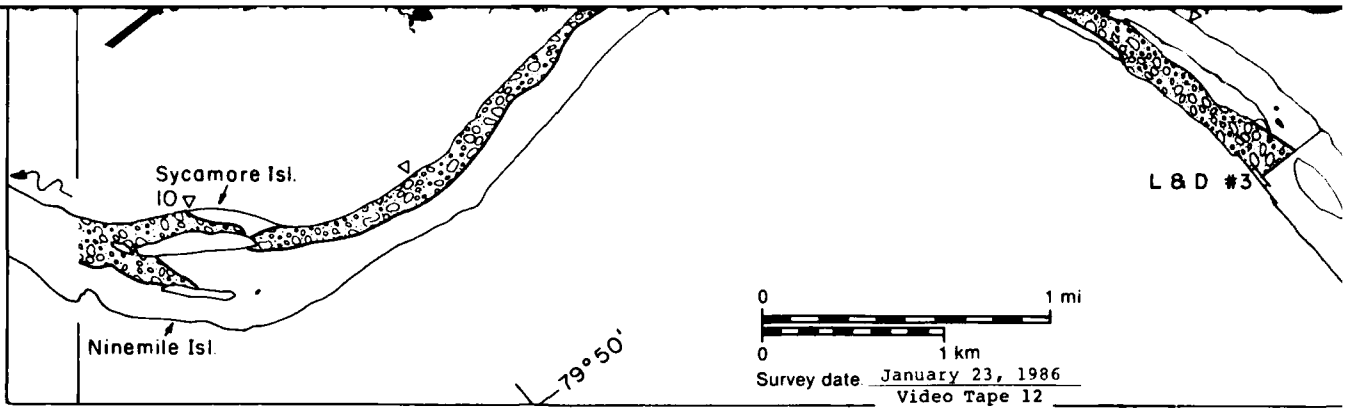


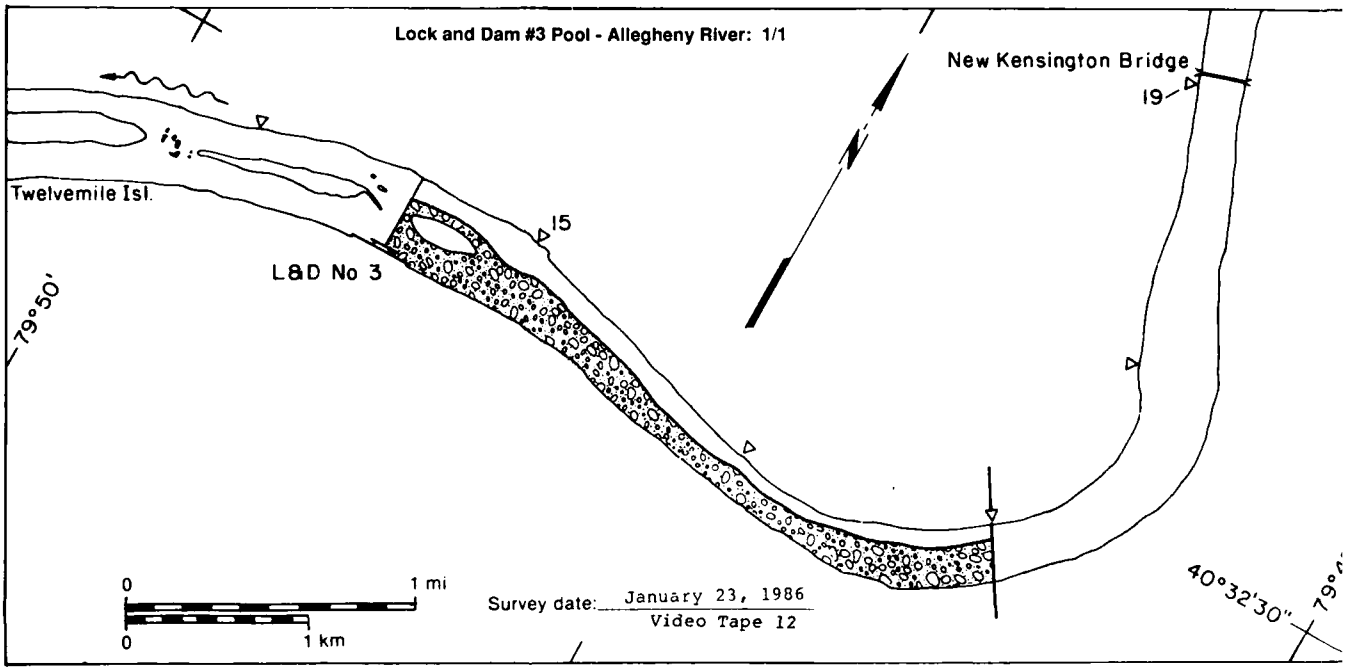
Lock and Dam #2 Pool

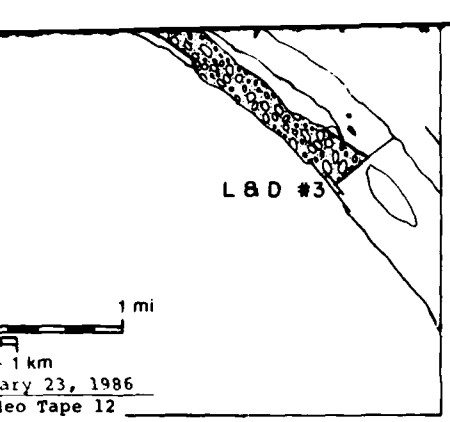
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.99	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.03	5
Total area ($m^2 \times 10^6$)	4.02	

Lock and Dam #3 Pool

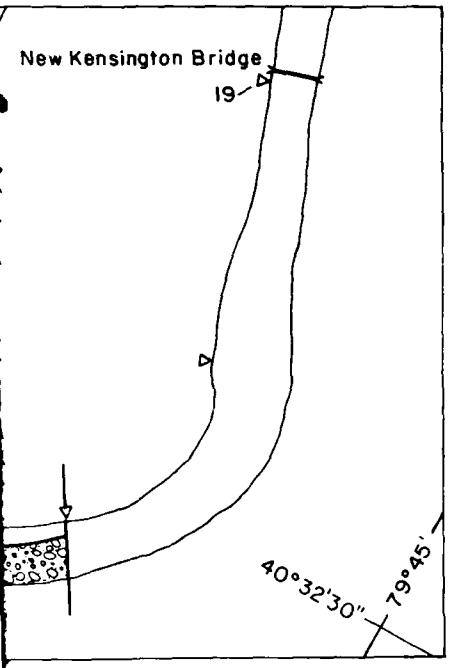
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.41	NA
Solid ice cover	0.00	NA


Sycamore Isl.
10
Ninemile Isl.
79°50'
L & D #3
0
1 mi
0
1 km
Survey date January 23, 1986
Video Tape 12


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 23, 1986
Video Tape 12
40°32'30"

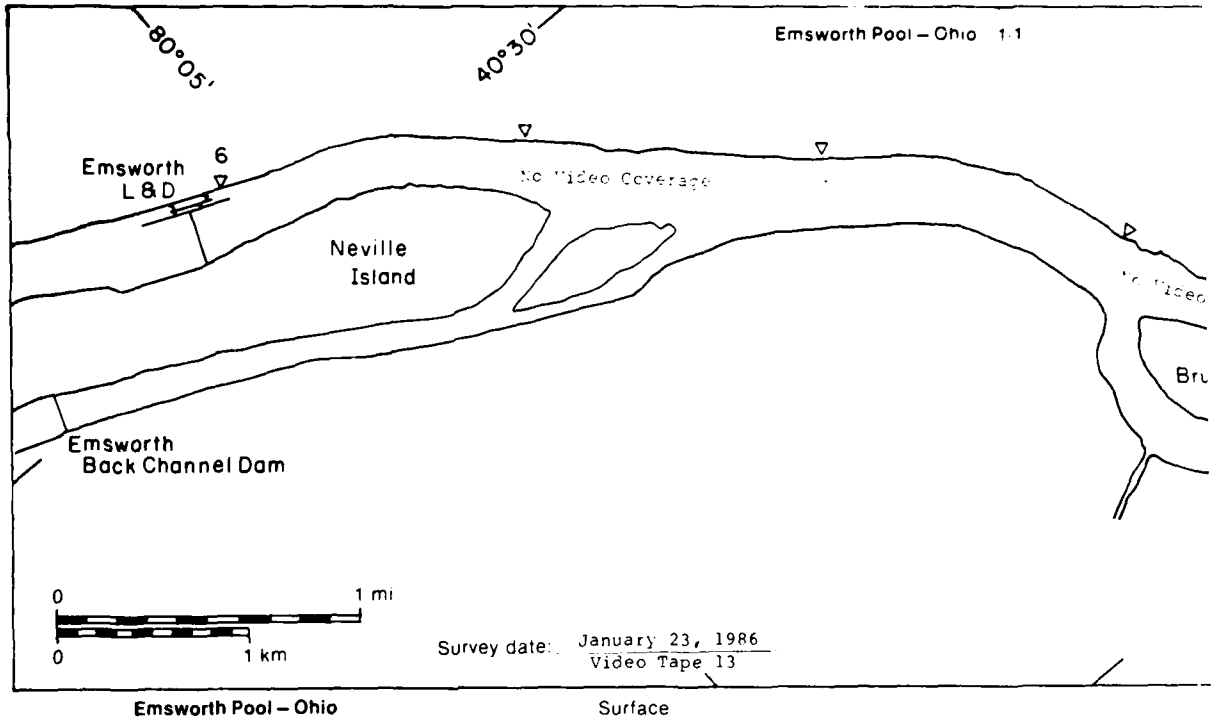


	Area ($m^2 \times 10^6$)	Surface concentration (%)
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.03	5
Total area ($m^2 \times 10^6$)	4.02	



Lock and Dam #3 Pool

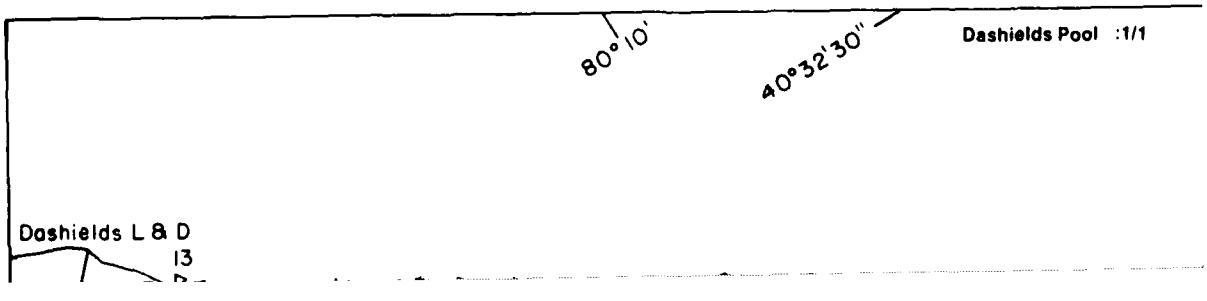
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.41	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.73	5
Total area ($m^2 \times 10^6$)	1.14	



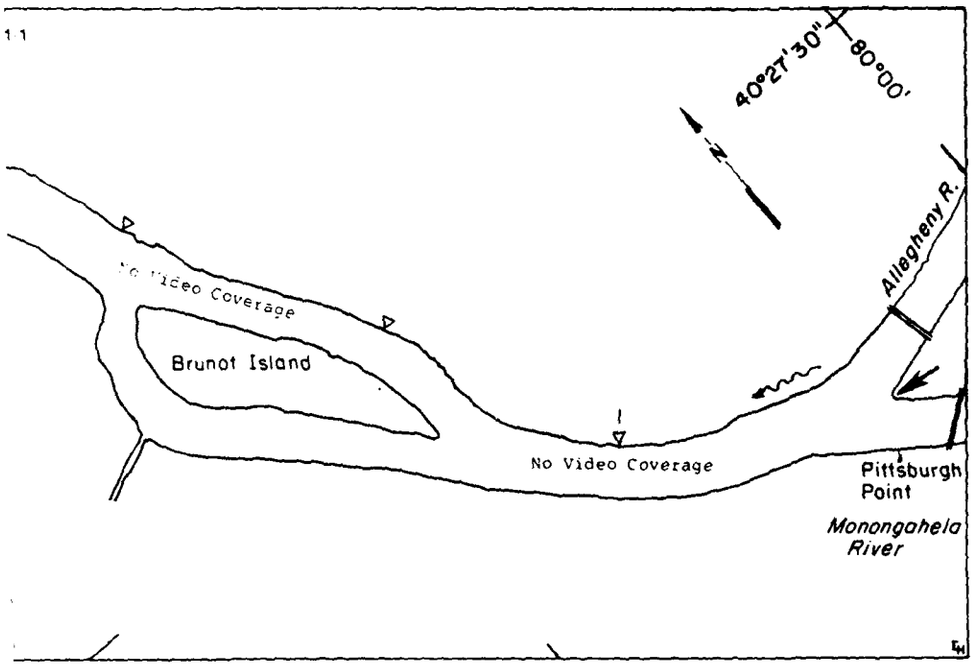
Emsworth Pool – Ohio

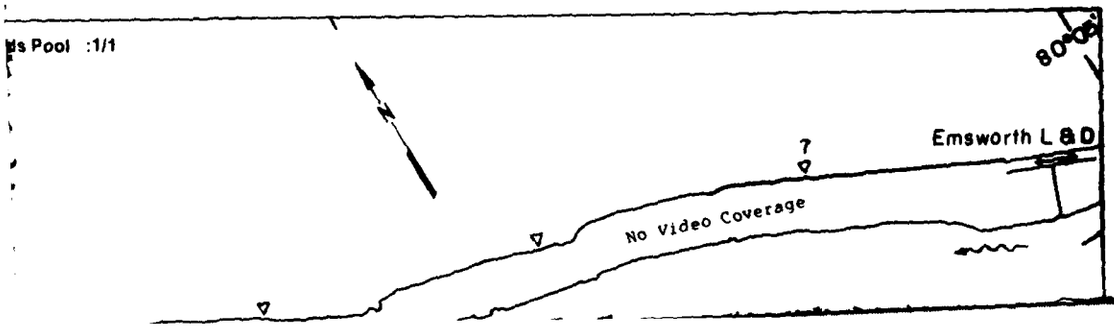
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 4.49×10^6 m^2 of no video coverage

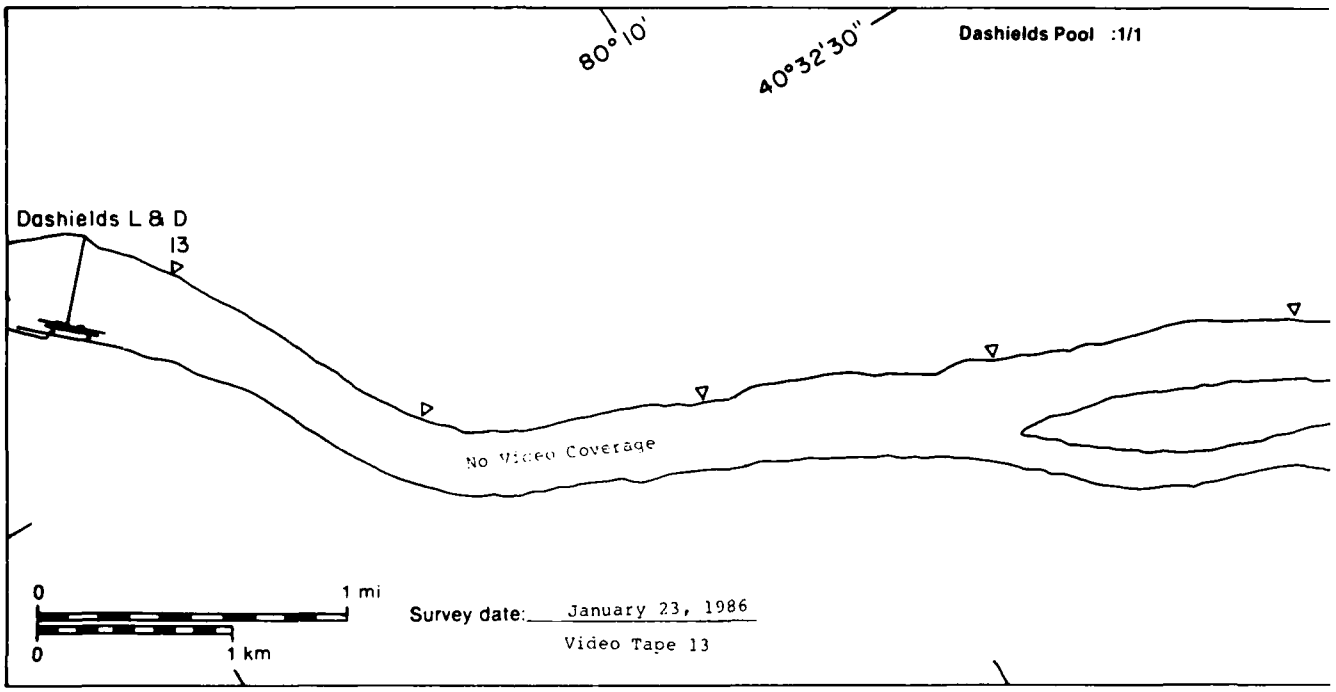


23 January 1986



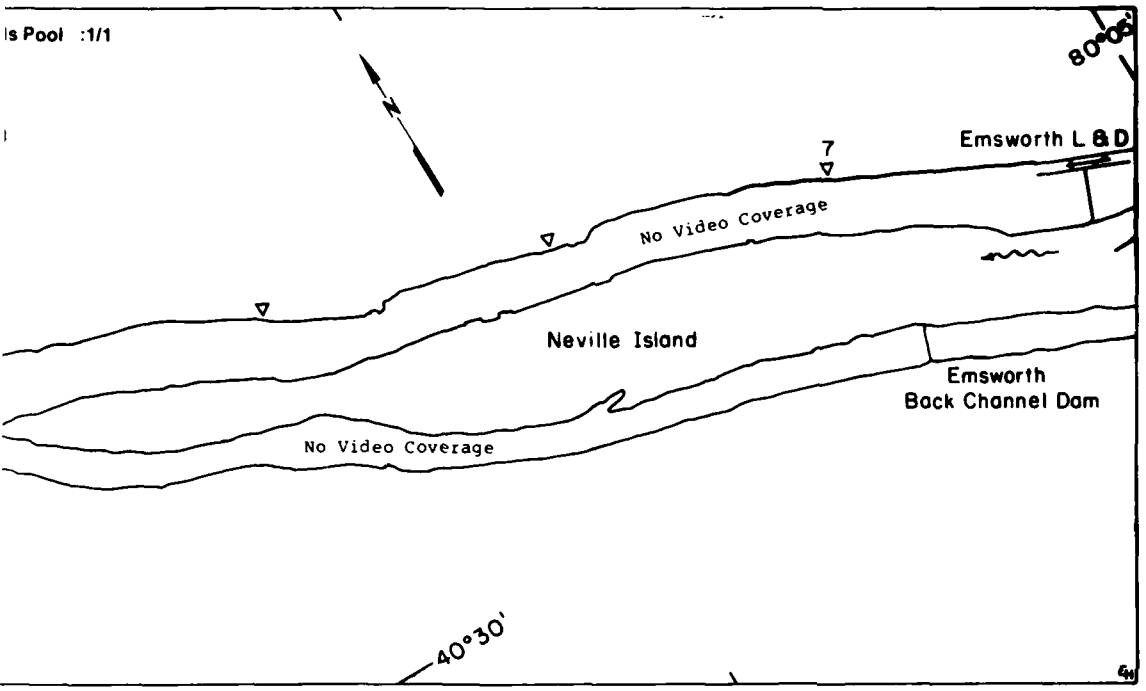


Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.49*	* Includes 4.49 x 10^6 m^2 of no video coverage

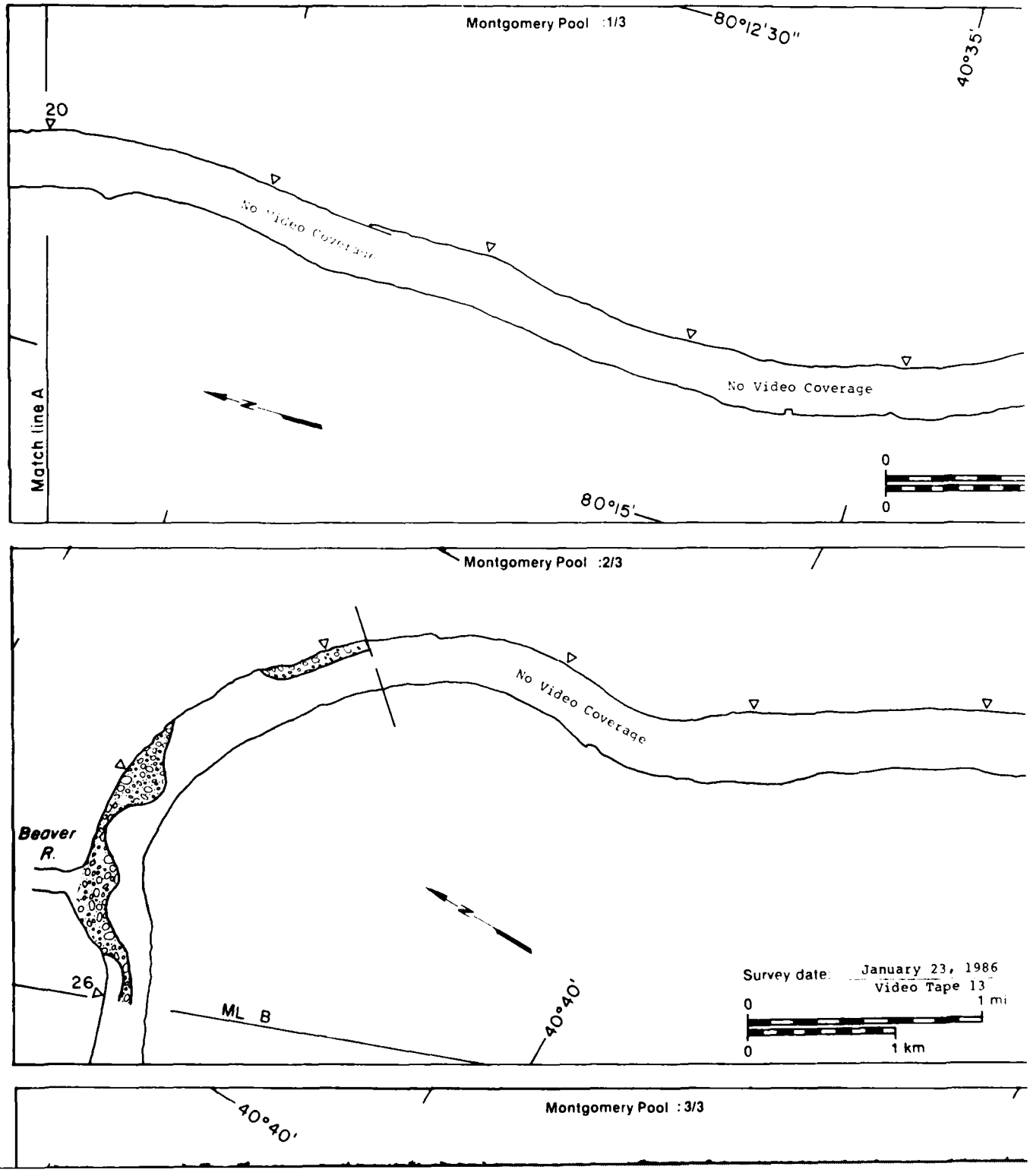


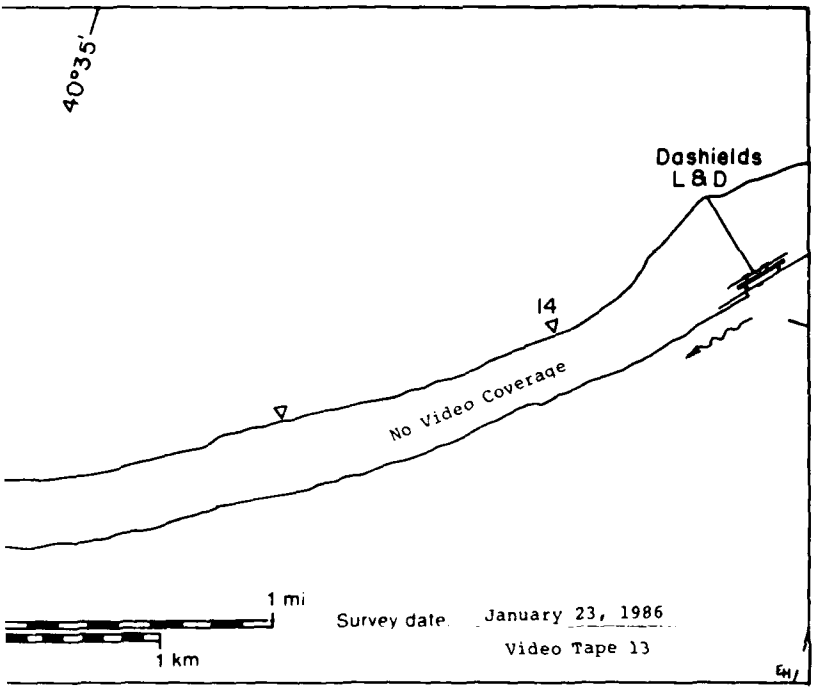
Dashields Pool

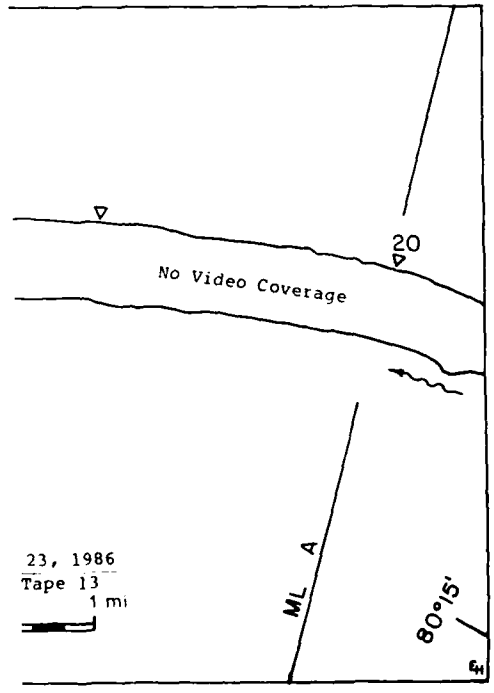
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	5.00*	* Includes 5.00 x 10^6 m^2 of no video coverage

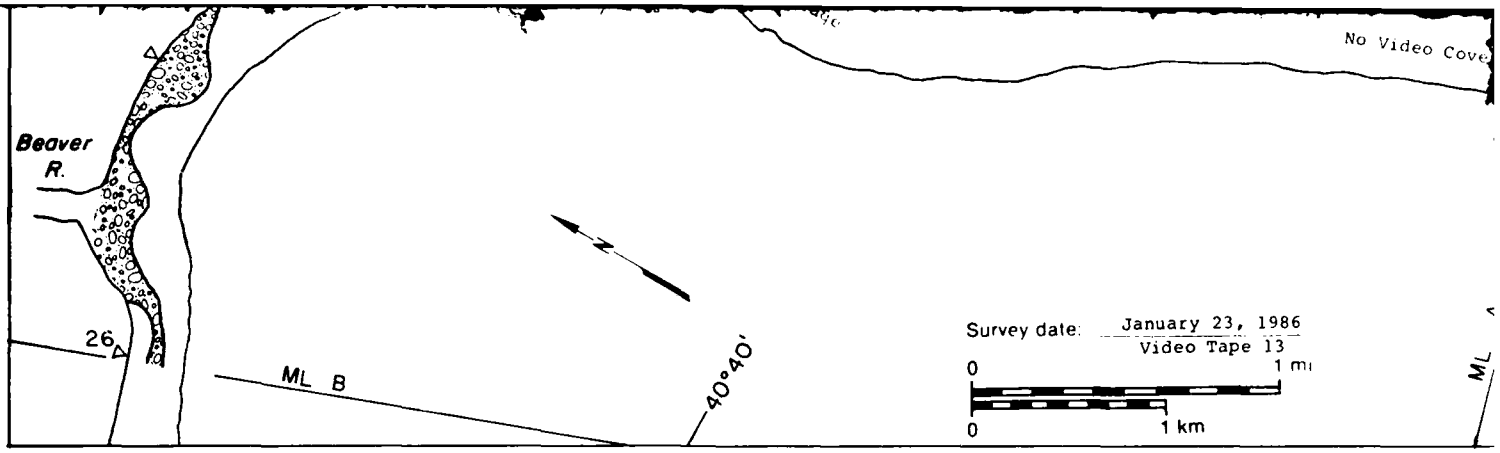

ls Pool :1/1
80°05'
Emsworth L & D
7
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

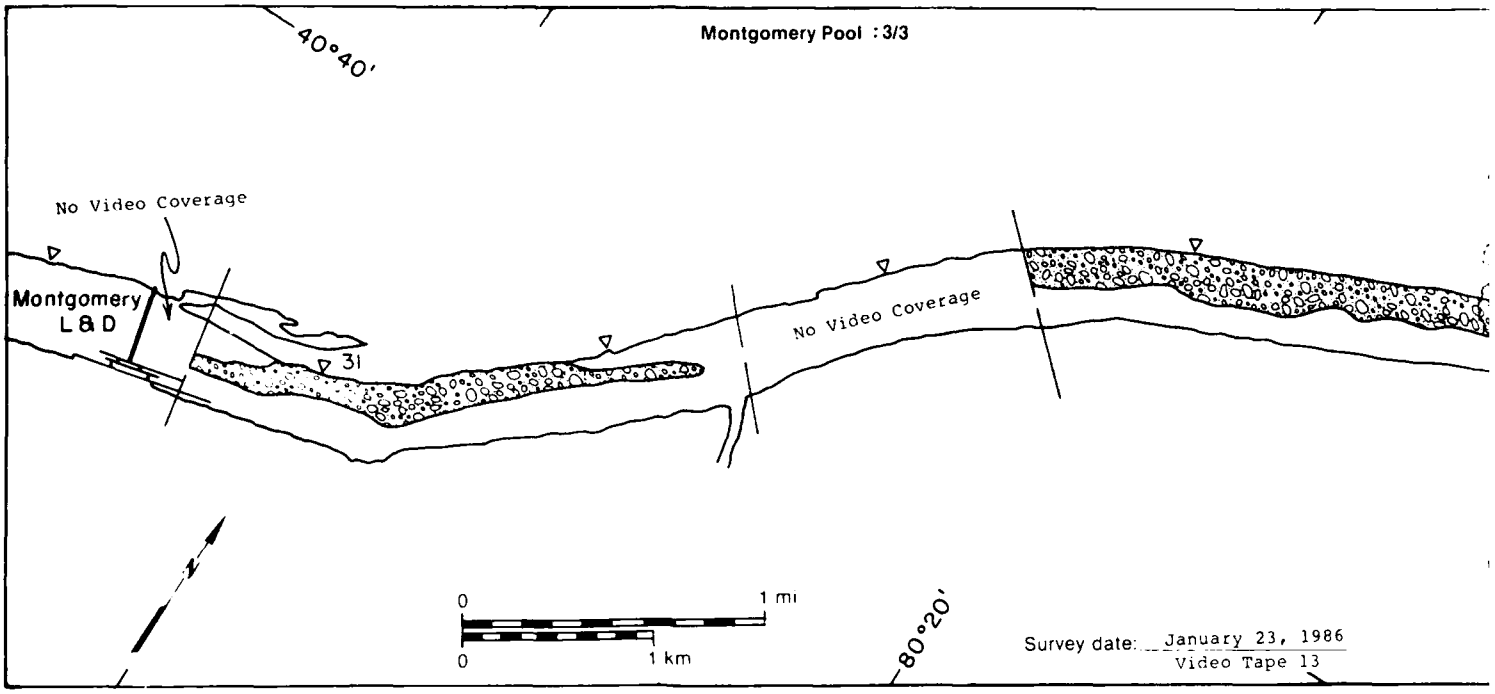
23 January 1986




40°35'
Dashields
L&D
14
No Video Coverage
1 mi
1 km
Survey date January 23, 1986
Video Tape 13


20
No Video Coverage
ML A
80°15'
23, 1986
Tape 13
1 mi

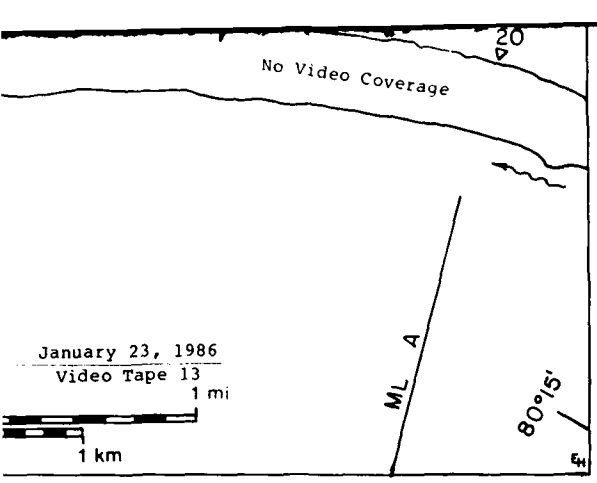


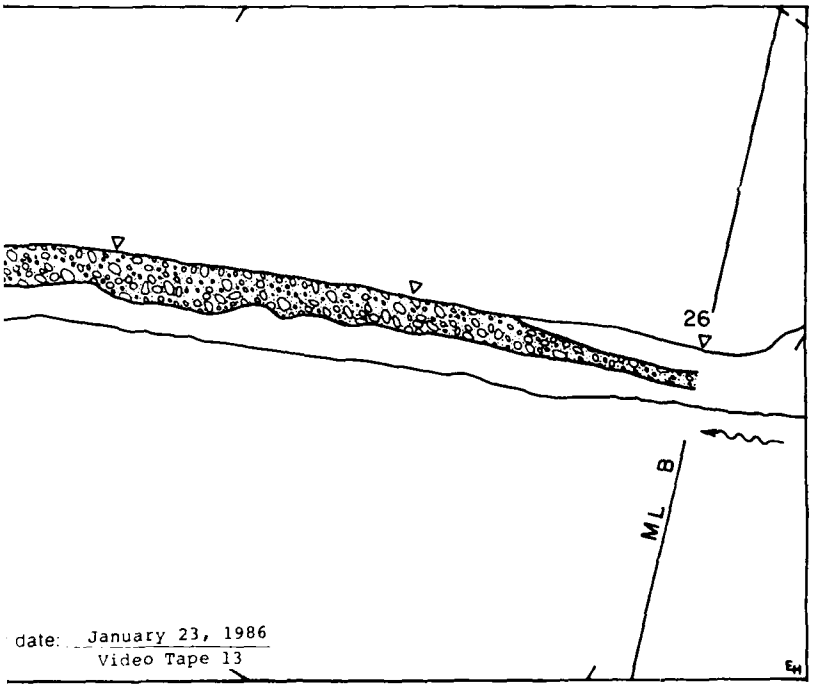


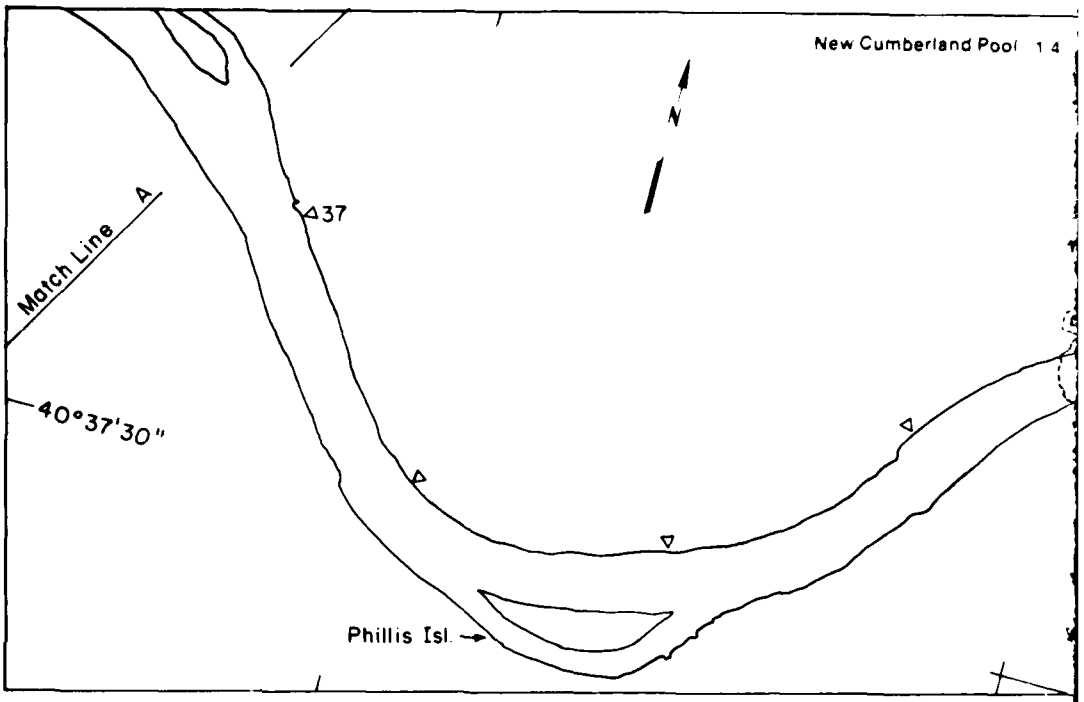
Montgomery Pool

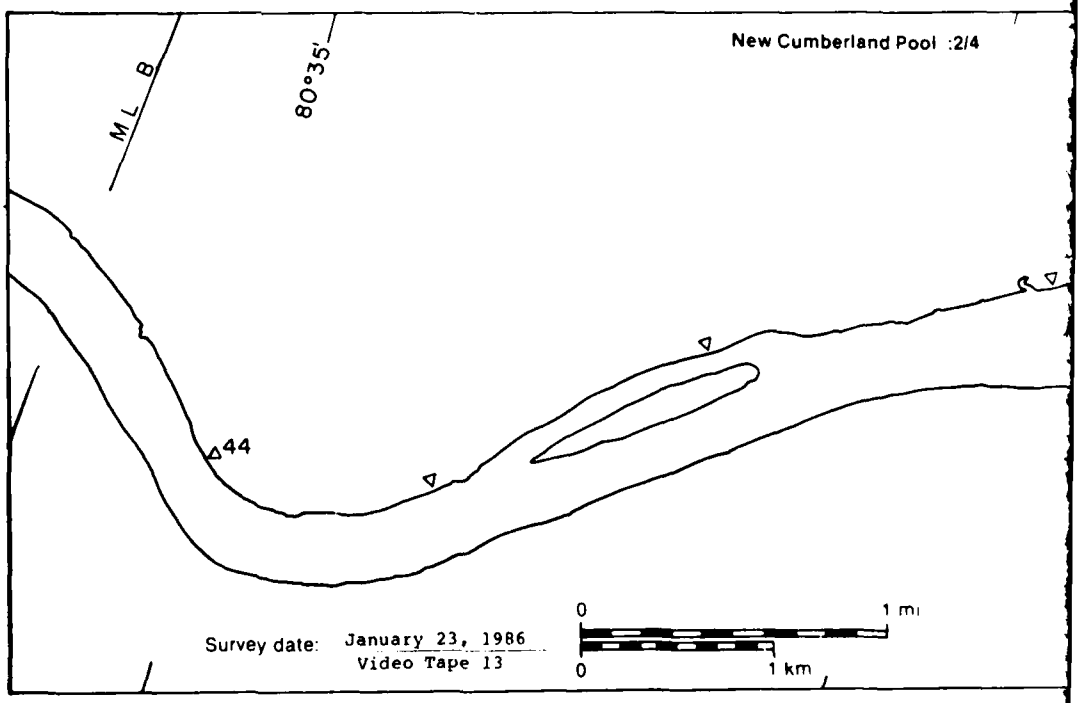
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.78	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.53	1
Total area ($m^2 \times 10^6$)	11.27*	

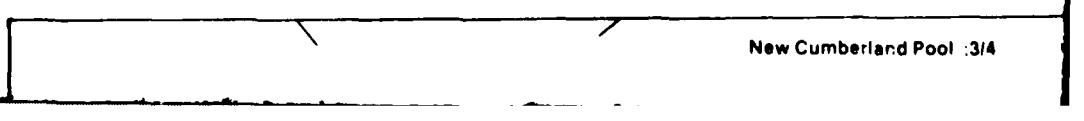
* Includes 6.96×10^6 m^2 of no video coverage


20
No Video Coverage
January 23, 1986
Video Tape 13
1 mi
1 km
ML A
80°15'

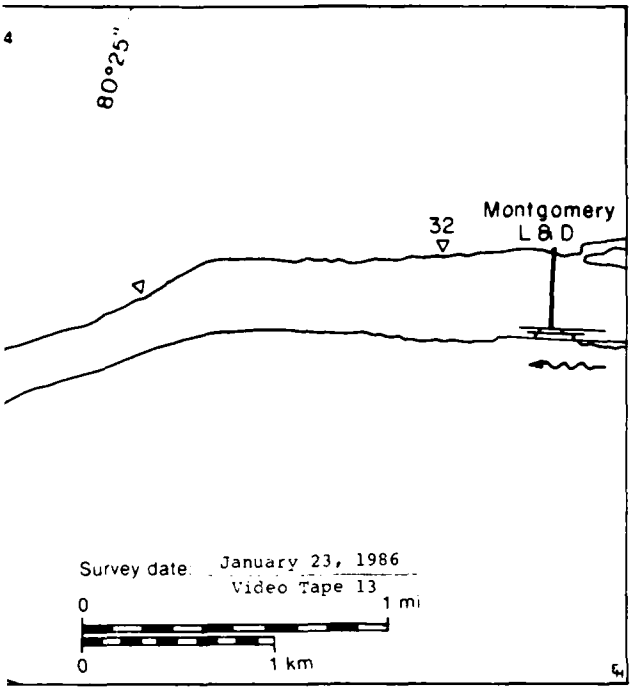

26
ML B
date: January 23, 1986
Video Tape 13

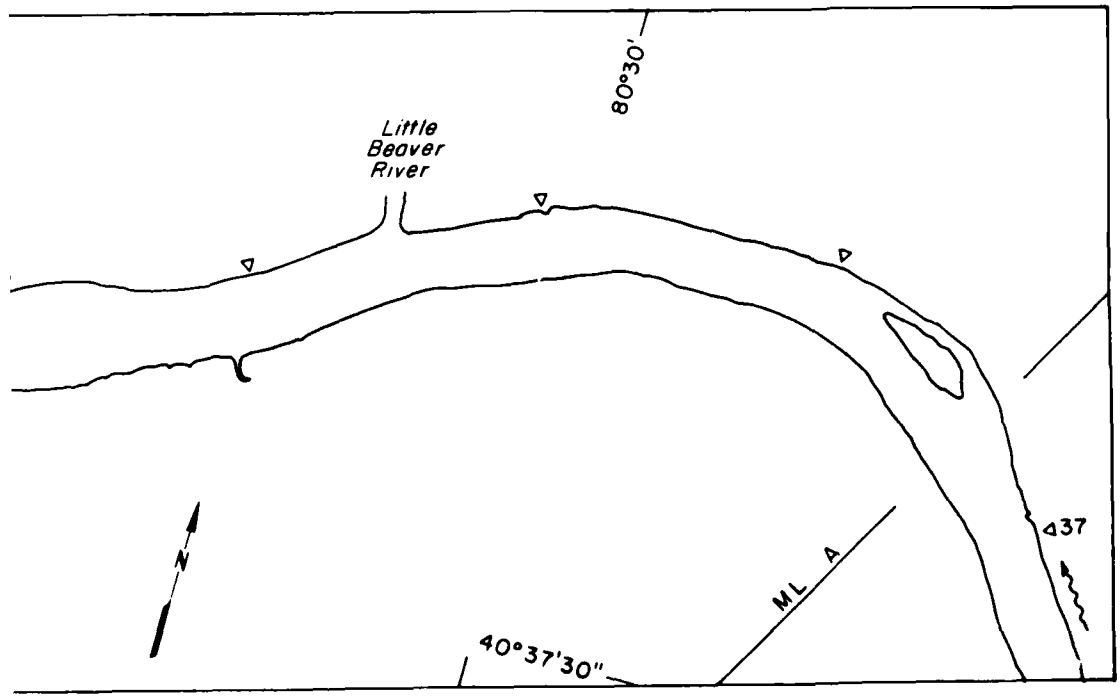

New Cumberland Pool 1 4
N
37
Match Line A
40°37'30"
Phillis Isl.

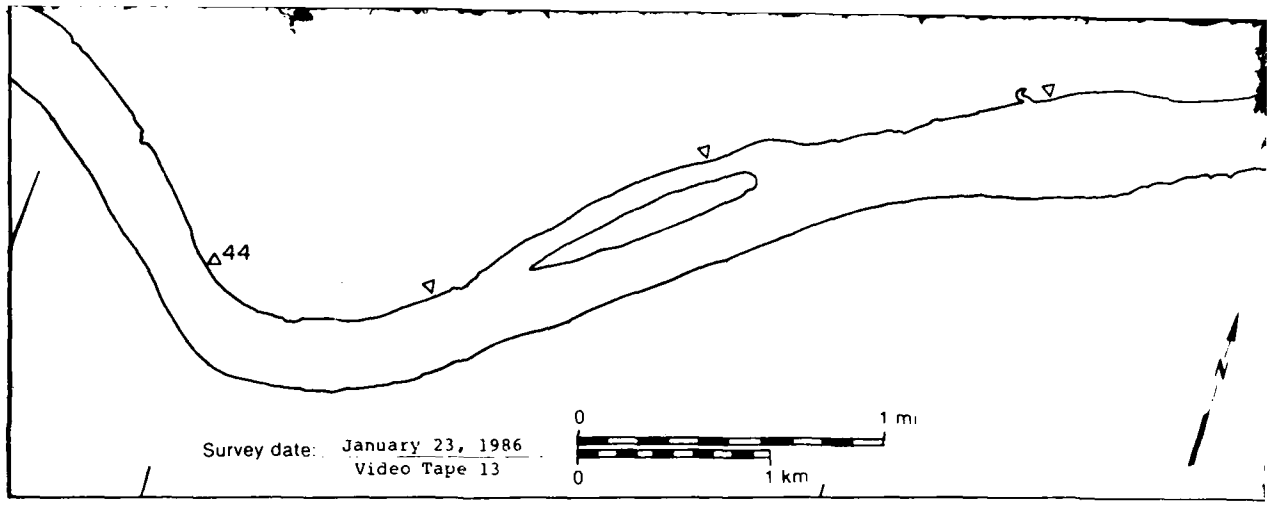

New Cumberland Pool :2/4
M L B
80°35'
44
Survey date: January 23, 1986
Video Tape 13
0
1 mi
0
1 km

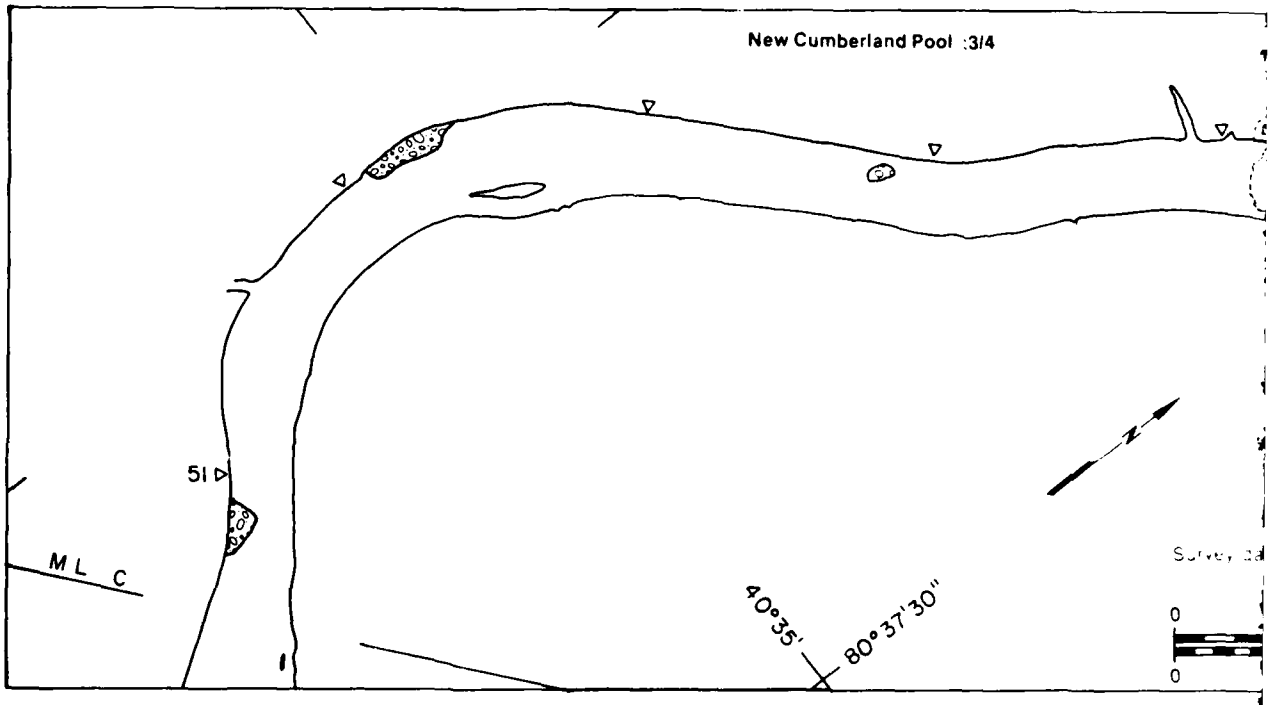

New Cumberland Pool :3/4

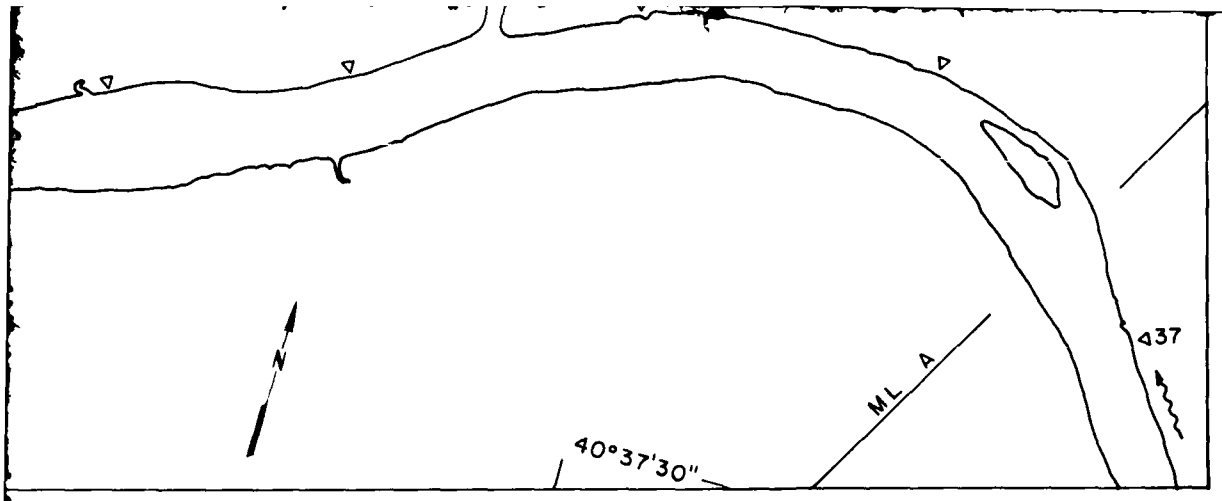
23 January 1986

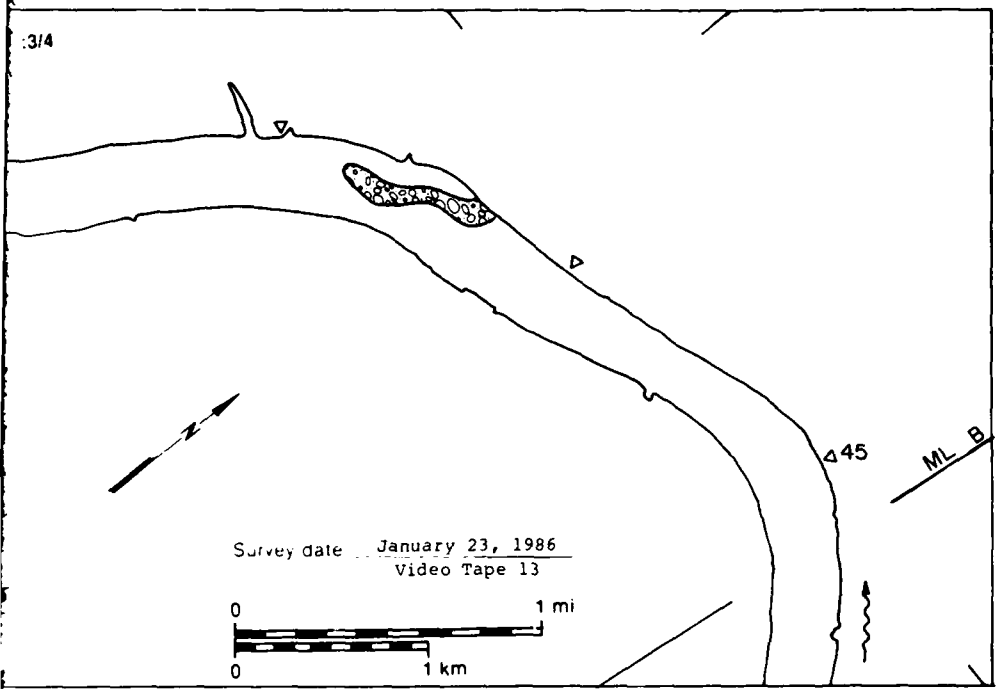




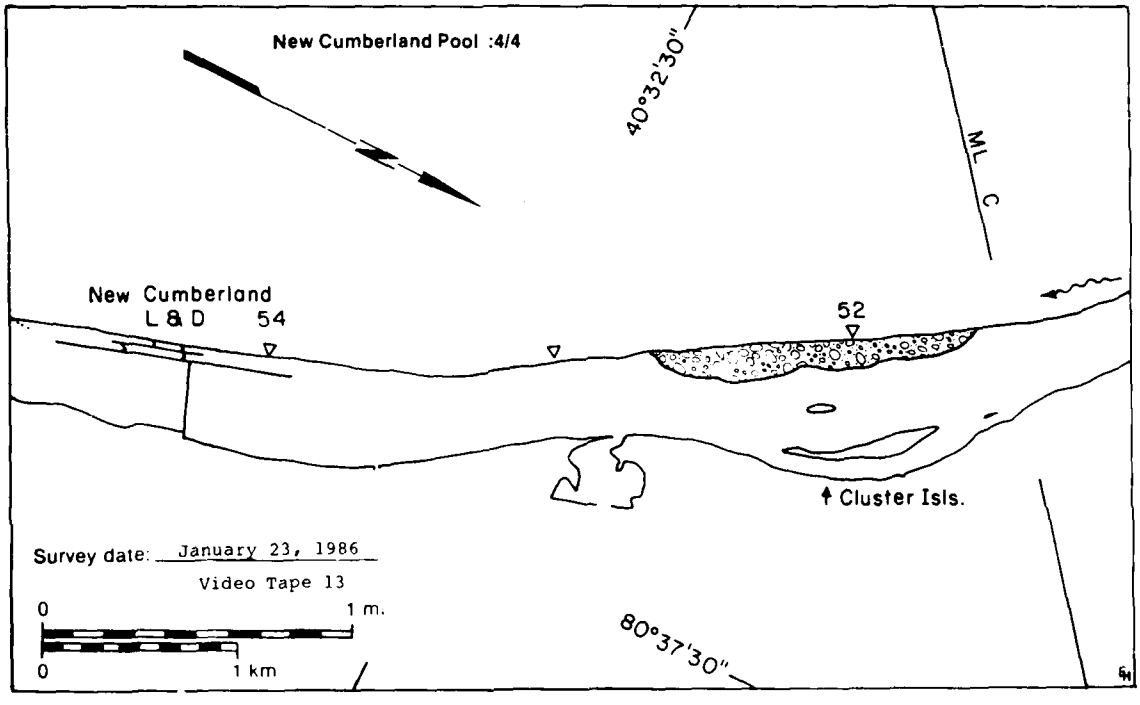

44
Survey date: January 23, 1986
Video Tape 13
0
1 mi
0
1 km

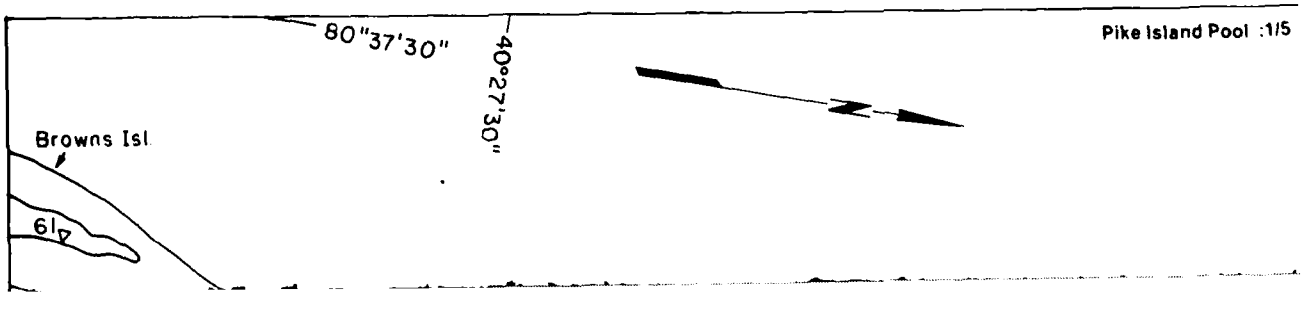

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0


37
ML A
40°37'30"


:3/4
45
ML B
Survey date January 23, 1986
Video Tape 13
0
1 mi
0
1 km

23 January 1986

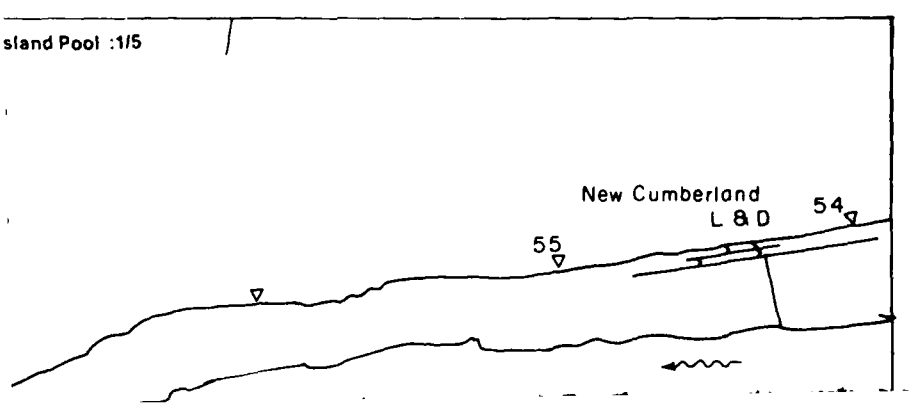


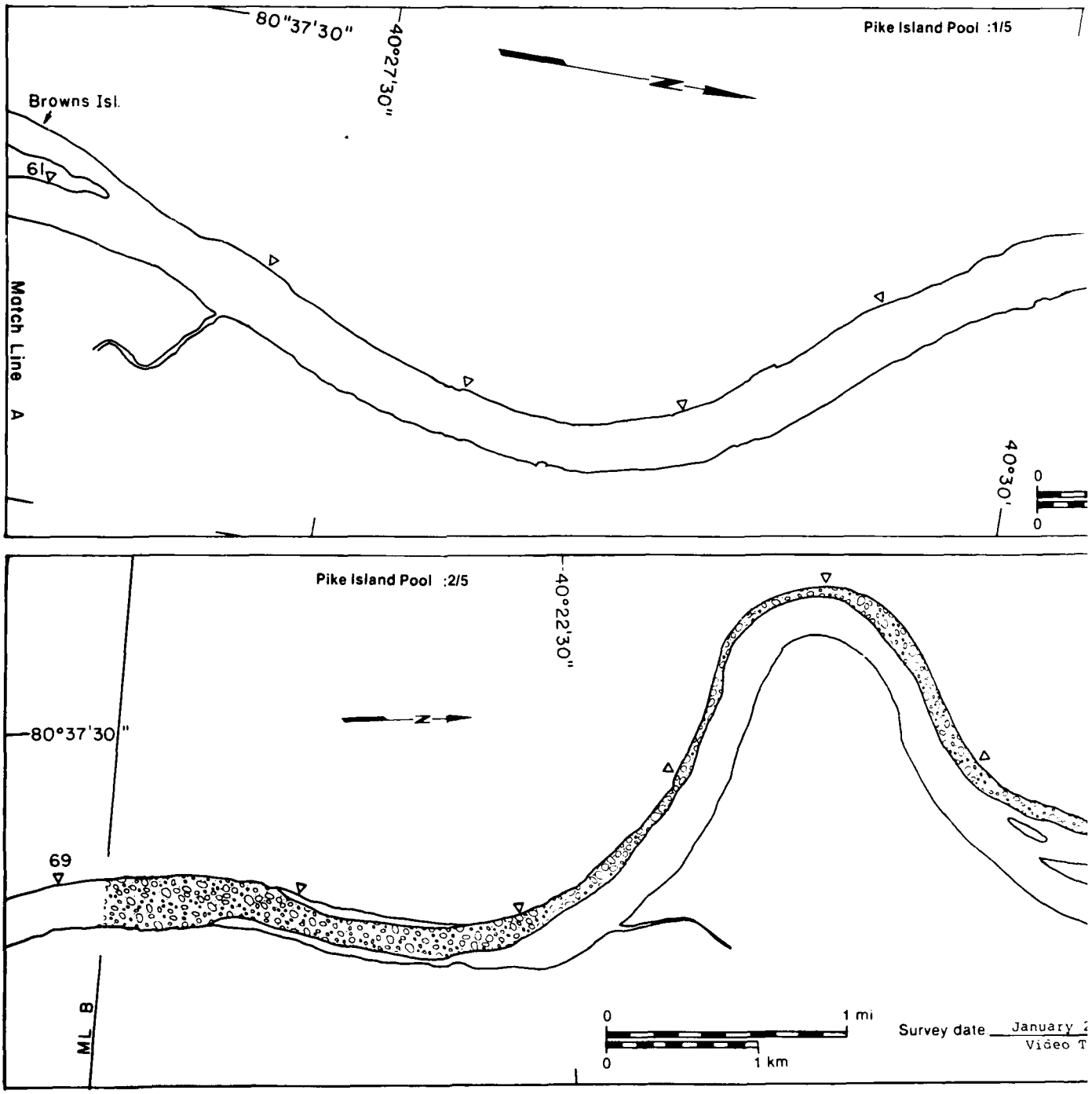


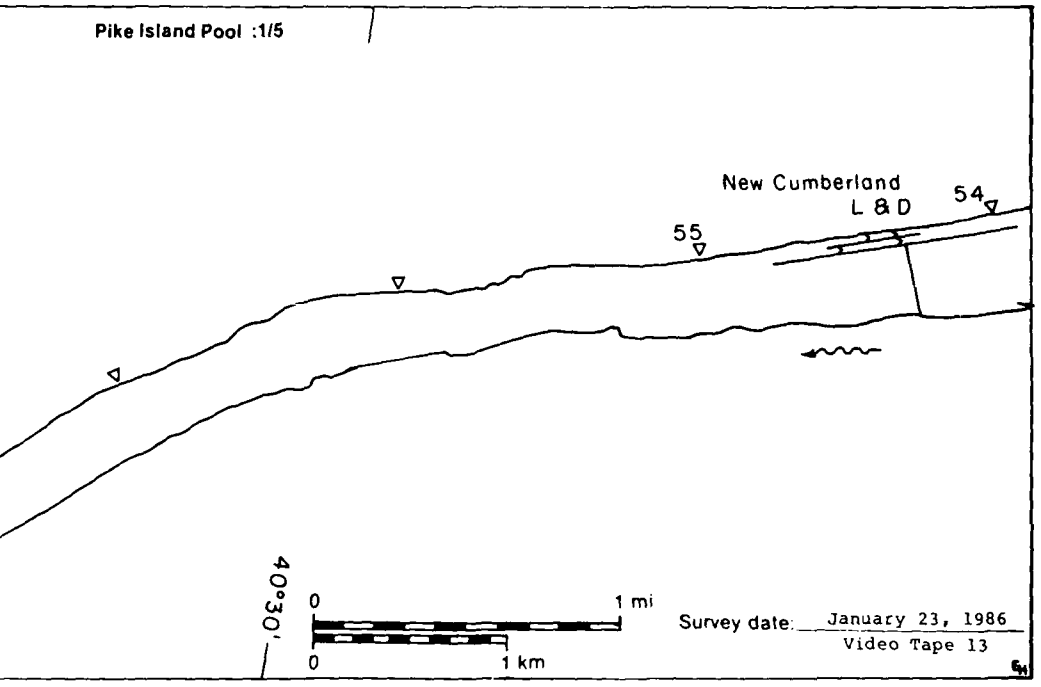
New Cumberland Pool

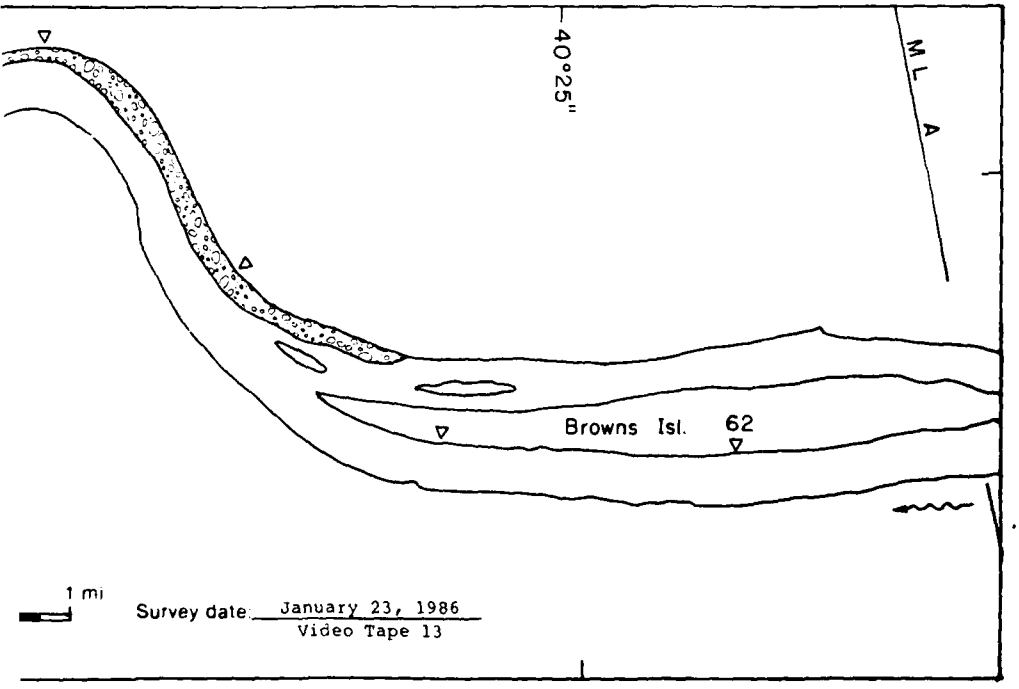
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	14.44	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.43	1
Total area ($m^2 \times 10^6$)	14.87	

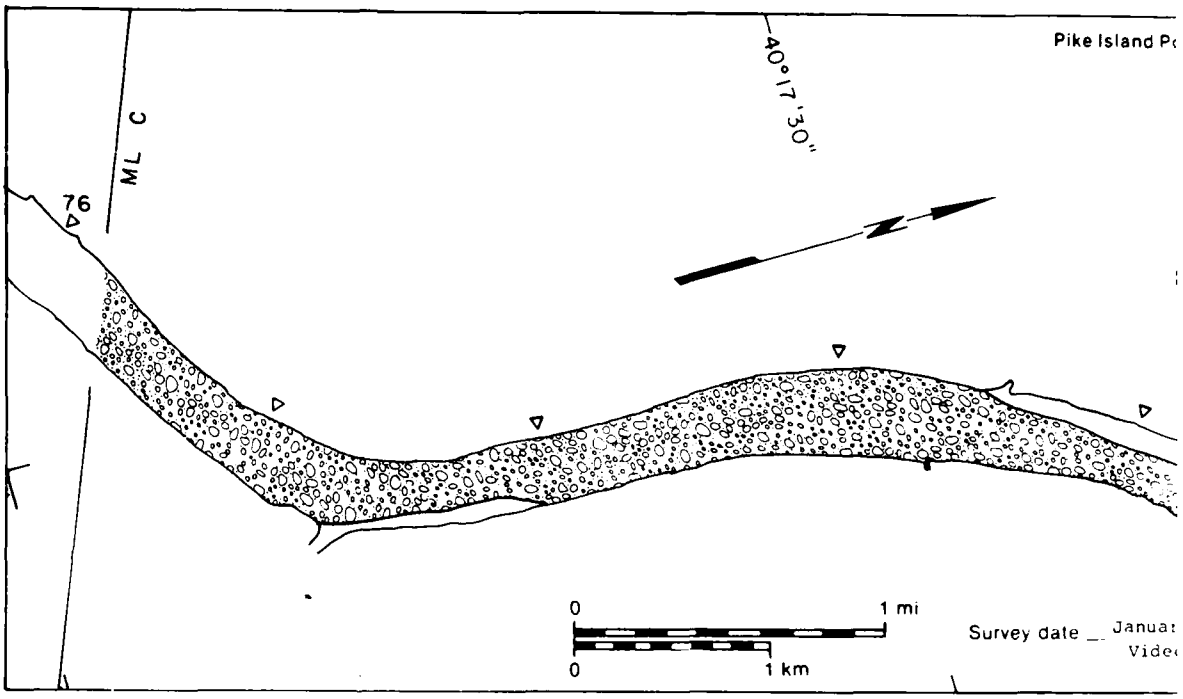
sland Pool :1/5

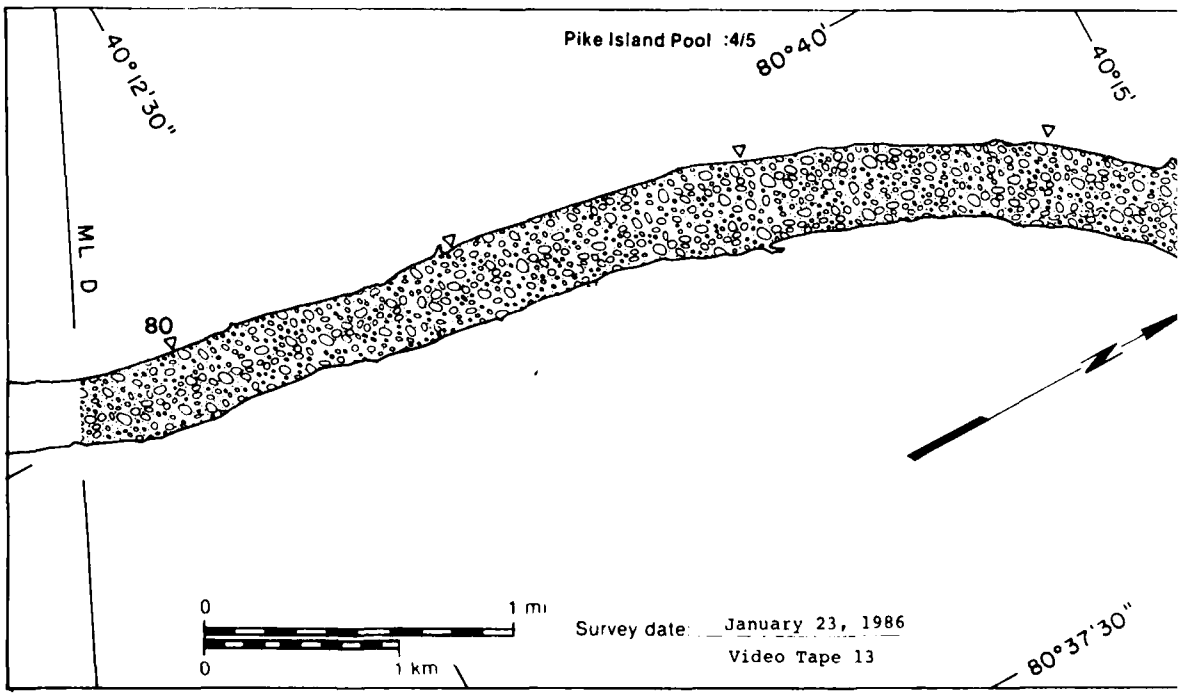


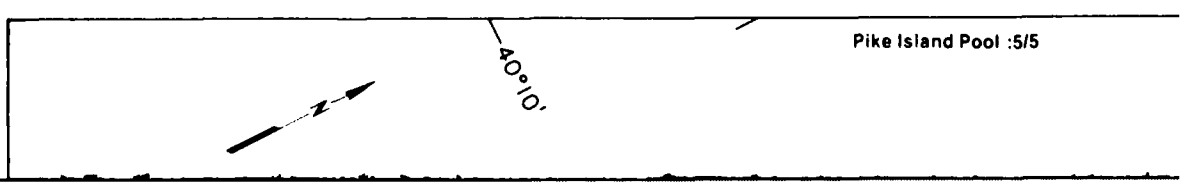

80°37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl.
61
Match Line A
40°30'
0
0
Pike Island Pool :2/5
40°22'30"
80°37'30"
69
ML B
0
1 mi
0
1 km
Survey date January 2
Video T


Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date: January 23, 1986
Video Tape 13

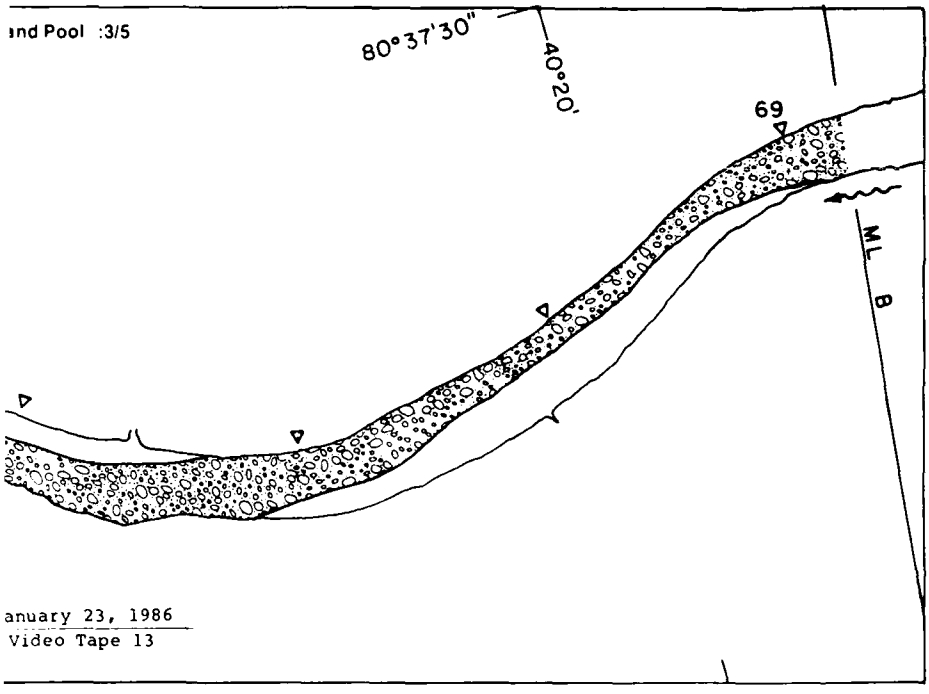

40°25"
M L A
Browns Isl.
62
1 mi
Survey date: January 23, 1986
Video Tape 13

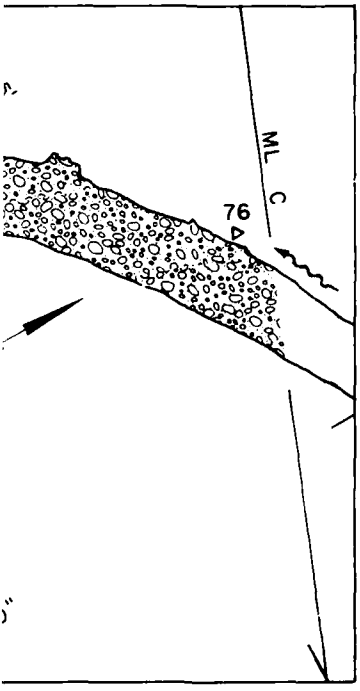

Pike Island Po
40°17'30"
ML C
76
0
1 mi
0
1 km
Survey date __ Januar
Vide

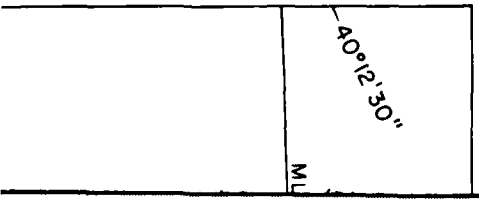

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
0
1 mi
0
1 km
Survey date: January 23, 1986
Video Tape 13
80°37'30"

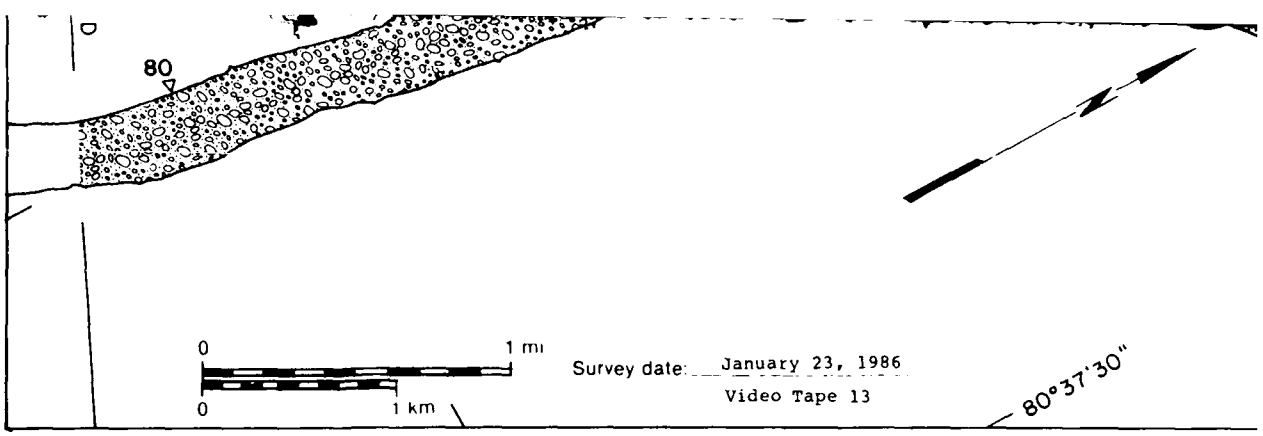

Pike Island Pool :5/5
40°10'

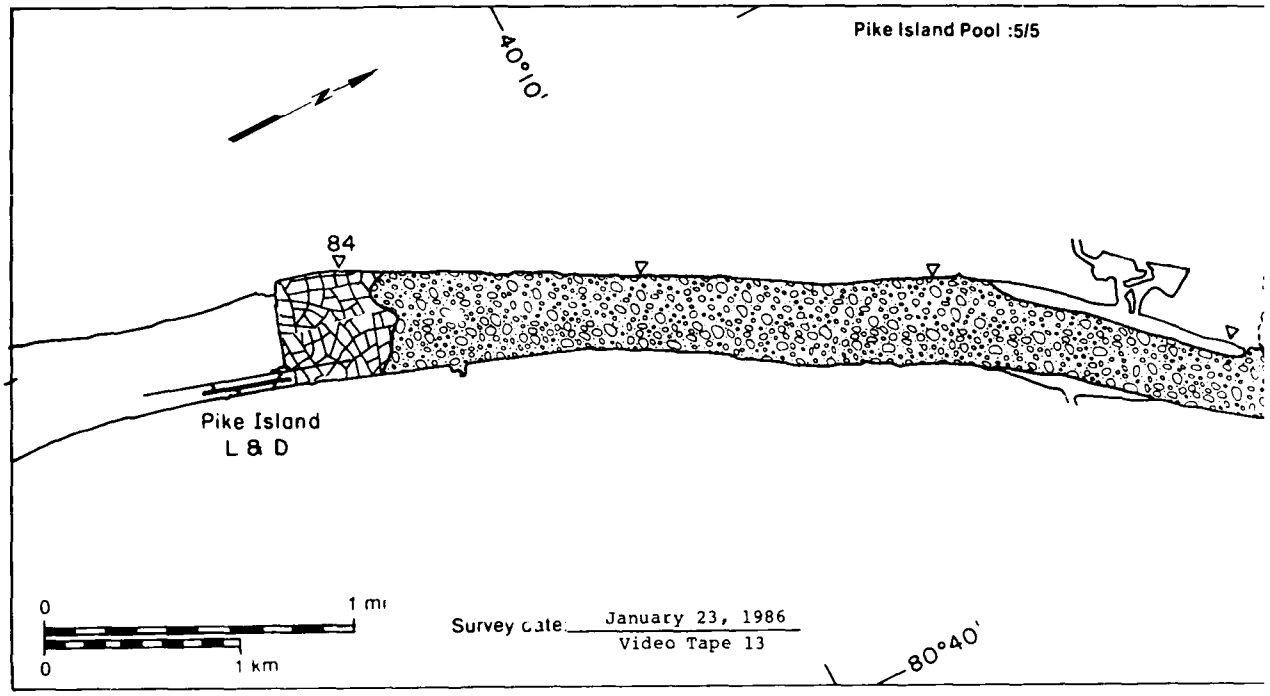
23 January 1986







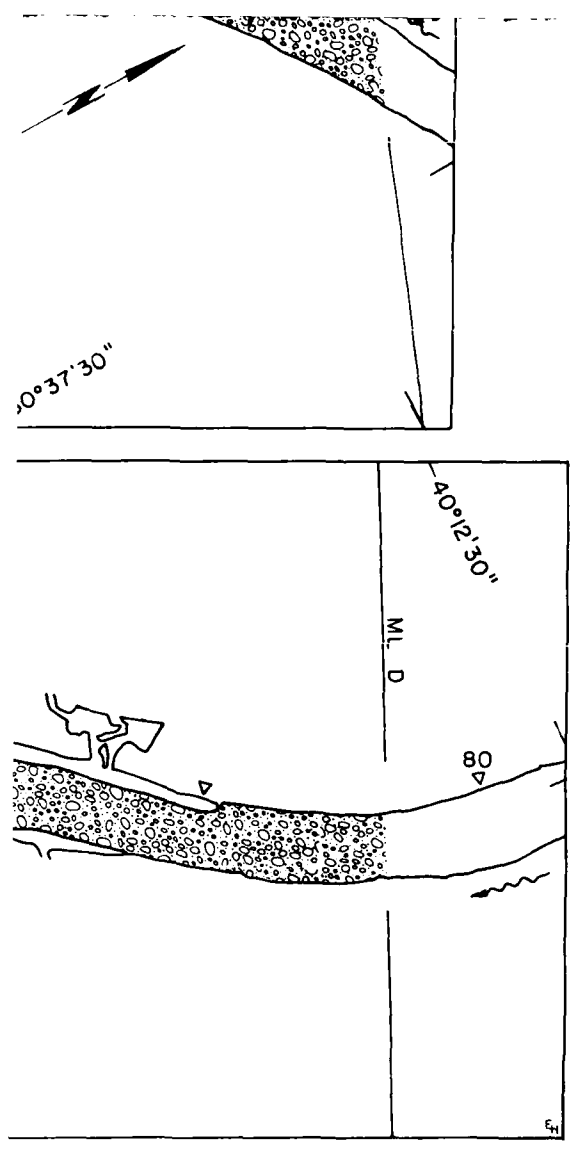




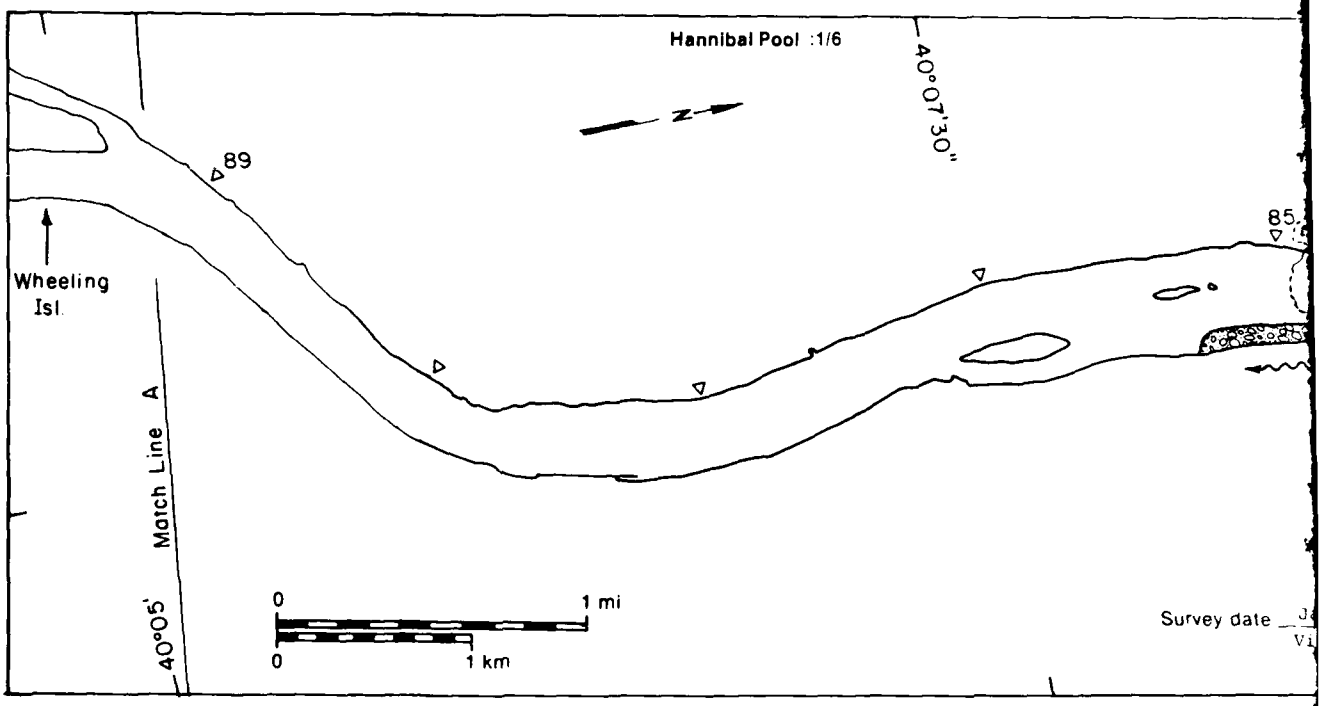
Pike Island Pool

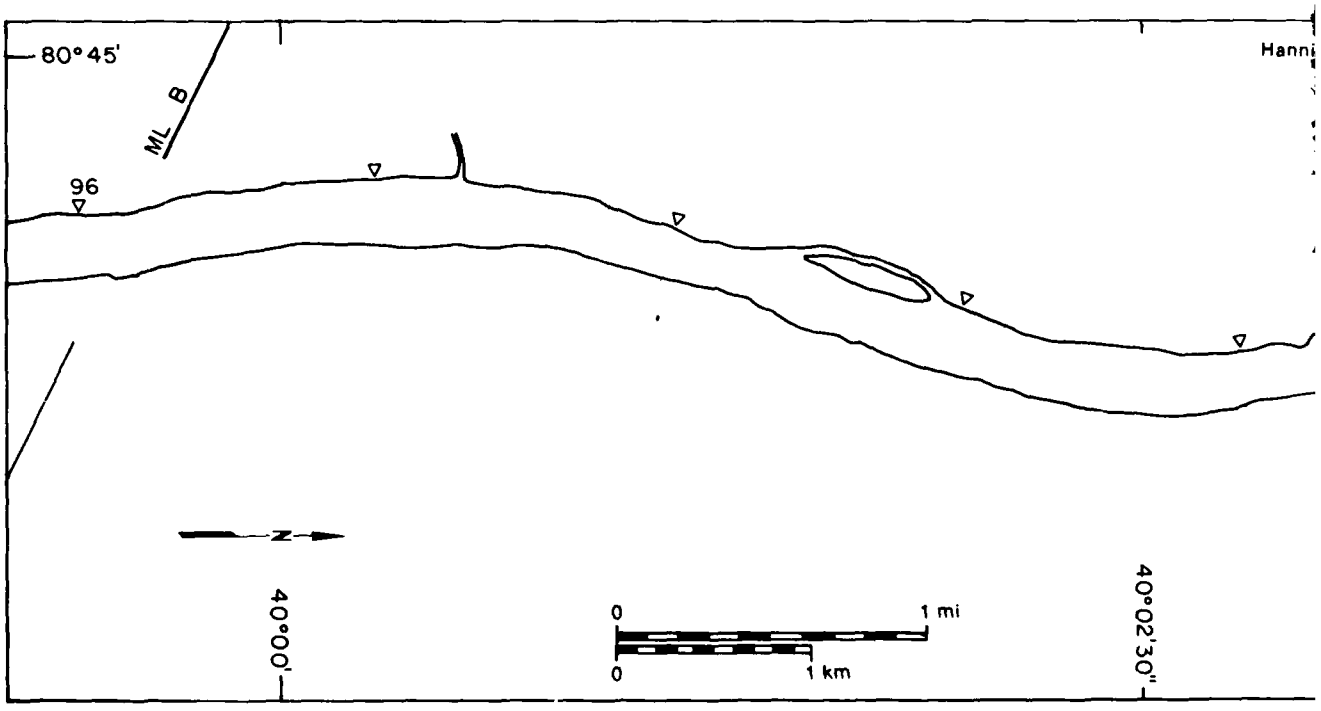
MAP UNITS

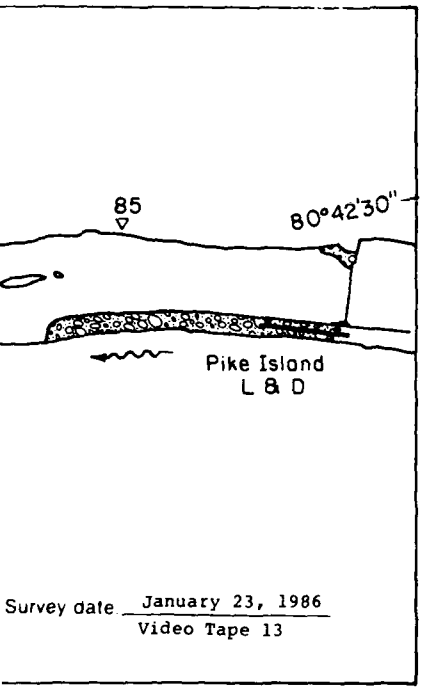
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.96	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.33	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	9.63	20
Total area ($m^2 \times 10^6$)	18.92	


40°37'30"
40°12'30"
ML D
80

23 January 1986

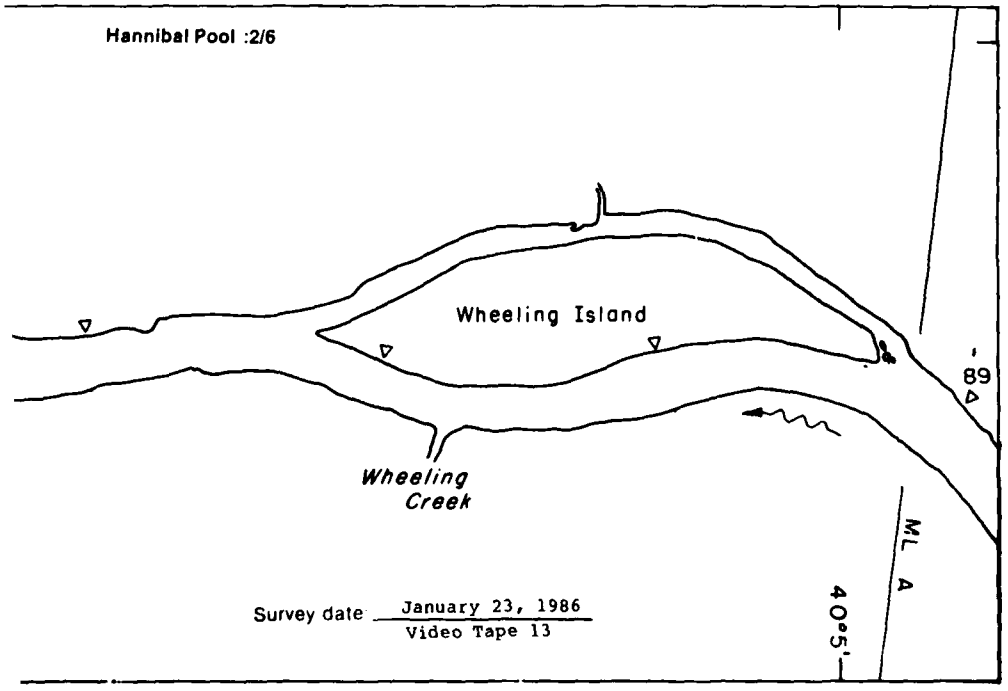




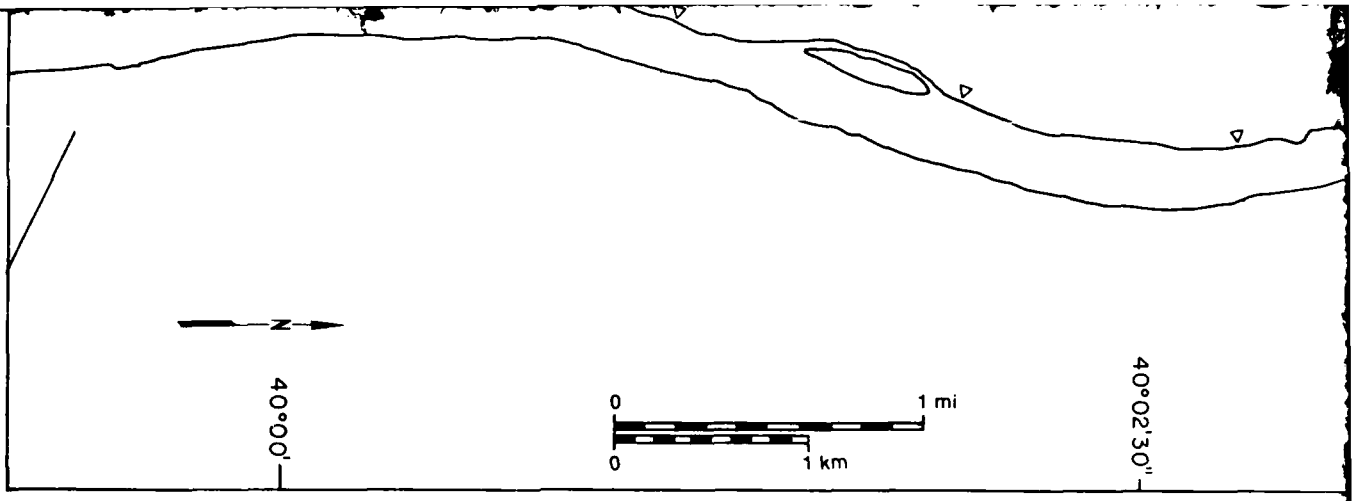


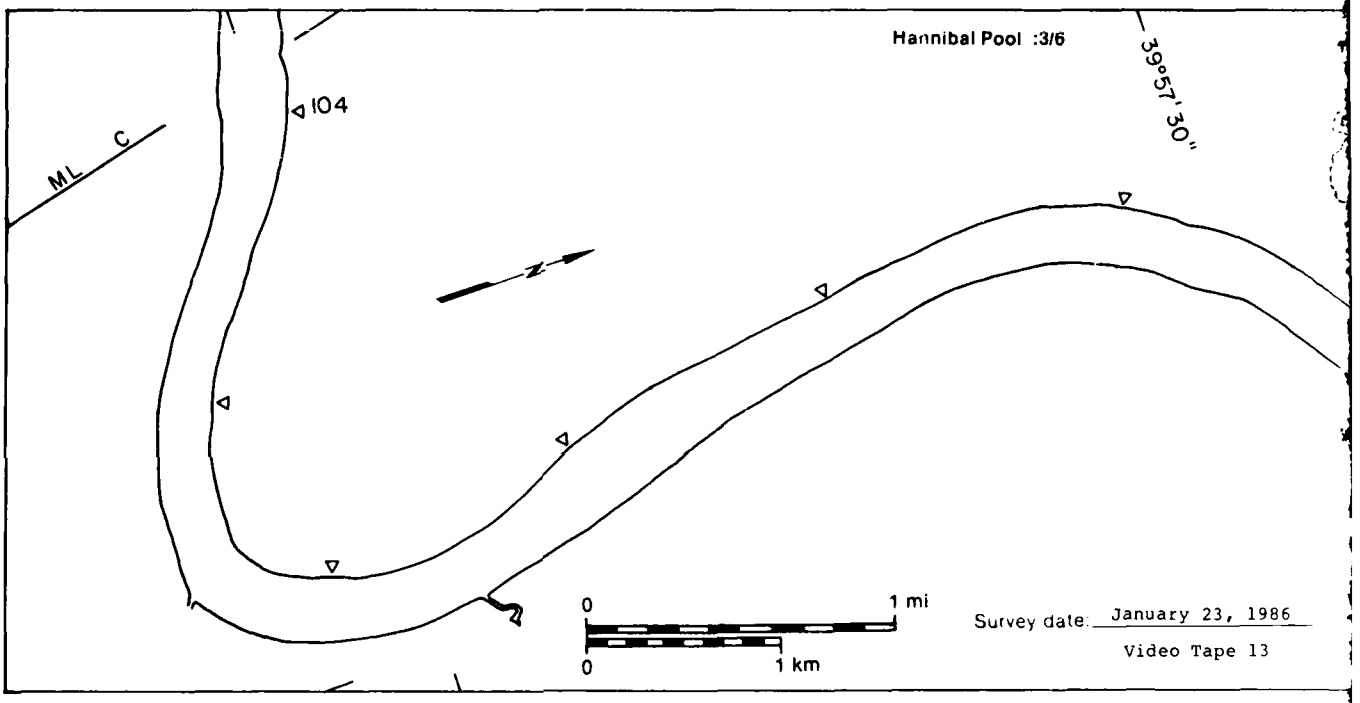
Survey date January 23, 1986
Video Tape 13

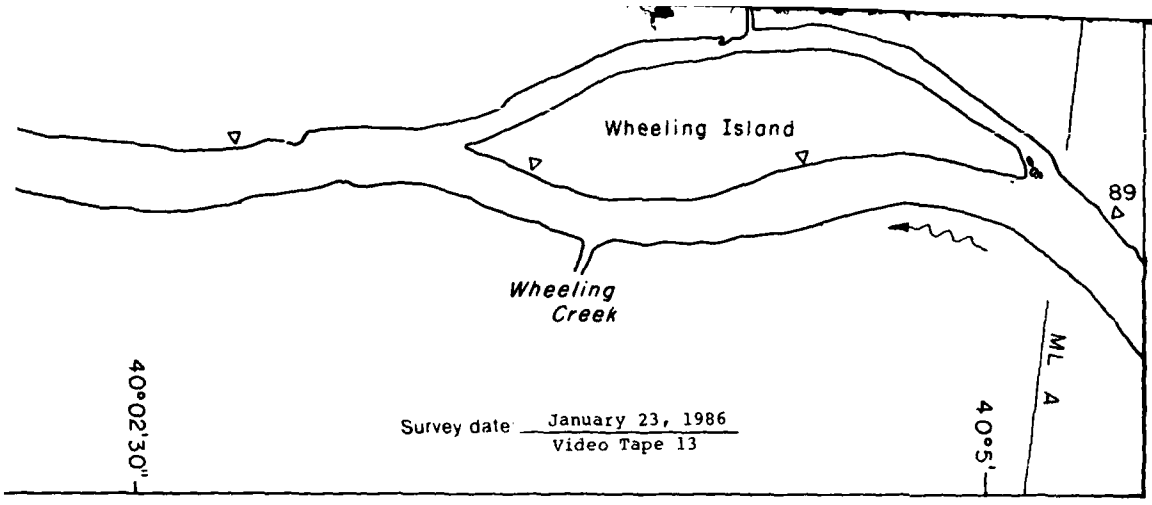
Hannibal Pool :2/6

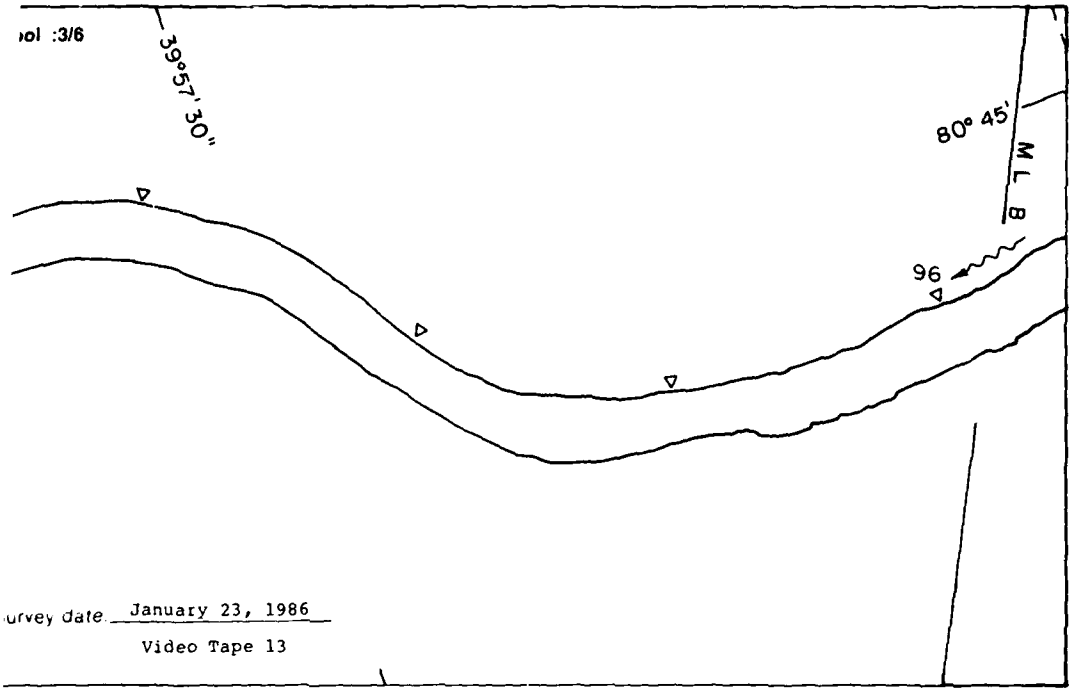


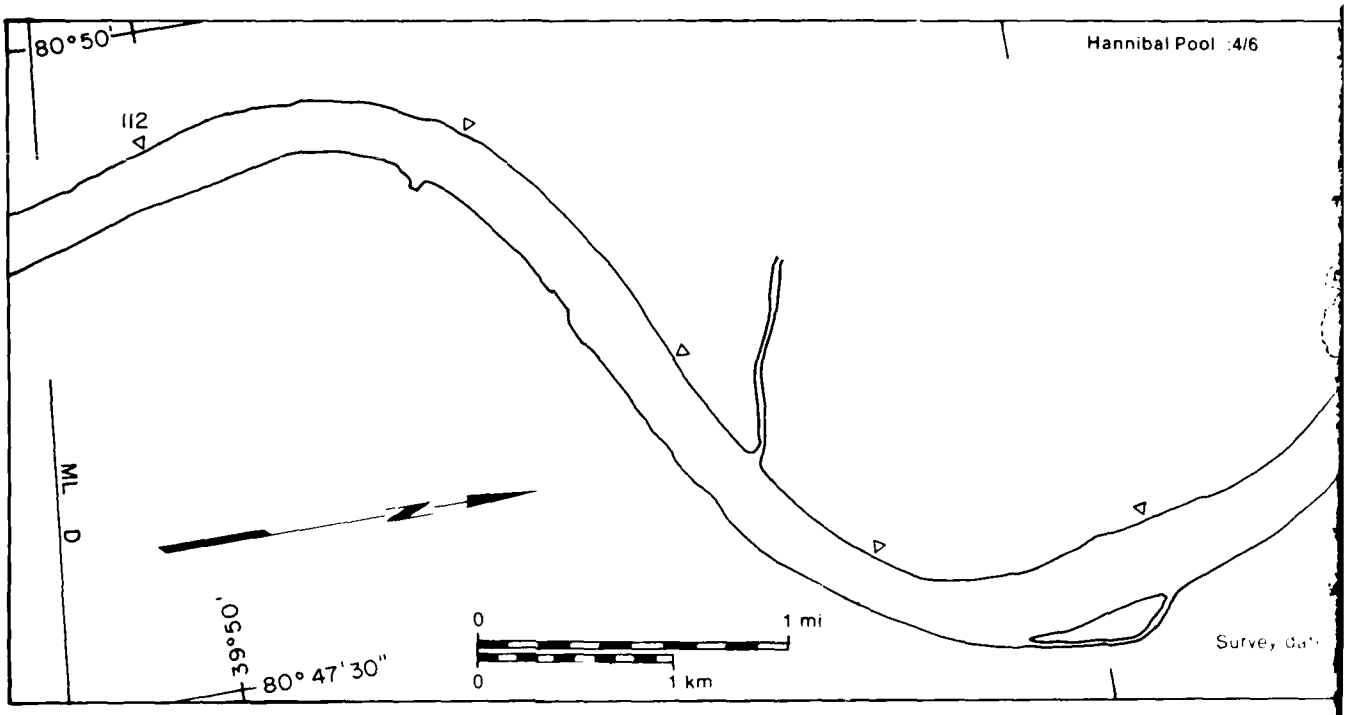
Survey date January 23, 1986
Video Tape 13

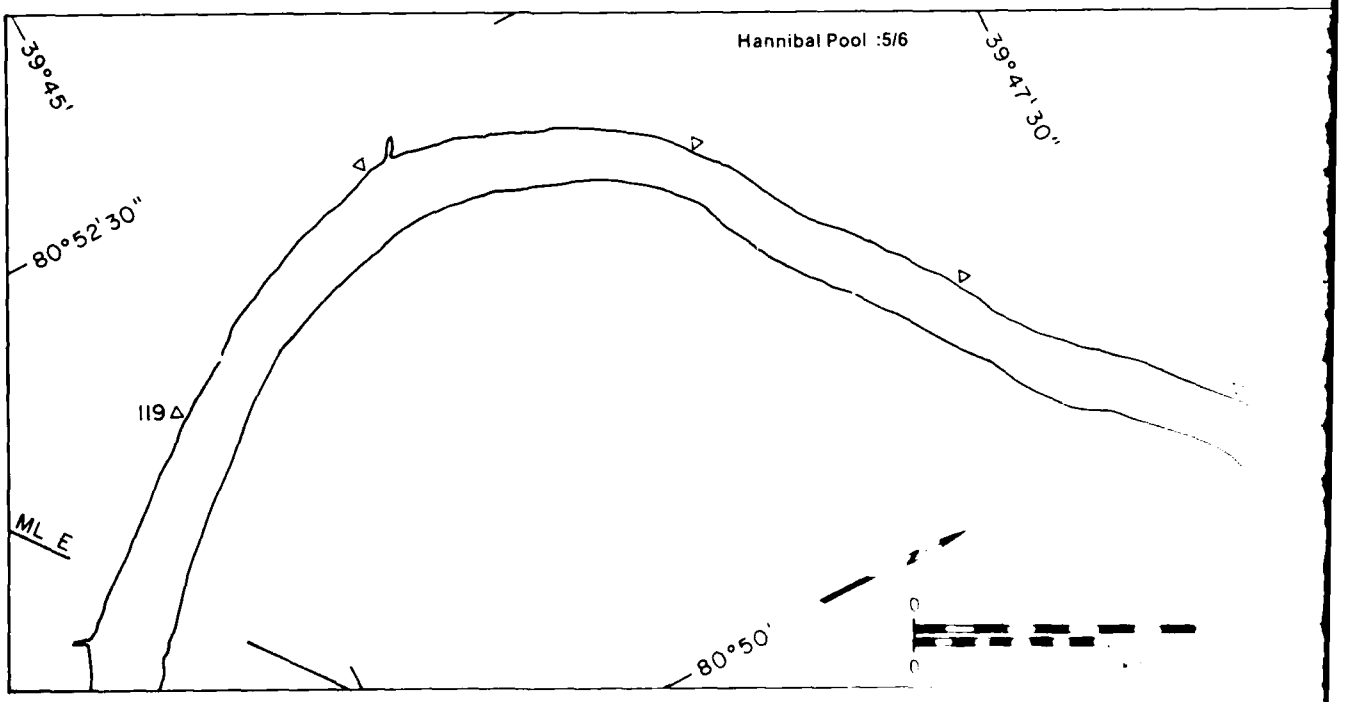

N
40°00'
0
1 mi
0
1 km
40°02'30"

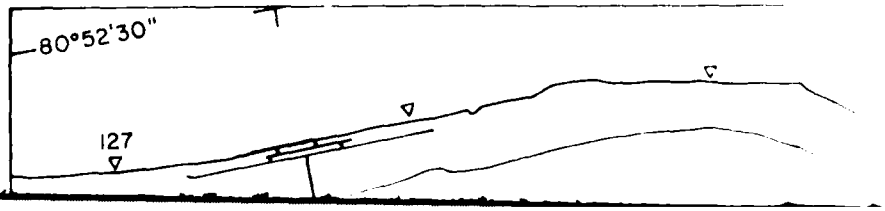

Hannibal Pool :3/6
39°57'30"
104
ML
C
N
0
1 mi
0
1 km
Survey date: January 23, 1986
Video Tape 13


Wheeling Island
89
Wheeling
Creek
ML 4
40°02'30"
40°5'
Survey date January 23, 1986
Video Tape 13


ol :3/6
39°57'30"
80° 45'
ML 8
96
urvey date January 23, 1986
Video Tape 13

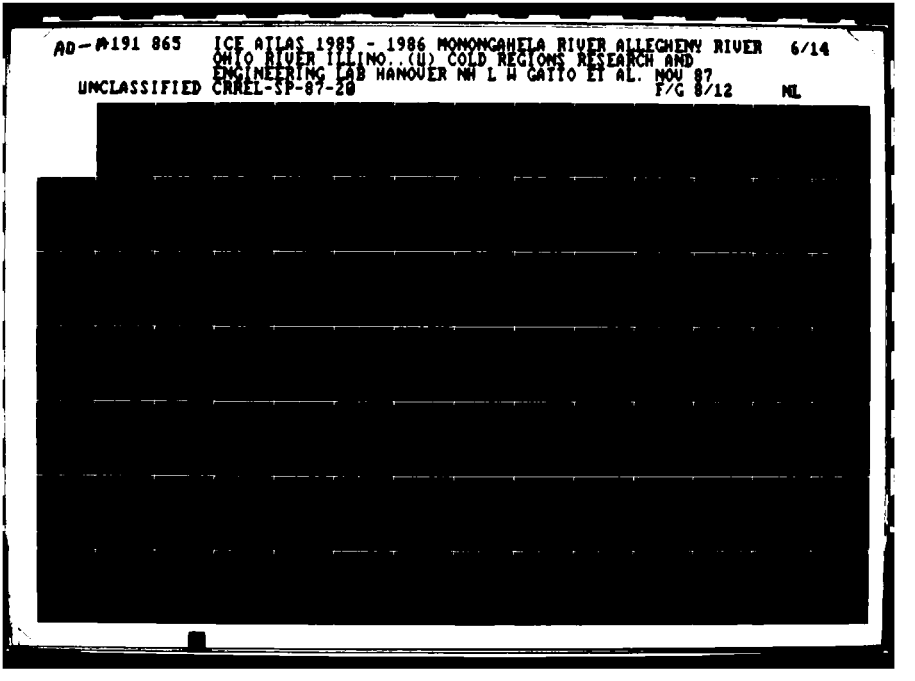

80°50'
Hannibal Pool :4/6
112
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km

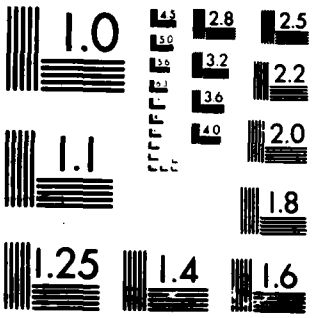

Hannibal Pool :5/6
39°45'
39°47'30"
80°52'30"
119
ML E
80°50'


80°52'30"
127

AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 6/14

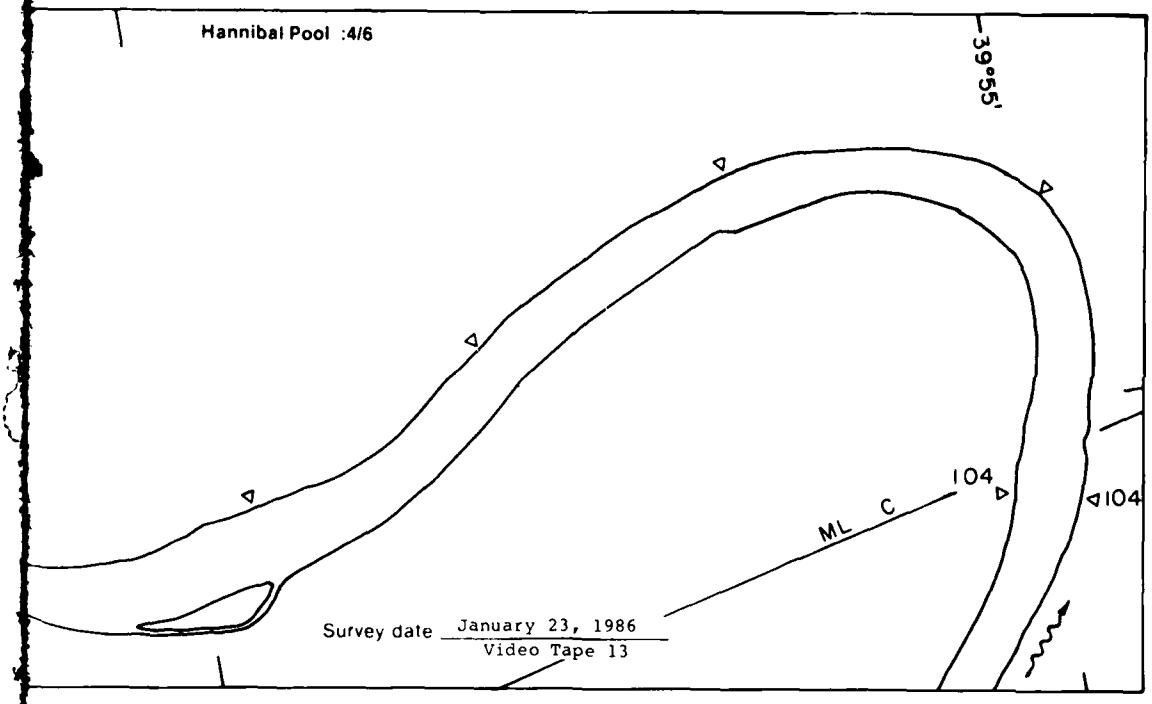
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

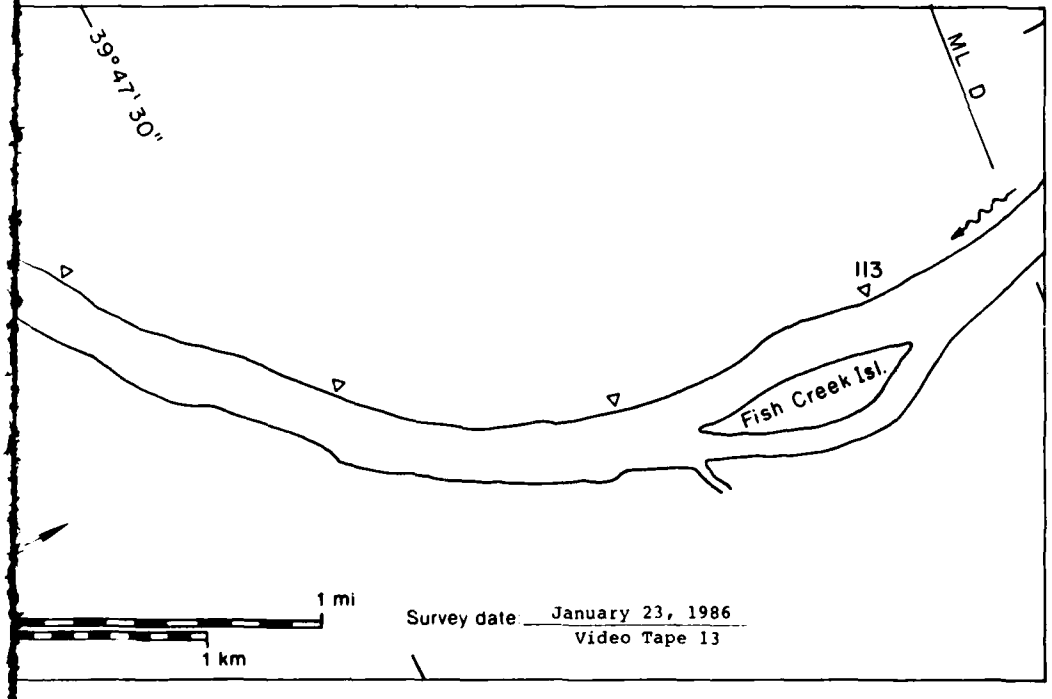


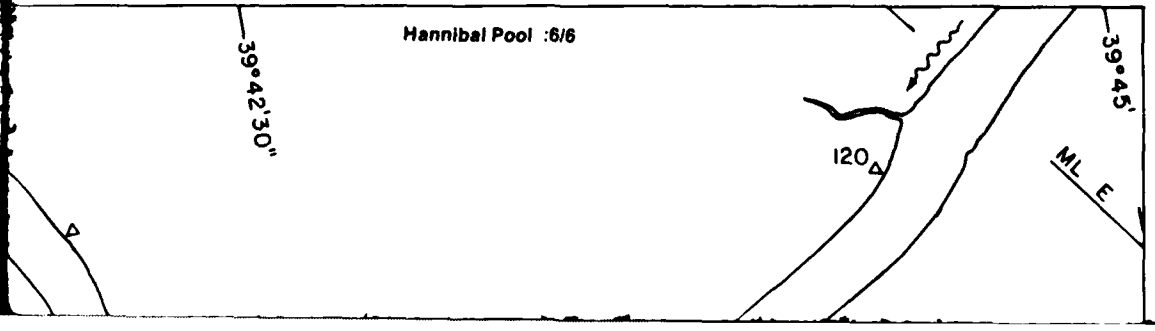

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6

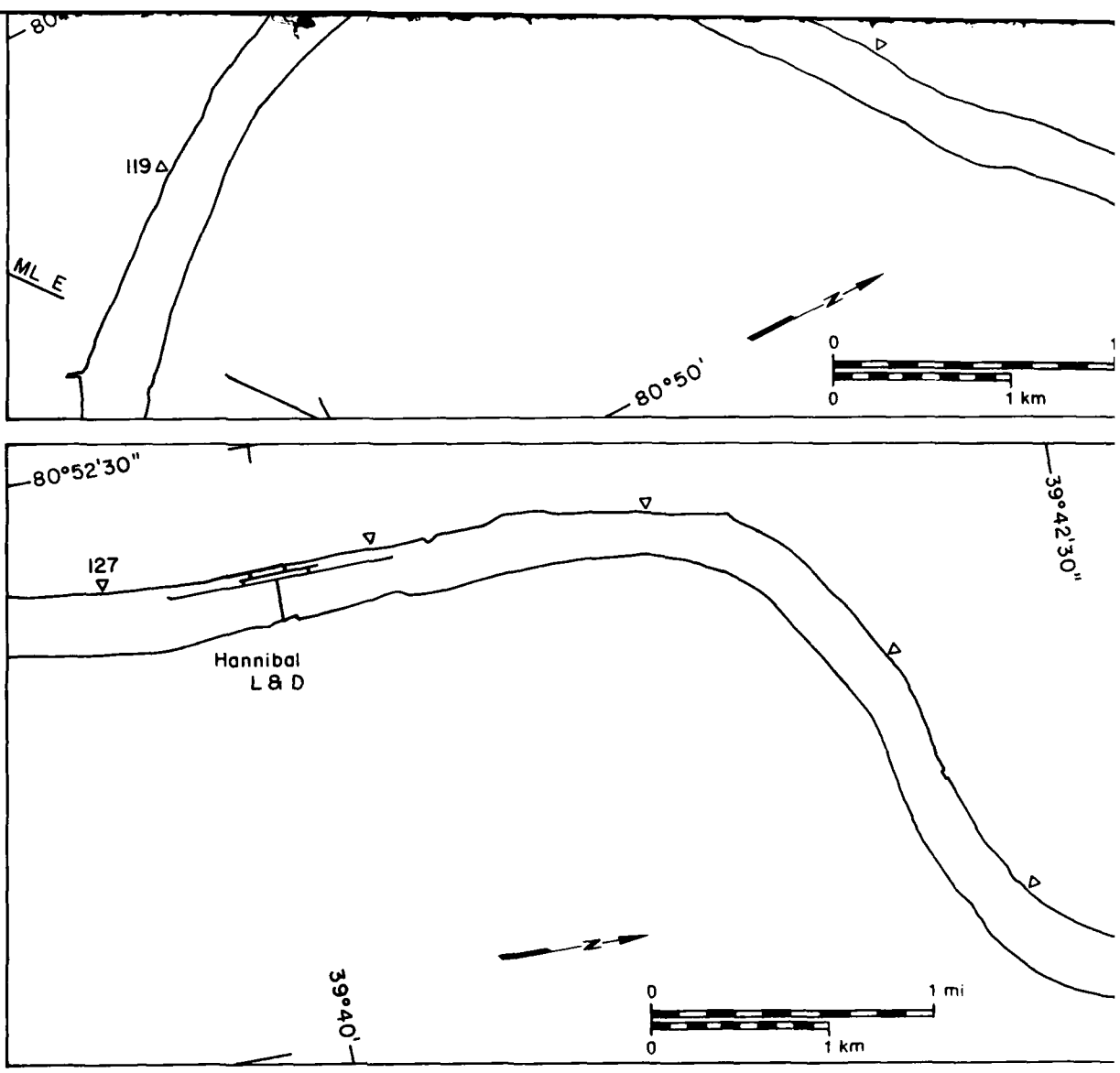
T3

23 January 1986



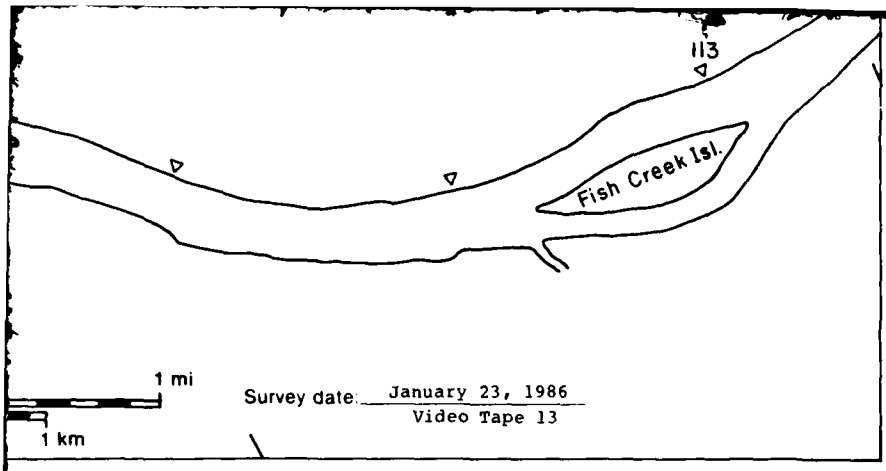


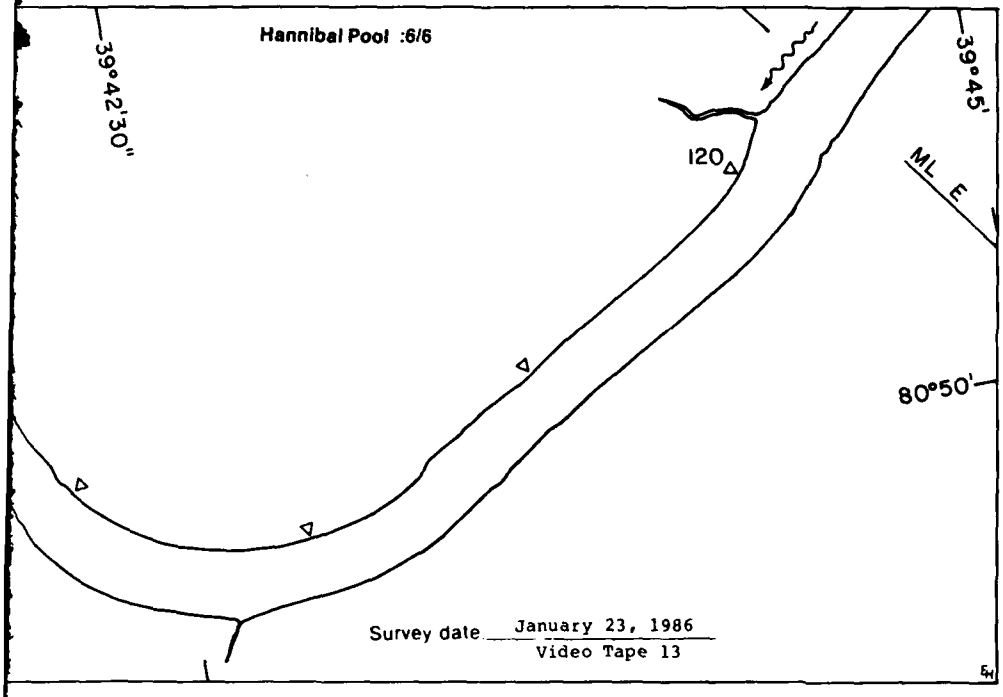


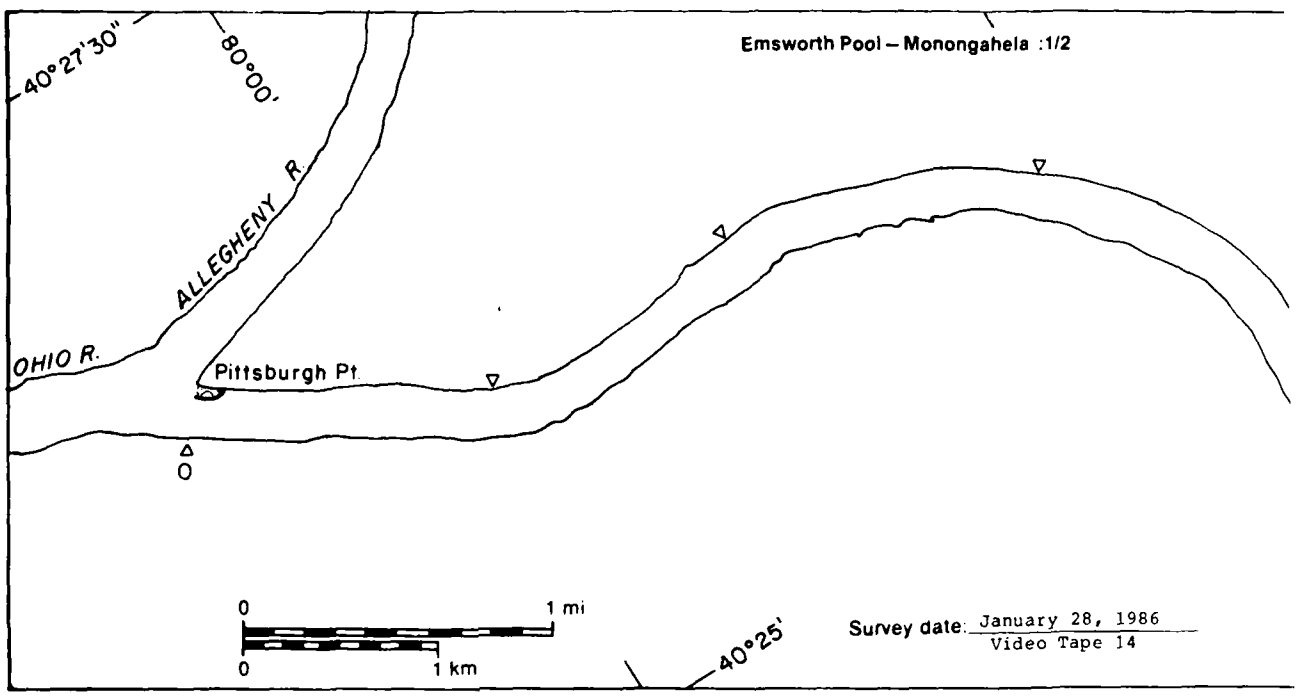


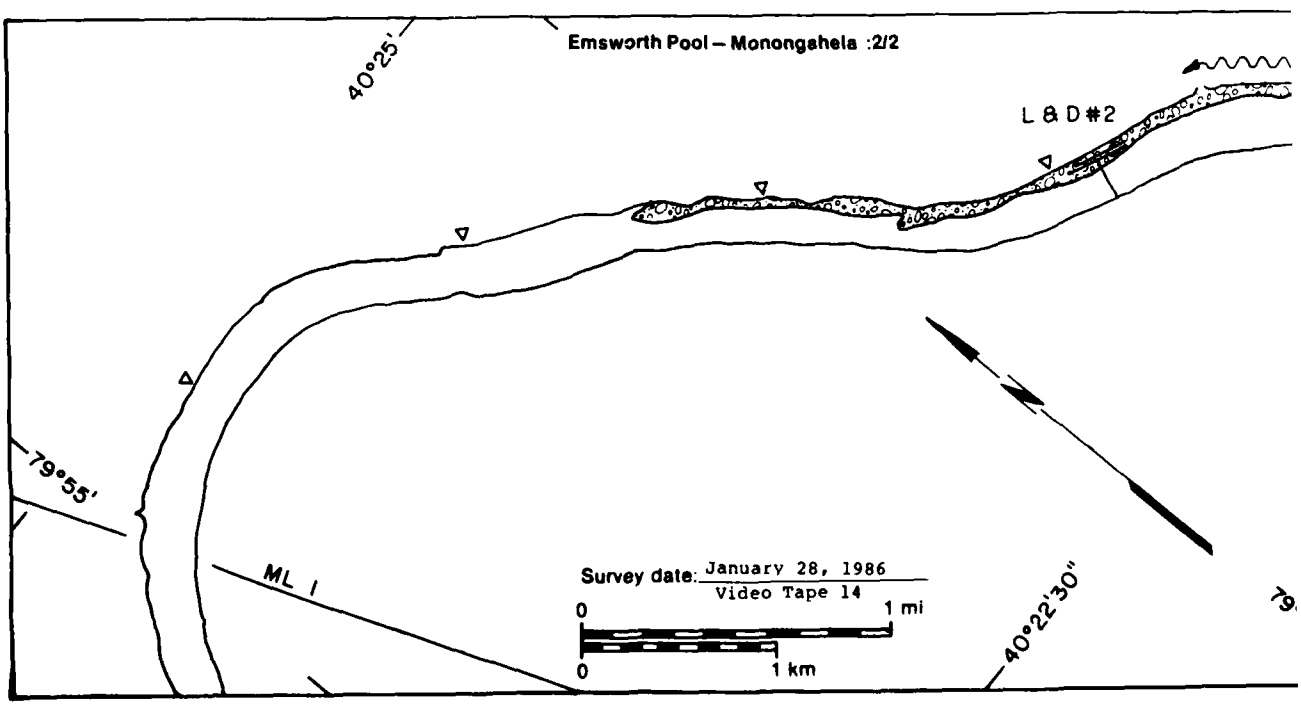
Hannibal Pool

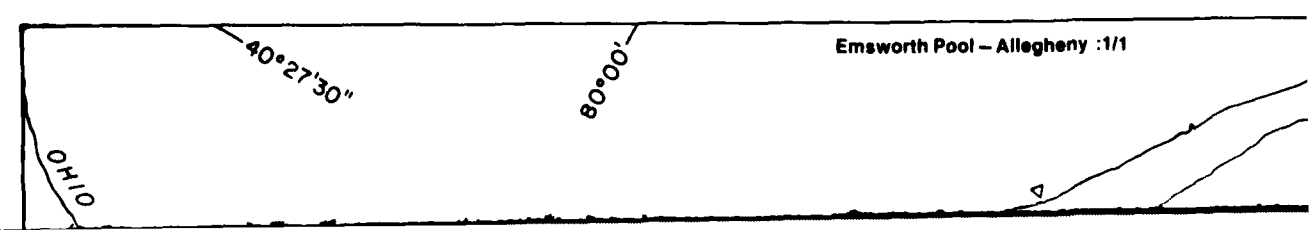
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	22.31	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.15	20
Total area (m^2 x 10^6)	22.46	


113
Fish Creek Isl.
1 mi
1 km
Survey date: January 23, 1986
Video Tape 13

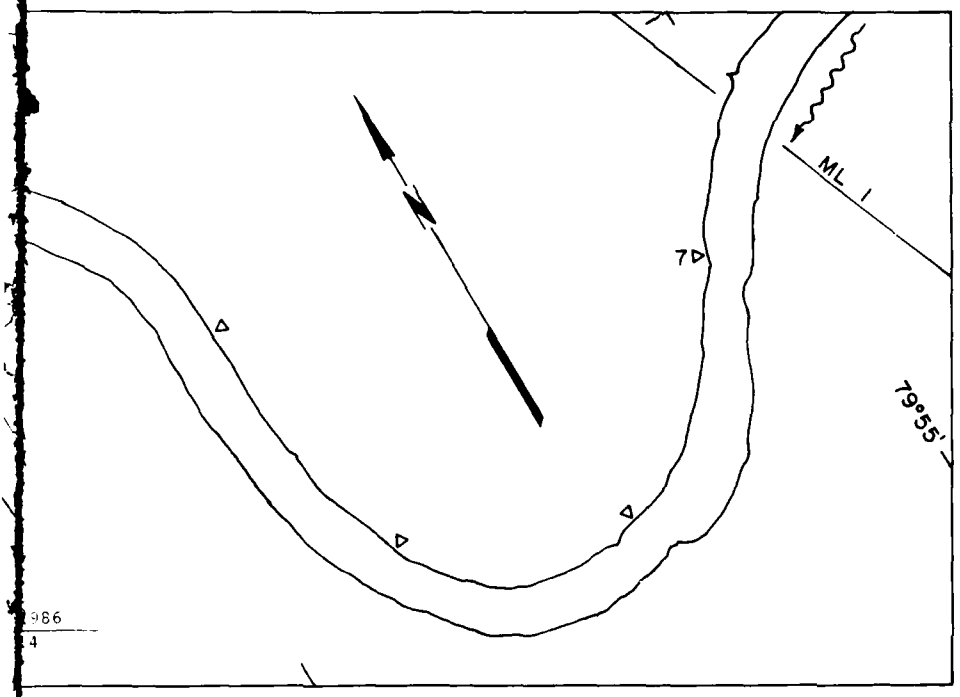

Hannibal Pool :6/6
39°42'30"
39°45'
120
ML E.
80°50'
Survey date: January 23, 1986
Video Tape 13

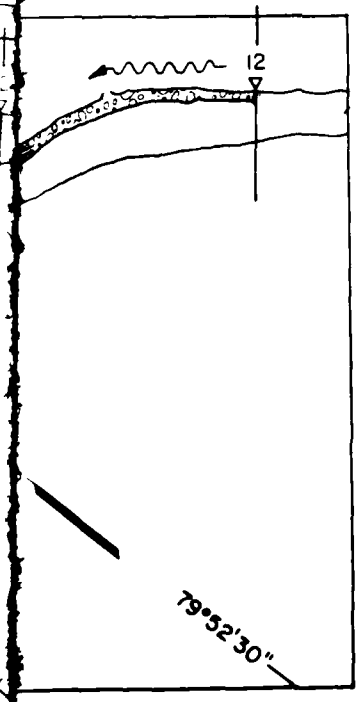

Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: January 28, 1986
Video Tape 14


Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
79°55'
ML 1
Survey date: January 28, 1986
Video Tape 14
0
1 mi
0
1 km
40°22'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'
OHIO

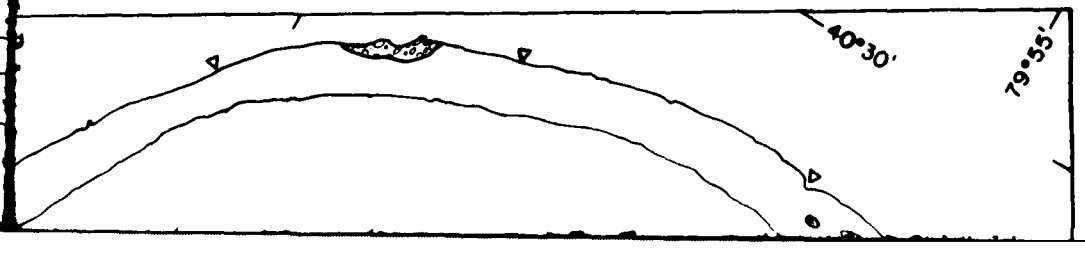
28 January 1986

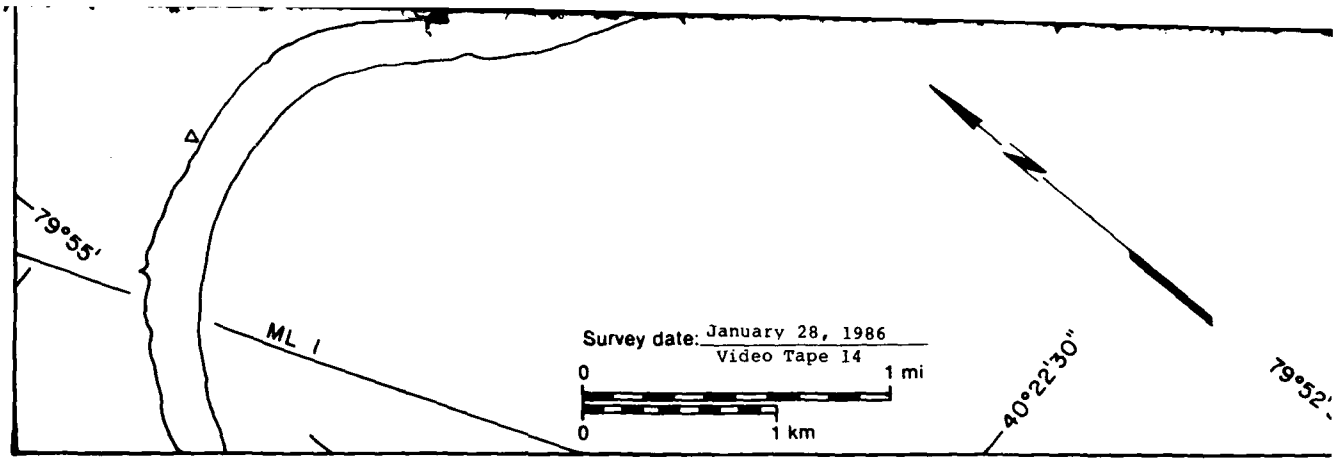


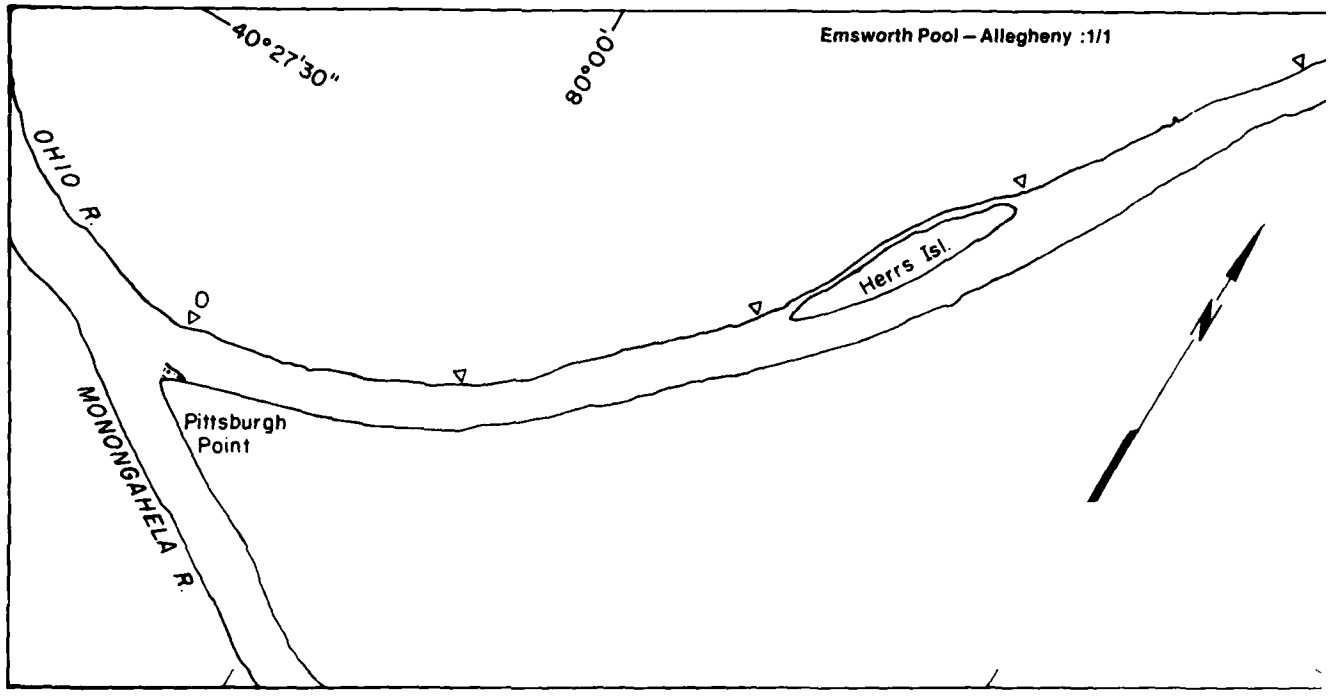


Emsworth Pool – Monongahela

MAP UNIT	Area (m^2 x 10^6)	
Open water	4.90	NA
[illegible]	0.00	NA
[illegible] with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes of [illegible] and plains	0.26	20
Total area (m^2 x 10^6)	5.16	

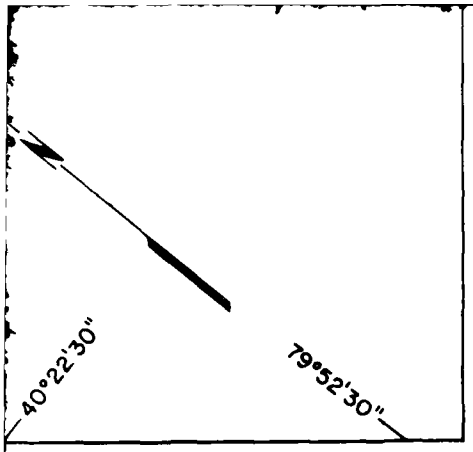




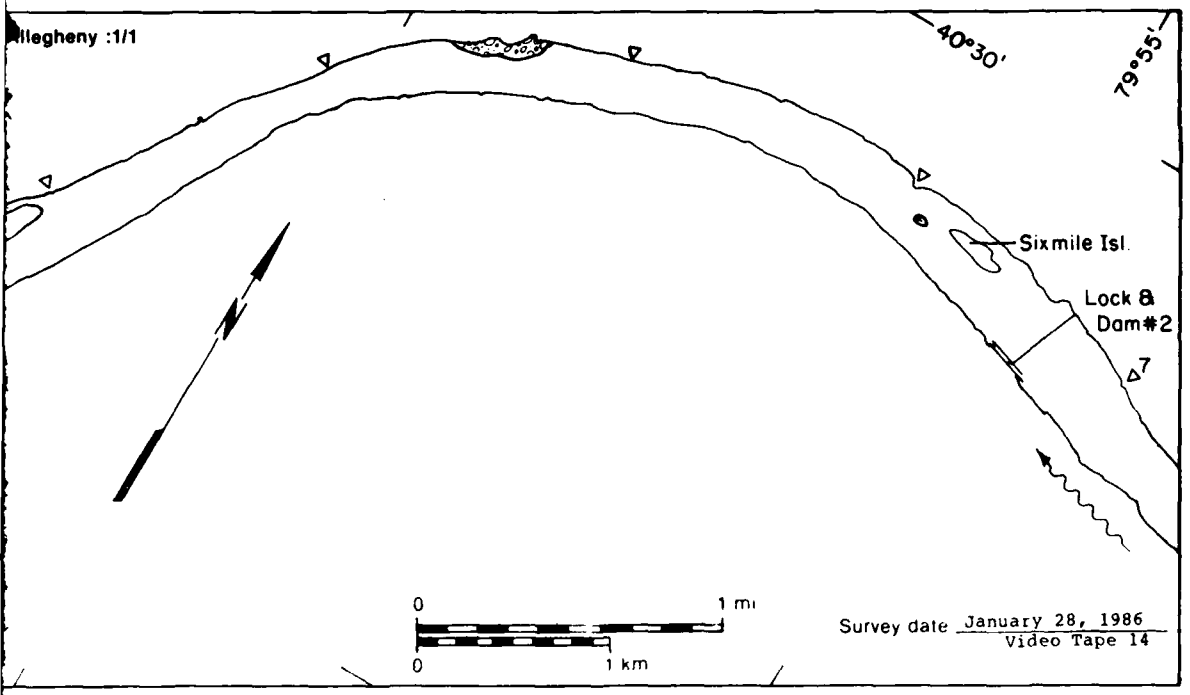


Emsworth Pool – Allegheny

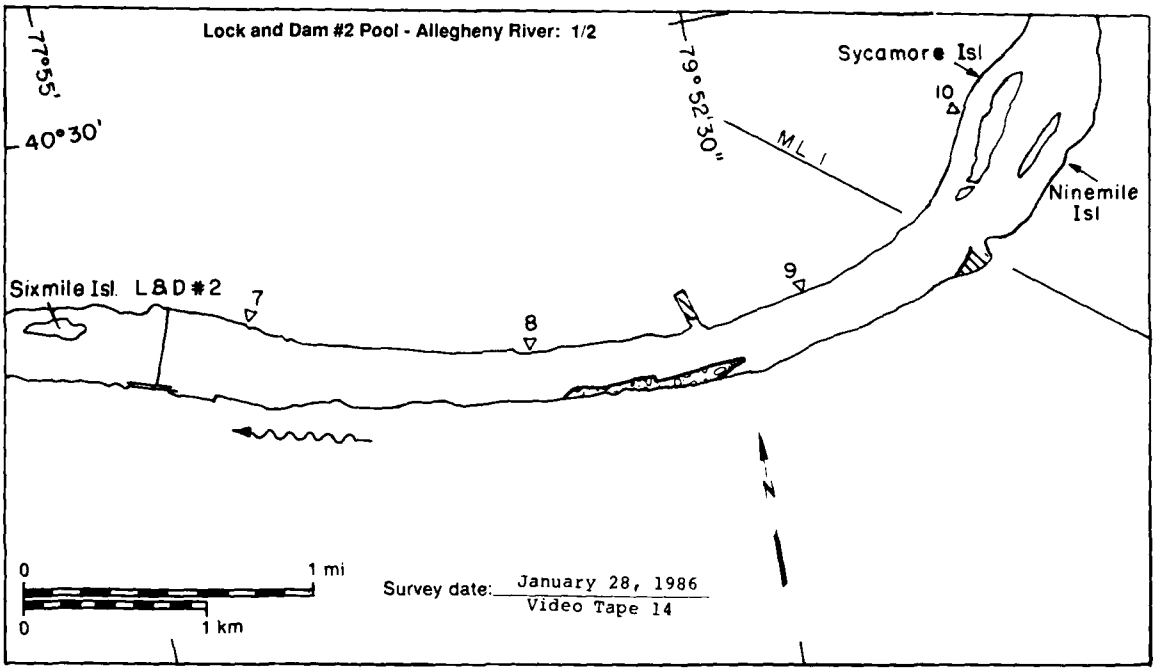
MAP UNITS	Area (m^2 x 10^6)	
Open water	3.01	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.06	50
Total area (m^2 x 10^6)	3.07	

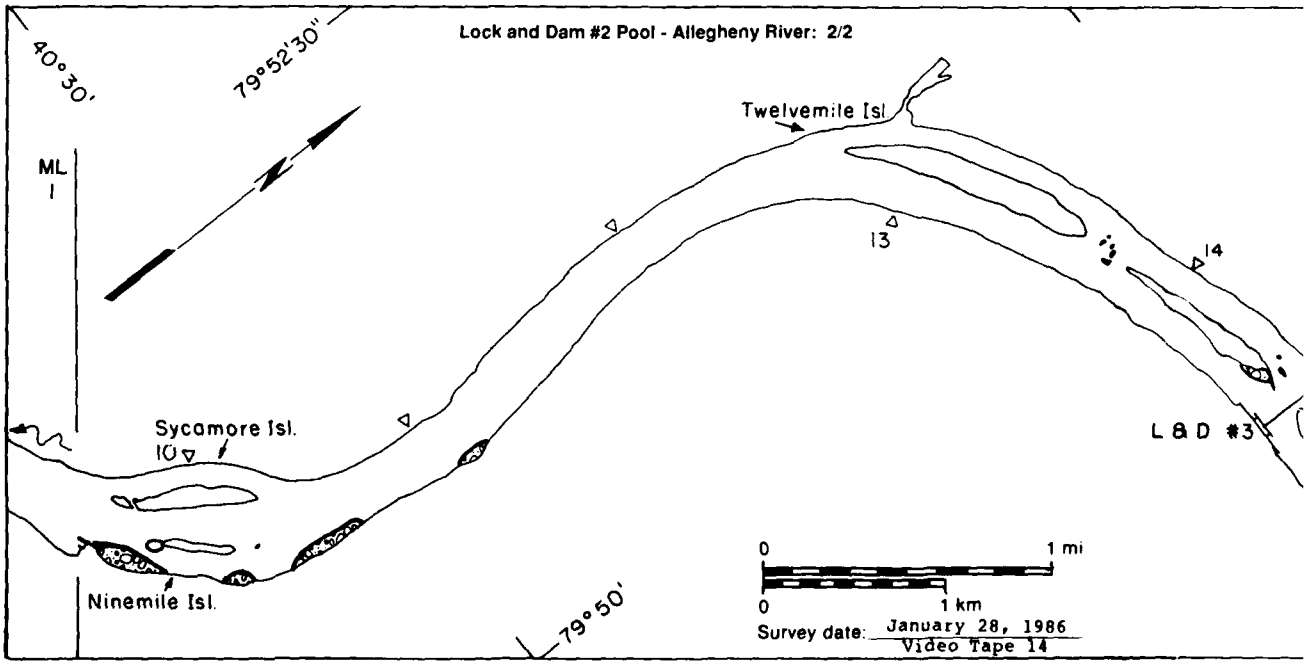


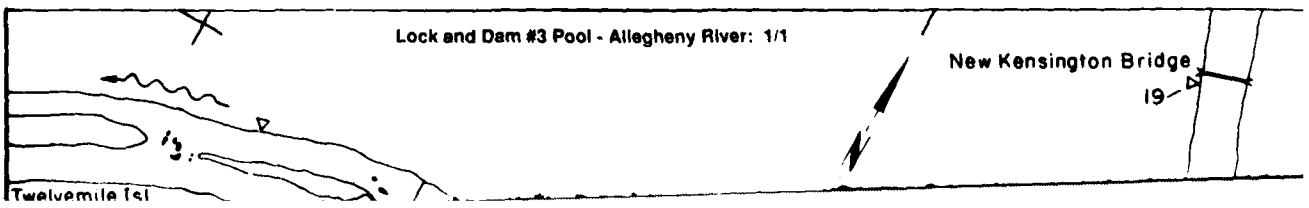
	Area (m^2 x 10^6)	
Open water	4.90	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.26	20
Total area (m^2 x 10^6)	5.16	

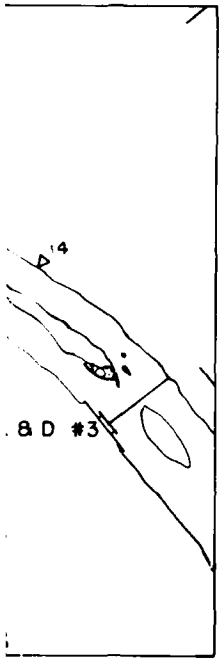


28 January 1986



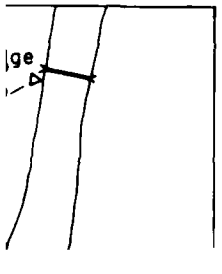






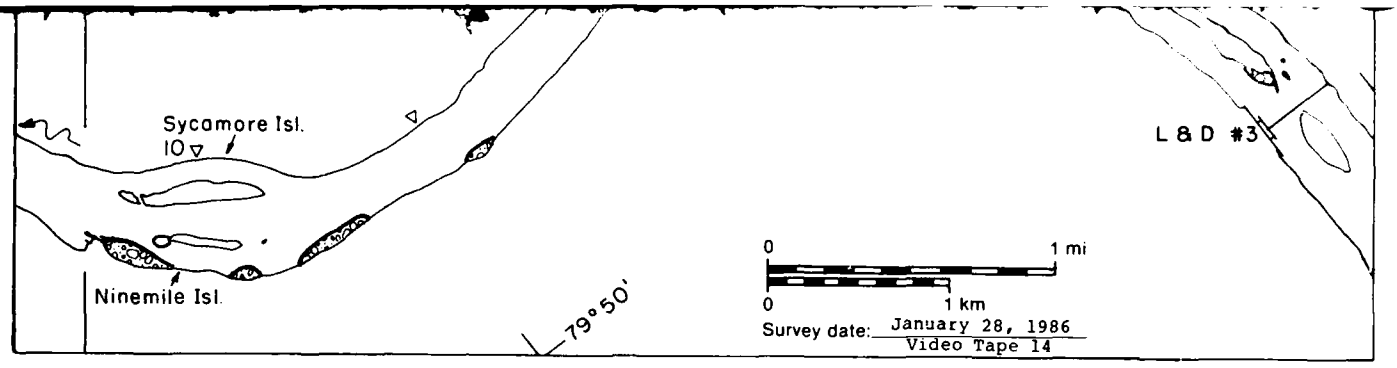
Lock and Dam #2 Pool

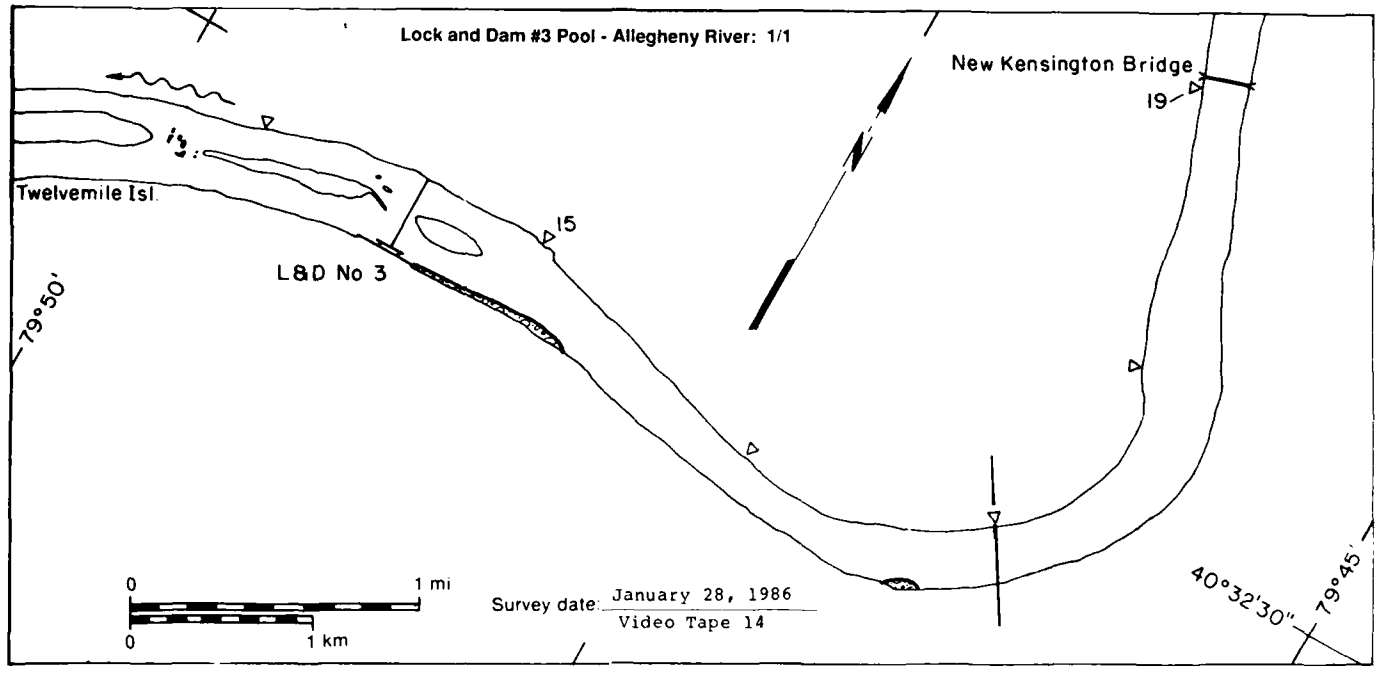
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	3.86	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.13	10
Total area (m^2 x 10^6)	4.02	

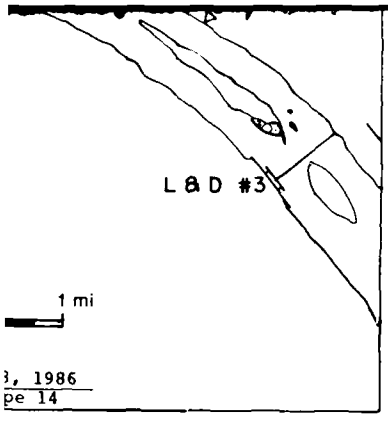


Lock and Dam #3 Pool

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	1.09	NA

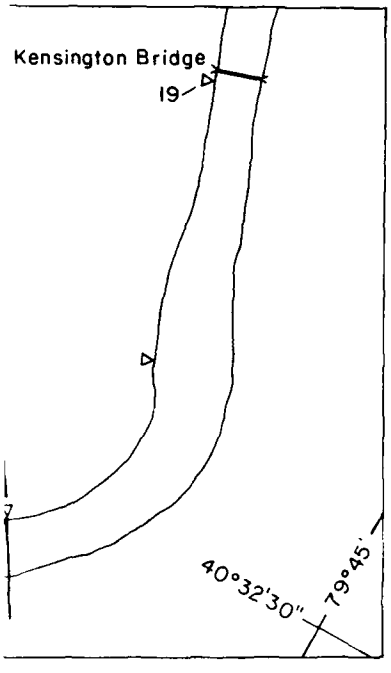

Sycamore Isl.
10
Ninemile Isl.
L & D #3
0
1 mi
0
1 km
79°50'
Survey date: January 28, 1986
Video Tape 14


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No 3
79°50'
0
1 mi
0
1 km
Survey date: January 28, 1986
Video Tape 14
40°32'30"
79°45'



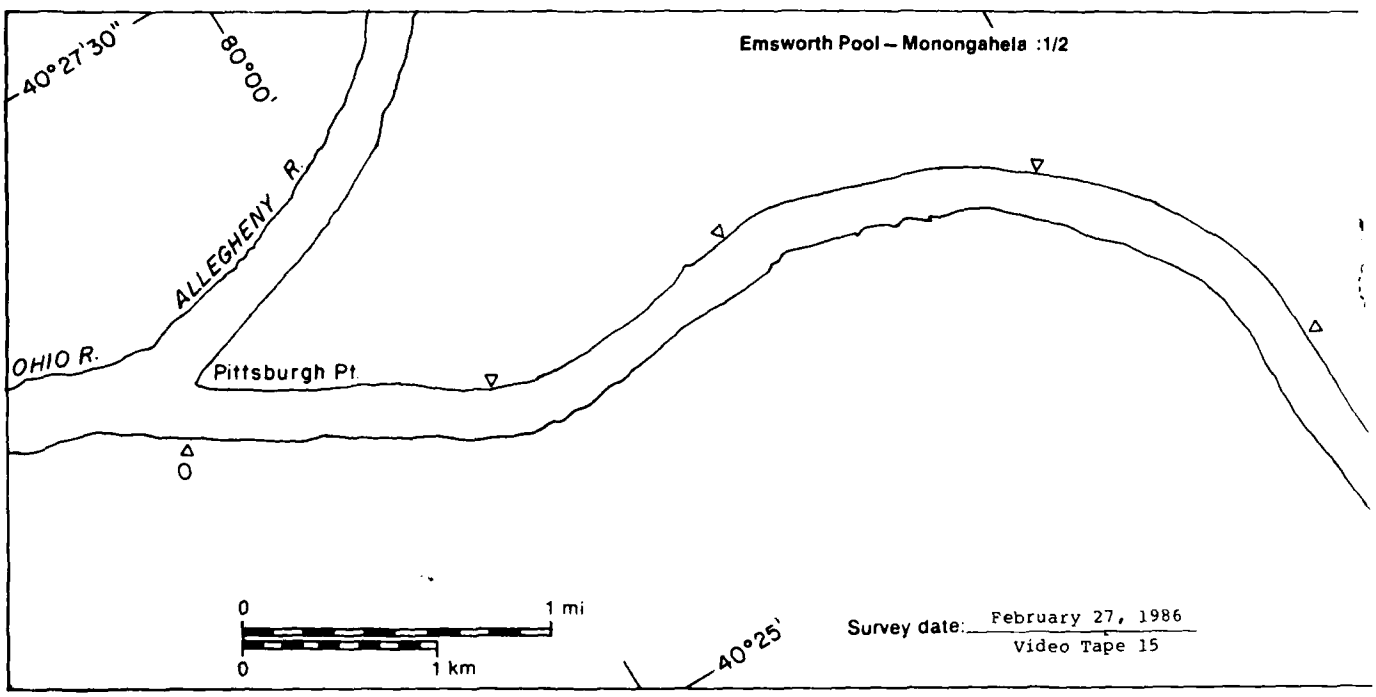
3, 1986
pe 14

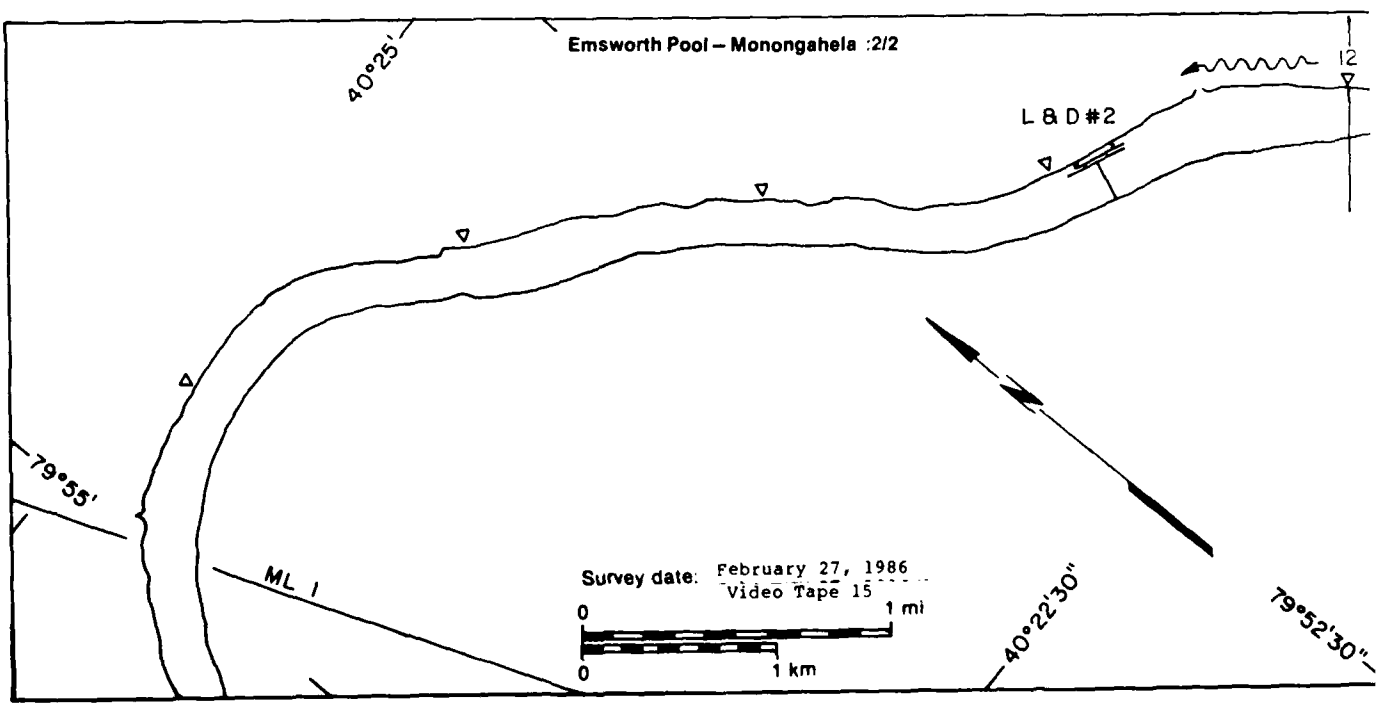
	Area (m^2 x 10^6)	Surface concentration (%)
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.13	10
Total area (m^2 x 10^6)	4.02	

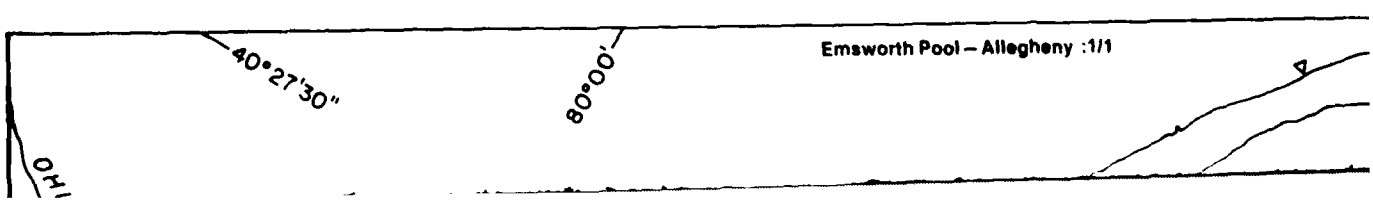


Lock and Dam #3 Pool

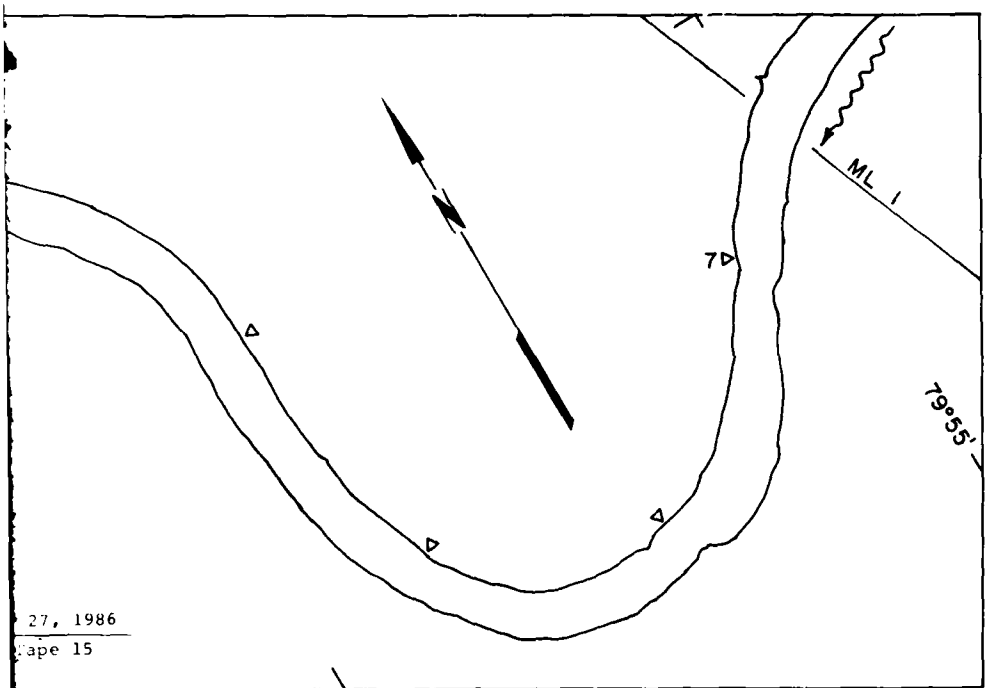
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	1.09	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.05	10
Total area (m^2 x 10^6)	1.14	


Emsworth Pool – Monongahela :1/2
40°27'30"
80°00'
ALLEGHENY R.
OHIO R.
Pittsburgh Pt.
0
0
1 mi
0
1 km
40°25'
Survey date: February 27, 1986
Video Tape 15

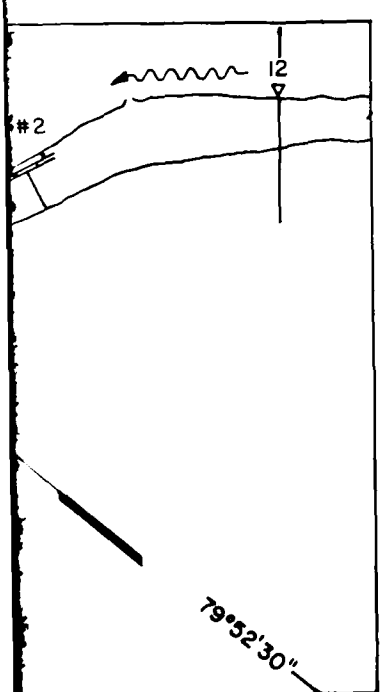

Emsworth Pool – Monongahela :2/2
40°25'
L & D #2
12
79°55'
ML 1
Survey date: February 27, 1986
Video Tape 15
0
1 mi
0
1 km
40°22'30"
79°52'30"


Emsworth Pool – Allegheny :1/1
40°27'30"
80°00'

27 February 1986

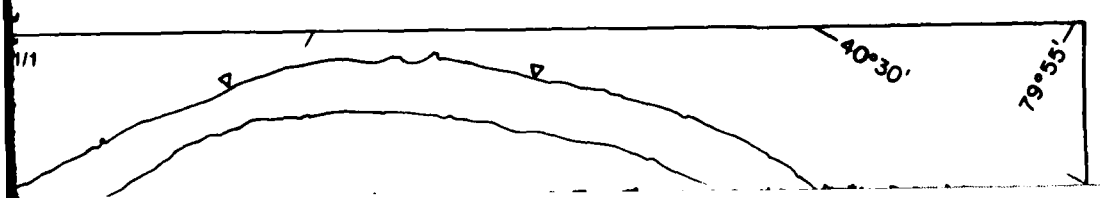


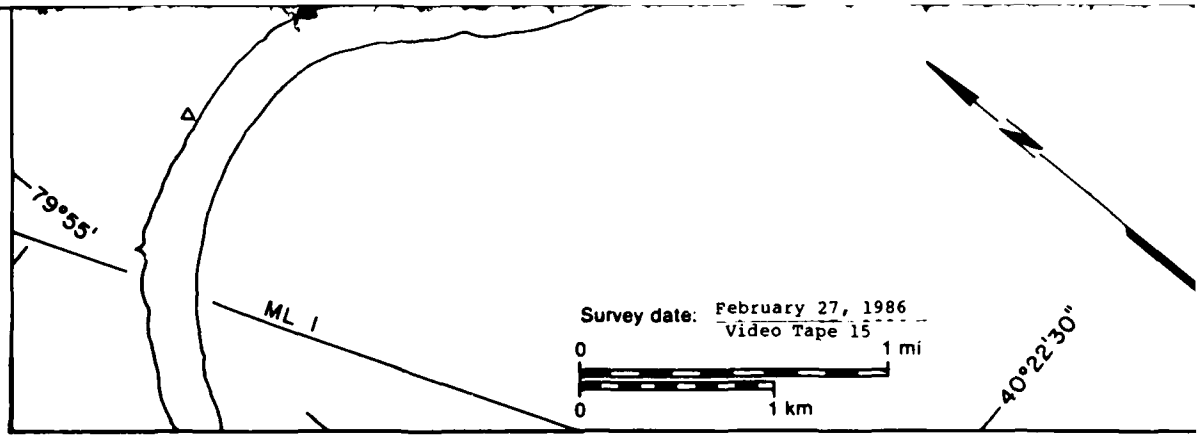
27, 1986
Tape 15

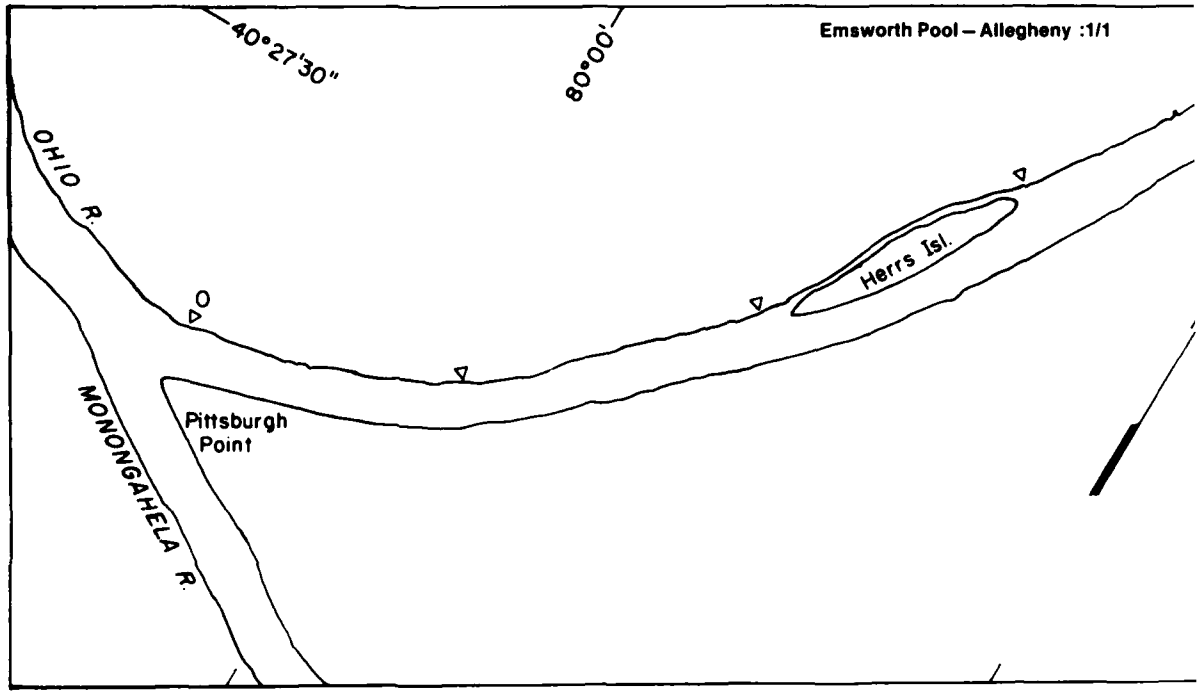


Emsworth Pool – Monongahela

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (-)
Open water	5.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.16	

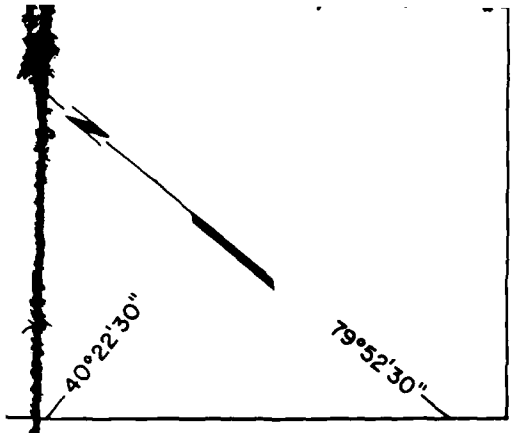




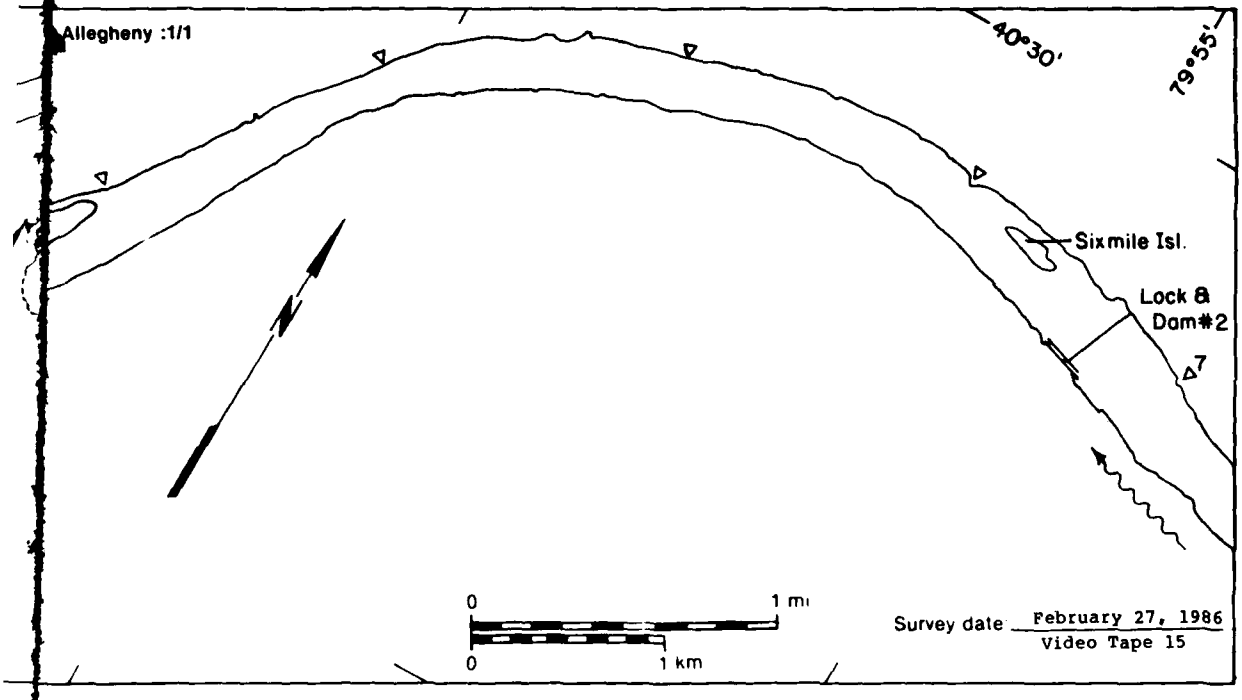


Emsworth Pool – Allegheny

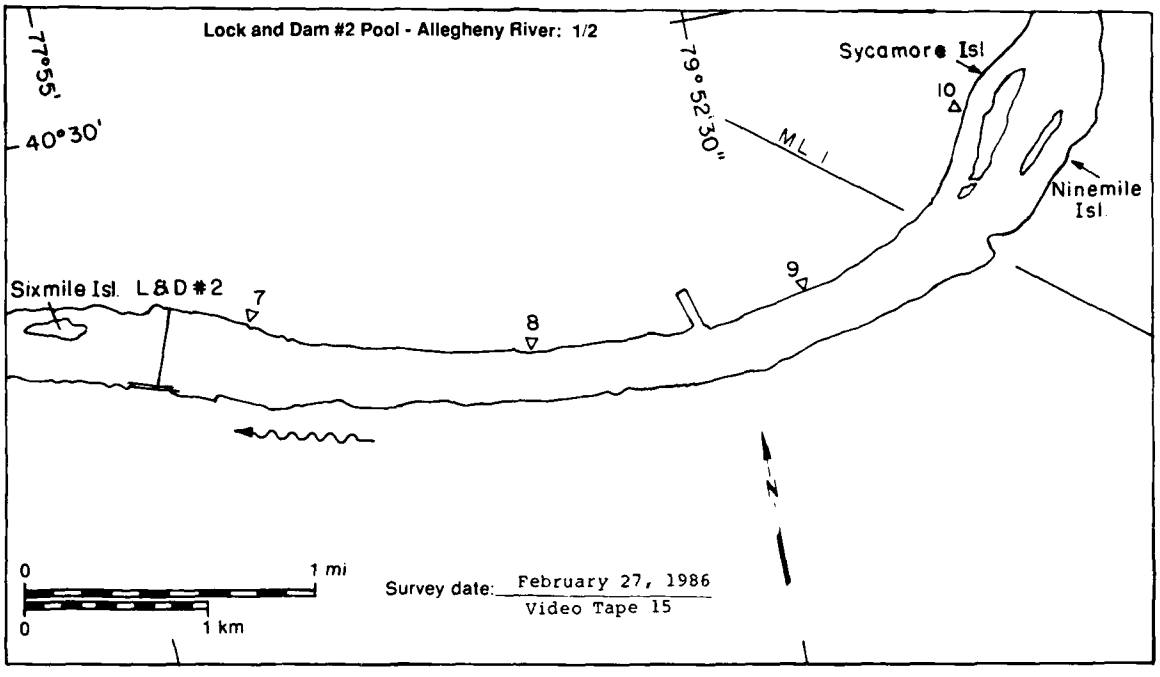
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (oil)
Open water	3.07	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	3.07	

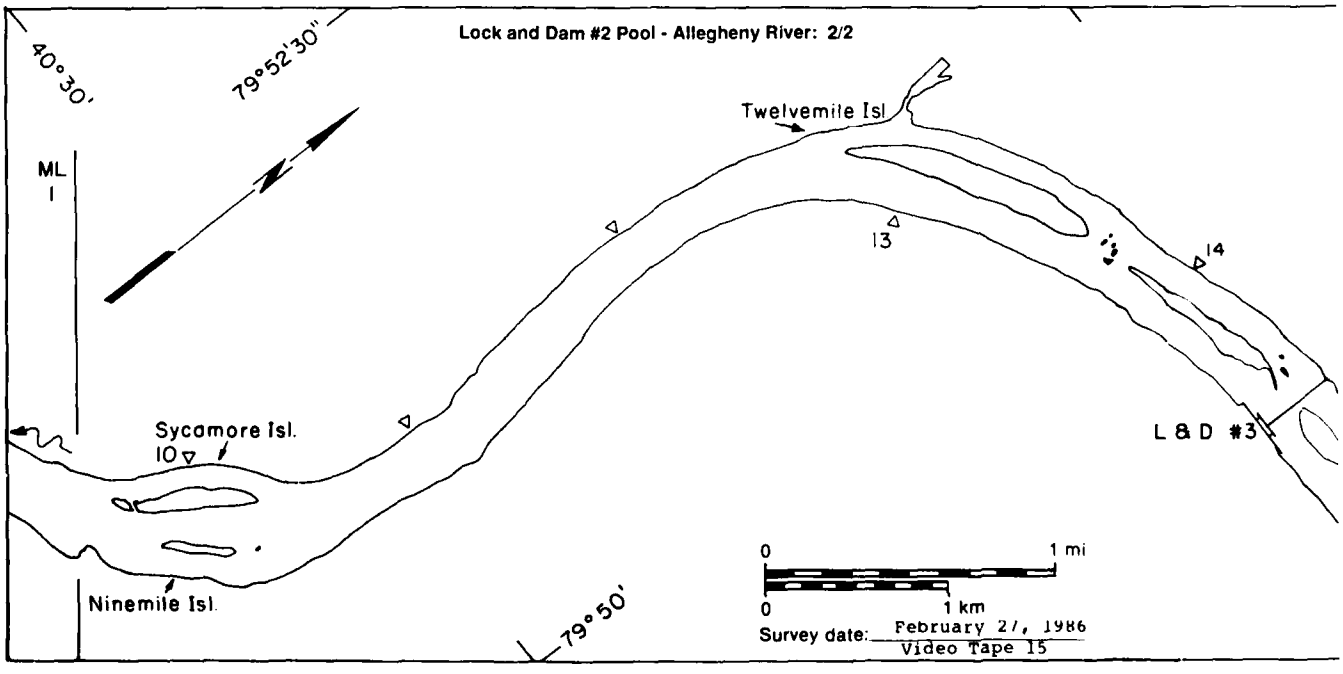


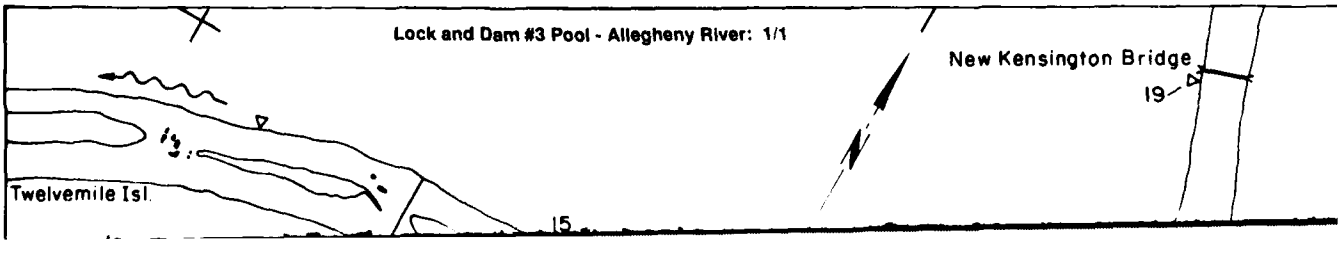
MAP UNITS		$(m^2 \times 10^6)$	
	Open water	5.16	NA
	Solid ice cover	0.00	NA
	Solid ice cover with open water areas	0.00	—
	Fragmented ice cover	0.00	NA
	Fragmented ice cover with open water areas	0.00	—
	Ice floes or frazil slush and pans	0.00	—
Total area $(m^2 \times 10^6)$		5.16	



27 February 1986





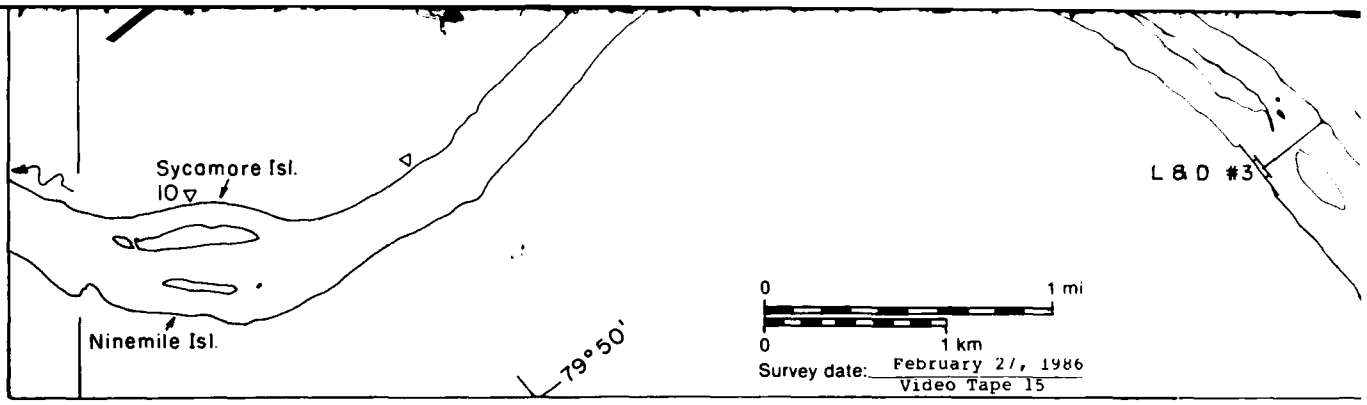


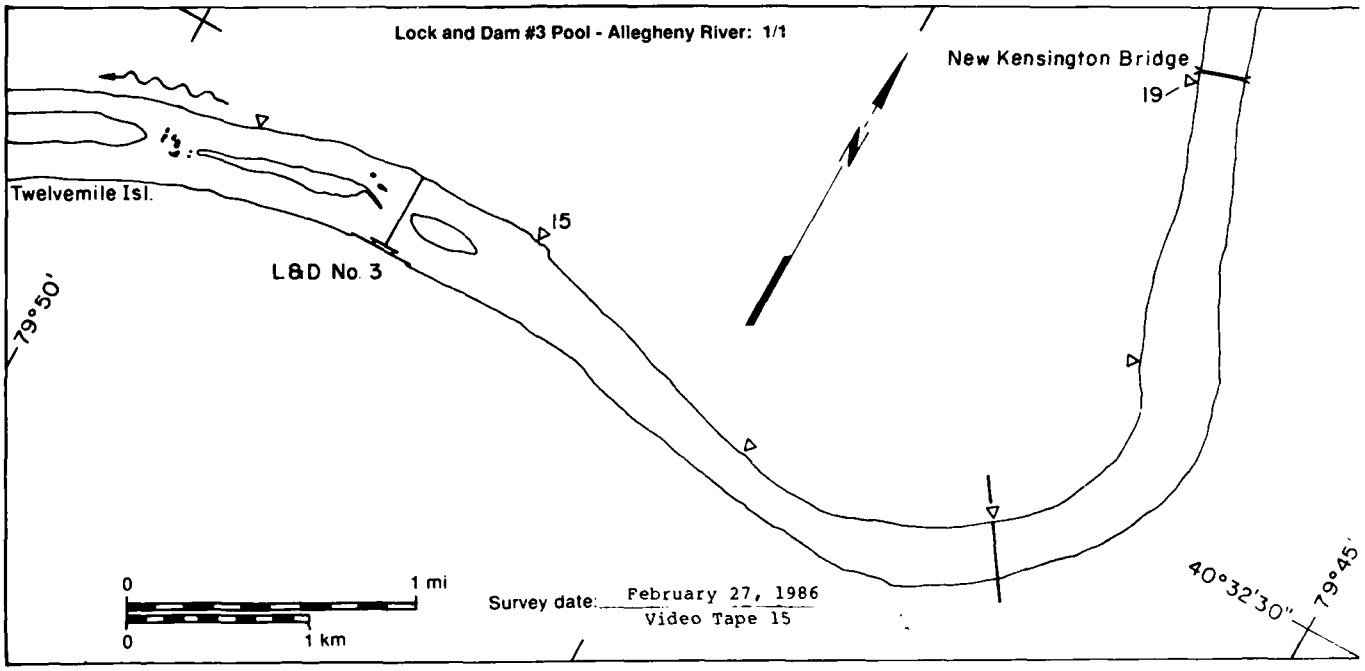
Lock and Dam #2 Pool

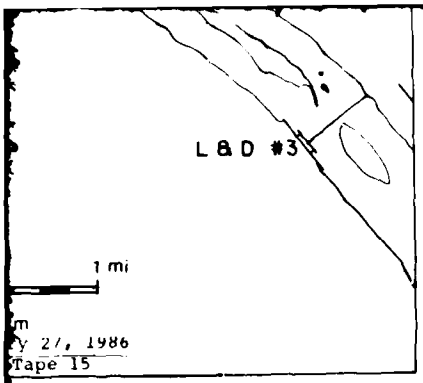
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.02	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.02	

Lock and Dam #3 Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.14	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—

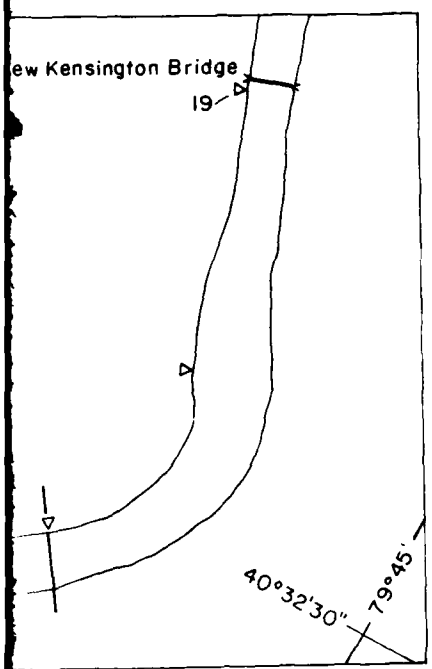

Sycamore Isl.
10
Ninemile Isl.
79°50'
L & D #3
0
1 mi
0
1 km
Survey date: February 27, 1986
Video Tape 15


Lock and Dam #3 Pool - Allegheny River: 1/1
New Kensington Bridge
19
Twelvemile Isl.
15
L&D No. 3
79°50'
0
1 mi
0
1 km
Survey date: February 27, 1986
Video Tape 15
40°32'30"
79°45'



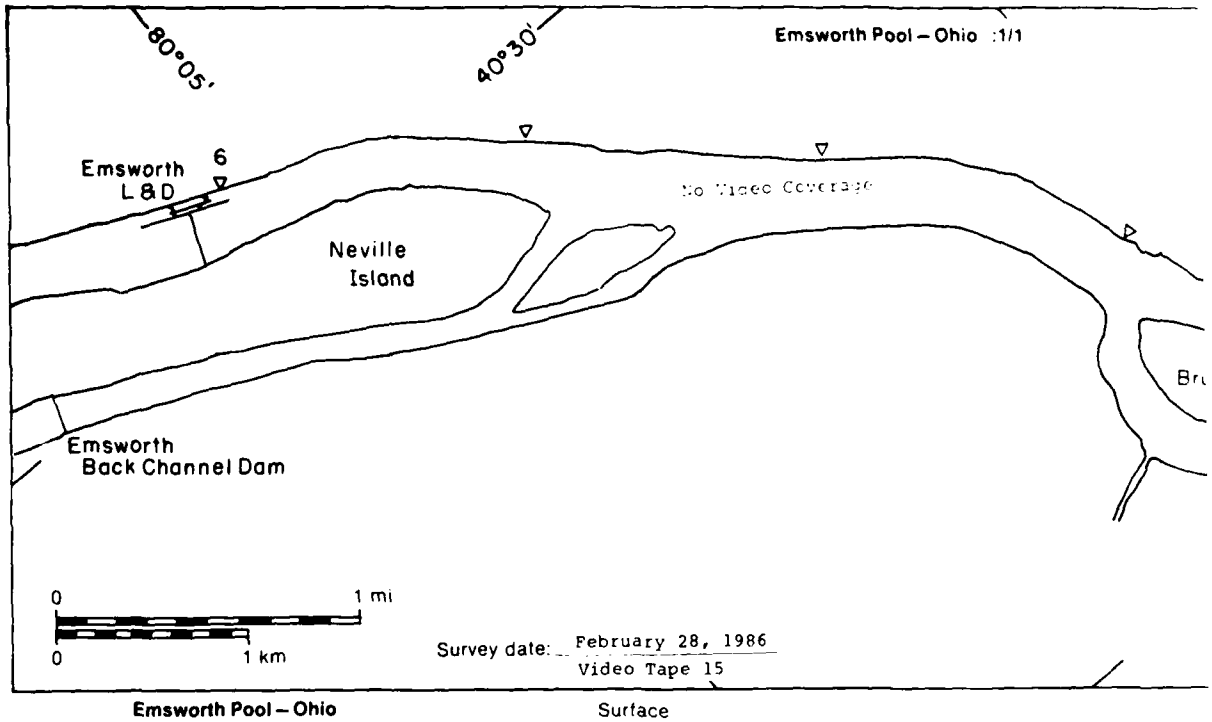
m
y 27, 1986
Tape 15

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.02	



Lock and Dam #3 Pool

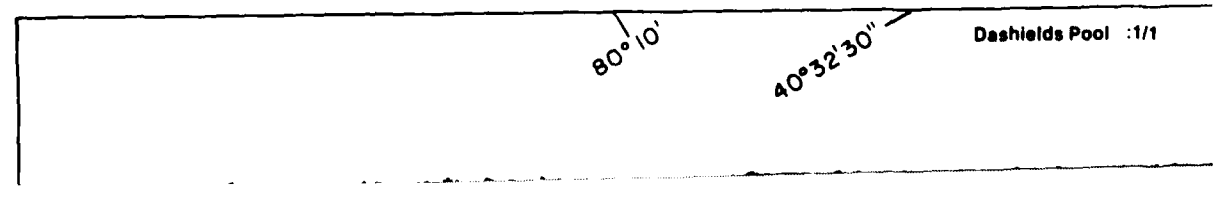
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.14	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	1.14	



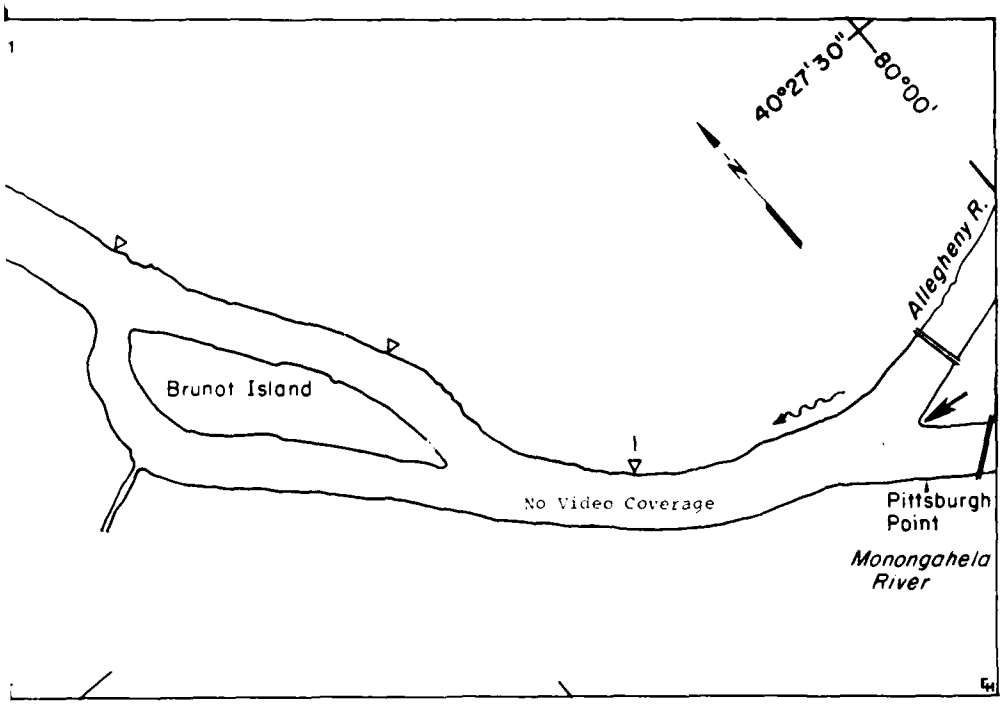
Emsworth Pool – Ohio

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	4.49*	

* Includes 4.49×10^6 m^2 of no video coverage

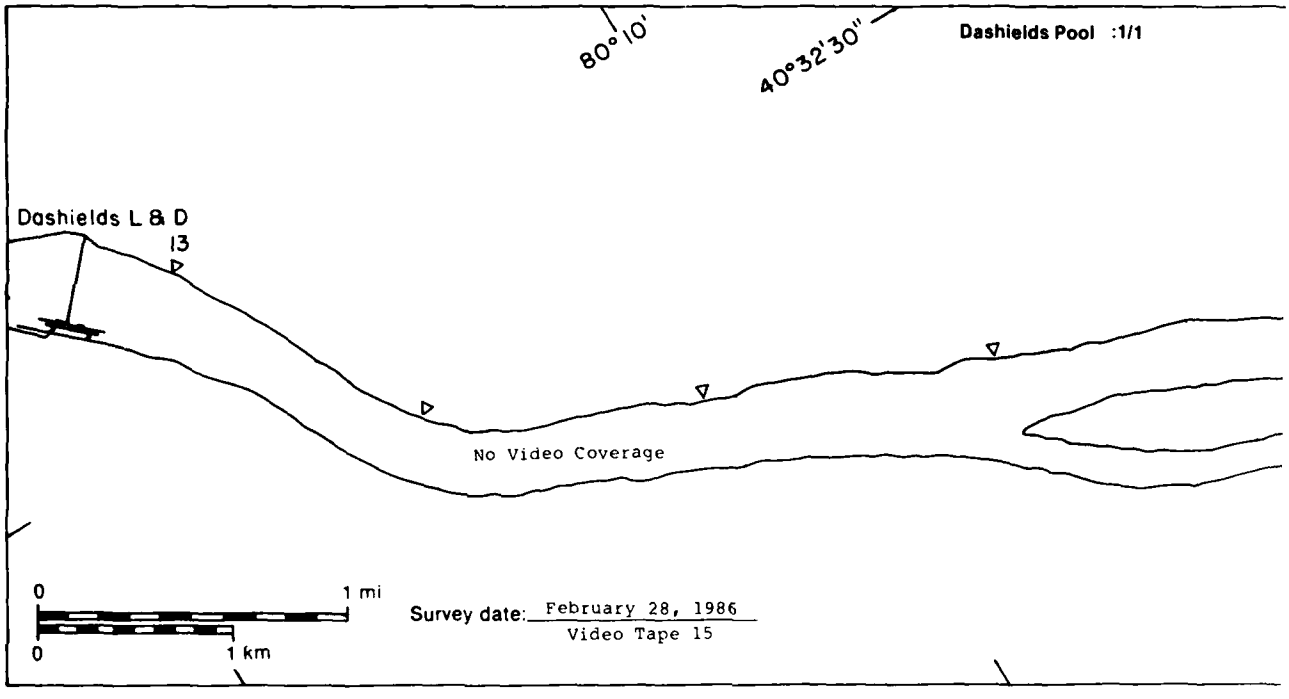


28 February 1986



	Area (m^2 x 10^6)	Surface concentration (%)
open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	4.49*	

* Includes 4.49 x 10^6 m^2 of no video coverage

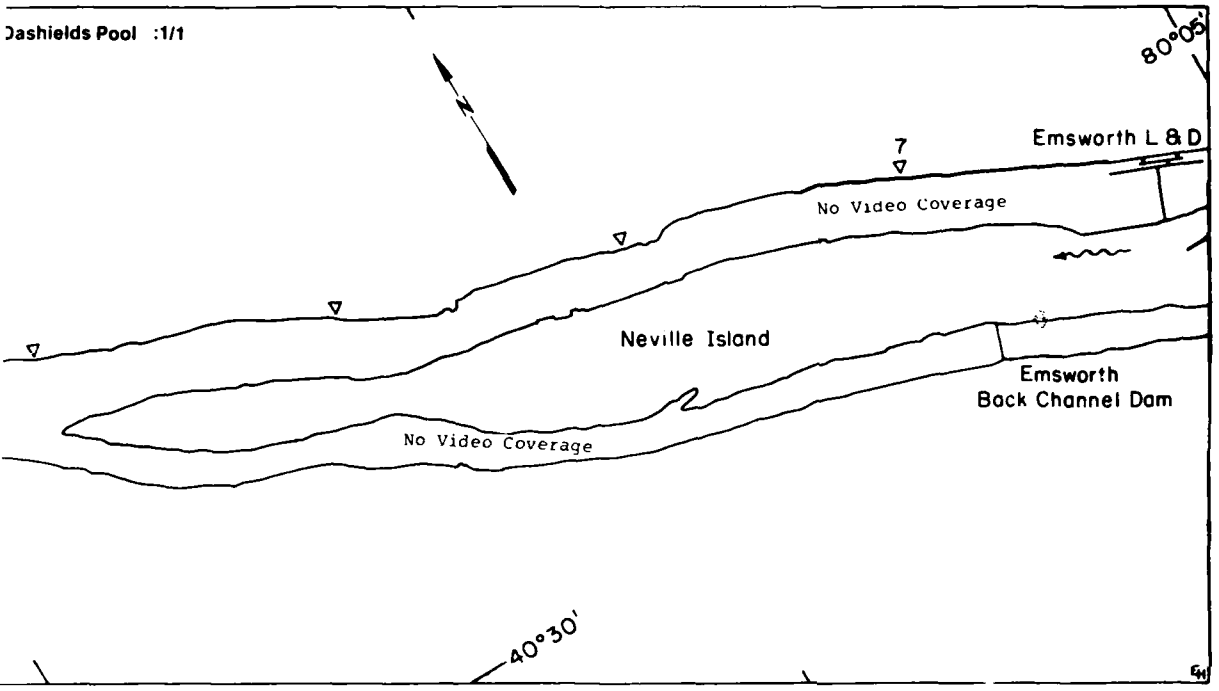


Dashields Pool

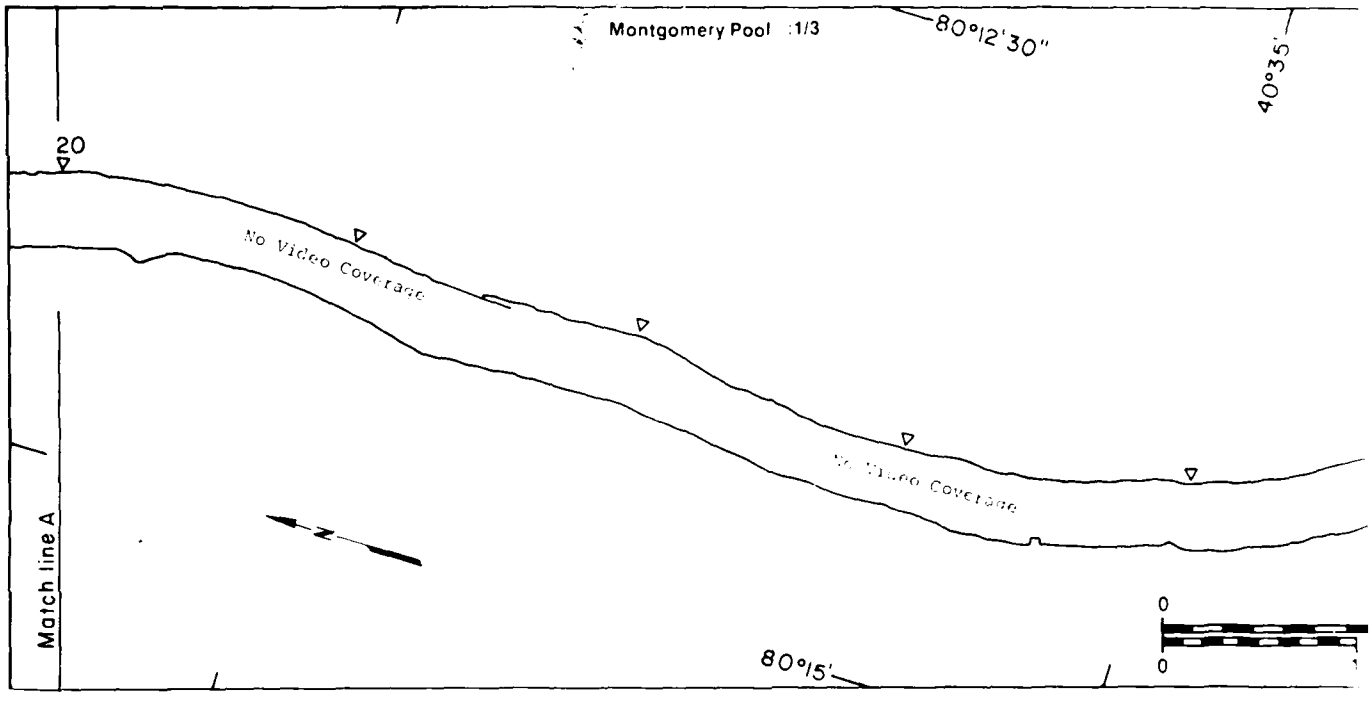
MAP UNITS

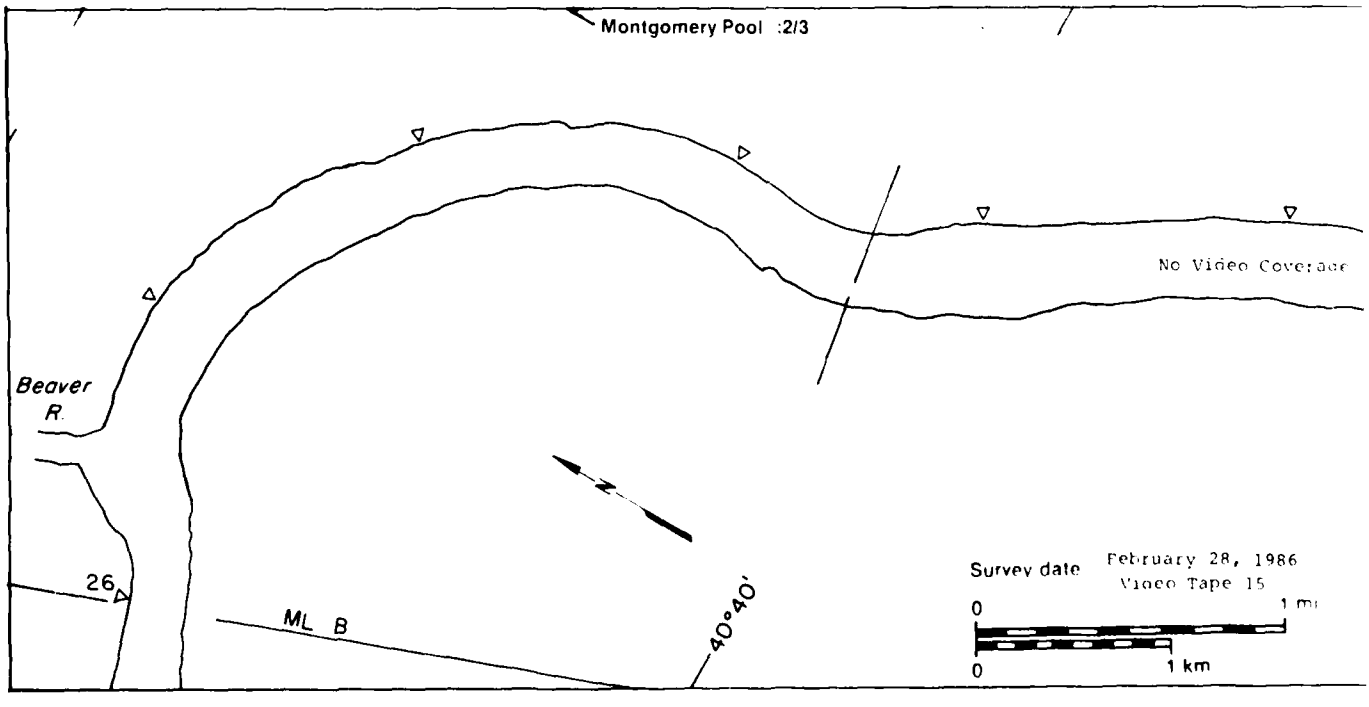
	Area (m^2 x 10^6)	Surface concentration (%)
Open water	0.00	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	5.00*	

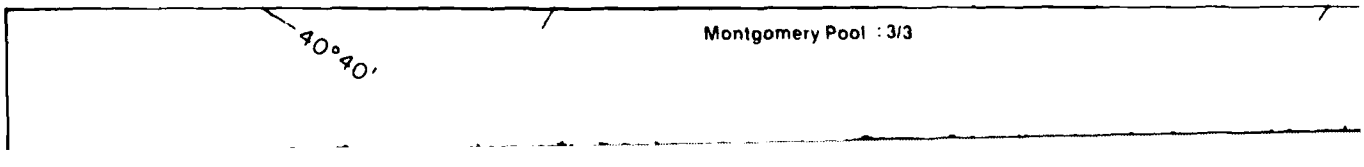
* Includes 5.00 x 10^6 m^2 of no video coverage

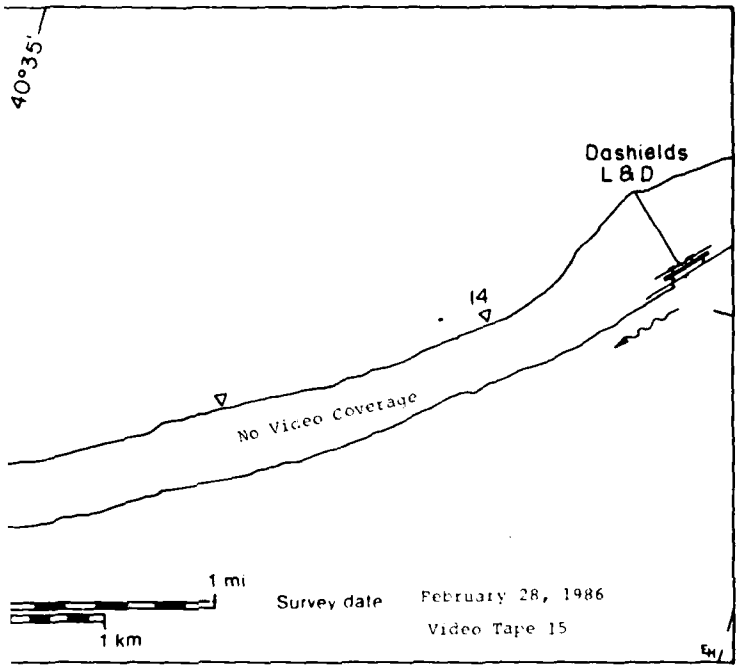

Dashields Pool :1/1
80°05'
Emsworth L & D
7
No Video Coverage
Neville Island
Emsworth
Back Channel Dam
No Video Coverage
40°30'

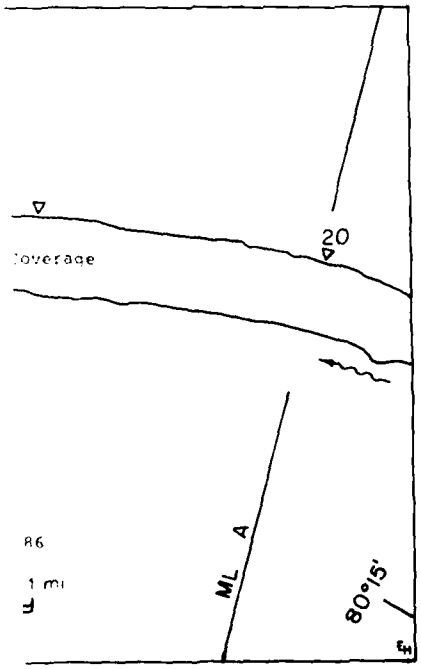
28 February 1986

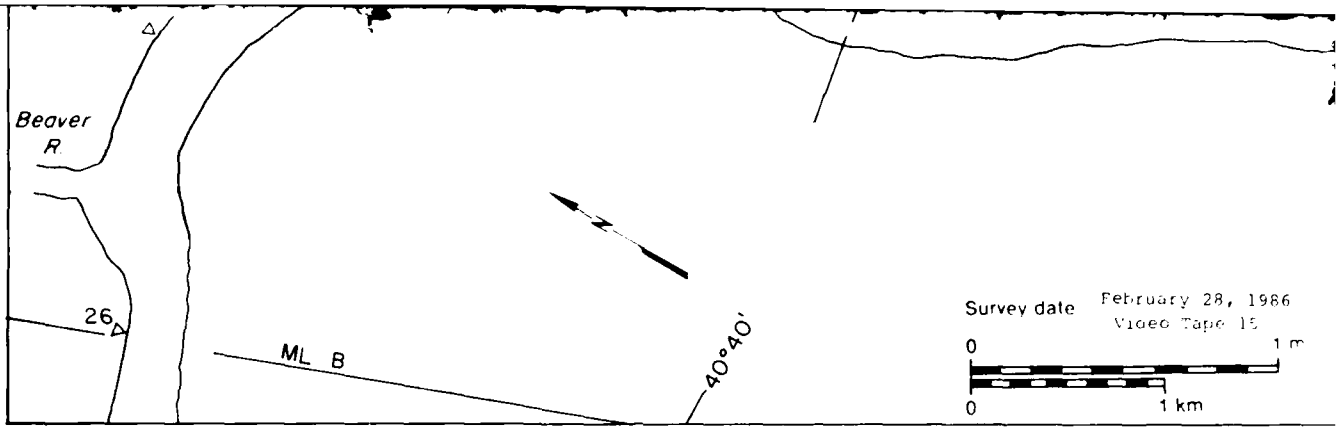


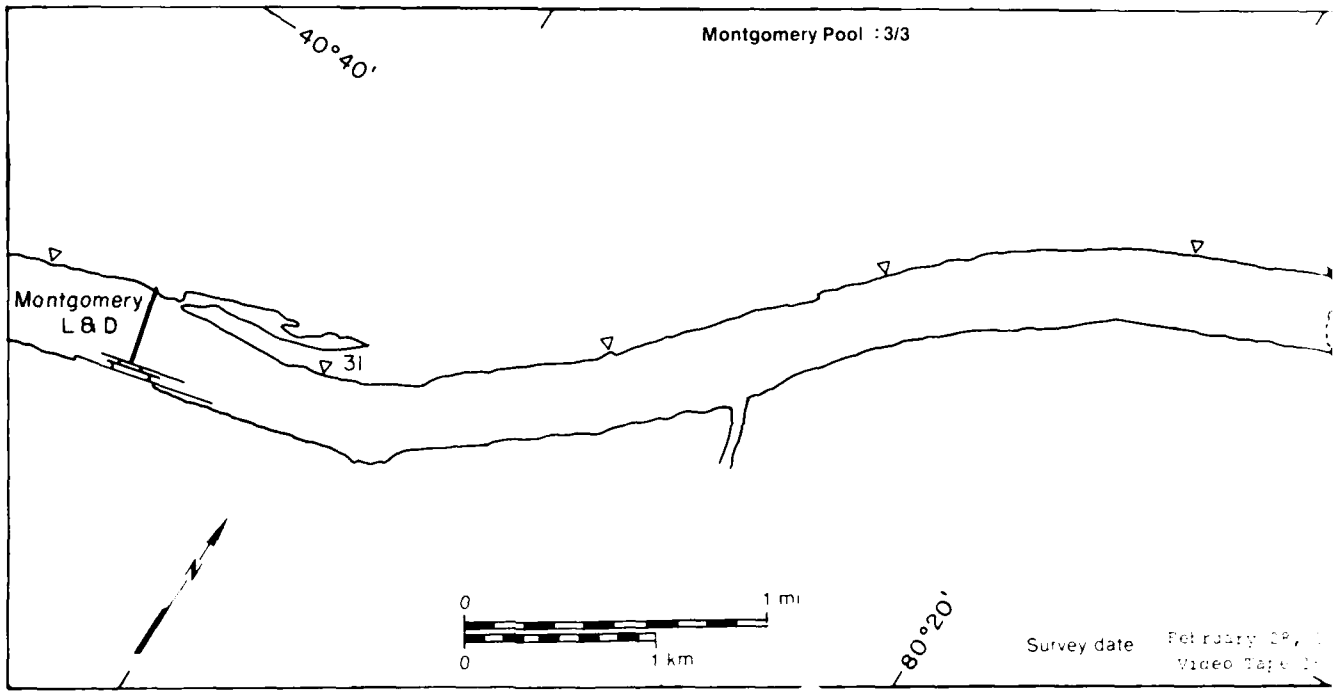





40°35'
Dashields
L&D
14
No Video Coverage
1 mi
1 km
Survey date February 28, 1986
Video Tape 15


20
ML A
80°15'

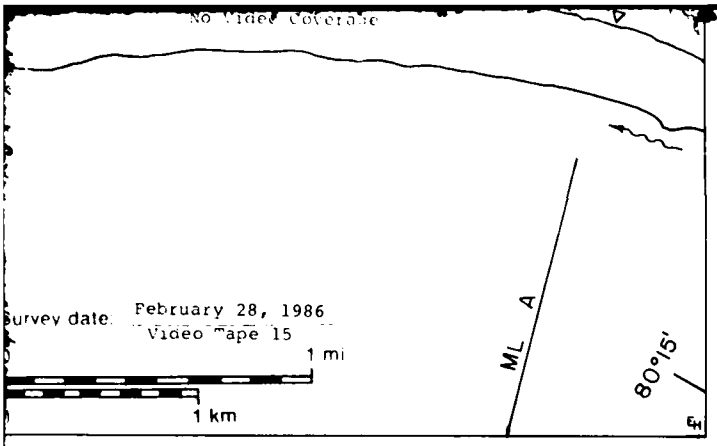


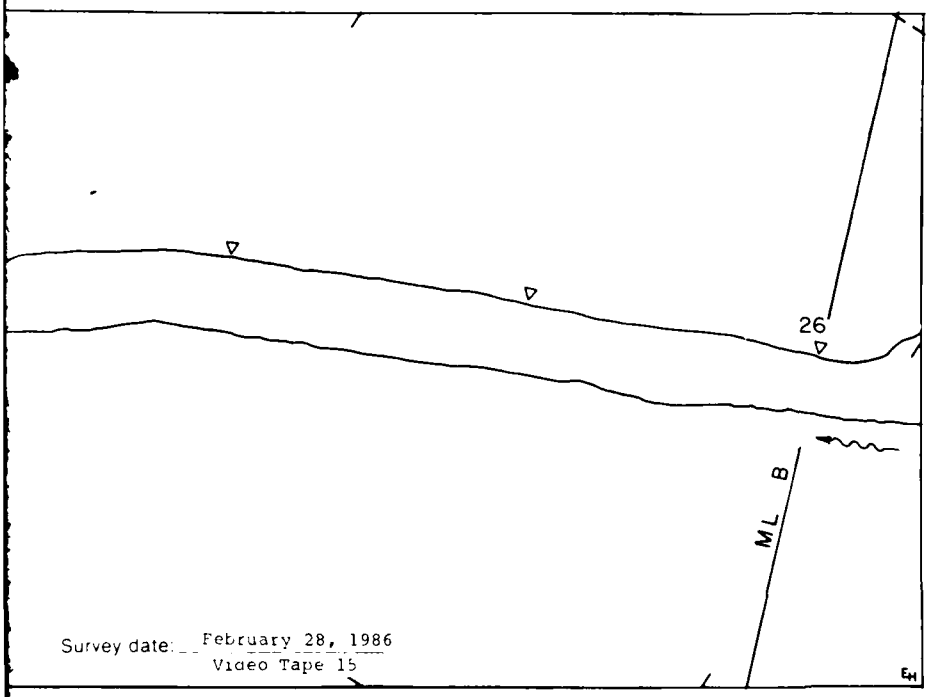


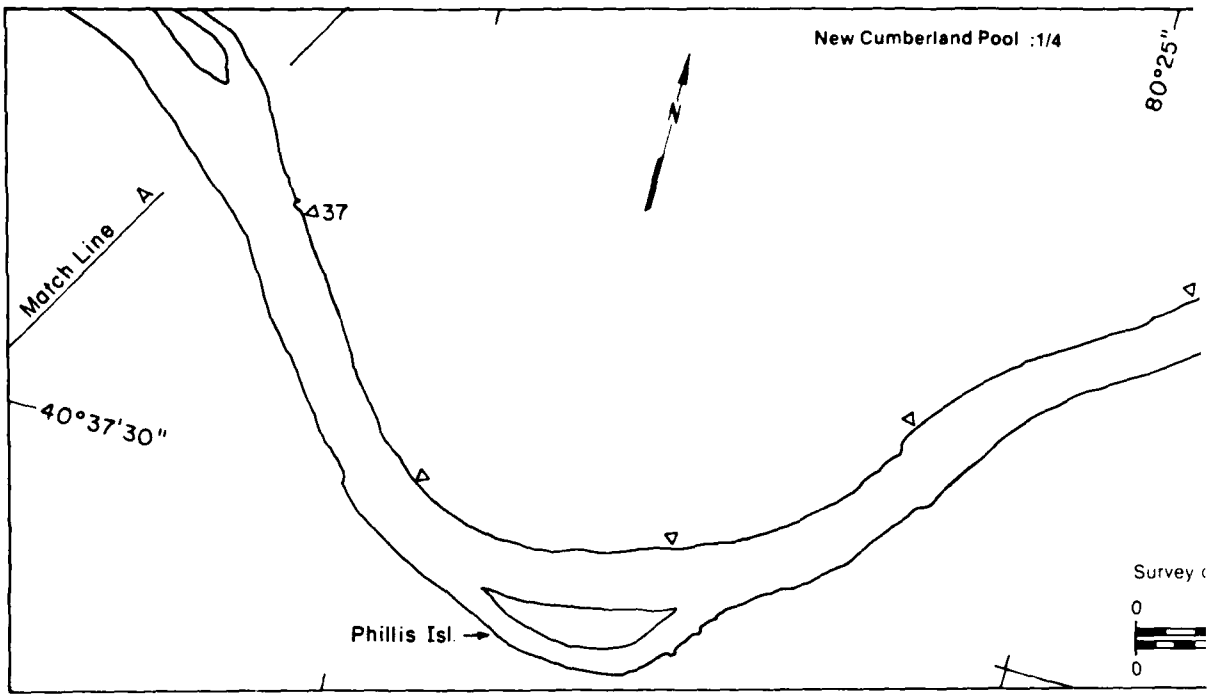
Montgomery Pool

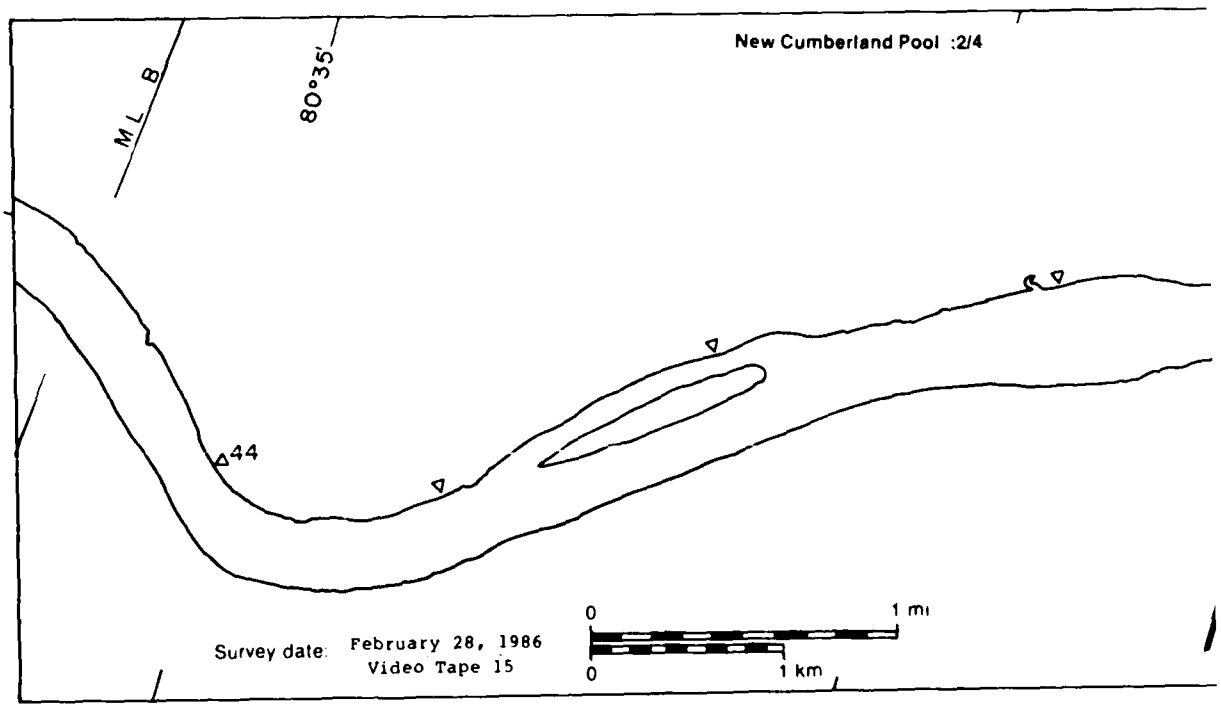
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (-)
Open water	5.76	NA
Solid ice cover	0.00	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.27*	

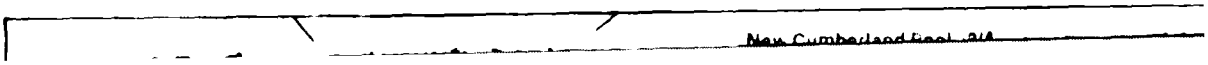
* Includes 5.51×10^6 m^2 of no video coverage


No Video Coverage
Survey date: February 28, 1986
Video Tape 15
1 mi
1 km
ML A
80°15'

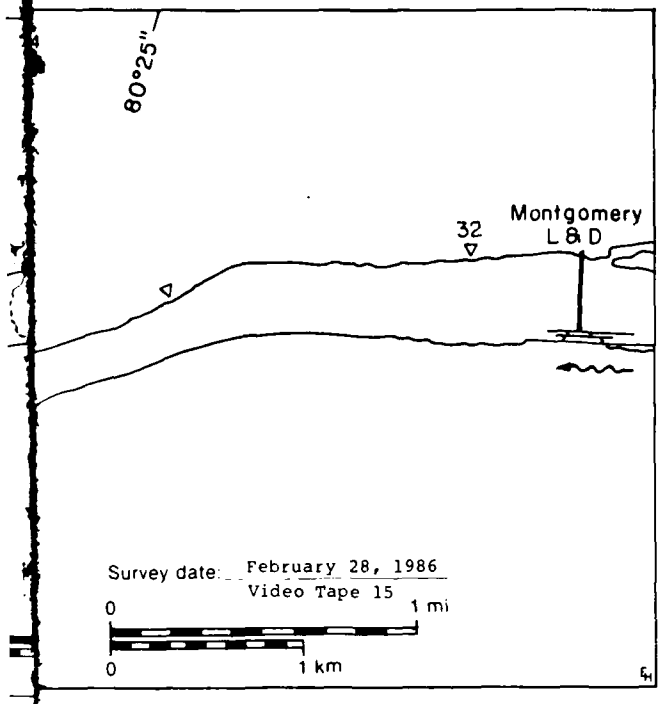

26
ML B
Survey date: February 28, 1986
Video Tape 15

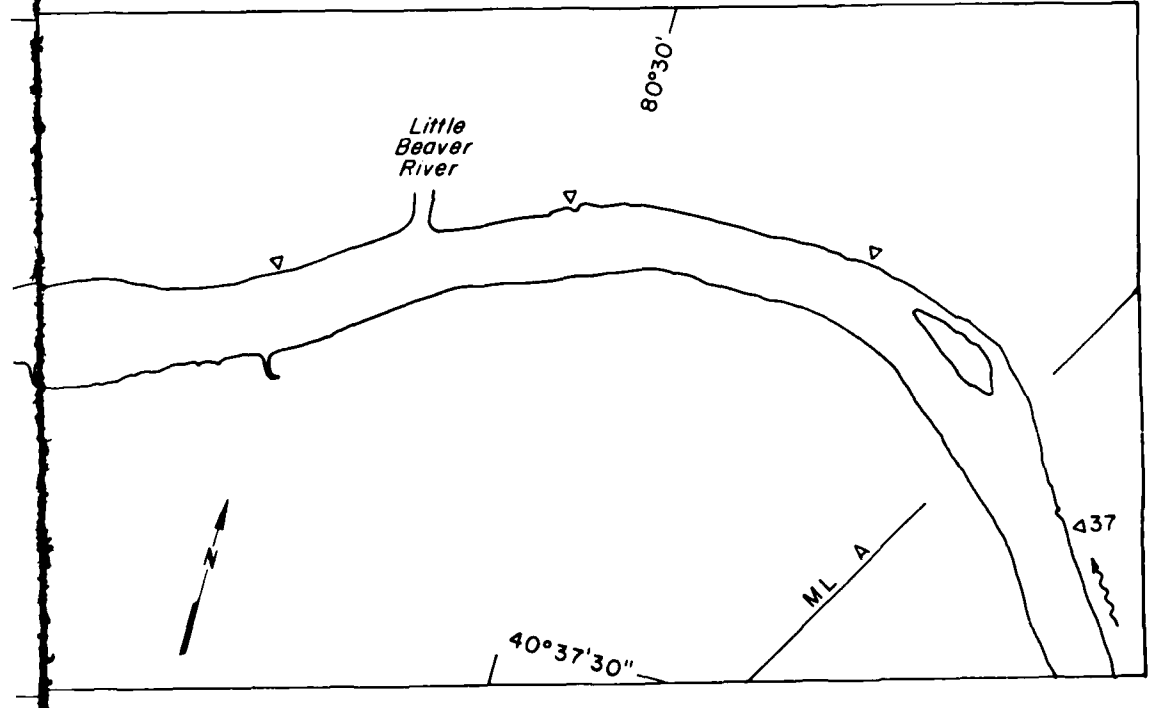

New Cumberland Pool :1/4
80°25"
Match Line A
37
40°37'30"
Phillis Isl.
Survey
0
0

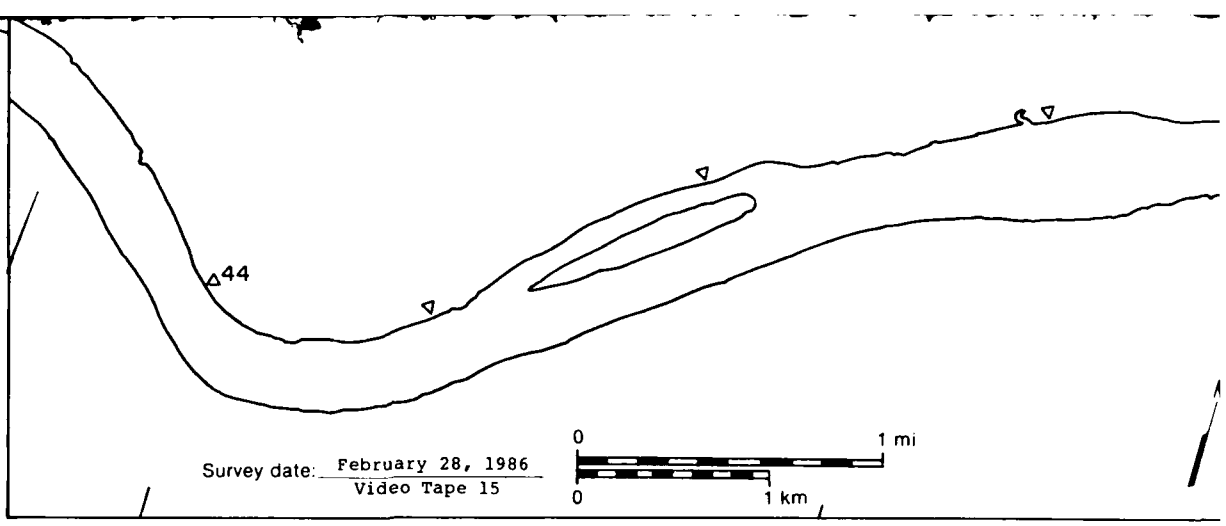

New Cumberland Pool :2/4
80°35'
M L B
44
Survey date: February 28, 1986
Video Tape 15
0
1 mi
0
1 km

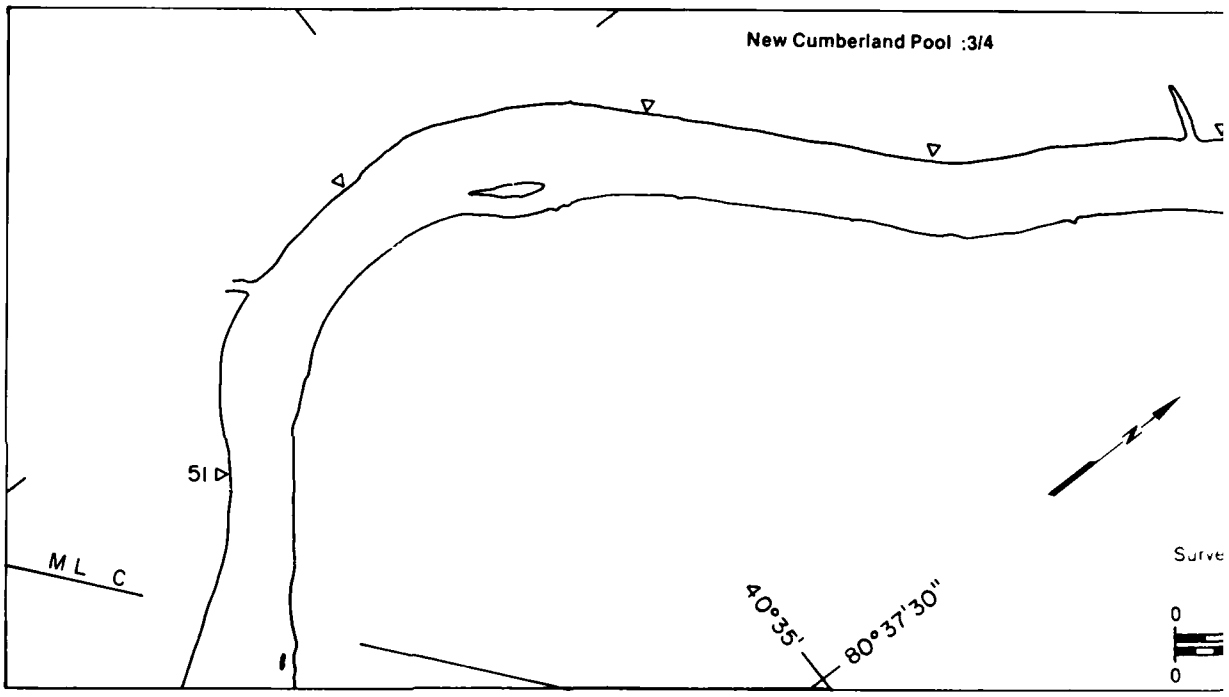

New Cumberland Pool :3/4

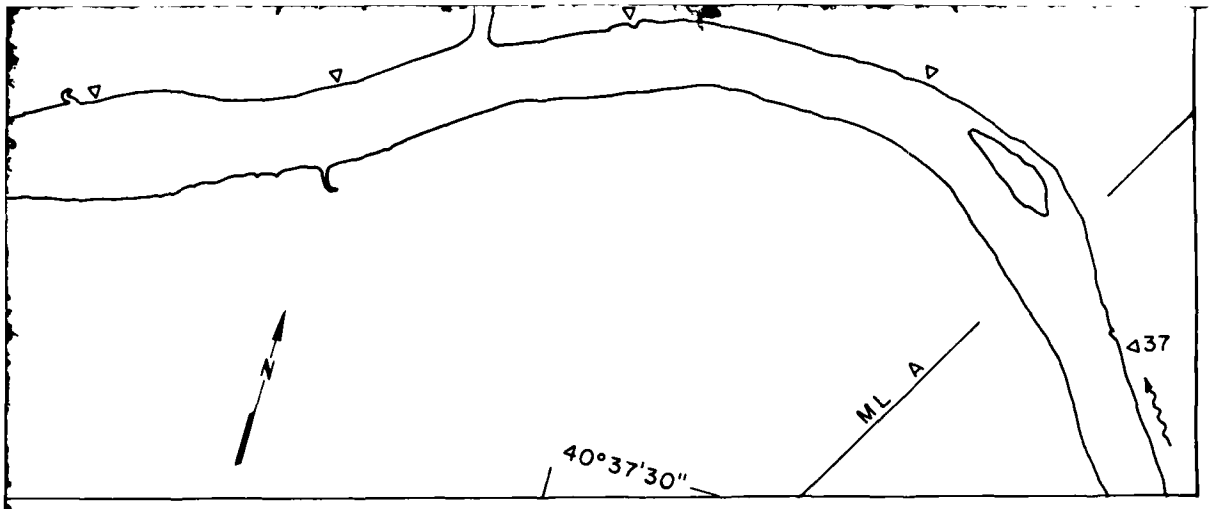
28 February 1986

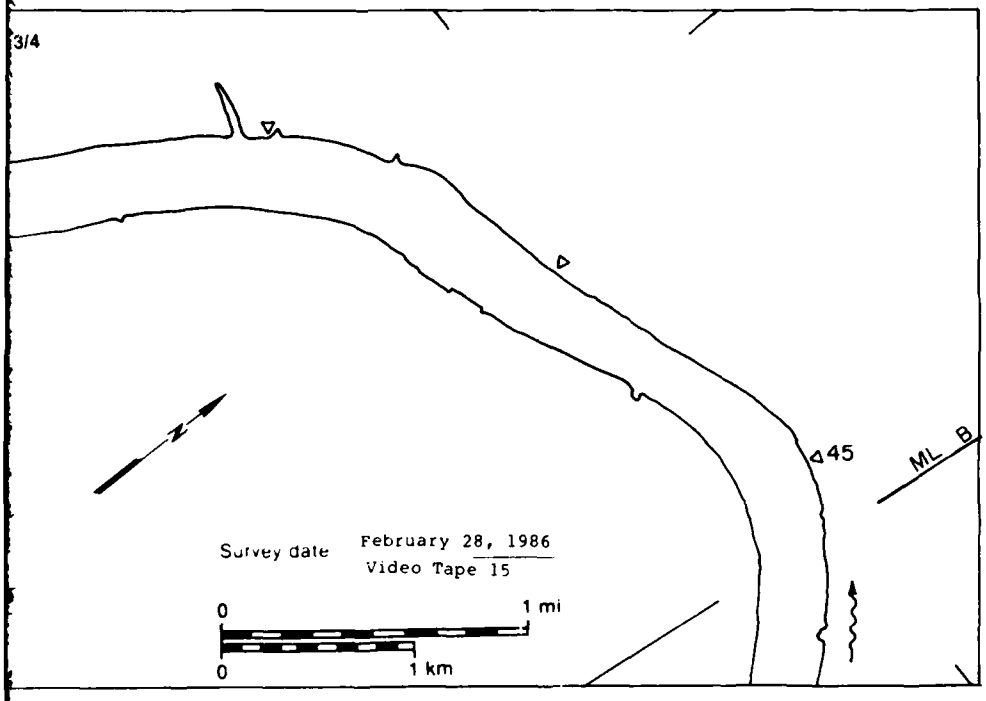




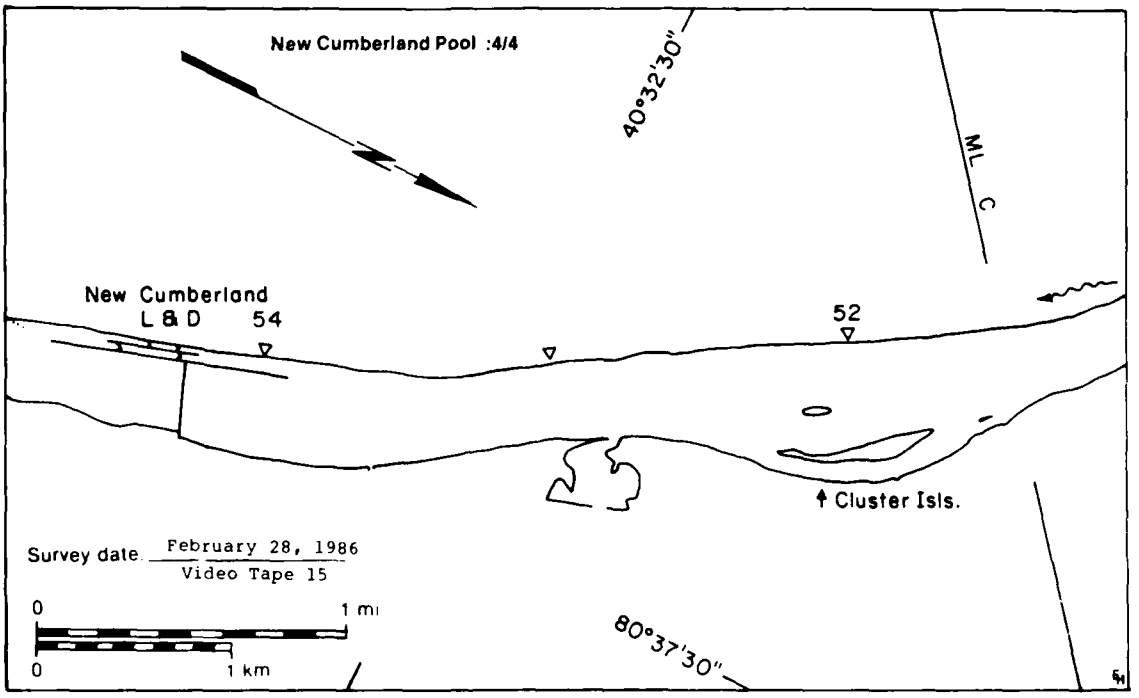

44
Survey date: February 28, 1986
Video Tape 15
0
1 mi
0
1 km

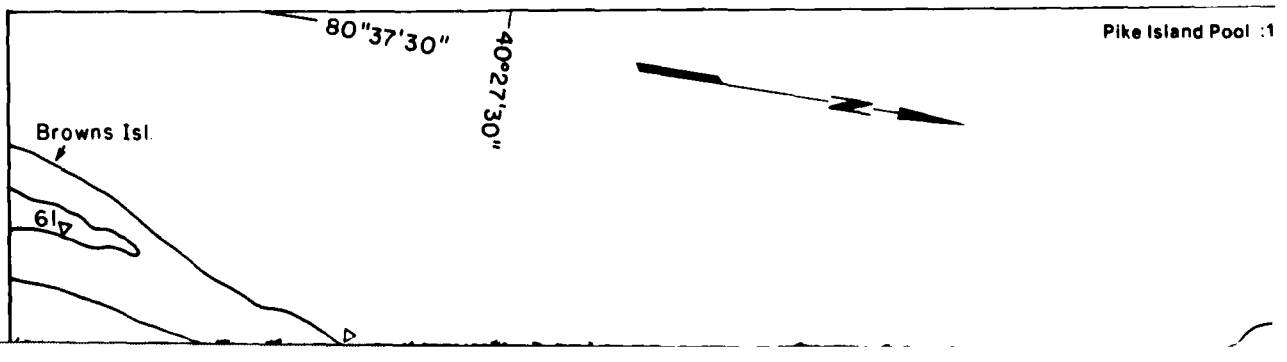

New Cumberland Pool :3/4
51
M L C
40°35'
80°37'30"
0
0


N
37
ML A
40°37'30"


3/4
N
45
ML B
Survey date
February 28, 1986
Video Tape 15
0
1 mi
0
1 km

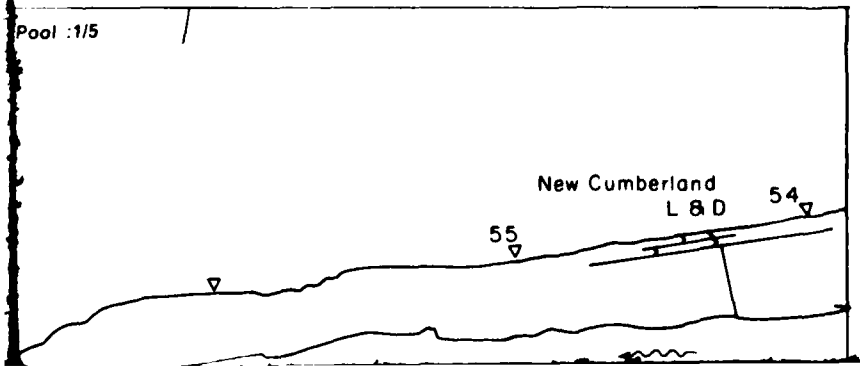
28 February 1986

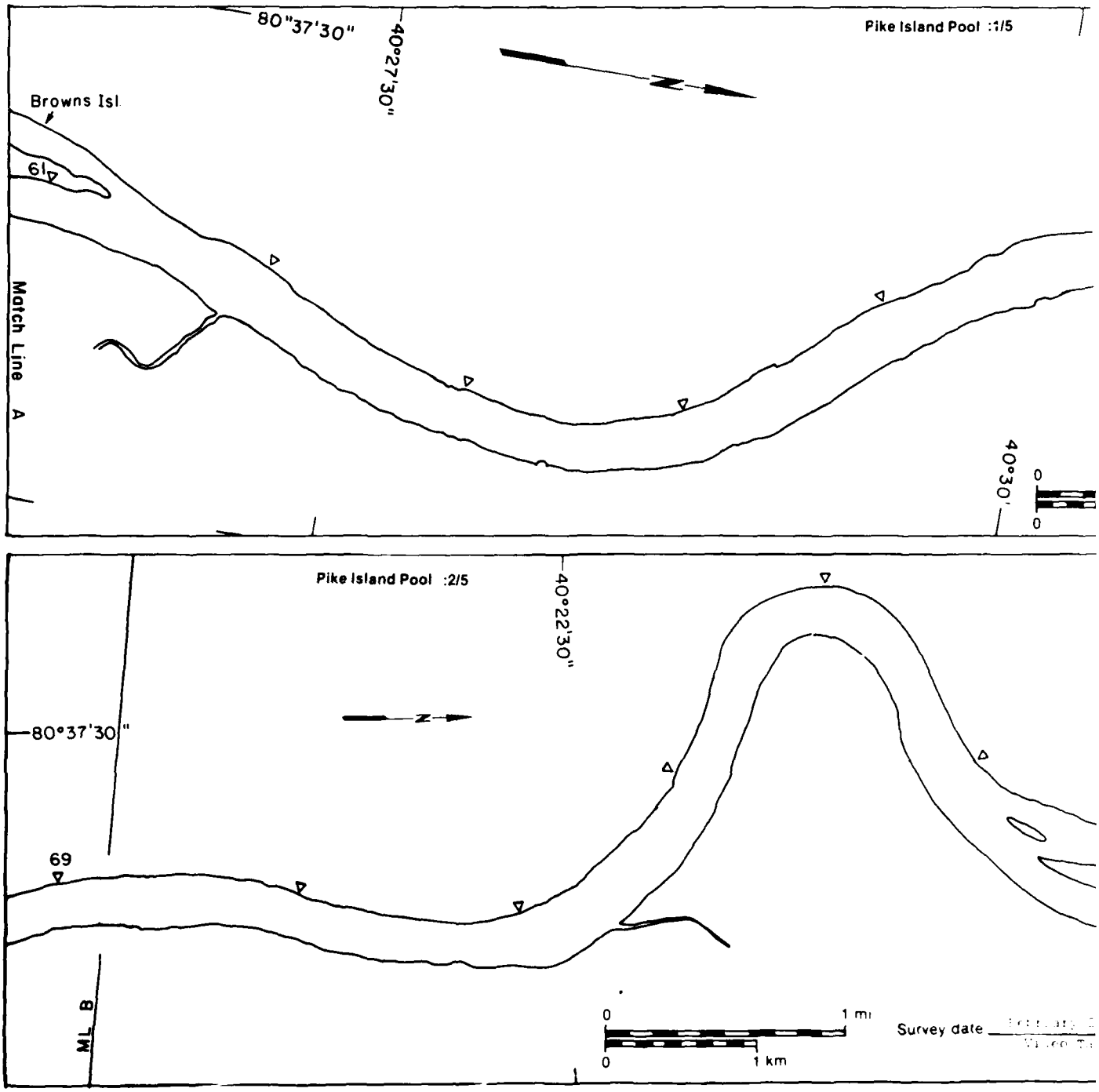


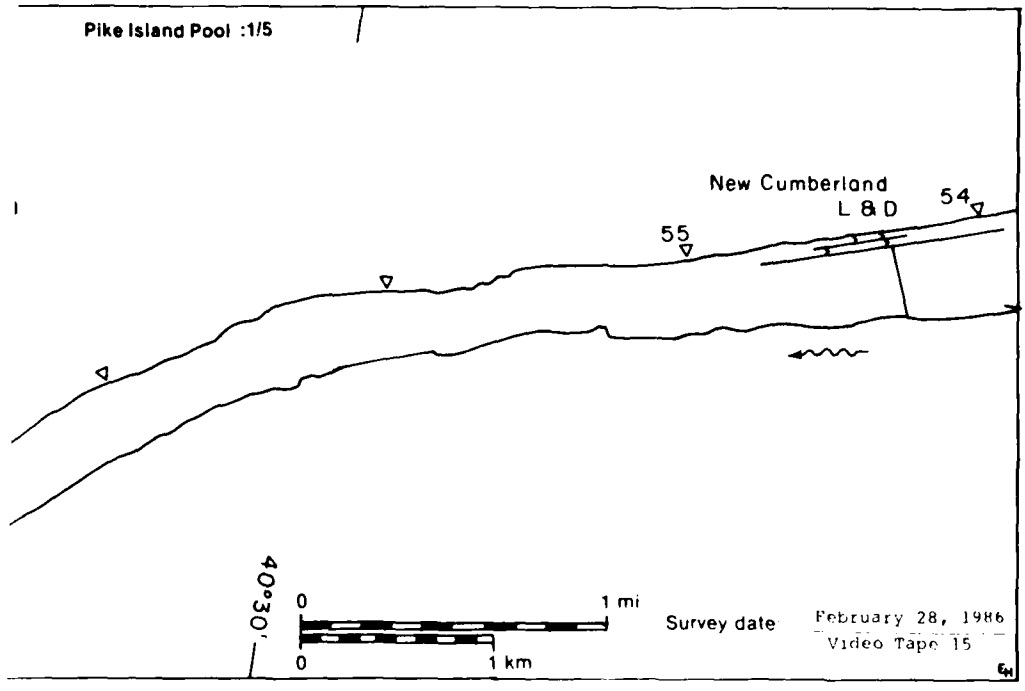


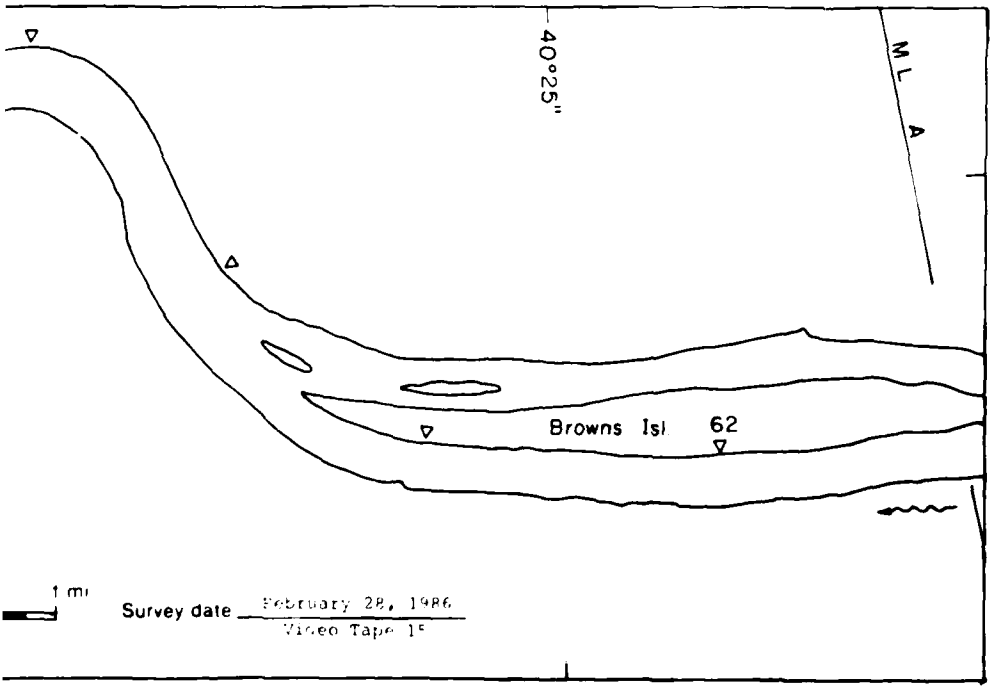
New Cumberland Pool

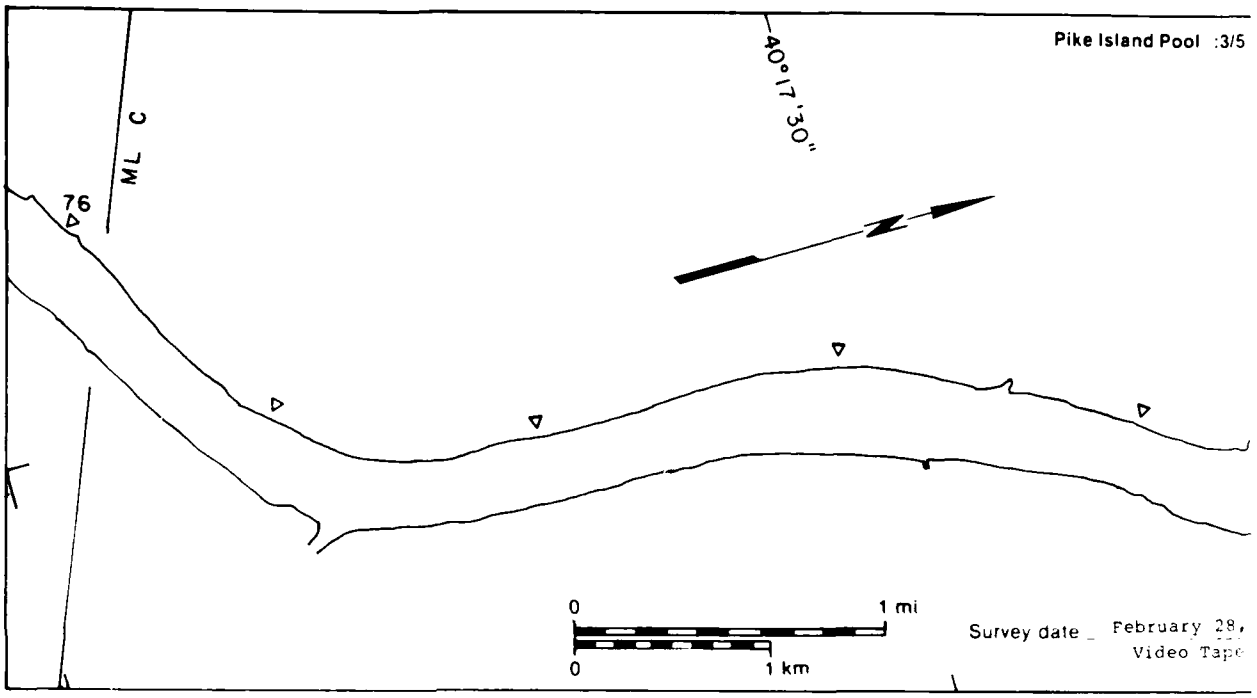
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	14.87	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	14.87	

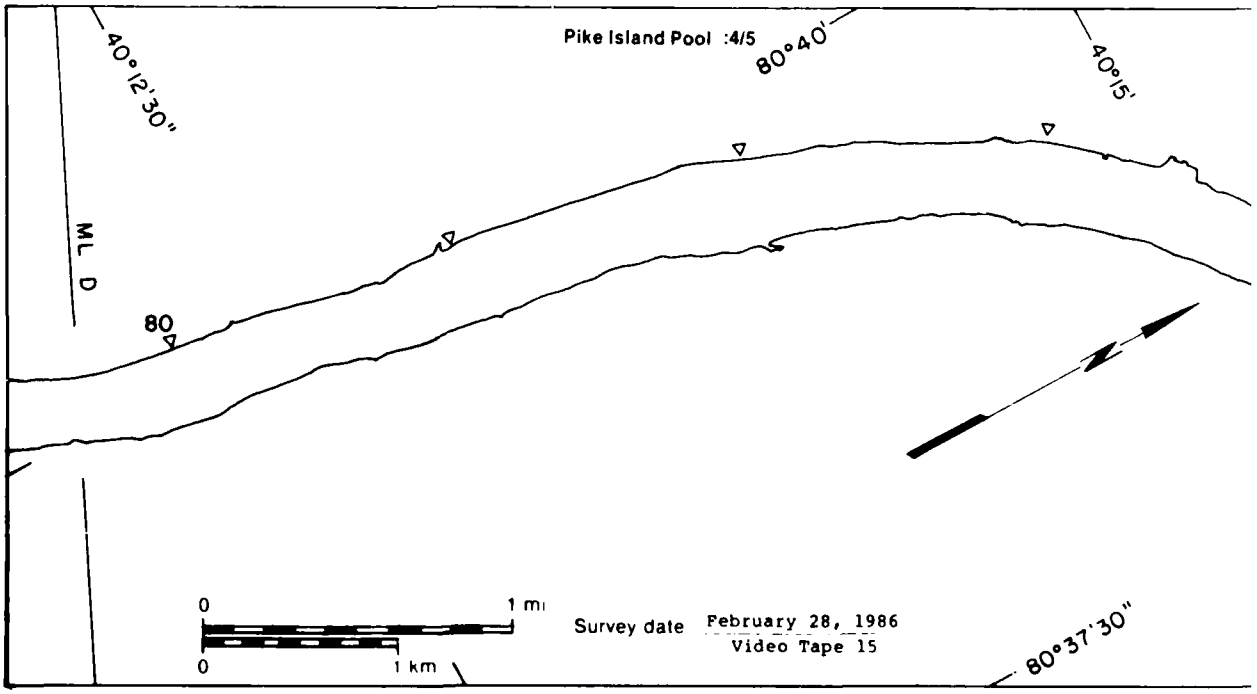


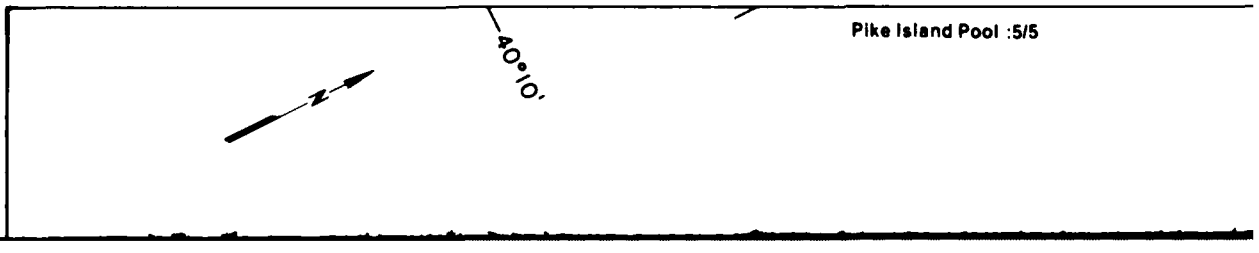

80°37'30"
40°27'30"
Pike Island Pool :1/5
Browns Isl
61
Match Line A
40°30'
0
0
Pike Island Pool :2/5
40°22'30"
80°37'30"
69
ML B
0
1 mi
0
1 km
Survey date


Pike Island Pool :1/5
New Cumberland
L & D
54
55
40°30'
0
1 mi
0
1 km
Survey date
February 28, 1986
Video Tape 15

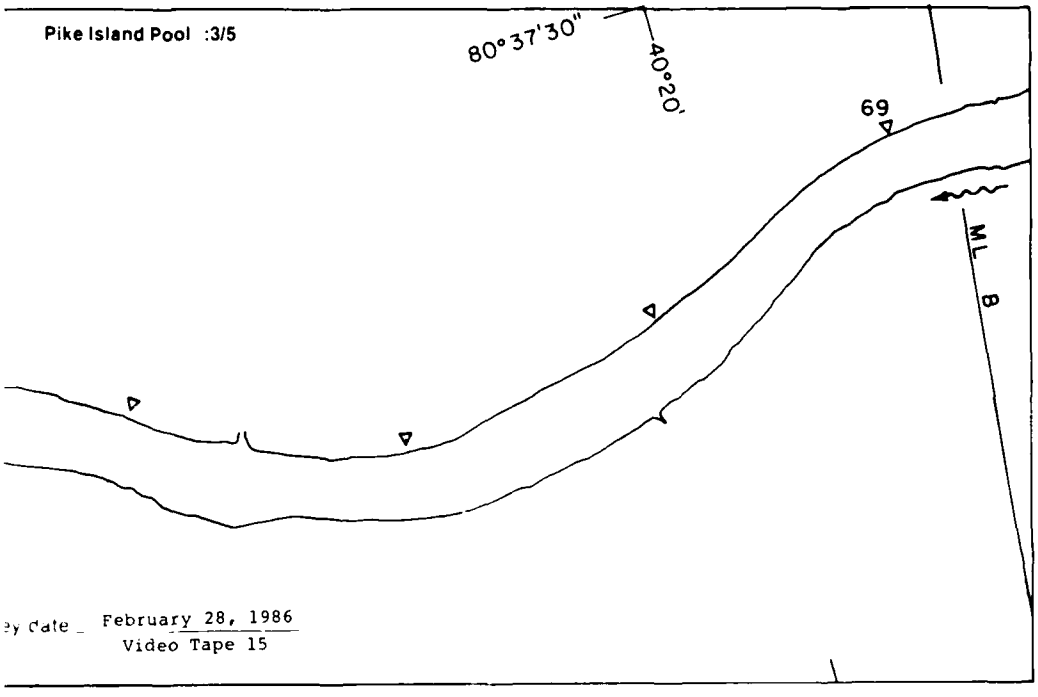

40°25"
M L A
Browns Isl
62
1 mi
Survey date
February 28, 1986
Video Tape 15

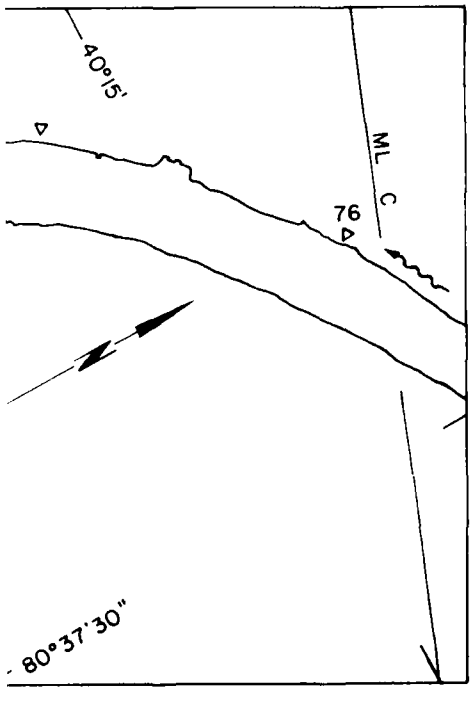

Pike Island Pool :3/5
40°17'30"
ML C
76
0
1 mi
0
1 km
Survey date _ February 28,
Video Tape

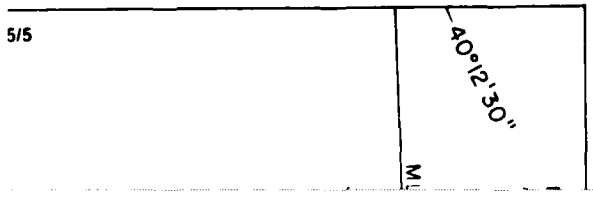

Pike Island Pool :4/5
40°12'30"
80°40'
40°15'
ML D
80
0
1 mi
0
1 km
Survey date February 28, 1986
Video Tape 15
80°37'30"

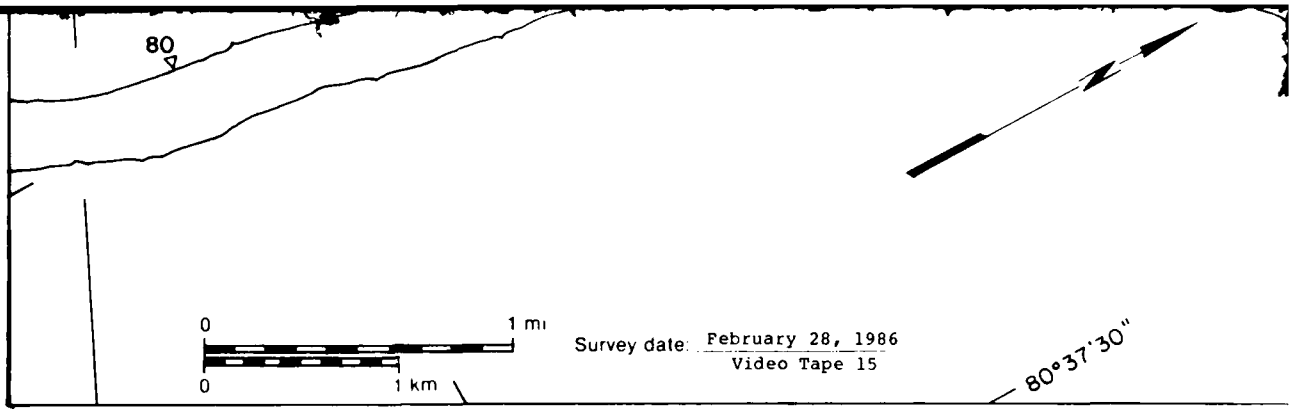

Pike Island Pool :5/5
40°10'

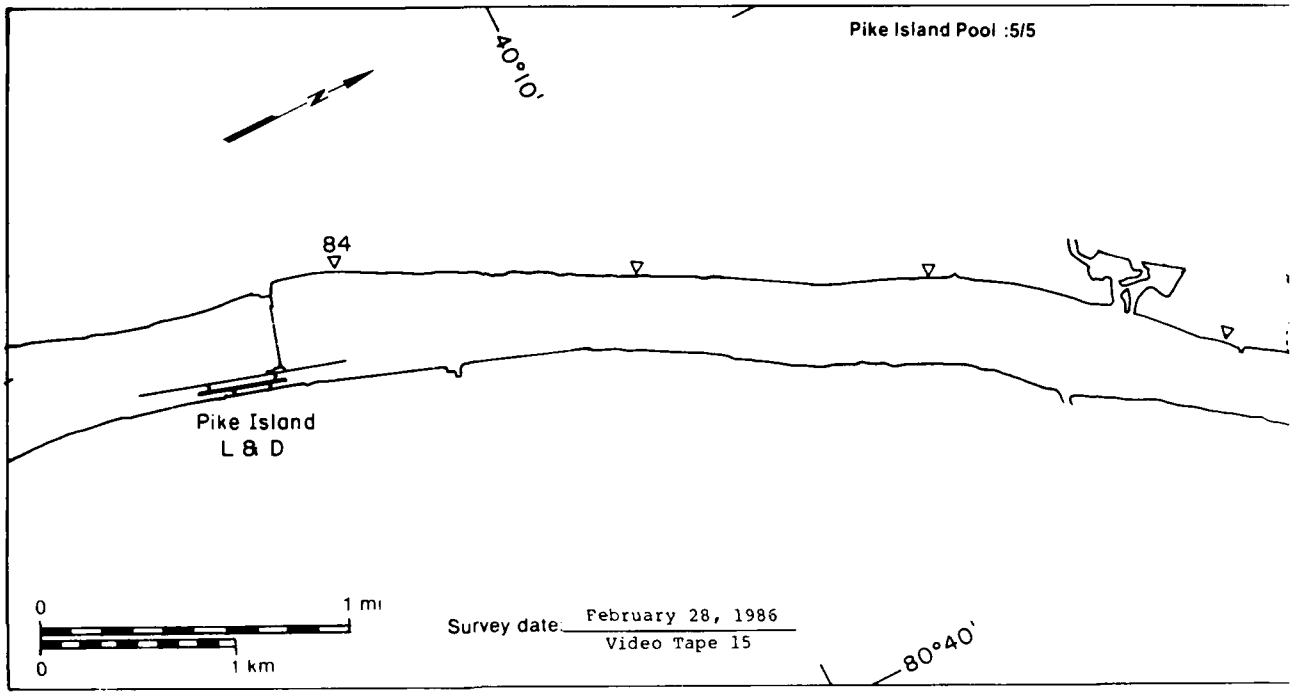
28 February 1986







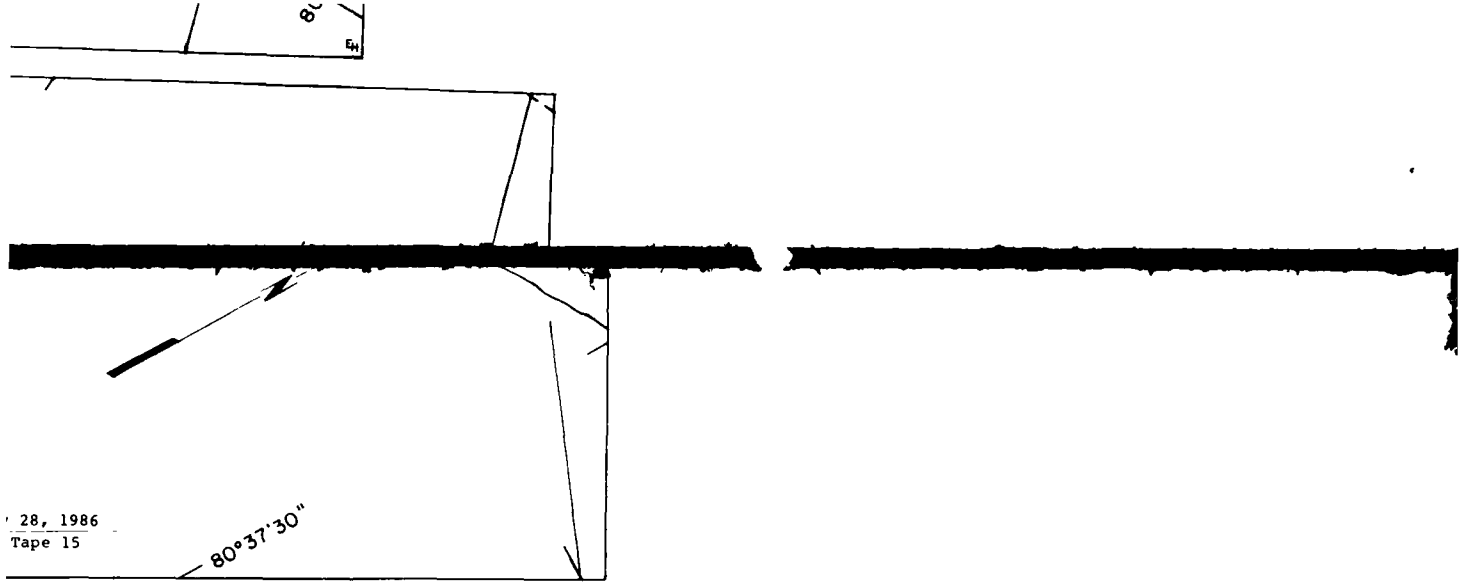


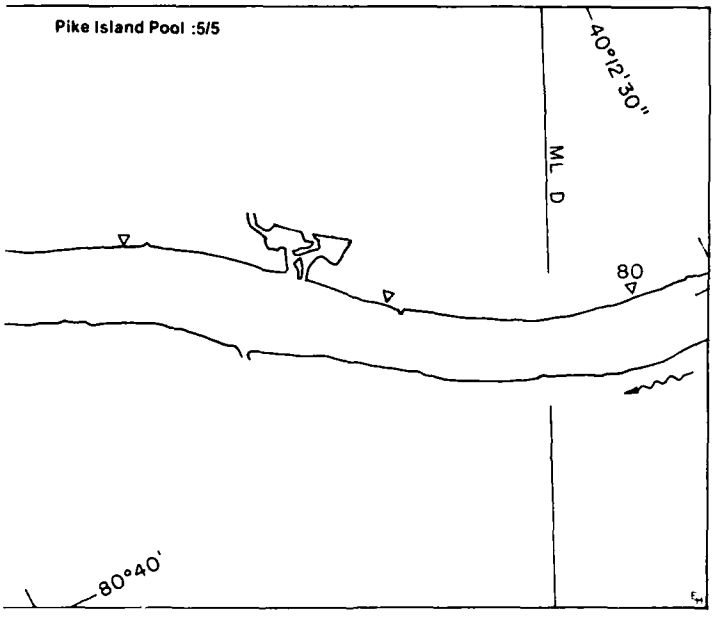


Pike Island Pool

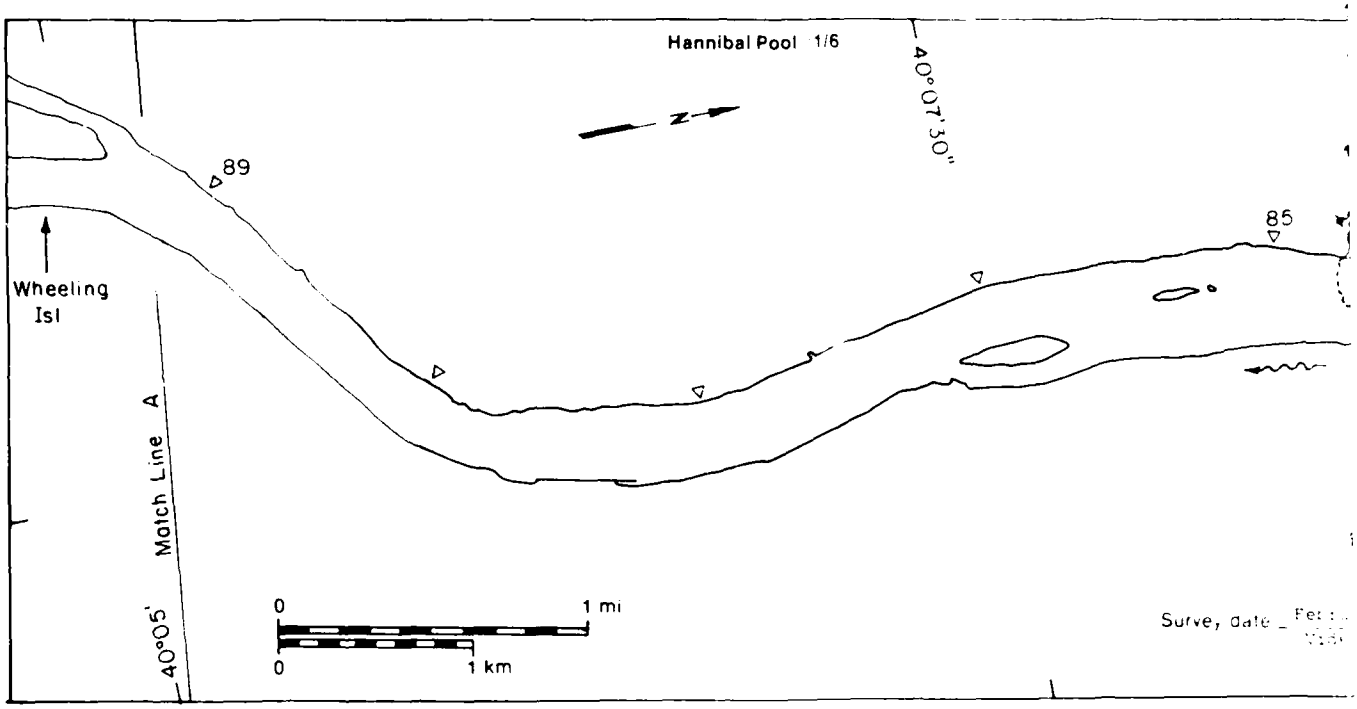
MAP UNITS

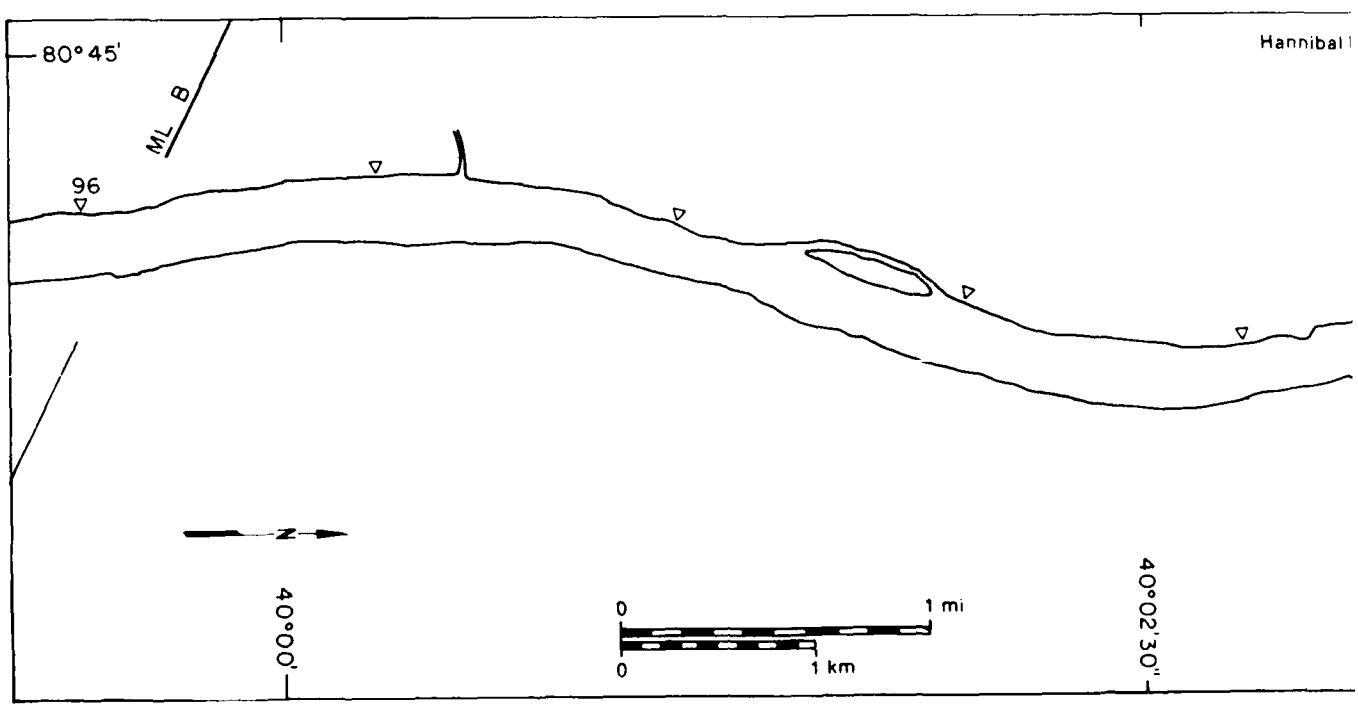
	Area (m^2 x 10^6)	Surface concentration (tenths)
Open water	18.92	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	18.92	

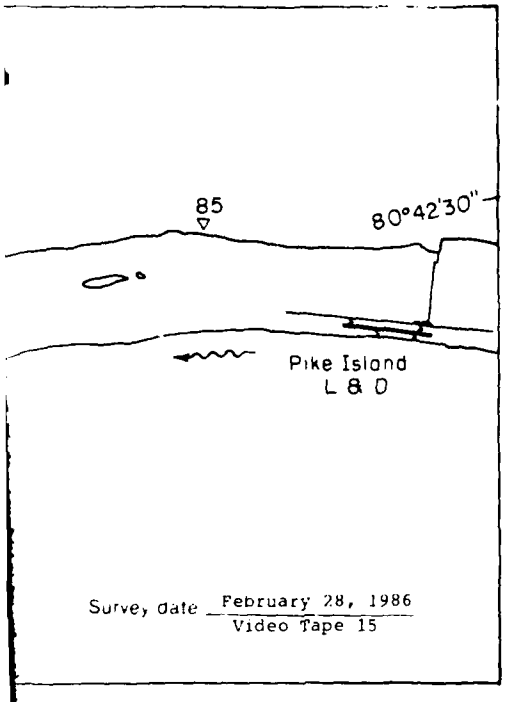

28, 1986
Tape 15
80°37'30"


Pike Island Pool :5/5
40°12'30"
ML D
80
80°40'

28 February 1986

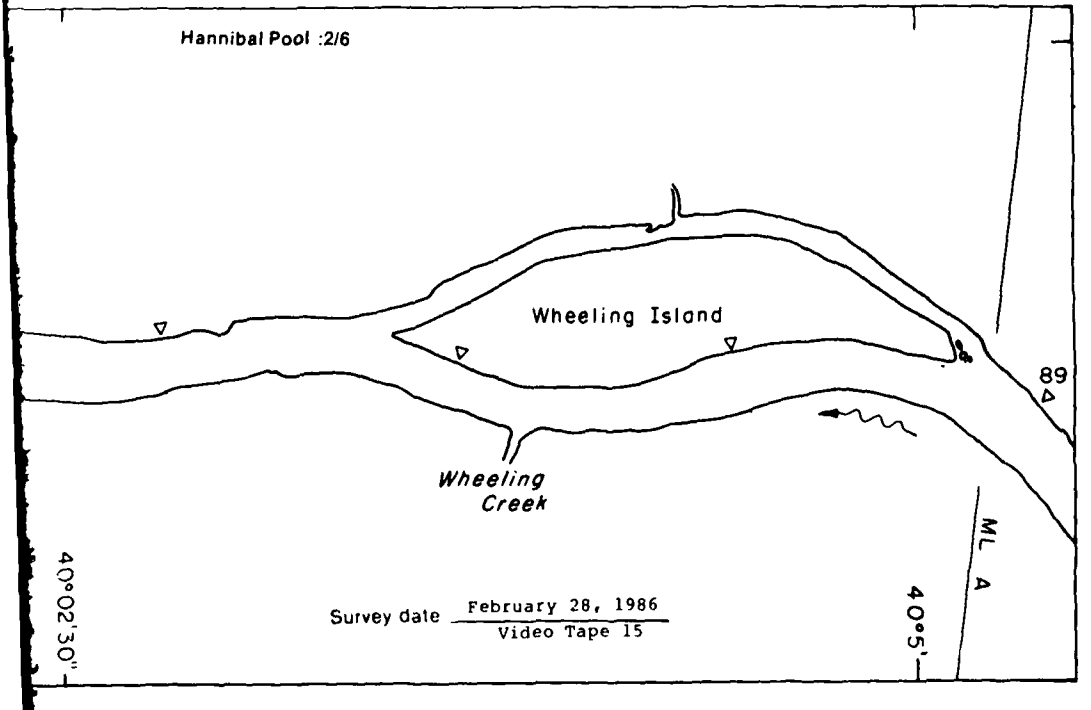




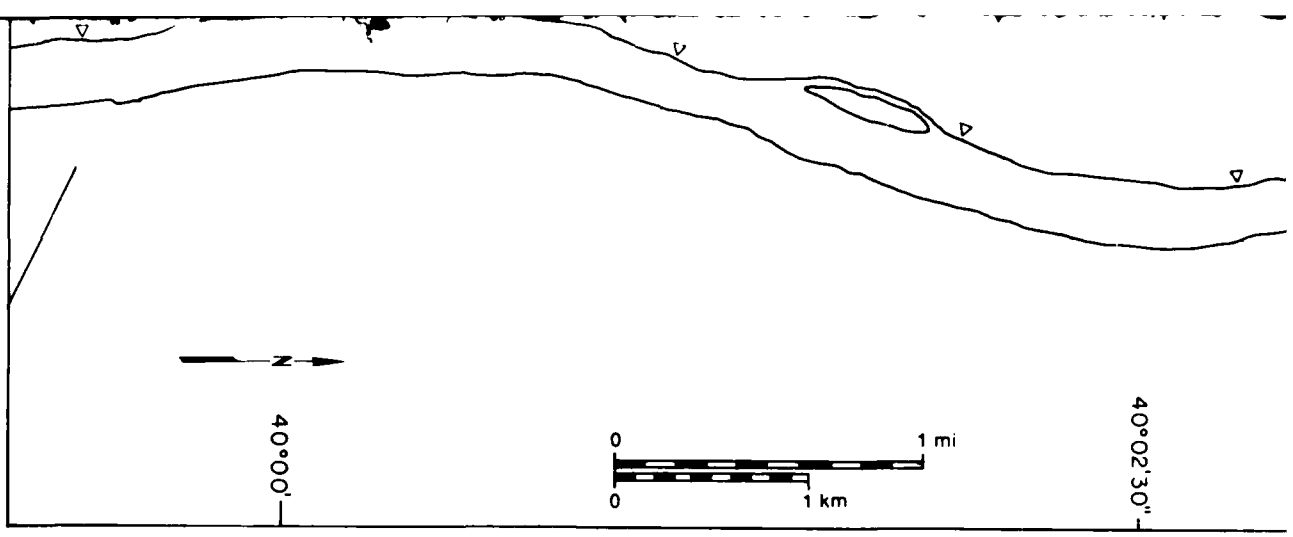


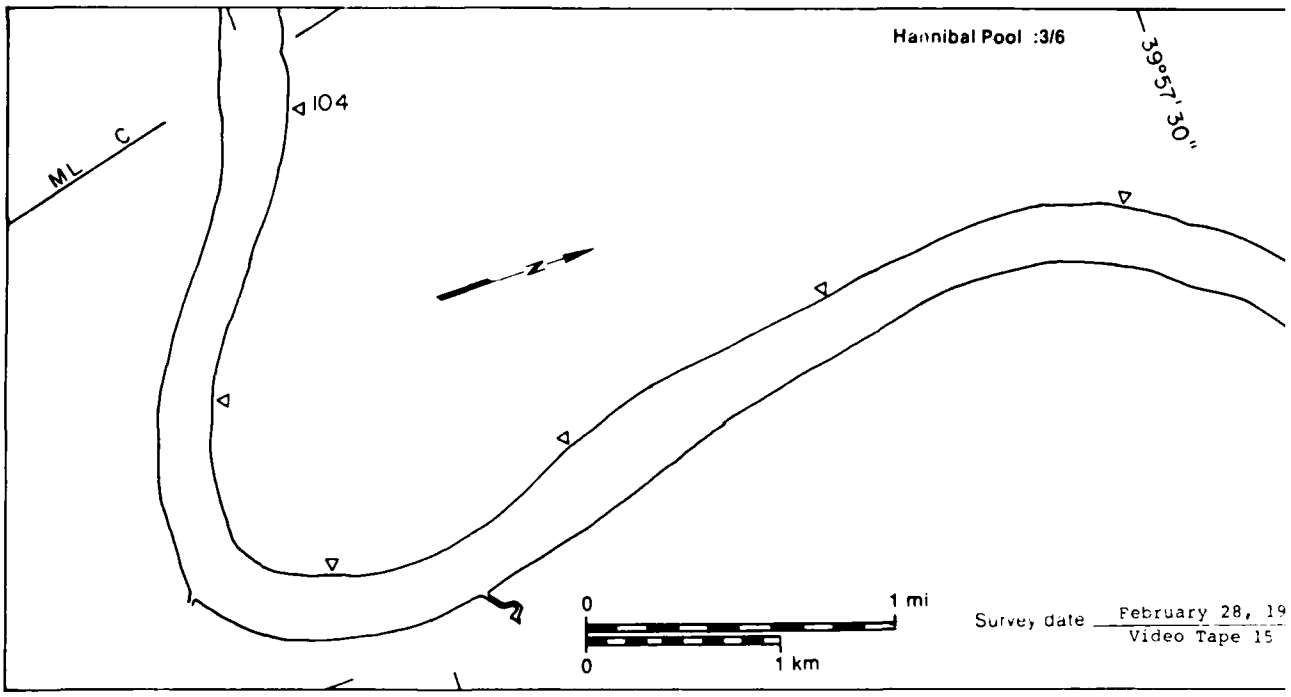
Survey date February 28, 1986
Video Tape 15

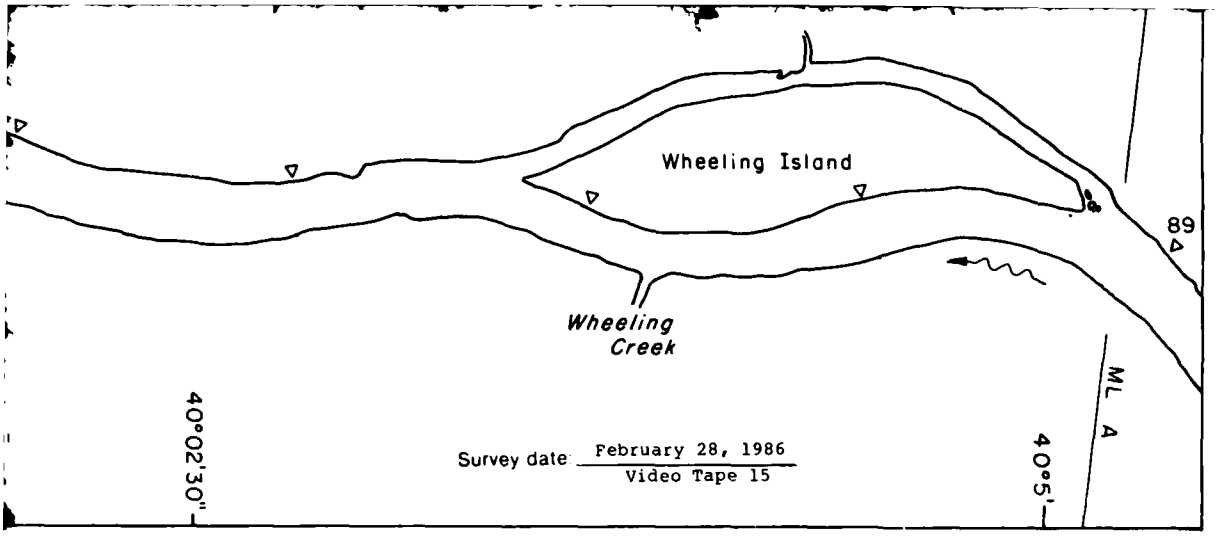
Hannibal Pool :2/6

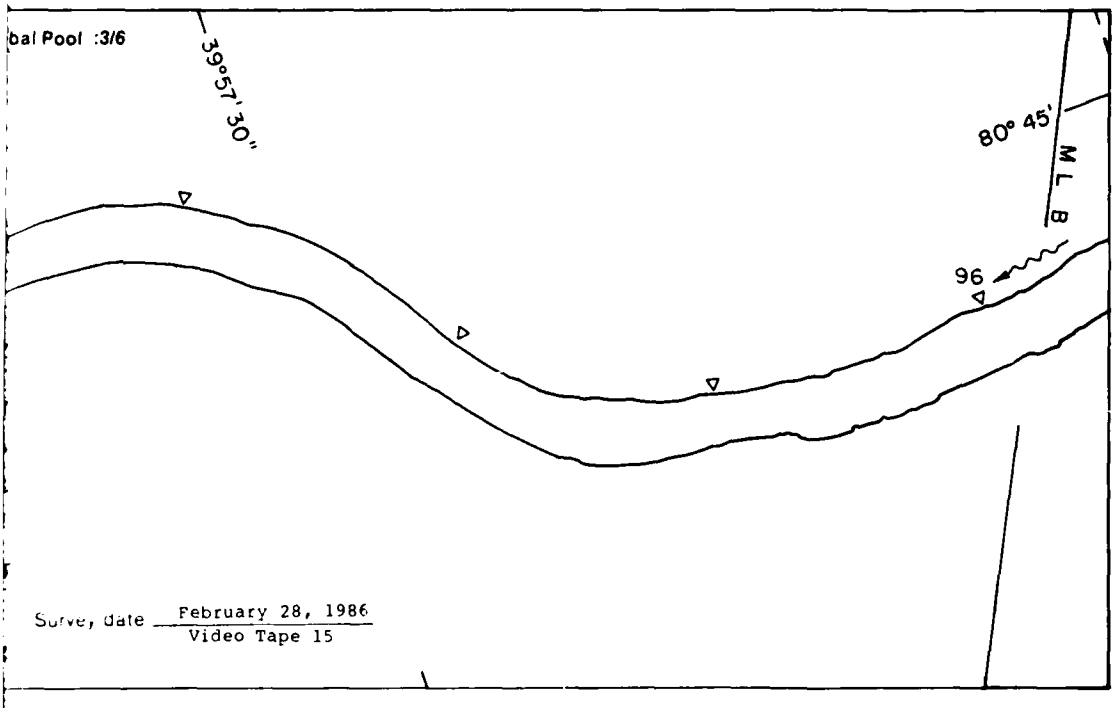


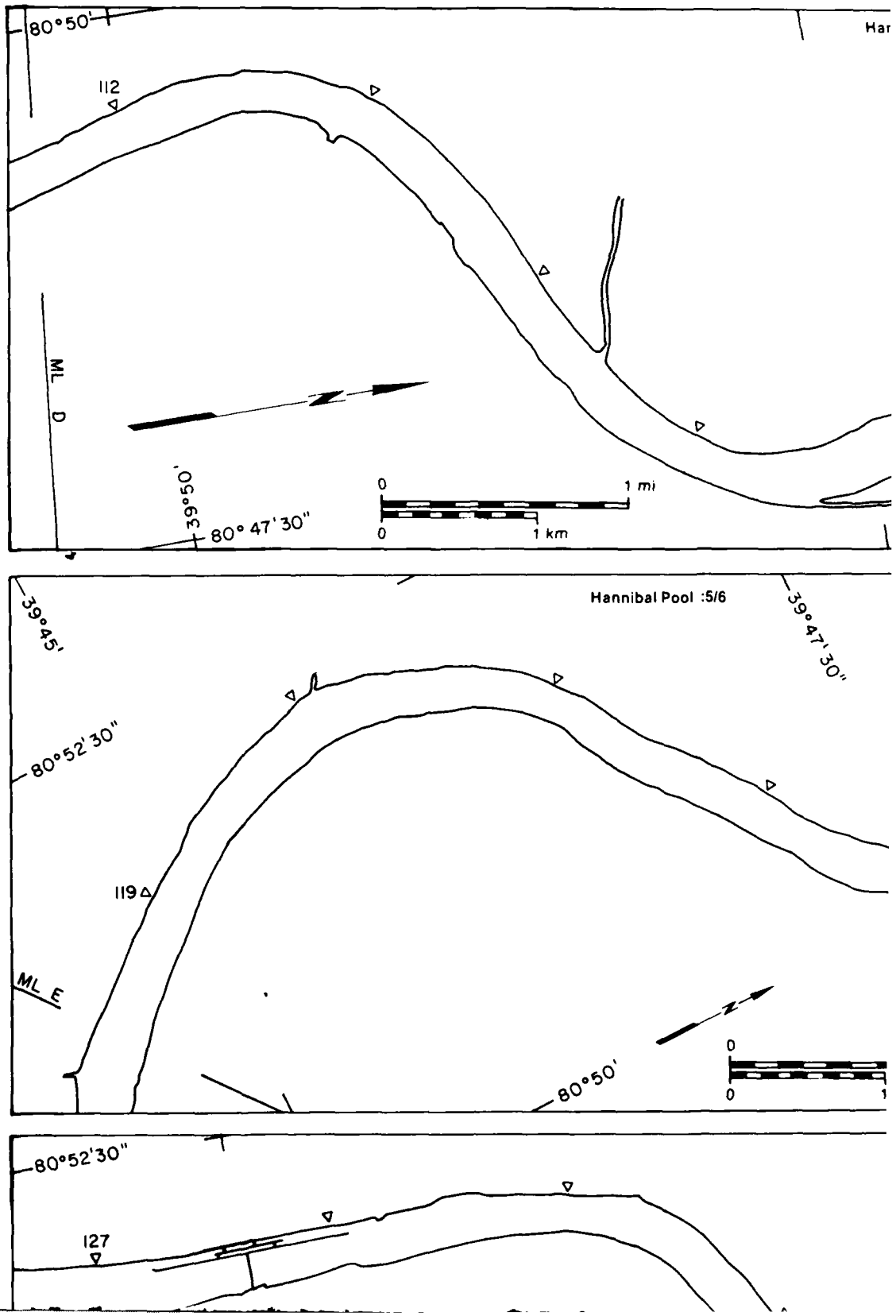
Survey date February 28, 1986
Video Tape 15


N
40°00'
0
1 mi
0
1 km
40°02'30"

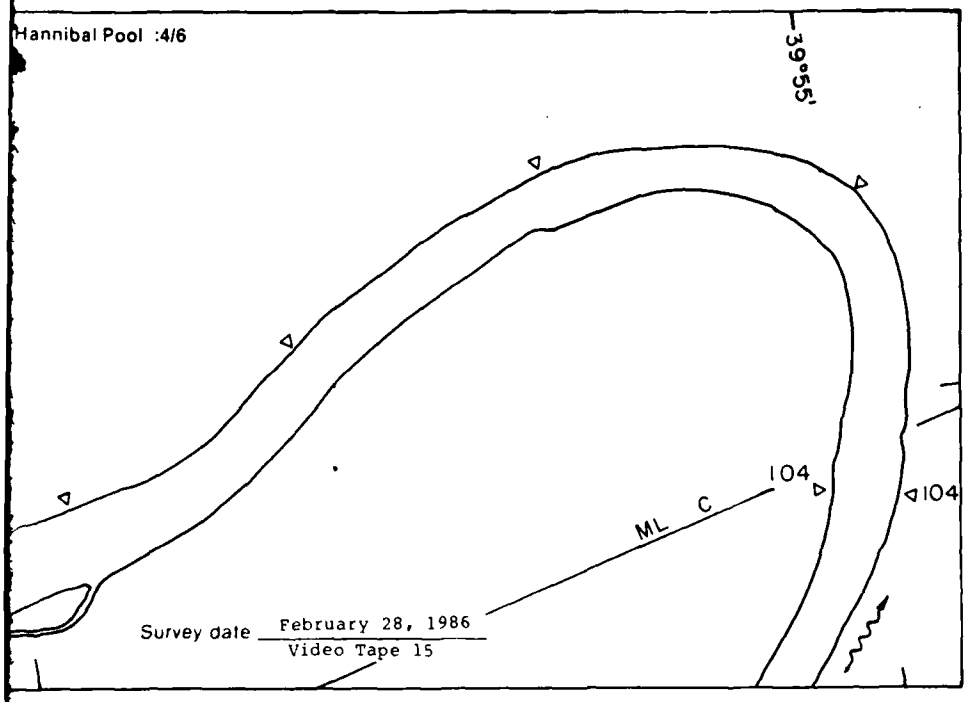

Hannibal Pool :3/6
39°57'30"
104
ML
C
N
0
1 mi
0
1 km
Survey date February 28, 19
Video Tape 15

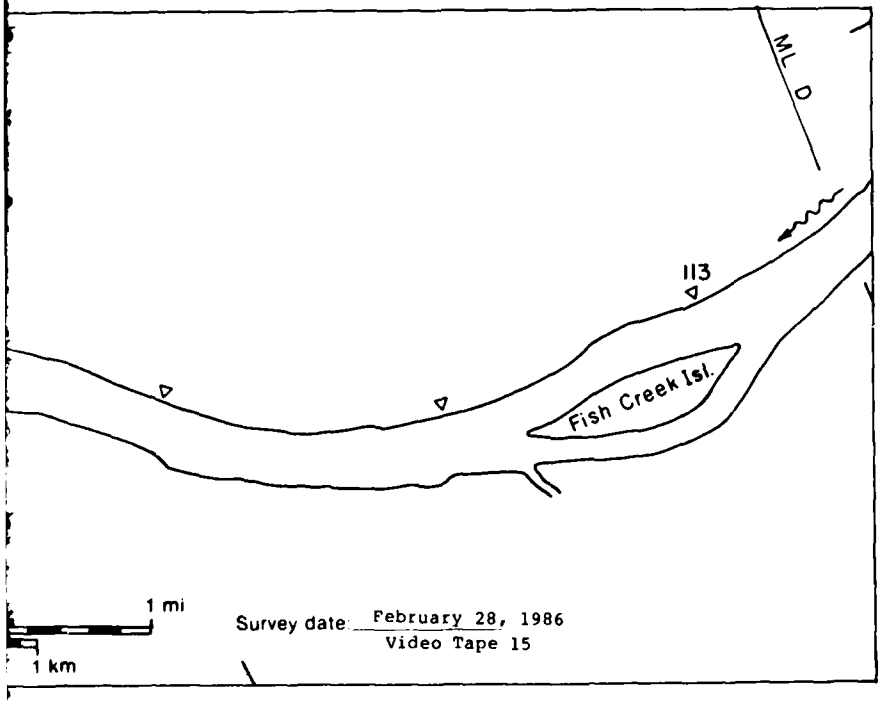

Wheeling Island
89
Wheeling
Creek
40°02'30"
Survey date February 28, 1986
Video Tape 15
40°5'
ML A

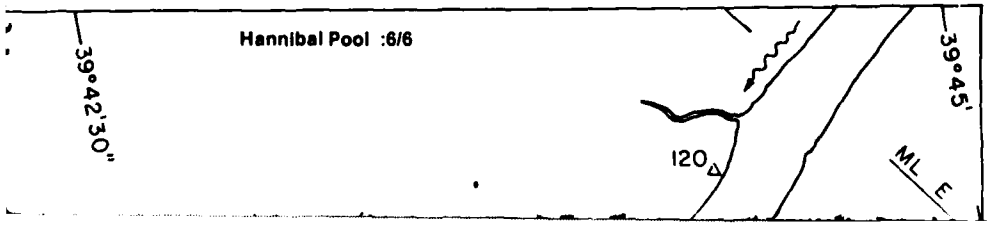

bal Pool :3/6
39°57'30"
80° 45'
ML B
96
Survey date February 28, 1986
Video Tape 15

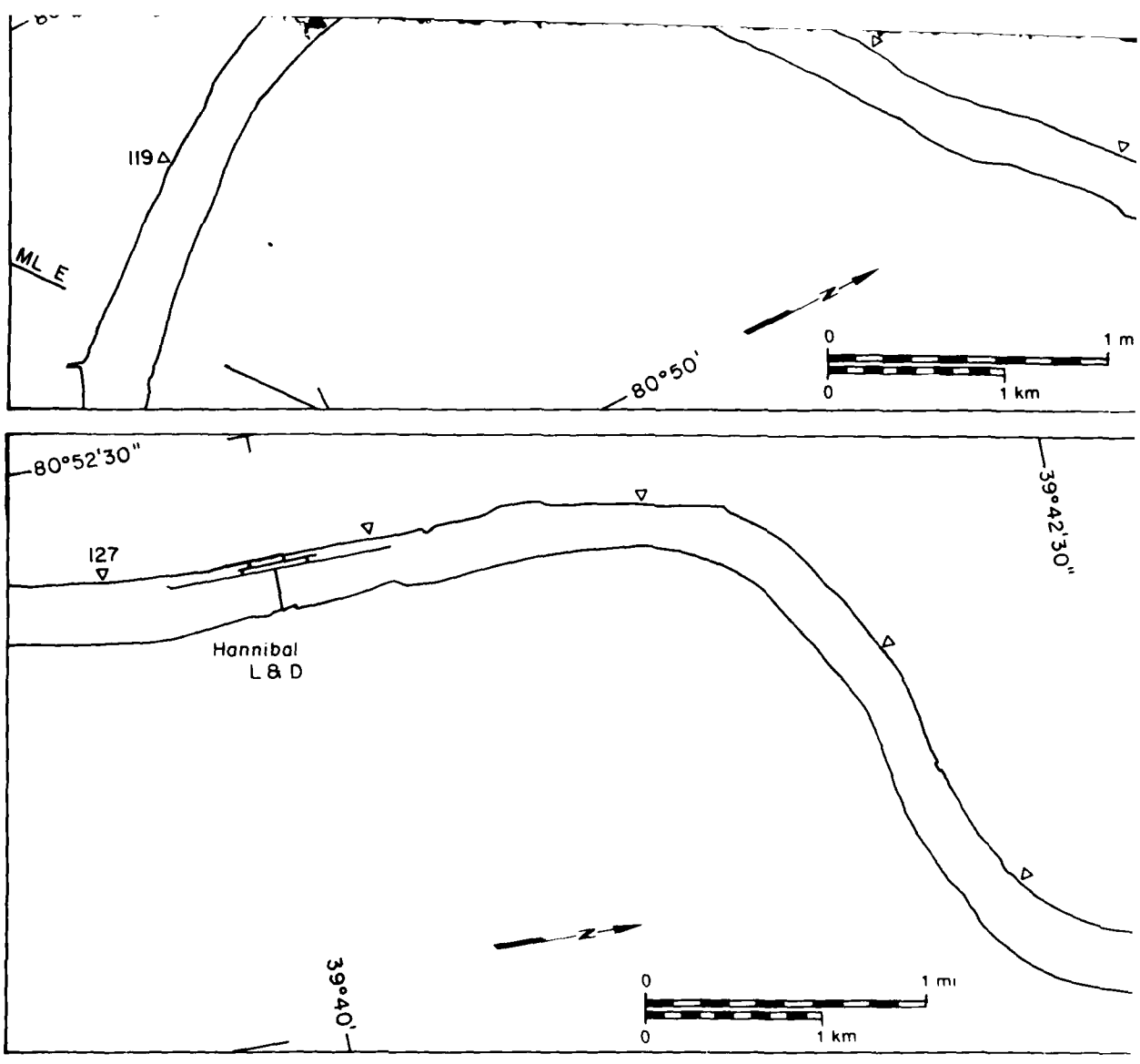

80°50'
112
ML D
39°50'
80° 47' 30"
0
1 mi
0
1 km
Hannibal Pool :5/6
39°45'
39°47'30"
80°52'30"
119
ML E
80°50'
0
0
80°52'30"
127

28 February 1986



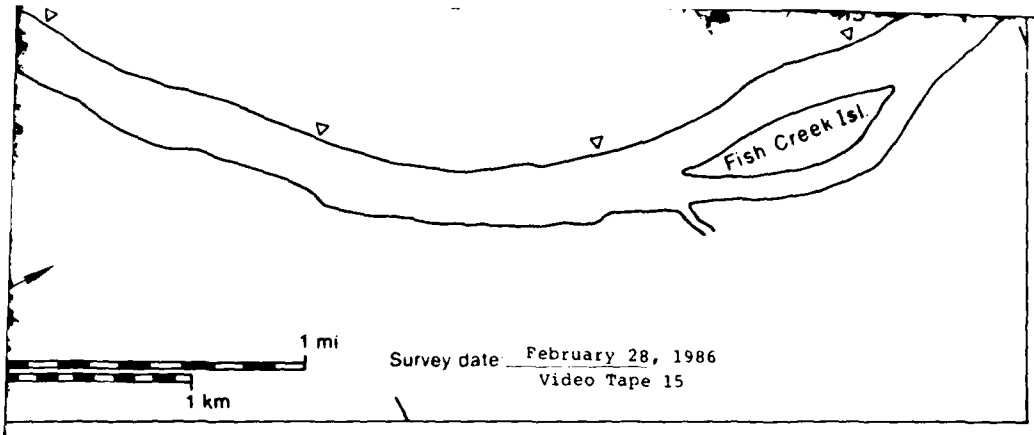


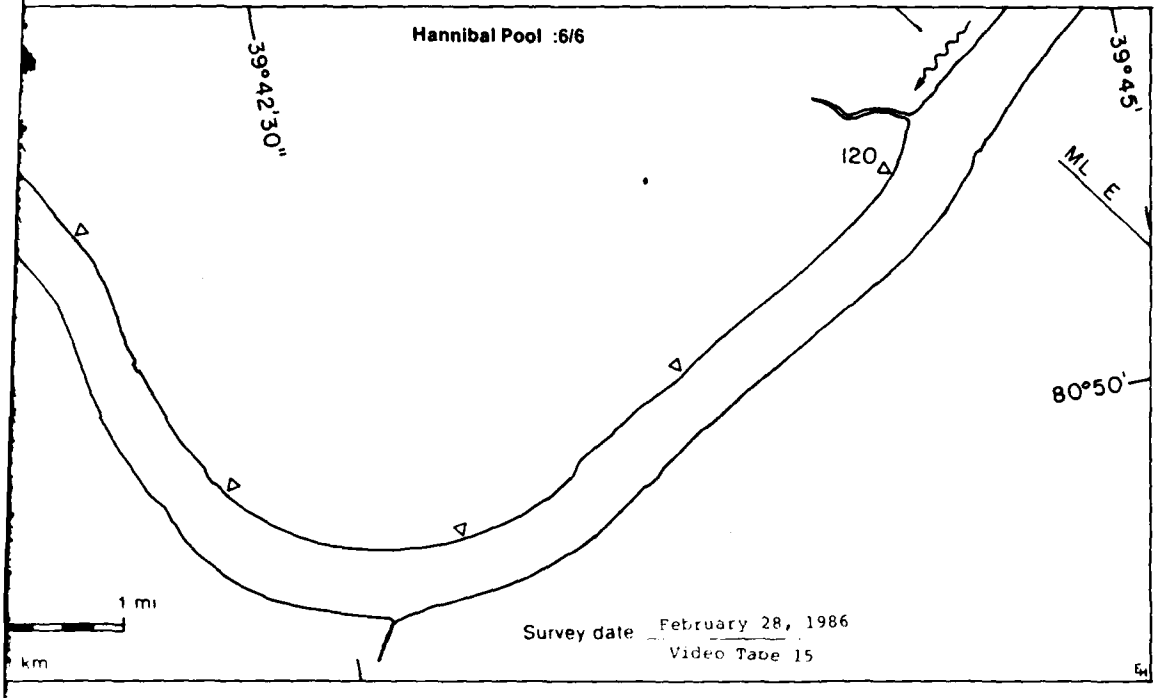




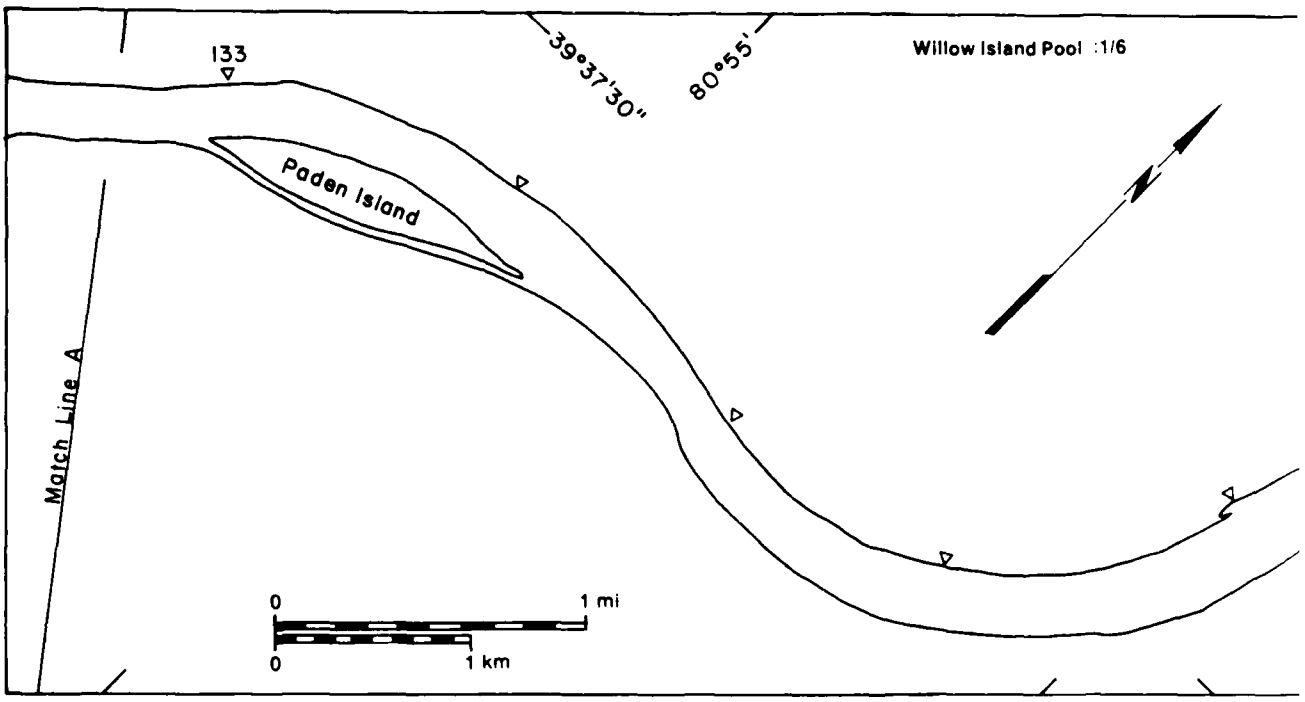
Hannibal Pool

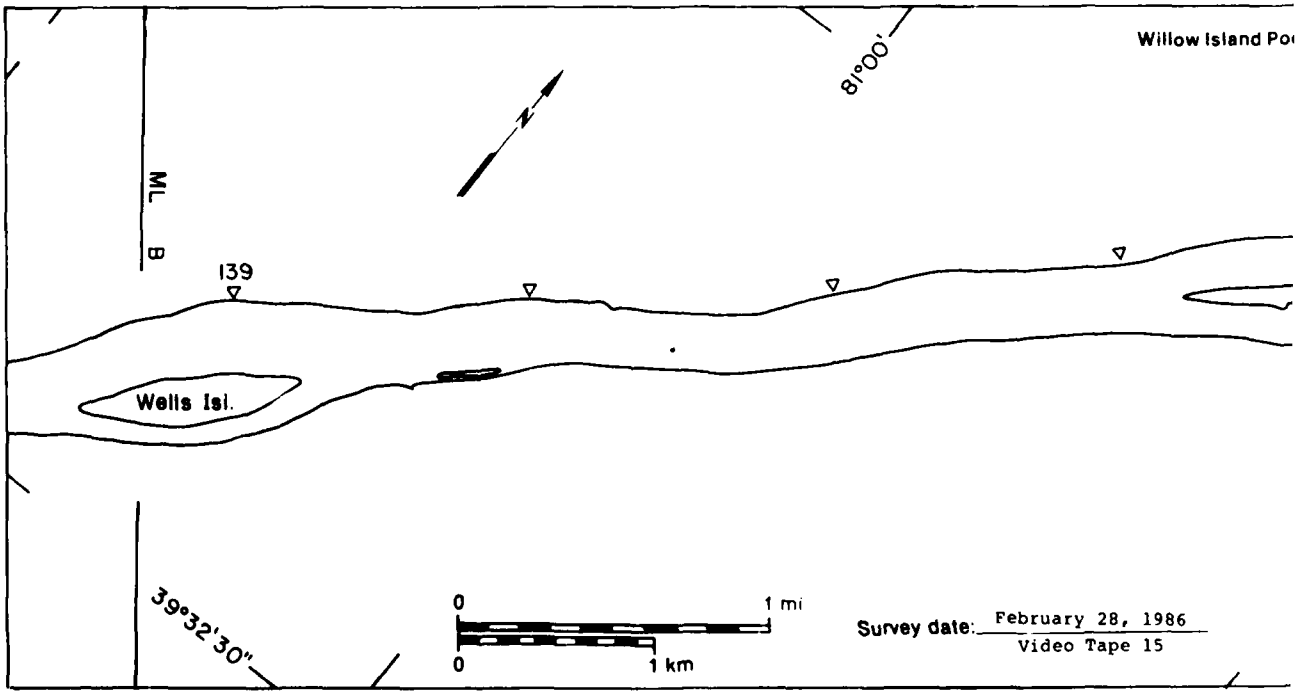
MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	22.46	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area (m^2 x 10^6)	22.46	

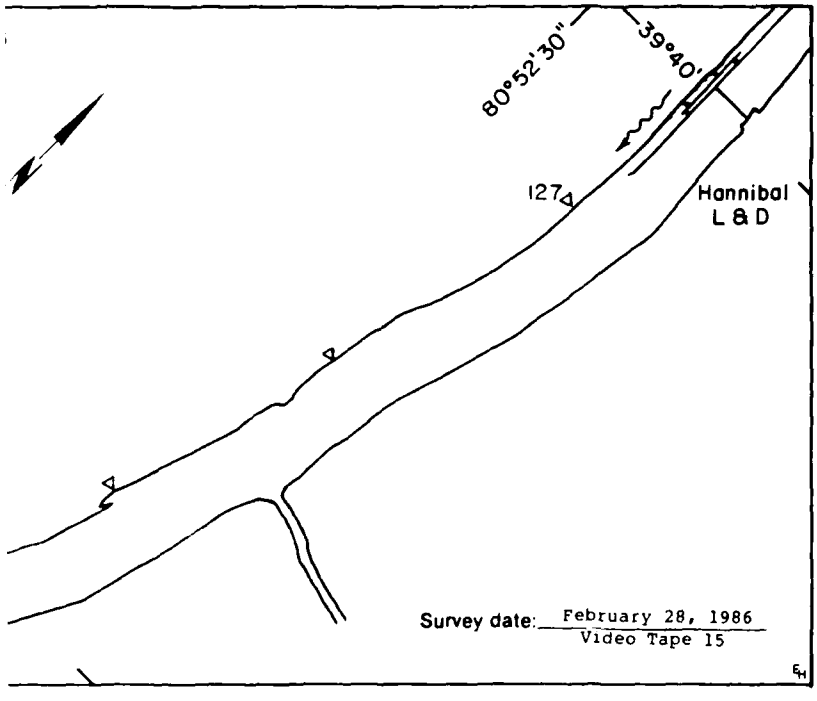

Fish Creek Isl.
1 mi
1 km
Survey date February 28, 1986
Video Tape 15

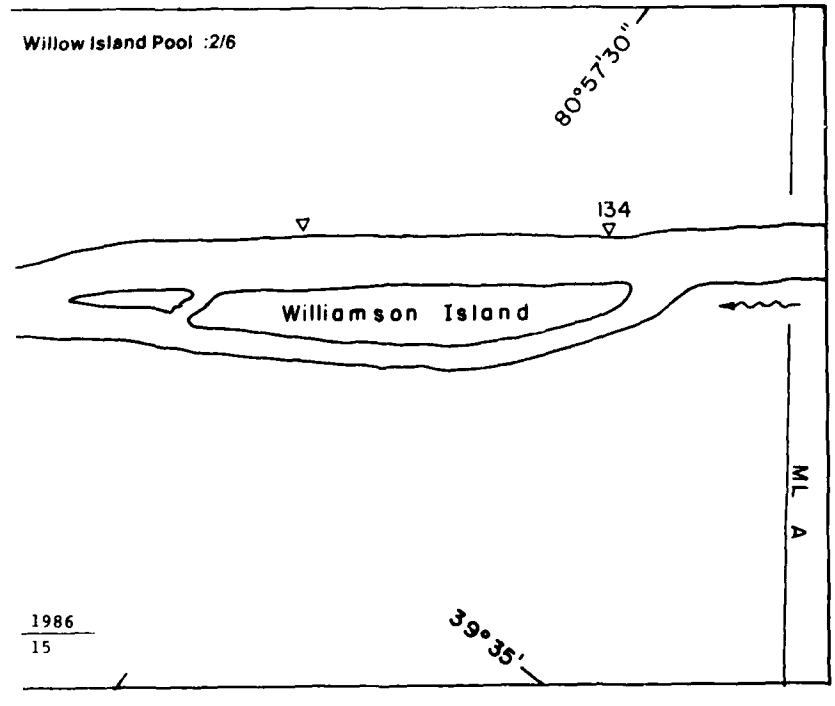

Hannibal Pool :6/6
39°42'30"
120
39°45'
ML E
80°50'
1 mi
km
Survey date February 28, 1986
Video Tape 15

28 February 1986

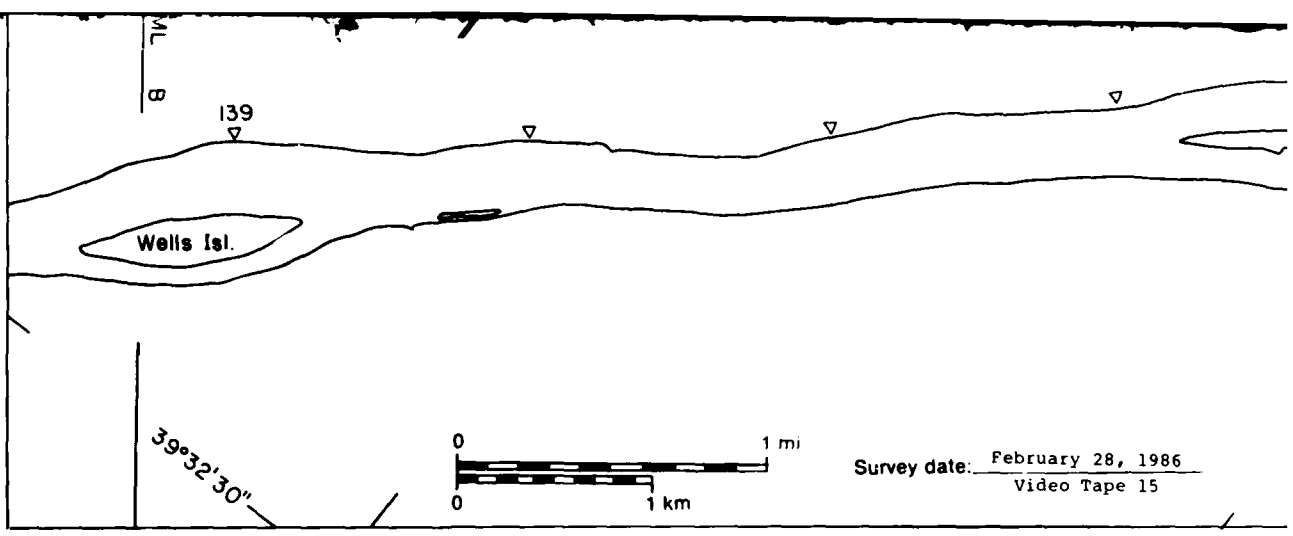


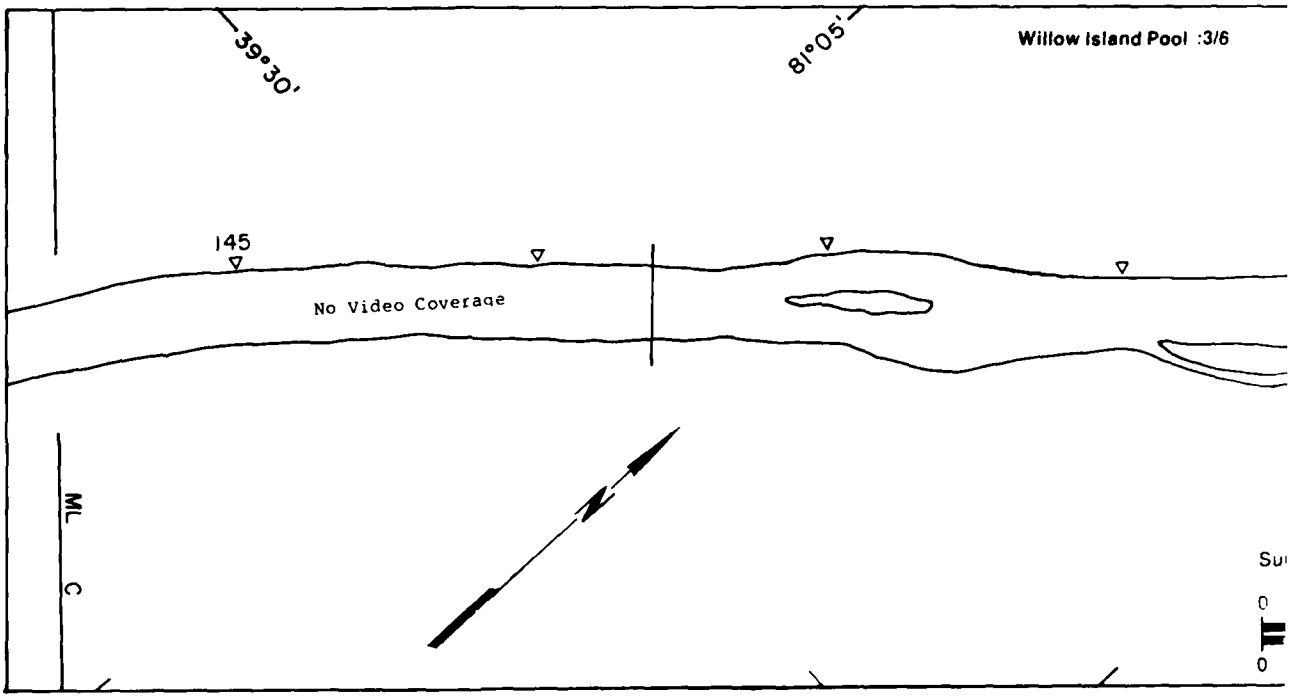


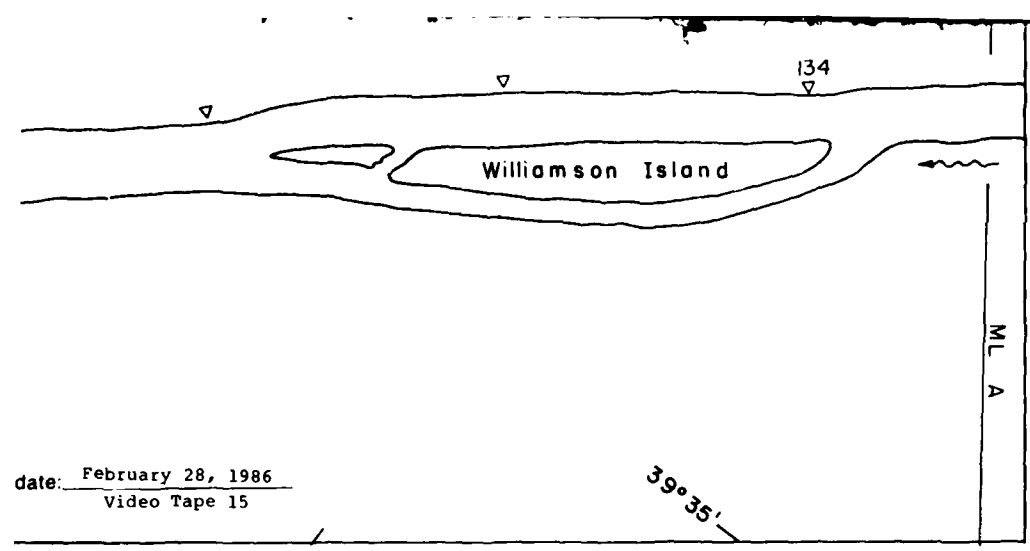

80°52'30"
39°40'
127
Hannibal
L & D
Survey date: February 28, 1986
Video Tape 15

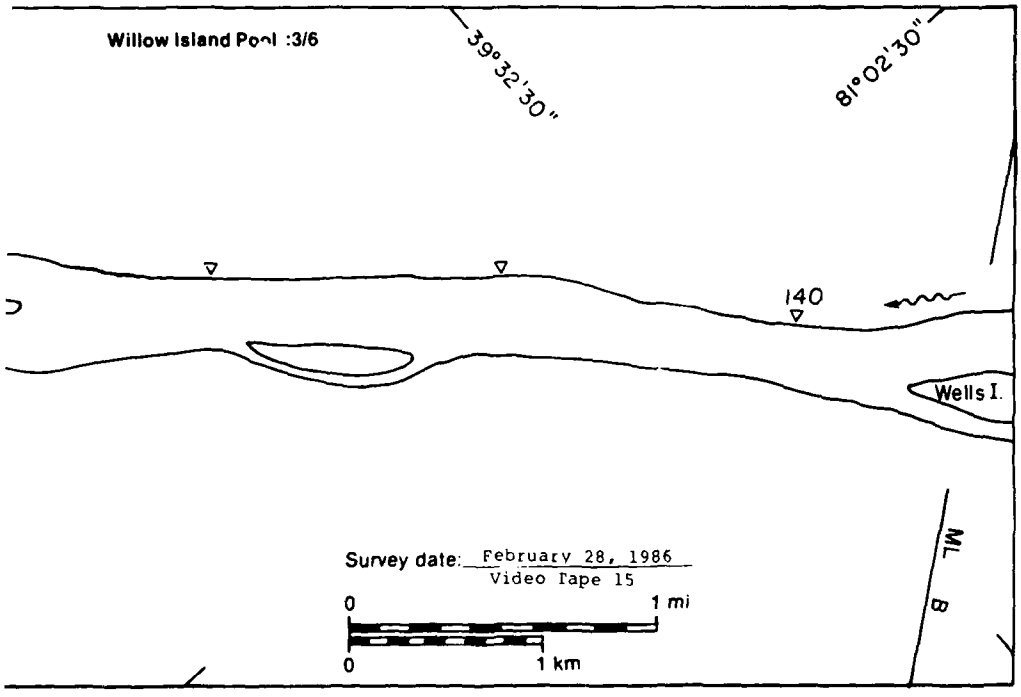

Willow Island Pool :2/6
80°57'30"
134
Williamson Island
ML A
1986
15
39°35'

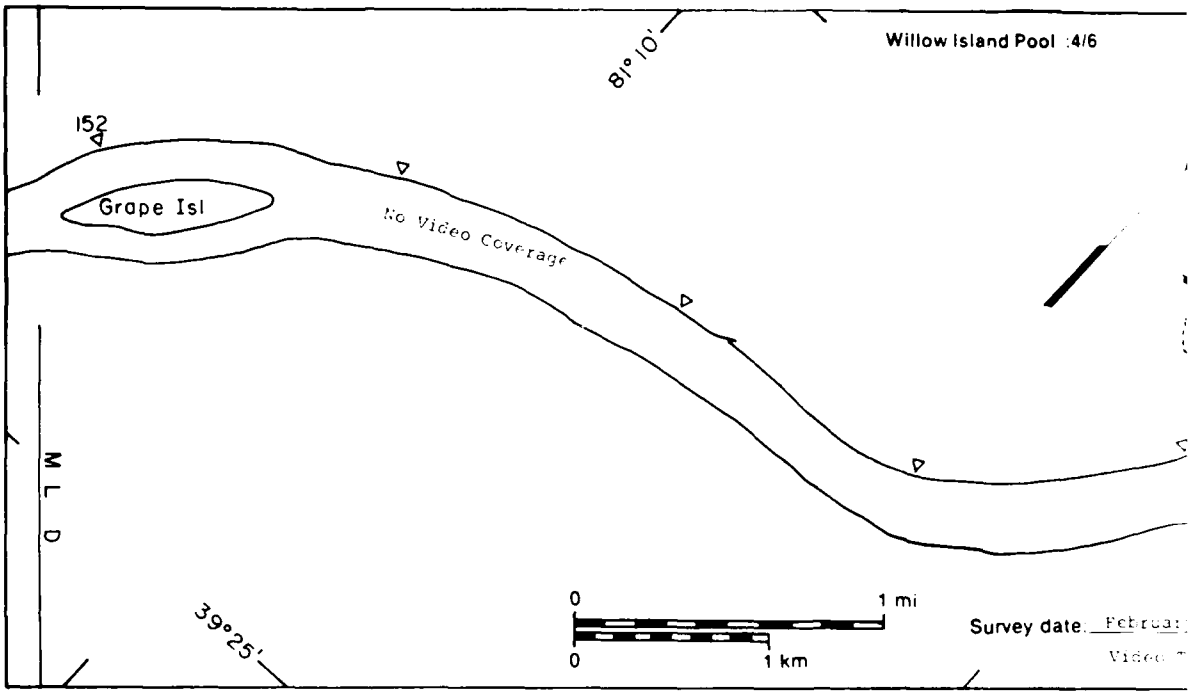
d Pool :3/6

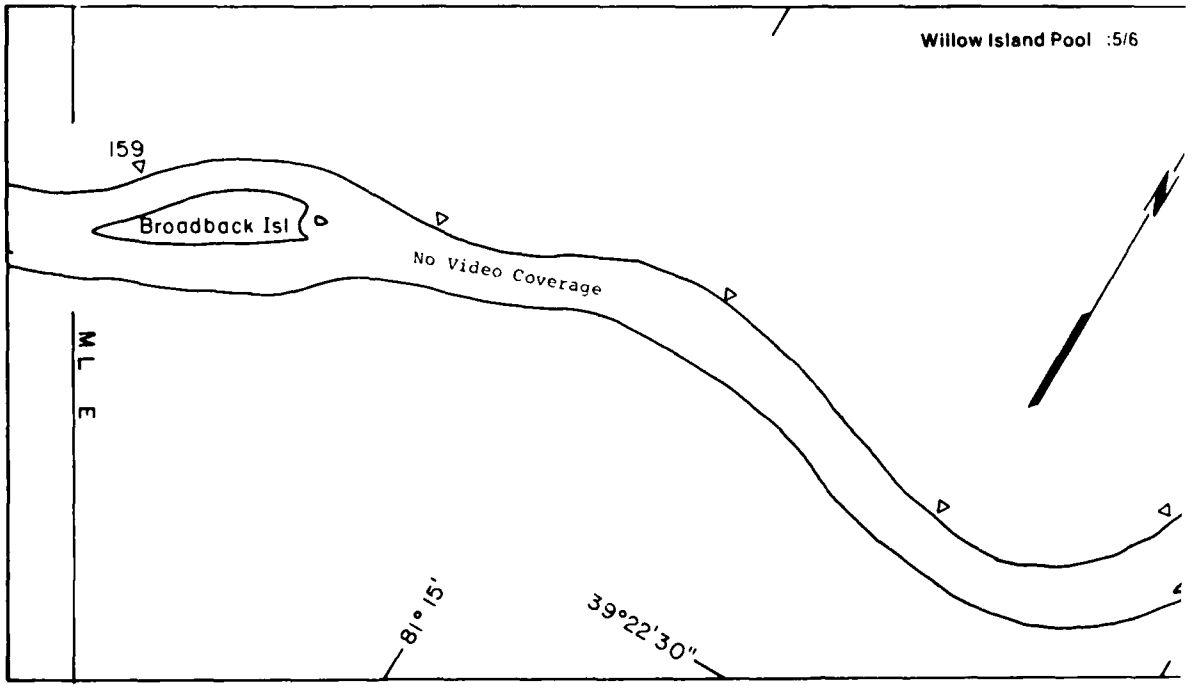

ML B
139
Wells Isl.
39°32'30"
0
1 mi
0
1 km
Survey date: February 28, 1986
Video Tape 15

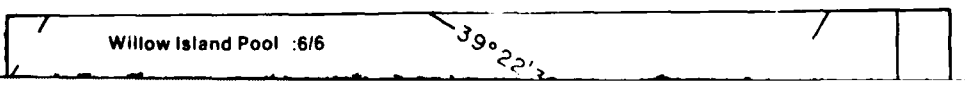

39°30'
81°05'
Willow Island Pool :3/6
145
No Video Coverage
ML C


134
Williamson Island
ML A
date: February 28, 1986
Video Tape 15
39°35'

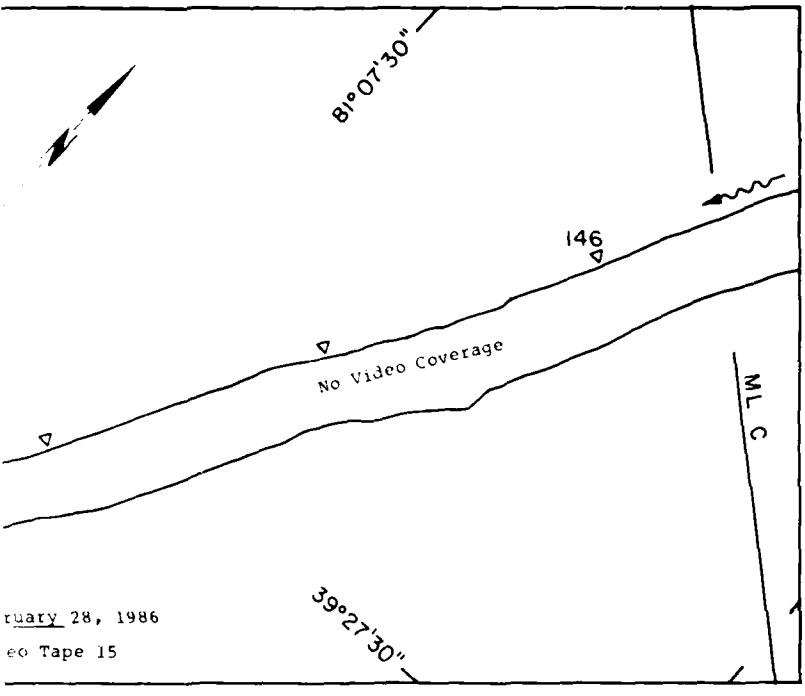

Willow Island Pool :3/6
39°32'30"
81°02'30"
140
Wells I.
ML B
Survey date: February 28, 1986
Video Tape 15
0
1 mi
0
1 km

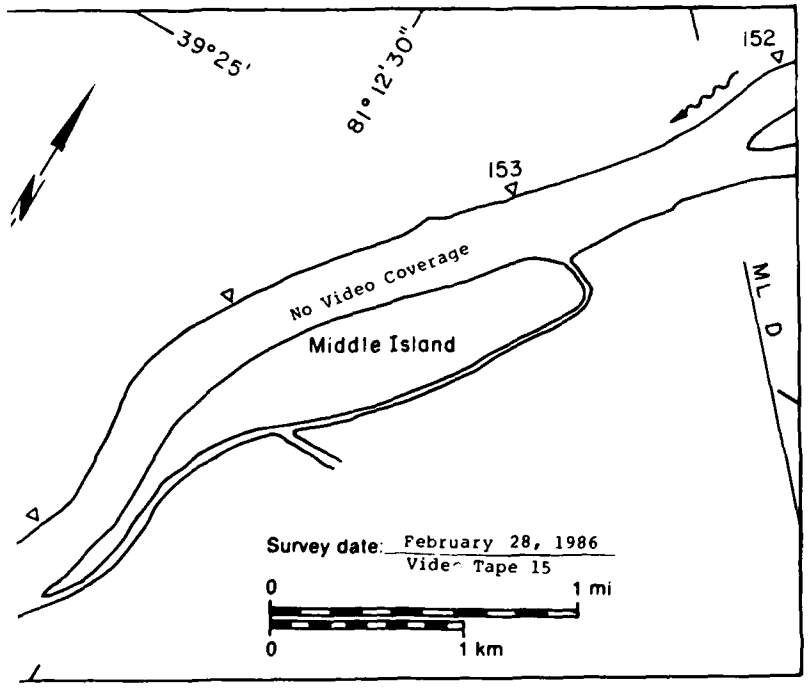

Willow Island Pool :4/6
81°10'
152
Grape Isl
No Video Coverage
MLD
39°25'
0
1 mi
0
1 km
Survey date: Februar


Willow Island Pool :5/6
159
Broadback Isl
No Video Coverage
MLE
81°15'
39°22'30"


Willow Island Pool :6/6

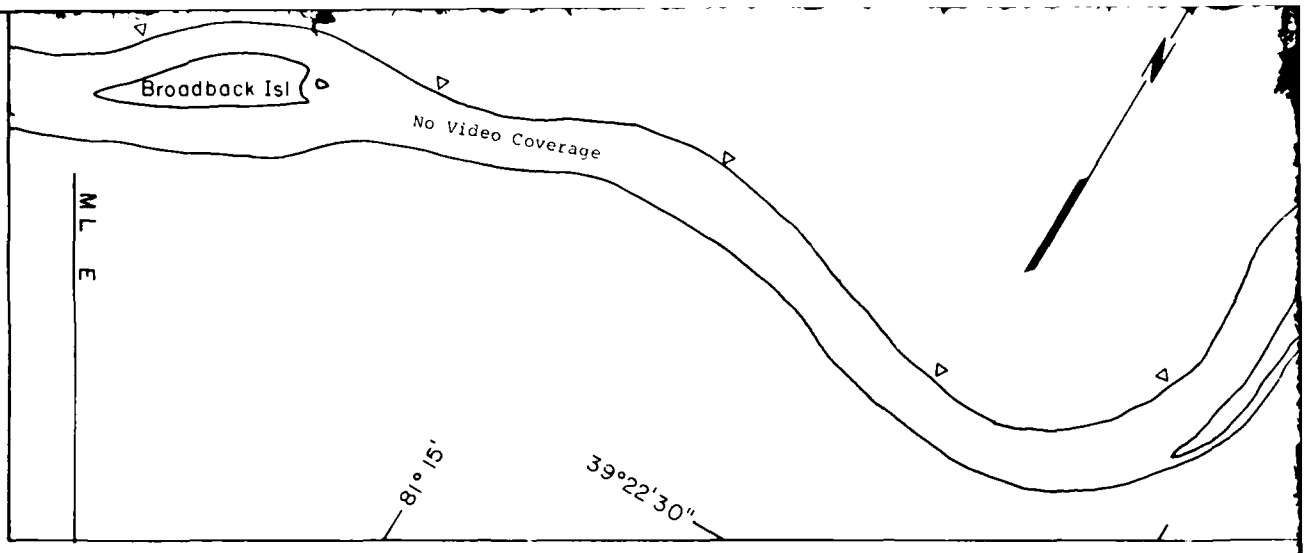
28 February 1986

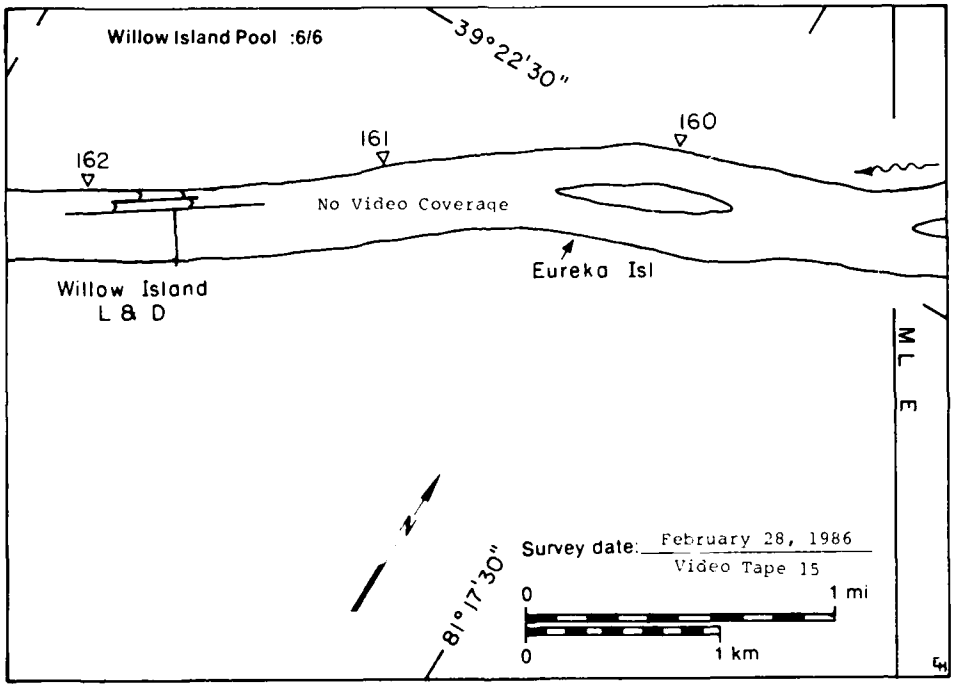


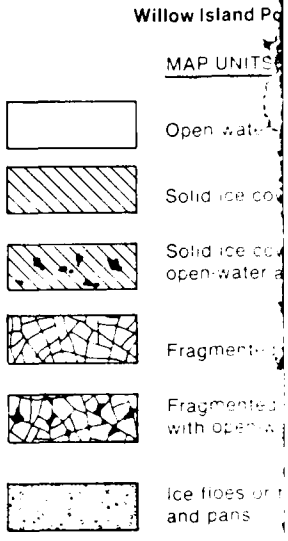


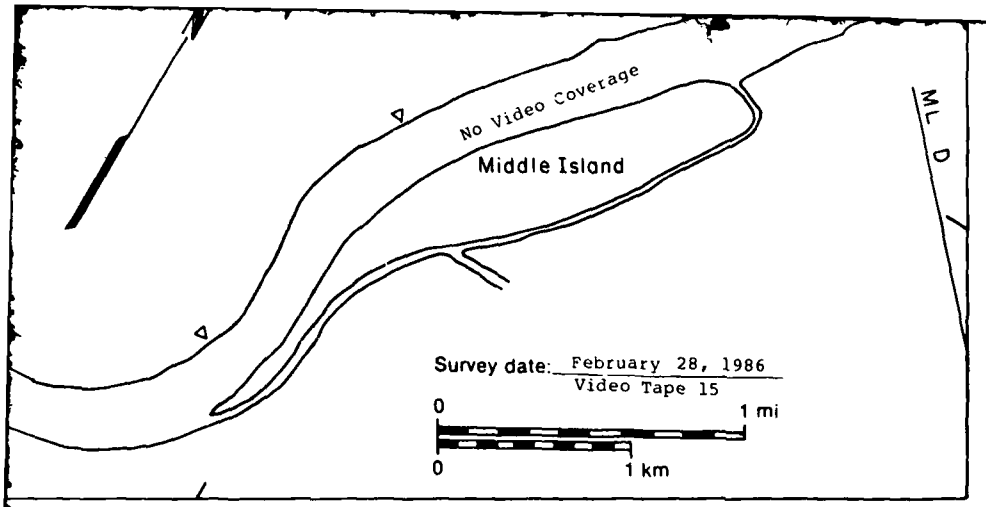
Willow Island Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)


Broadback Isl
No Video Coverage
M L E
81° 15'
39°22'30"


Willow Island Pool :6/6
39°22'30"
162
161
160
No Video Coverage
Eureka Isl
Willow Island
L & D
M L E
81°17'30"
Survey date: February 28, 1986
Video Tape 15
0
1 mi
0
1 km


Willow Island Po
MAP UNITS
Open wat
Solid ice co
Solid ice co
open-water
Fragment
Fragmented
with ope
Ice floes or
and pans
Total

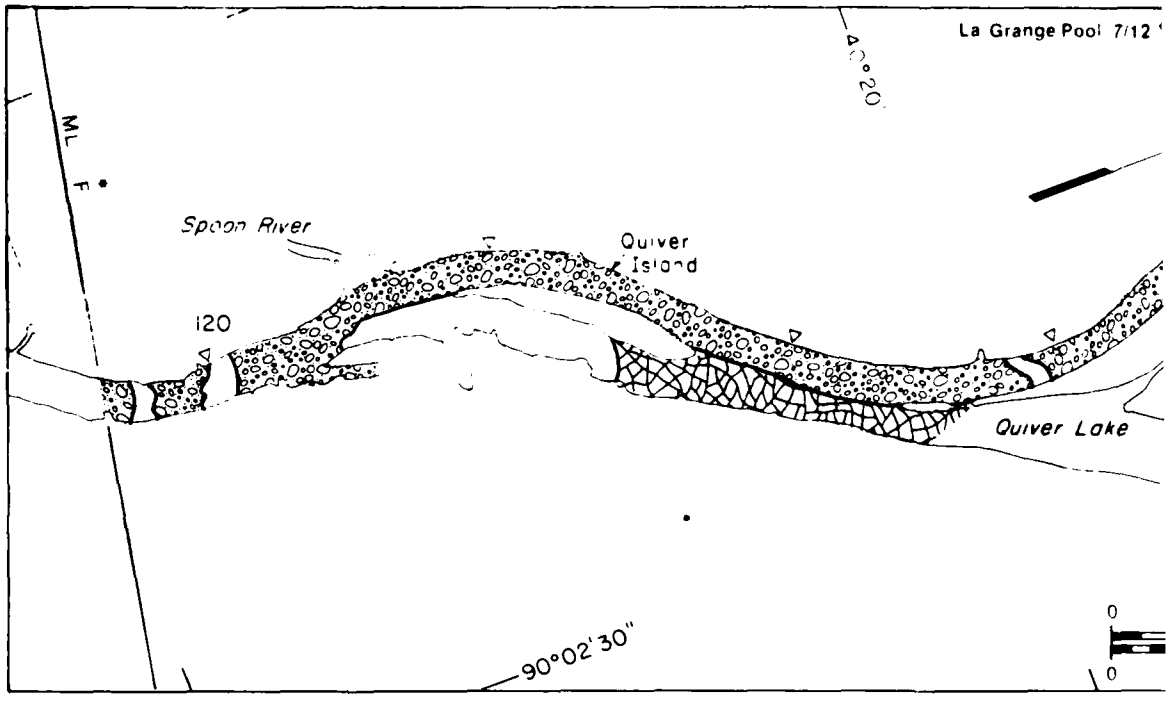


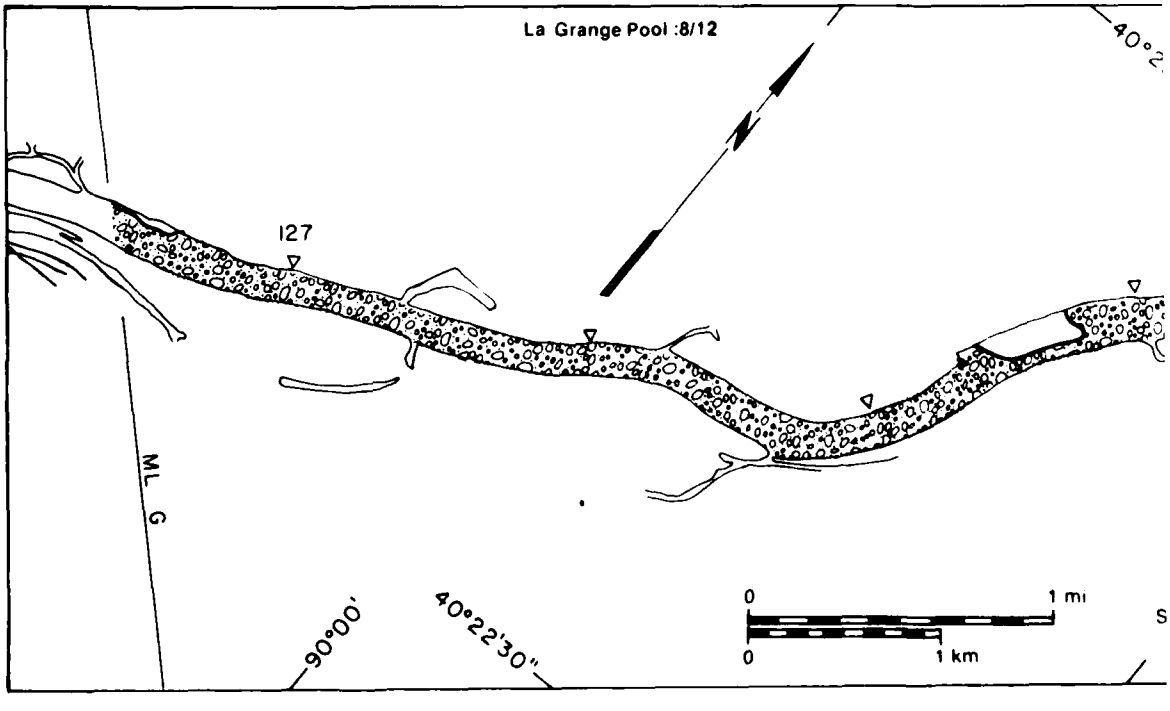
Willow Island Pool

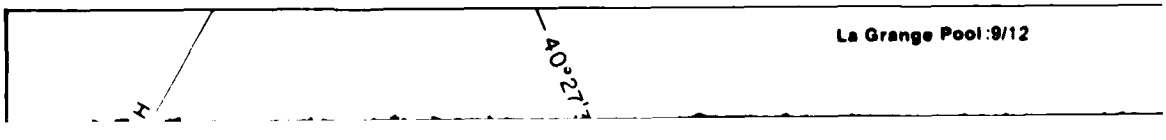
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.21	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	21.24*	

* Includes 11.03×10^6 m^2 of no video coverage

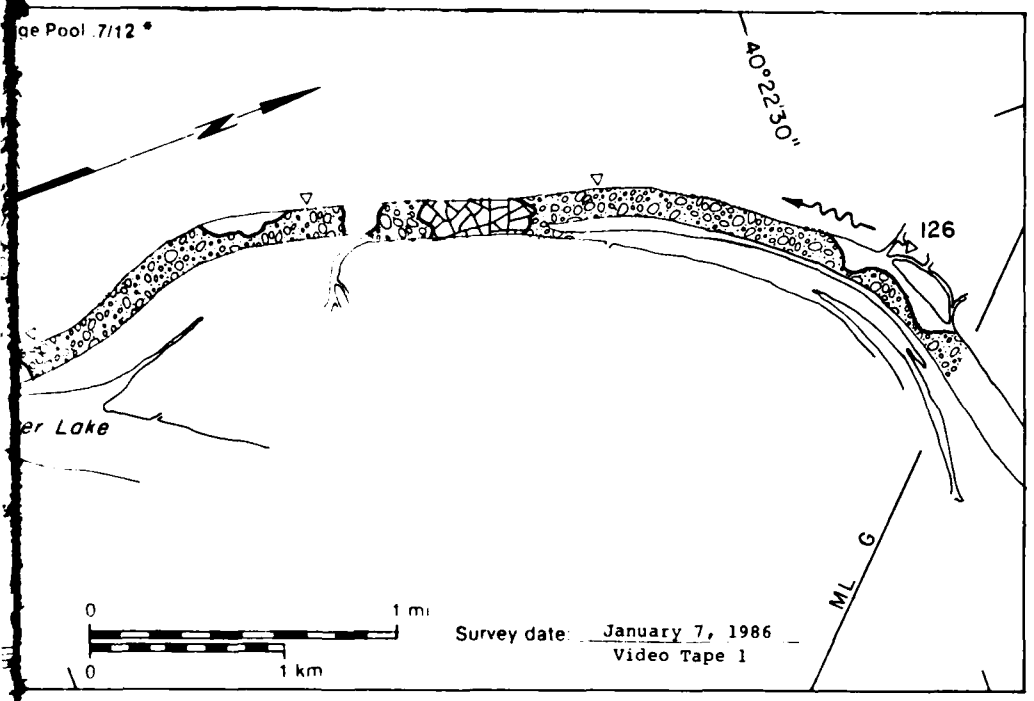
MAPS OF ICE CONDITIONS ON THE ILLINOIS AND KANKAKEE RIVERS

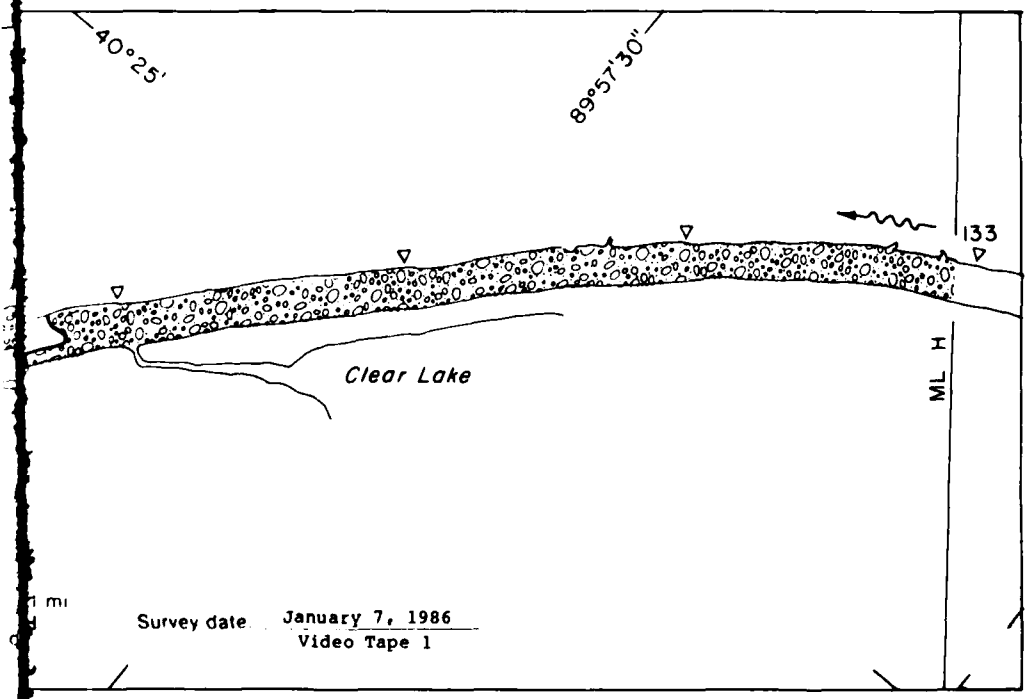


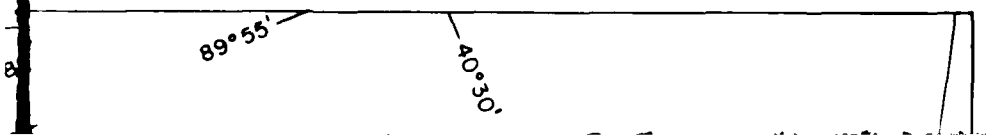


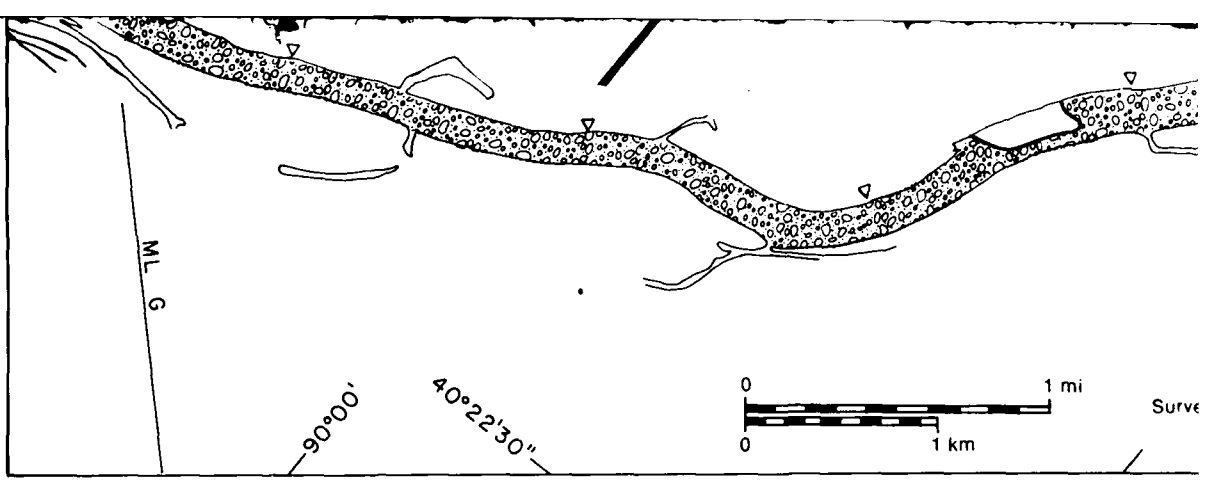


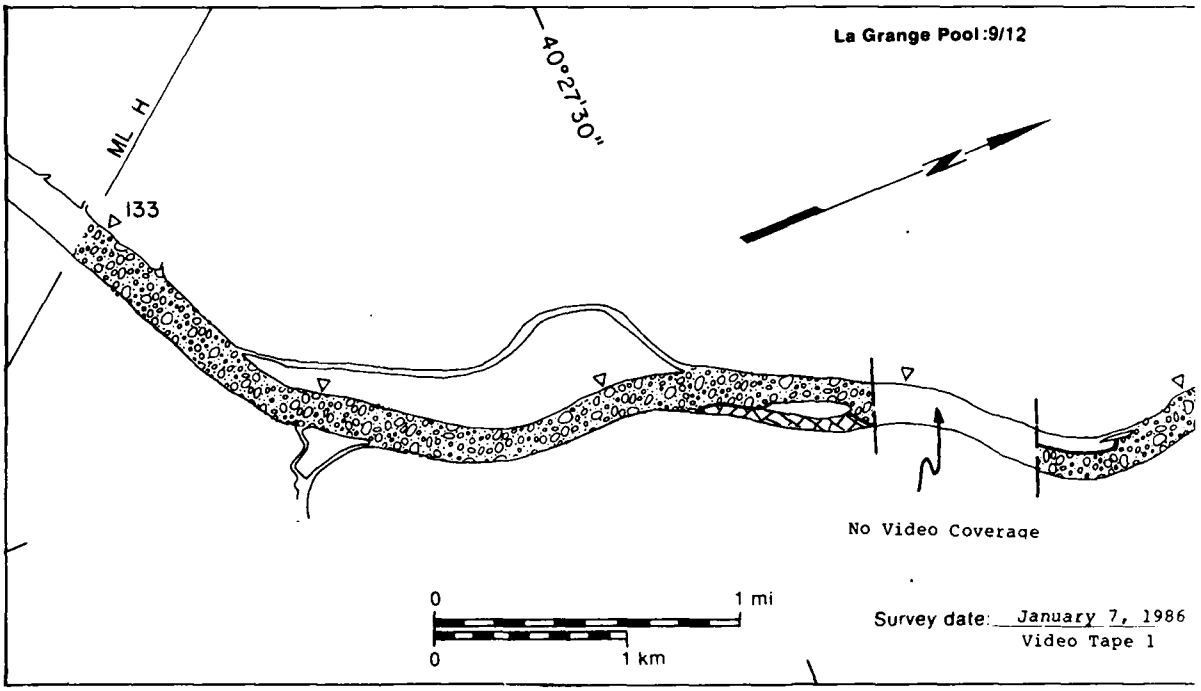
7 January 1986



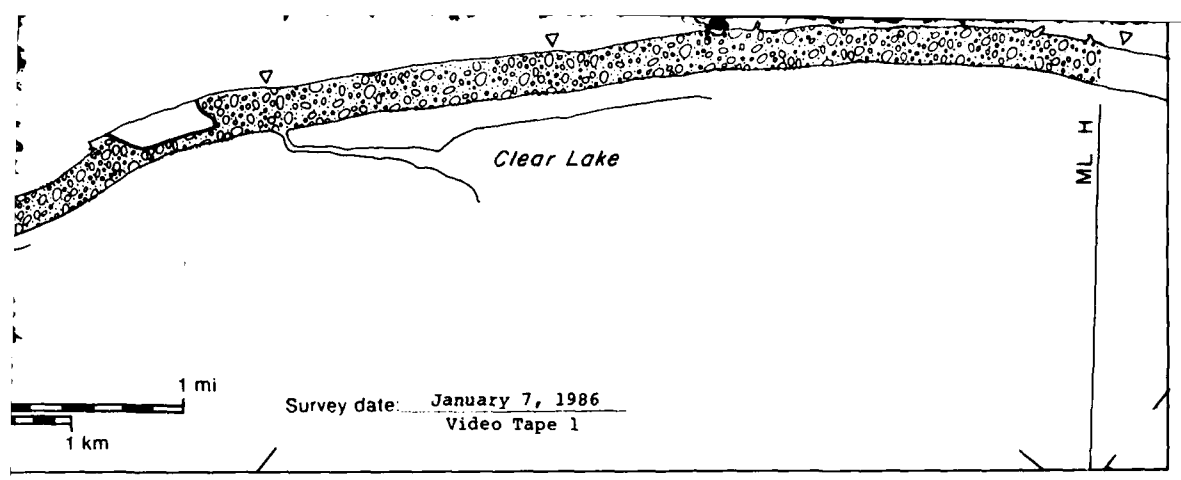


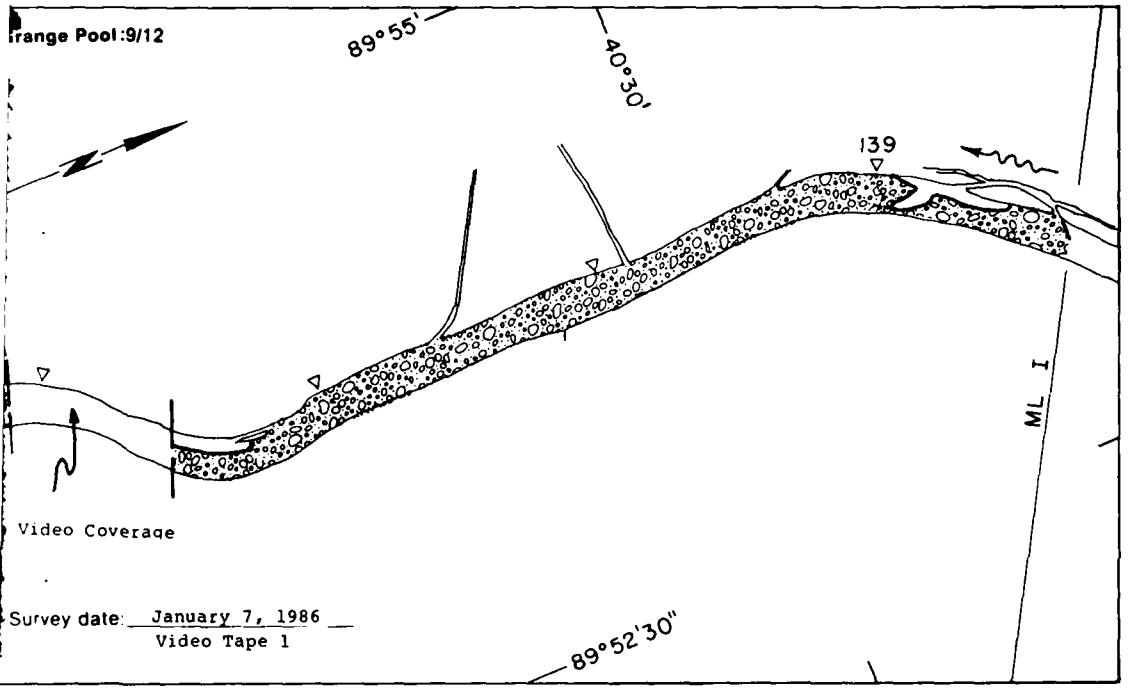




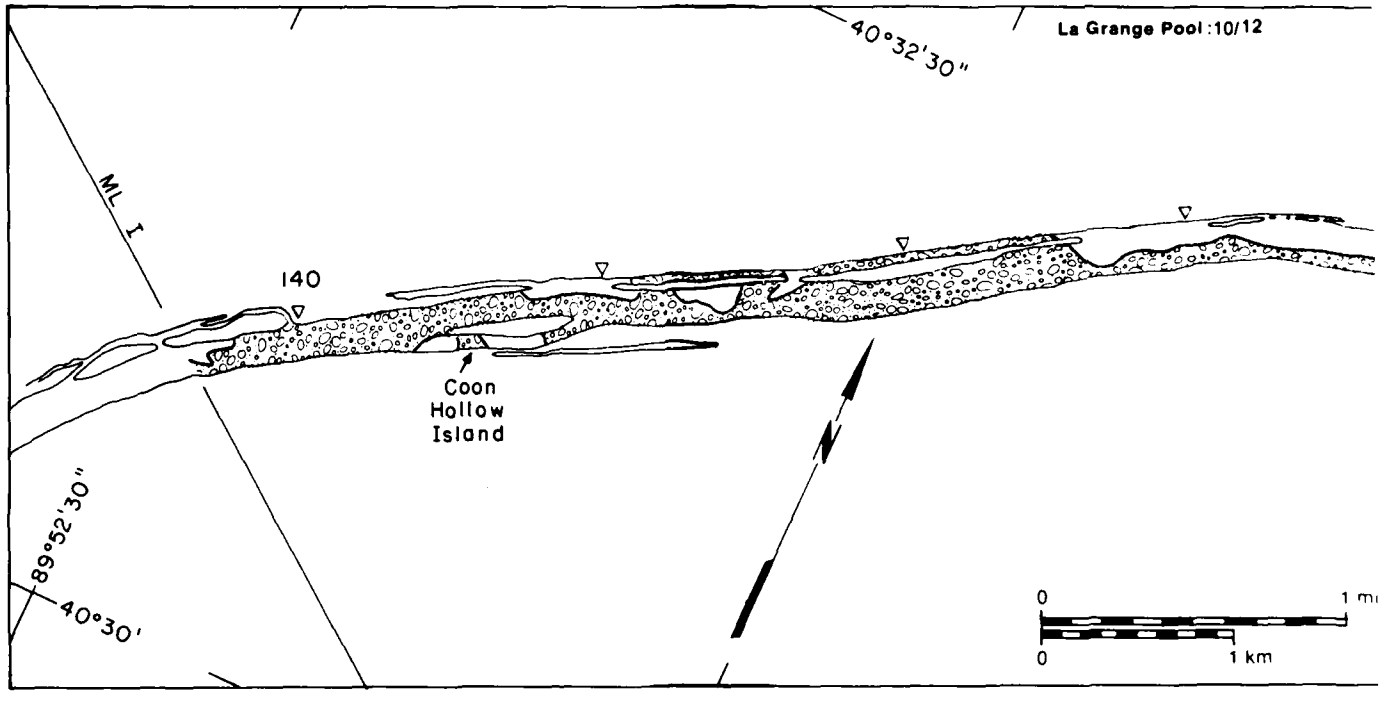


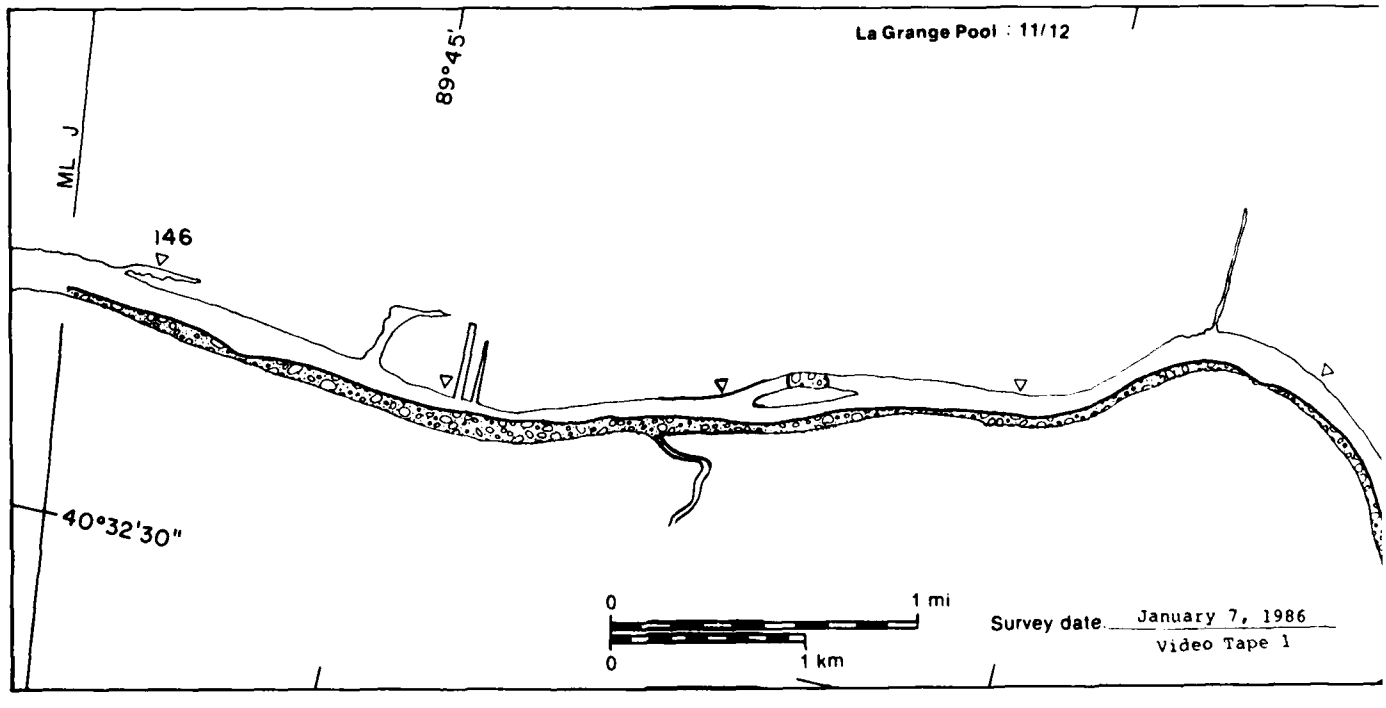
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

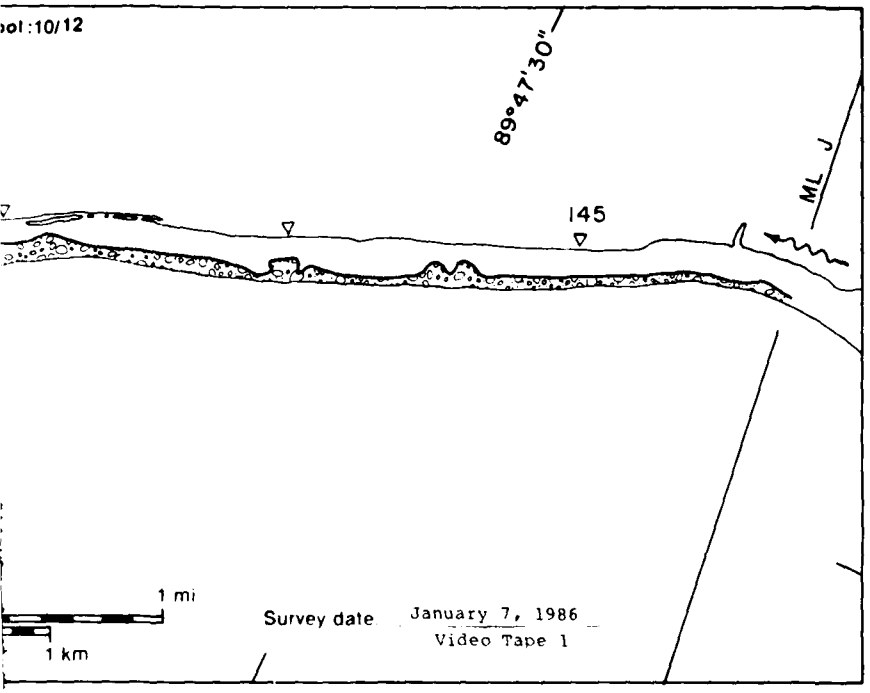

Clear Lake
ML H
1 mi
1 km
Survey date: January 7, 1986
Video Tape 1

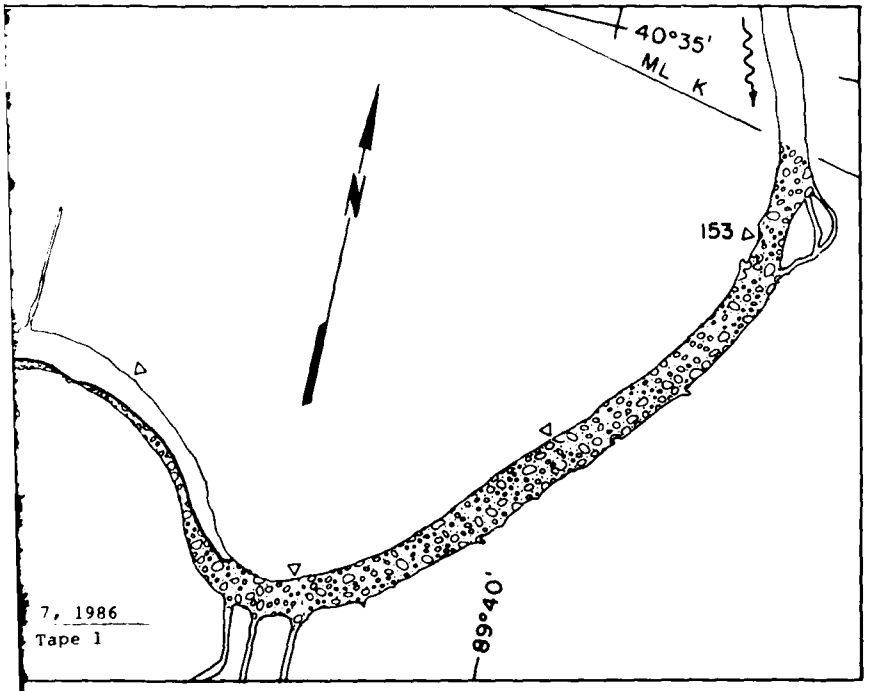

range Pool:9/12
89°55'
40°30'
139
ML I
Video Coverage
Survey date: January 7, 1986
Video Tape 1
89°52'30"

7 January 1986





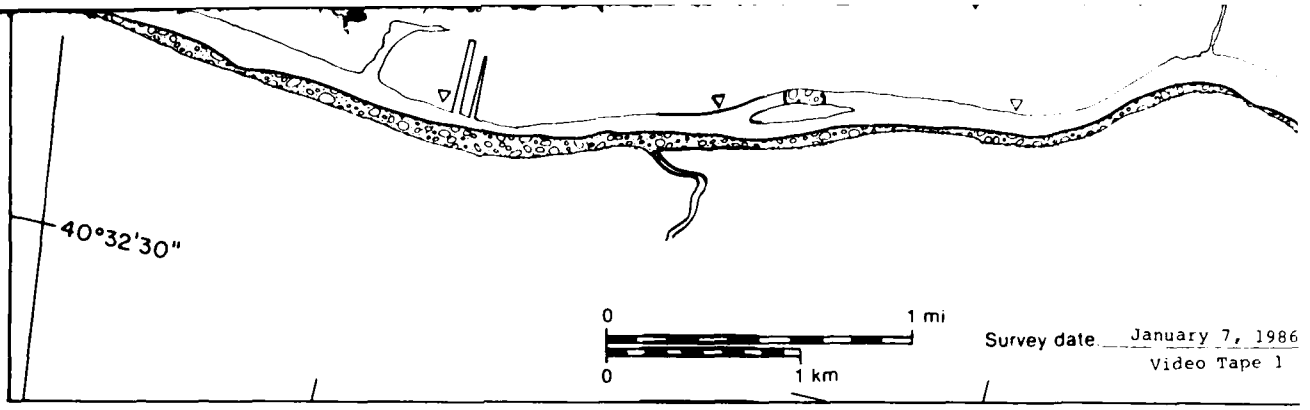


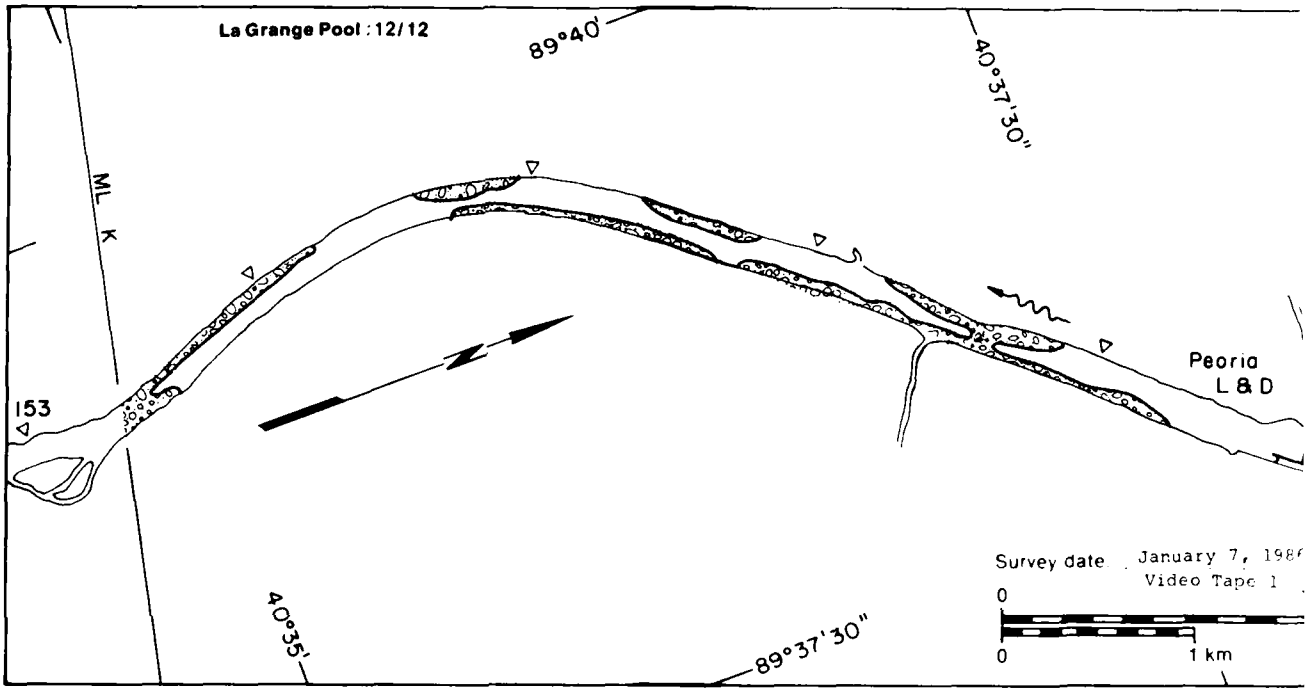


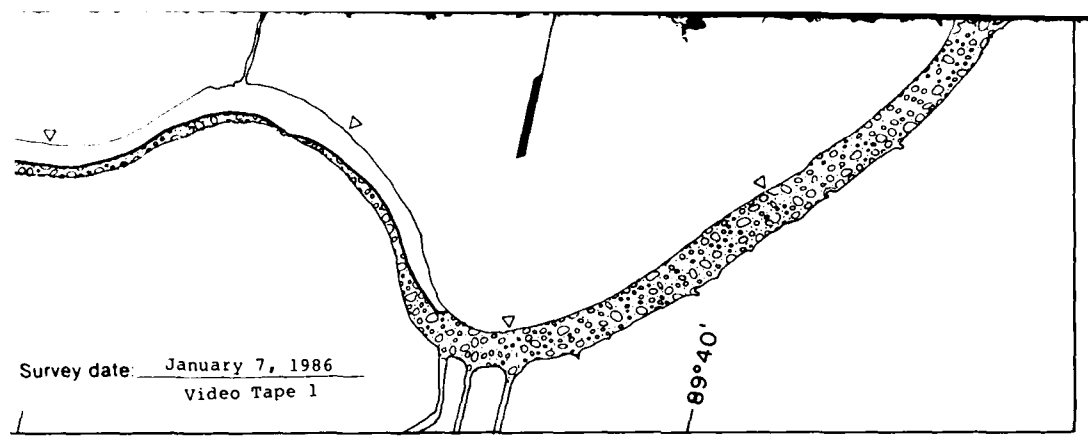
La Grange Pool

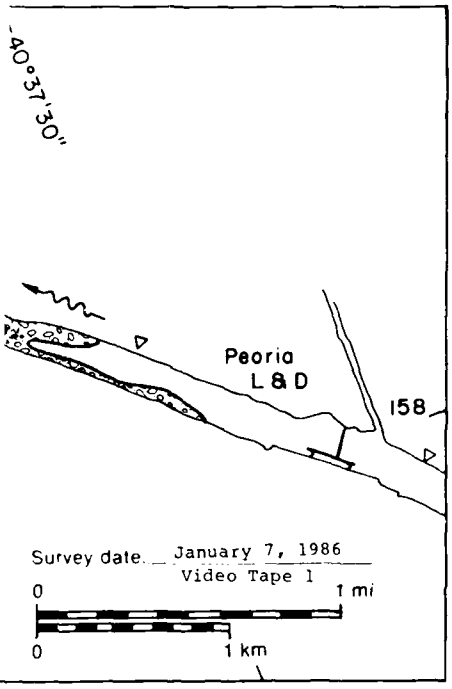
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


40°32'30"
0
1 mi
0
1 km
Survey date January 7, 1986
Video Tape 1


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L&D
Survey date January 7, 1986
Video Tape 1
0
1 km
40°35'
89°37'30"



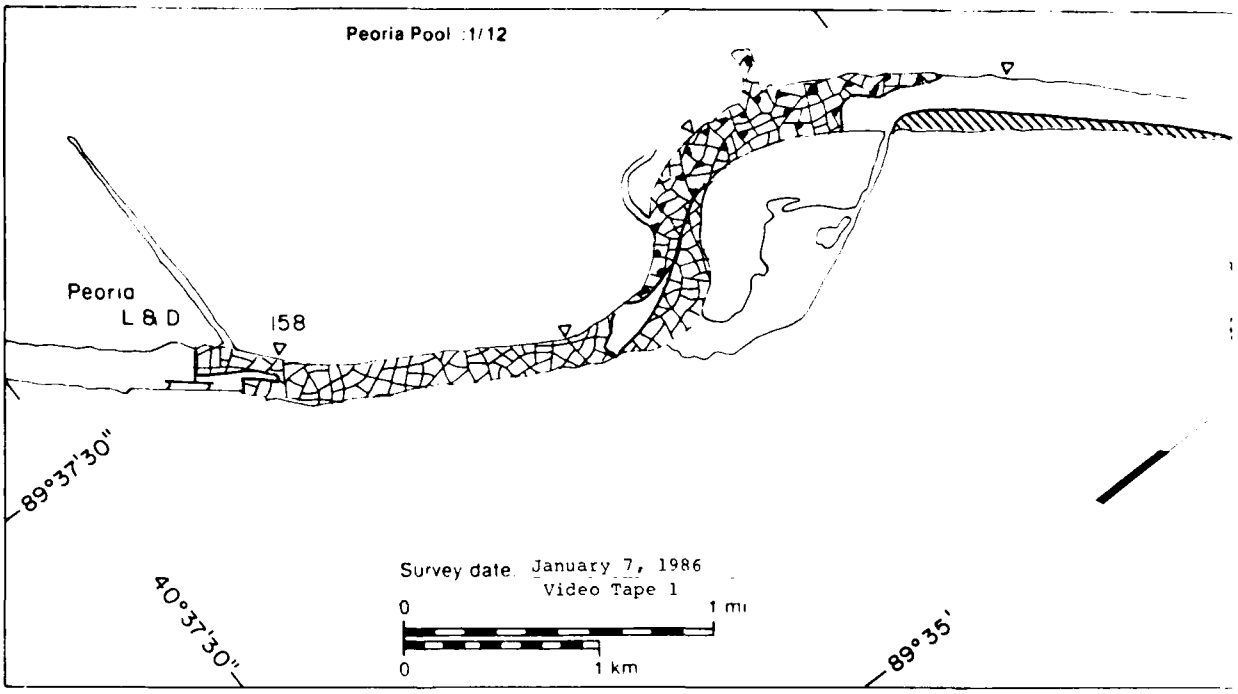


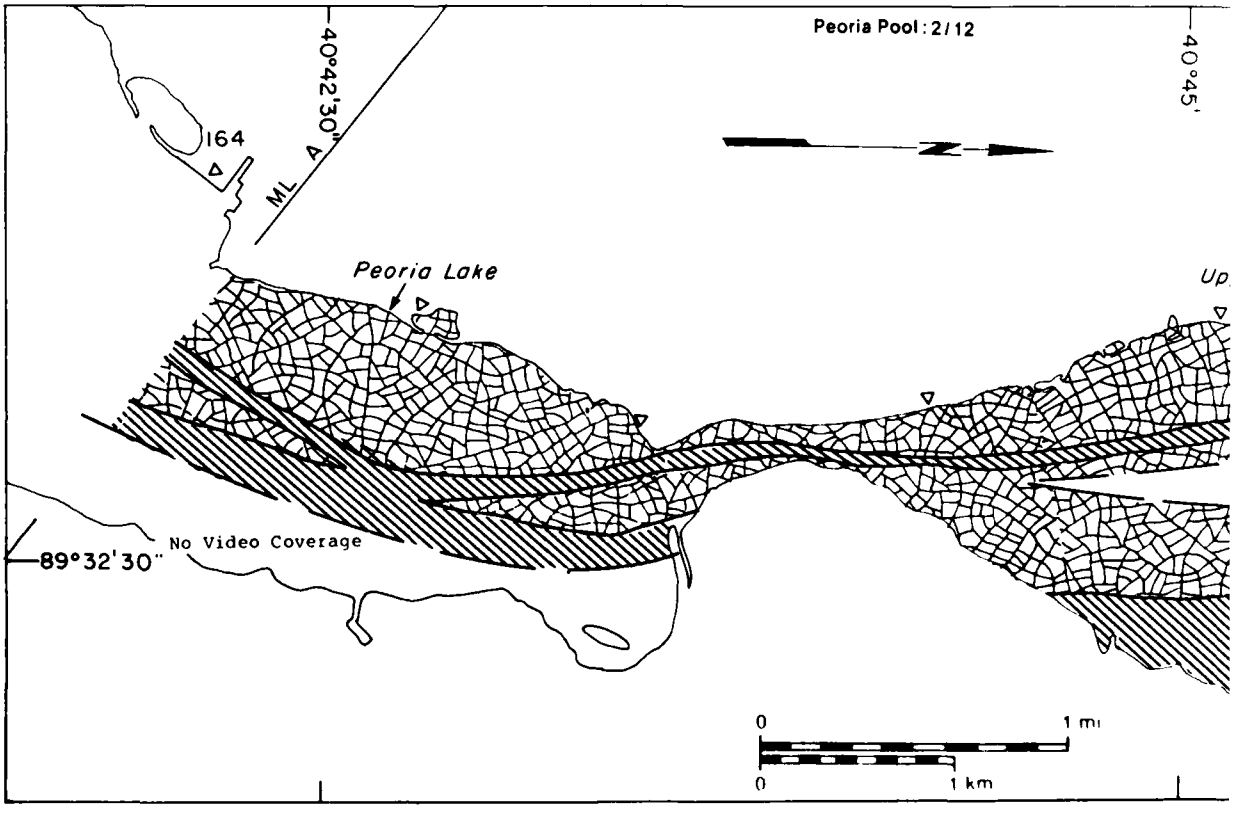
La Grange Pool

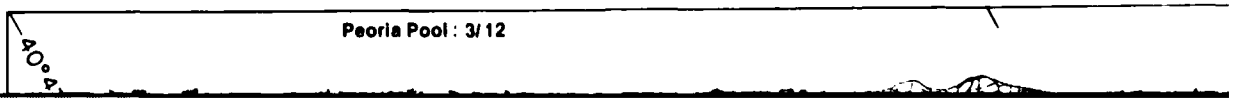
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.53	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.52	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	7.46	40
Total Area ($m^2 \times 10^6$)	11.71*	

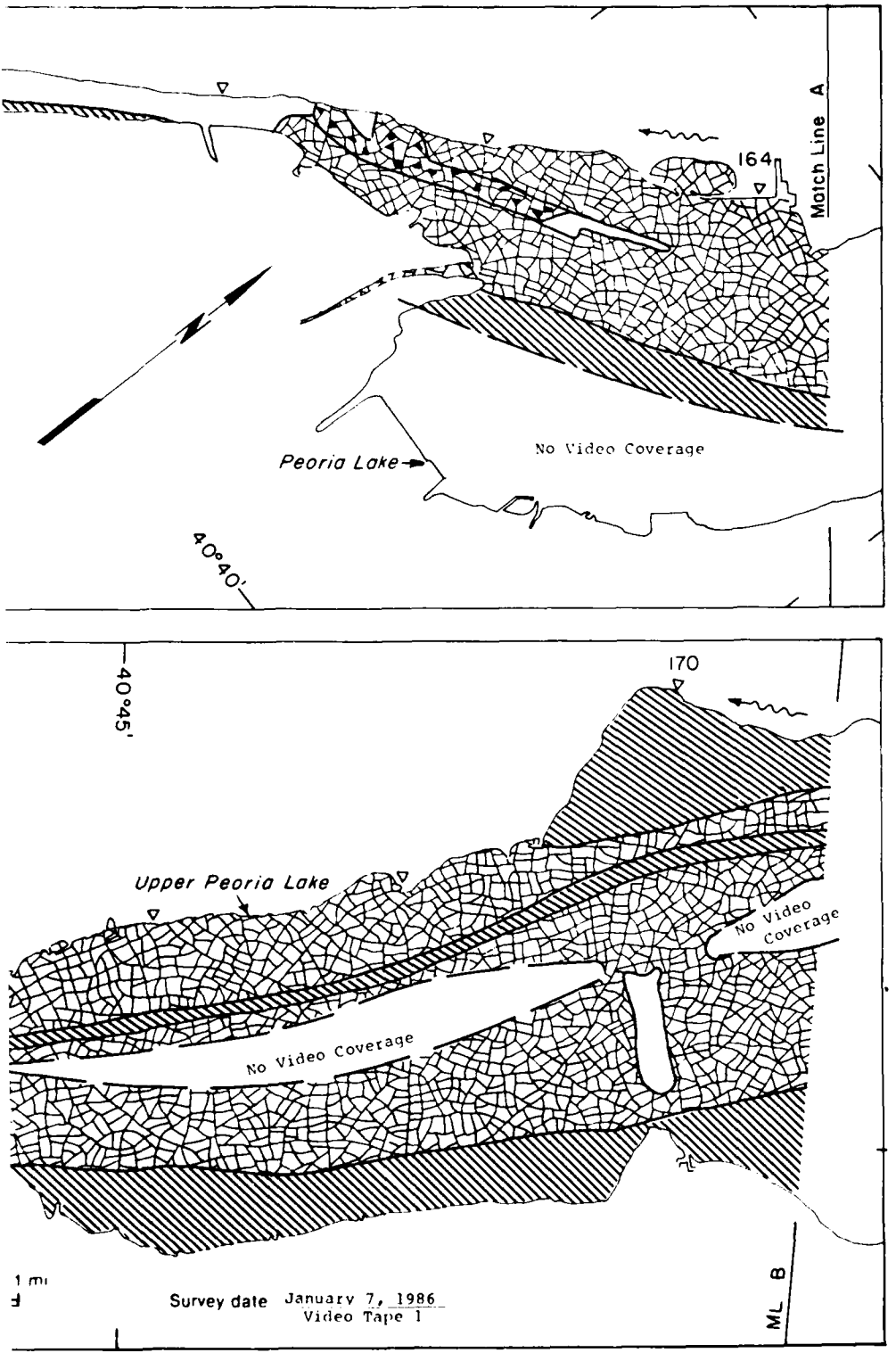
* Includes 0.20×10^6 m^2 of no video coverage

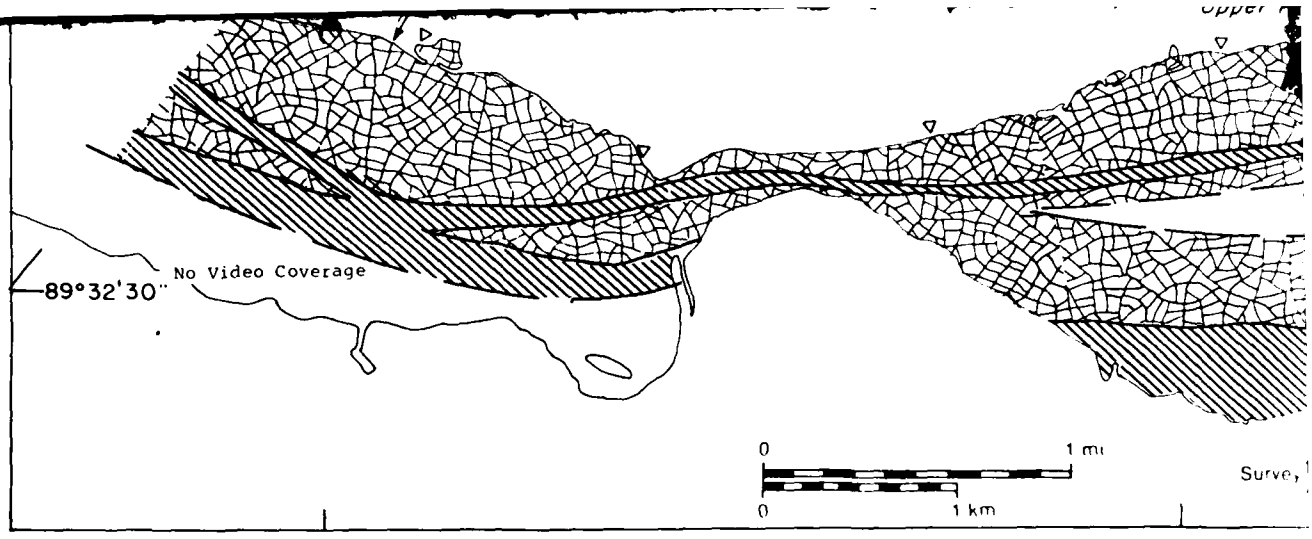

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
89°35'
Survey date January 7, 1986
Video Tape 1
0
1 mi
0
1 km

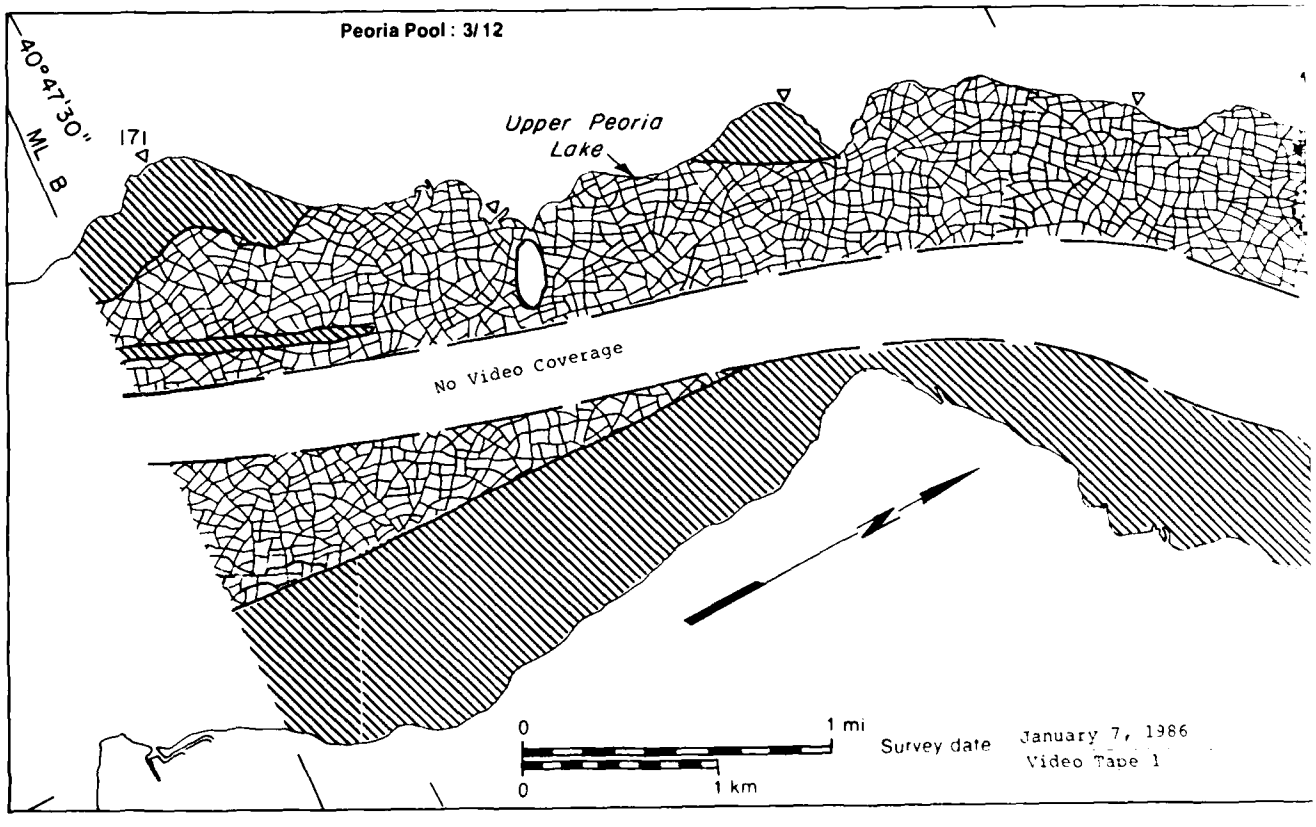

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
No Video Coverage
89°32'30"
0
1 mi
0
1 km

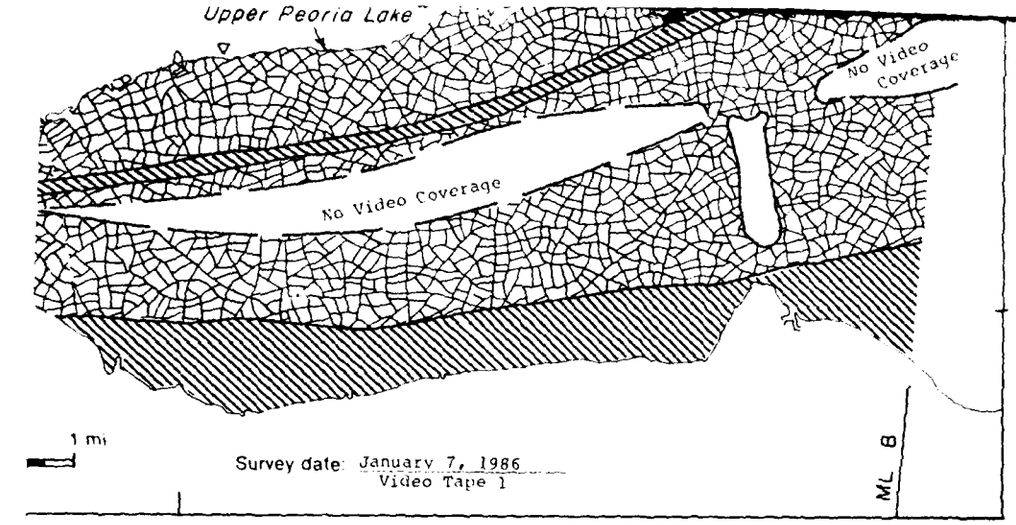

Peoria Pool : 3/12
40°4

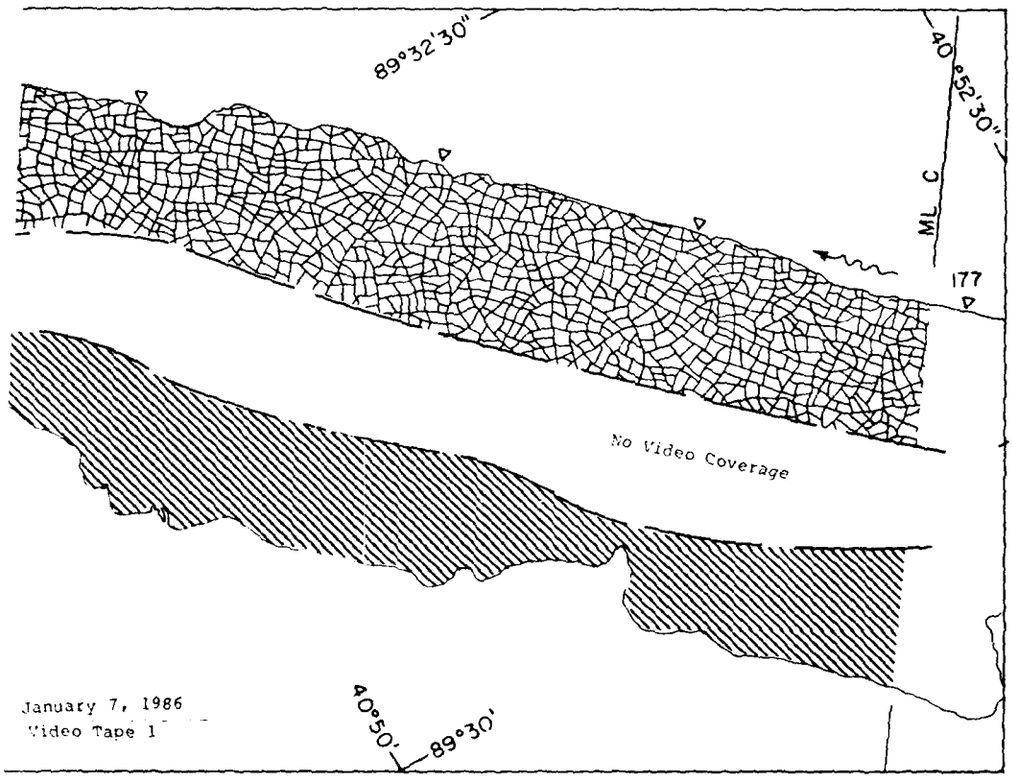
7 January 1986



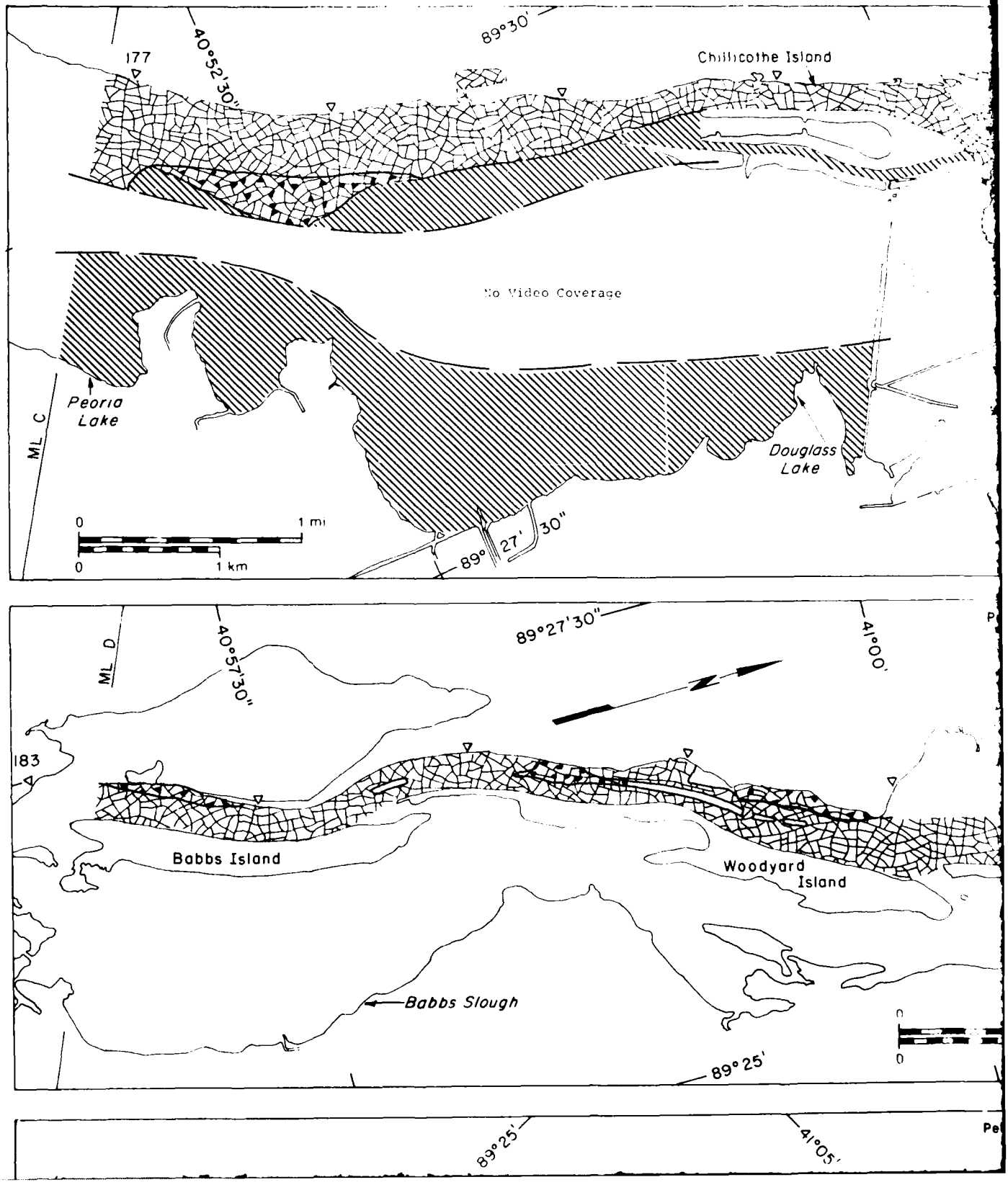

No Video Coverage
89°32'30"
0
1 mi
0
1 km

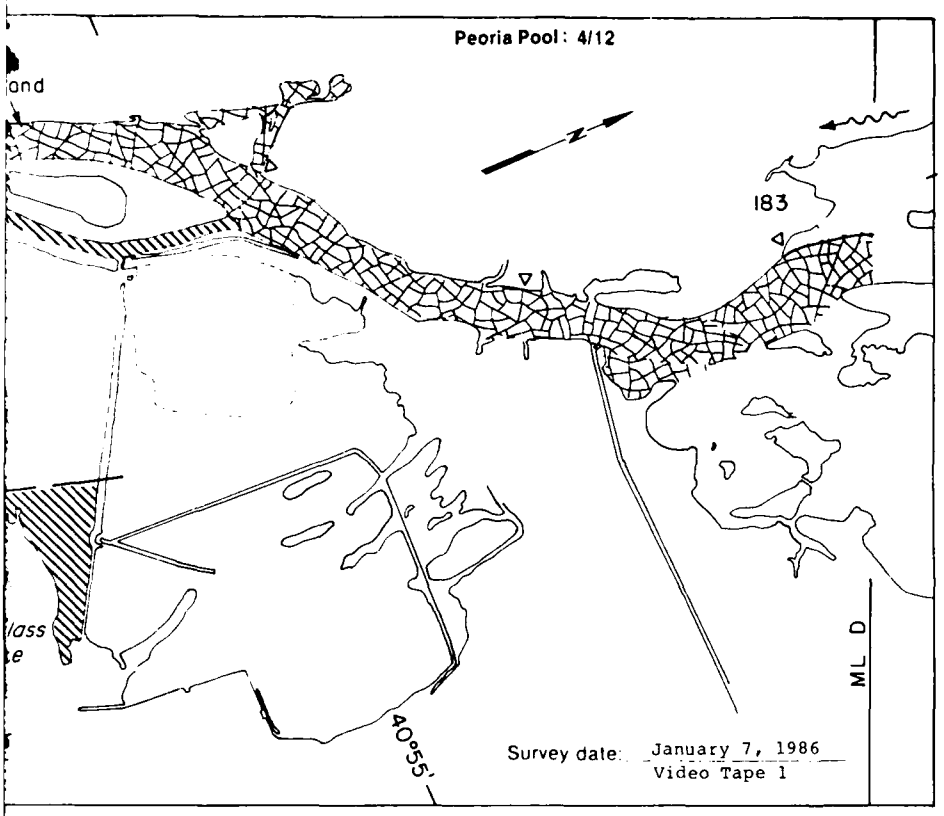

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
0
1 mi
0
1 km
Survey date January 7, 1986
Video Tape 1

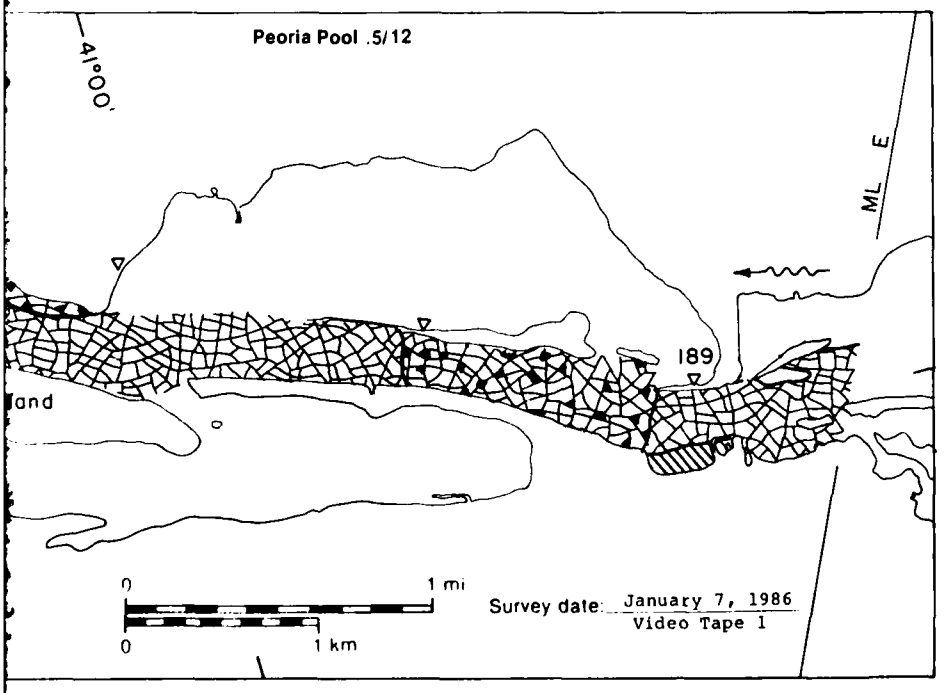

Upper Peoria Lake
No Video Coverage
No Video Coverage
1 mi
Survey date: January 7, 1986
Video Tape 1
ML B


89°32'30"
40°52'30"
ML C
177
No Video Coverage
January 7, 1986
Video Tape 1
40°50'
89°30'

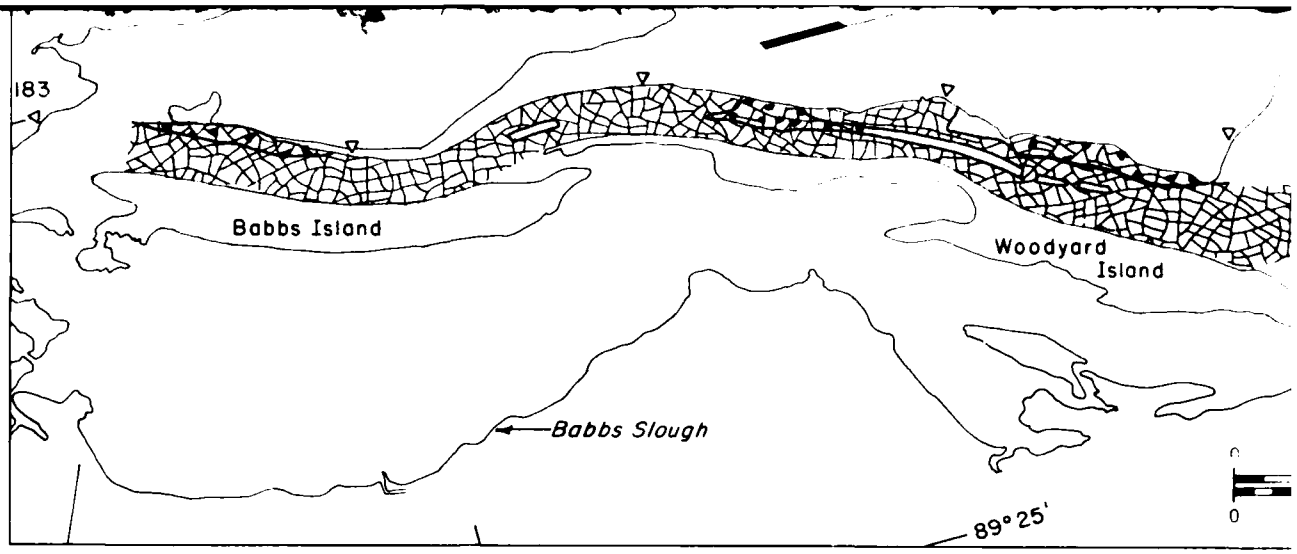
7 January 1986

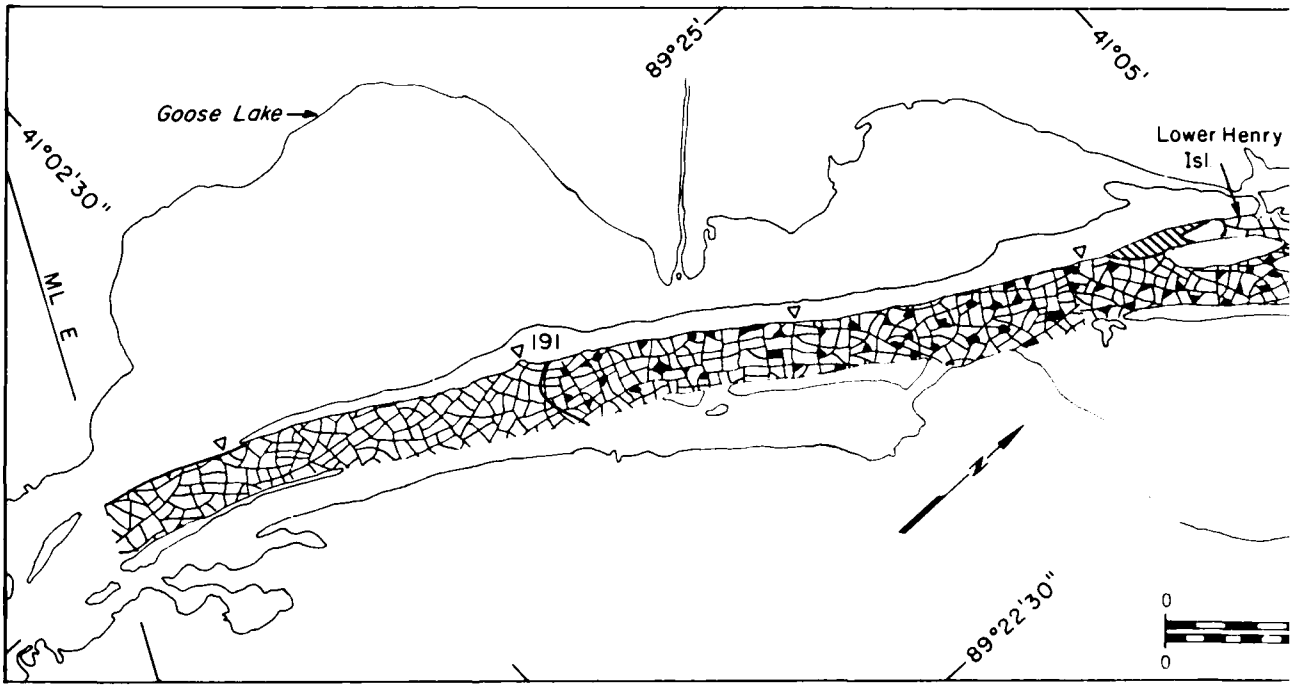


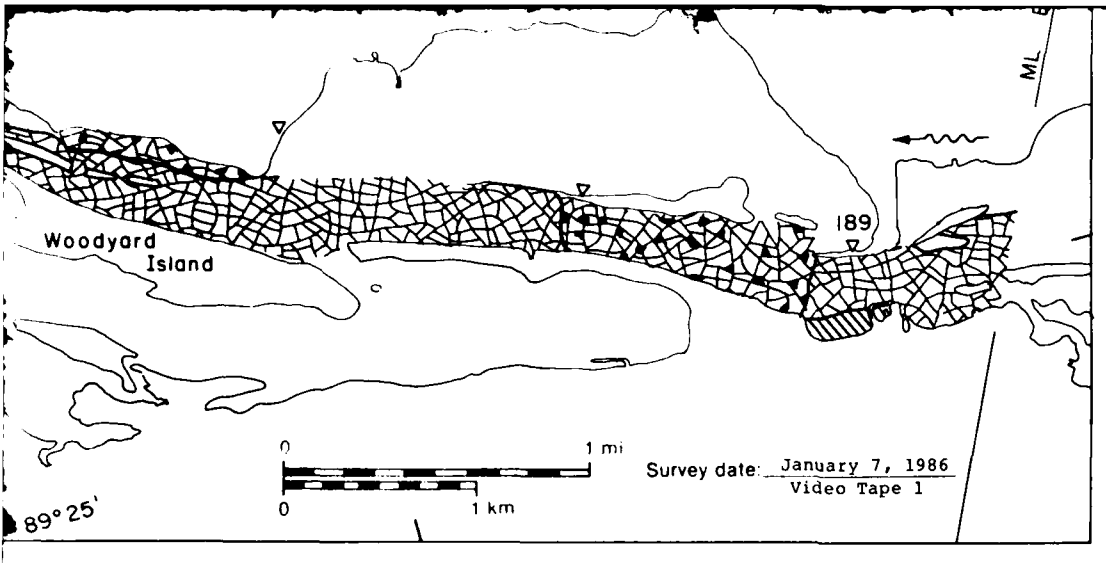

Peoria Pool : 4/12
183
ML D
40°55'
Survey date: January 7, 1986
Video Tape 1

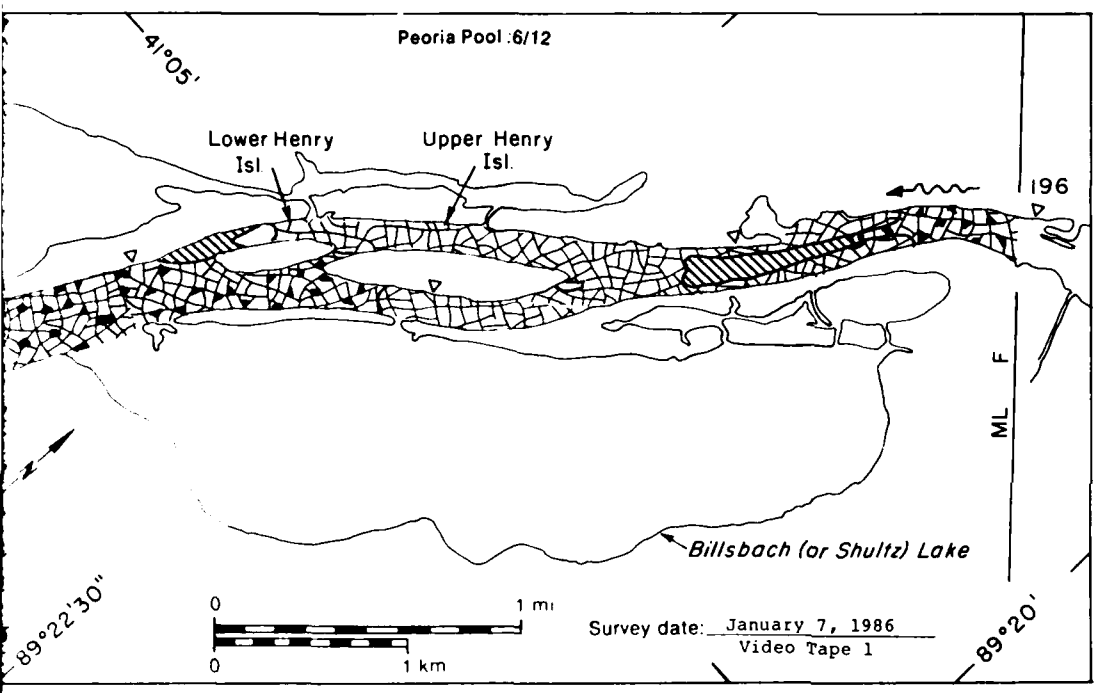

Peoria Pool .5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1

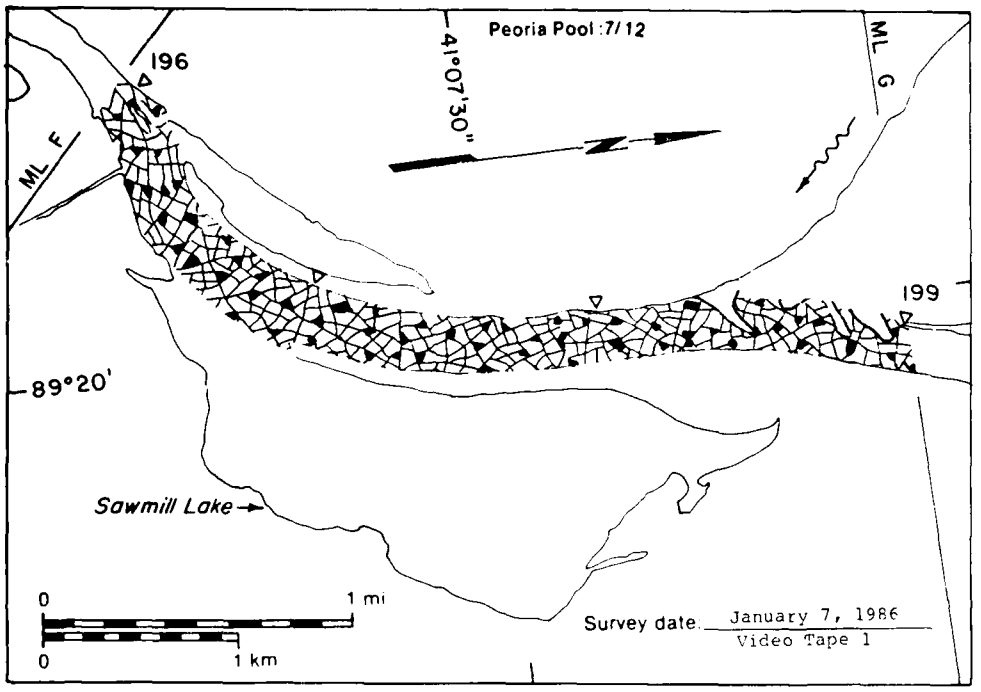
Peoria Pool :6/12

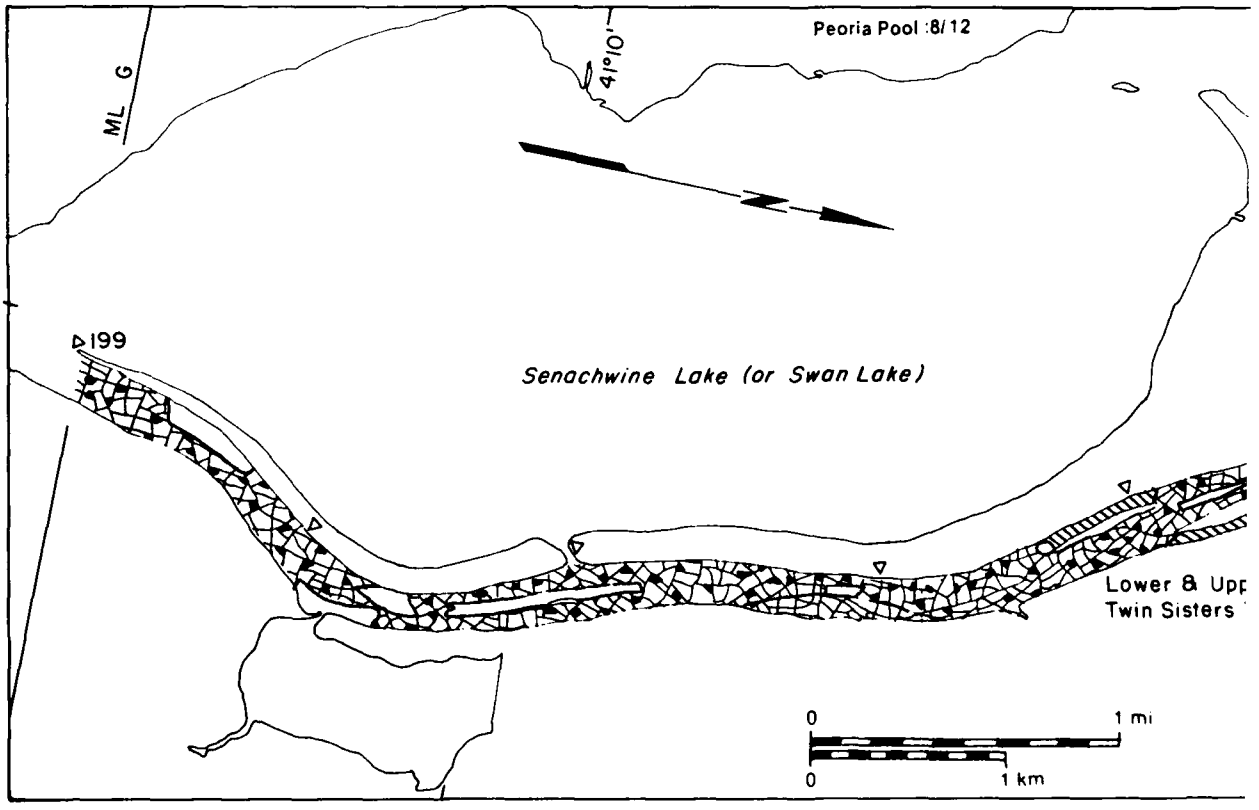

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0

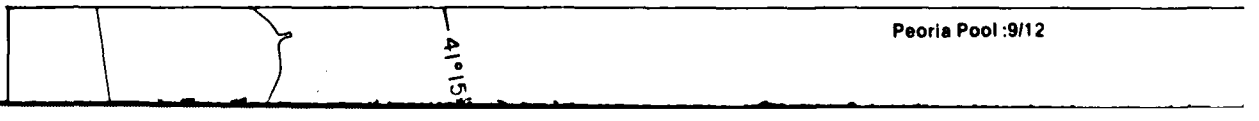

89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
N
89°22'30"
0
0


ML
189
Woodyard
Island
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1
89°25'

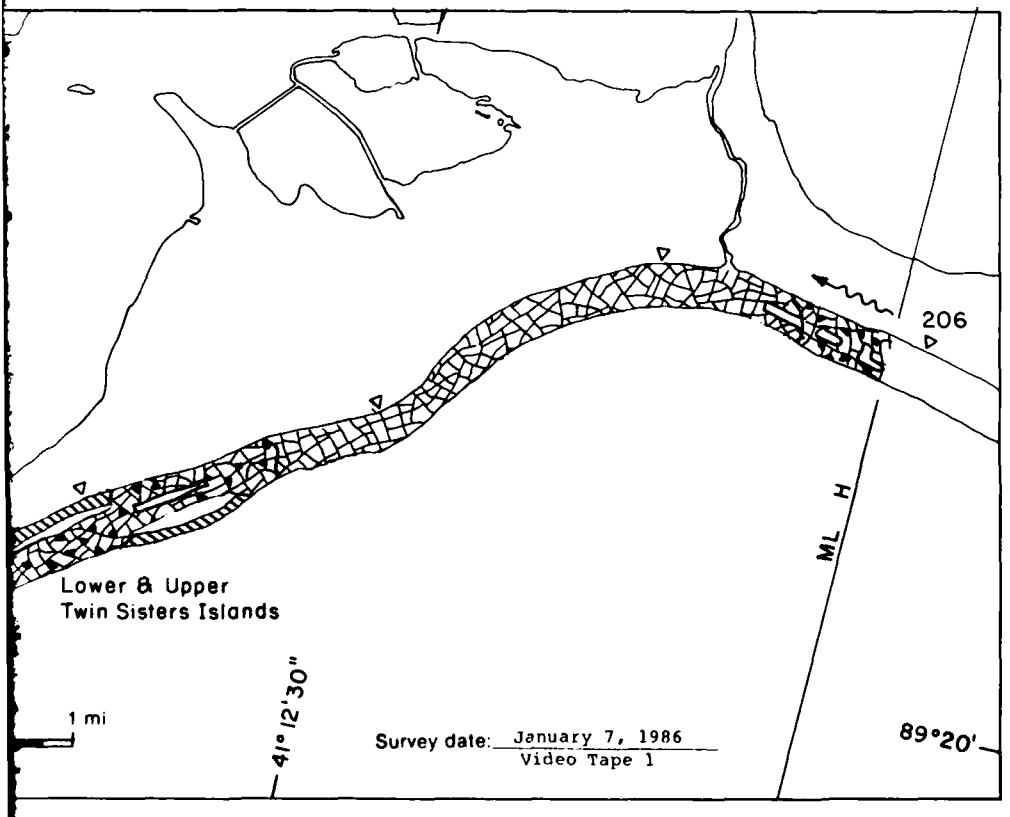

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1
89°22'30"
89°20'

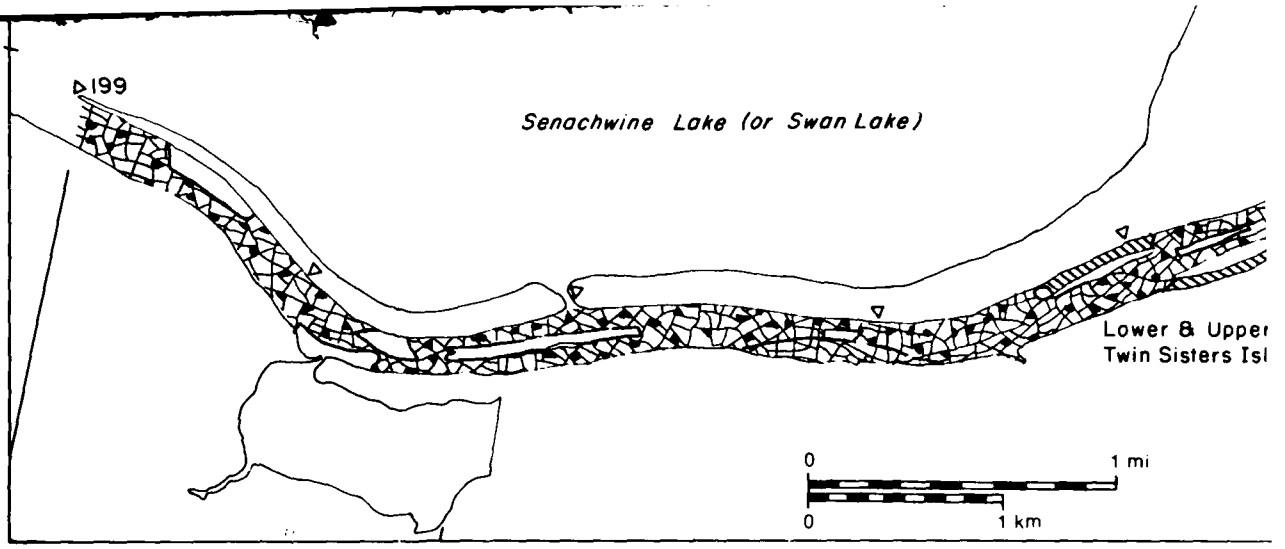

Peoria Pool :7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1

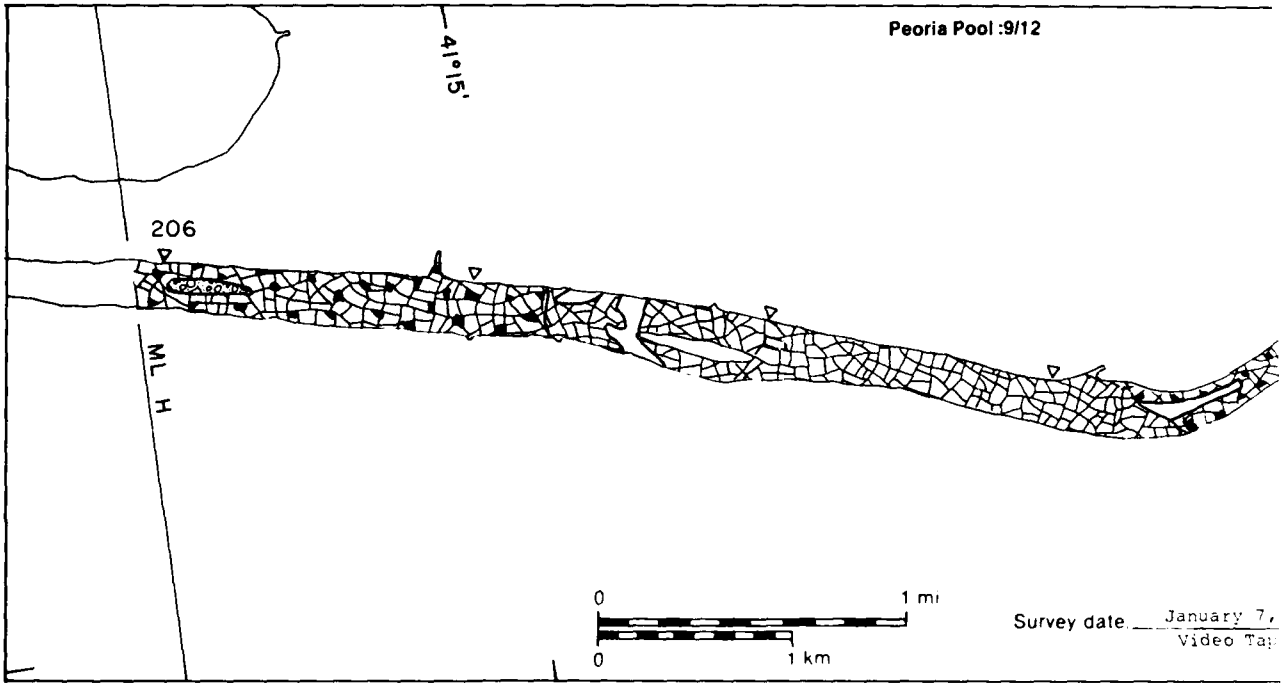

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower & Upp
Twin Sisters
0
1 mi
0
1 km

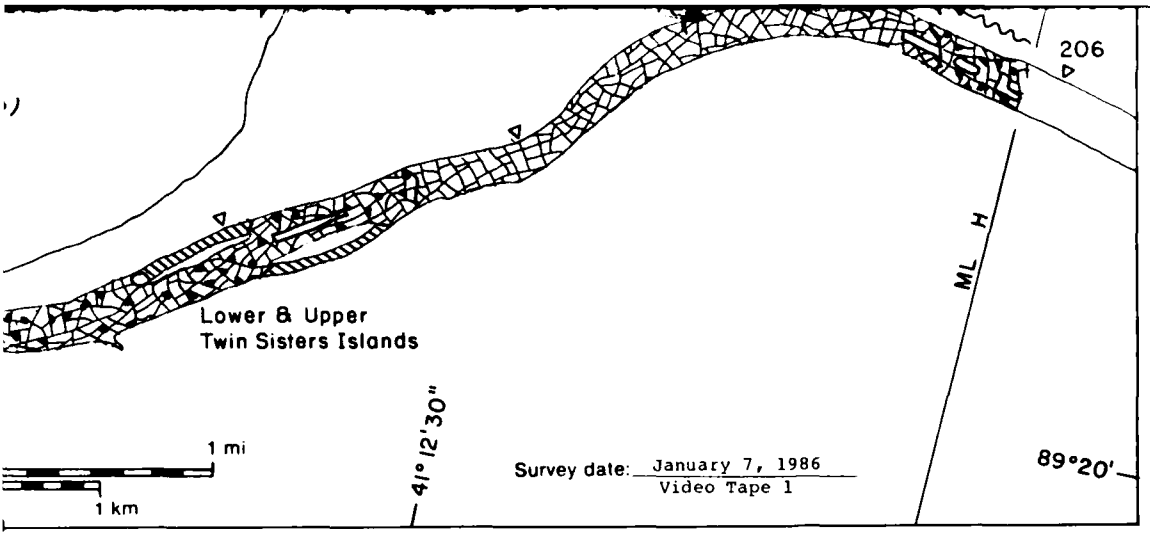

Peoria Pool :9/12
41°15

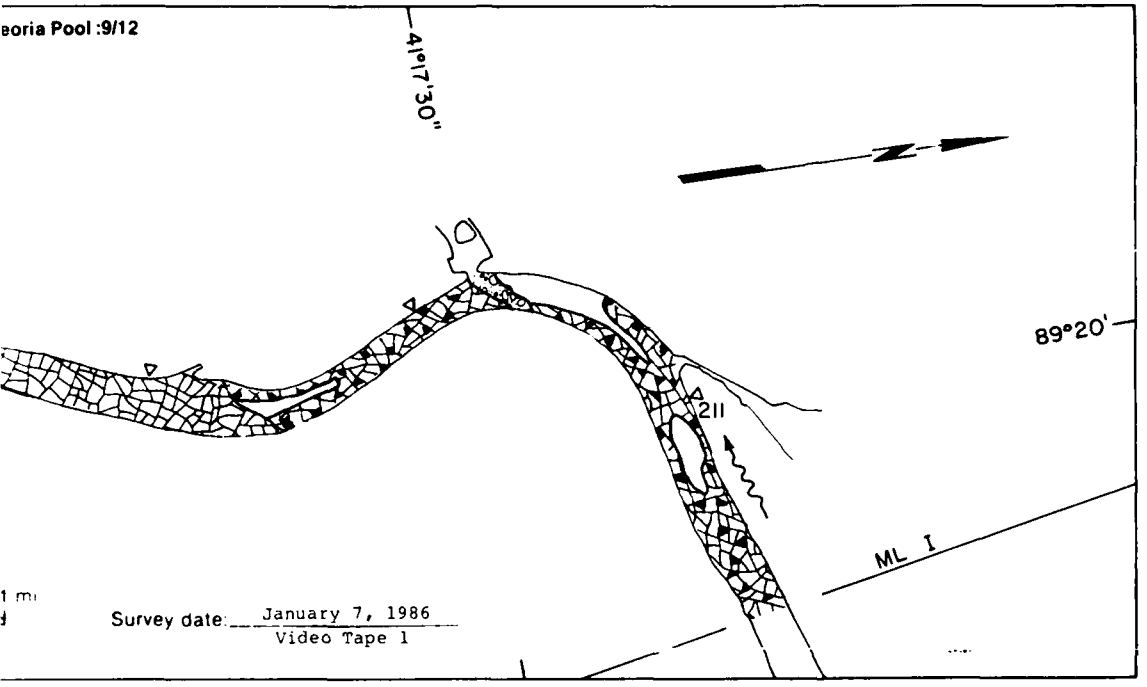
7 January 1986



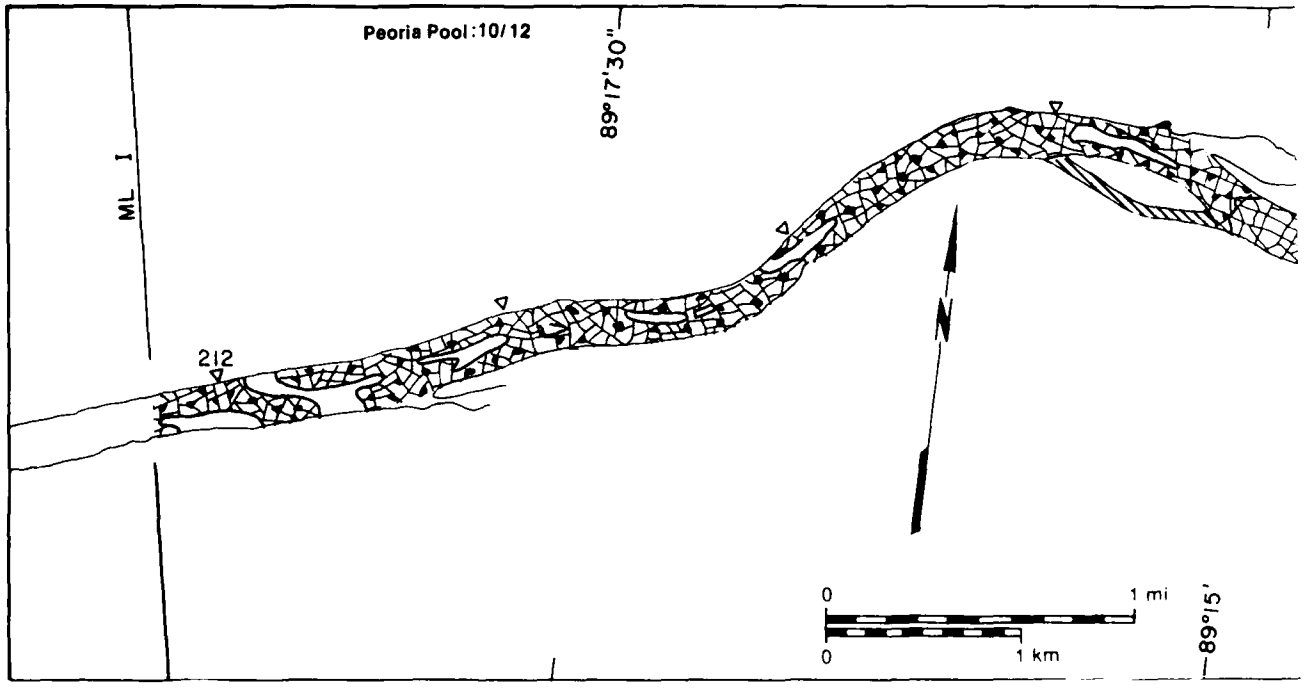

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Isl
0
1 mi
0
1 km

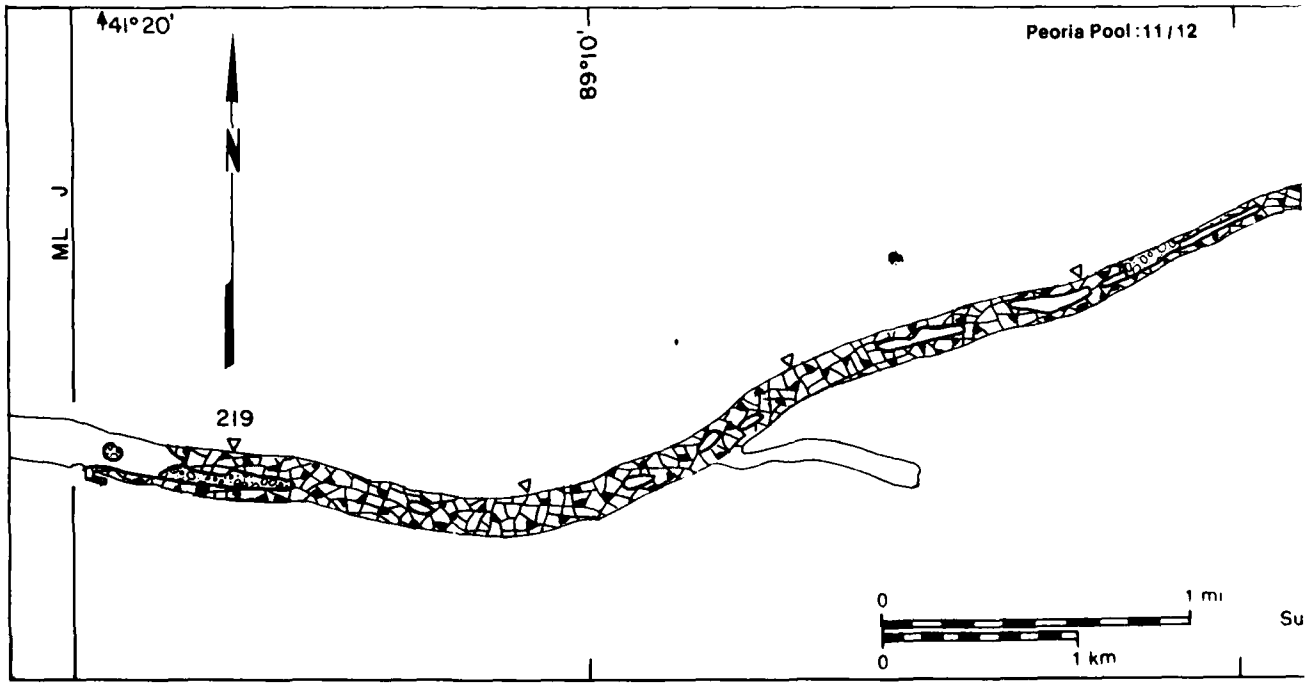

Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date January 7,
Video Ta

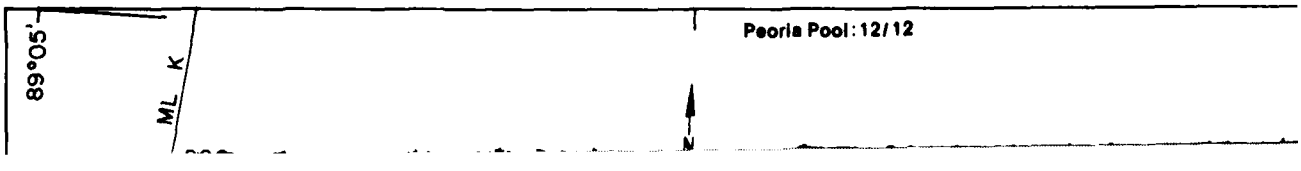

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: January 7, 1986
Video Tape 1
89°20'

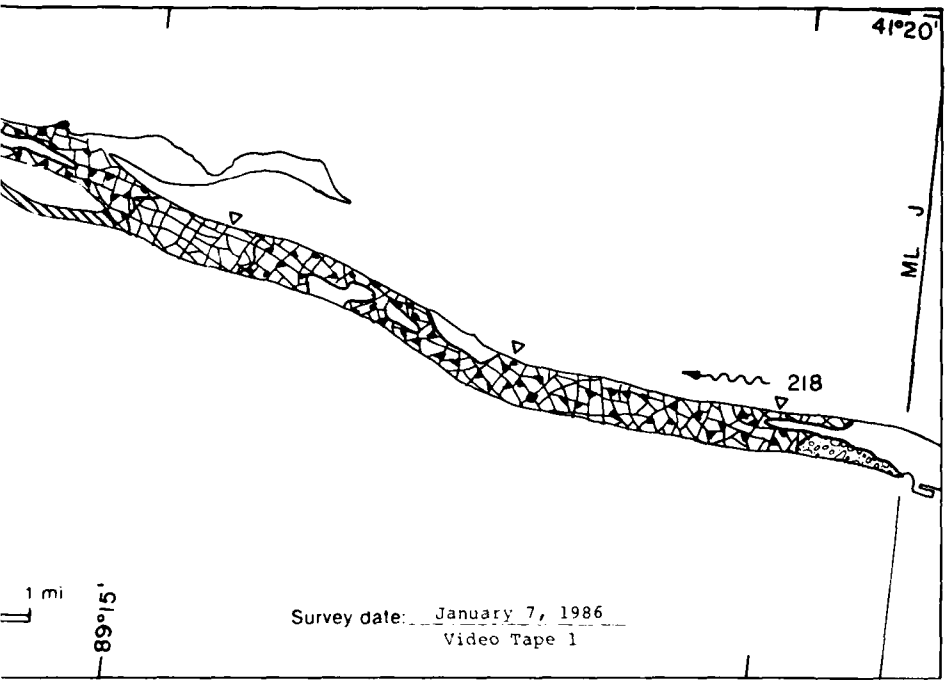

eoria Pool :9/12
41°17'30"
89°20'
211
ML I
1 mi
Survey date: January 7, 1986
Video Tape 1

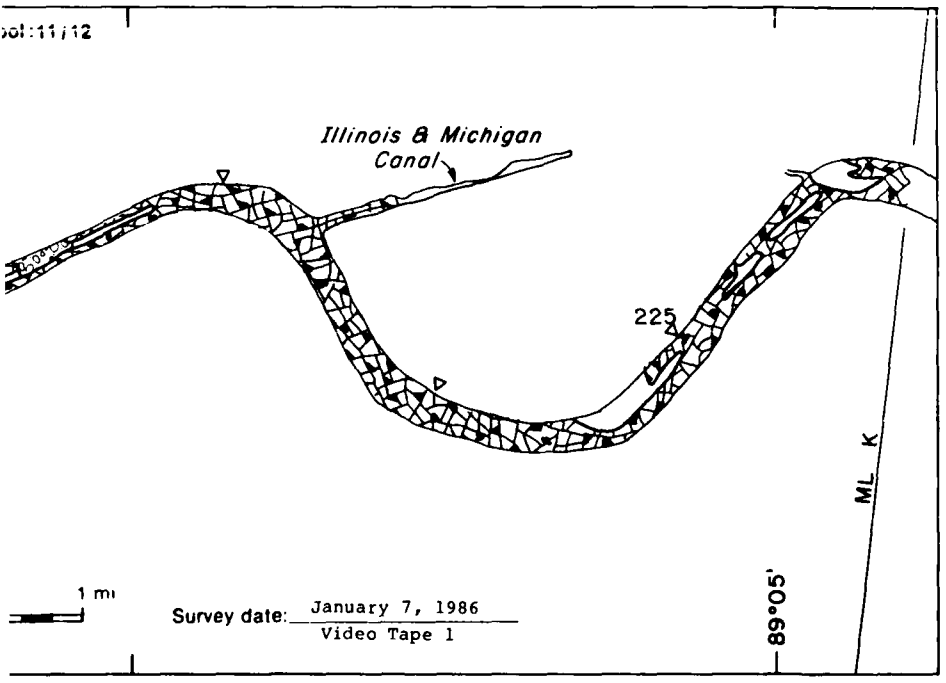
7 January 1986



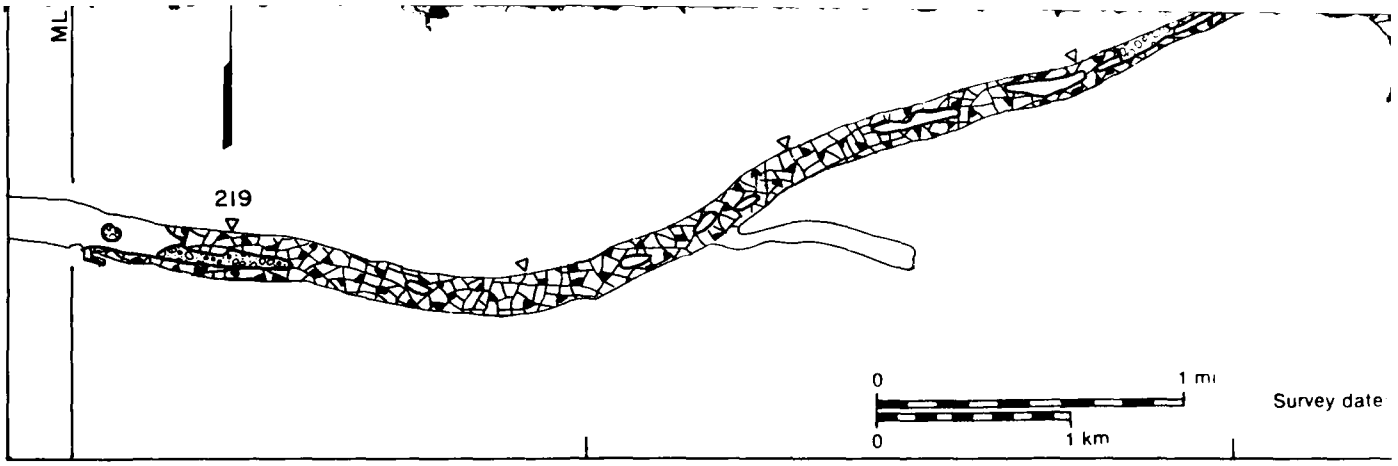


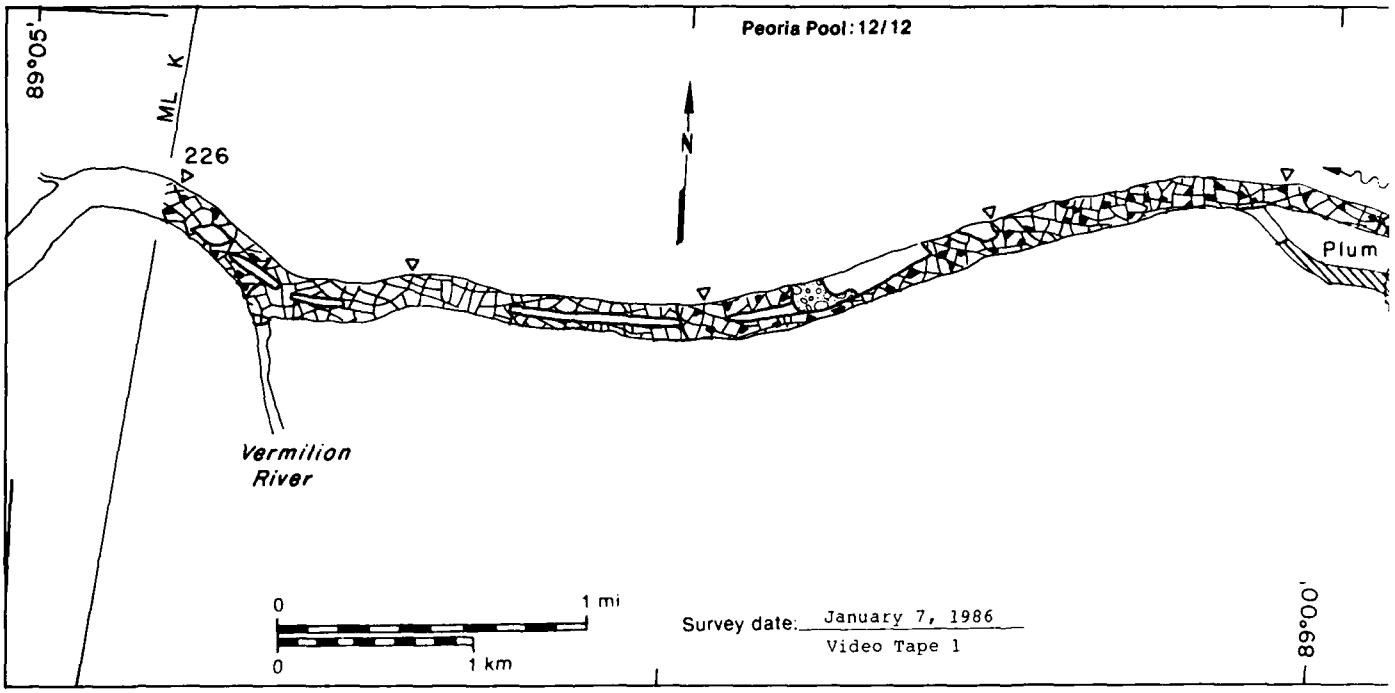



41°20'
ML J
218
1 mi
89°15'
Survey date: January 7, 1986
Video Tape 1


Illinois & Michigan Canal
225
ML K
1 mi
Survey date: January 7, 1986
Video Tape 1
89°05'

41°20'

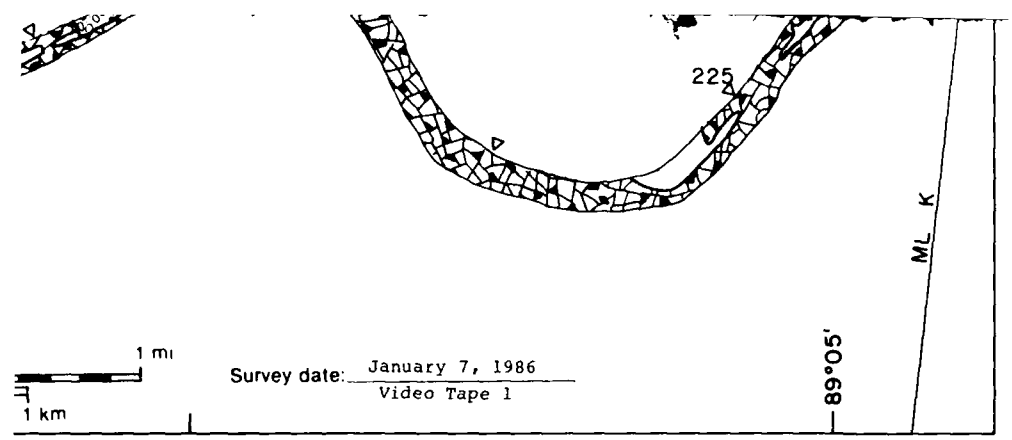


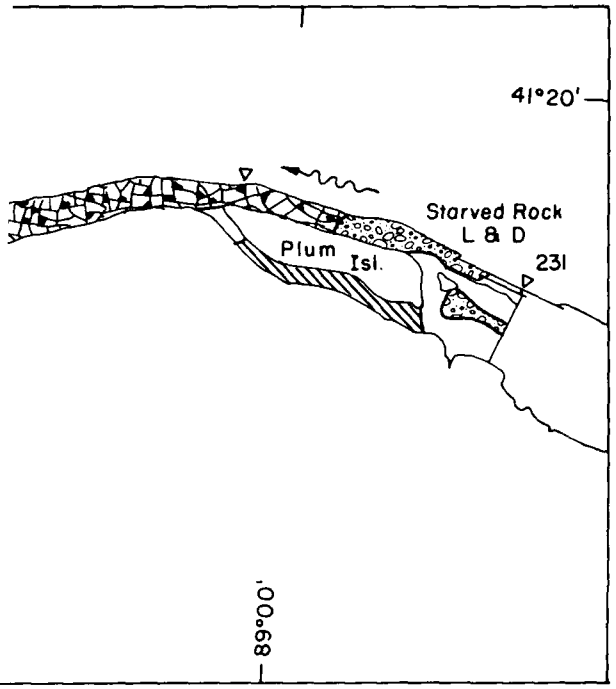


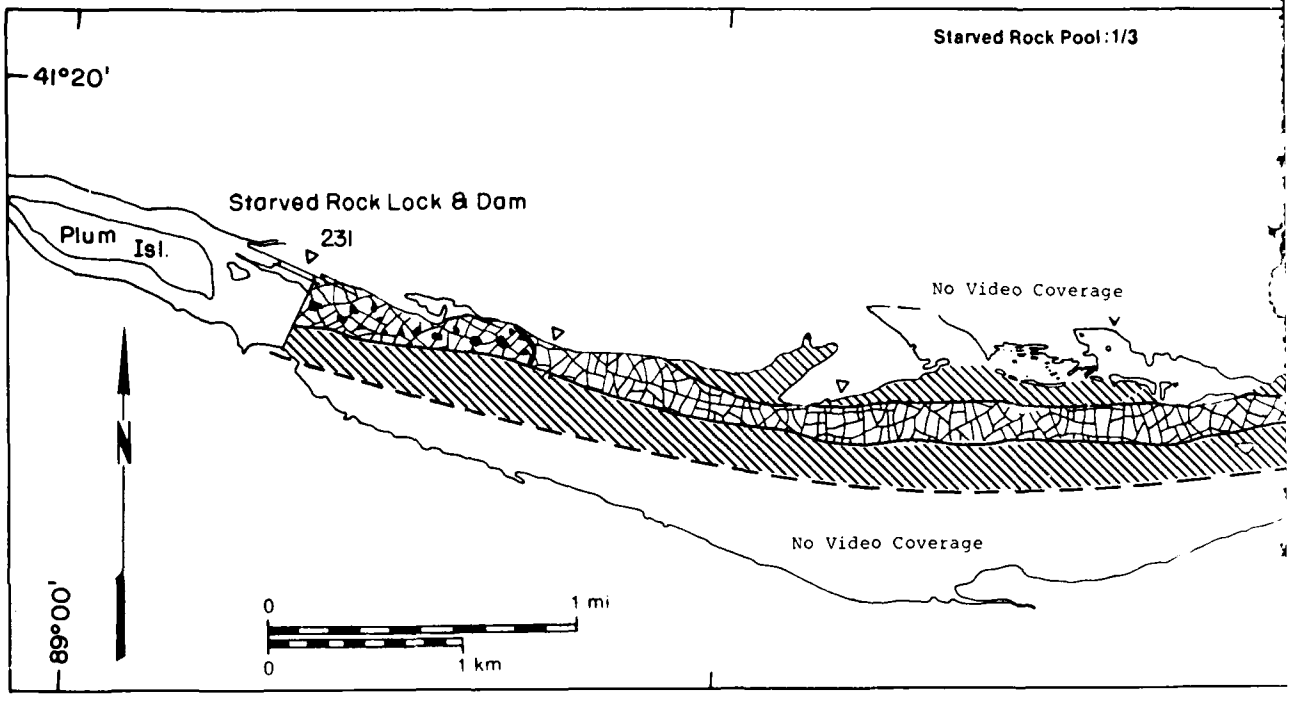
Peoria Pool

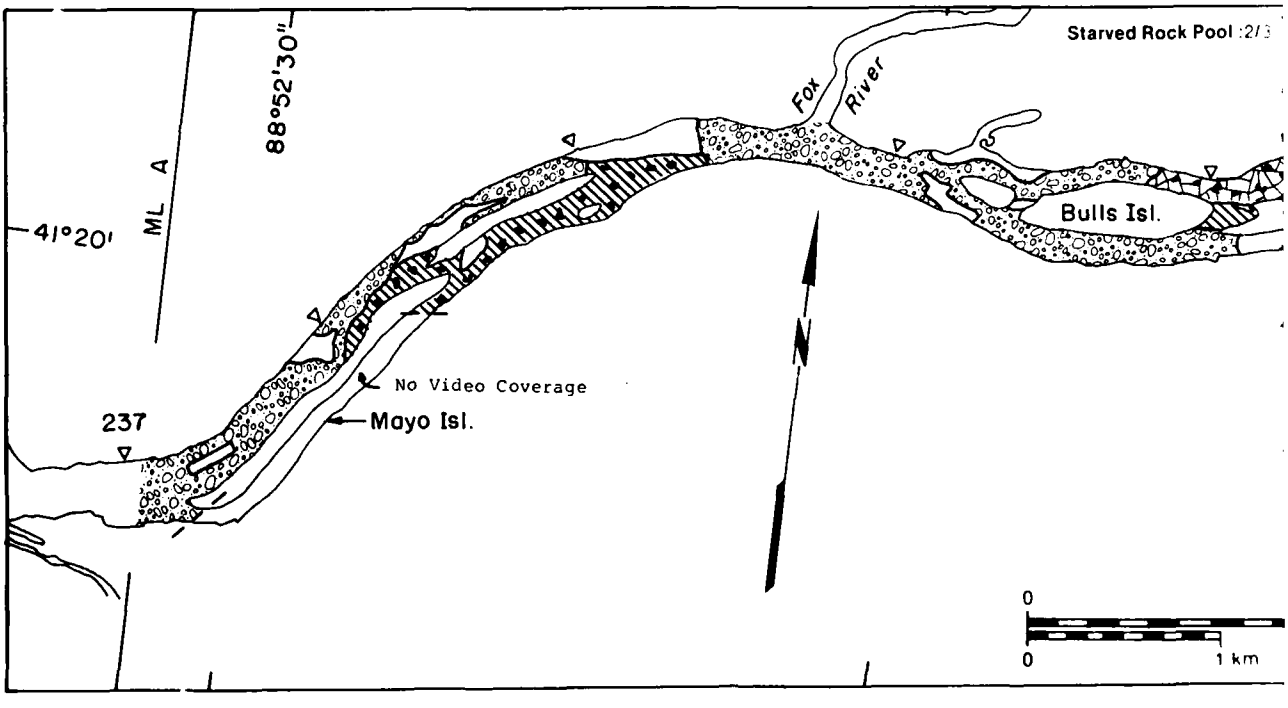
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	2.72	NA
Solid ice cover	20.61	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	29.71	NA
Fragmented ice cover with open-water areas	11.92	90
Ice floes or frazil slush and pans	0.40	80
Total Area ($m^2 \times 10^6$)	81.33*	

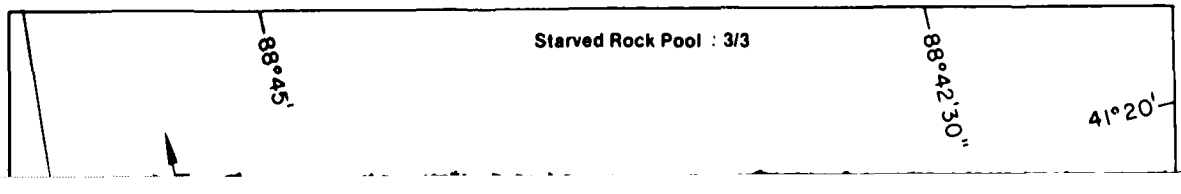
* Includes 15.97 x 10^6 m^2 of no video coverage


225
ML K
89°05'
1 mi
1 km
Survey date: January 7, 1986
Video Tape 1

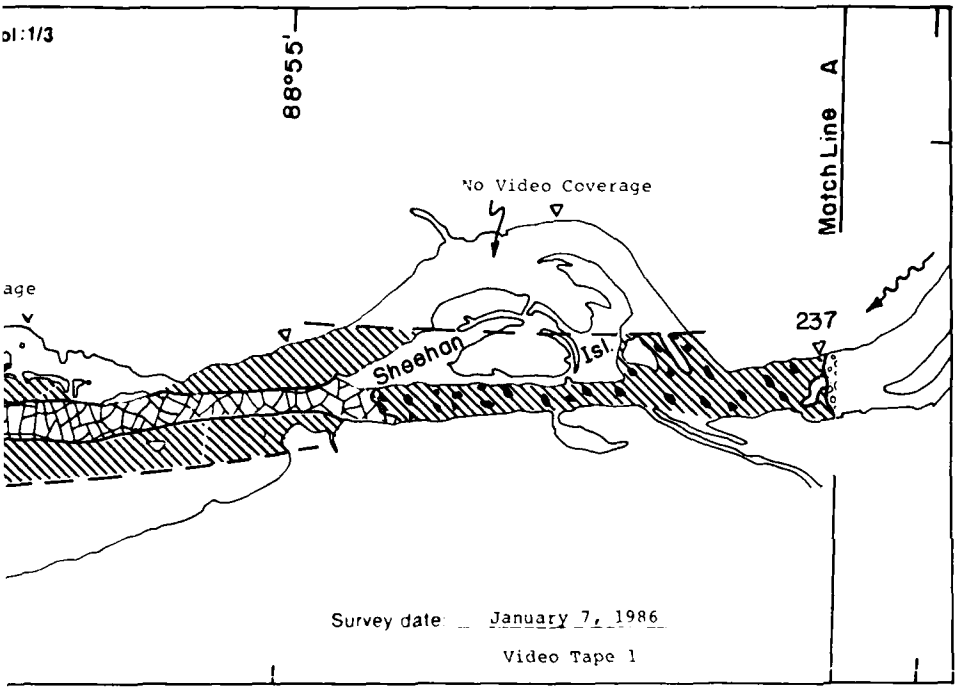

41°20'
Starved Rock
L & D
231
Plum Isl.
89°00'

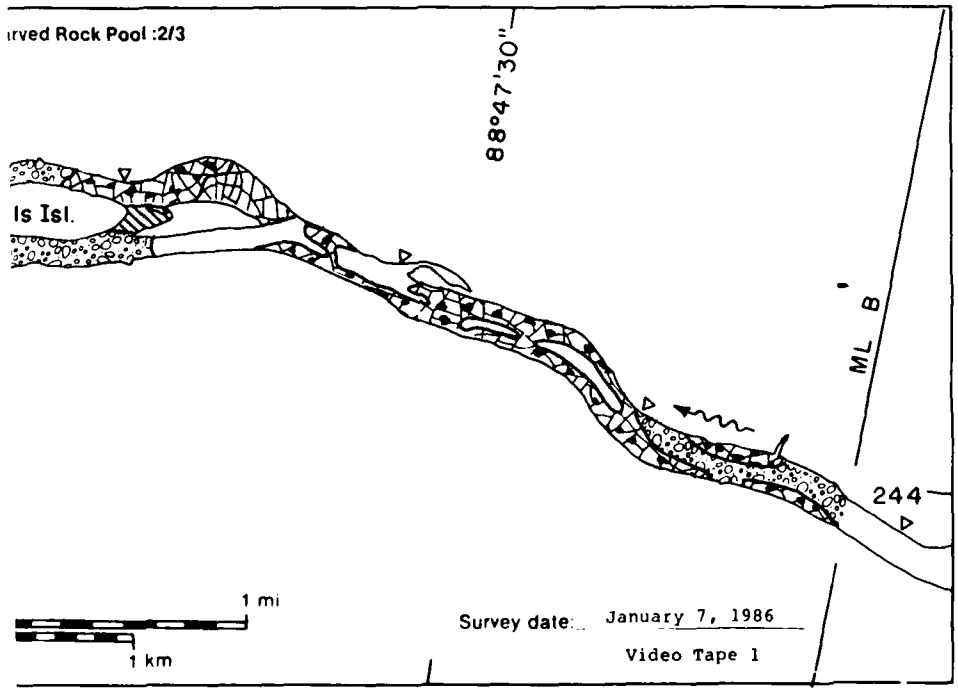

Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
No Video Coverage
N
89°00'
0
1 mi
0
1 km


Starved Rock Pool : 2/3
88°52'30"
ML A
41°20'
Fox River
Bulls Isl.
N
No Video Coverage
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

7 January 1986

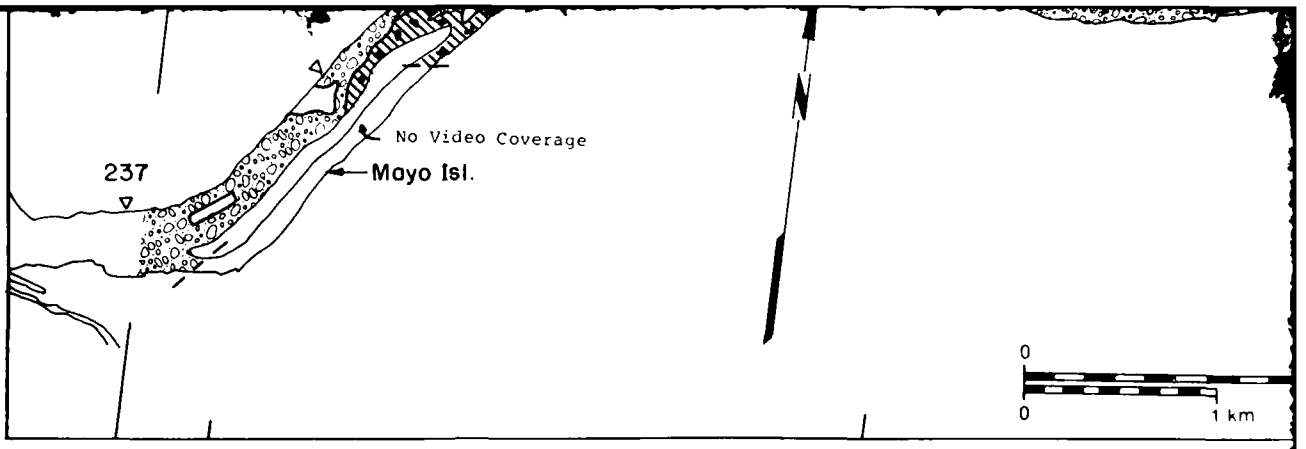


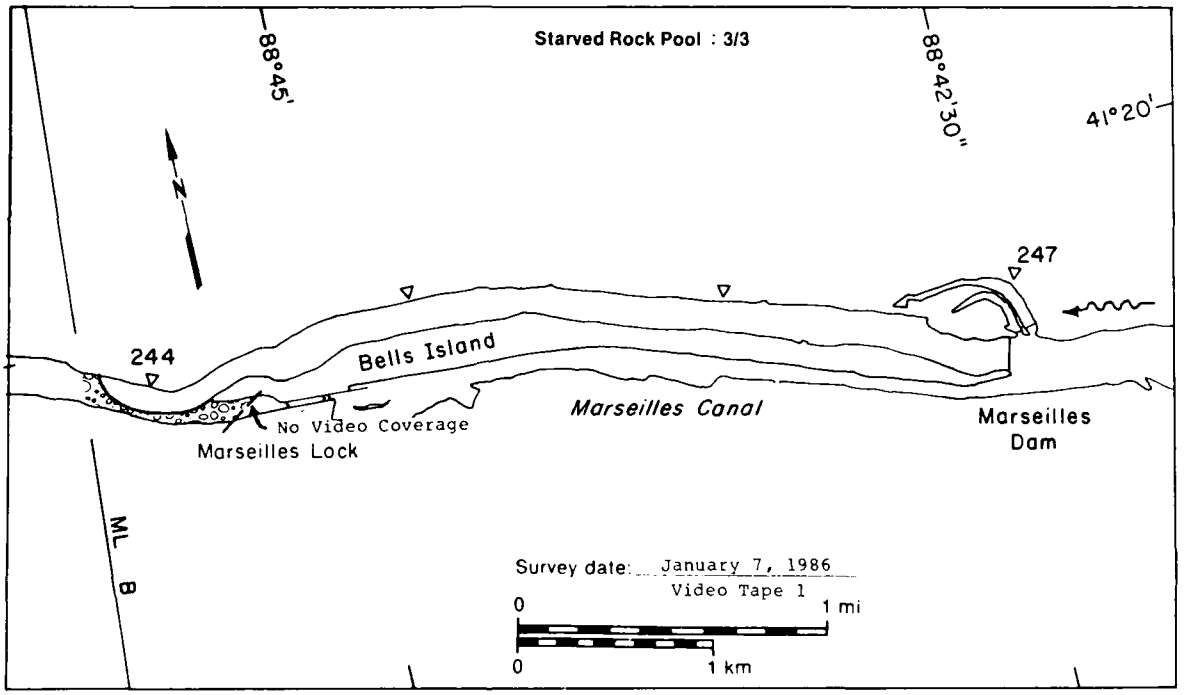


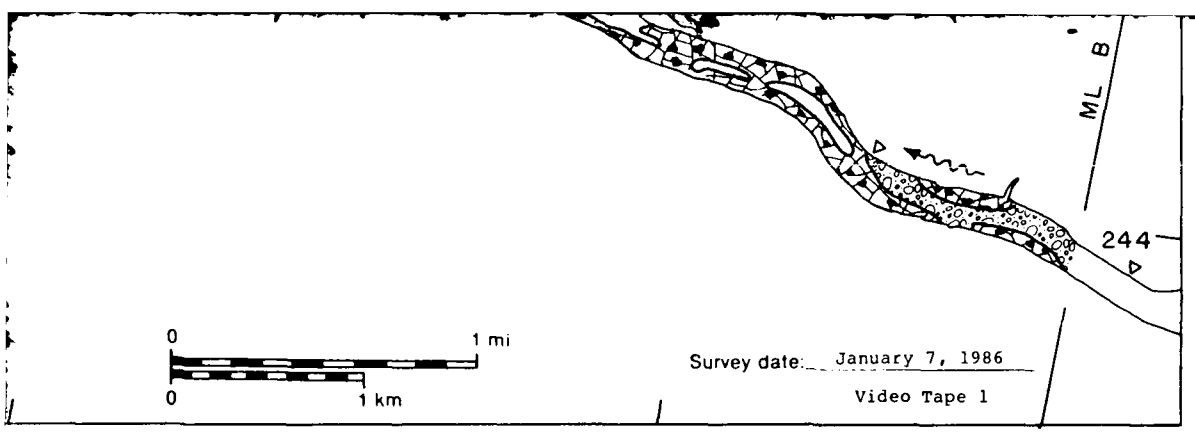
°20'

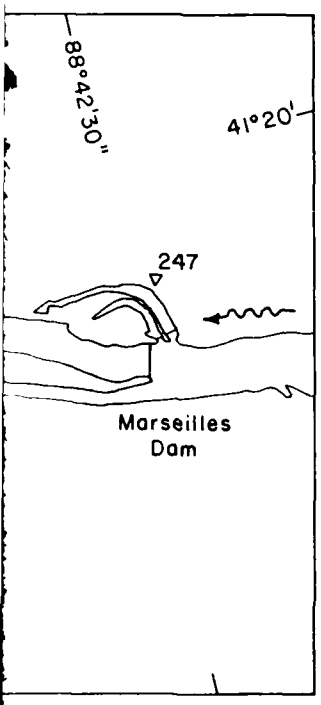
Starved Rock Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)


No Video Coverage
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
247
244
Bells Island
Marseilles Canal
No Video Coverage
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 7, 1986
Video Tape 1
0
1 mi
0
1 km



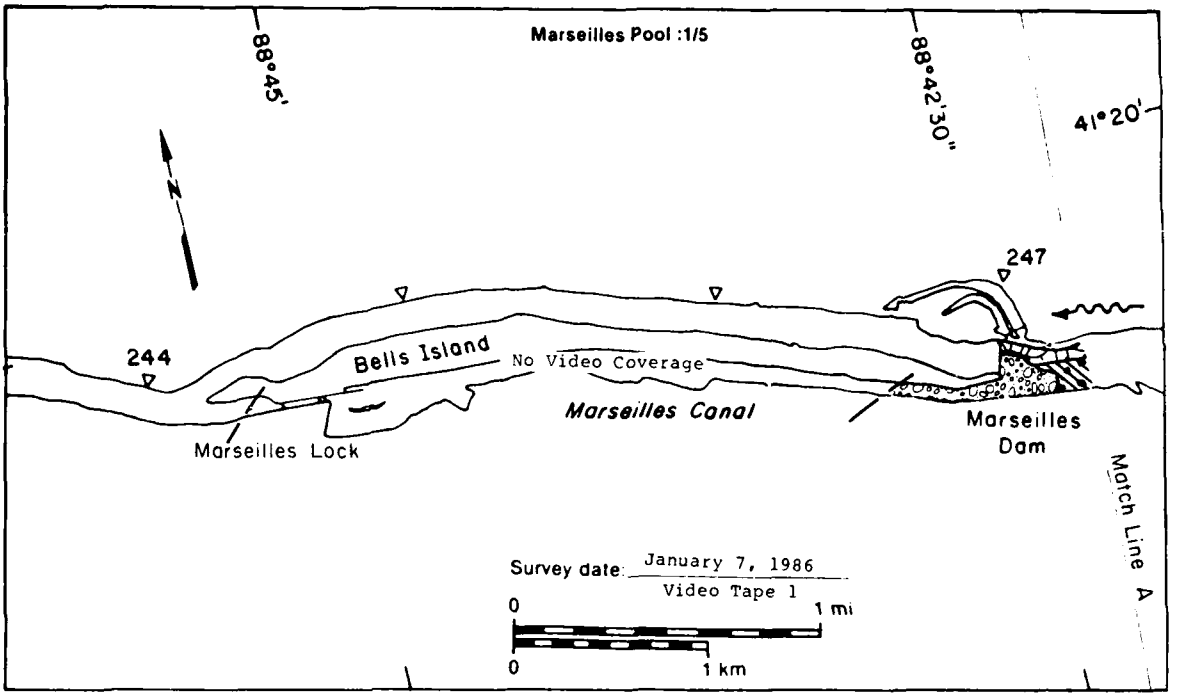


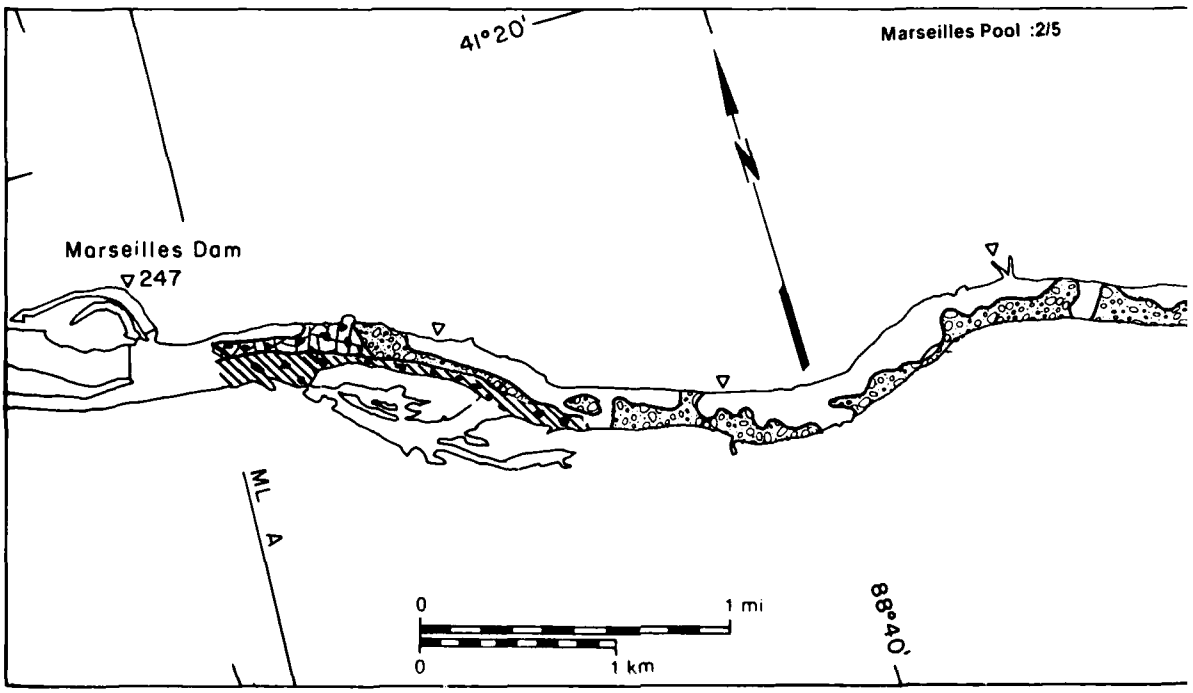
Starved Rock Pool

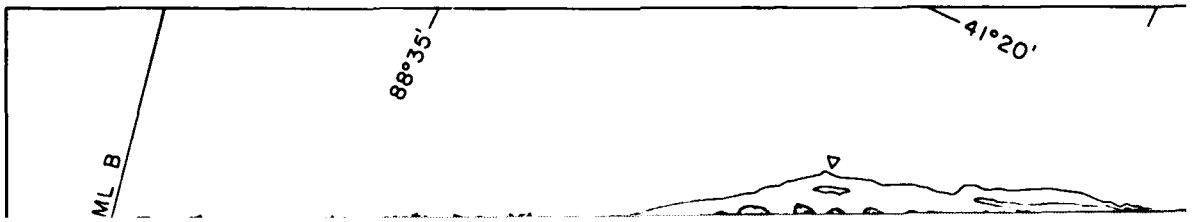
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.50	NA
Solid ice cover	2.03	NA
Solid ice cover with open-water areas	0.85	90
Fragmented ice cover	1.06	NA
Fragmented ice cover with open-water areas	0.72	90
Ice floes or frazil slush and pans	1.28	80
Total Area ($m^2 \times 10^6$)	10.19*	

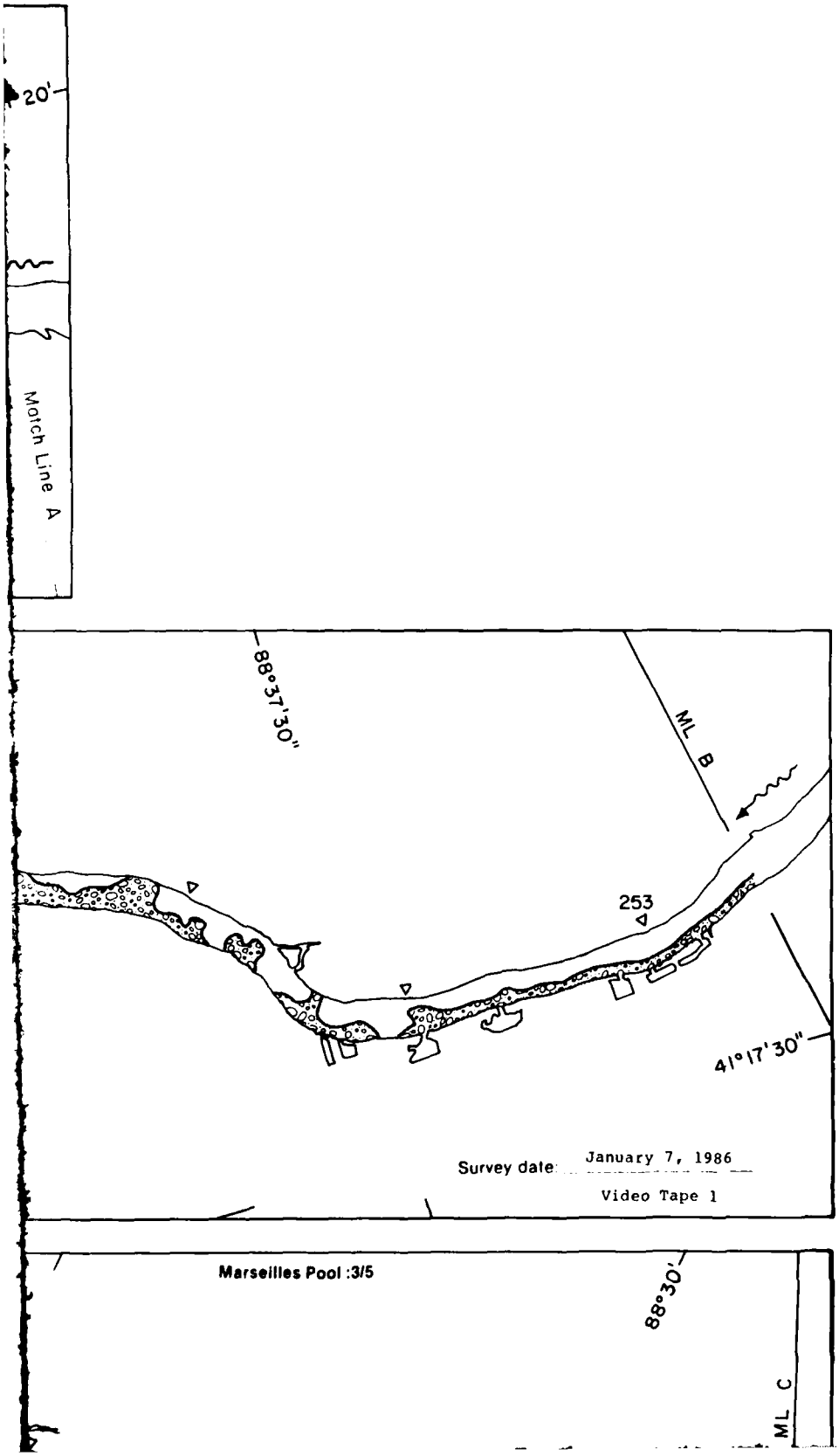
* Includes 2.75×10^6 m^2 of no video coverage

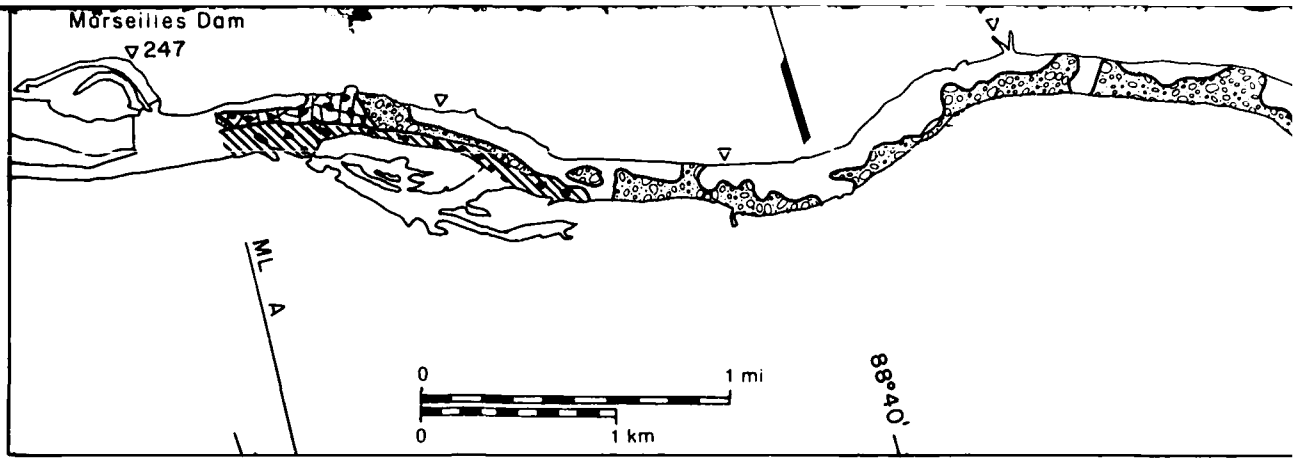
7 January 1986

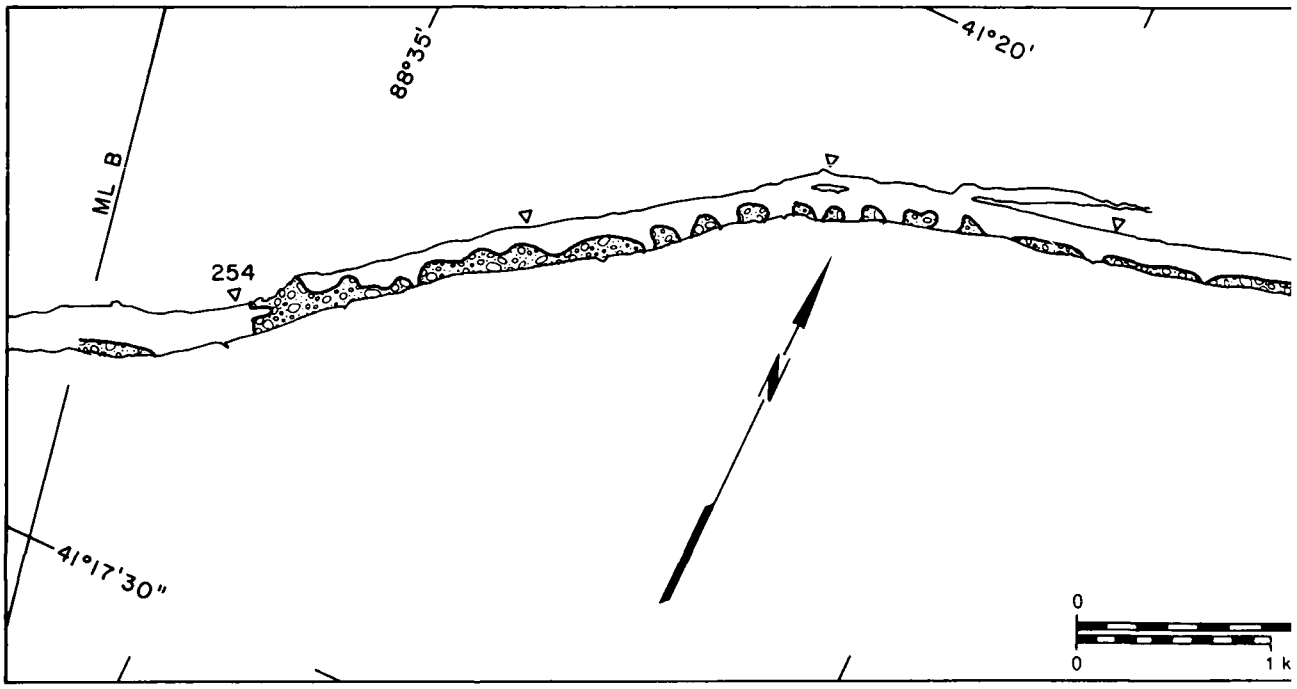


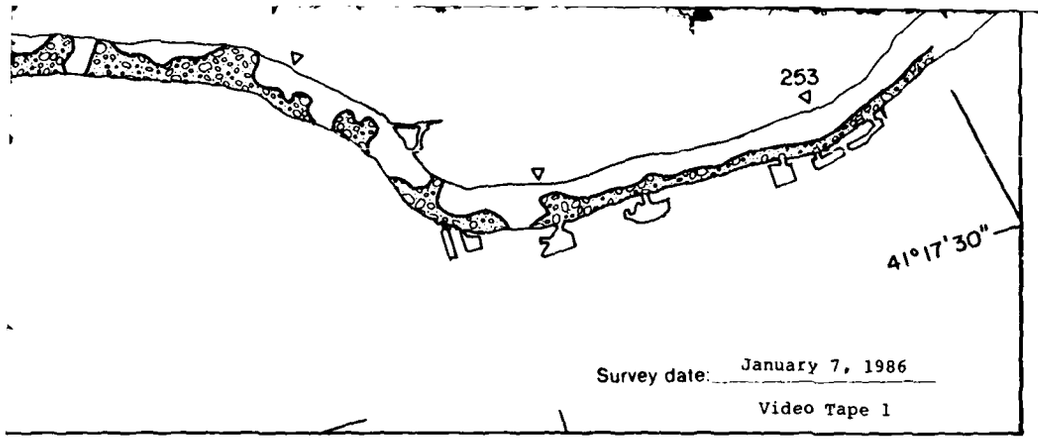


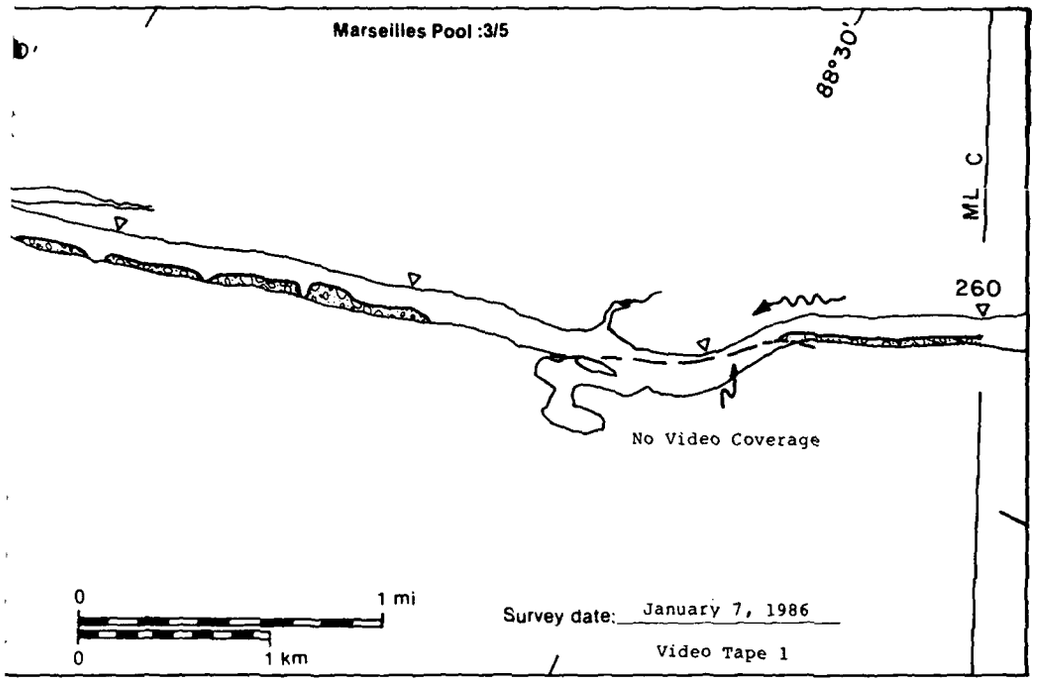


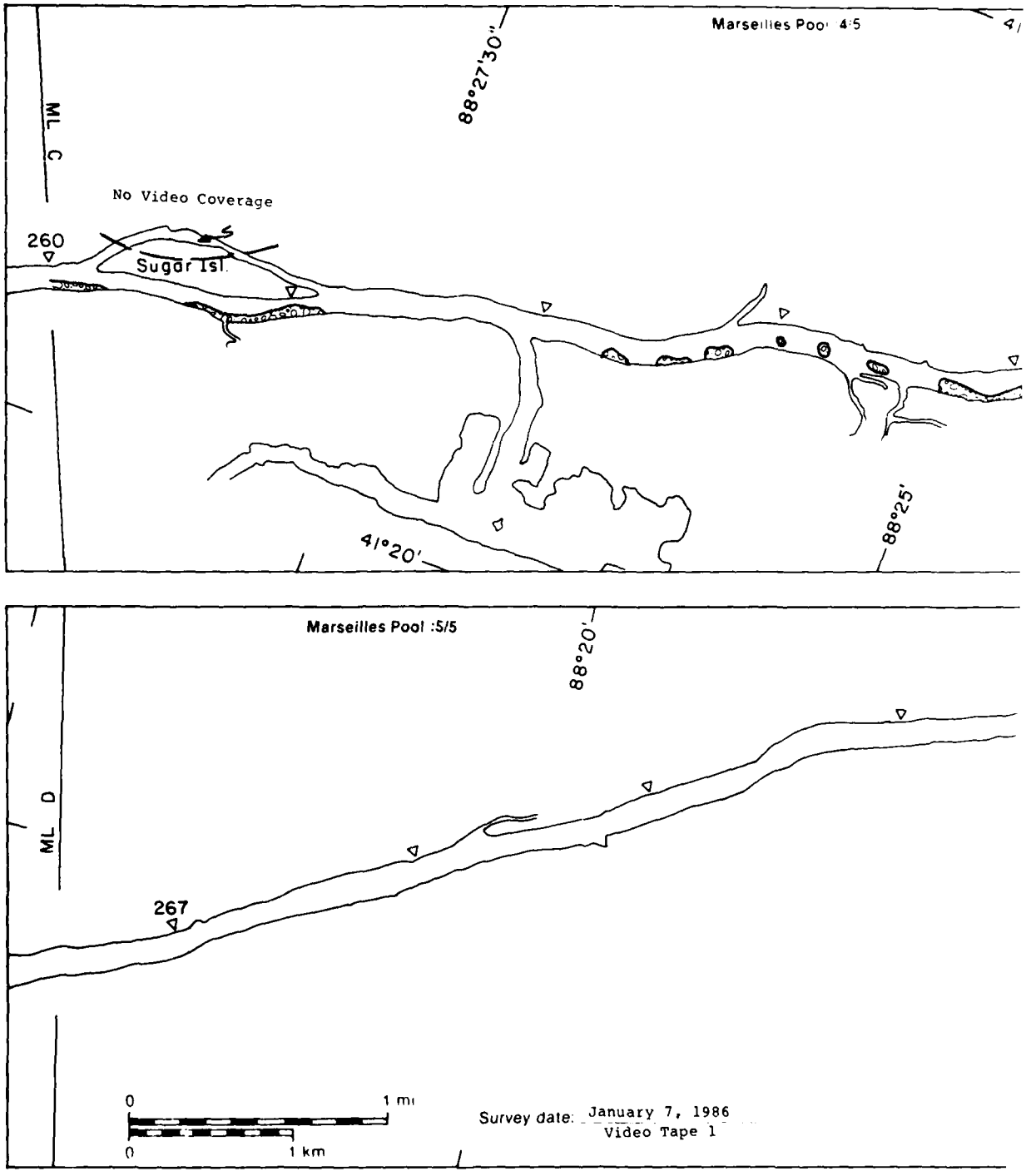

20'
March Line A
88°37'30"
ML B
253
41°17'30"
Survey date: January 7, 1986
Video Tape 1
Marseilles Pool :3/5
88°30'
ML C


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'


88°35'
41°20'
ML B
254
41°17'30"
0
0
1 k


253
41°17'30"
Survey date: January 7, 1986
Video Tape 1

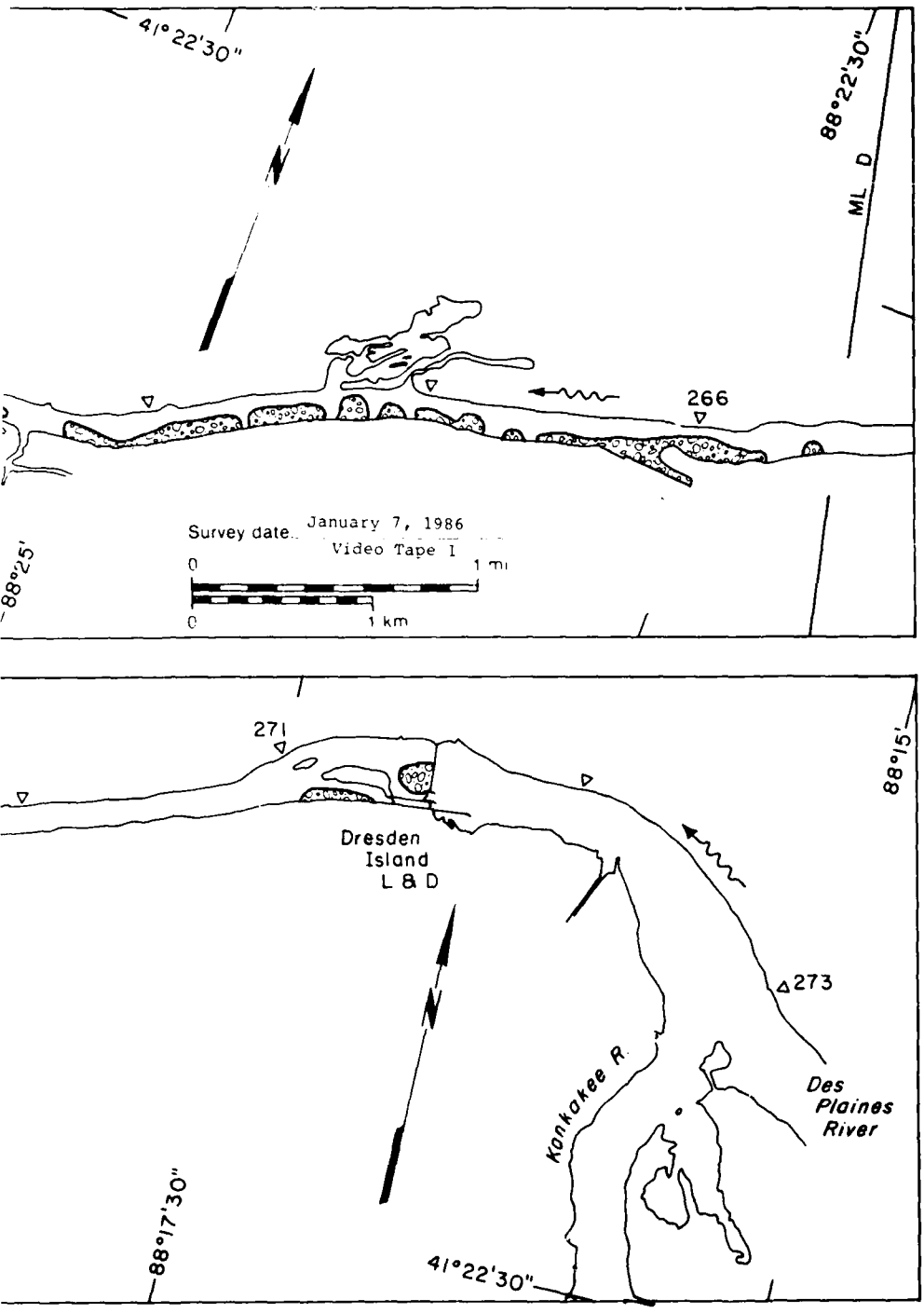

Marseilles Pool :3/5
88°30'
ML C
260
No Video Coverage
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1

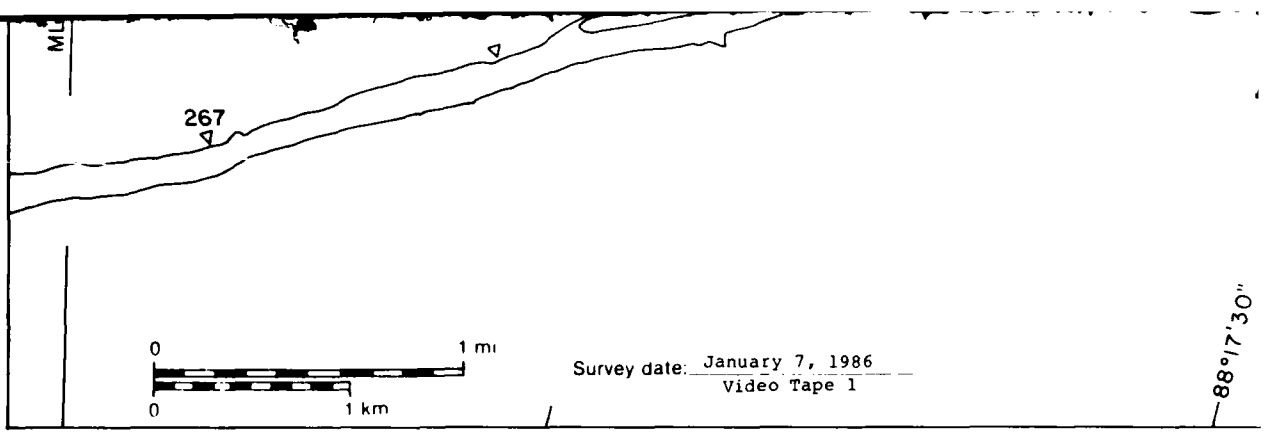


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.40	NA

7 January 1986

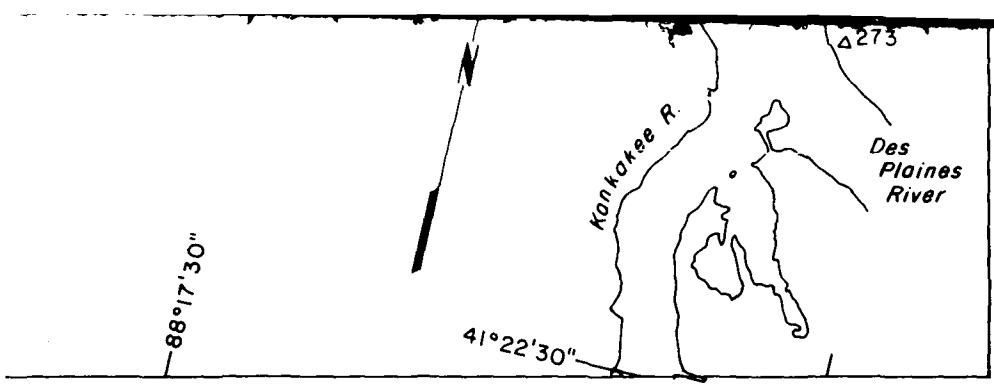




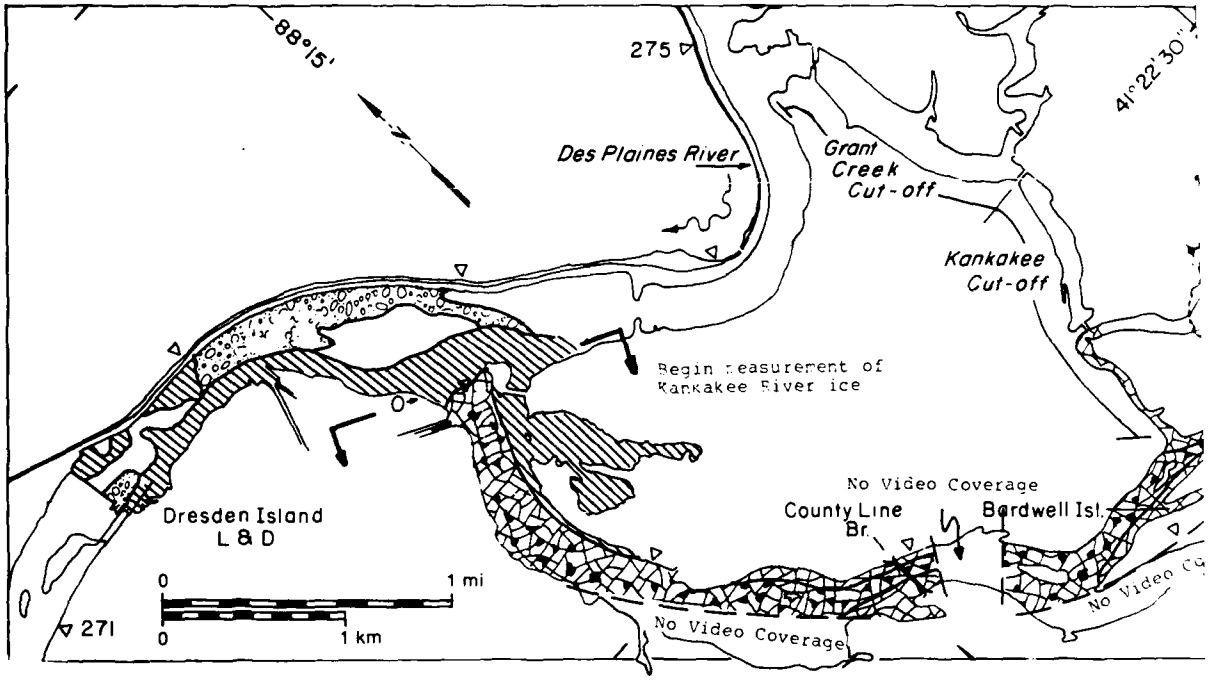
Marseilles Pool

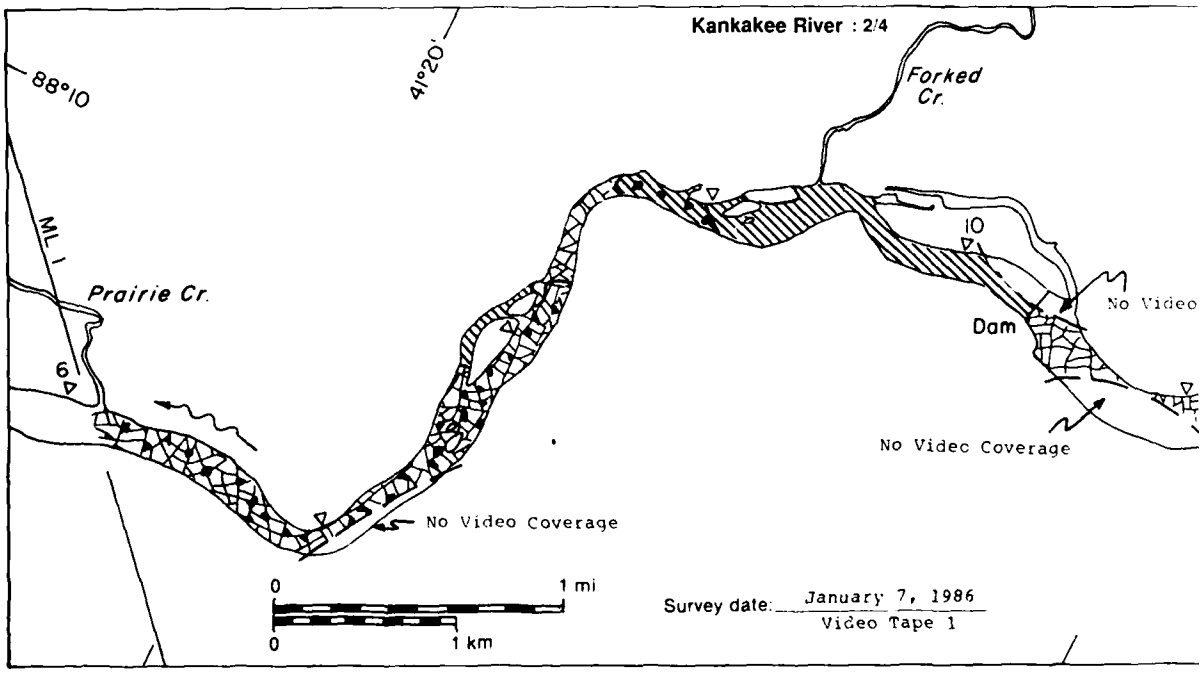
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.40	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.21	70
Fragmented ice cover	0.04	NA
Fragmented ice cover with open-water areas	0.07	90
Ice floes or frazil slush and pans	1.86	50
Total Area ($m^2 \times 10^6$)	8.19*	

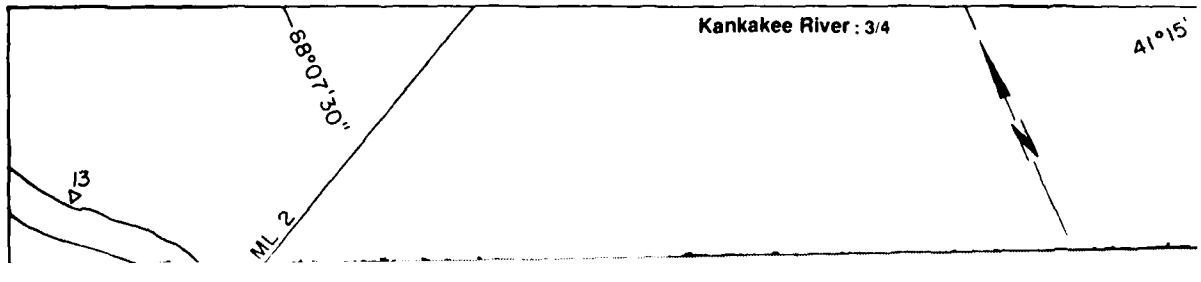
* Includes 0.61×10^6 m^2 of no video coverage

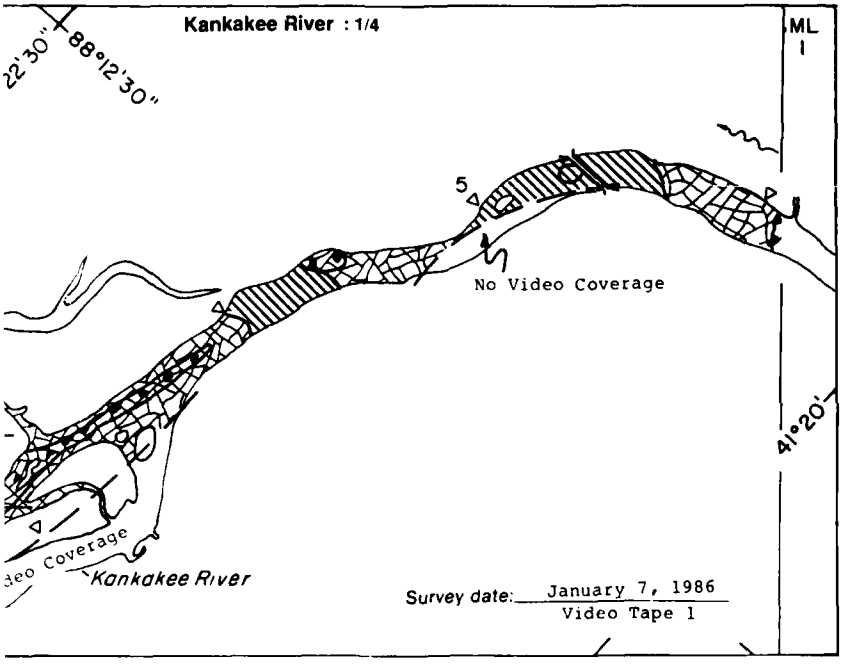

△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

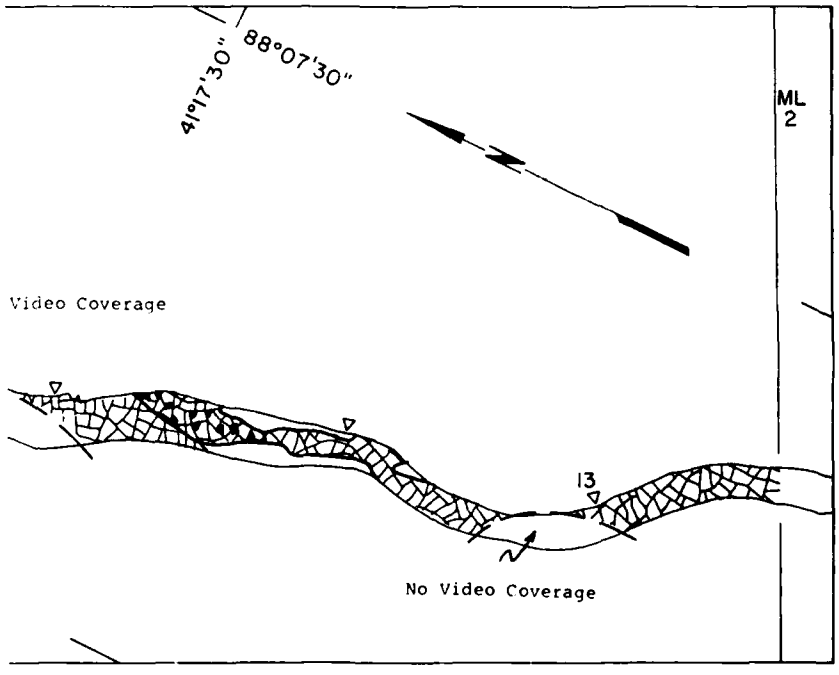
7 January 1986

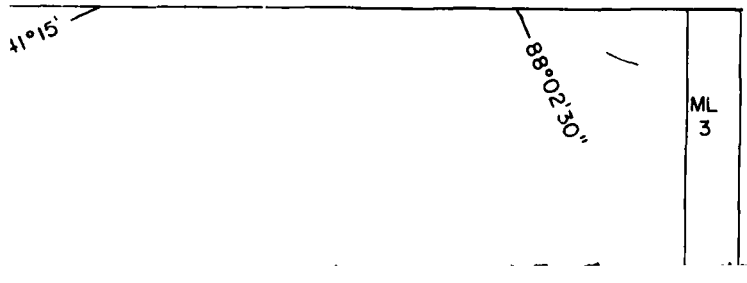


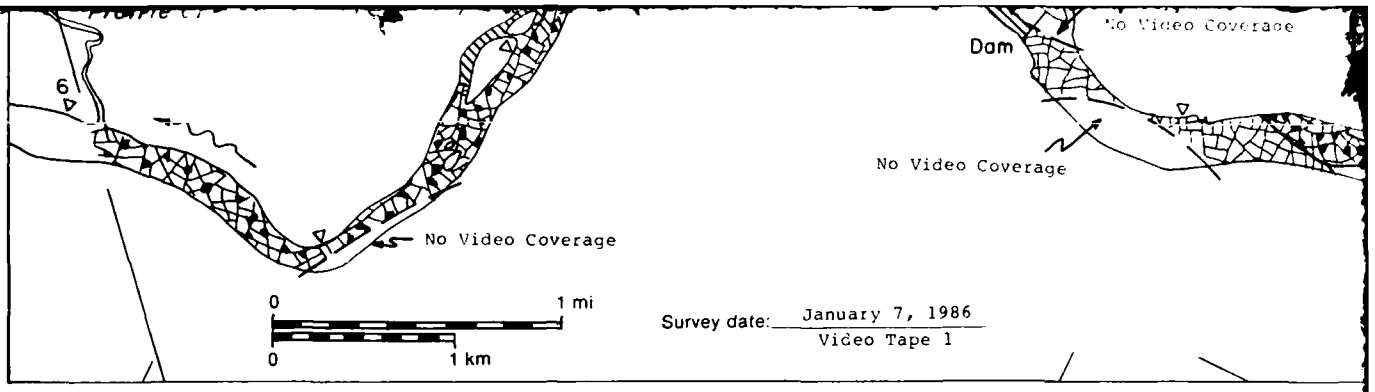


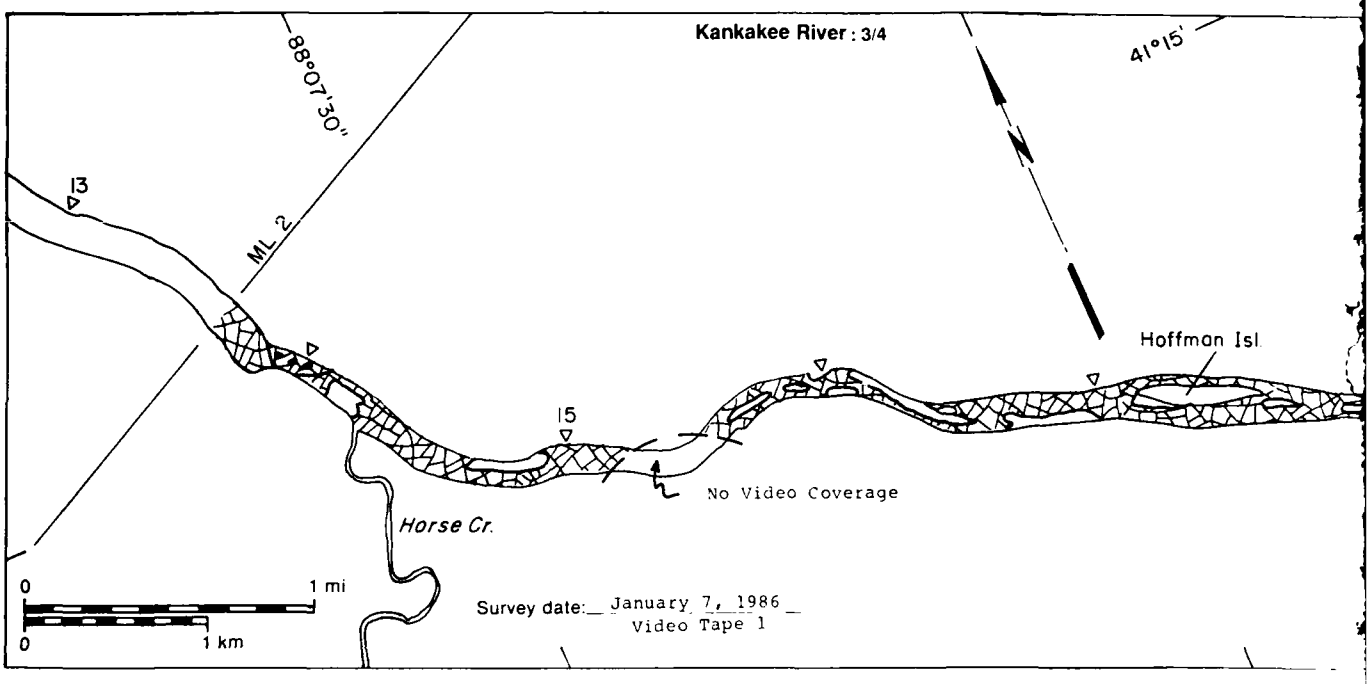


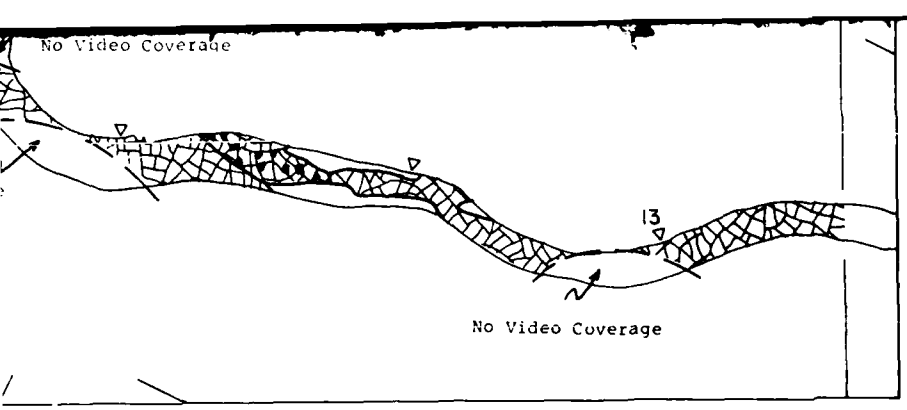

Kankakee River : 1/4
22'30"
88°12'30"
ML
1
5
No Video Coverage
41°20'
Kankakee River
Survey date: January 7, 1986
Video Tape 1

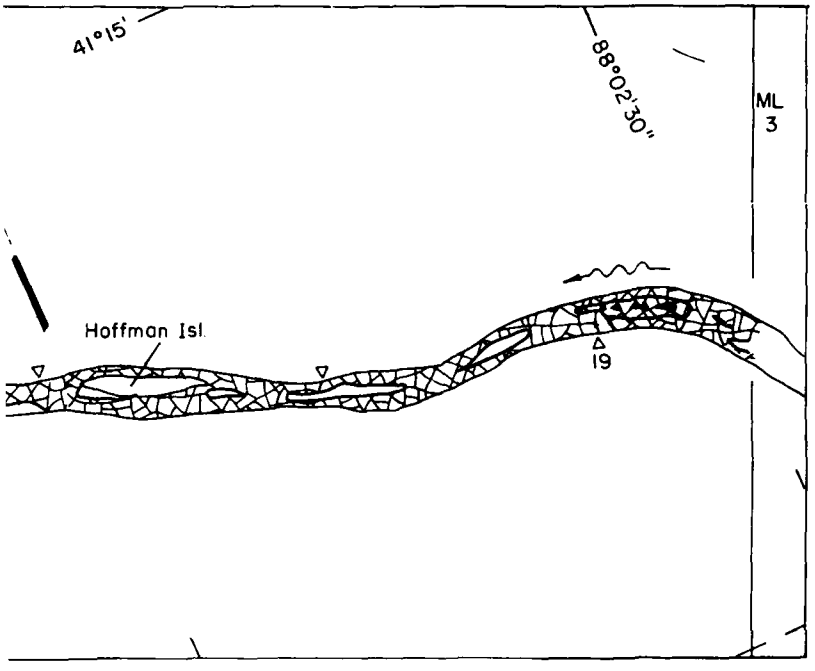

41°17'30"
88°07'30"
ML
2
Video Coverage
13
No Video Coverage

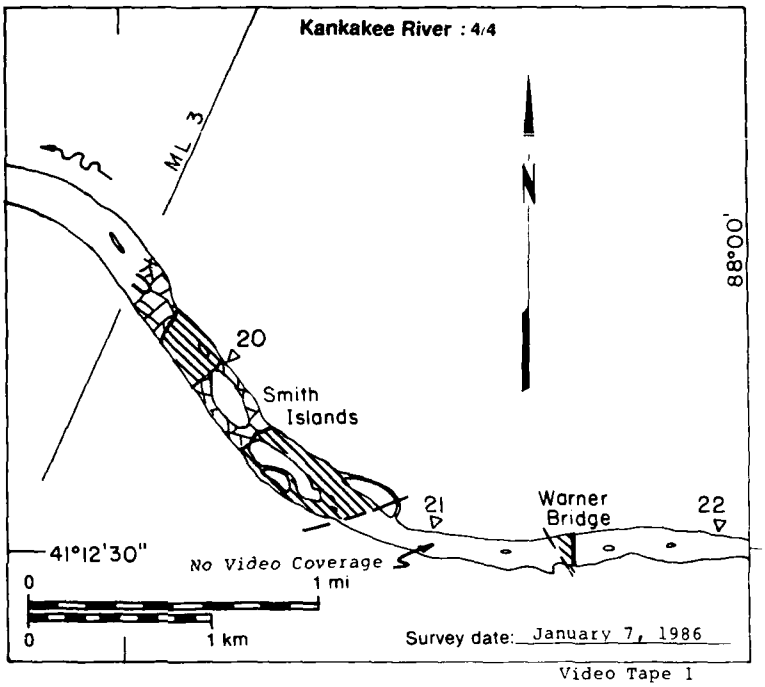

41°15'
88°02'30"
ML
3


6
Dam
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
Hoffman Isl.
15
No Video Coverage
Horse Cr.
0
1 mi
0
1 km
Survey date: January 7, 1986
Video Tape 1


No Video Coverage
13
No Video Coverage

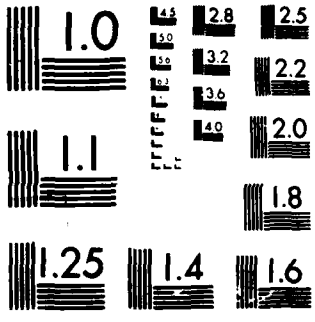

41°15'
88°02'30"
ML
3
Hoffman Isl
19


Kankakee River : 4/4
ML 3
N
88°00'
20
Smith
Islands
21
Warner
Bridge
22
41°12'30"
No Video Coverage
0
1 mi
0
1 km
Survey date: January 7, 1986

Video Tape 1

AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 7/14

UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3
7.1
8.0
9.0
10.0
11.2
12.5
14.0
16.0
18.0
20.0
22.4
25.0
28.0
32.0
36.0
40.0
45.0
50.0
56.0
63.0
71.0
80.0
90.0
100.0
112.0
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140.0
160.0
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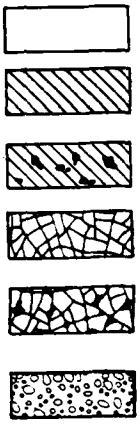
7 January 1986

Kankakee River

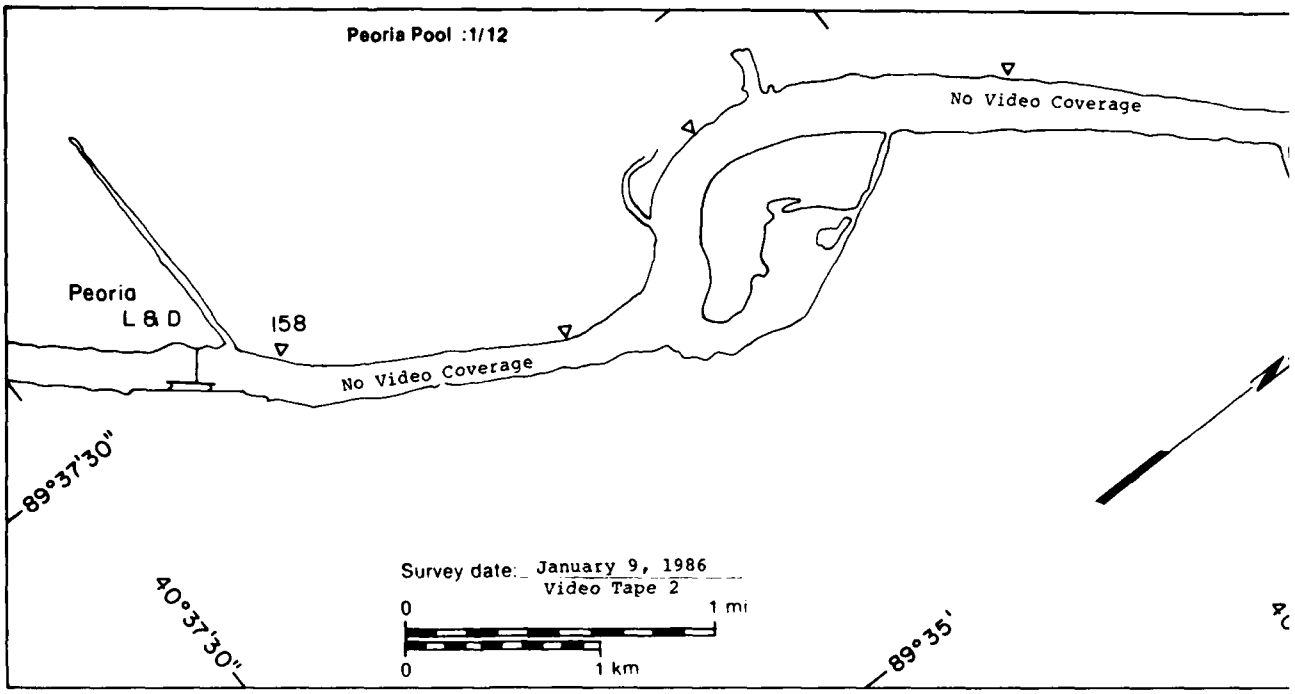
MAP UNITS

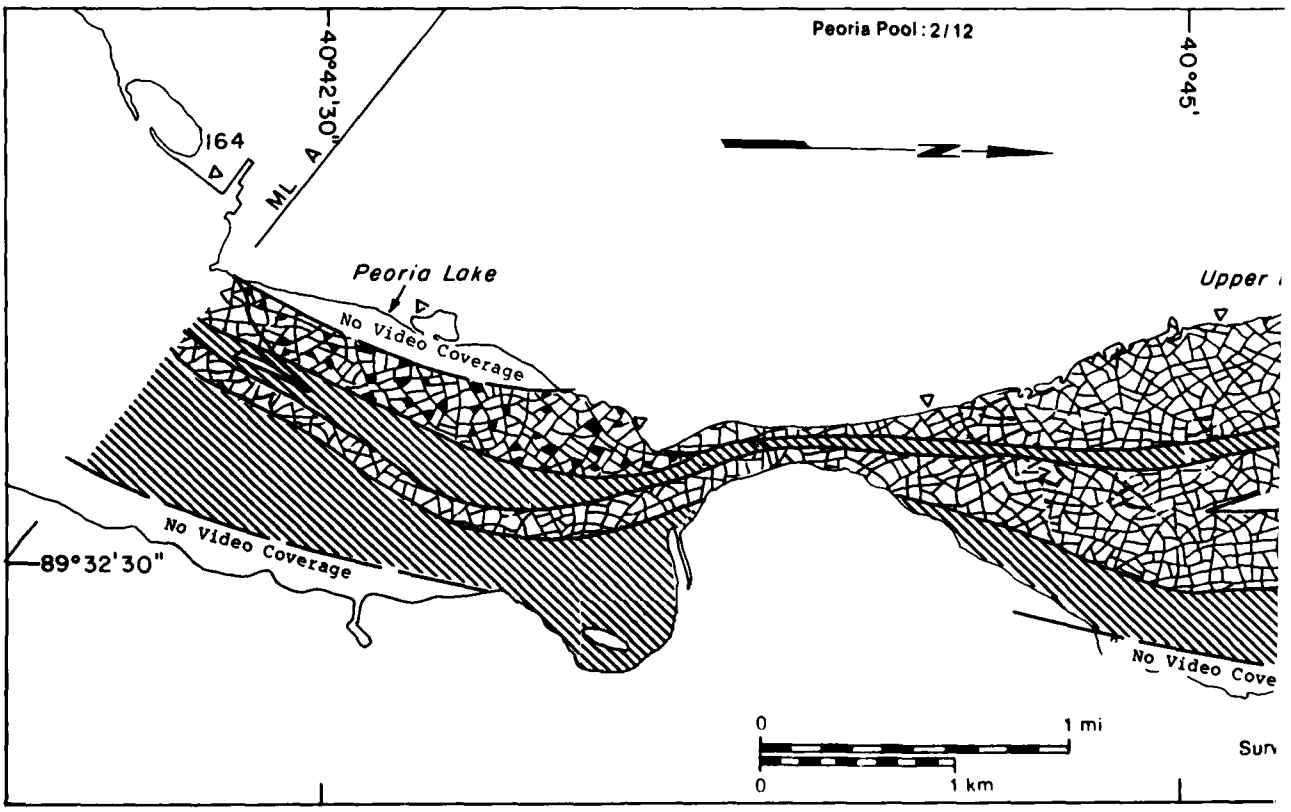


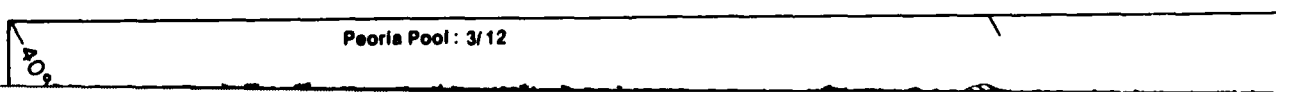
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.38	NA
Solid ice cover	1.07	NA
Solid ice cover with open-water areas	0.09	95
Fragmented ice cover	1.65	NA
Fragmented ice cover with open-water areas	2.94	90
Ice floes or frazil slush and pans	0.00	—
Total Area ($m^2 \times 10^6$)	7.30*	

* Includes 1.17×10^6 m^2 of no video coverage

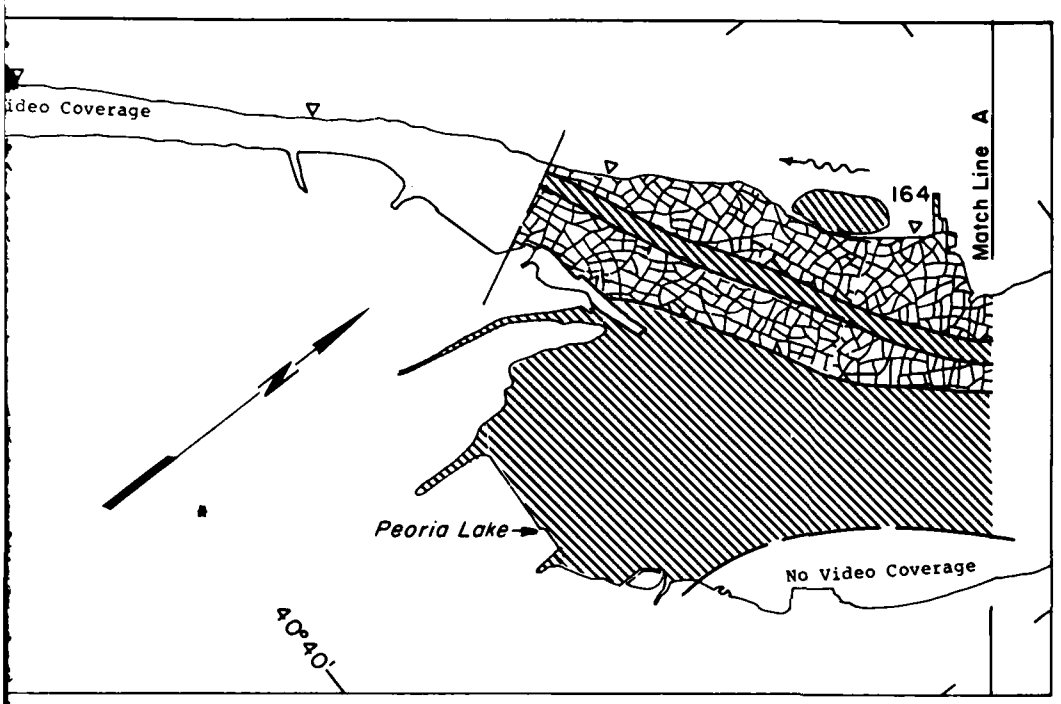
A

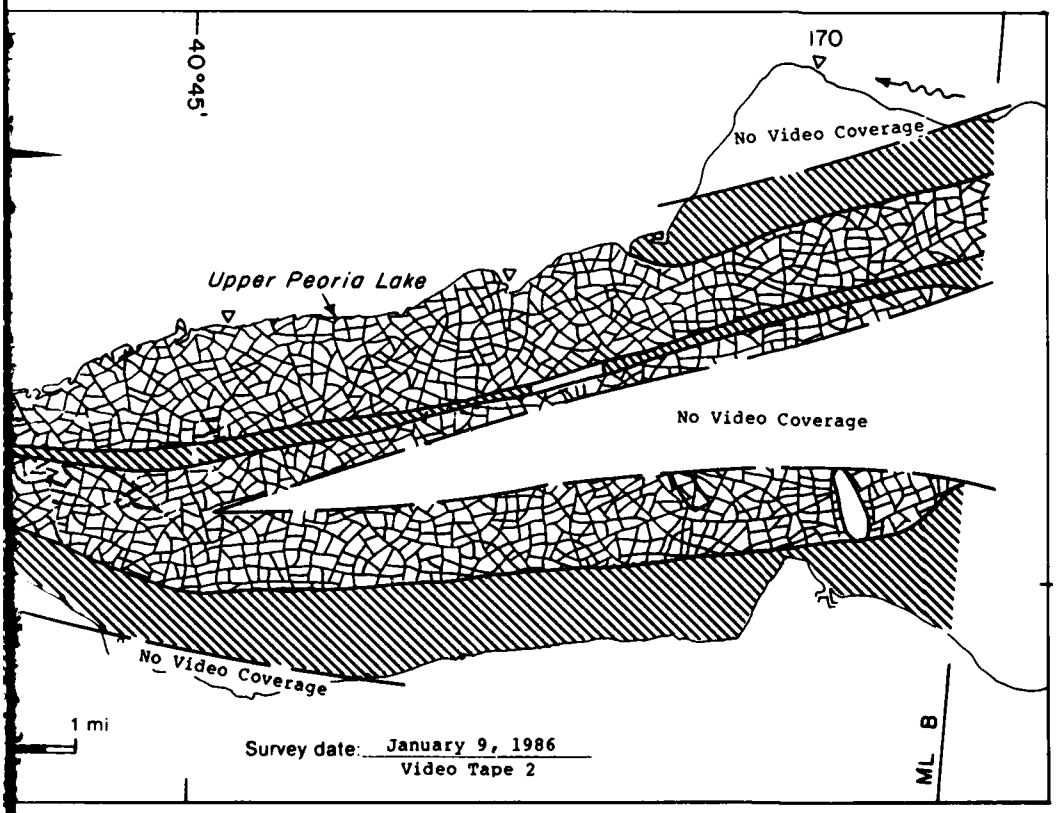

Peoria Pool :1/12
No Video Coverage
Peoria
L & D
158
No Video Coverage
89°37'30"
40°37'30"
Survey date: January 9, 1986
Video Tape 2
0
1 mi
0
1 km
89°35'

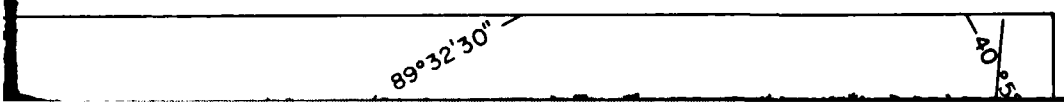

Peoria Pool :2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
No Video Coverage
Upper
No Video Coverage
89°32'30"
No Video Cove
0
1 mi
0
1 km

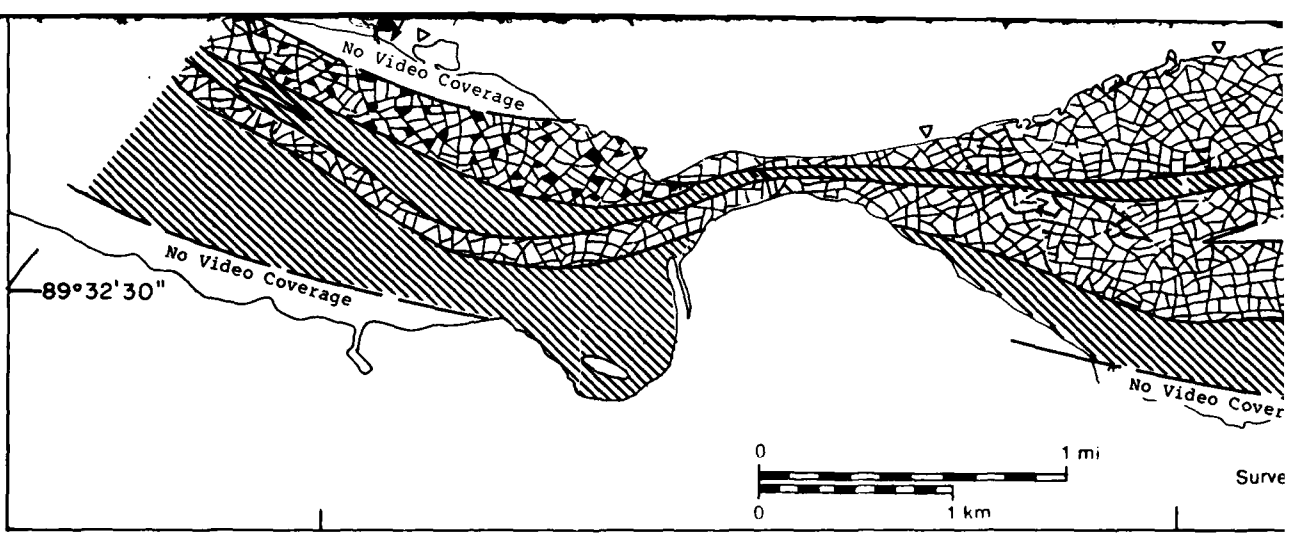

Peoria Pool : 3/12

9 January 1986





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89°32'30"
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0
1 mi
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1 km
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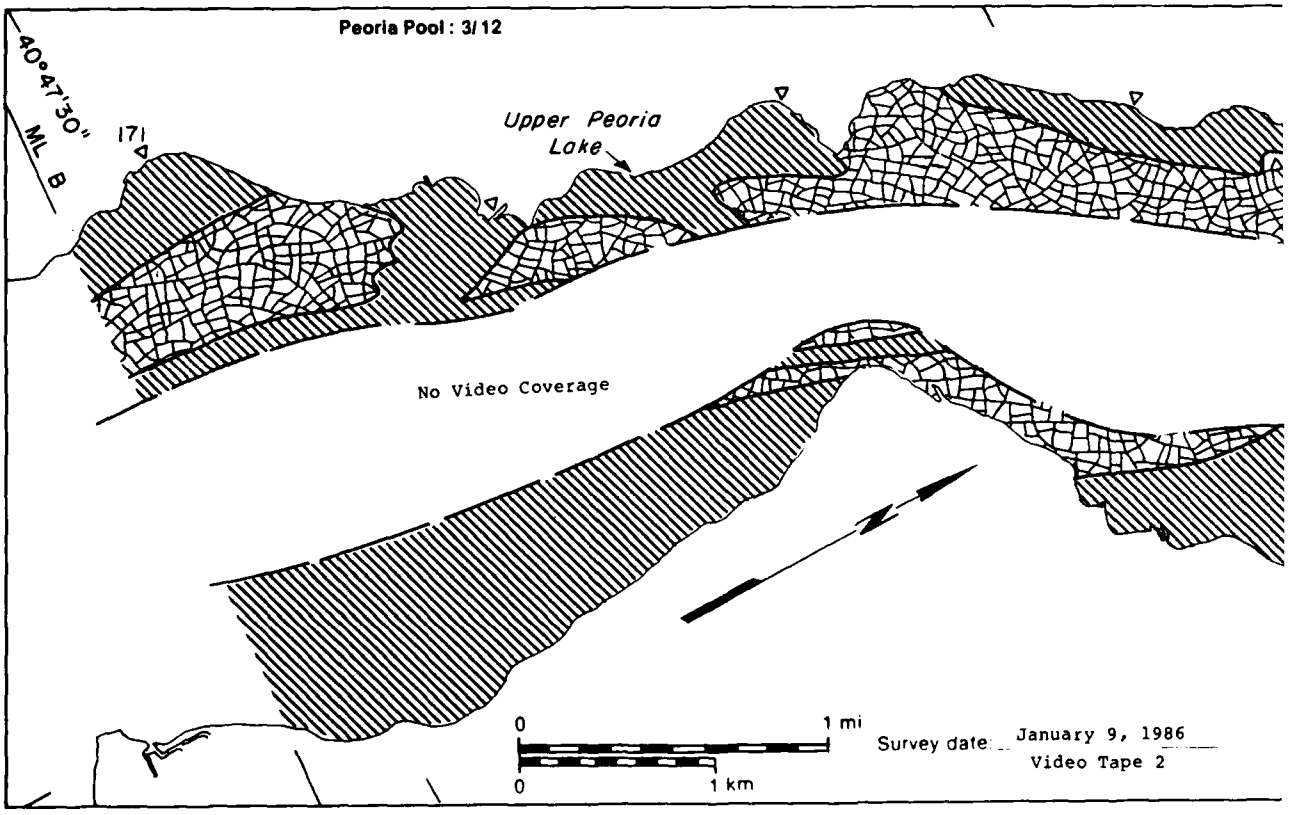
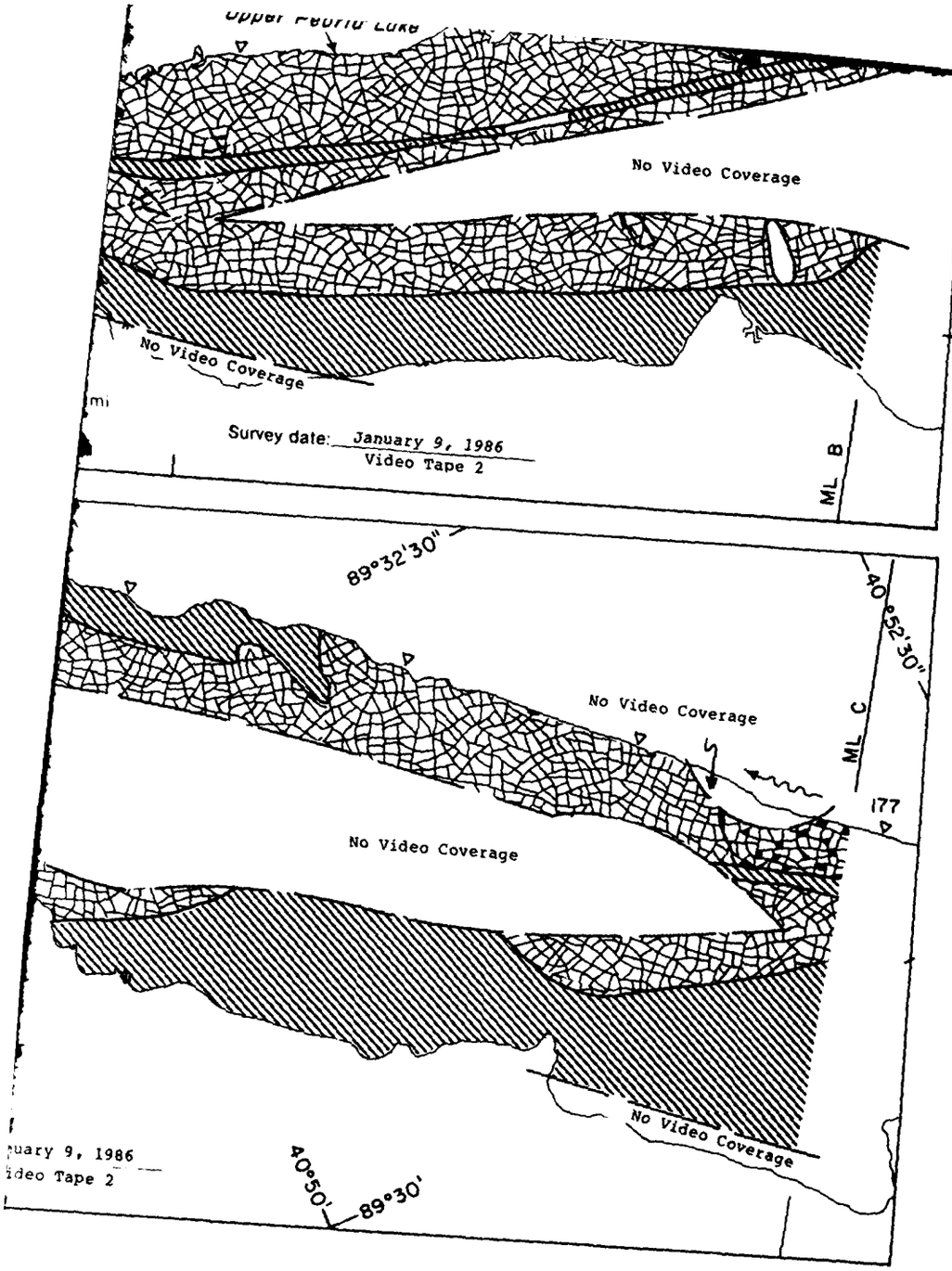
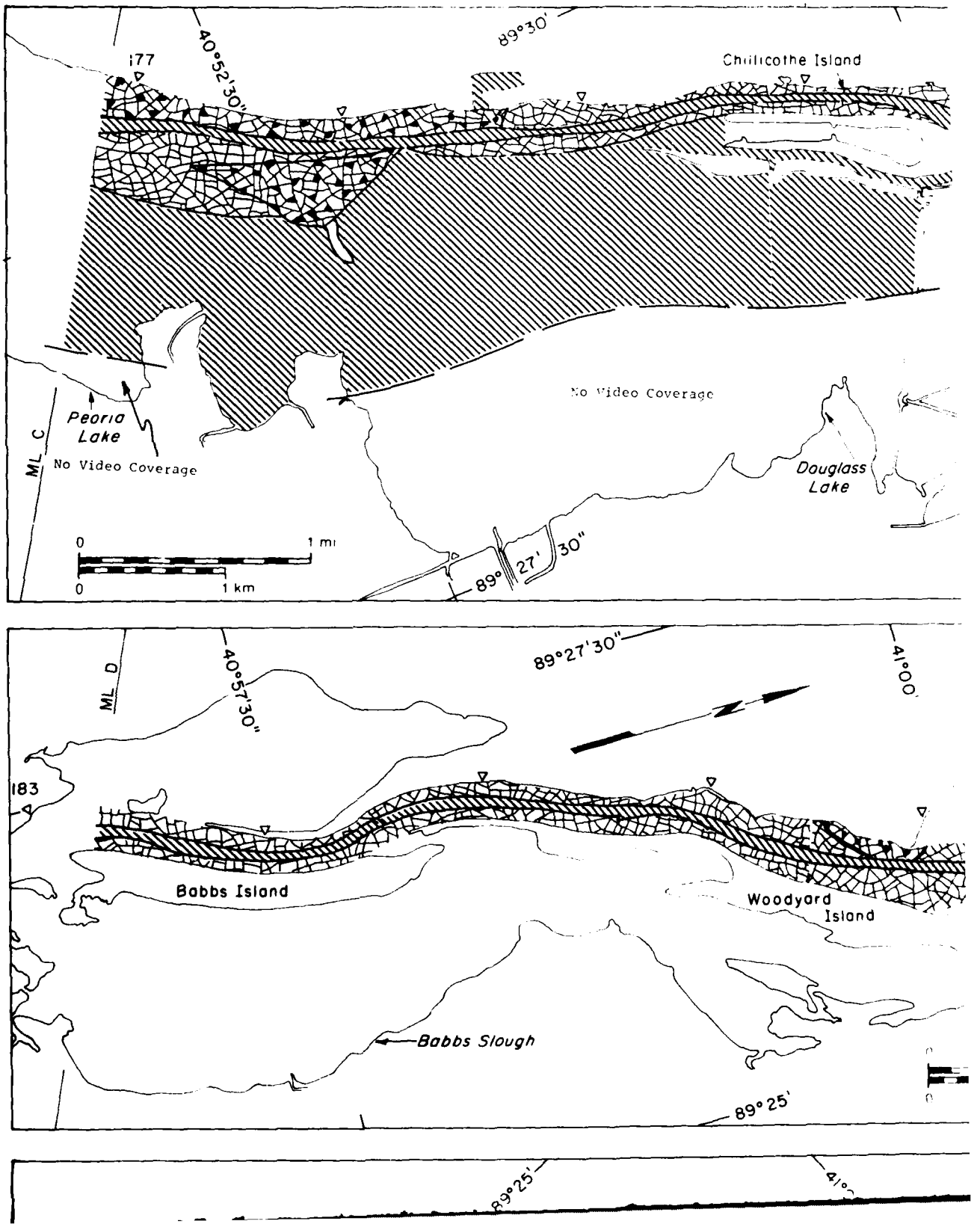
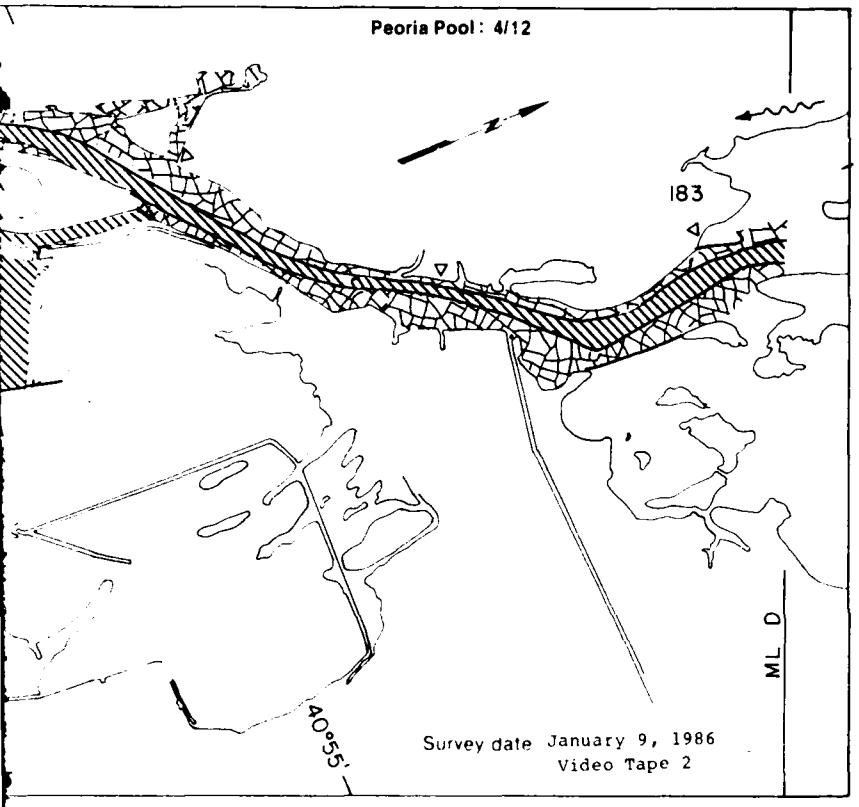
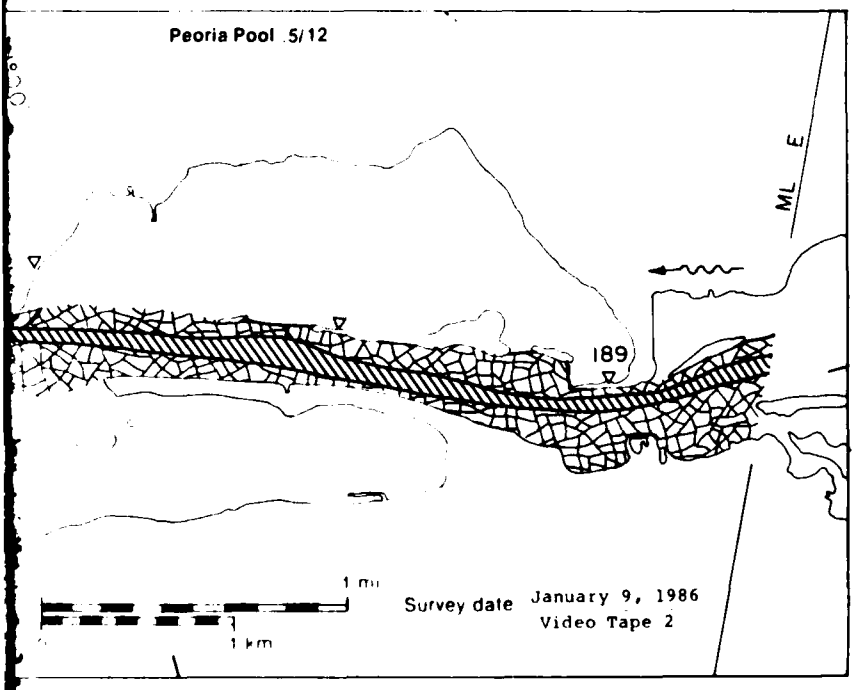

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
0
1 mi
0
1 km
Survey date: January 9, 1986
Video Tape 2

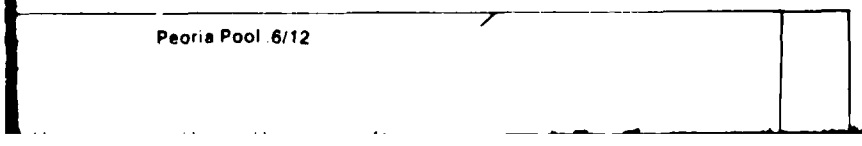

No Video Coverage
No Video Coverage
Survey date: January 9, 1986
Video Tape 2
ML B
89°32'30"
40°52'30"
No Video Coverage
ML C
177
No Video Coverage
No Video Coverage
uary 9, 1986
ideo Tape 2
40°50'
89°30'

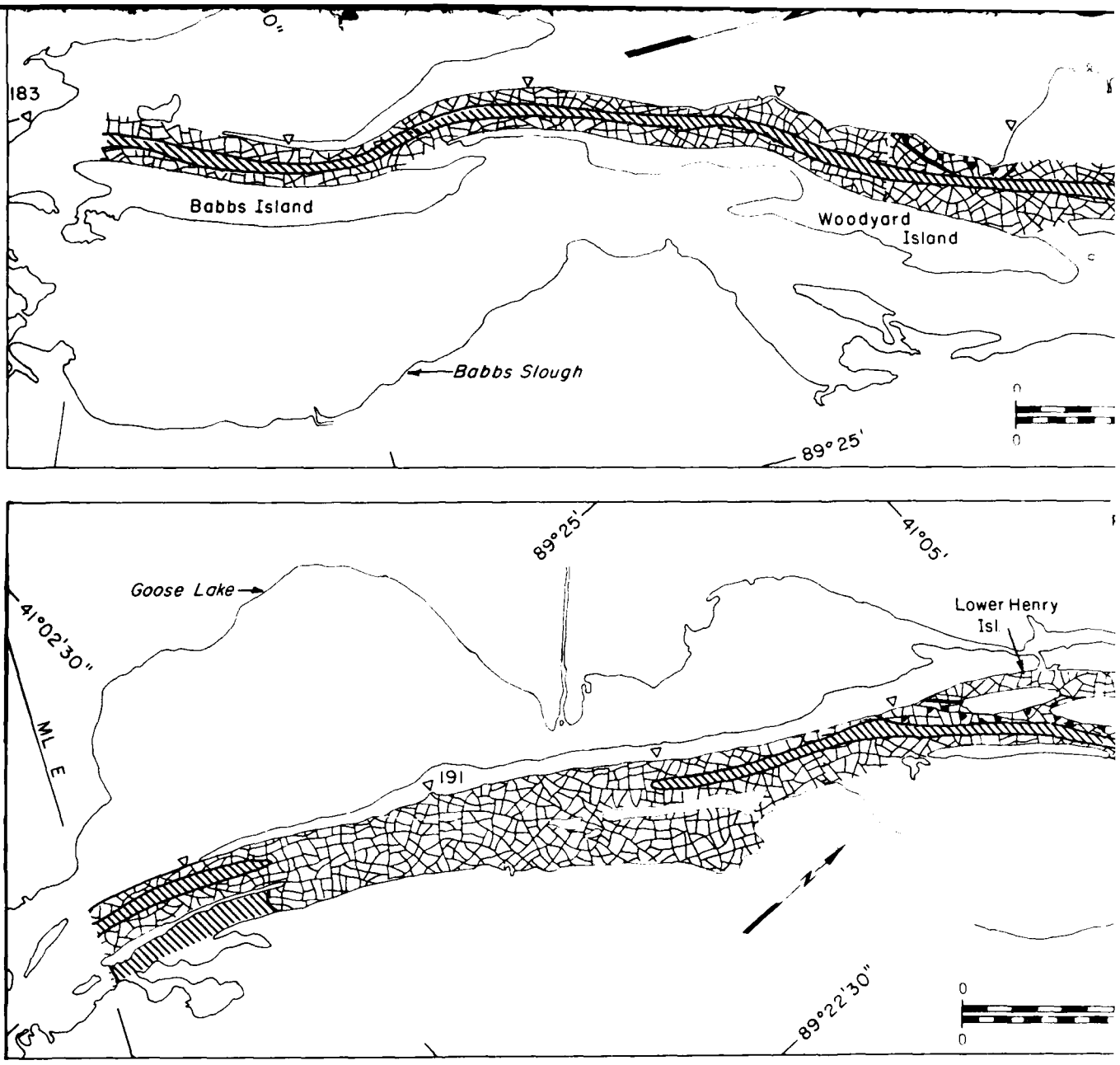
9 January 1986

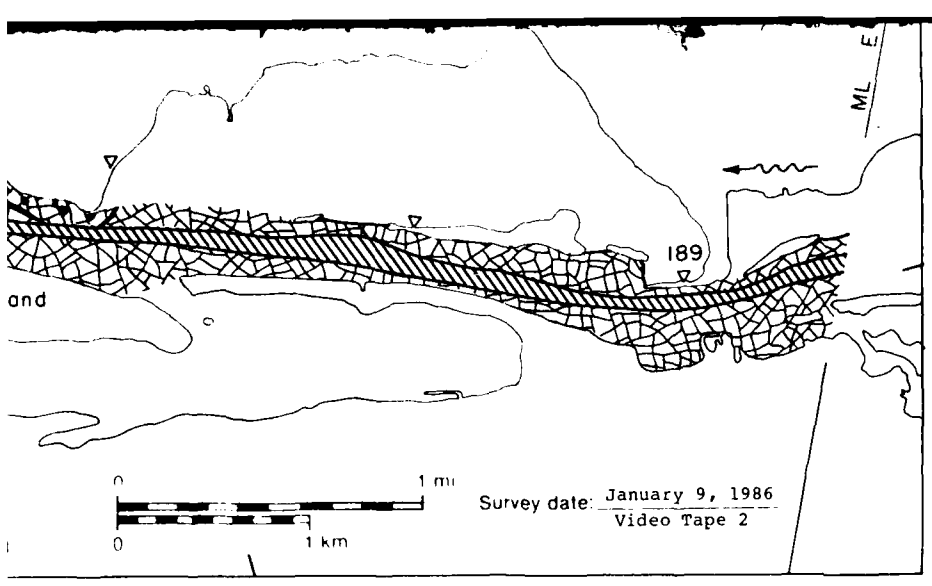


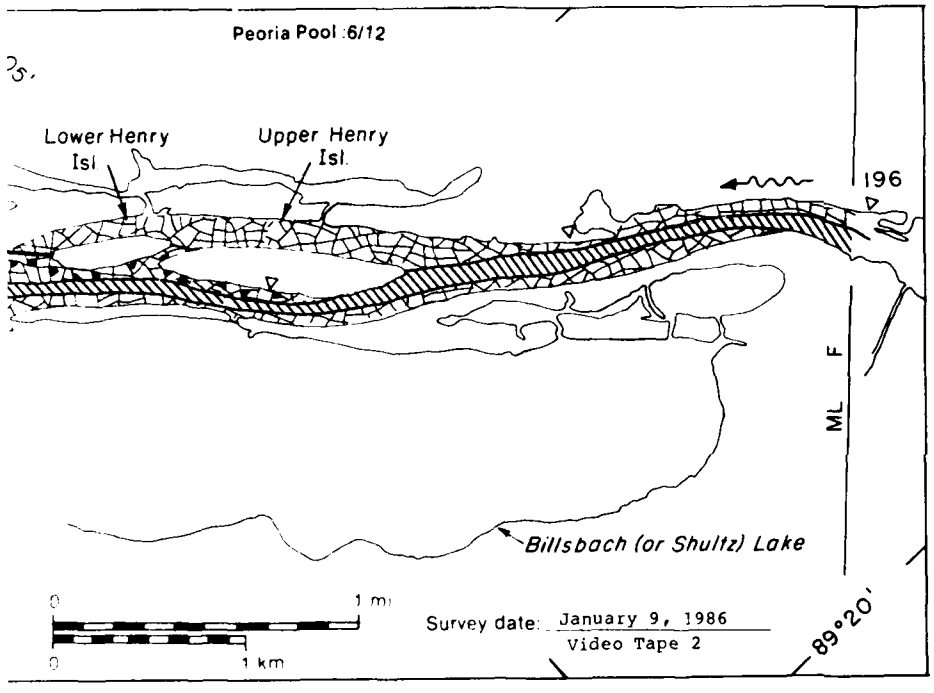

Peoria Pool : 4/12
183
ML D
40°55'
Survey date January 9, 1986
Video Tape 2

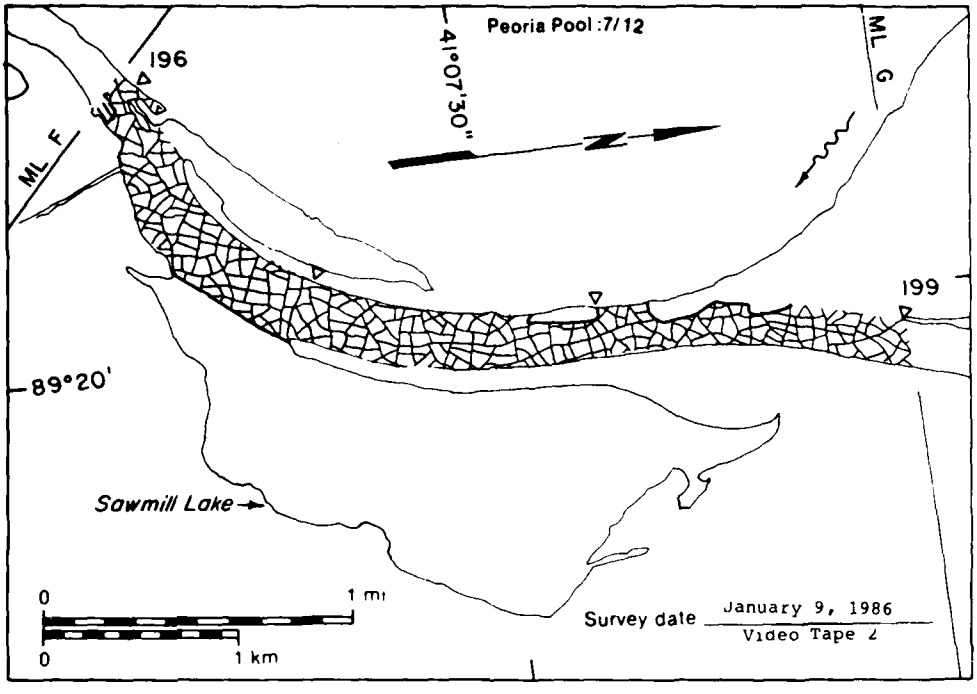

Peoria Pool .5/12
ML E
189
1 mi
1 km
Survey date January 9, 1986
Video Tape 2

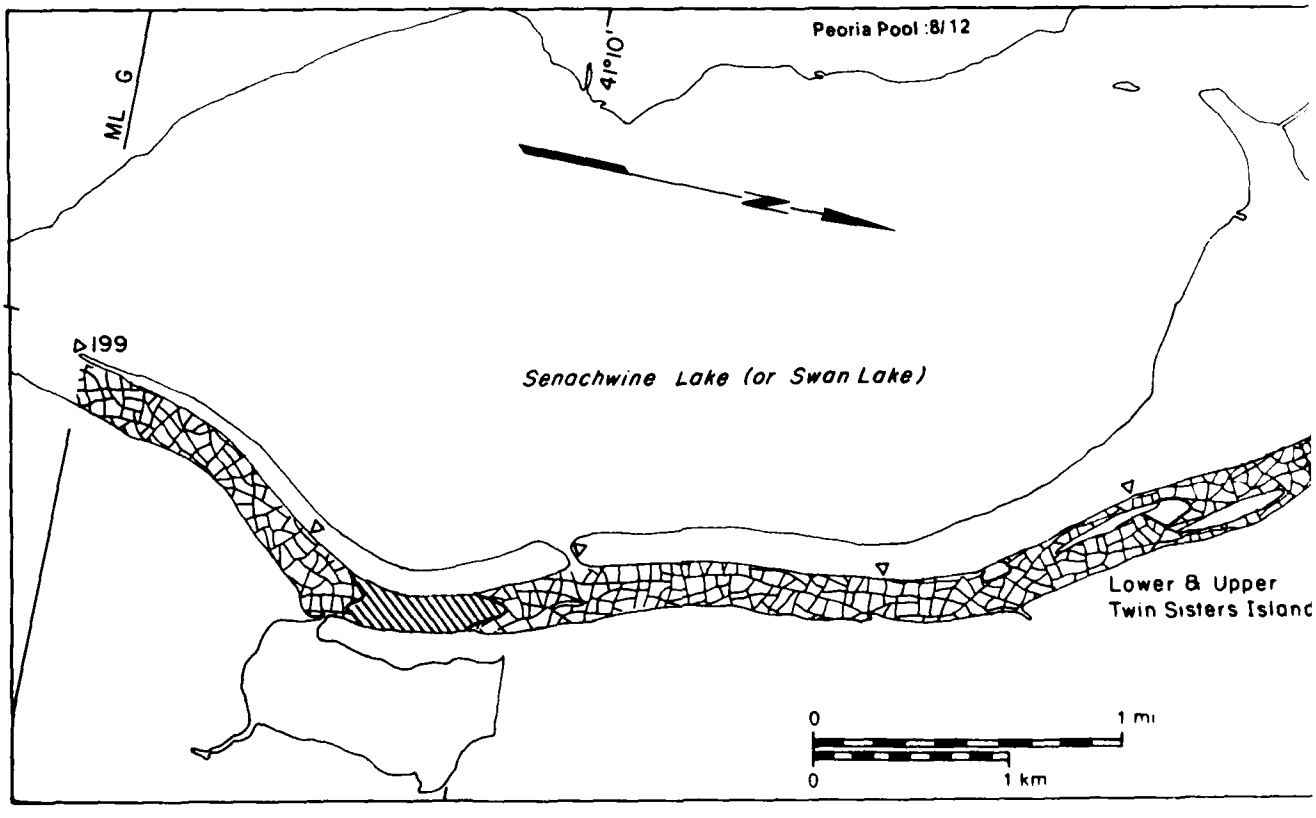

Peoria Pool .6/12

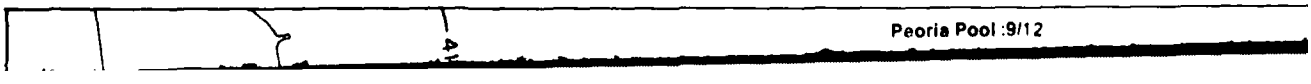

183
Babbs Island
Woodyard Island
Babbs Slough
89°25'
89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry Isl
ML E
191
89°22'30"


ML E
189
and
0
1 mi
0
1 km
Survey date: January 9, 1986
Video Tape 2

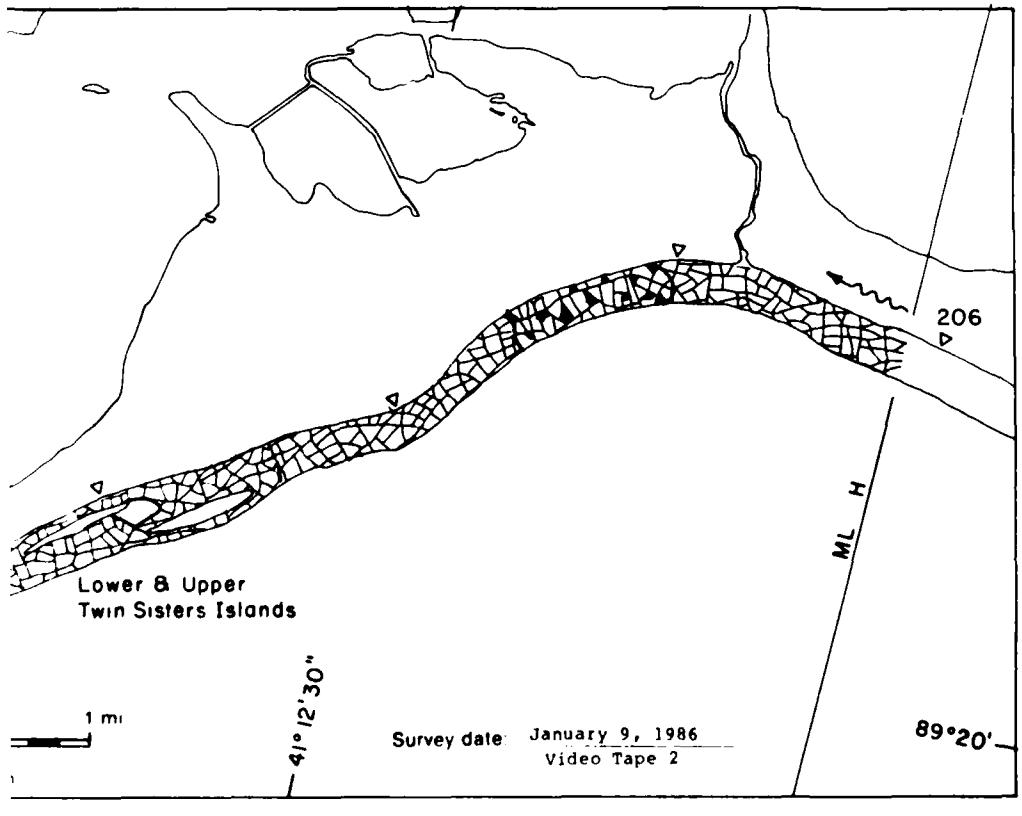

Peoria Pool :6/12
Lower Henry Isl
Upper Henry Isl
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 9, 1986
Video Tape 2
89°20'

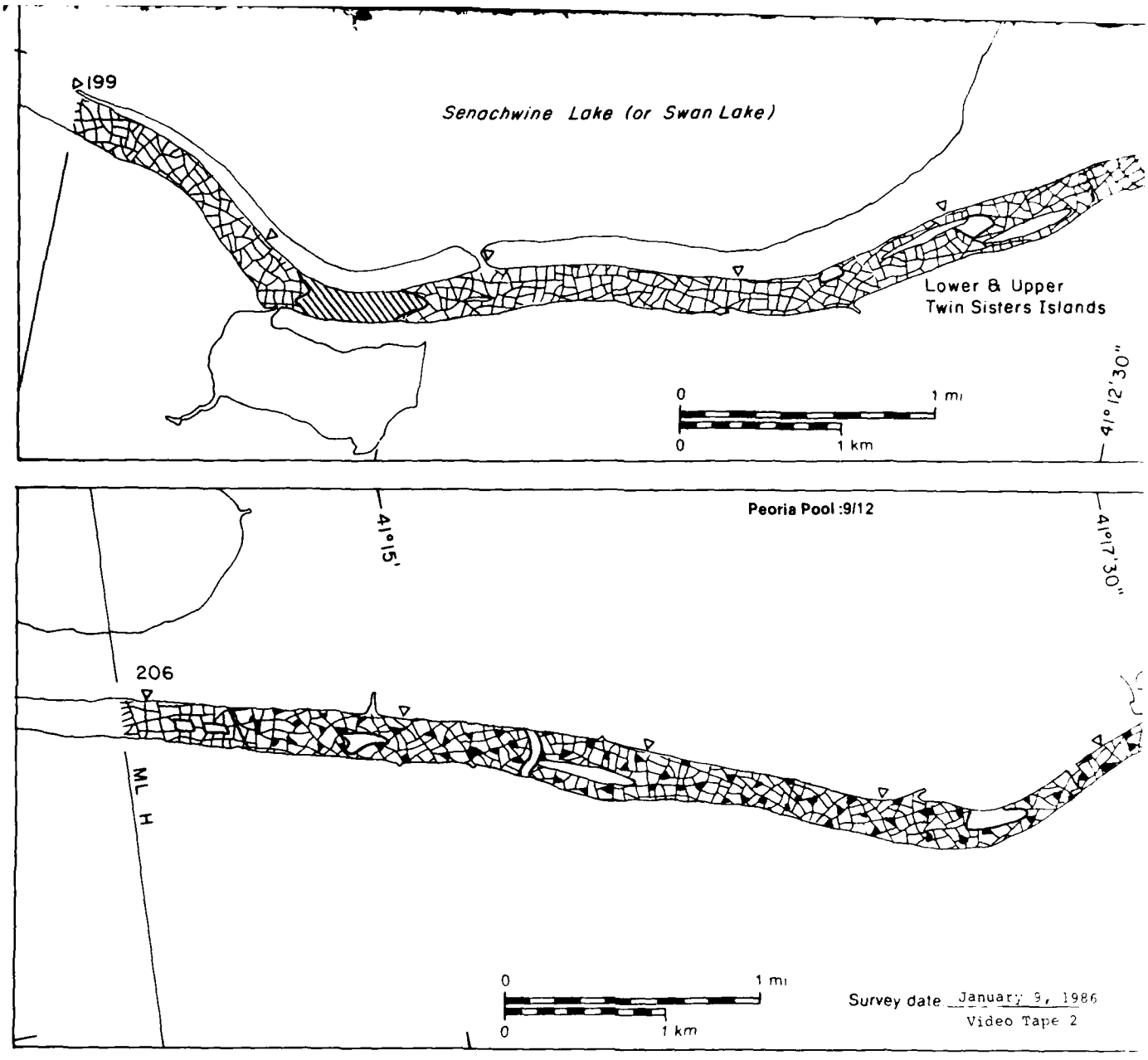

Peoria Pool :7/12
196
41°07'30"
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date January 9, 1986
Video Tape 2

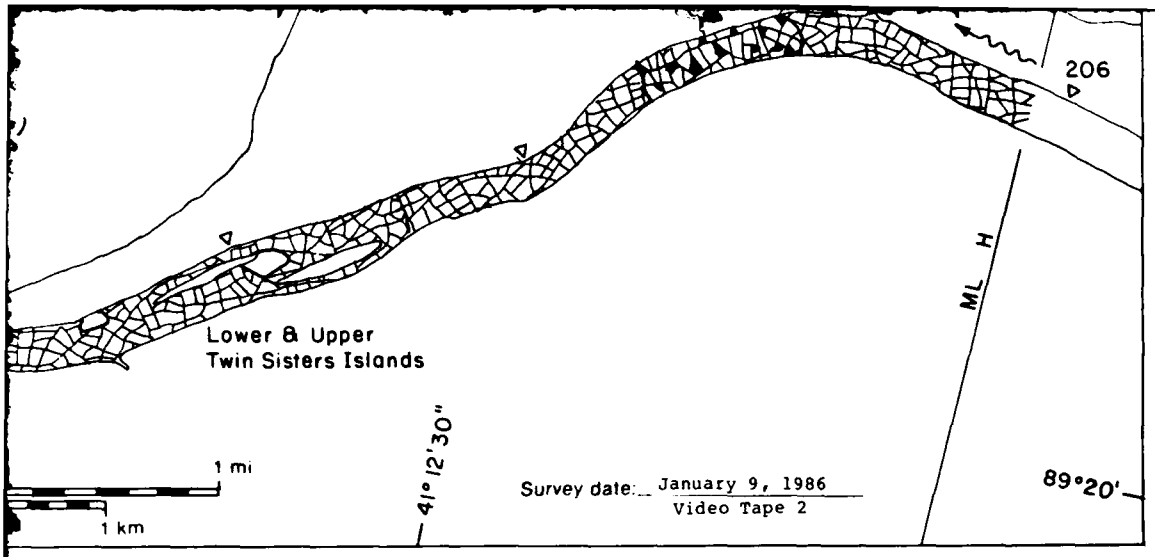

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Island
0
1 mi
0
1 km

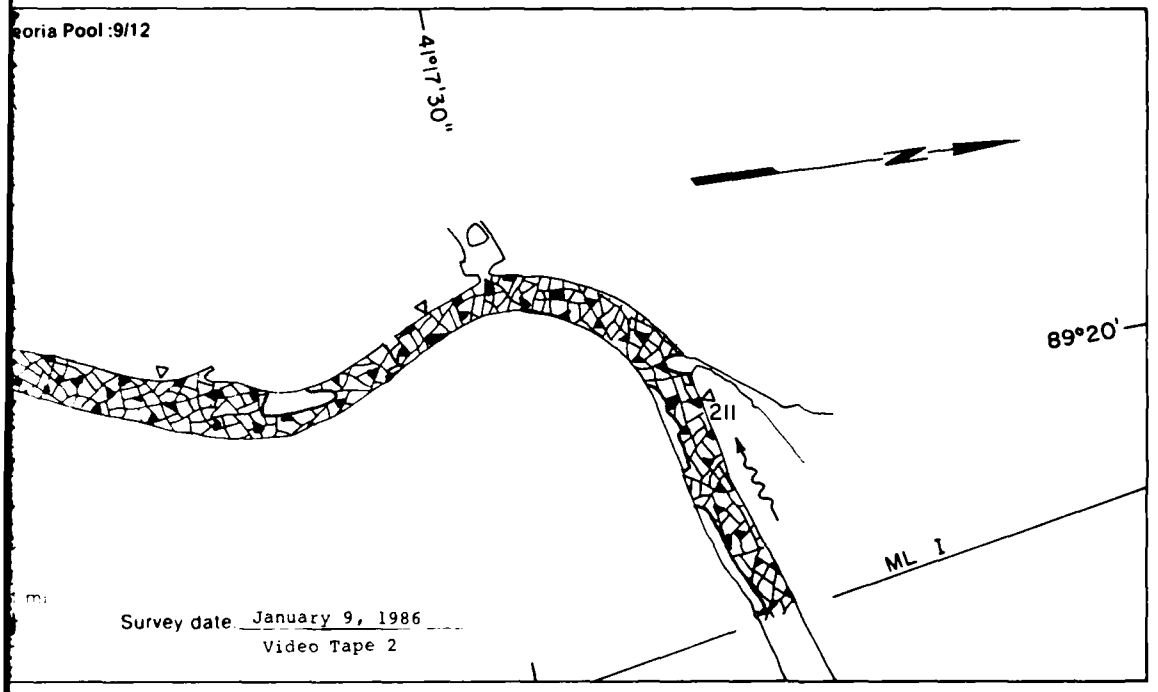

Peoria Pool :9/12

9 January 1986

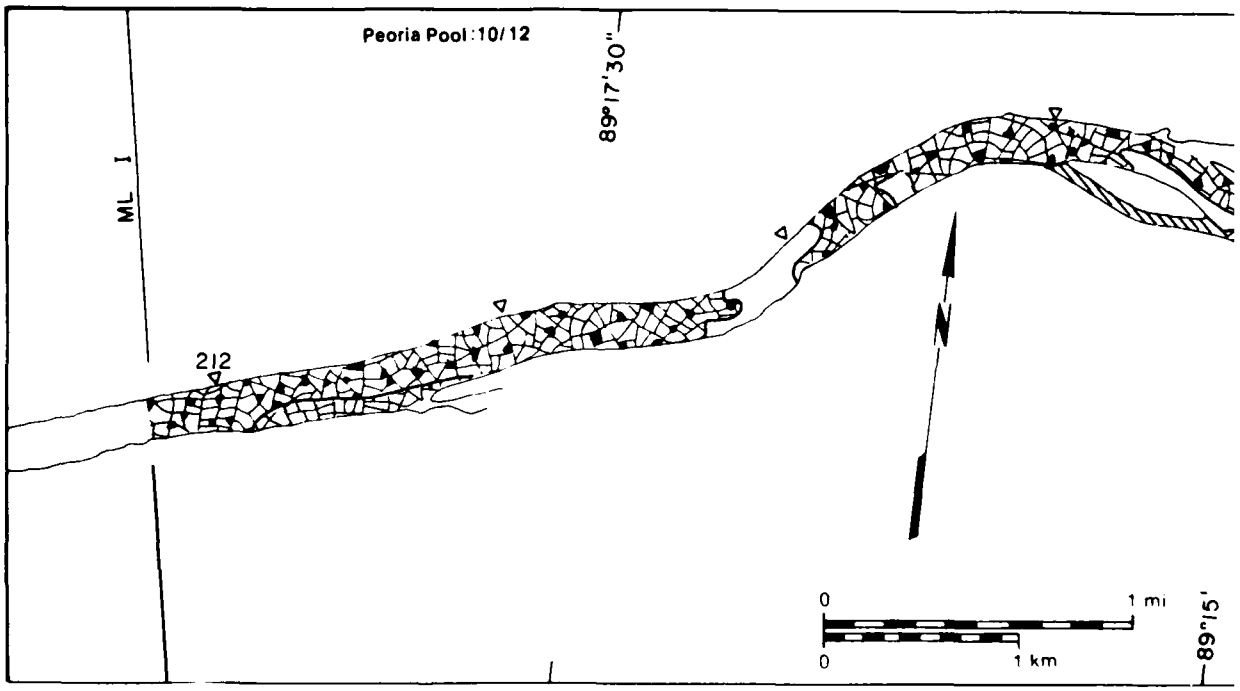


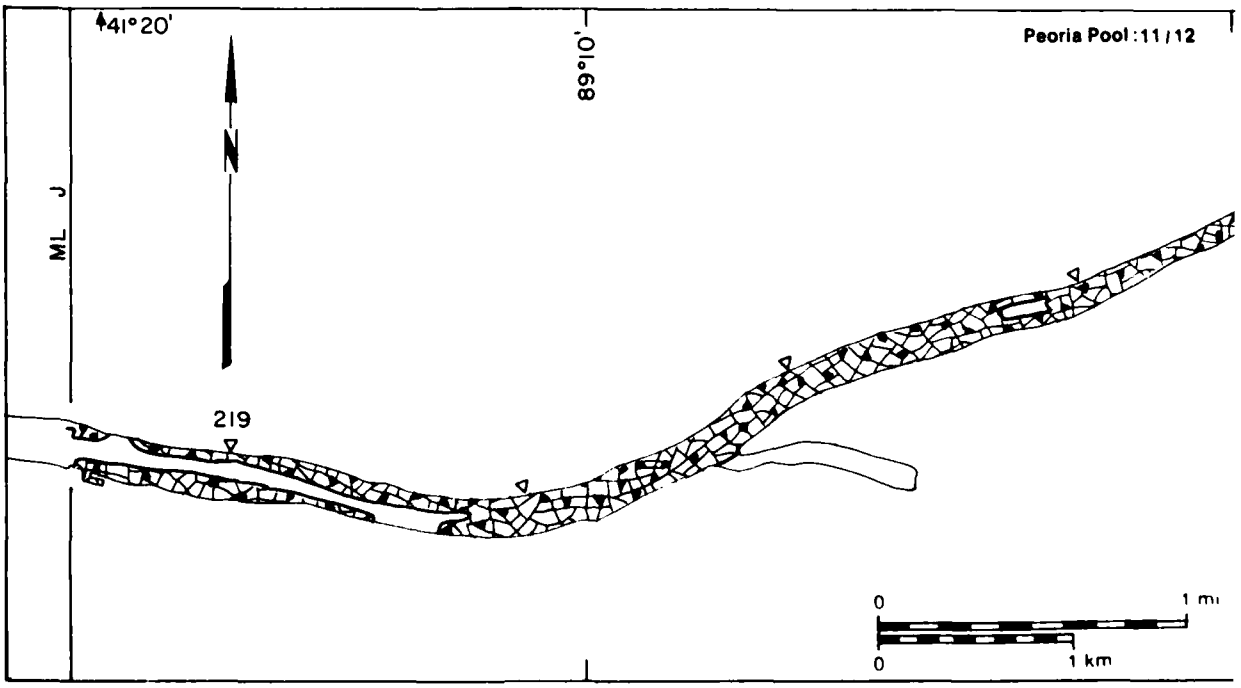

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41°21'30"
Peoria Pool :9/12
41°15'
41°17'30"
206
ML
H
0
1 mi
0
1 km
Survey date January 9, 1986
Video Tape 2

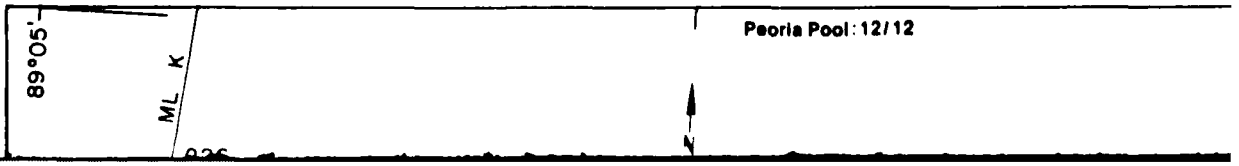

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: January 9, 1986
Video Tape 2
89°20'

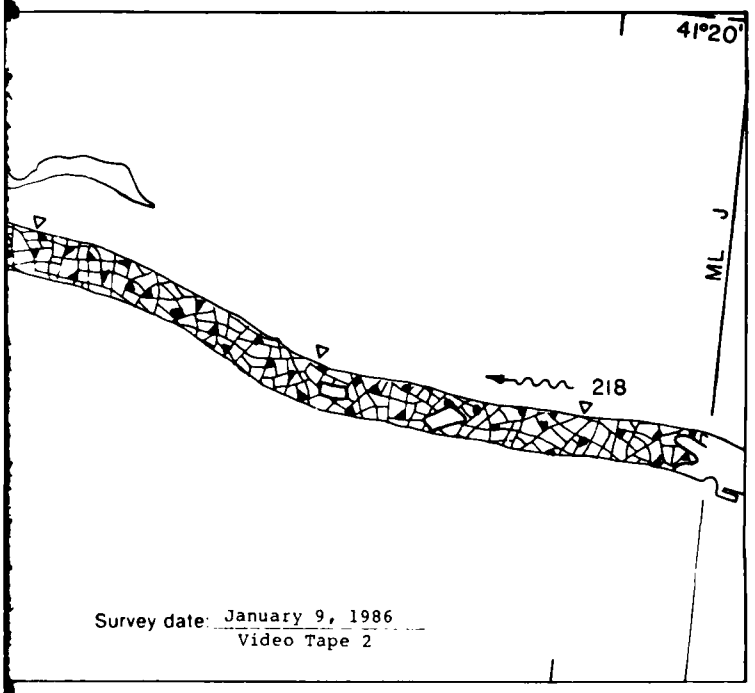

oria Pool :9/12
41°17'30"
89°20'
211
ML I
Survey date January 9, 1986
Video Tape 2

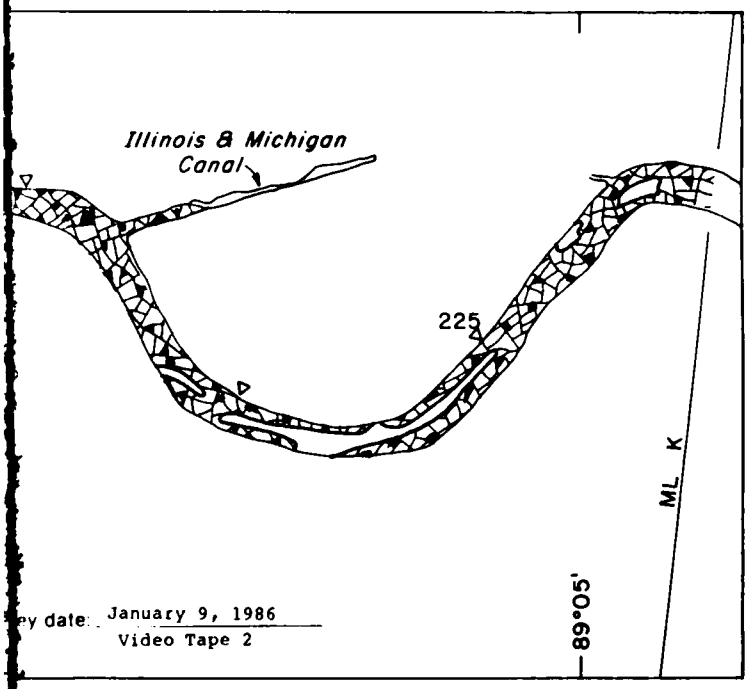
9 January 1986

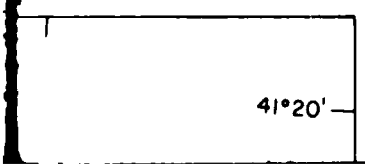


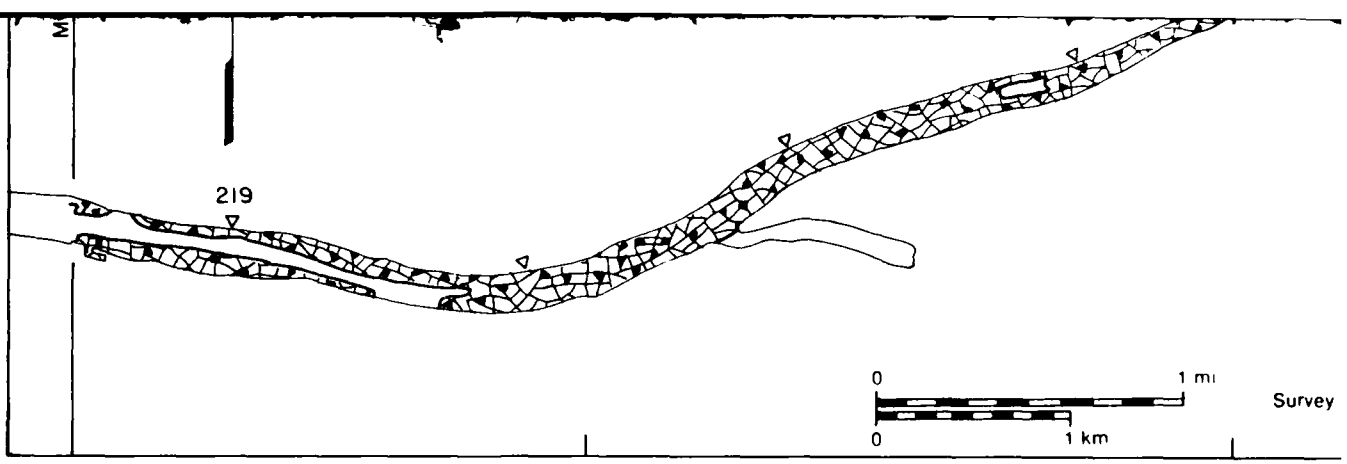


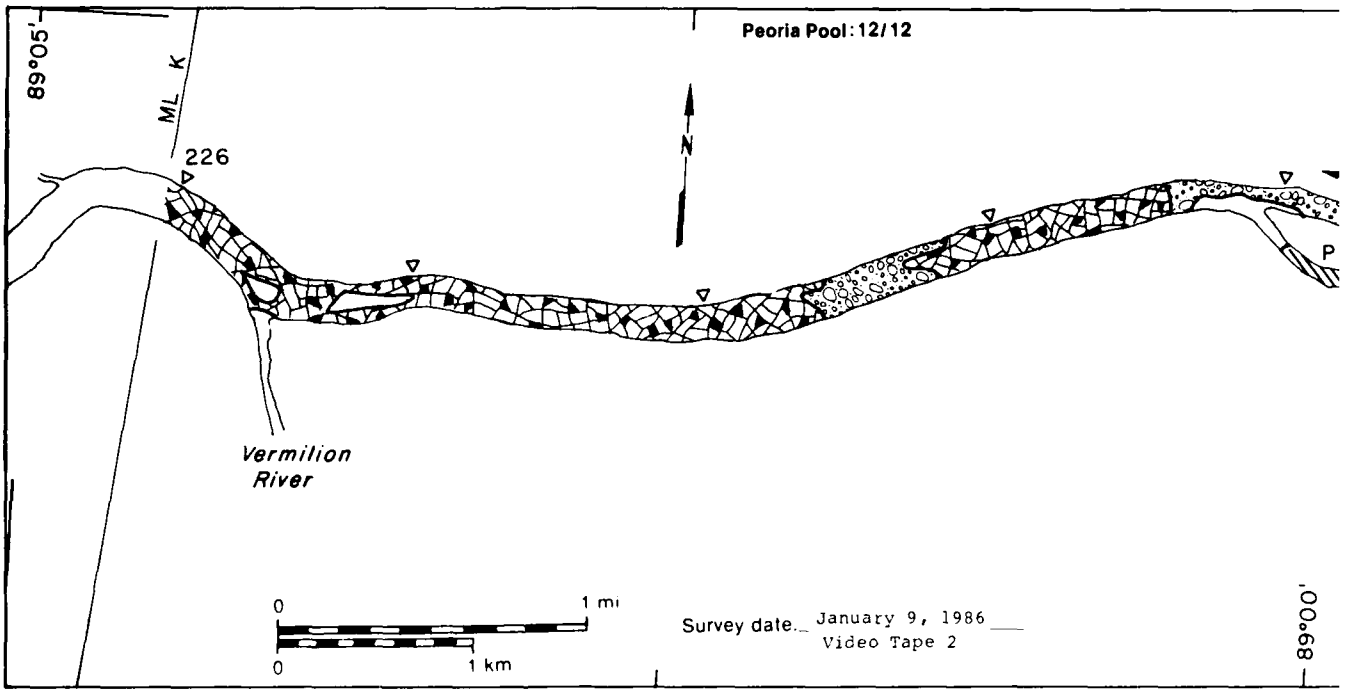



41°20'
ML J
218
Survey date: January 9, 1986
Video Tape 2


Illinois & Michigan Canal
225
ML K
89°05'
ey date: January 9, 1986
Video Tape 2


41°20'

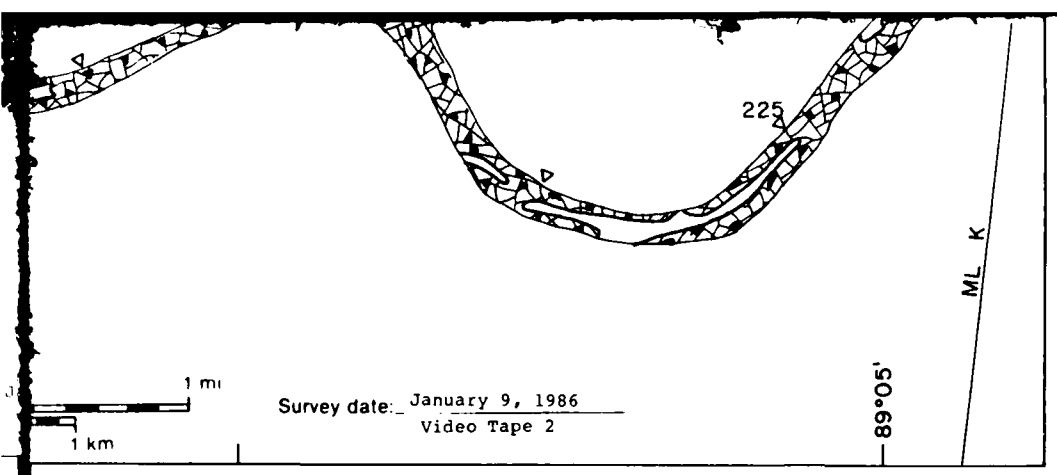


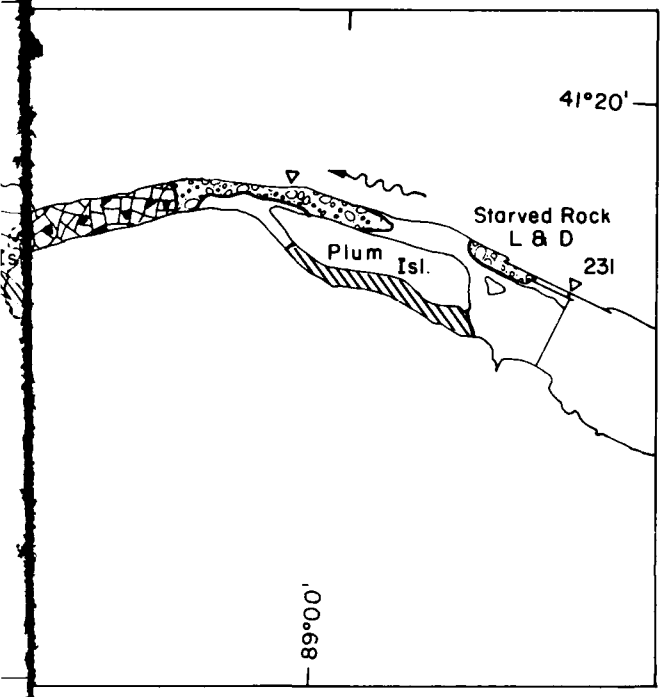


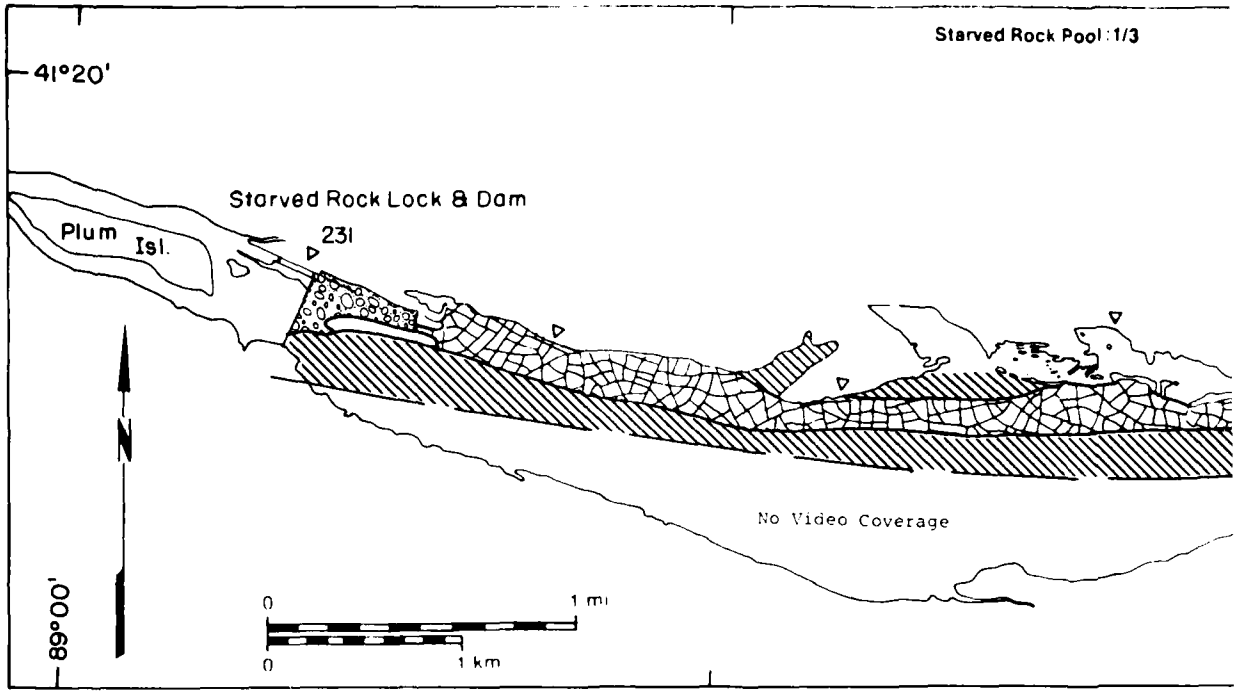
Peoria Pool

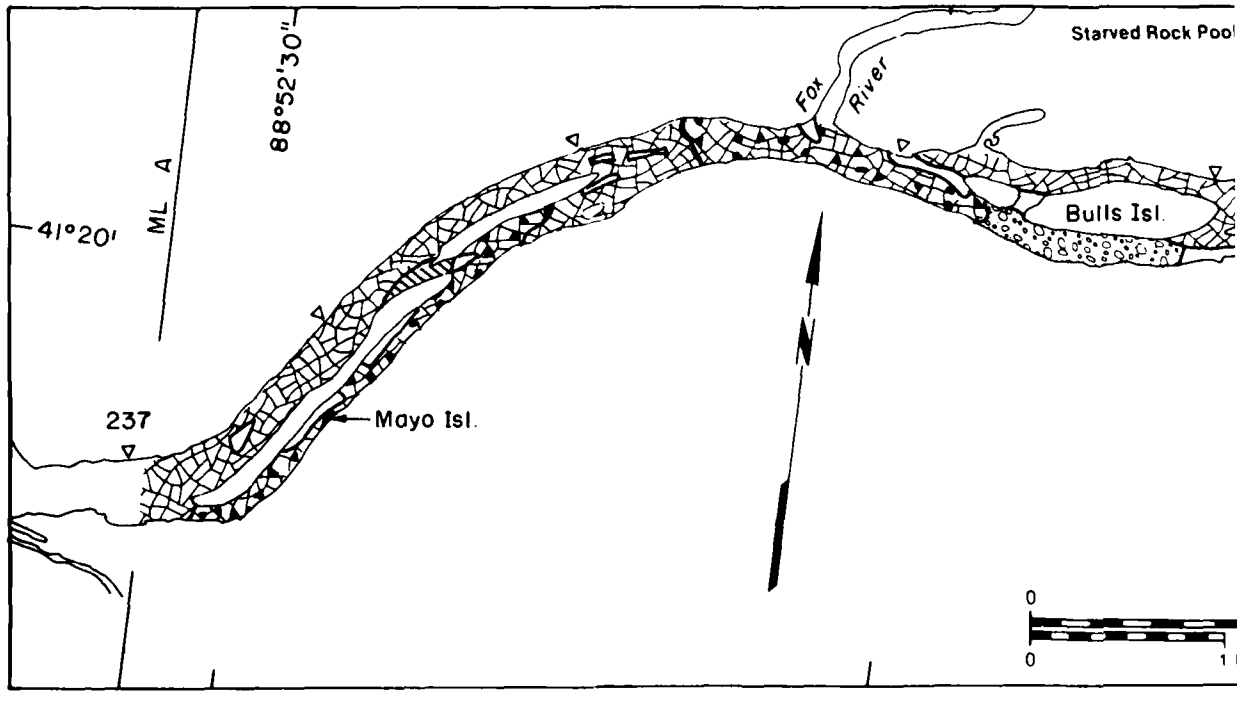
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	1.34	NA
Solid ice cover	26.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	25.96	NA
Fragmented ice cover with open-water areas	9.00	90
Ice floes or frazil slush and pans	0.29	50
Total area ($m^2 \times 10^6$)	81.33*	

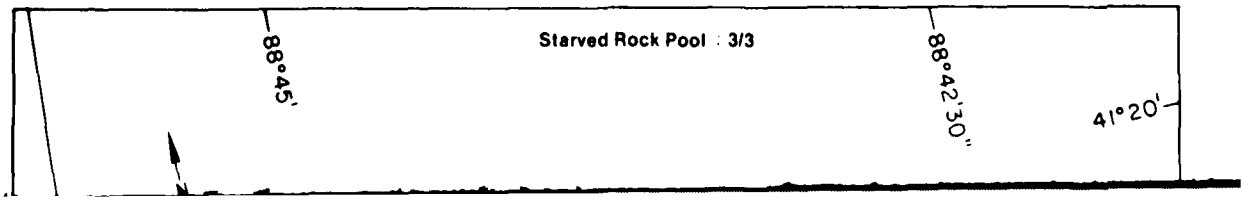
* Includes 18.70×10^6 m^2 of no video coverage


225
ML K
89°05'
1 mi
1 km
Survey date: January 9, 1986
Video Tape 2

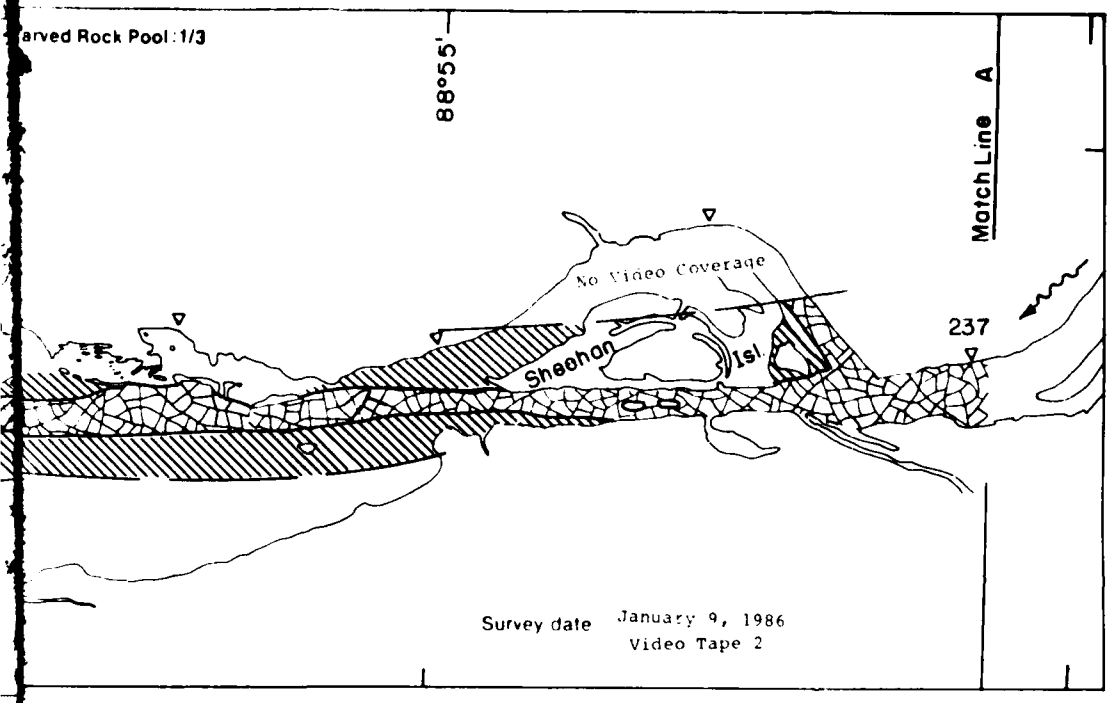

41°20'
Starved Rock
L & D
231
Plum Isl.
89°00'

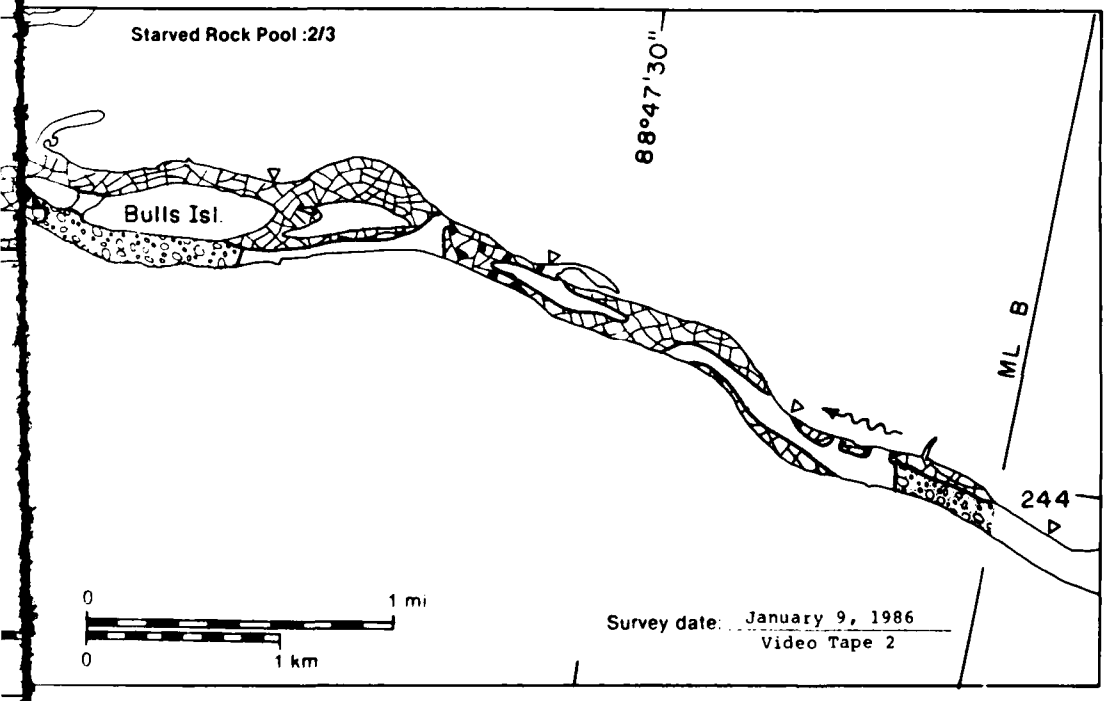

Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock Pool
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
0
0


88°45'
Starved Rock Pool : 3/3
88°42'30"
41°20'

9 January 1986



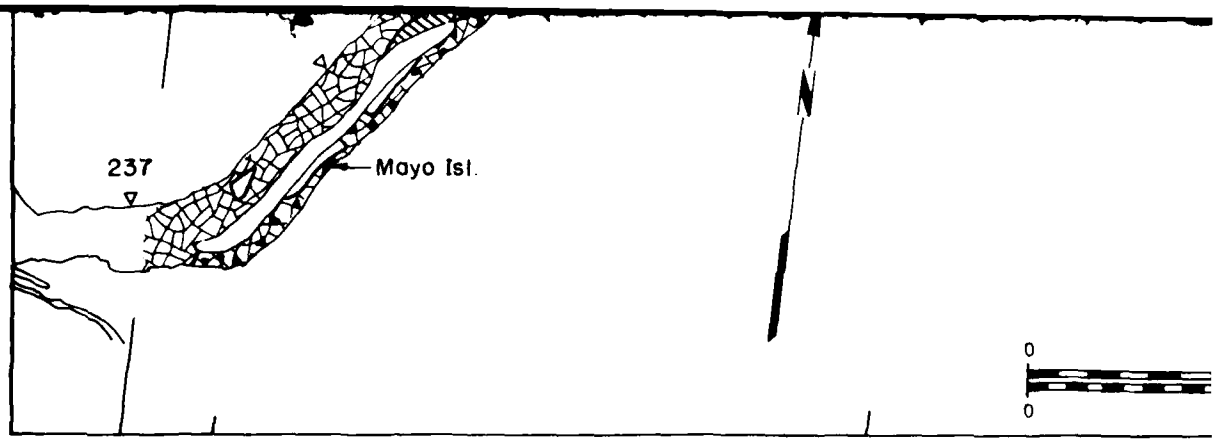


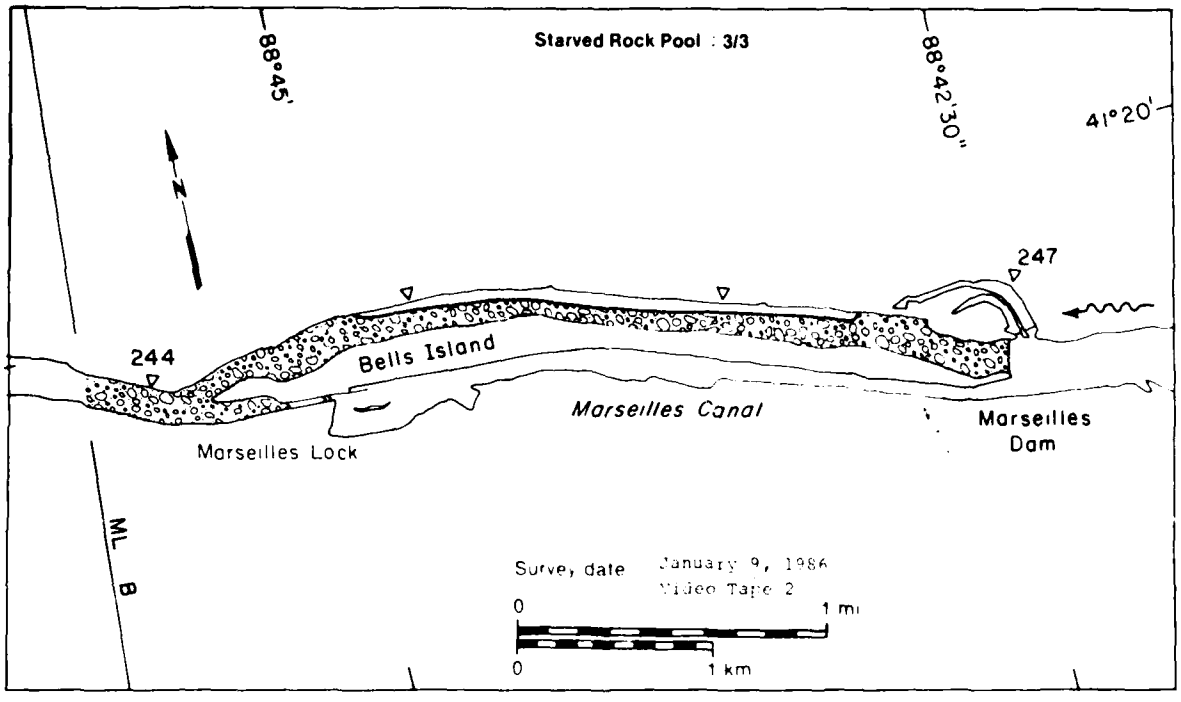
41°20'

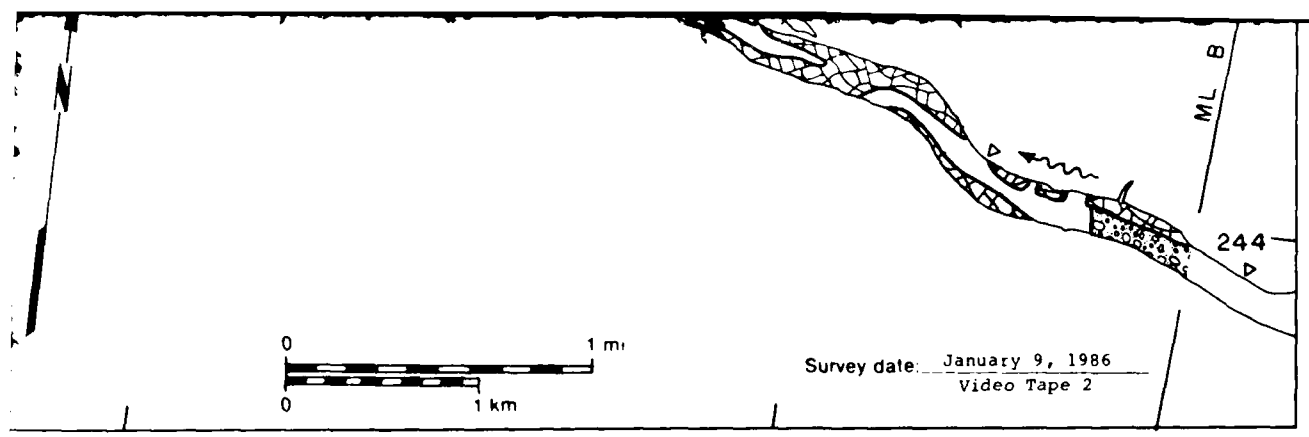
Starved Rock Pool

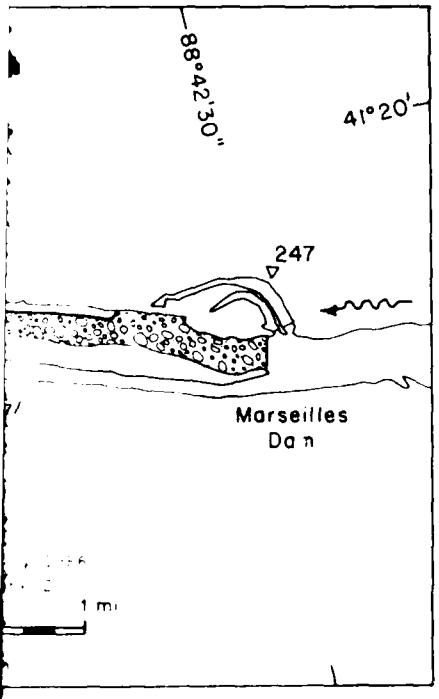
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


237
Mayo Isl.
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Dam
Marseilles Lock
ML B
Survey date January 9, 1986
Video Tape 2
0
1 mi
0
1 km



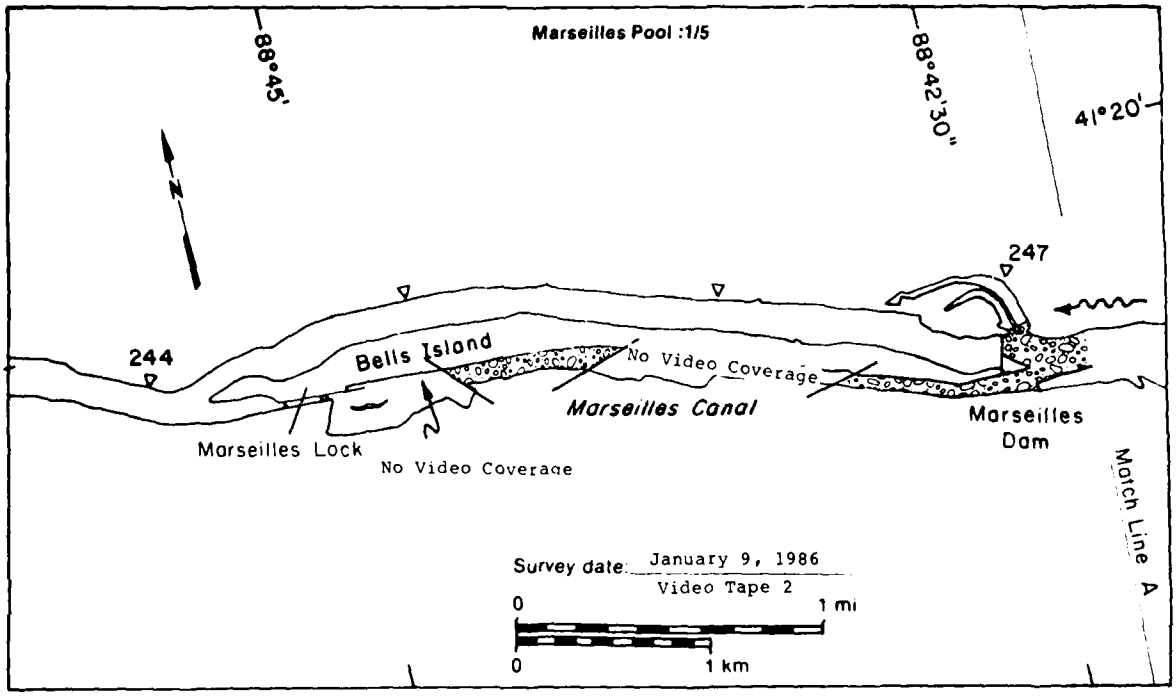


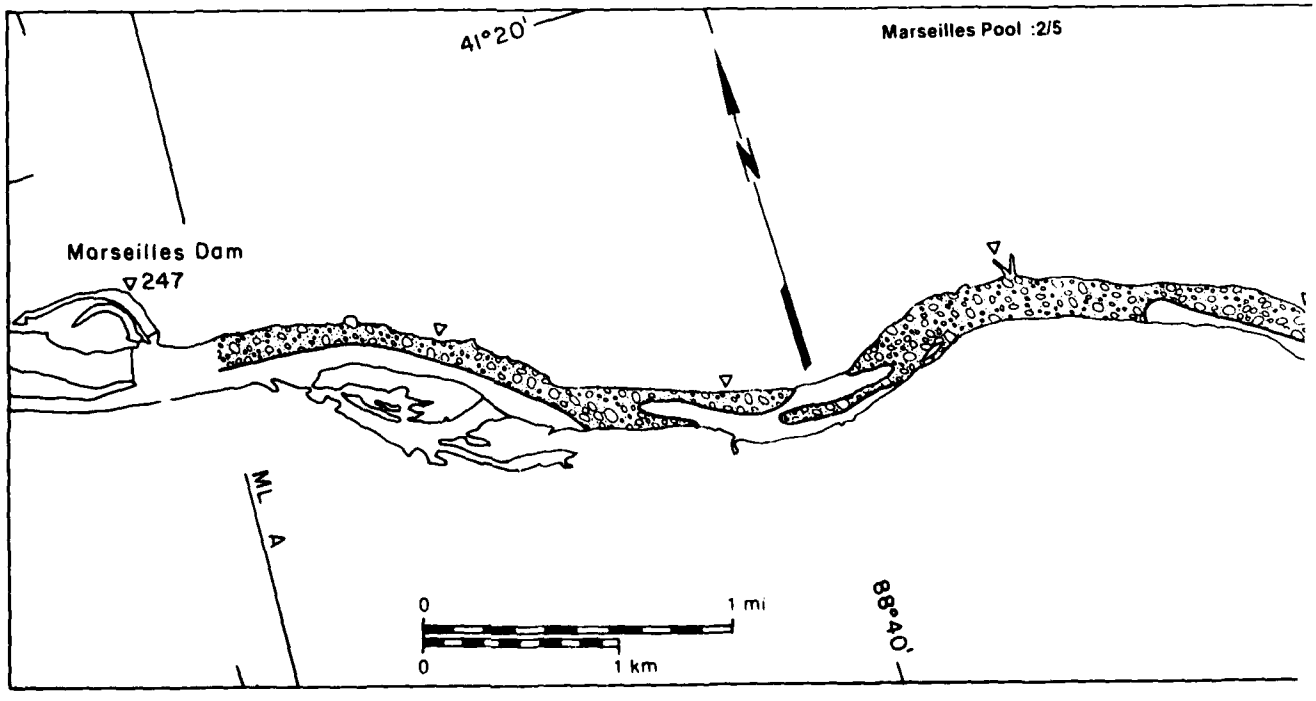
Starved Rock Pool

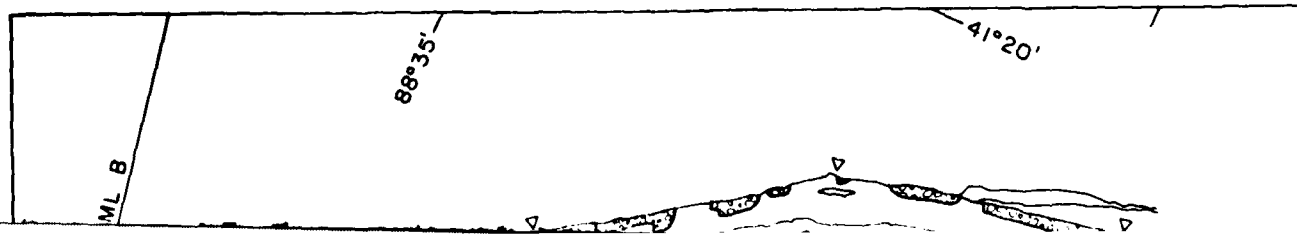
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.63	NA
Solid ice cover	2.01	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	3.25	NA
Fragmented ice cover with open-water areas	0.61	80
Ice floes or frazil slush and pans	1.10	60
Total area ($m^2 \times 10^6$)	10.19*	

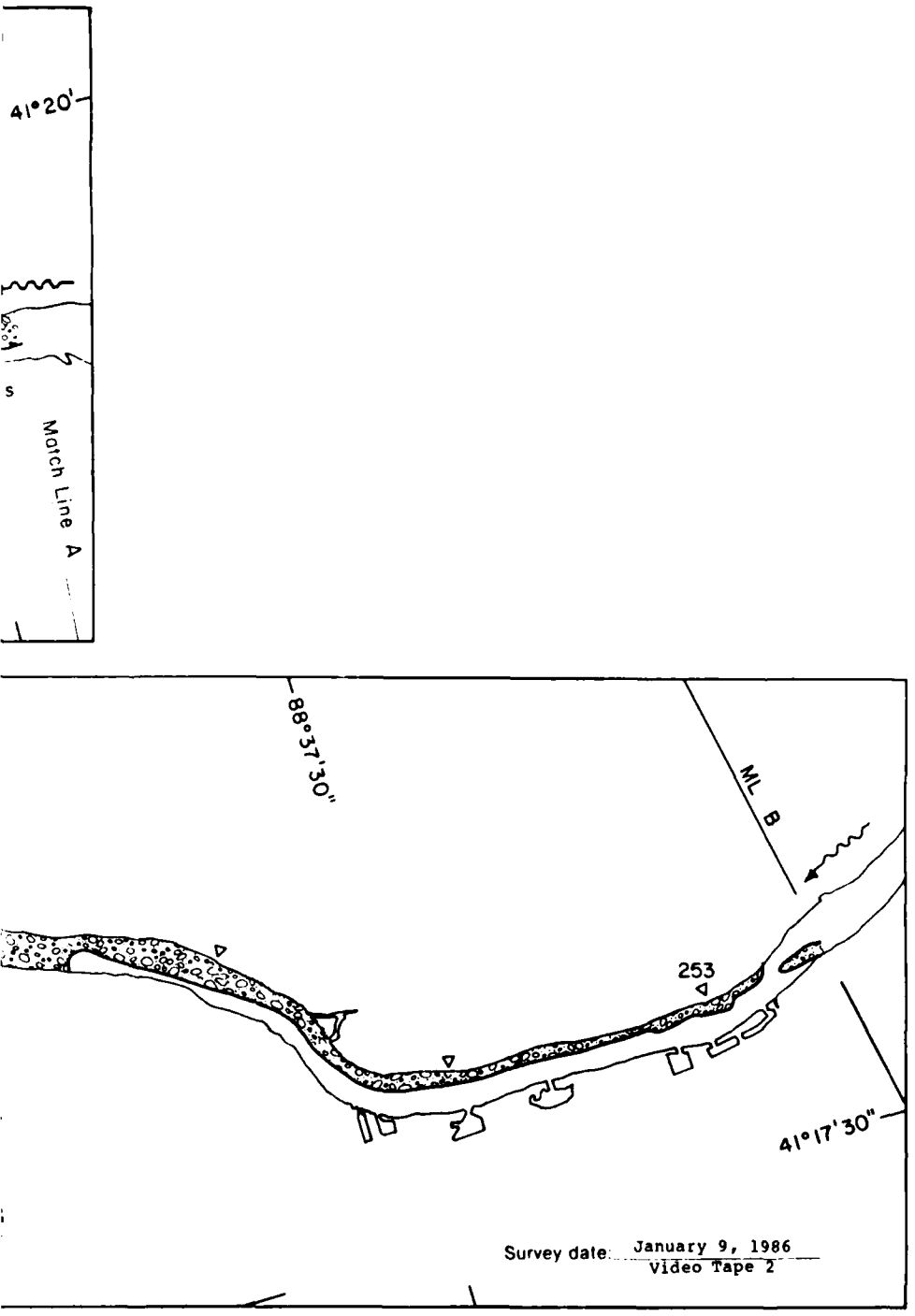
* Includes 2.59×10^6 m^2 of no video coverage

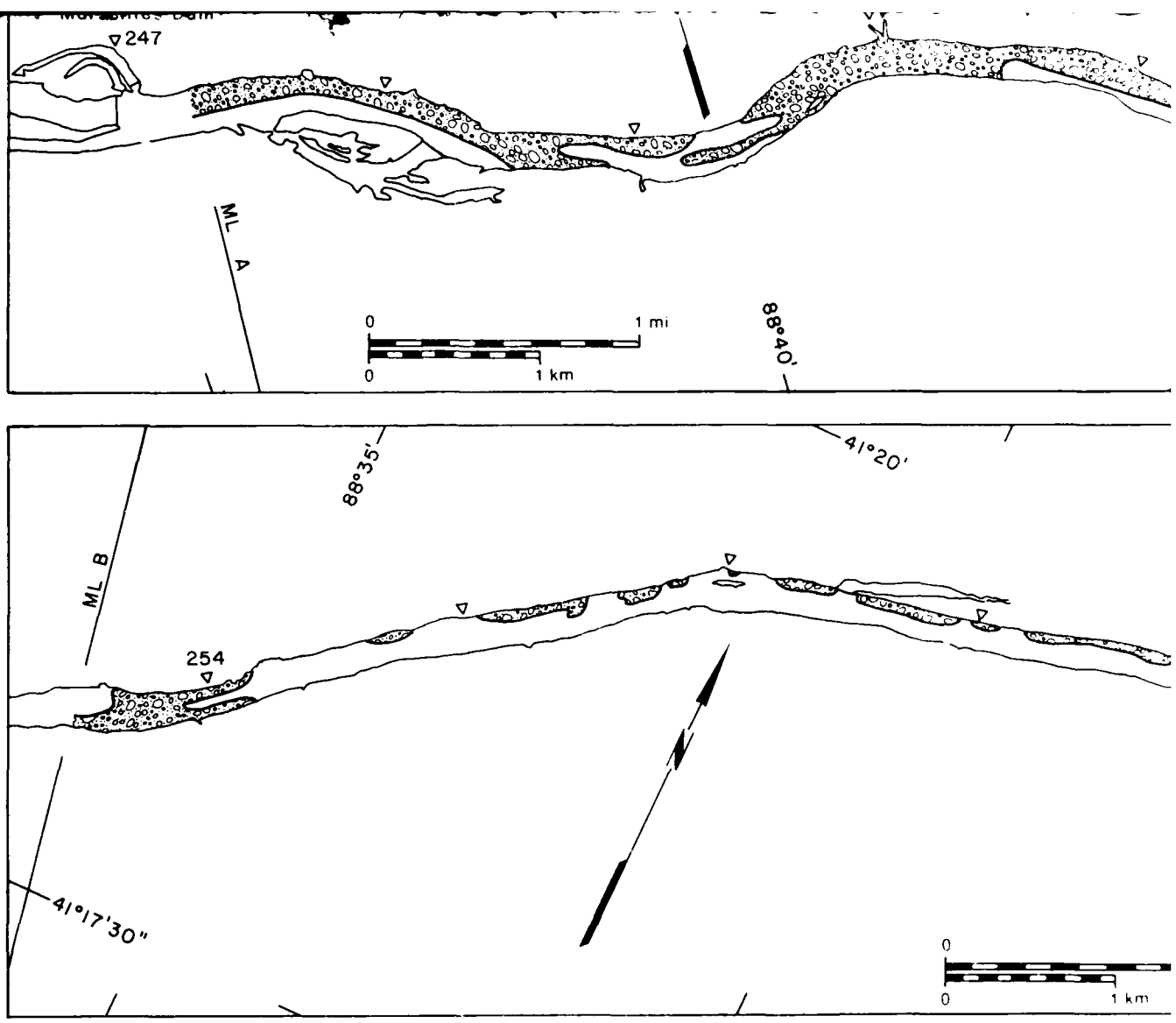
9 January 1986

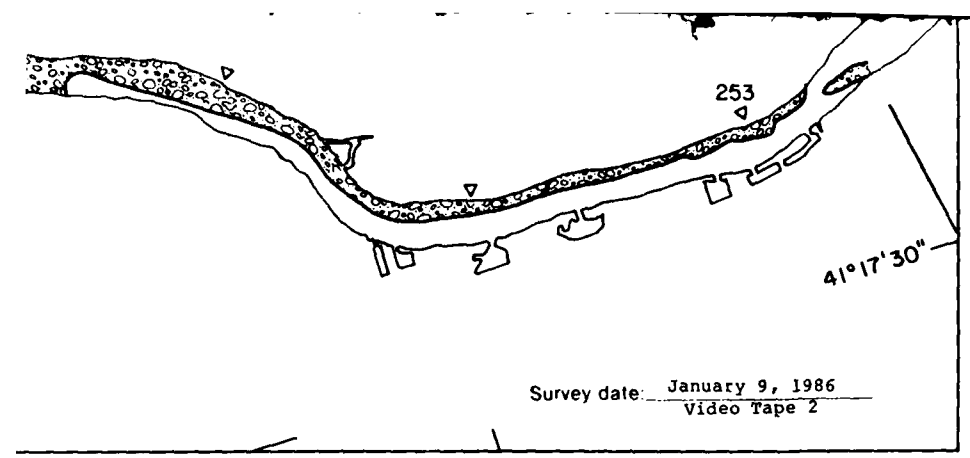


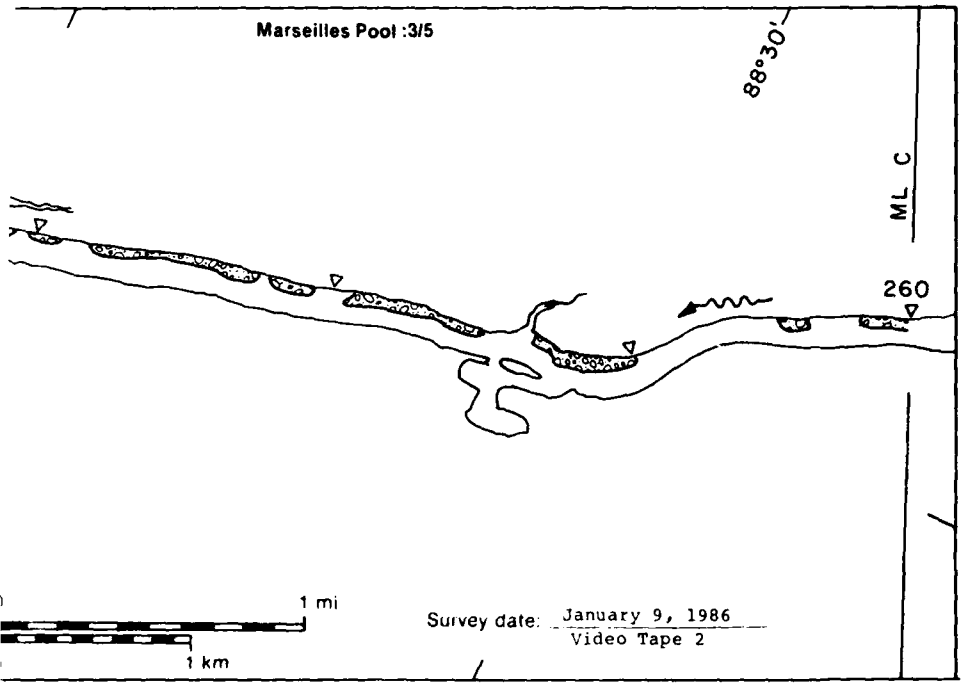


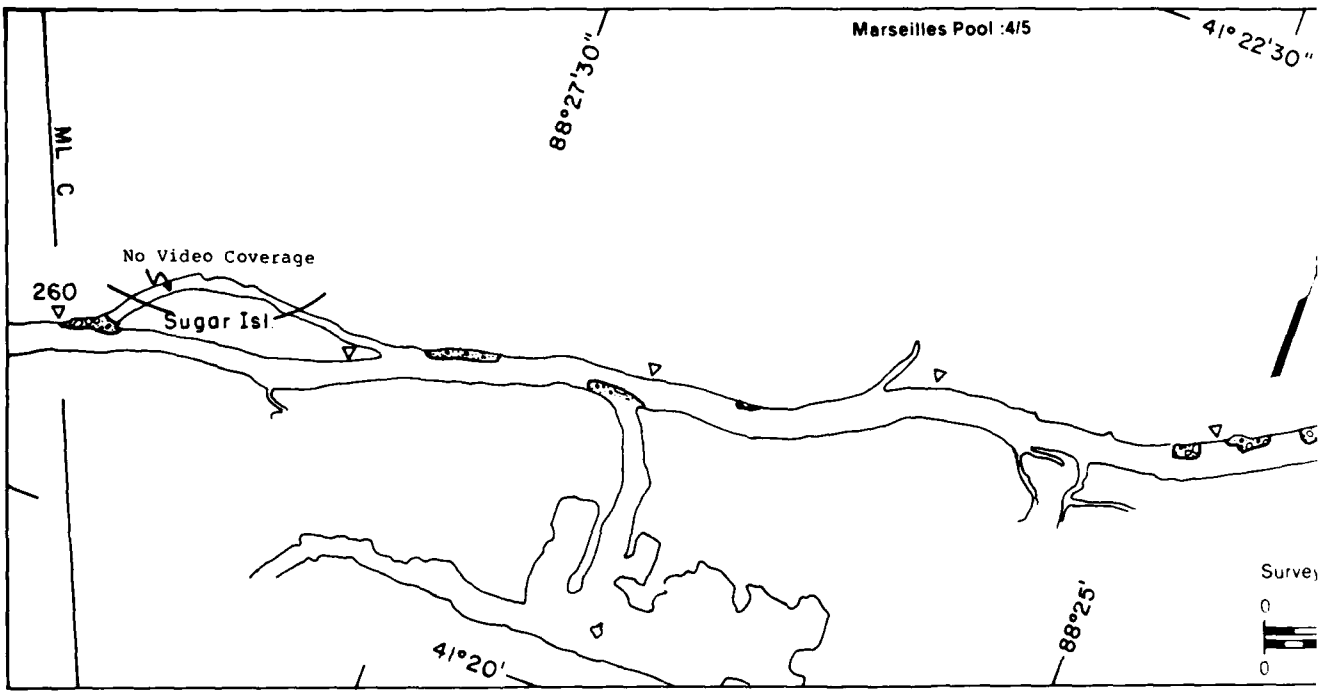


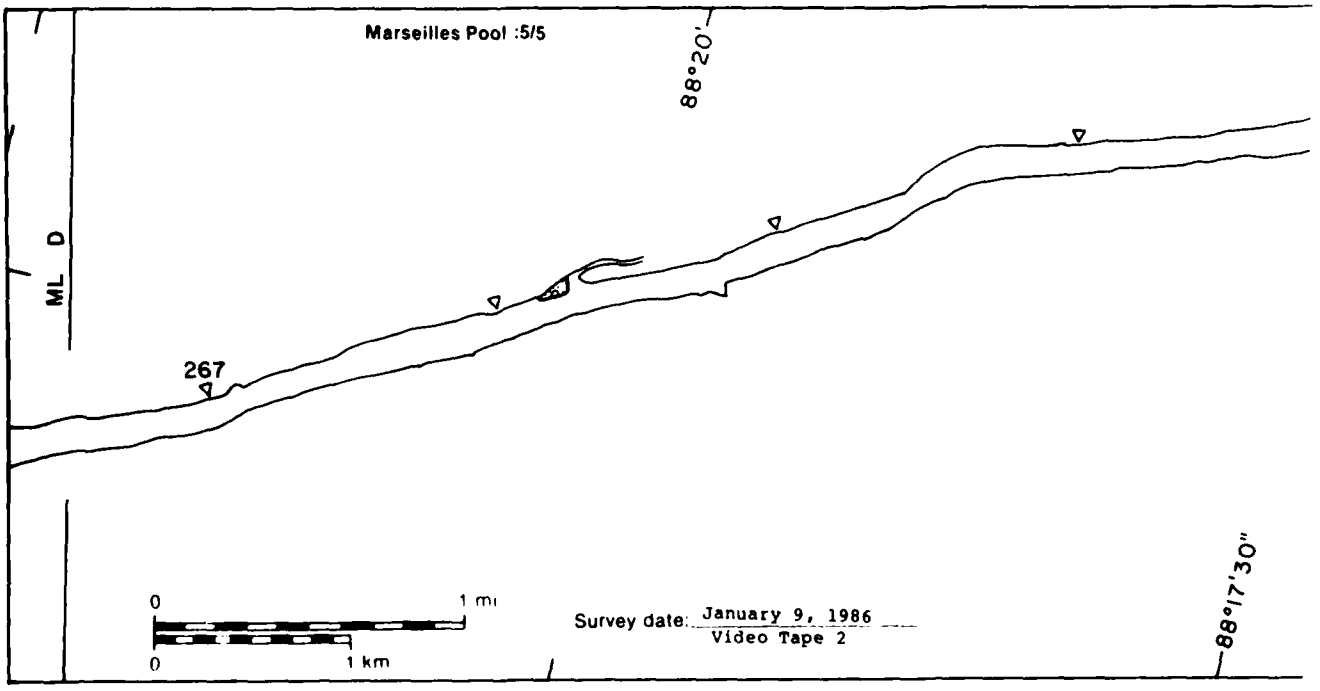

41°20'
March Line A
88°37'30"
ML B
253
41°17'30"
Survey date: January 9, 1986
Video Tape 2
Marseilles Pool :3/5
88°30'


247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
1 km


253
41°17'30"
Survey date: January 9, 1986
Video Tape 2


Marseilles Pool :3/5
88°30'
ML C
260
1 mi
1 km
Survey date: January 9, 1986
Video Tape 2



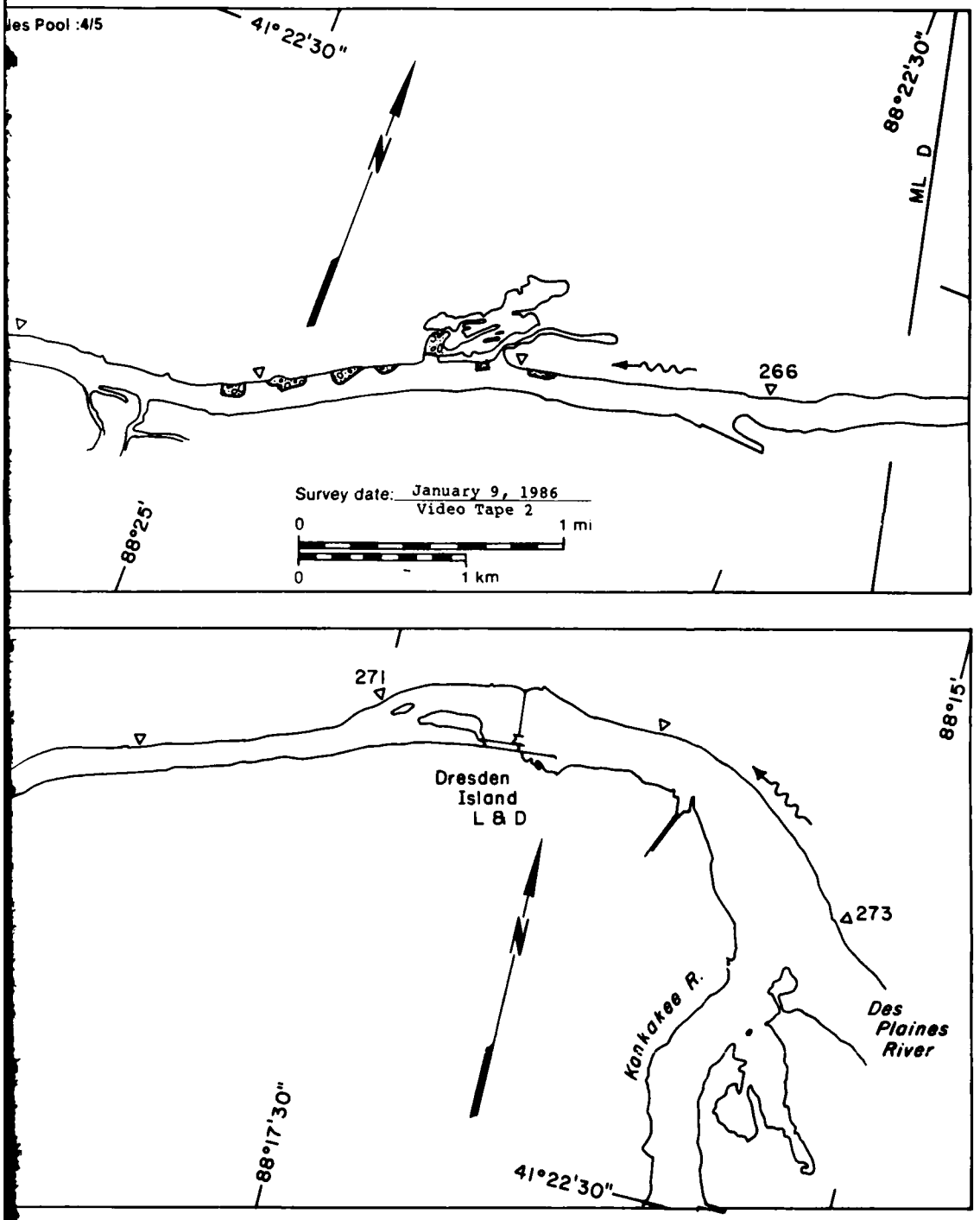


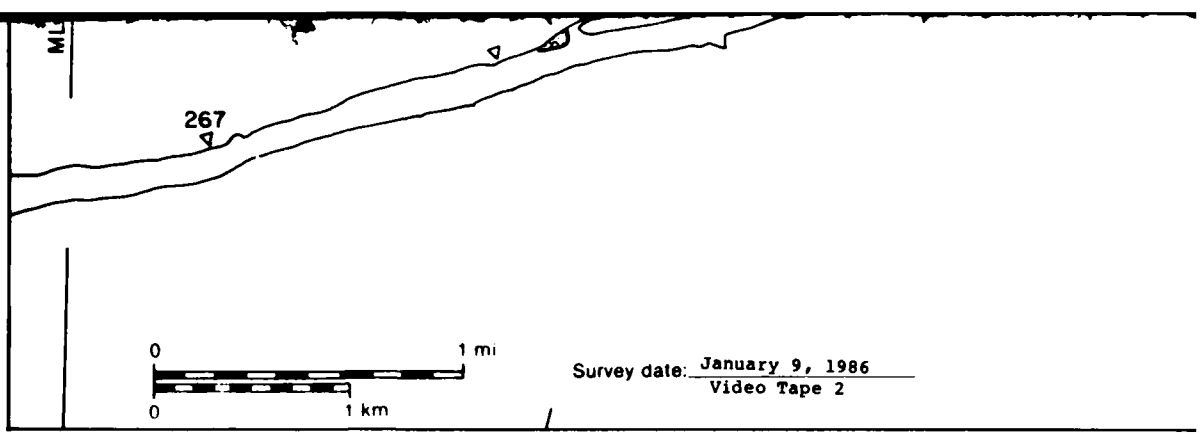
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)

9 January 1986

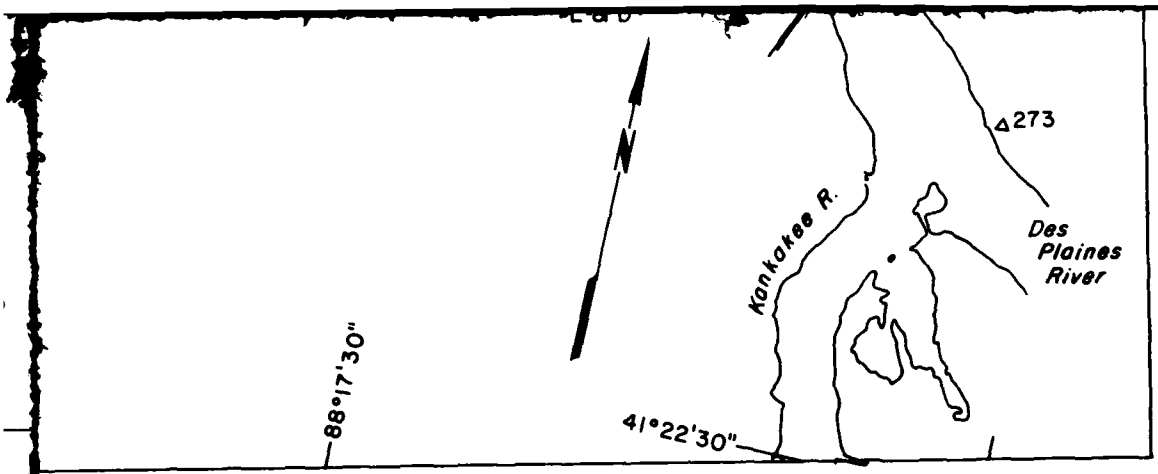


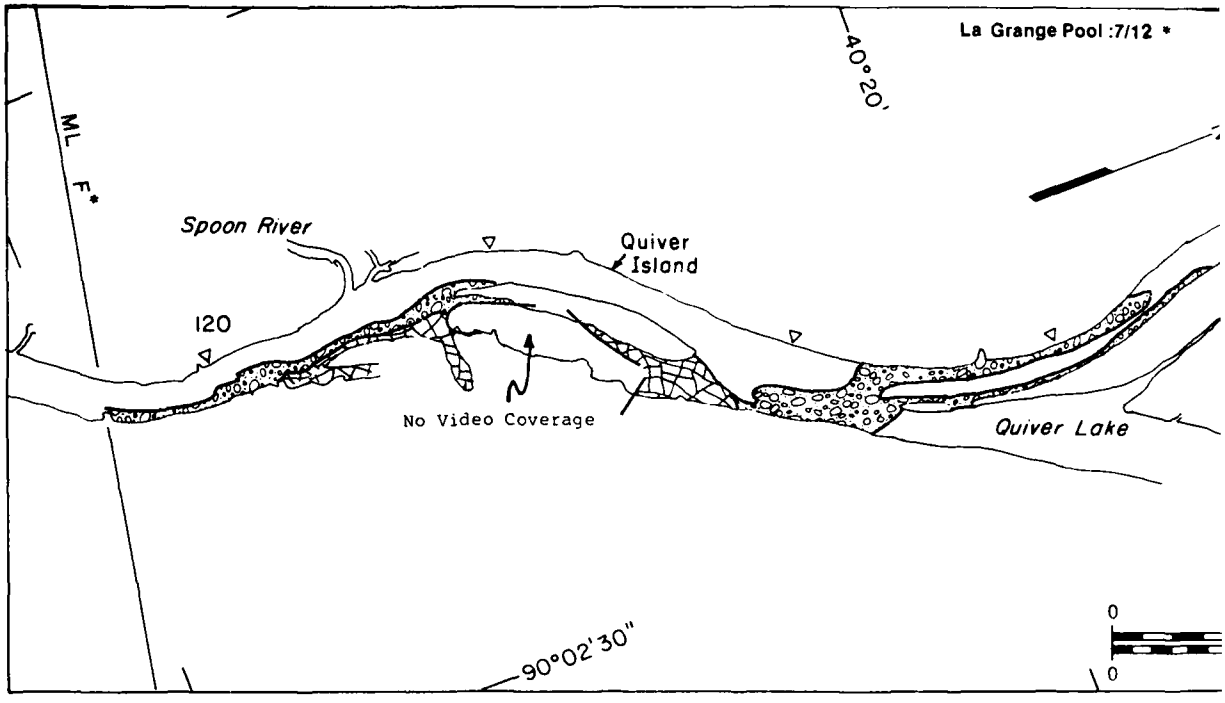


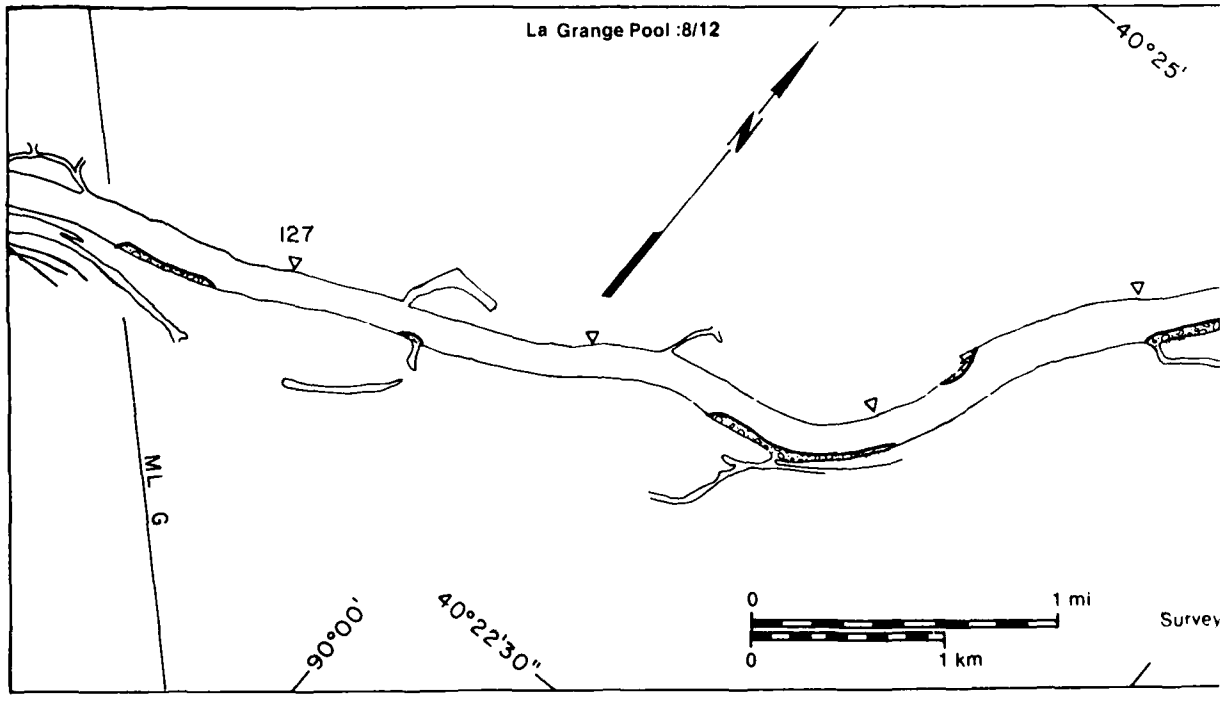
Marseilles Pool

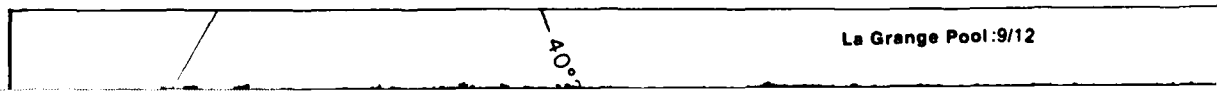
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.66	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.03	60
Total area ($m^2 \times 10^6$)	8.19*	

* Includes 0.50×10^6 m^2 of no video coverage

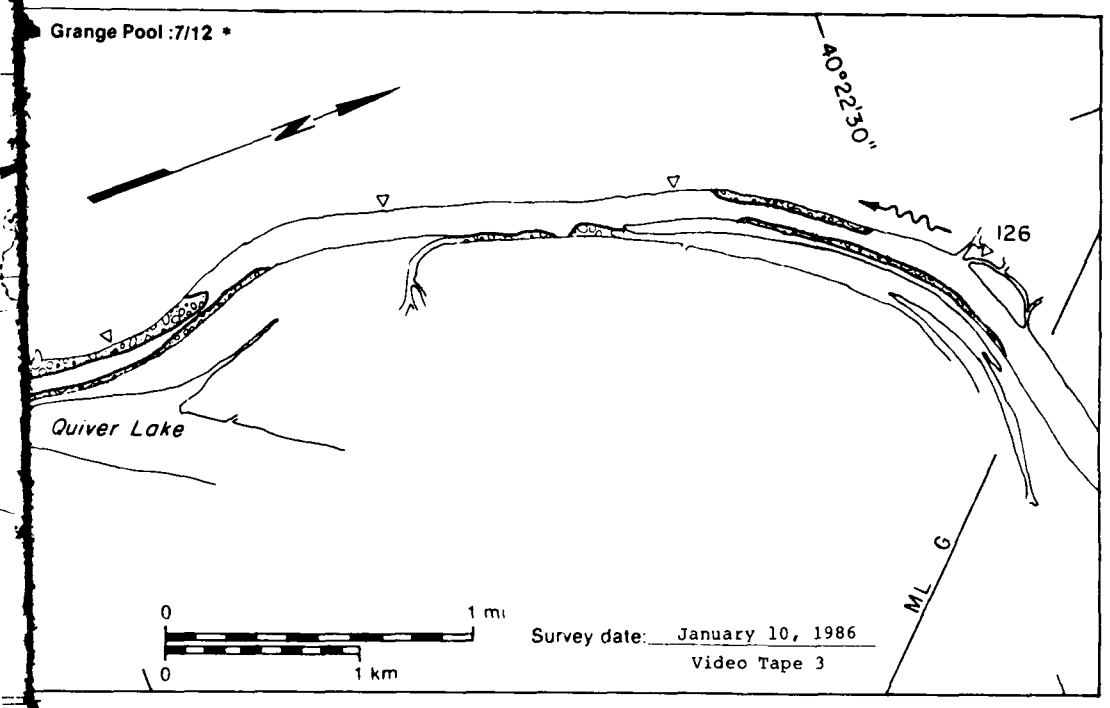

△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

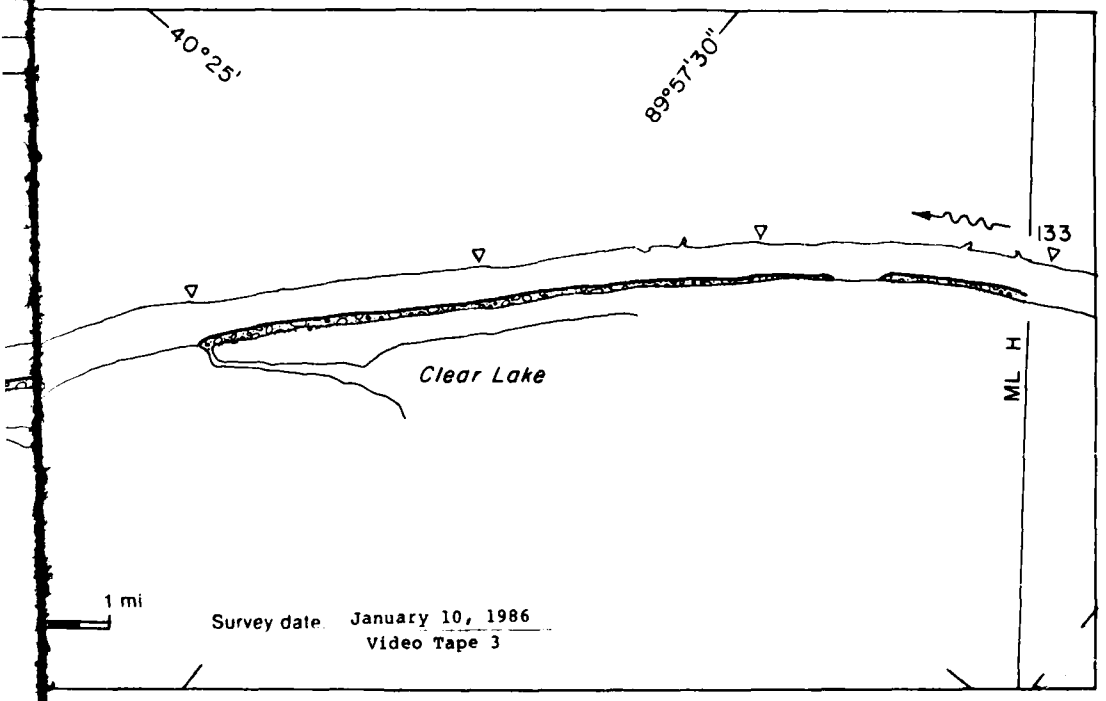

La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0
0

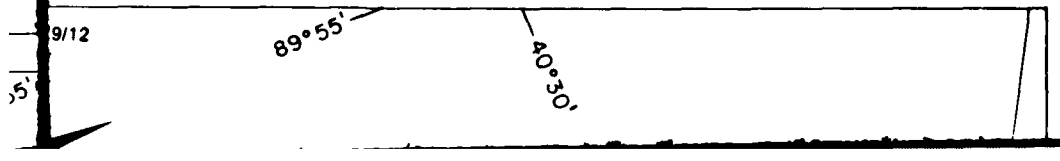

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey

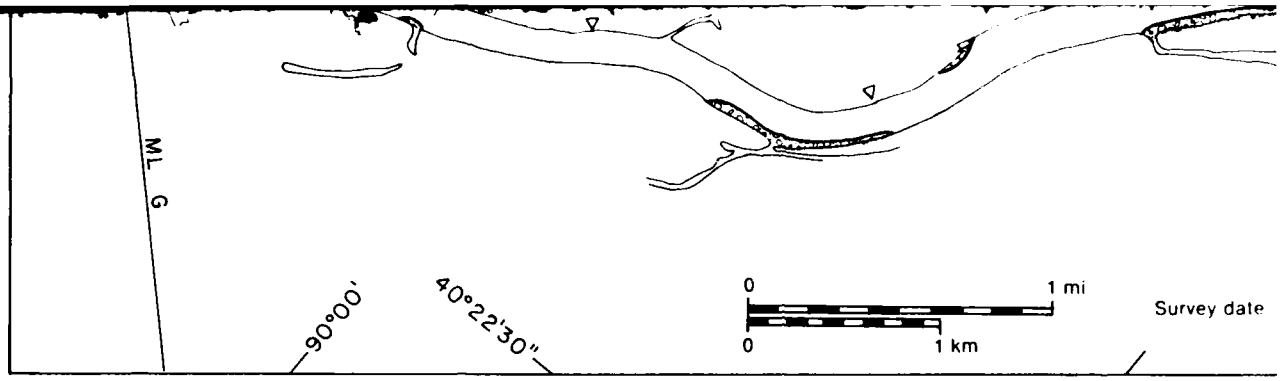

La Grange Pool :9/12
40°

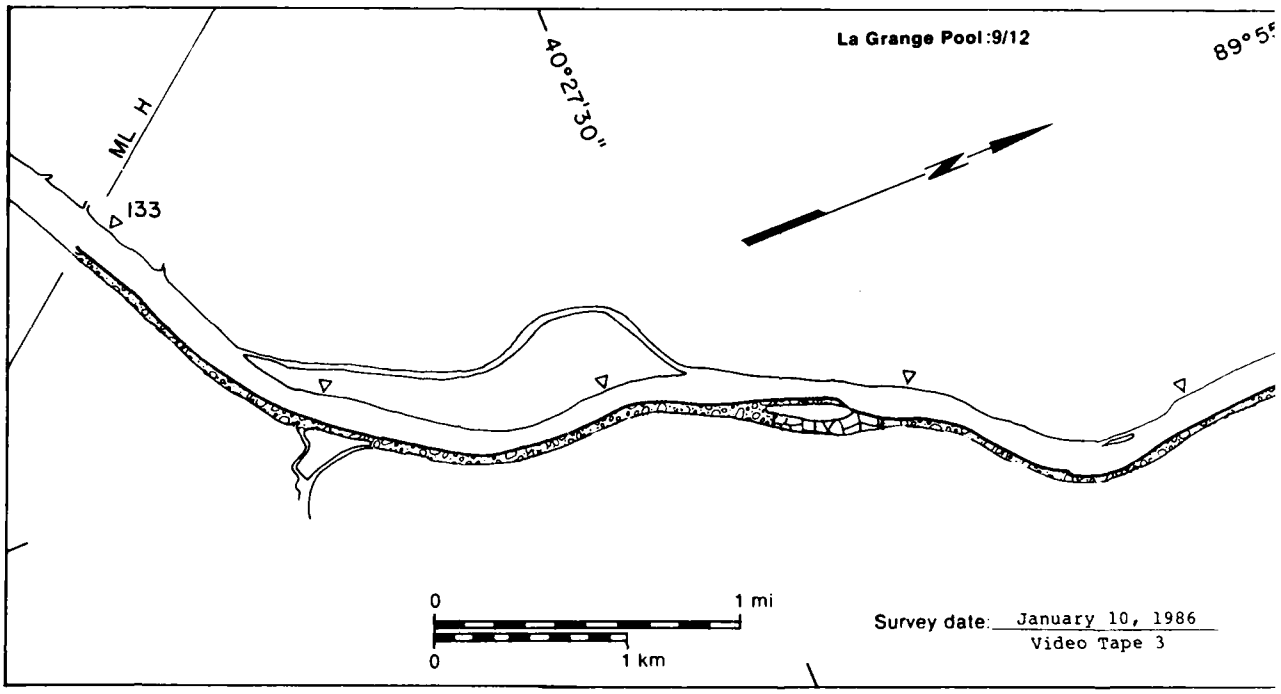
10 January 1986



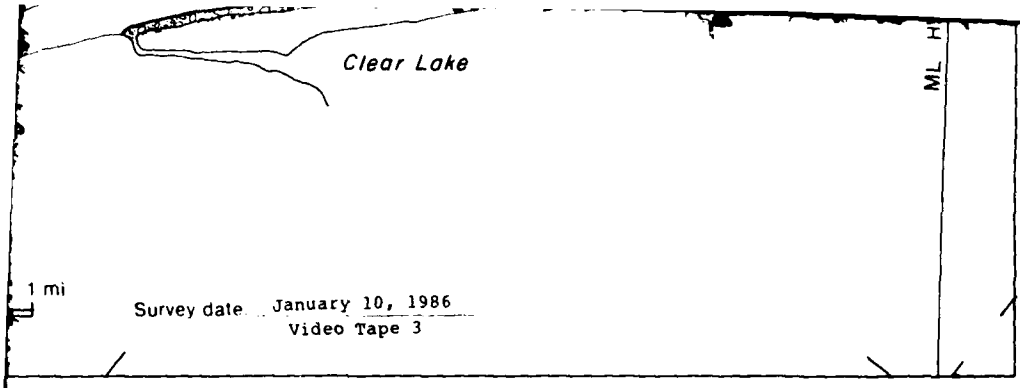


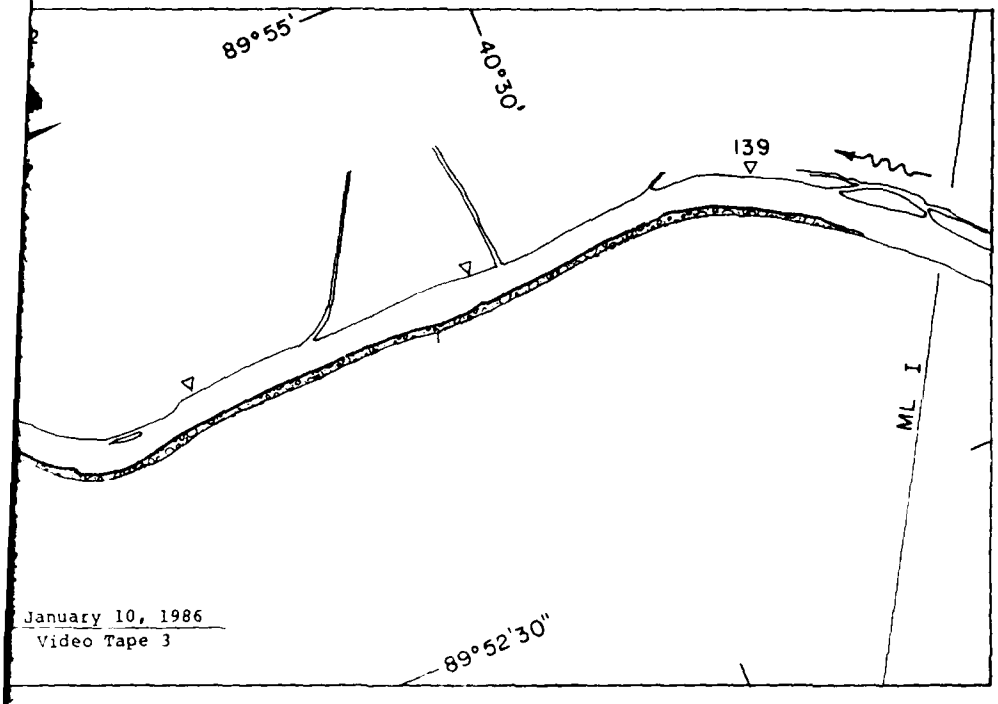




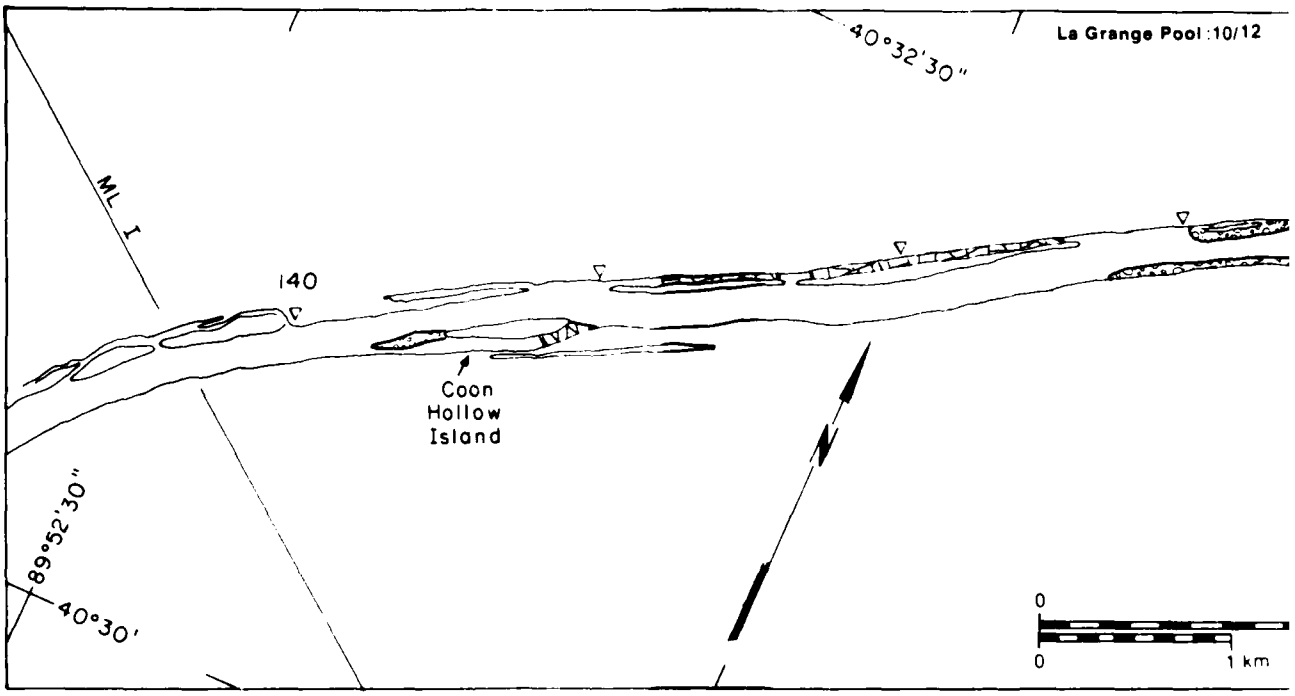


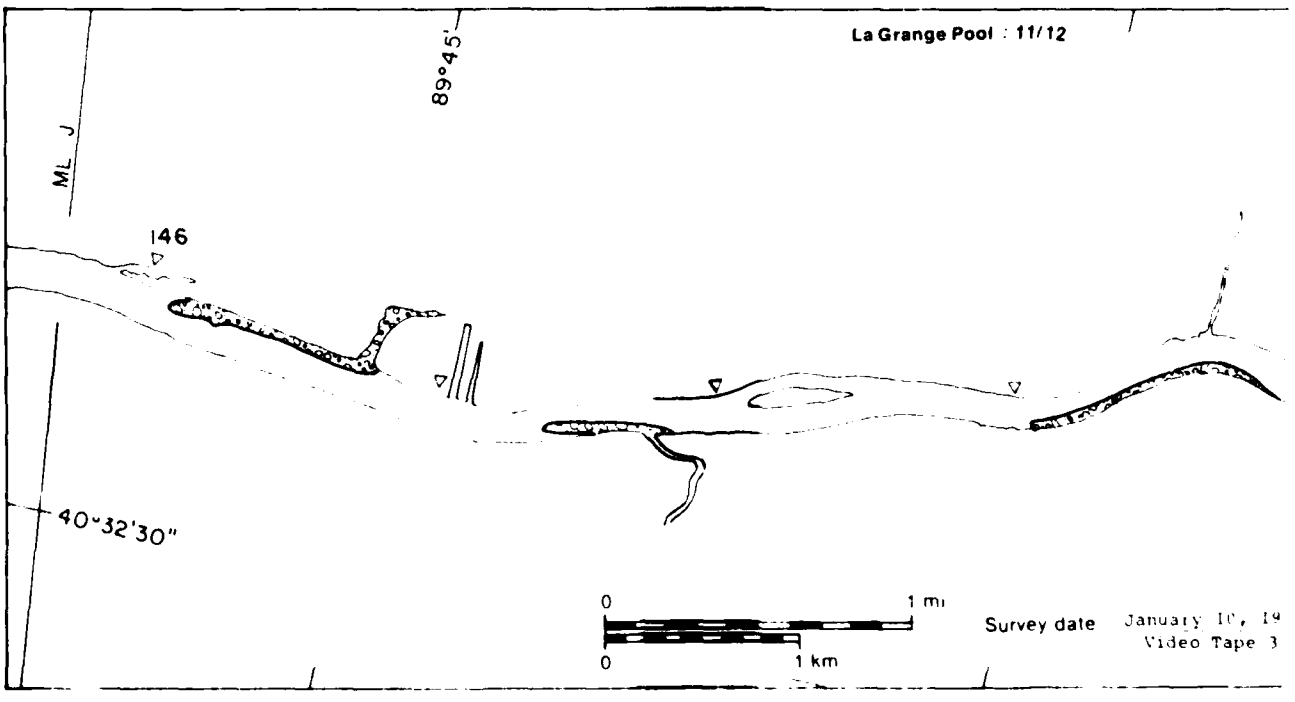
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

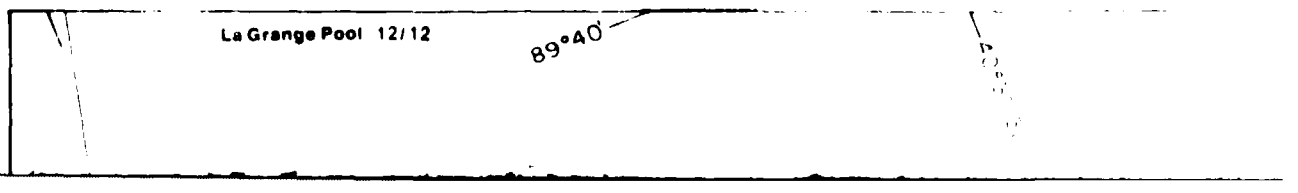

Clear Lake
ML H
1 mi
Survey date January 10, 1986
Video Tape 3

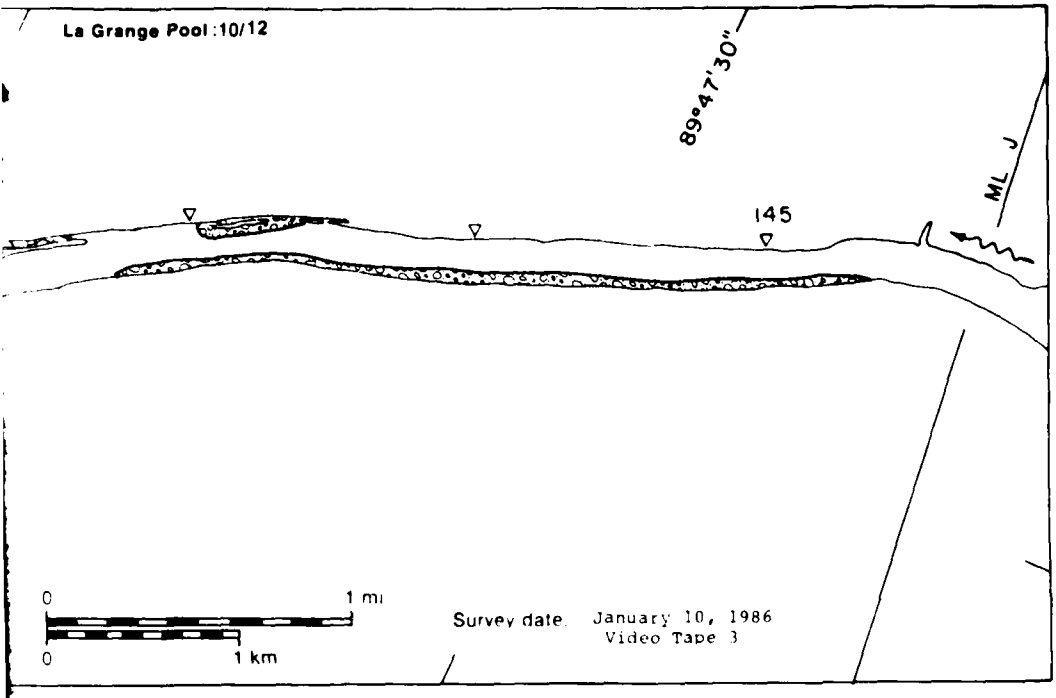

89°55'
40°30'
139
ML I
January 10, 1986
Video Tape 3
89°52'30"

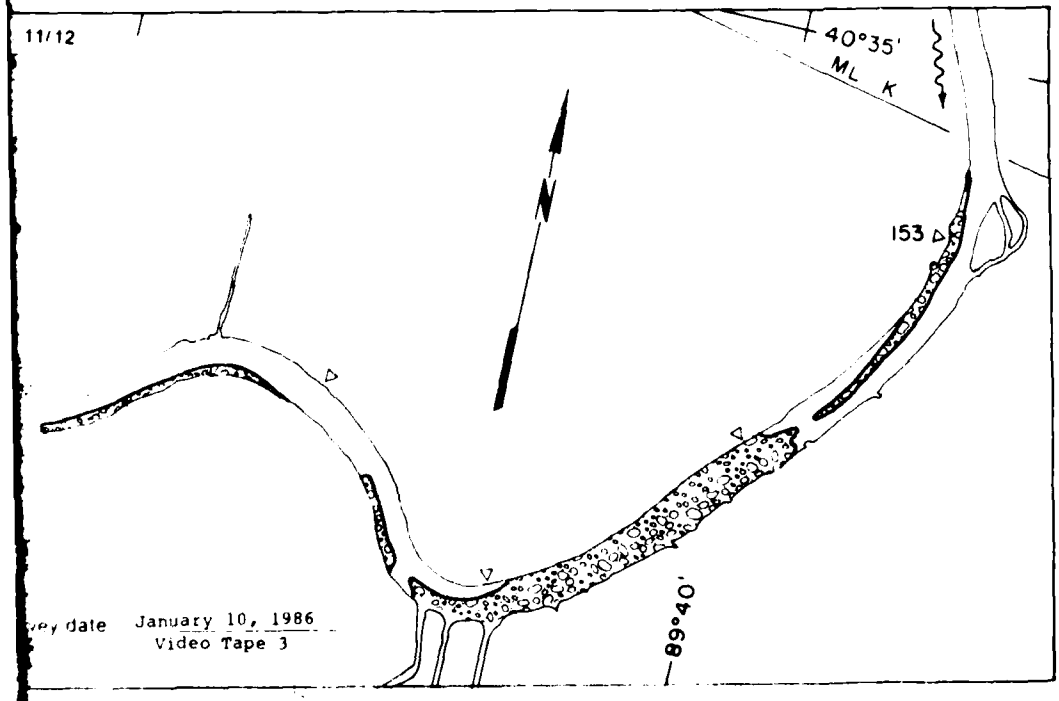
10 January 1986



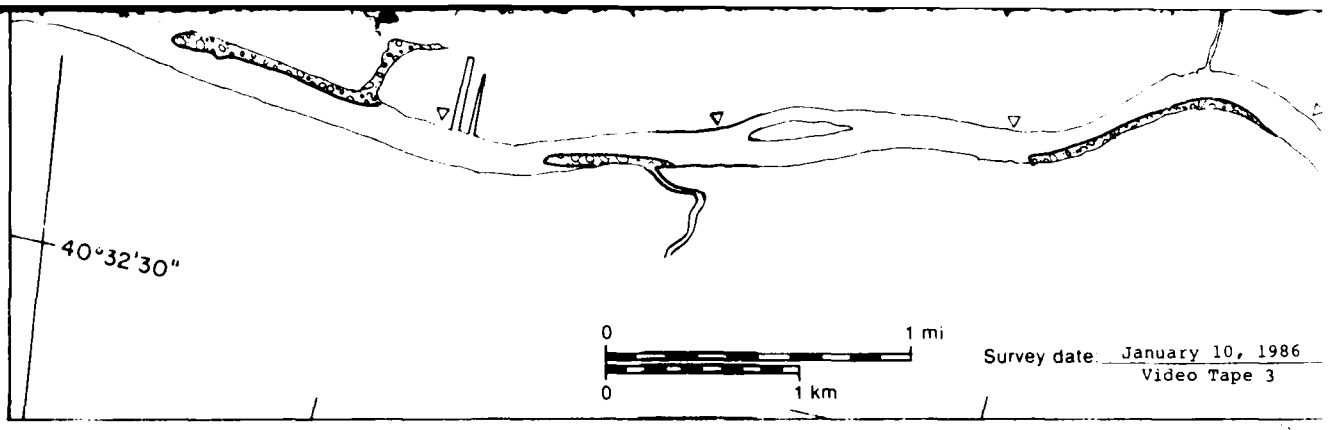


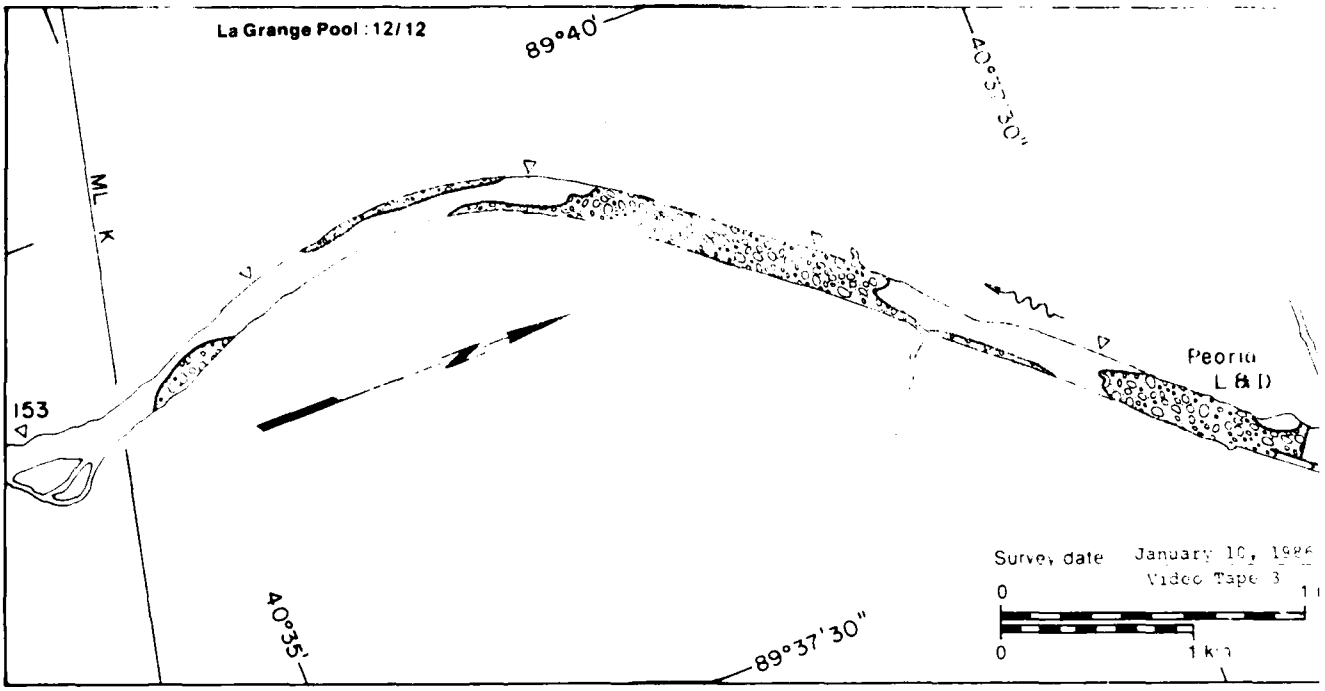


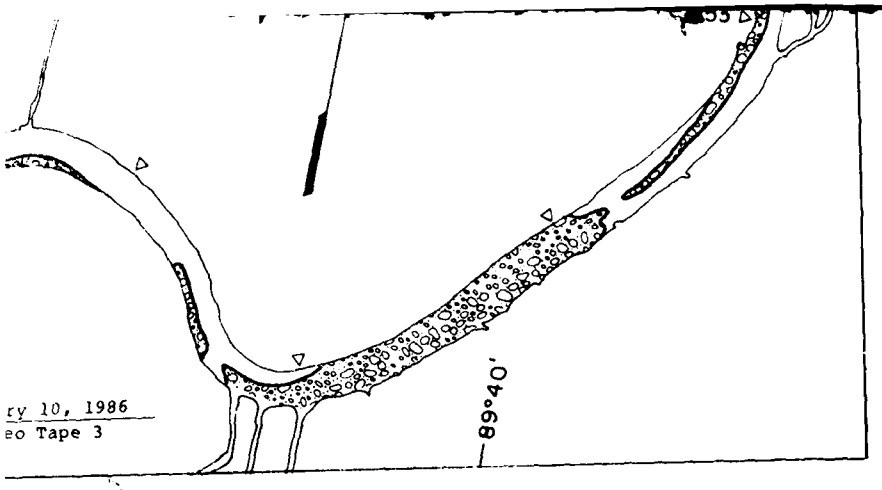




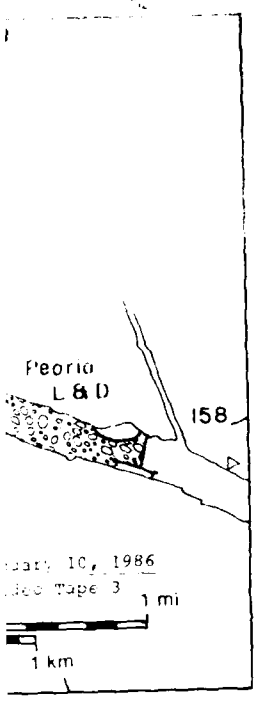
La Grange Pool	Area ($m^2 \times 10^6$)	Surface concentration (%)
UNITS		
Open water	8.24	NA


40°32'30"
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3


La Grange Pool : 12/12
89°40'
40°35'30"
ML K
153
Peoria
L & D
Survey date January 10, 1986
Video Tape 3
0
1 km
40°35'
89°37'30"



ry 10, 1986
eo Tape 3

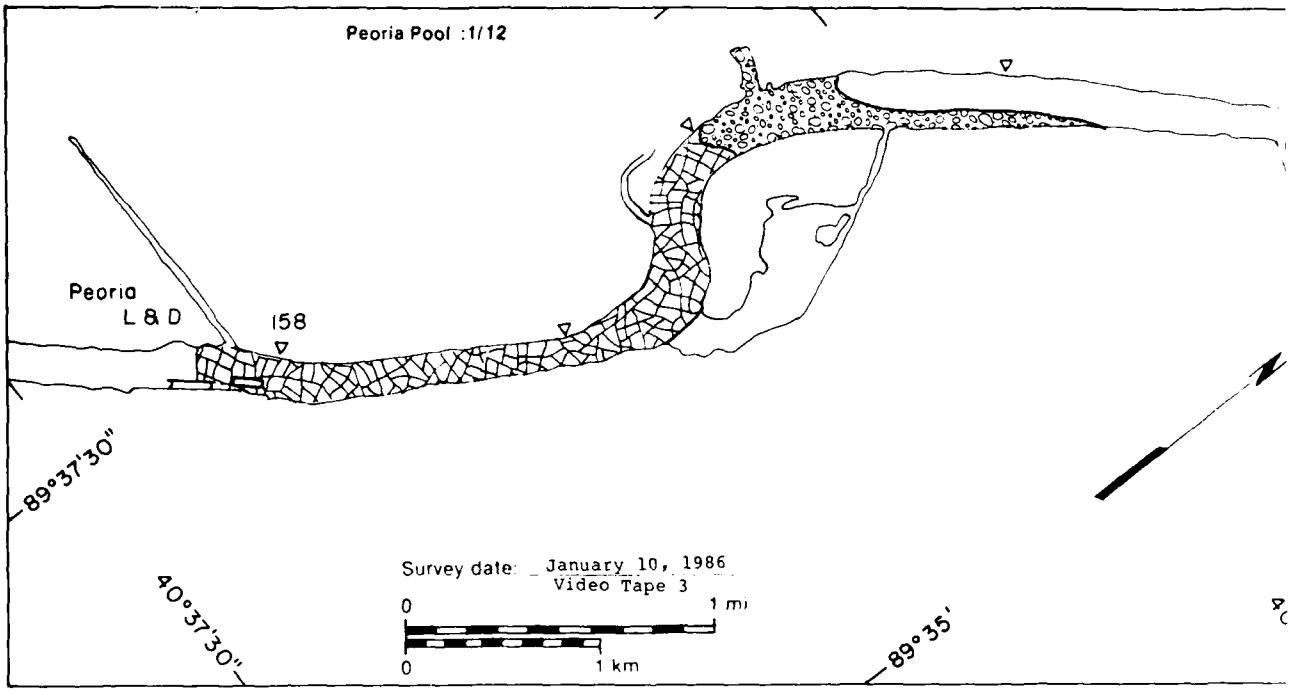


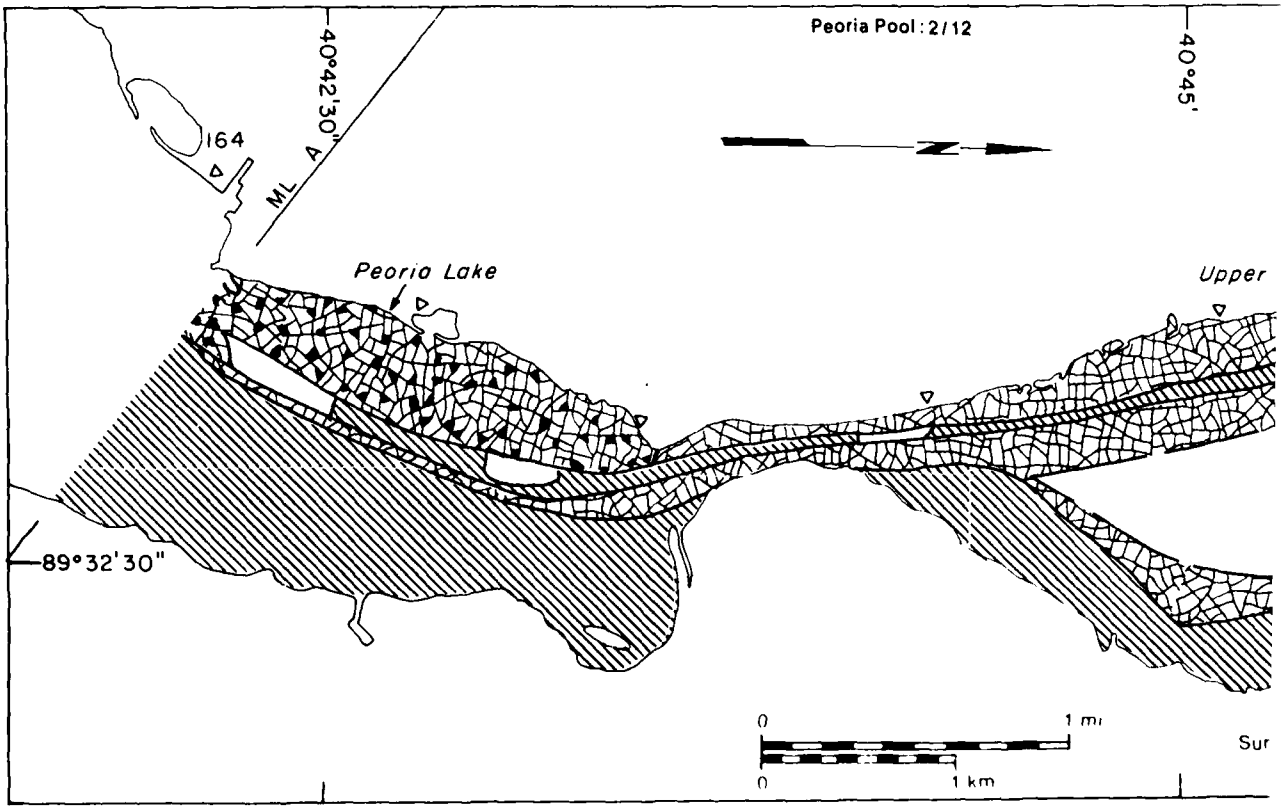
La Grange Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.24	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.24	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	3.06	60
Total area ($m^2 \times 10^6$)	11.71*	

* Includes 0.17×10^6 m^2 of no video coverage


Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: January 10, 1986
Video Tape 3
0
1 mi
0
1 km
89°35'


Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
Upper
89°32'30"
0
1 mi
0
1 km

Peoria Pool : 3/12

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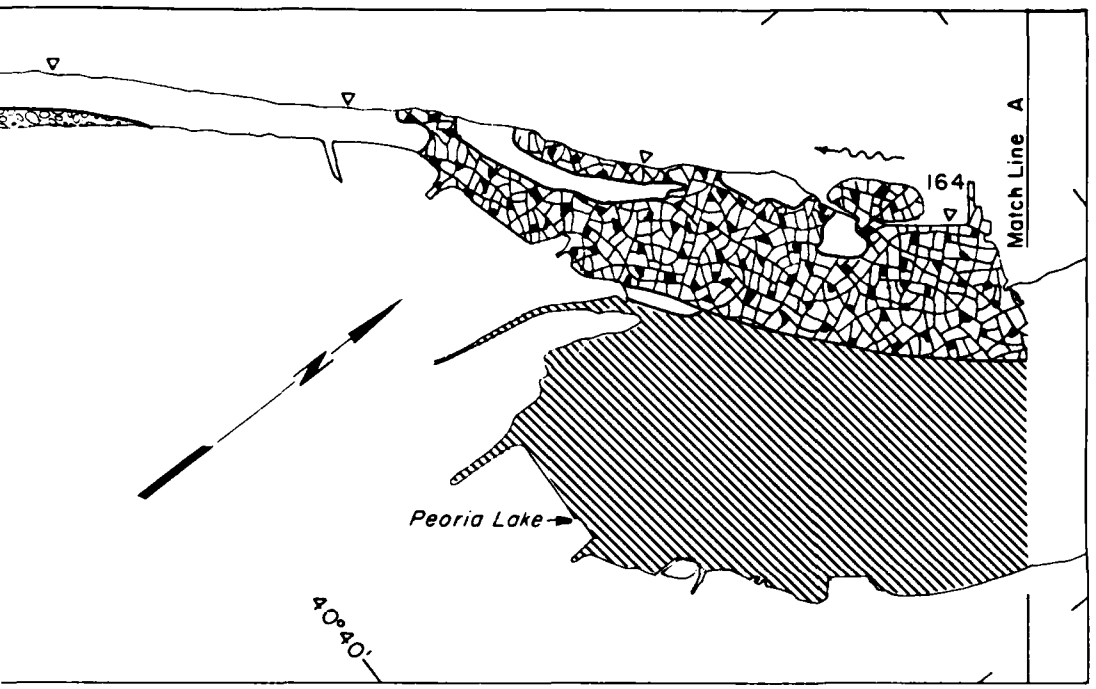
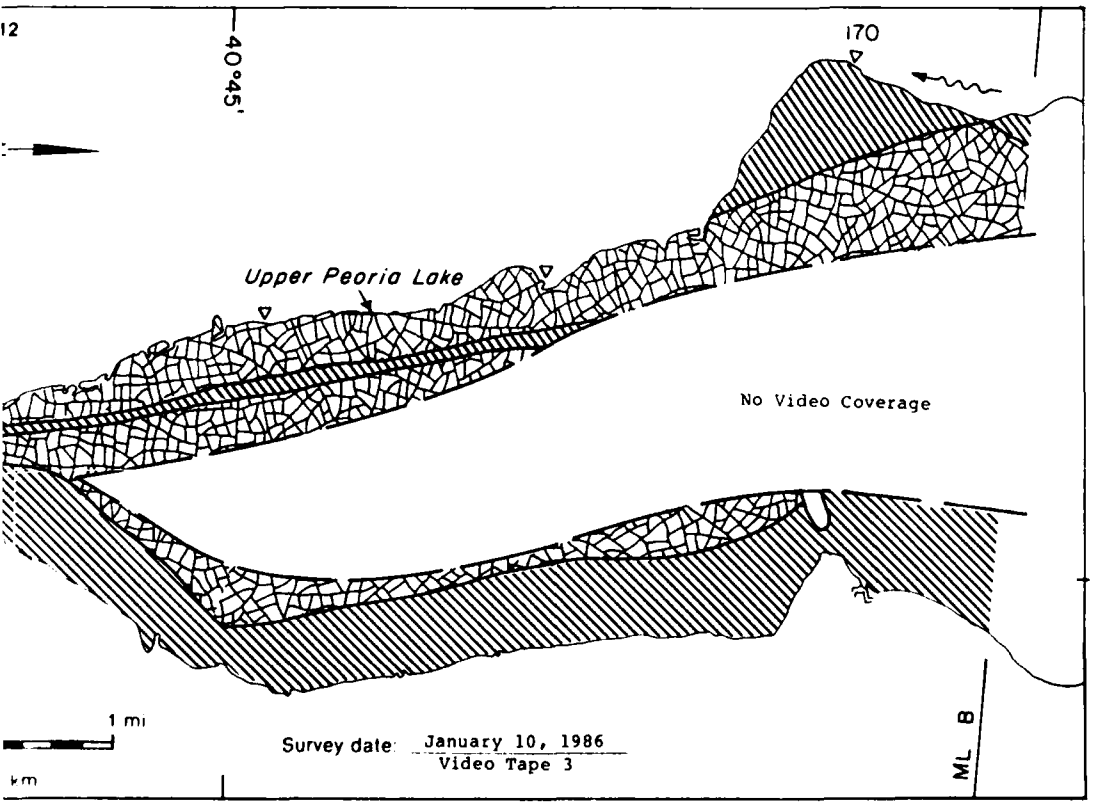
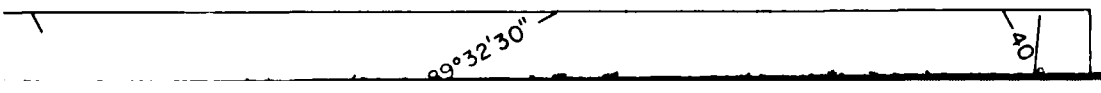
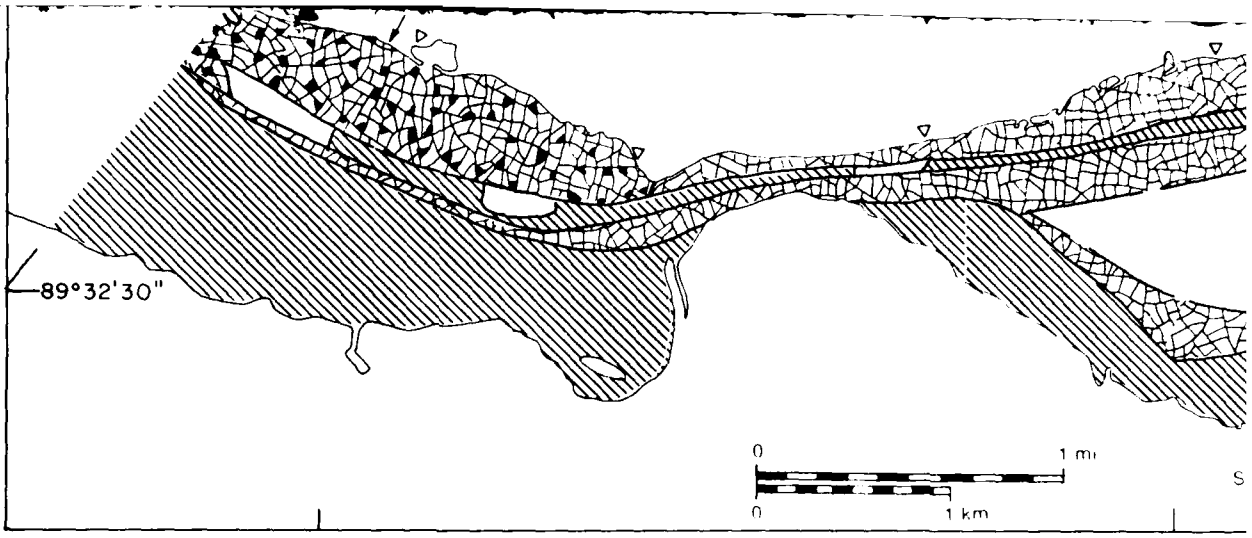
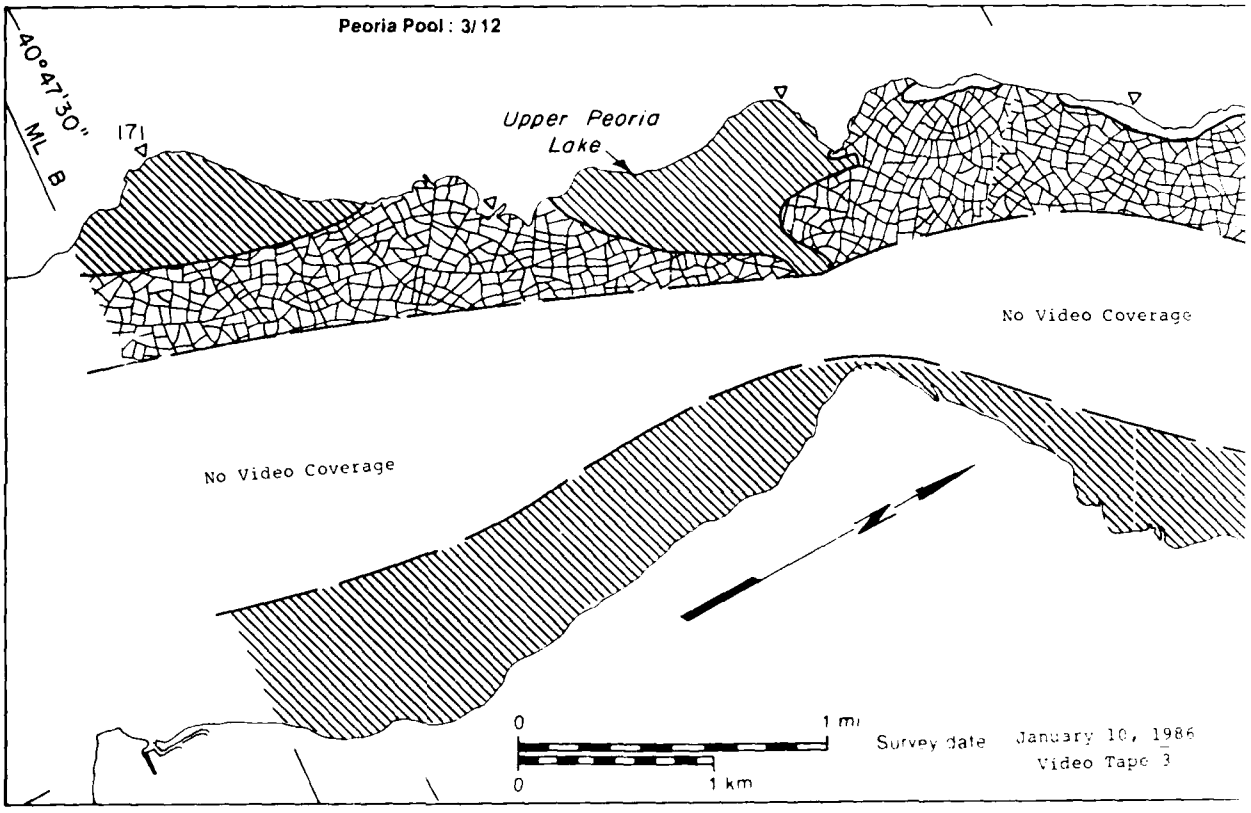
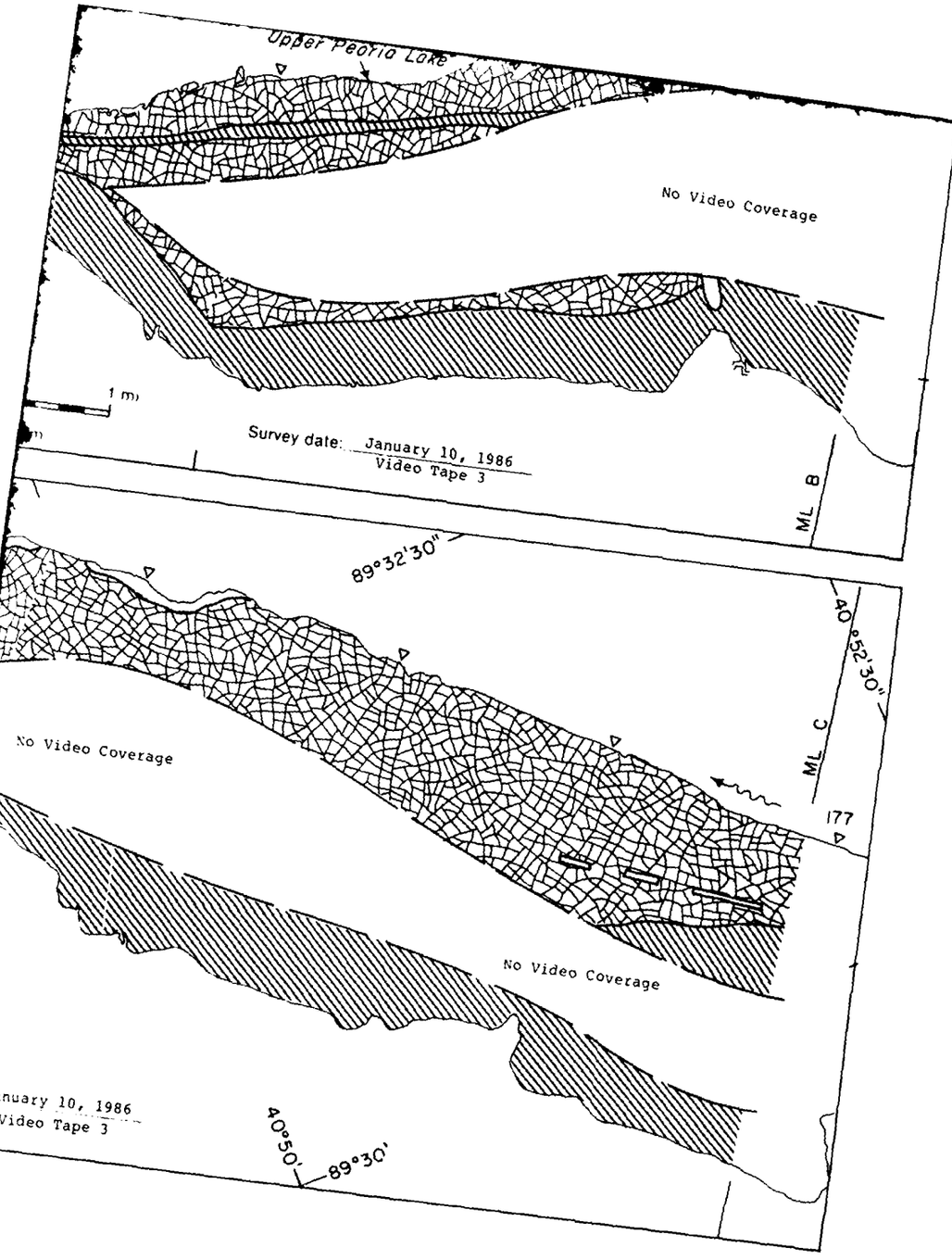







89°32'30"
0
1 mi
0
1 km


Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date January 10, 1986
Video Tape 3


Upper Peoria Lake
No Video Coverage
1 m
Survey date: January 10, 1986
Video Tape 3
ML B
89°32'30"
40°52'30"
ML C
No Video Coverage
177
No Video Coverage
January 10, 1986
Video Tape 3
40°50'
89°30'

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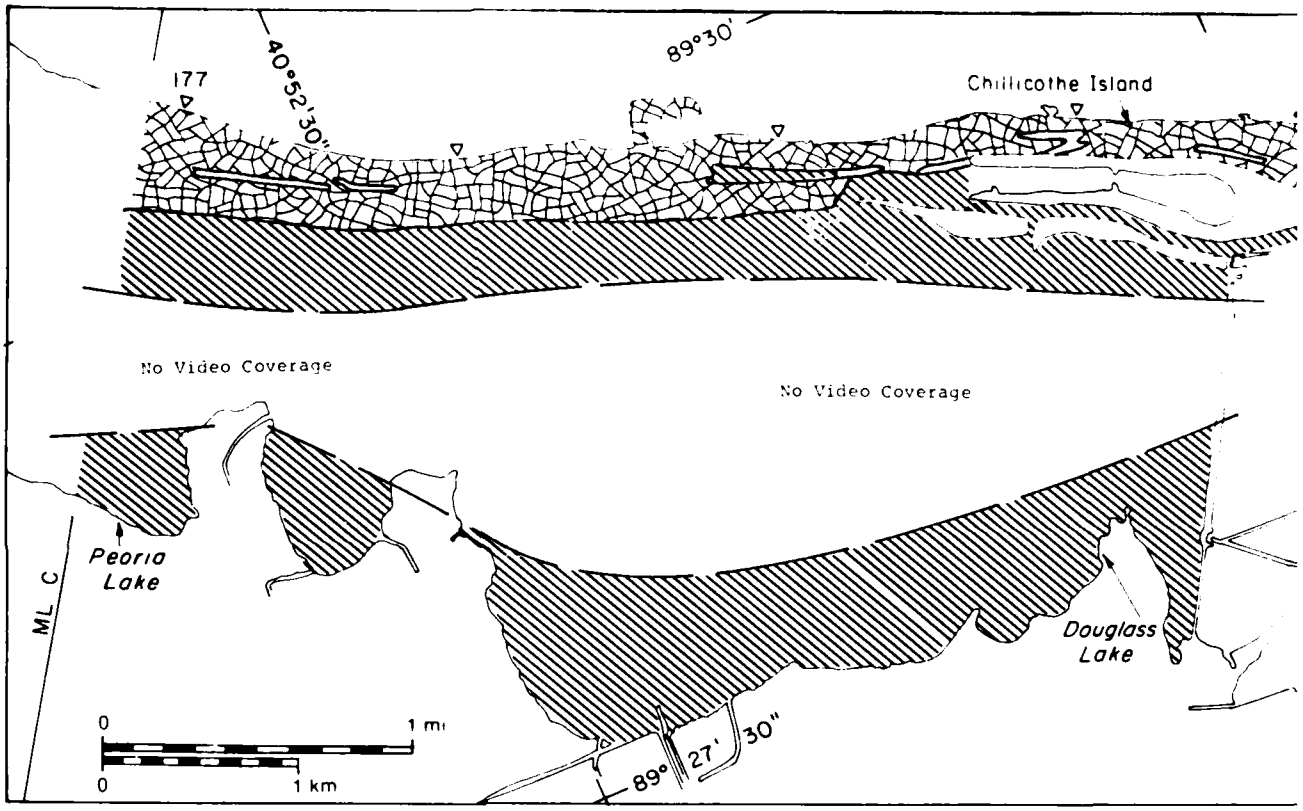
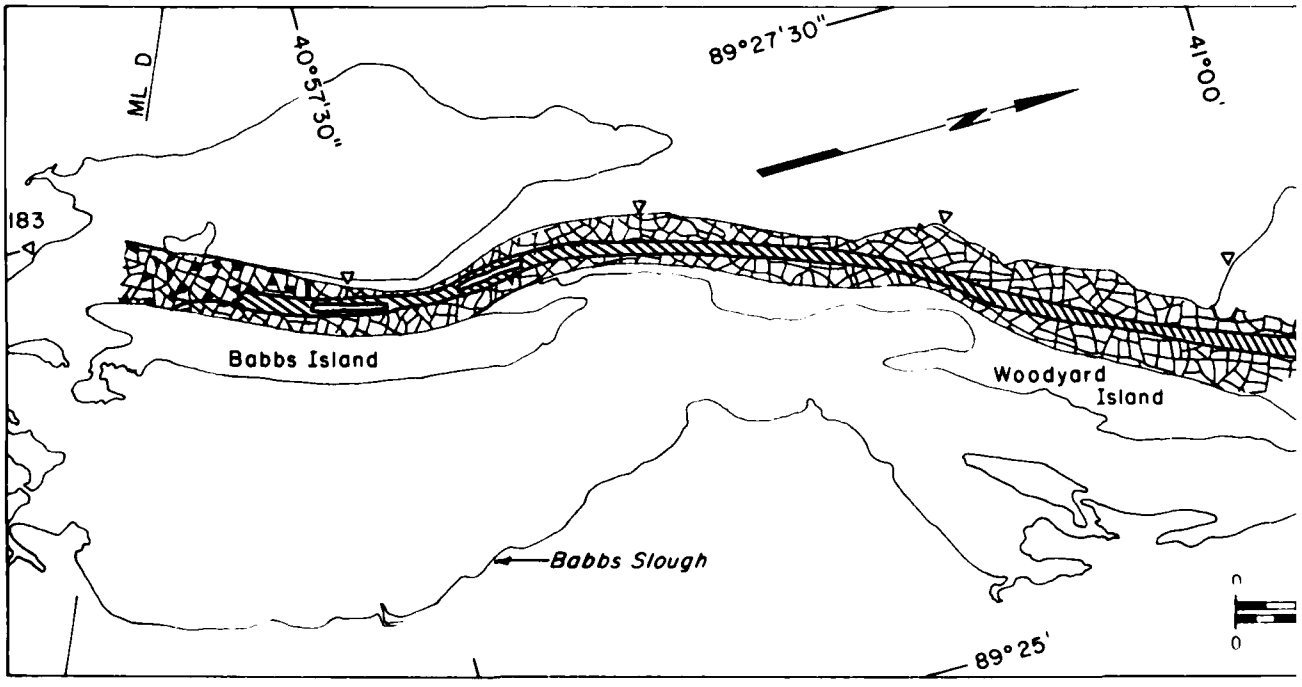
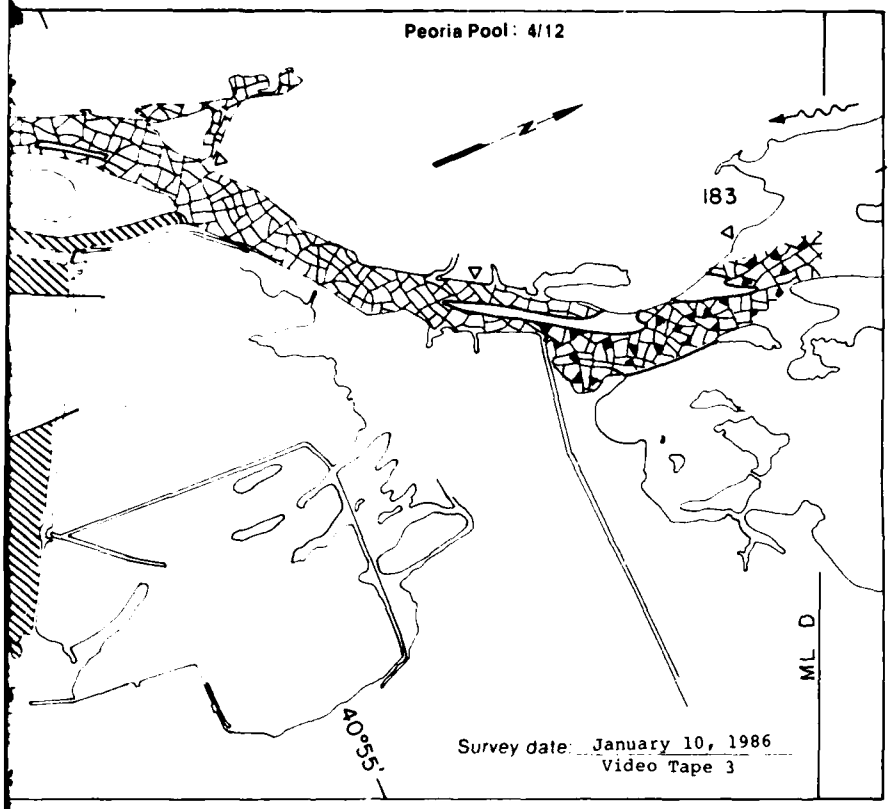
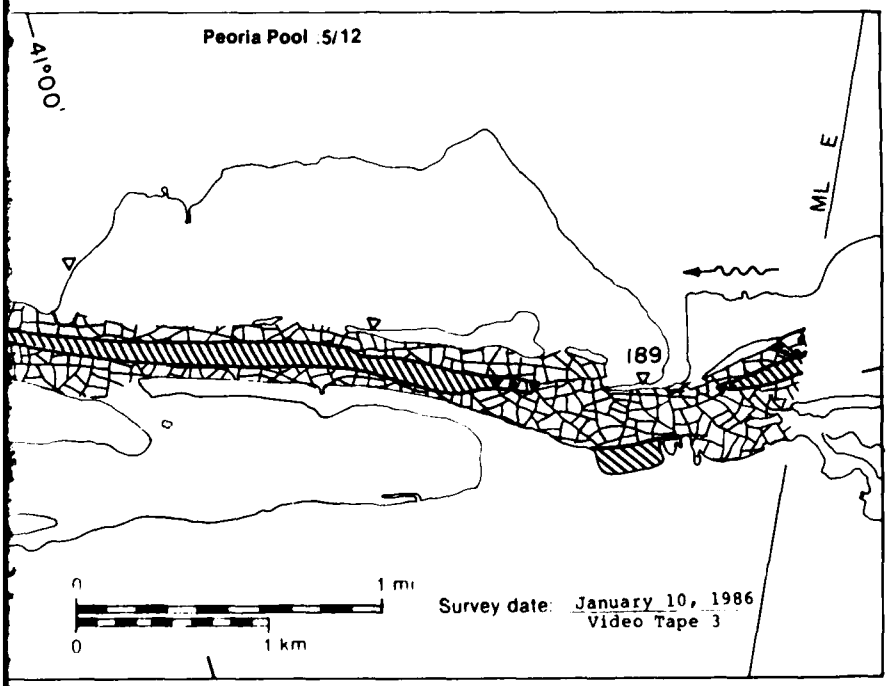
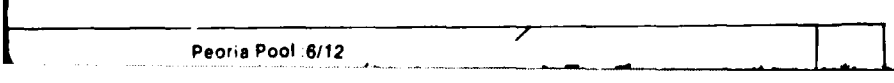
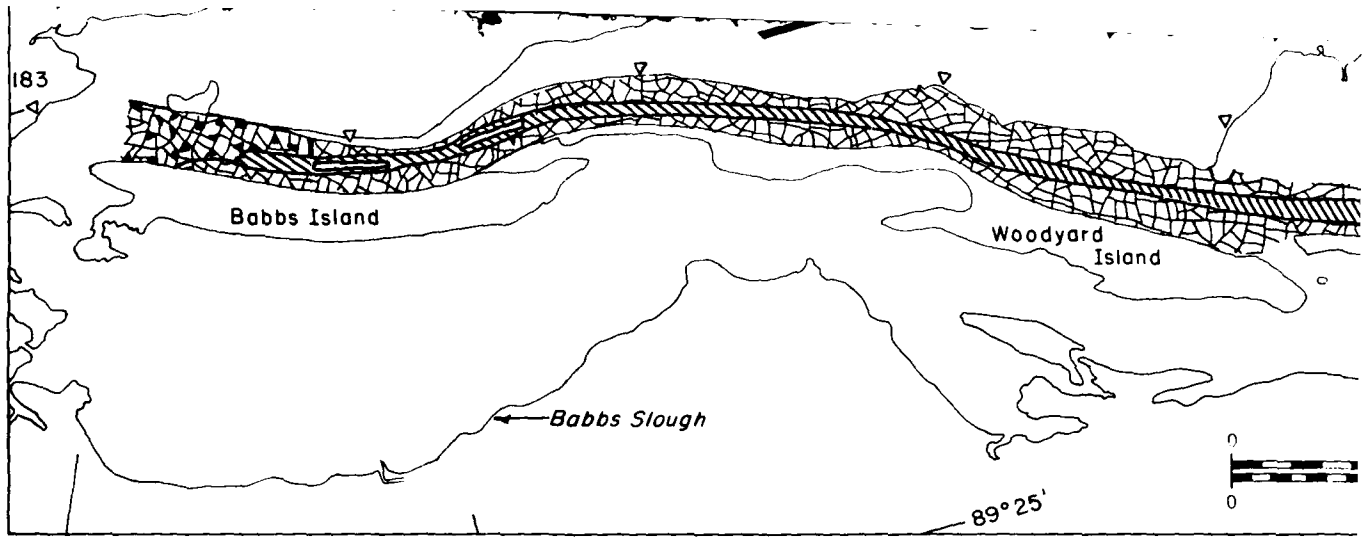


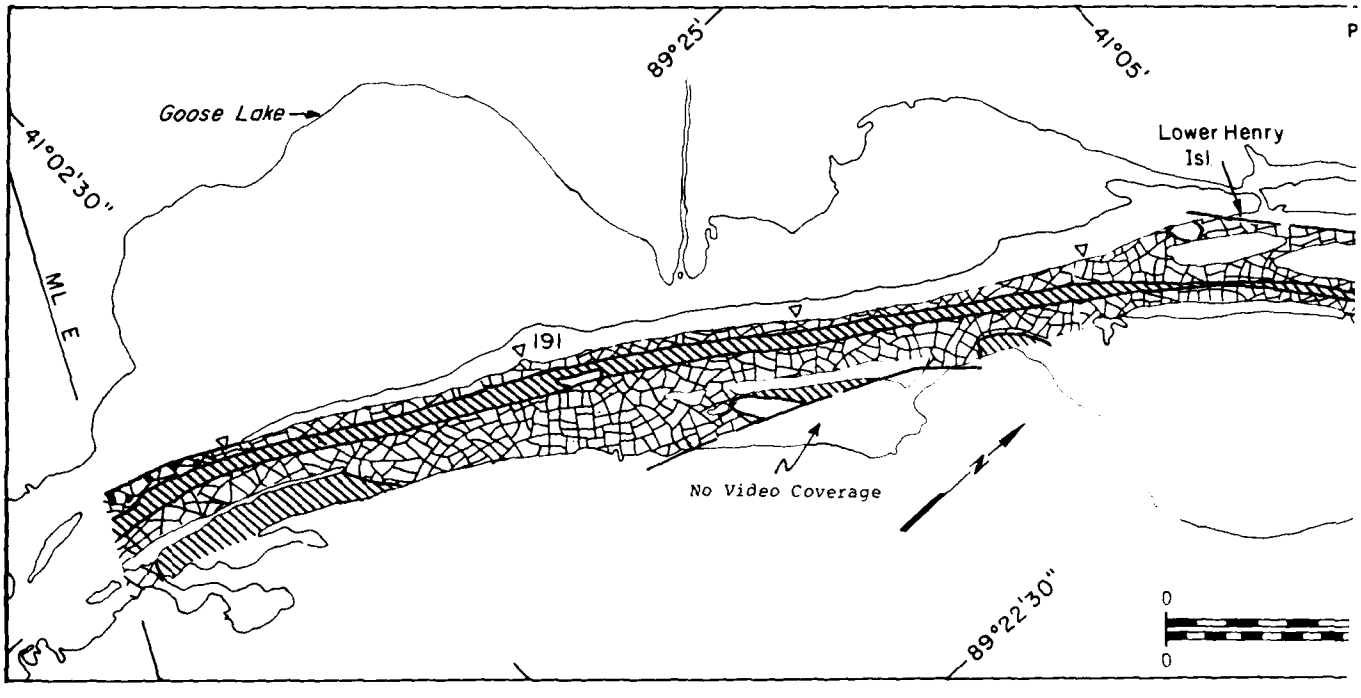


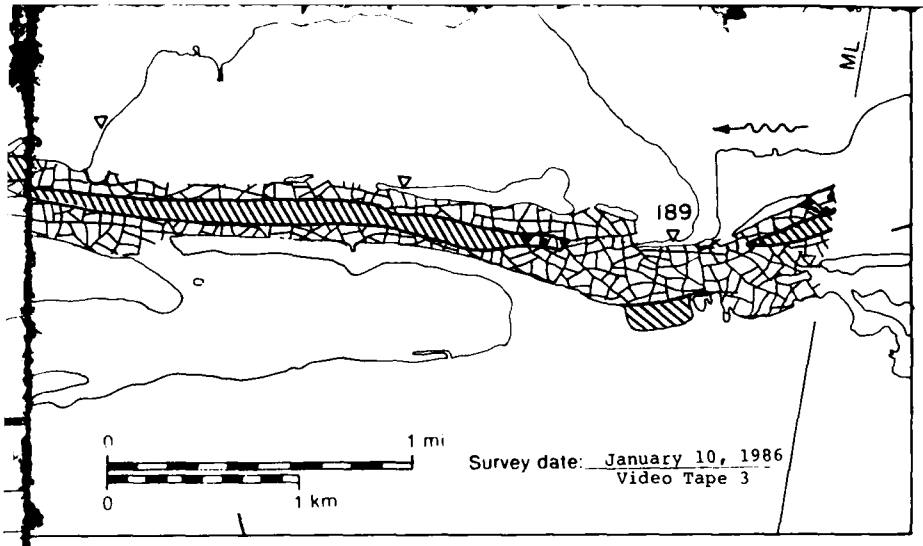

Peoria Pool : 4/12
183
ML D
40°55'
Survey date: January 10, 1986
Video Tape 3

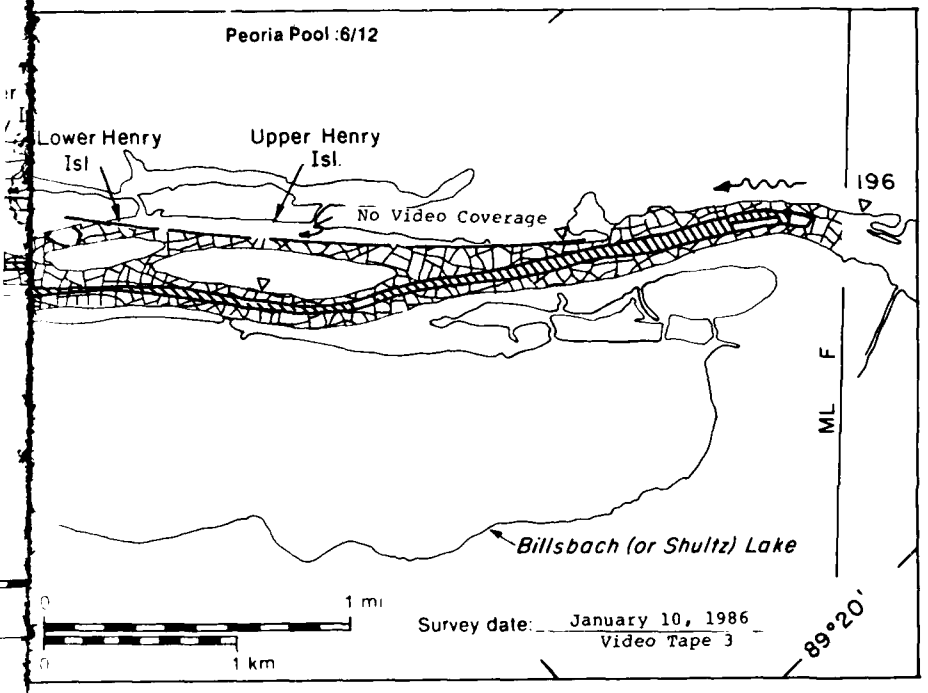

Peoria Pool .5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3

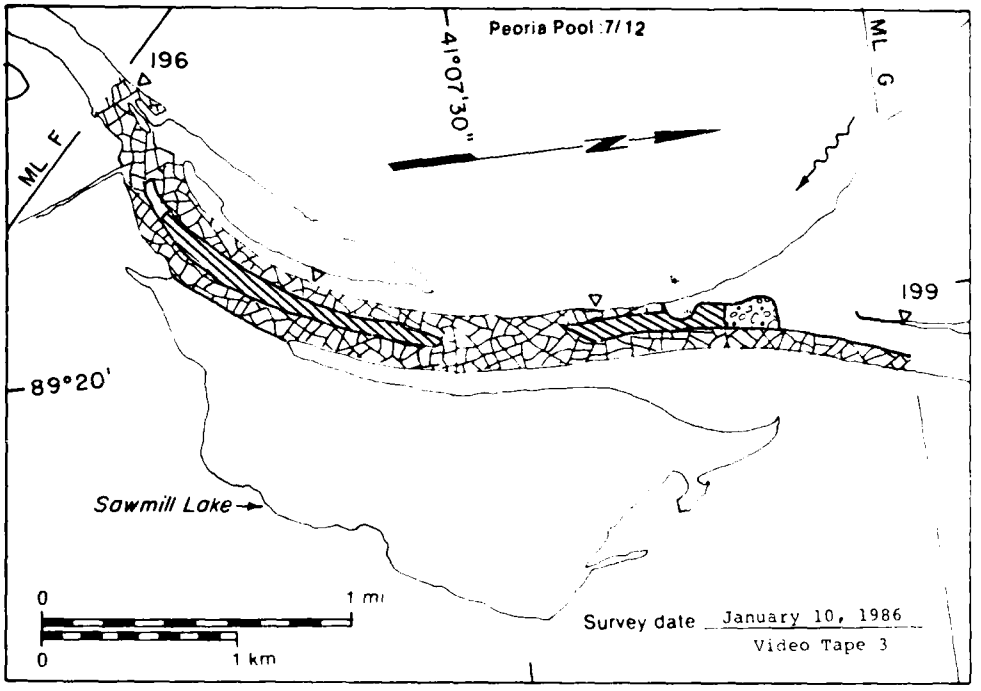

Peoria Pool .6/12

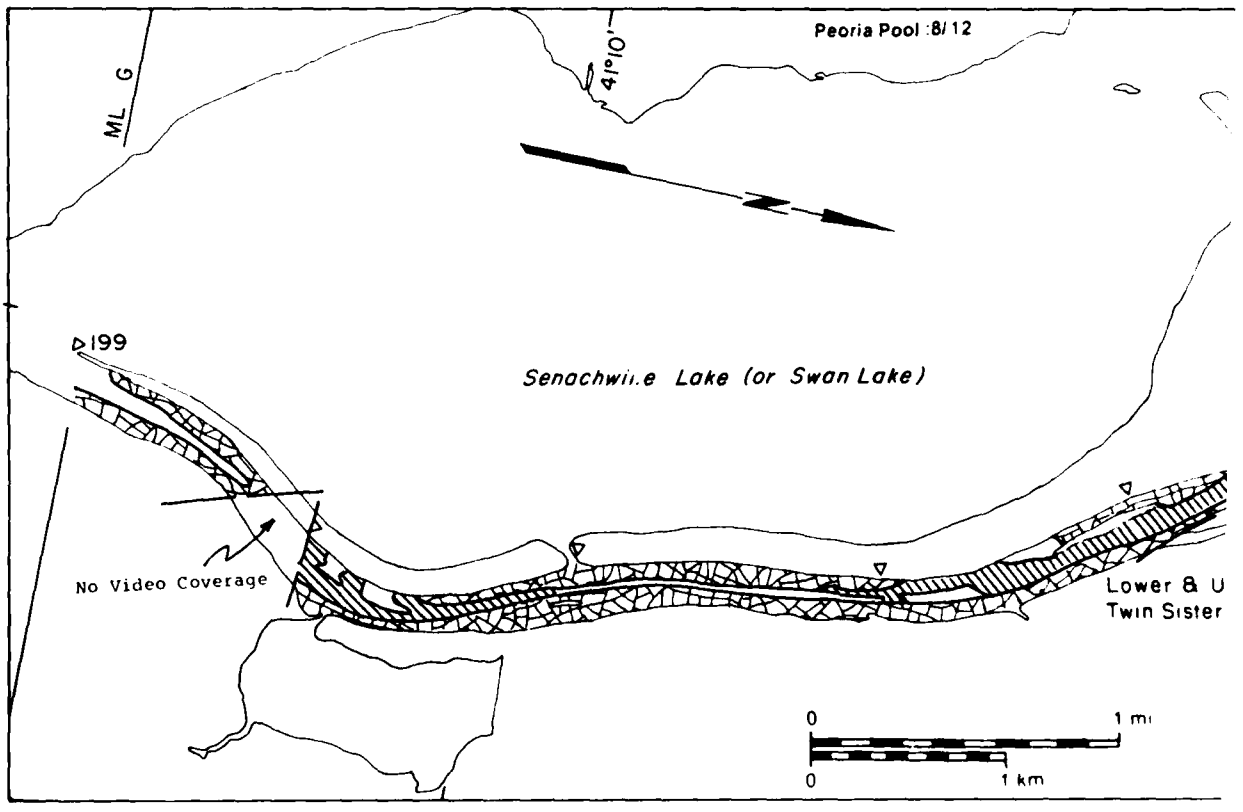

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
0


89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
No Video Coverage
89°22'30"
0
0


ML
189
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3

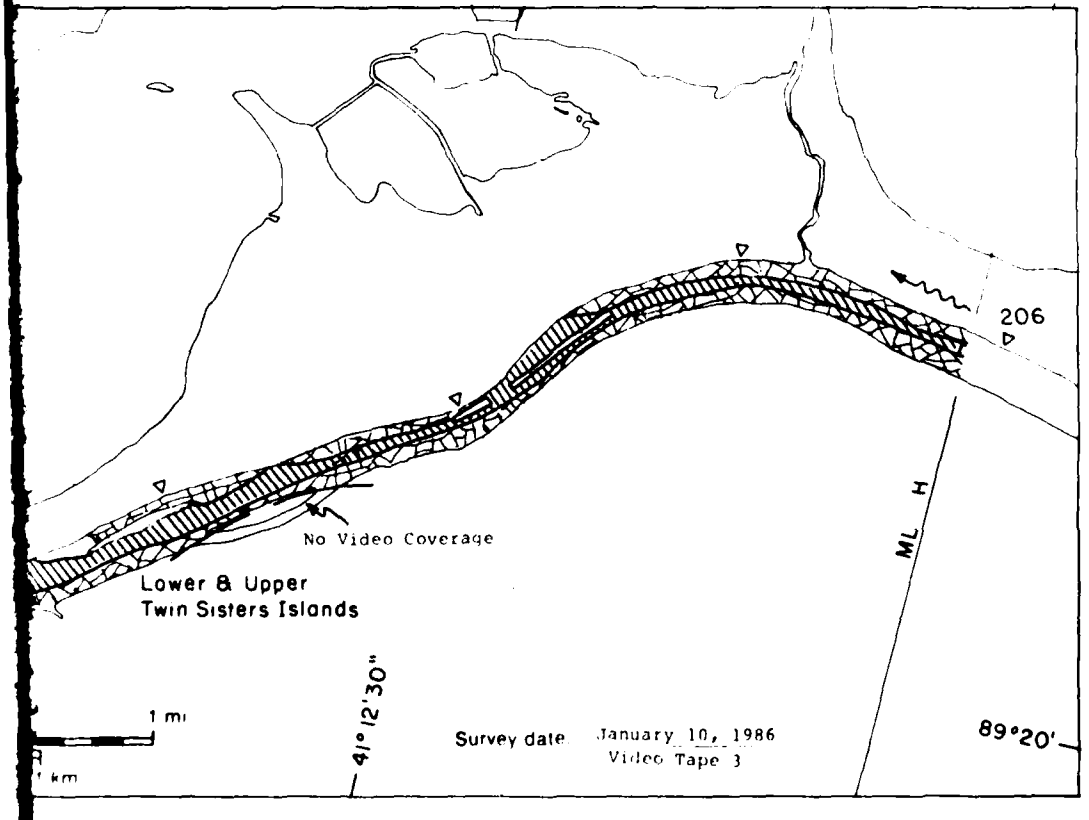

Peoria Pool :6/12
Lower Henry Isl
Upper Henry Isl.
No Video Coverage
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3
89°20'

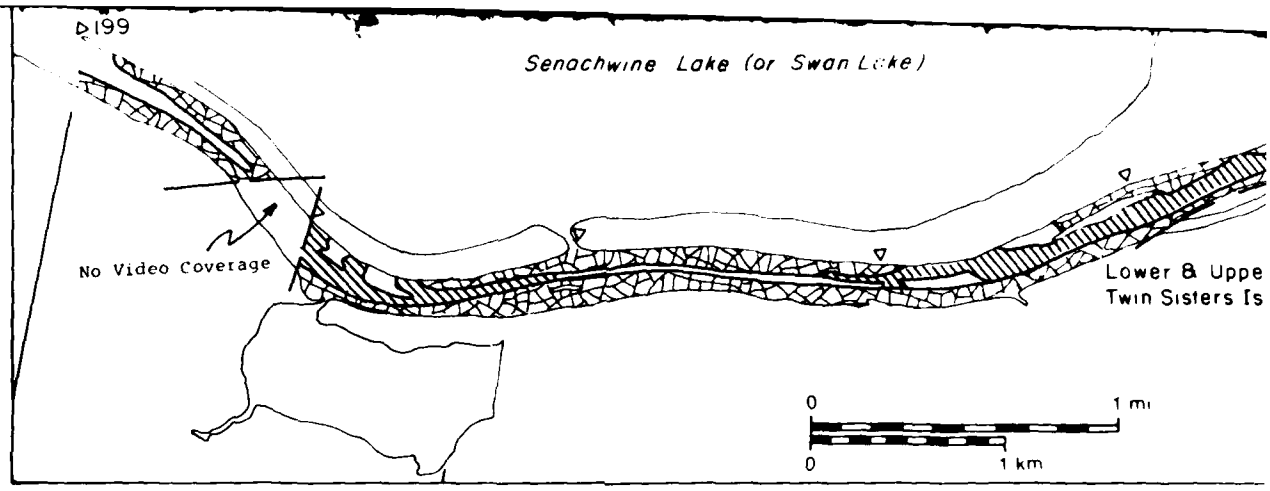

Peoria Pool :7/12
41°07'30"
ML G
196
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date January 10, 1986
Video Tape 3

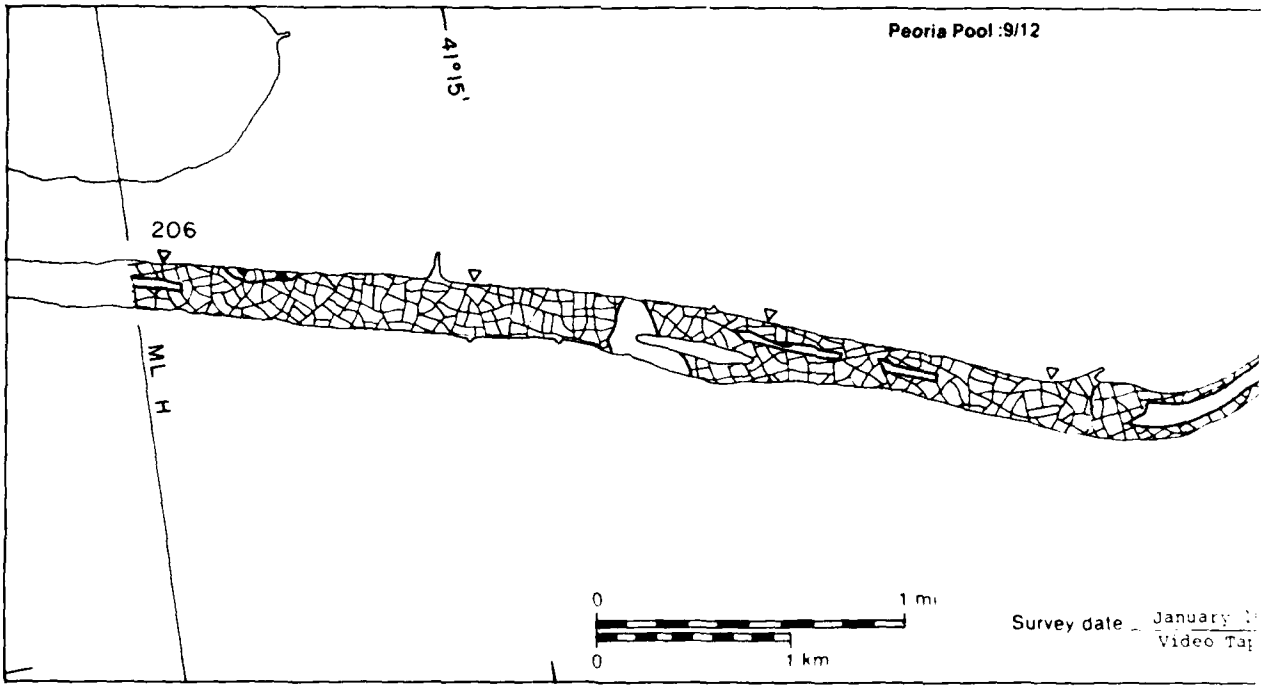

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
No Video Coverage
Lower & U
Twin Sister
0
1 mi
0
1 km

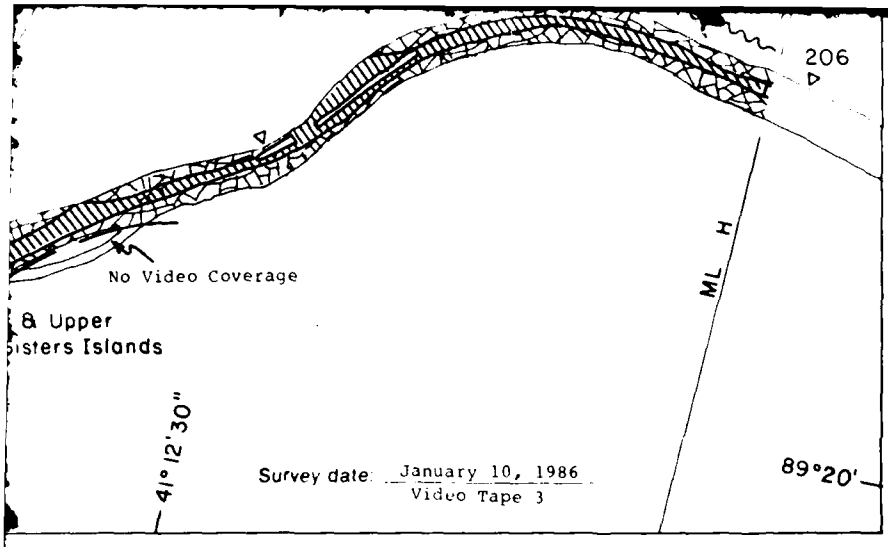
Peoria Pool :9/12

10 January 1986

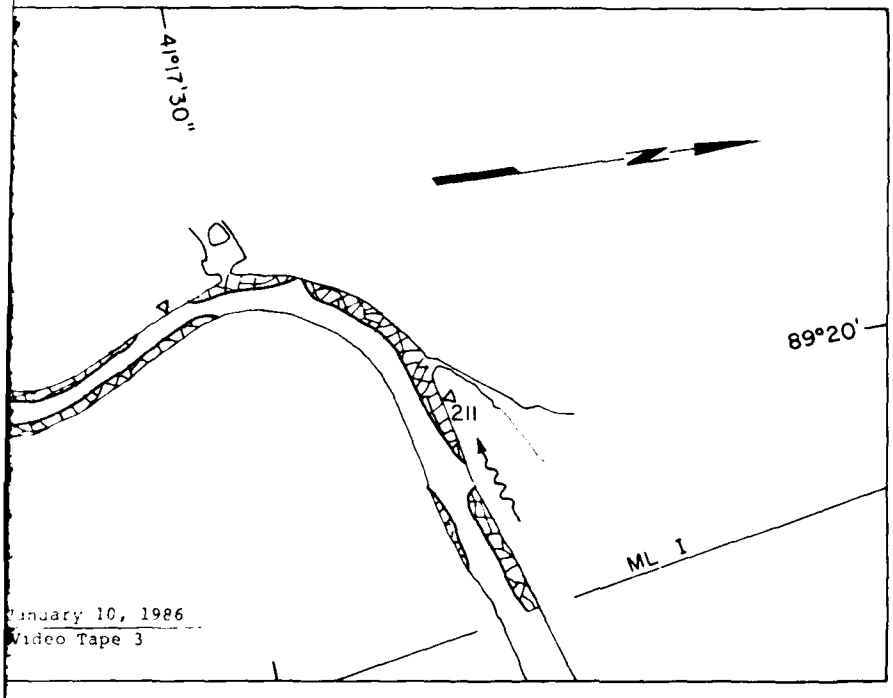



199
Senachwine Lake (or Swan Lake)
No Video Coverage
Lower & Uppe
Twin Sisters Is
0
1 mi
0
1 km


Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date _ January
Video Ta

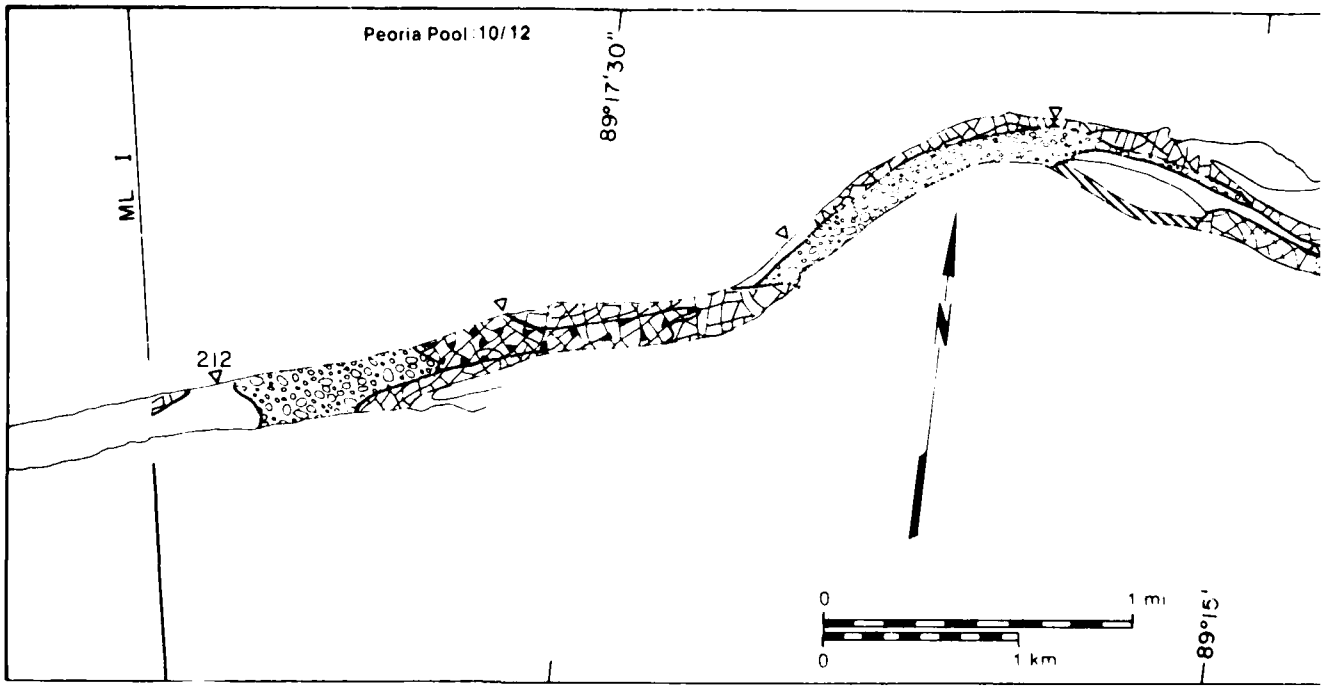


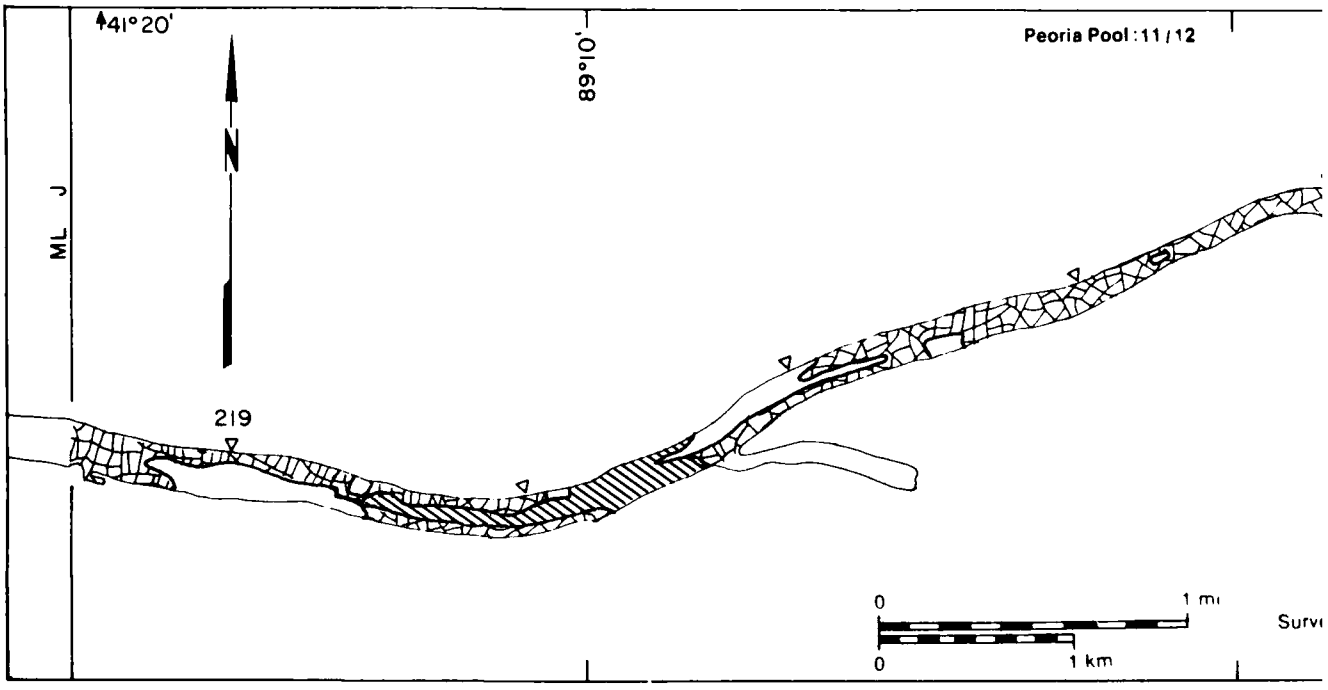
& Upper
sters Islands

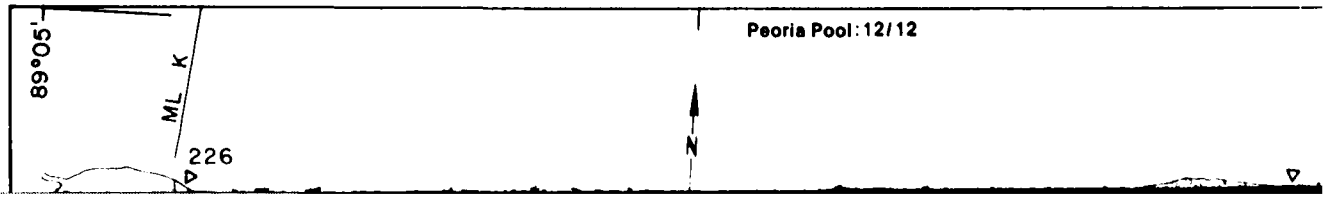


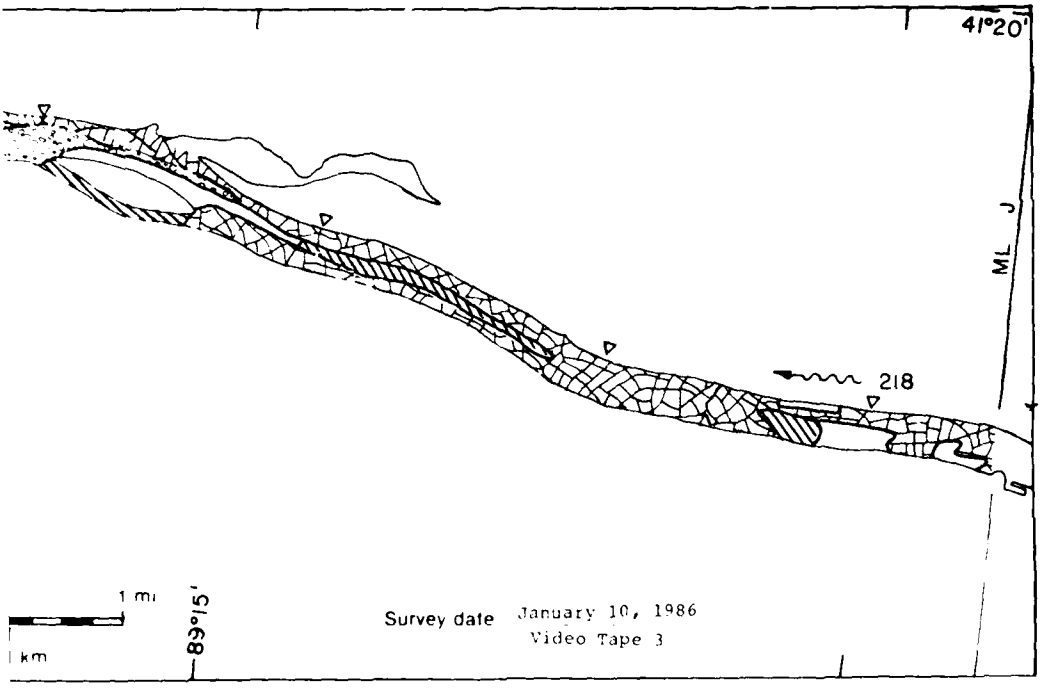
nuary 10, 1986
Video Tape 3

10 January 1986

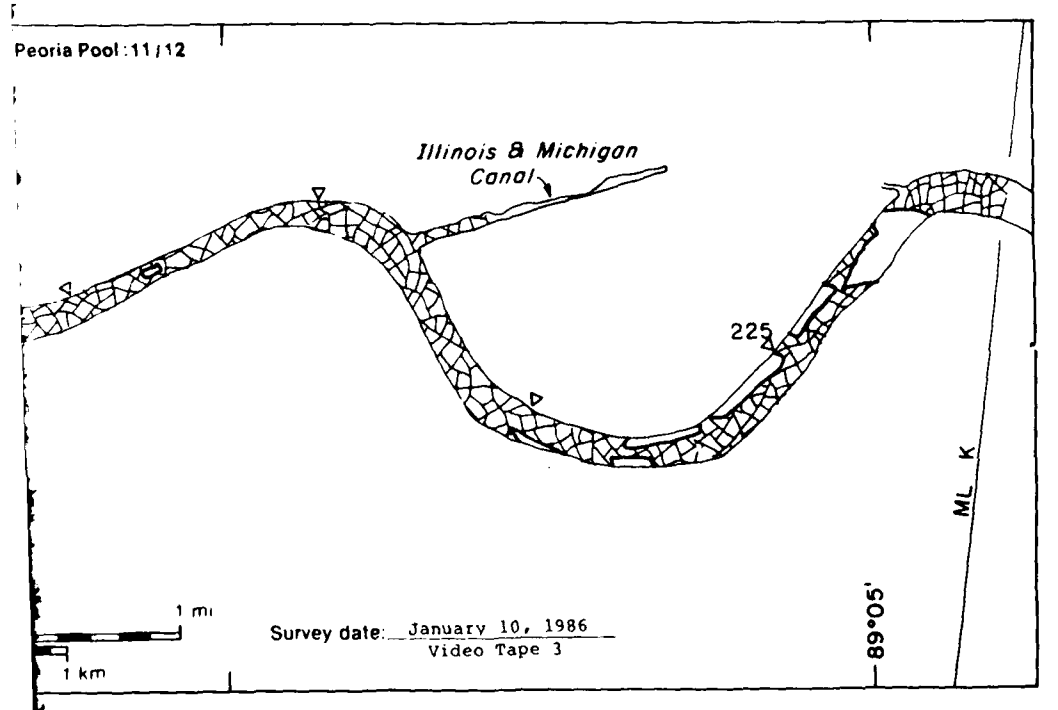


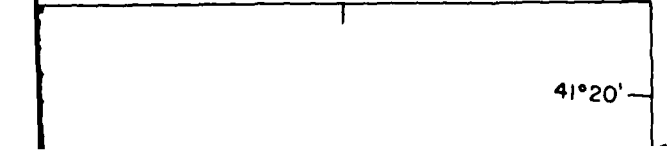


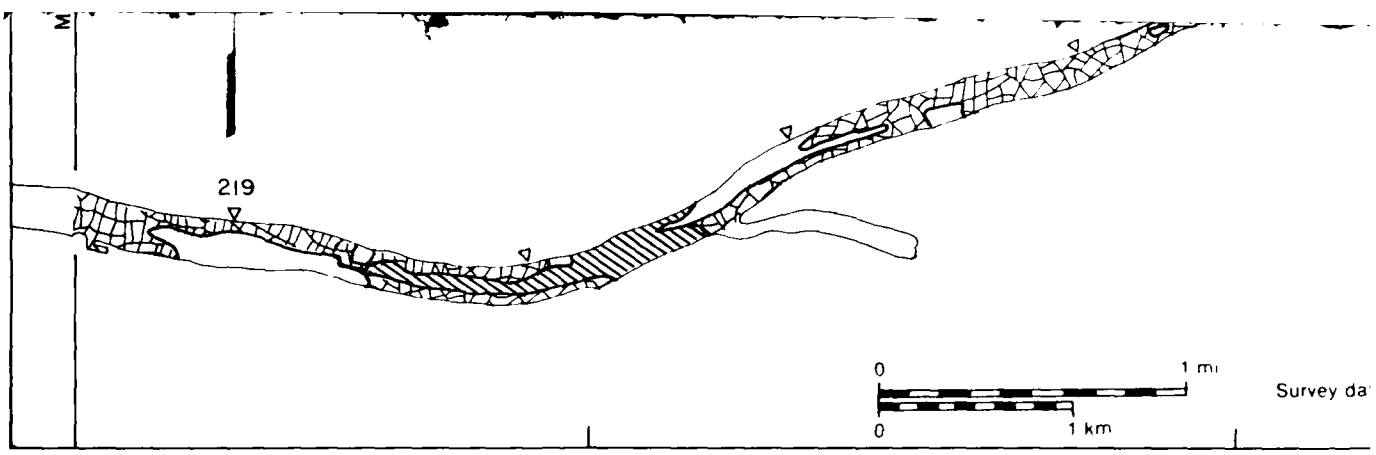


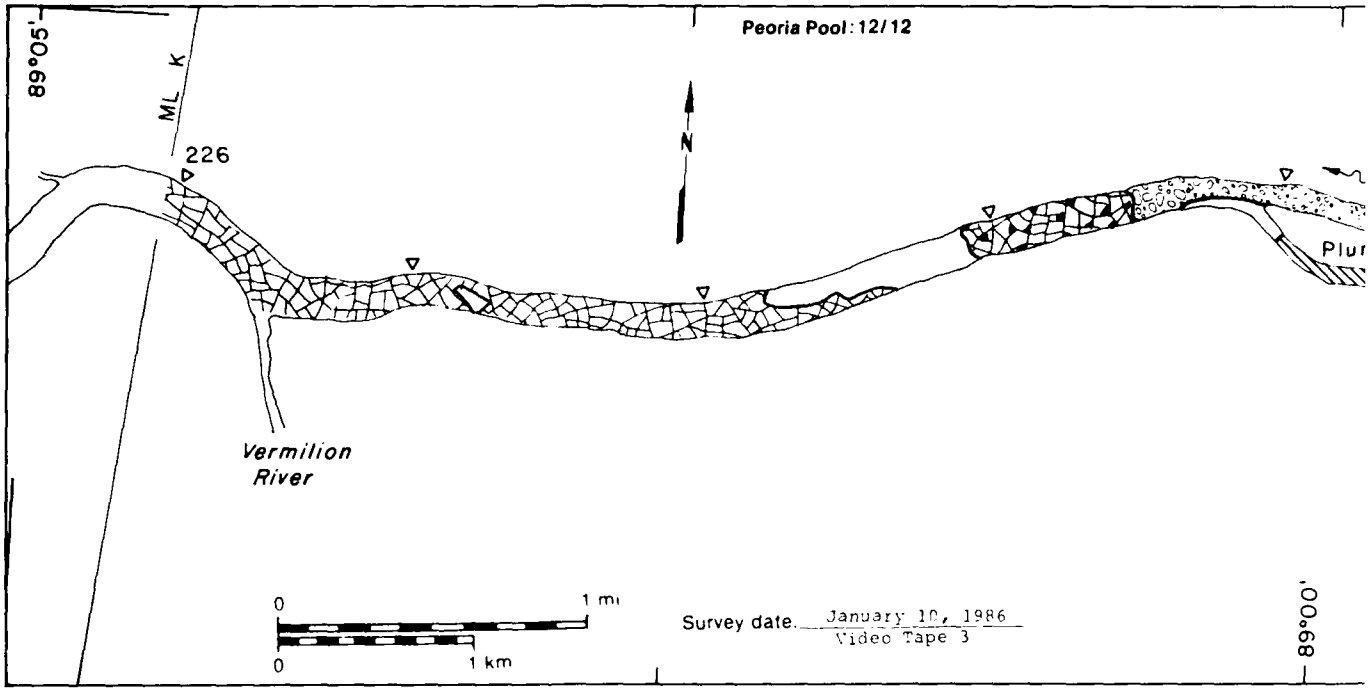


Peoria Pool : 11 / 12





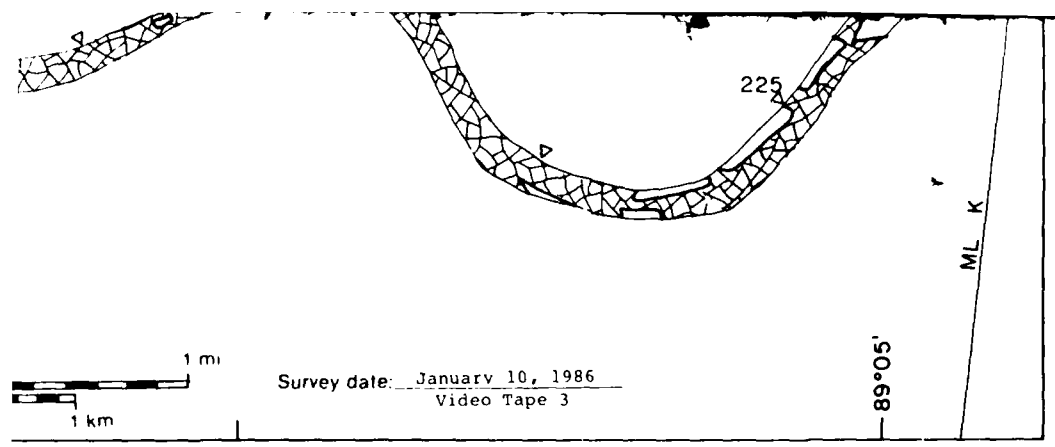


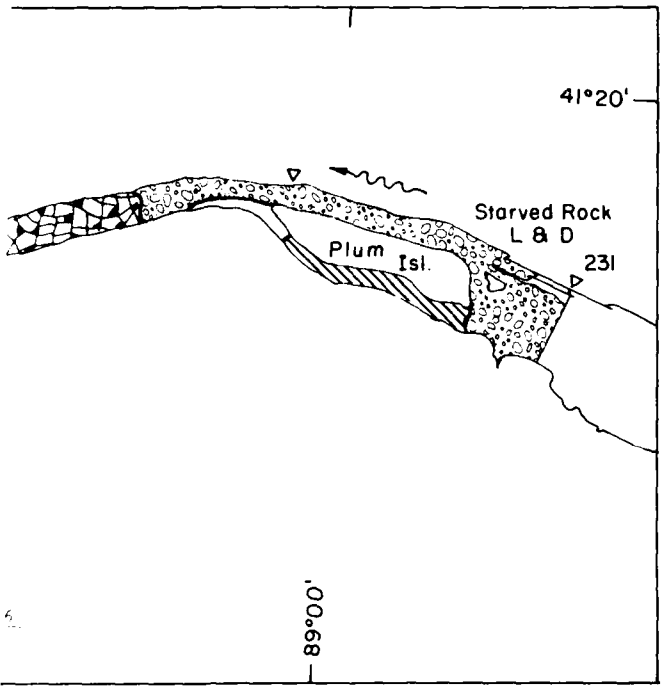


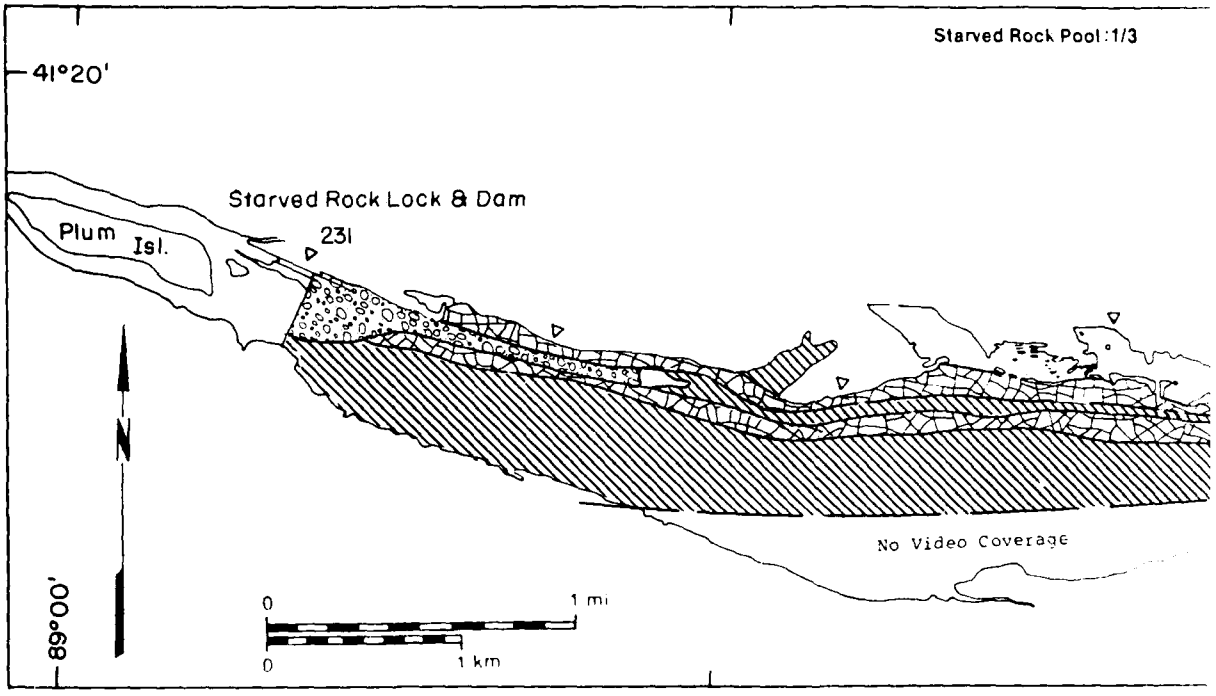
Peoria Pool

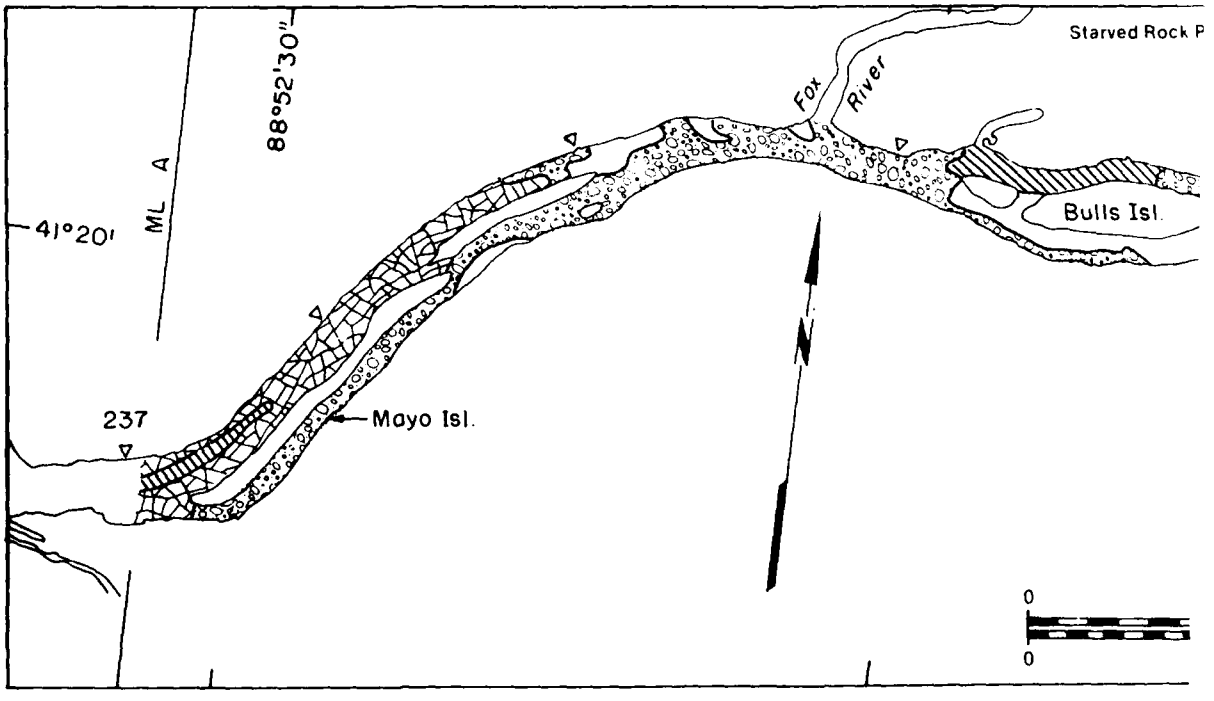
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	5.25	NA
Solid ice cover	23.10	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	26.41	NA
Fragmented ice cover with open water areas	4.24	80
Ice floes or frazil slush and pans	1.27	20
Total area ($m^2 \times 10^6$)	81.33*	

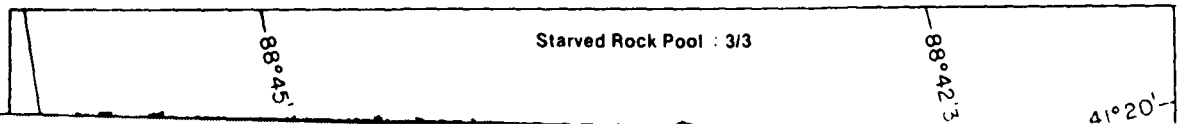
* Includes 21.06×10^6 m^2 of no video coverage


225
ML K
89°05'
1 mi
1 km
Survey date: Januarv 10, 1986
Video Tape 3

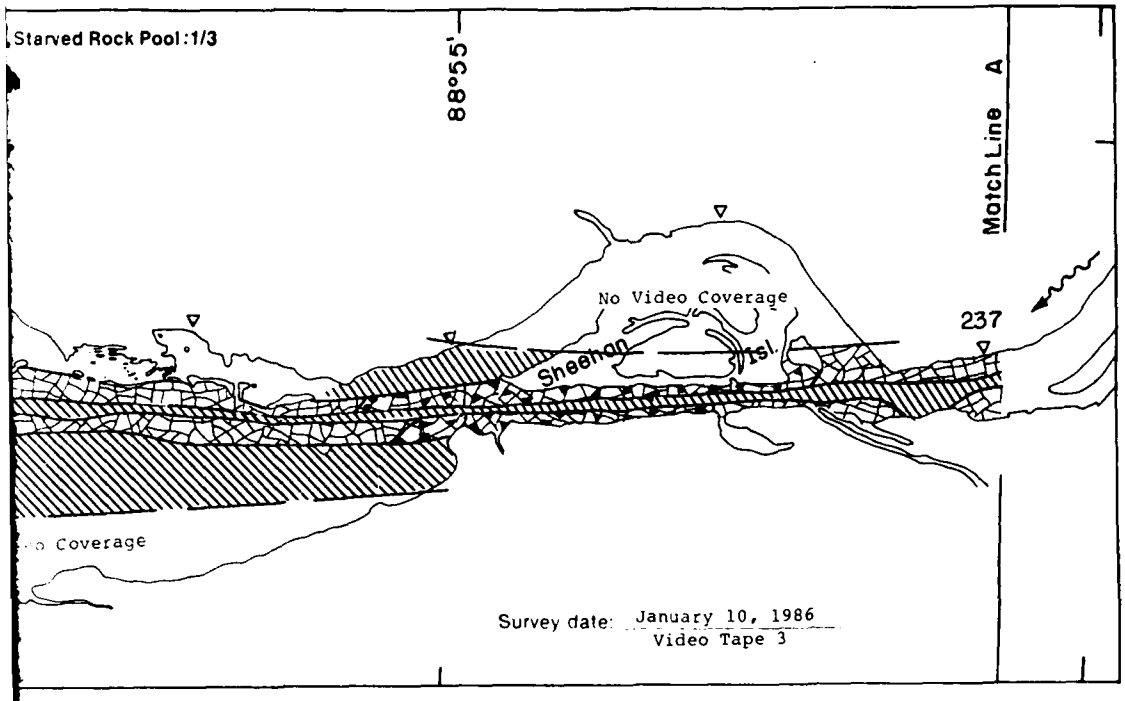

41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'

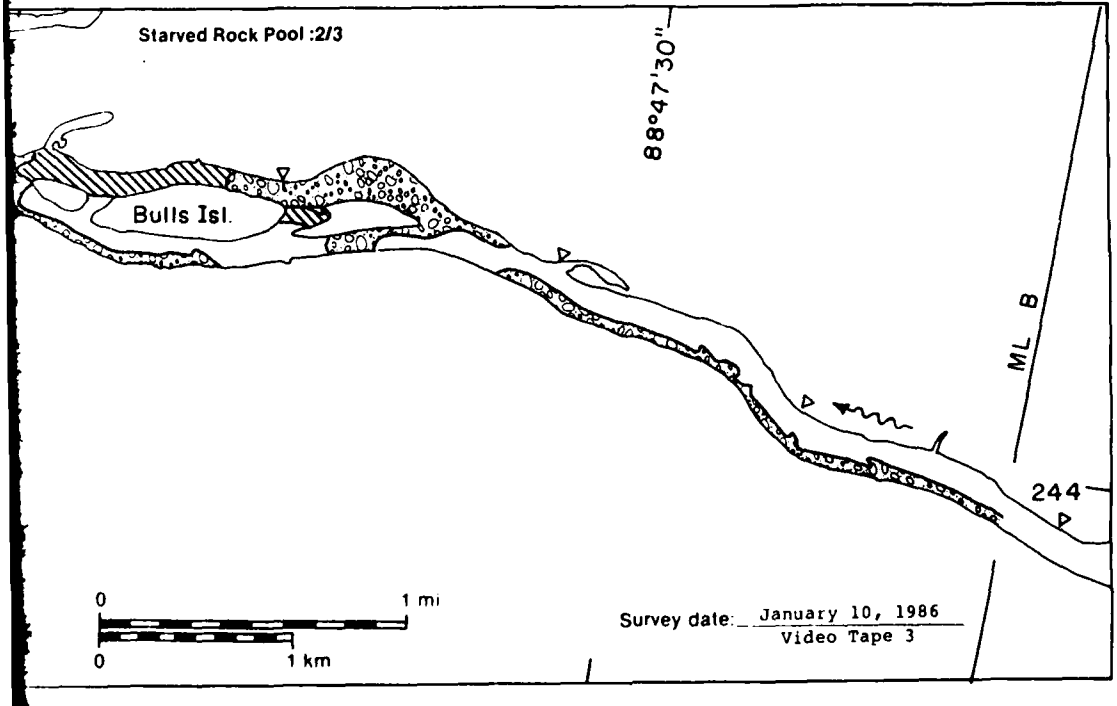

Starved Rock Pool:1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
N
No Video Coverage
89°00'
0
1 mi
0
1 km

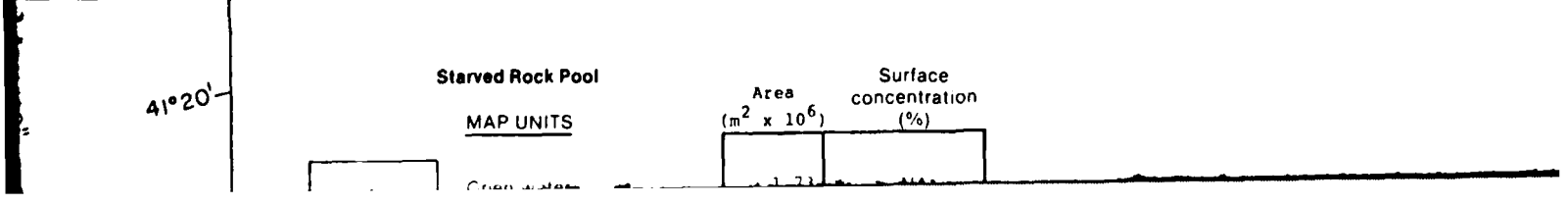

Starved Rock P
88°52'30"
Fox
River
ML A
41°20'
Bulls Isl.
237
Mayo Isl.
N
0
0

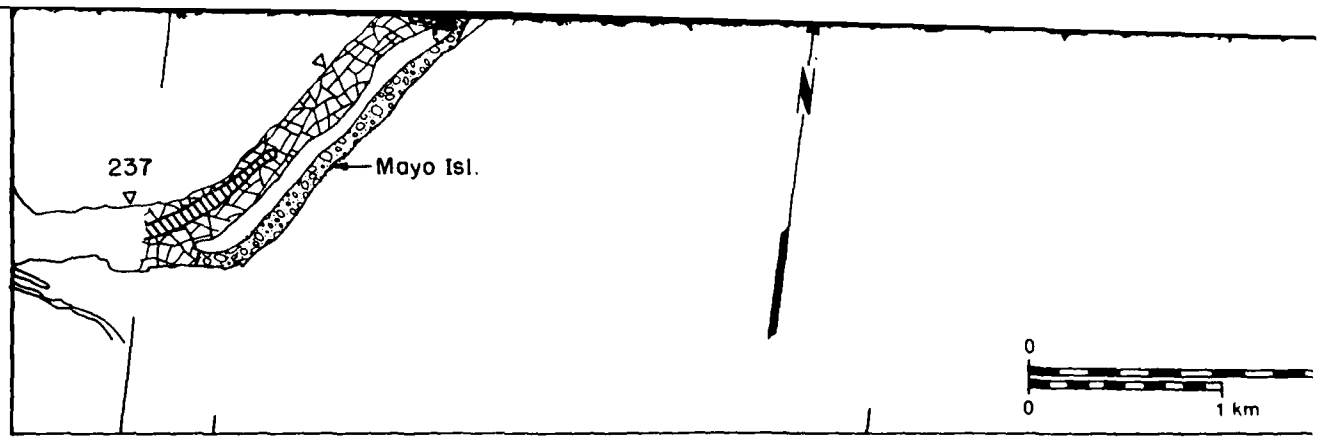

88°45'
Starved Rock Pool : 3/3
88°42'3
41°20'

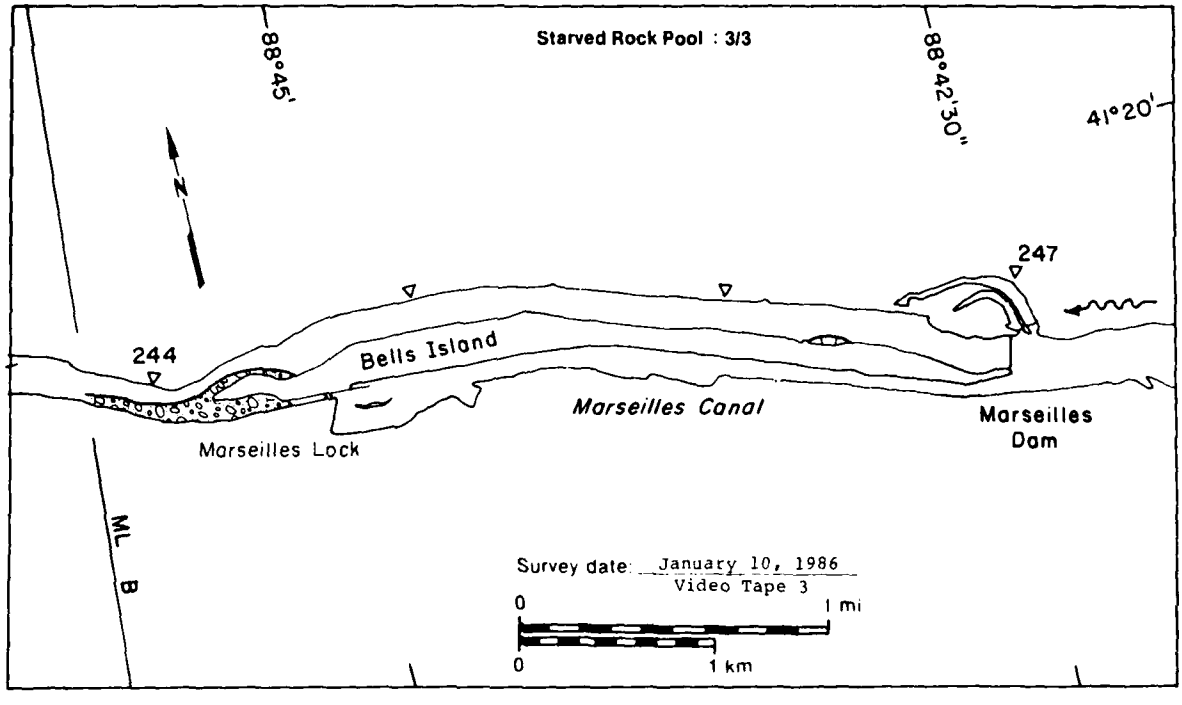
10 January 1986

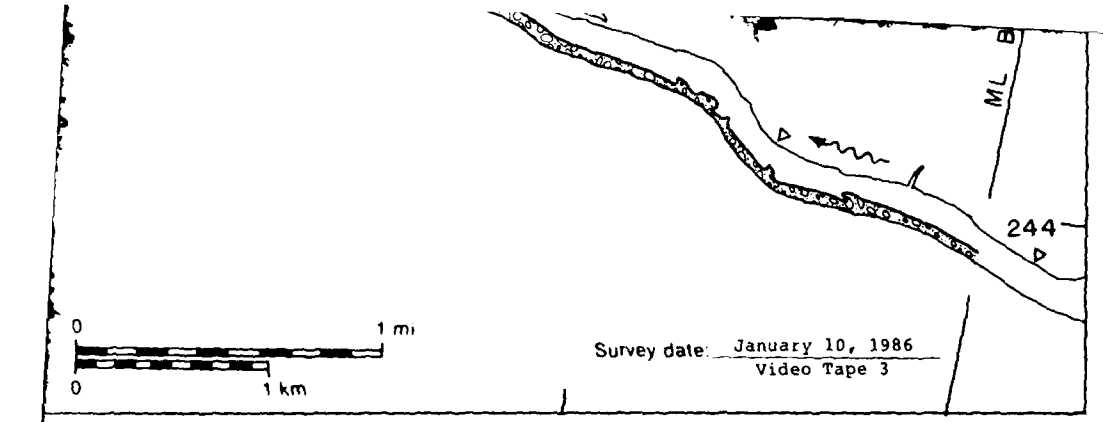


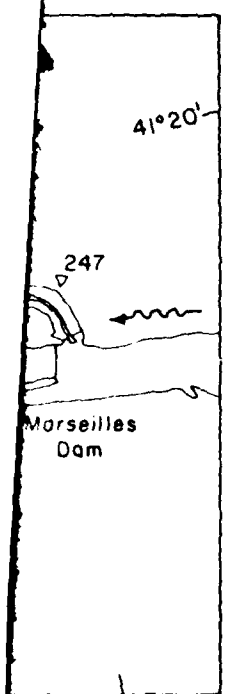





237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 10, 1986
Video Tape 3
0
1 mi
0
1 km



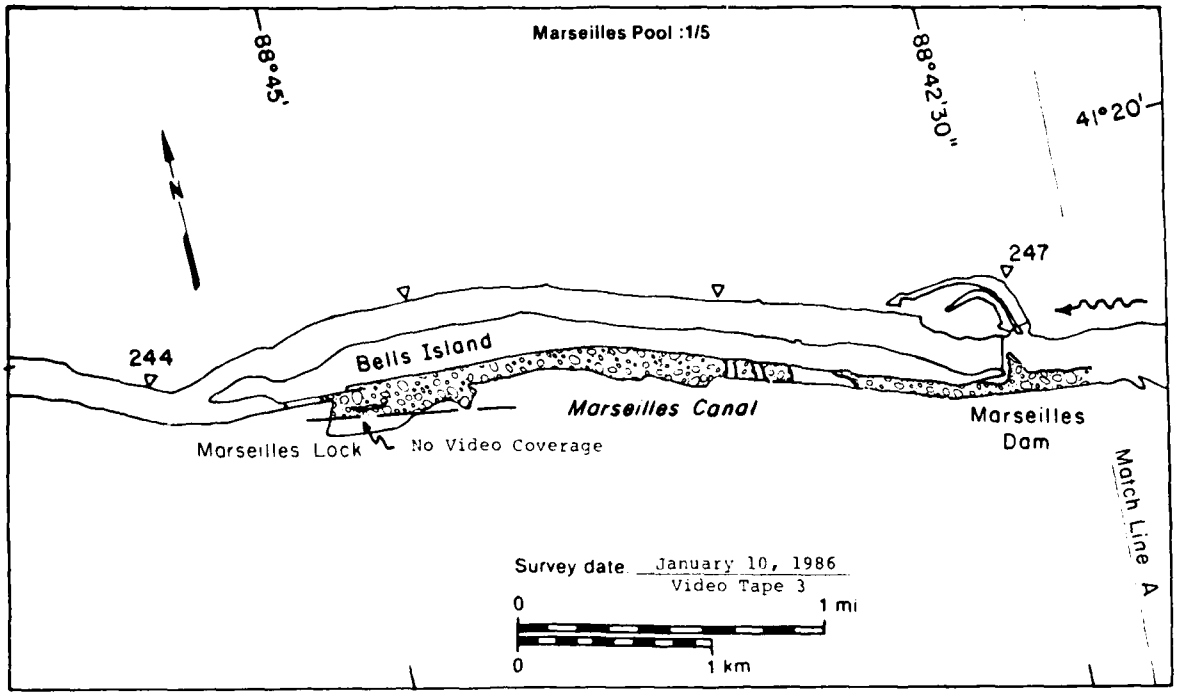


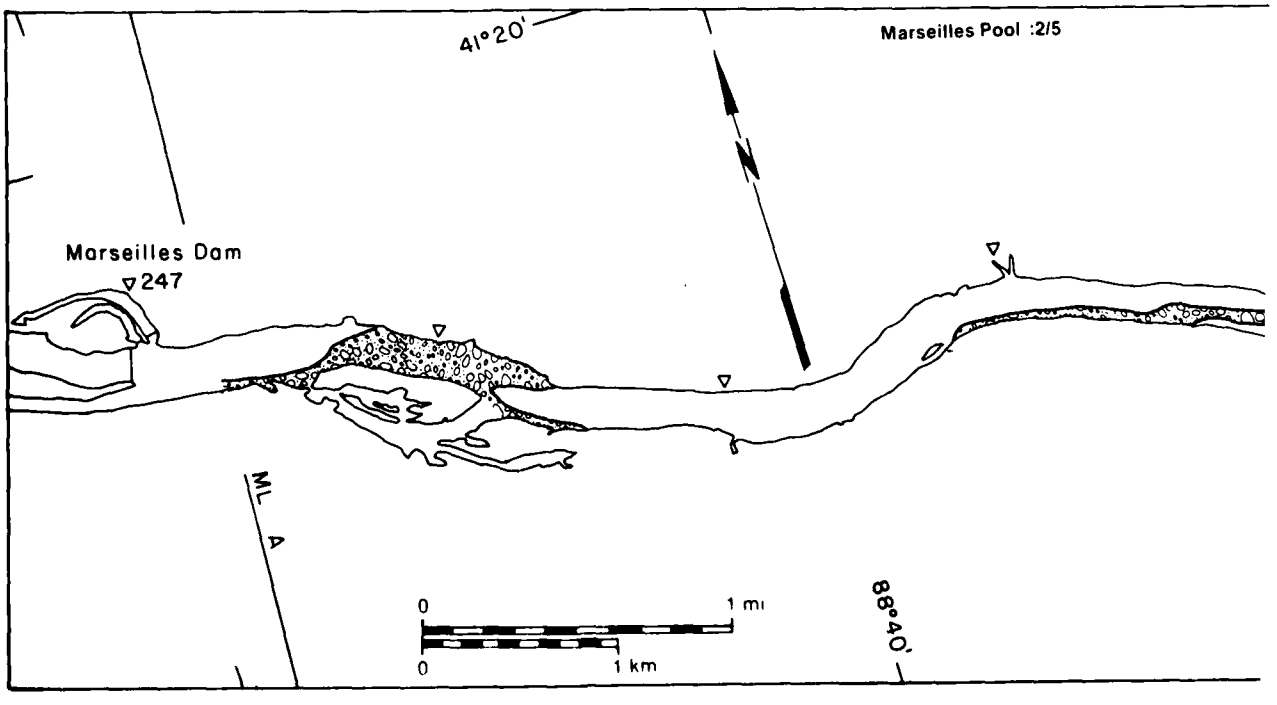
Starved Rock Pool

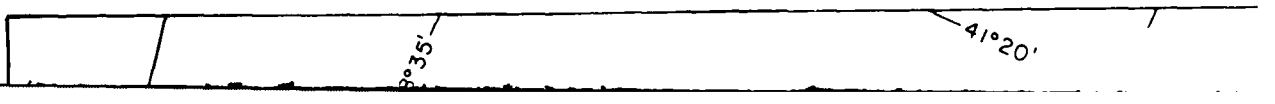
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.73	NA
Solid ice cover	3.28	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	1.65	NA
Fragmented ice cover with open-water areas	0.31	90
Ice floes or frazil slush and pans	1.65	60
Total area ($m^2 \times 10^6$)	10.19*	

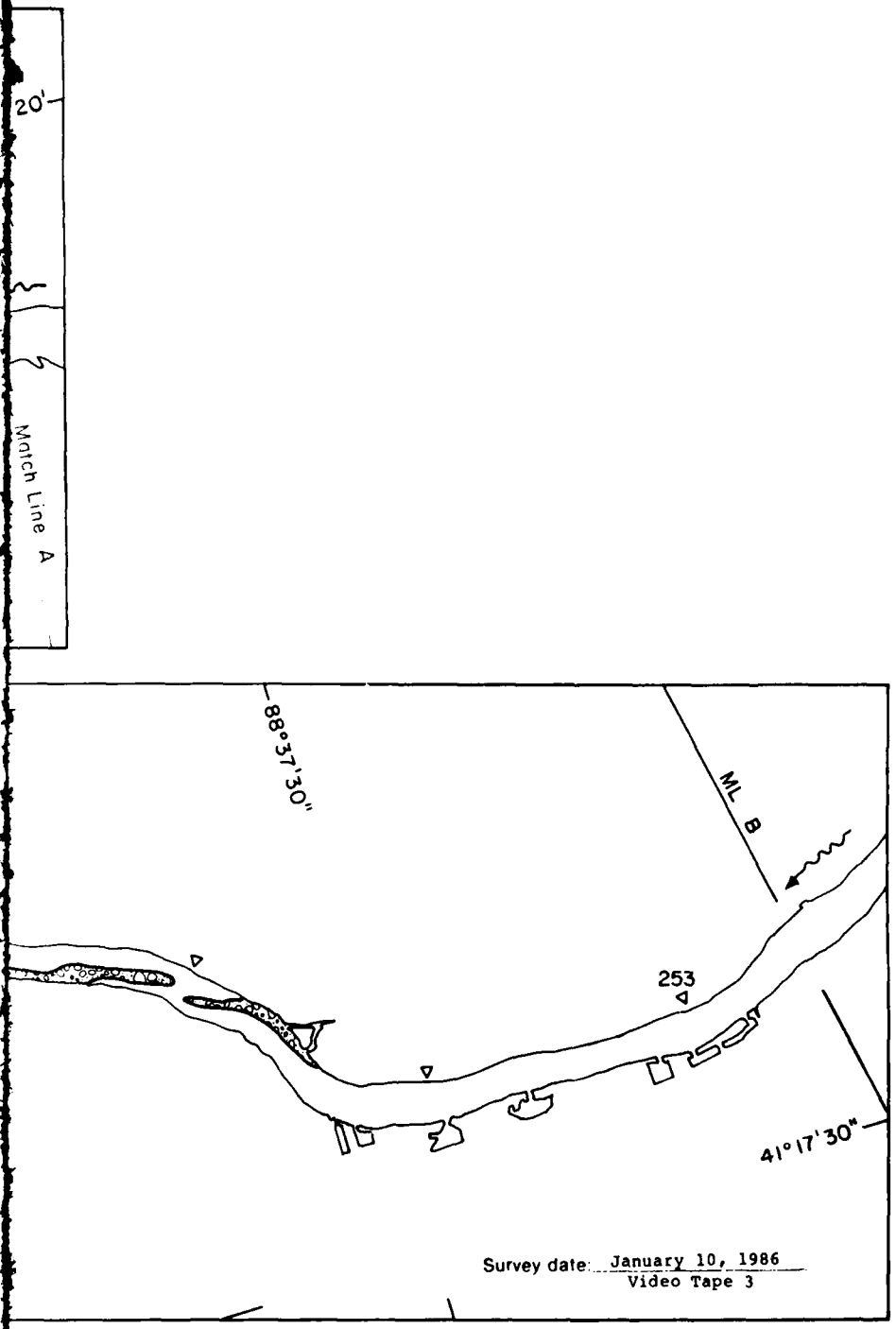
* Includes 1.57×10^6 m^2 of no video coverage

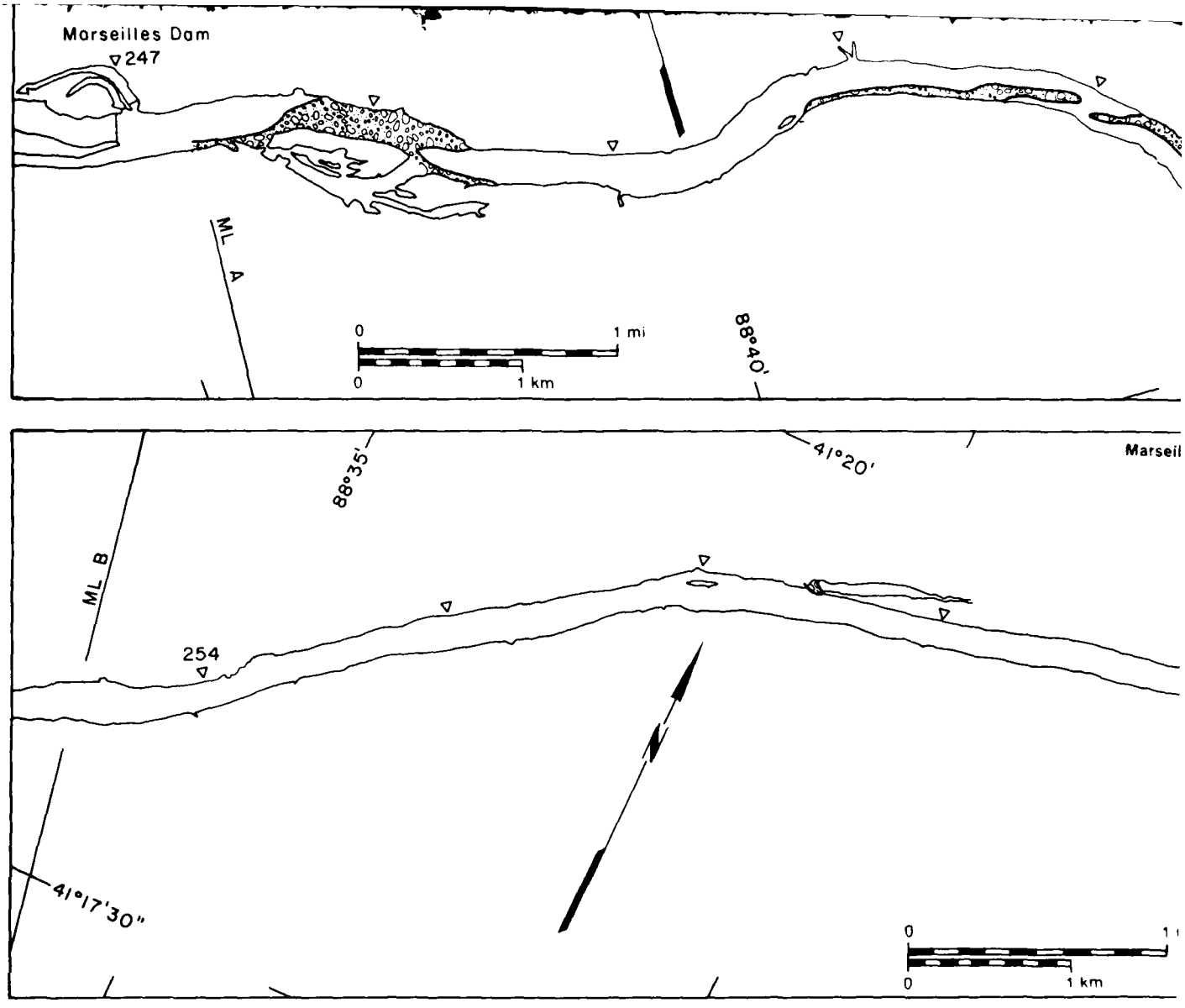
10 January 1986

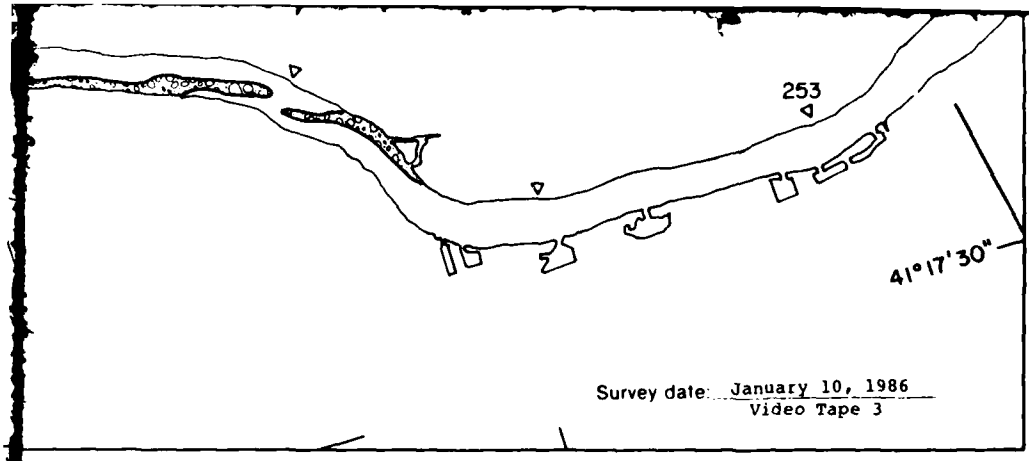




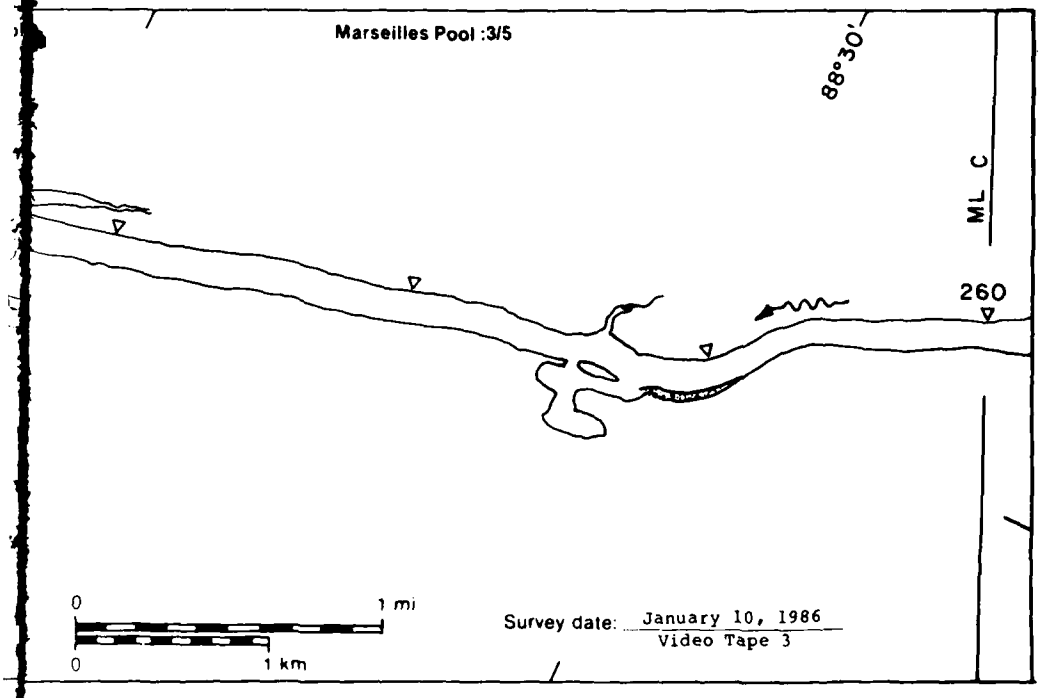



20'
Match Line A
88°37'30"
ML B
253
41°17'30"
Survey date: January 10, 1986
Video Tape 3
Marseilles Pool :3/5
88°30'
ML C

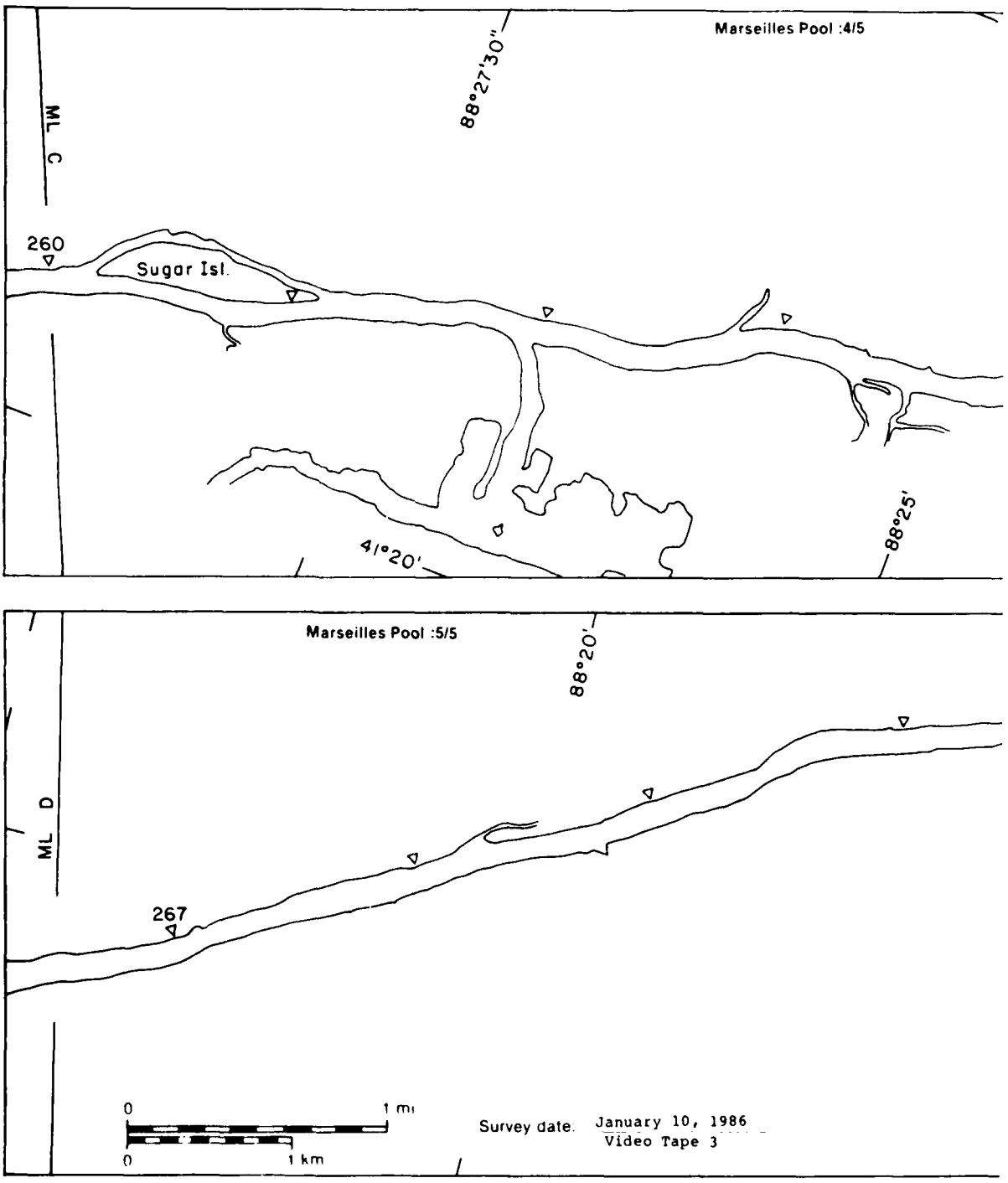

Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
Marseil
ML B
254
41°17'30"
0
1 km



Survey date: January 10, 1986
Video Tape 3



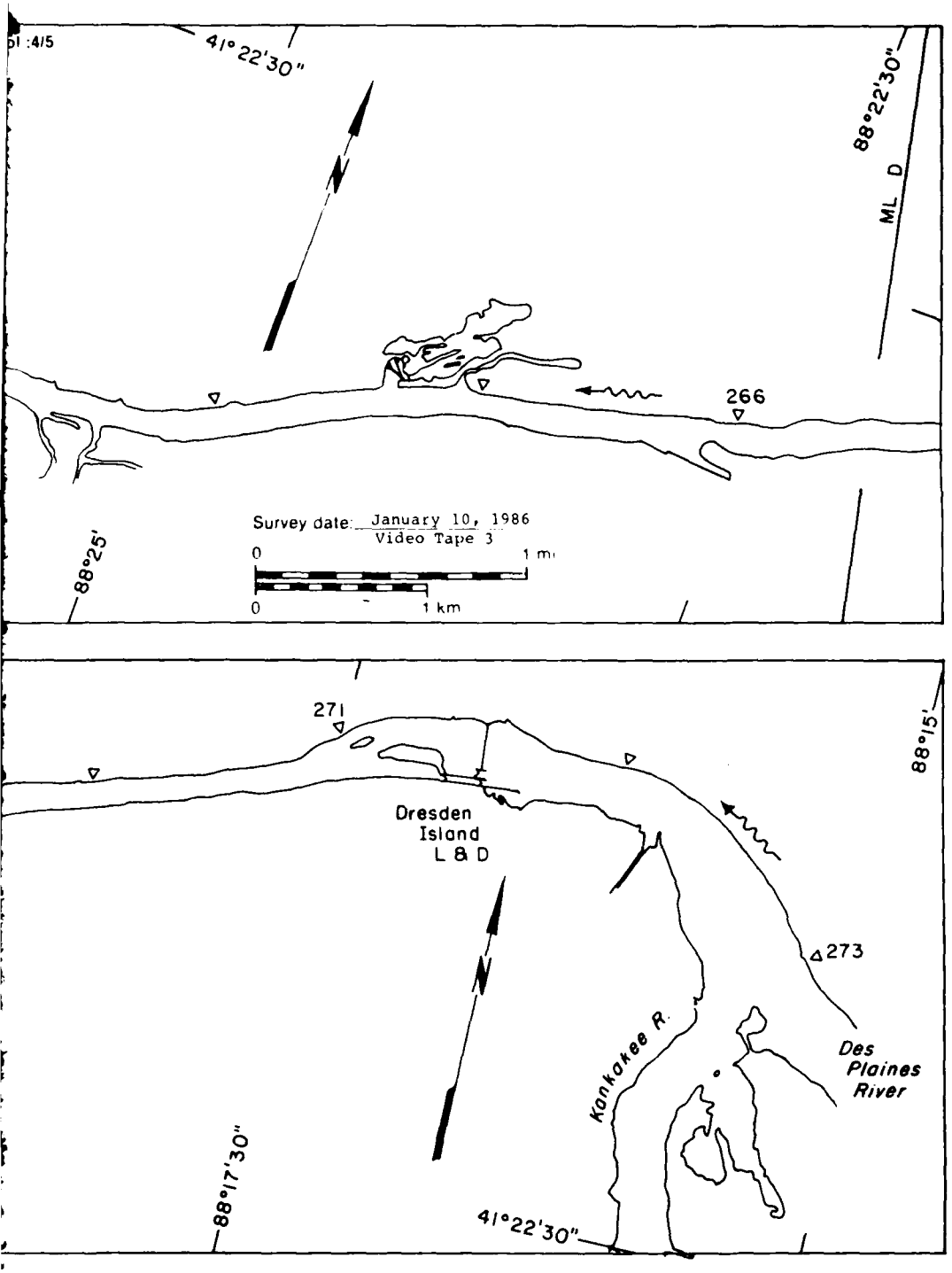
Survey date: January 10, 1986
Video Tape 3

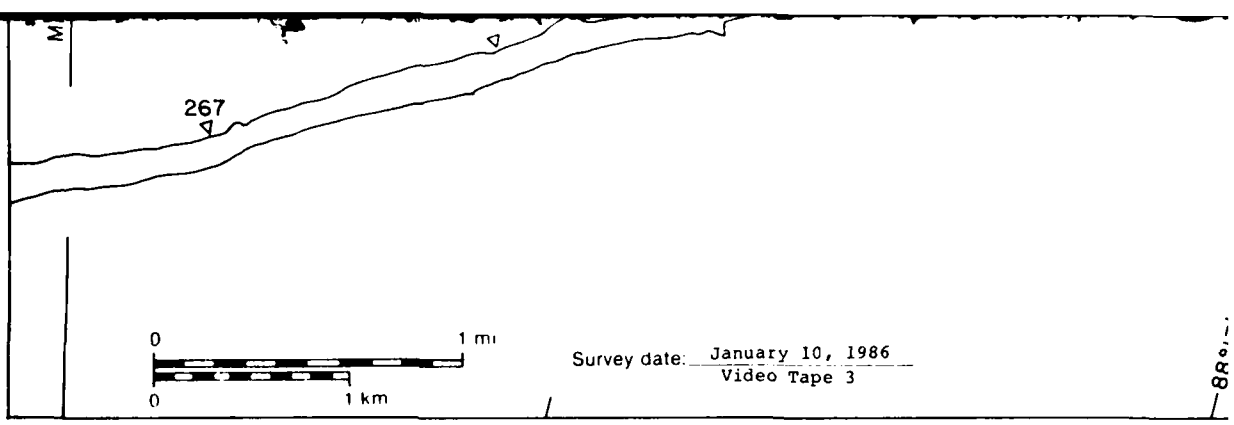


Marseilles Pool

MAP UNITS		Area ($m^2 \times 10^6$)	Surface concentration (‰)
	Open water	7.30	NA

10 January 1986





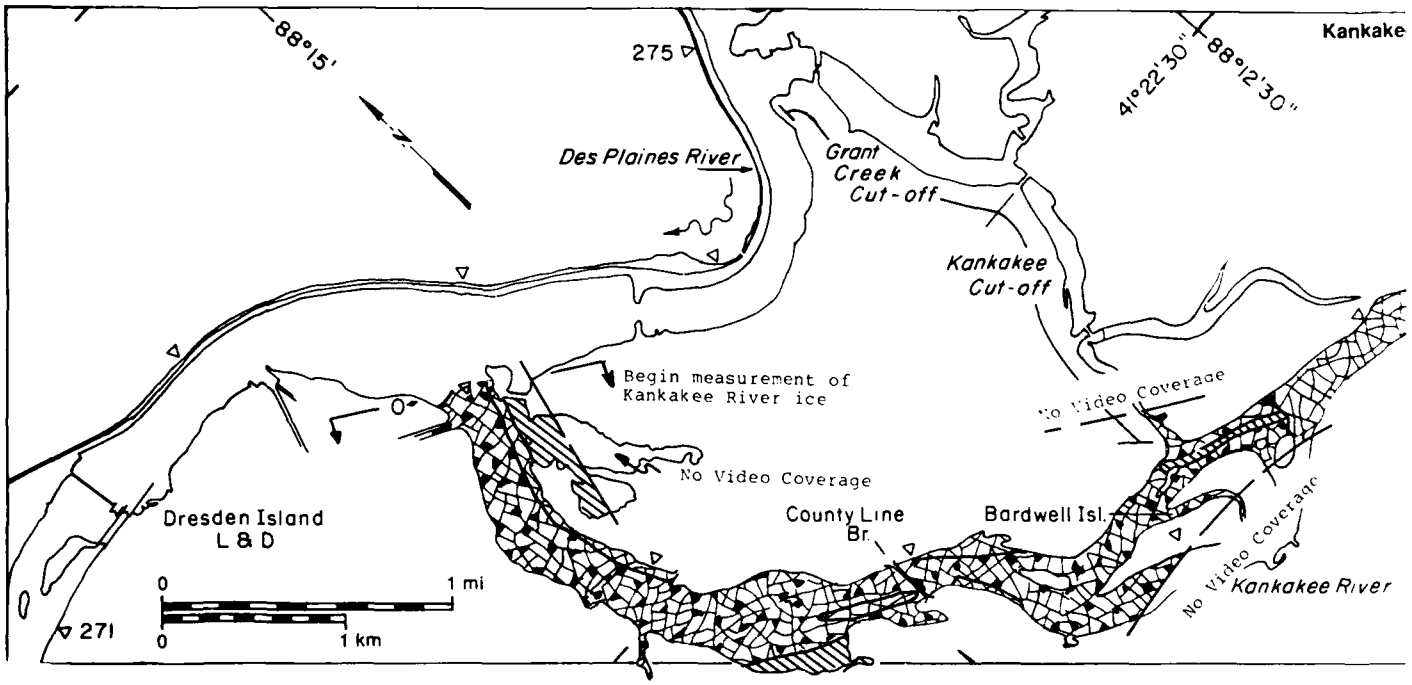
Marseilles Pool

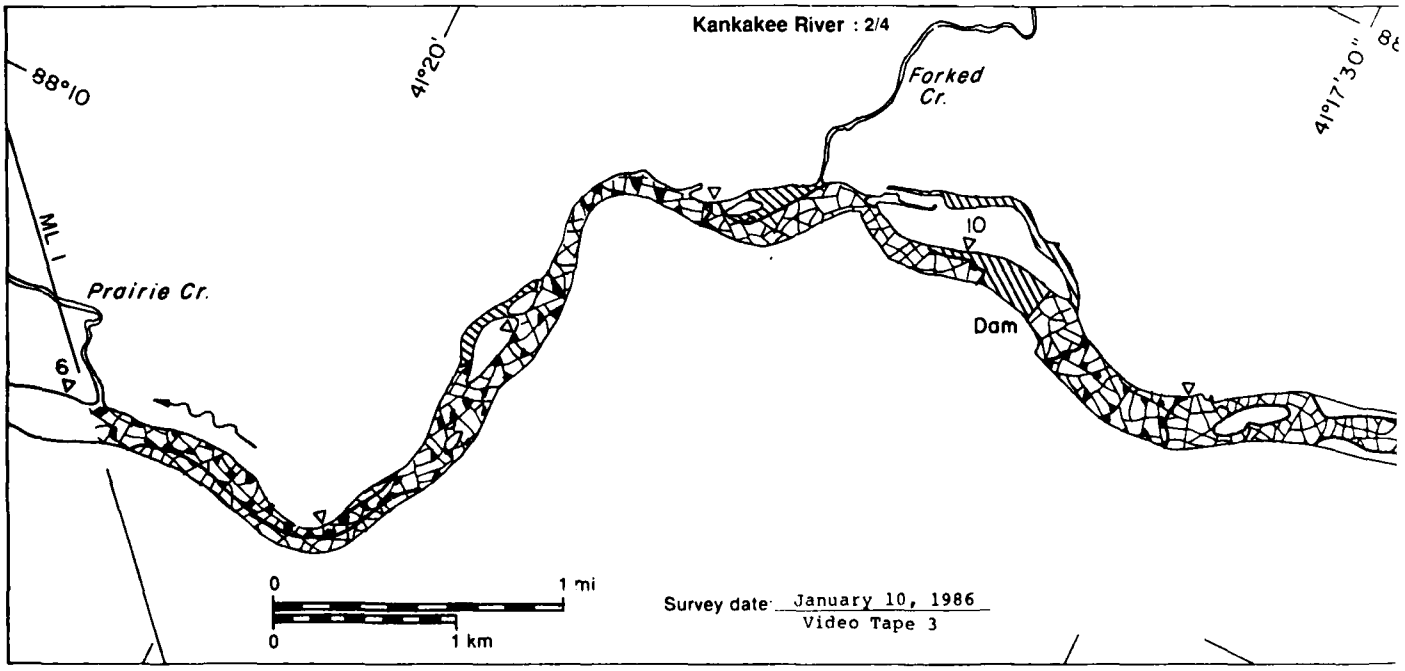
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.30	NA
Solid ice cover	Trace	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.84	60
Total area ($m^2 \times 10^6$)	8.19*	

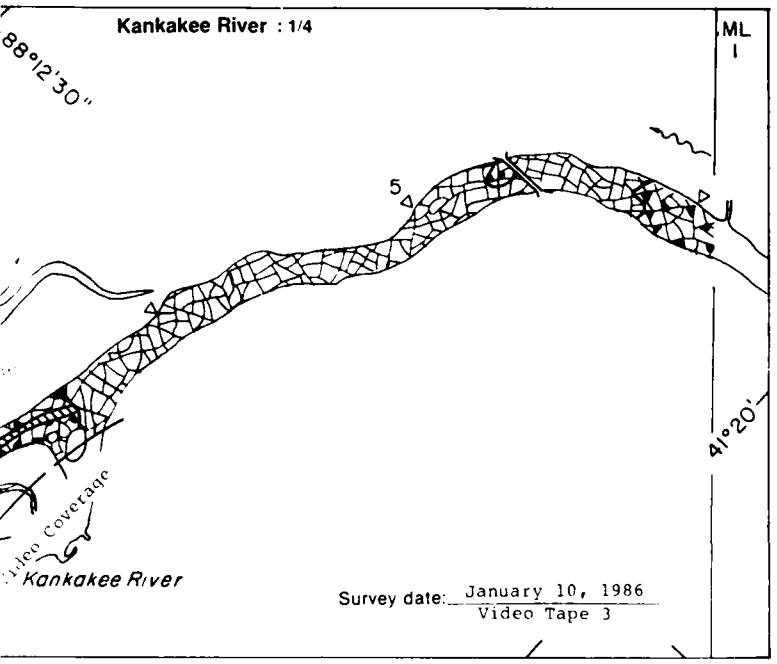
* Includes 0.05×10^6 m^2 of no video coverage

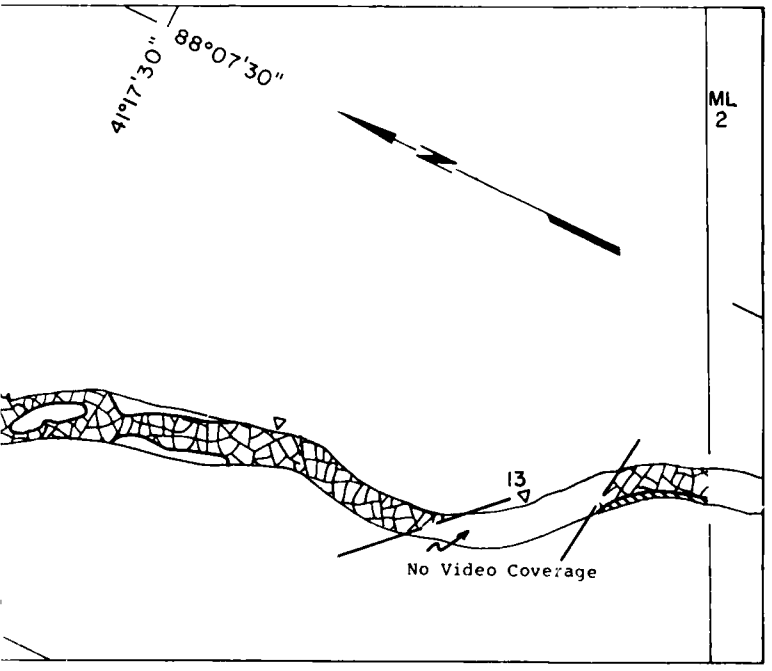
273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

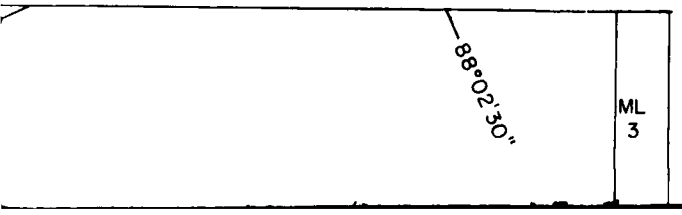
10 January 1986

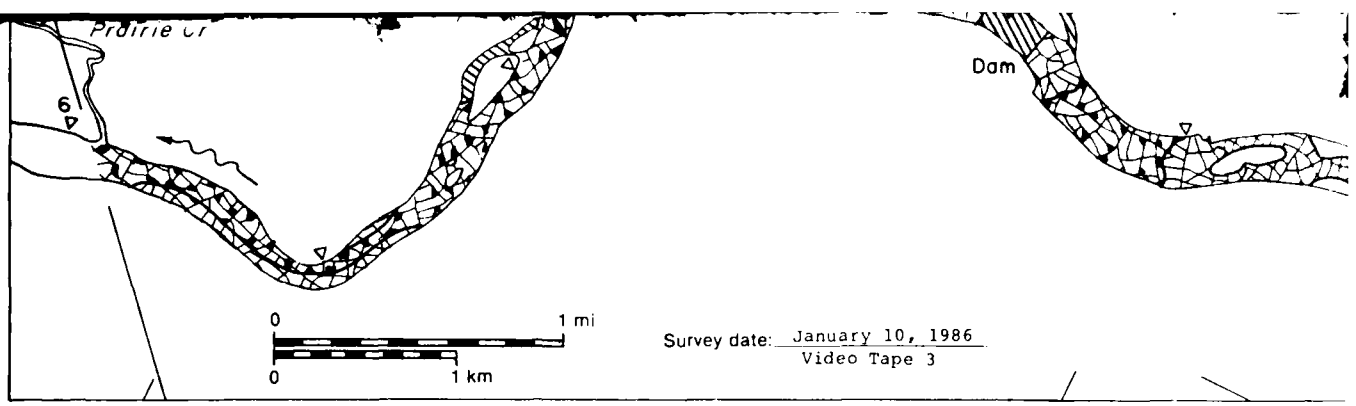


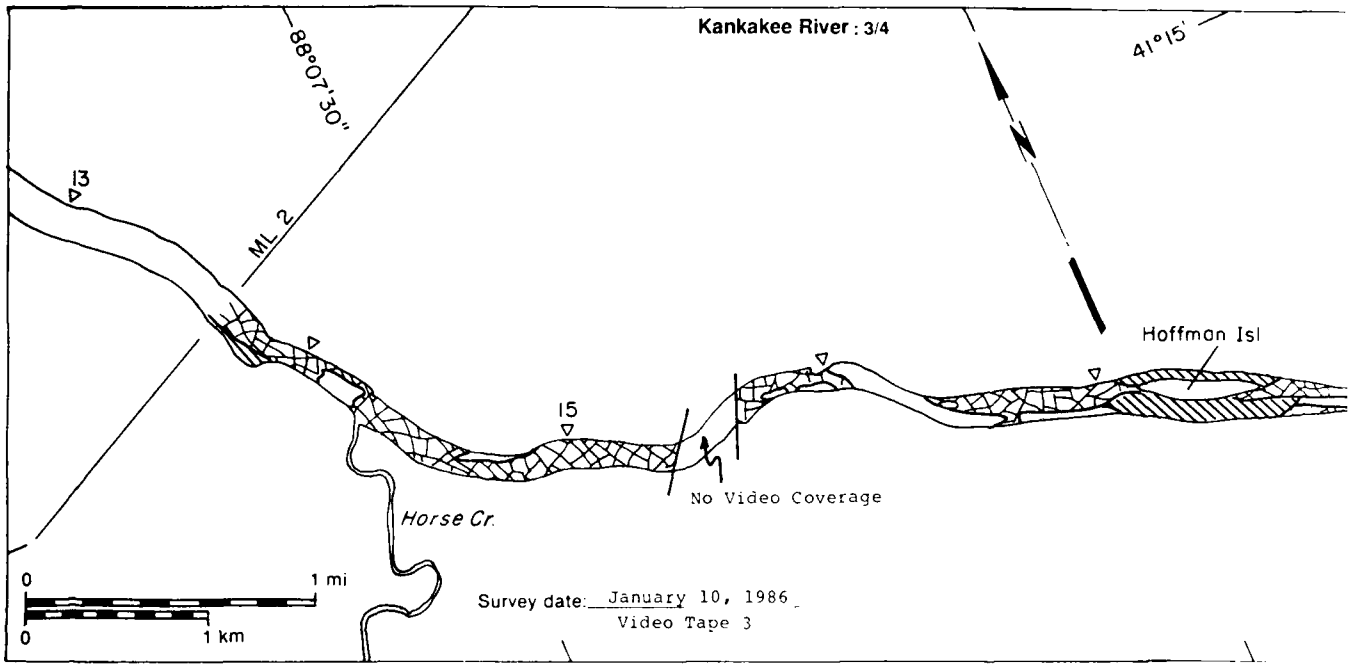


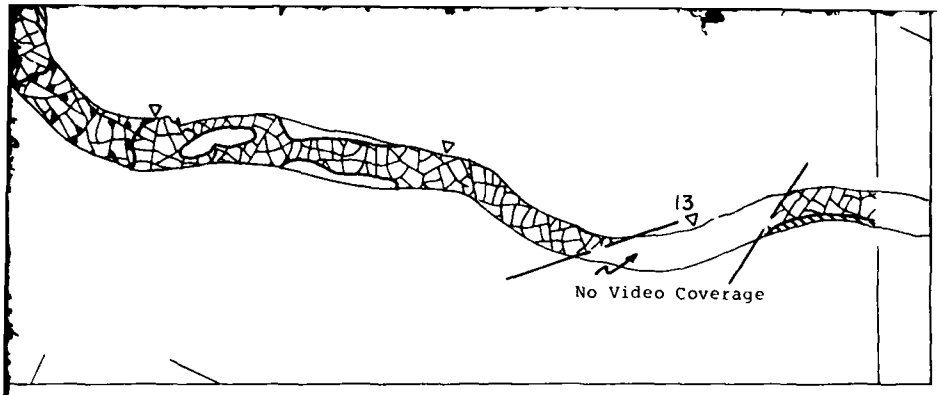

Kankakee River : 1/4
88°12'30"
ML
1
5
41°20'
Video Coverage
Kankakee River
Survey date: January 10, 1986
Video Tape 3

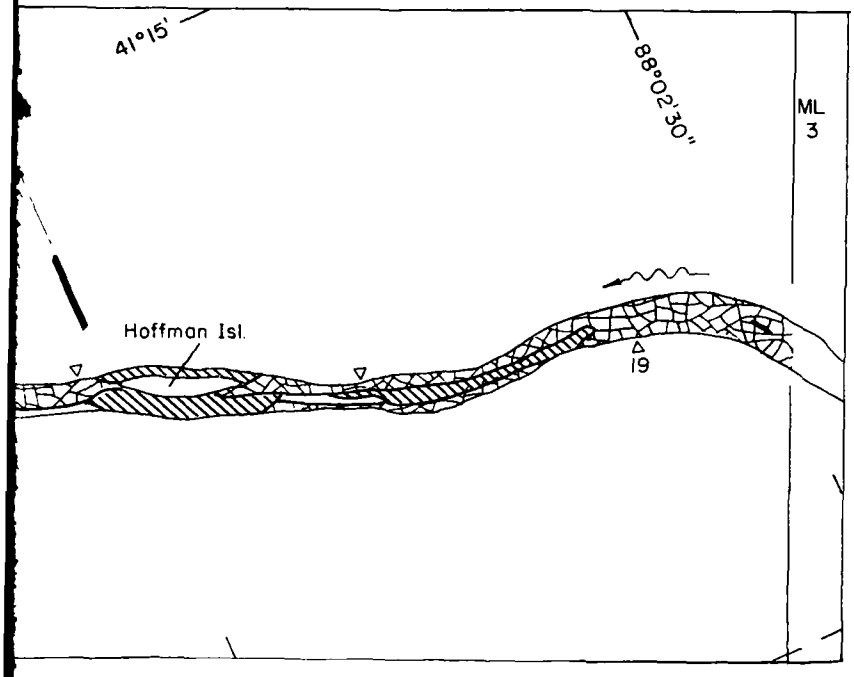

41°17'30"
88°07'30"
ML
2
13
No Video Coverage

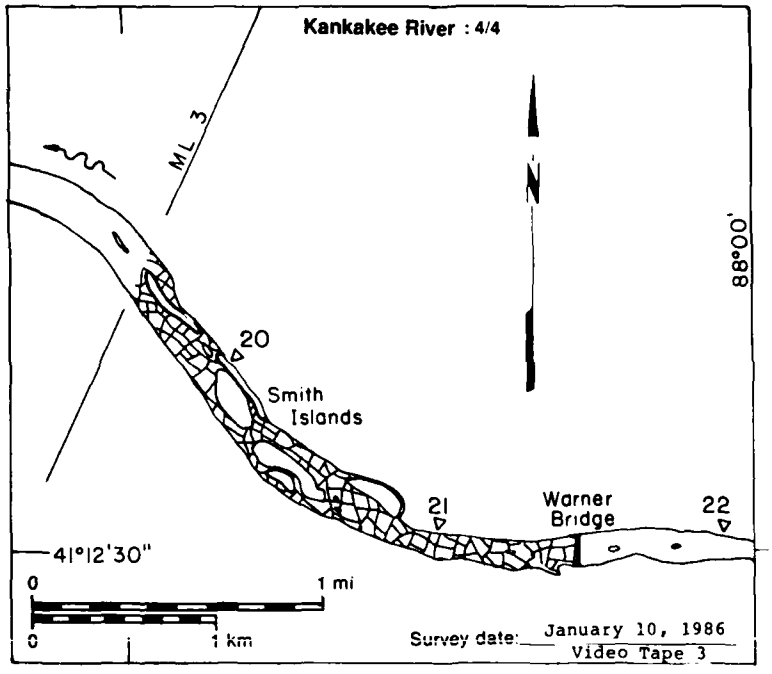

88°02'30"
ML
3


Prairie Cr
6
Dam
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
No Video Coverage
Horse Cr.
0
1 mi
0
1 km
Survey date: January 10, 1986
Video Tape 3


13
No Video Coverage


41°15'
88°02'30"
ML
3
Hoffman Isl.
19



Kankakee River

MAP UNITS

Open water

Solid ice cover

Solid ice cover with open-water areas

Fragmented ice cov

Fragmented ice cov with open-water are

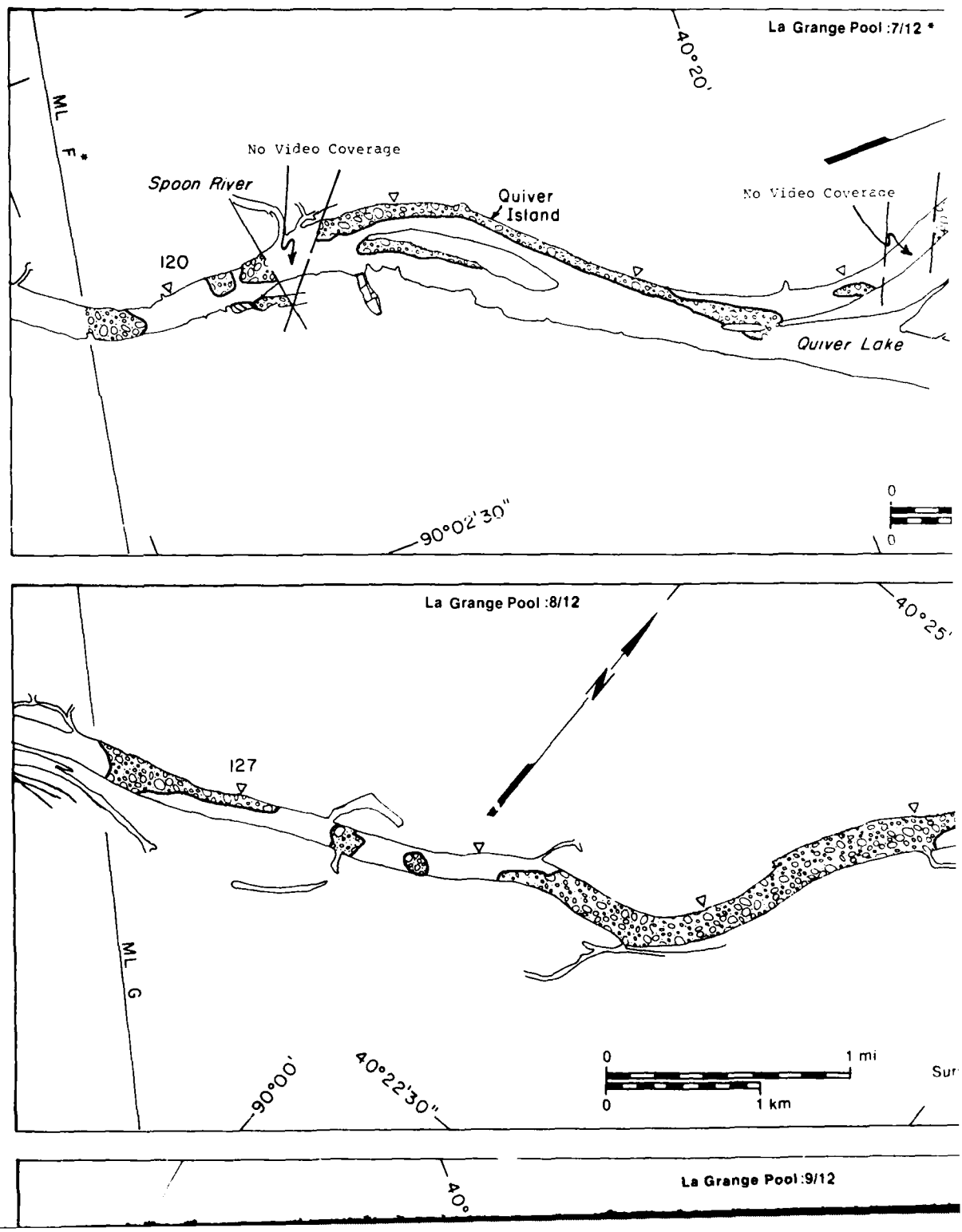
Ice floes or frazil sl and pans

Total area (m^2

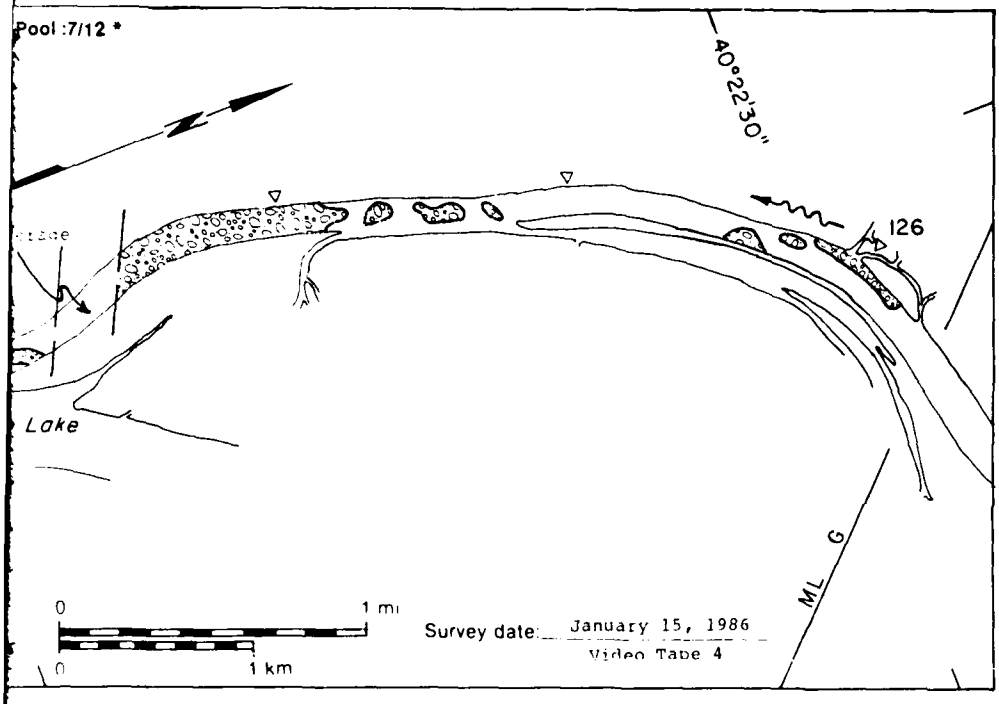
10 January 1986

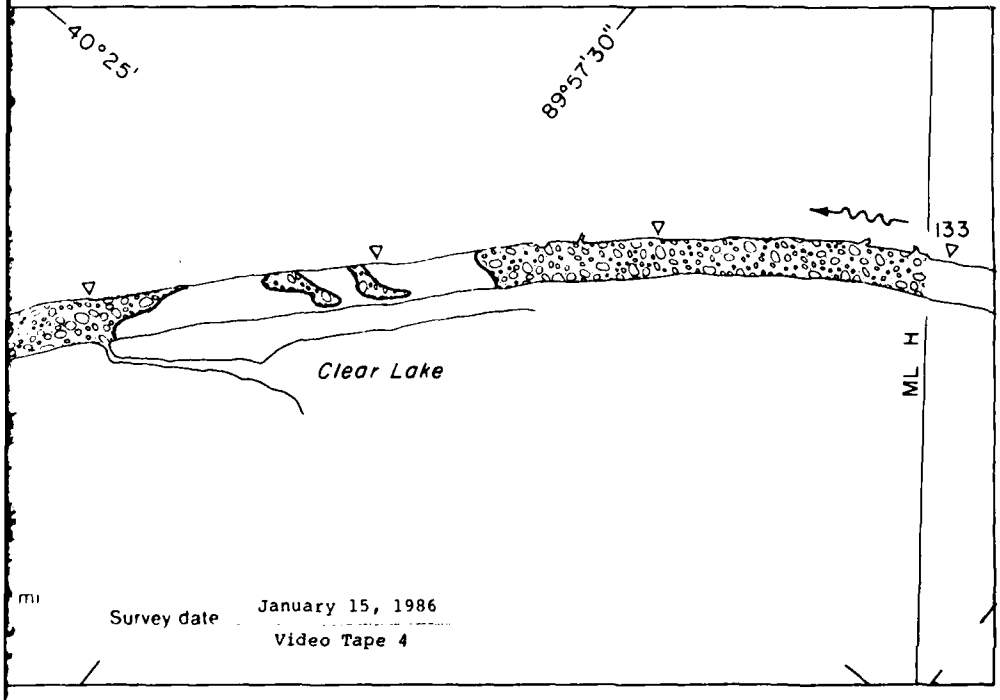
	Area ($m^2 \times 10^6$)	Surface concentration (%)
	0.24	NA
er	0.75	NA
er with reas	0.00	—
ce cover	3.37	NA
ce cover er areas	2.38	80
azil slush	0.00	—
($m^2 \times 10^6$)	7.30*	

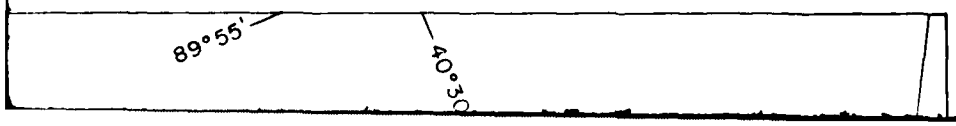
* Includes 0.56×10^6 m^2 of no video coverage

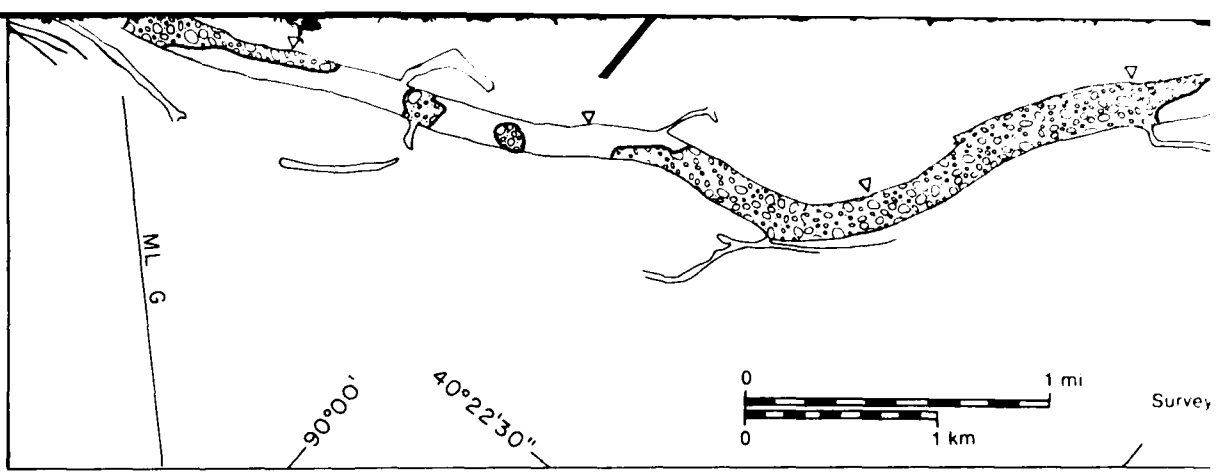

La Grange Pool :7/12 *
40°20'
ML F *
No Video Coverage
Spoon River
Quiver Island
No Video Coverage
120
Quiver Lake
90°02'30"
0
0
La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
La Grange Pool :9/12
40°

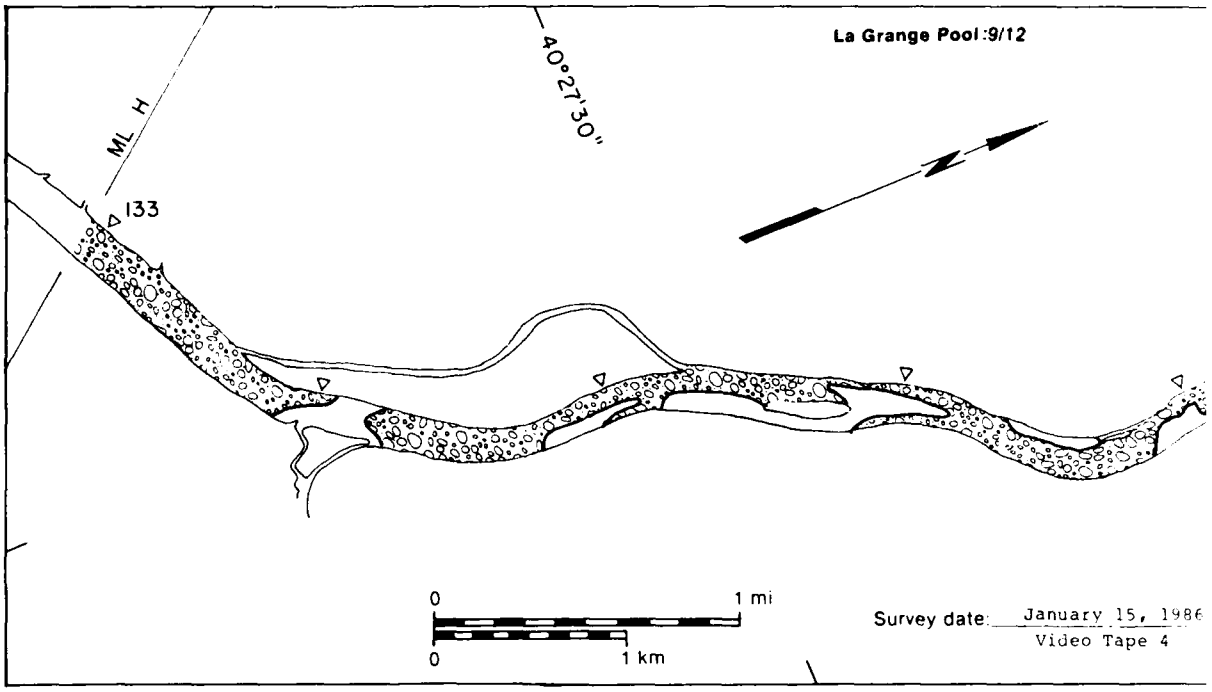
15 January 1986



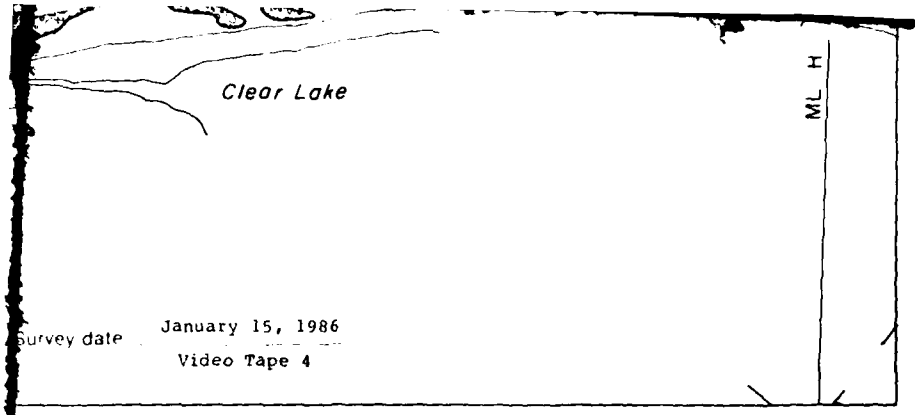


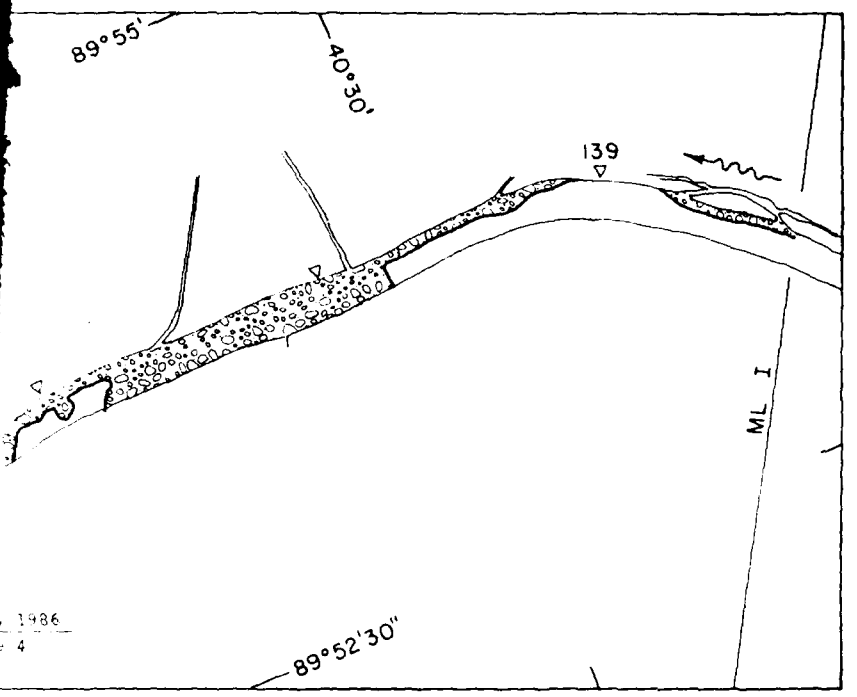




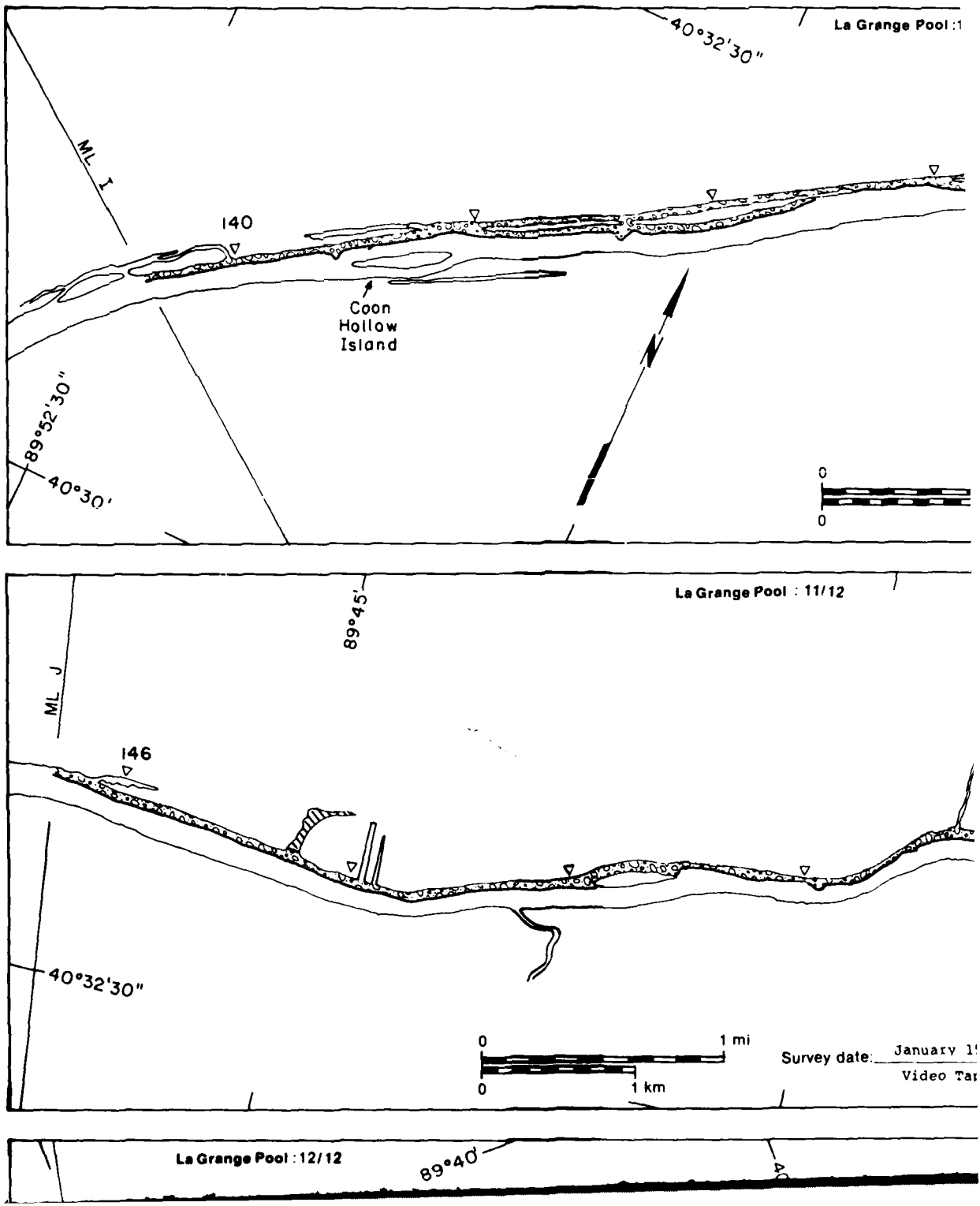


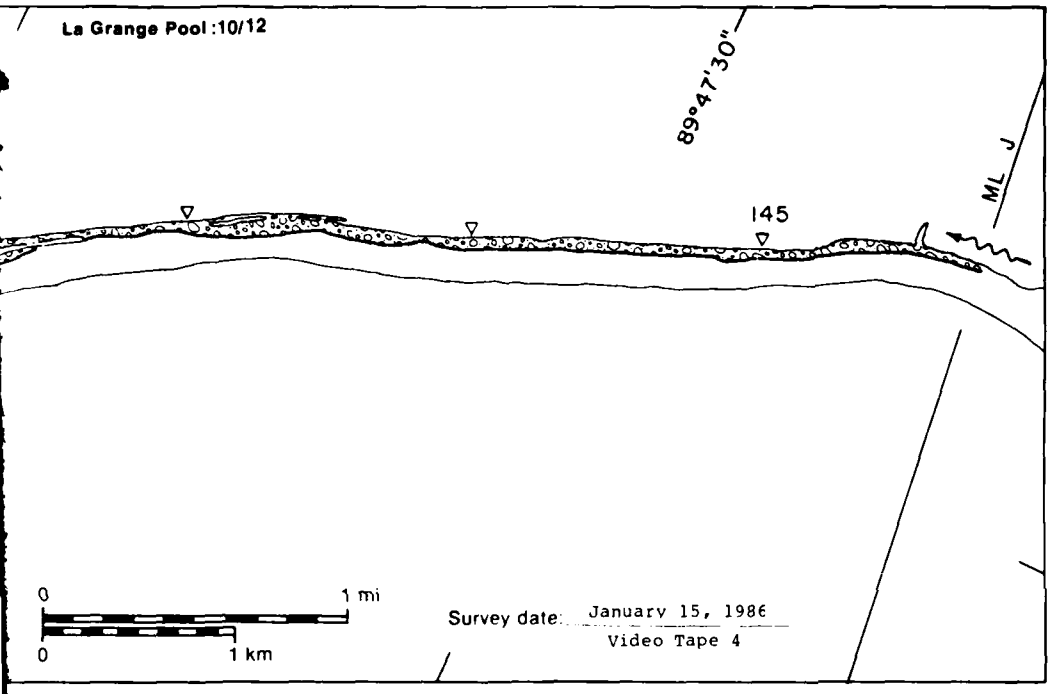
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

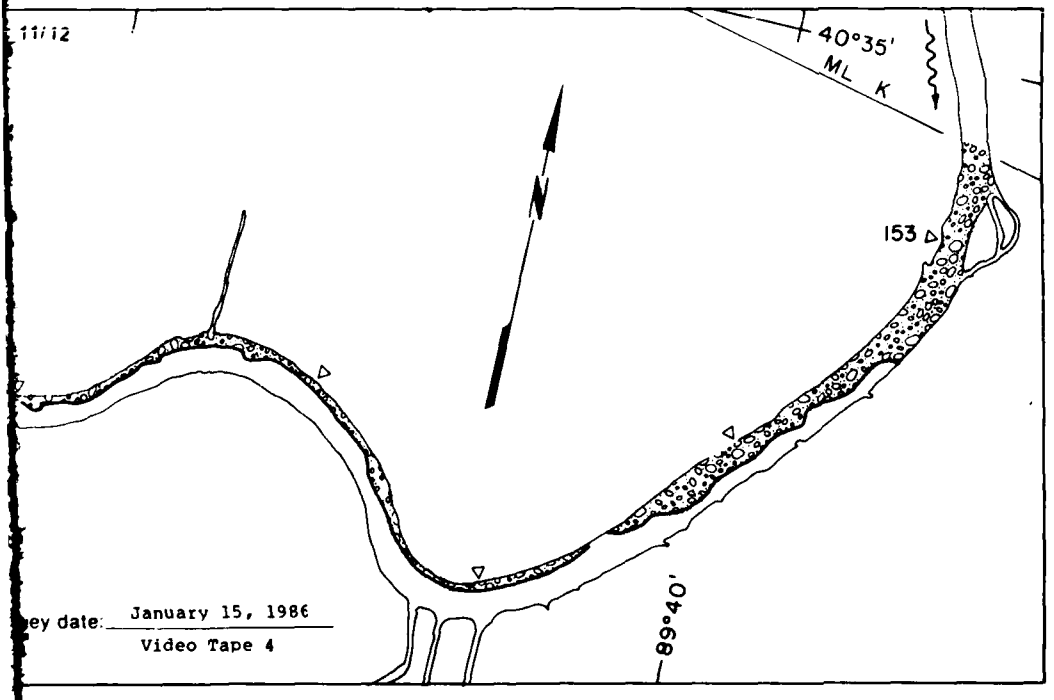

Clear Lake
ML H
Survey date January 15, 1986
Video Tape 4


89°55'
40°30'
139
ML I
89°52'30"

15 January 1986



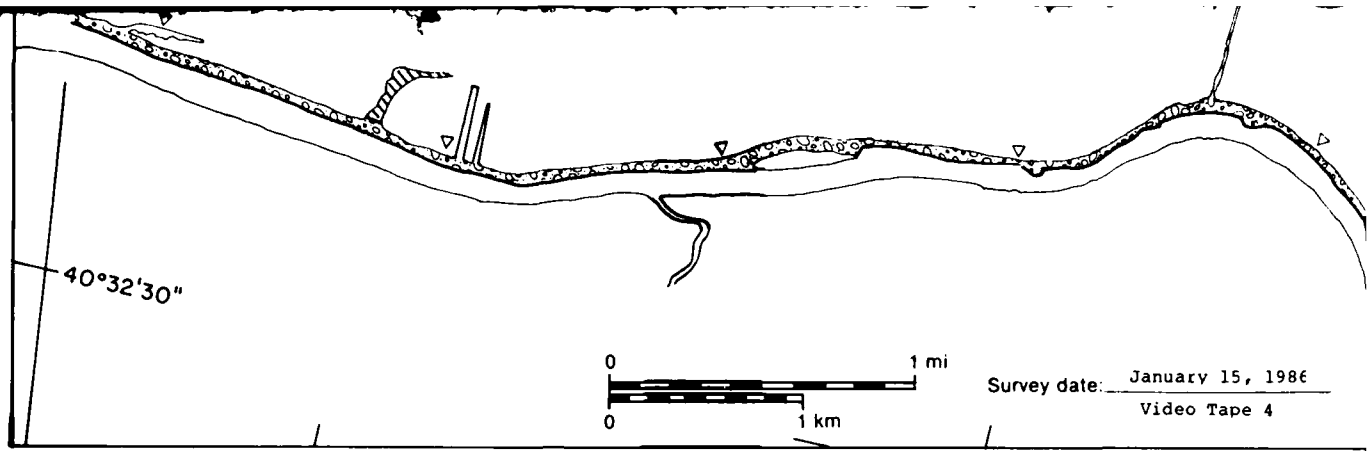


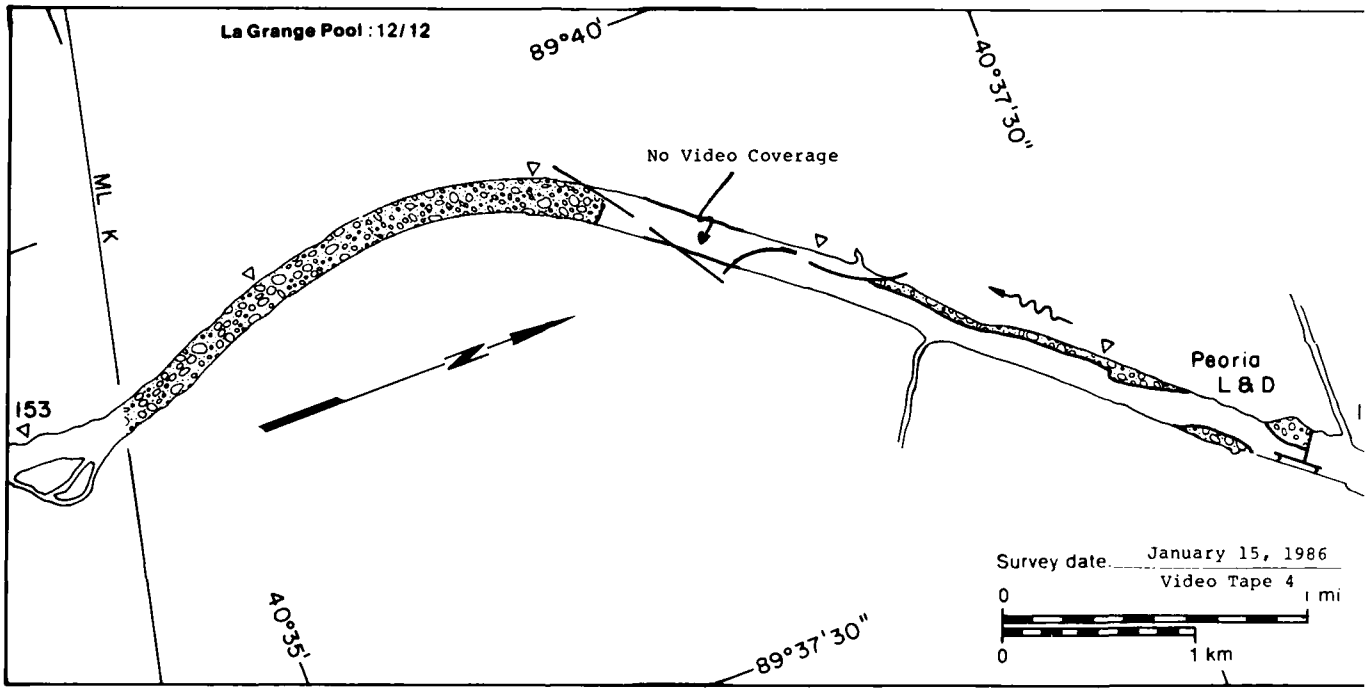


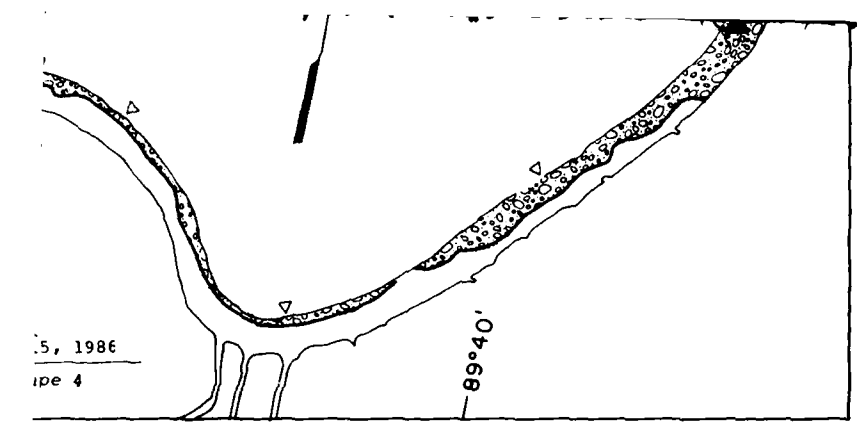
La Grange Pool

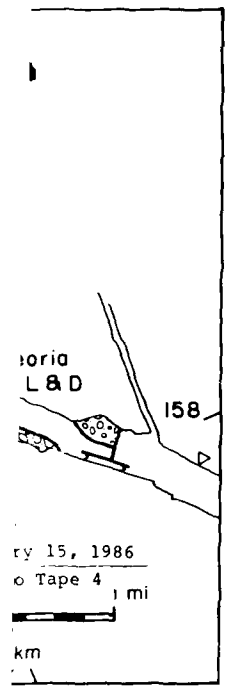
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.26	NA


40°32'30"
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4


La Grange Pool : 12/12
89°40'
40°37'30"
No Video Coverage
ML K
153
Peoria
L&D
Survey date: January 15, 1986
Video Tape 4
0
1 mi
0
1 km
40°35'
89°37'30"

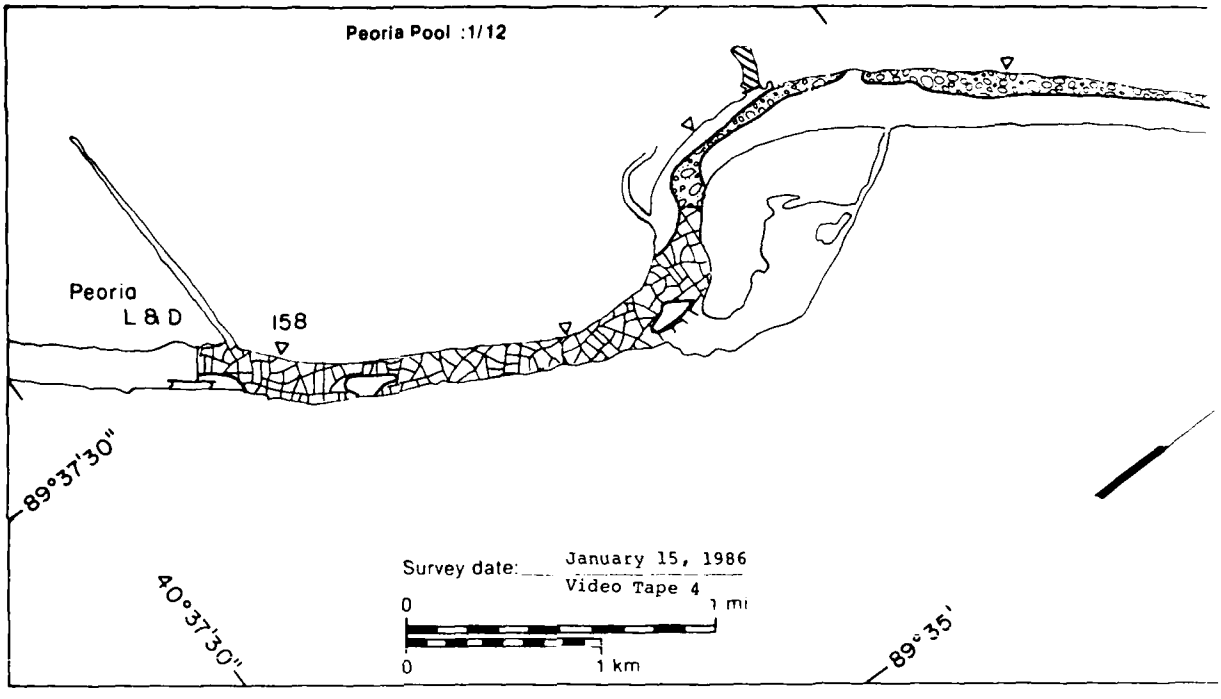


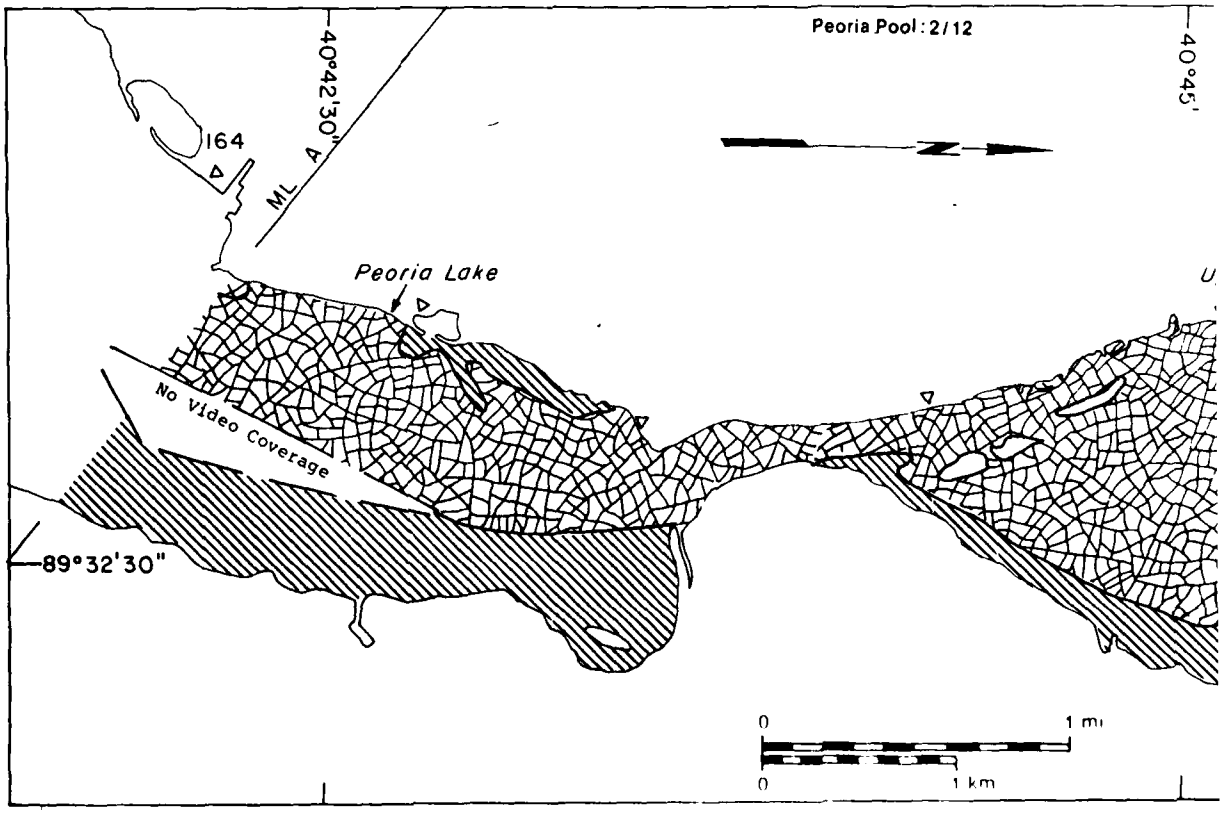


La Grange Pool

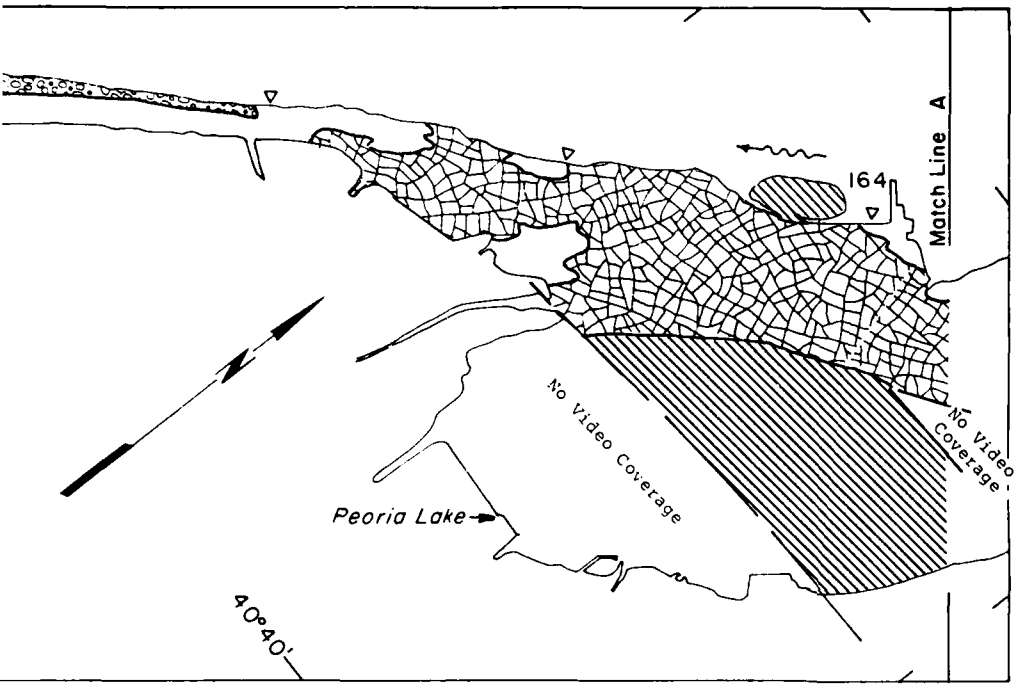
MAP UNITS		Area ($m^2 \times 10^6$)	Surface concentration (%)
	Open water	5.26	NA
	Solid ice cover	0.04	NA
	Solid ice cover with open-water areas	0.00	—
	Fragmented ice cover	0.04	NA
	Fragmented ice cover with open-water areas	0.00	—
	Ice floes or frazil slush and pans	6.06	30
	Total area ($m^2 \times 10^6$)	11.71*	

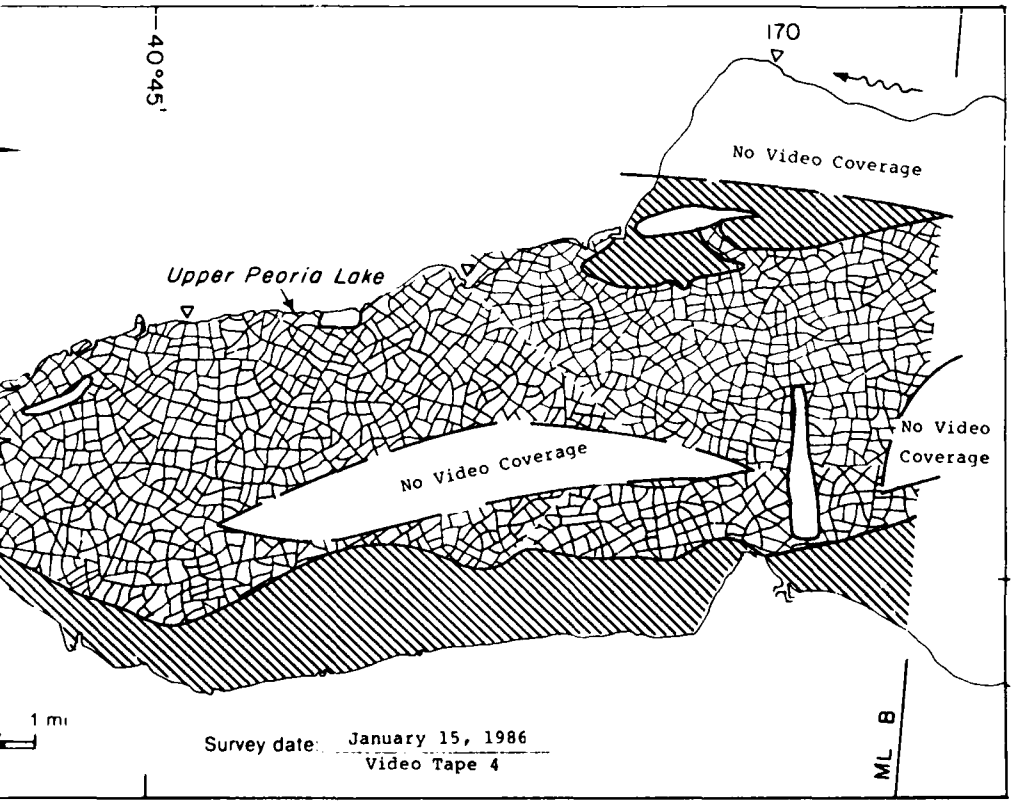
* Includes 0.31×10^6 m^2 of no video coverage

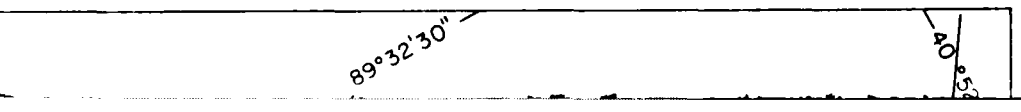

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: January 15, 1986
Video Tape 4
0
1 mi
0
1 km
89°35'

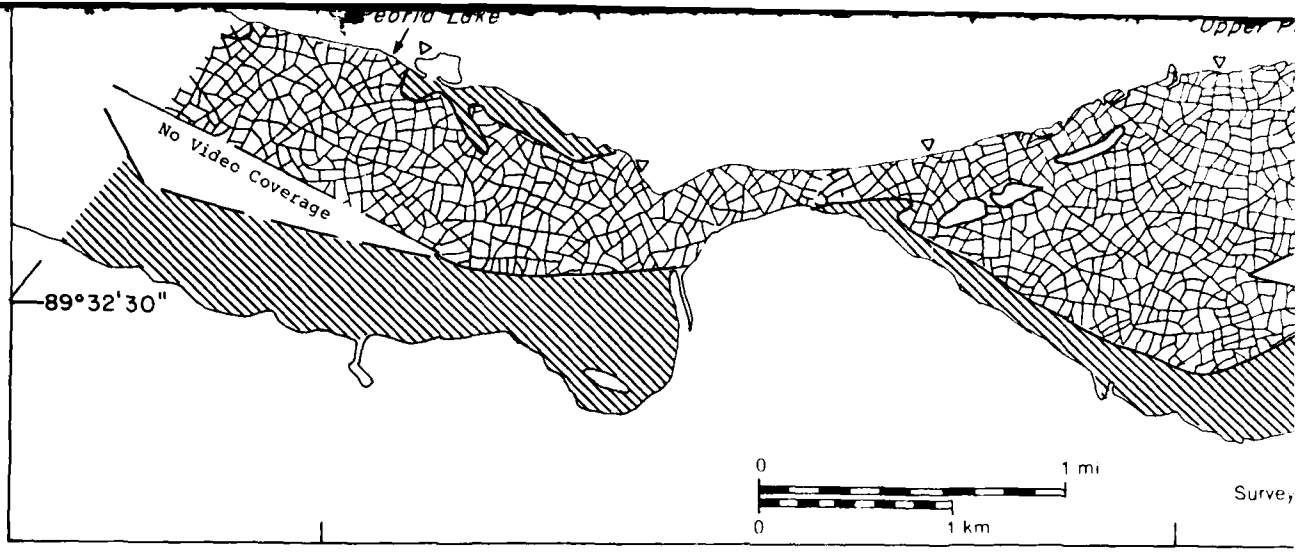

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
No Video Coverage
89°32'30"
0
1 mi
0
1 km

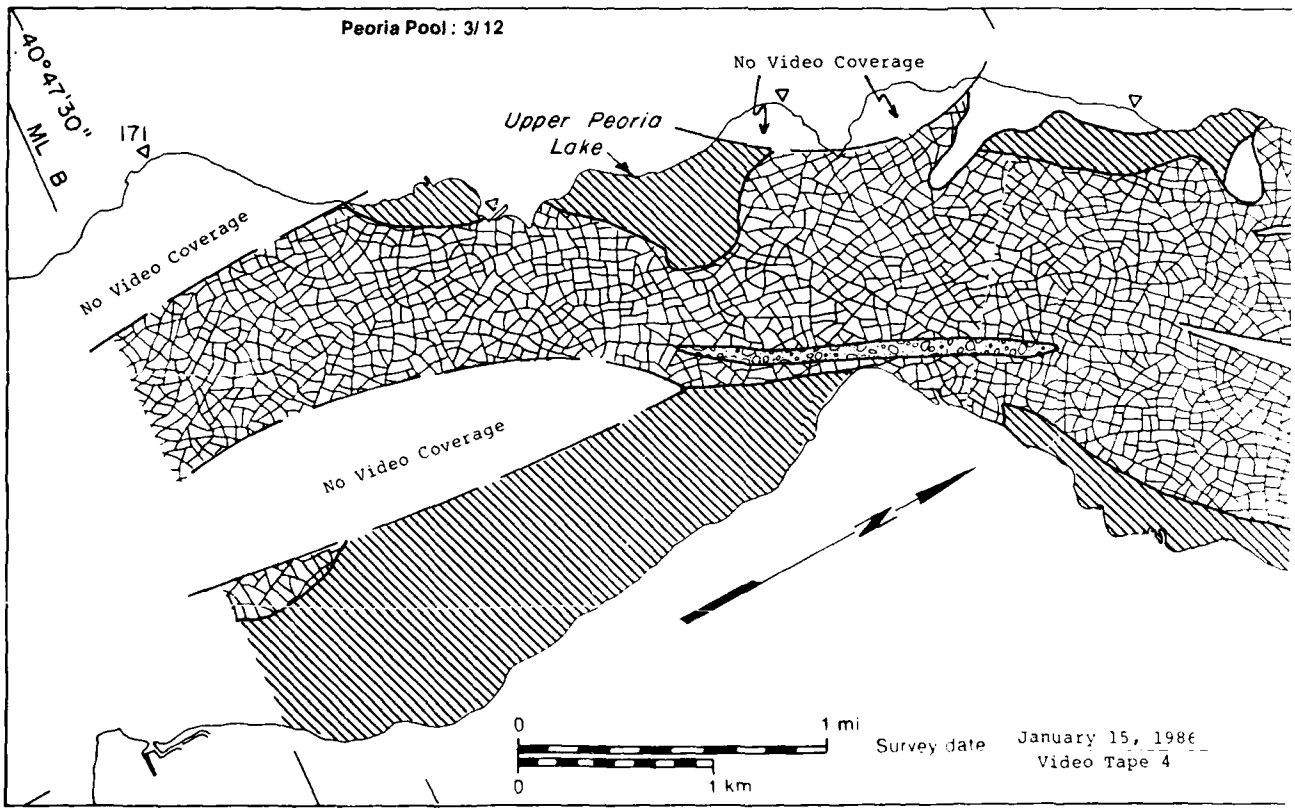
15 January 1986

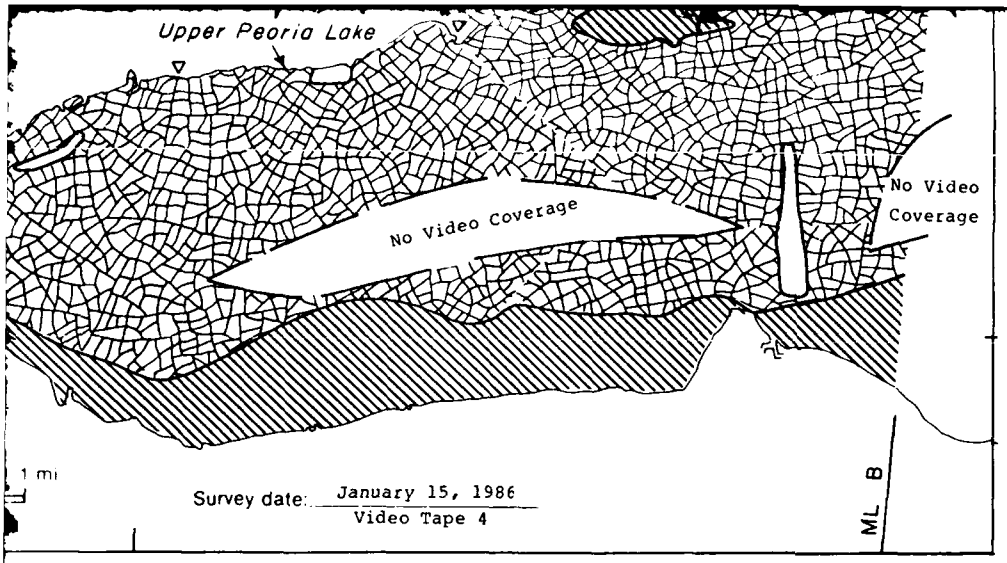


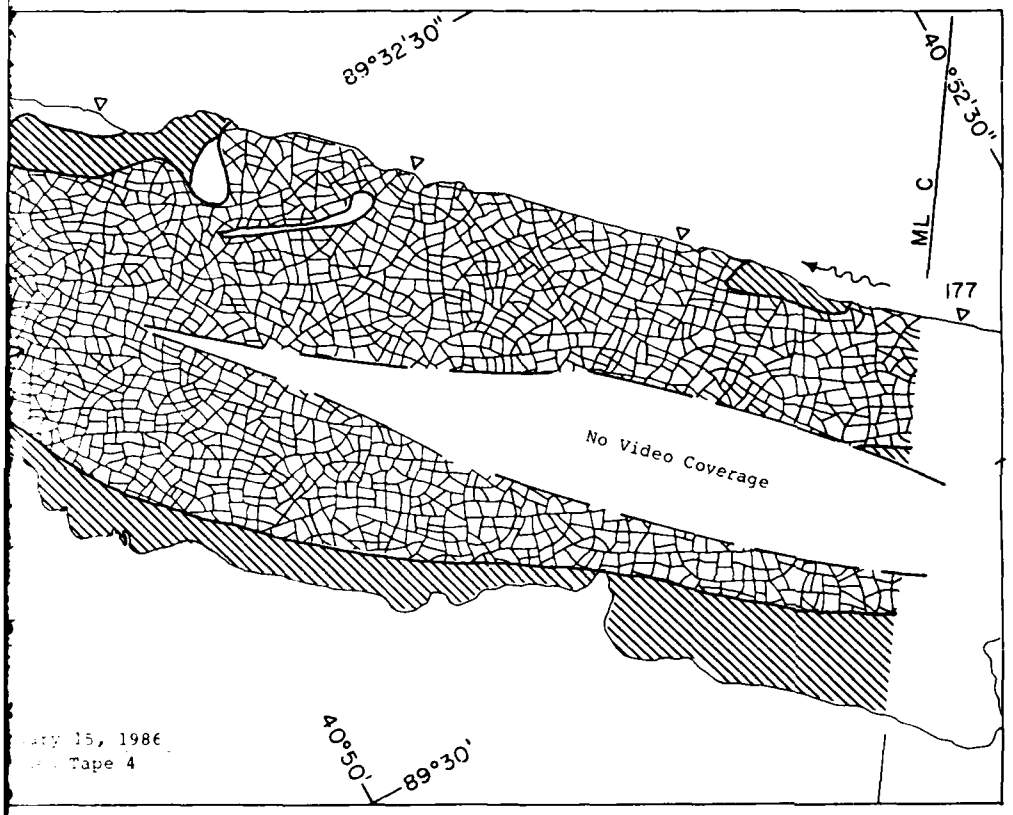




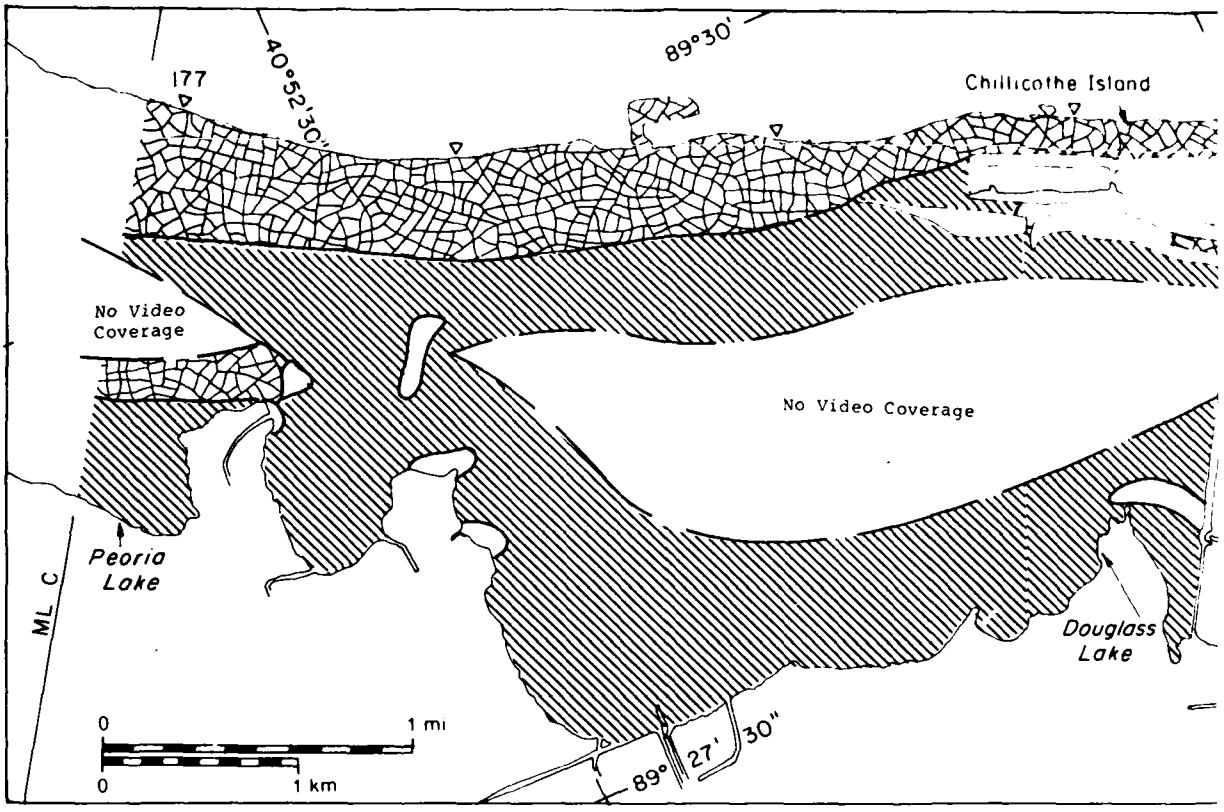

No Video Coverage
89°32'30"
0
1 mi
0
1 km

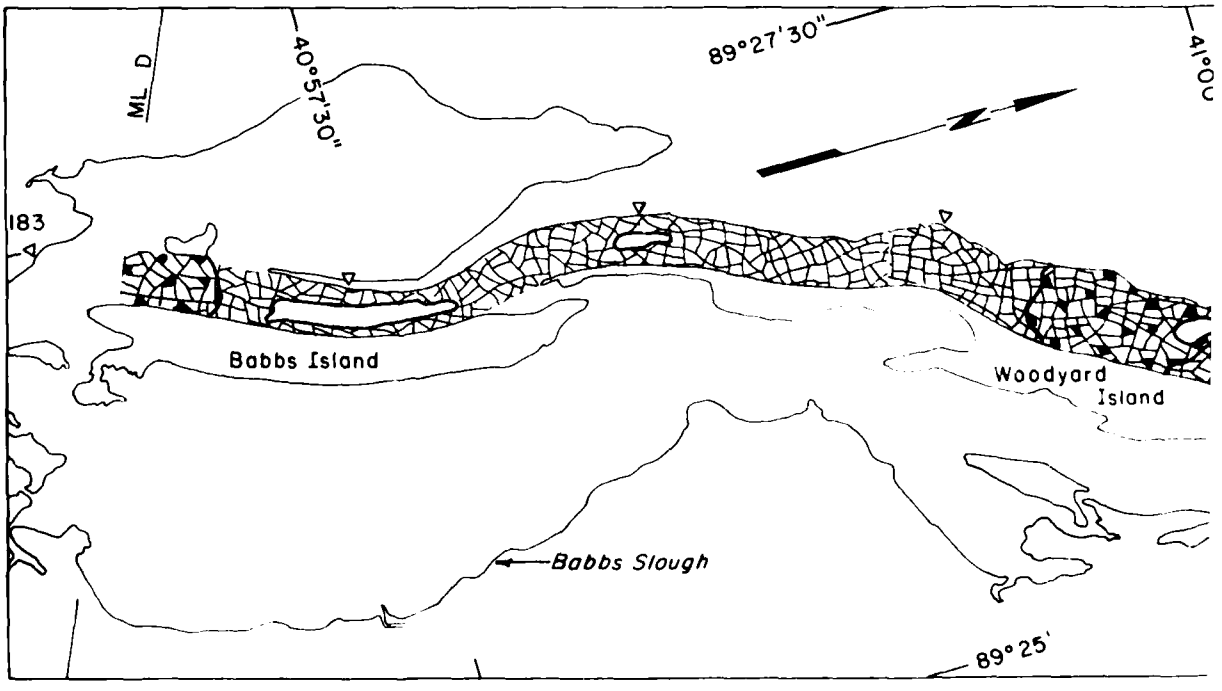

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date
January 15, 1986
Video Tape 4

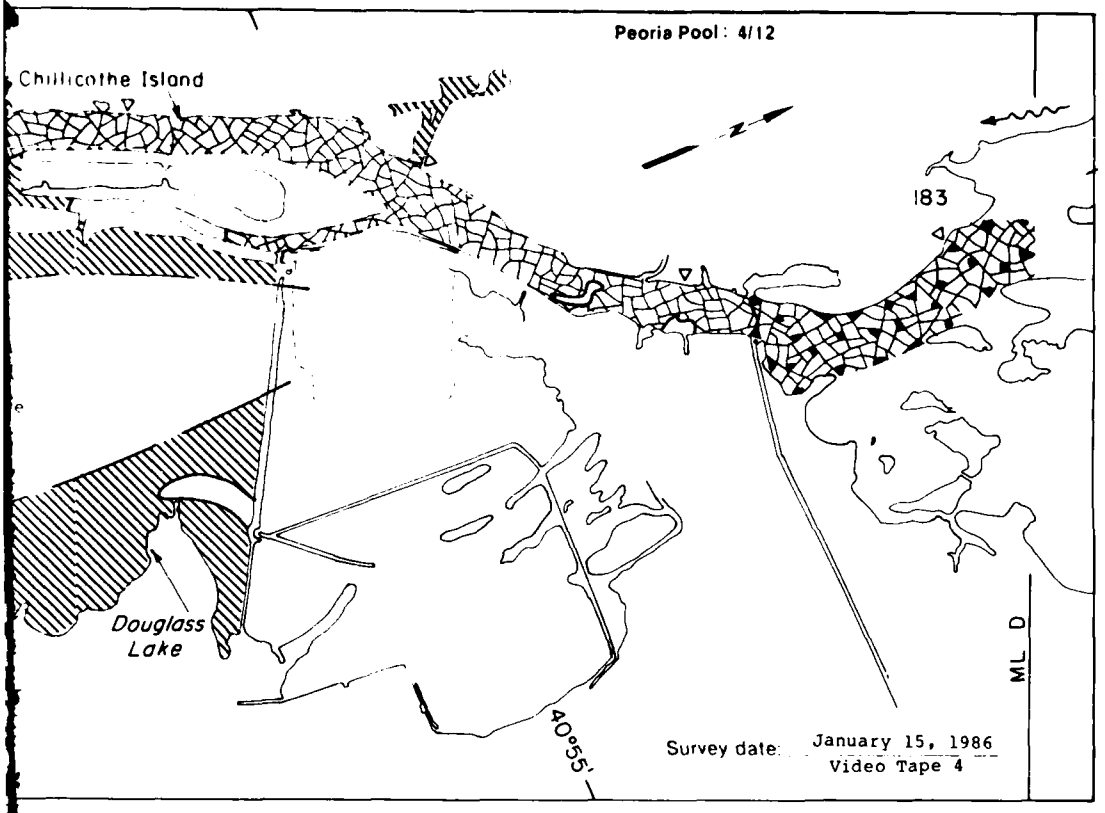

Upper Peoria Lake
No Video Coverage
No Video Coverage
1 mi
Survey date: January 15, 1986
Video Tape 4
ML B

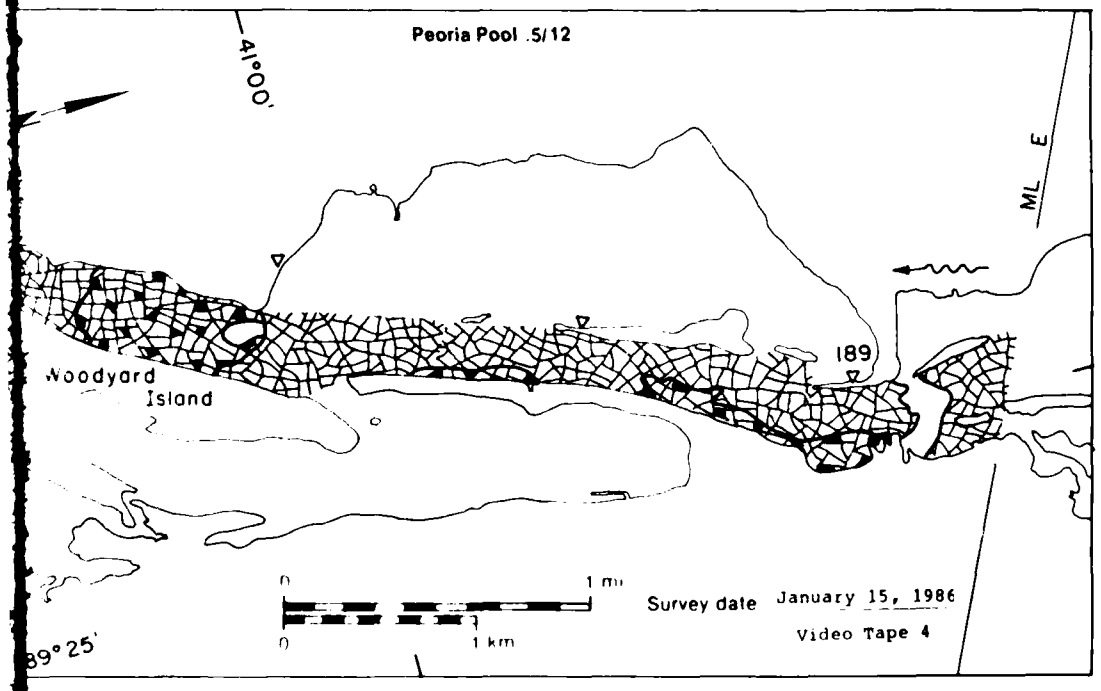

89°32'30"
40°52'30"
ML C
177
No Video Coverage
40°50'
89°30'

15 January 1986

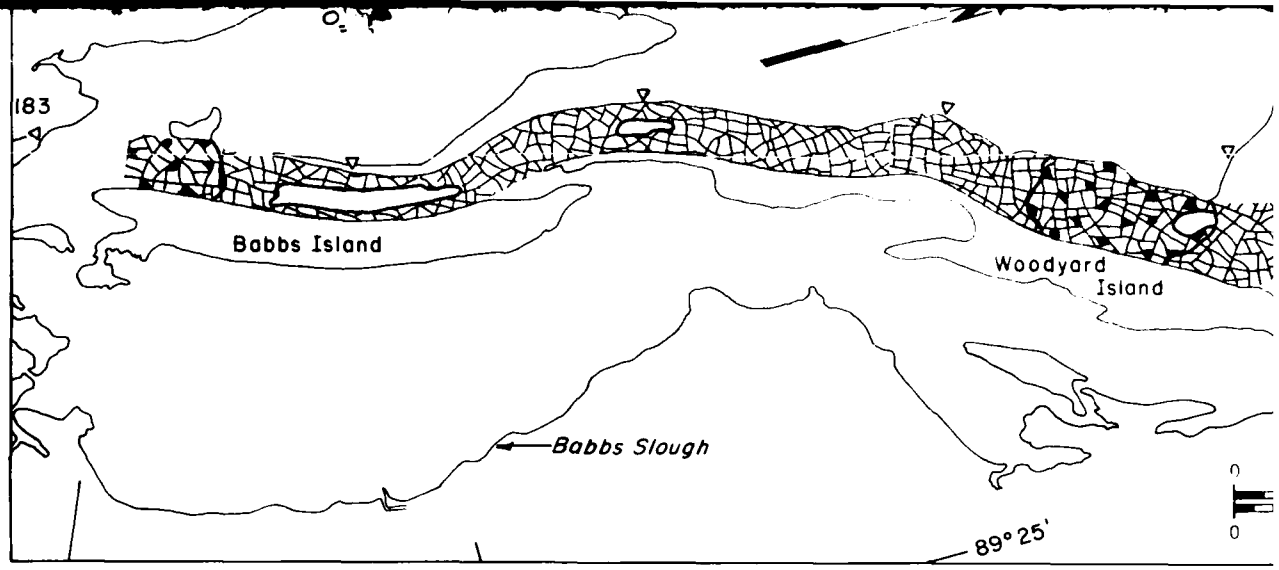


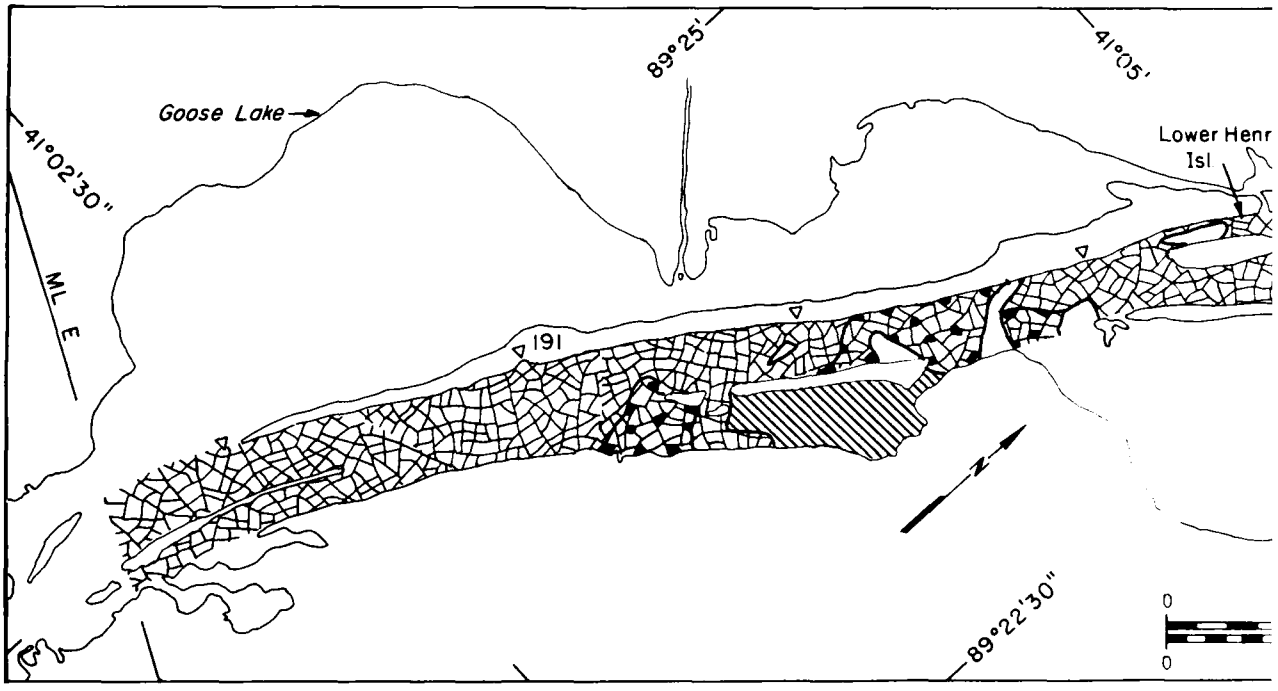


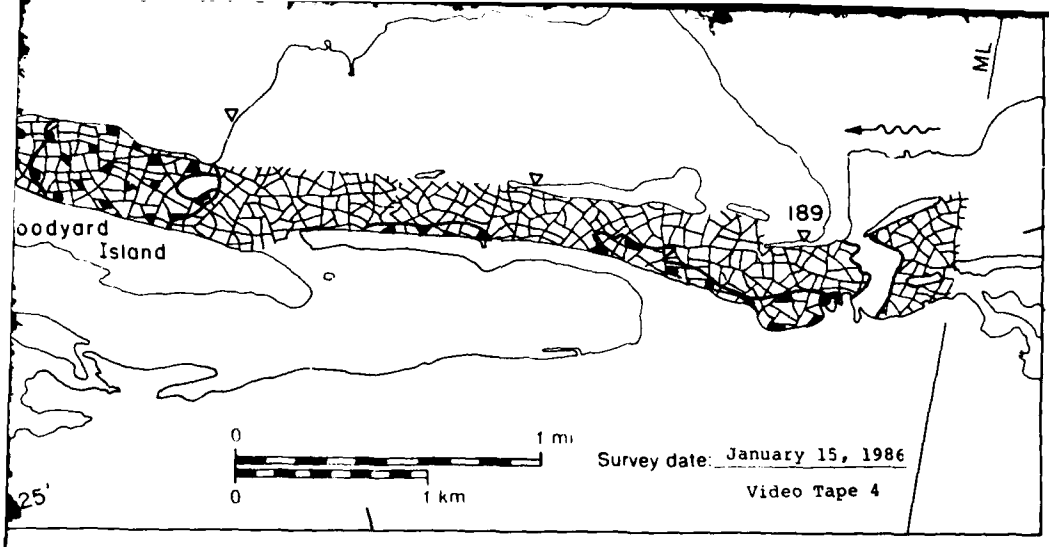


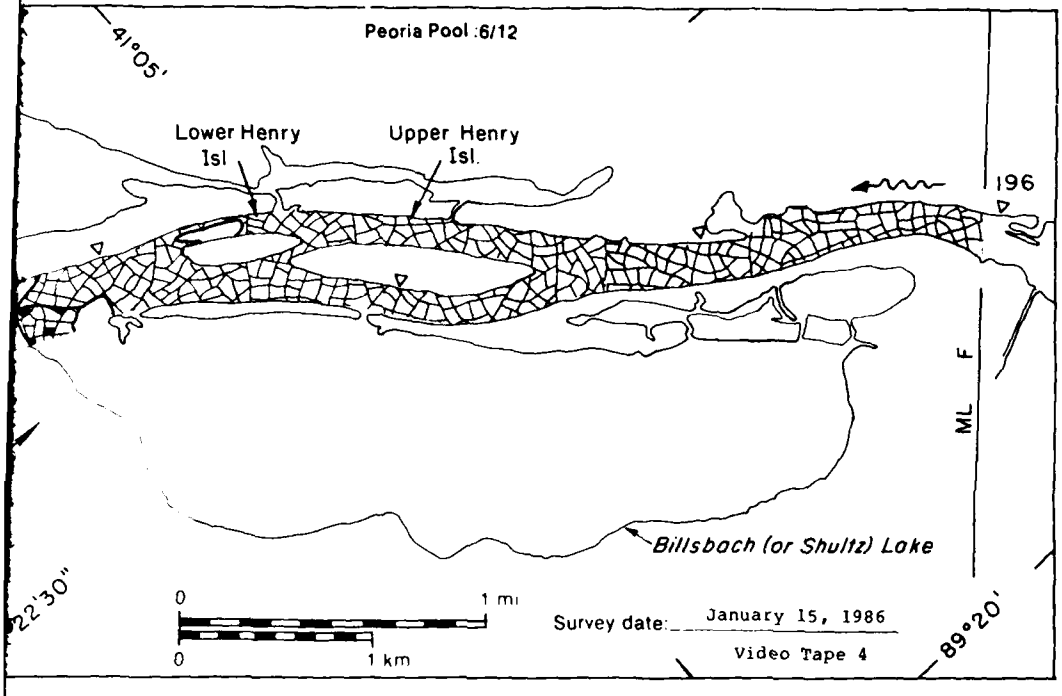


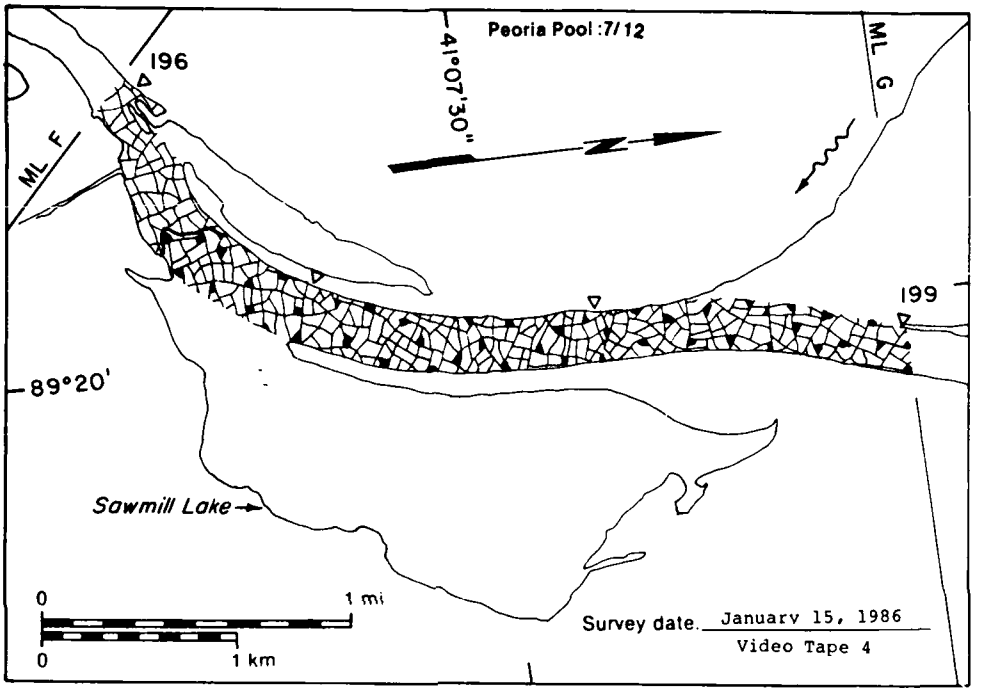
Peoria Pool 6/12

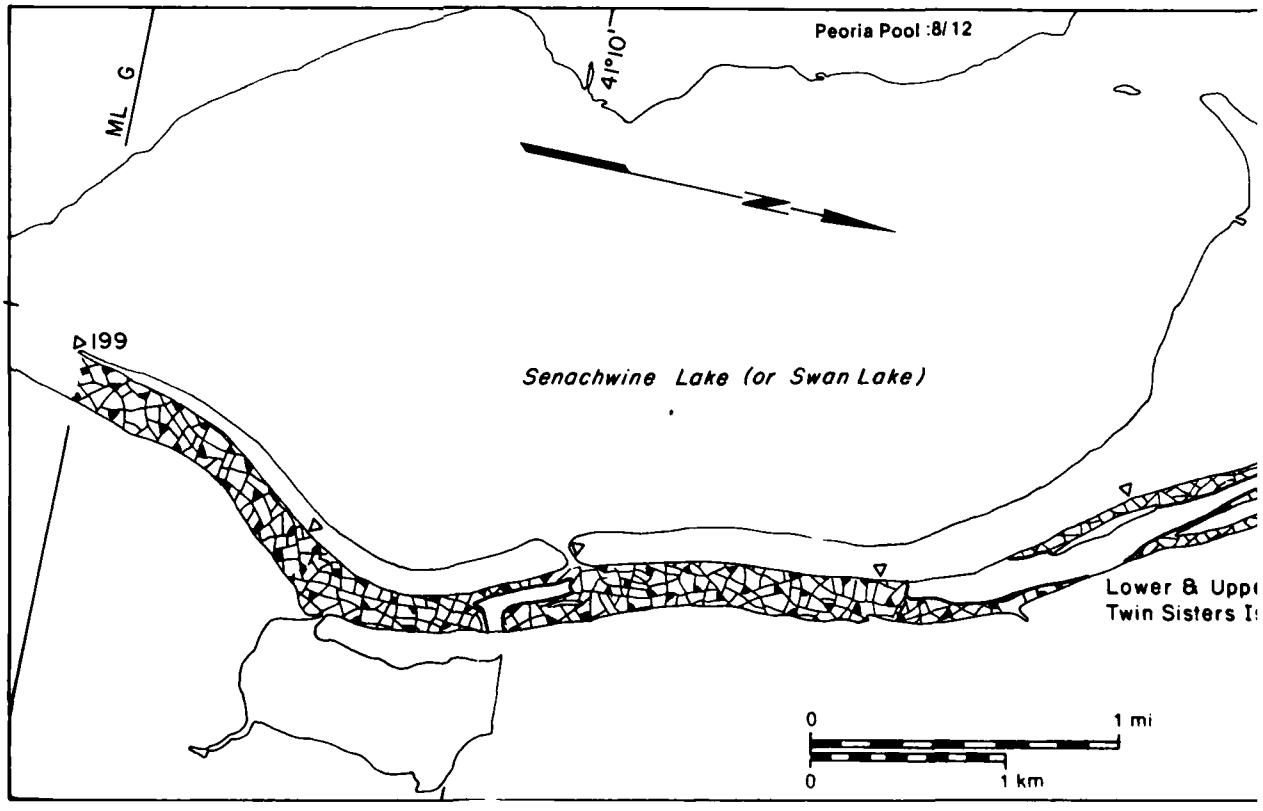

183
Babbs Island
Woodyard
Island
Babbs Slough
89° 25'
0
0

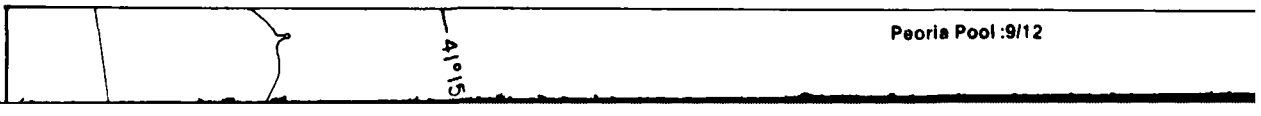

89°25'
41°05'
Goose Lake
41°02'30"
Lower Henr
Isl
ML E
191
89°22'30"
0
0


ML
189
oodyard
Island
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4
25'

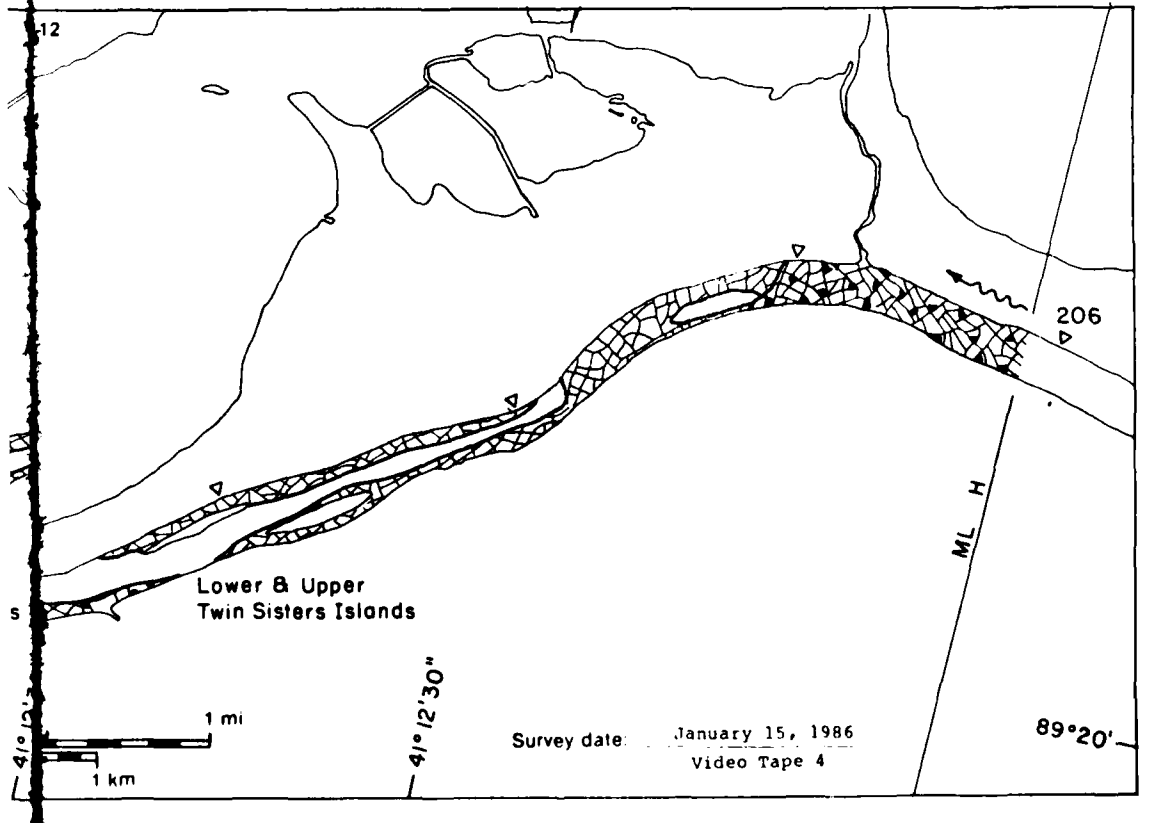

Peoria Pool :6/12
41°05'
Lower Henry
Isl
Upper Henry
Isl.
196
ML F
Billsboch (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4
22'30"
89°20'


Peoria Pool :7/12
41°07'30"
196
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date. Januarv 15, 1986
Video Tape 4

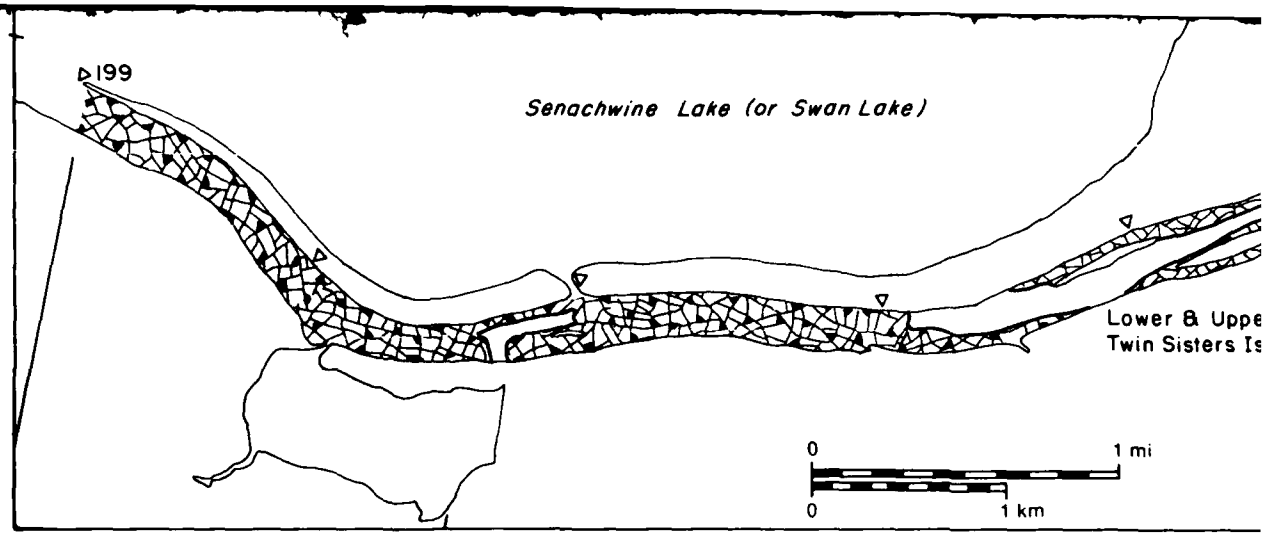

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower & Upp
Twin Sisters I
0
1 mi
0
1 km

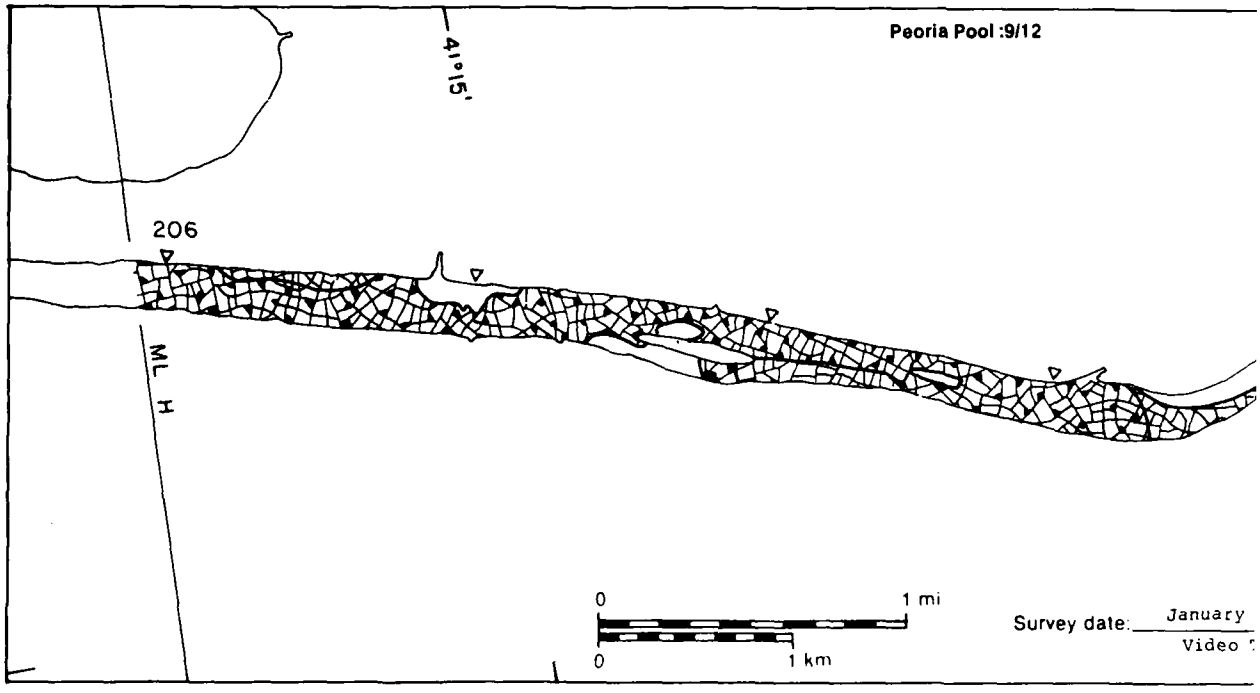

Peoria Pool :9/12
41°15

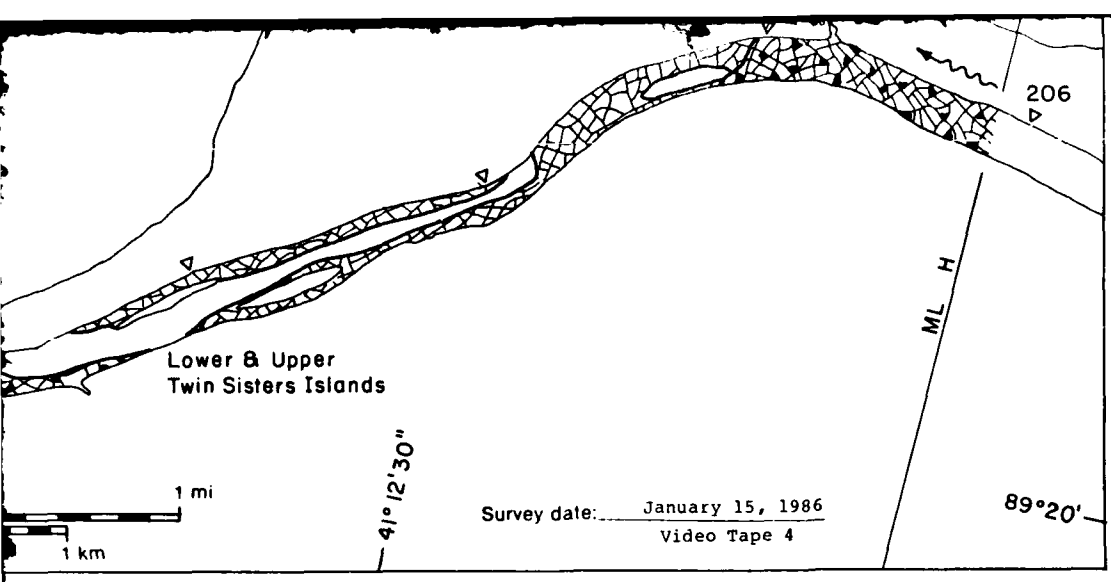
15 January 1986

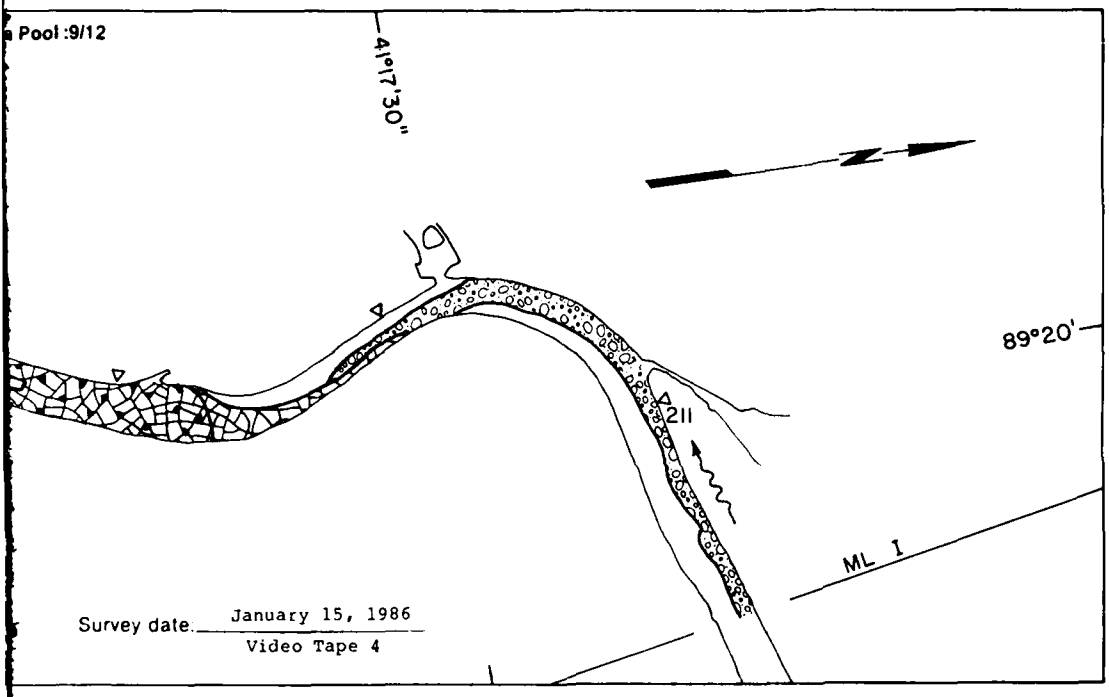


Pool :9/12

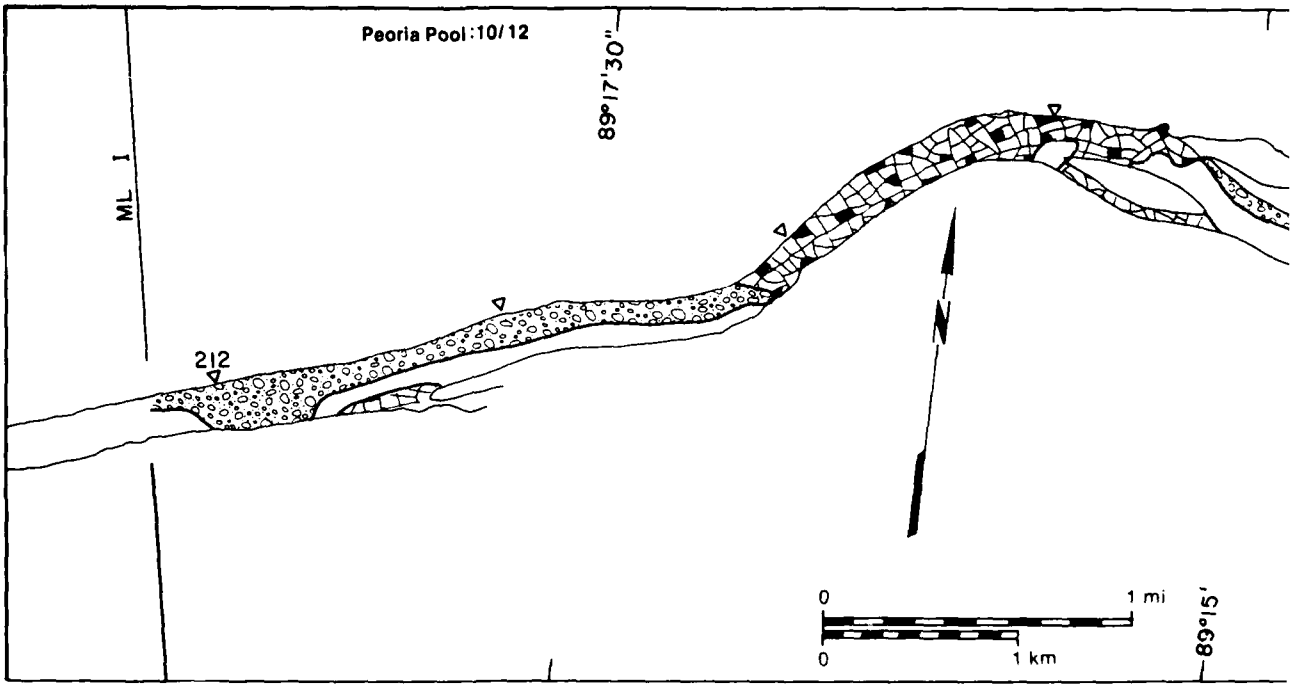

199
Senachwine Lake (or Swan Lake)
Lower & Uppe
Twin Sisters Is
0
1 mi
0
1 km

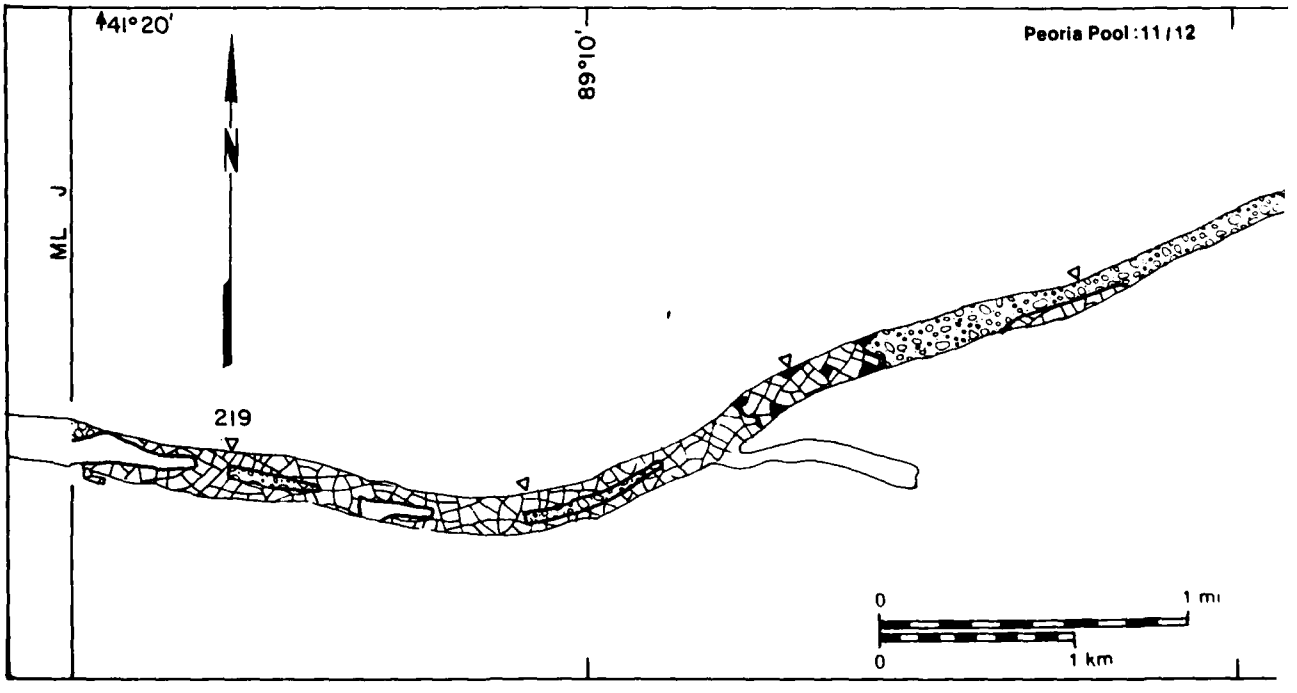

Peoria Pool :9/12
41°15'
206
ML H
0
1 mi
0
1 km
Survey date: January
Video

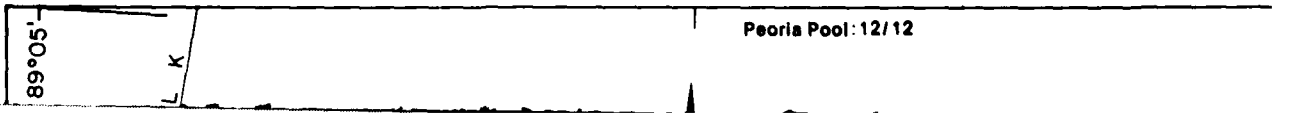

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: January 15, 1986
Video Tape 4
89°20'

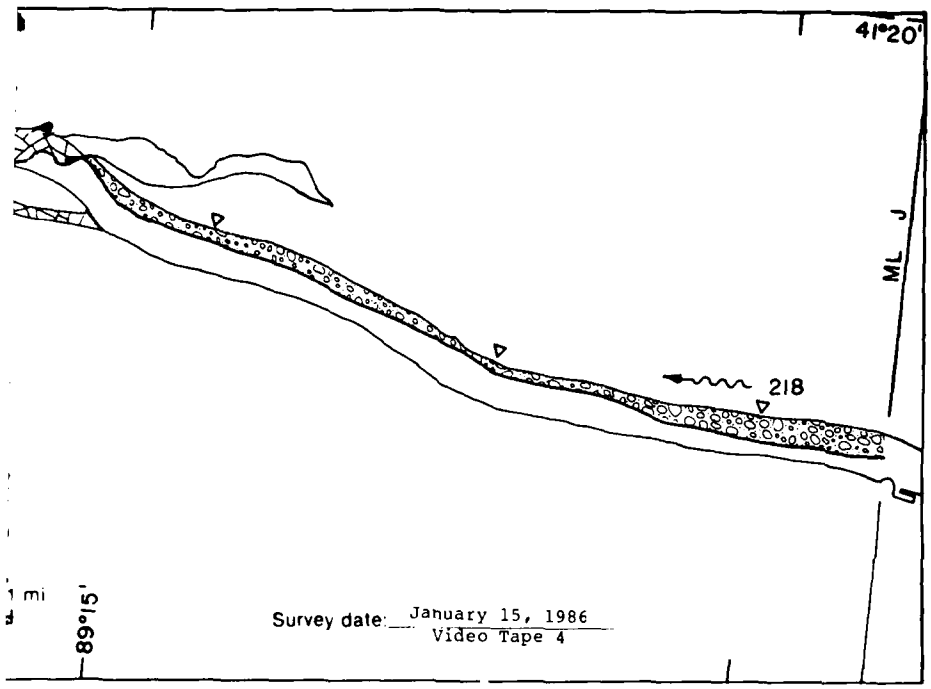

Pool :9/12
41°17'30"
89°20'
211
ML I
Survey date. January 15, 1986
Video Tape 4

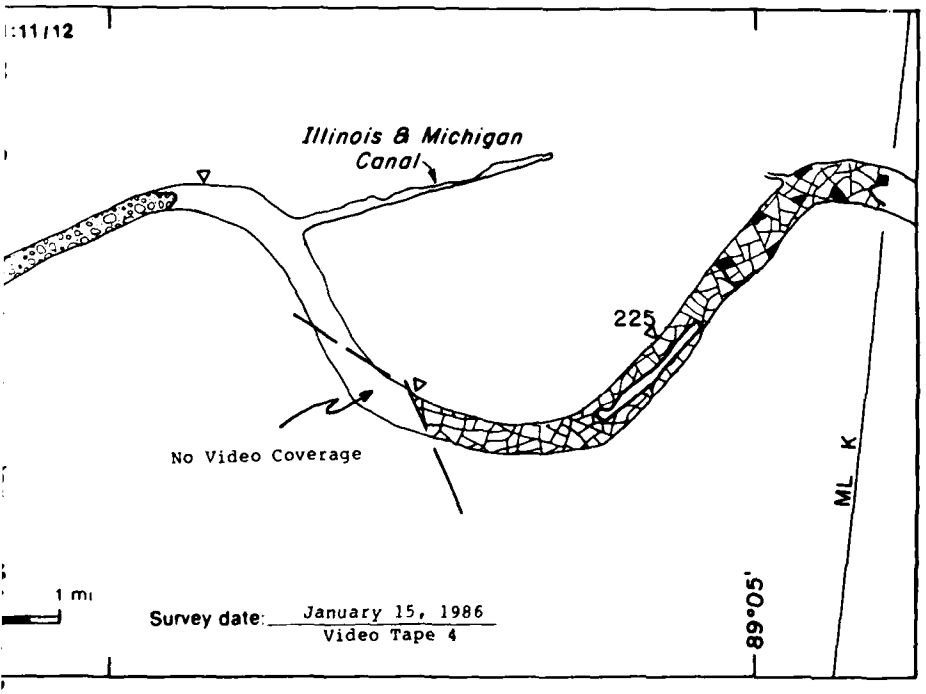
15 January 1986

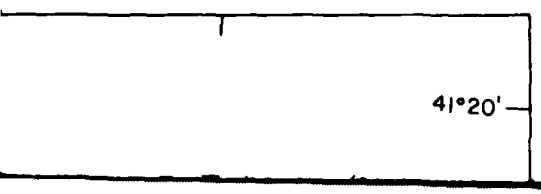


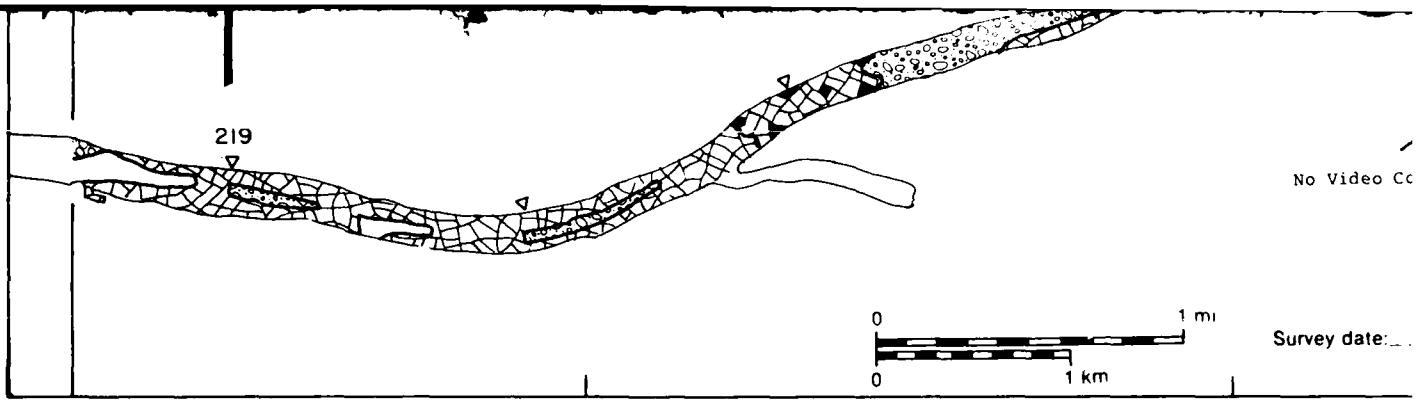


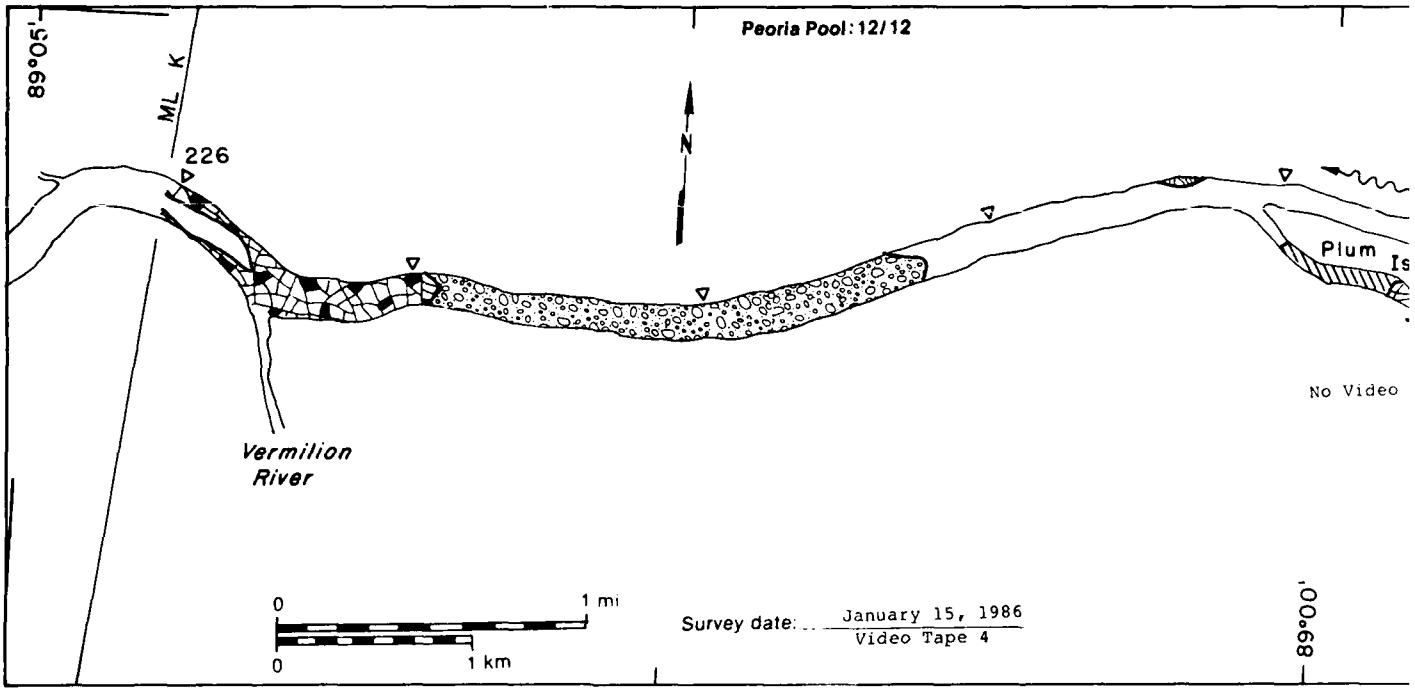



41°20'
ML J
218
1 mi
89°15'
Survey date: January 15, 1986
Video Tape 4


11/12
Illinois & Michigan Canal
225
No Video Coverage
ML K
1 mi
Survey date: January 15, 1986
Video Tape 4
89°05'


41°20'

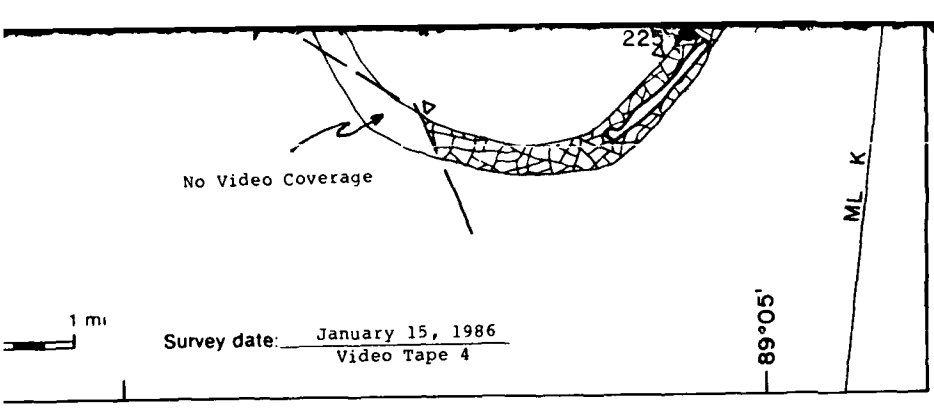


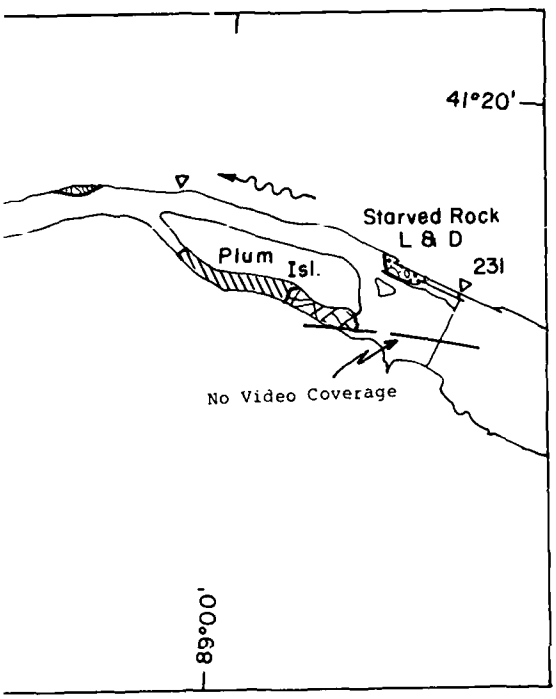


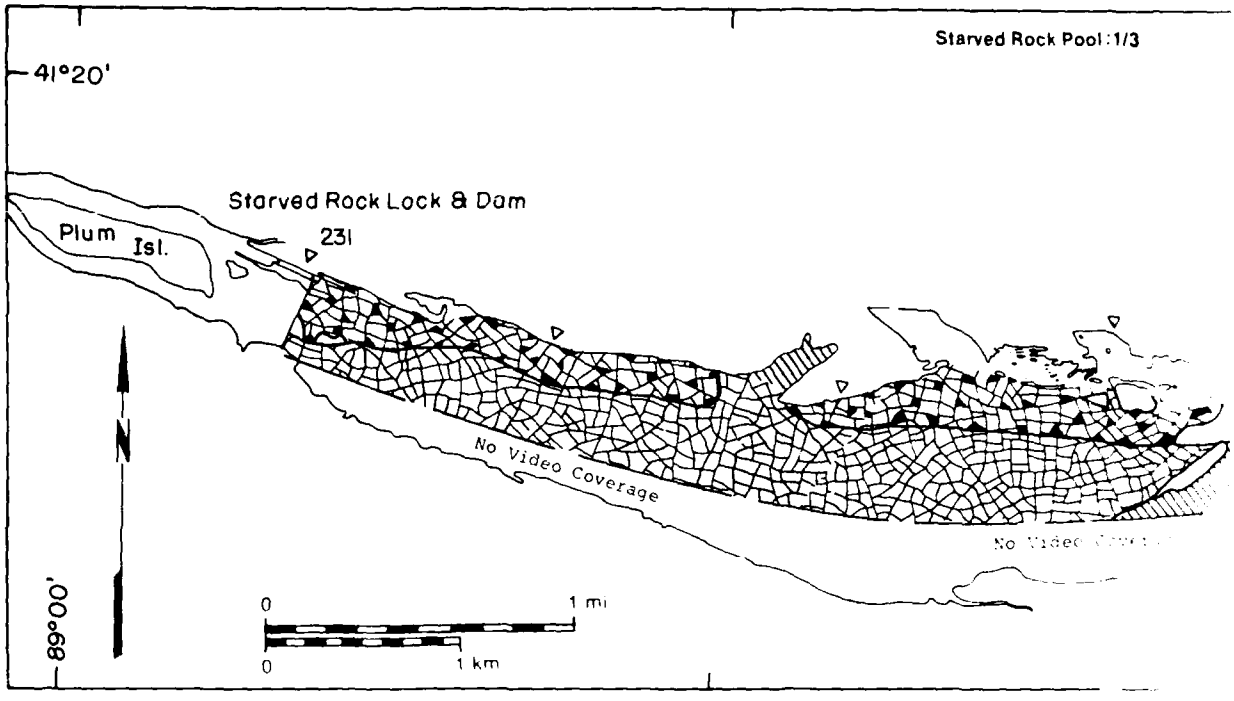
Peoria Pool

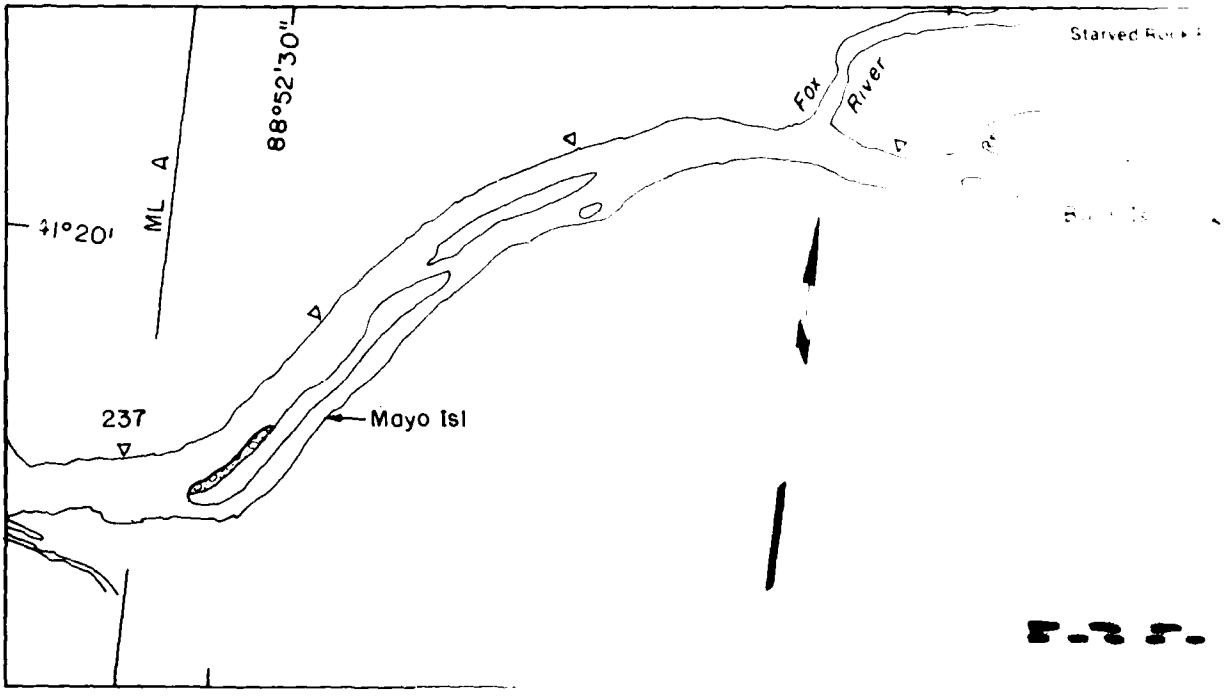
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.73	NA
Solid ice cover	18.85	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	34.24	NA
Fragmented ice cover with open-water areas	6.81	80
Ice floes or frazil slush and pans	2.85	20
Total area ($m^2 \times 10^6$)	81.33*	

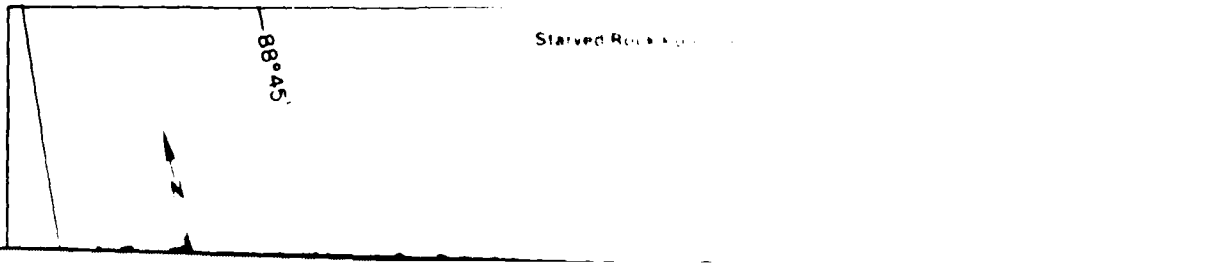
* Includes 12.85×10^6 m^2 of no video coverage


225
No Video Coverage
ML K
89°05'
1 mi
Survey date: January 15, 1986
Video Tape 4

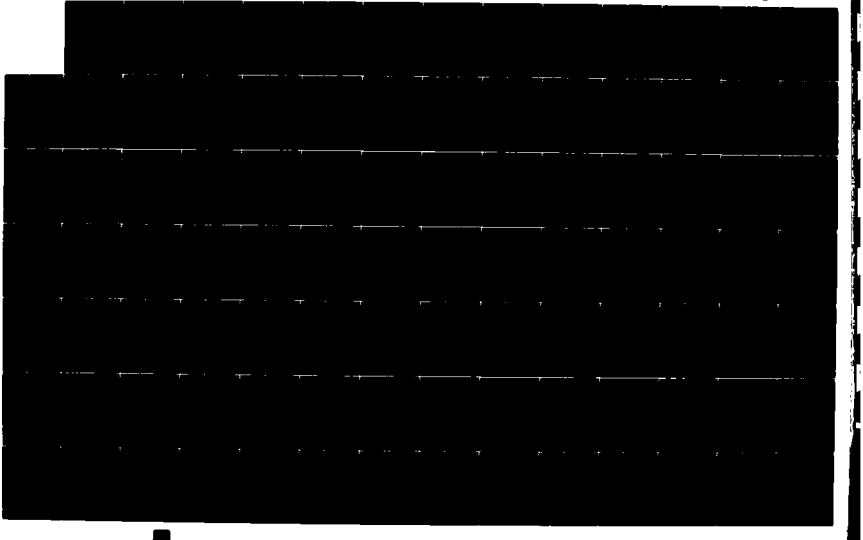

41°20'
Starved Rock
L & D
Plum Isl.
231
No Video Coverage
89°00'

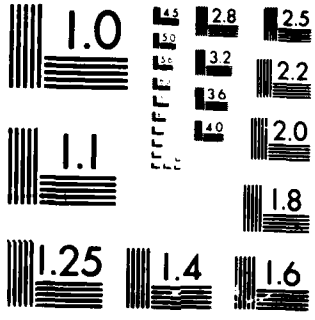

Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km

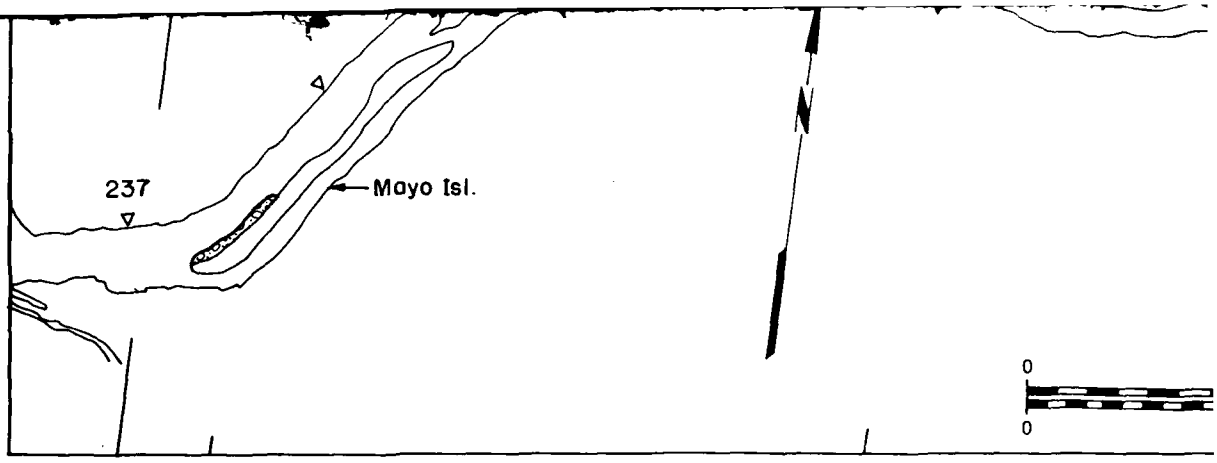

88°52'30"
ML 4
41°20'
Fox River
237
Mayo Isl

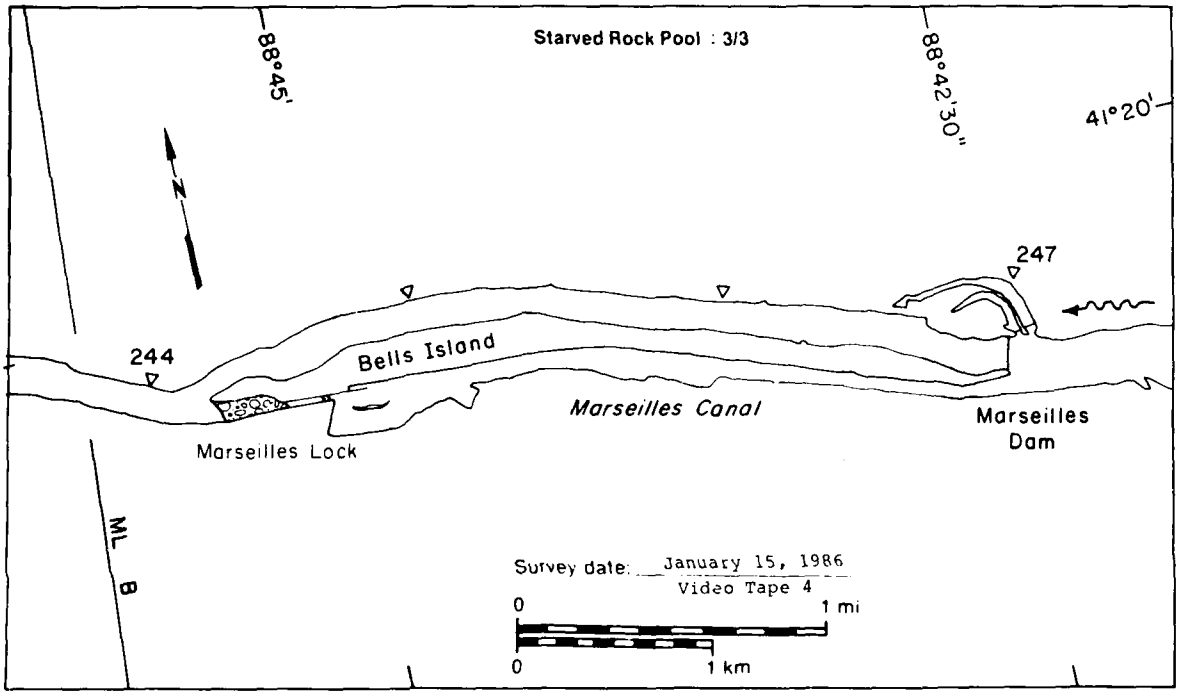

88°45'

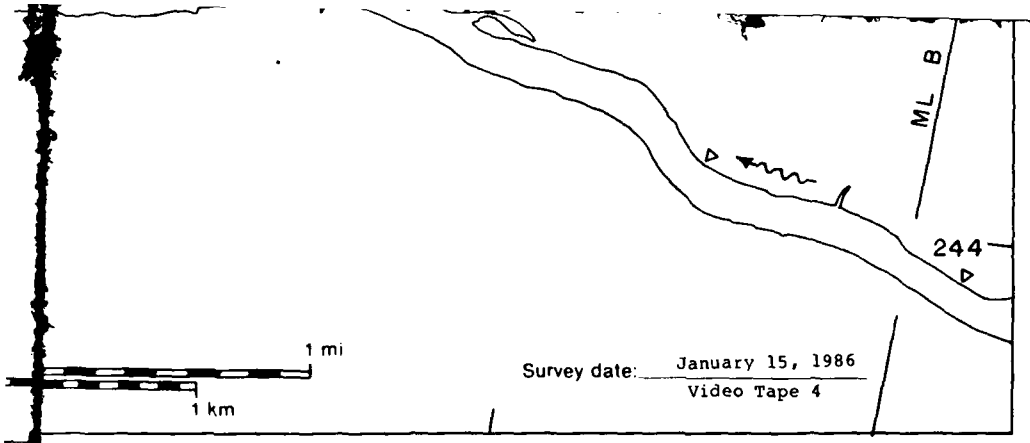
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER 8/14
OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND
ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

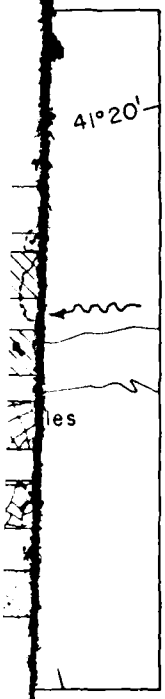



1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0


237
Mayo Isl.
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 15, 1986
Video Tape 4
0
1 mi
0
1 km



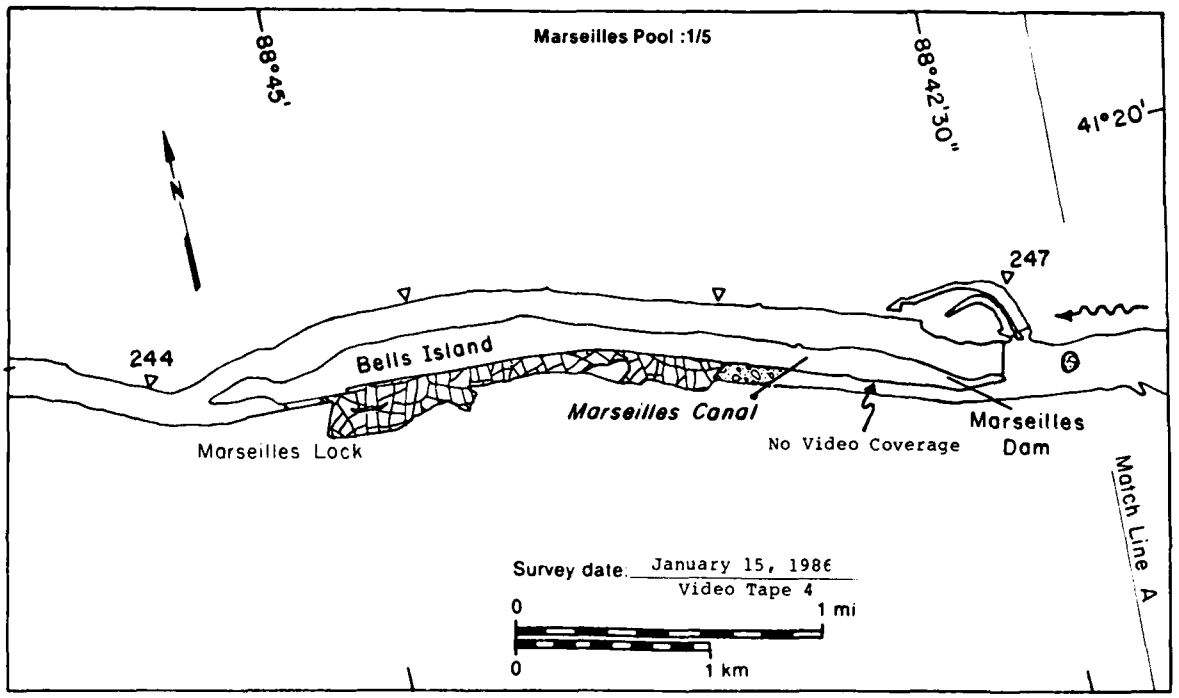


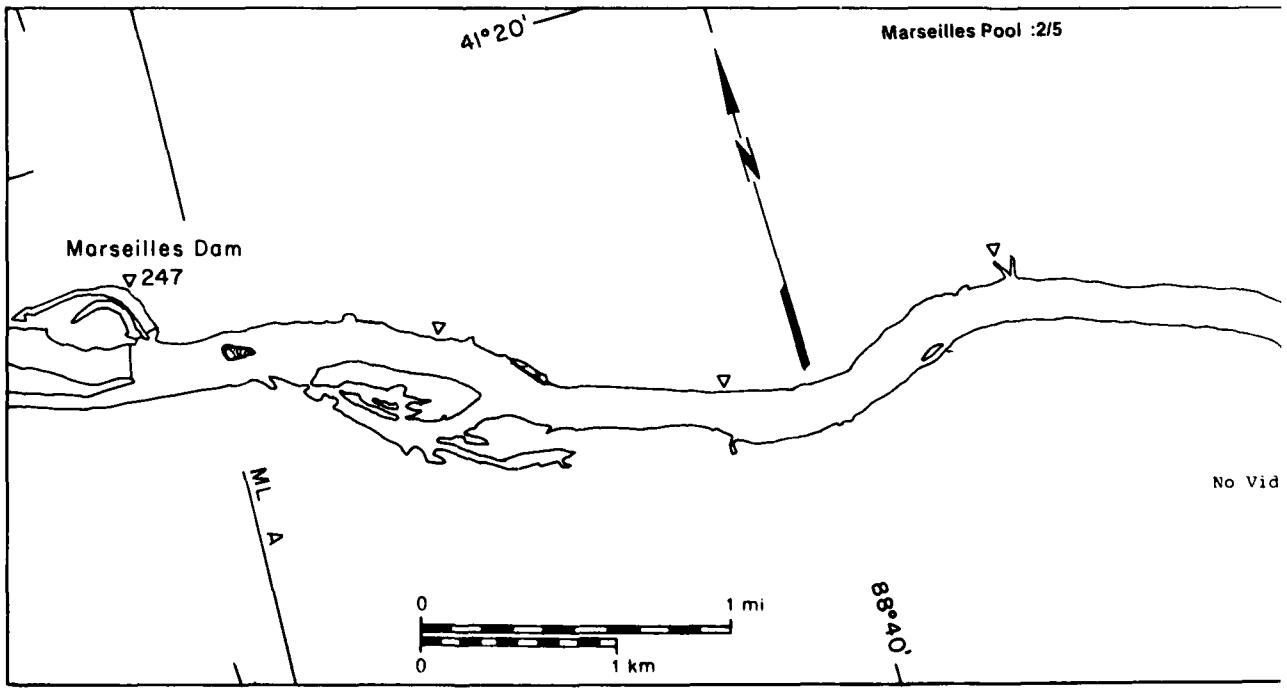
Starved Rock Pool

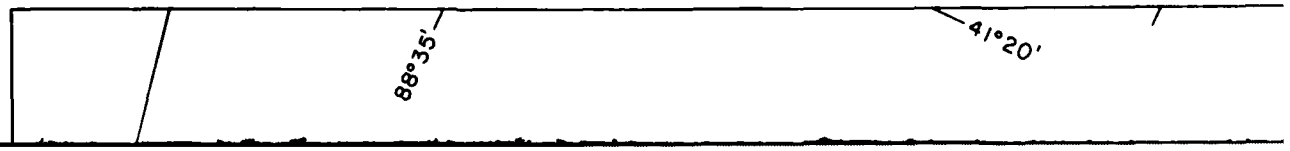
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	5.20	NA
Solid ice cover	0.40	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	2.10	NA
Fragmented ice cover with open-water areas	0.98	80
Ice floes or frazil slush and pans	0.07	50
Total area ($m^2 \times 10^6$)	10.19*	

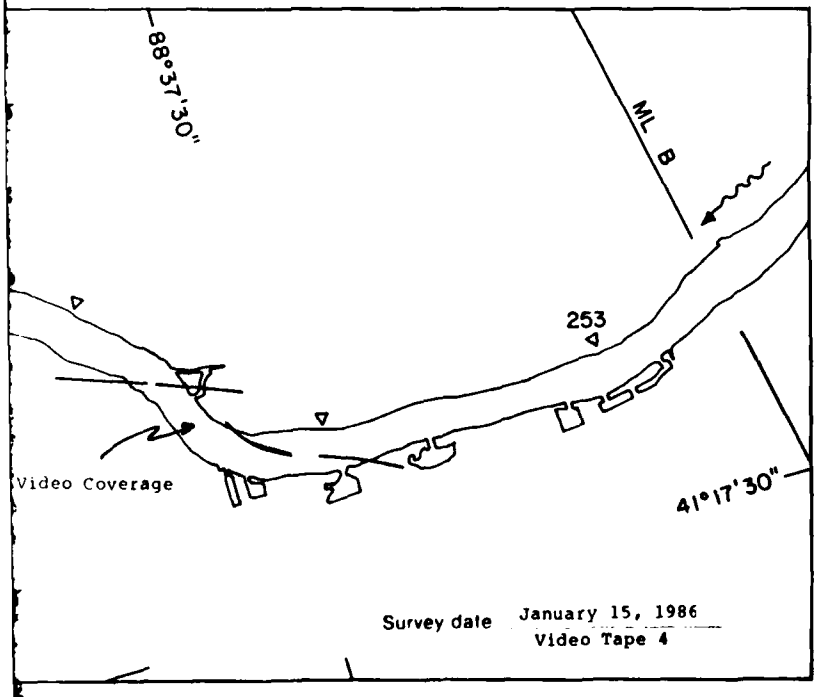
* Includes 1.44×10^6 m^2 of no video coverage

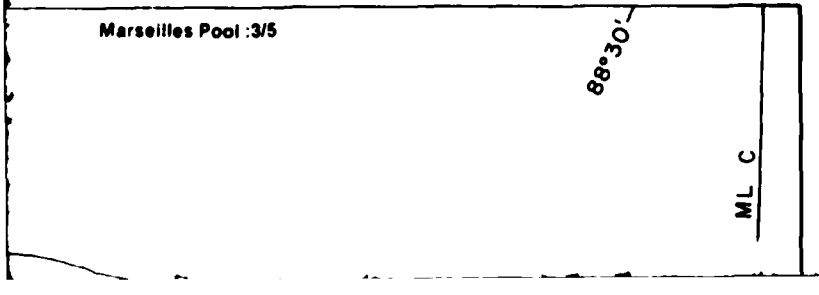
15 January 1986

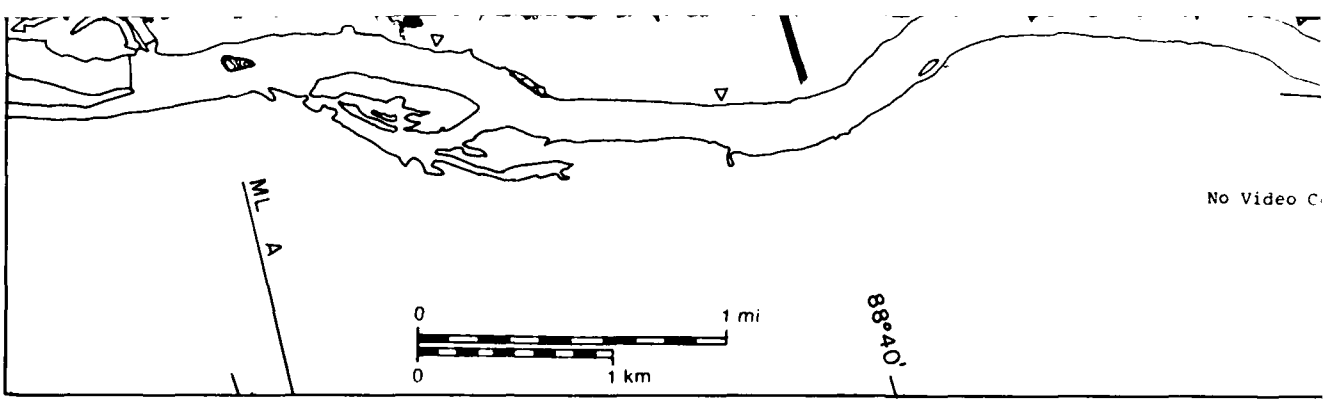


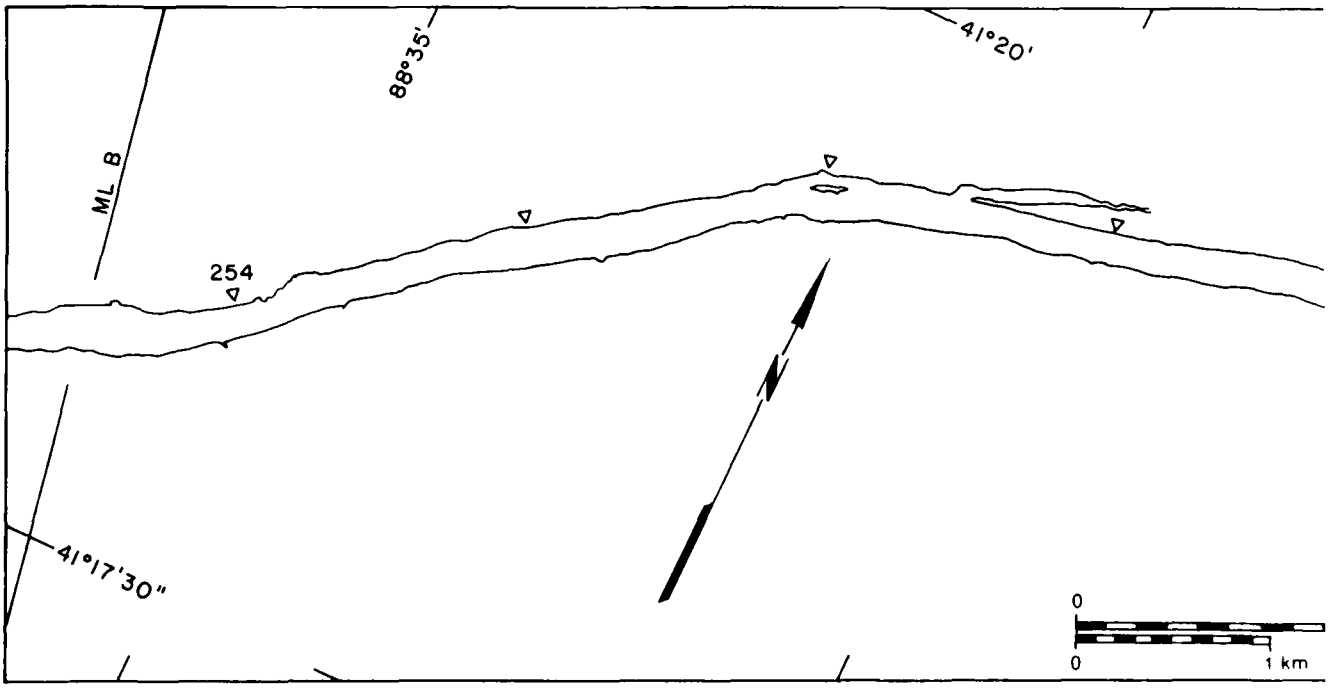


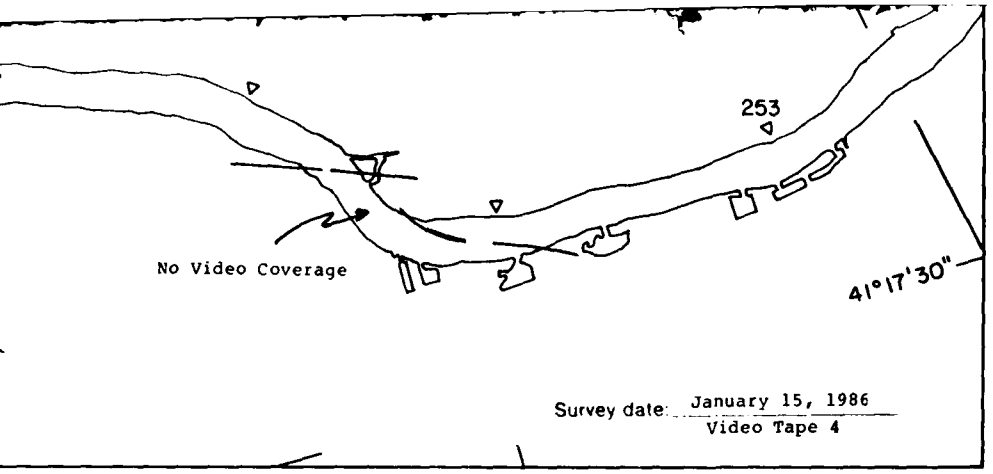


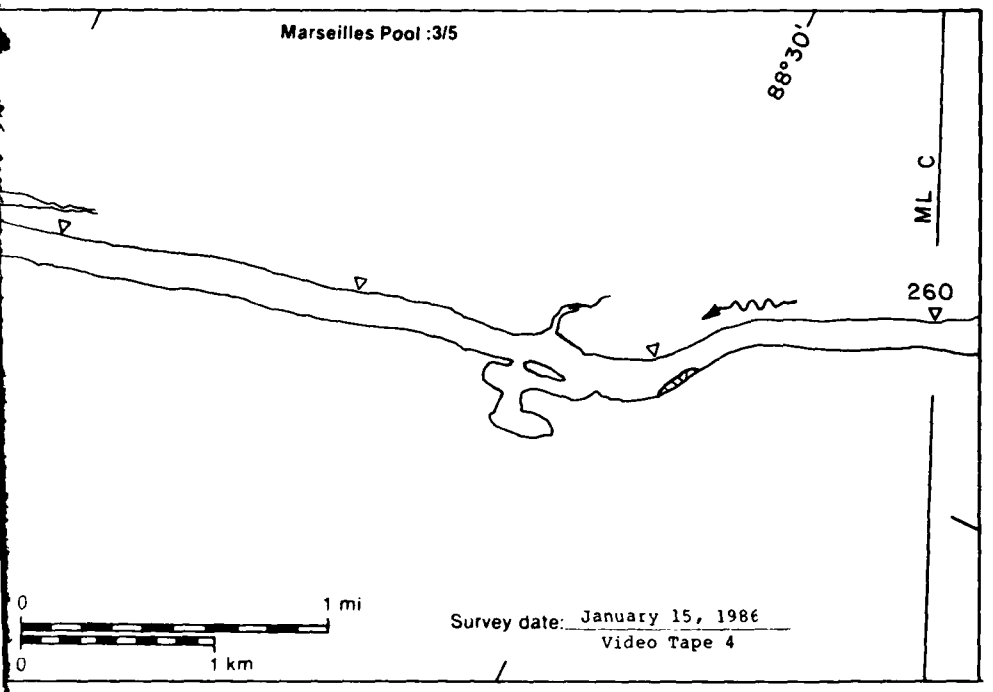

88°37'30"
ML B
253
Video Coverage
41°17'30"
Survey date January 15, 1986
Video Tape 4

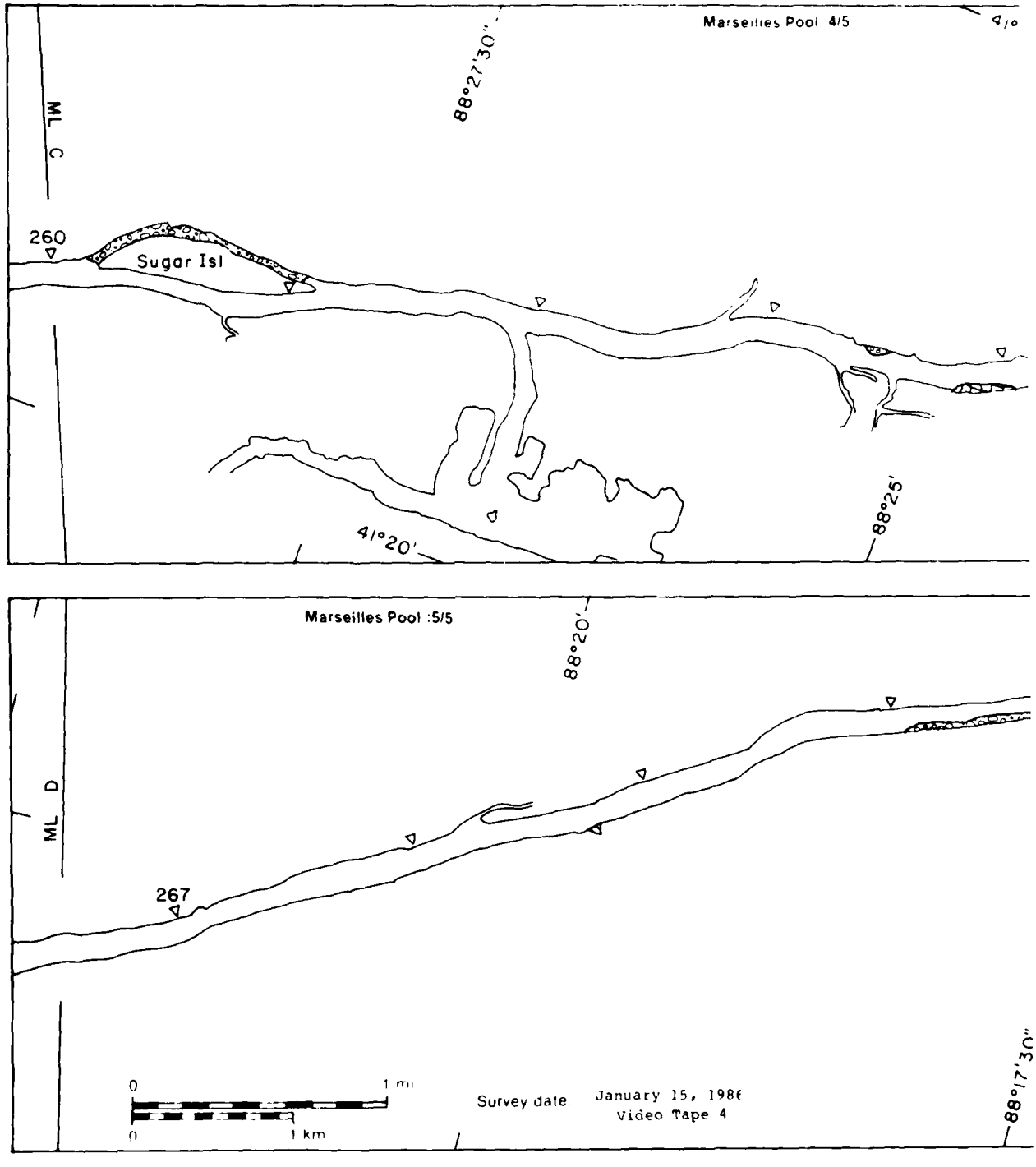

Marseilles Pool :3/5
88°30'
ML C


ML A
No Video C
0
1 mi
0
1 km
88°40'


88°35'
41°20'
ML B
254
41°17'30"
0
0
1 km


253
No Video Coverage
41°17'30"
Survey date: January 15, 1986
Video Tape 4

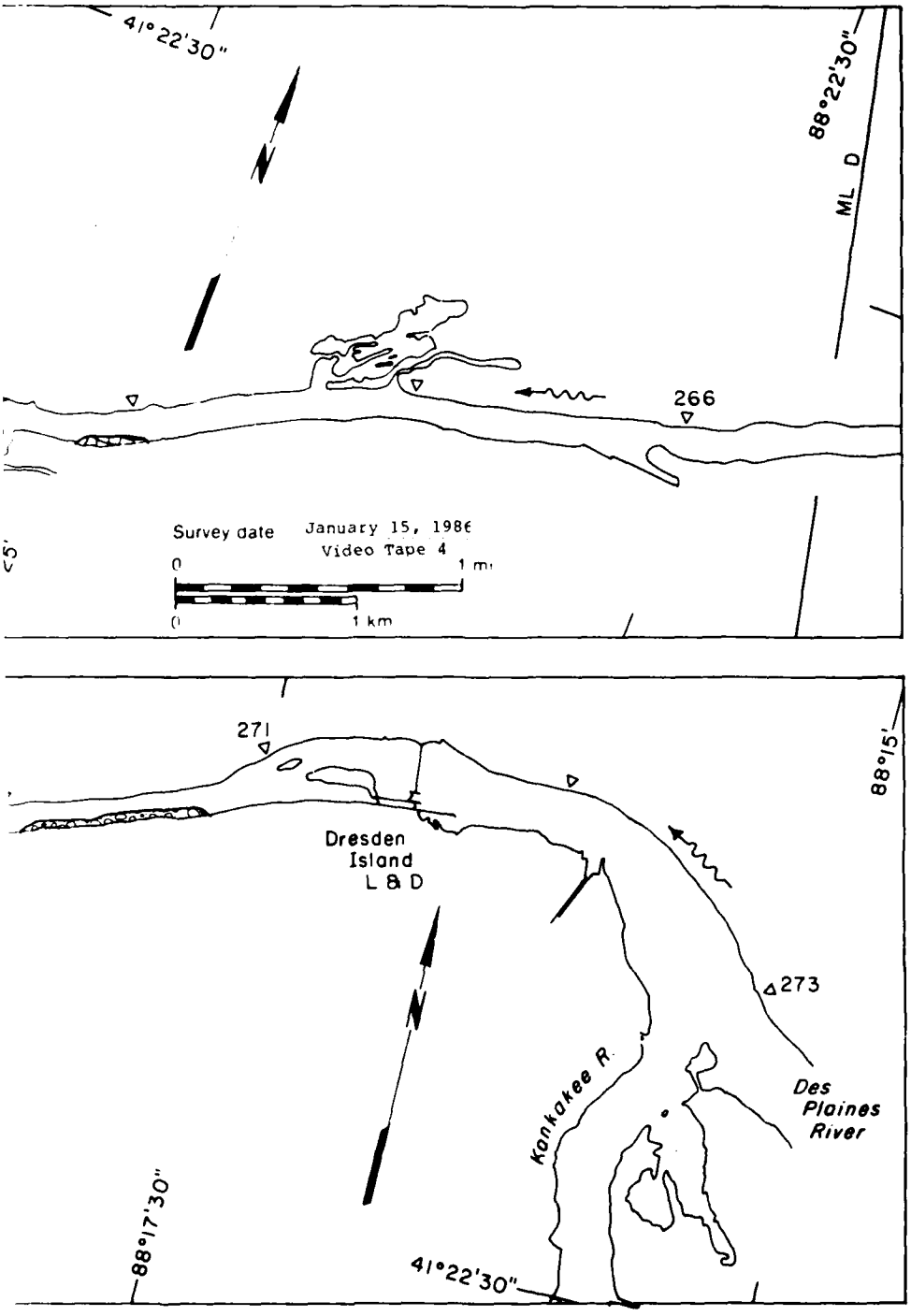

Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4

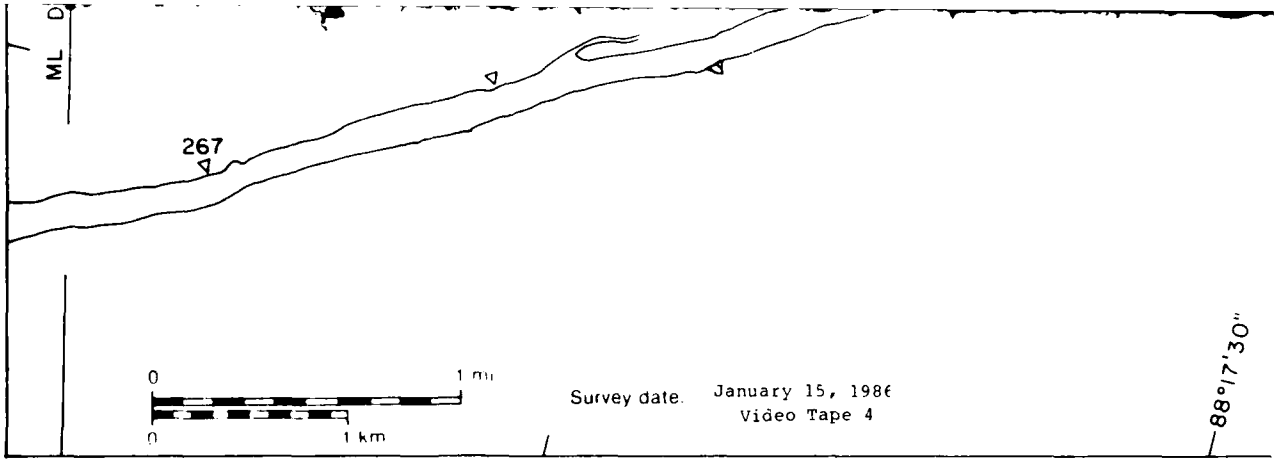


Marseilles Pool

MAP UNITS	Area (m^2 x 10^6)	Surface concentration
Open water	7.32	NA

15 January 1986

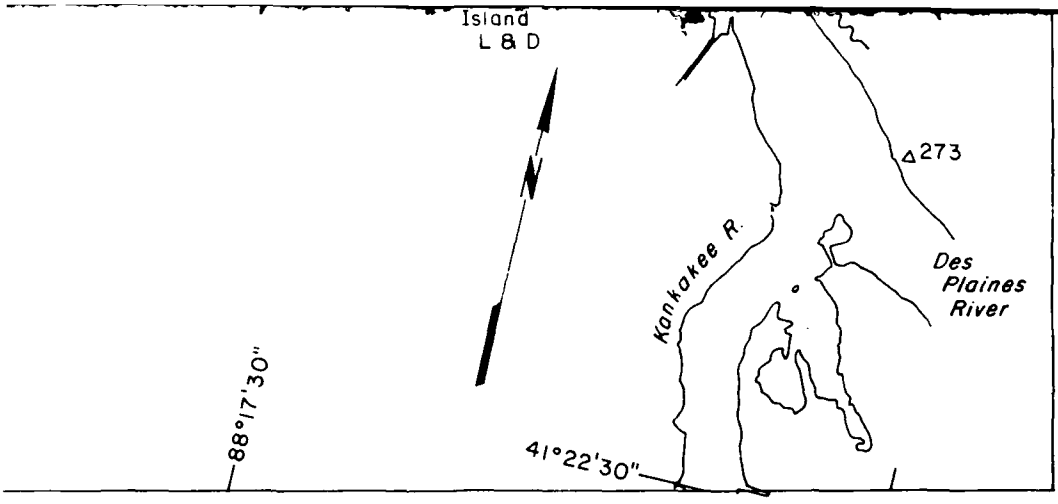




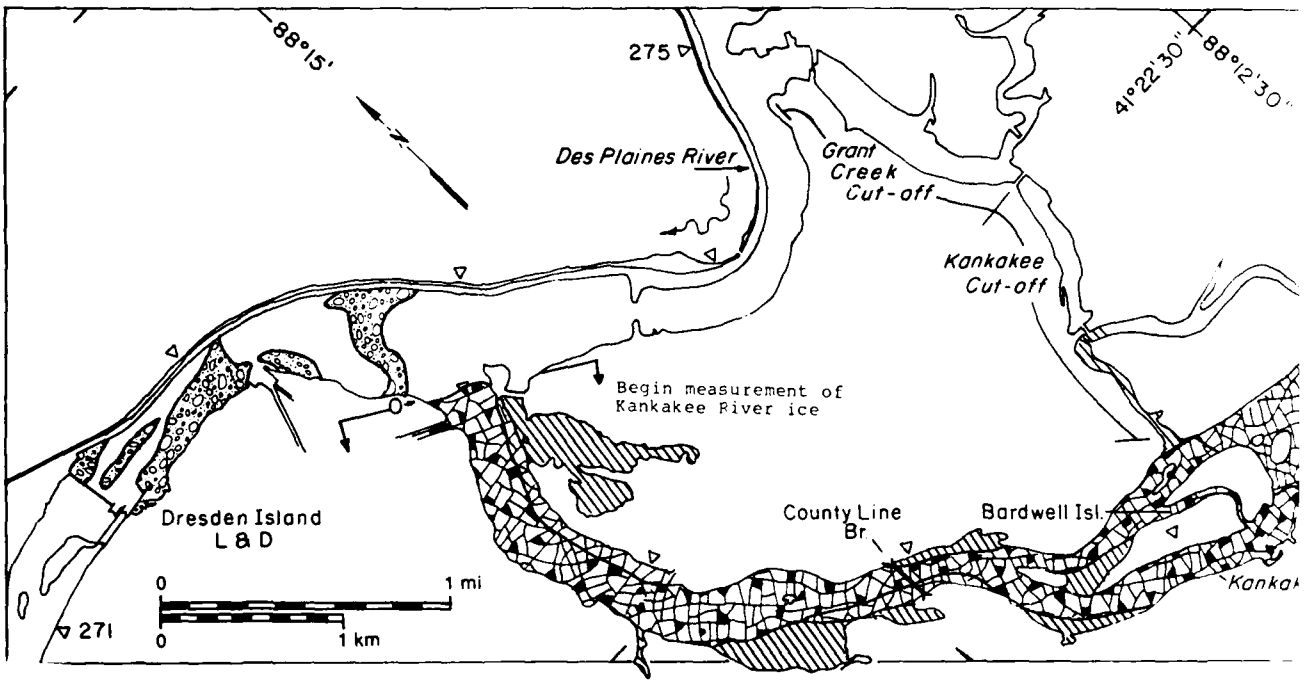
Marseilles Pool

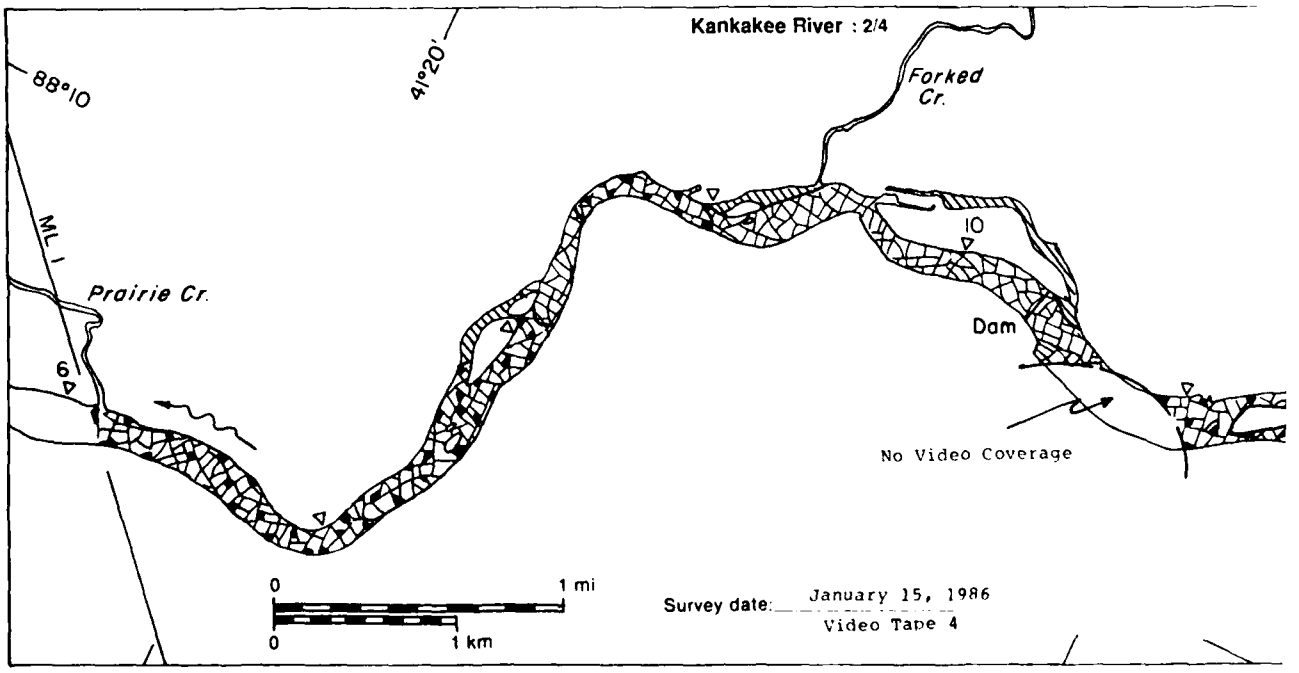
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.32	NA
Solid ice cover	Trace	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.40	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.21	30
Total area ($m^2 \times 10^6$)	8.19*	

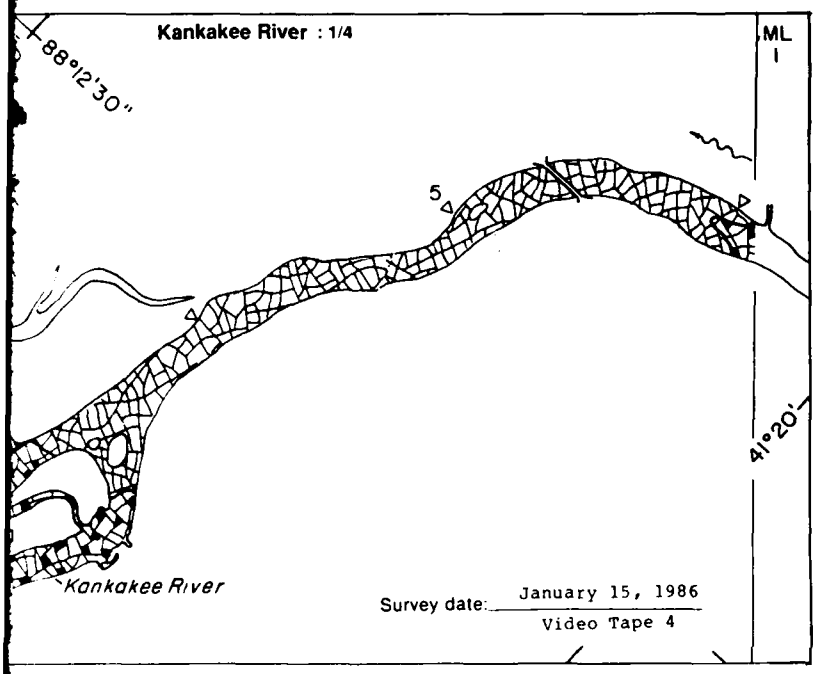
* Includes 0.26 x 10^6 m^2 of no video coverage

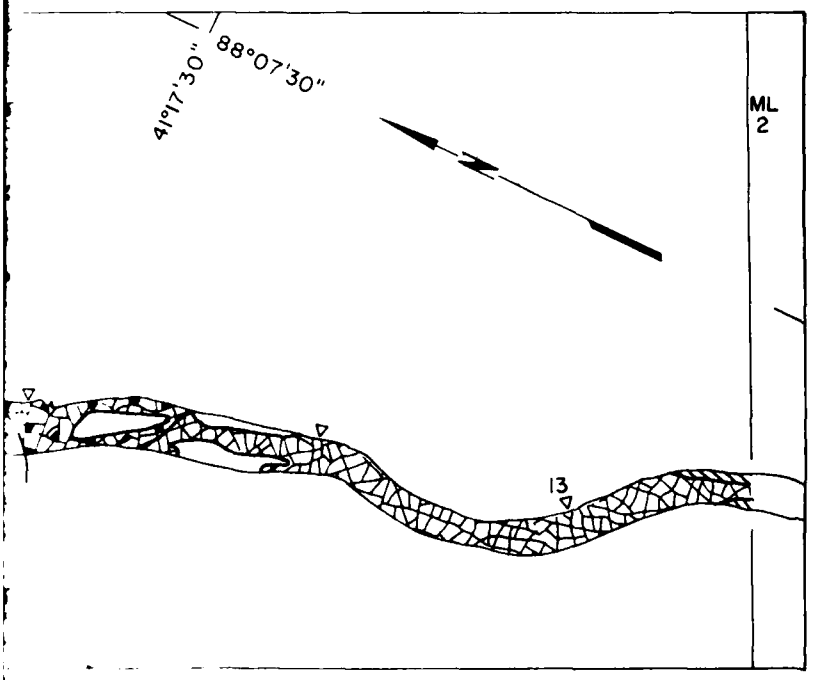

Island
L & D
△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

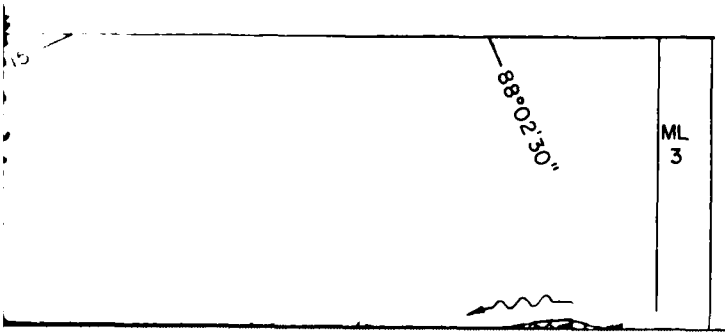
15 January 1986

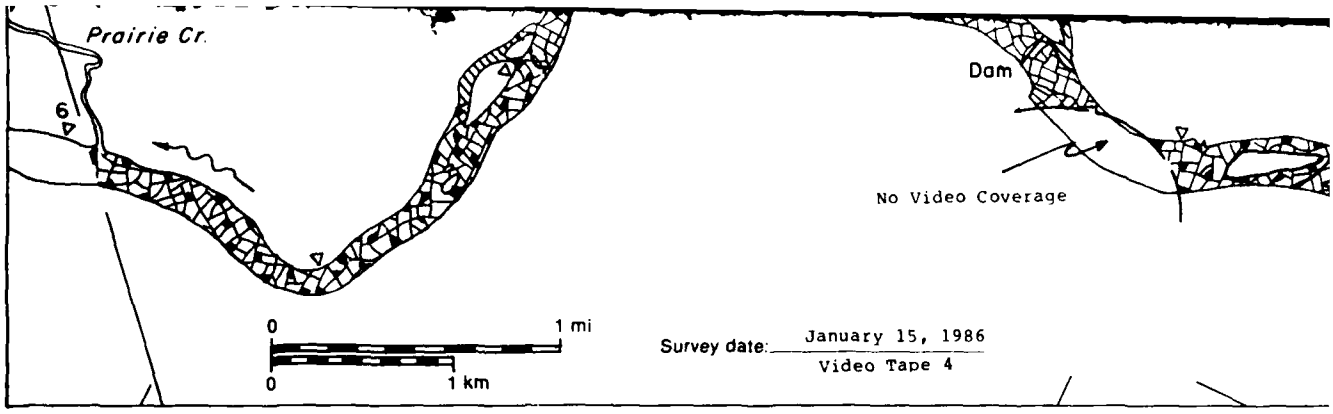


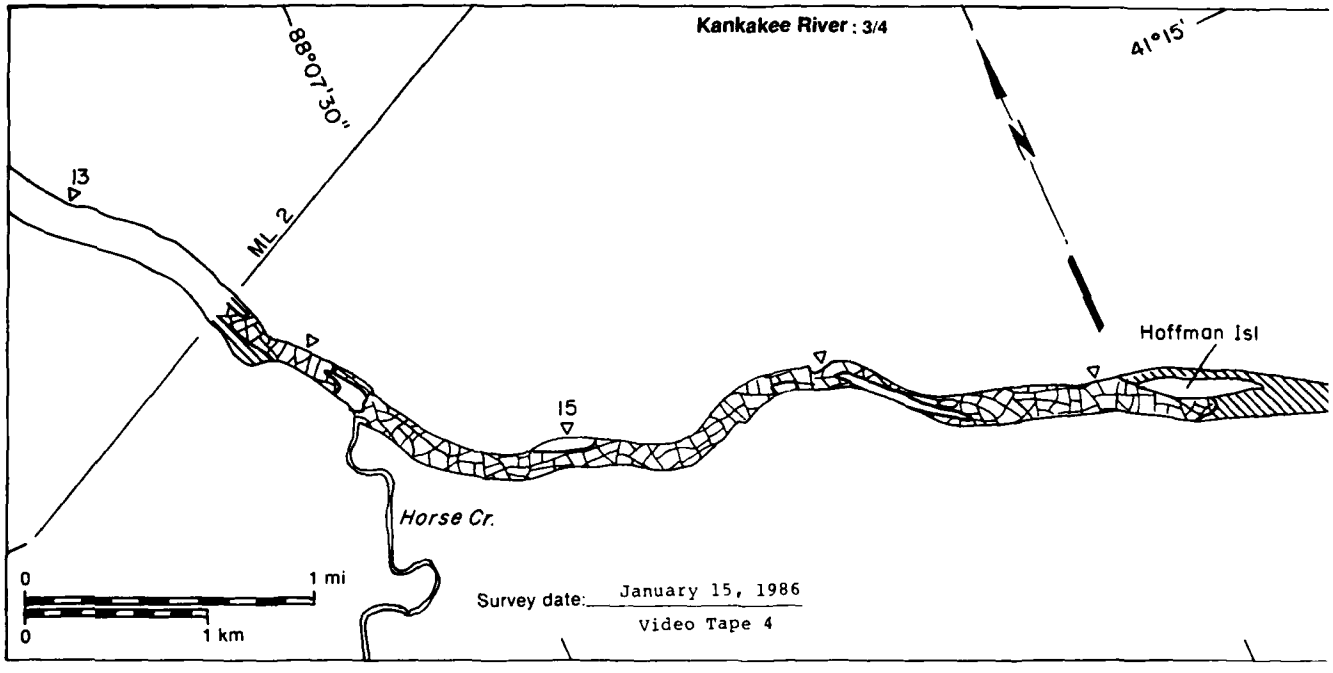


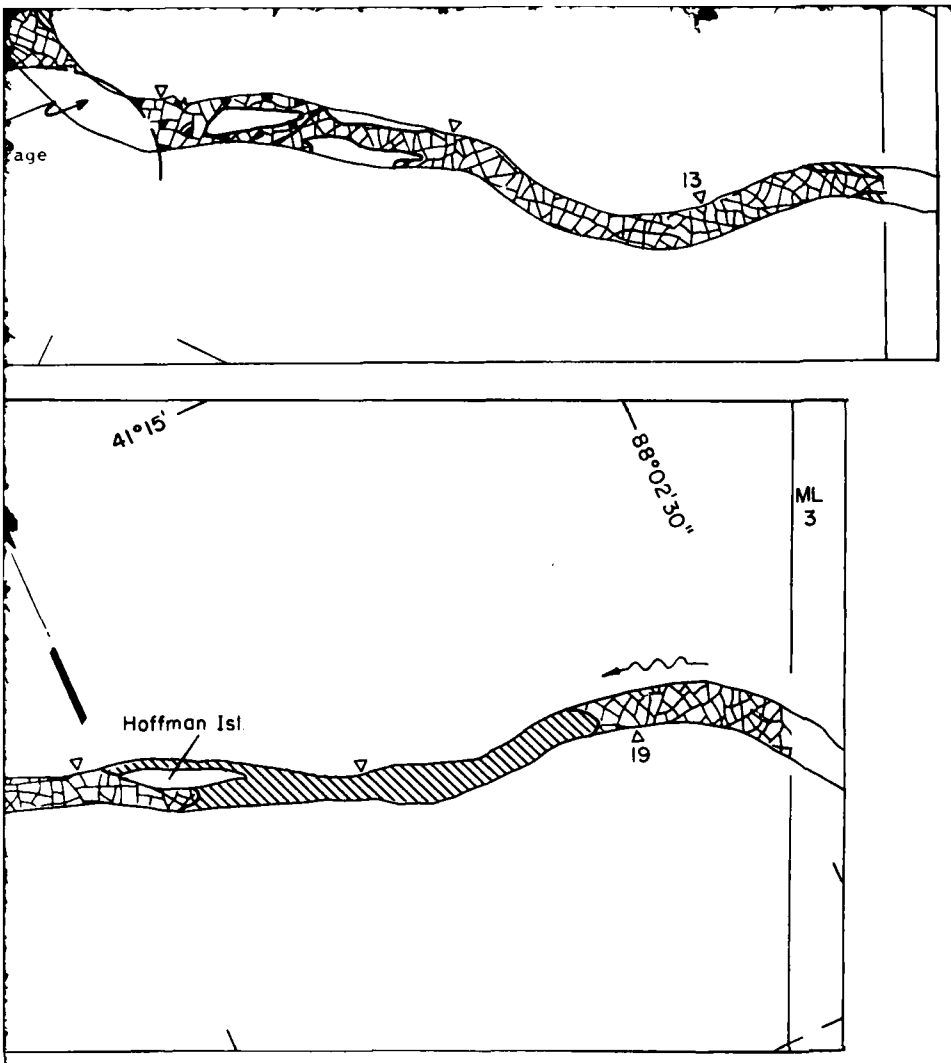

Kankakee River : 1/4
88°12'30"
ML
1
5
41°20'
Kankakee River
Survey date: January 15, 1986
Video Tape 4

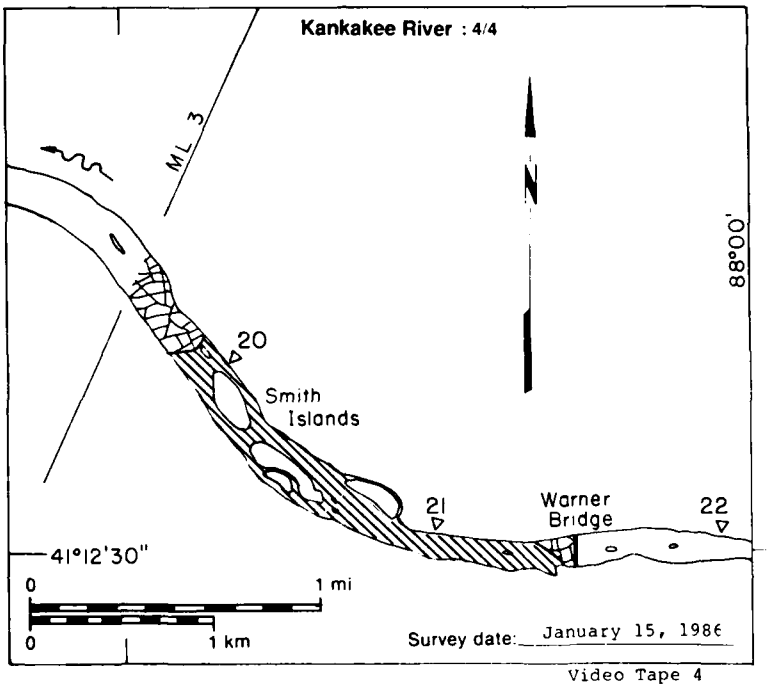

41°17'30"
88°07'30"
ML
2
13


88°02'30"
ML
3


Prairie Cr.
6
Dam
No Video Coverage
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: January 15, 1986
Video Tape 4


Page
13
41°15'
88°02'30"
ML
3
Hoffman Isl.
19



Video Tape 4

Kankakee River

MAP UNITS

Open water

Solid ice cover

Solid ice cover with open-water areas

Fragmented ice cover

Fragmented ice cover with open-water areas

Ice floes or frazil slush and pans

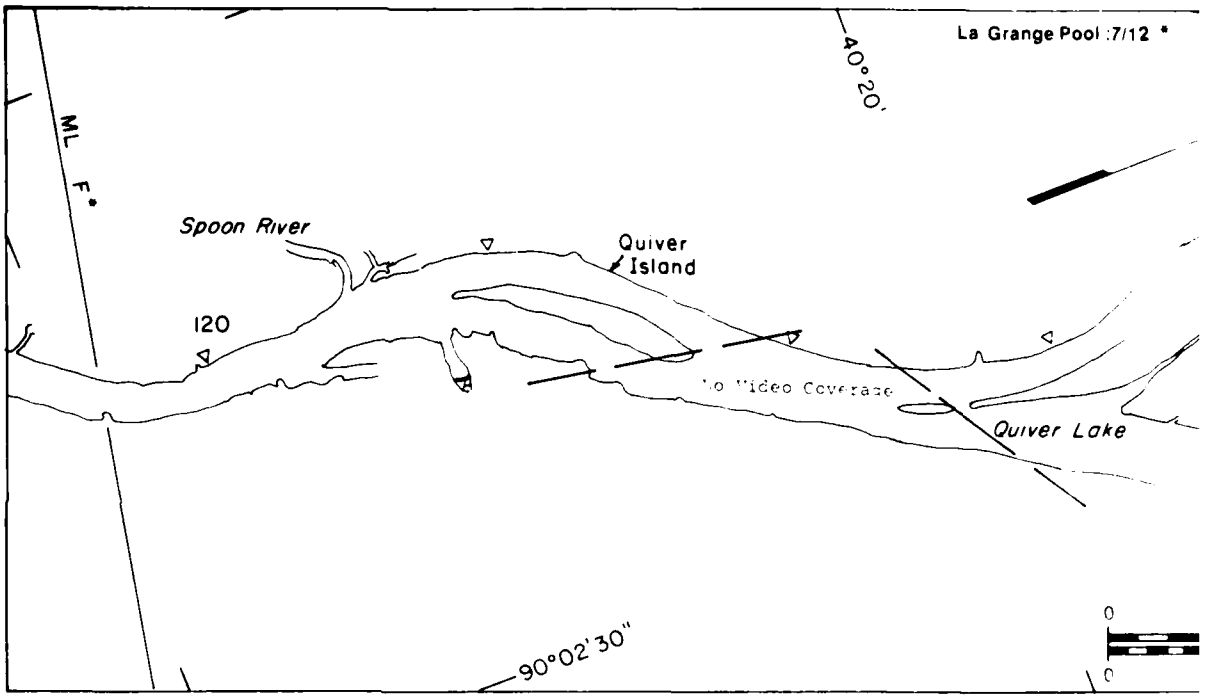
Total area (m^2 x

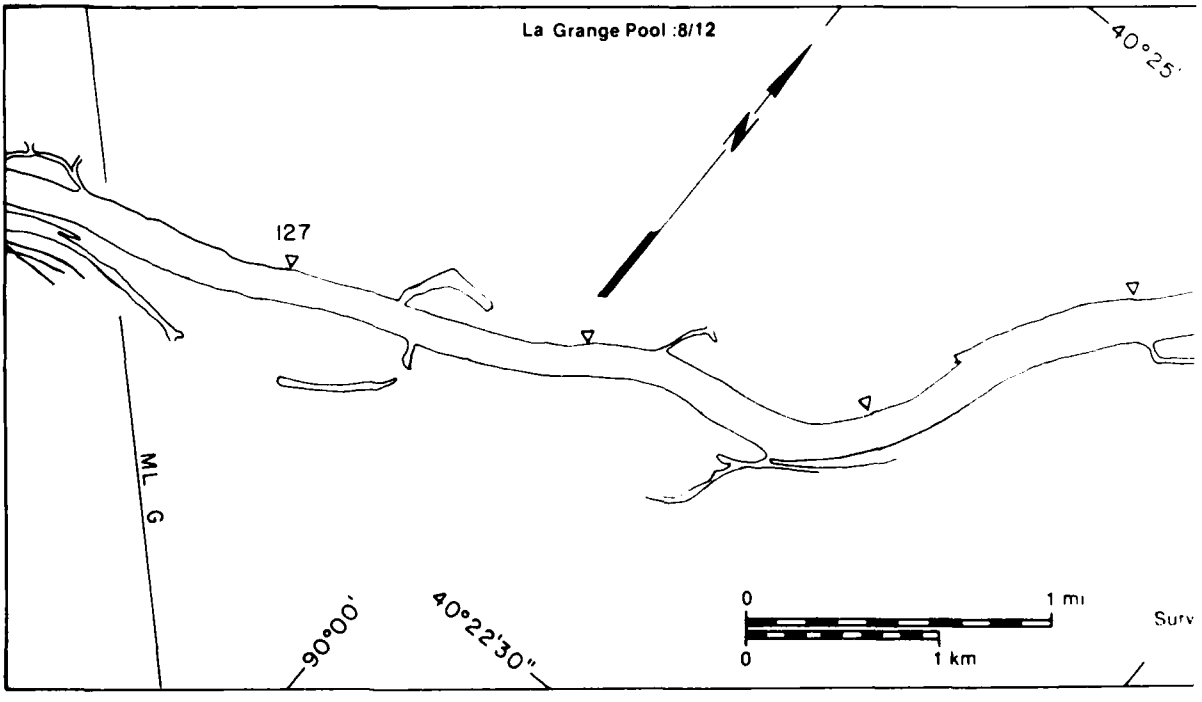
15 January 1986

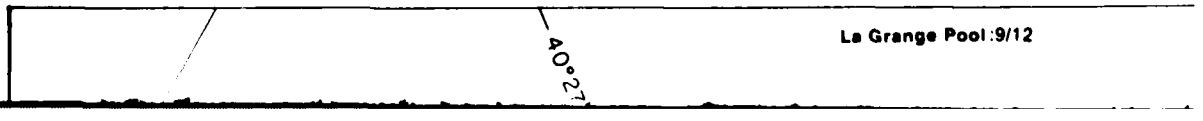
Kankakee River

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.26	NA
Solid ice cover	1.07	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	3.18	NA
Fragmented ice cover with open-water areas	2.67	90
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	7.30*	

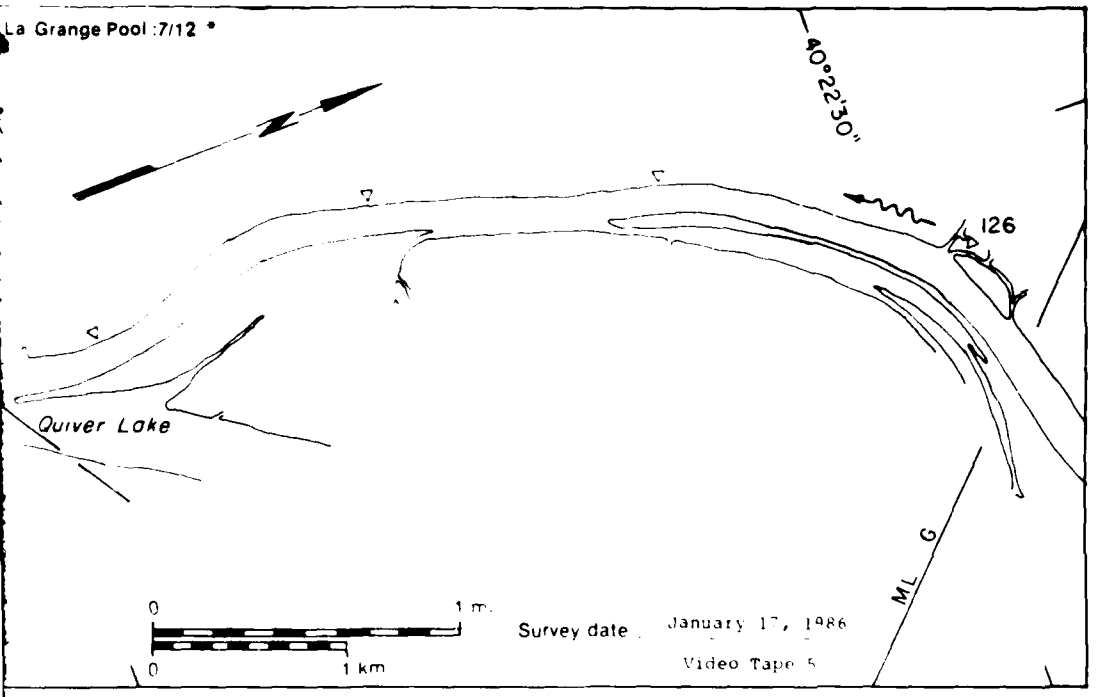
* Includes 0.12×10^6 m^2 of no video coverage

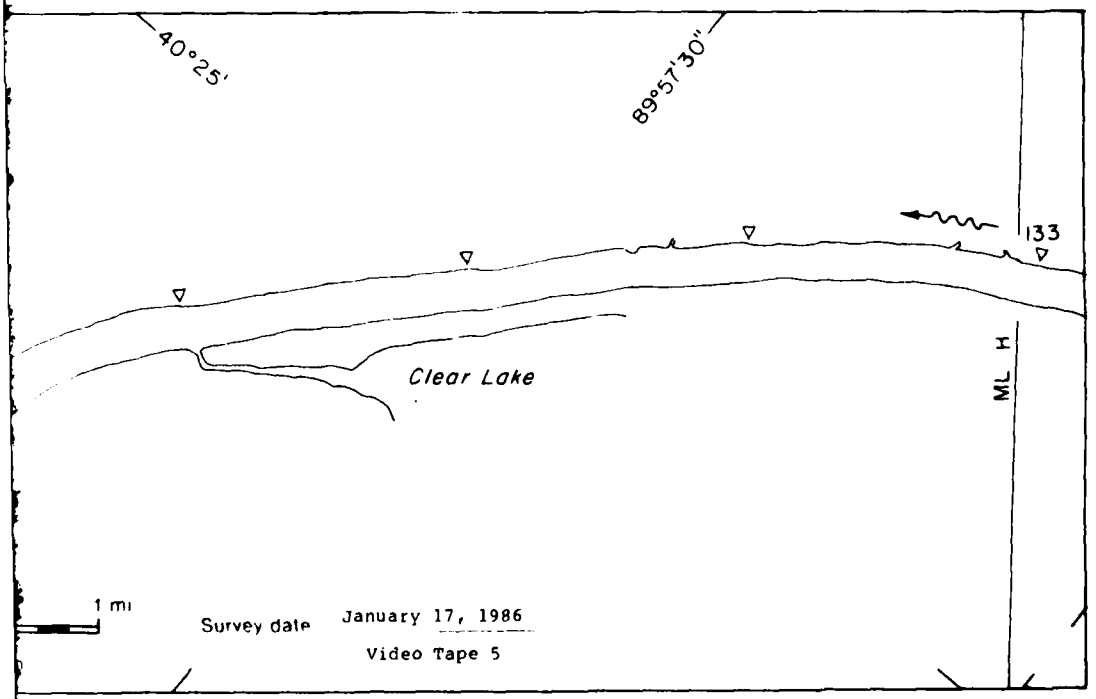

La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0

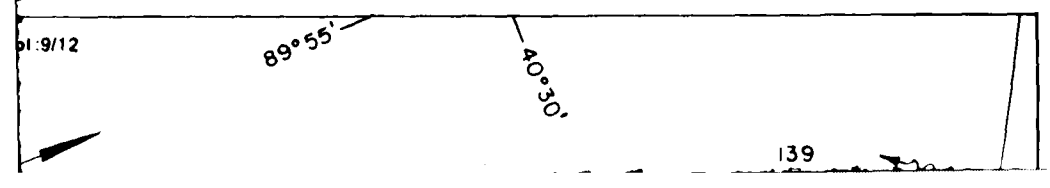

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km

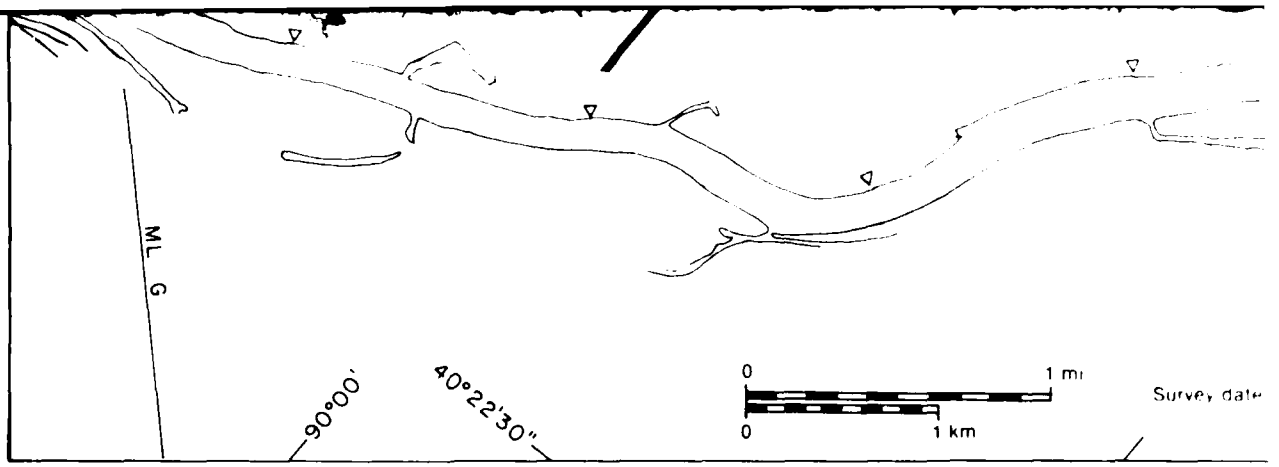

La Grange Pool :9/12
40°27

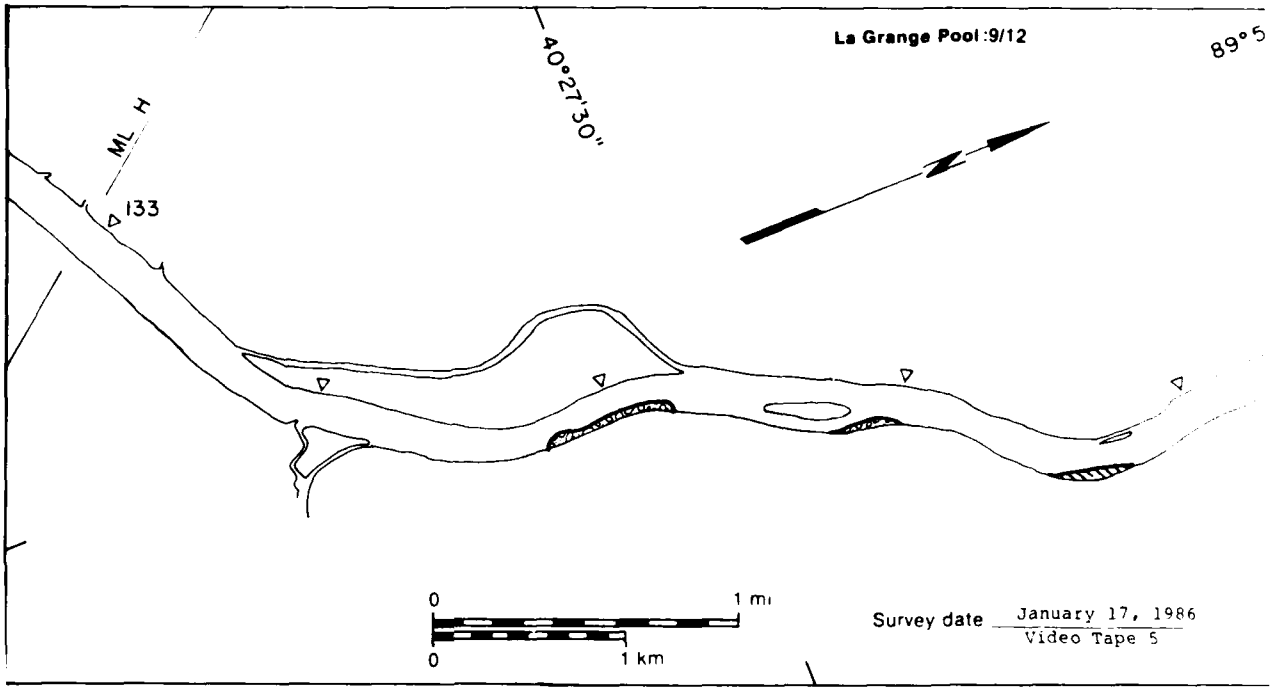
17 January 1986



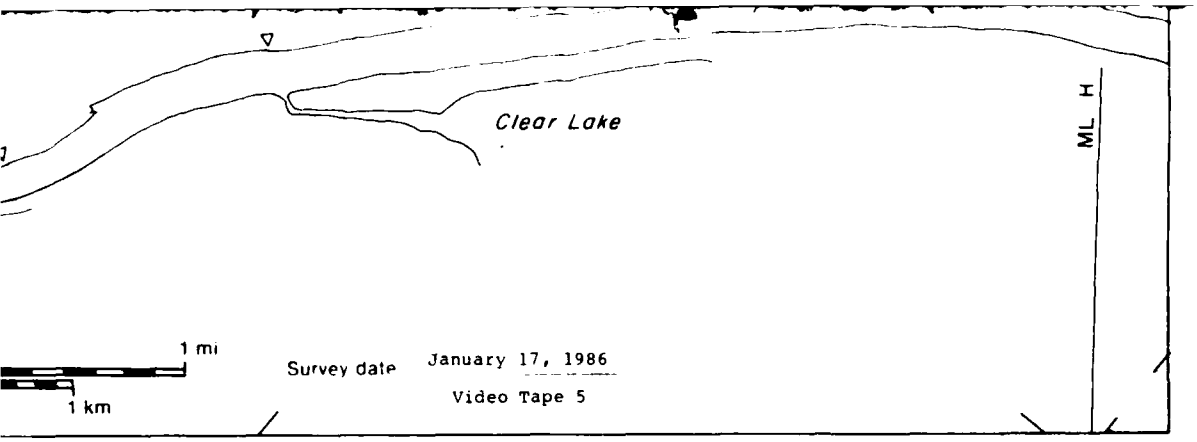


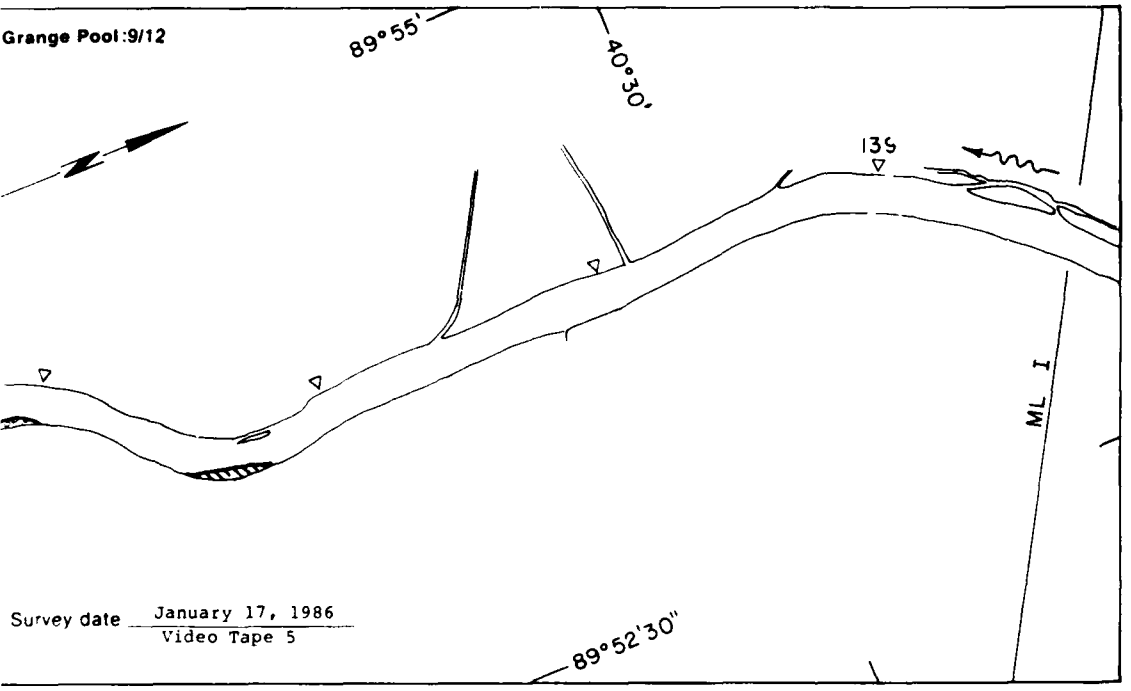




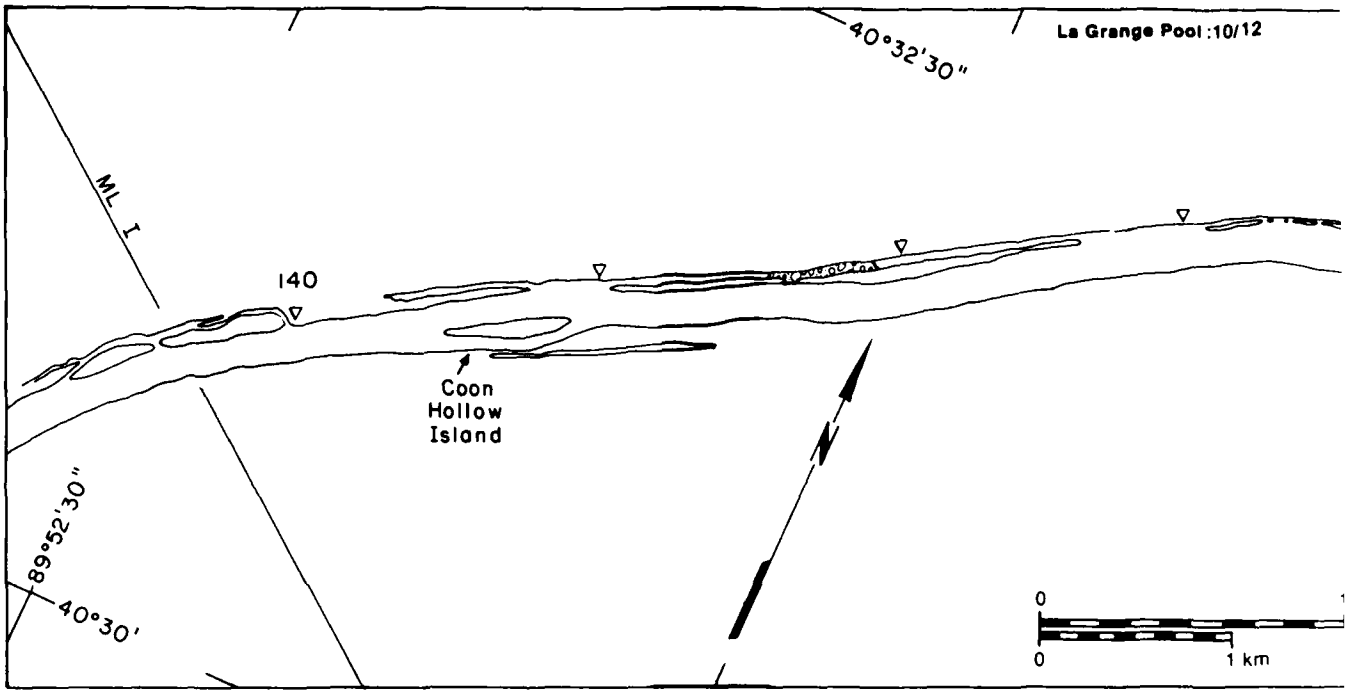


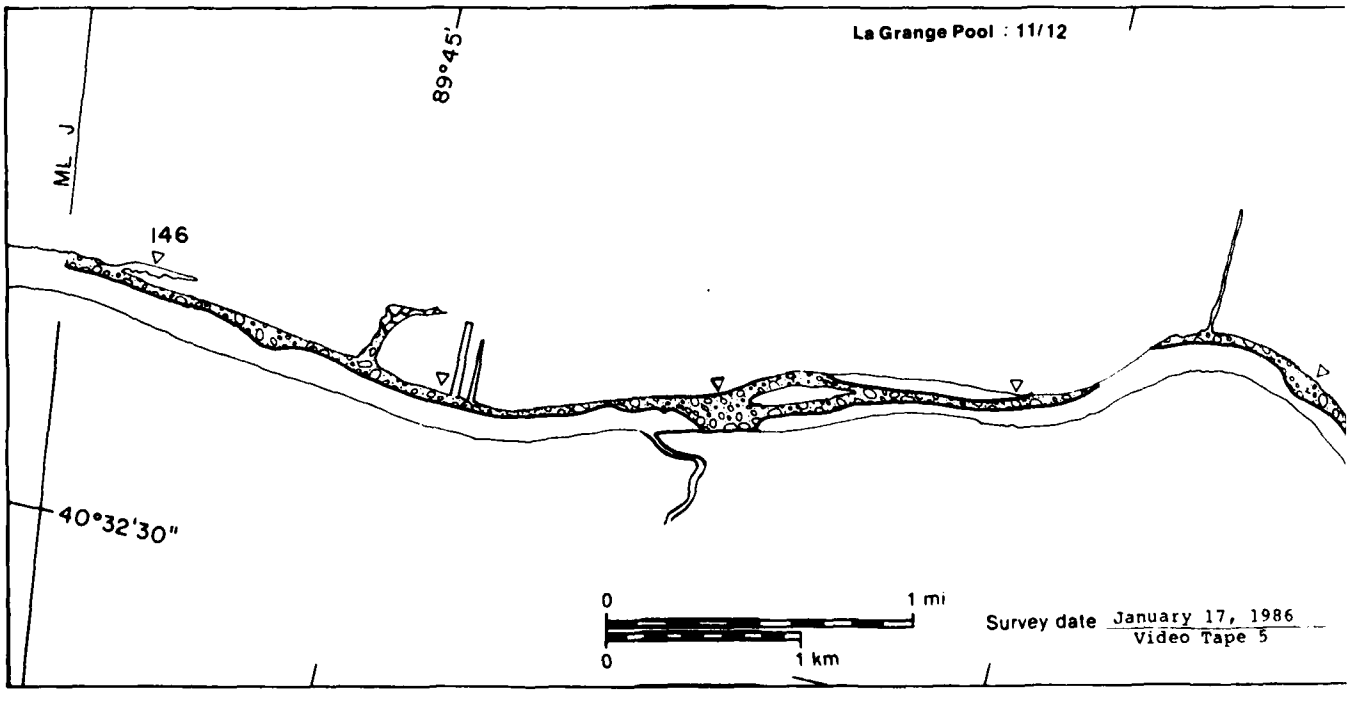
[1] The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 5/12 (match lines A through E).

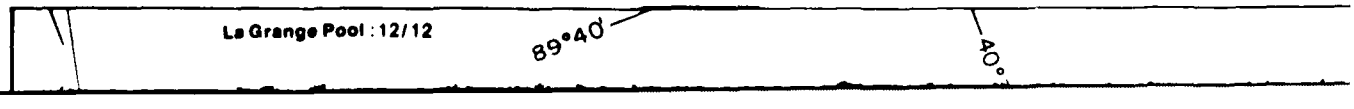

Clear Lake
ML H
1 mi
1 km
Survey date January 17, 1986
Video Tape 5

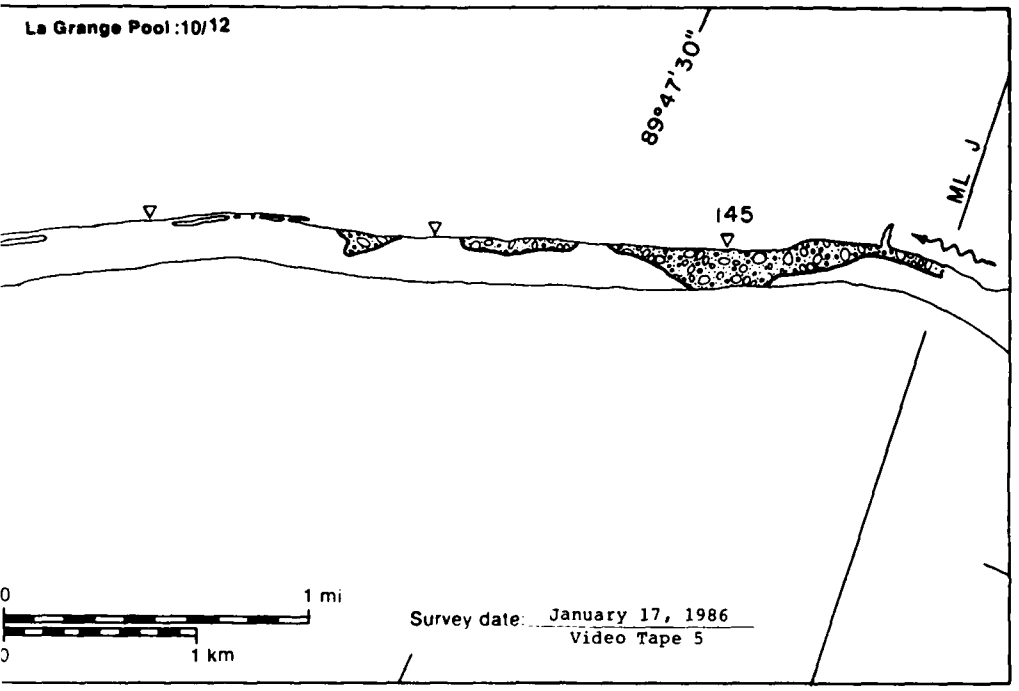

Grange Pool:9/12
89°55'
40°30"
135
ML I
Survey date January 17, 1986
Video Tape 5
89°52'30"

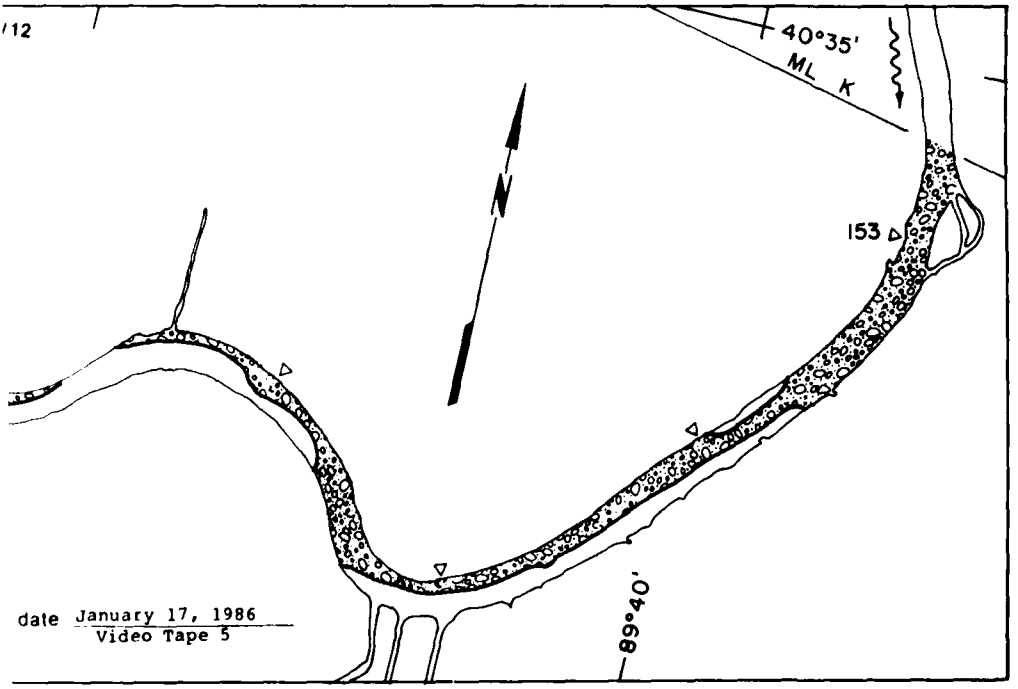
17 January 1986







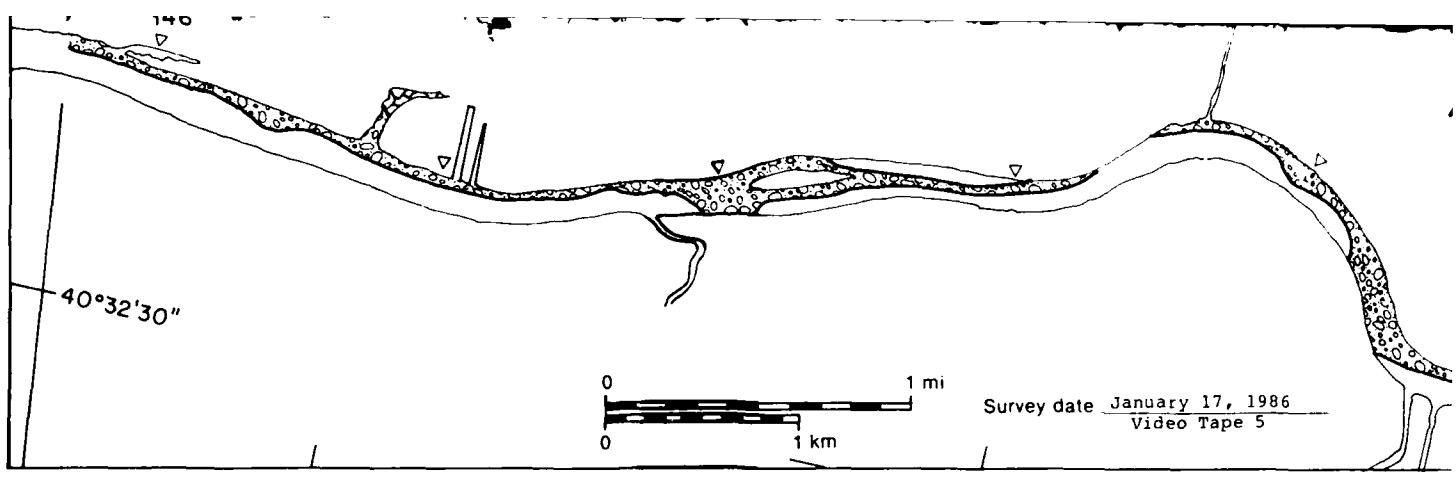


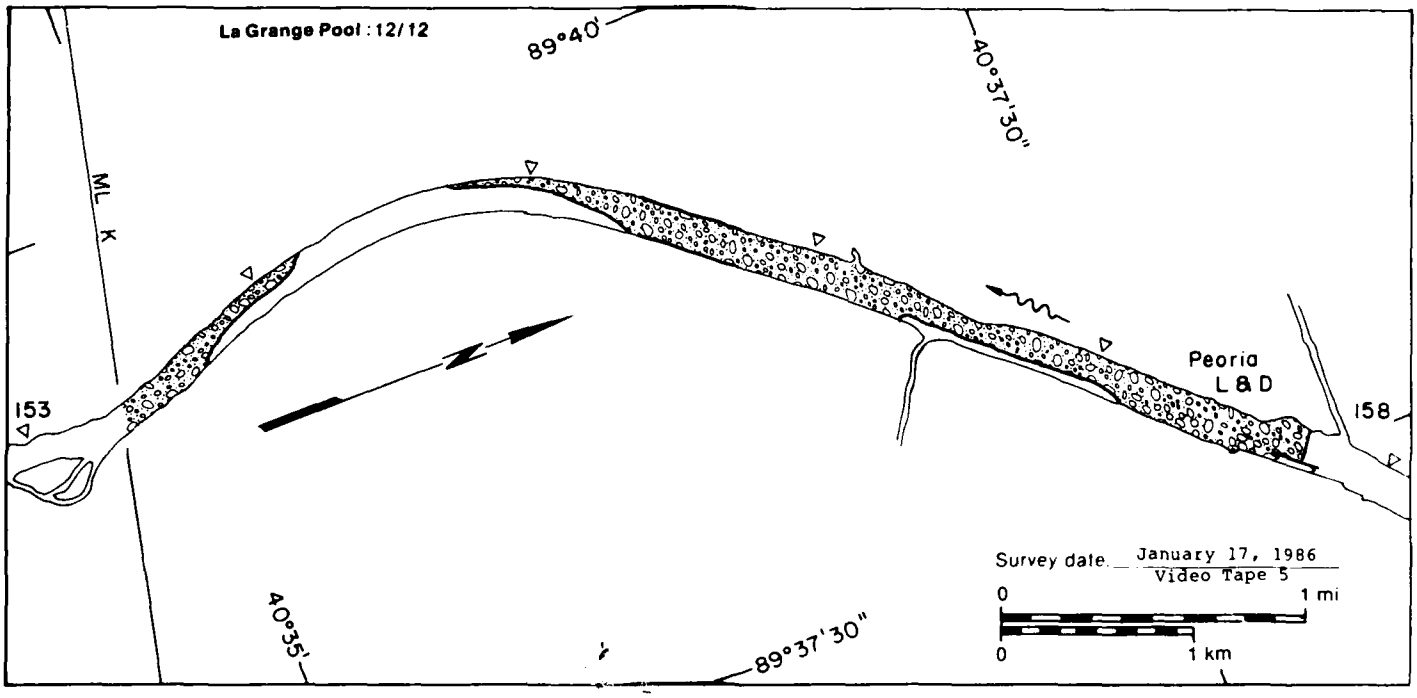


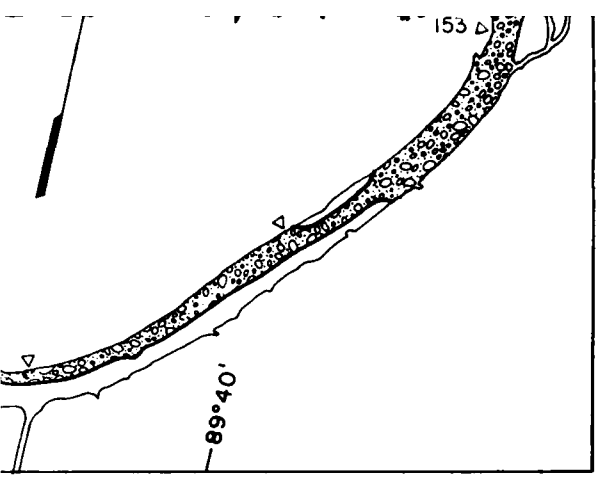
La Grange Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


146
40°32'30"
0
1 mi
0
1 km
Survey date January 17, 1986
Video Tape 5

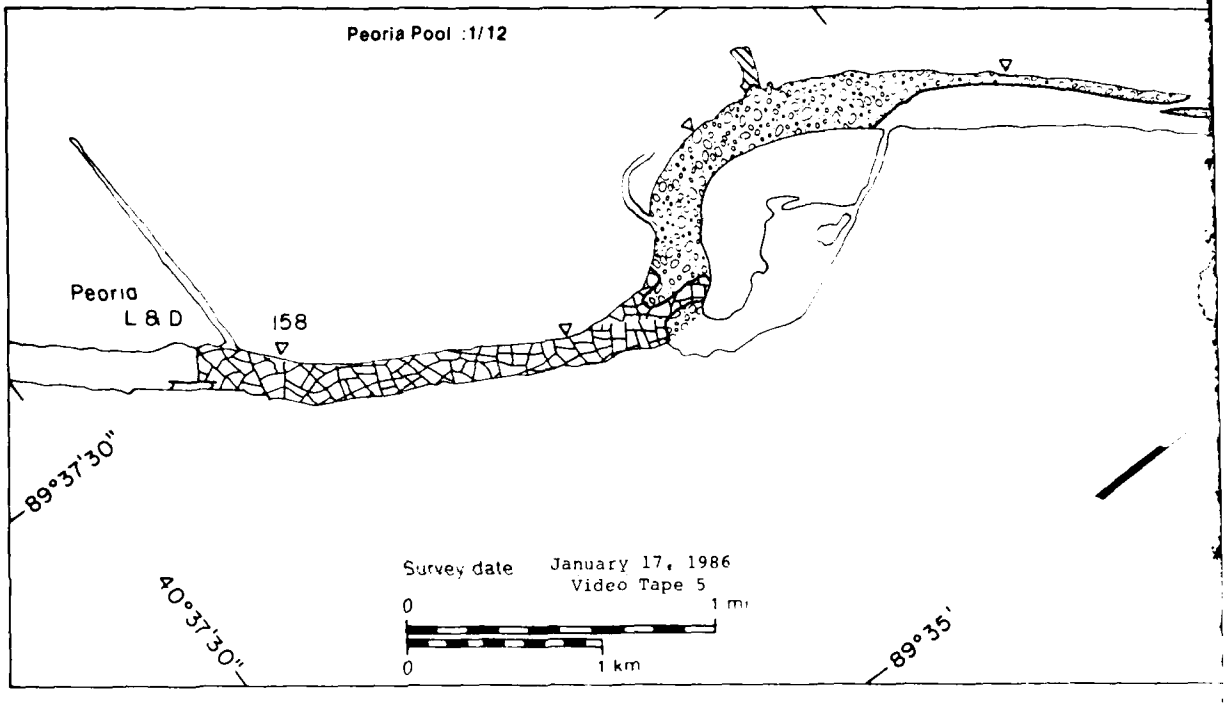

La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
158
Peoria
L&D
Survey date January 17, 1986
Video Tape 5
0
1 mi
0
1 km
40°35'
89°37'30"

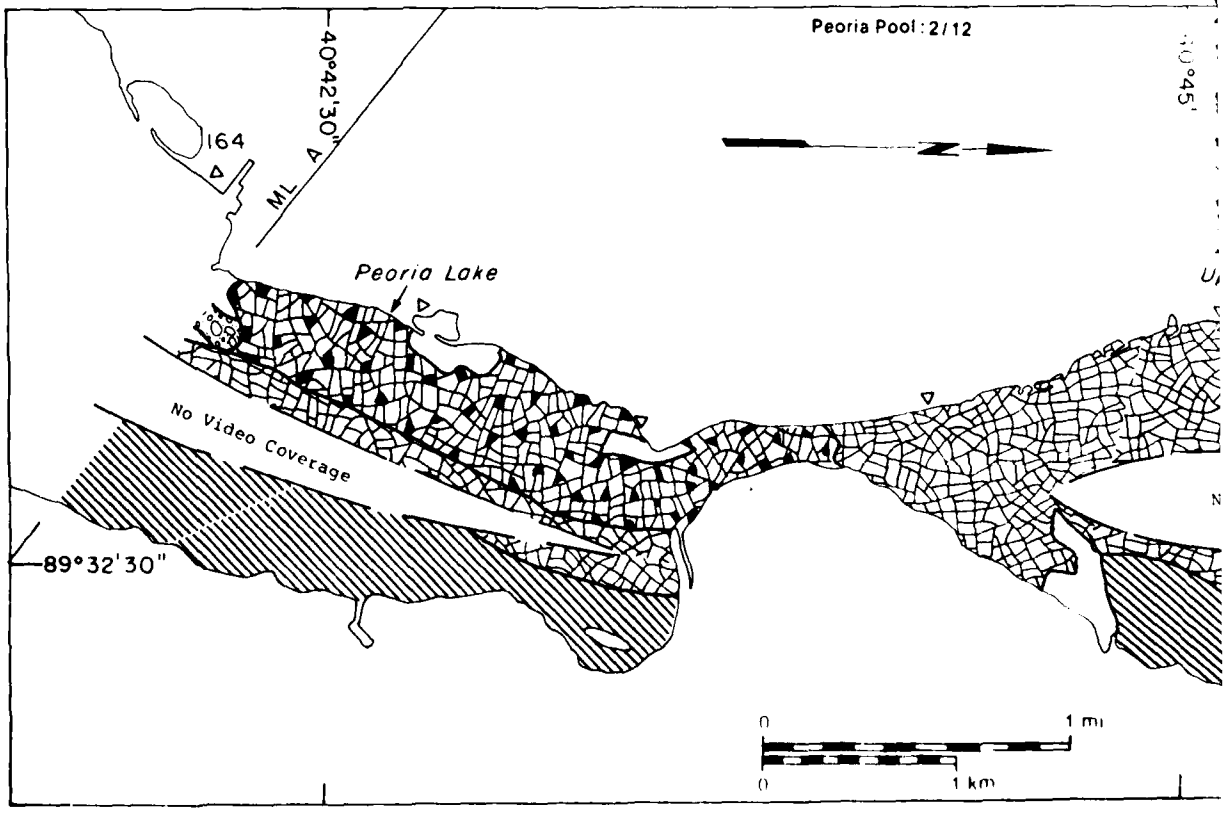


La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.63	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	2.49	10
Total area ($m^2 \times 10^6$)	11.71*	

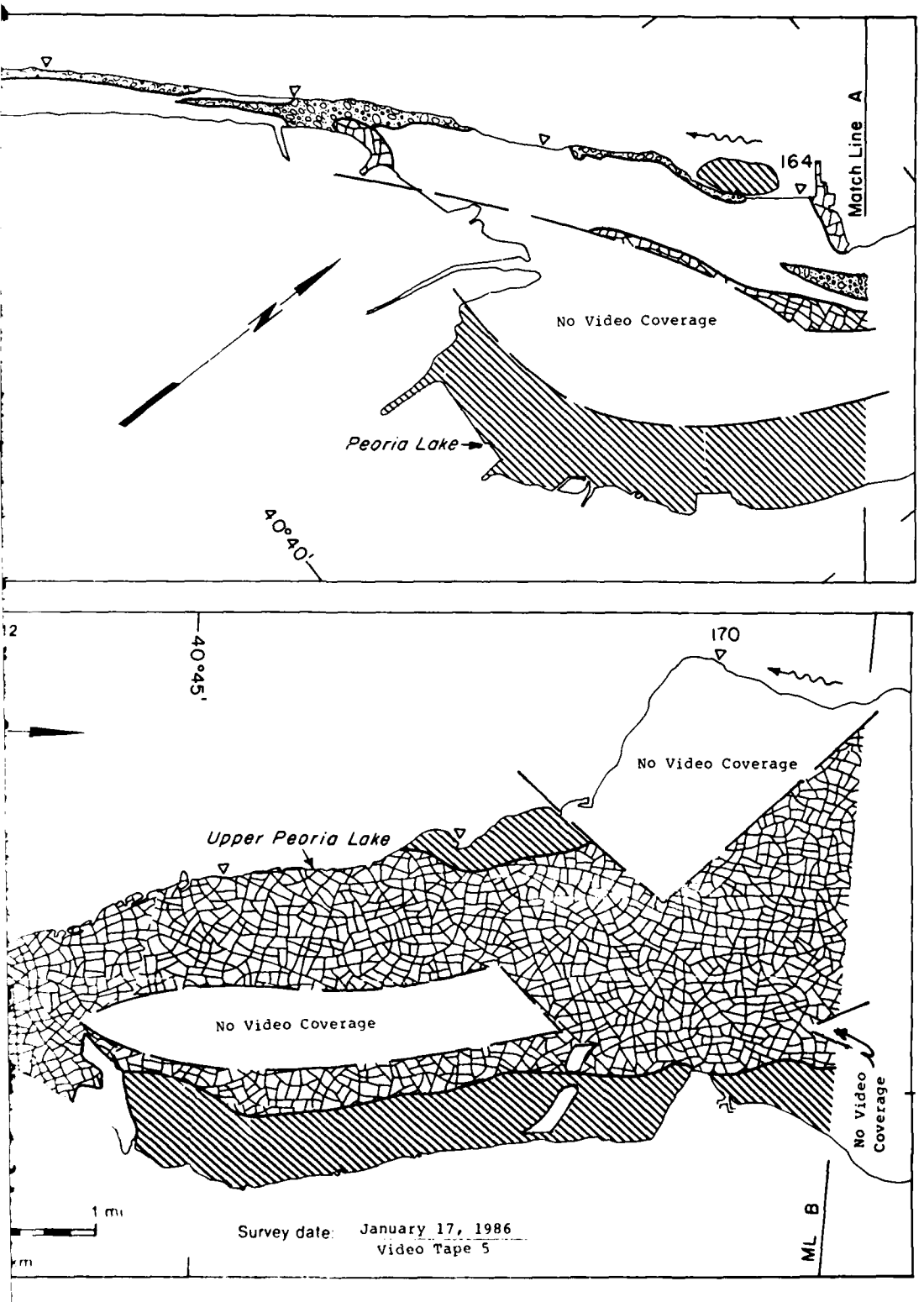
* Includes 0.54×10^6 m^2 of no video coverage

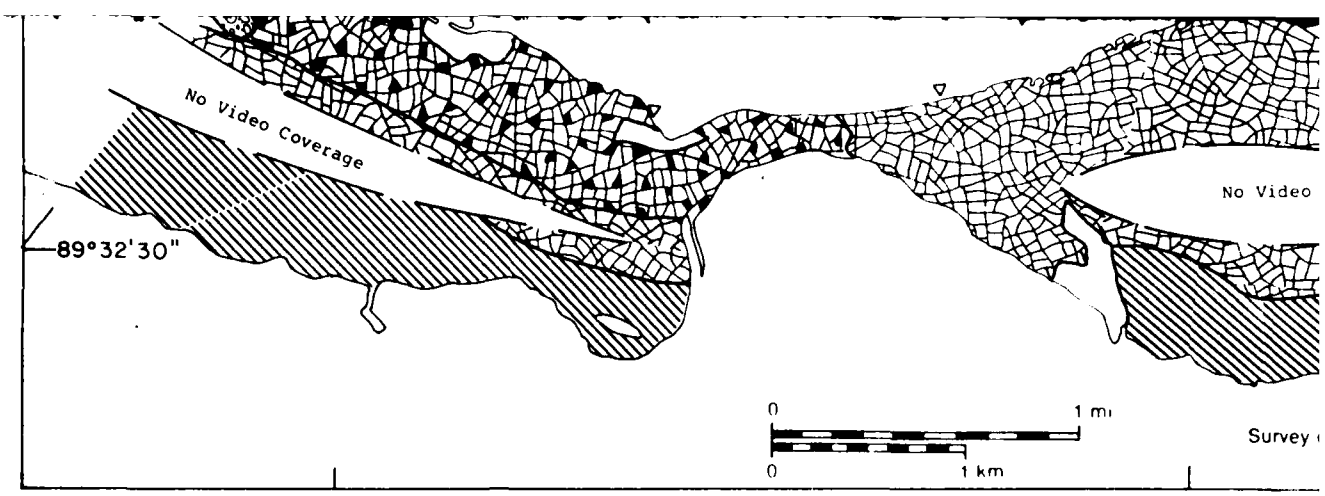

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date January 17, 1986
Video Tape 5
0 1 mi
0 1 km
89°35'

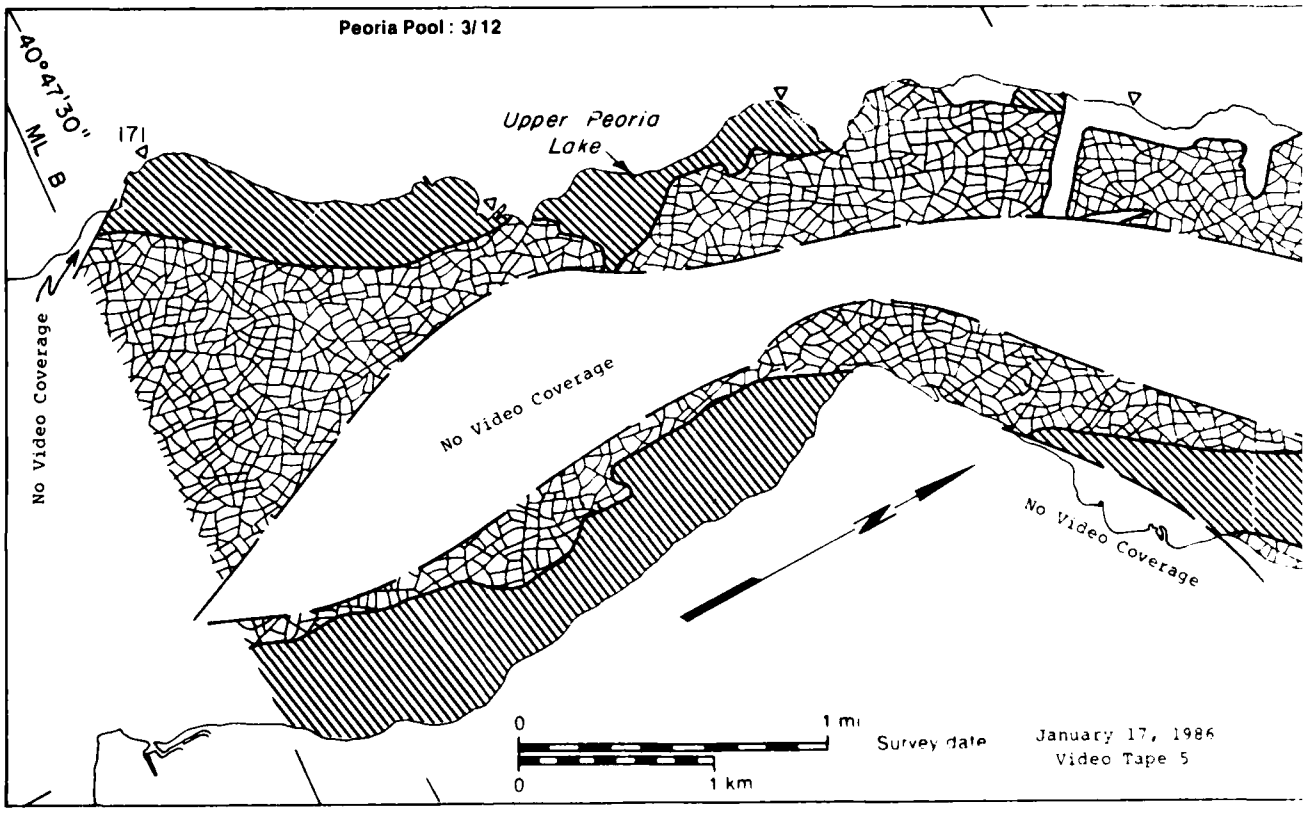

Peoria Pool : 2/12
40°42'30"
ML A
164
Peoria Lake
No Video Coverage
89°32'30"
0 1 mi
0 1 km

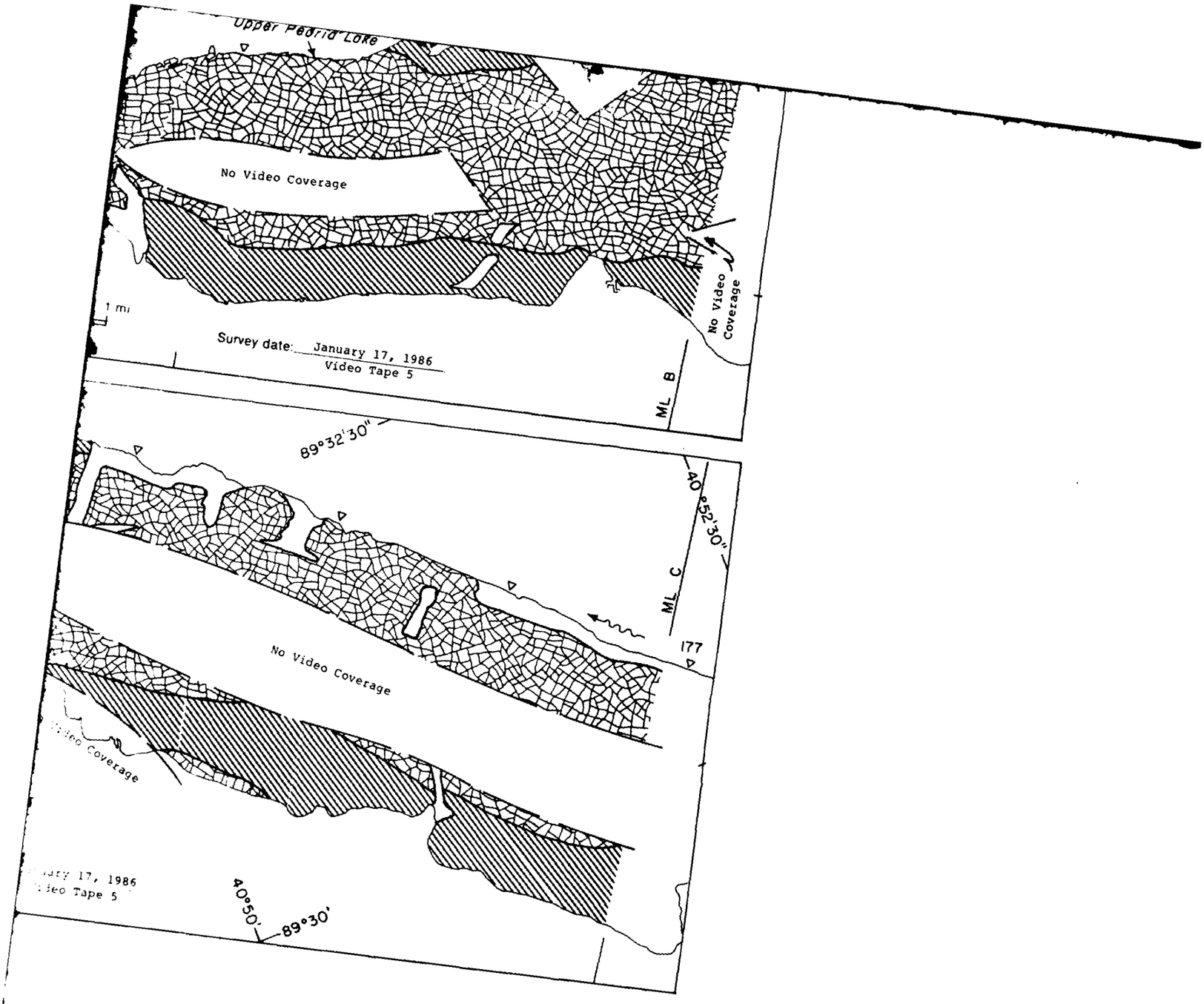
Peoria Pool : 3/12

17 January 1986

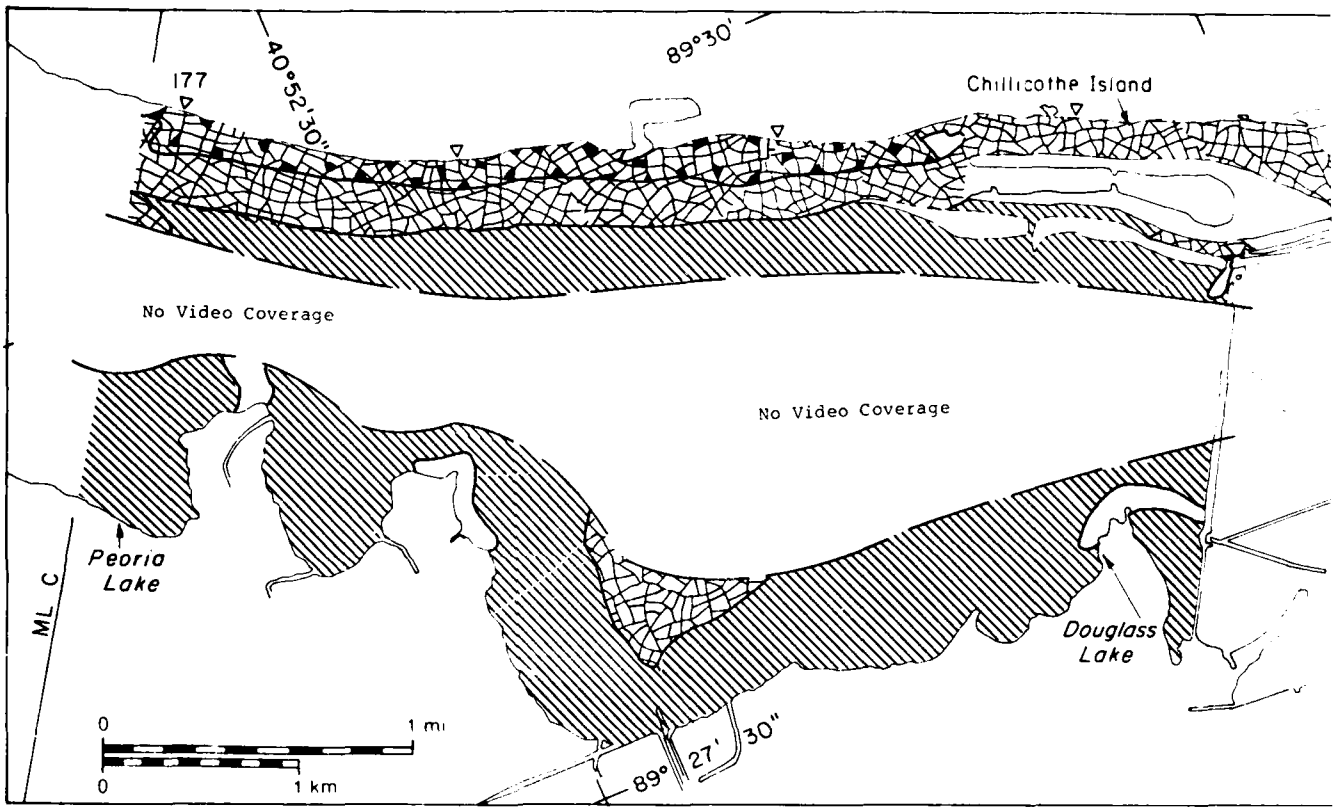


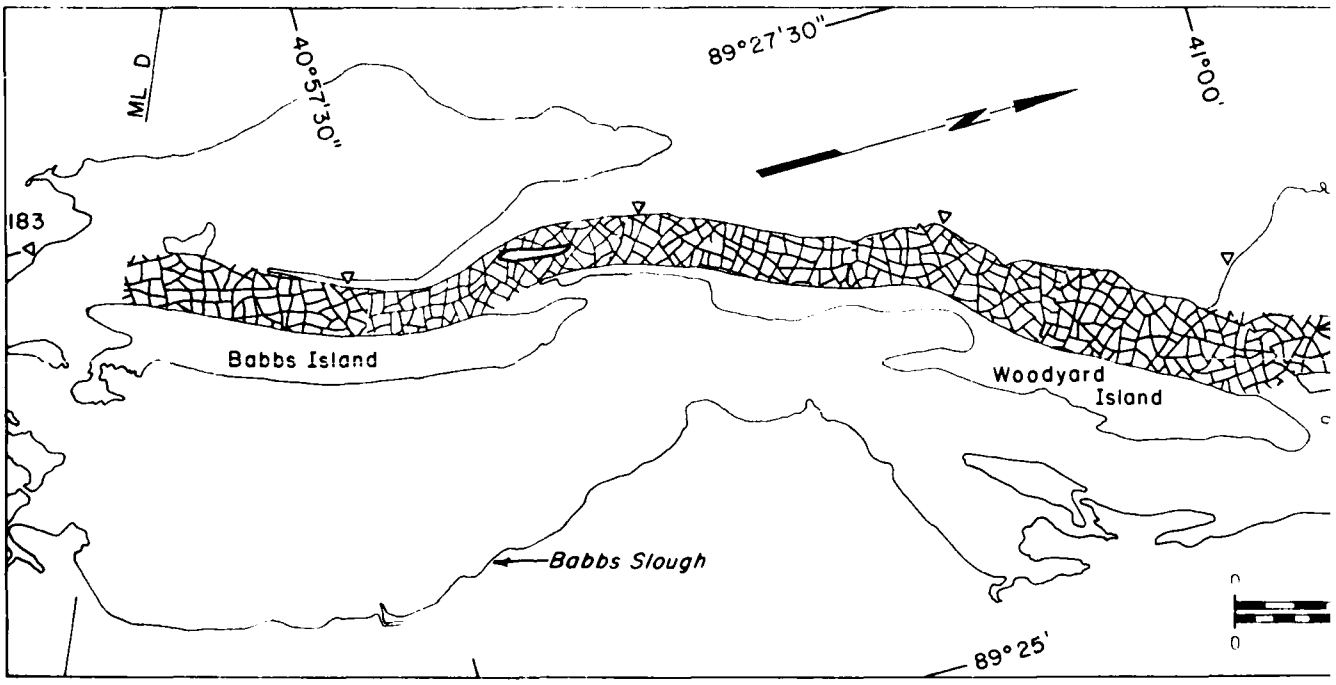

No Video Coverage
89°32'30"
No Video
0
1 mi
0
1 km
Survey

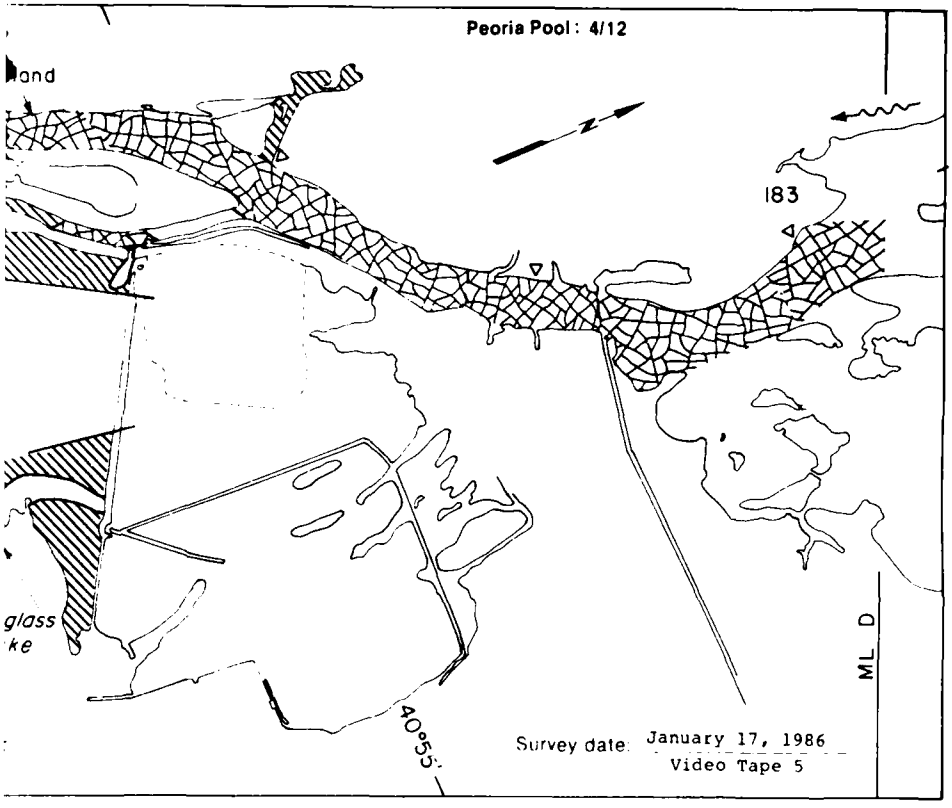

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date
January 17, 1986
Video Tape 5

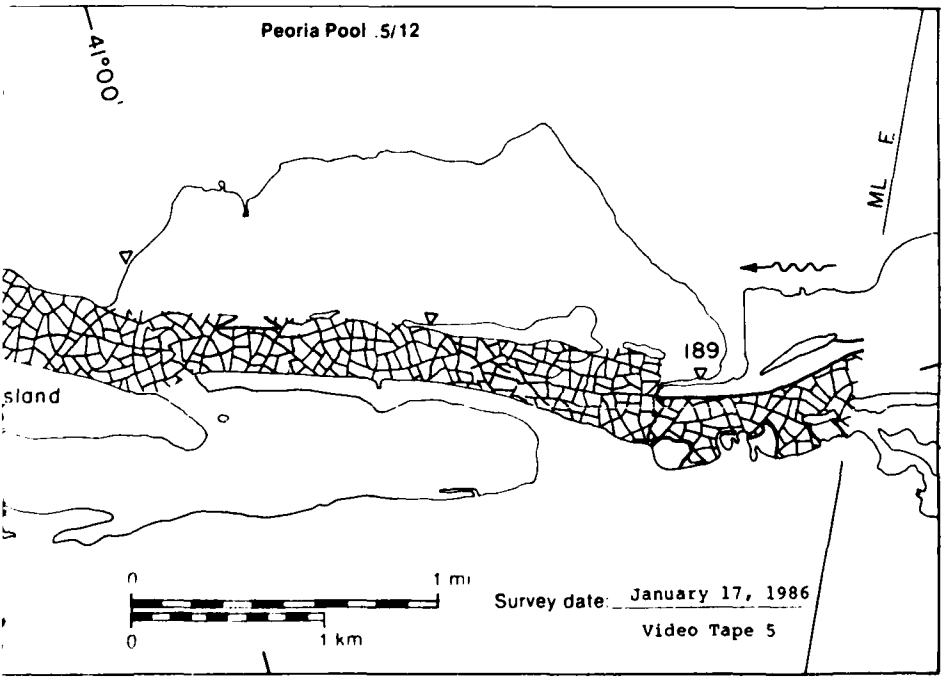

Upper Peoria Lake
No Video Coverage
1 mi
Survey date: January 17, 1986
Video Tape 5
No Video Coverage
ML B
89°32'30"
40°52'30"
ML C
177
No Video Coverage
Video Coverage
40°50'
89°30'

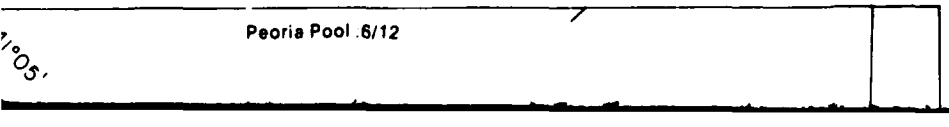
17 January 1986

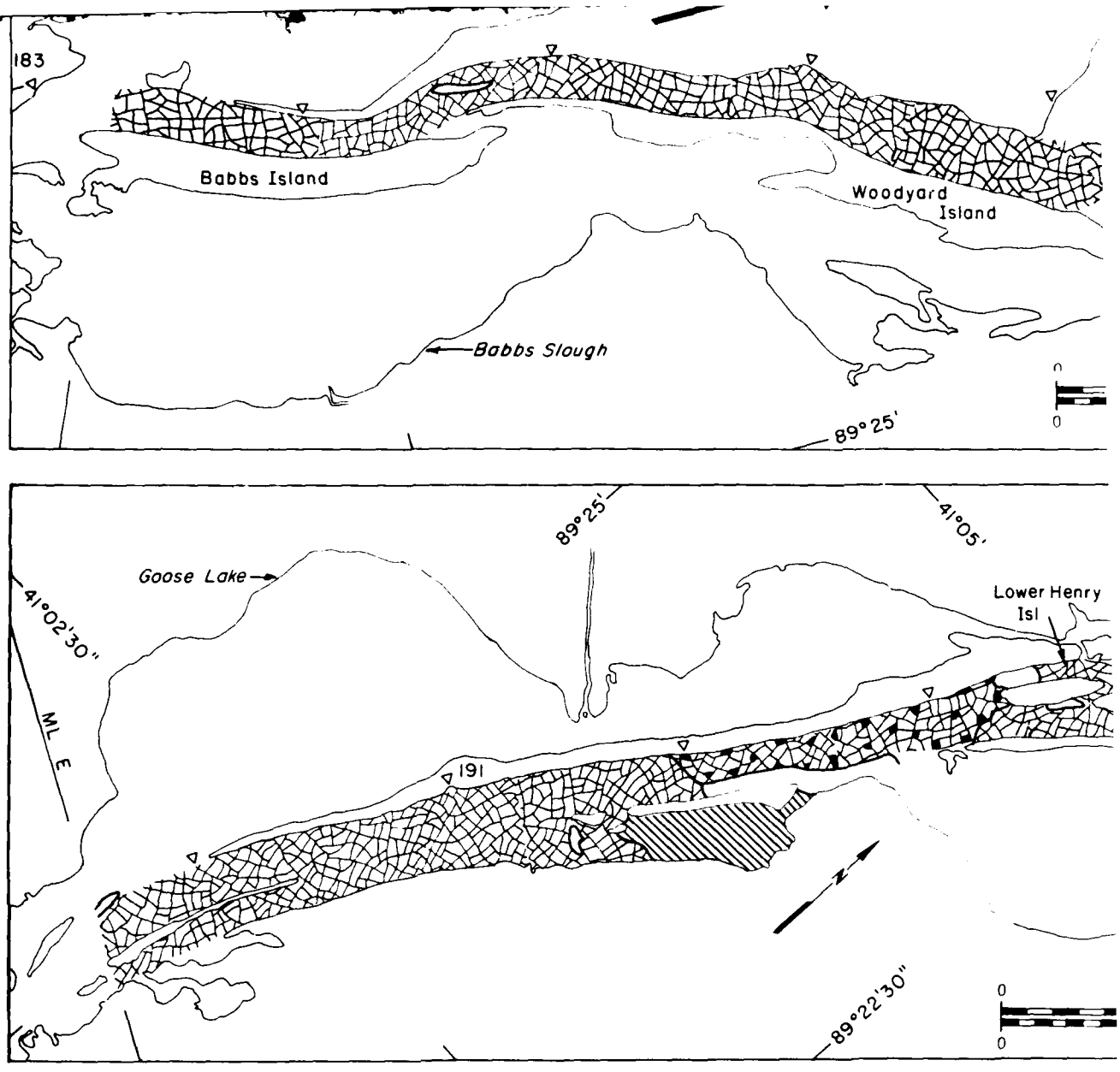


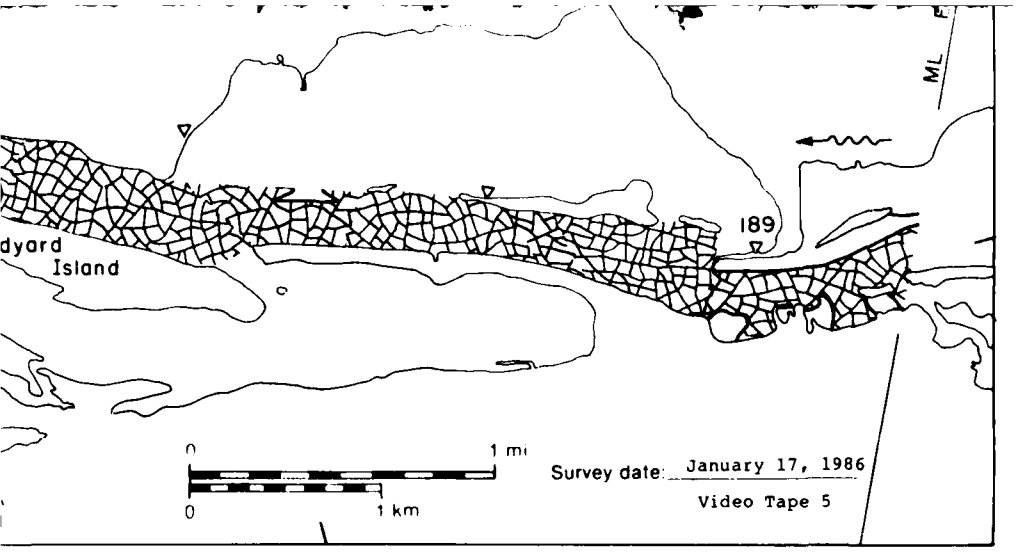


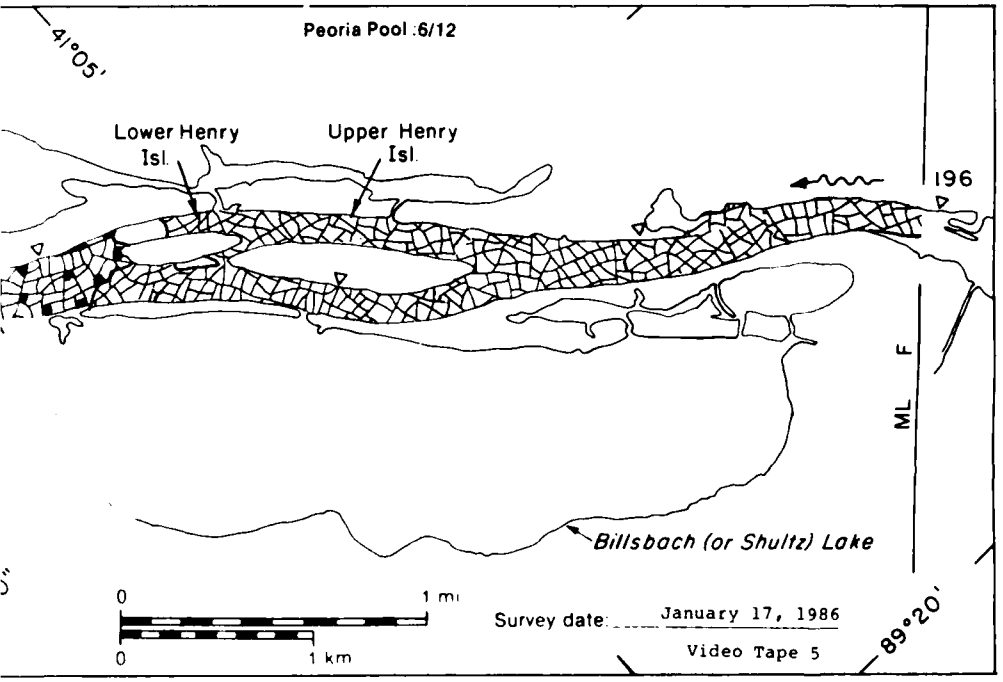

Peoria Pool : 4/12
183
ML D
40°55'
Survey date: January 17, 1986
Video Tape 5

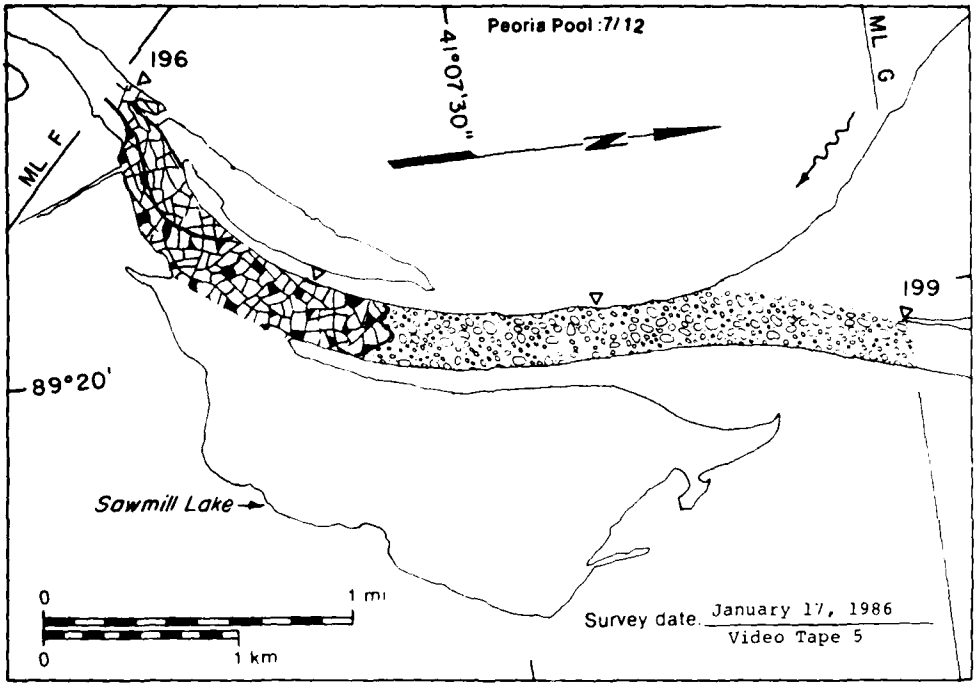

Peoria Pool .5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date: January 17, 1986
Video Tape 5

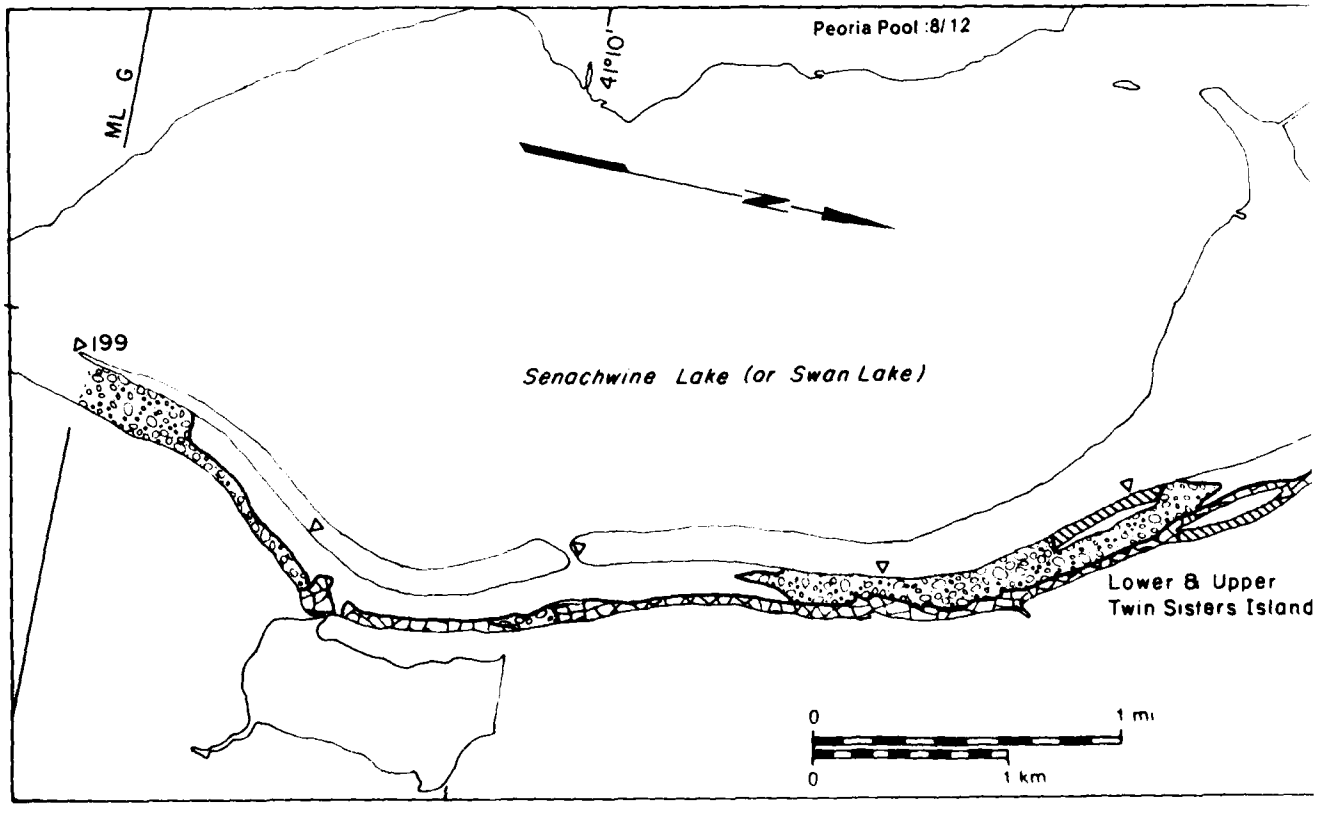

Peoria Pool .6/12

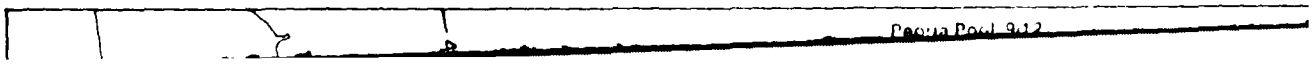

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
89°22'30"
0
0
0
0


ML
189
dyard
Island
0
1 mi
0
1 km
Survey date: January 17, 1986
Video Tape 5

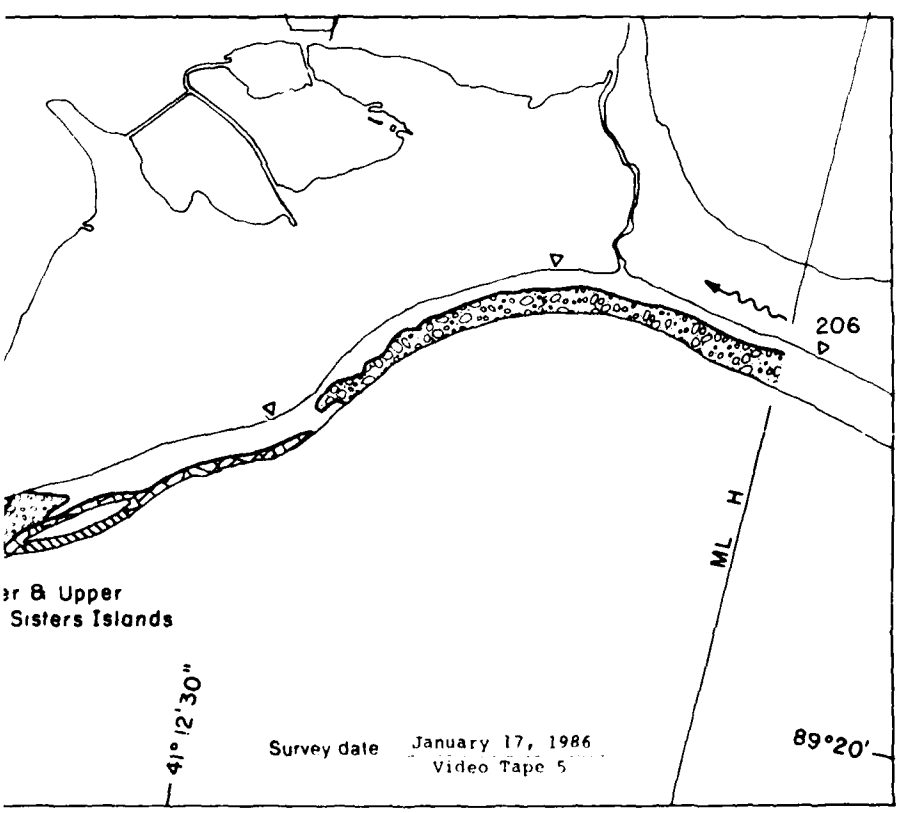

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 17, 1986
Video Tape 5
89°20'

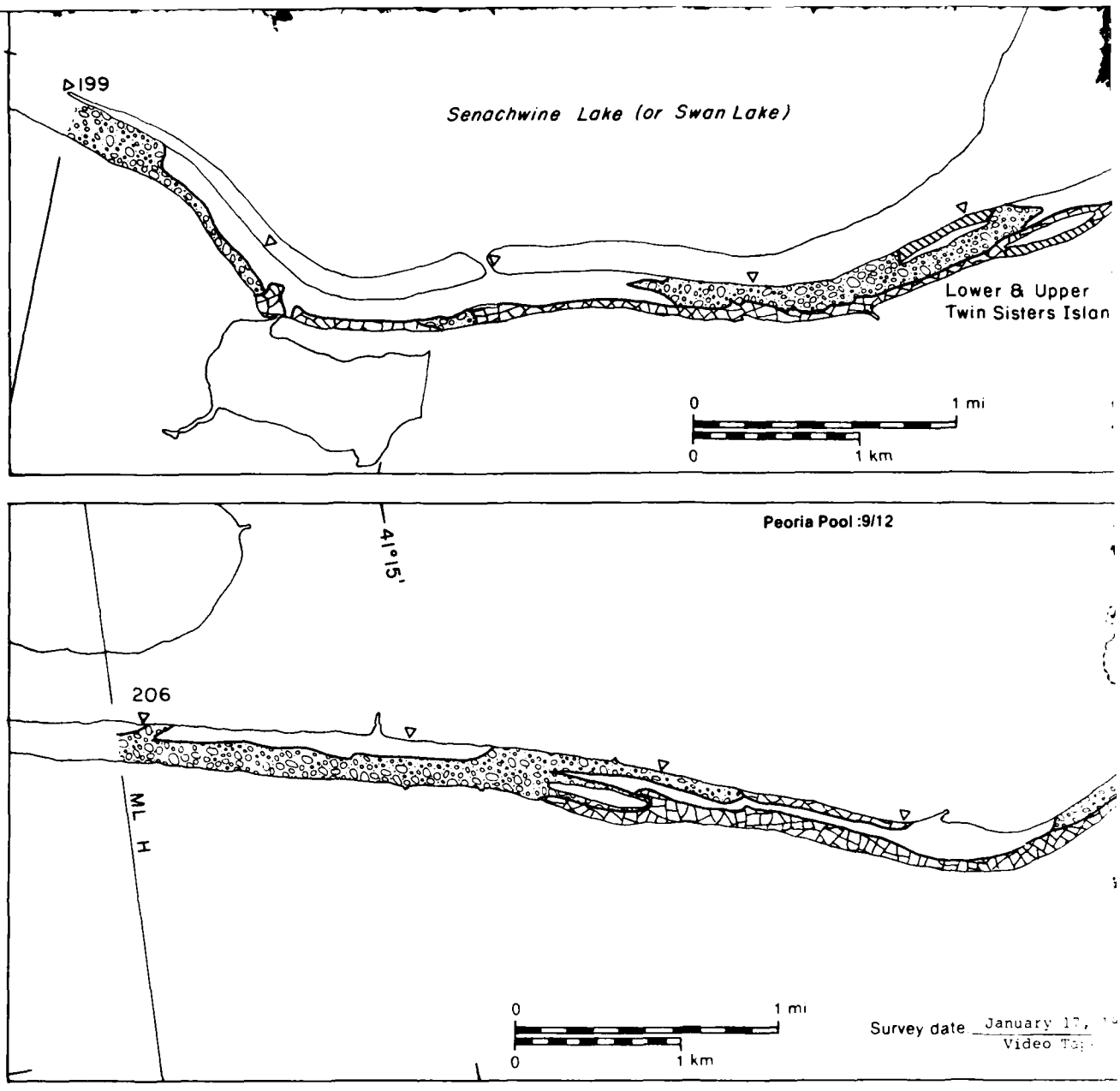

Peoria Pool :7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date. January 17, 1986
Video Tape 5


Peoria Pool :8/12
41°01'
ML G
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Island
0
1 mi
0
1 km

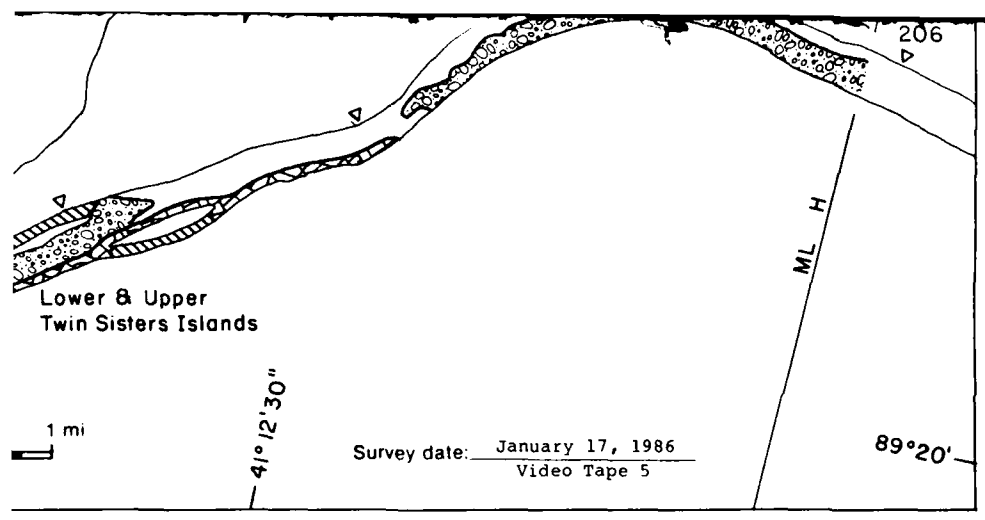

Peoria Pool 9/12

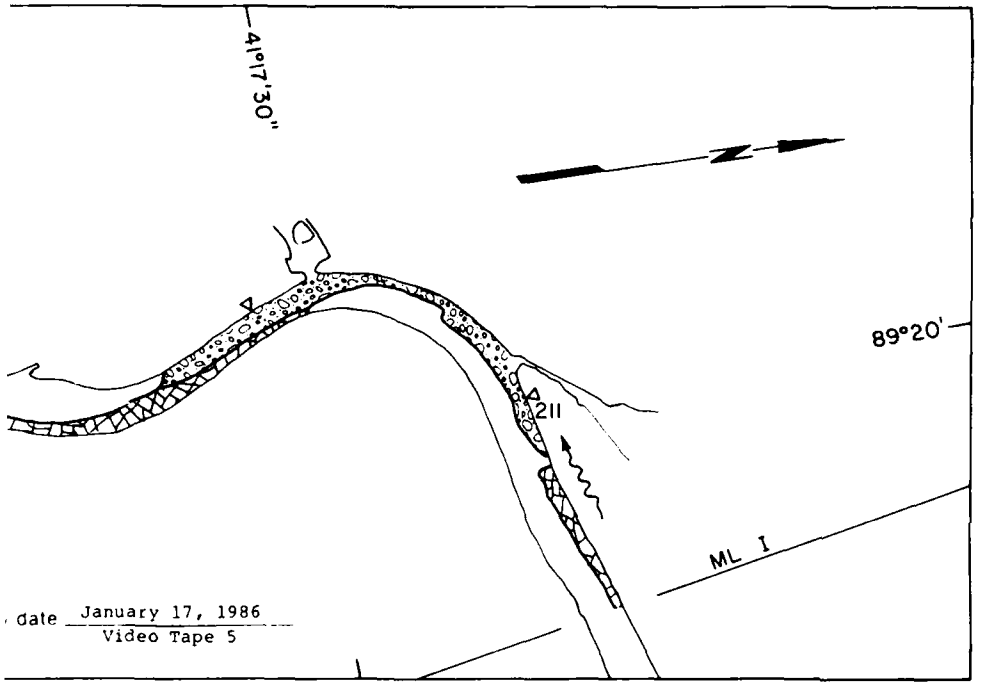
17 January 1986



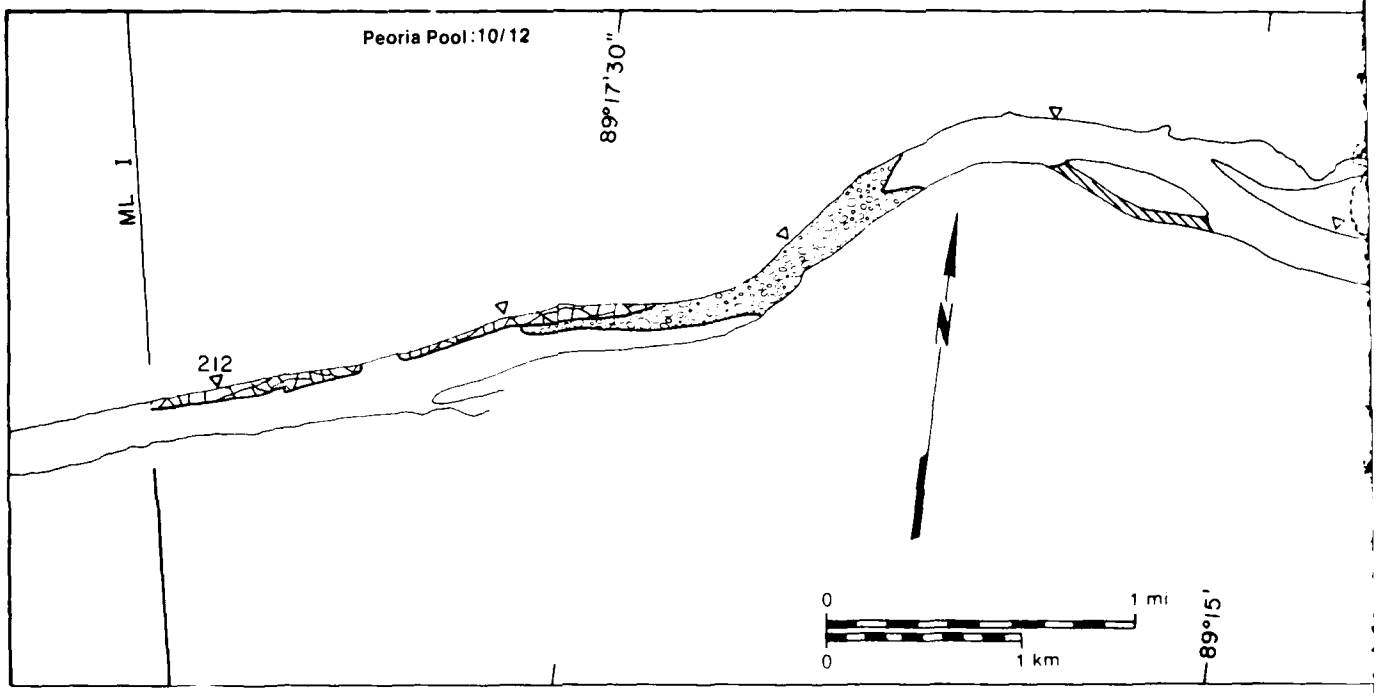

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islan
0
1 mi
0
1 km

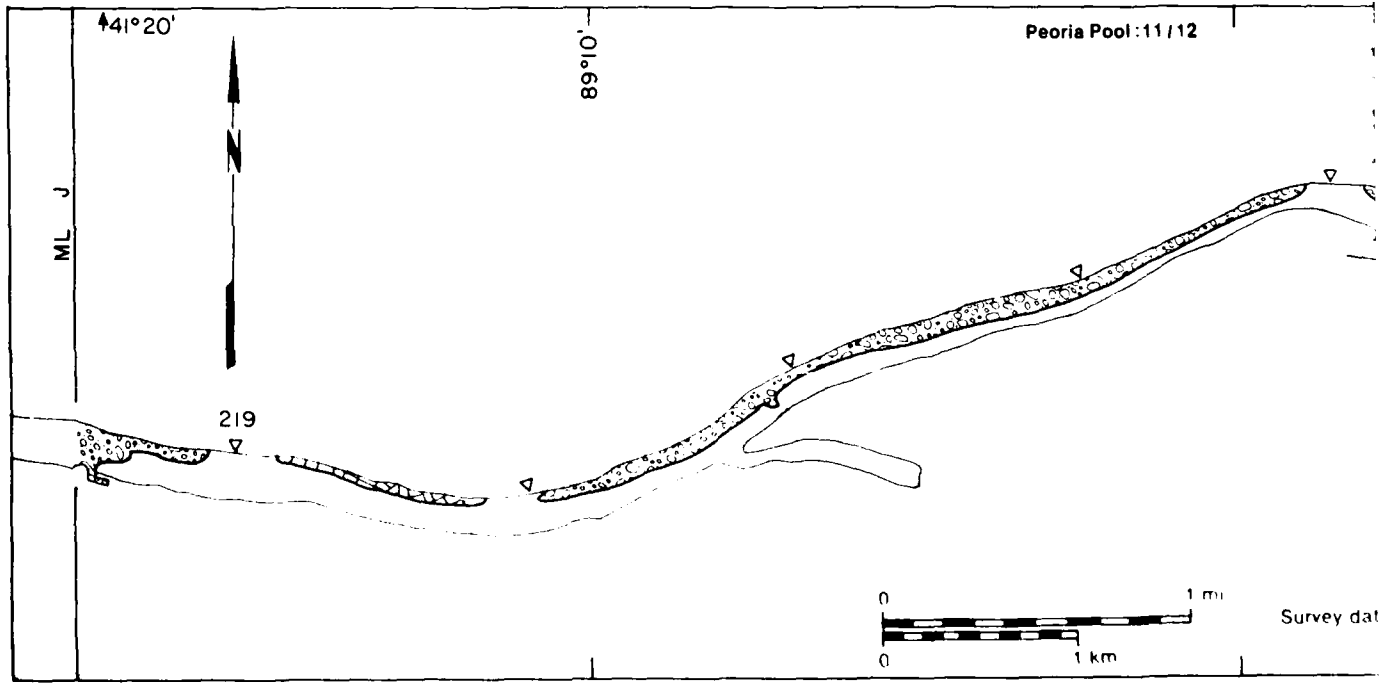
Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date January 17,
Video Ta

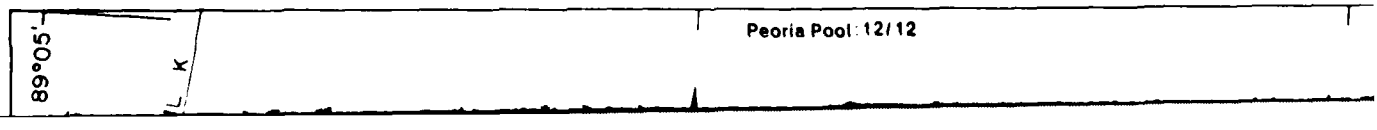

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
41° 12'30"
Survey date: January 17, 1986
Video Tape 5
89°20'

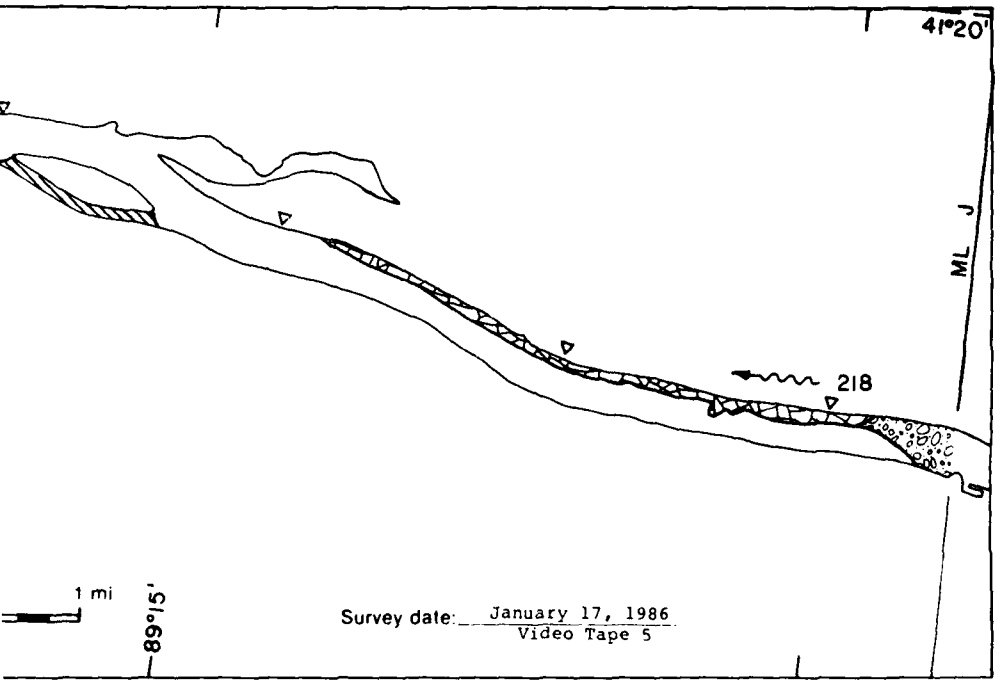

41°17'30"
89°20'
211
ML I
date January 17, 1986
Video Tape 5

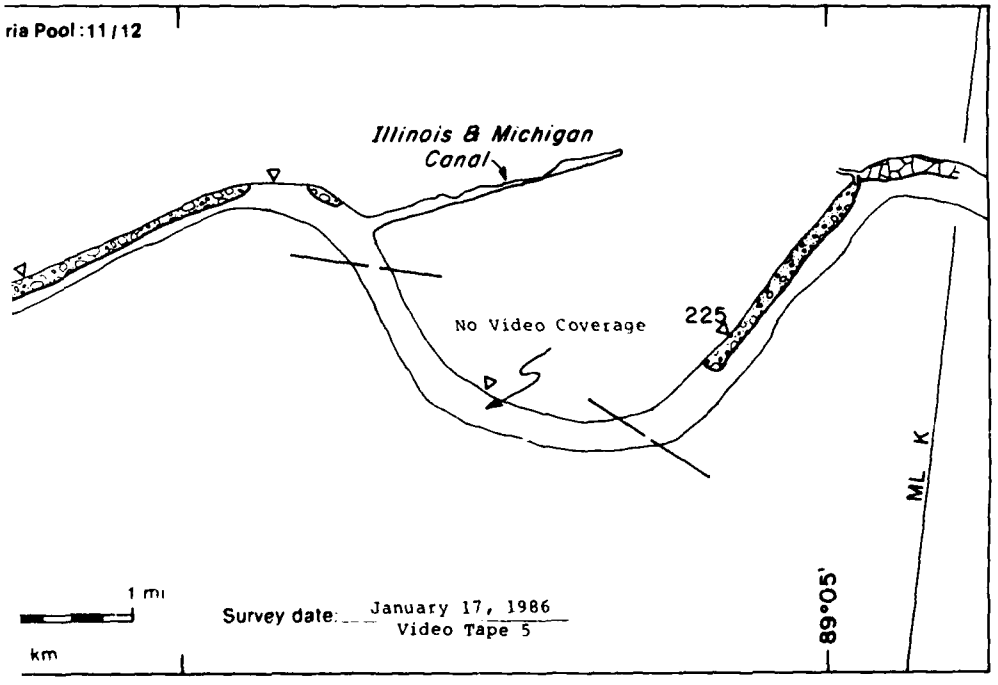
17 January 1986

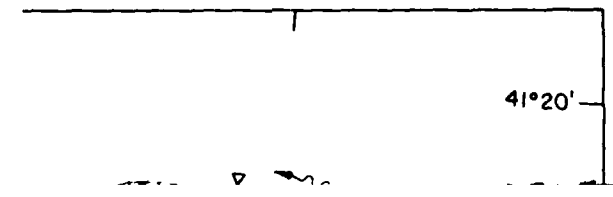


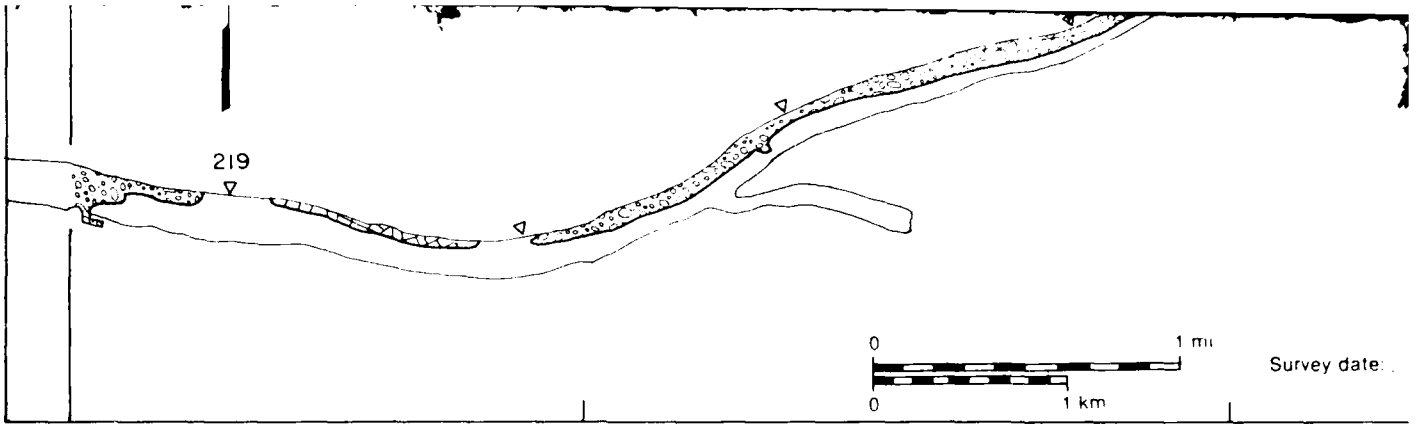


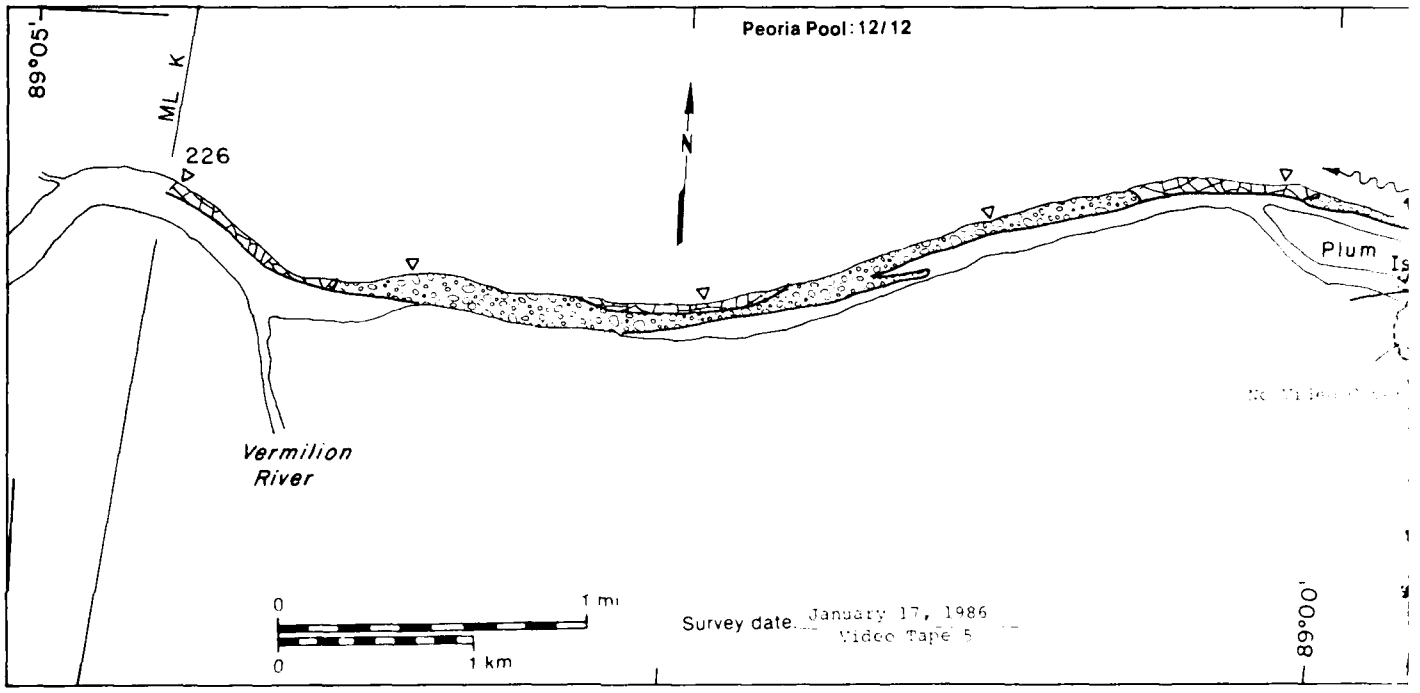



41°20'
ML J
218
1 mi
89°15'
Survey date: January 17, 1986
Video Tape 5


ria Pool : 11 / 12
Illinois & Michigan Canal
No Video Coverage
225
ML K
1 mi
km
89°05'
Survey date: January 17, 1986
Video Tape 5


41°20'

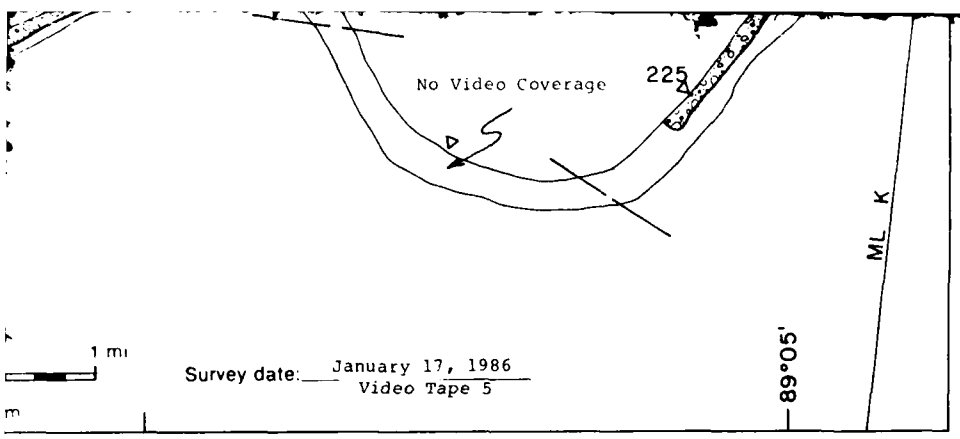


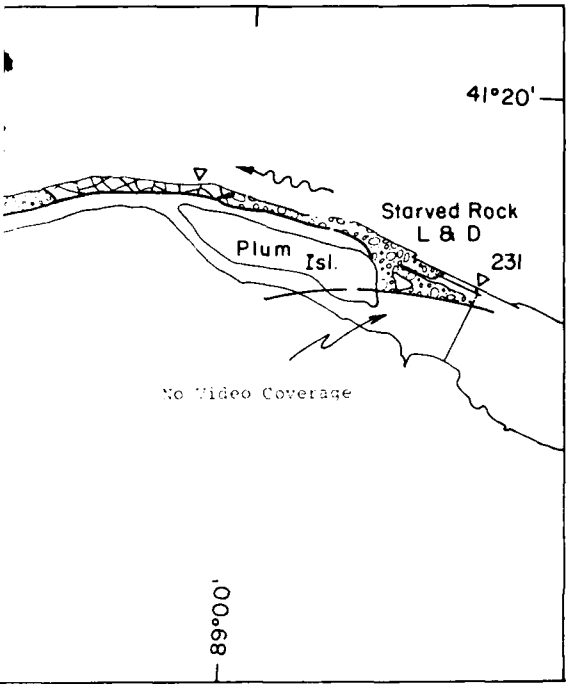


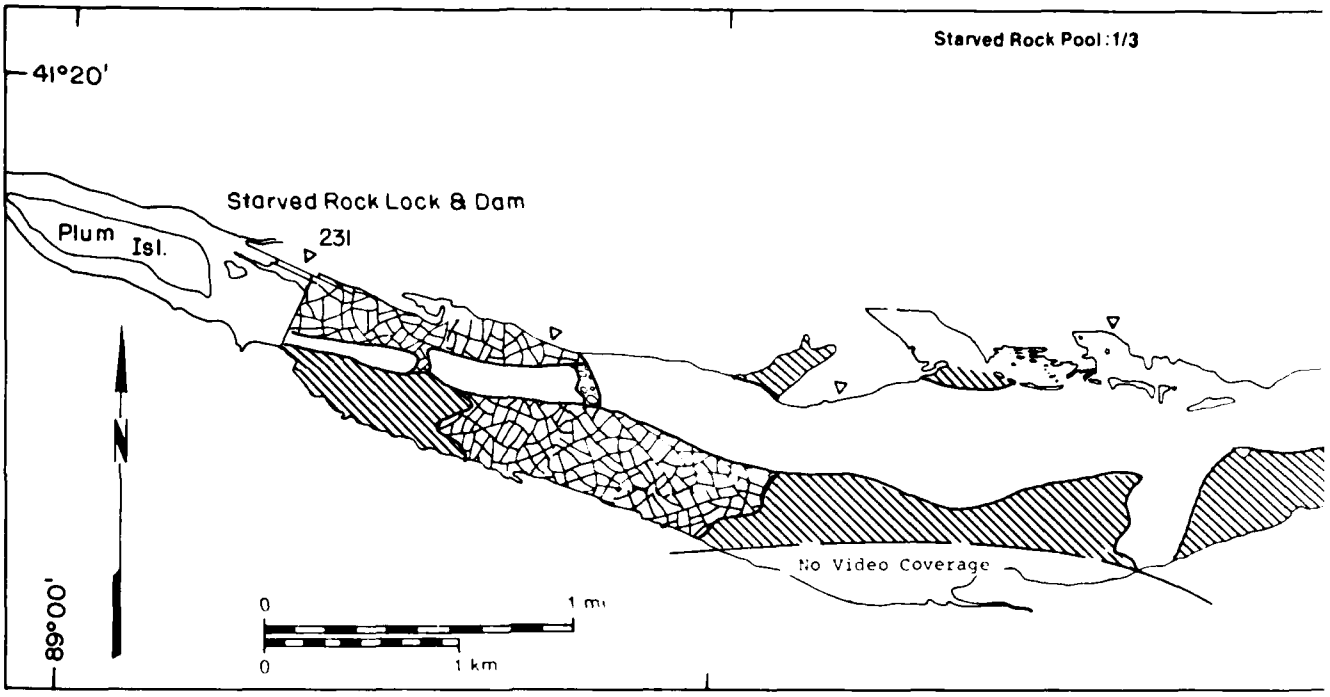
Peoria Pool

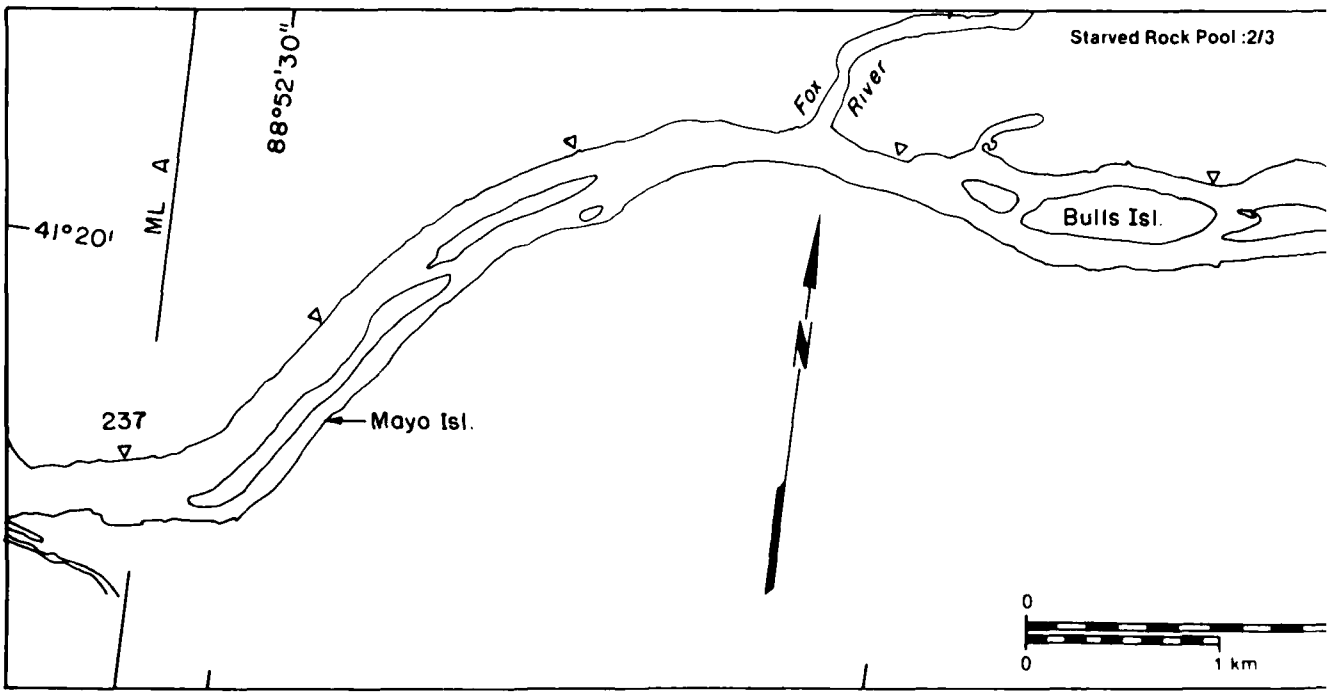
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	9.47	NA
Solid ice cover	16.16	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	26.93	NA
Fragmented ice cover with open water areas	3.18	75
Ice floes or frazil slush and pans	5.16	30
Total area ($m^2 \times 10^6$)	81.33*	

* Includes 20.43 x 10^6 m^2 of no video coverage


No Video Coverage
225
ML K
89°05'
1 mi
Survey date: January 17, 1986
Video Tape 5

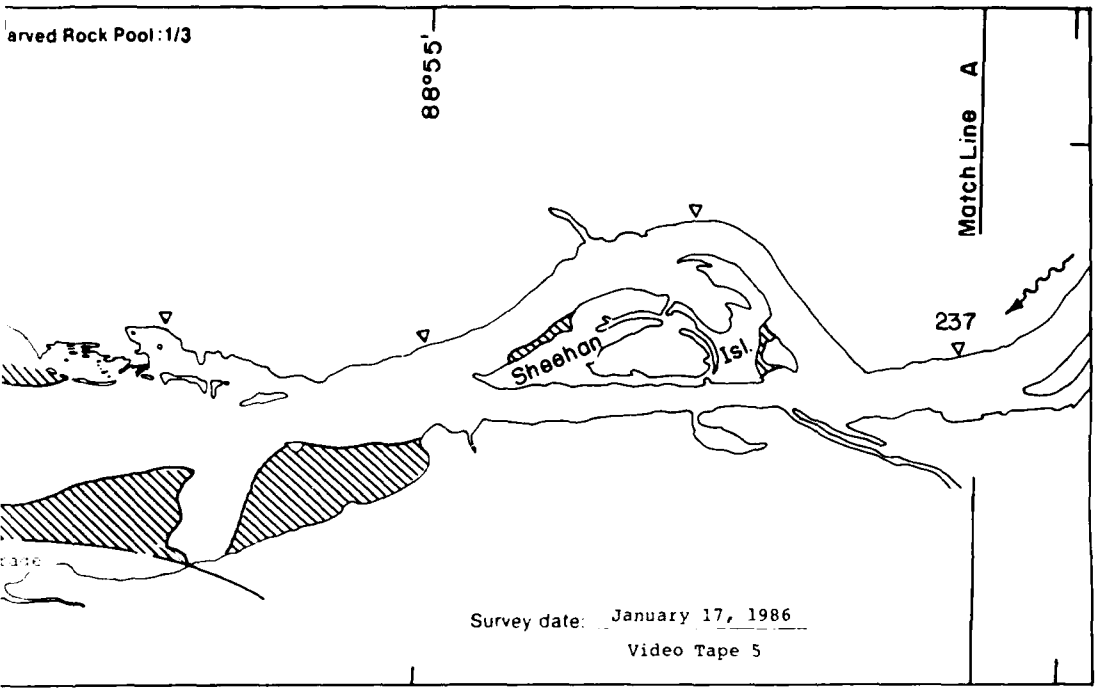

41°20'
Starved Rock
L & D
231
Plum Isl.
No Video Coverage
89°00'

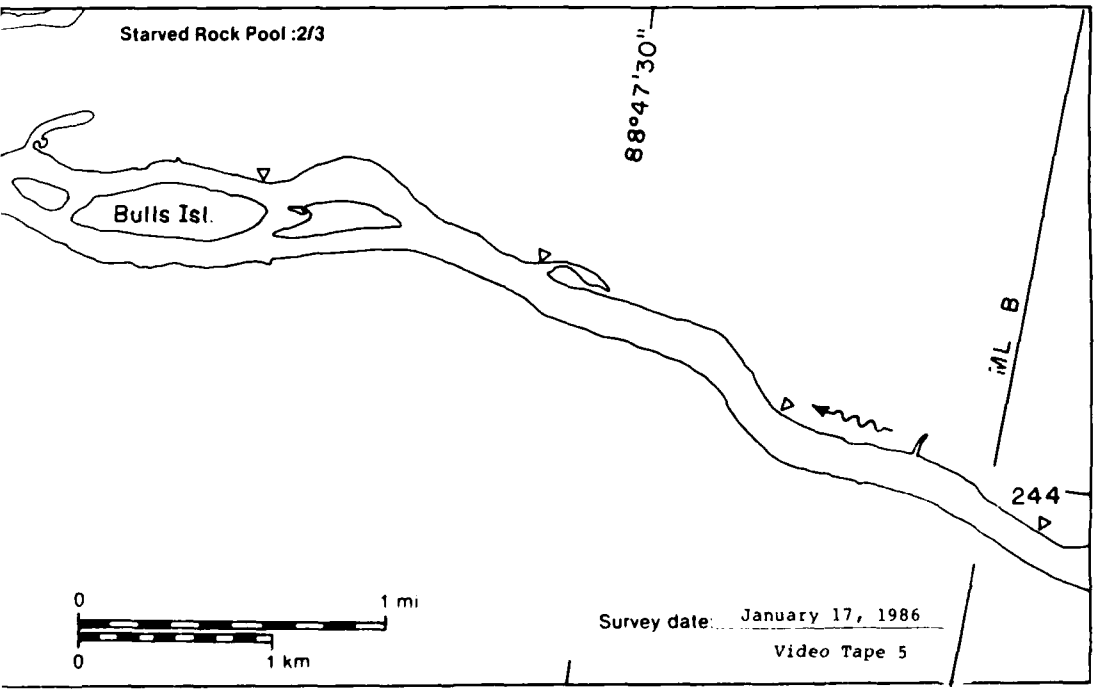

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
N
89°00'
No Video Coverage
0
1 mi
0
1 km


Starved Rock Pool :2/3
88°52'30"
ML 4
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
N
0
0
1 km

Starved Rock Pool : 3/3
88°
88°

17 January 1986



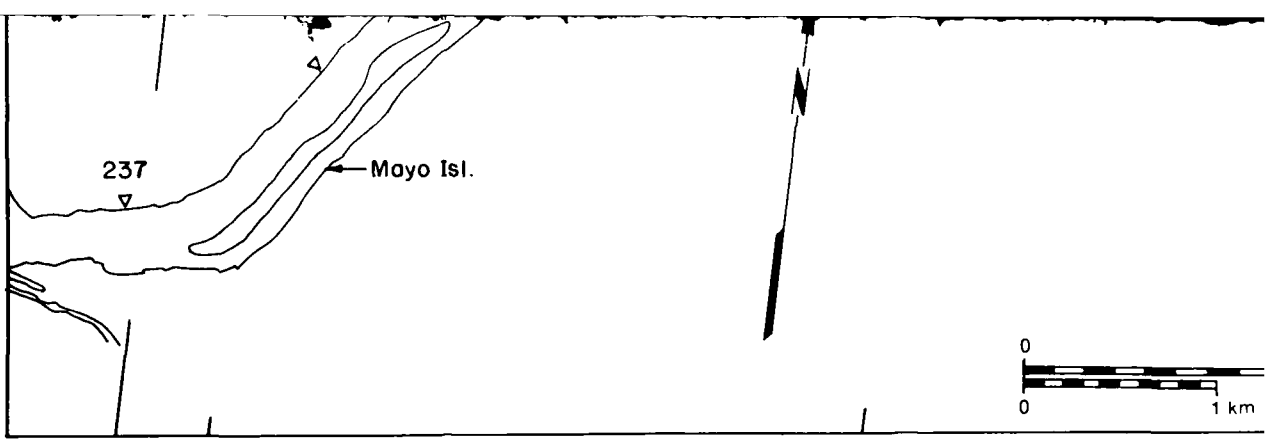


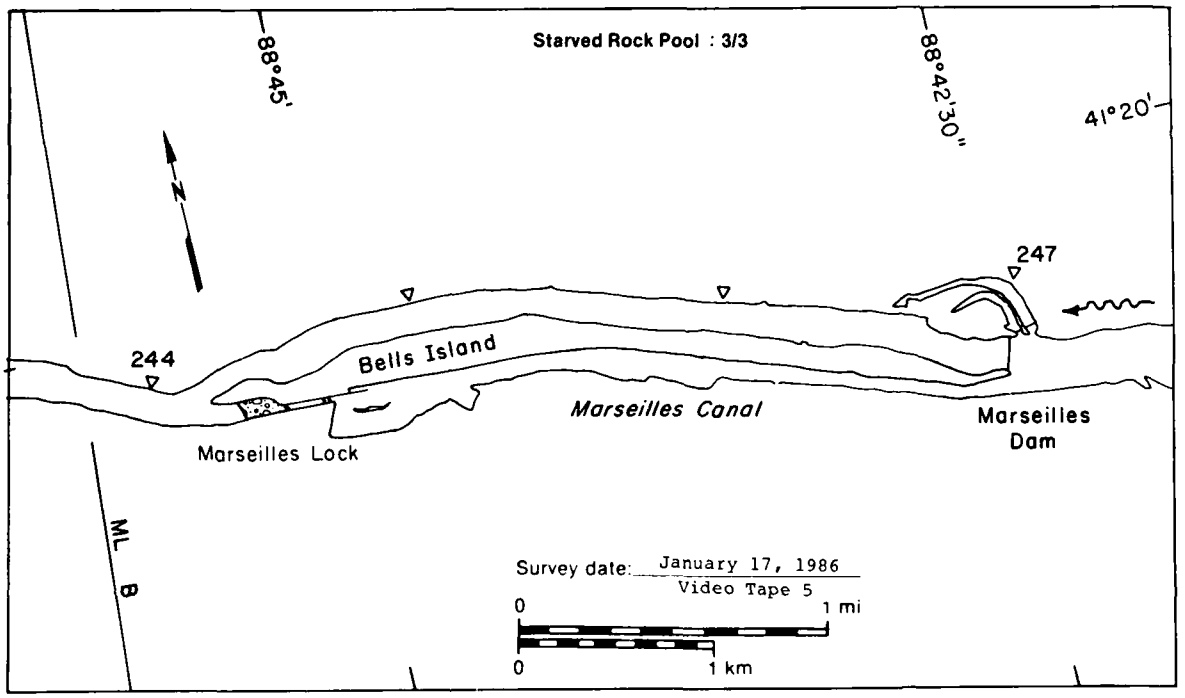
41°20'

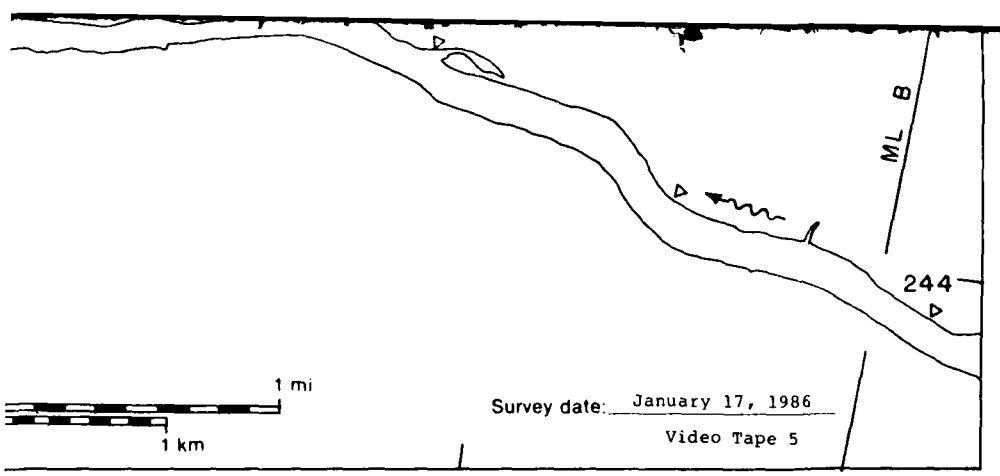
Starved Rock Pool

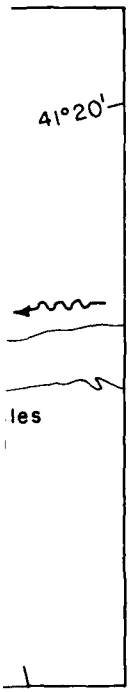
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


237
Moyo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 17, 1986
Video Tape 5
0
1 mi
0
1 km



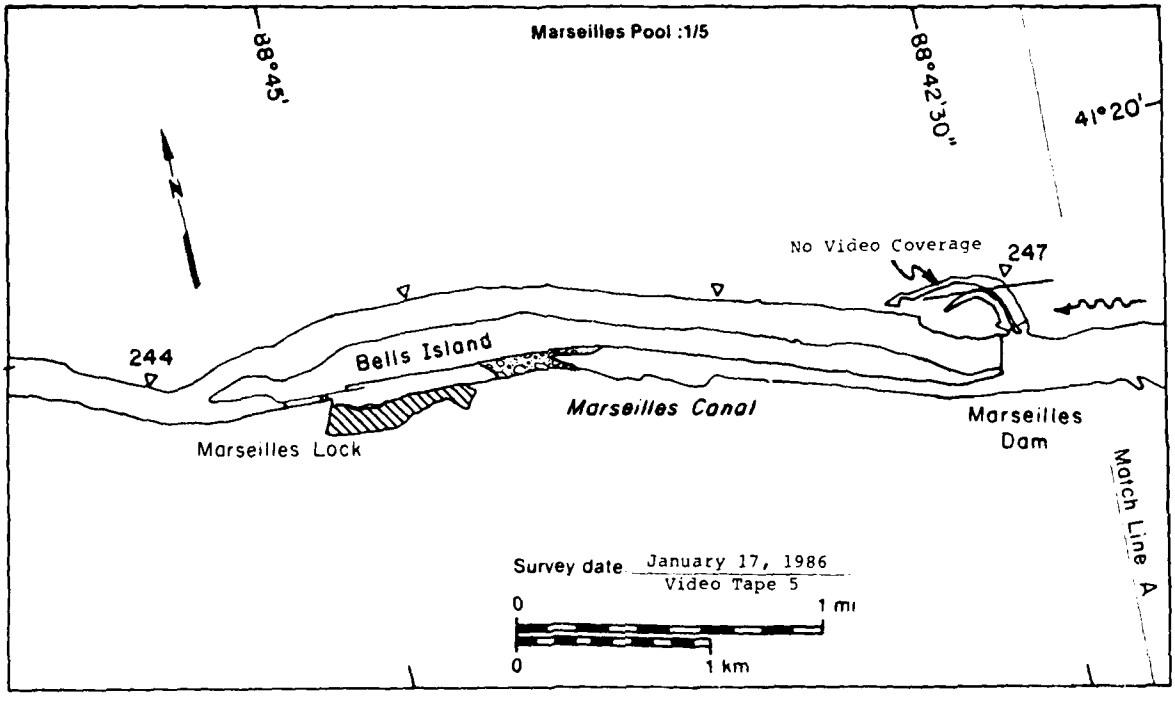


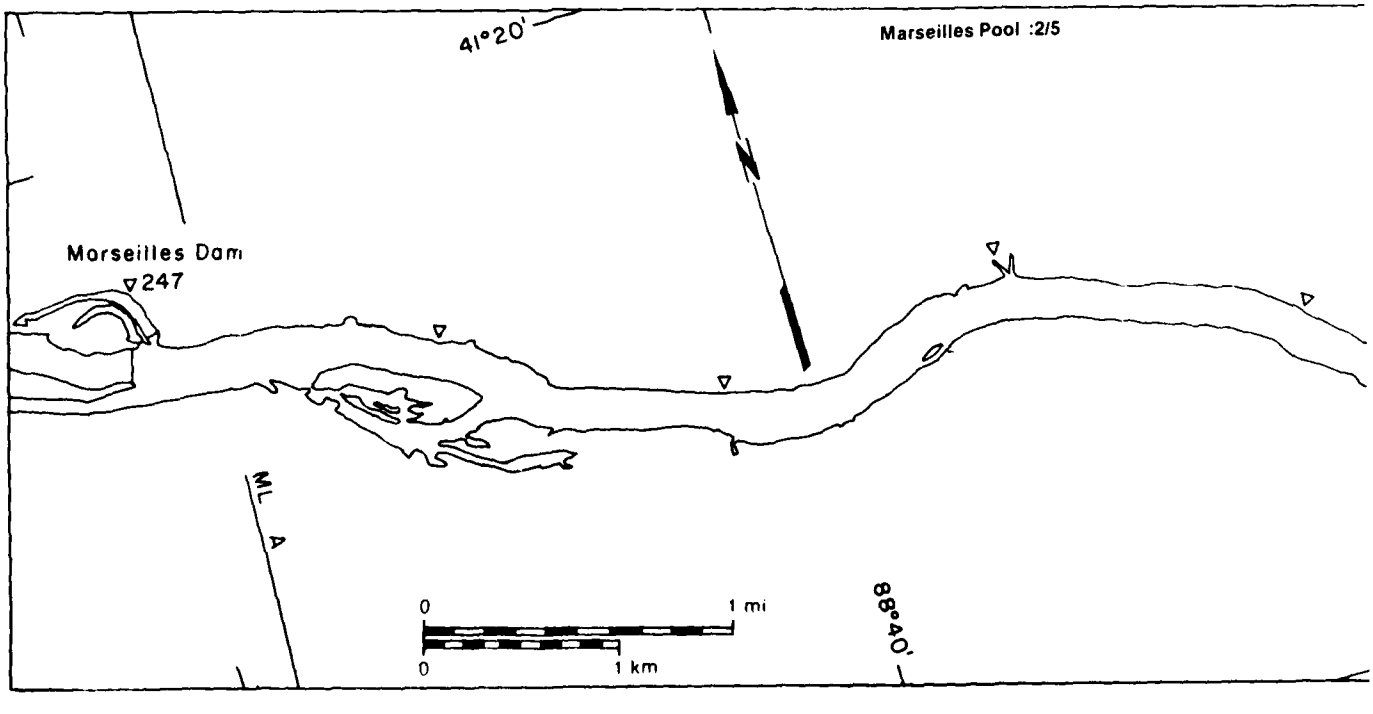
Starved Rock Pool

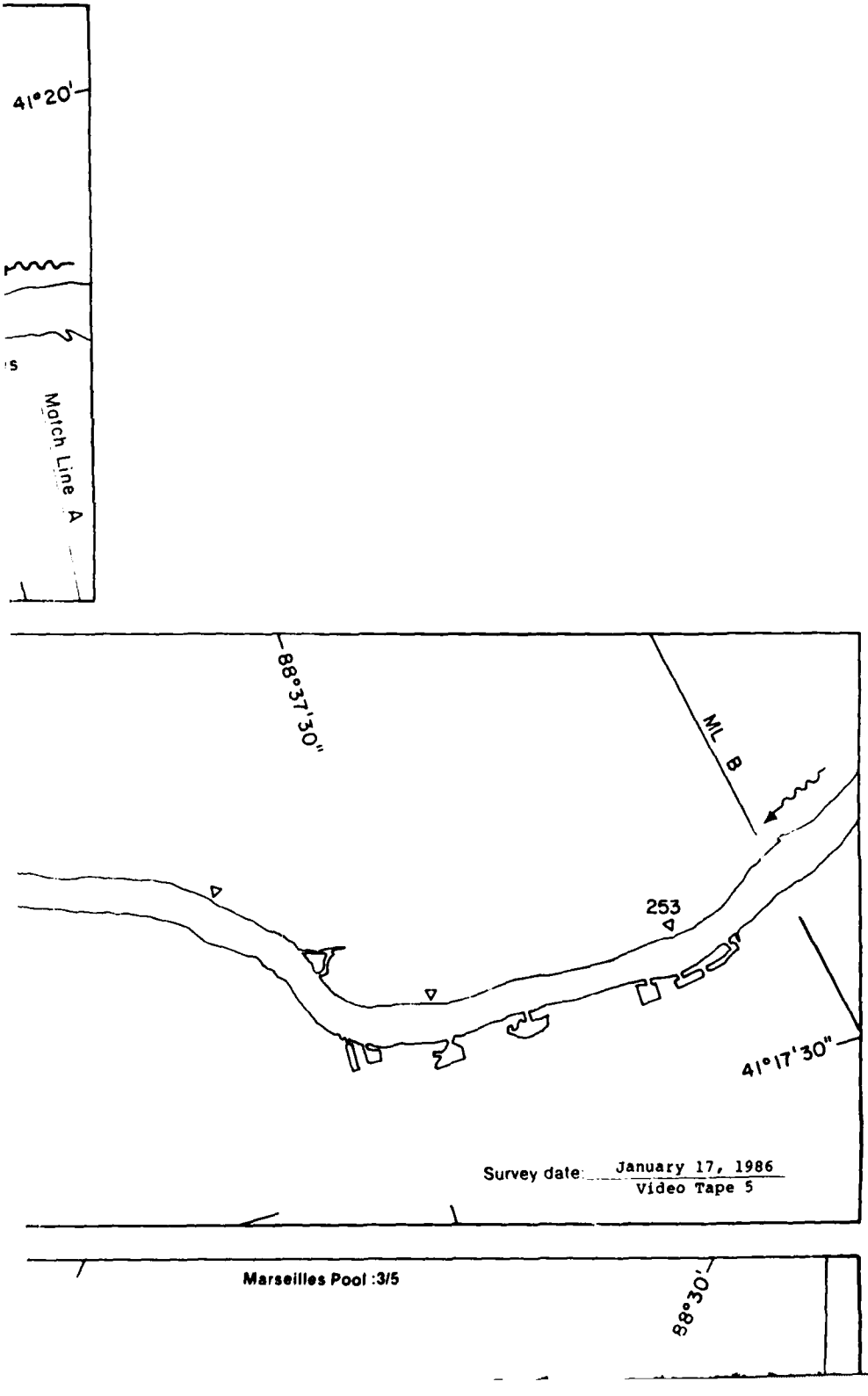
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.30	NA
Solid ice cover	1.46	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	1.03	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.04	20
Total area ($m^2 \times 10^6$)	10.19*	

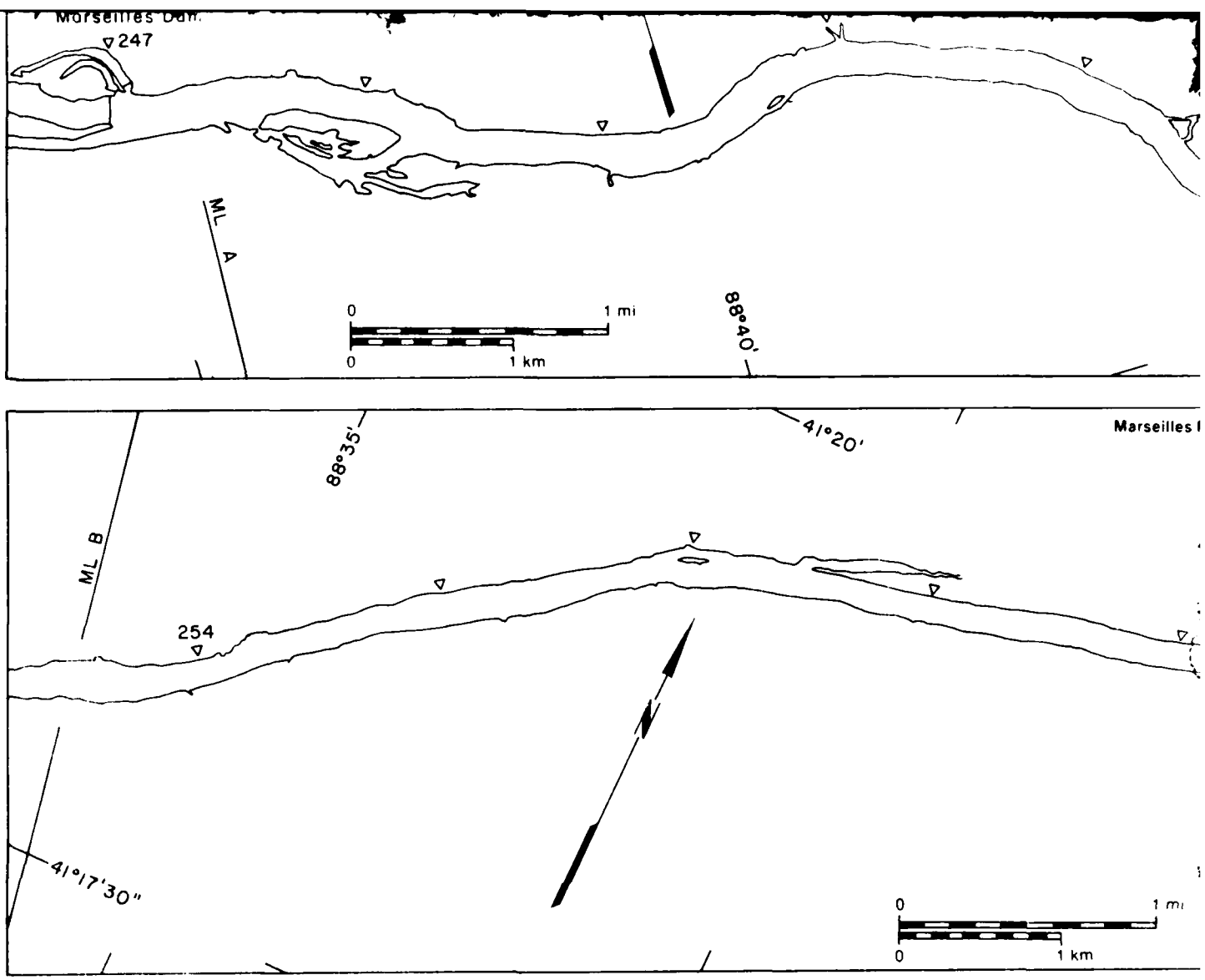
* Includes 0.36×10^6 m^2 of no video coverage

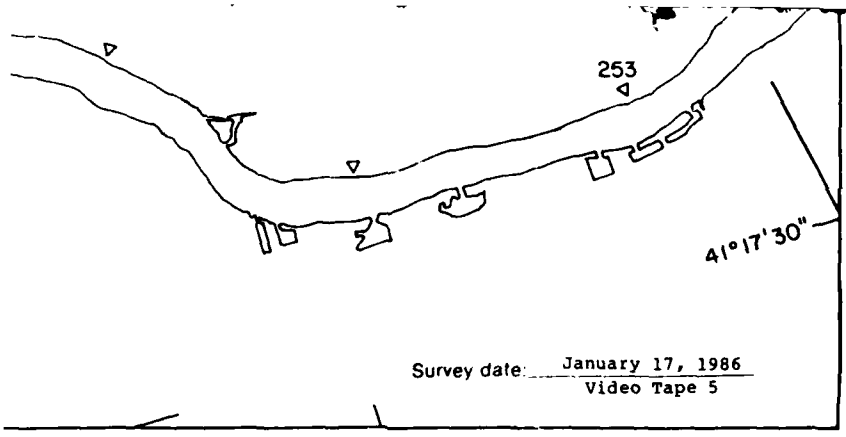
17 January 1986

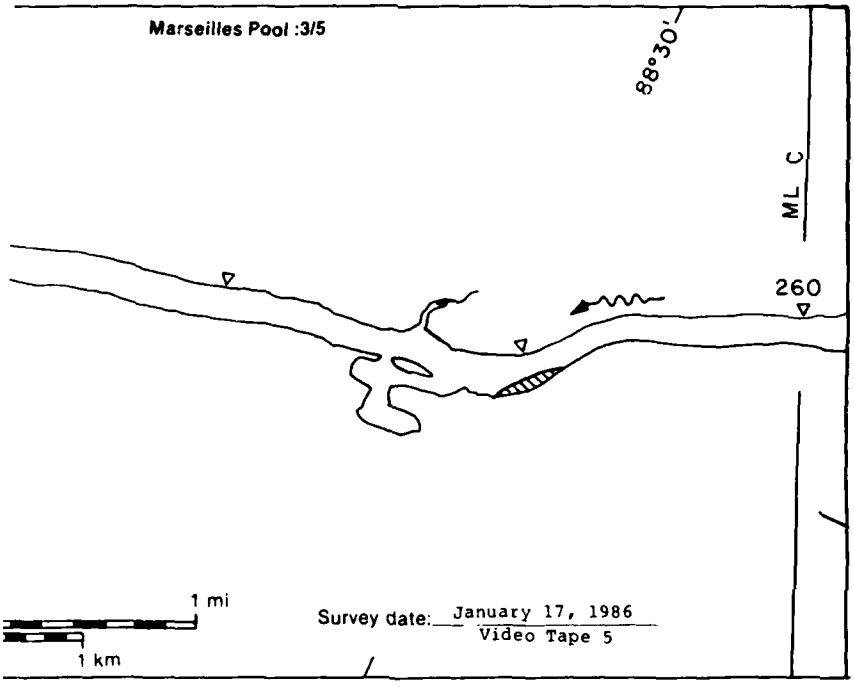


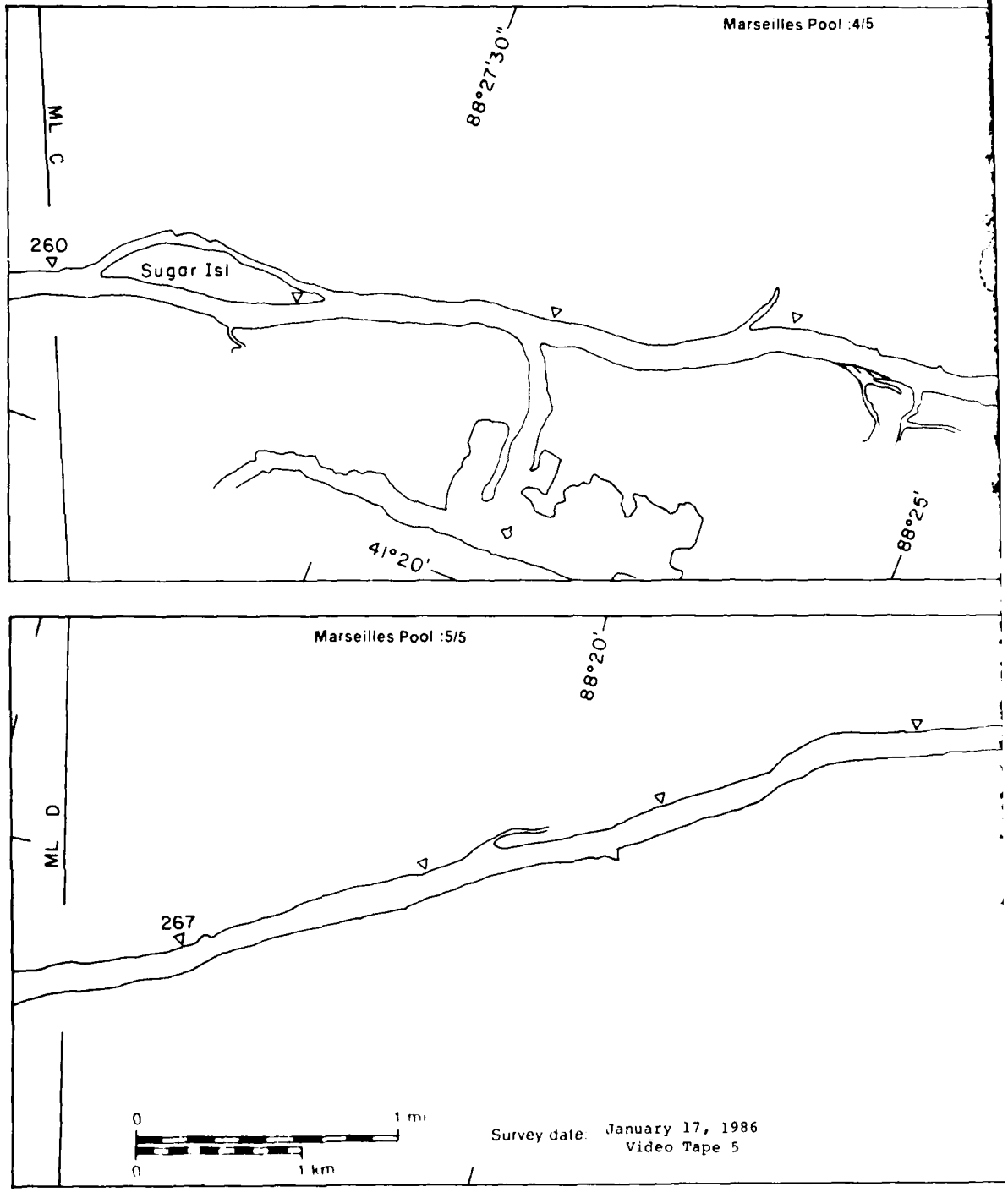



41°20'
Match Line A
88°37'30"
ML B
253
41°17'30"
Survey date: January 17, 1986
Video Tape 5
Marseilles Pool :3/5
88°30'


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
Marseilles
ML B
254
41°17'30"
0
1 mi
0
1 km


253
41°17'30"
Survey date: January 17, 1986
Video Tape 5


Marseilles Pool :3/5
88°30'
ML C
260
1 mi
1 km
Survey date: January 17, 1986
Video Tape 5

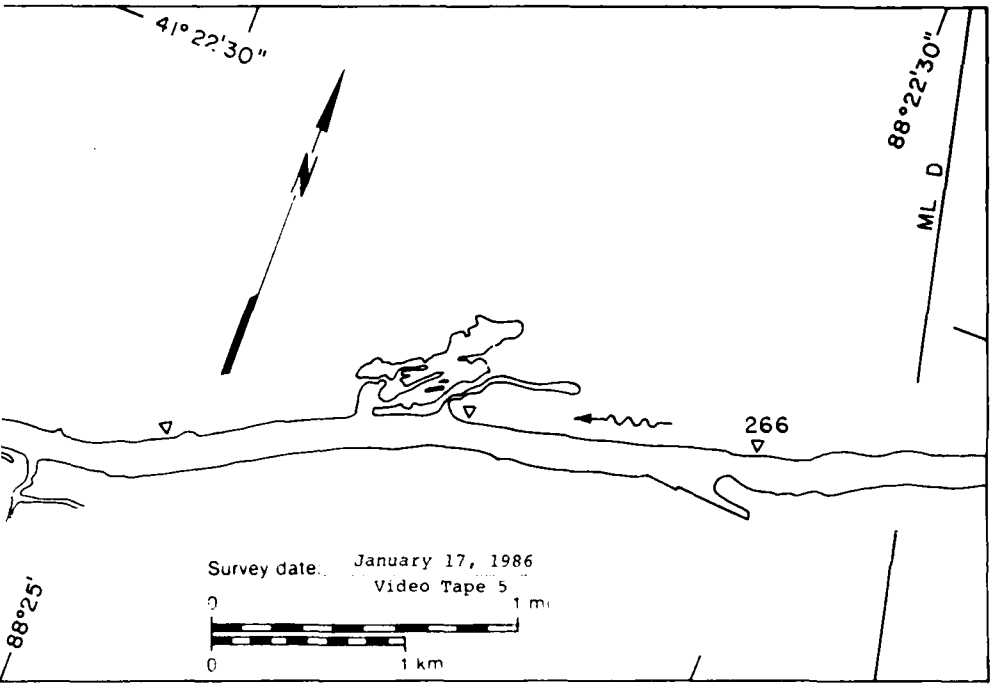


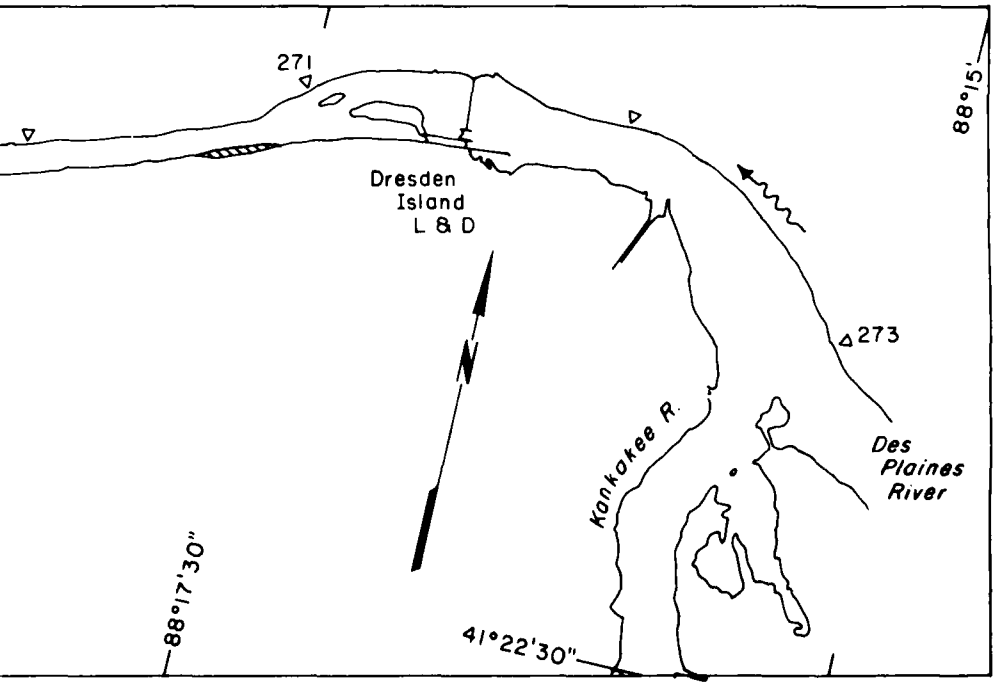
Marseilles Pool

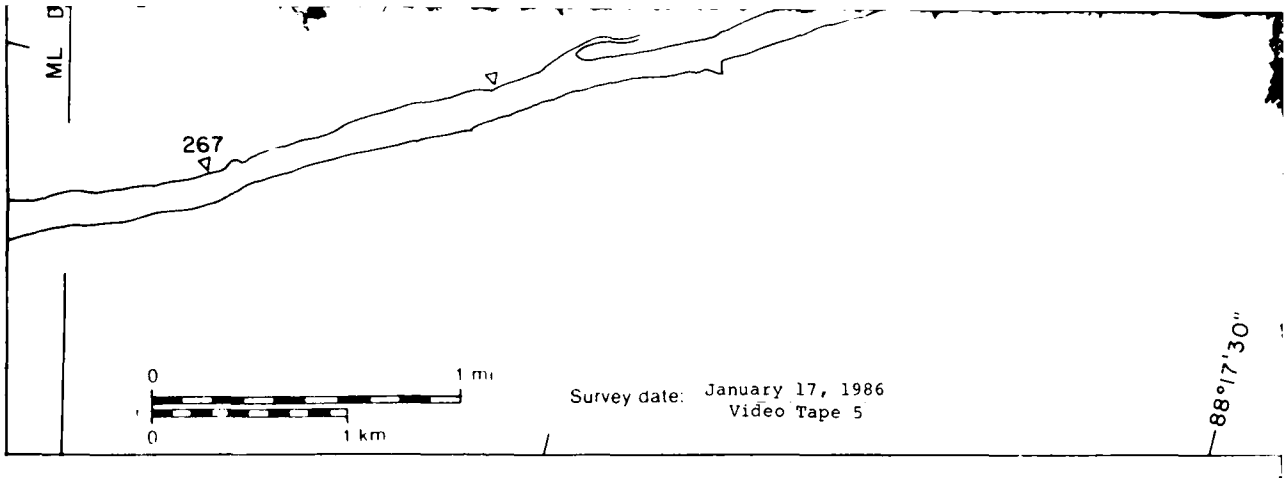
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	7.96	NA

17 January 1986



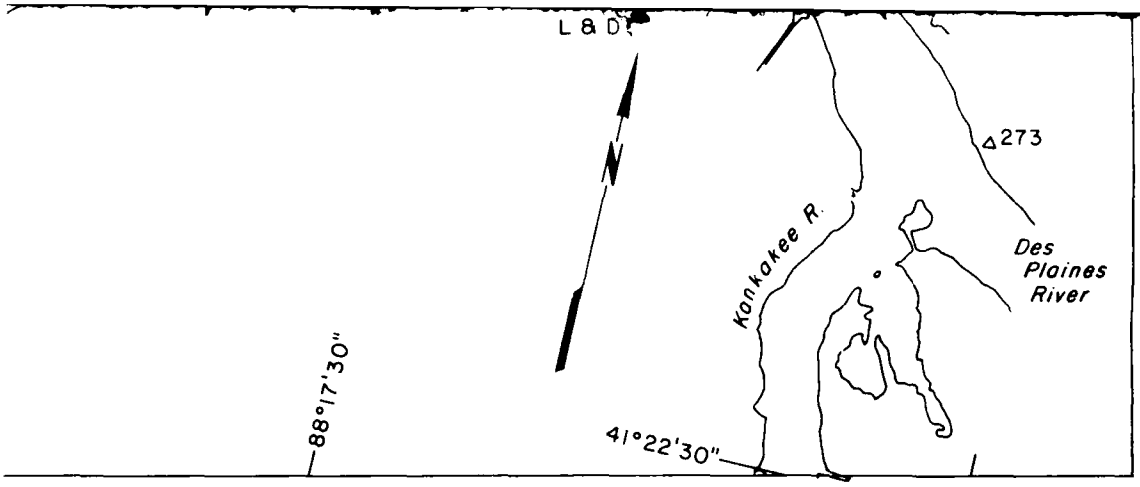




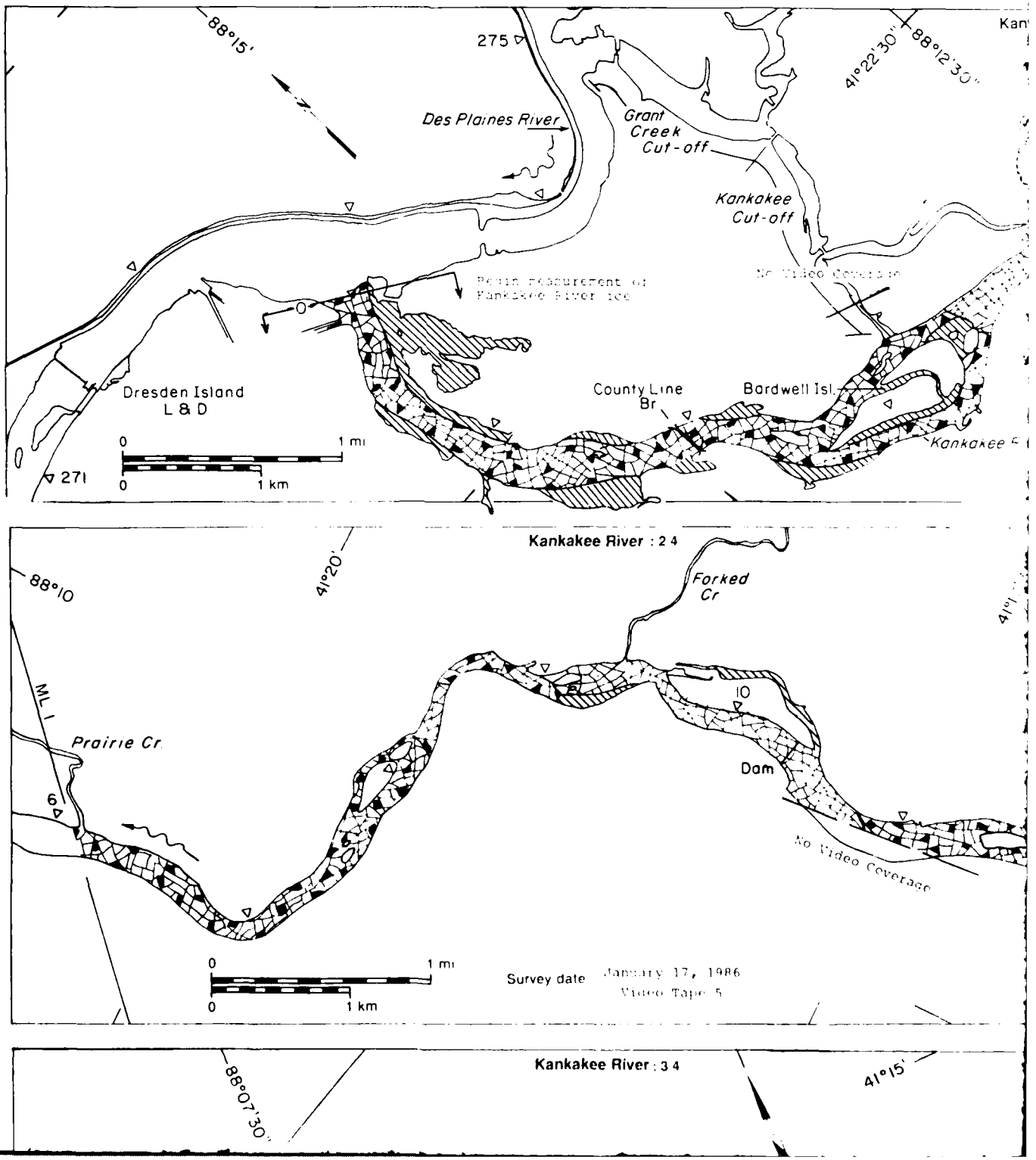
Marseilles Pool

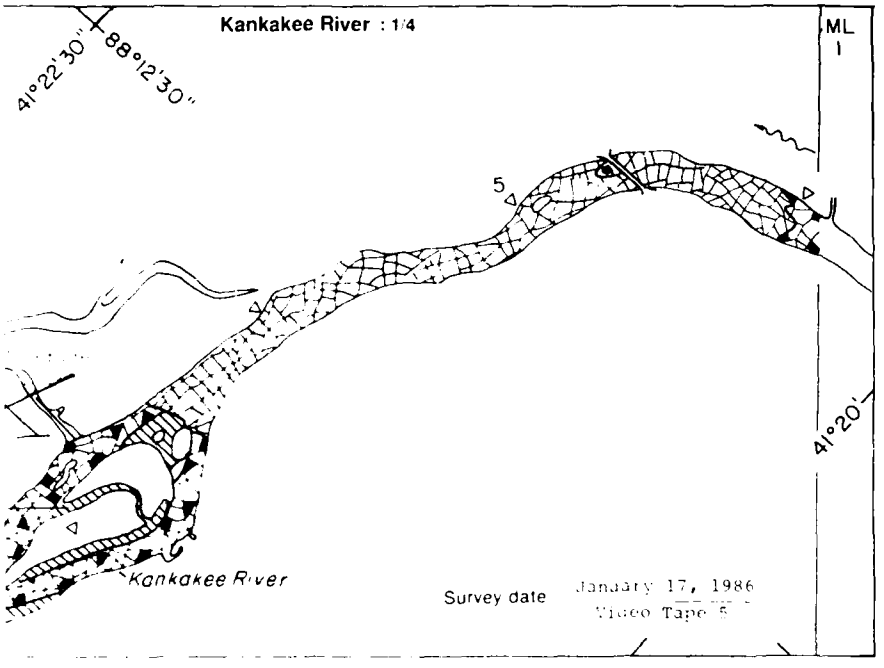
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.96	NA
Solid ice cover	0.14	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.06	30
Total area ($m^2 \times 10^6$)	8.19*	

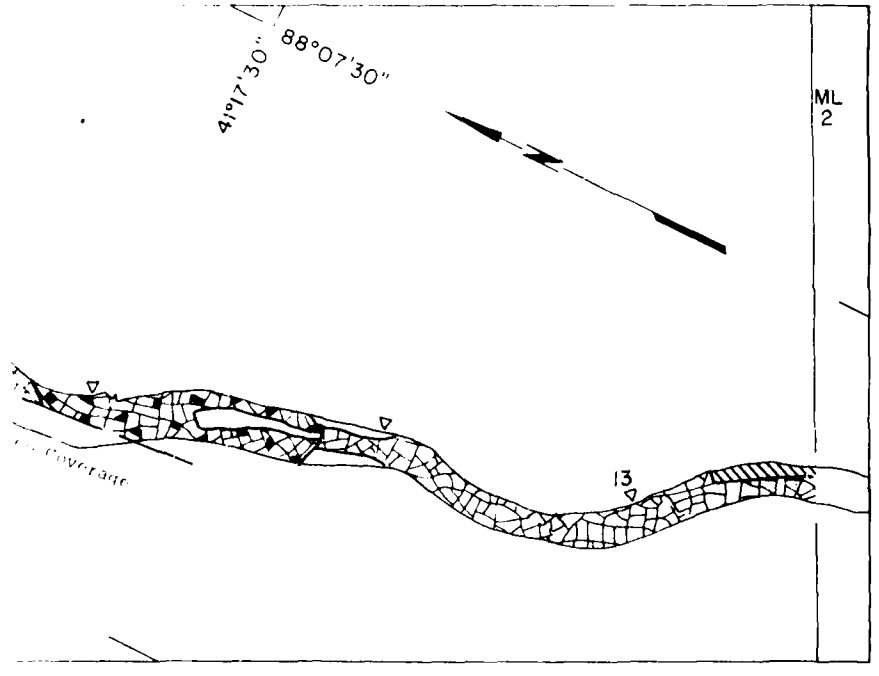
* Includes 0.03×10^6 m^2 of no video coverage

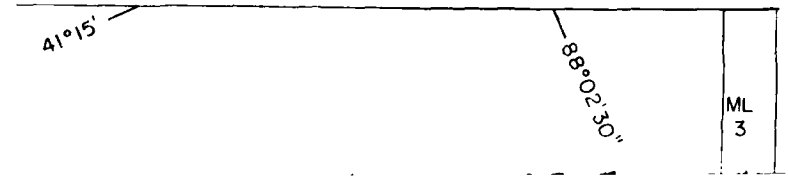

L & D
△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

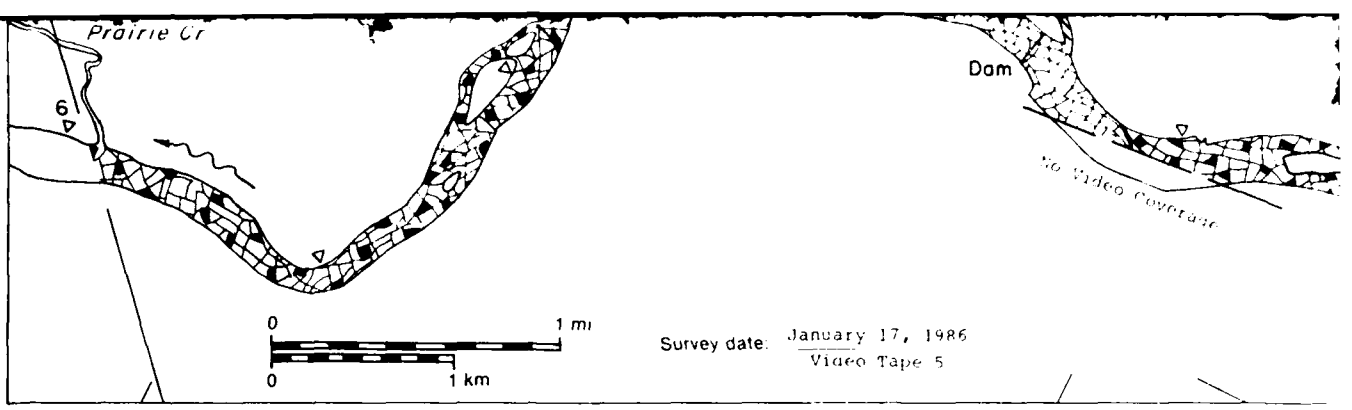
17 January 1986

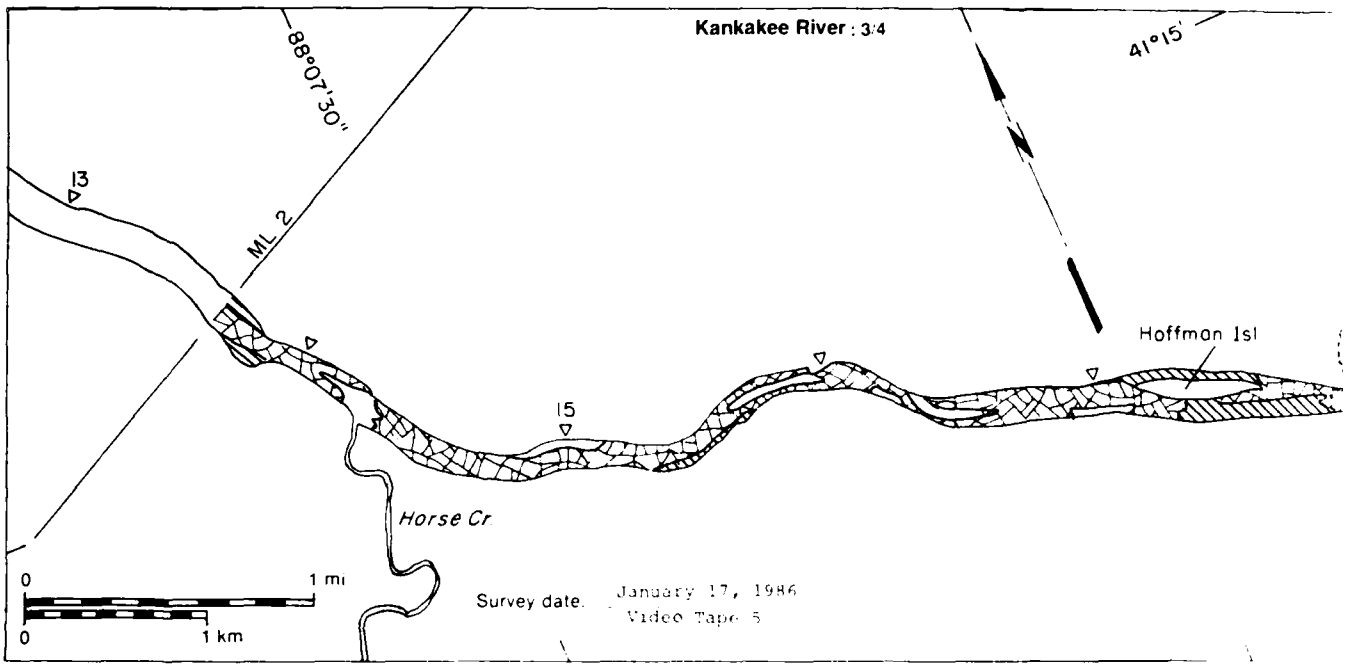


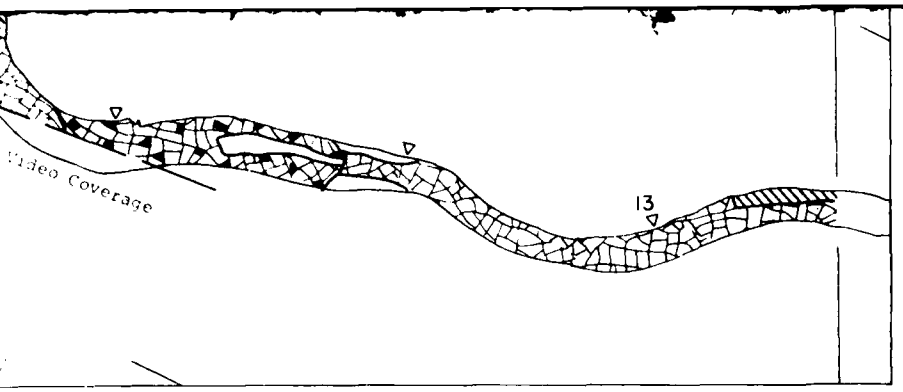

Kankakee River : 1/4
41°22'30"
88°12'30"
ML
1
5
41°20'
Kankakee River
Survey date
January 17, 1986
Video Tape 5

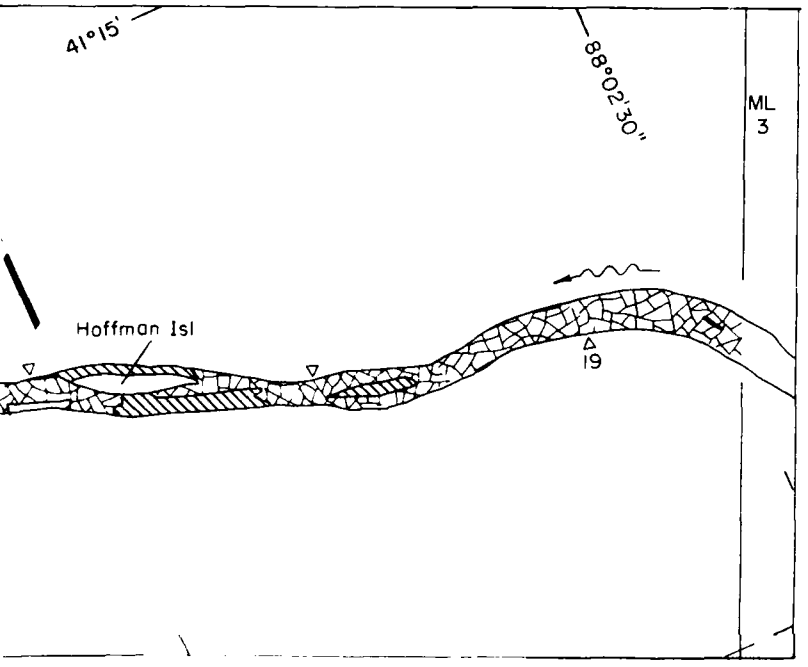

41°17'30"
88°07'30"
ML
2
13

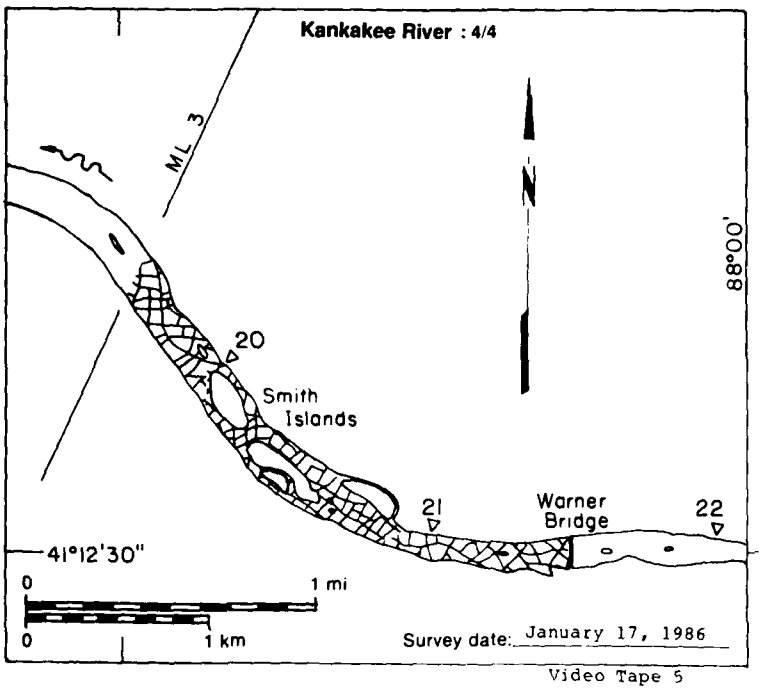

41°15'
88°02'30"
ML
3


Prairie Cr
6
Dam
No Video Coverage
0
1 mi
0
1 km
Survey date: January 17, 1986
Video Tape 5


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr
0
1 mi
0
1 km
Survey date: January 17, 1986
Video Tape 5


Video Coverage
13


41°15'
88°02'30"
ML
3
Hoffman Isl
19



Video Tape 5

Kankakee River

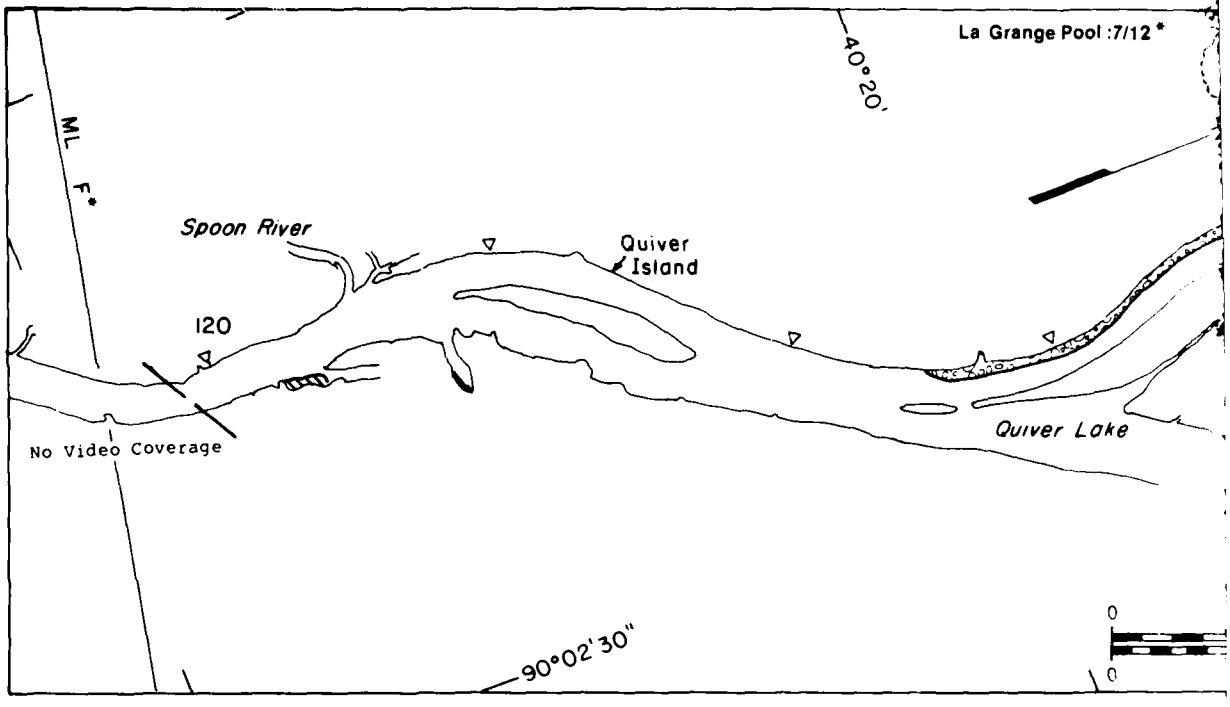
MAP UNITS	Area (m^2 x)
Open water	0.29
Solid ice cover	1.05
Solid ice cover with open-water areas	0.06
Fragmented ice cover	3.39
Fragmented ice cover with open-water areas	2.45
Ice floes or frazil slush and pans	0.00
Total area (m^2 x 10^6)	7.30

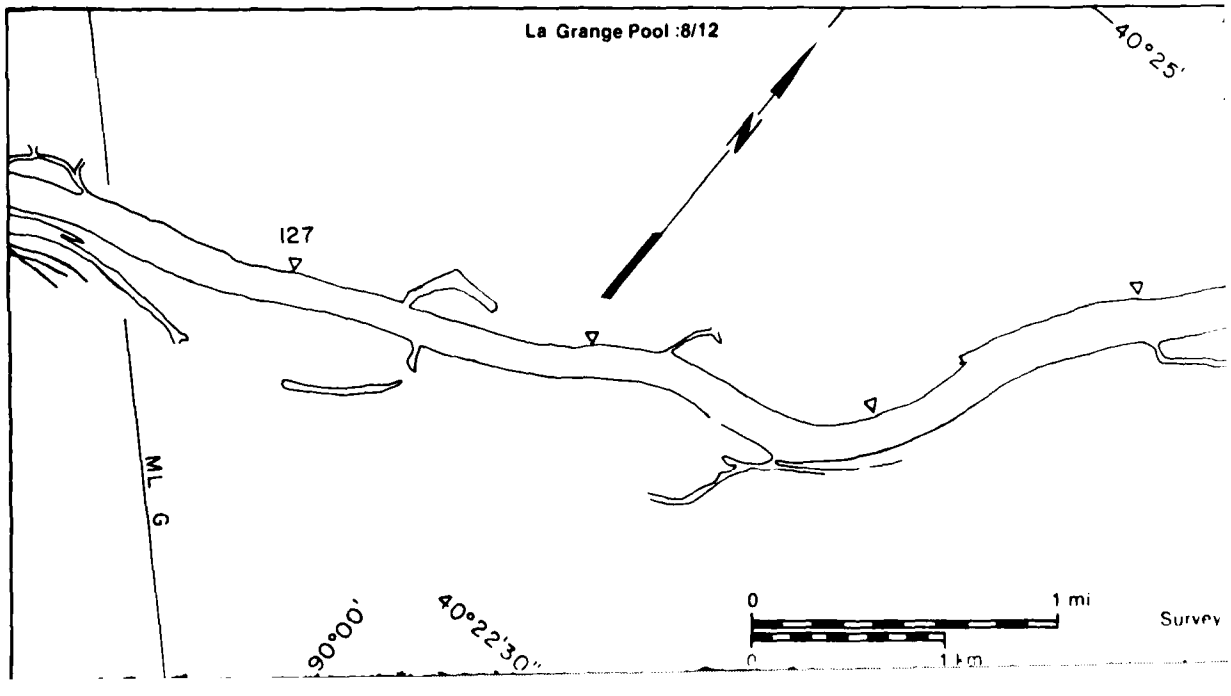
17 January 1986

nkakee River

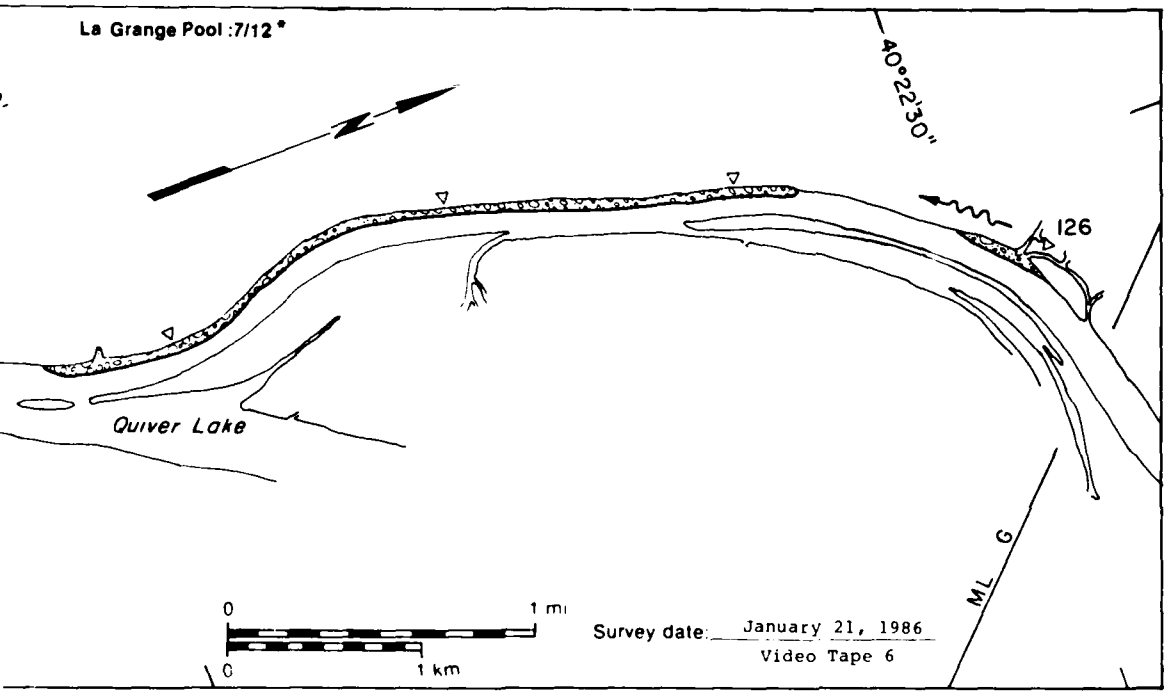
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.29	NA
Solid ice cover	1.05	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	3.39	NA
Fragmented ice cover with open-water areas	2.45	80
ce floes or frazil slush and pans	0.00	—
otal area ($m^2 \times 10^6$)	7.30*	

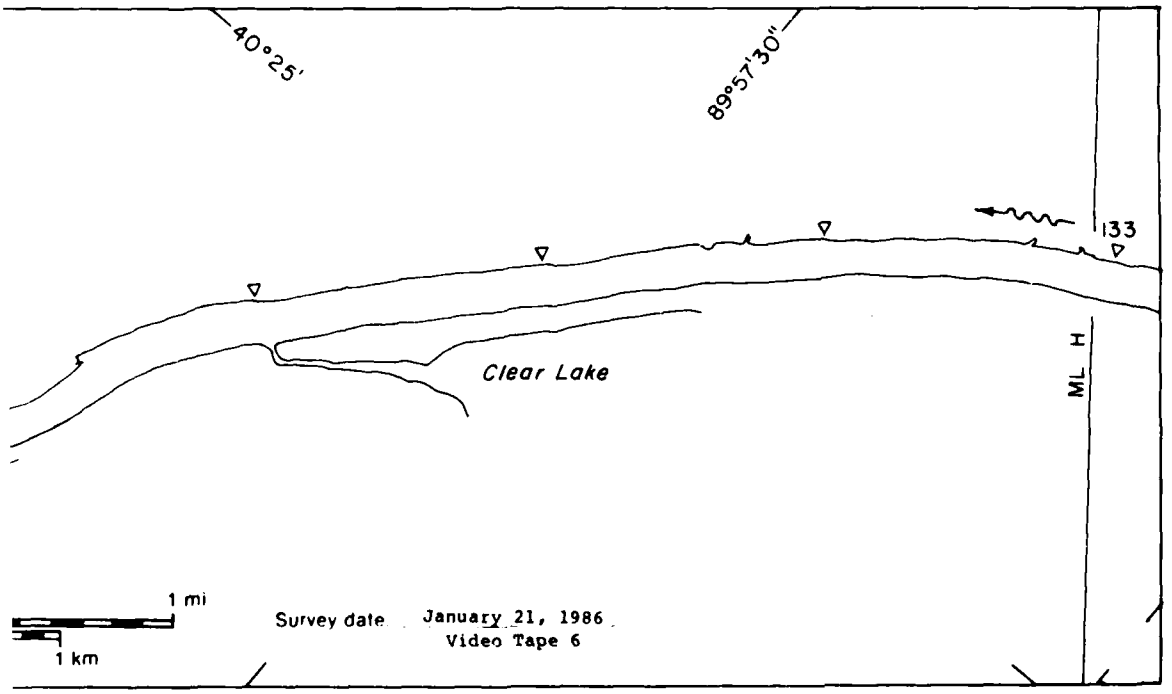
* Includes 0.12×10^6 m^2 of no video coverage

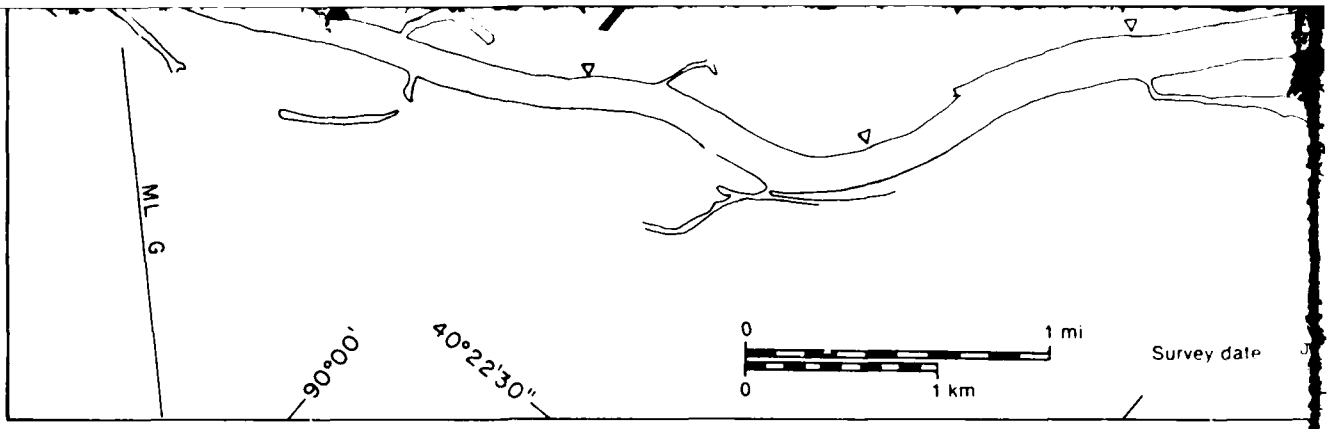

La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0
0

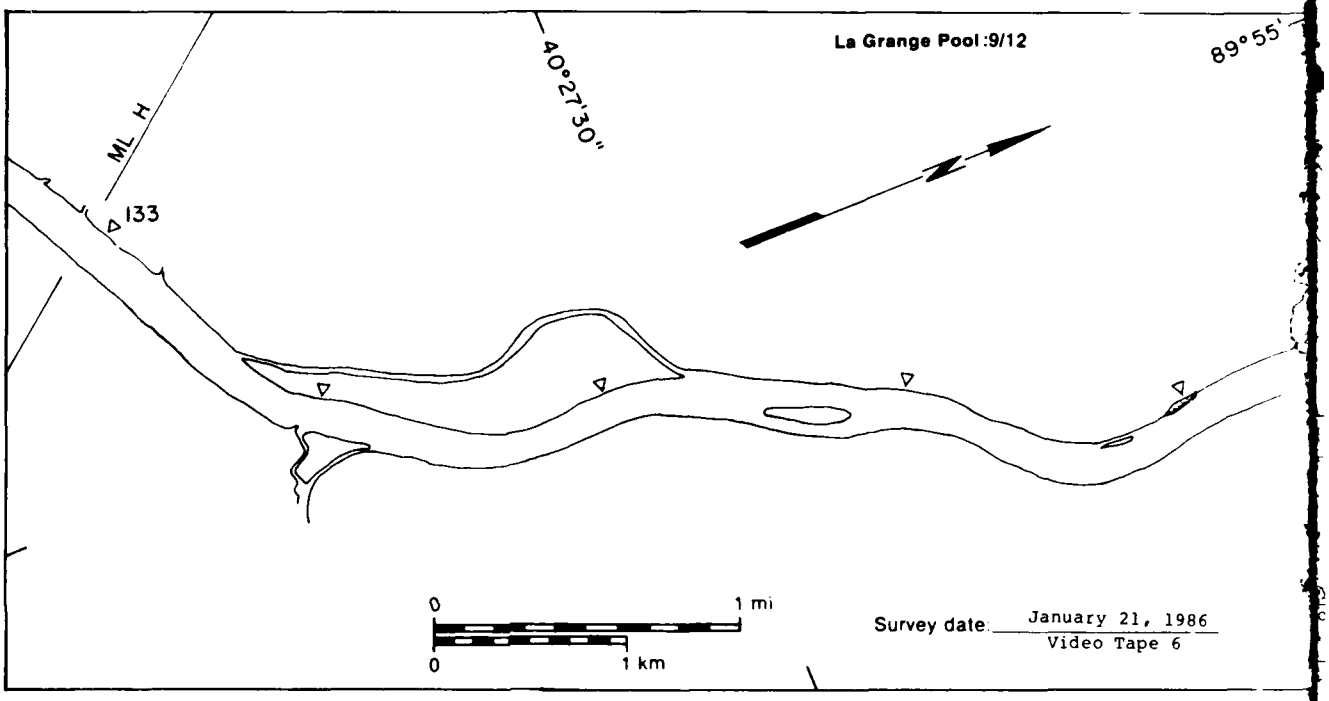

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey

21 January 1986

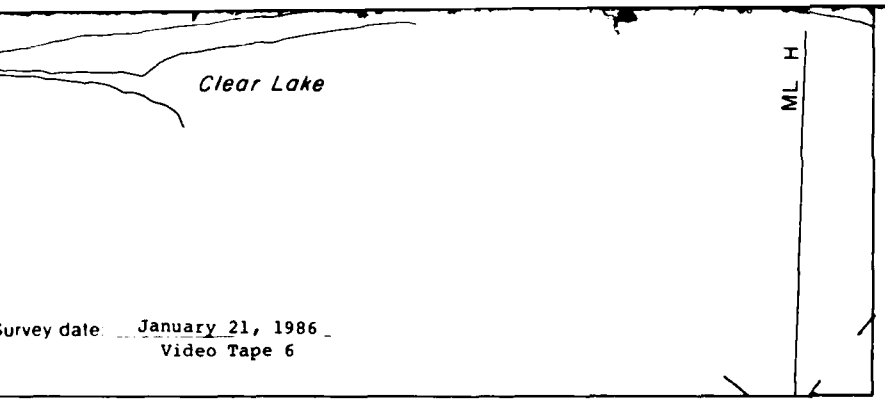




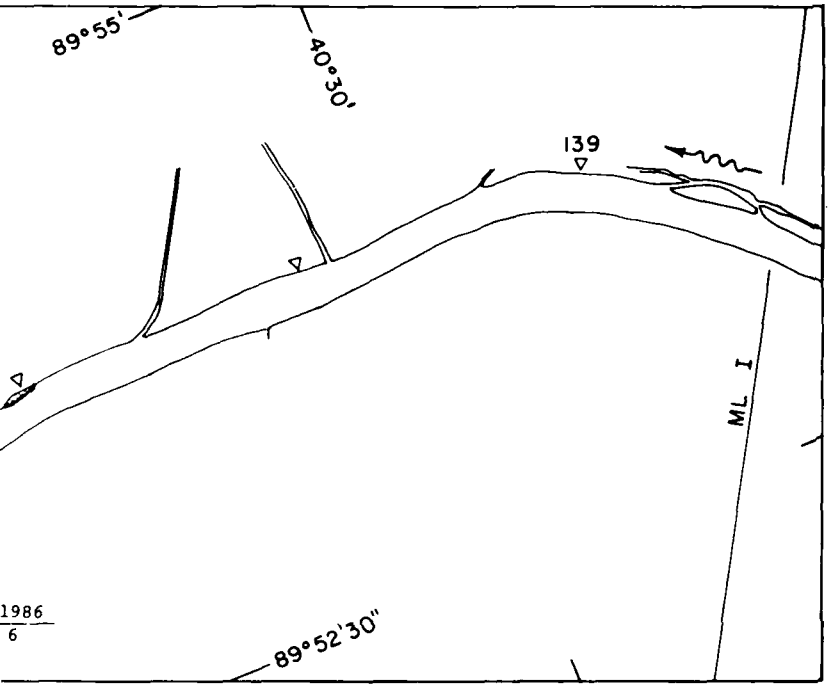




* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).



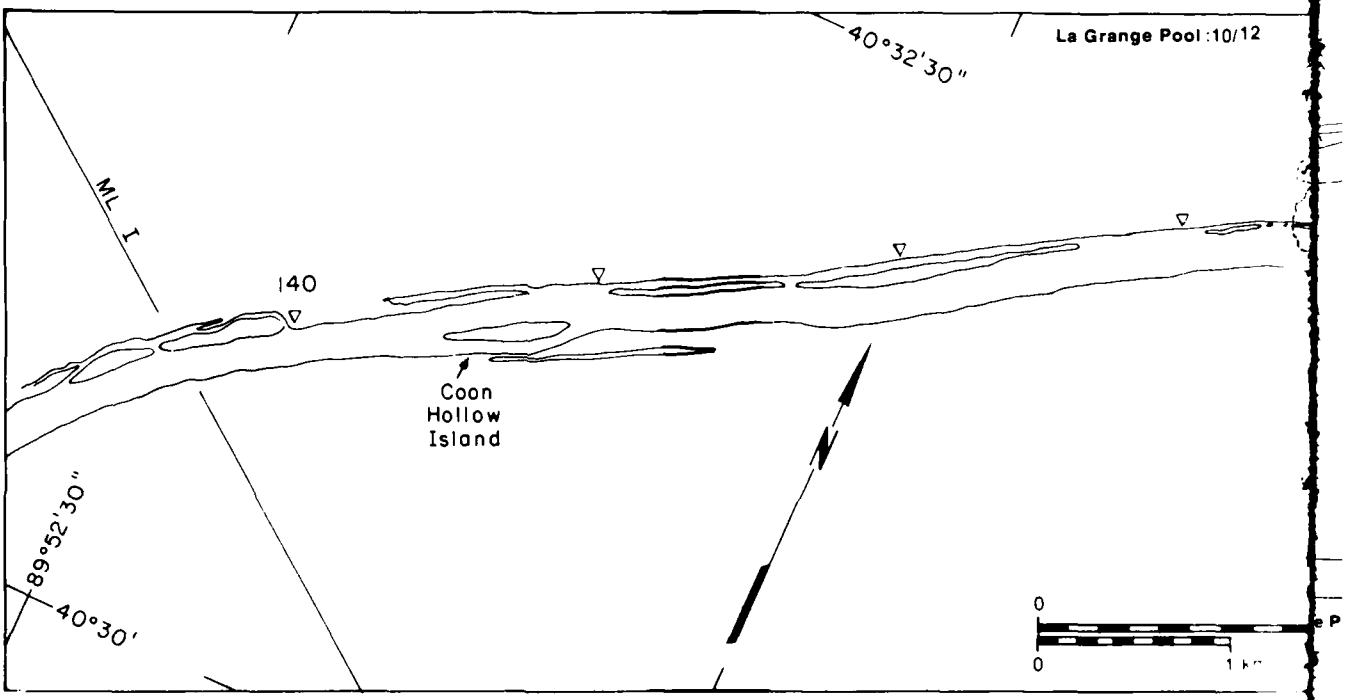
Survey date January 21, 1986
Video Tape 6

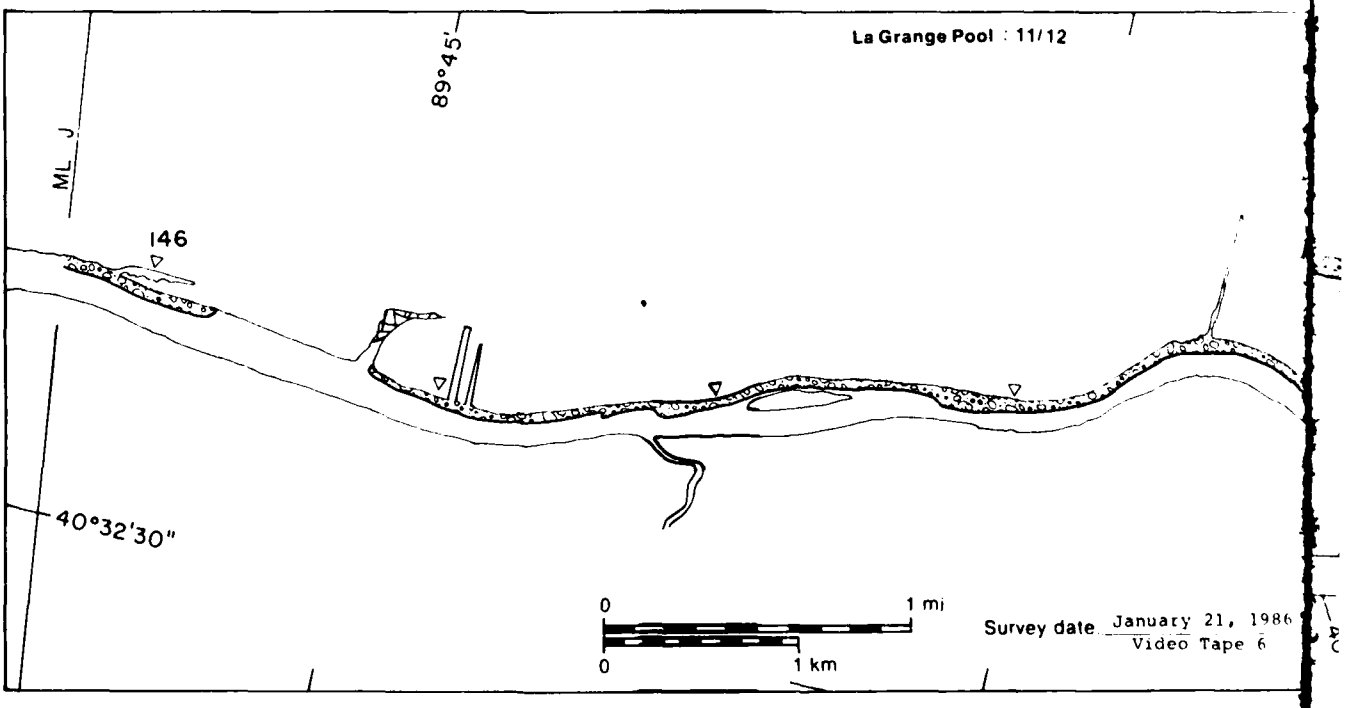


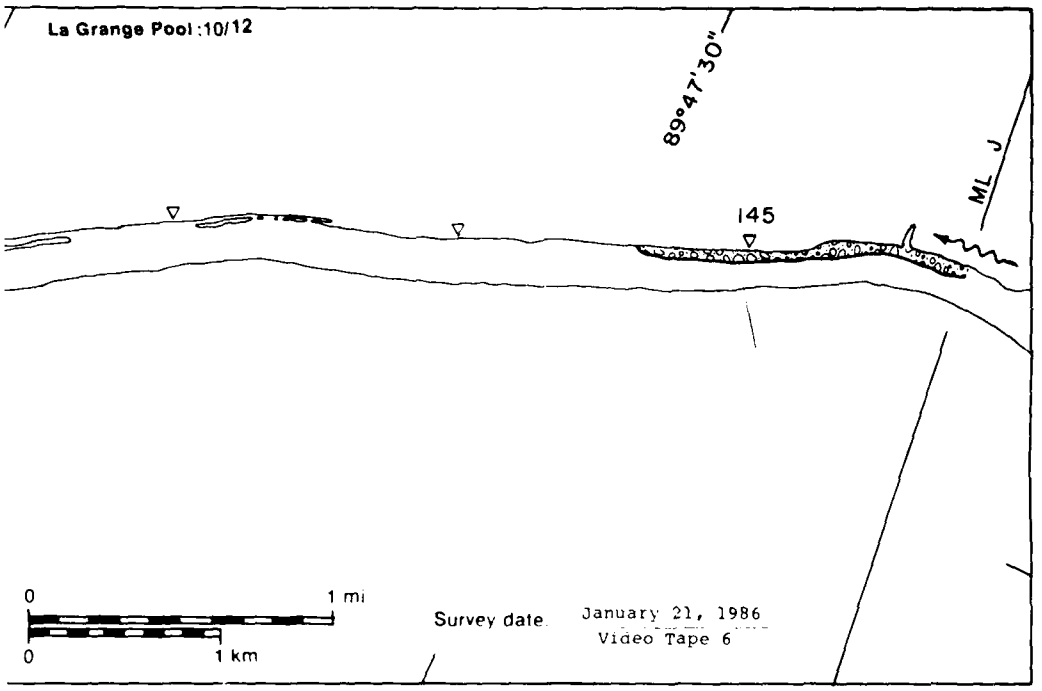
1986
6

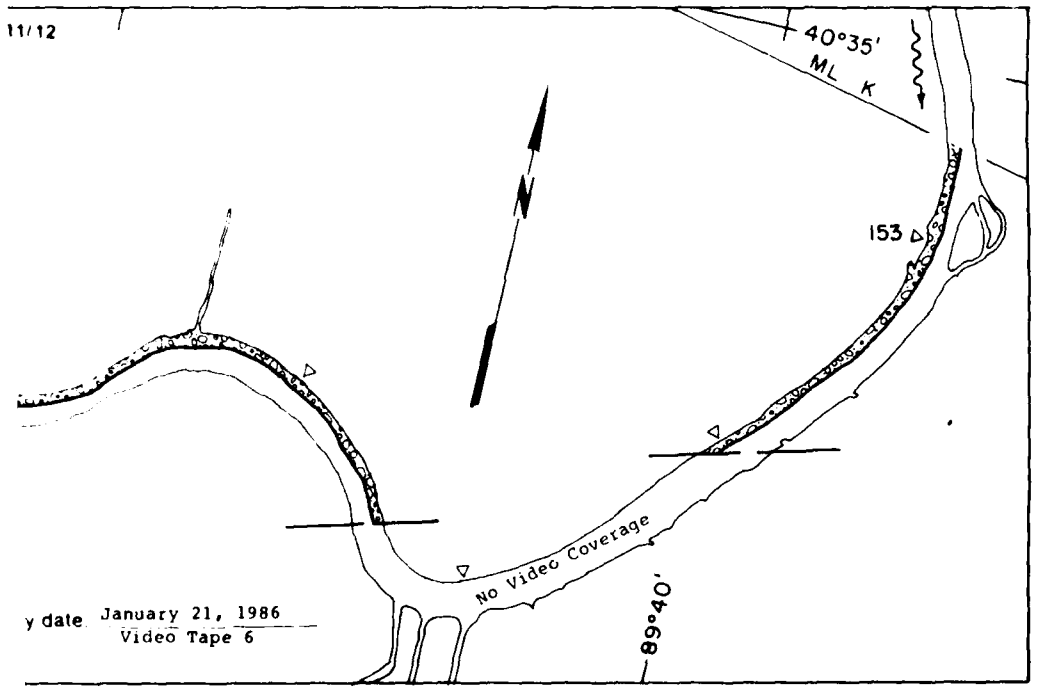
D

21 January 1986





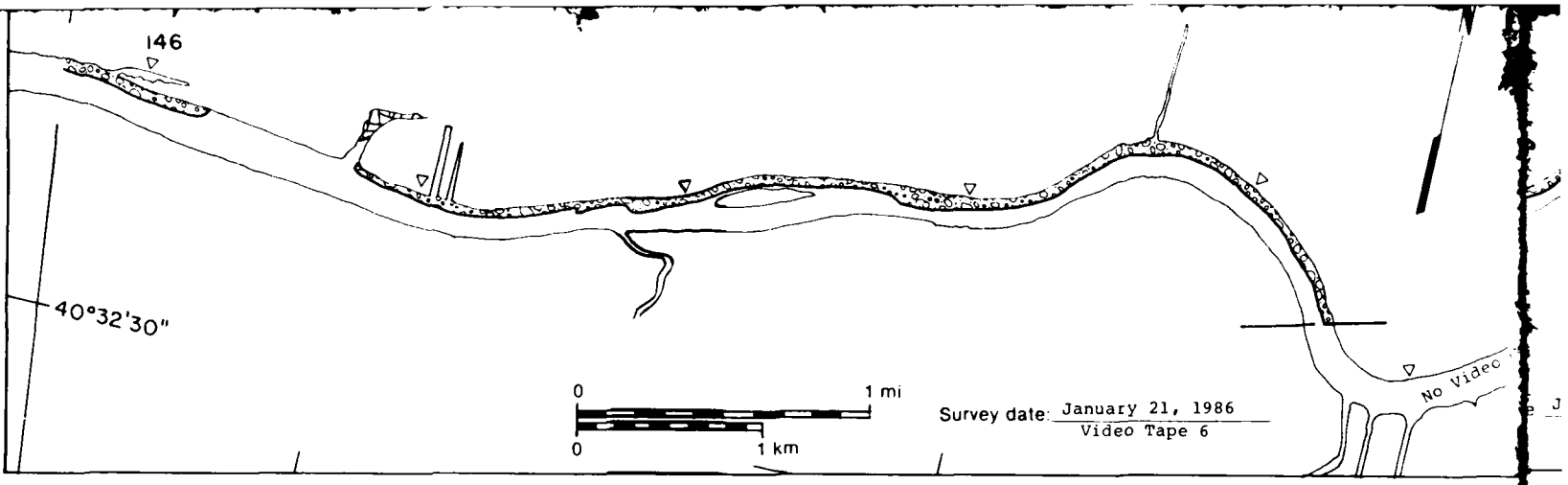


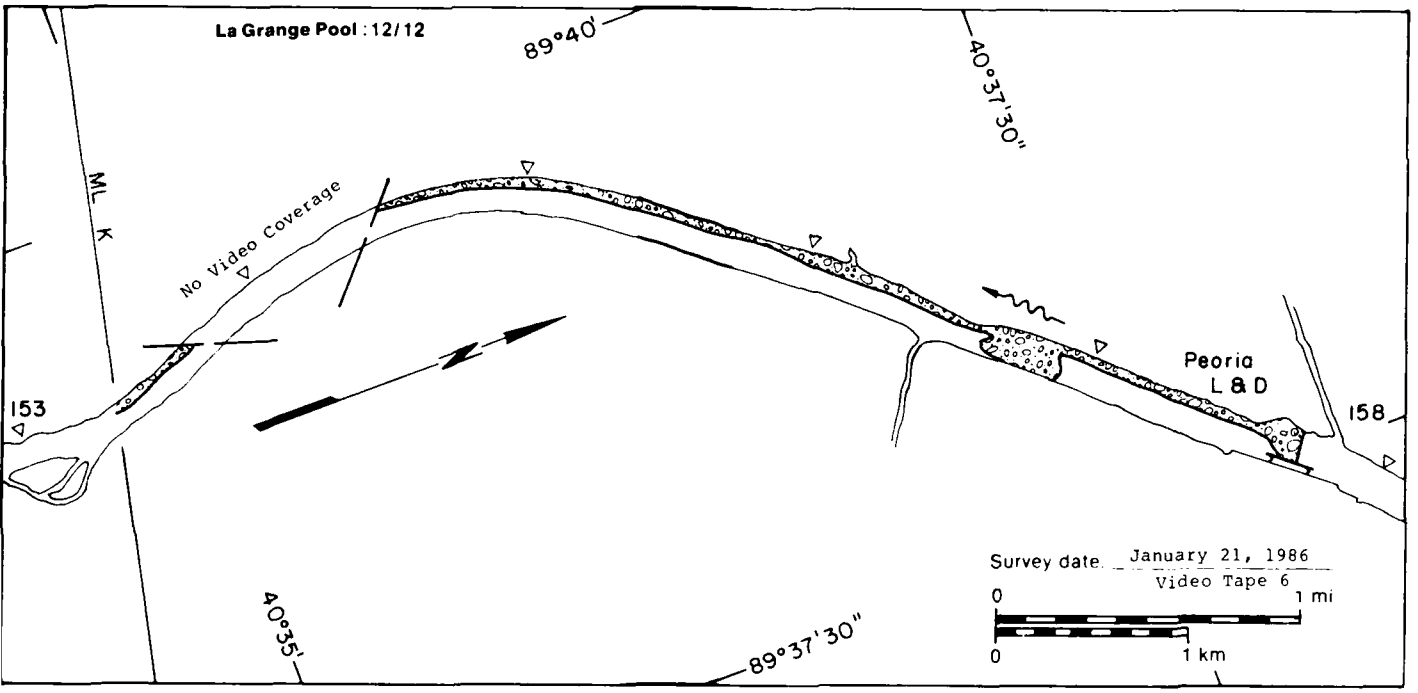


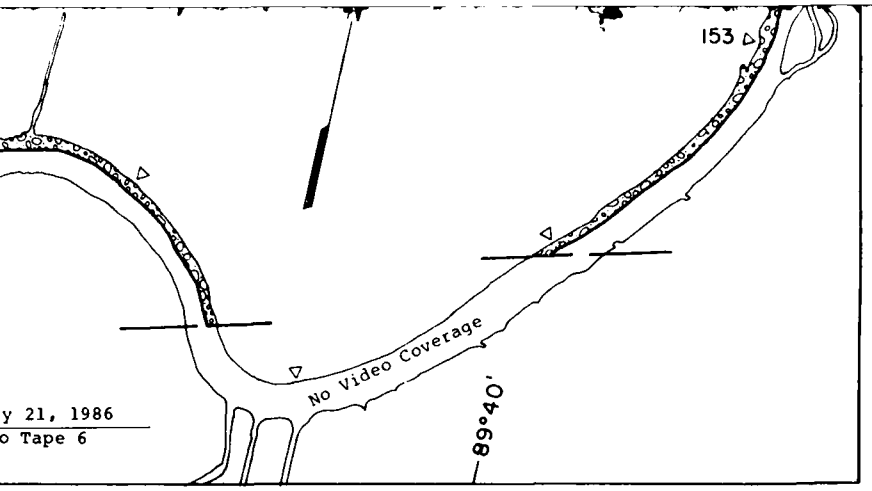
La Grange Pool

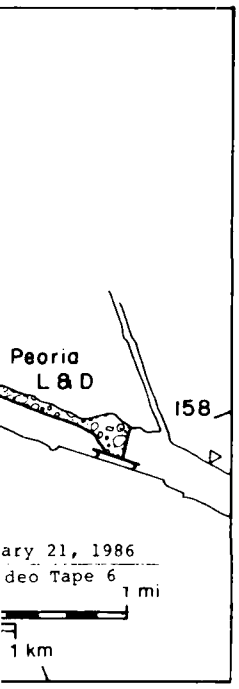
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.26	NA


146
40°32'30"
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6
No Video


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
No Video Coverage
153
Peoria
L & D
158
Survey date: January 21, 1986
Video Tape 6
0
1 mi
0
1 km
40°35'
89°37'30"



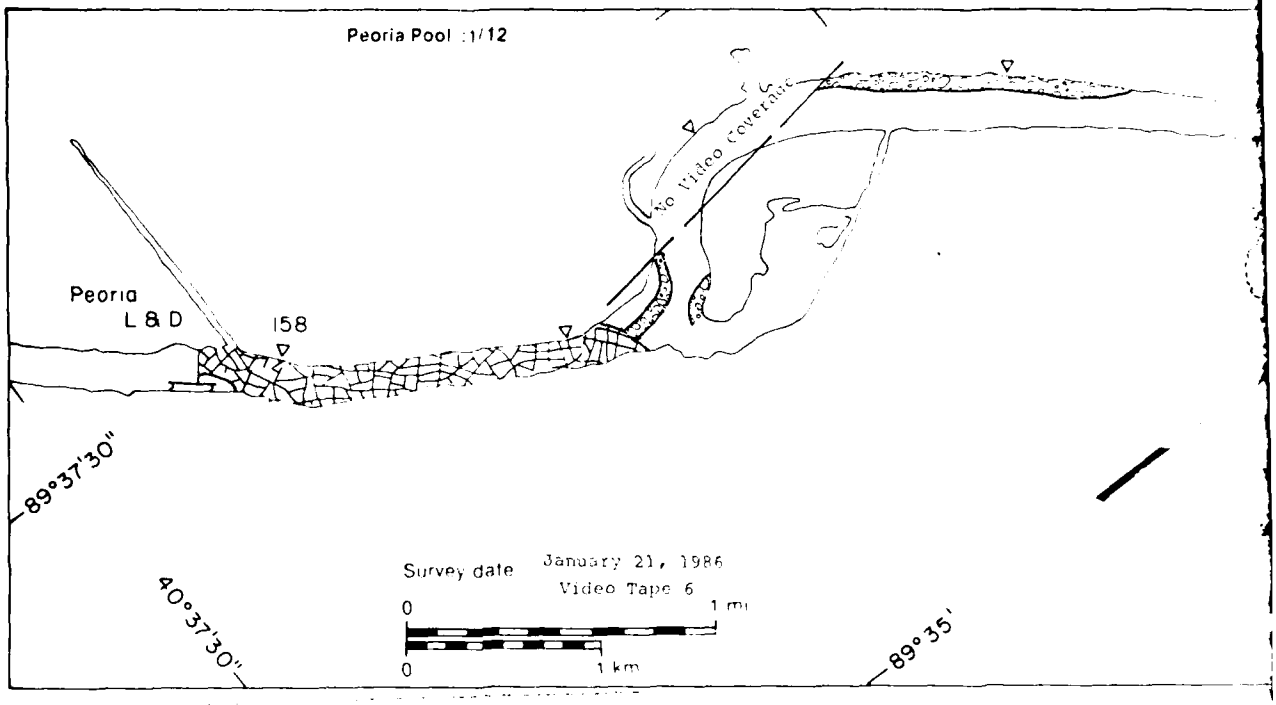


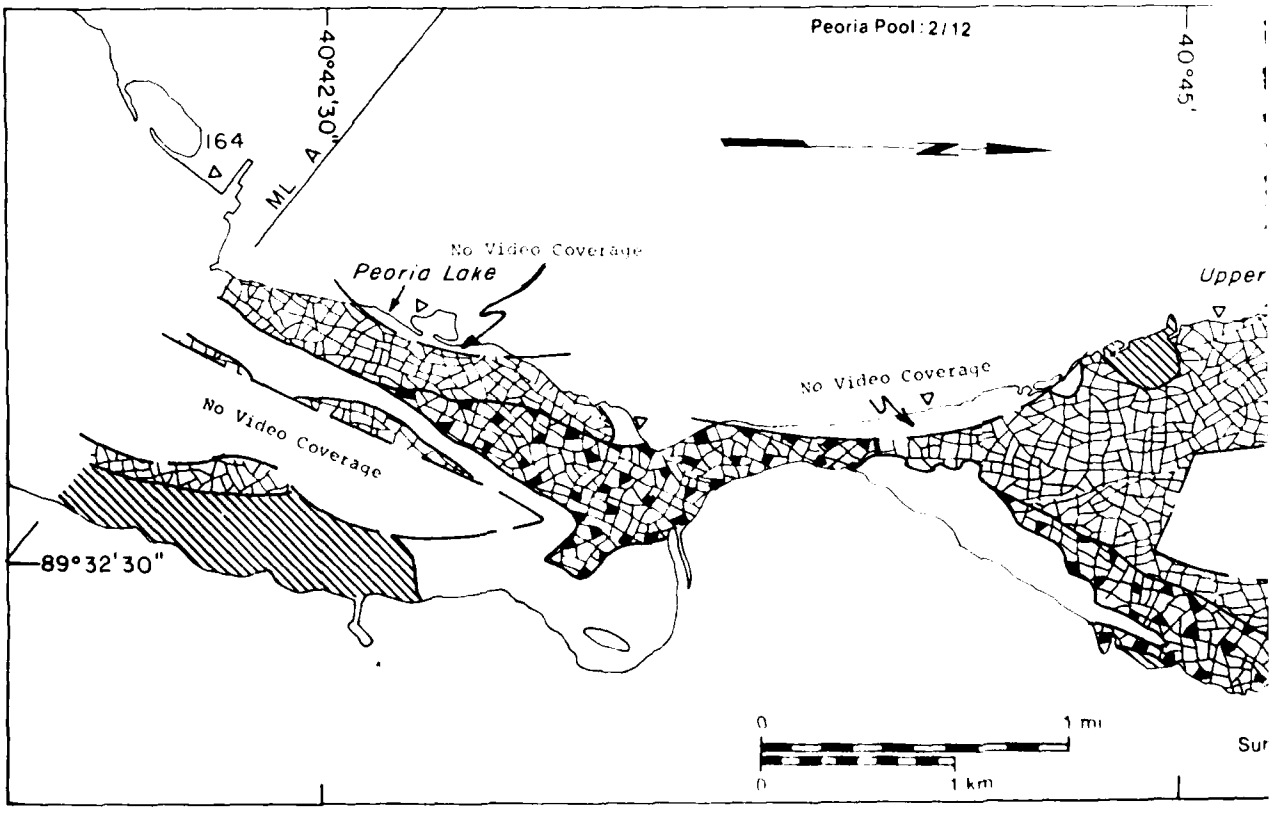
La Grange Pool

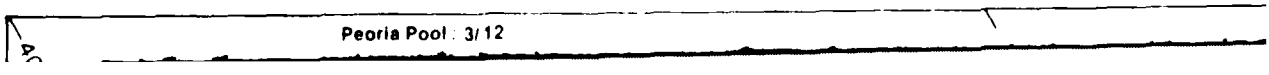
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.26	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.02	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.69	50
Total area ($m^2 \times 10^6$)	11.71*	

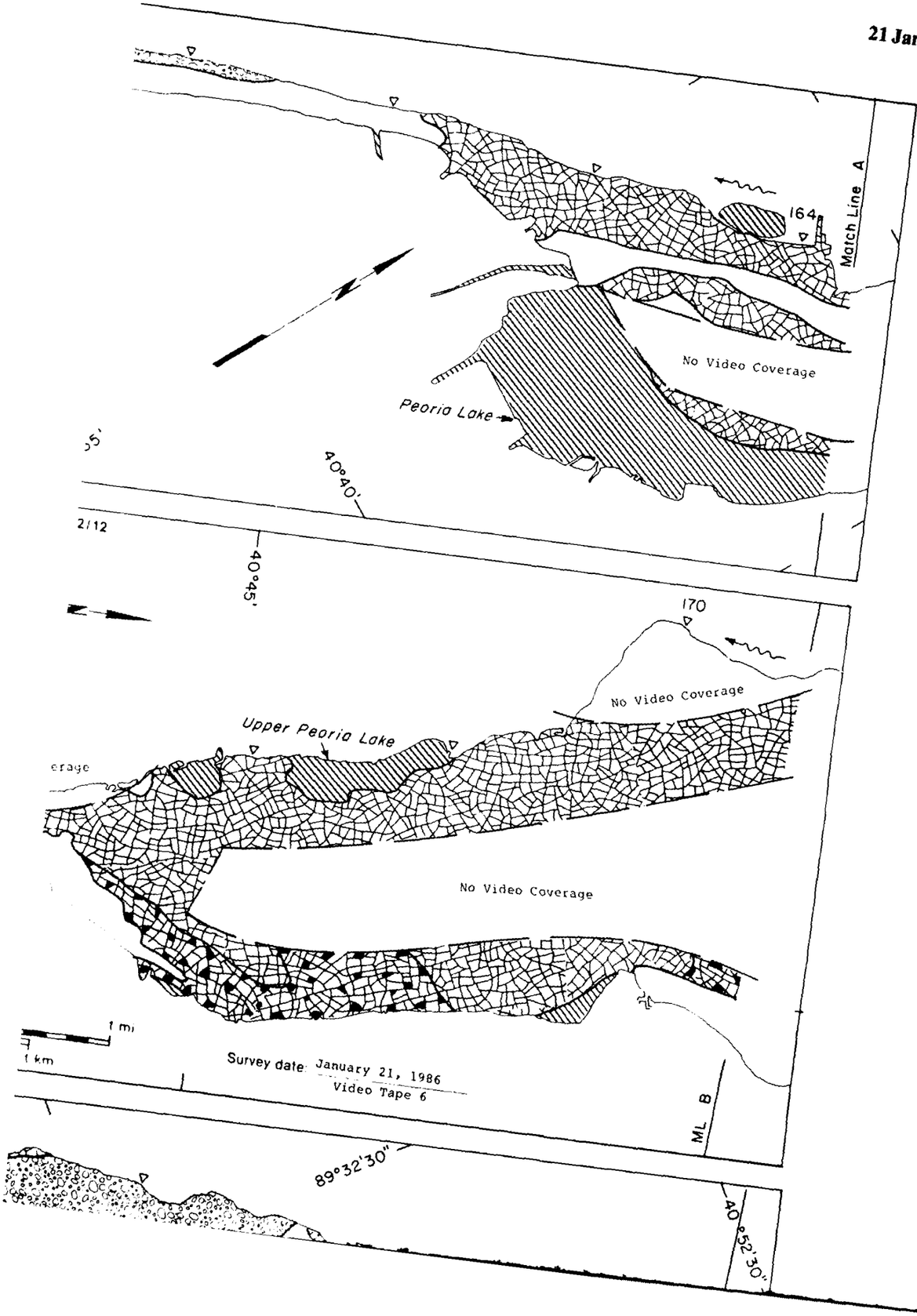
* Includes 0.74×10^6 m^2 of no video coverage

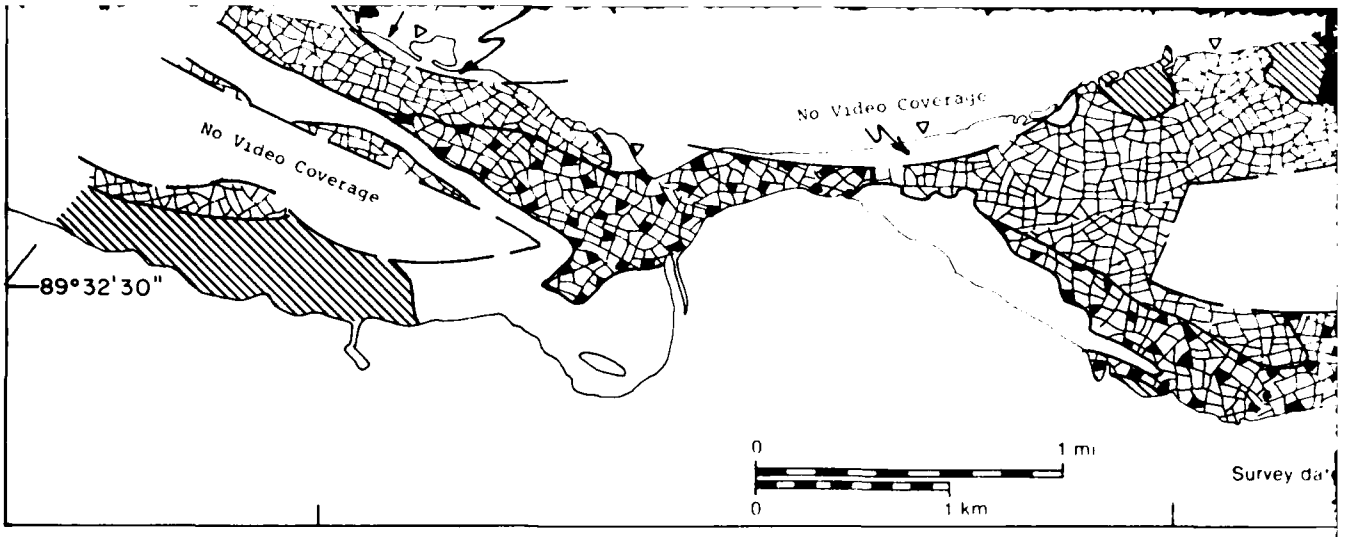

Peoria Pool : 1/12
No Video Coverage
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date January 21, 1986
Video Tape 6
0 1 mi
0 1 km
89°35'

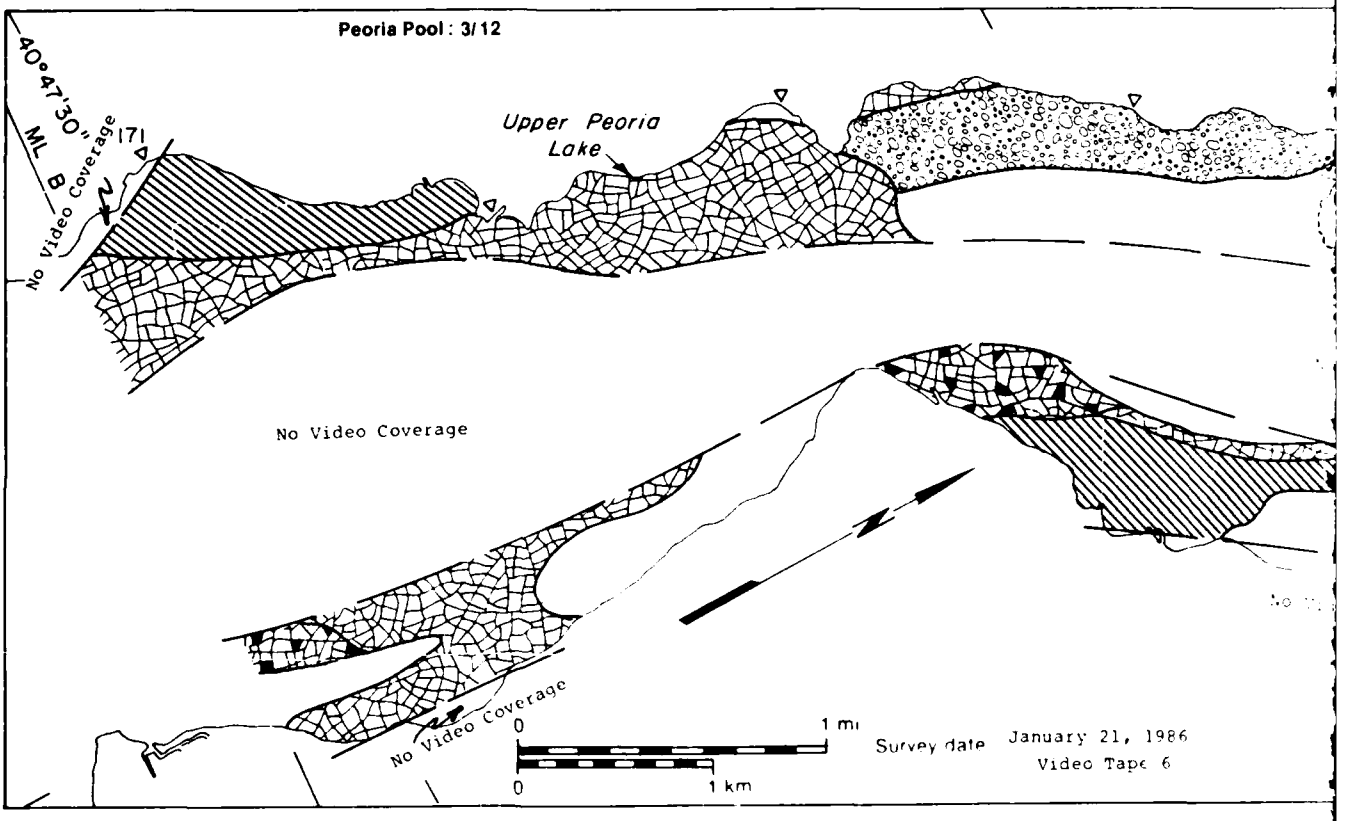

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
No Video Coverage
Peoria Lake
Upper
No Video Coverage
No Video Coverage
89°32'30"
0 1 mi
0 1 km
Sur

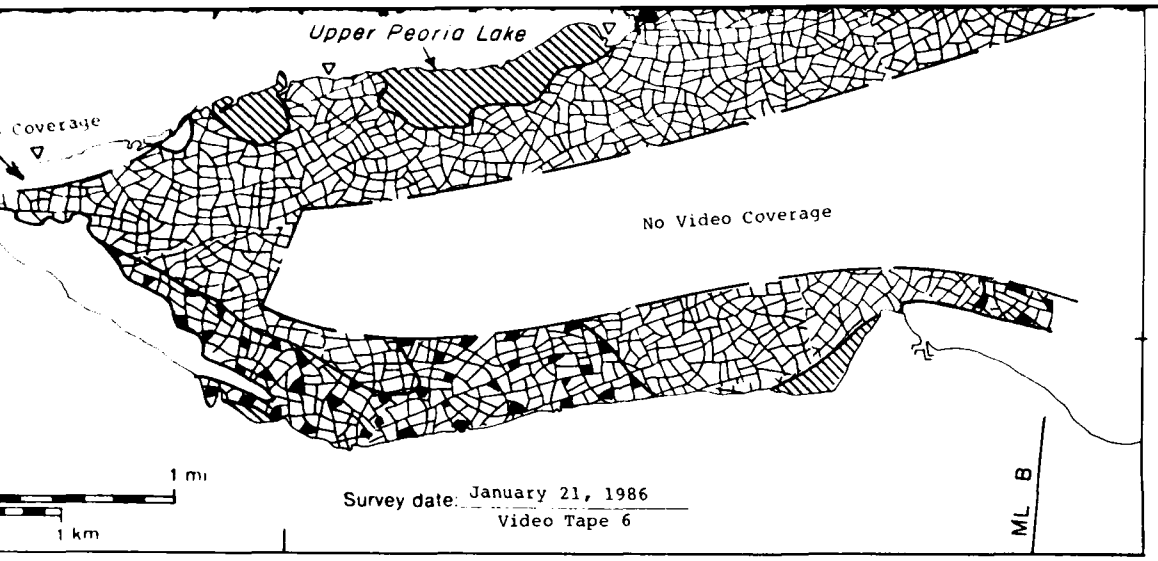

Peoria Pool : 3/12

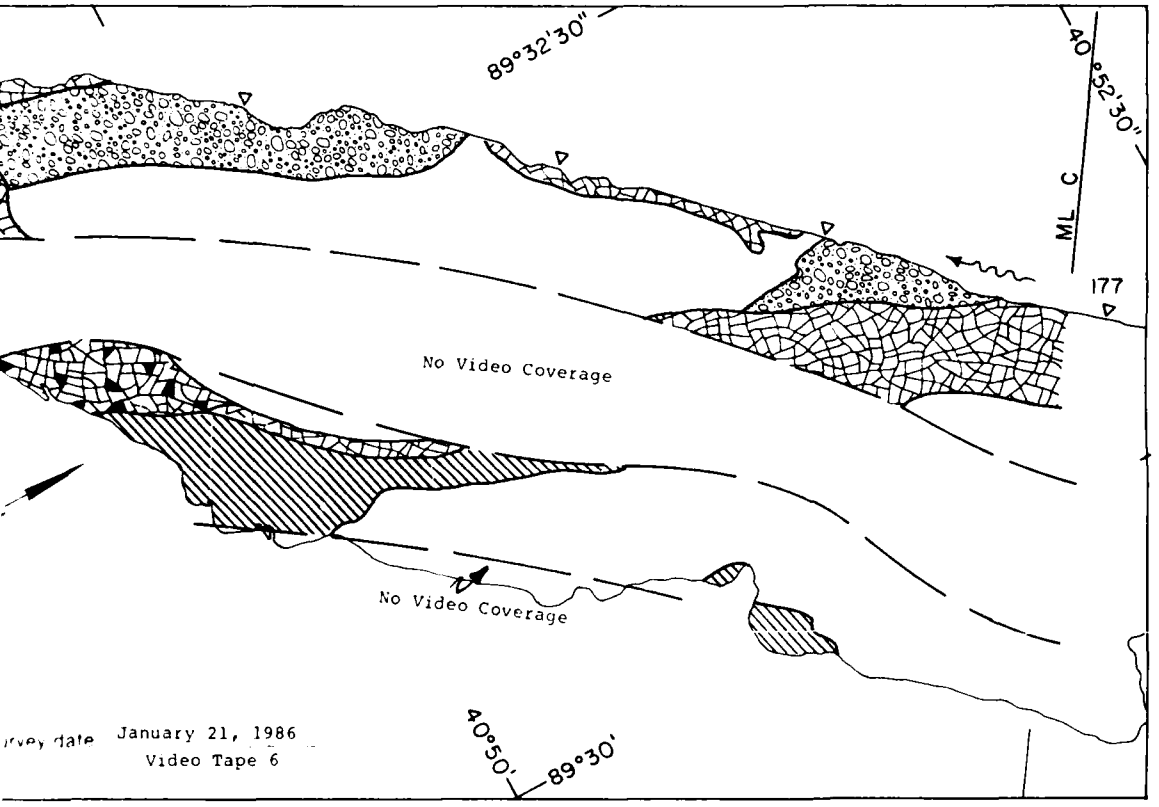
21 January 1986



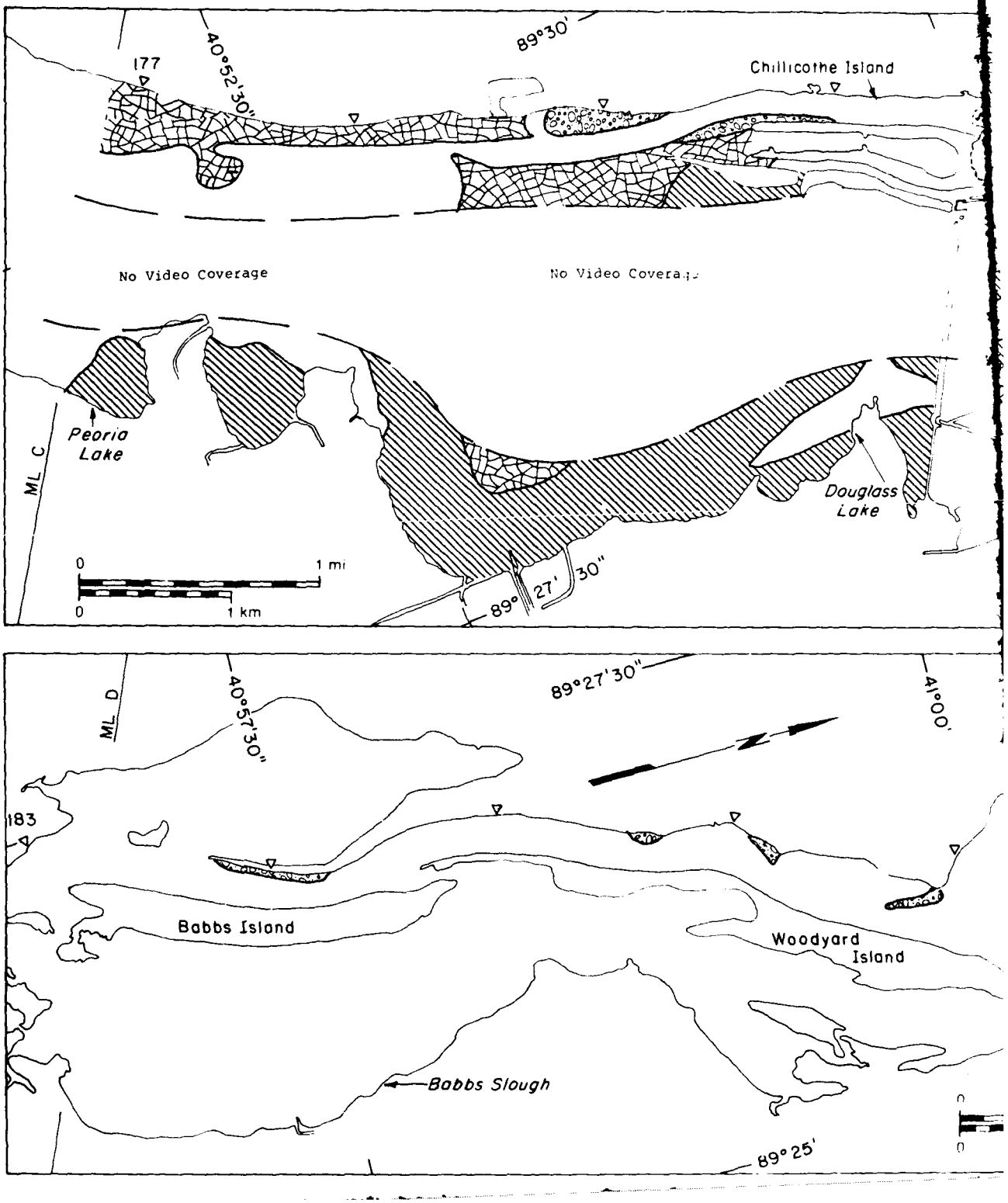

No Video Coverage
No Video Coverage
89°32'30"
0
1 mi
0
1 km
Survey da

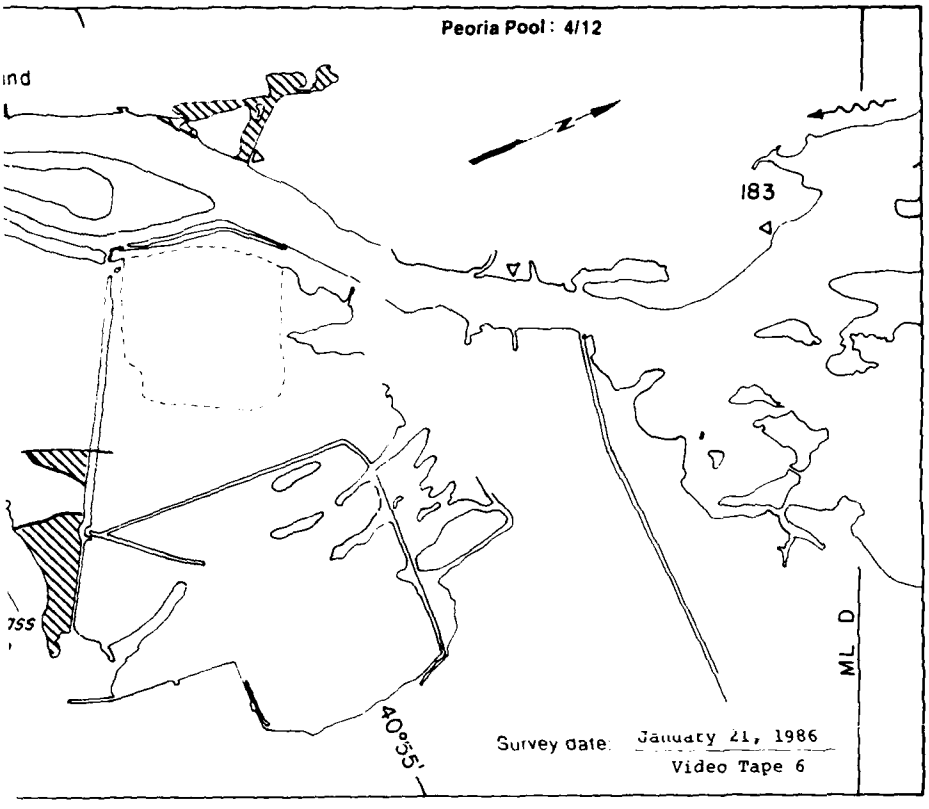

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date January 21, 1986
Video Tape 6

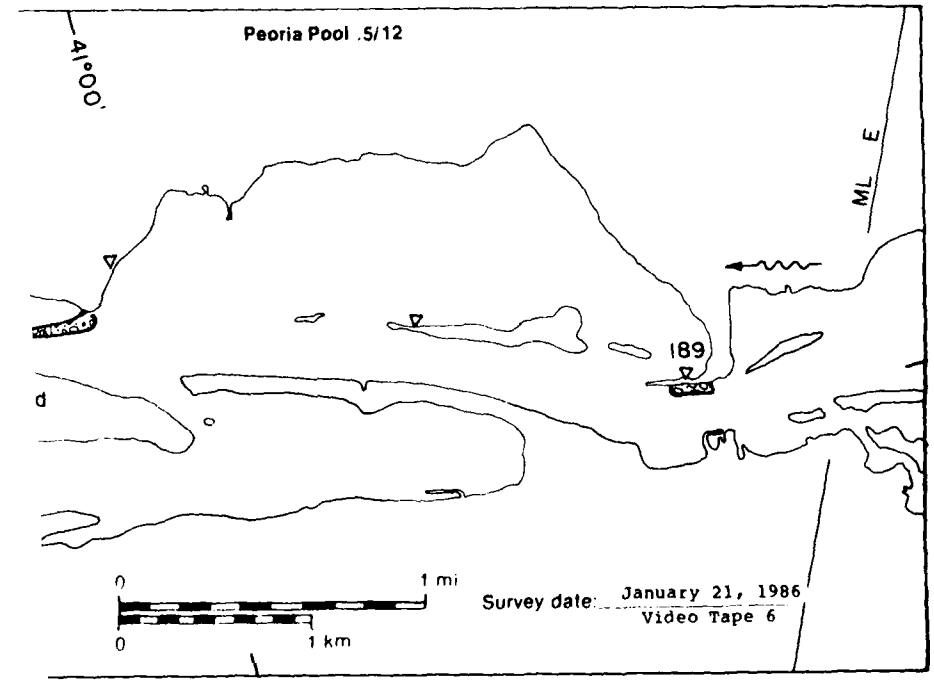

Upper Peoria Lake
Coverage
No Video Coverage
1 mi
1 km
Survey date: January 21, 1986
Video Tape 6
ML B


89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
January 21, 1986
Video Tape 6
40°50'
89°30'

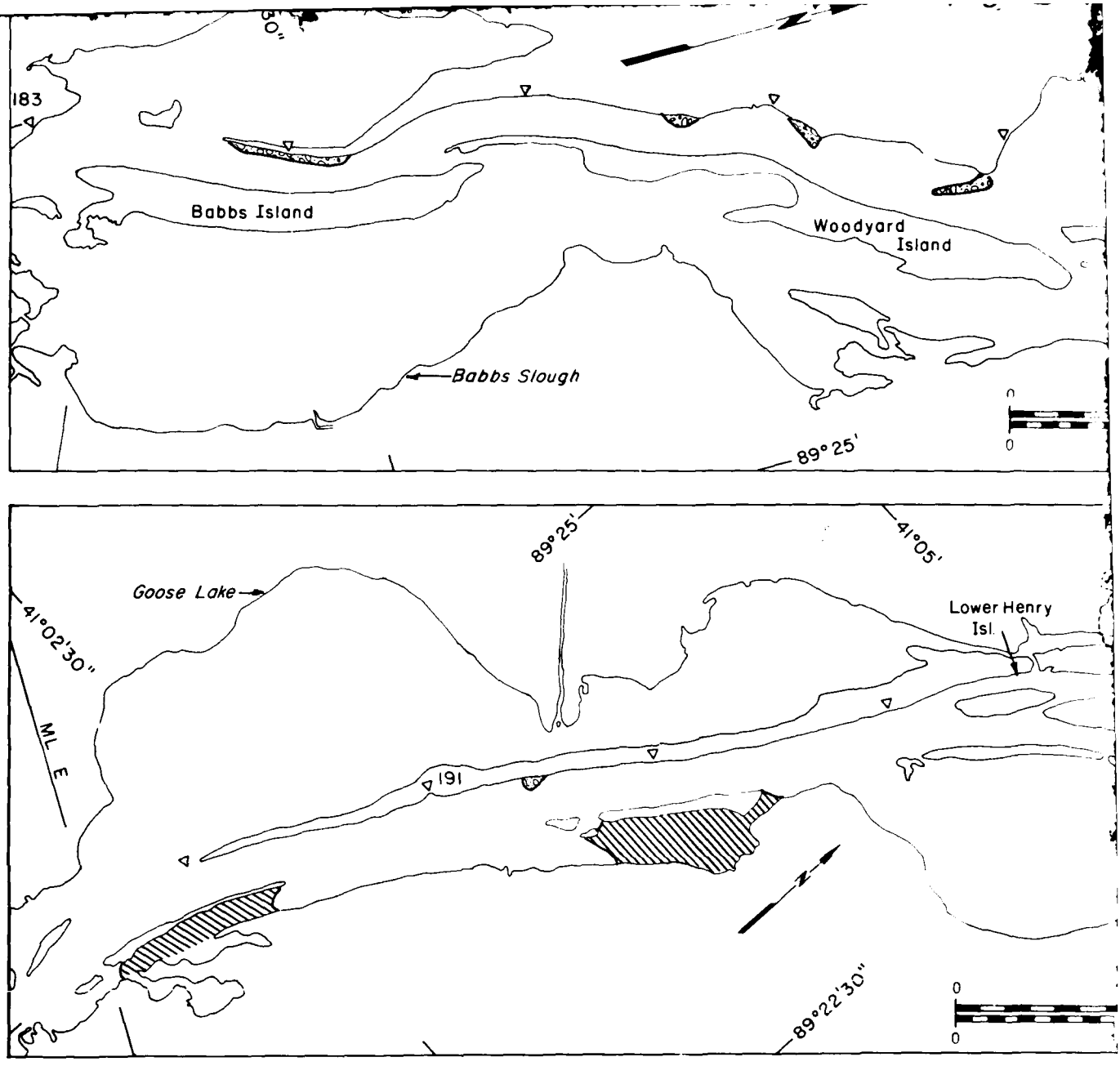
21 January 1986

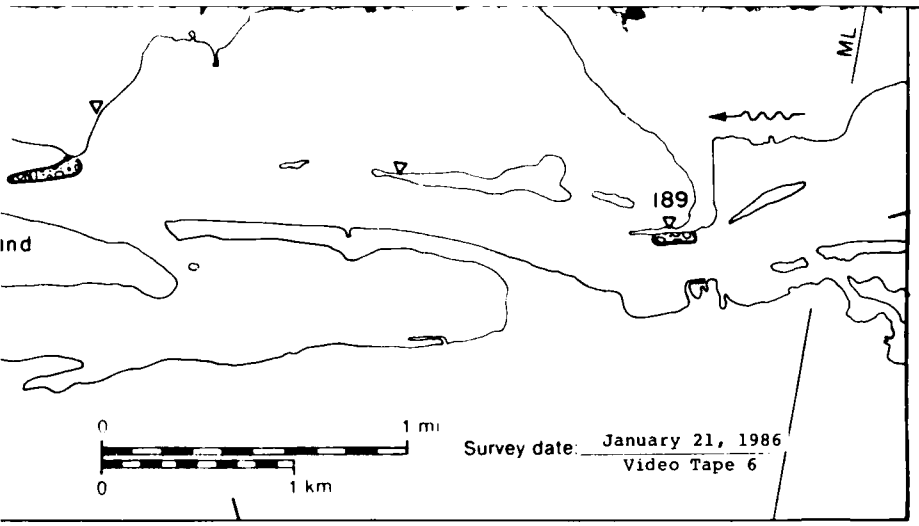


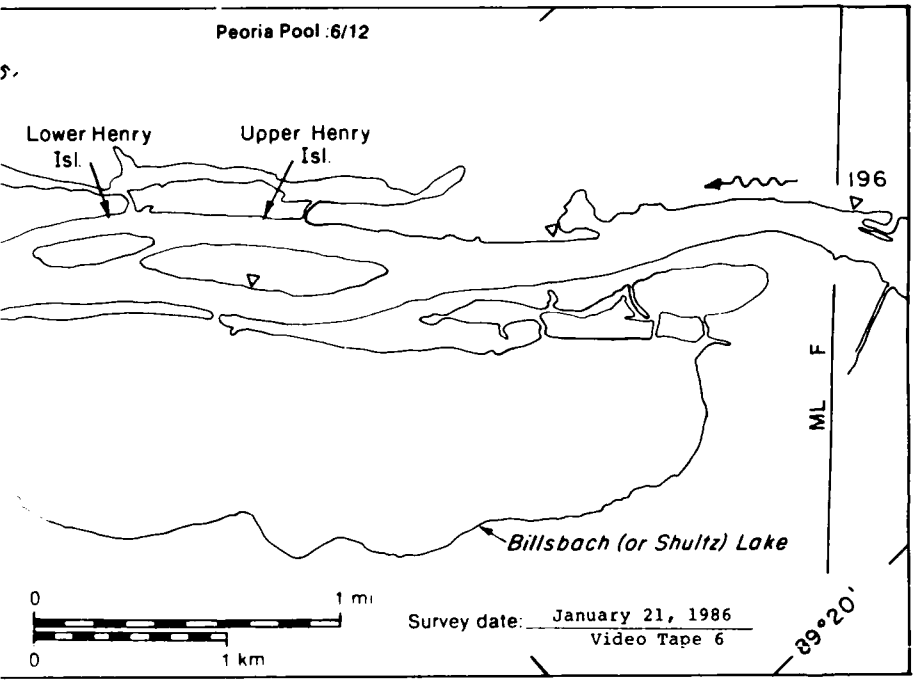

Peoria Pool : 4/12
183
ML D
40°55'
Survey date: January 21, 1986
Video Tape 6

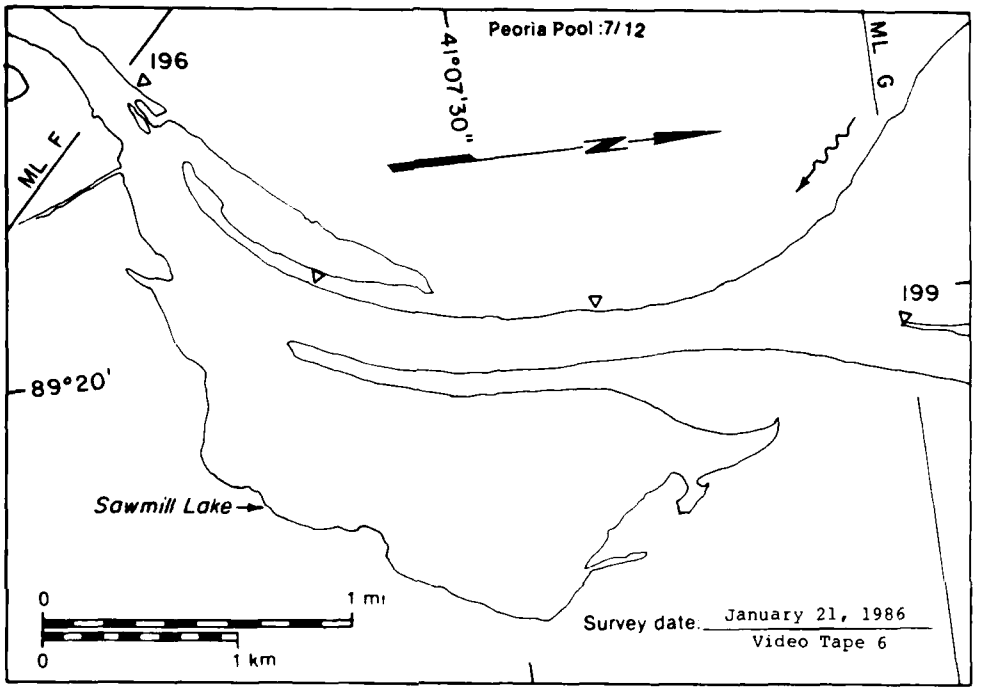

Peoria Pool .5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6

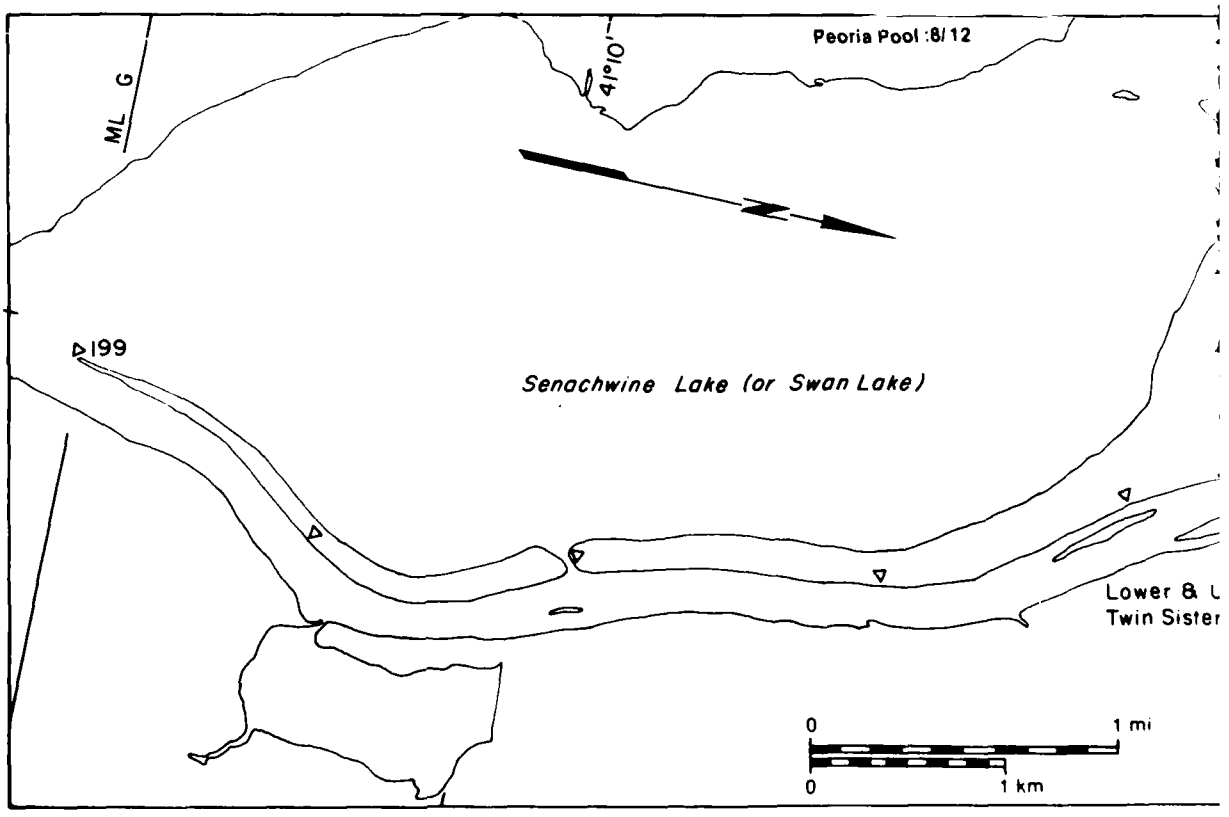
Peoria Pool :6/12

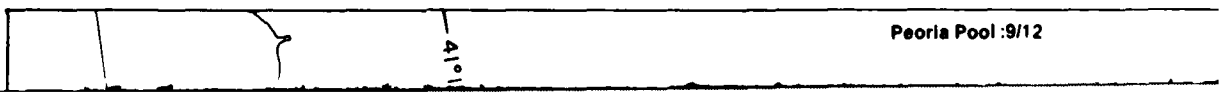

183
Babbs Island
Woodyard
Island
Babbs Slough
89° 25'
0
0
89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl.
ML E
191
89°22'30"
0
0


ML
189
ind
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6

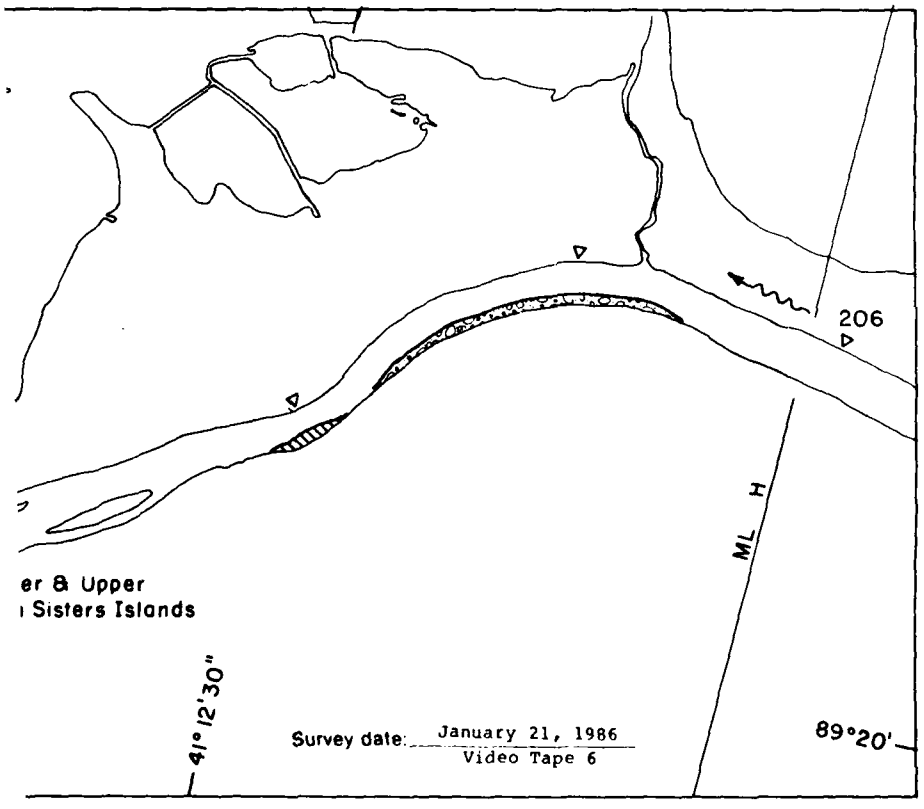

Peoria Pool :6/12
Lower Henry Isl.
Upper Henry Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6
39°20'

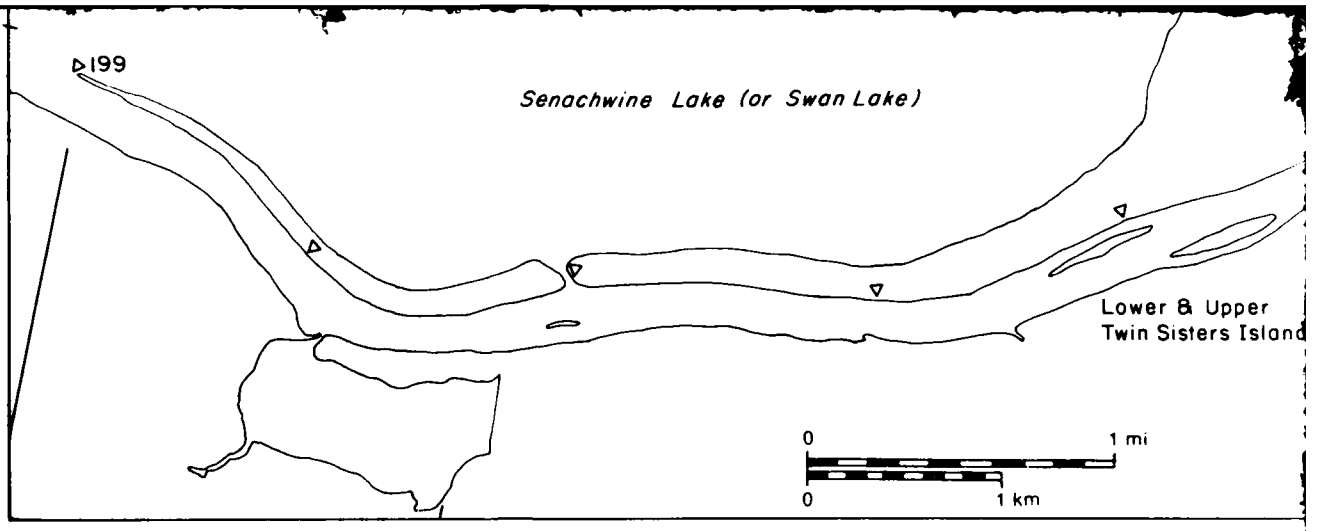

Peoria Pool :7/12
196
41°07'30"
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6

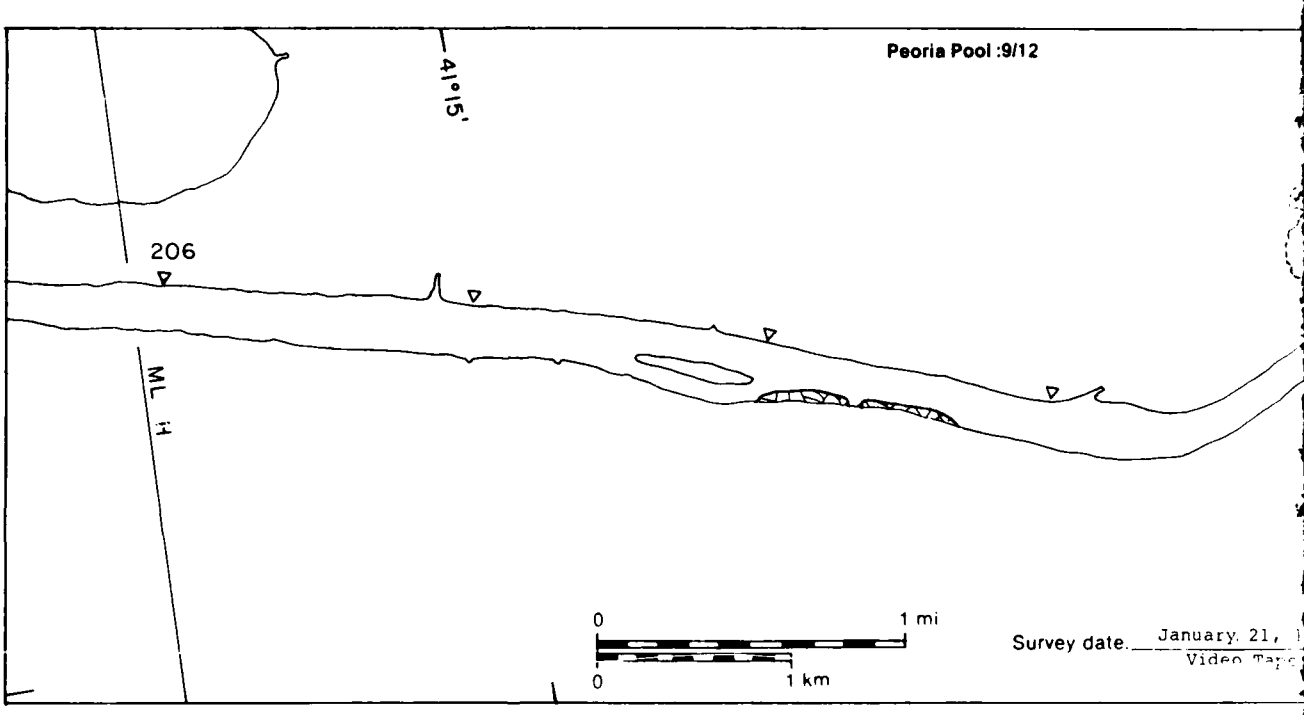

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower &
Twin Sister
0
1 mi
0
1 km

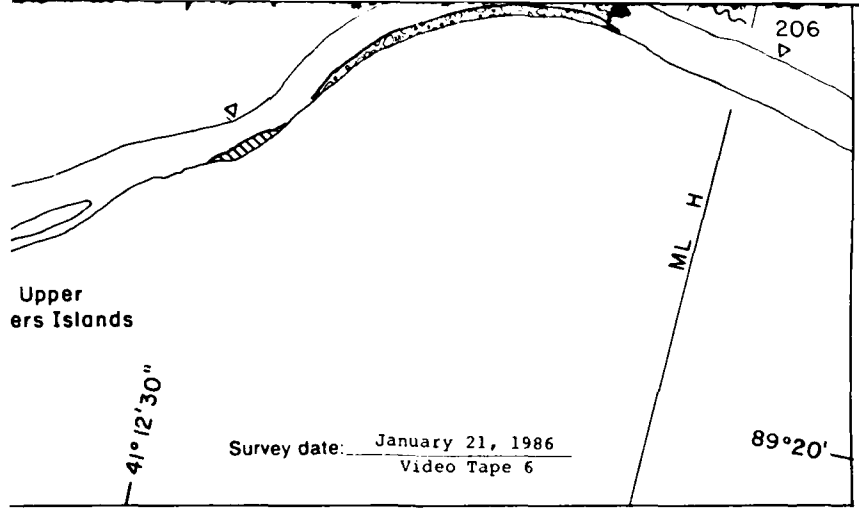

Peoria Pool :9/12

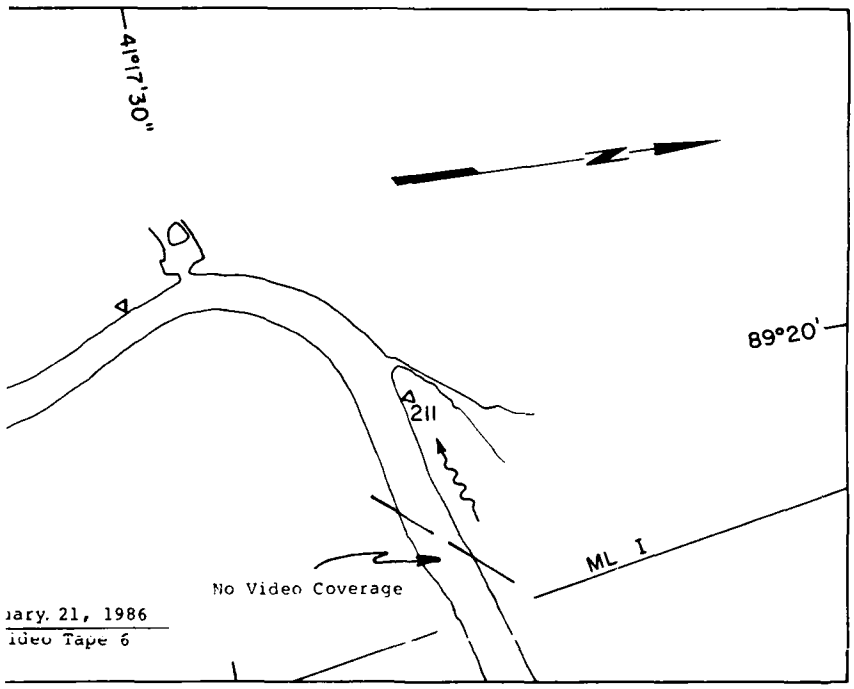
21 January 1986



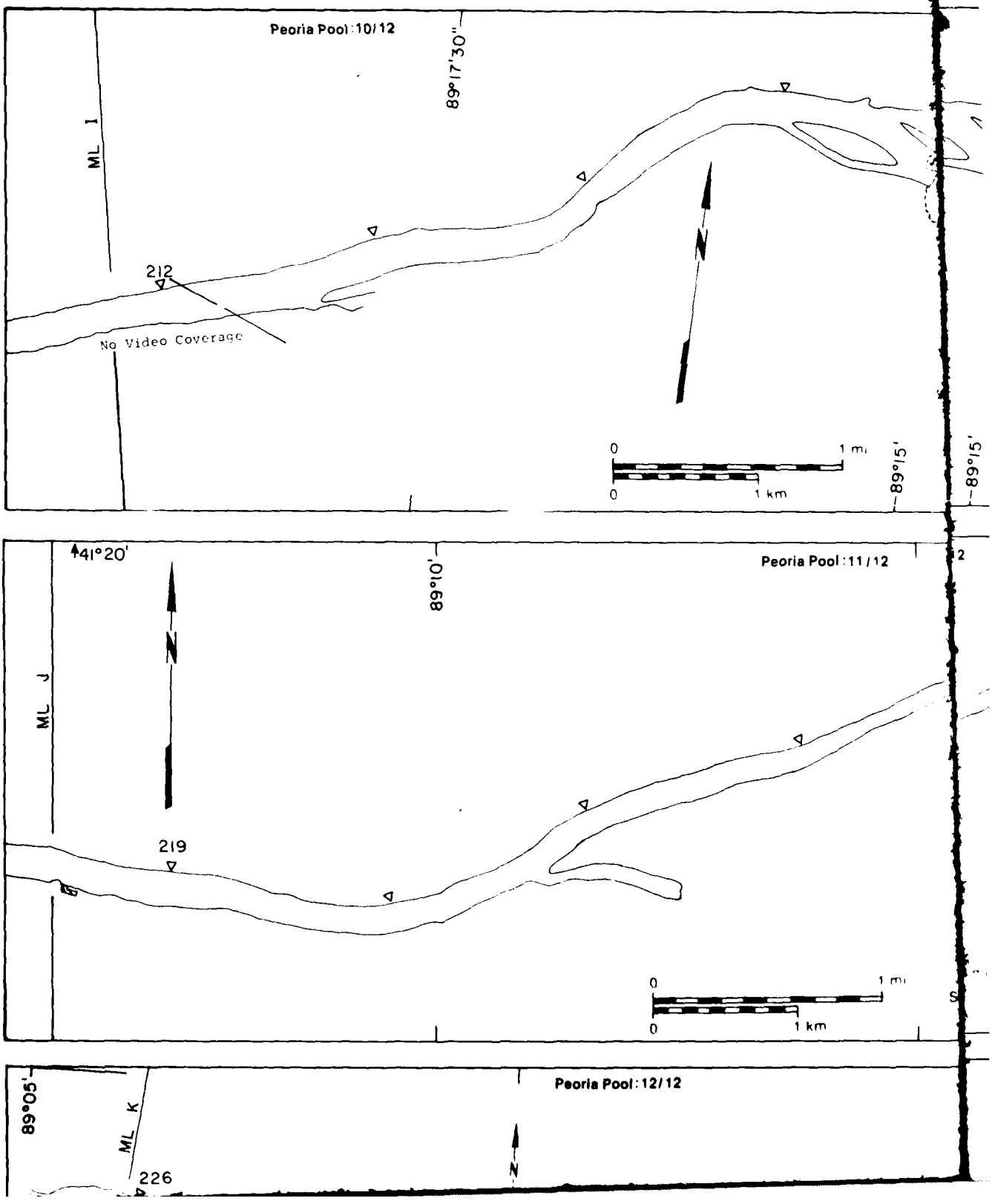

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Island
0
1 mi
0
1 km

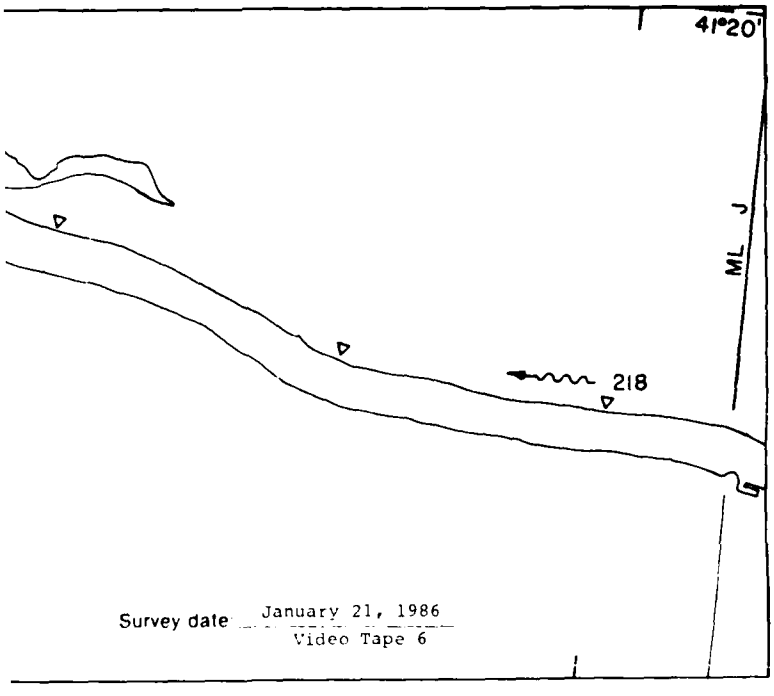

Peoria Pool :9/12
41°15'
206
ML 11
0
1 mi
0
1 km
Survey date. January. 21,
Video Tape

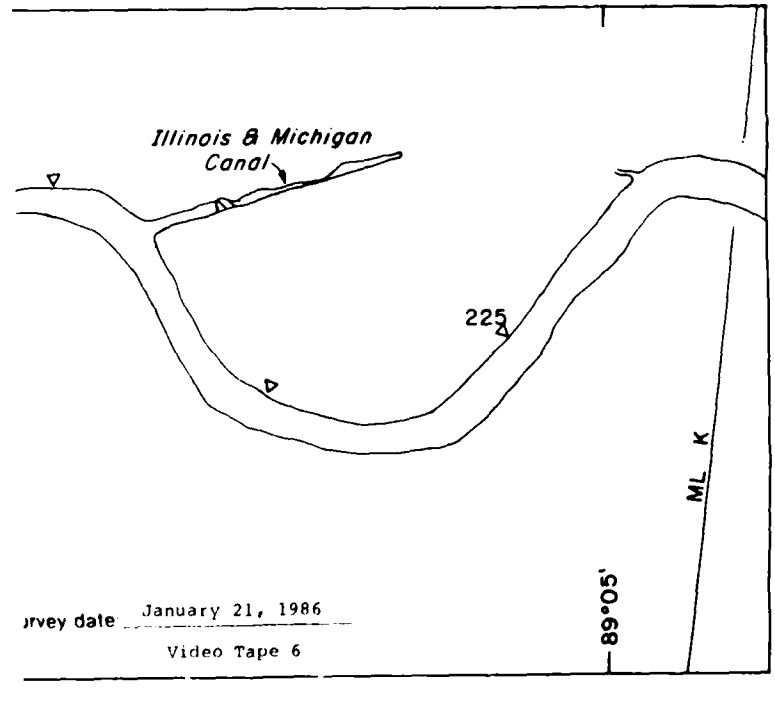

206
ML H
Upper
ers Islands
41°12'30"
Survey date: January 21, 1986
Video Tape 6
89°20'

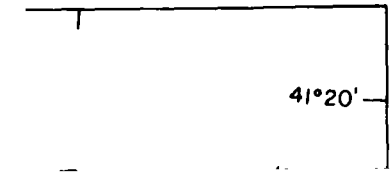

41°17'30"
89°20'
211
ML I
No Video Coverage
uary. 21, 1986
ideo Tape 6

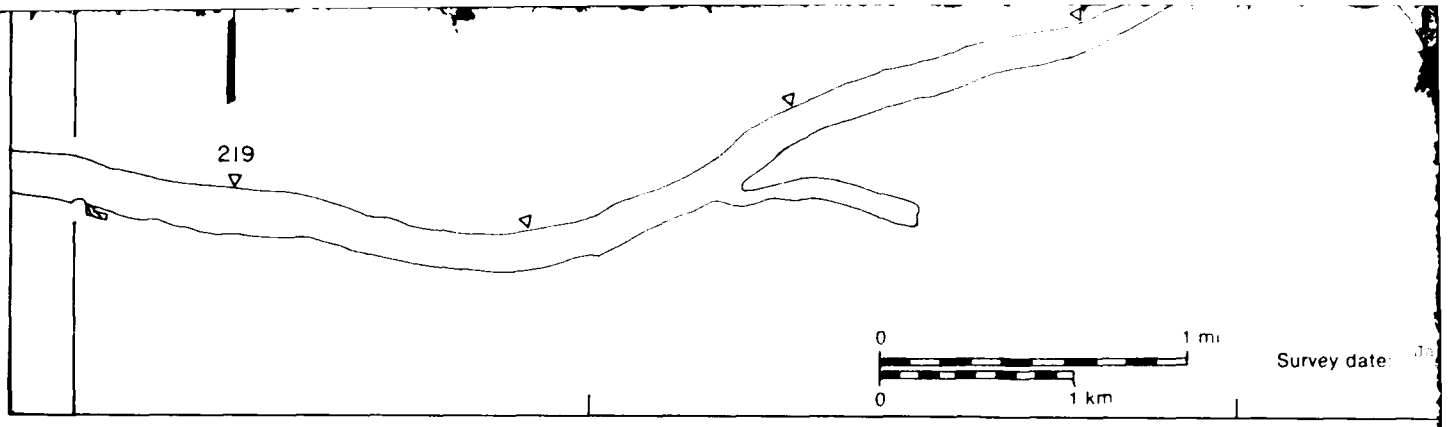
21 January 1986

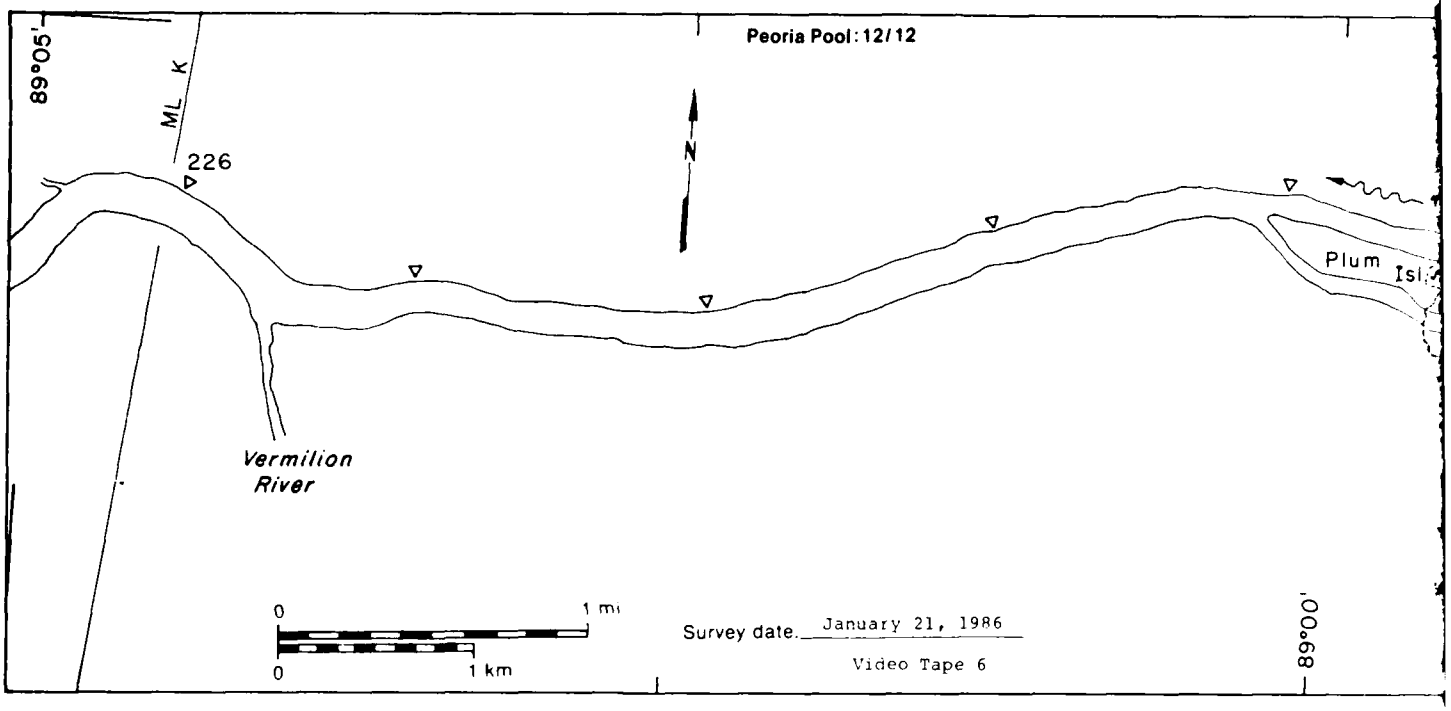



41°20'
ML J
218
Survey date January 21, 1986
Video Tape 6


Illinois & Michigan
Canal
225
ML K
89°05'
urvey date January 21, 1986
Video Tape 6


41°20'

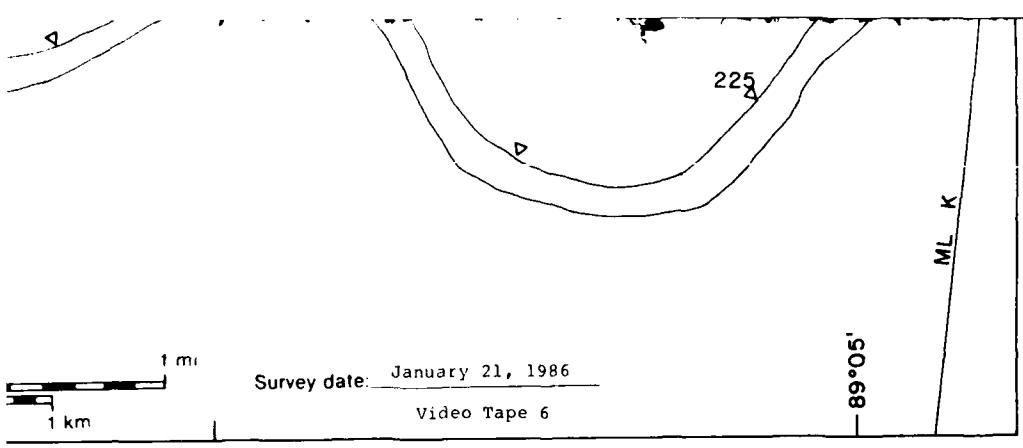


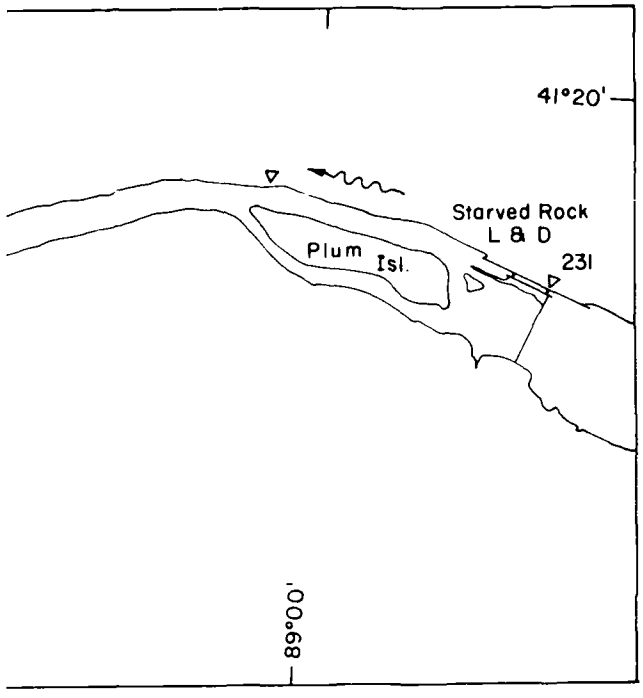


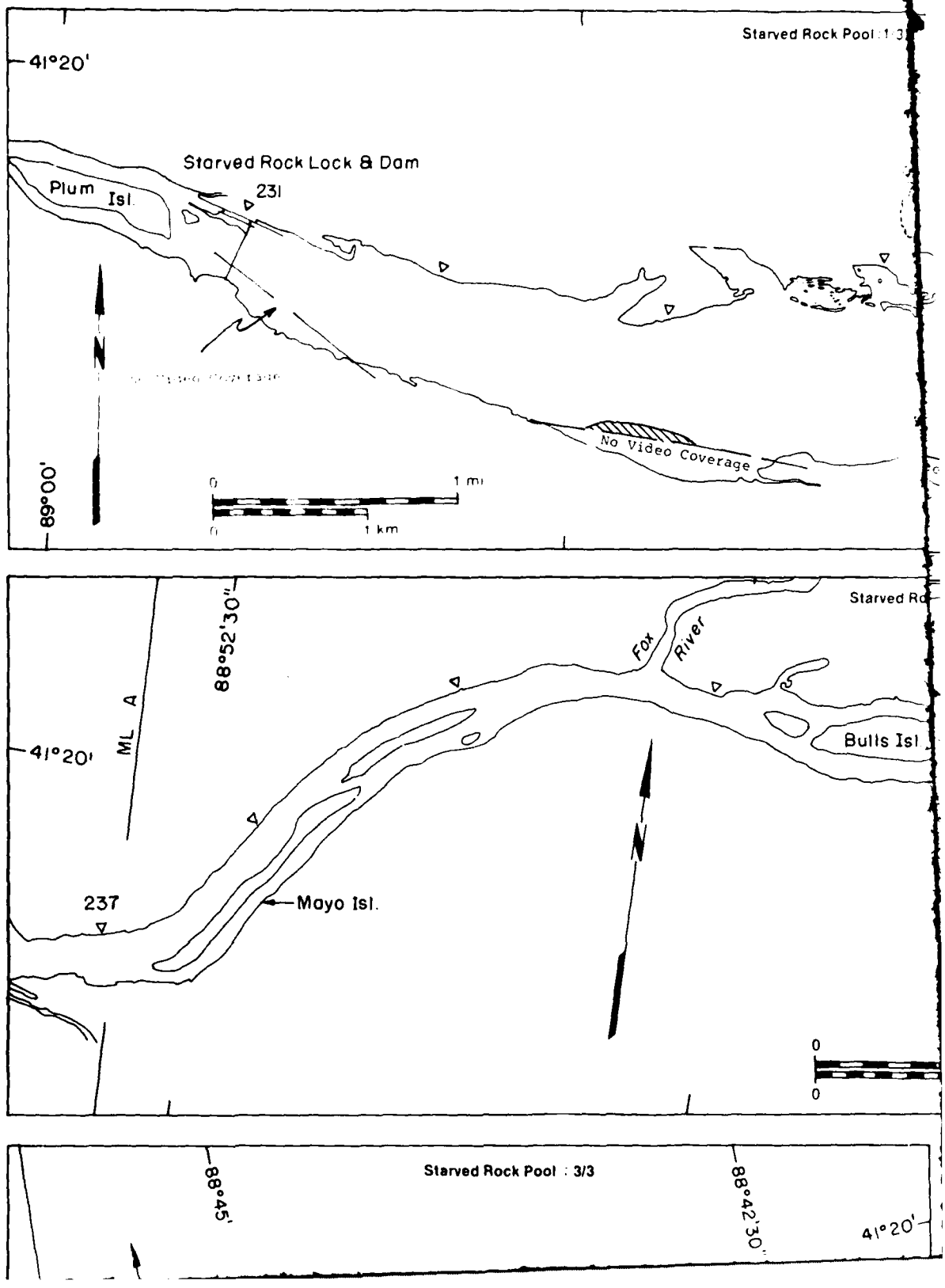
Peoria Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	32.13	NA
Solid ice cover	8.45	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	11.69	NA
Fragmented ice cover with open-water areas	2.46	70
Ice floes or frazil slush and pans	1.83	70
Total area ($m^2 \times 10^6$)	81.33*	

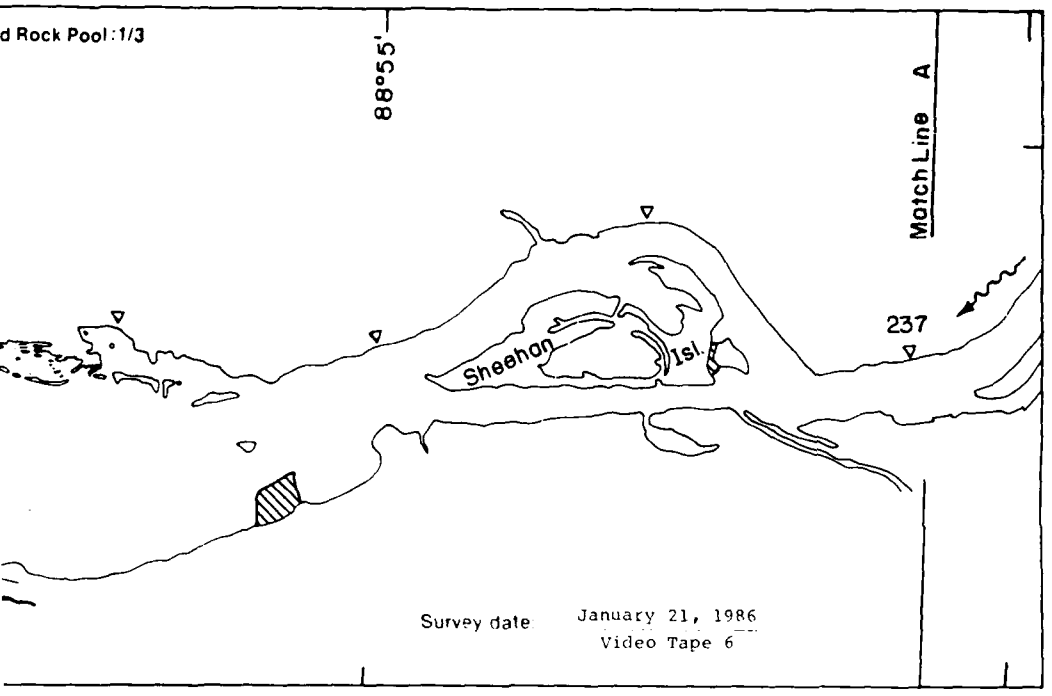
* Includes 24.77×10^6 m^2 of no video coverage

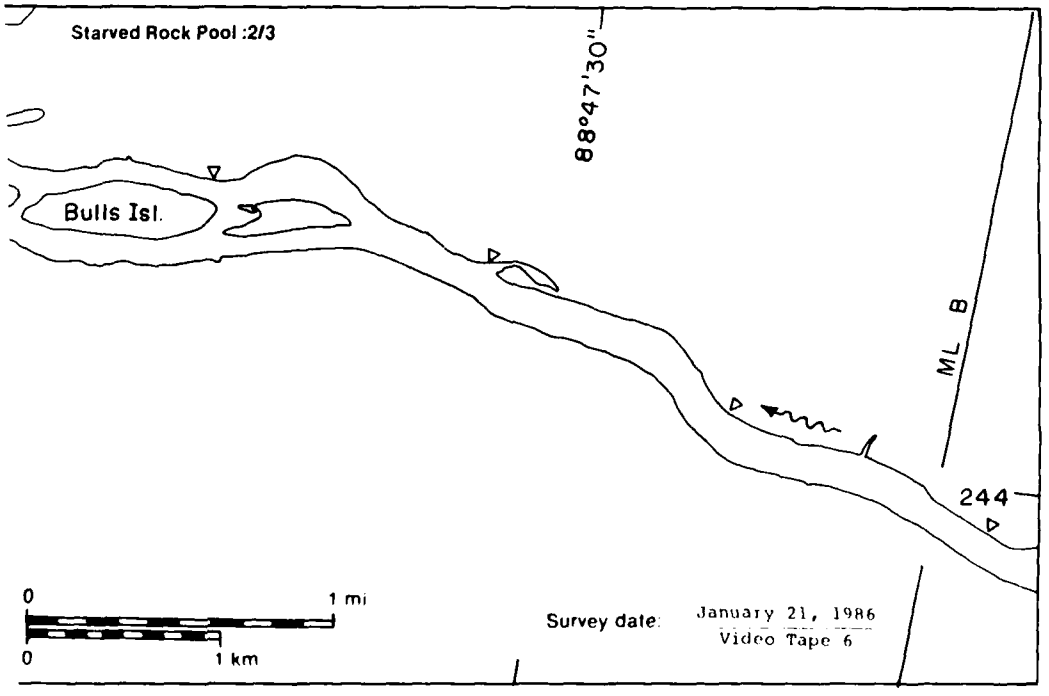

225
ML K
89°05'
1 mi
1 km
Survey date: January 21, 1986
Video Tape 6

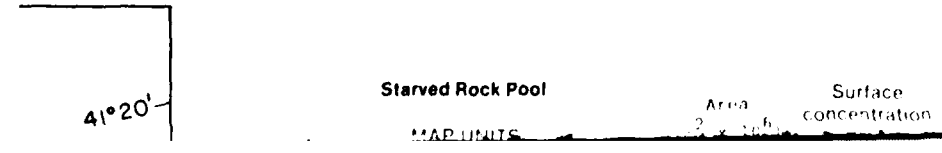

41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'

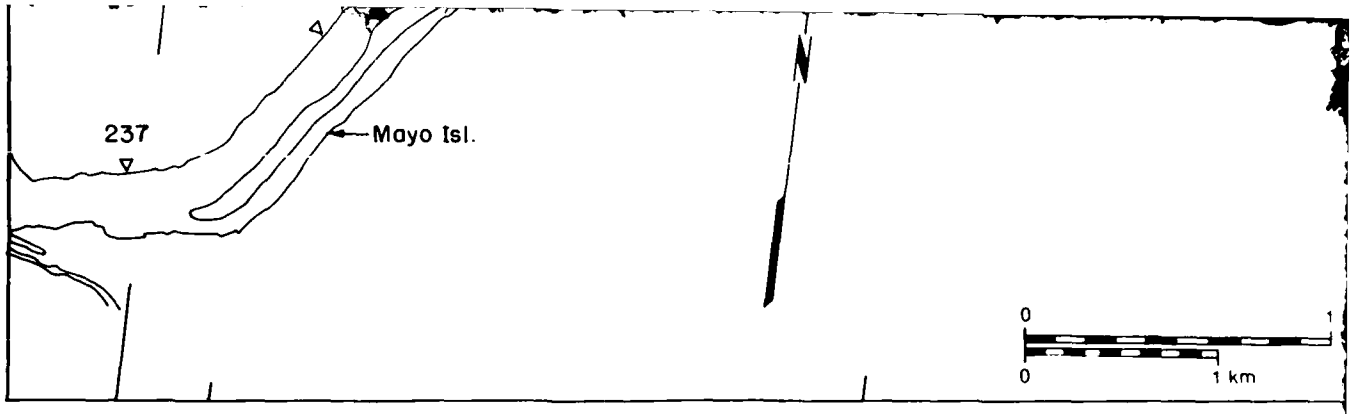

Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km
Starved Rock Pool : 2/3
88°52'30"
ML A
41°20'
Fox River
Bulls Isl.
237
Mayo Isl.
0
0
Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

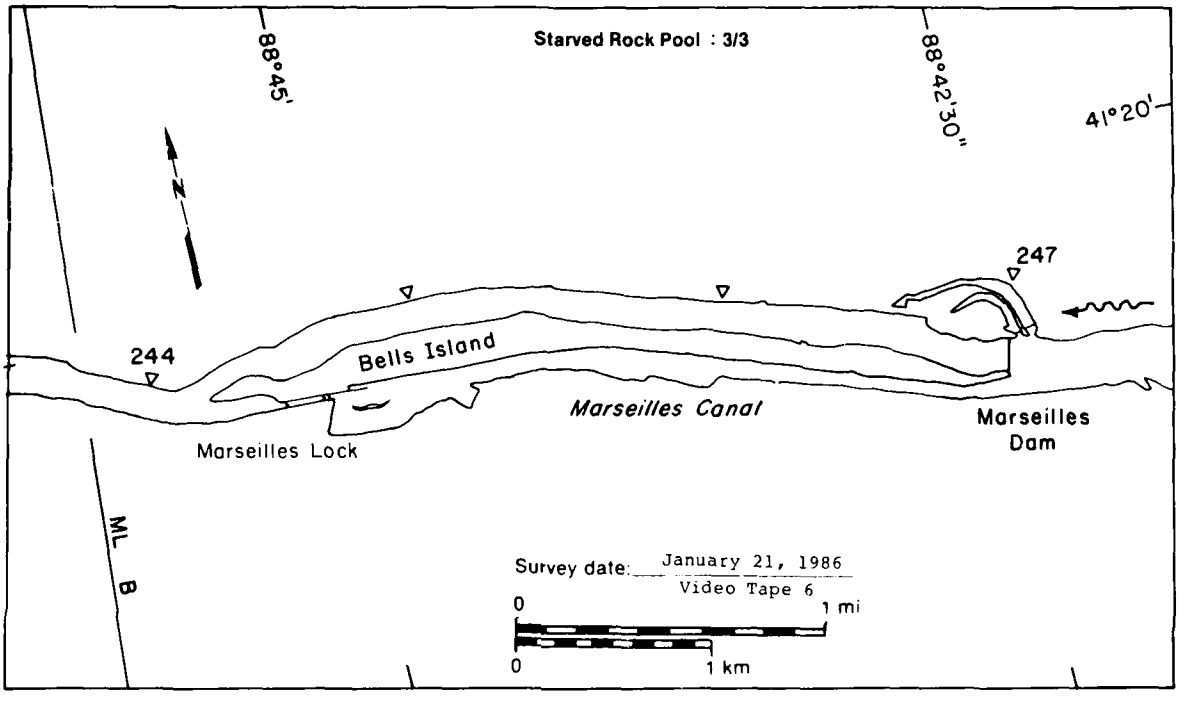
21 January 1986

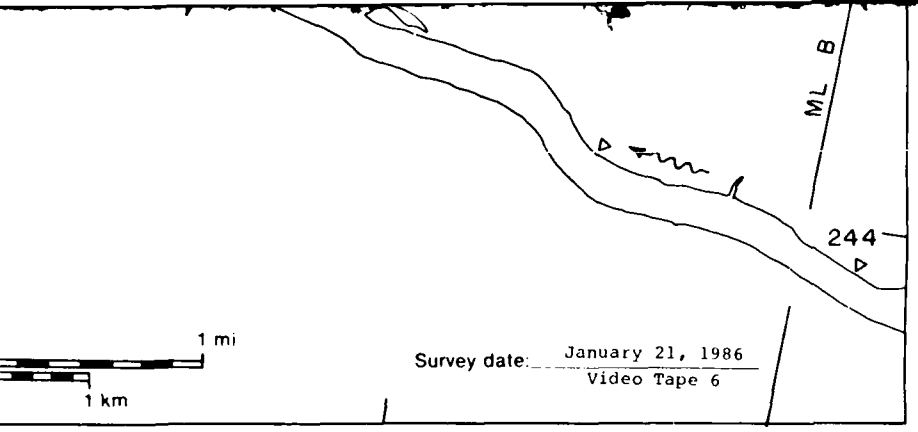







237
Mayo Isl.
0
1
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 21, 1986
Video Tape 6
0
1 mi
0
1 km



Starved Rock Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	9.75	NA
Solid ice cover	0.09	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	10.19*	

* Includes 0.35×10^6 m^2 of no video coverage

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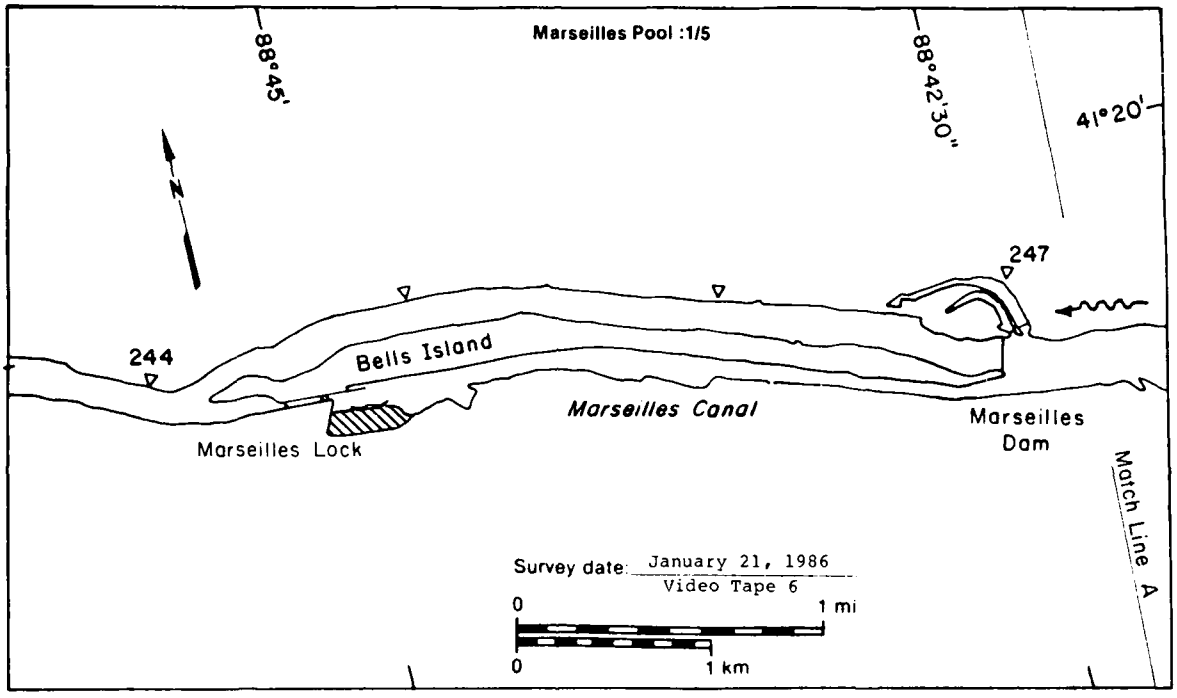
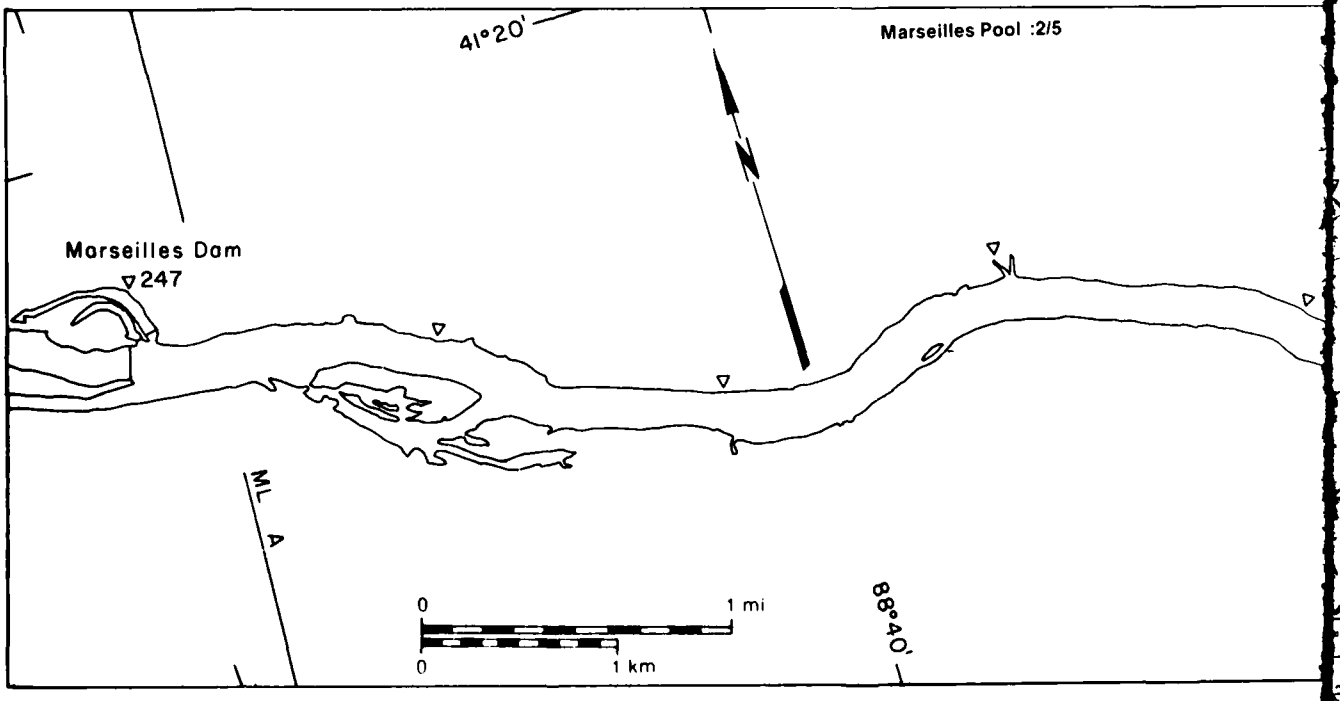
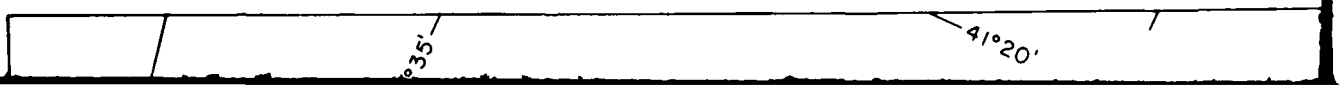
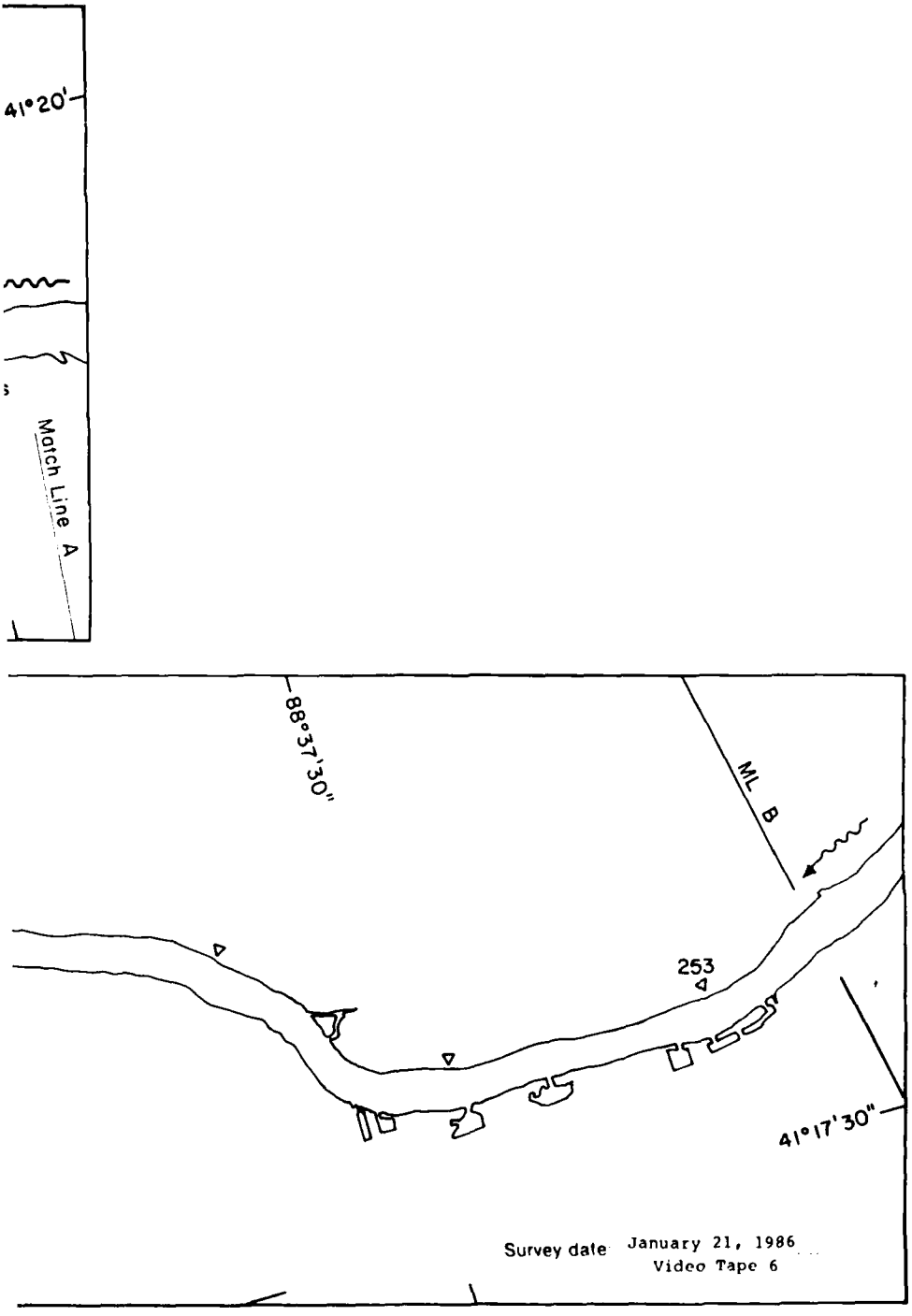
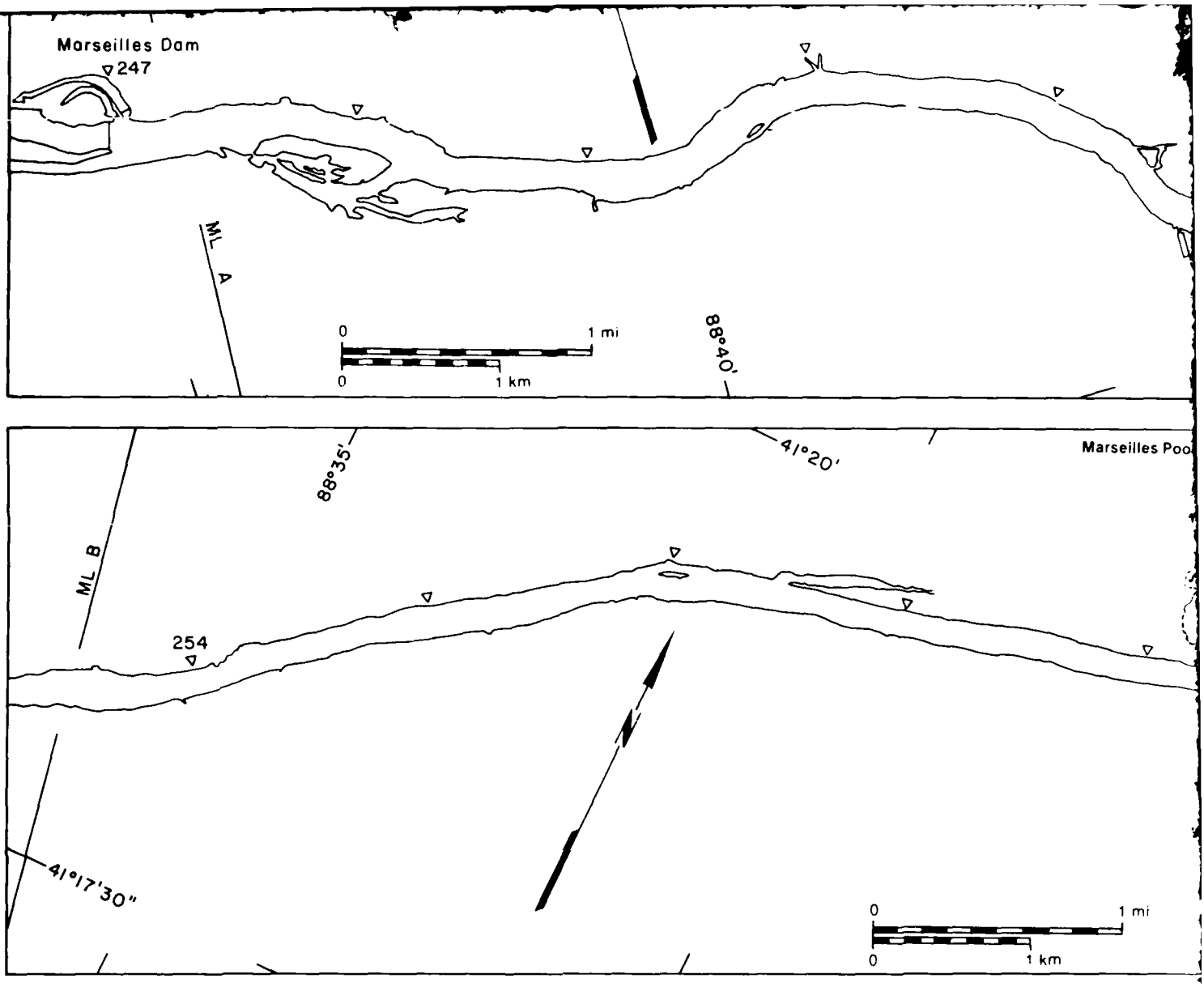
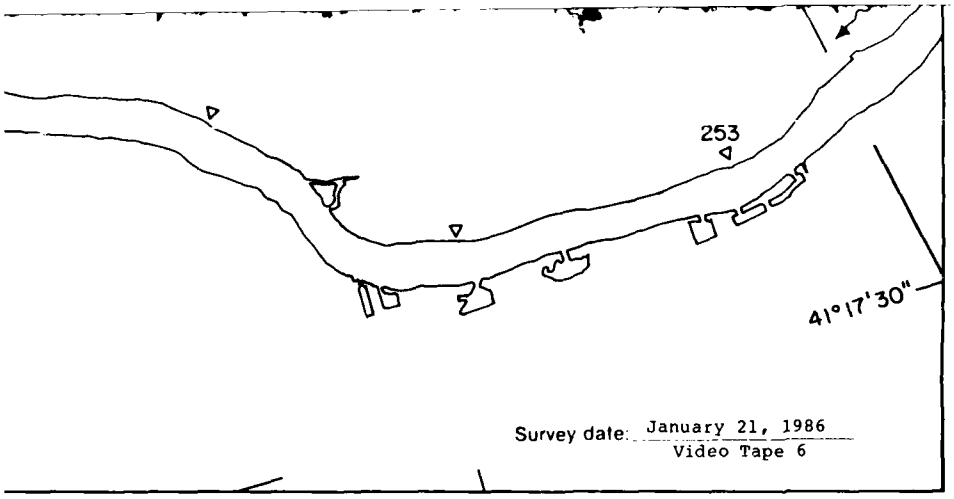


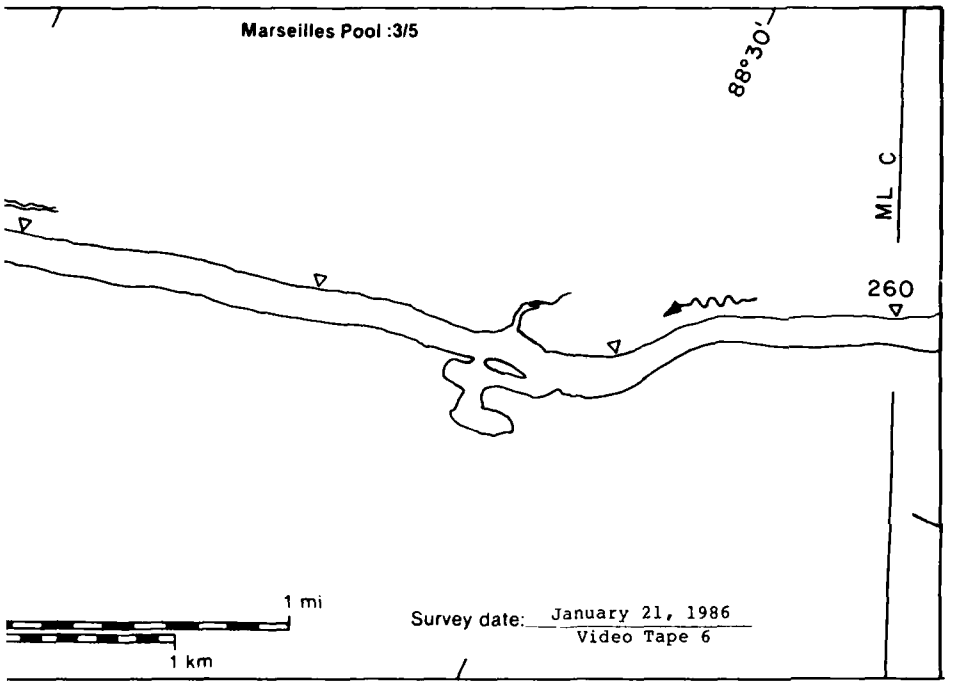


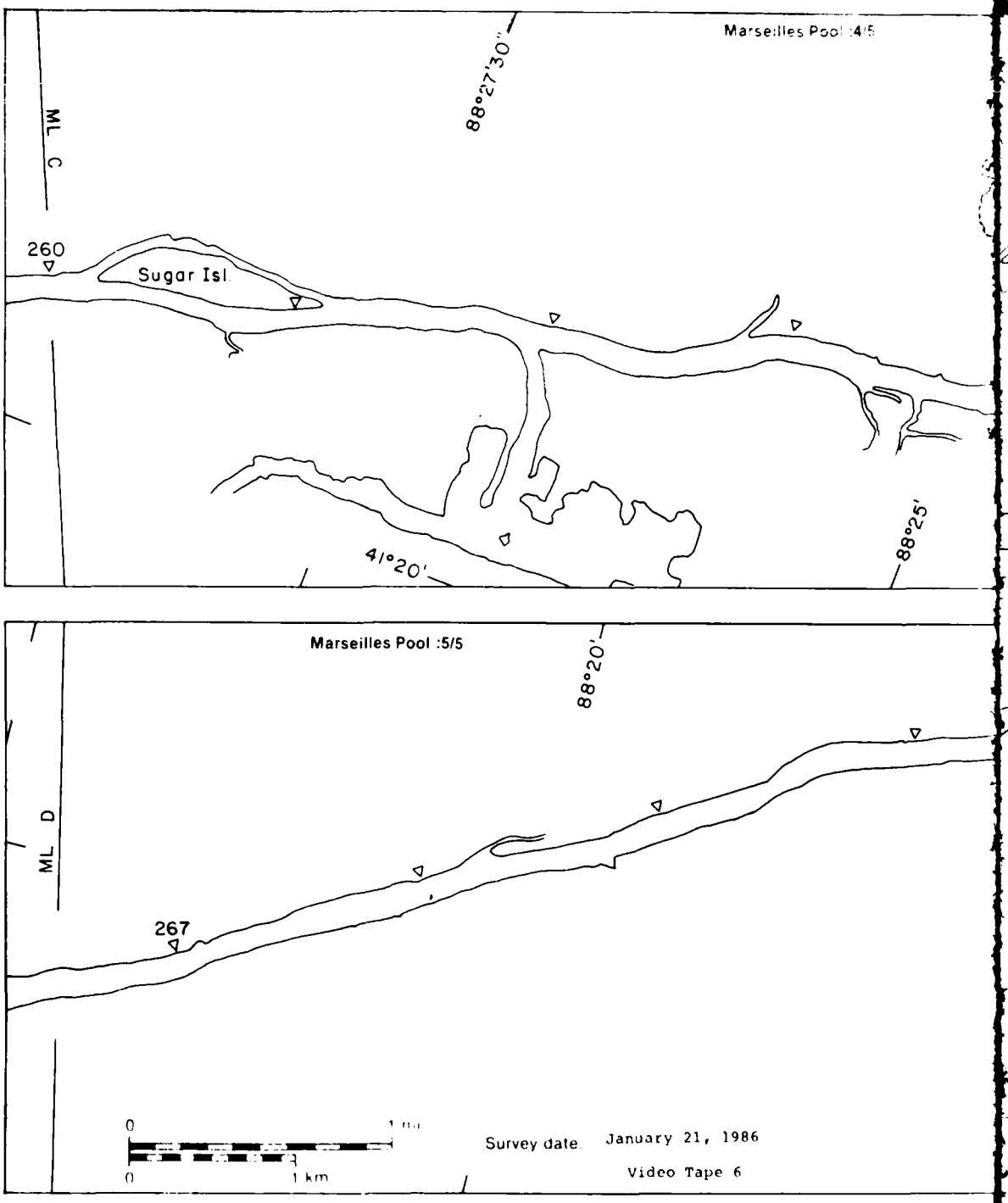



41°20'
Match Line A
88°37'30"
ML B
253
41°17'30"
Survey date January 21, 1986
Video Tape 6
Marseilles Pool :3/5
88°30'


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
Marseilles Pool
ML B
254
41°17'30"
0
1 mi
0
1 km


253
41°17'30"
Survey date: January 21, 1986
Video Tape 6


Marseilles Pool :3/5
88°30'
ML C
260
1 mi
1 km
Survey date: January 21, 1986
Video Tape 6

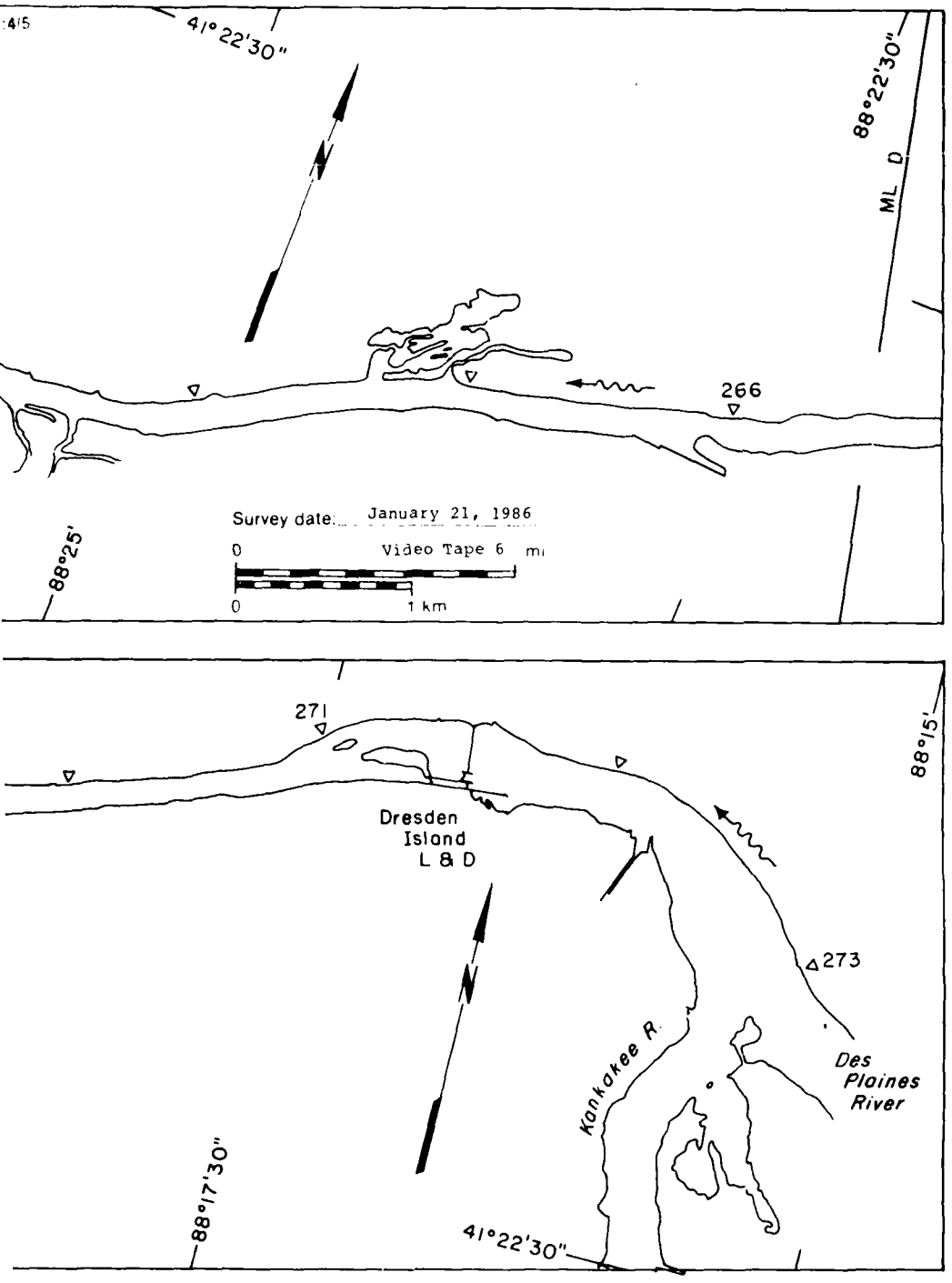


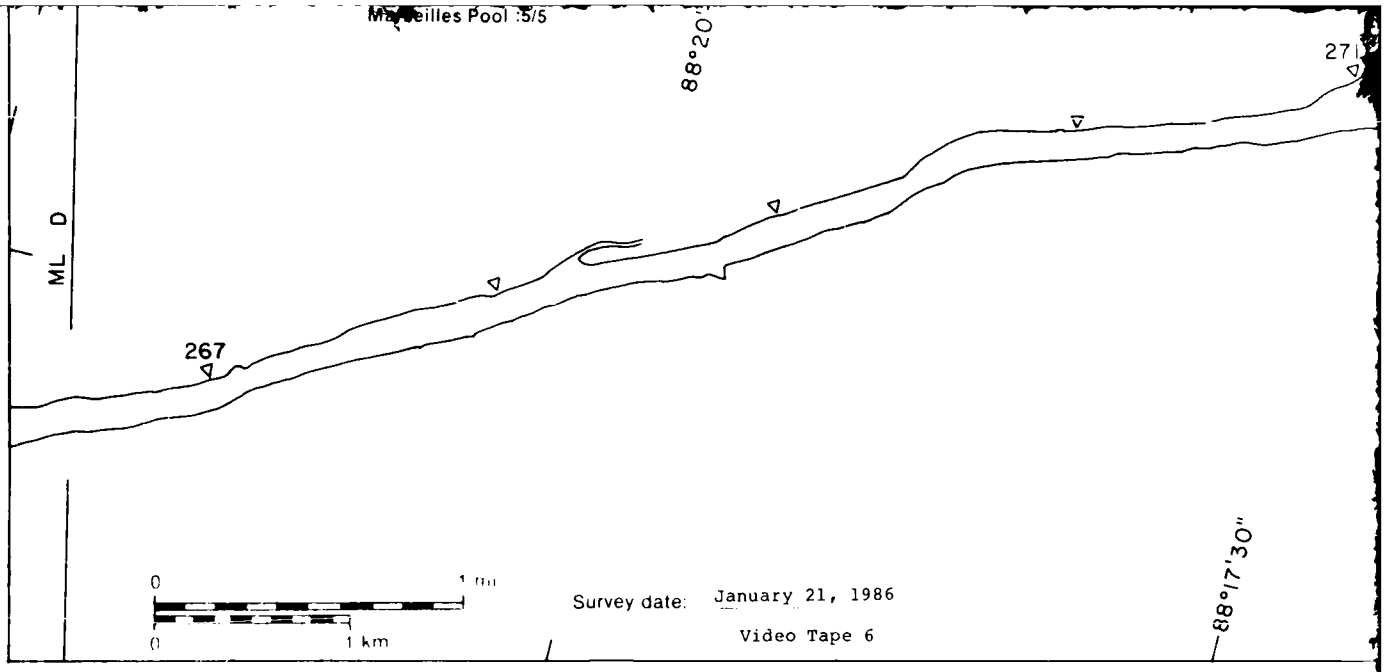
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (g/m^2)

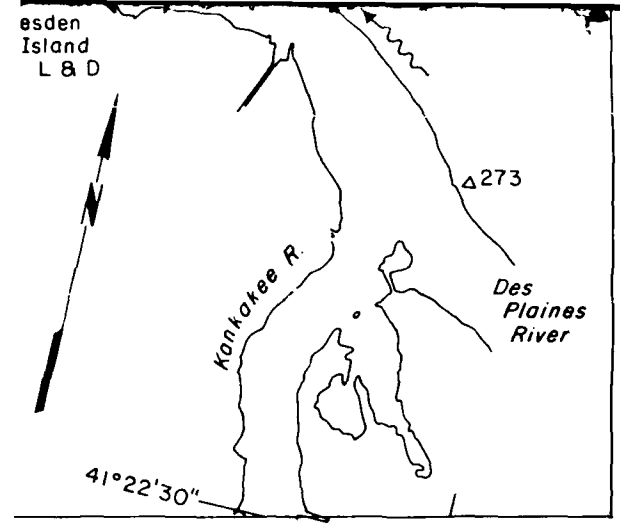
21 January 1986



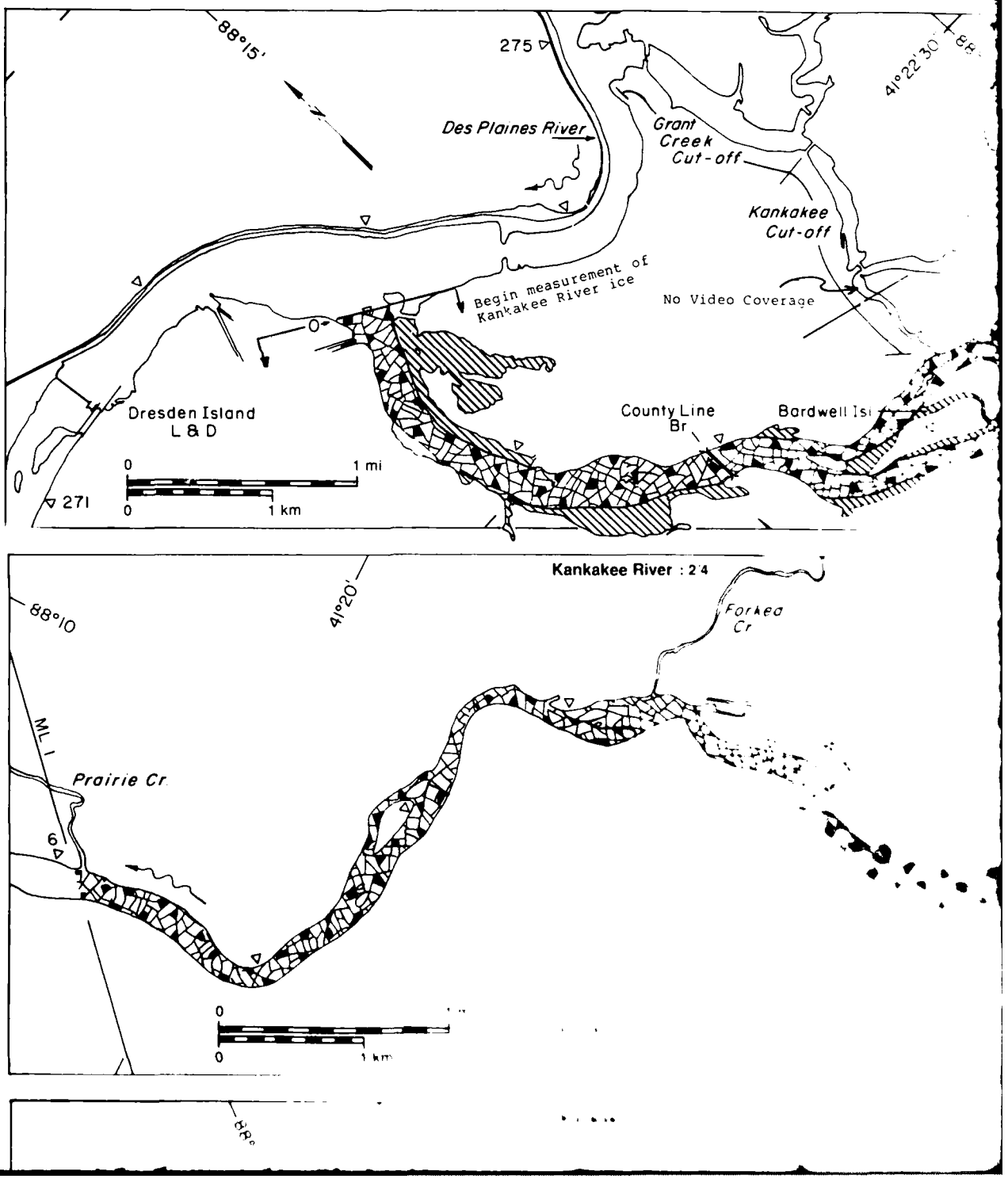


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.13	NA
Solid ice cover	0.06	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	8.19	

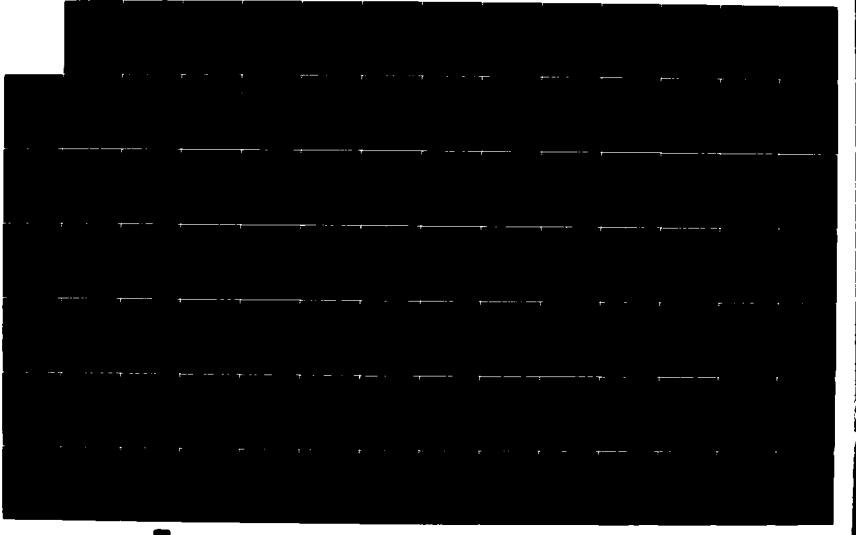

esden
Island
L & D
△273
Kankakee R.
Des
Plaines
River
41°22'30"

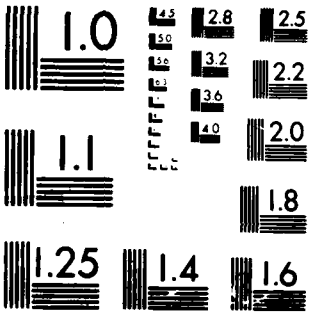
21 January 1986

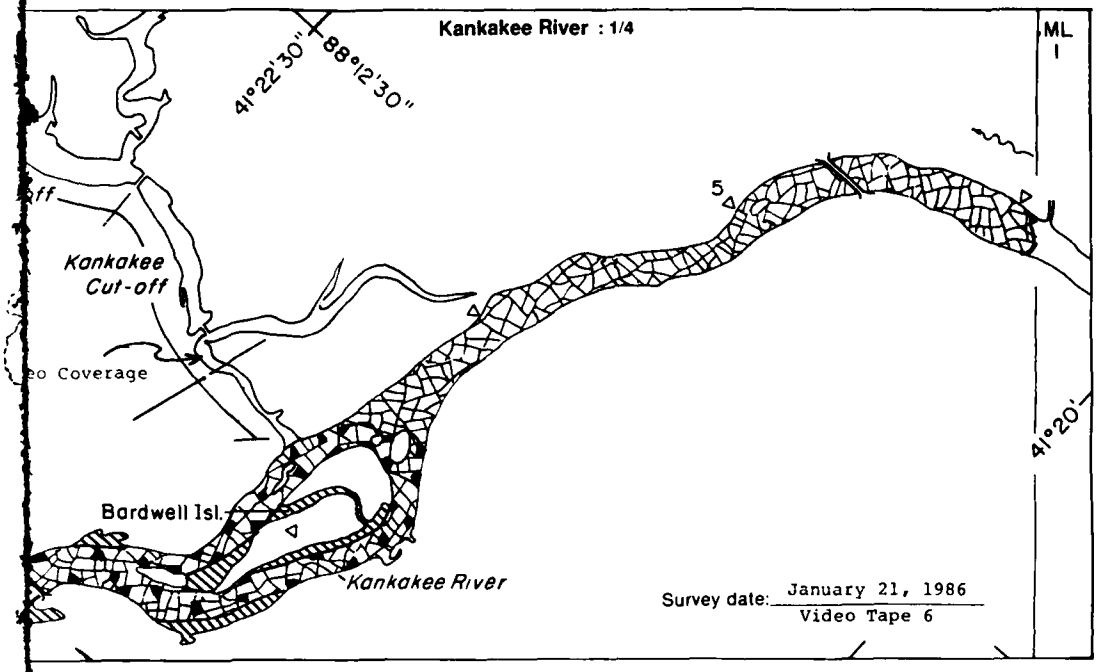


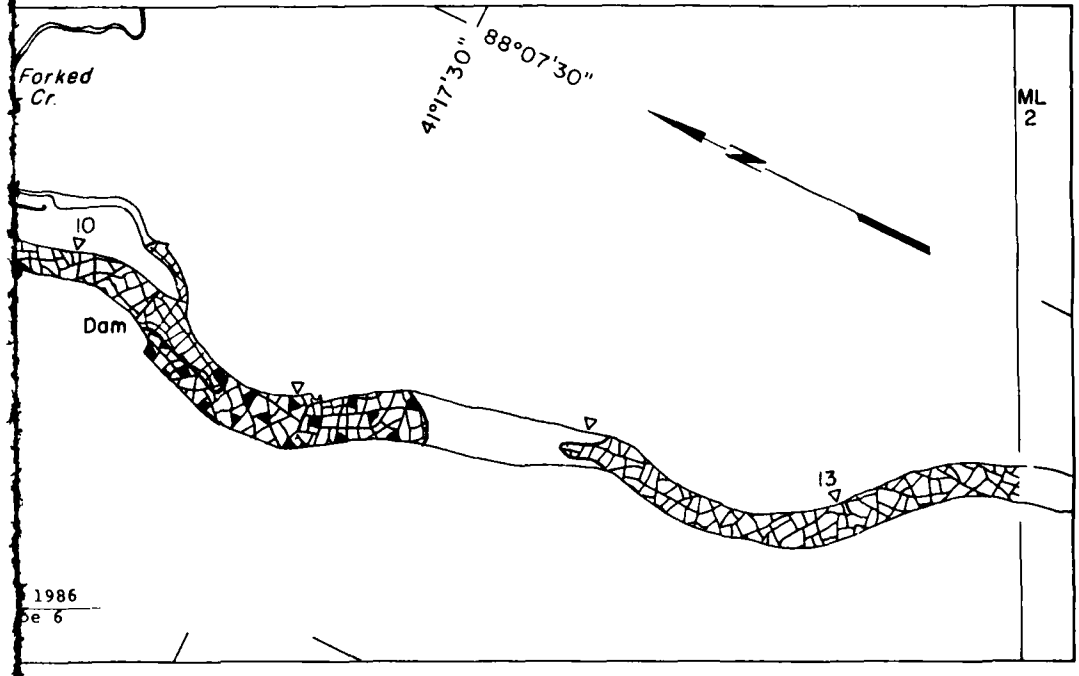
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 9/14

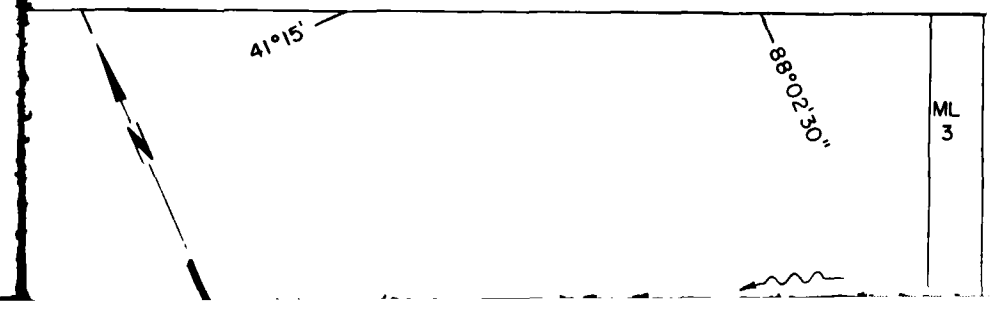
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

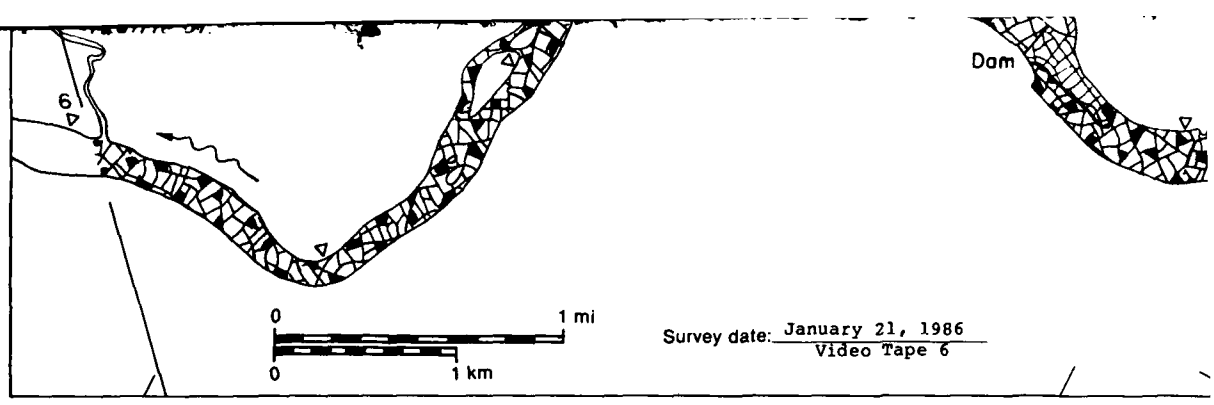


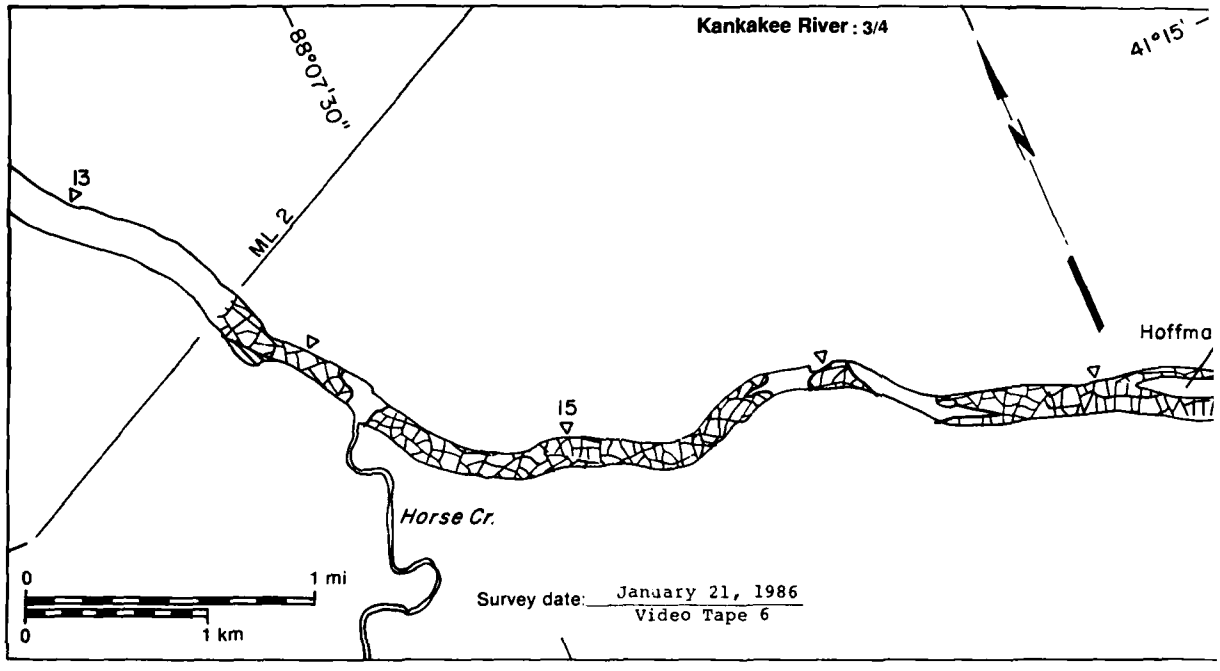

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
6.3

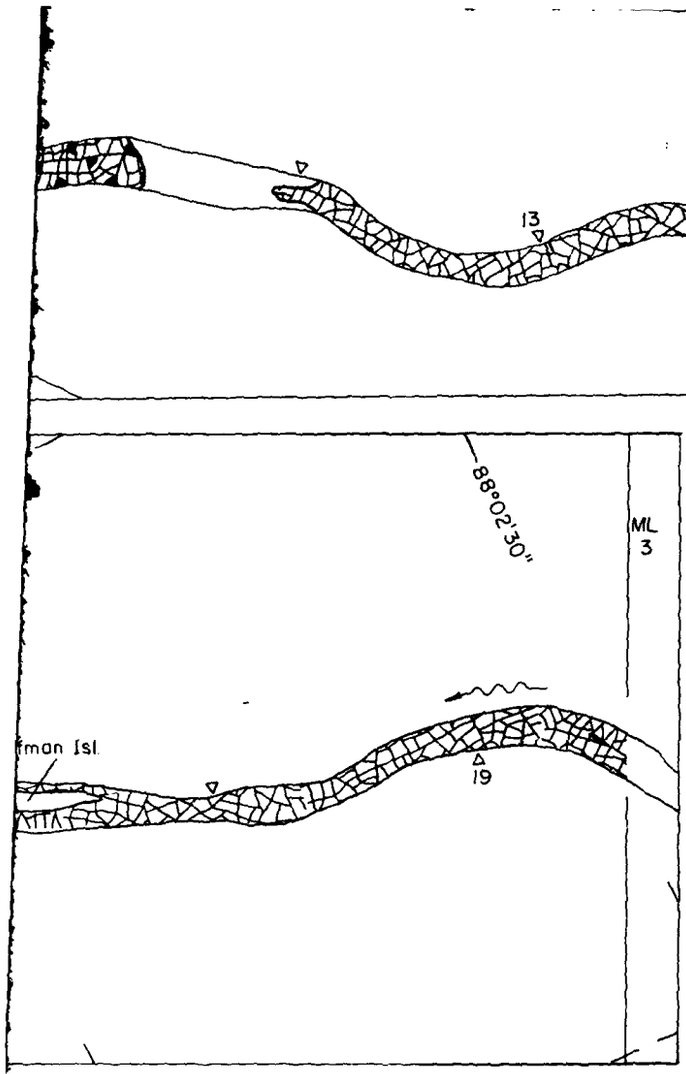

Kankakee River : 1/4
ML 1
41°22'30"
88°12'30"
5
Kankakee Cut-off
Bardwell Isl.
Kankakee River
41°20'
Survey date: January 21, 1986
Video Tape 6


Forked Cr.
41°17'30"
88°07'30"
ML 2
10
Dam
13
1986
e 6

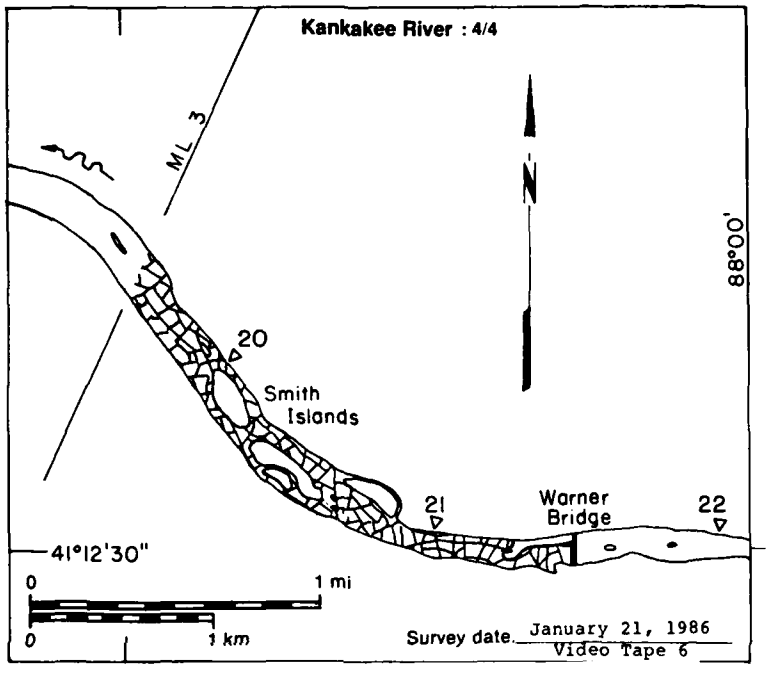

41°15'
88°02'30"
ML 3


6
Dam
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffma
Horse Cr.
0
1 mi
0
1 km
Survey date: January 21, 1986
Video Tape 6


13
88°02'30"
ML
3
fman Isl.
19

A



Kankakee River

MAP UNITS

Open water

Solid ice cover

Solid ice cover with open-water areas

Fragmented ice cover

Fragmented ice cover with open-water areas

Ice floes or frazil slus and pans

Total area (m^2 x

B

21 January 1986

Area
m^2 x 1

0.4

0.6

0.6

3.0

2.4

0.0

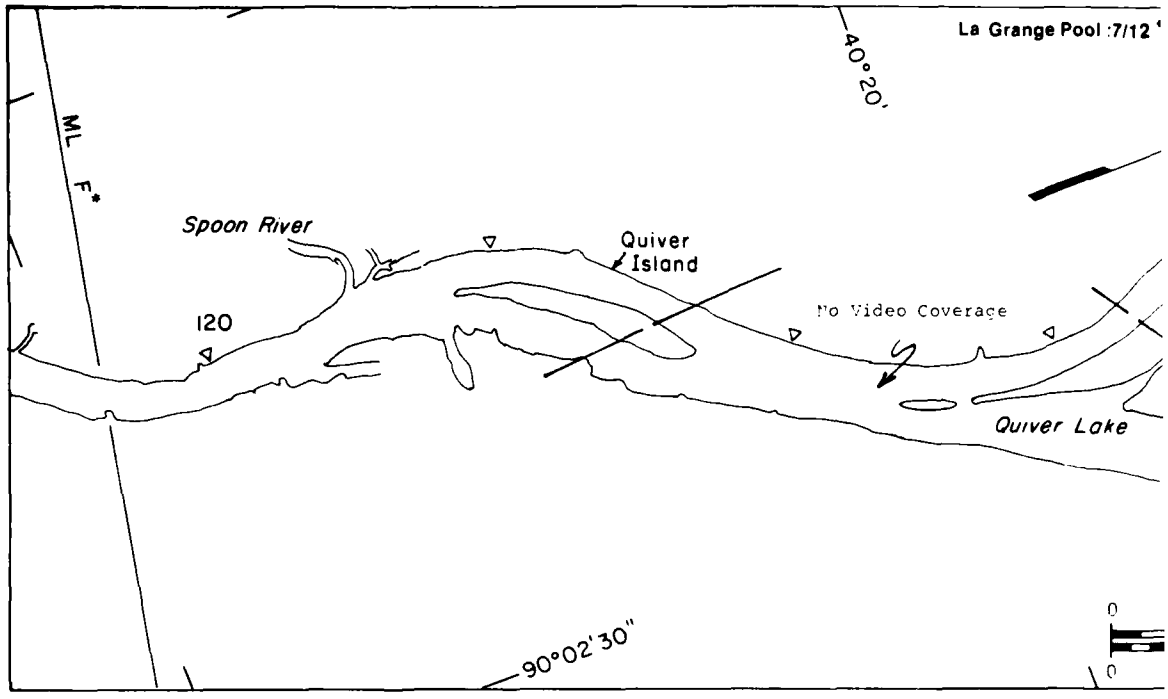
7.3

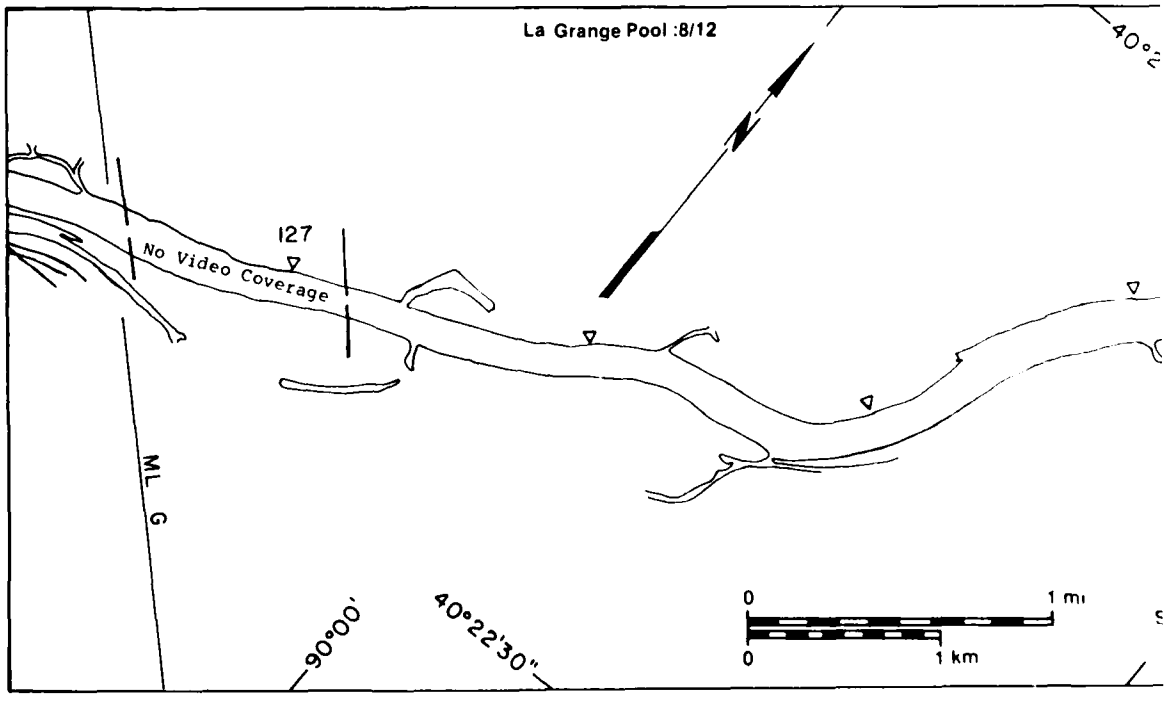
Kankakee River

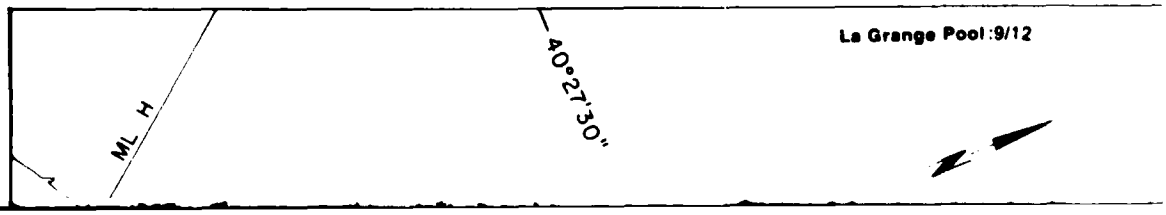
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.44	NA
Solid ice cover	0.68	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	3.72	NA
Fragmented ice cover with open-water areas	2.43	90
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	7.30*	

* Includes 0.03×10^6 m^2 of no video coverage

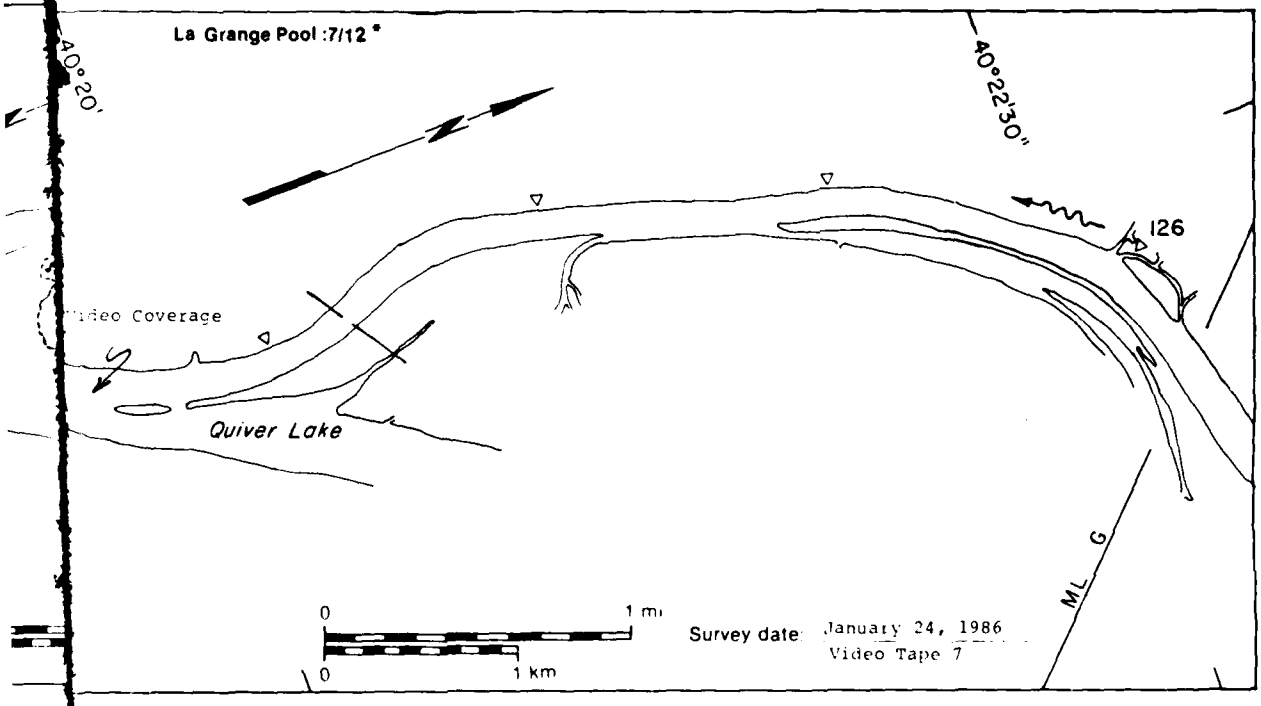
A

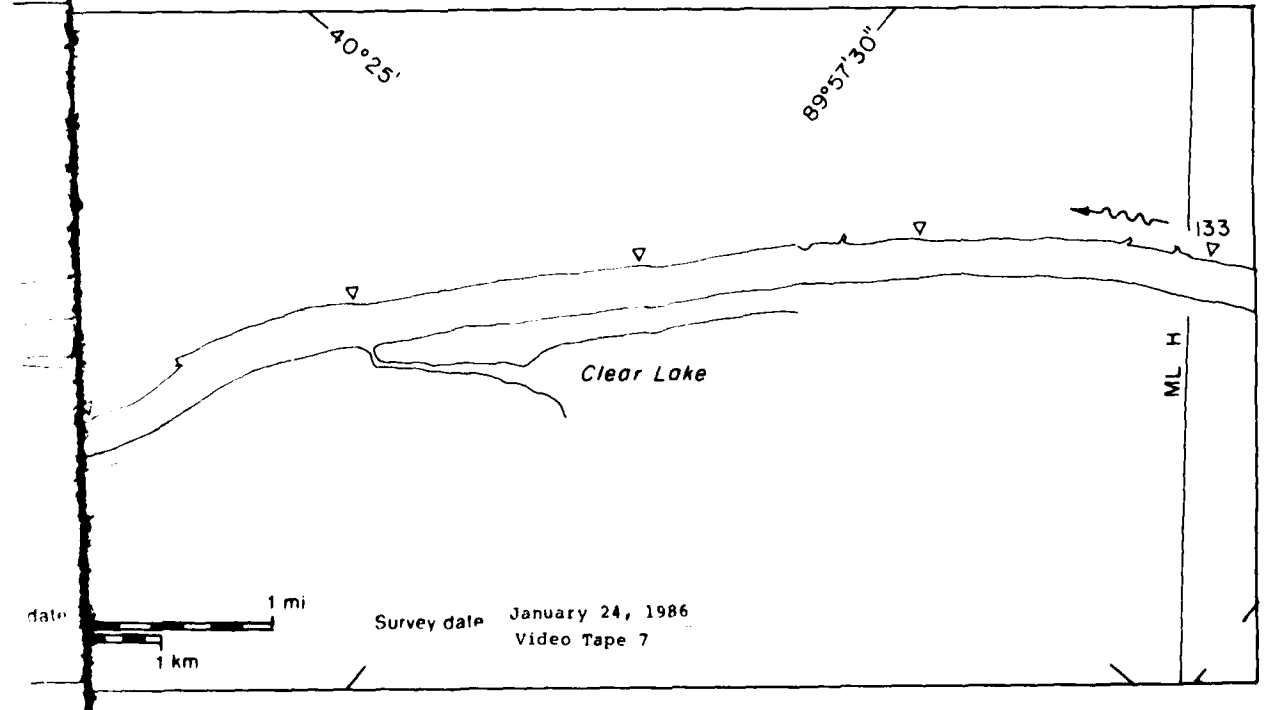

La Grange Pool :7/12
40°20'
ML F*
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0
0

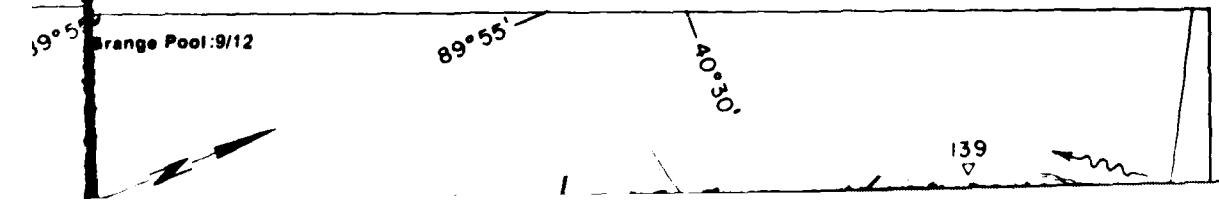

La Grange Pool :8/12
127
No Video Coverage
ML G
90°00'
40°22'30"
0
1 mi
0
1 km

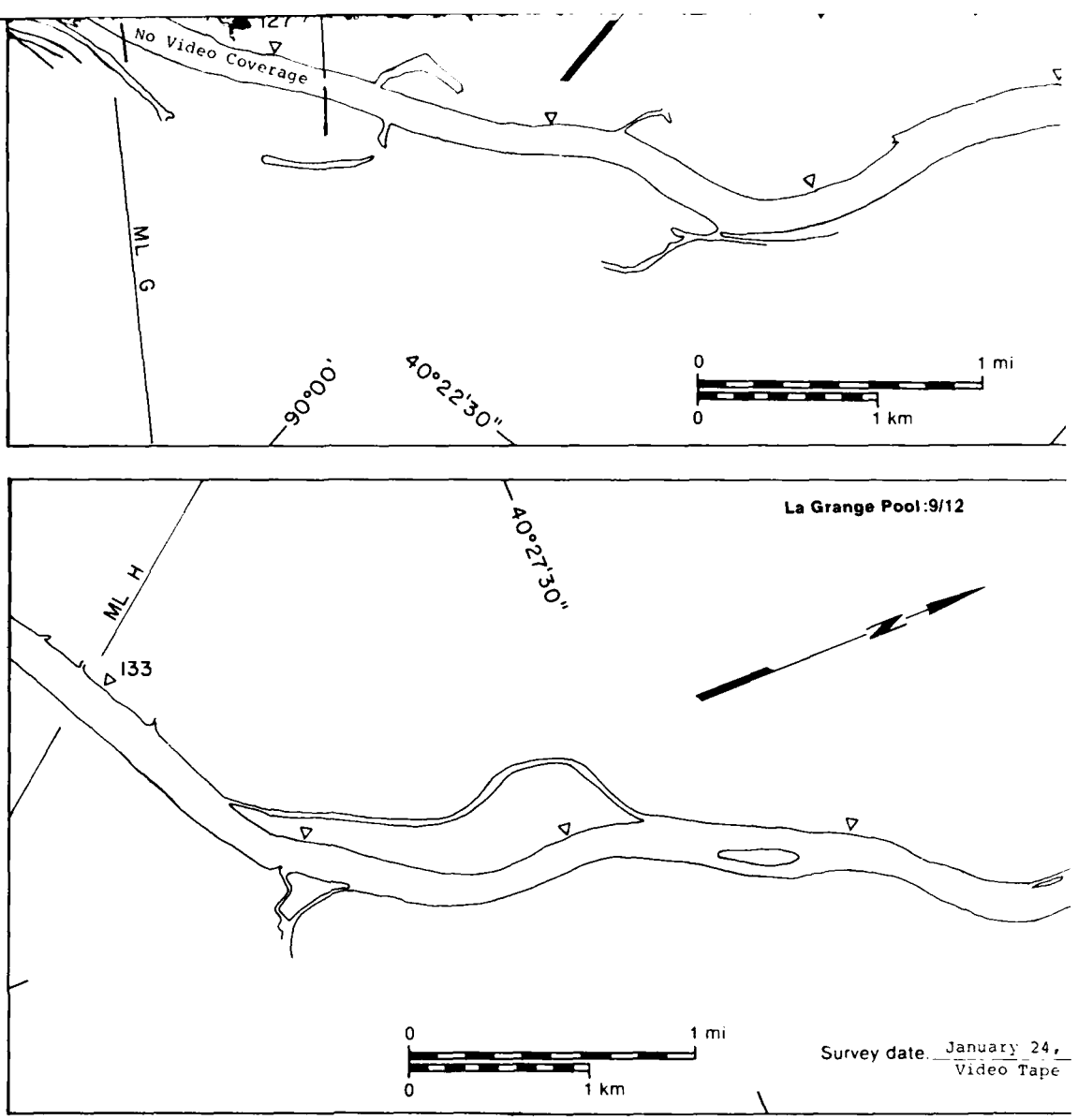

La Grange Pool :9/12
40°27'30"
ML H

24 January 1986

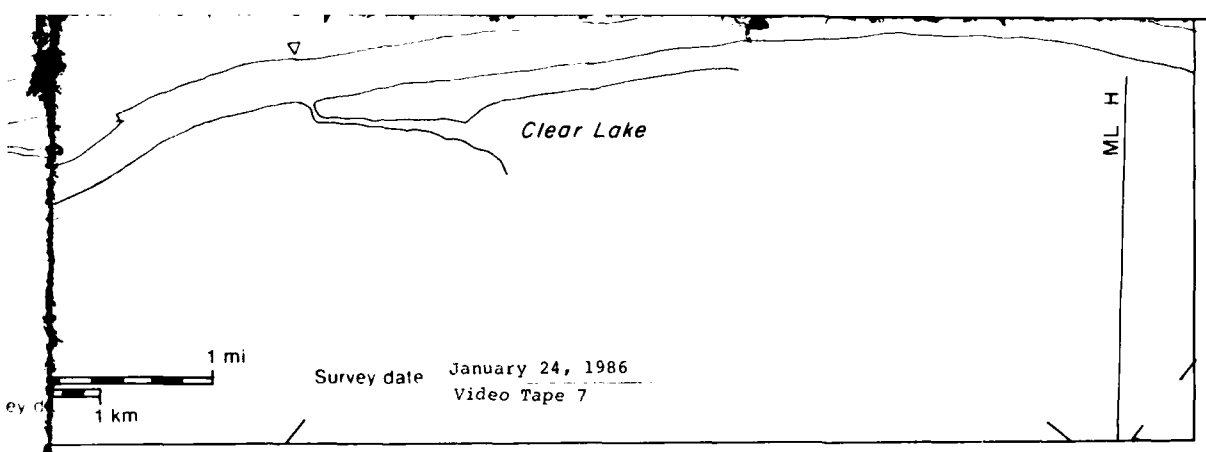


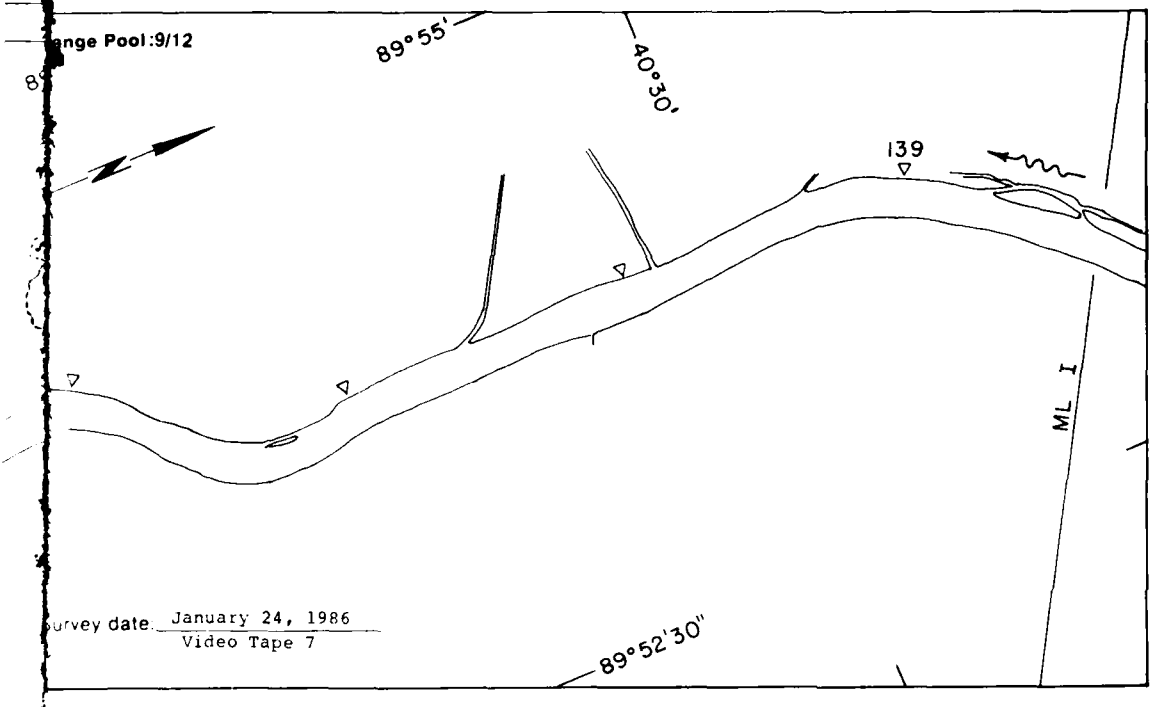




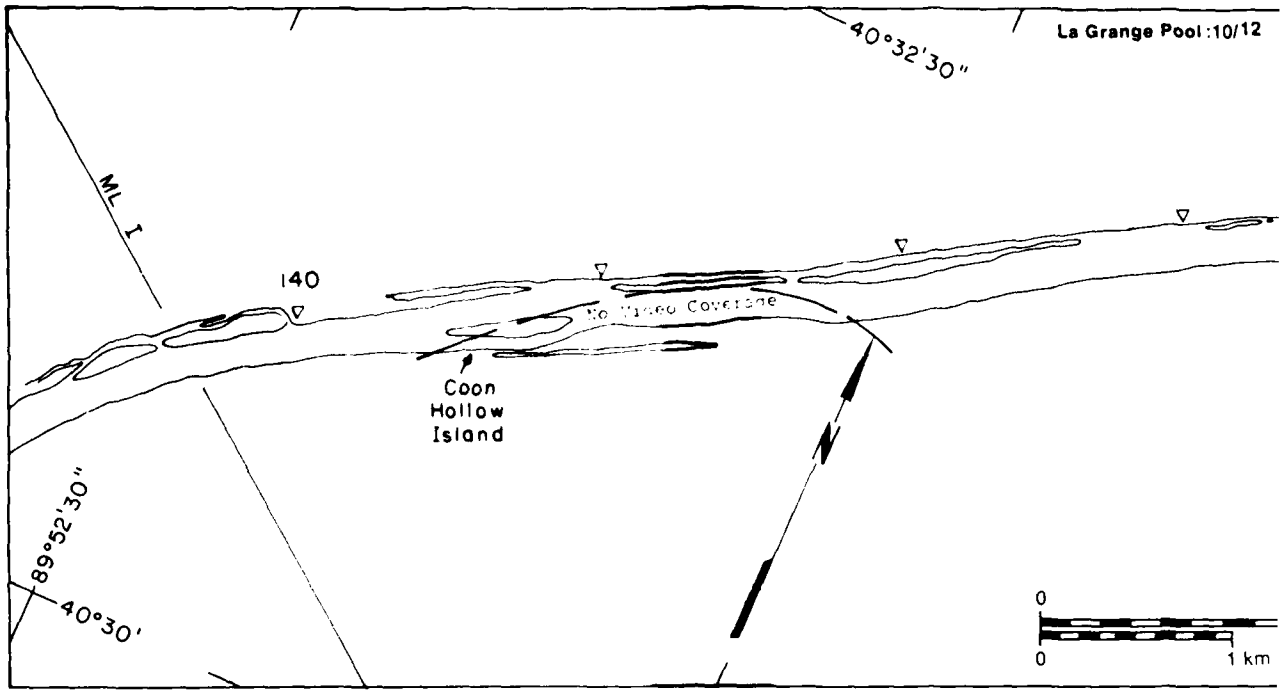


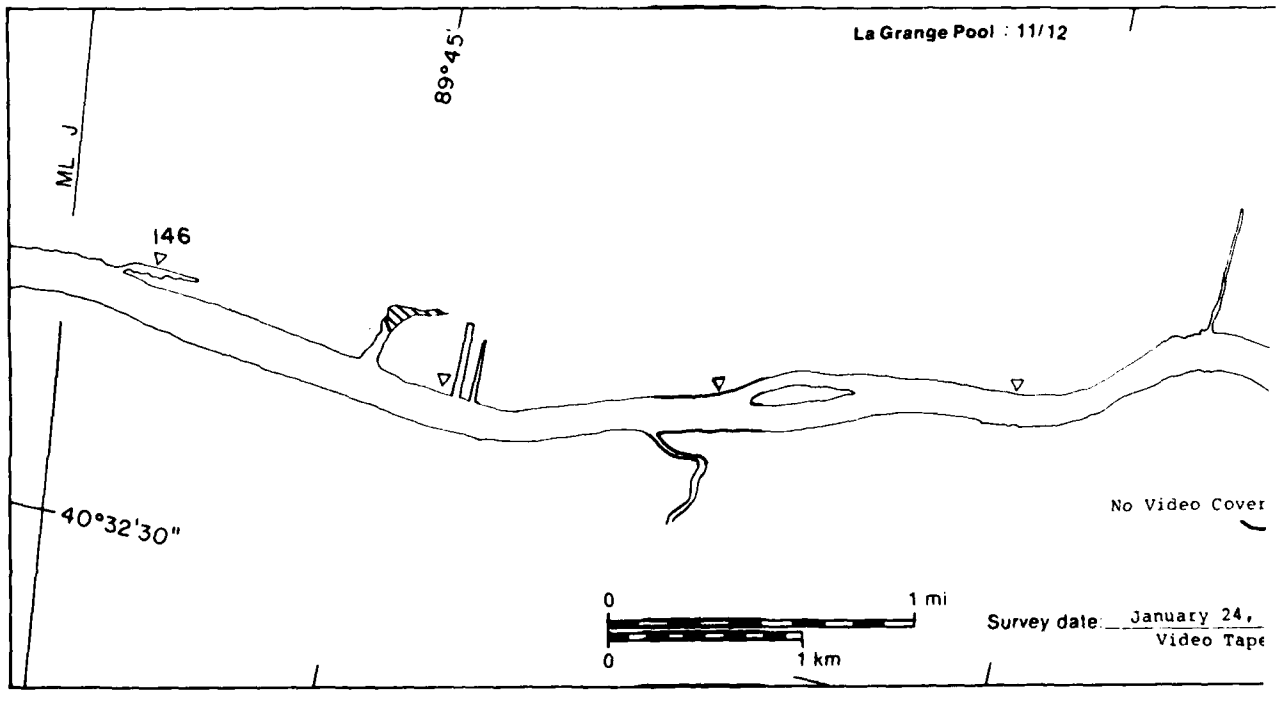
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

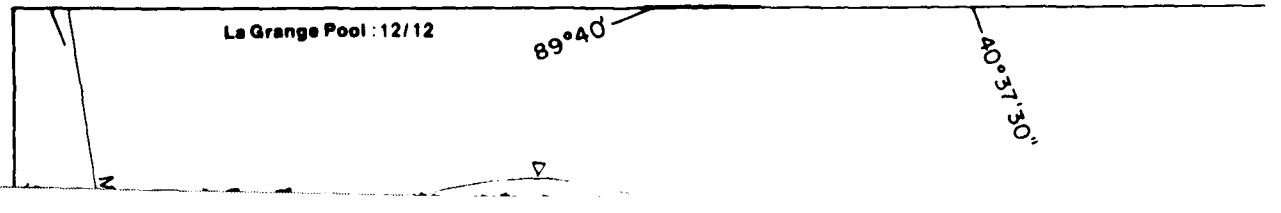

Clear Lake
ML H
1 mi
1 km
Survey date January 24, 1986
Video Tape 7

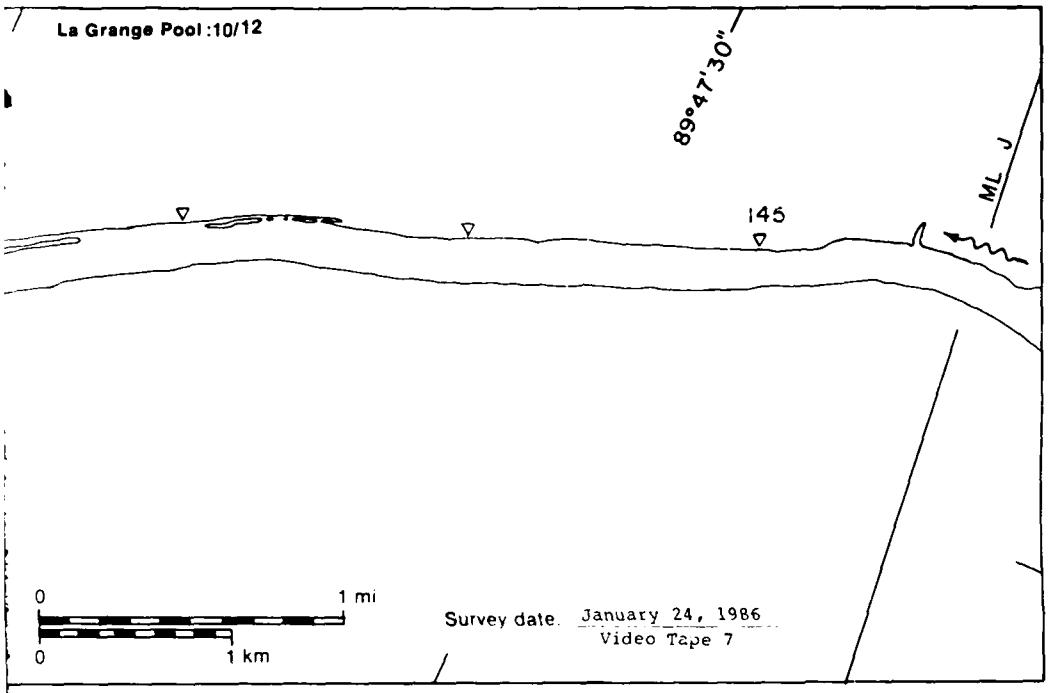

89°55'
40°30'
139
ML I
89°52'30"
Survey date January 24, 1986
Video Tape 7

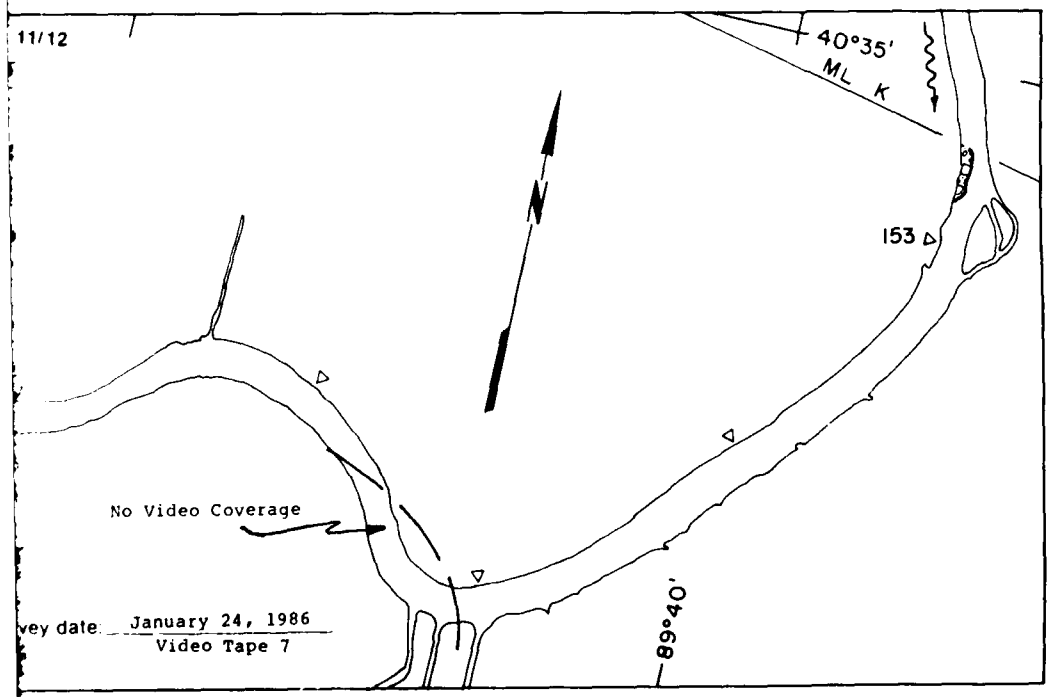
24 January 1986







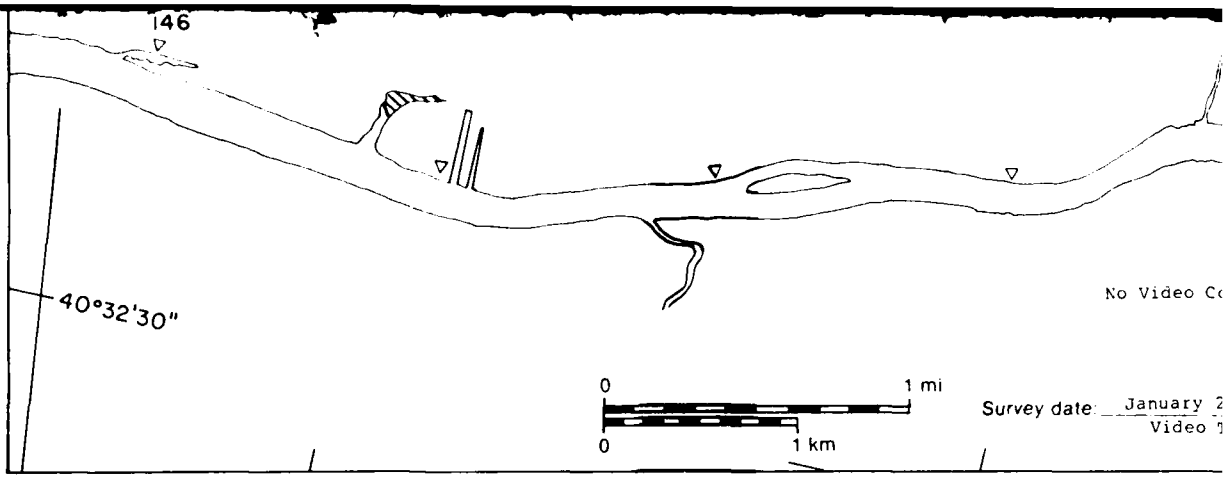


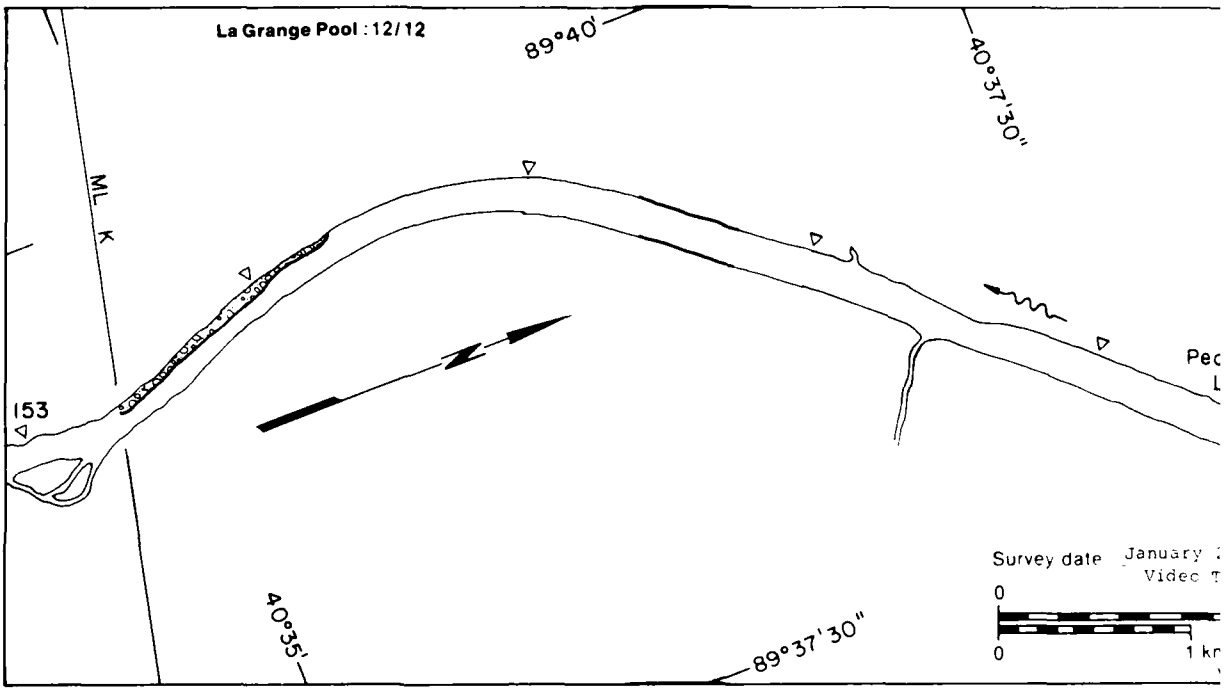


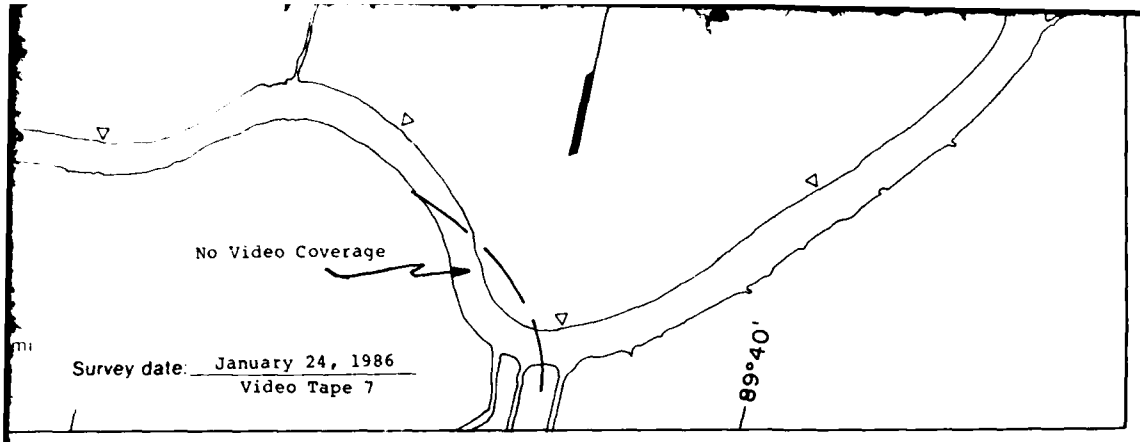
La Grange Pool

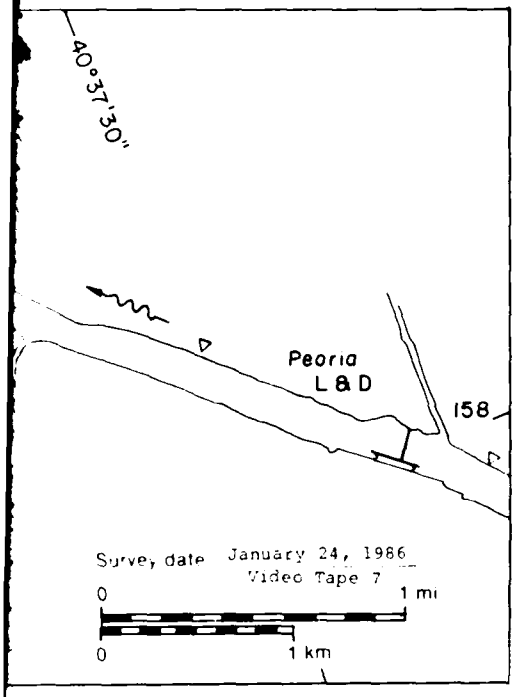
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.14	NA


146
40°32'30"
No Video Co
0
1 mi
0
1 km
Survey date: January 2
Video 1


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Pec
L
Survey date January 2
Video T
0
1 km
40°35'
89°37'30"



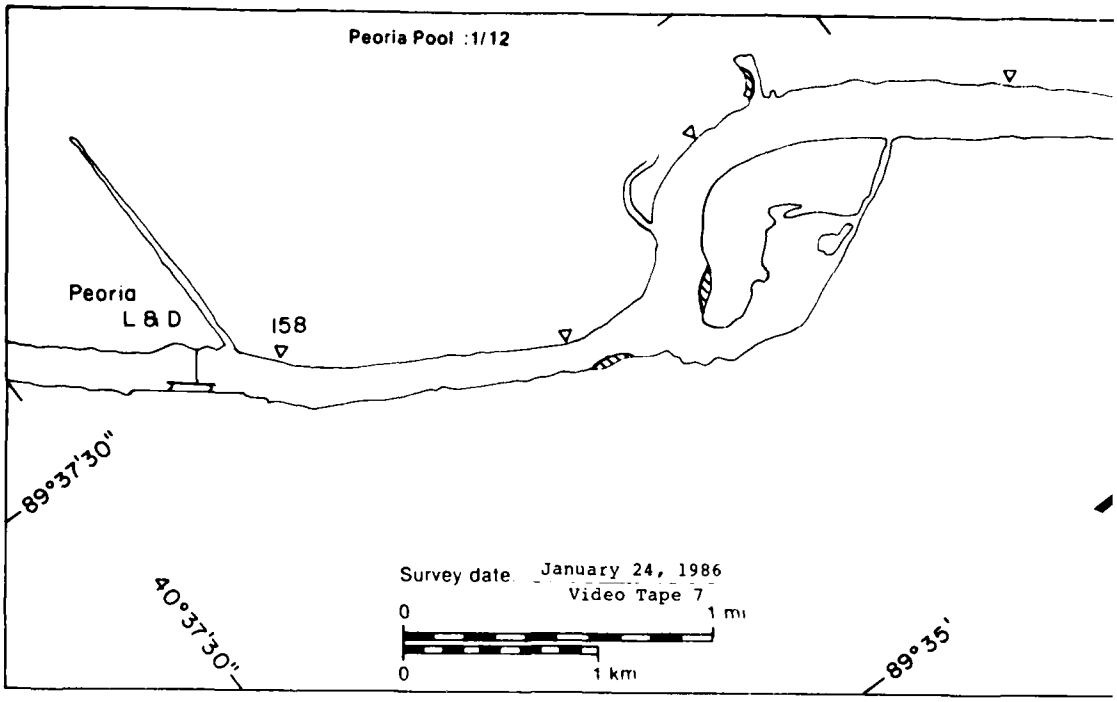


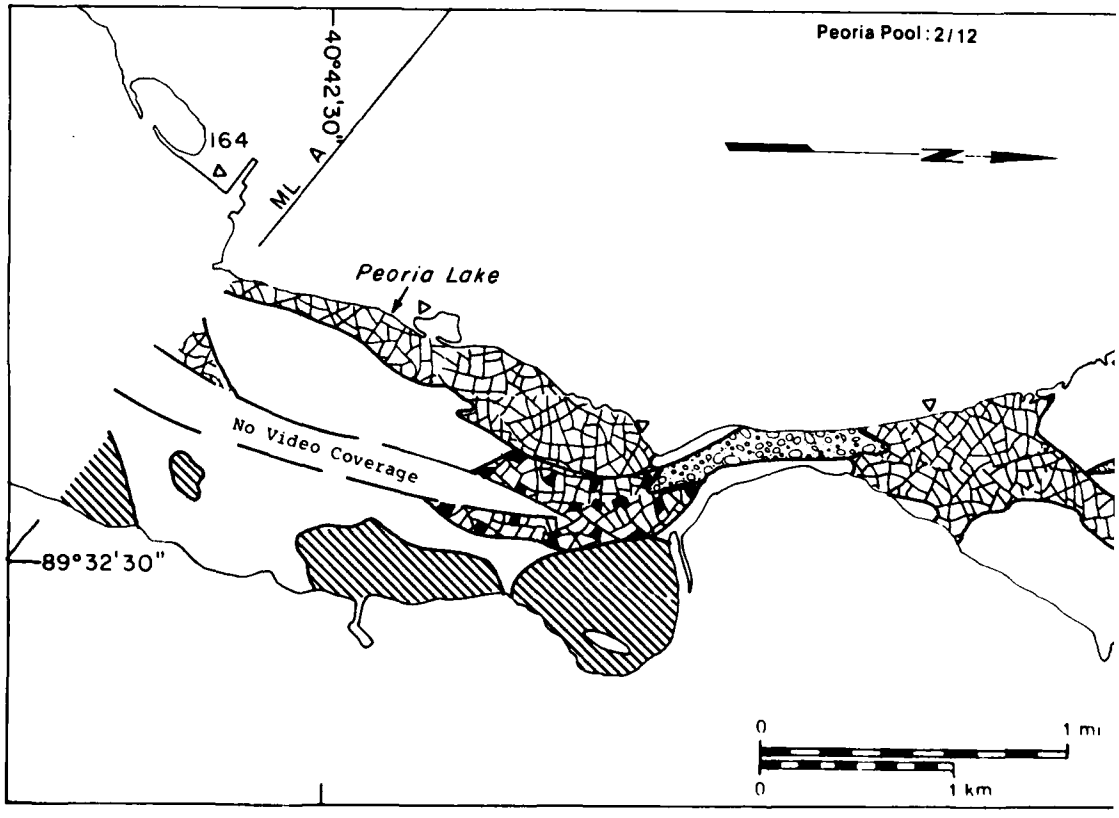
La Grange Pool

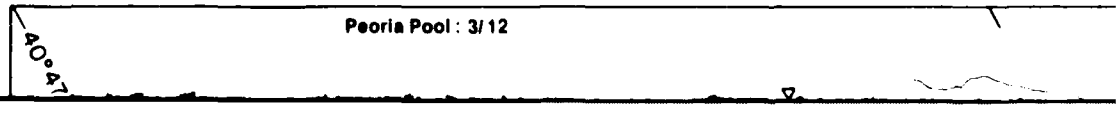
MAP UNITS

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.14	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.08	10
Total area ($m^2 \times 10^6$)	11.71*	

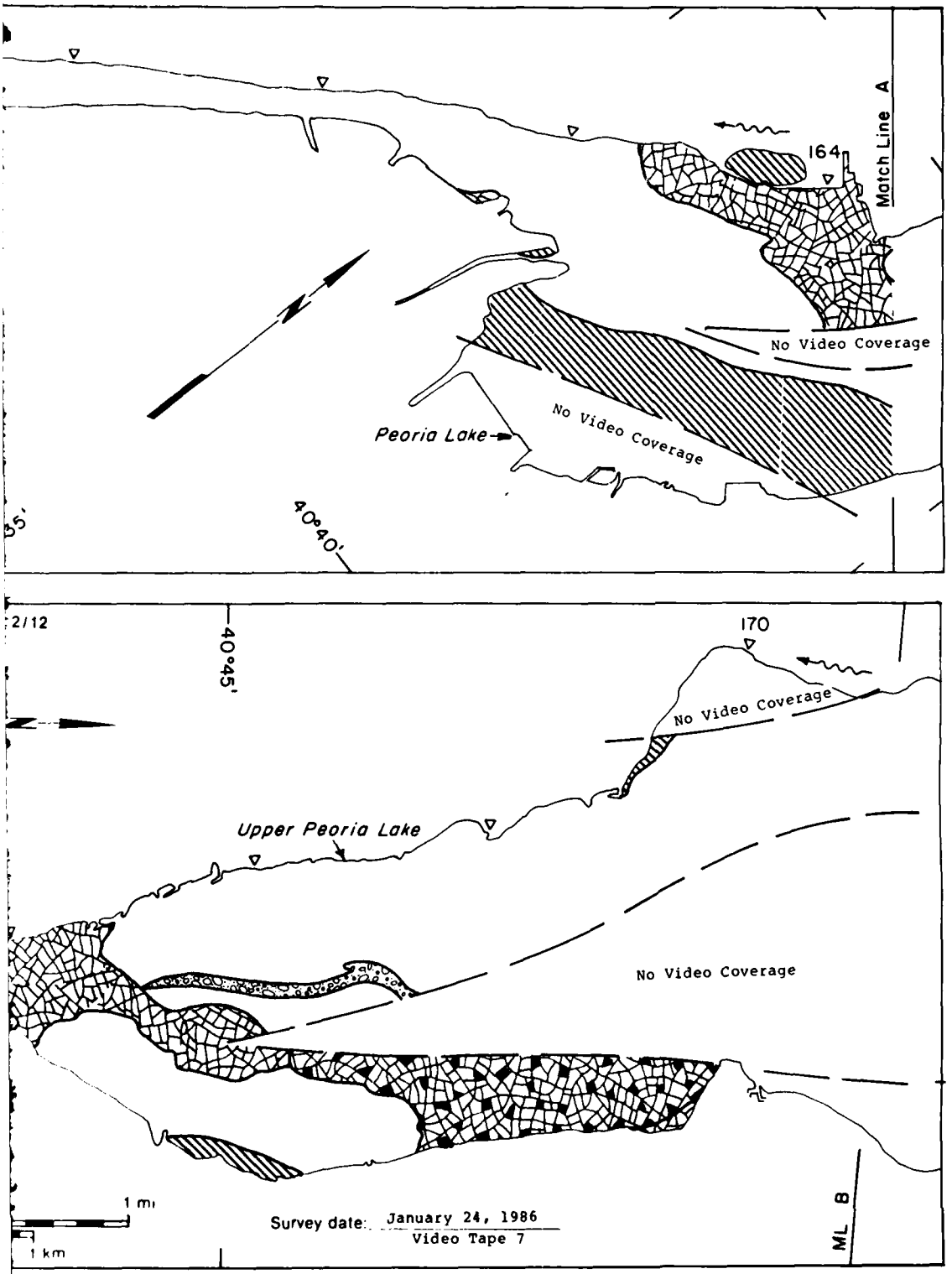
* Includes 1.47×10^6 m^2 of no video coverage

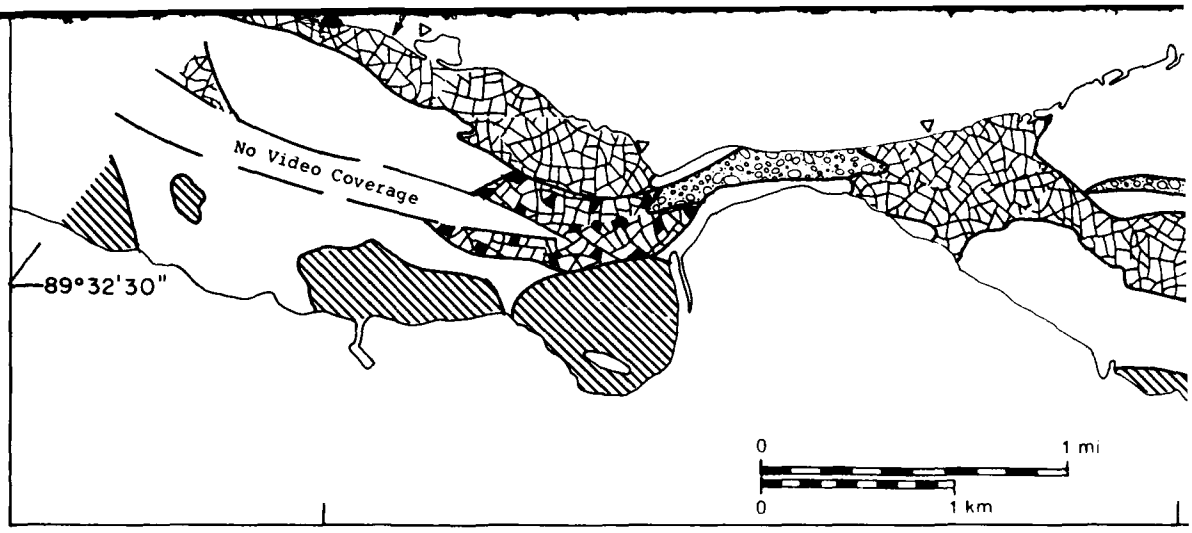

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date January 24, 1986
Video Tape 7
0
1 mi
0
1 km
89°35'

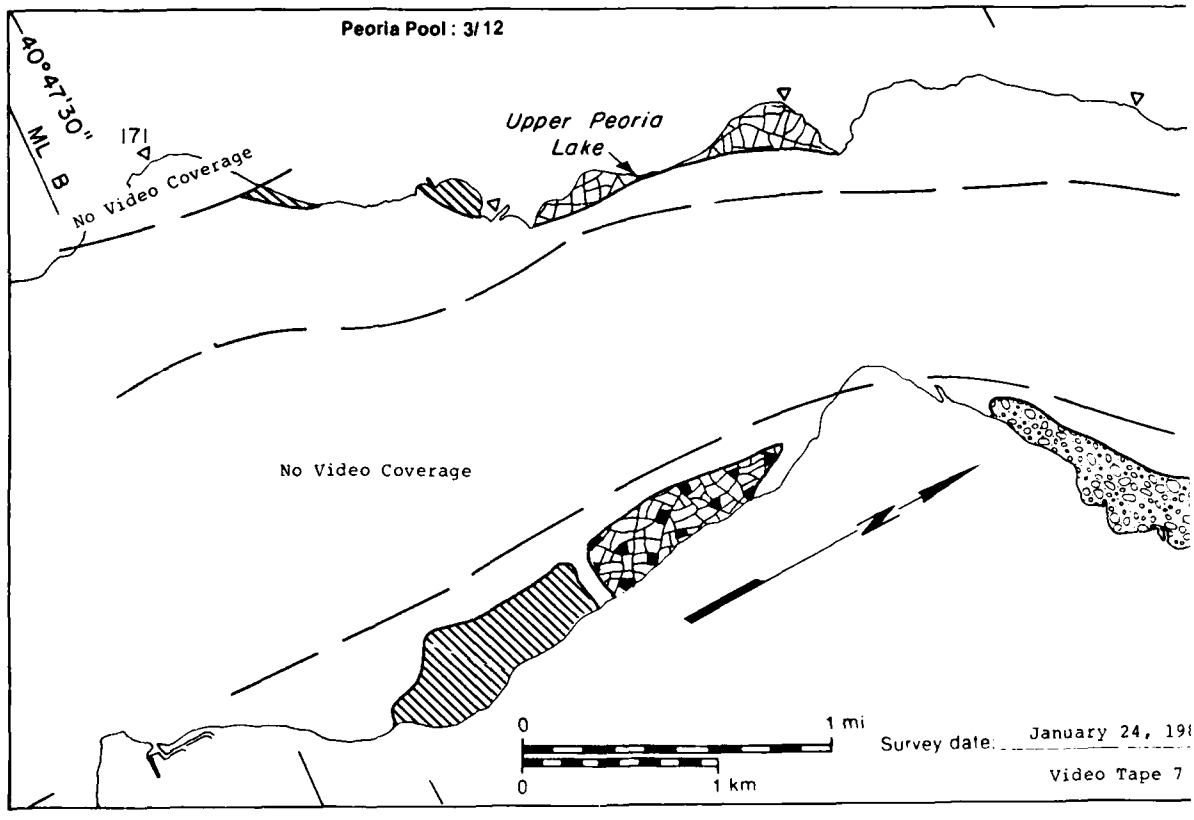

Peoria Pool : 2/12
40°42'30"
164
ML A
Peoria Lake
No Video Coverage
89°32'30"
0
1 mi
0
1 km

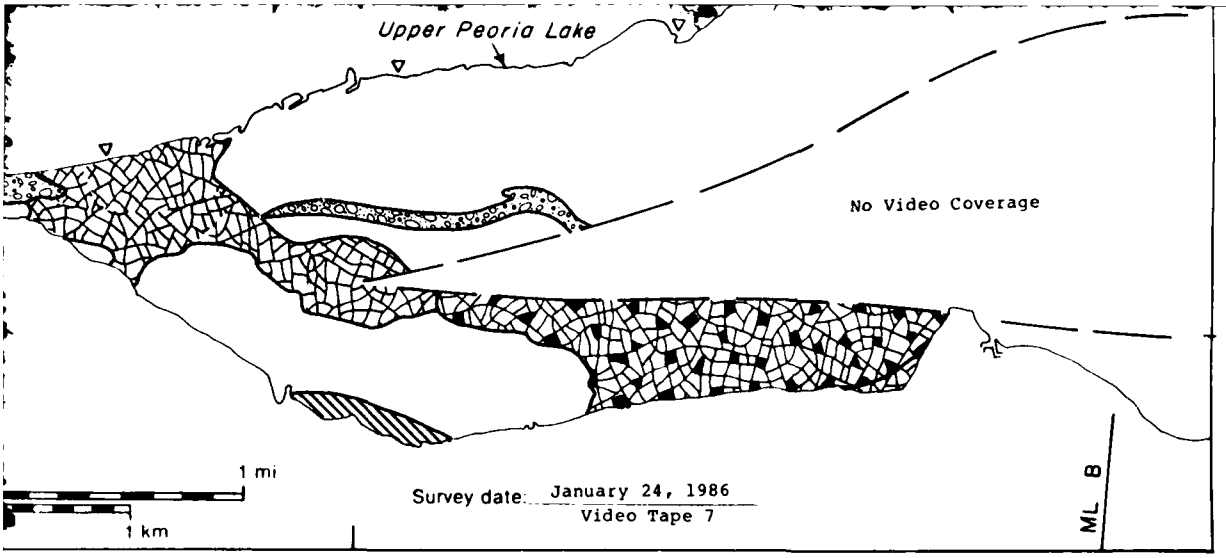

Peoria Pool : 3/12
40°47

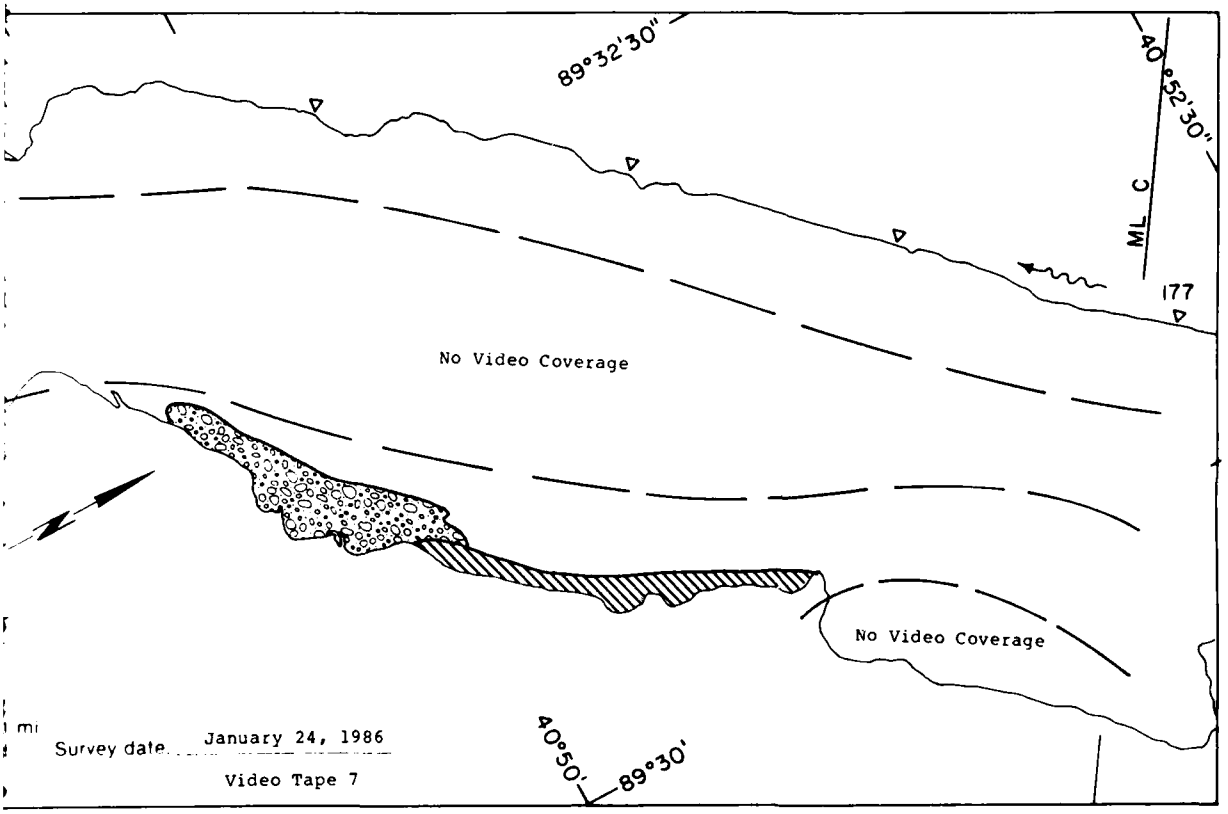
24 January 1986



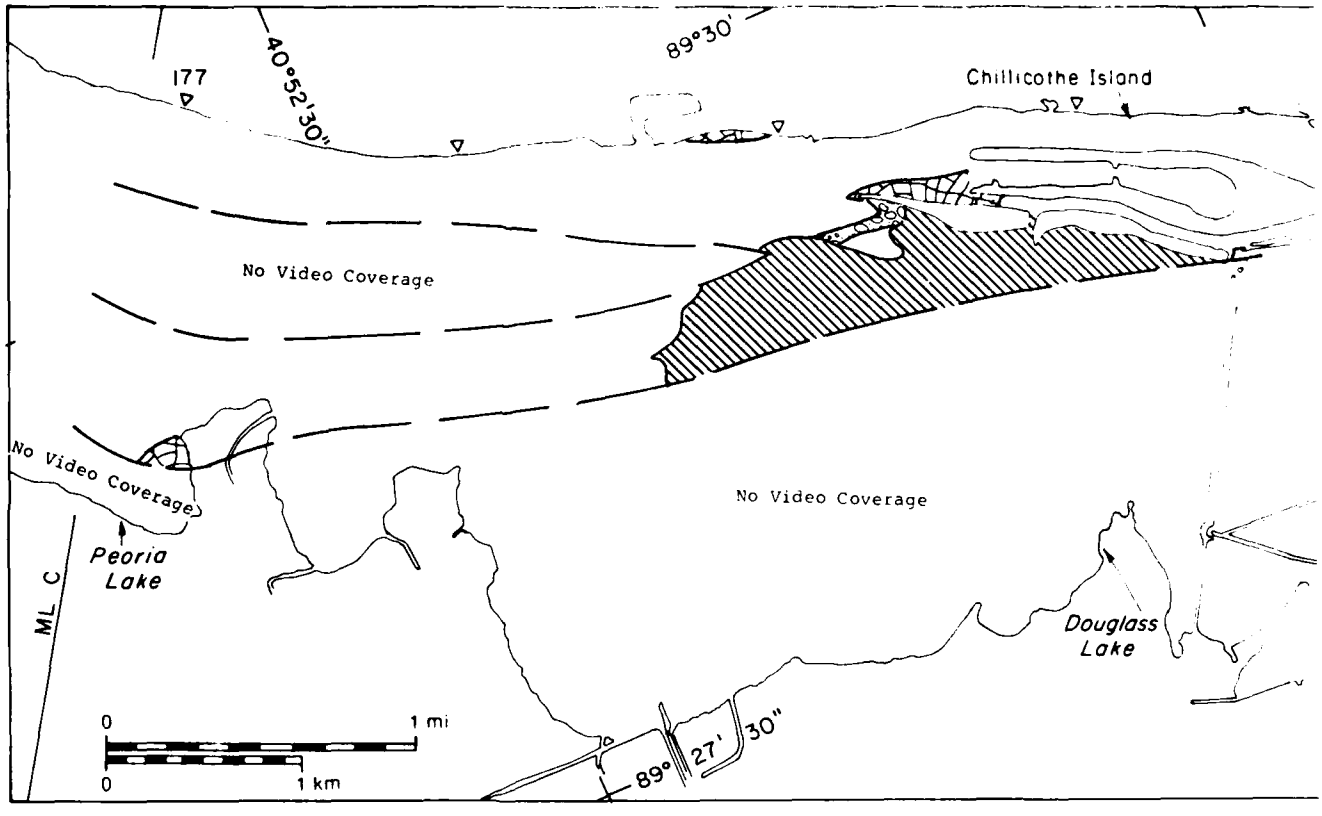

No Video Coverage
89°32'30"
0
1 mi
0
1 km

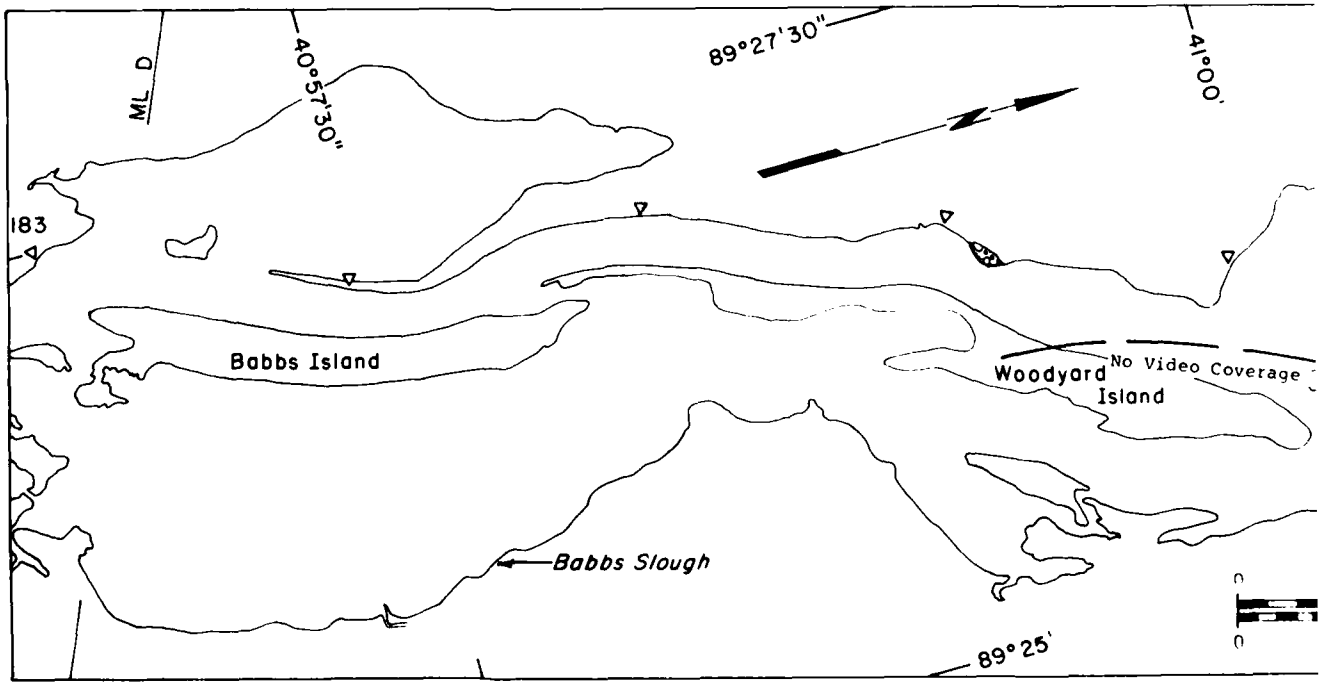

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
0
1 mi
0
1 km
Survey date: January 24, 19
Video Tape 7

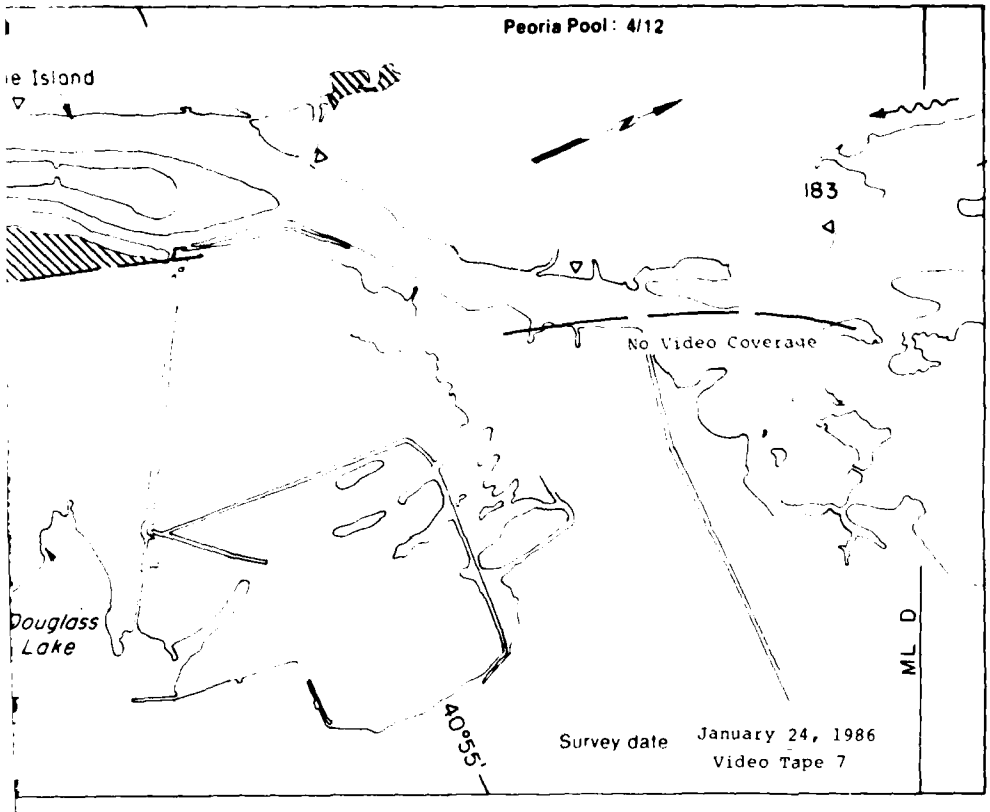

Upper Peoria Lake
No Video Coverage
1 mi
1 km
Survey date: January 24, 1986
Video Tape 7
ML B

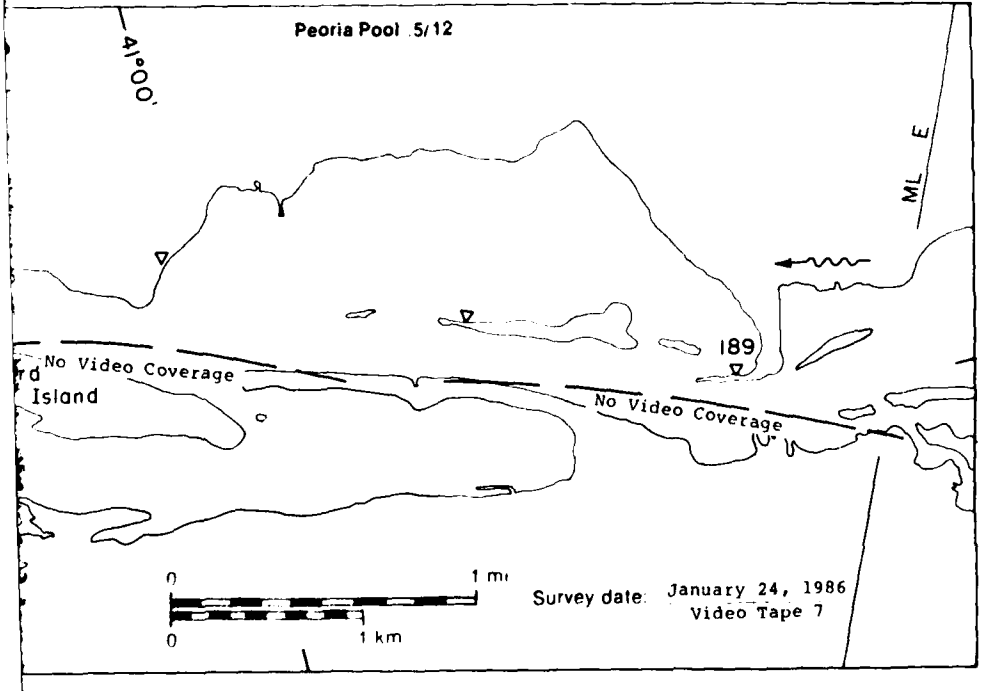

89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
mi
Survey date: January 24, 1986
Video Tape 7
40°50'
89°30'

24 January 1986

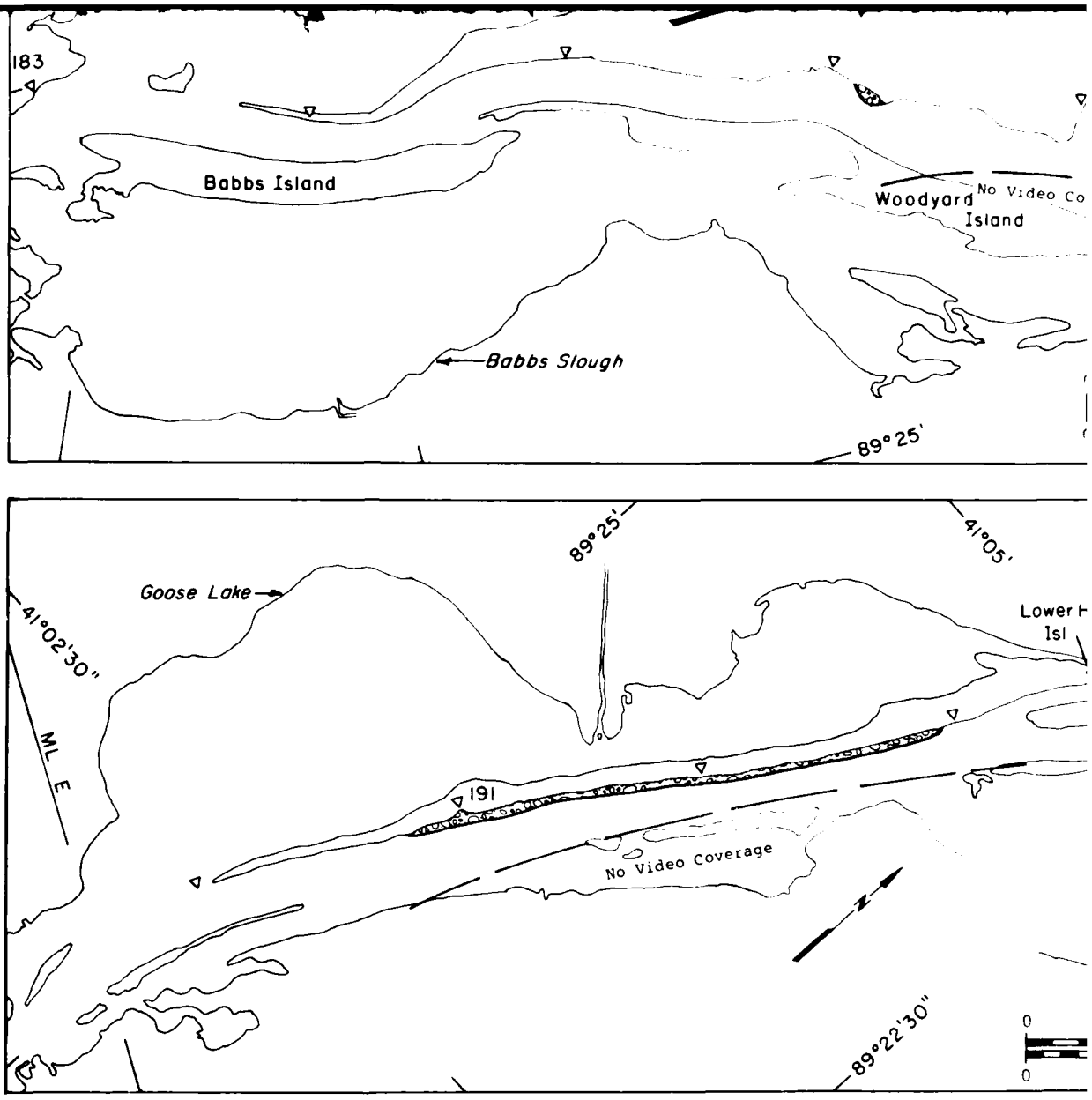


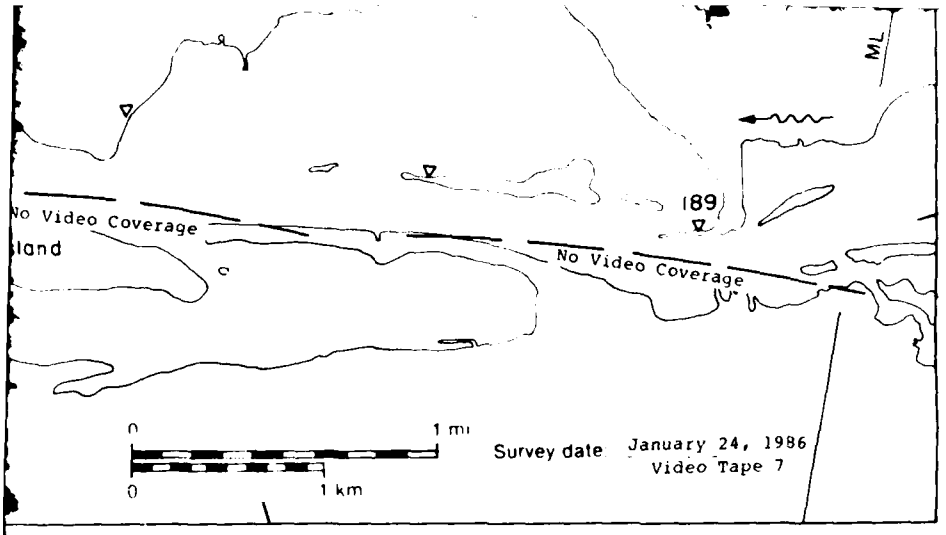


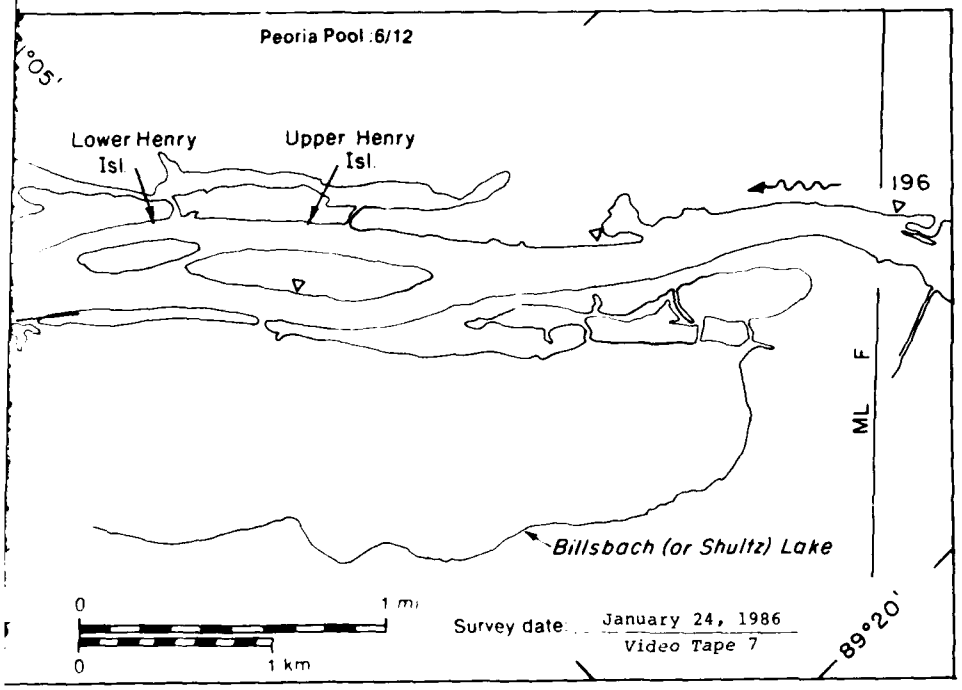

Peoria Pool : 4/12
e Island
183
No Video Coverage
Douglass
Lake
ML D
40°55'
Survey date January 24, 1986
Video Tape 7

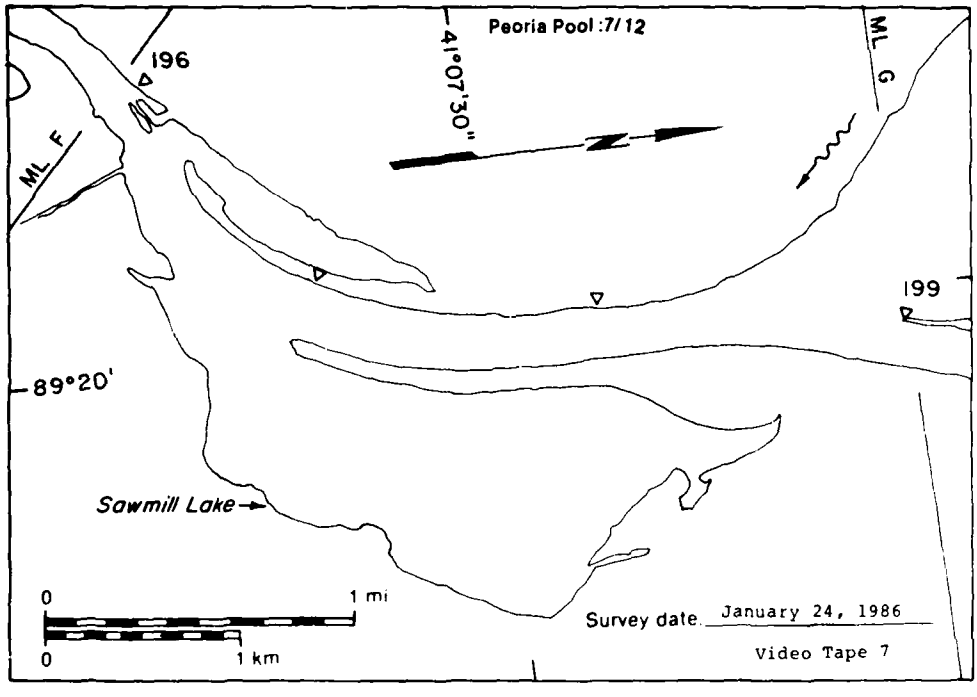

Peoria Pool 5/12
41°00'
ML E
189
No Video Coverage
Island
No Video Coverage
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7

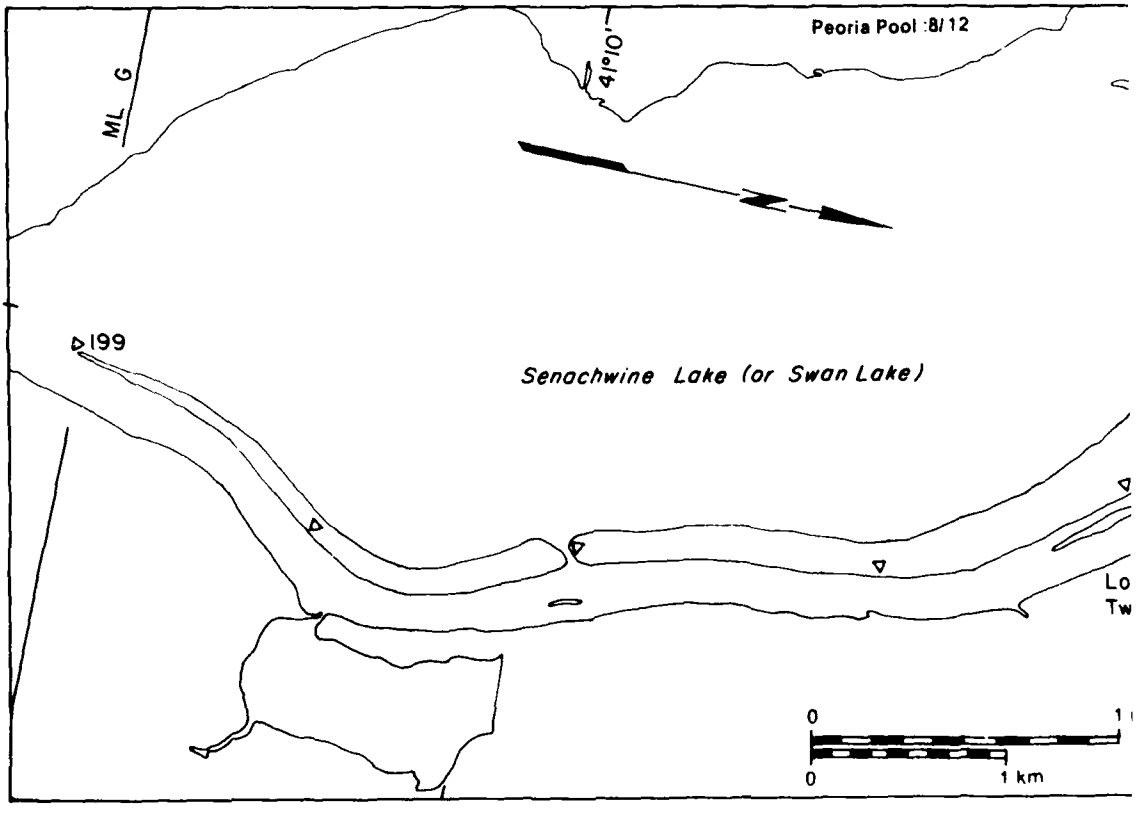
Peoria Pool 6/12

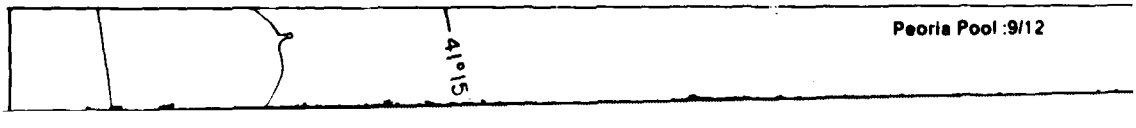

183
Babbs Island
Woodyard Island
No Video Co
Babbs Slough
89°25'
89°25'
41°05'
Goose Lake
41°02'30"
ML E
191
No Video Coverage
89°22'30"
0
0


ML
189
No Video Coverage
land
No Video Coverage
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7

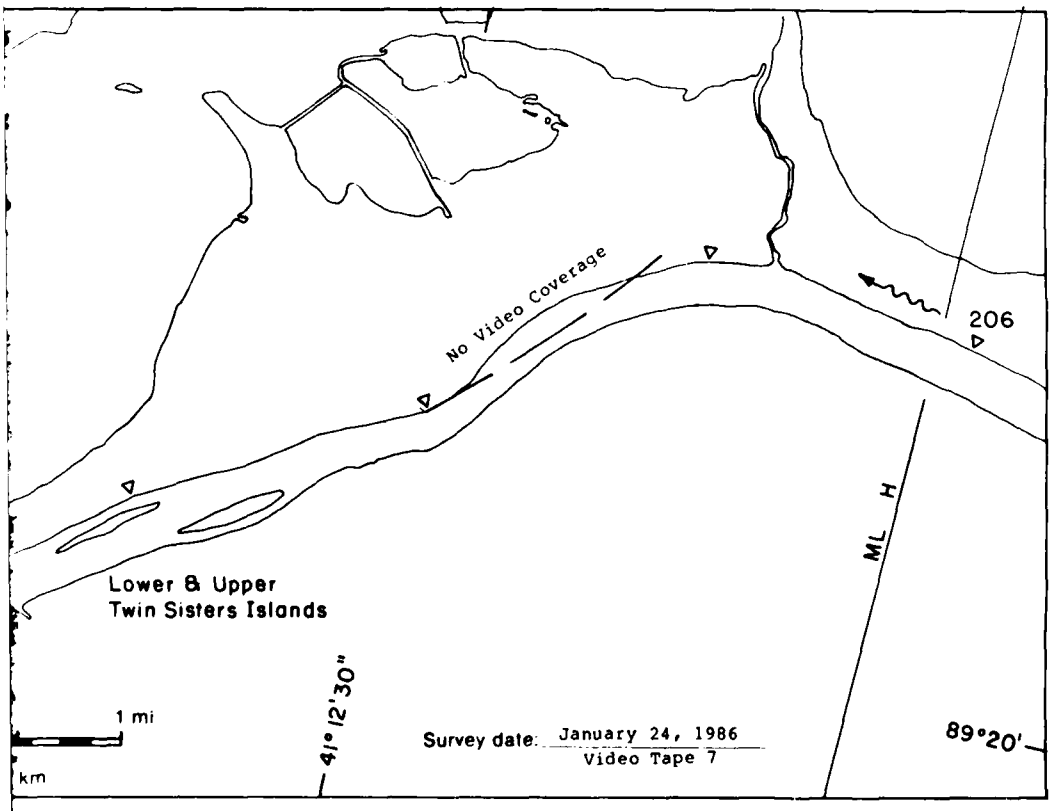

Peoria Pool :6/12
°05'
Lower Henry Isl.
Upper Henry Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7
89°20'

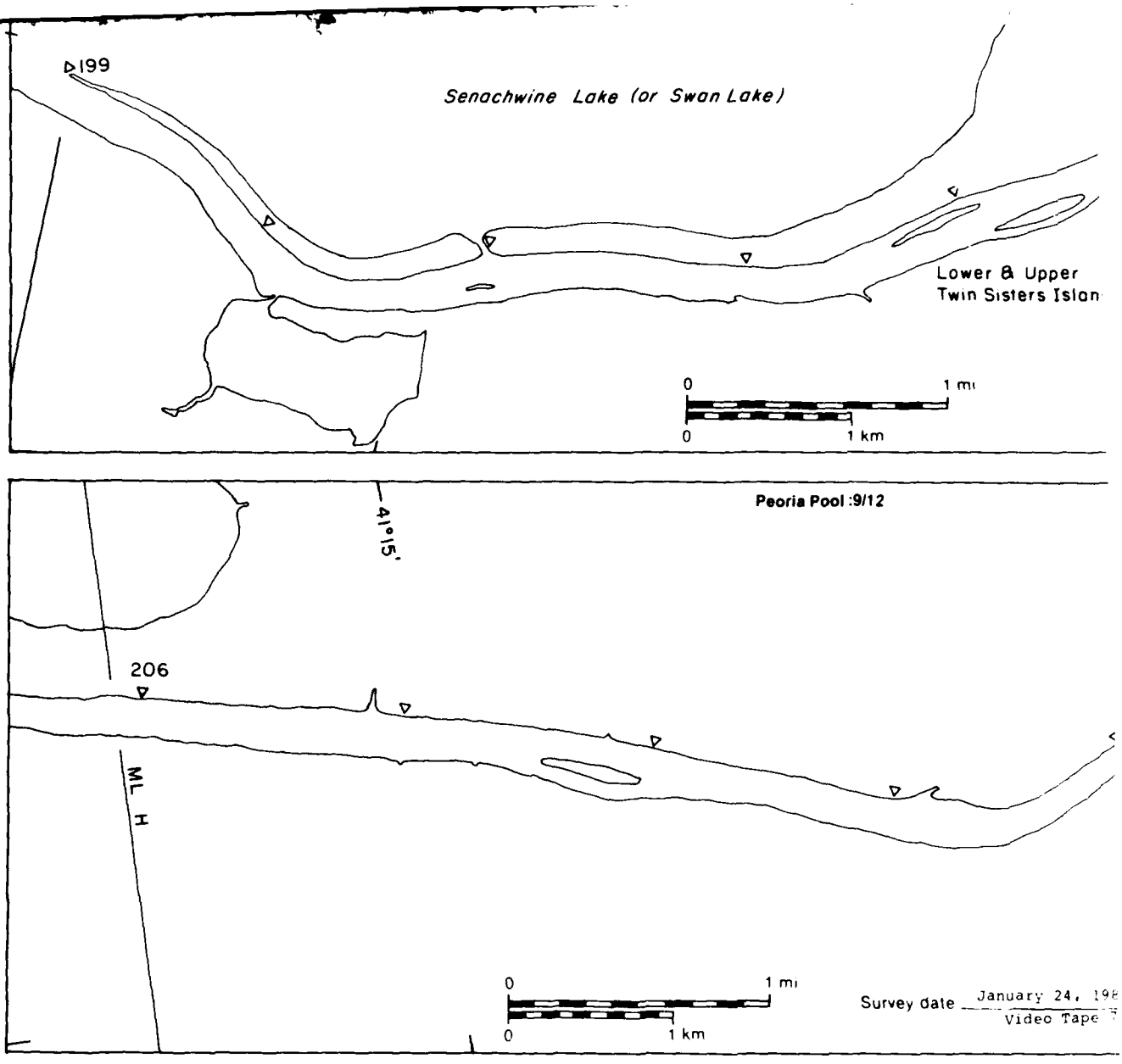

Peoria Pool :7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date January 24, 1986
Video Tape 7


Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
0
1 km

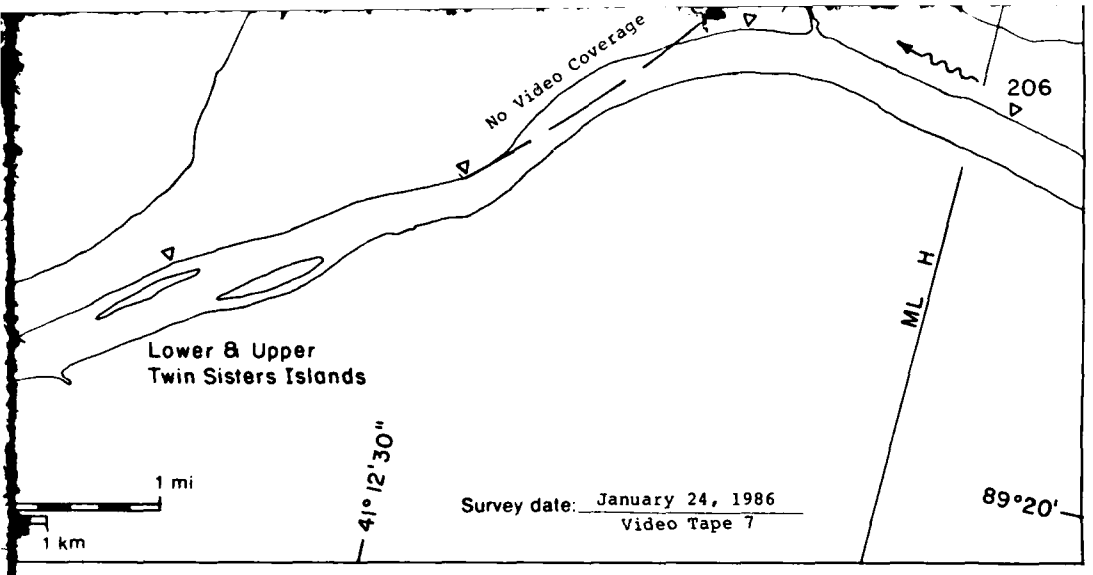

Peoria Pool :9/12
41°15

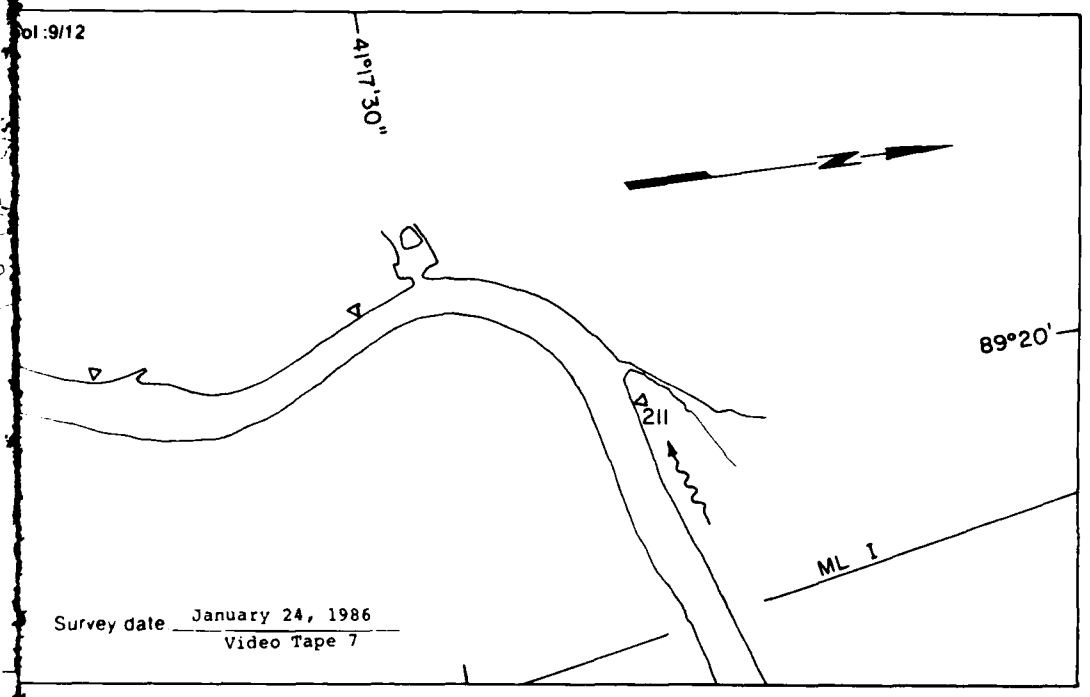
24 January 1986



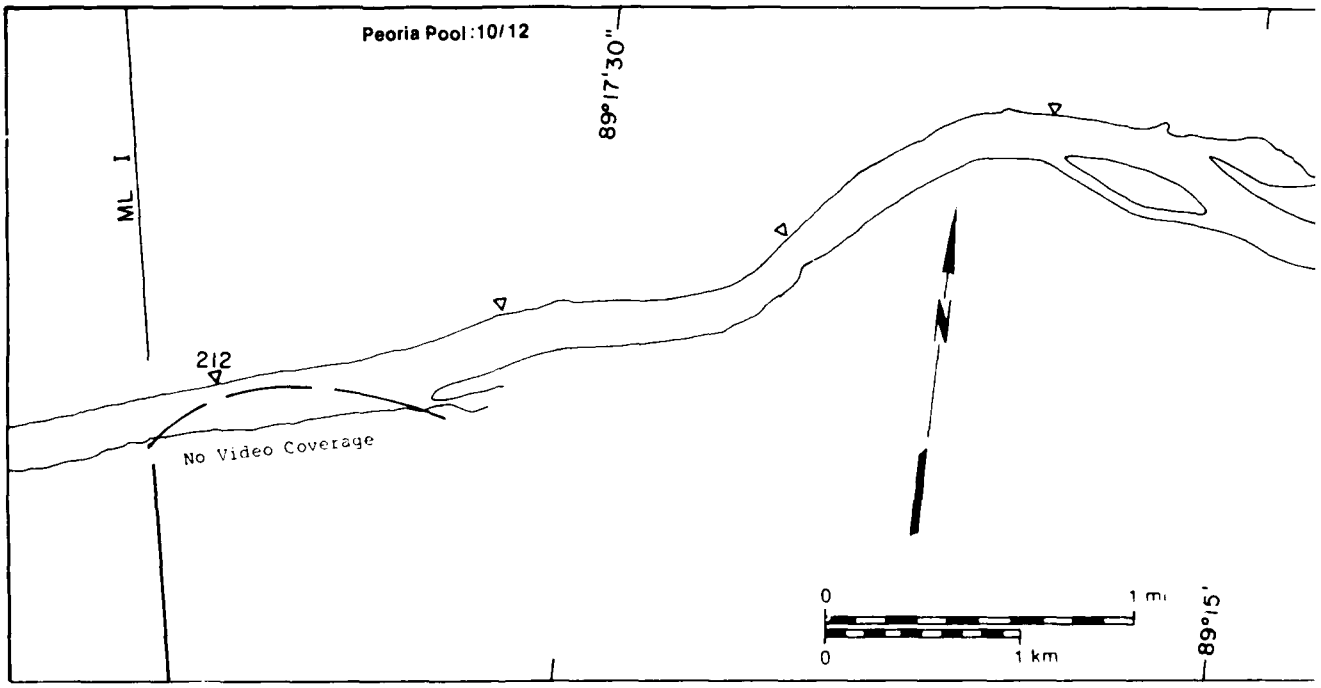

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islan
0
1 mi
0
1 km

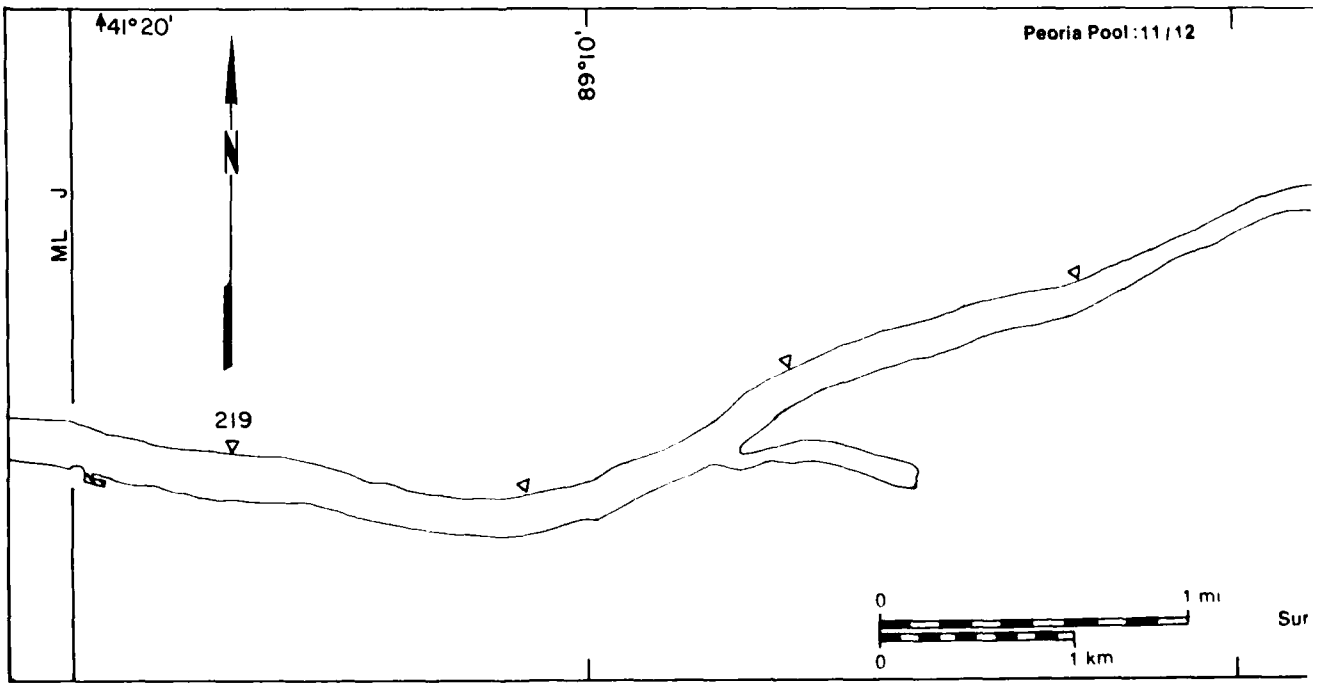
Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date January 24, 19
Video Tape

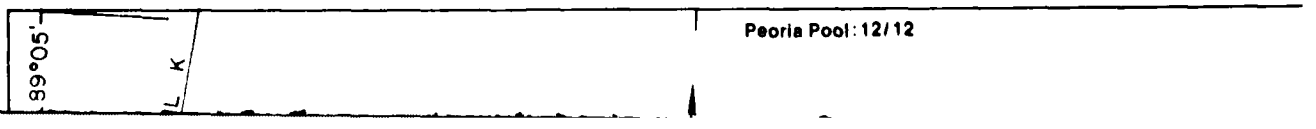

No Video Coverage
206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12' 30"
Survey date: January 24, 1986
Video Tape 7
89°20'

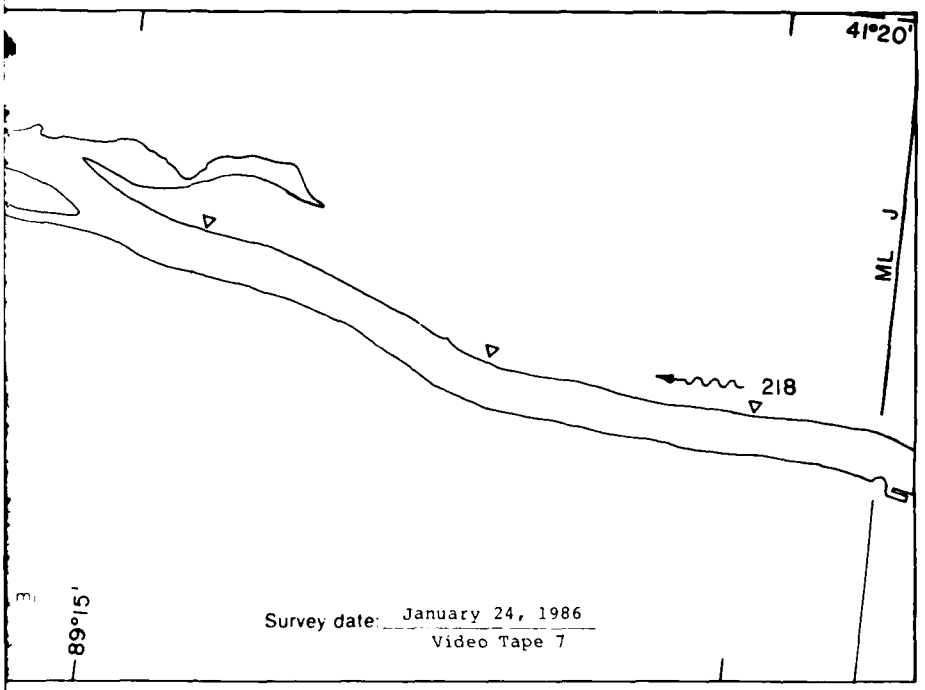

ol :9/12
41°17'30"
89°20'
211
ML I
Survey date January 24, 1986
Video Tape 7

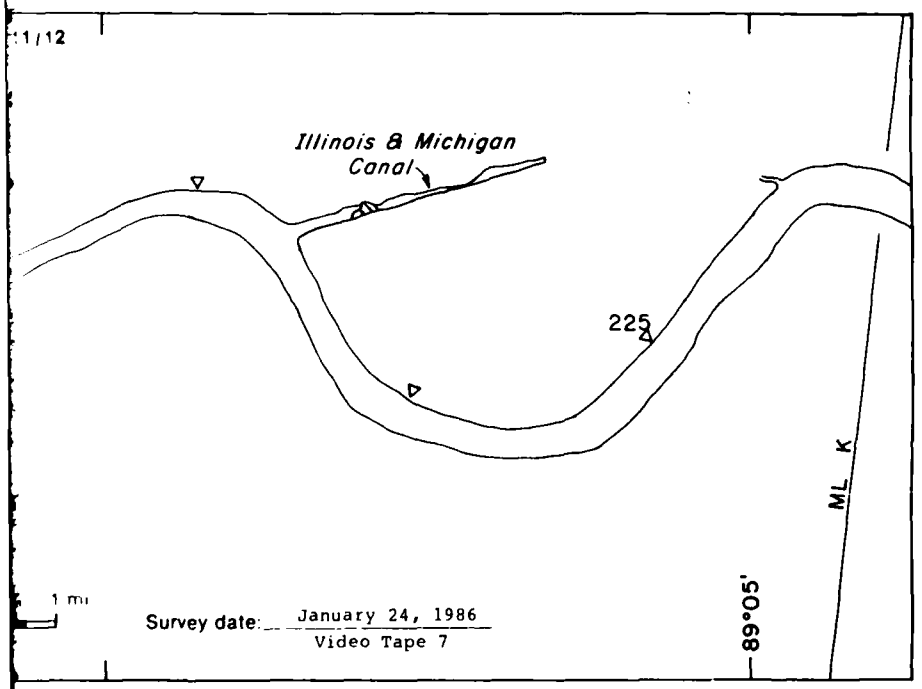
24 January 1986



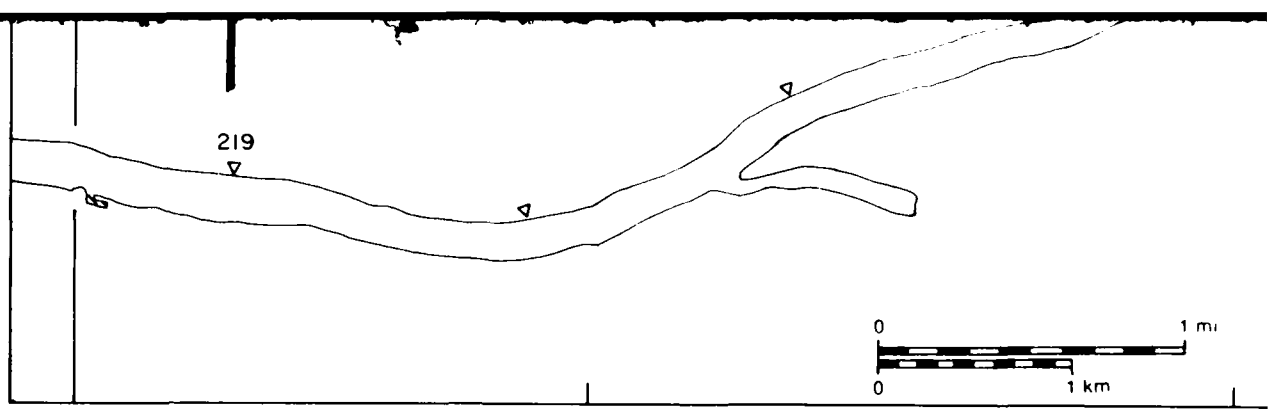


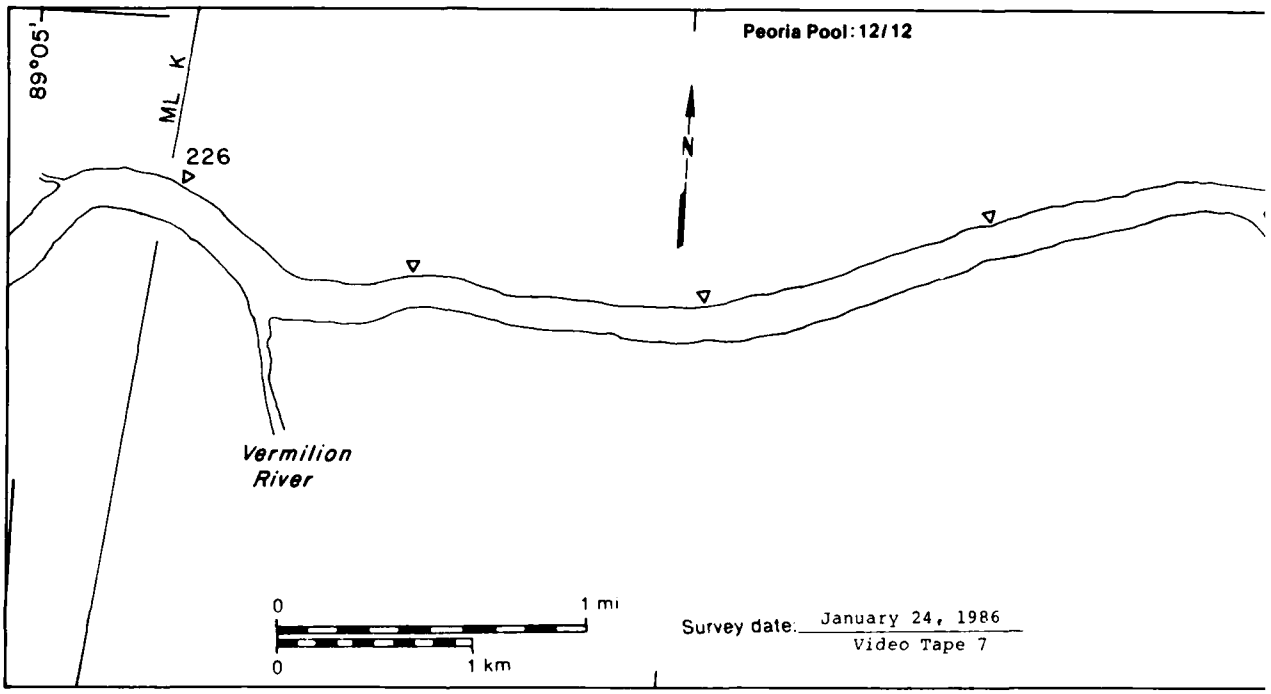



41°20'
ML J
218
89°15'
Survey date: January 24, 1986
Video Tape 7


11/12
Illinois & Michigan Canal
225
ML K
89°05'
1 mi
Survey date: January 24, 1986
Video Tape 7

41°20'

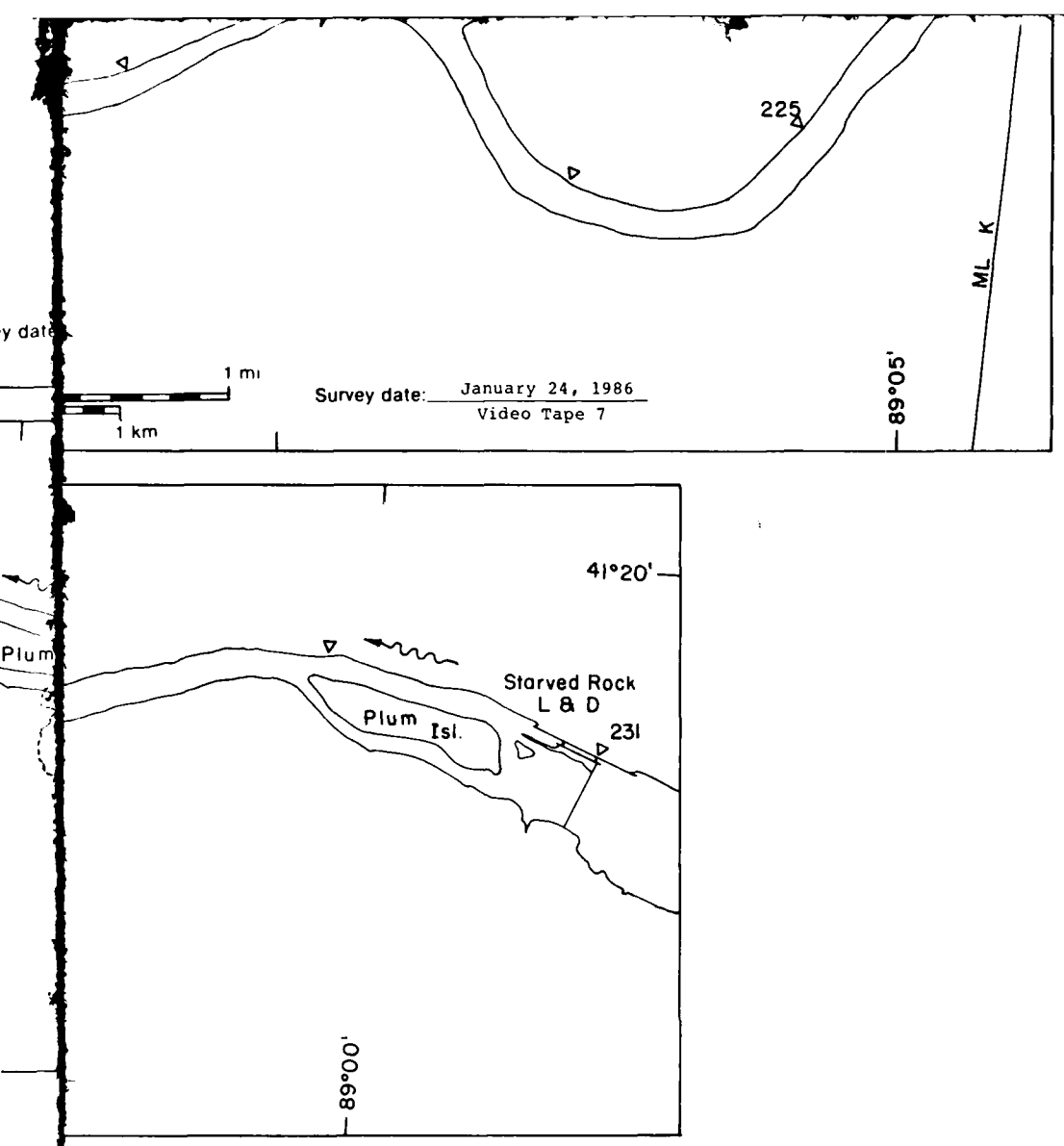




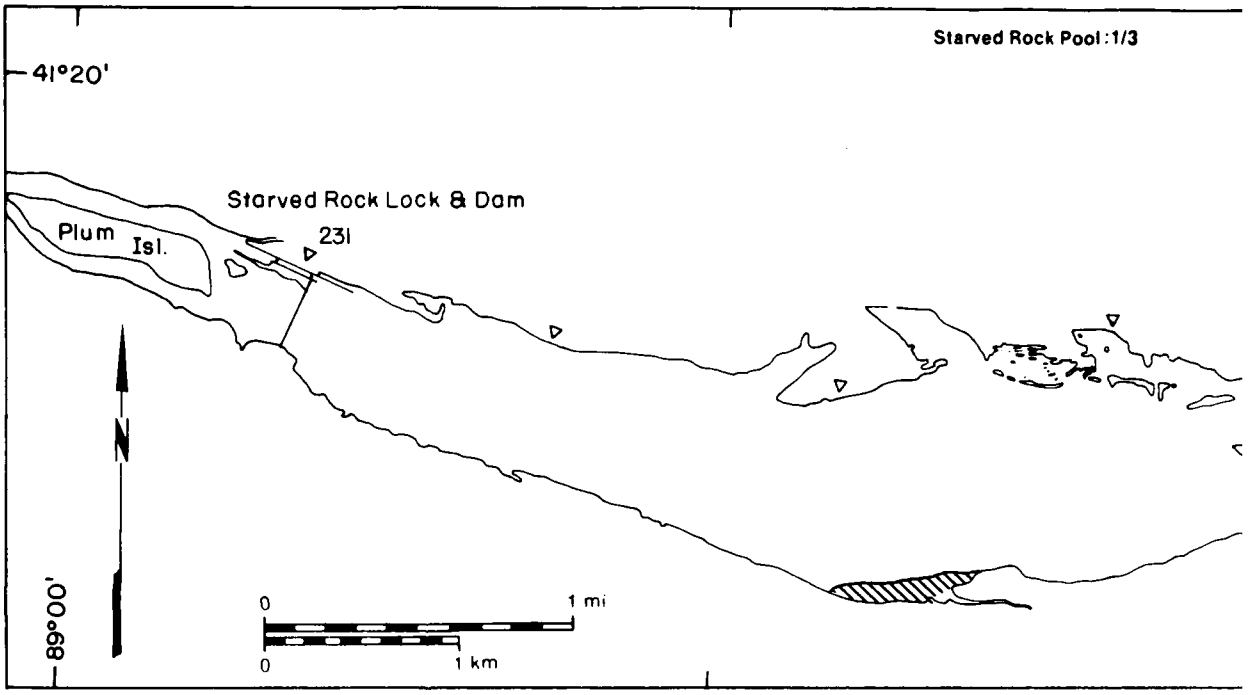
Peoria Pool

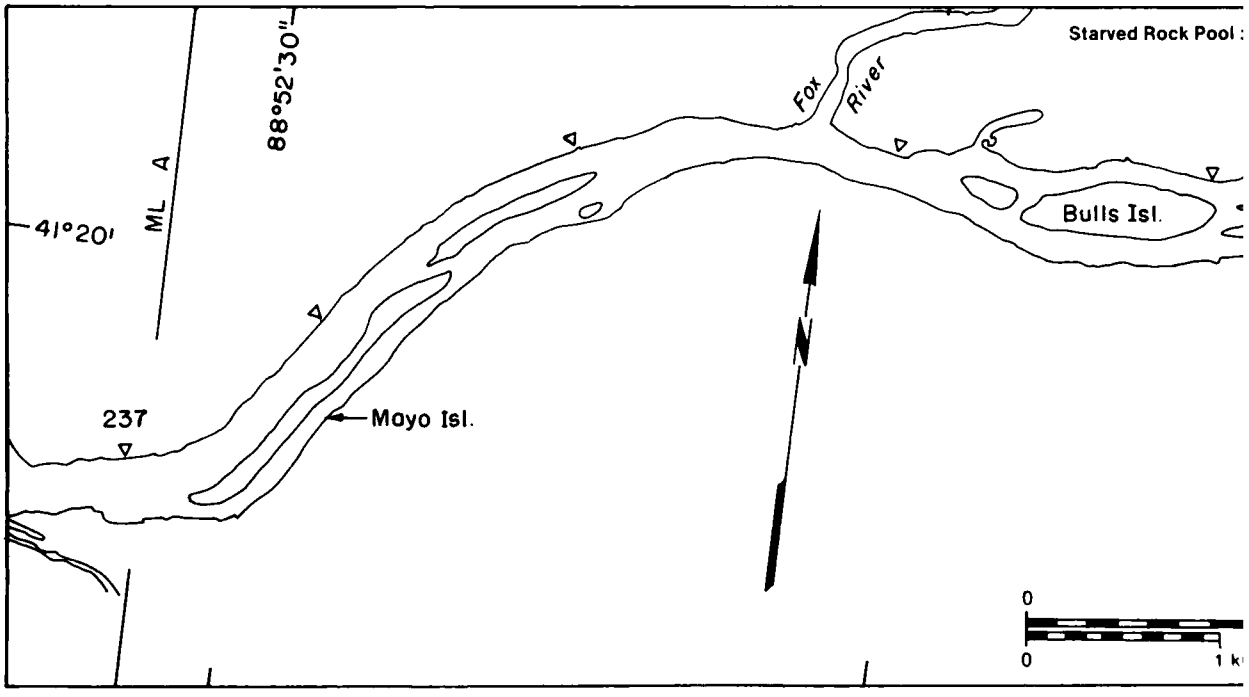
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	43.53	NA
Solid ice cover	4.52	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	2.41	NA
Fragmented ice cover with open-water areas	1.44	70
Ice floes or frazil slush and pans	1.01	30
Total area ($m^2 \times 10^6$)	81.33*	

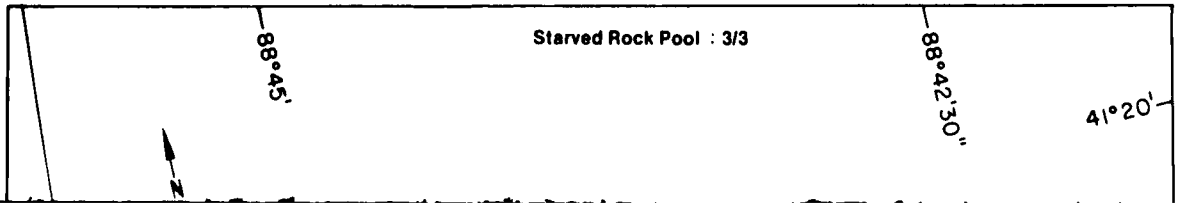
* Includes 28.42 x 10^6 m^2 of no video coverage


225
ML K
89°05'
1 mi
1 km
Survey date: January 24, 1986
Video Tape 7

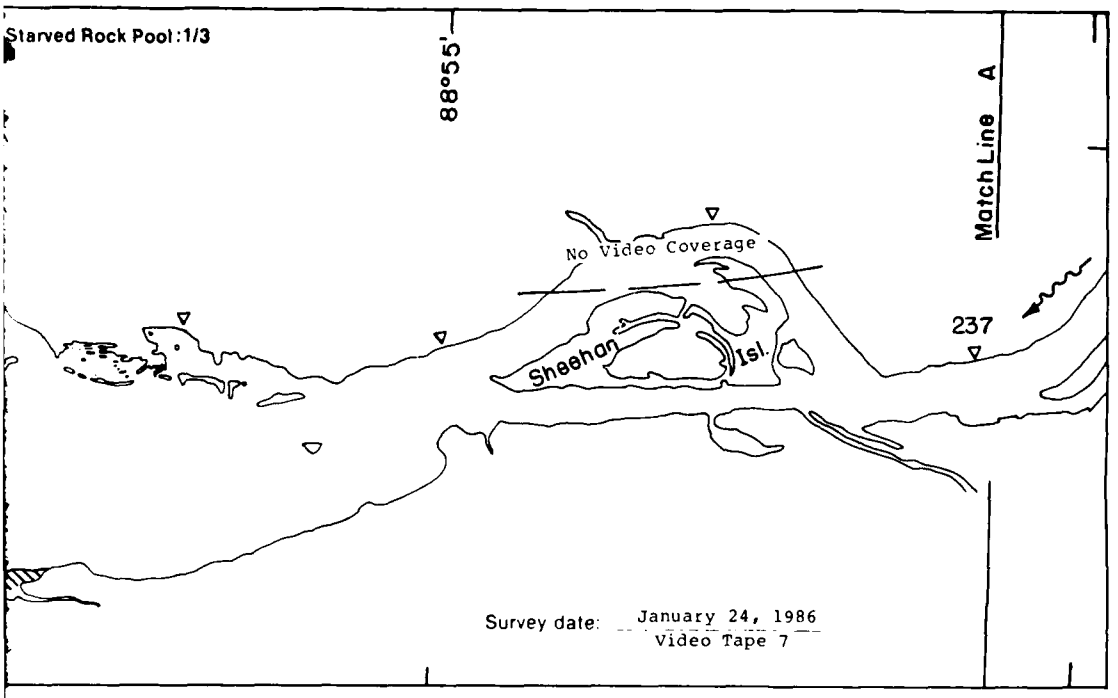
41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'

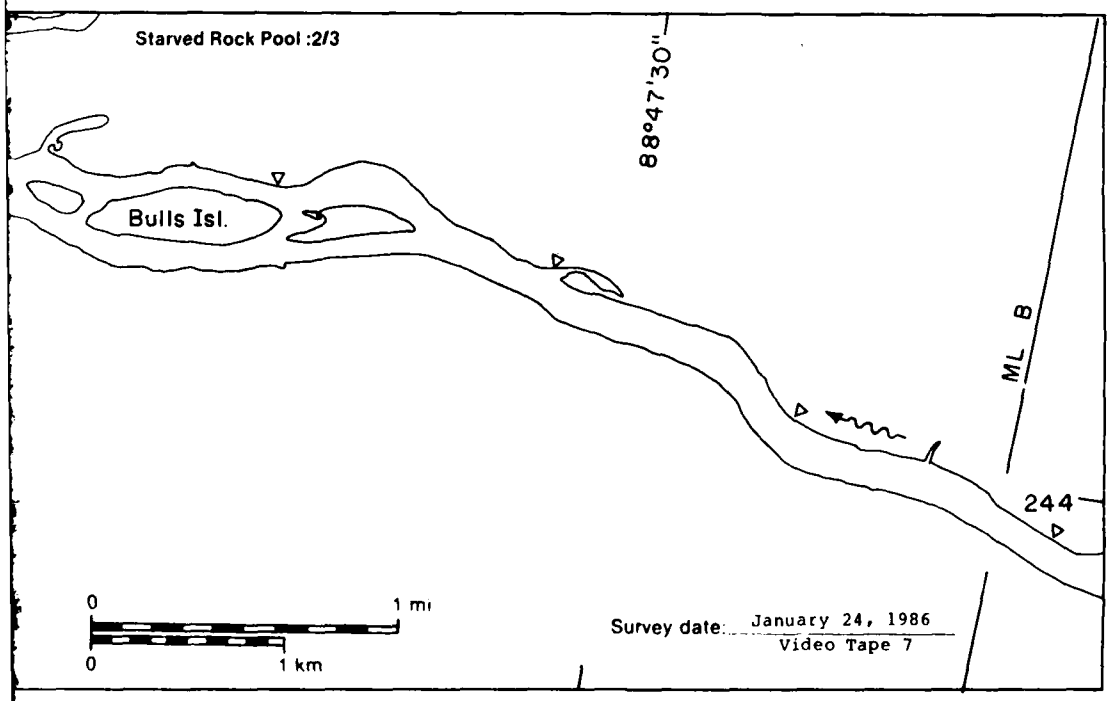

Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
89°00'
0
1 mi
0
1 km


Starved Rock Pool :
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

24 January 1986





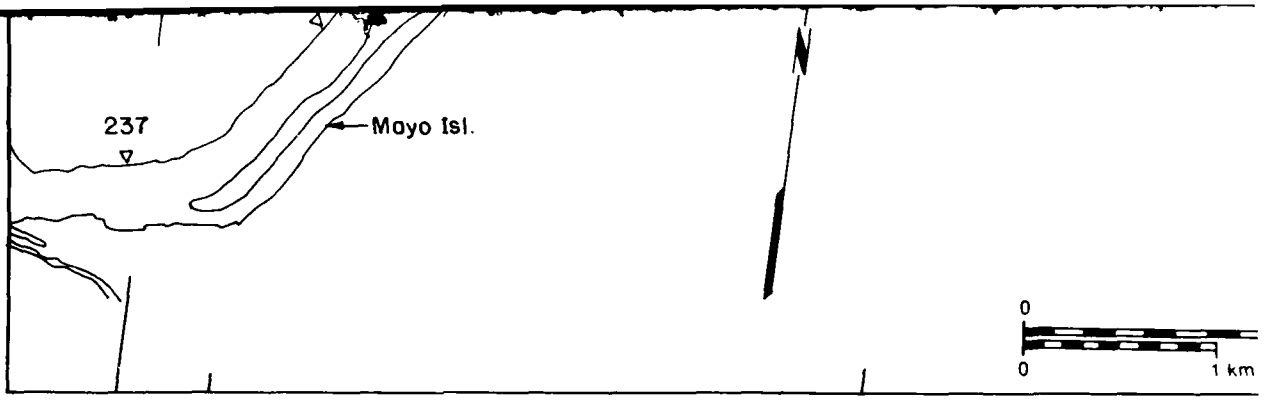
41°20'

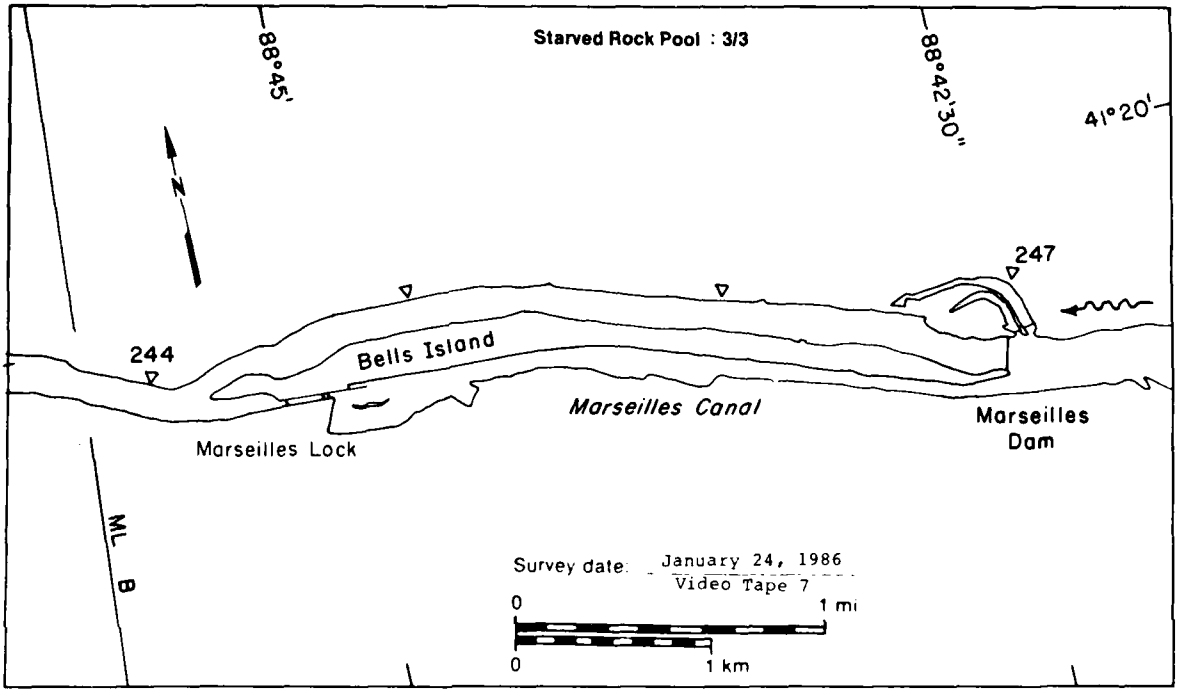
Starved Rock Pool

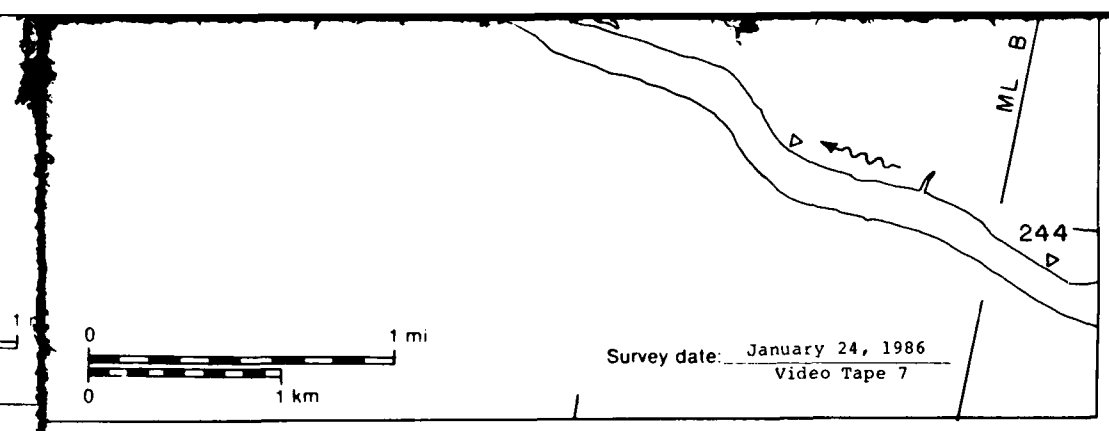
MAP UNITS

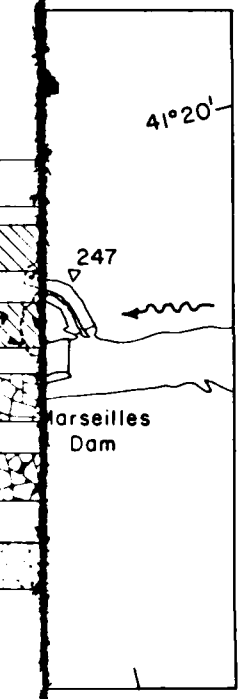
Area ($m^2 \times 10^6$)

Surface concentration (%)


237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 24, 1986
Video Tape 7
0
1 mi
0
1 km



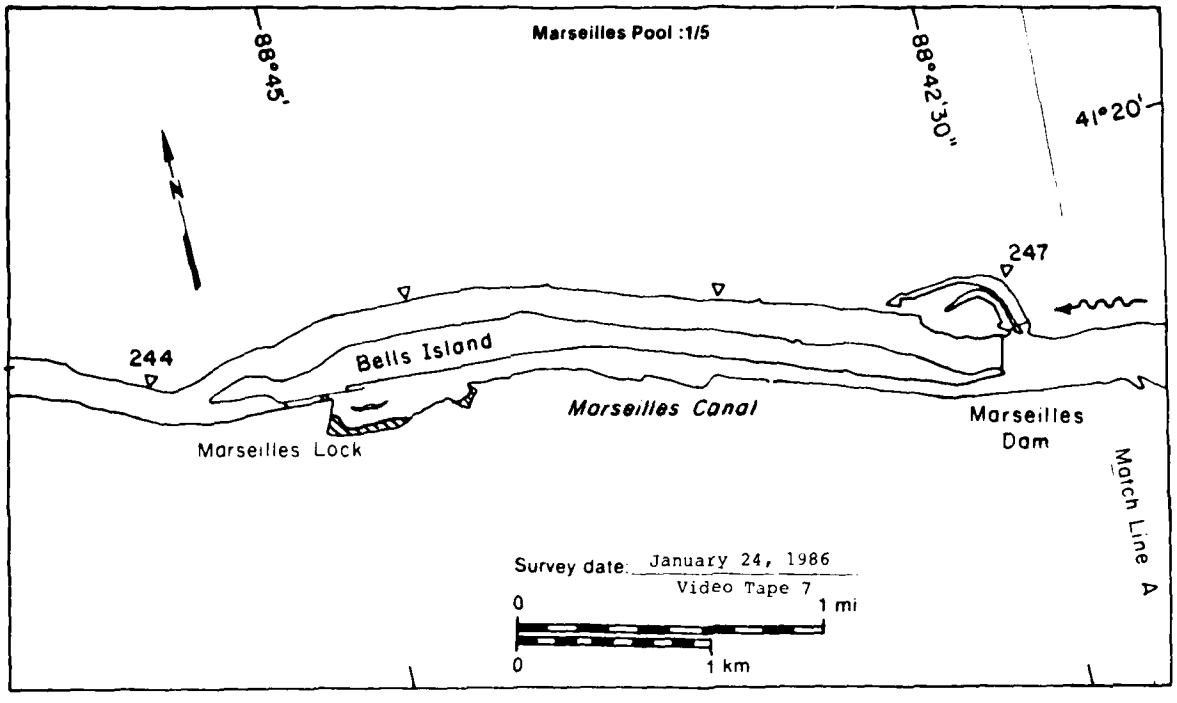


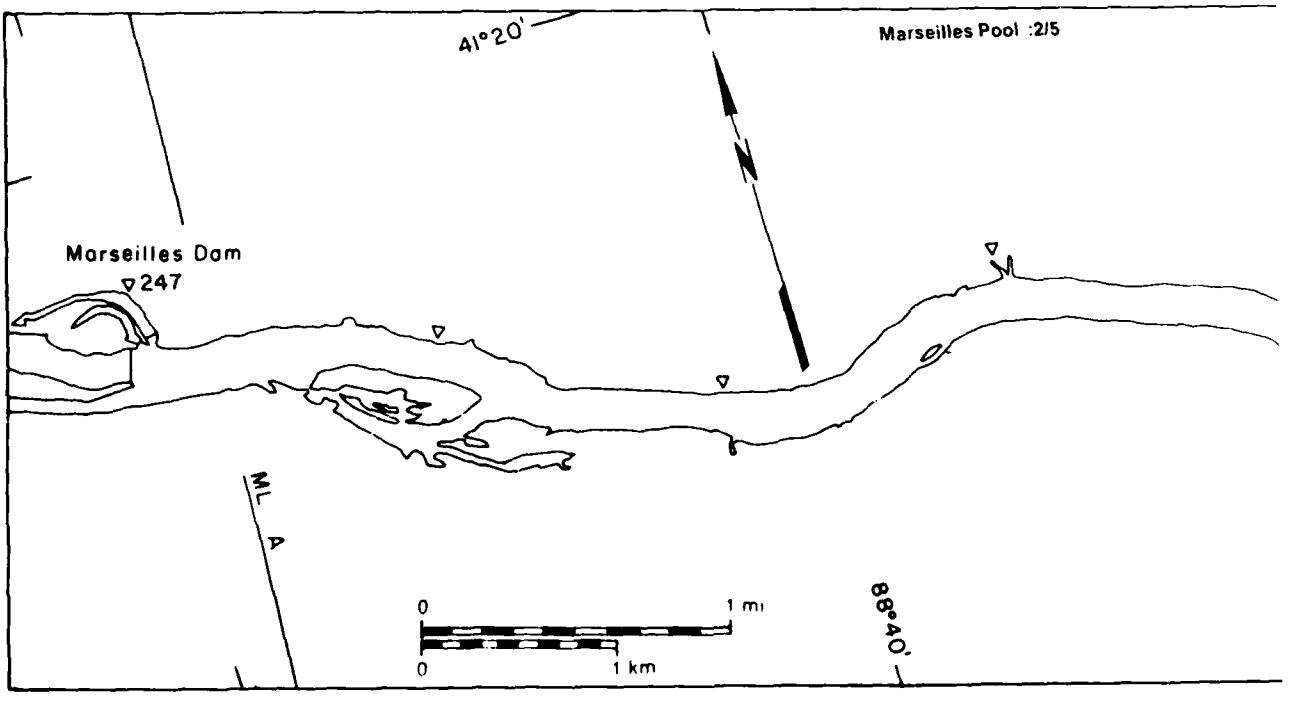
Starved Rock Pool

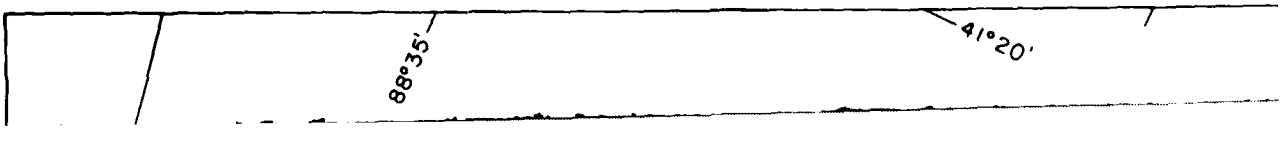
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	9.91	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	10.19*	

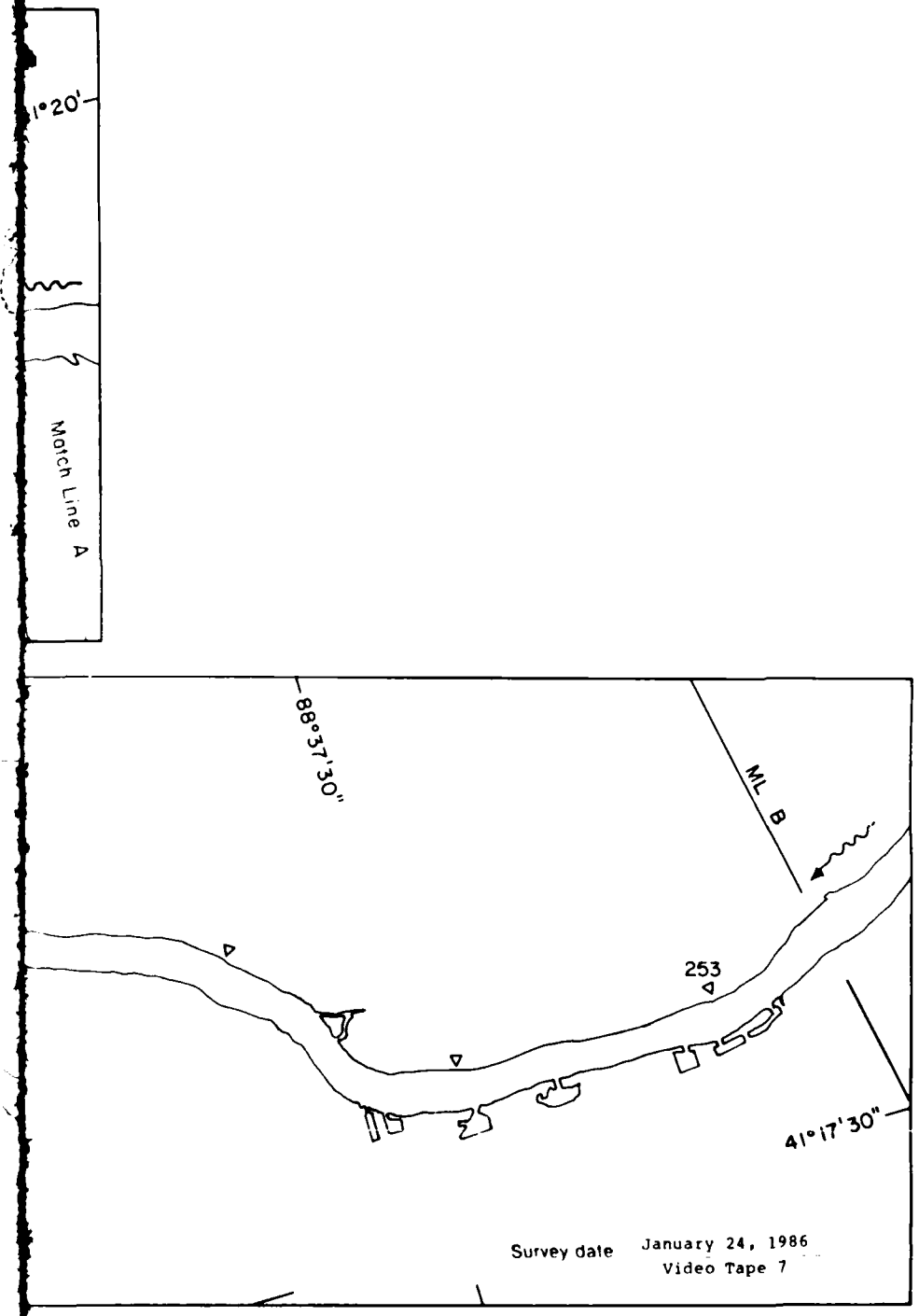
* Includes 0.24×10^6 m^2 of no video coverage

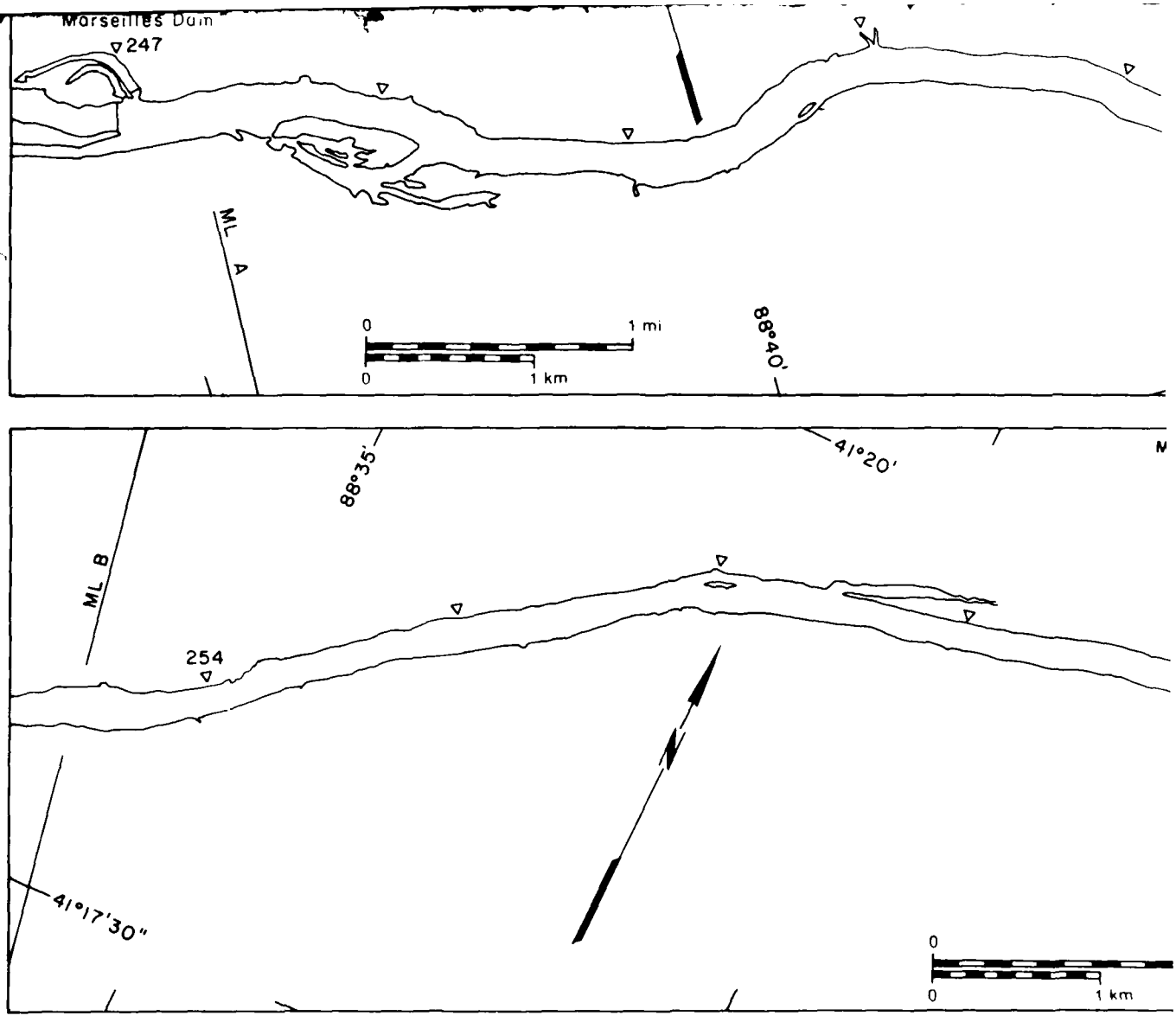
24 January 1986

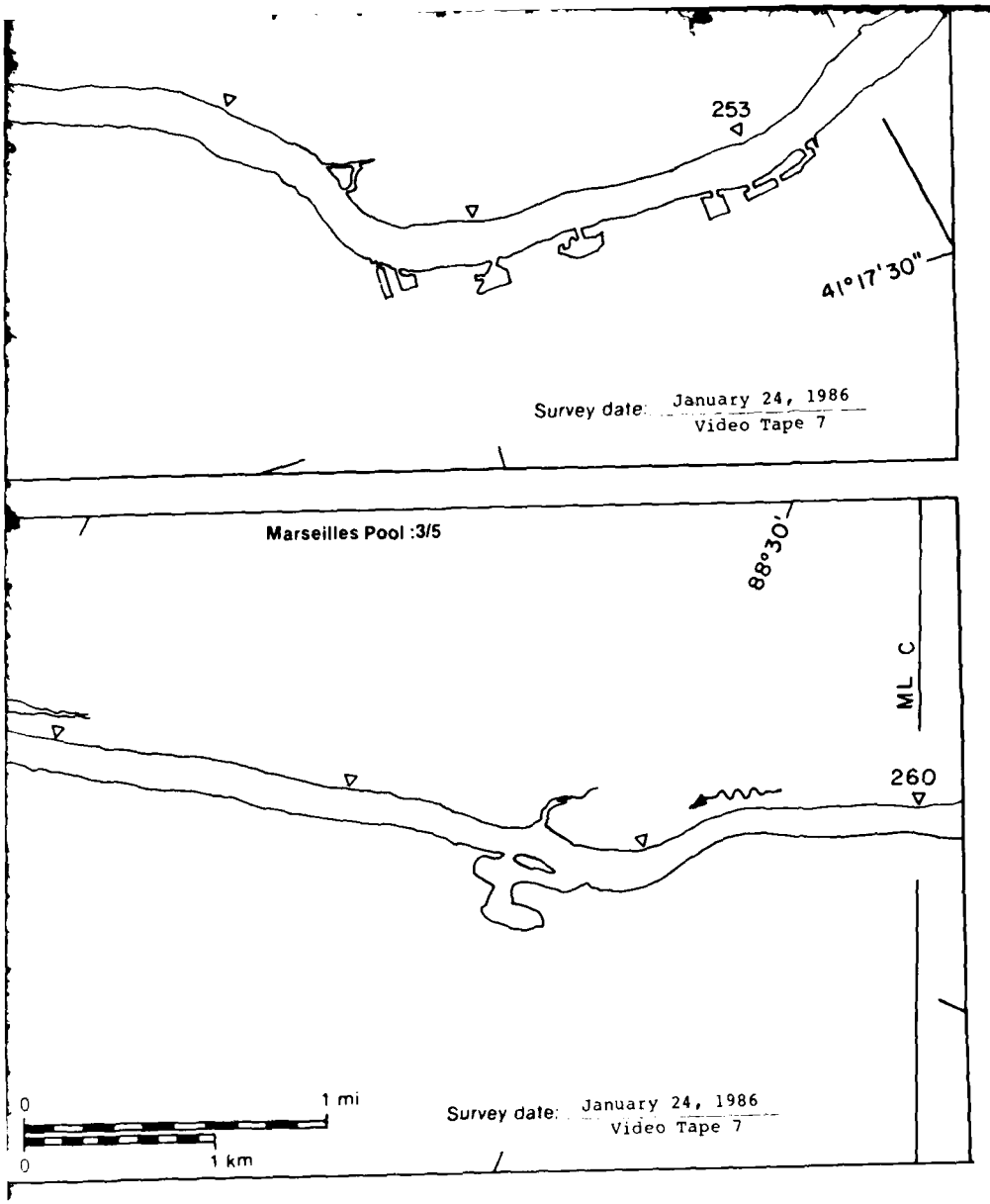


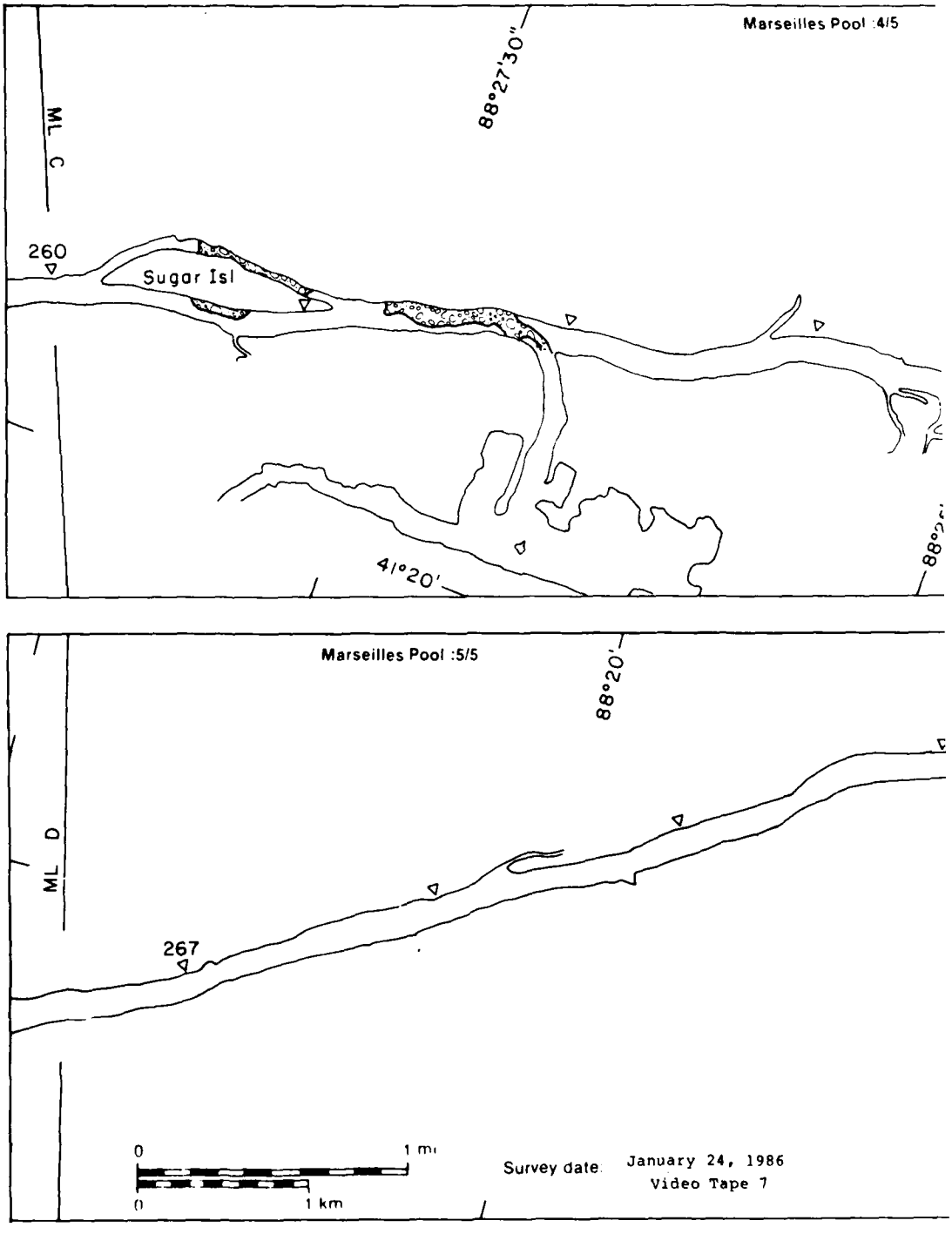





1°20'
March Line A
88°37'30"
ML B
253
41°17'30"
Survey date January 24, 1986
Video Tape 7
Marseilles Pool :3/5
88°30'
C


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
0
1 km

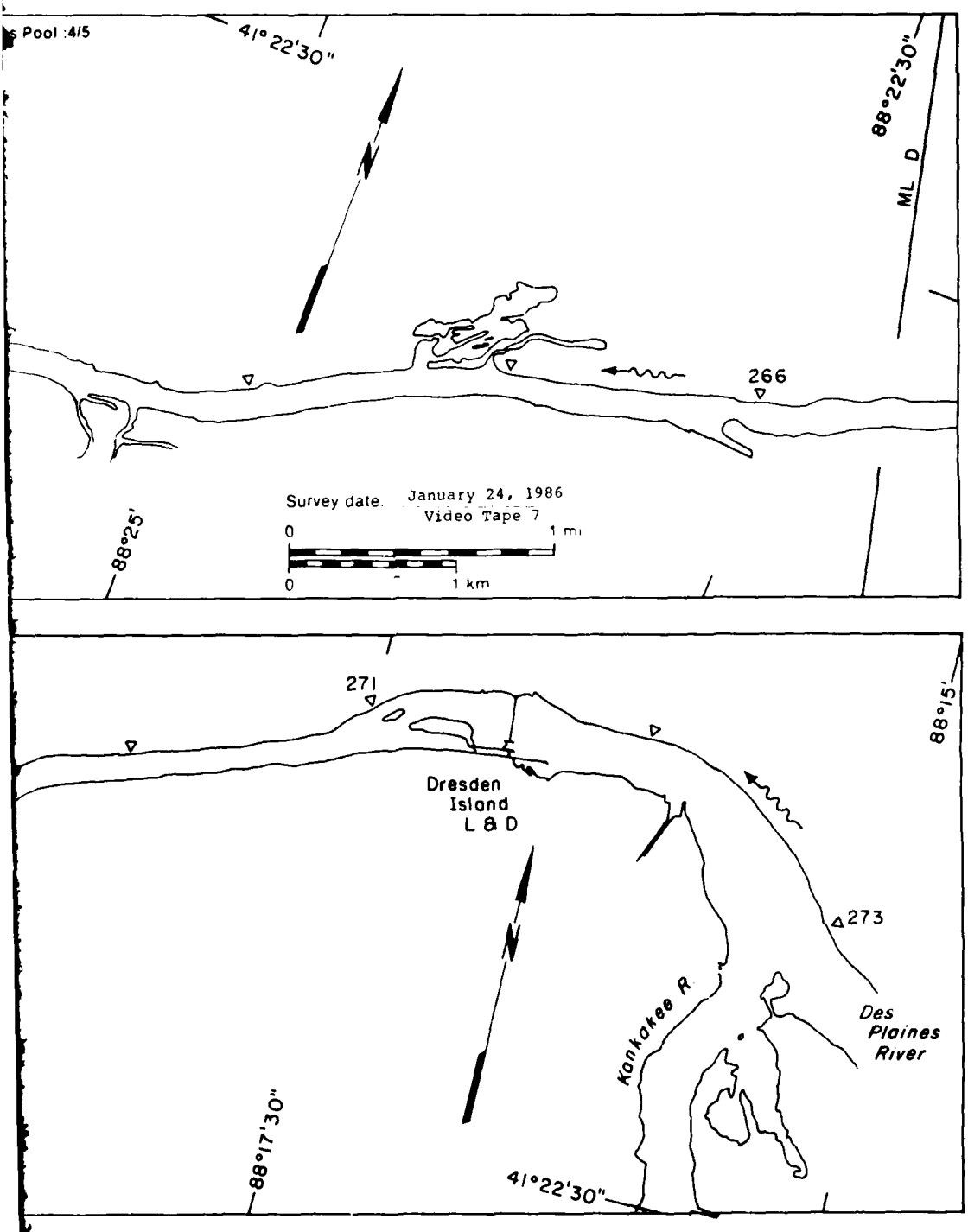

253
41°17'30"
Survey date: January 24, 1986
Video Tape 7
Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7

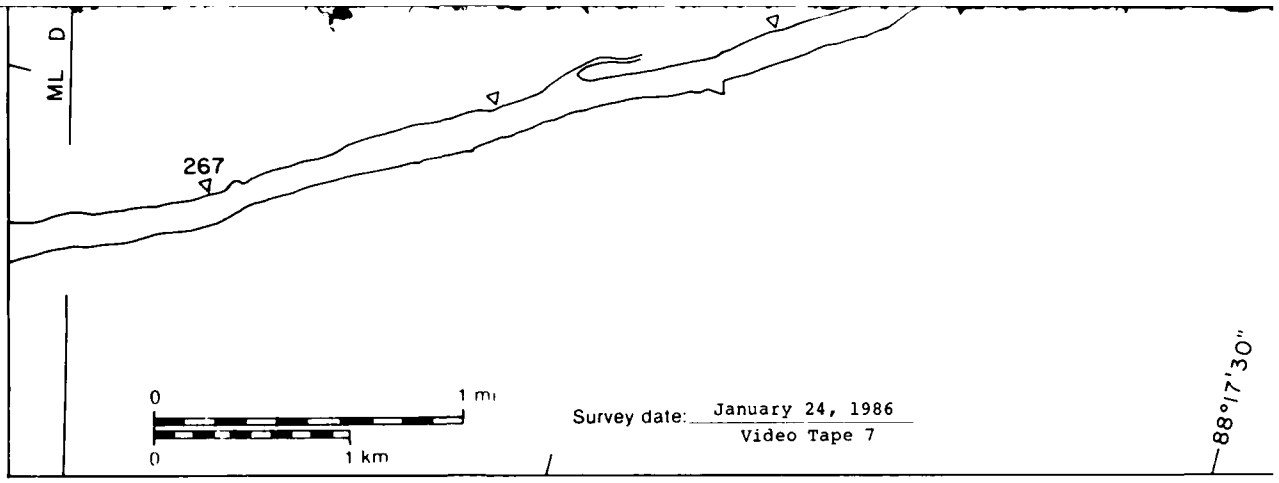


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	8.00	NA

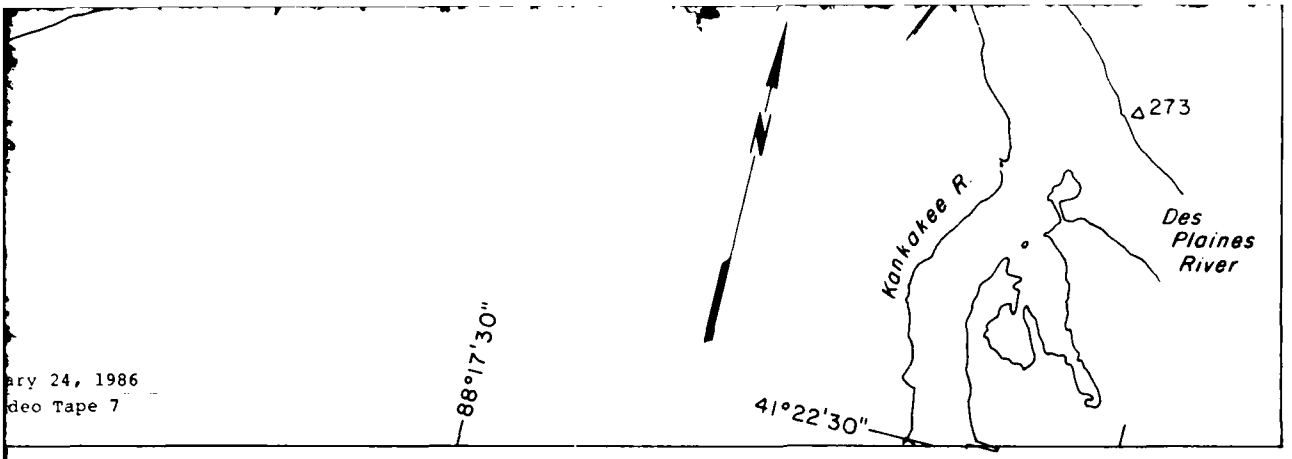
24 January 1986





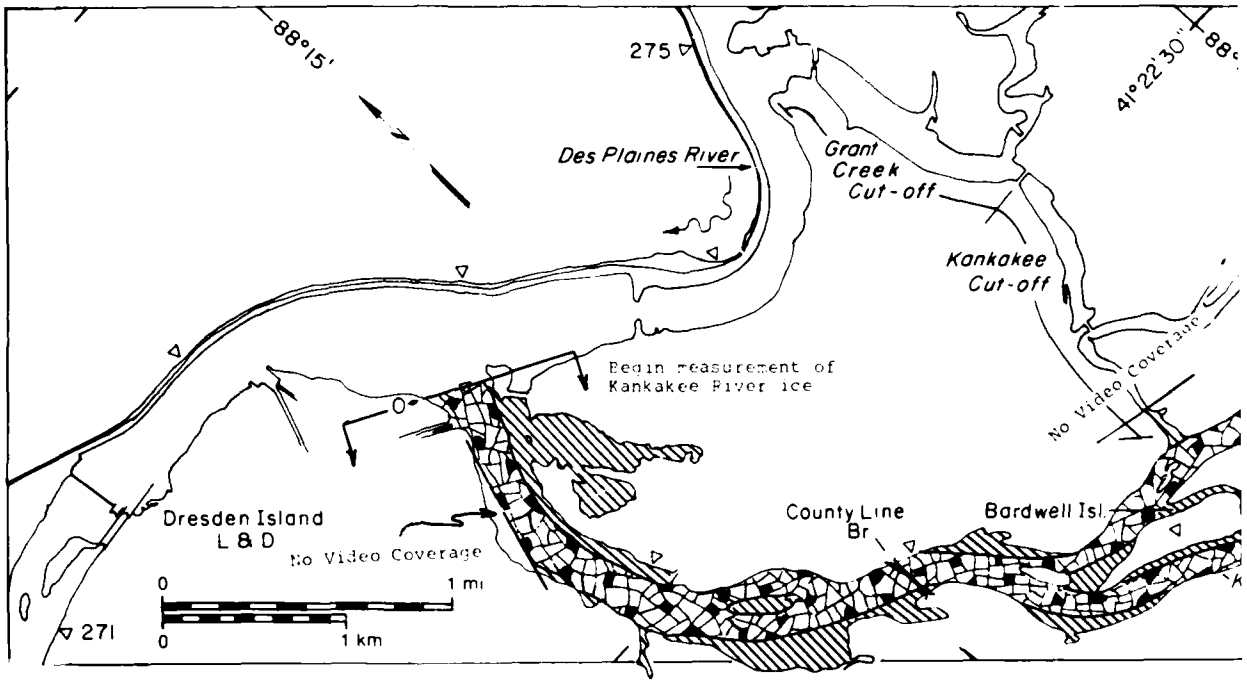
Marseilles Pool

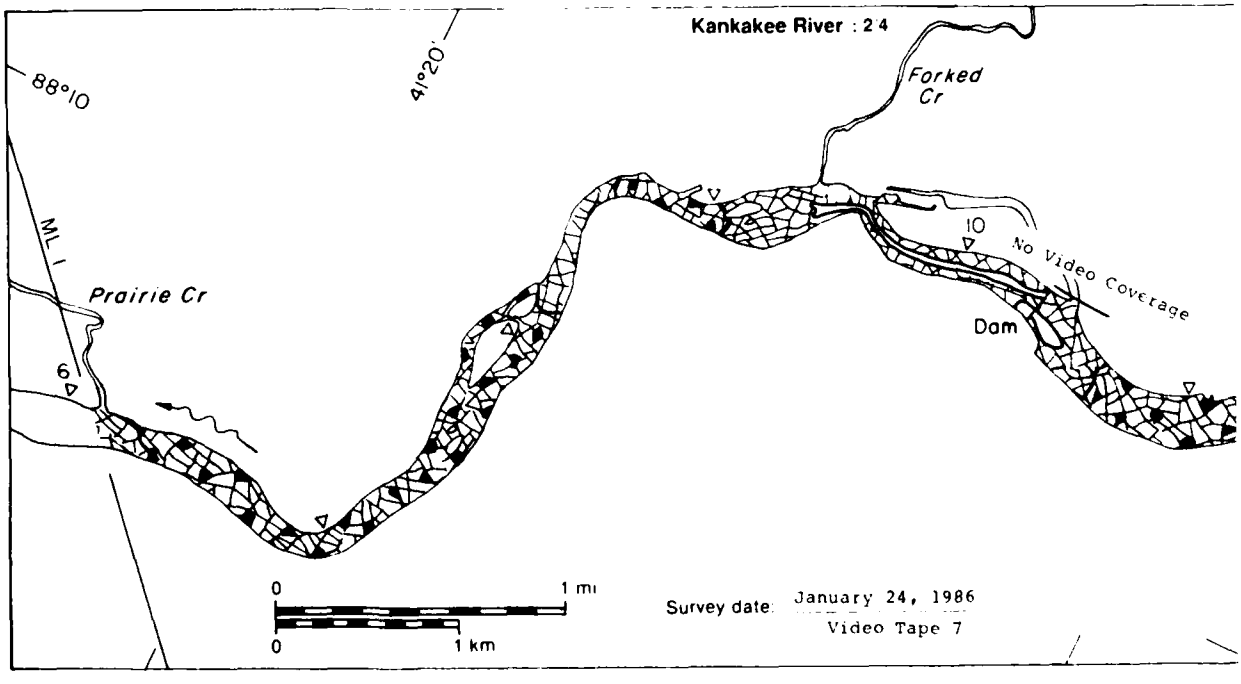
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.00	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.16	1
Total area ($m^2 \times 10^6$)	8.19	

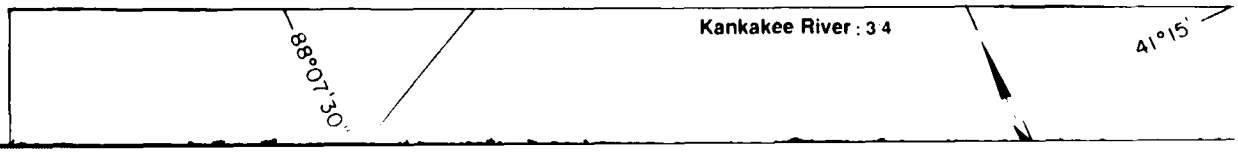


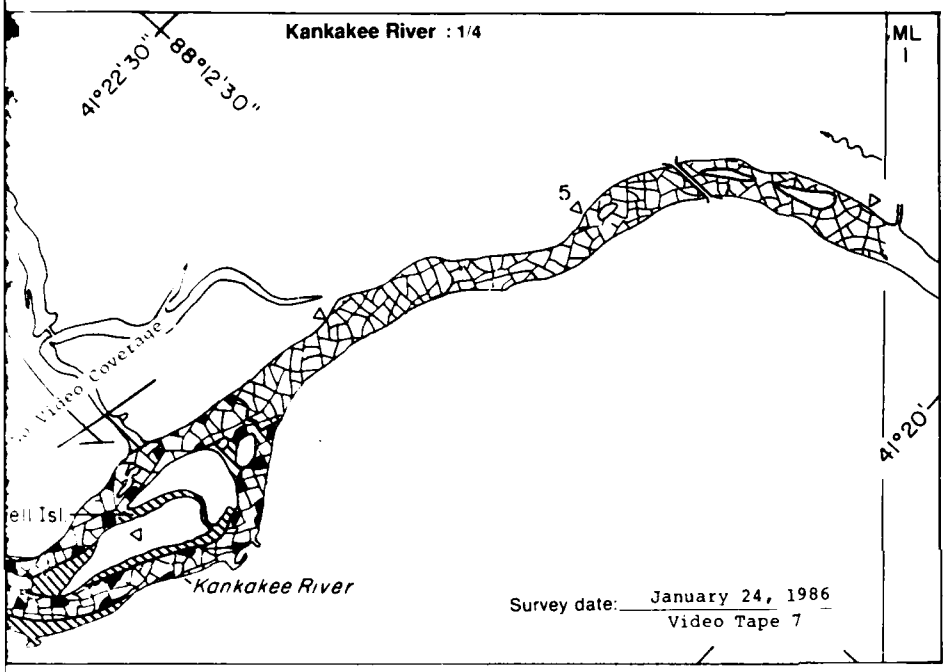
ary 24, 1986
deo Tape 7

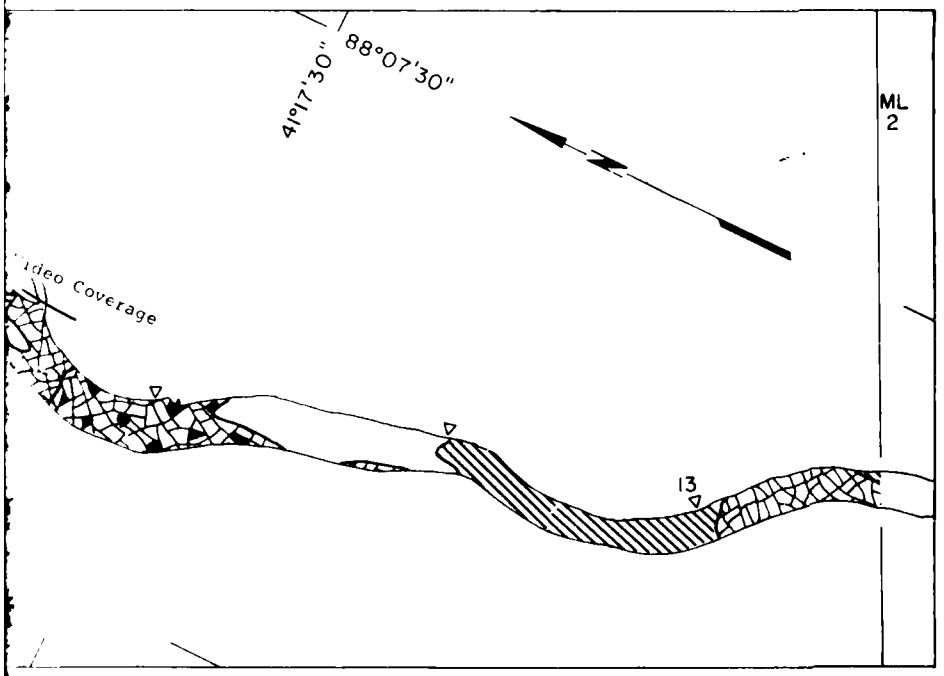
24 January 1986

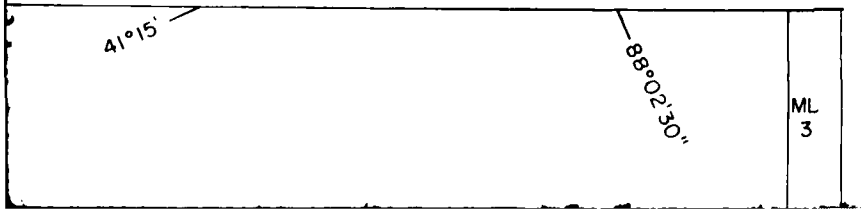


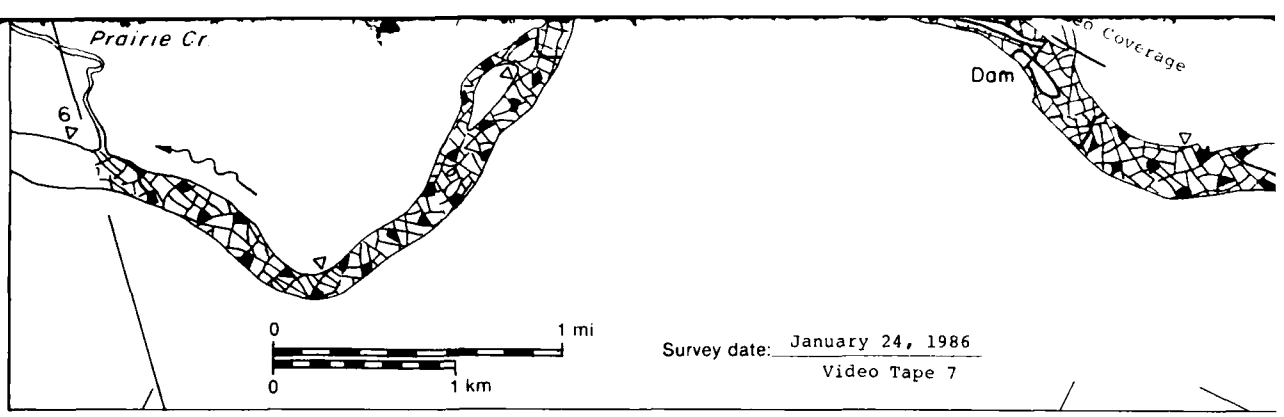


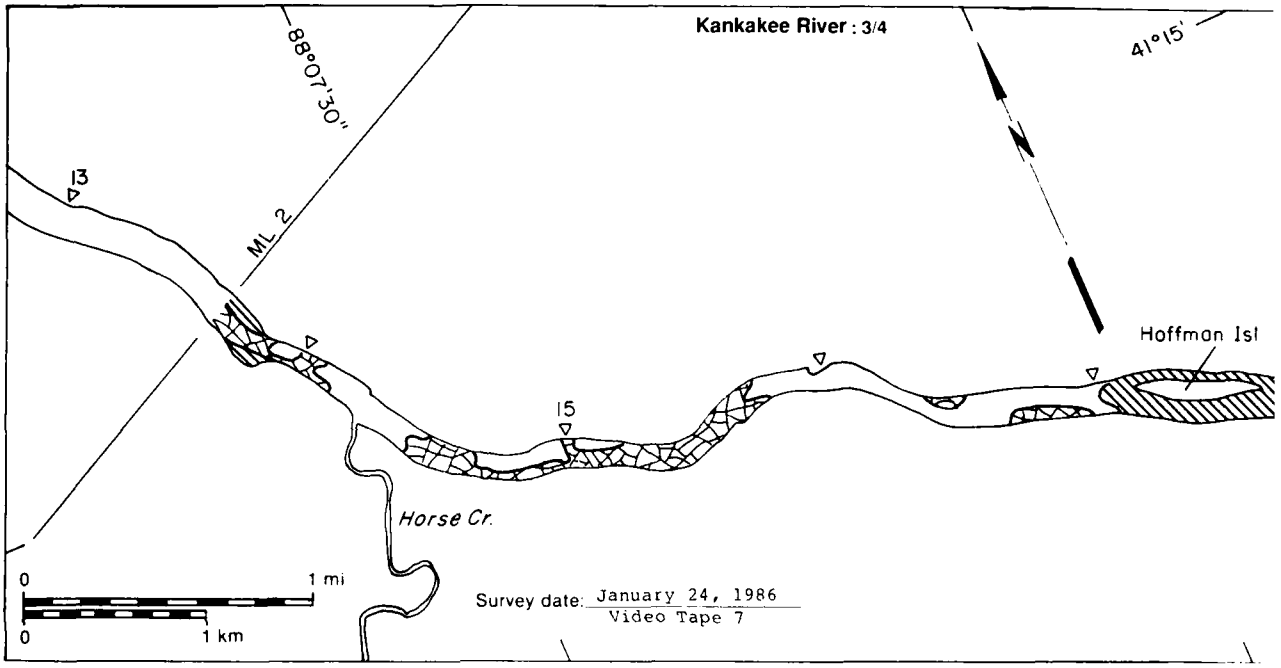


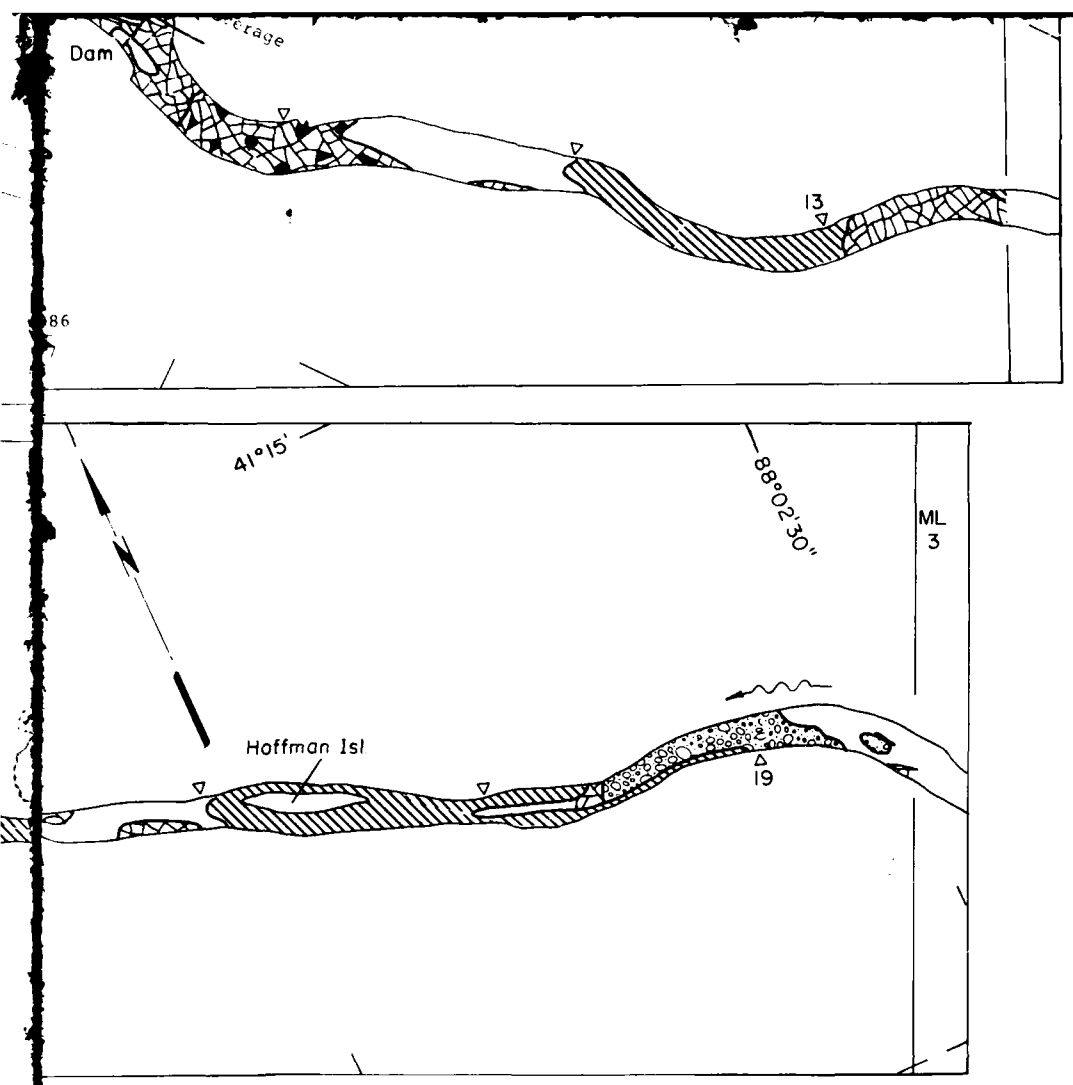

Kankakee River : 1/4
41°22'30"
88°12'30"
ML
1
5
41°20'
Video Coverage
Kankakee River
Survey date: January 24, 1986
Video Tape 7

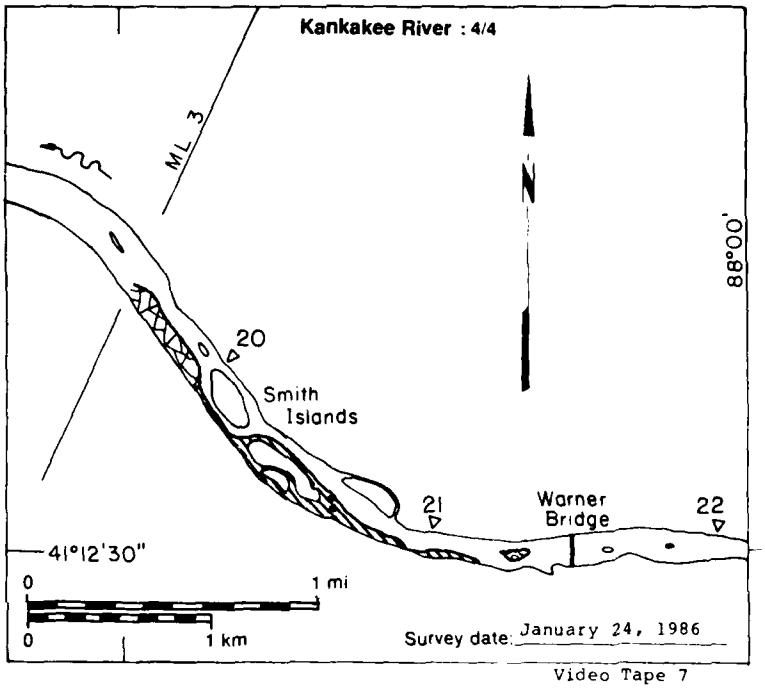

41°17'30"
88°07'30"
ML
2
Video Coverage
13


41°15'
88°02'30"
ML
3


Prairie Cr
6
Dam
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: January 24, 1986
Video Tape 7


Dam
13
41°15'
88°02'30"
ML
3
Hoffman Isl
19



Video Tape 7

Kankakee River

MAP UNITS

Open water

Solid ice cover

Solid ice cover
open-water are

Fragmented ice

Fragmented ice
with open-wate

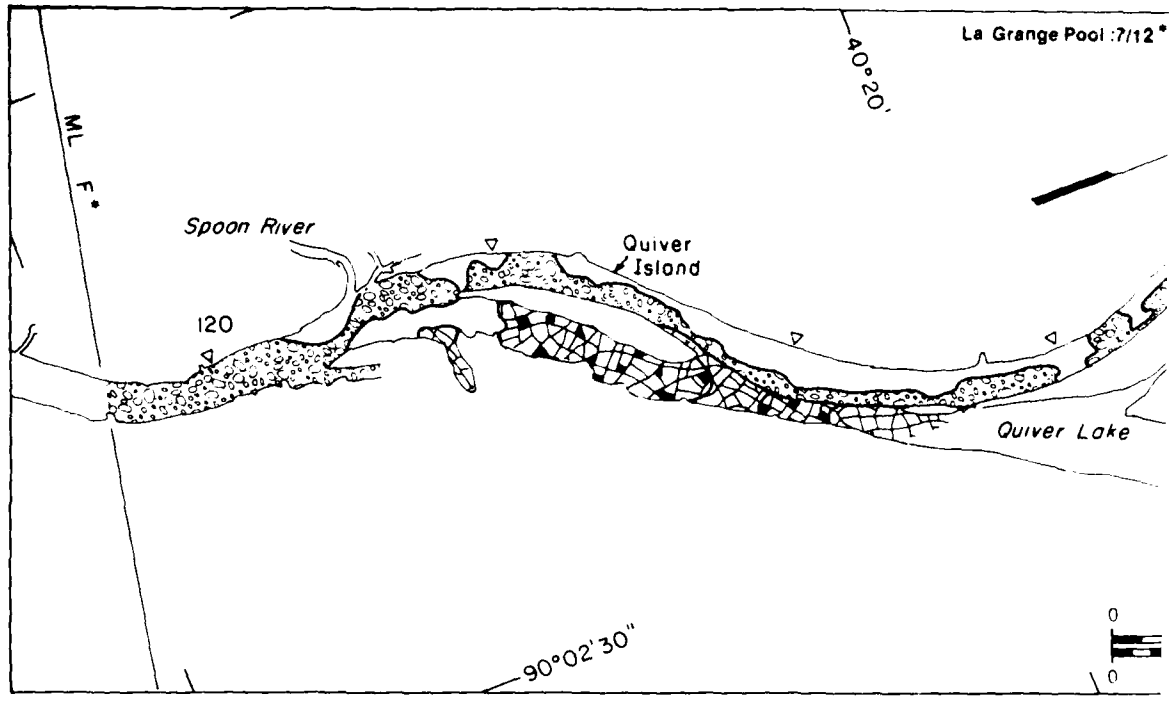
Ice floes or fraz
and pans

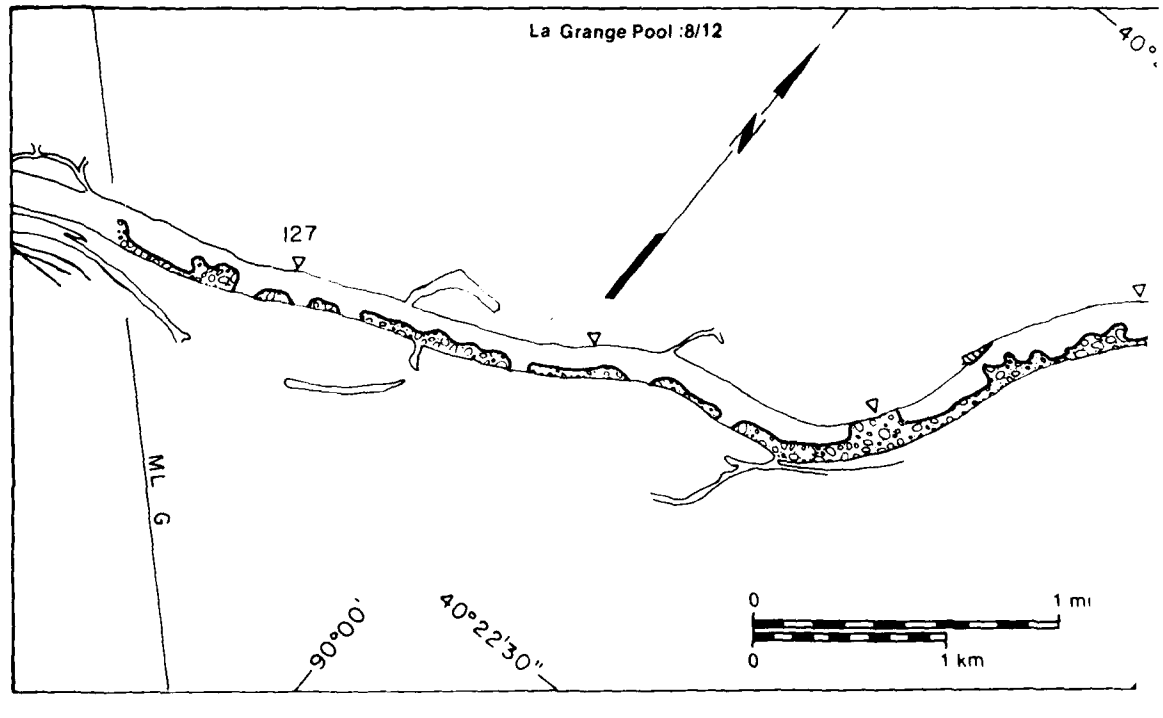
Total area (

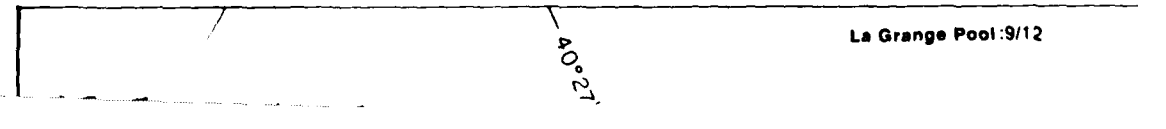
24 January 1986

Kankakee River

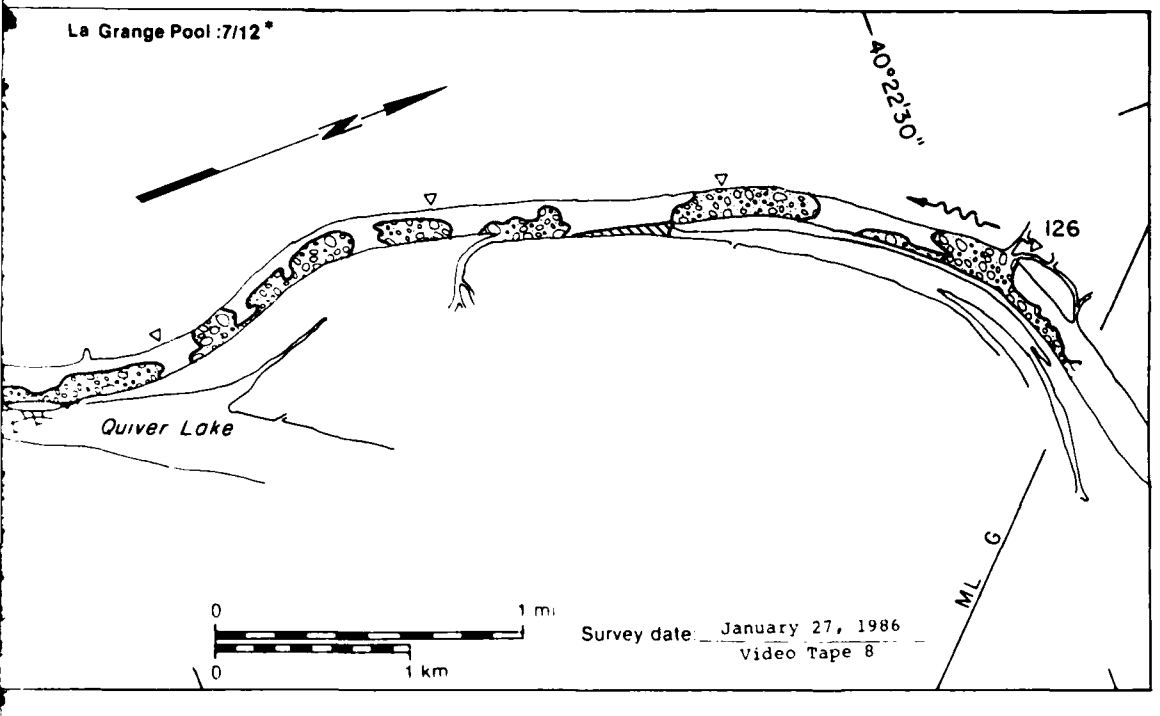
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.42	NA
Solid ice cover	1.54	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	1.81	NA
Fragmented ice cover with open-water areas	2.21	80
Ice floes or frazil slush and pans	0.18	1
Total area ($m^2 \times 10^6$)	7.30*	* Includes 0.14 x 10^6 m^2 of no video coverage

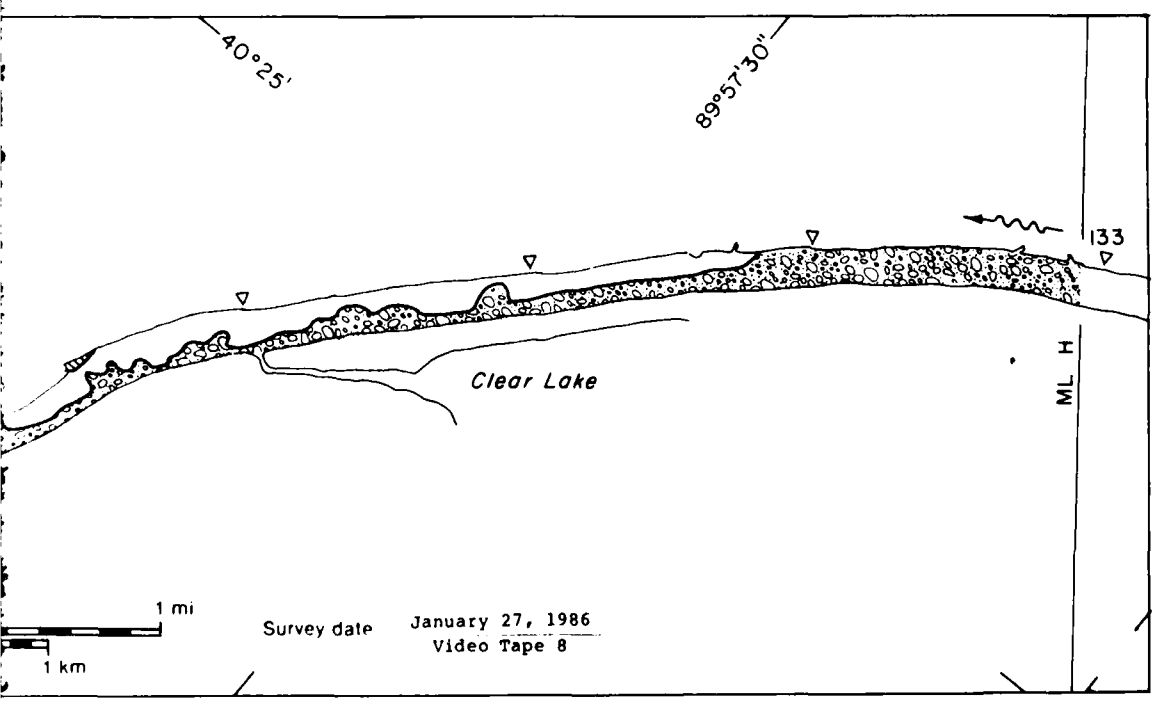

La Grange Pool :7/12
40°20'
ML F
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0

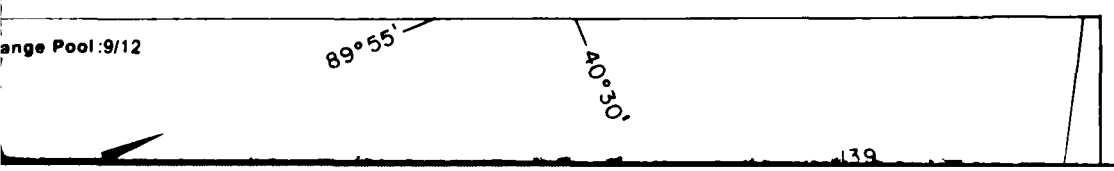

La Grange Pool :8/12
40°
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km

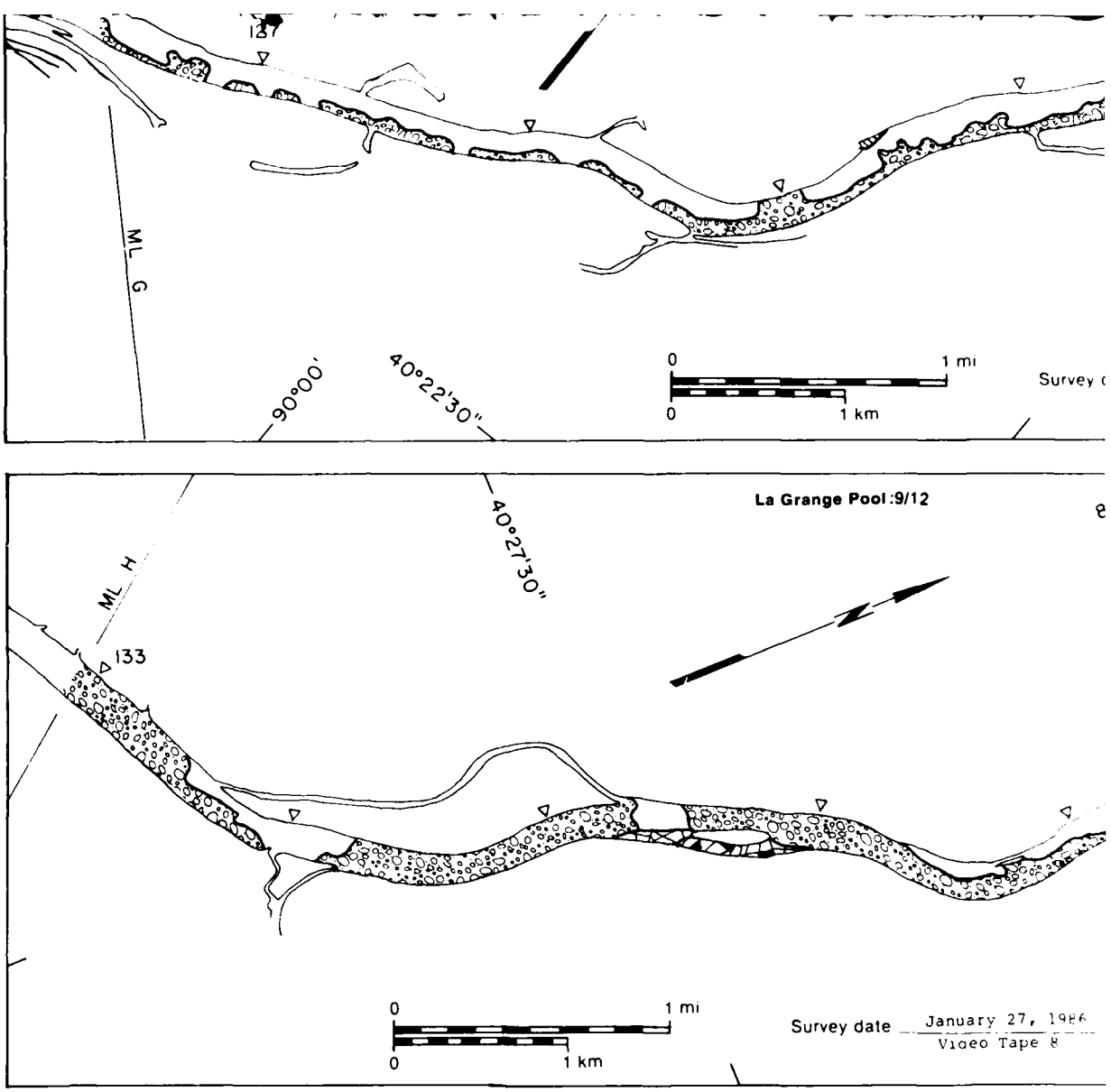

La Grange Pool :9/12
40°27

27 January 1986

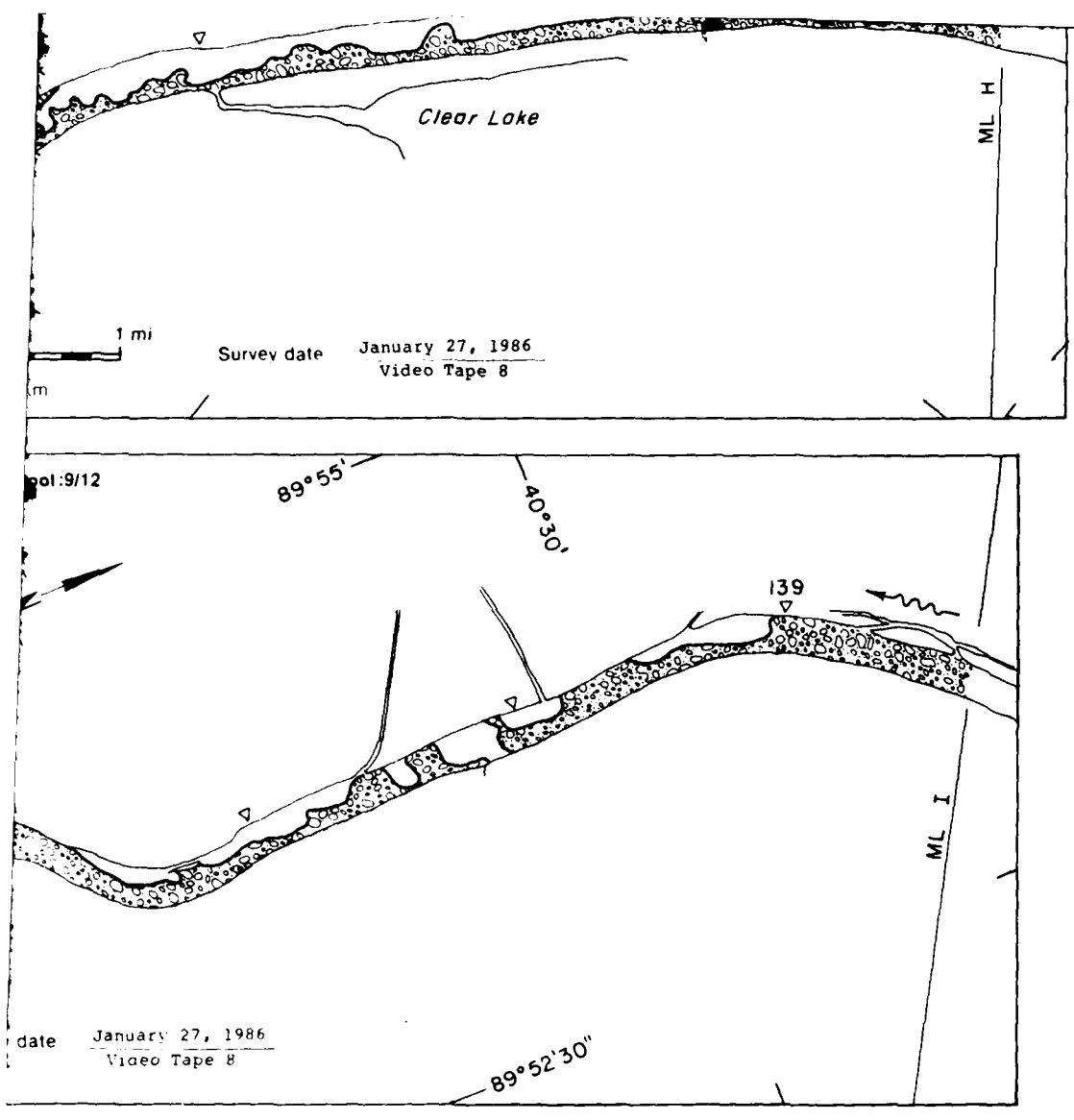




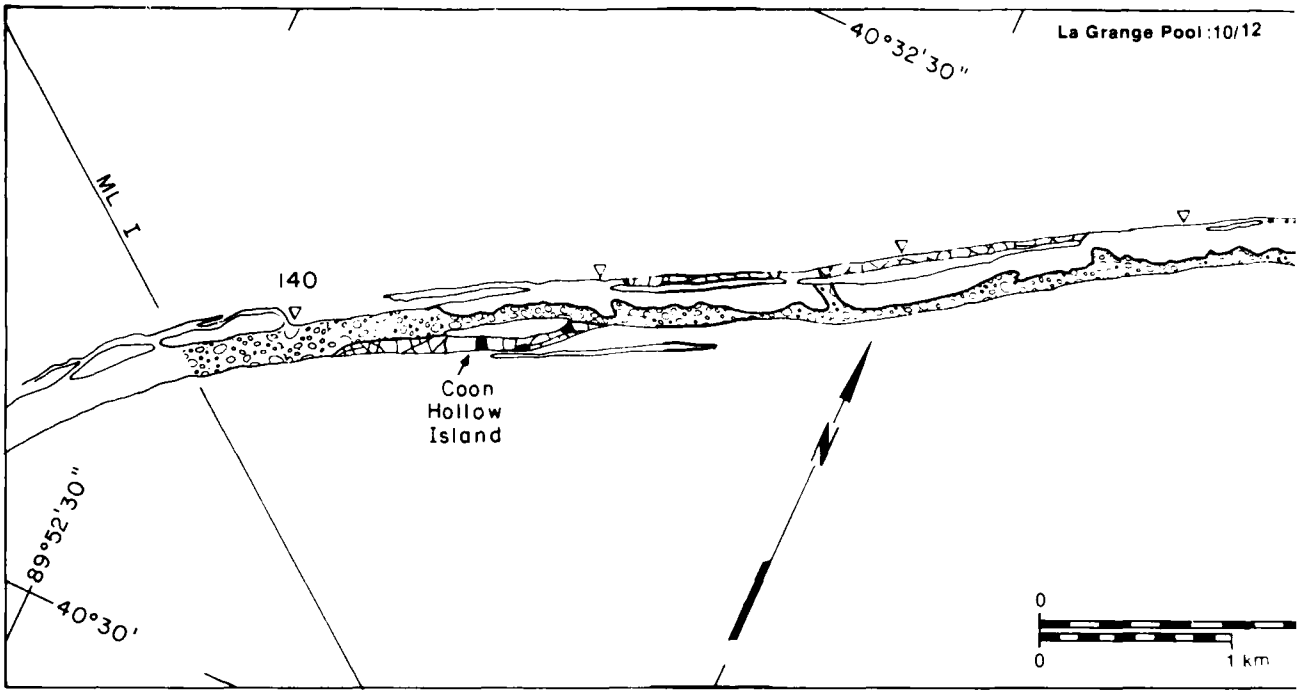


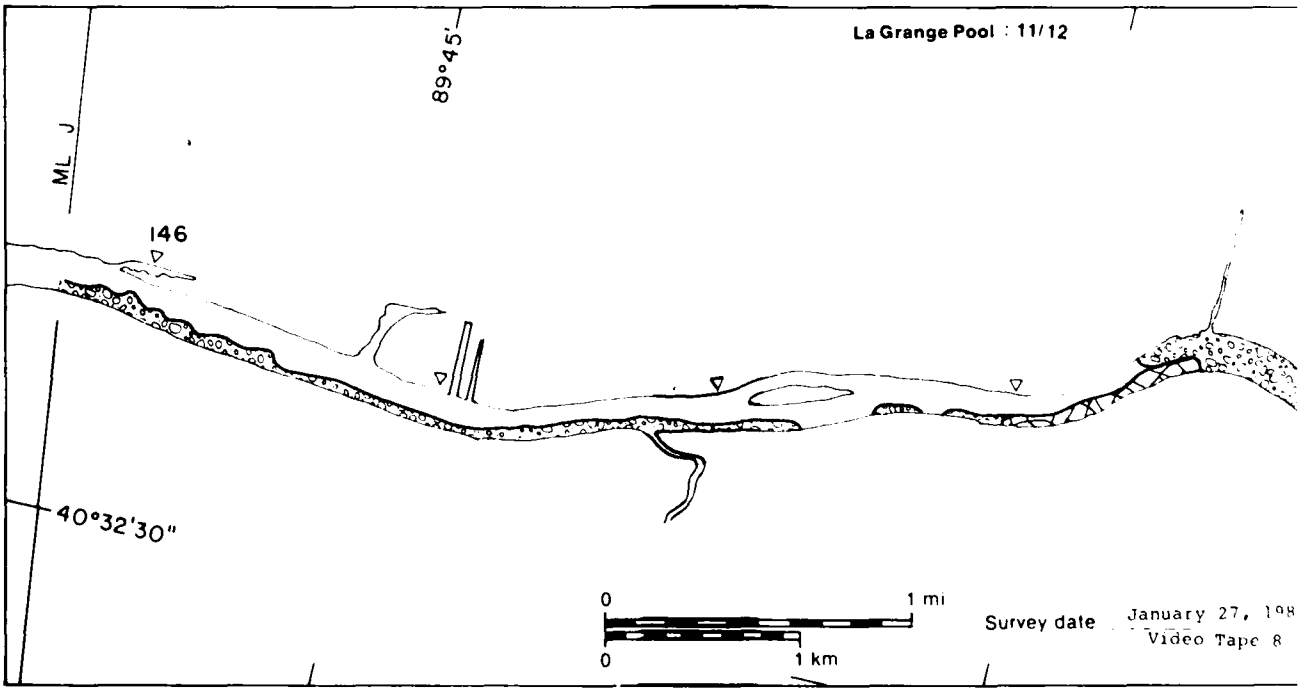


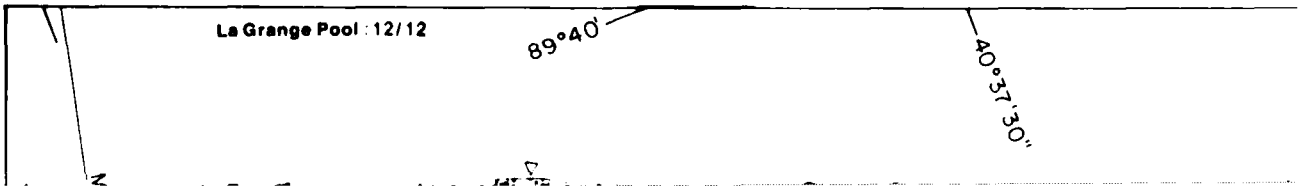
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

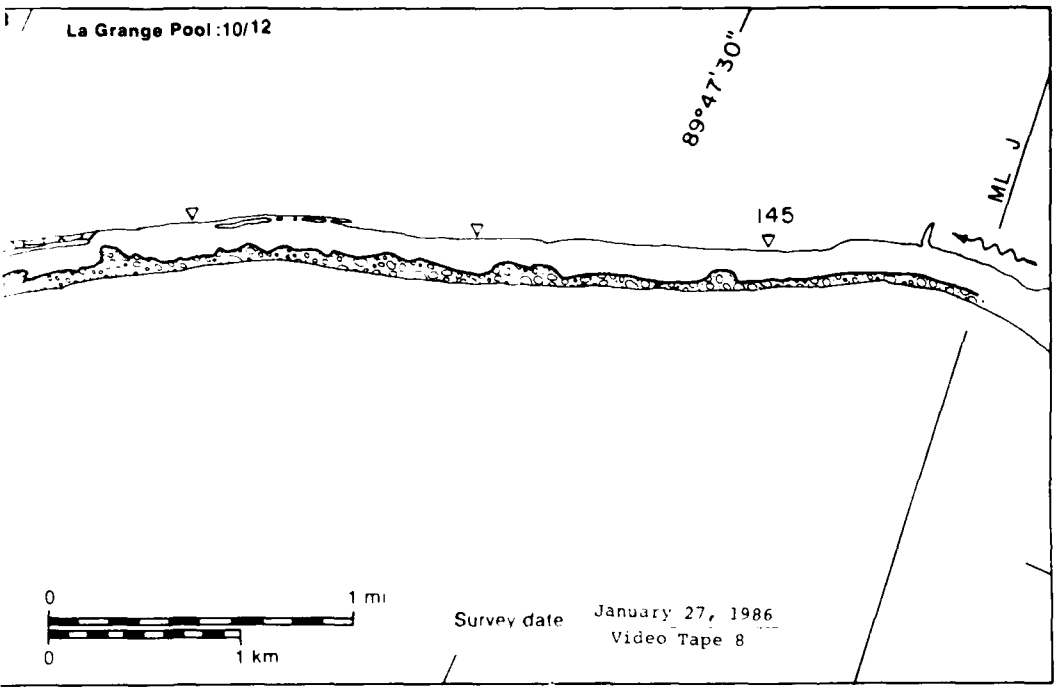

Clear Lake
ML H
1 mi
Survey date January 27, 1986
Video Tape 8
89°55'
40°30'
139
ML I
89°52'30"

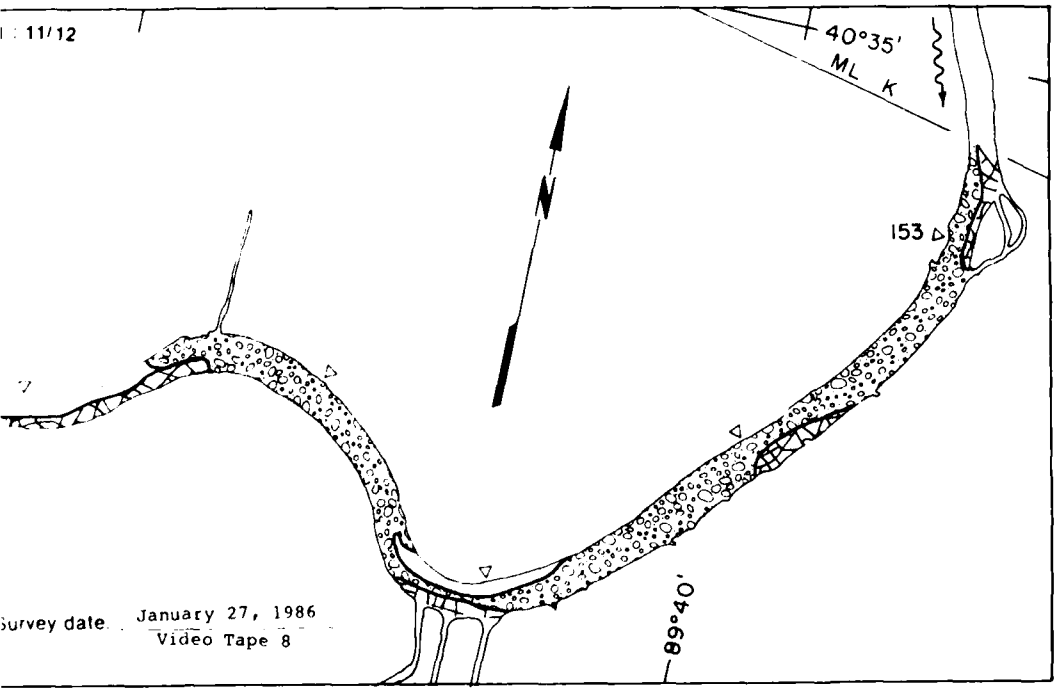
27 January 1986







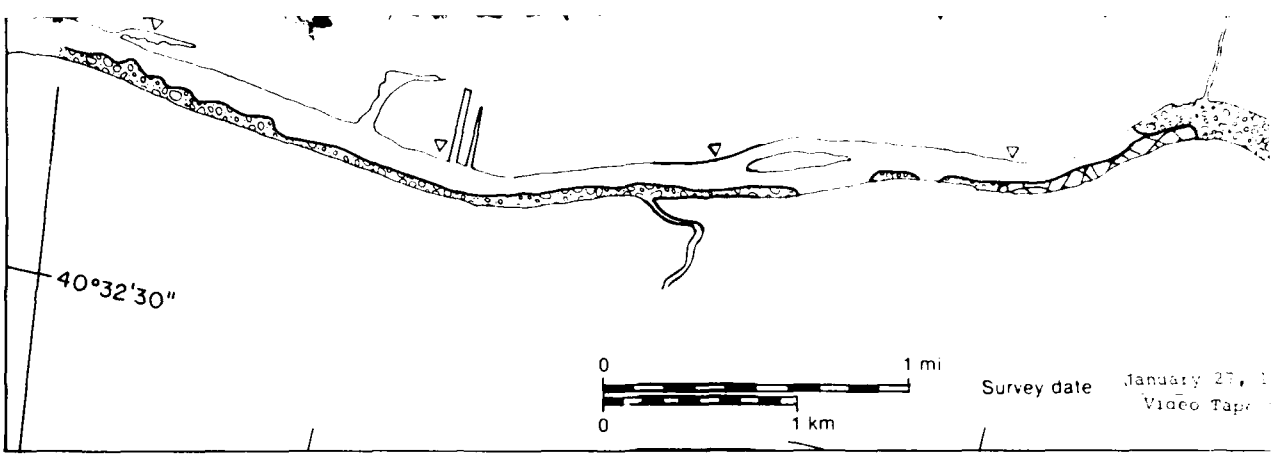


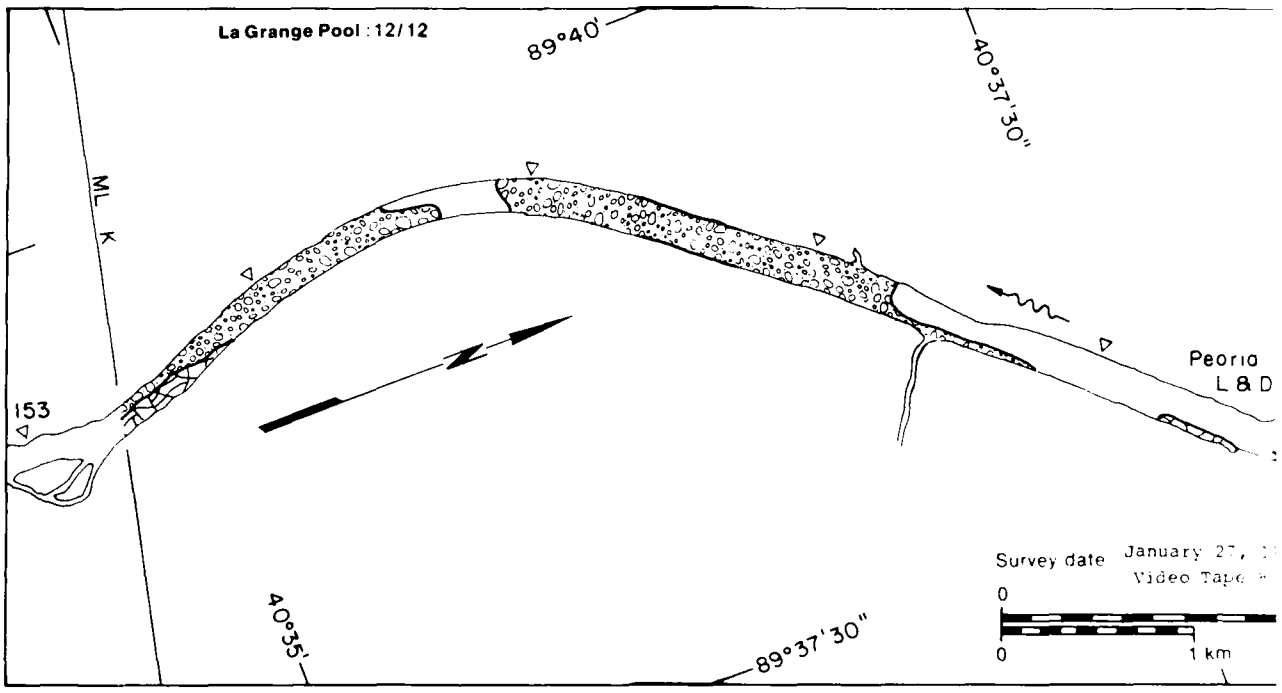


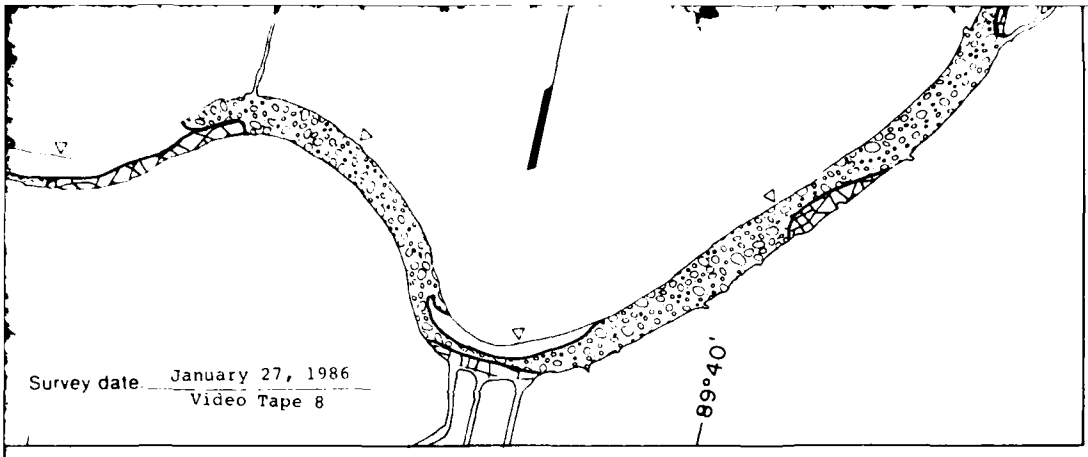
La Grange Pool

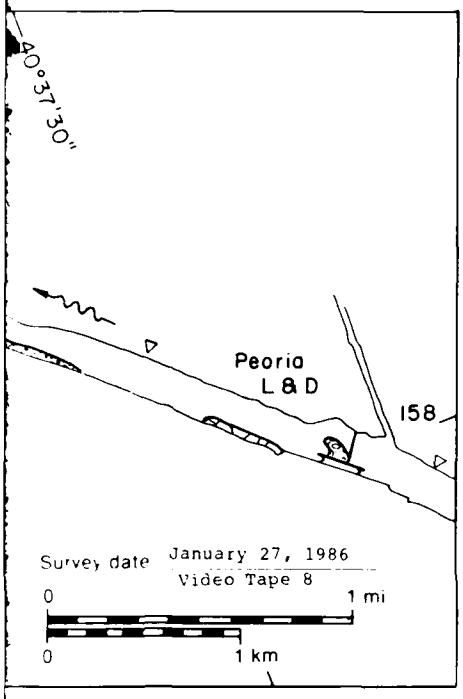
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


40°32'30"
0
1 mi
0
1 km
Survey date


La Grange Pool : 12/12
89°40'
40°37'30"
ML
K
153
Peoria
L & D
Survey date
0
1 km
40°35'
89°37'30"

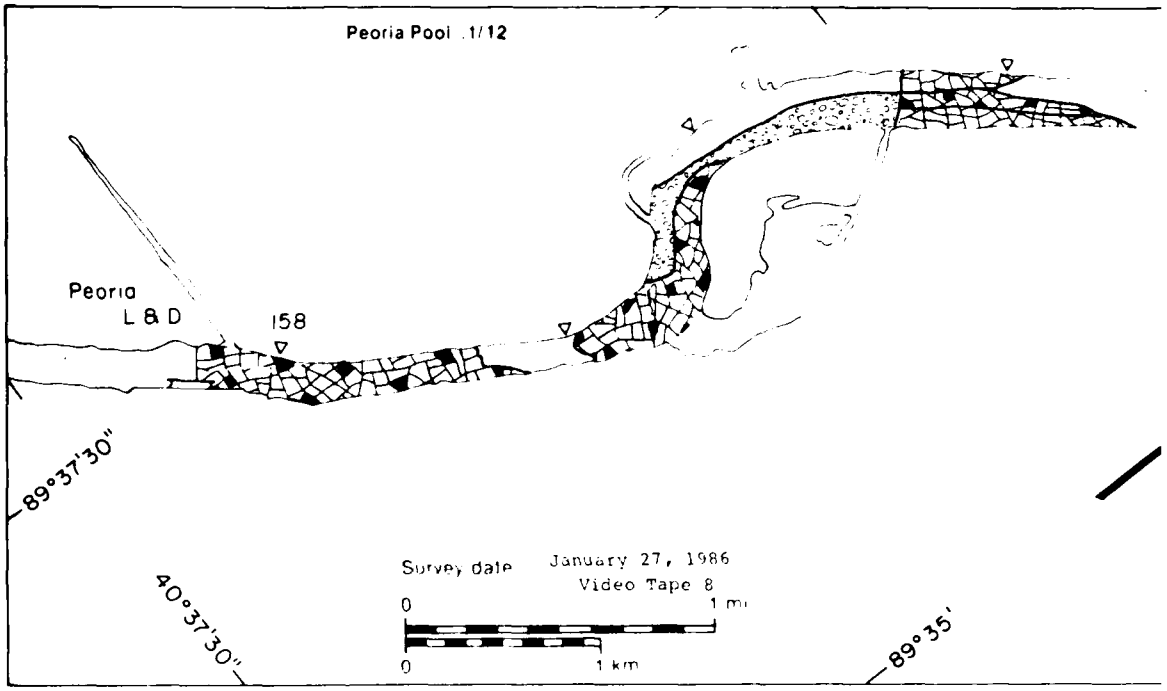


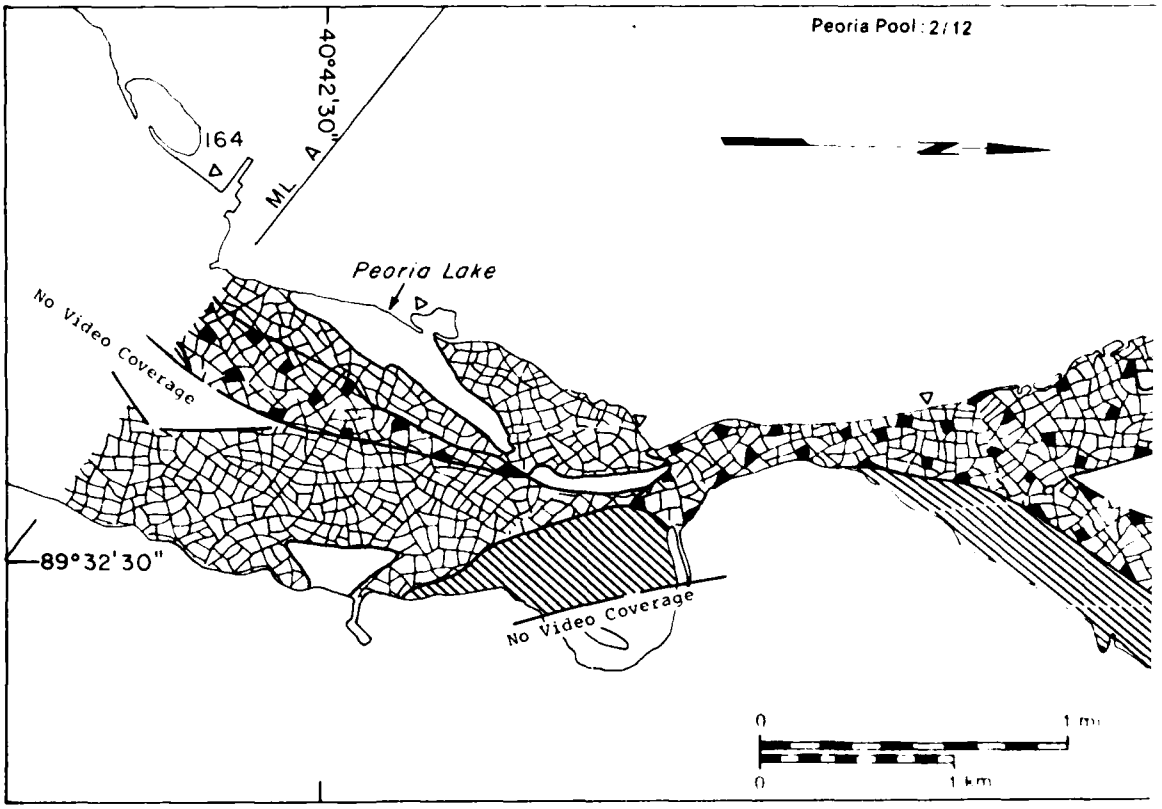


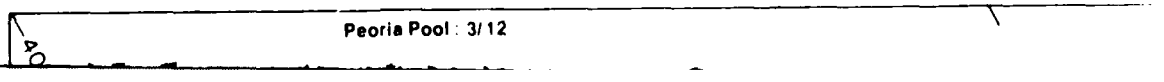
La Grange Pool

MAP UNITS

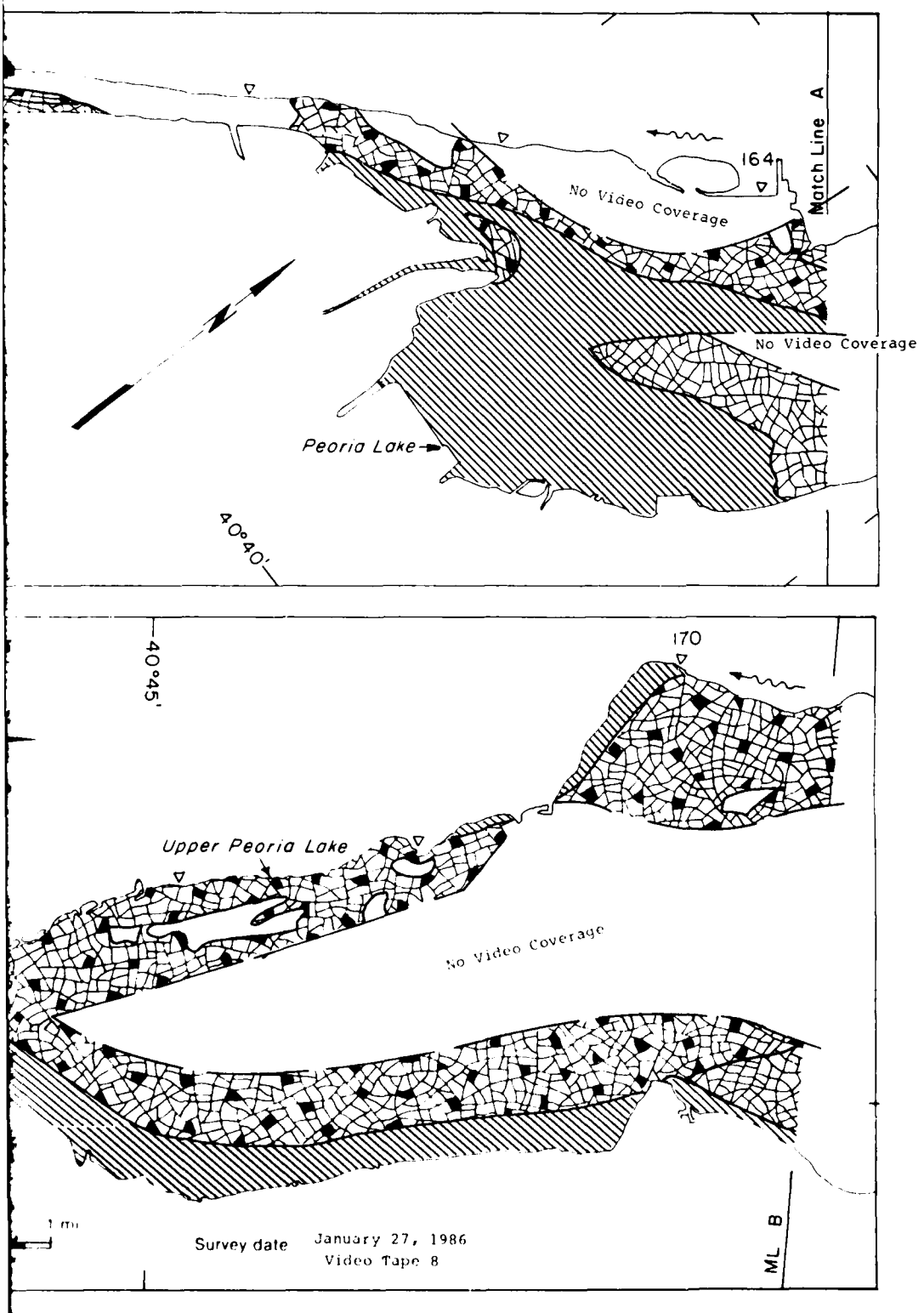
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.88	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.73	NA
Fragmented ice cover with open-water areas	0.41	80
Ice floes or frazil slush and pans	6.67	30
Total area ($m^2 \times 10^6$)	11.71	

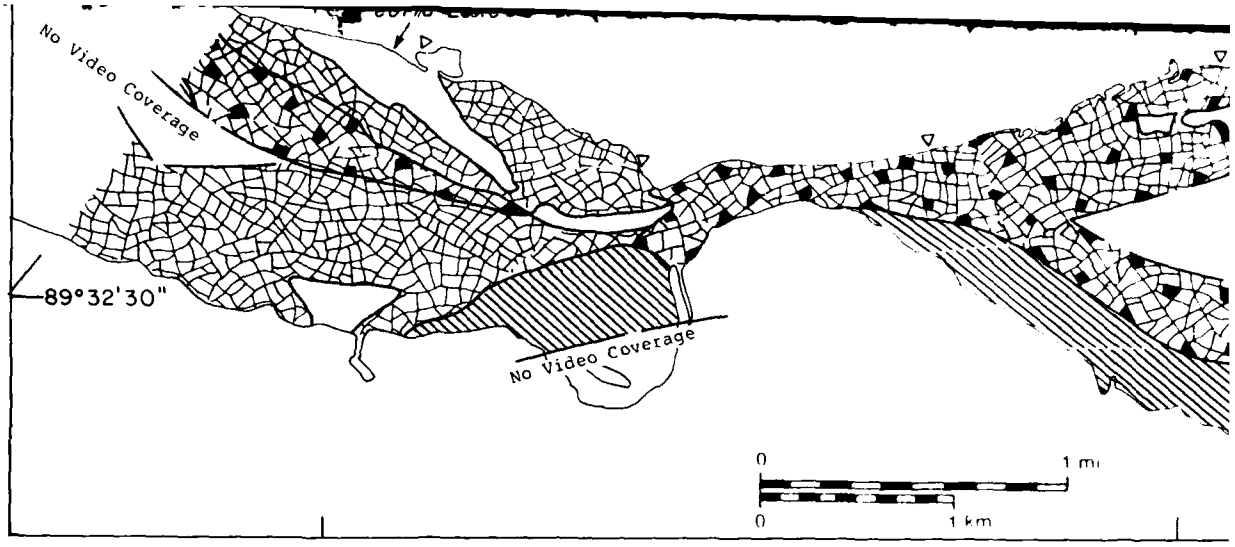

Peoria Pool : 1/12
Peoria
L & D
158
89°37'30"
40°37'30"
89°35'
Survey date January 27, 1986
Video Tape 8
0
1 mi
0
1 km

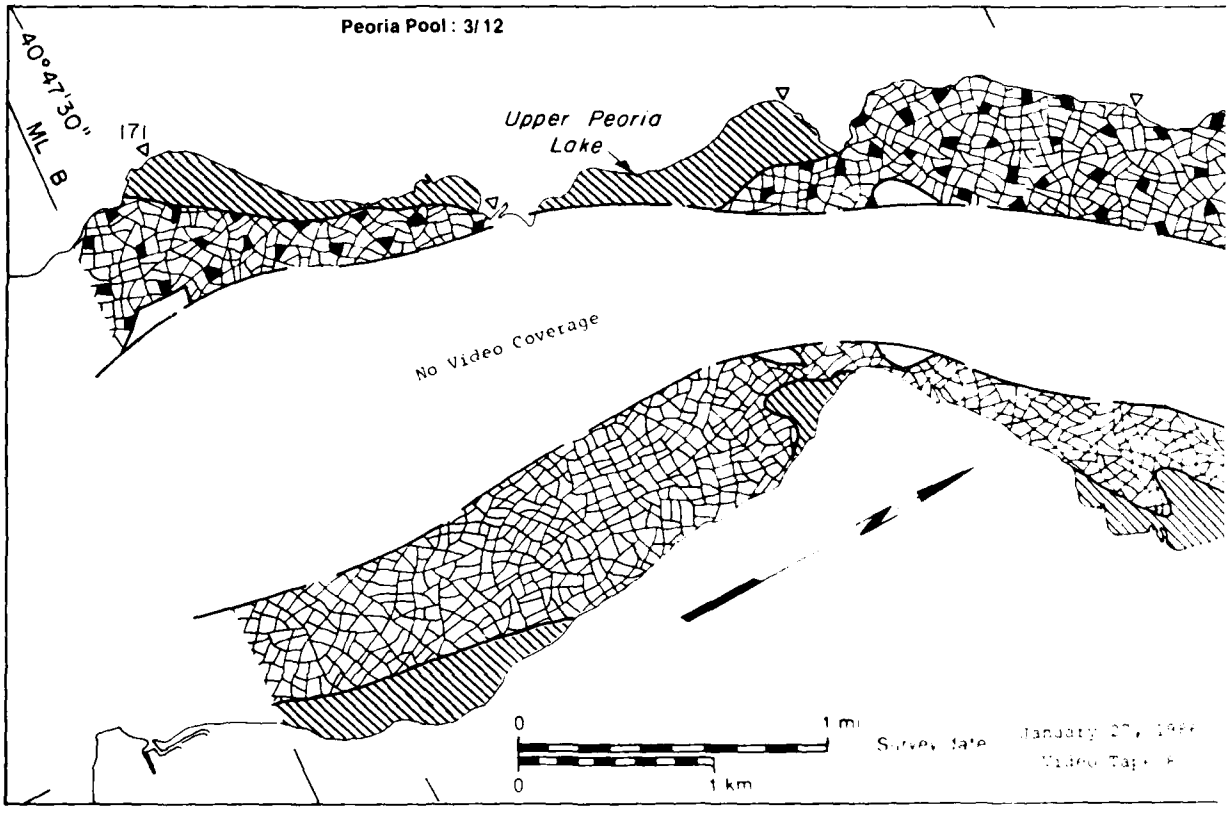

Peoria Pool : 2/12
40°42'30"
164
ML A
Peoria Lake
No Video Coverage
89°32'30"
No Video Coverage
0
1 mi
0
1 km

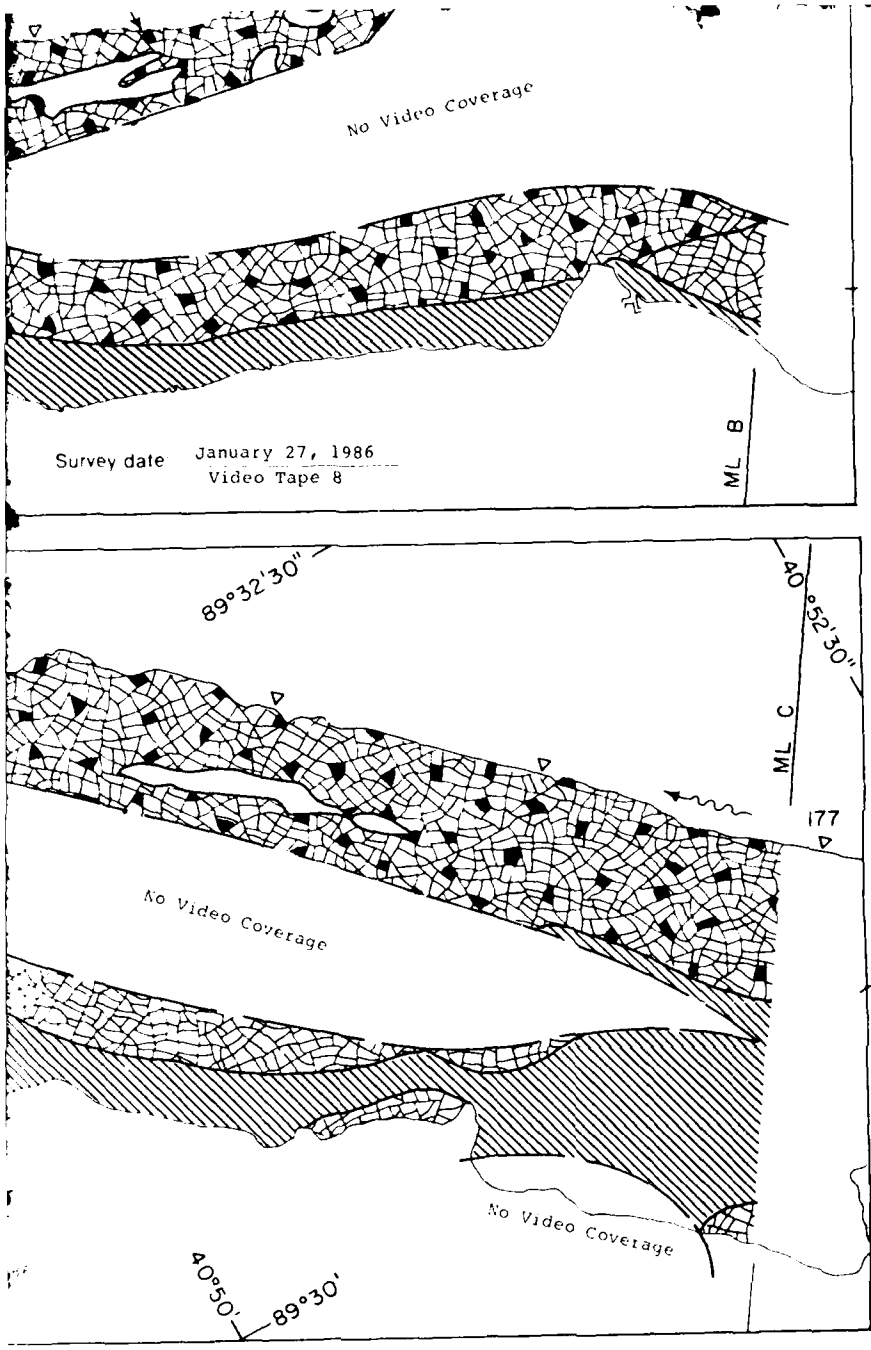

Peoria Pool : 3/12

27 January 1986

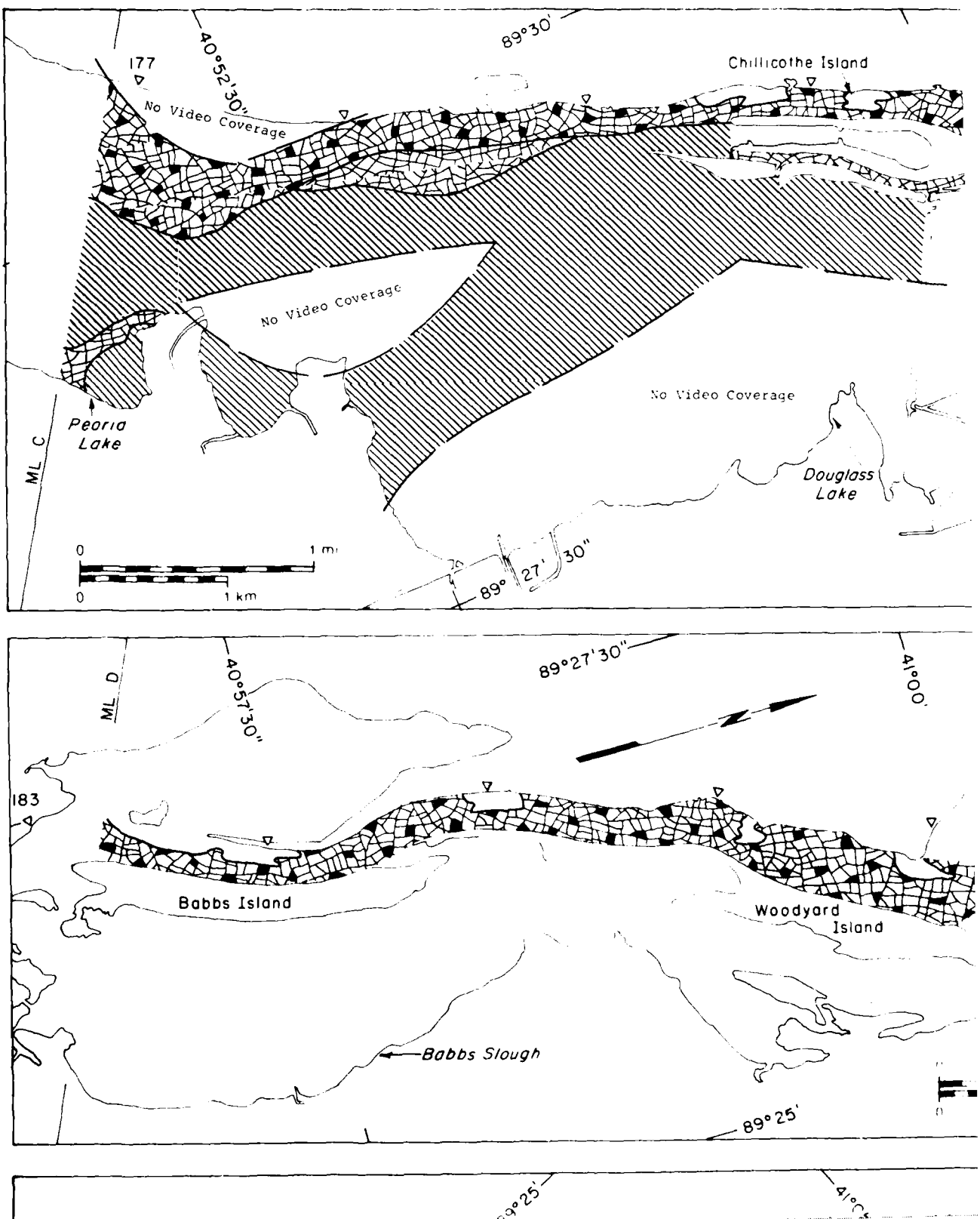


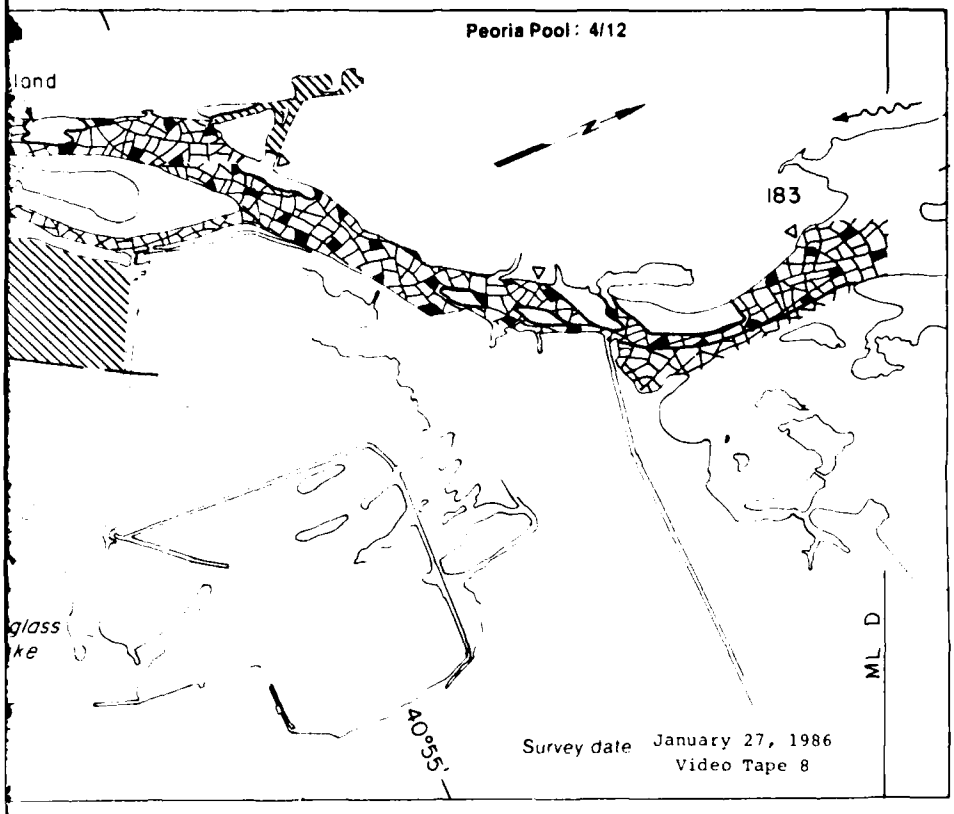

No Video Coverage
89°32'30"
No Video Coverage
0
1 mi
0
1 km

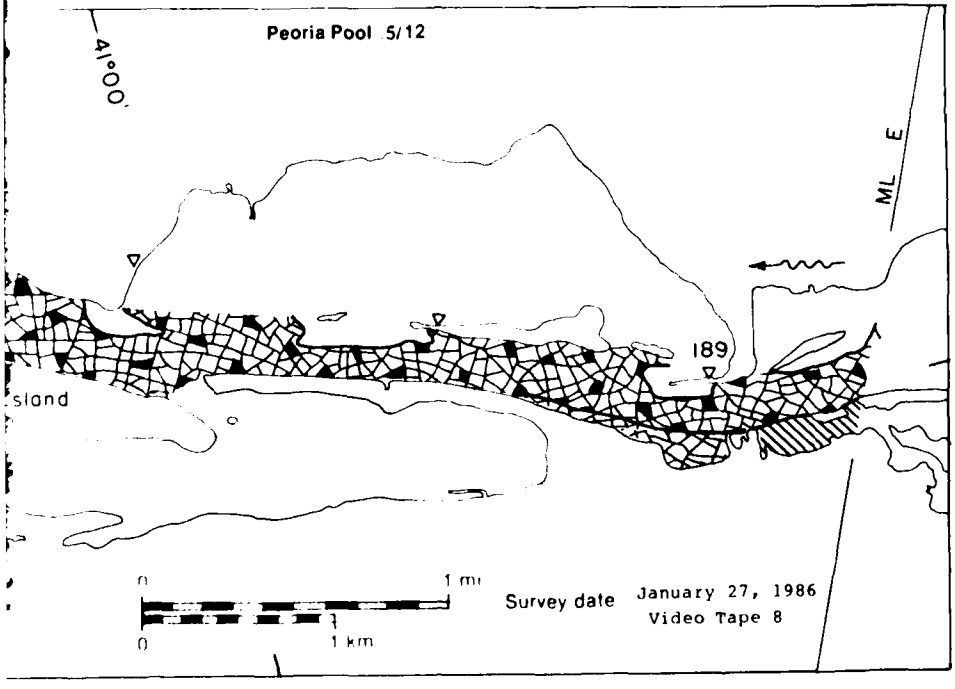

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
0
1 mi
0
1 km


No Video Coverage
ML B
Survey date January 27, 1986
Video Tape 8
89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
40°50'
89°30'

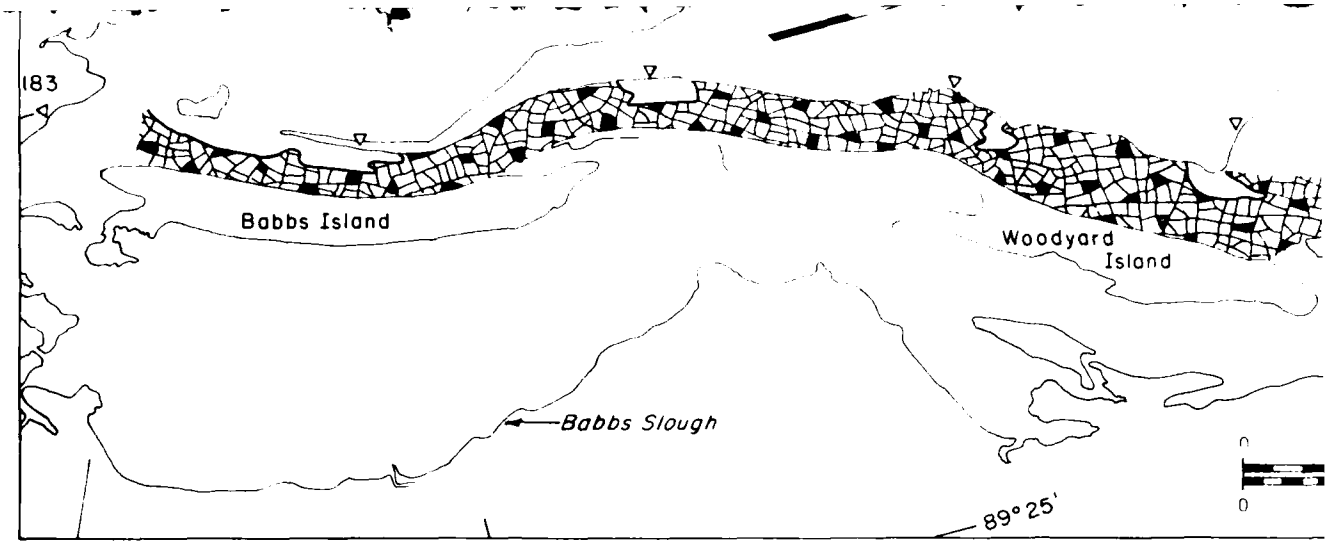
27 January 1986

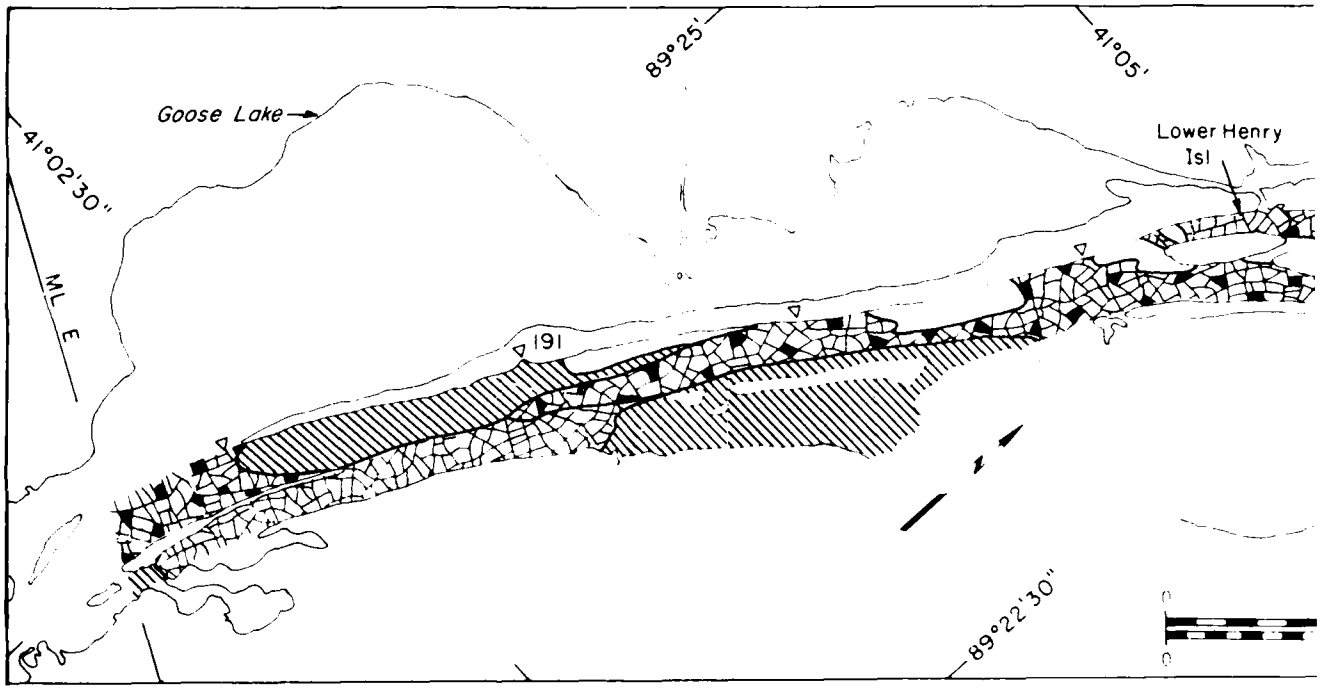


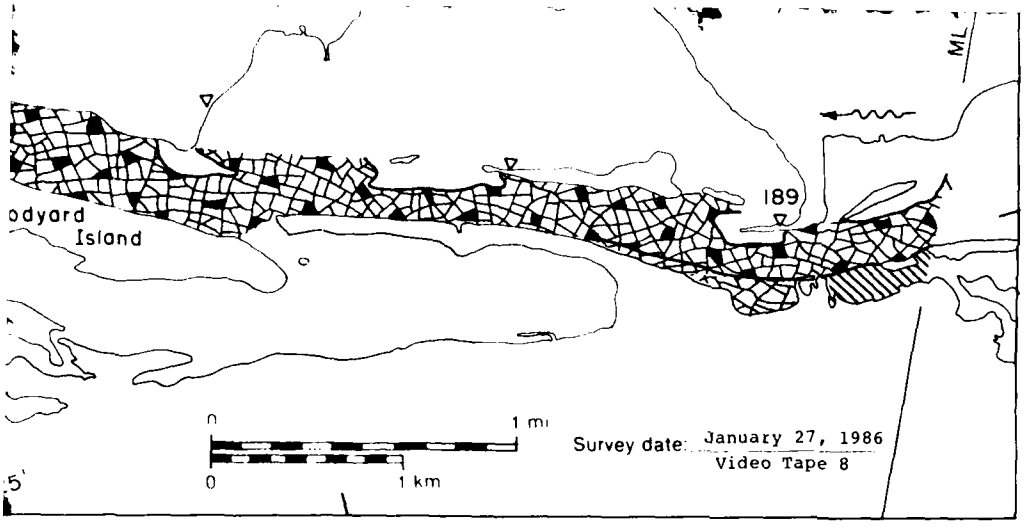

Peoria Pool : 4/12
183
ML D
40°55'
Survey date January 27, 1986
Video Tape 8

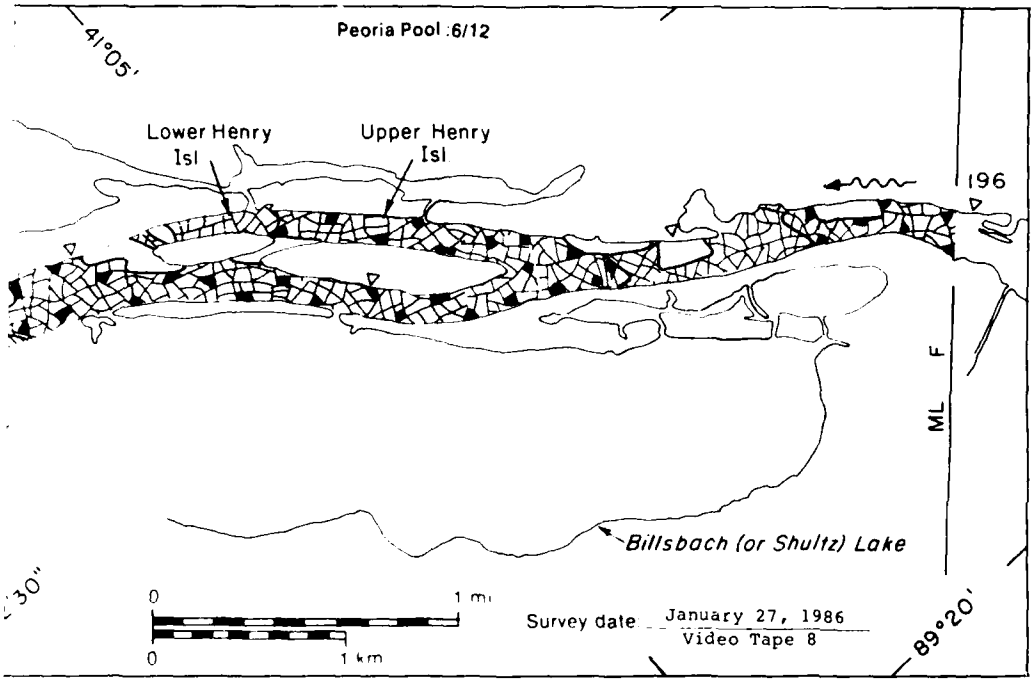

Peoria Pool 5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date January 27, 1986
Video Tape 8

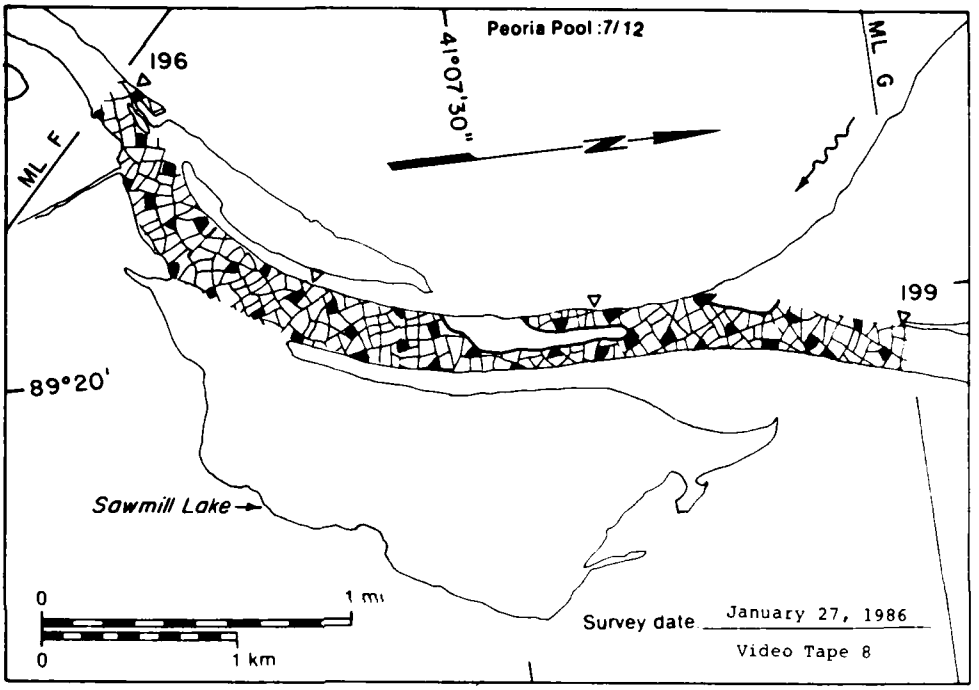
Peoria Pool 6/12

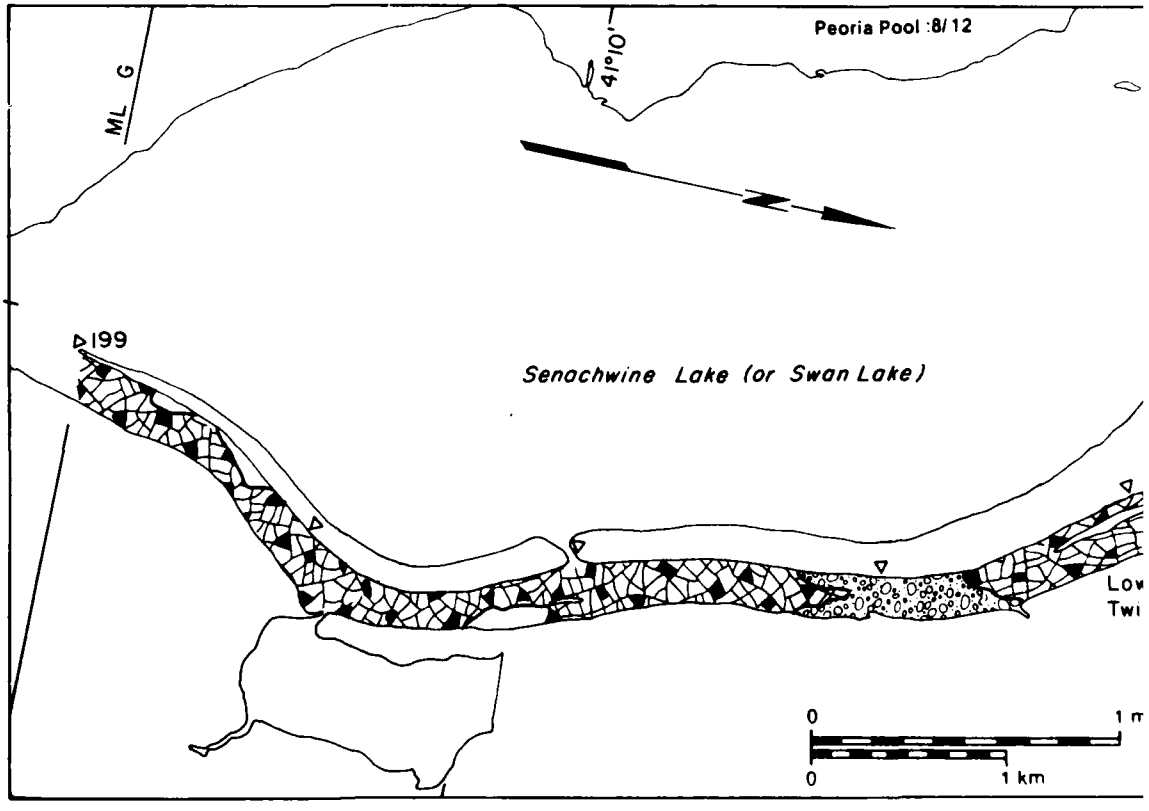

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'


89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
89°22'30"


ML
odyard
Island
189
0
1 mi
0
1 km
Survey date: January 27, 1986
Video Tape 8
.5'

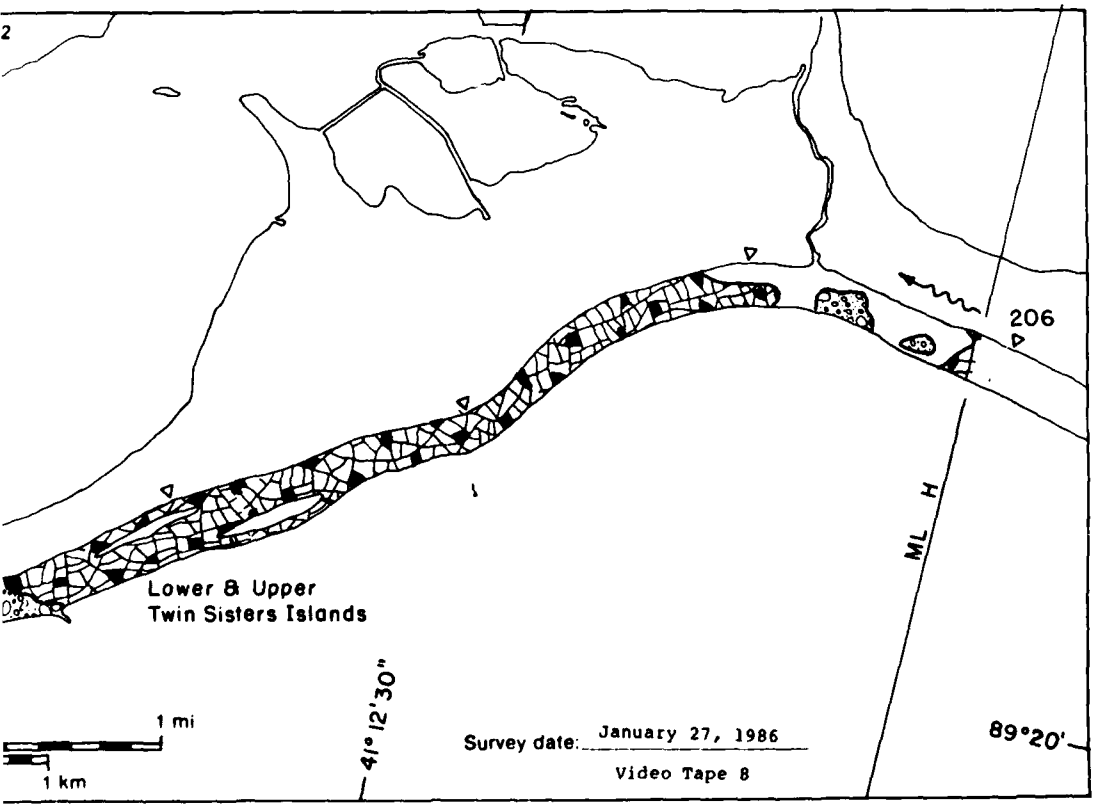

Peoria Pool :6/12
41°05'
Lower Henry
Isl
Upper Henry
Isl
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date January 27, 1986
Video Tape 8
89°20'

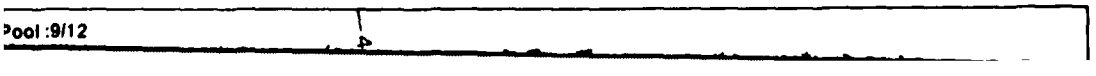

Peoria Pool :7/12
196
41°07'30"
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date January 27, 1986
Video Tape 8

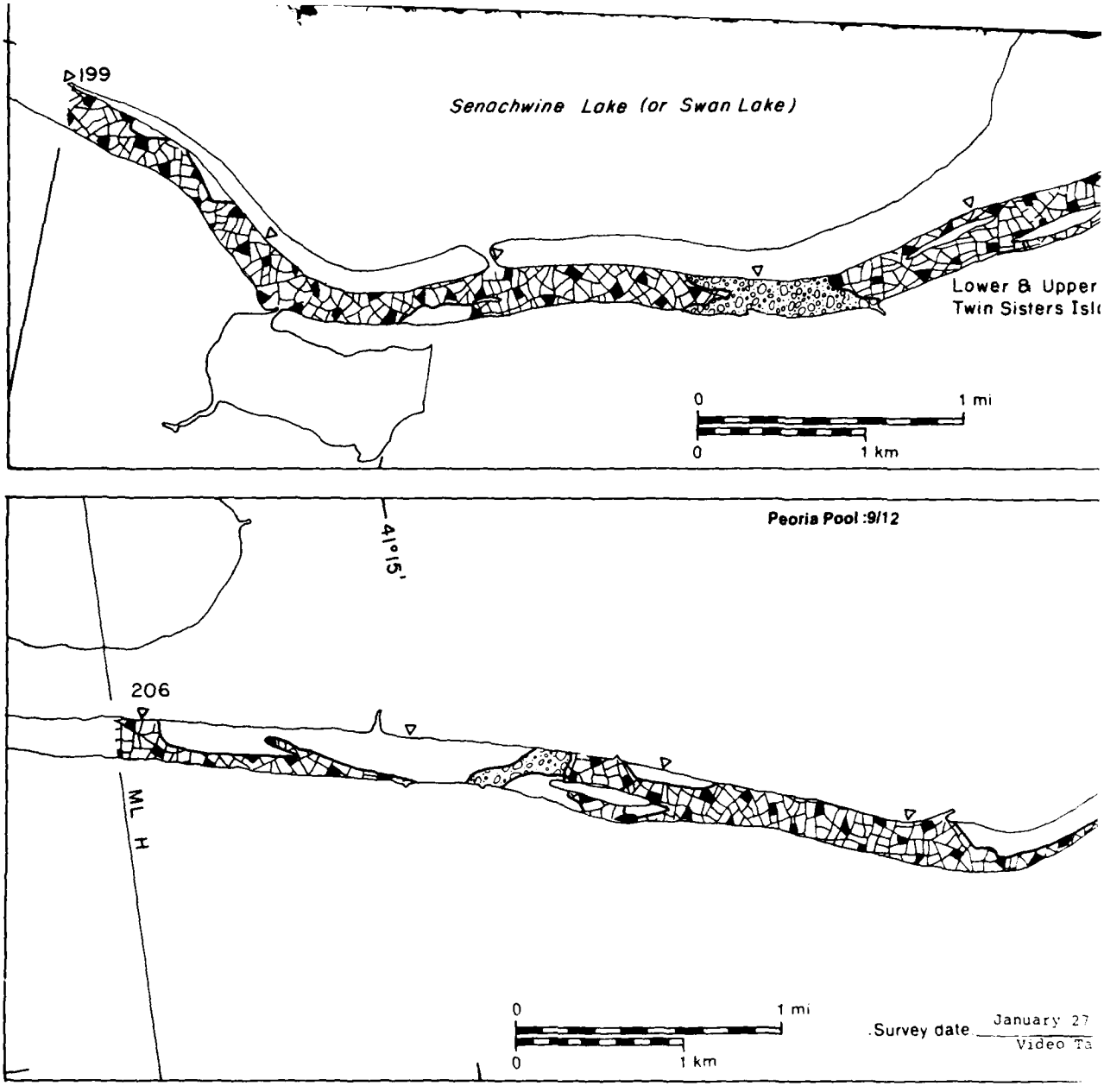

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
0
1 km

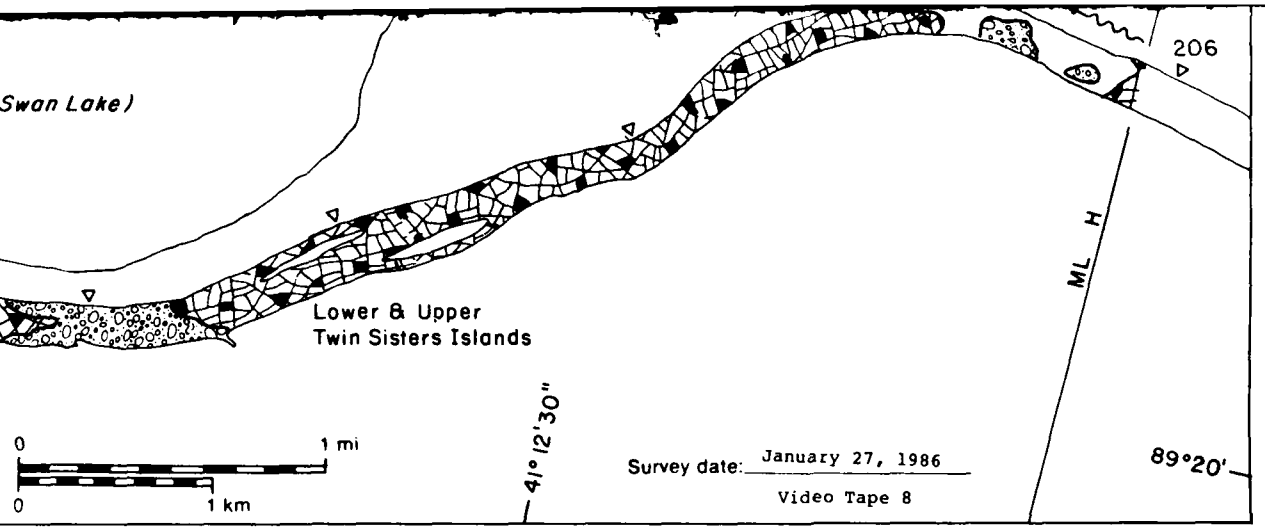
Peoria Pool :9/12
41°15

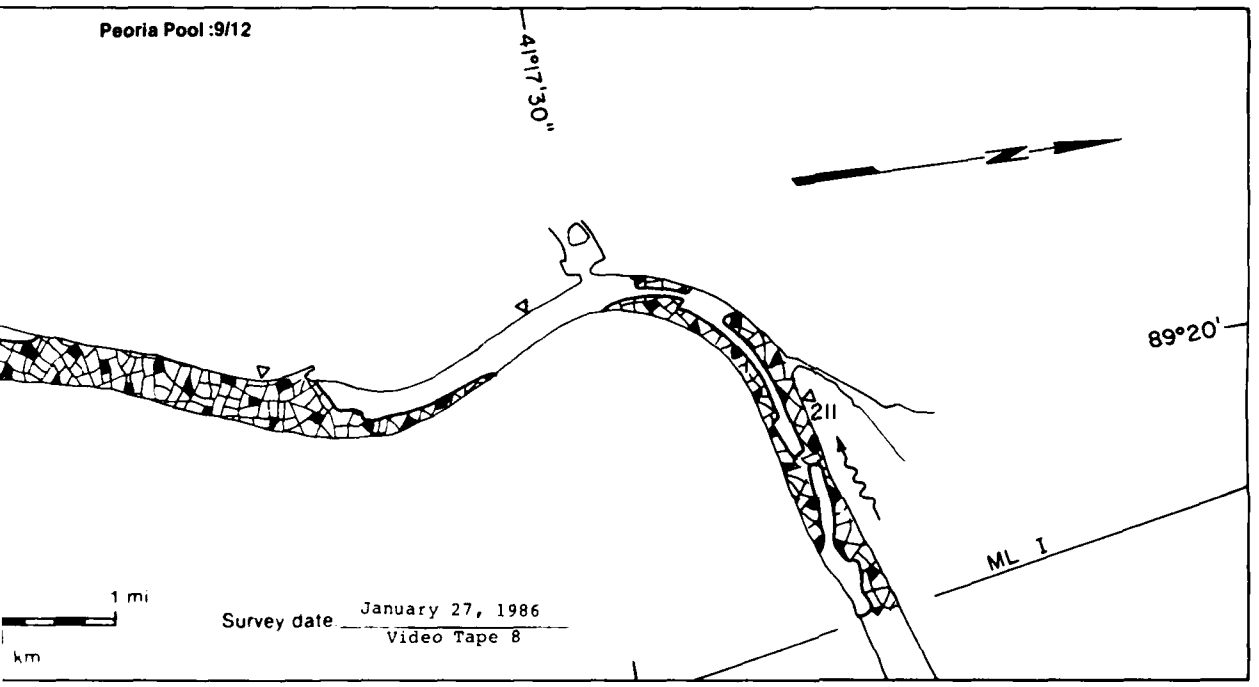
27 January 1986



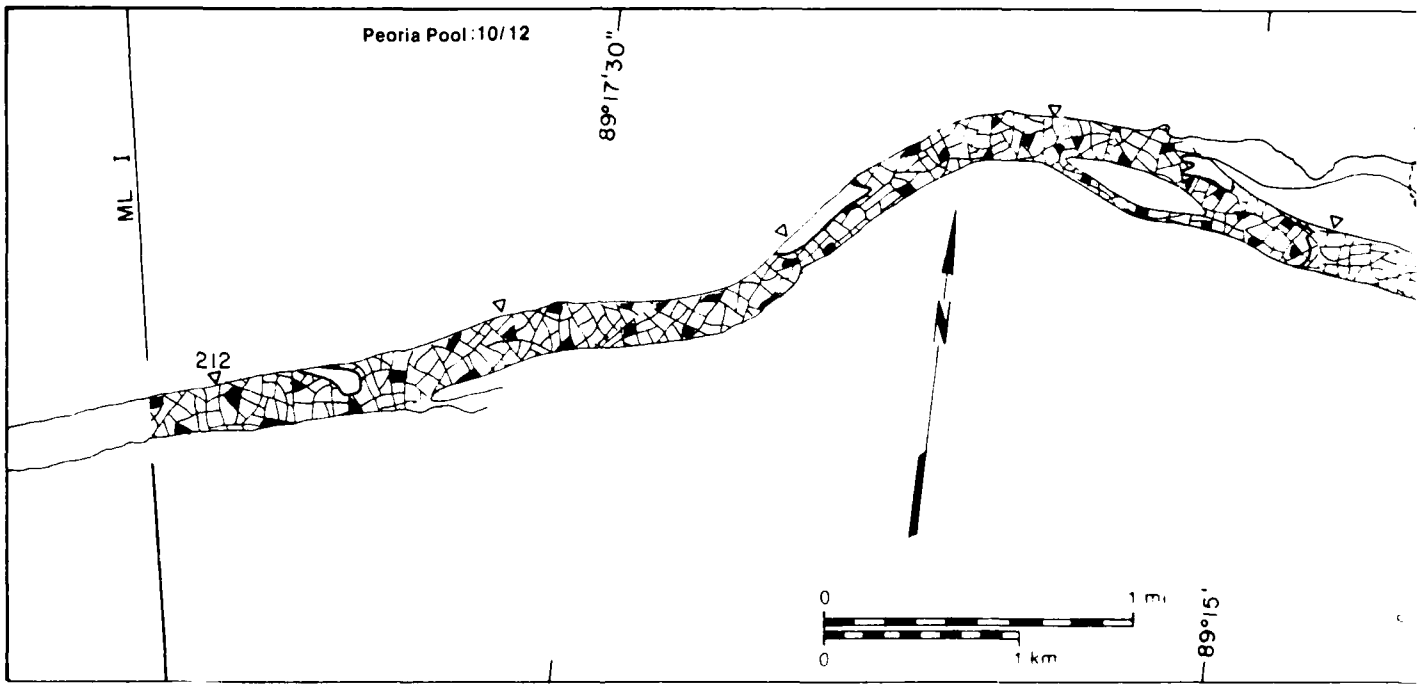


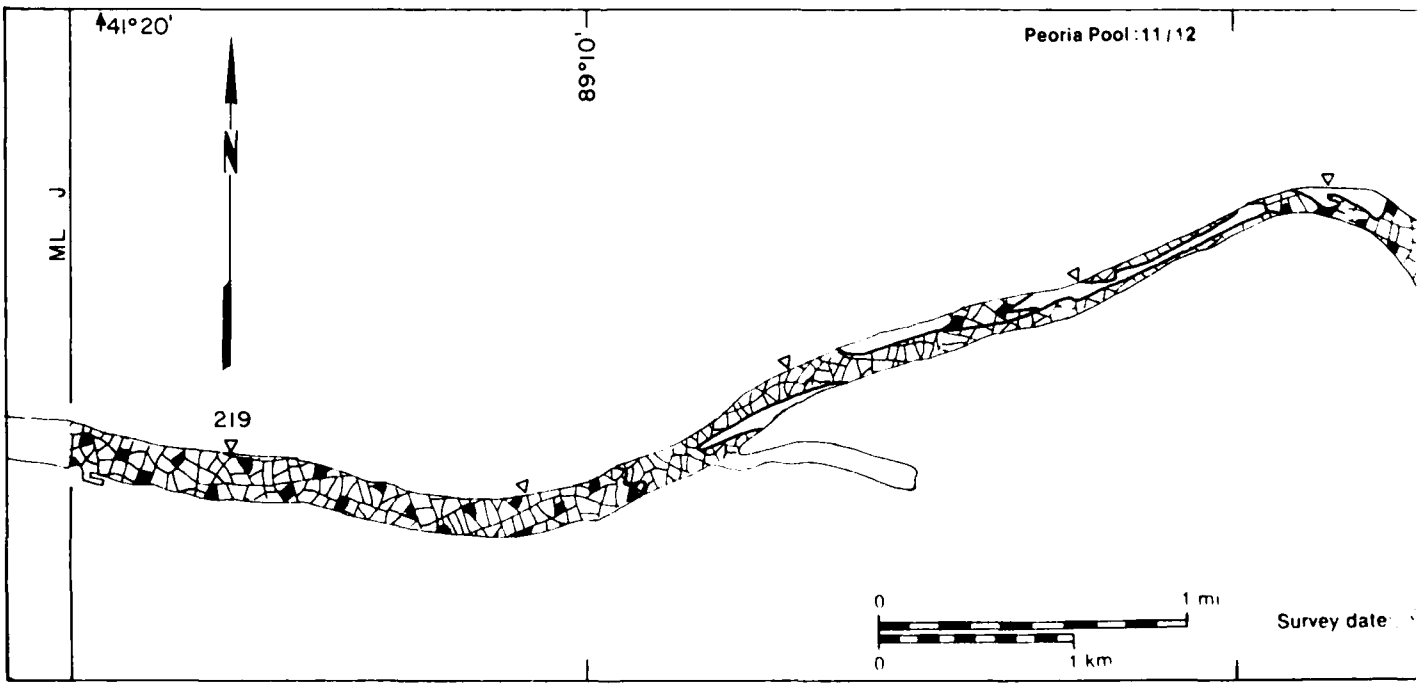

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Isl
0
1 mi
0
1 km
Peoria Pool :9/12
41°15'
206
ML H
0
1 mi
0
1 km
Survey date January 27
Video Ta

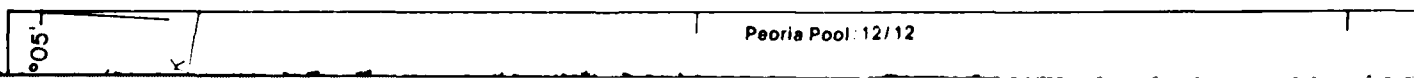

(Swan Lake)
206
ML H
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41° 12'30"
Survey date: January 27, 1986
Video Tape 8
89°20'

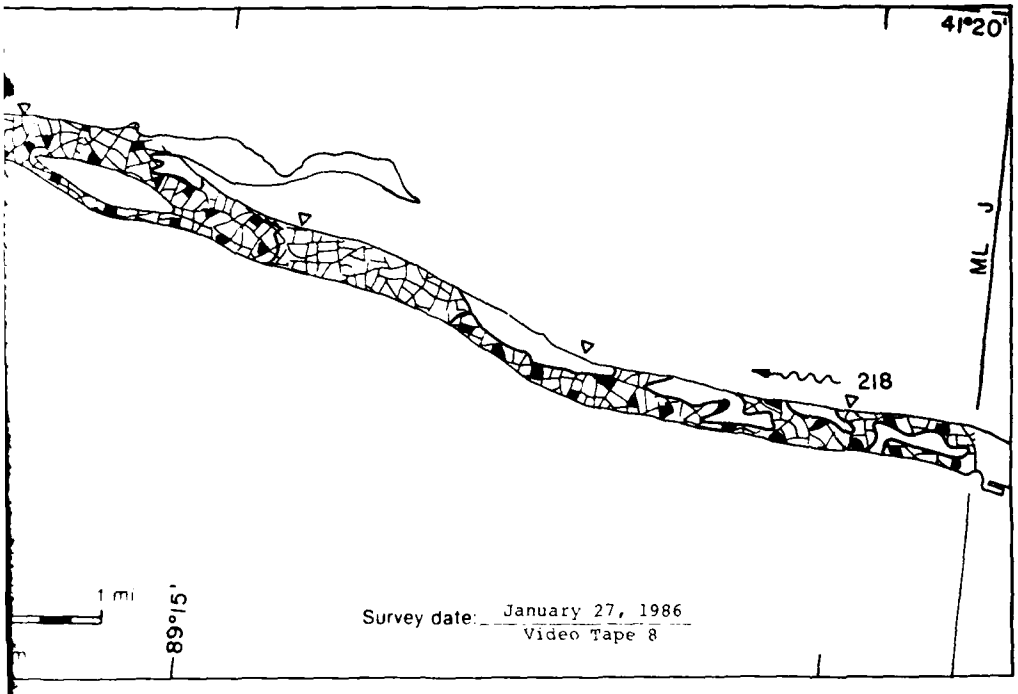

Peoria Pool :9/12
41°17'30"
89°20'
211
ML I
1 mi
km
Survey date January 27, 1986
Video Tape 8

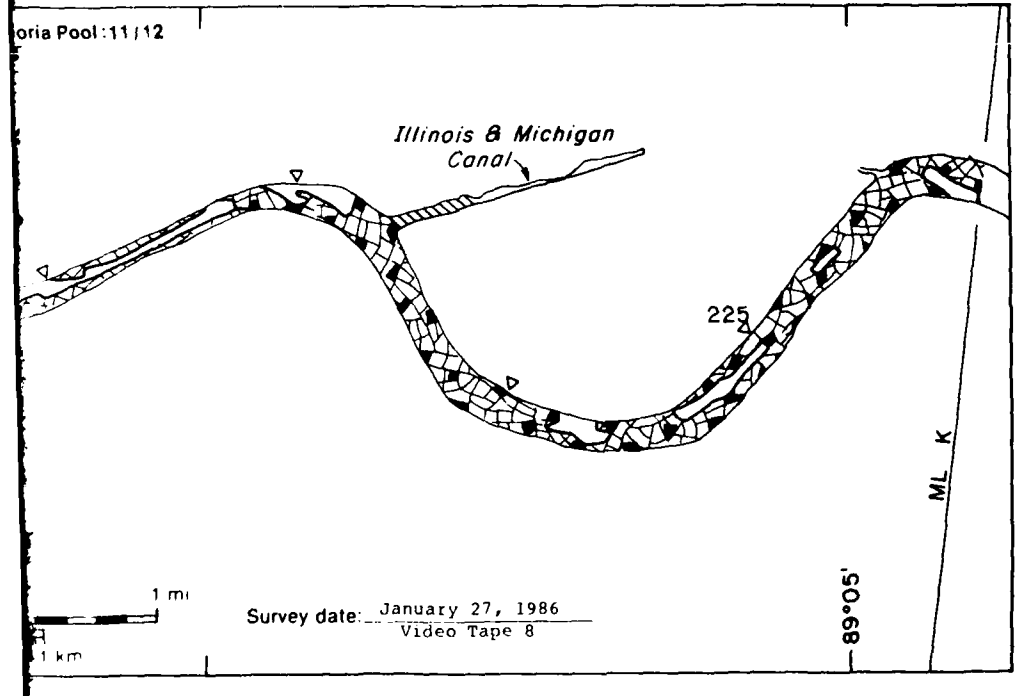
27 January 1986

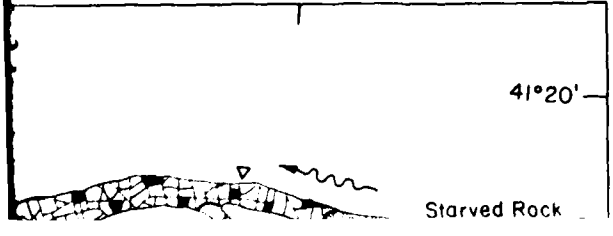


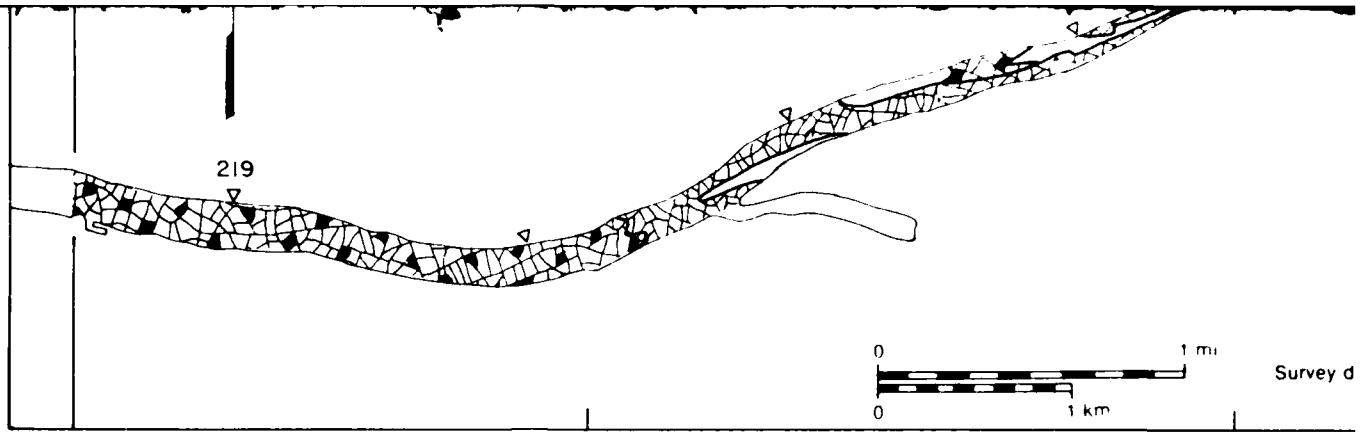


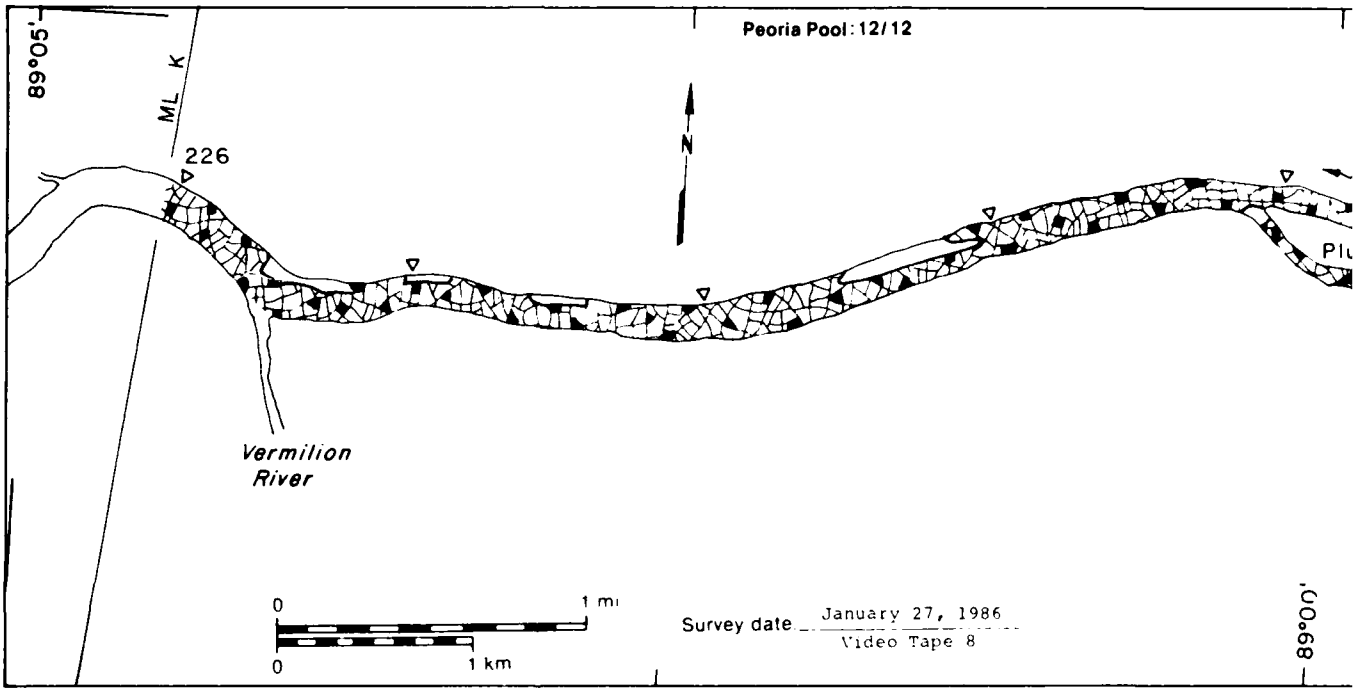



41°20'
ML J
218
1 mi
89°15'
Survey date: January 27, 1986
Video Tape 8


oria Pool : 11 / 12
Illinois & Michigan
Canal
225
ML K
89°05'
1 mi
1 km
Survey date: January 27, 1986
Video Tape 8


41°20'
Starved Rock

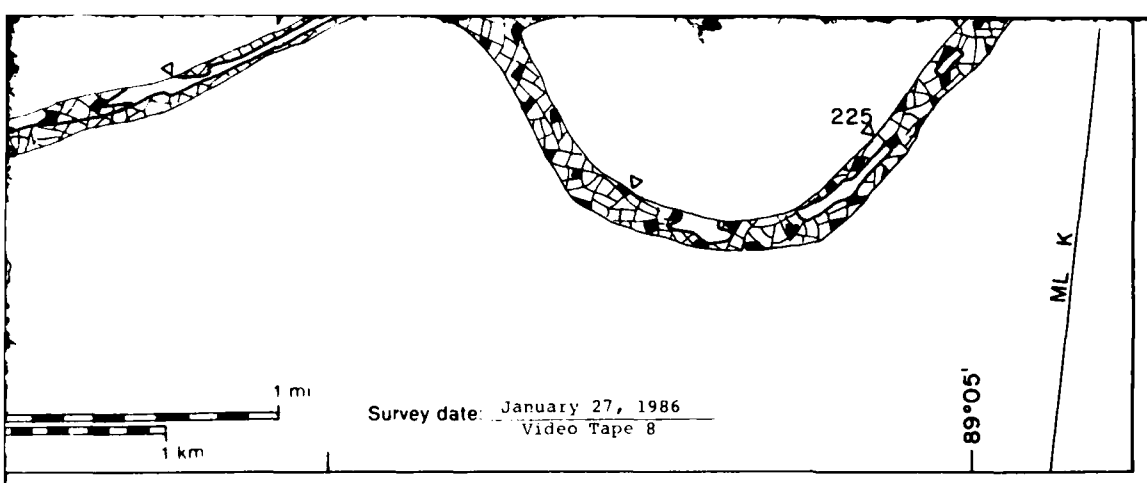


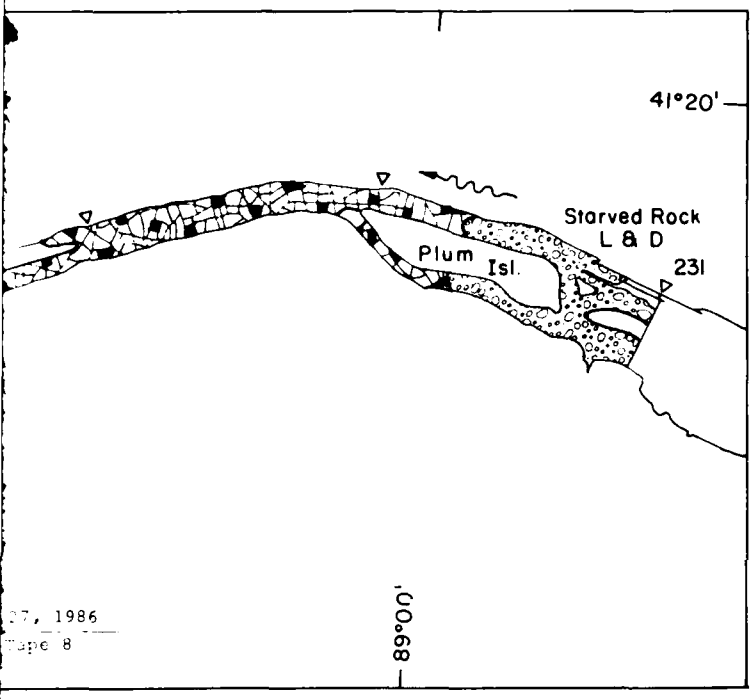


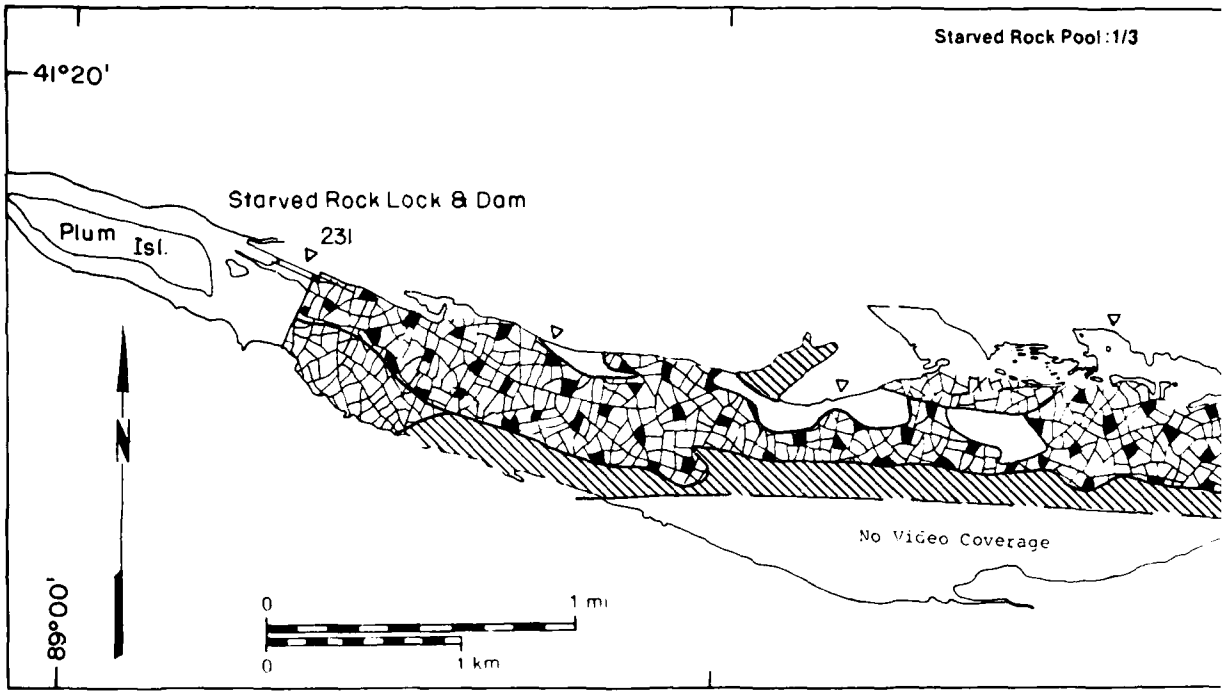
Peoria Pool

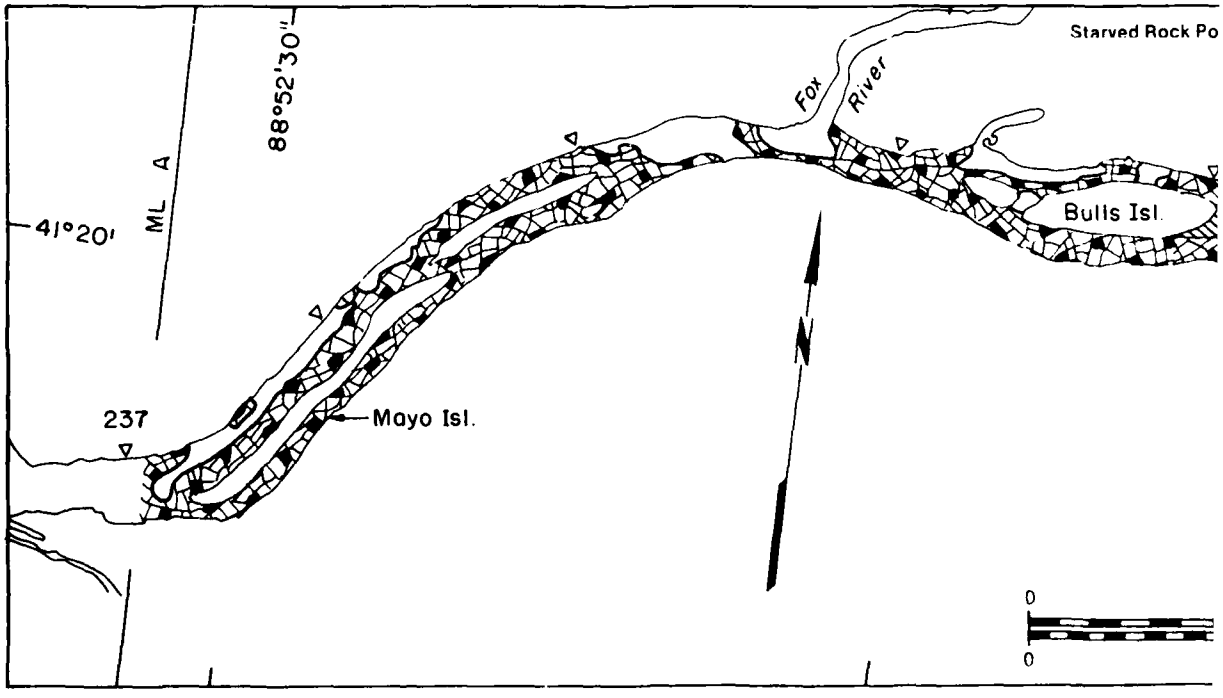
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (—)
Open water	4.58	NA
Solid ice cover	15.84	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	9.40	NA
Fragmented ice cover with open-water areas	29.63	80
Ice floes or frazil slush and pans	0.82	40
Total area ($m^2 \times 10^6$)	81.33*	

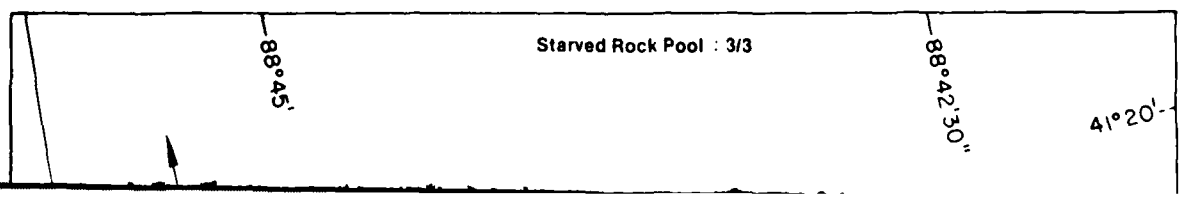
* Includes 21.06×10^6 m^2 of no video coverage


225
ML K
89°05'
1 mi
1 km
Survey date: January 27, 1986
Video Tape 8

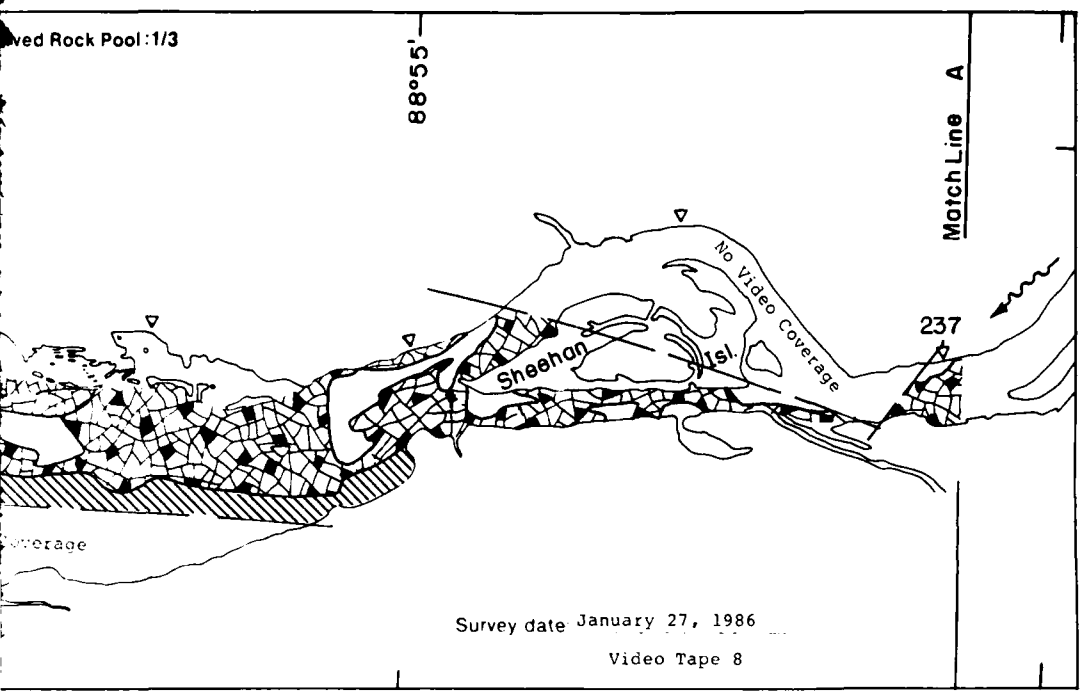

41°20'
Starved Rock
L & D
231
Plum Isl.
89°00'
27, 1986
Tape 8

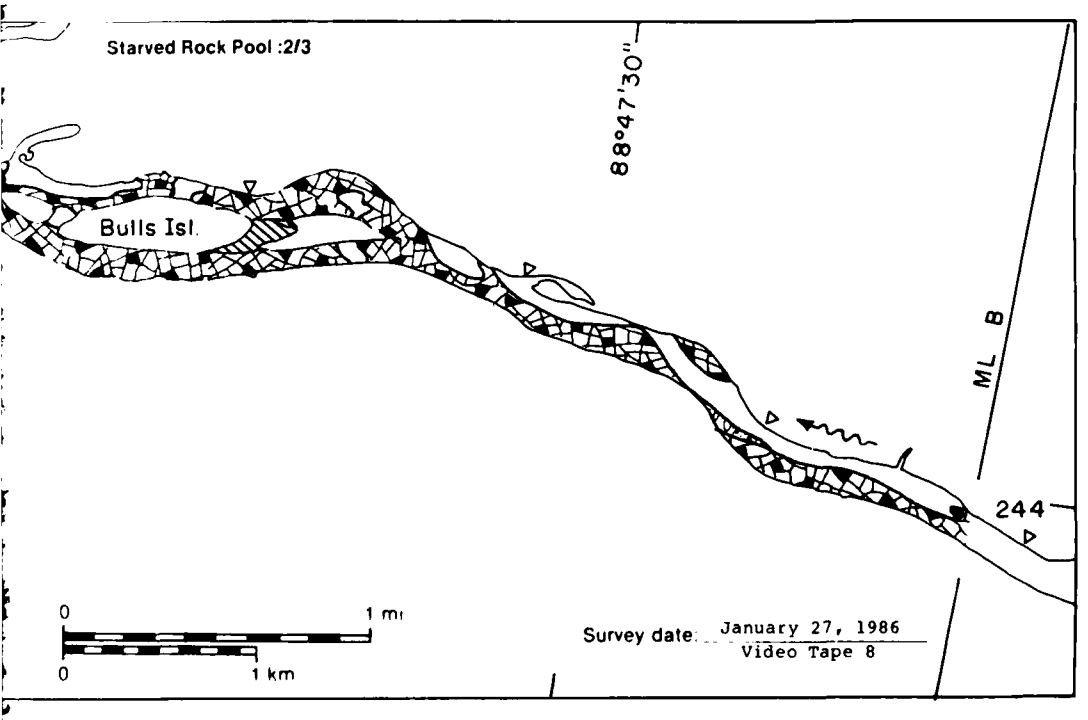

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock Po
88°52'30"
ML A
Fox
River
41°20'
Bulls Isl.
237
Mayo Isl.
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

27 January 1986



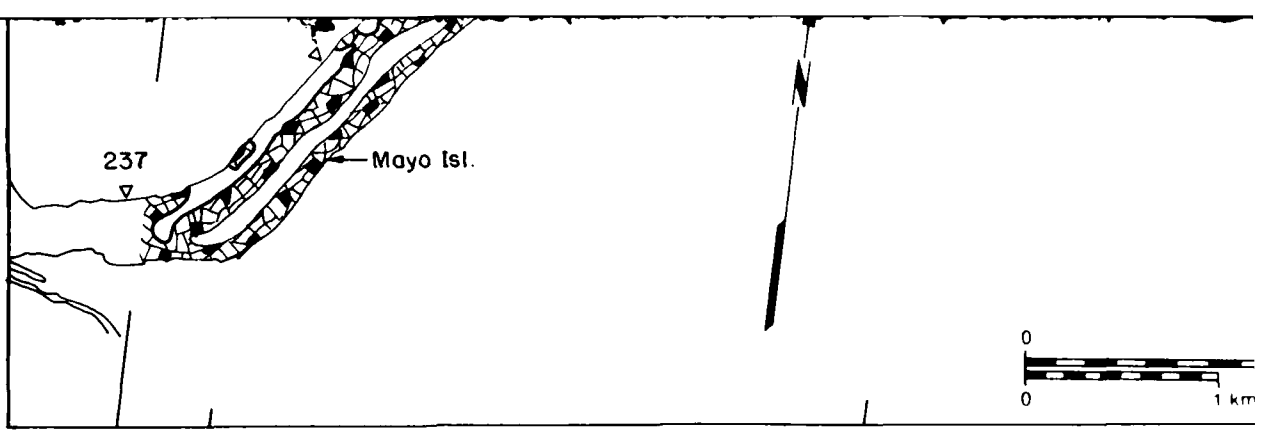


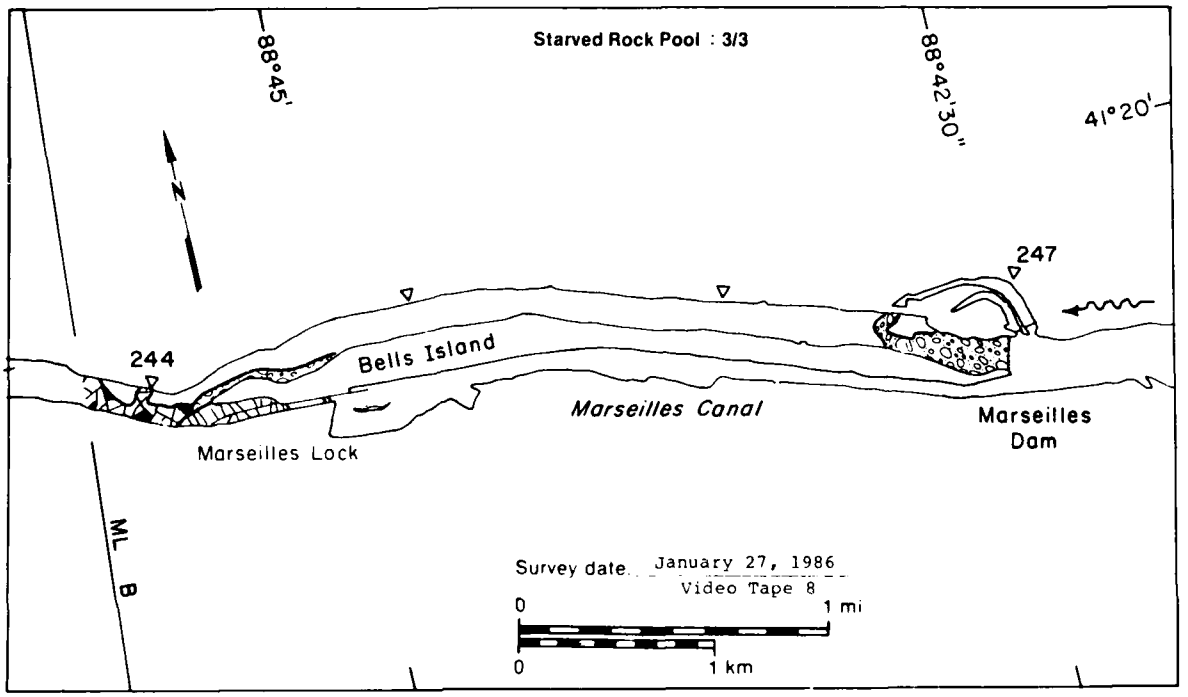
41°20'

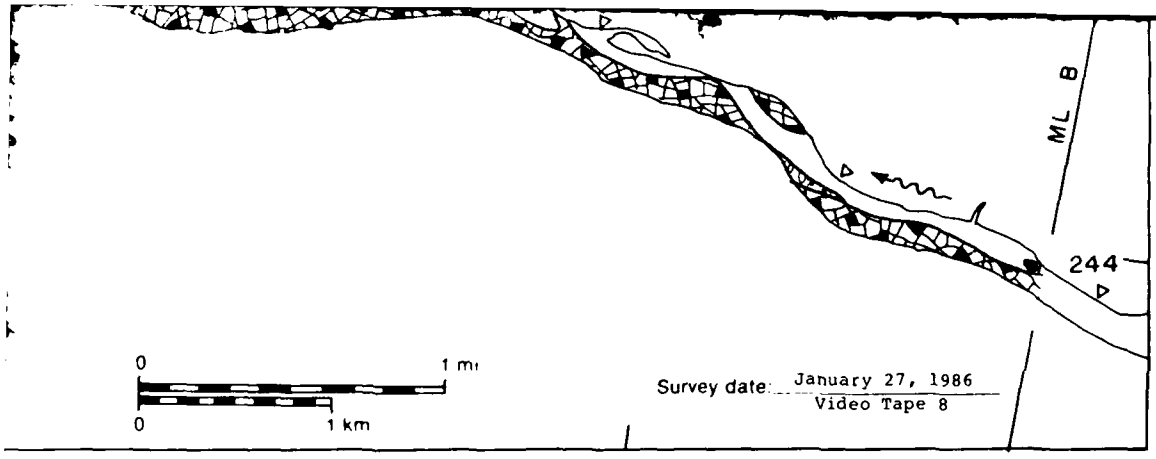
Starved Rock Pool

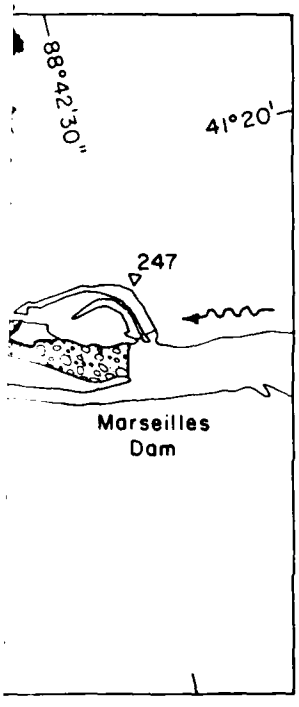
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 27, 1986
Video Tape 8
0
1 mi
0
1 km



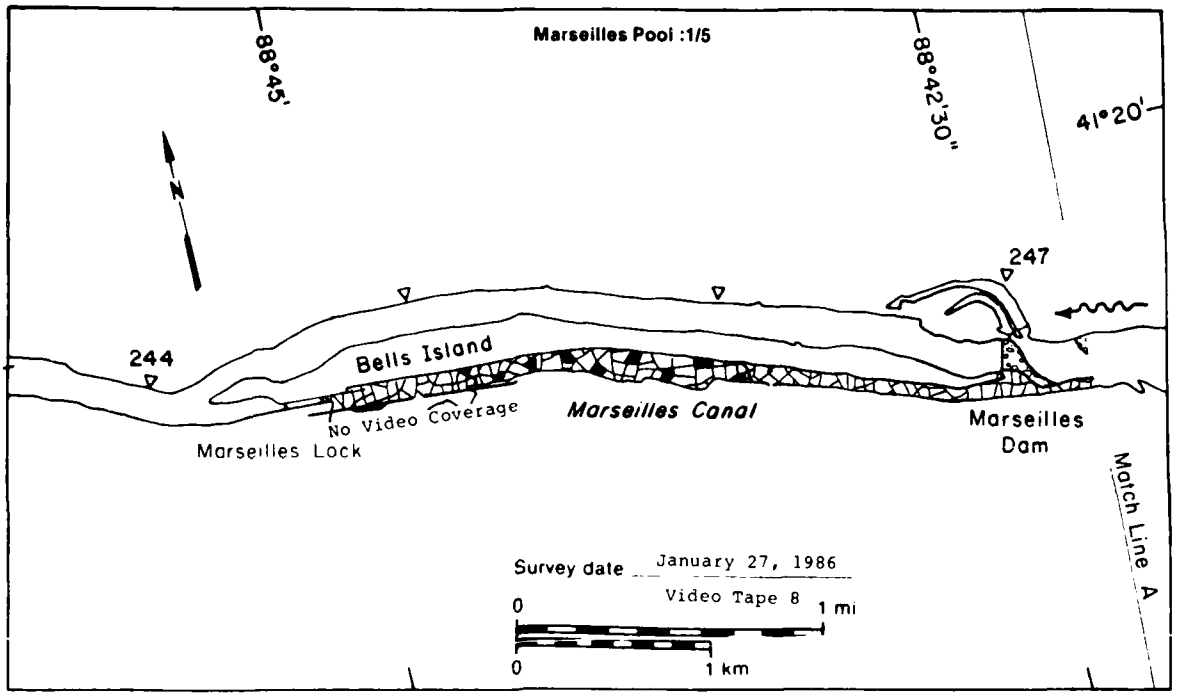


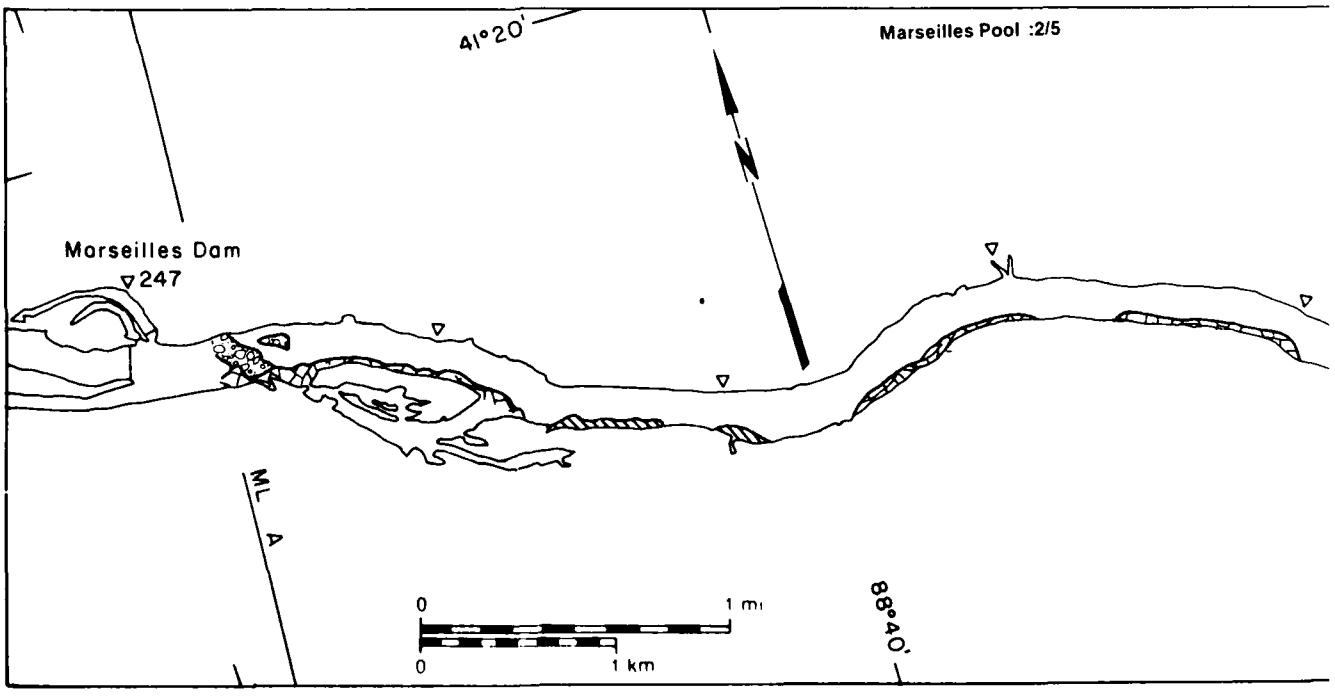
Starved Rock Pool

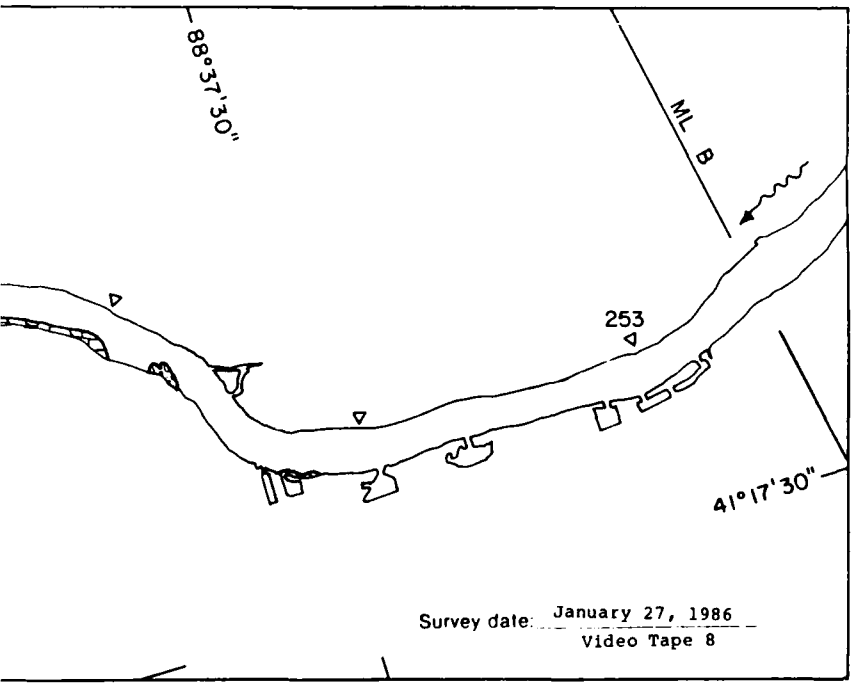
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.86	NA
Solid ice cover	1.14	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.37	NA
Fragmented ice cover with open-water areas	5.04	75
Ice floes or frazil slush and pans	0.15	40
Total area ($m^2 \times 10^6$)	10.19*	

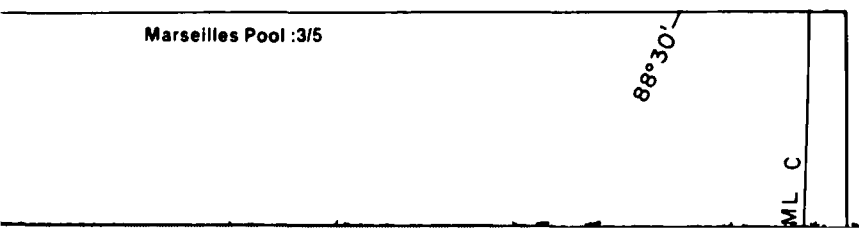
* Includes 1.63×10^6 m^2 of no video coverage

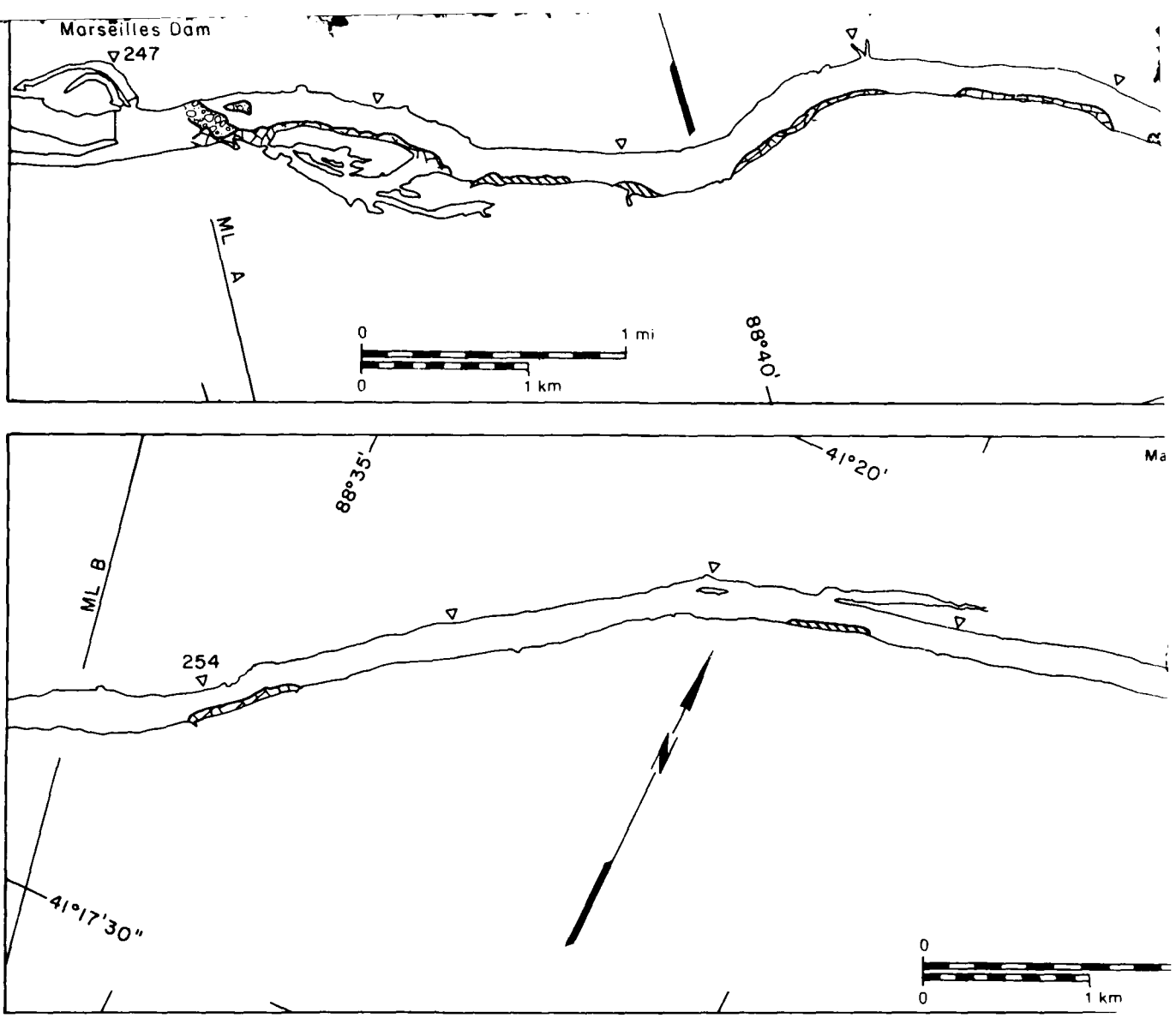
27 January 1986

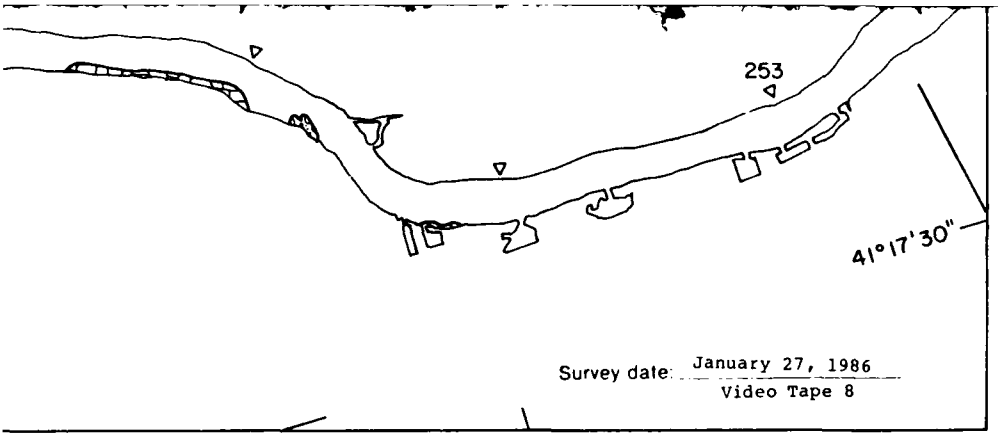


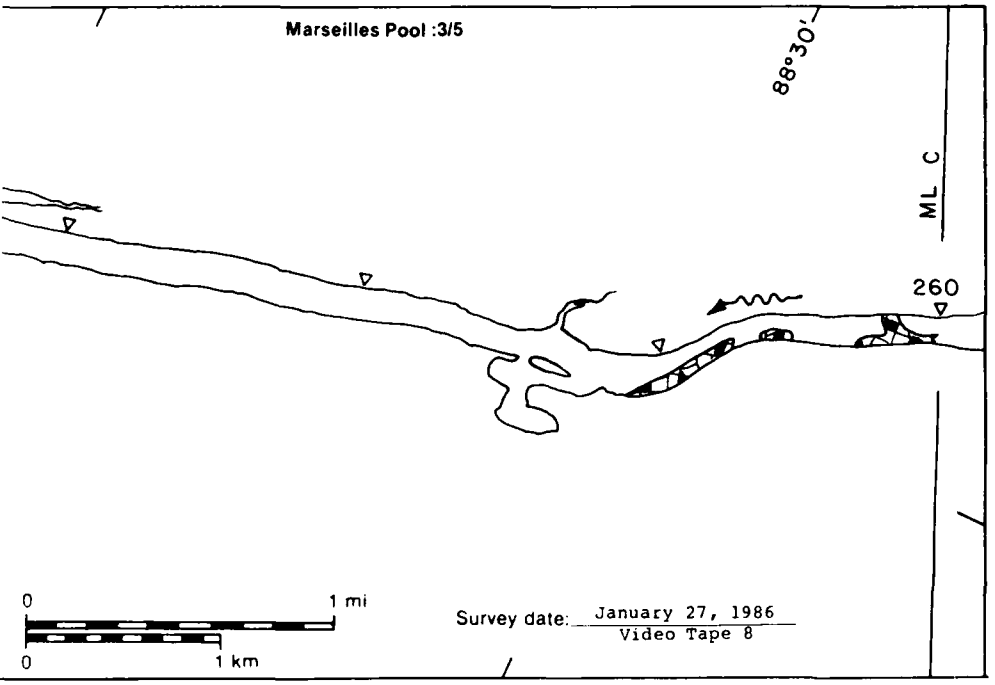


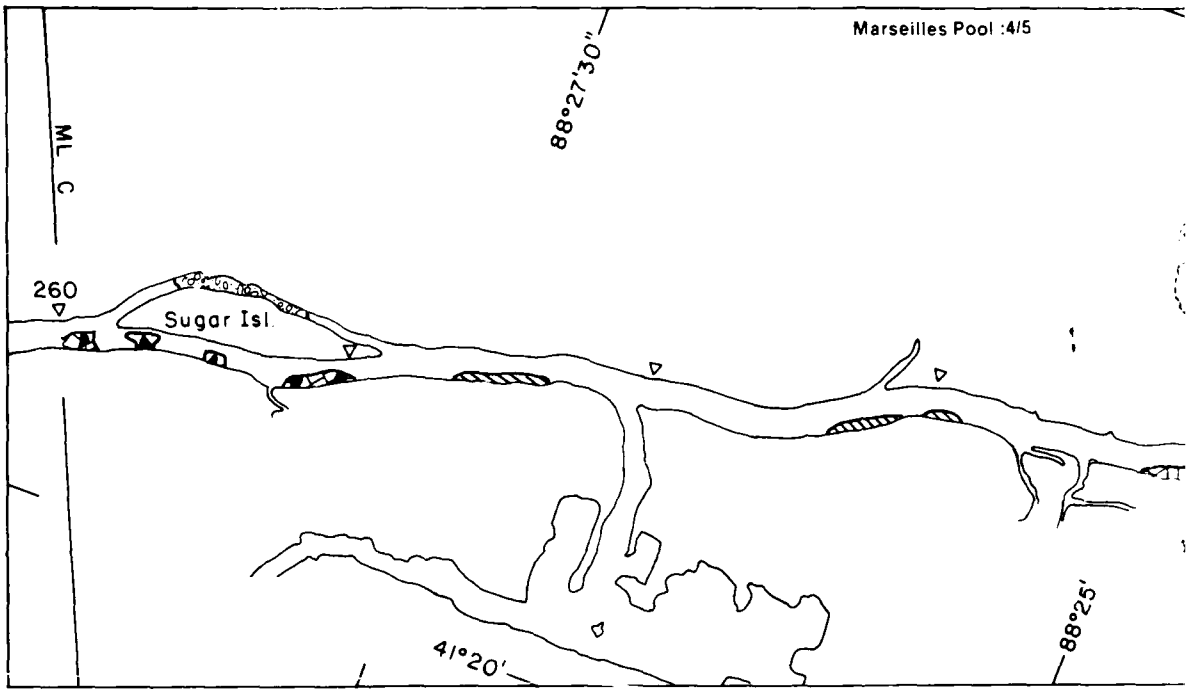

88°37'30"
ML B
253
41°17'30"
Survey date: January 27, 1986
Video Tape 8

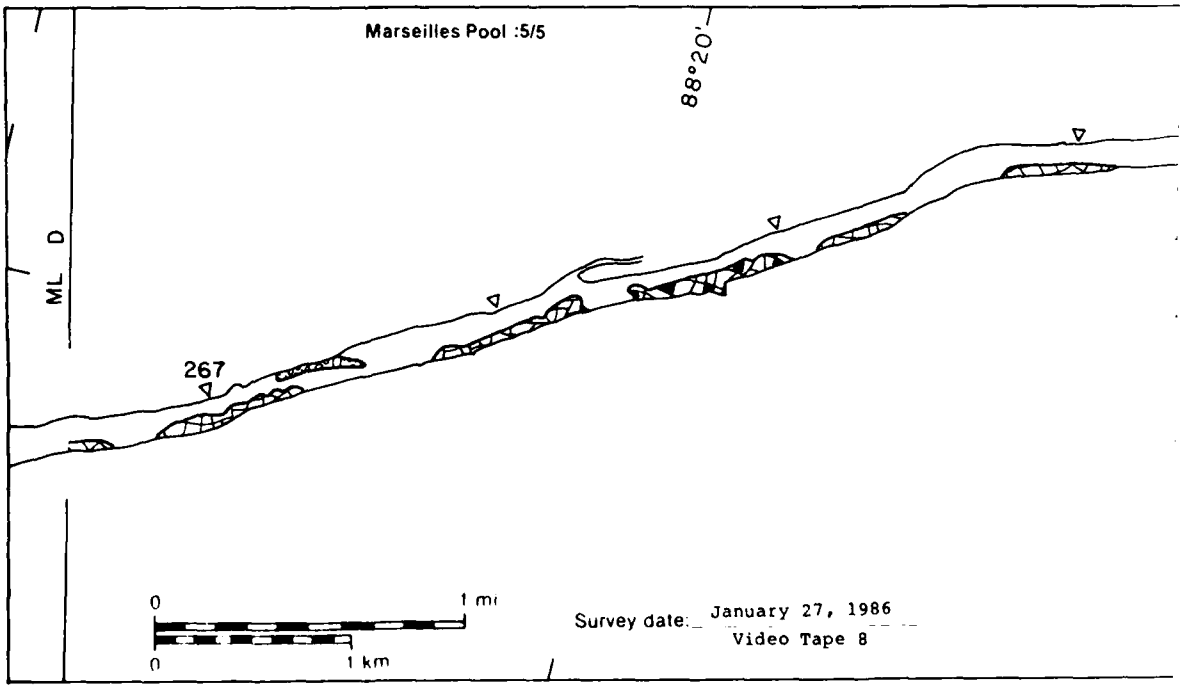

88°30'
ML C


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
1 km


253
41°17'30"
Survey date: January 27, 1986
Video Tape 8


Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: January 27, 1986
Video Tape 8



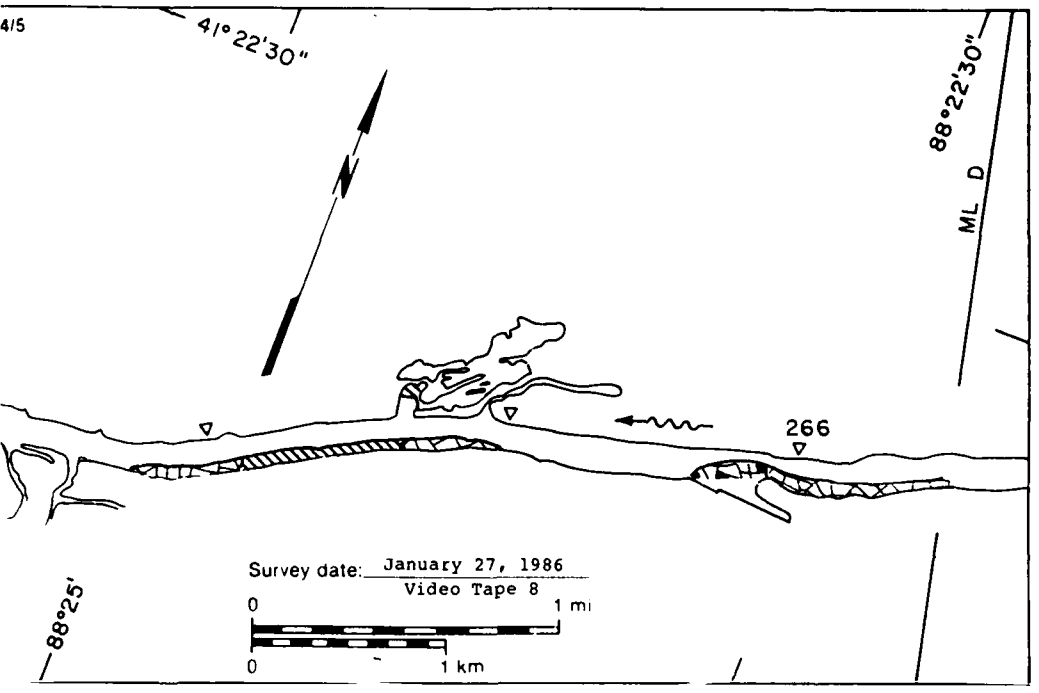


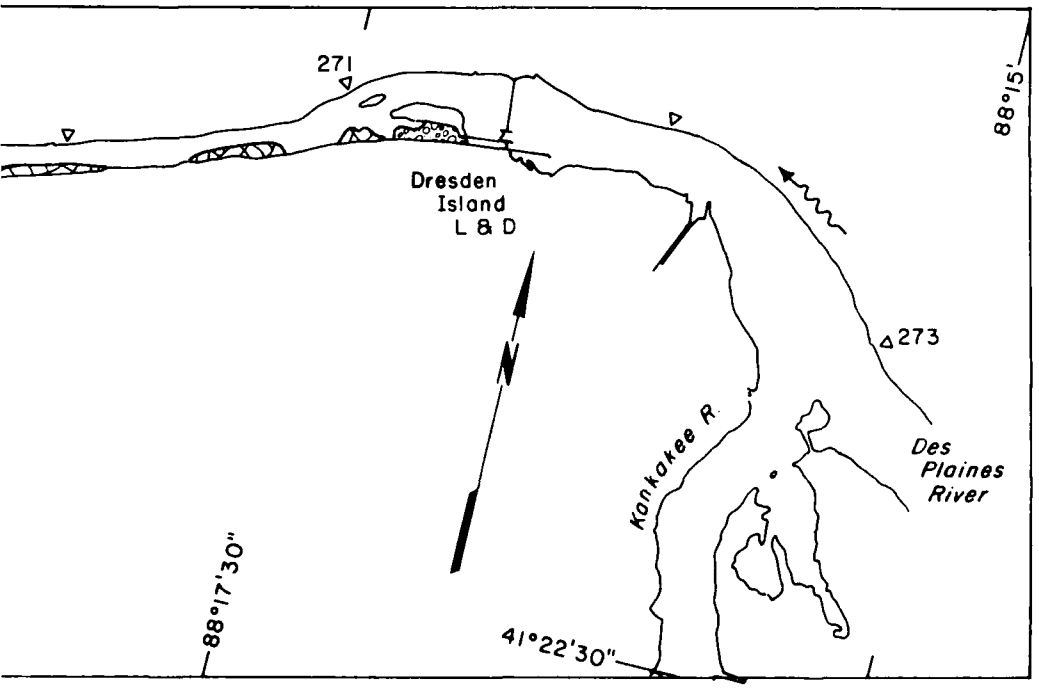
Marseilles Pool

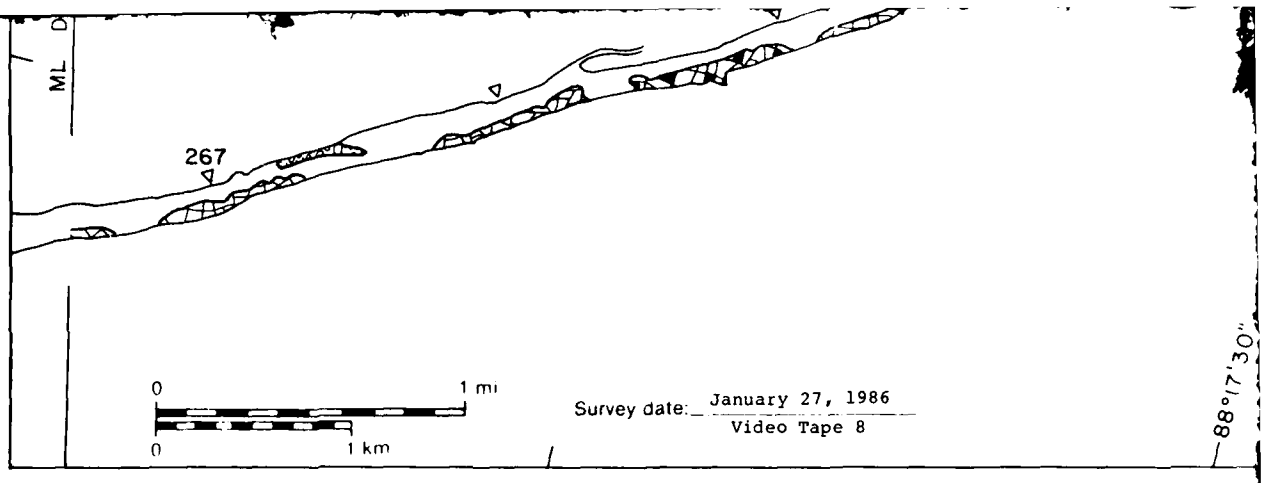
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	6.44	NA

27 January 1986



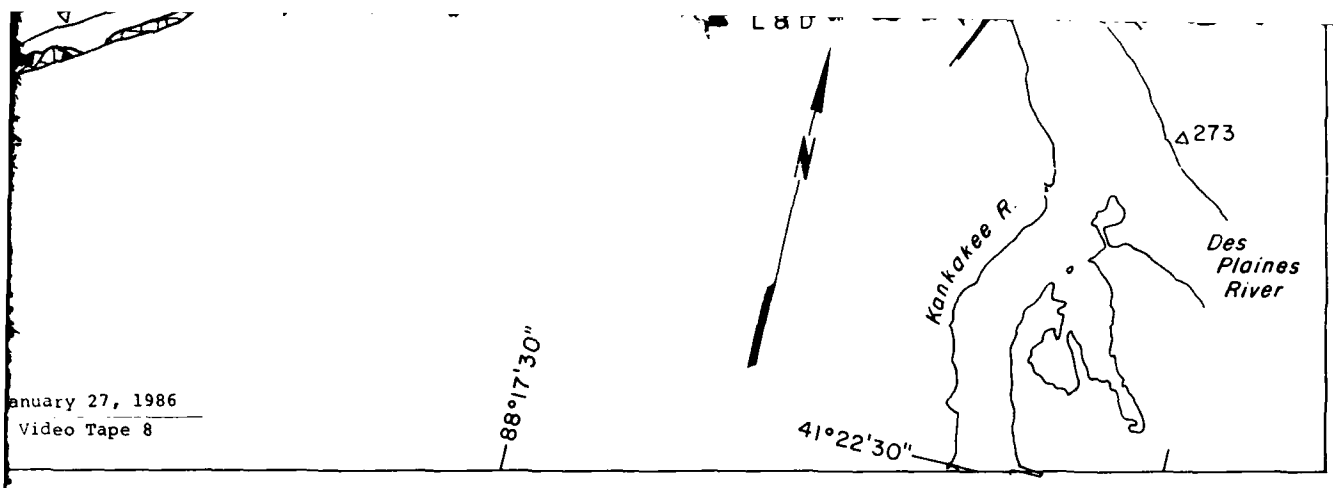




Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.44	NA
Solid ice cover	0.21	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.84	NA
Fragmented ice cover with open-water areas	0.39	80
Ice floes or frazil slush and pans	0.23	40
Total area ($m^2 \times 10^6$)	8.19*	

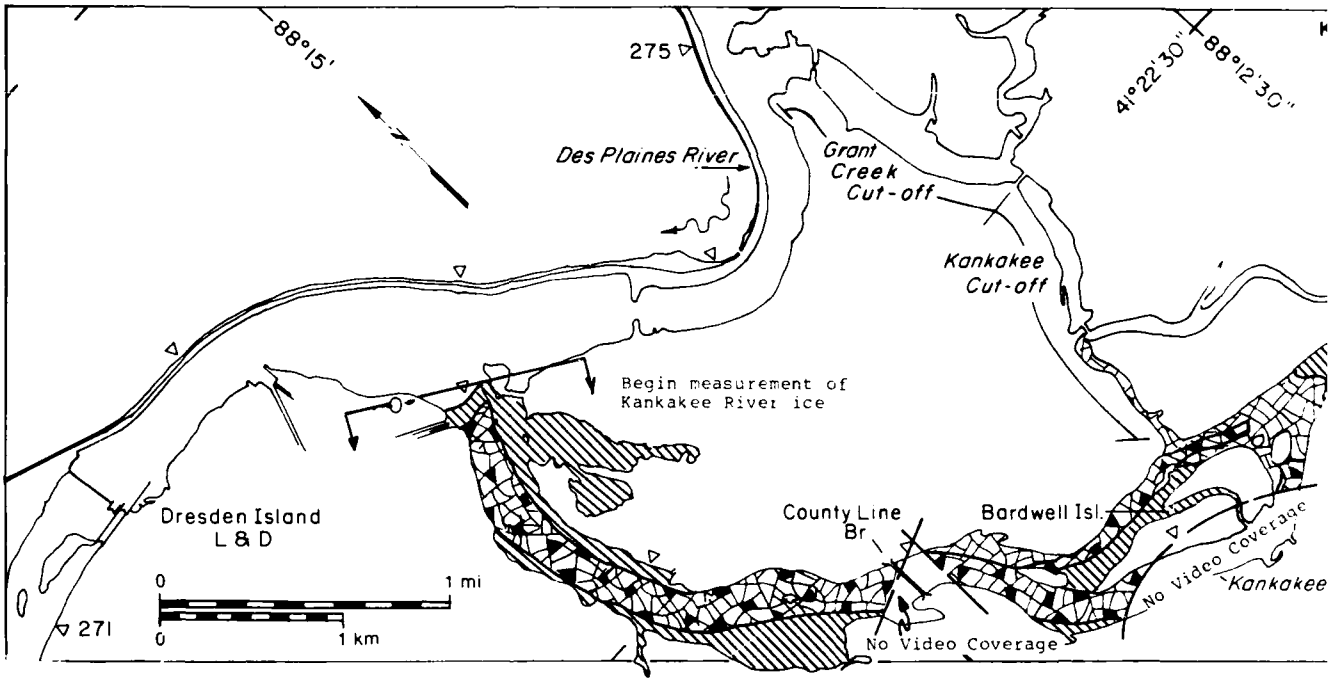
* Includes 0.08×10^6 m^2 of no video coverage

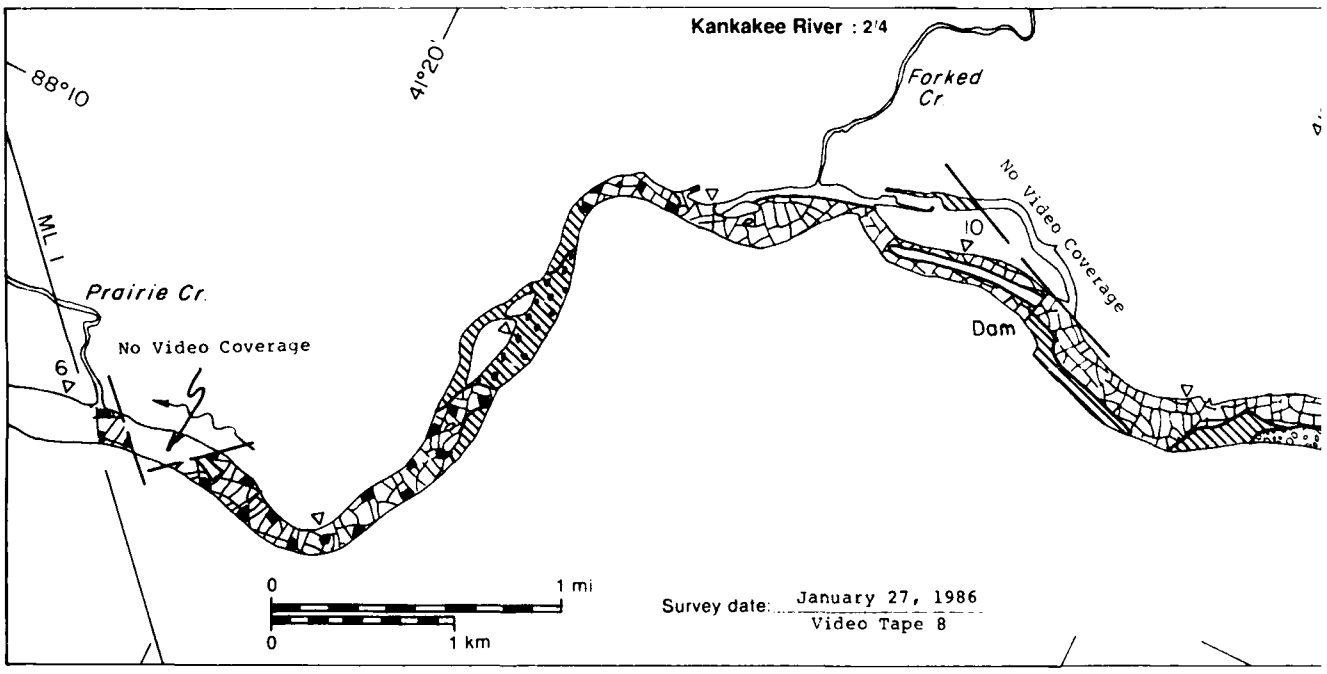


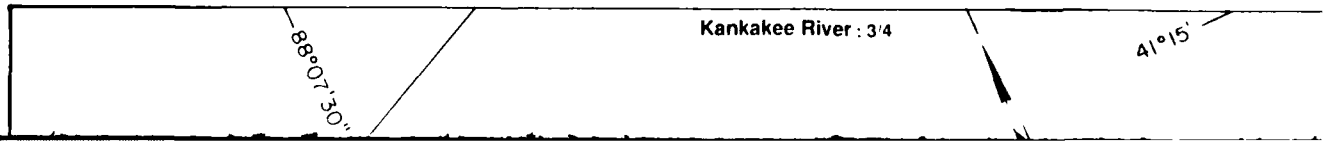
anuary 27, 1986
Video Tape 8

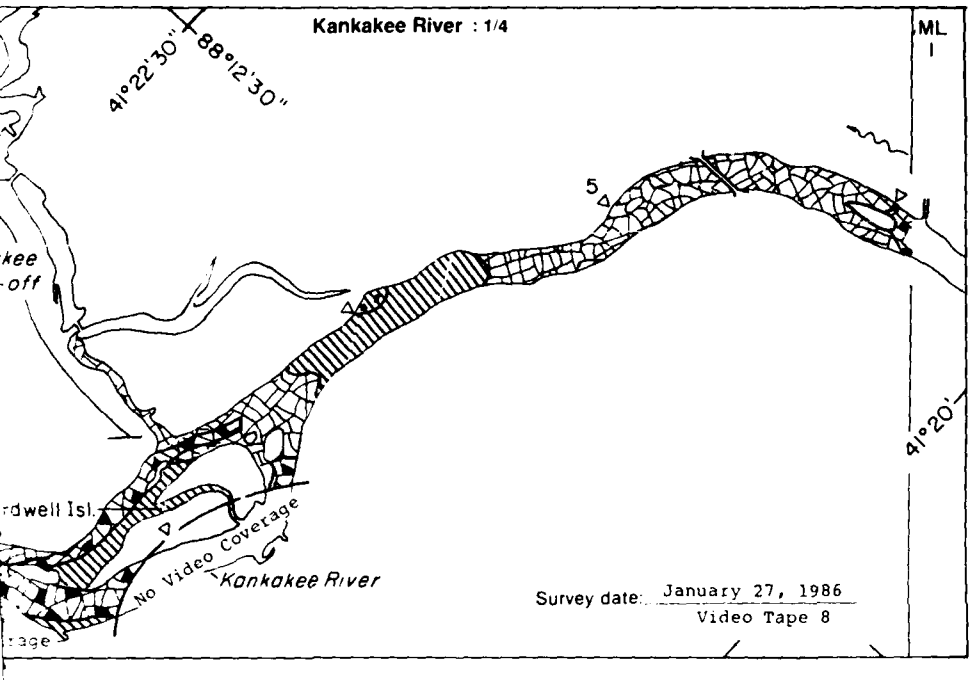
08 x 10^6 m^2
overage

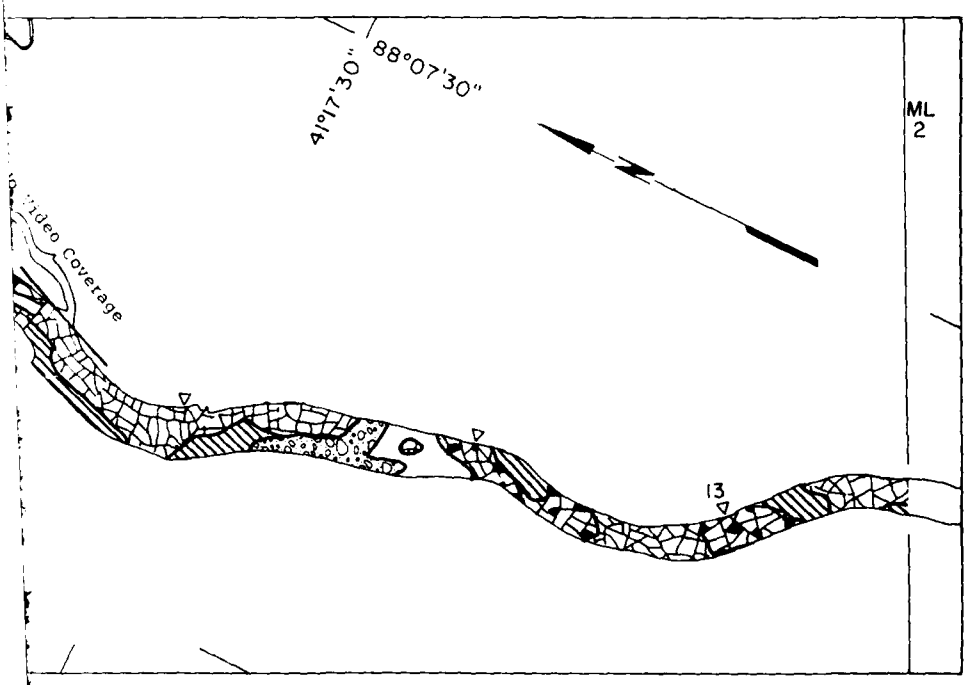
27 January 1986

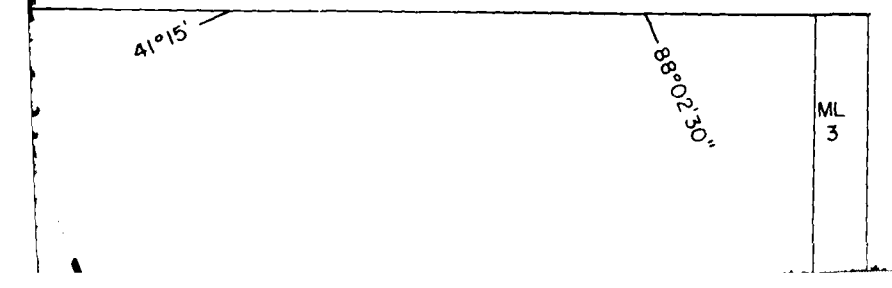


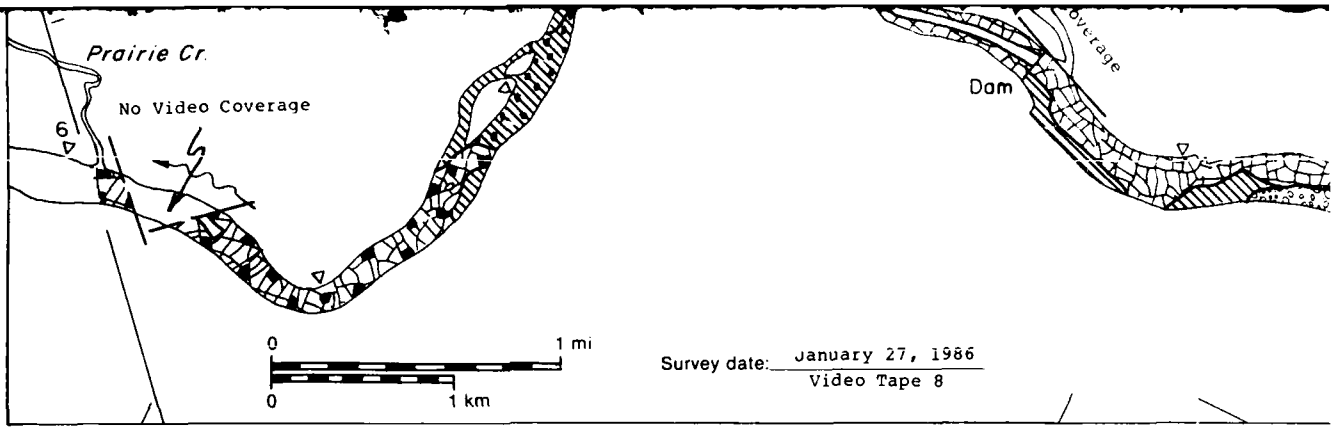


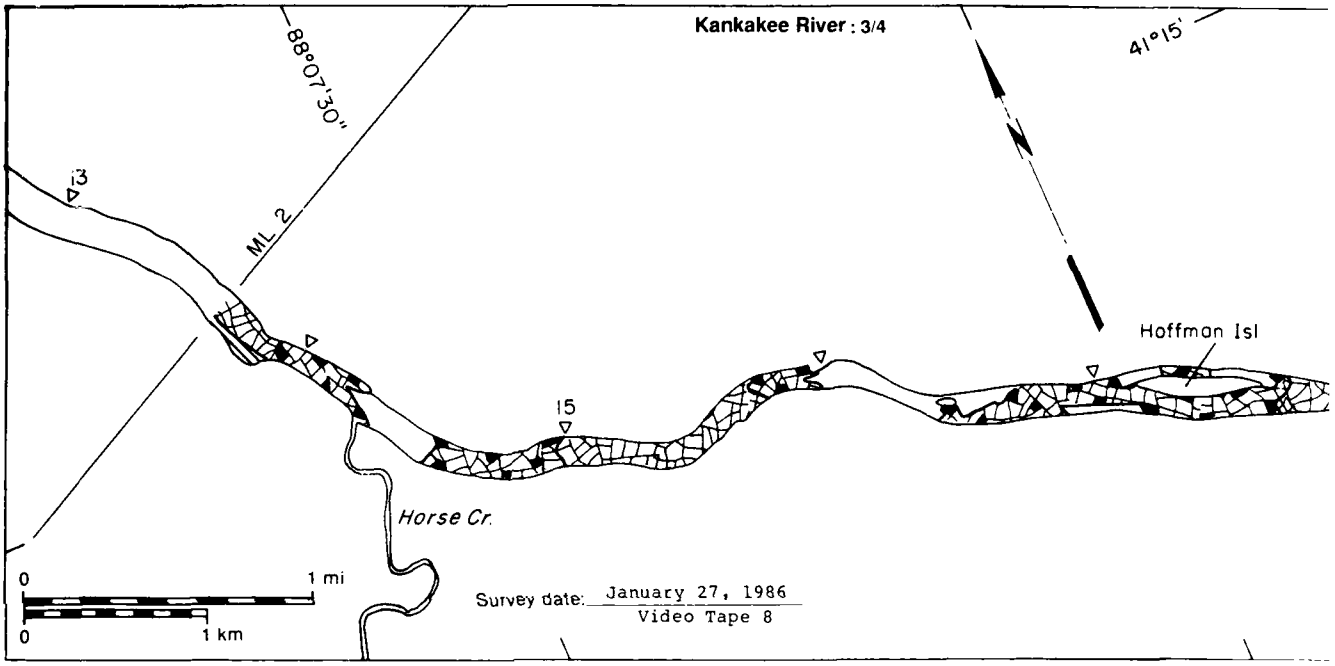


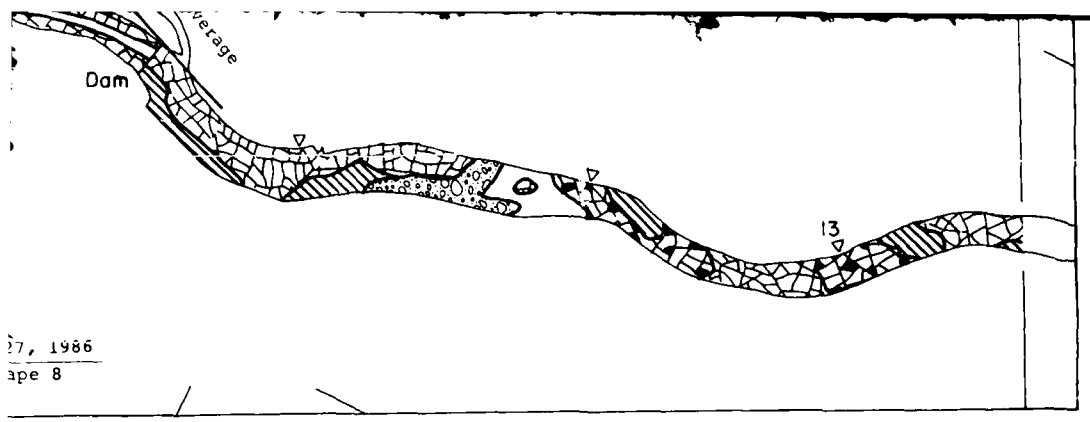

Kankakee River : 1/4
41°22'30"
88°12'30"
ML
1
5
41°20'
dwell Isl.
No Video Coverage
Kankakee River
Survey date: January 27, 1986
Video Tape 8


41°17'30"
88°07'30"
ML
2
Video Coverage
13

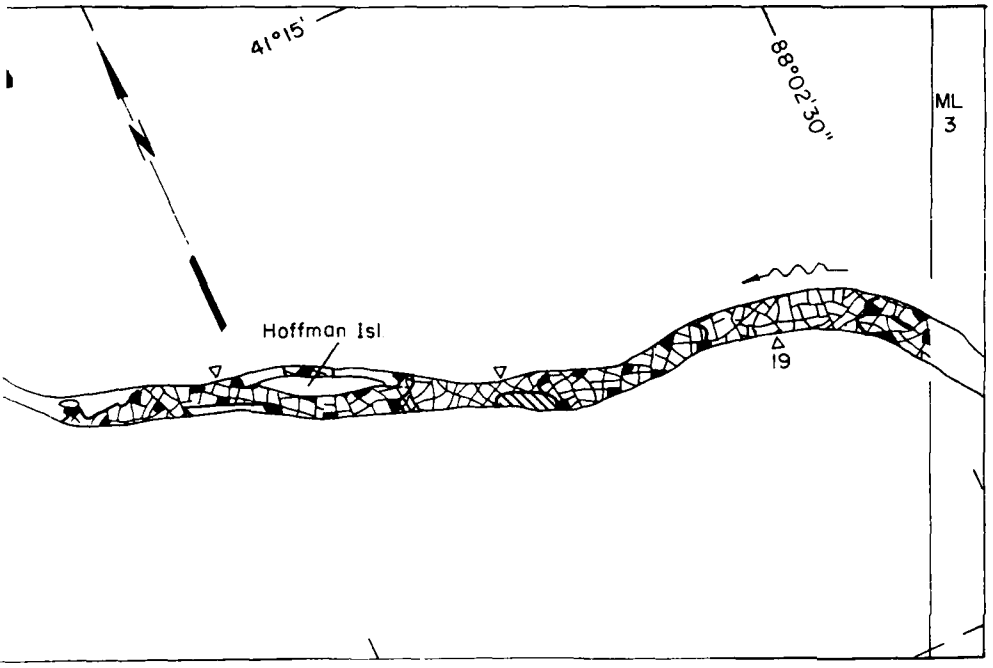

41°15'
88°02'30"
ML
3

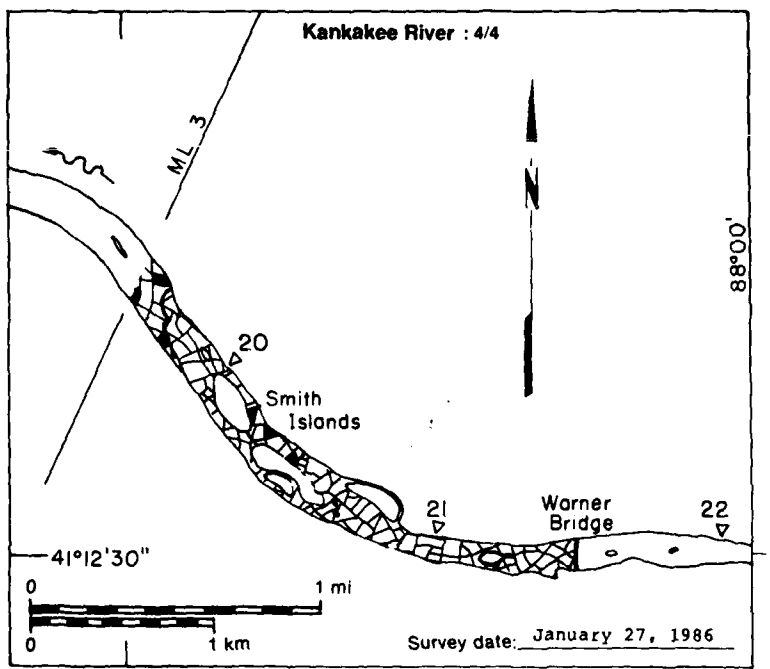

Prairie Cr.
No Video Coverage
6
Dam
0
1 mi
0
1 km
Survey date: January 27, 1986
Video Tape 8


Kankakee River: 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: January 27, 1986
Video Tape 8



27, 1986
ape 8





Kankakee River

MAP UNITS

Open water

Solid ice cove

Solid ice cove
open-water are

Fragmented ic

Fragmented ic
with open-wate

Ice floes or fra
and pans

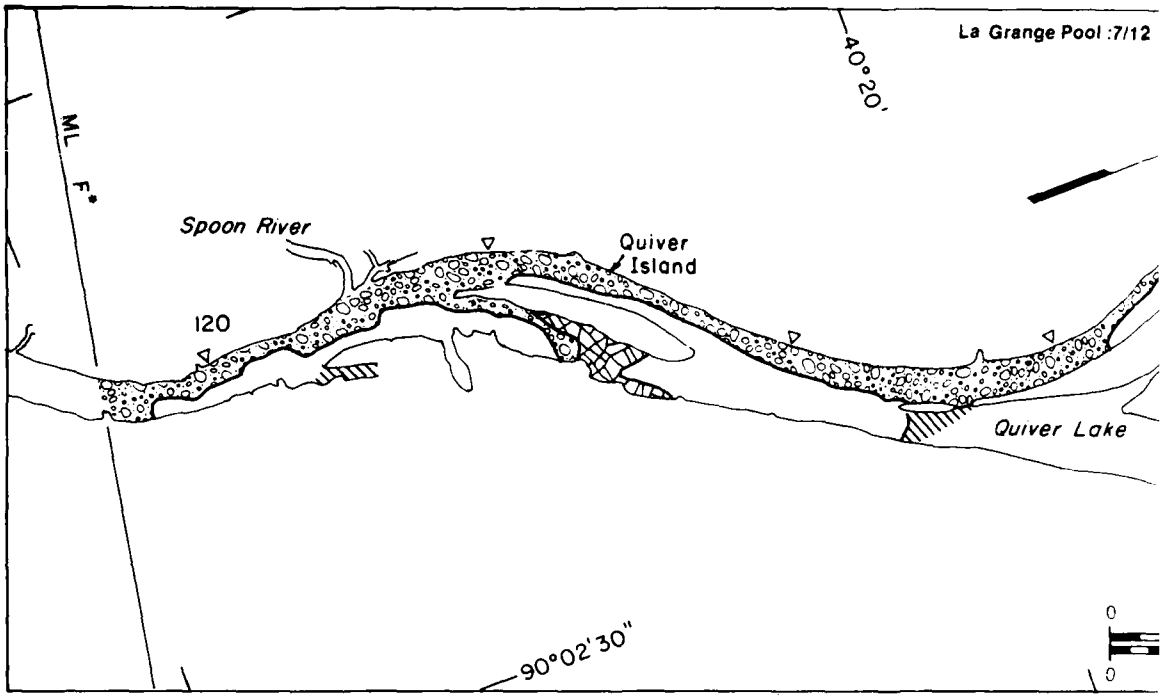
Total area (

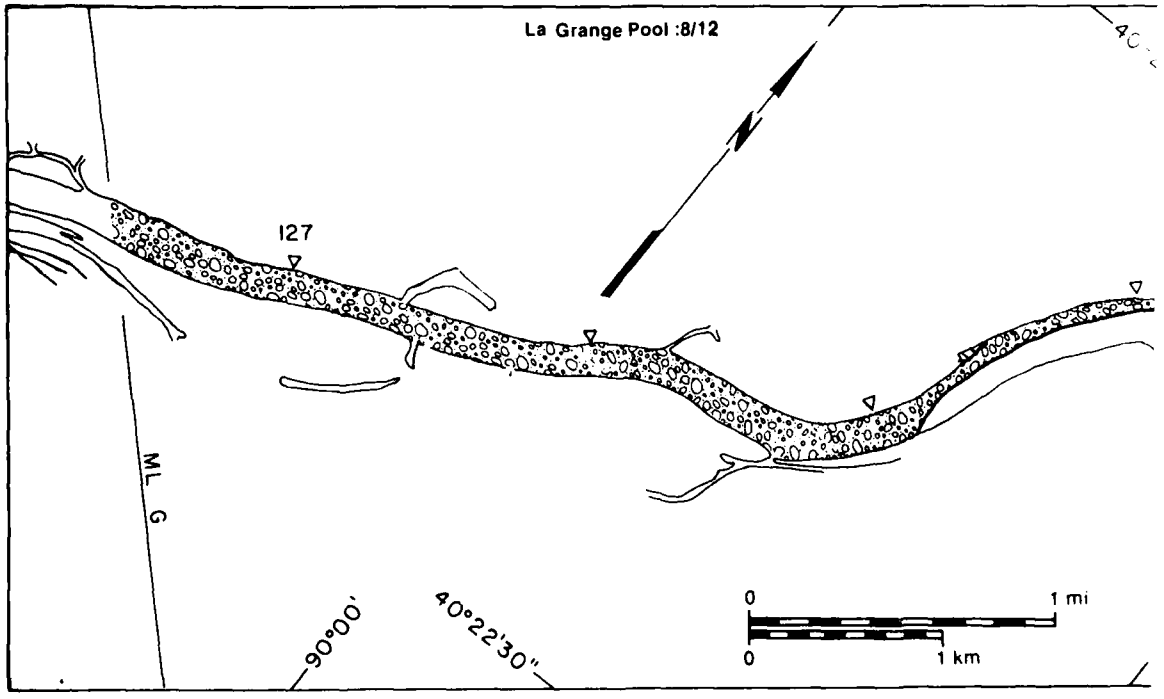
27 January 1986

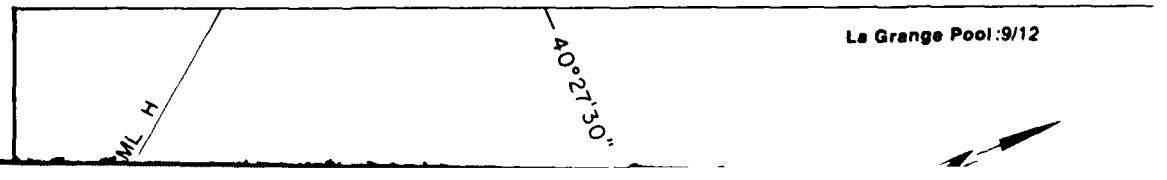
ankakee River

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.39	NA
Solid ice cover	1.28	NA
Solid ice cover with open-water areas	0.10	90
Fragmented ice cover	2.79	NA
Fragmented ice cover with open-water areas	2.24	90
Ice floes or frazil slush and pans	0.13	20
Total area ($m^2 \times 10^6$)	7.30*	

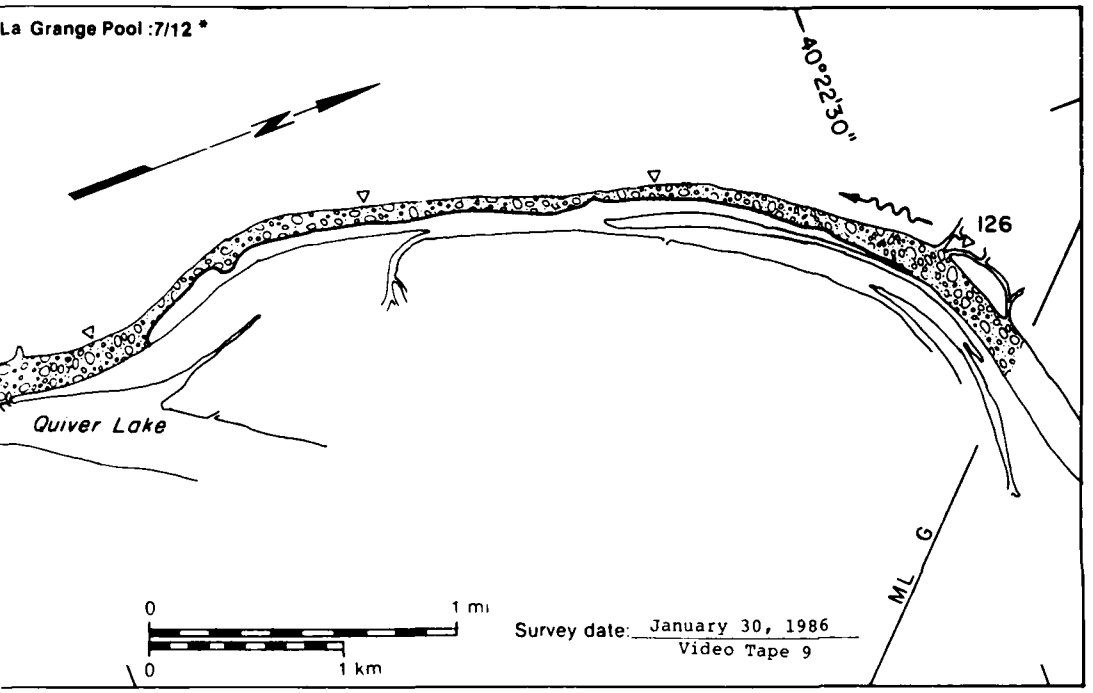
* Includes 0.37×10^6 m^2 of no video coverage

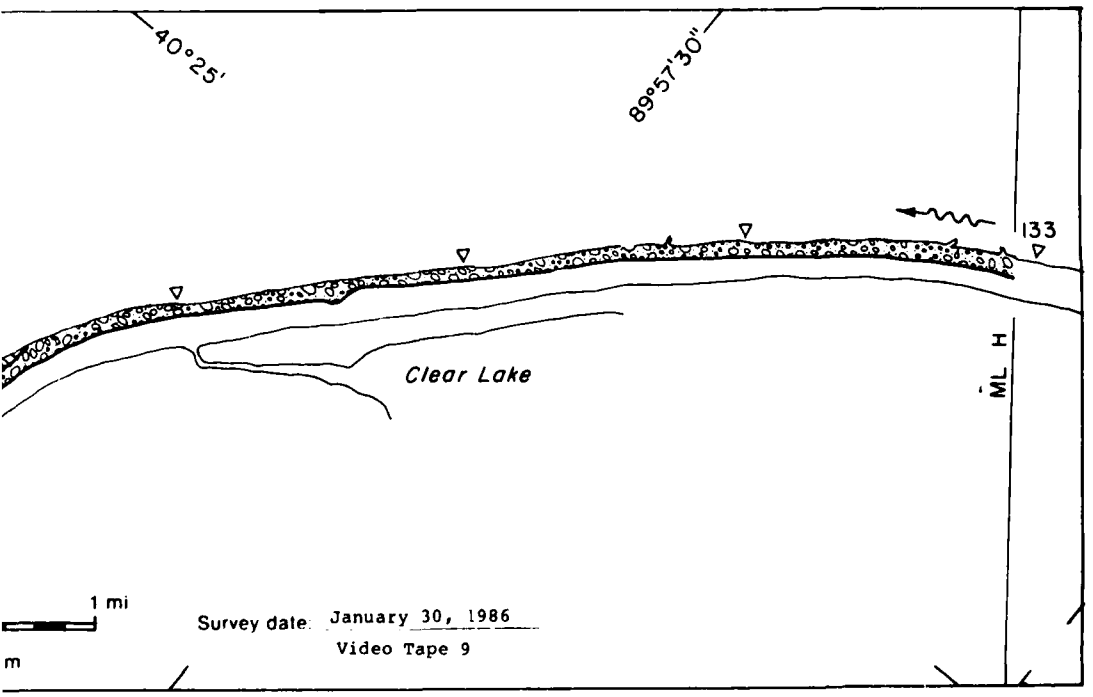

La Grange Pool :7/12
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0

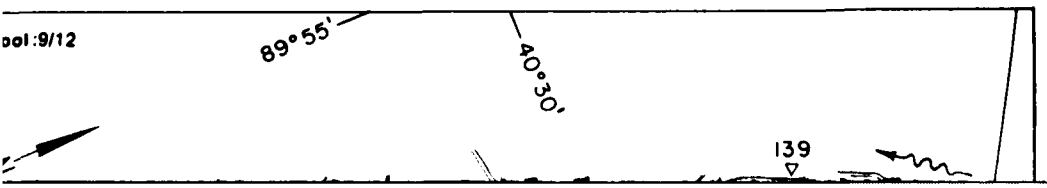

La Grange Pool :8/12
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km

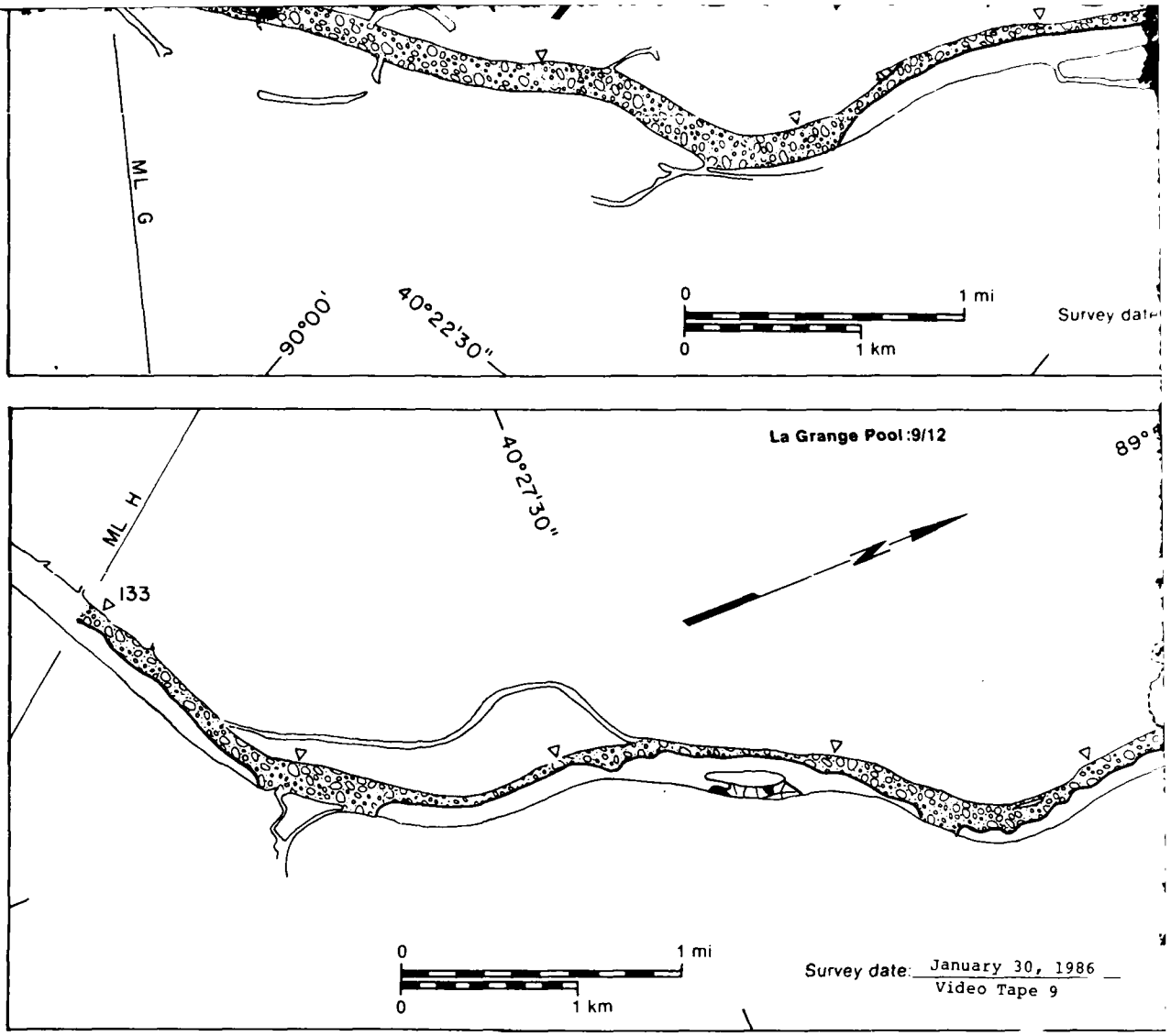

La Grange Pool :9/12
40°27'30"
ML H

30 January 1986

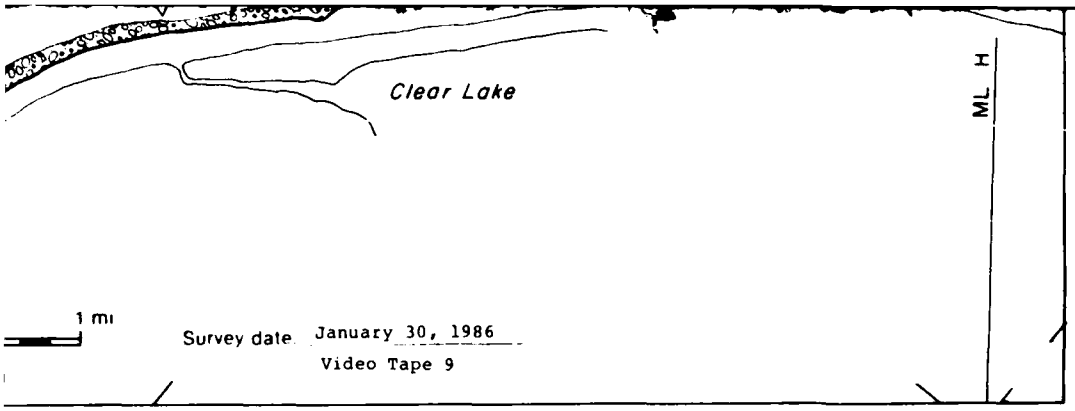


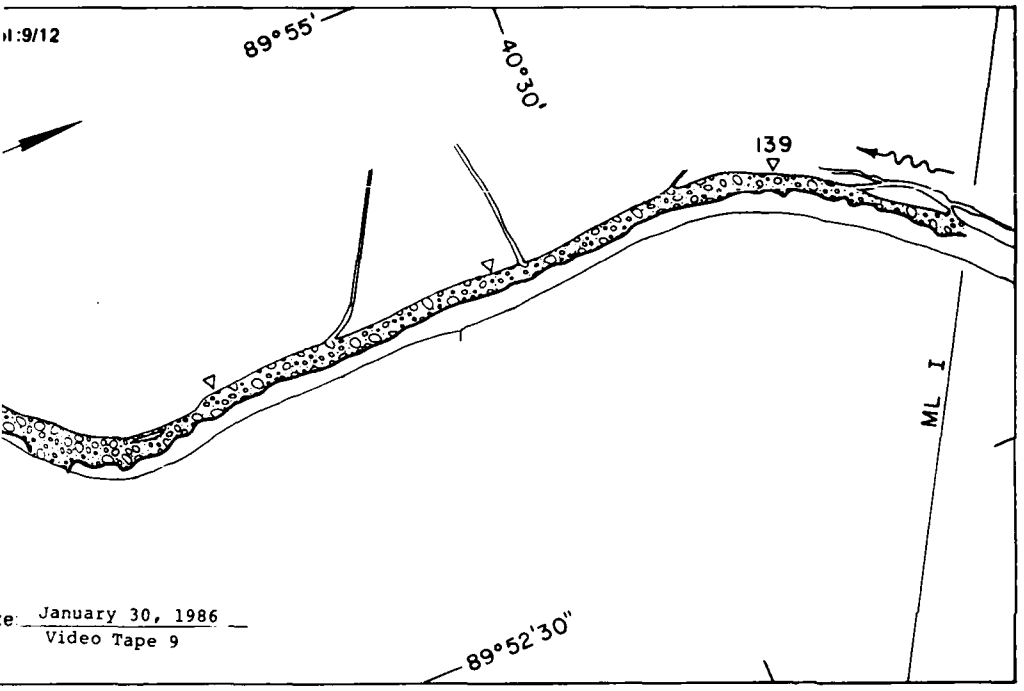




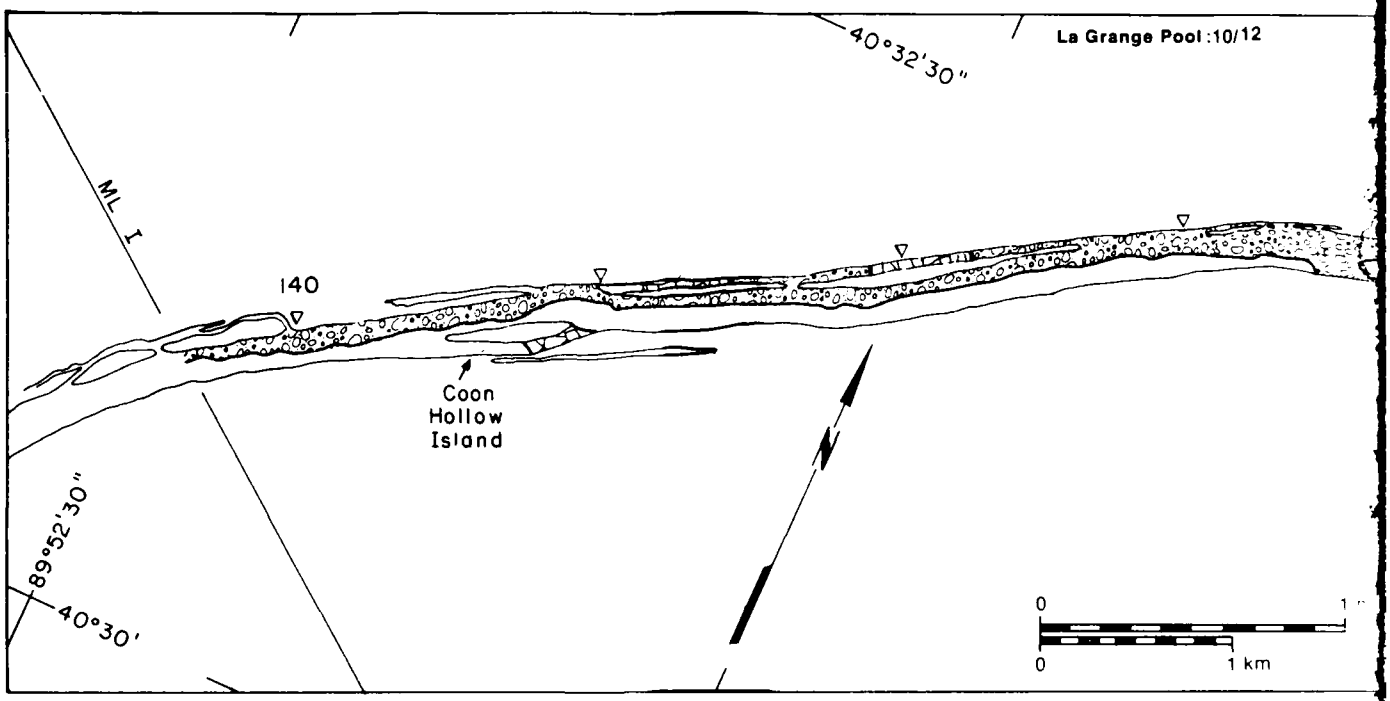


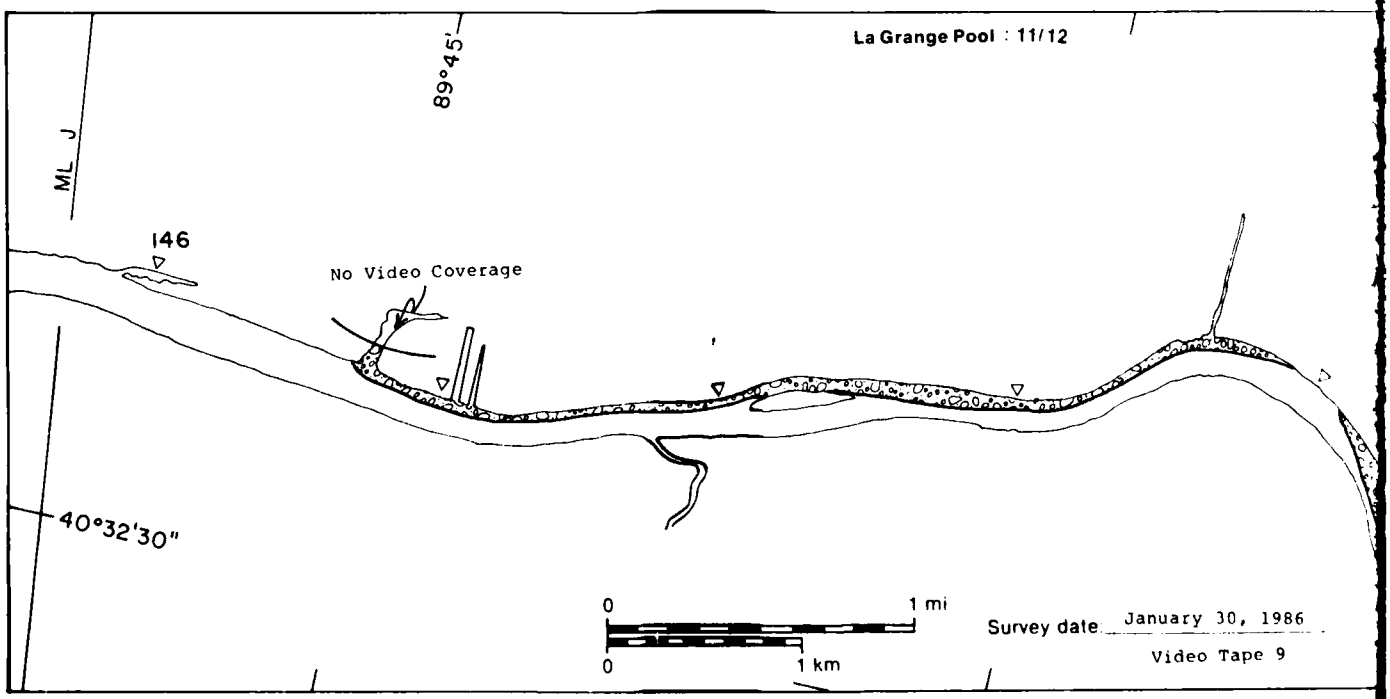
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

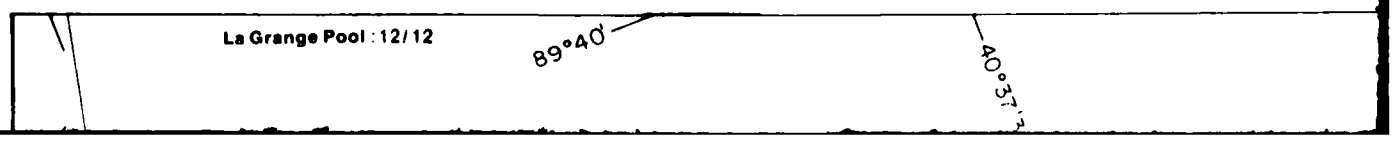

Clear Lake
ML H
1 mi
Survey date January 30, 1986
Video Tape 9

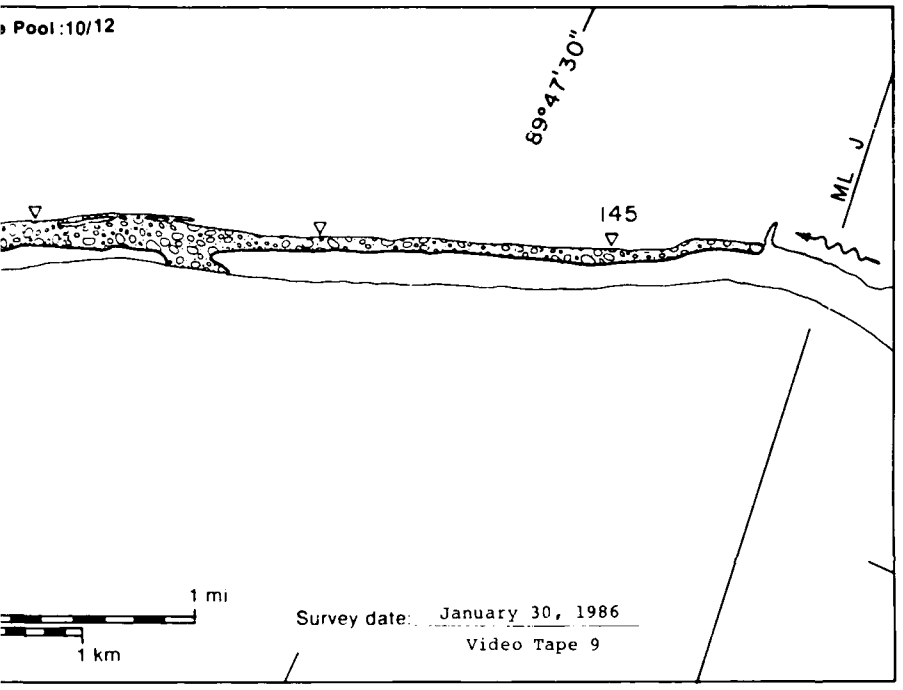

89°55'
40°30'
139
ML I
89°52'30"
January 30, 1986
Video Tape 9

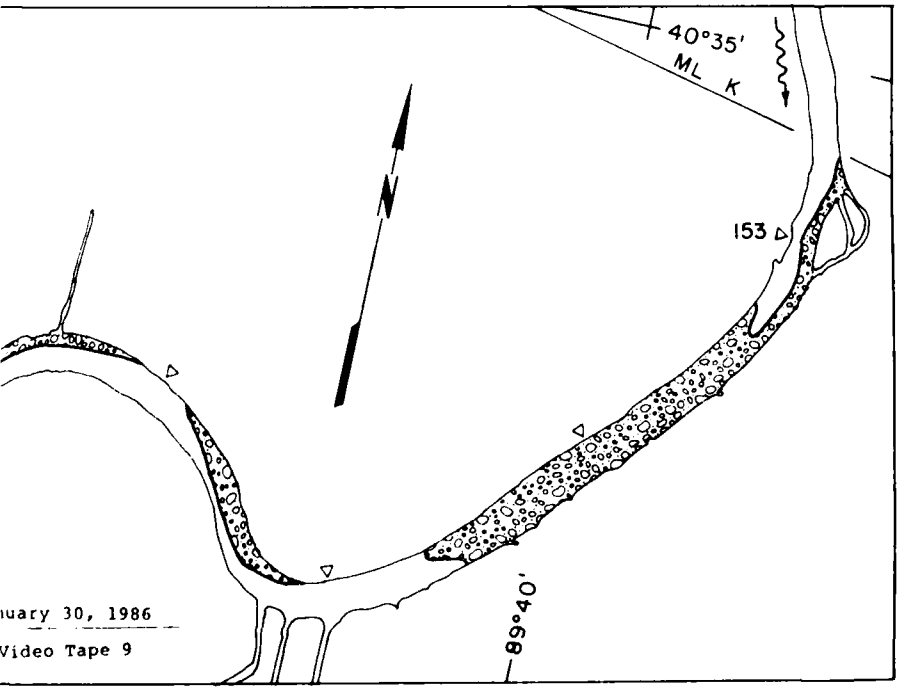
30 January 1986







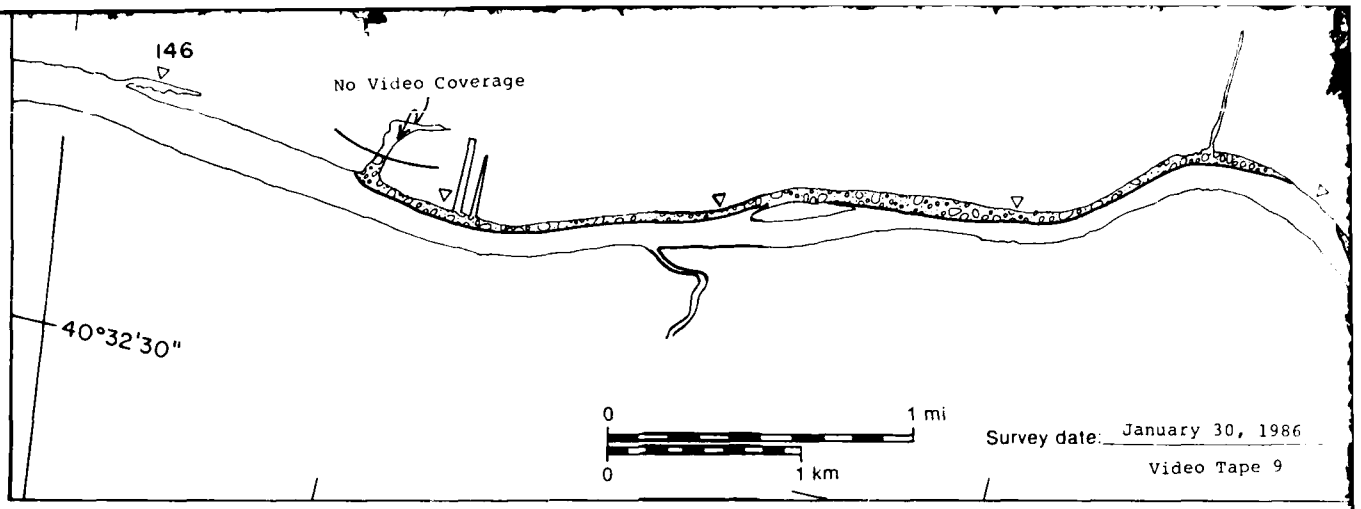


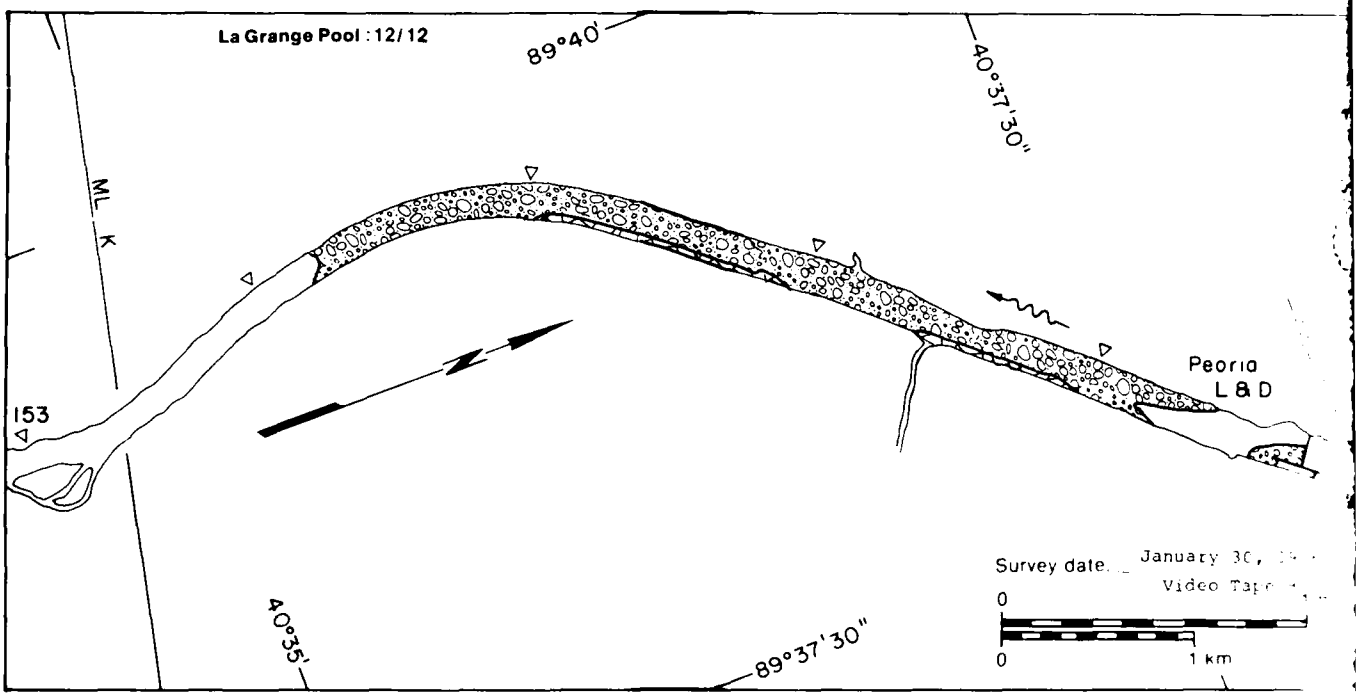


La Grange Pool

MAP UNITS

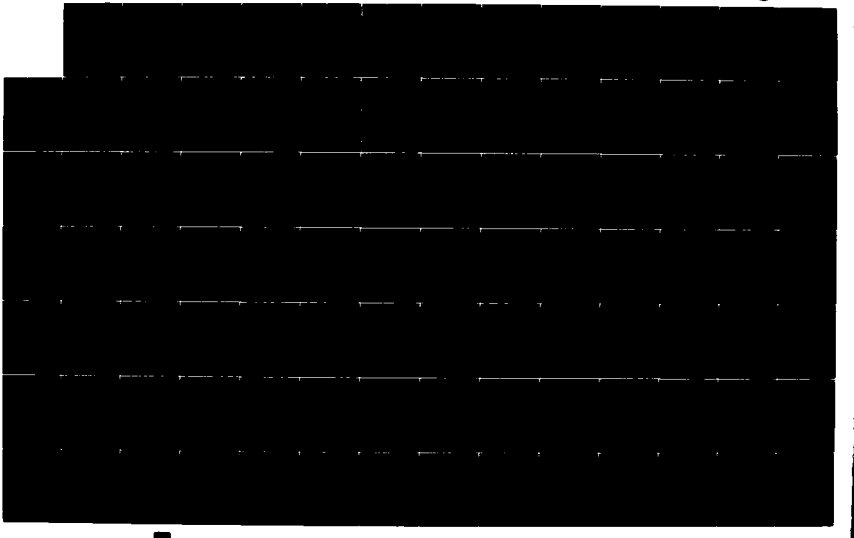
	Area ($m^2 \times 10^6$)	Surface concentration (‰)

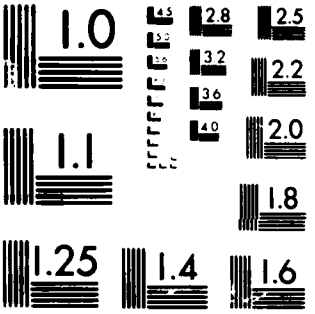

146
No Video Coverage
40°32'30"
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9

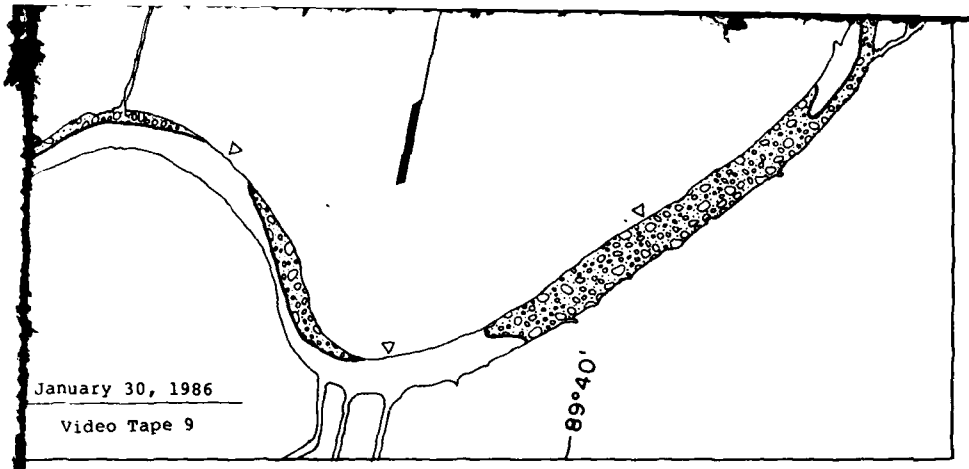

La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L&D
Survey date: January 30,
Video Tape
0
1 km
40°35'
89°37'30"

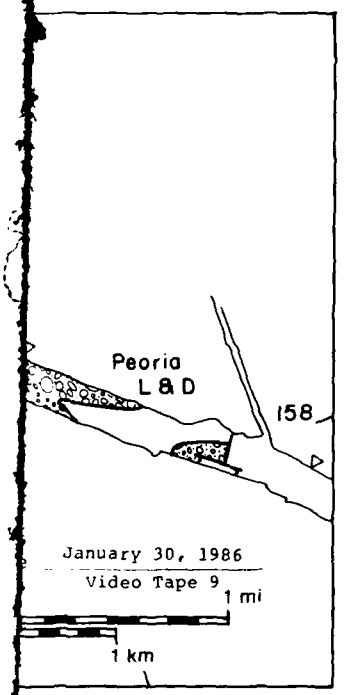
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER 1/14
OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND
ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87

UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL




1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5

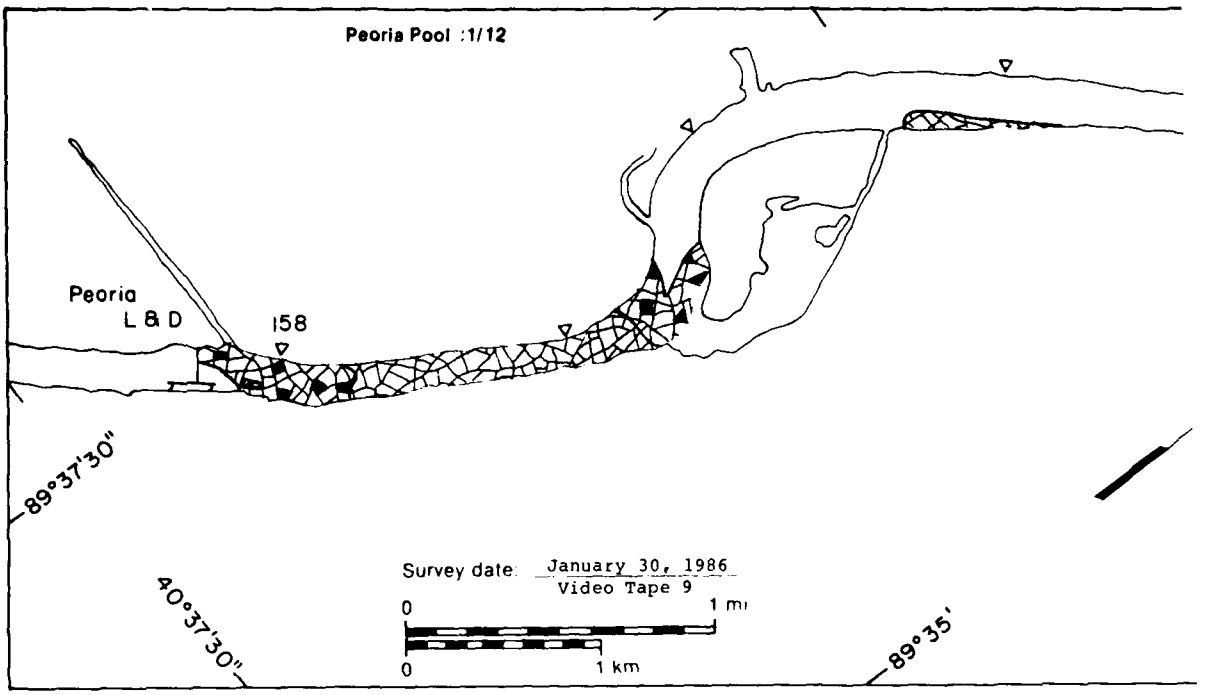


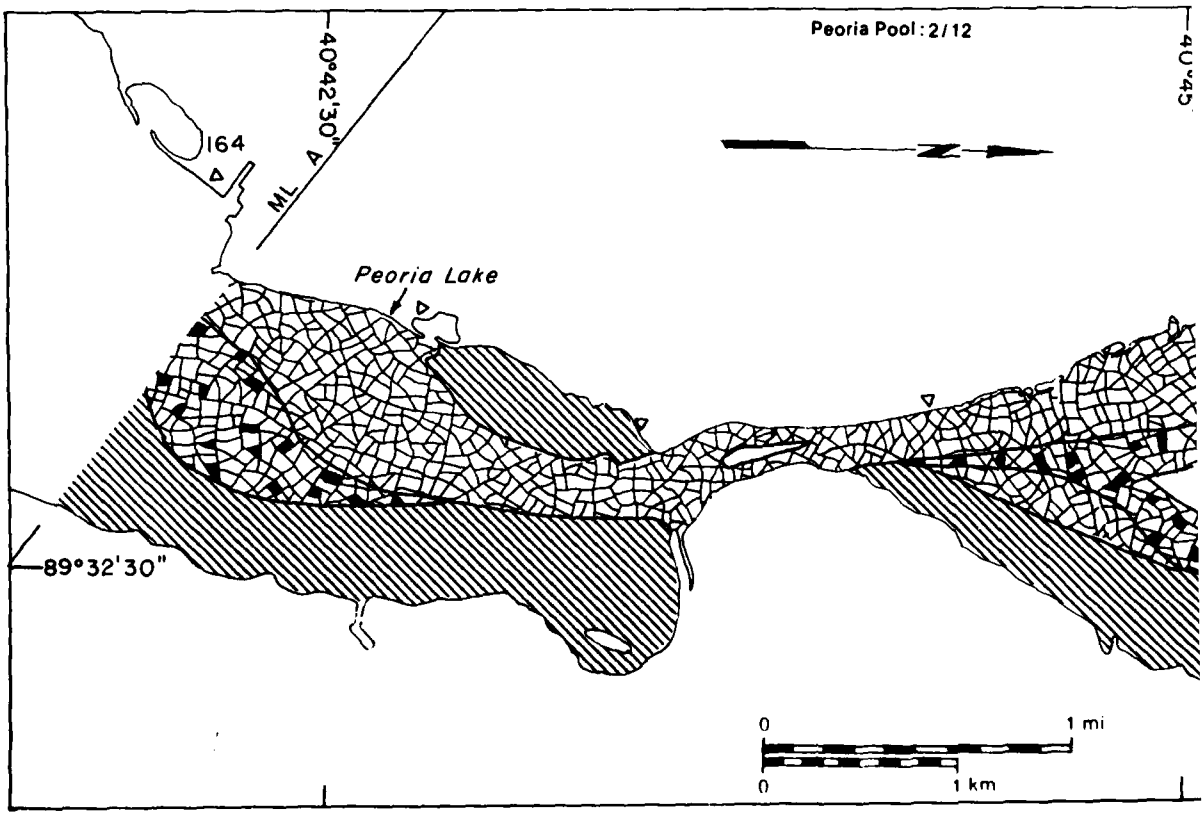


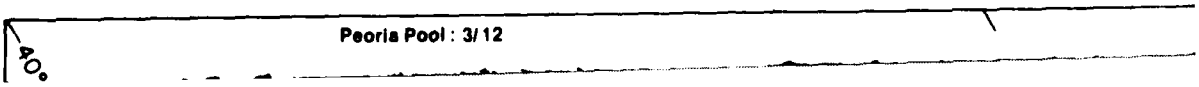
La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.94	NA
Solid ice cover	0.04	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.27	NA
Fragmented ice cover with open-water areas	0.04	80
Ice floes or frazil slush and pans	6.39	40
Total area ($m^2 \times 10^6$)	11.71*	

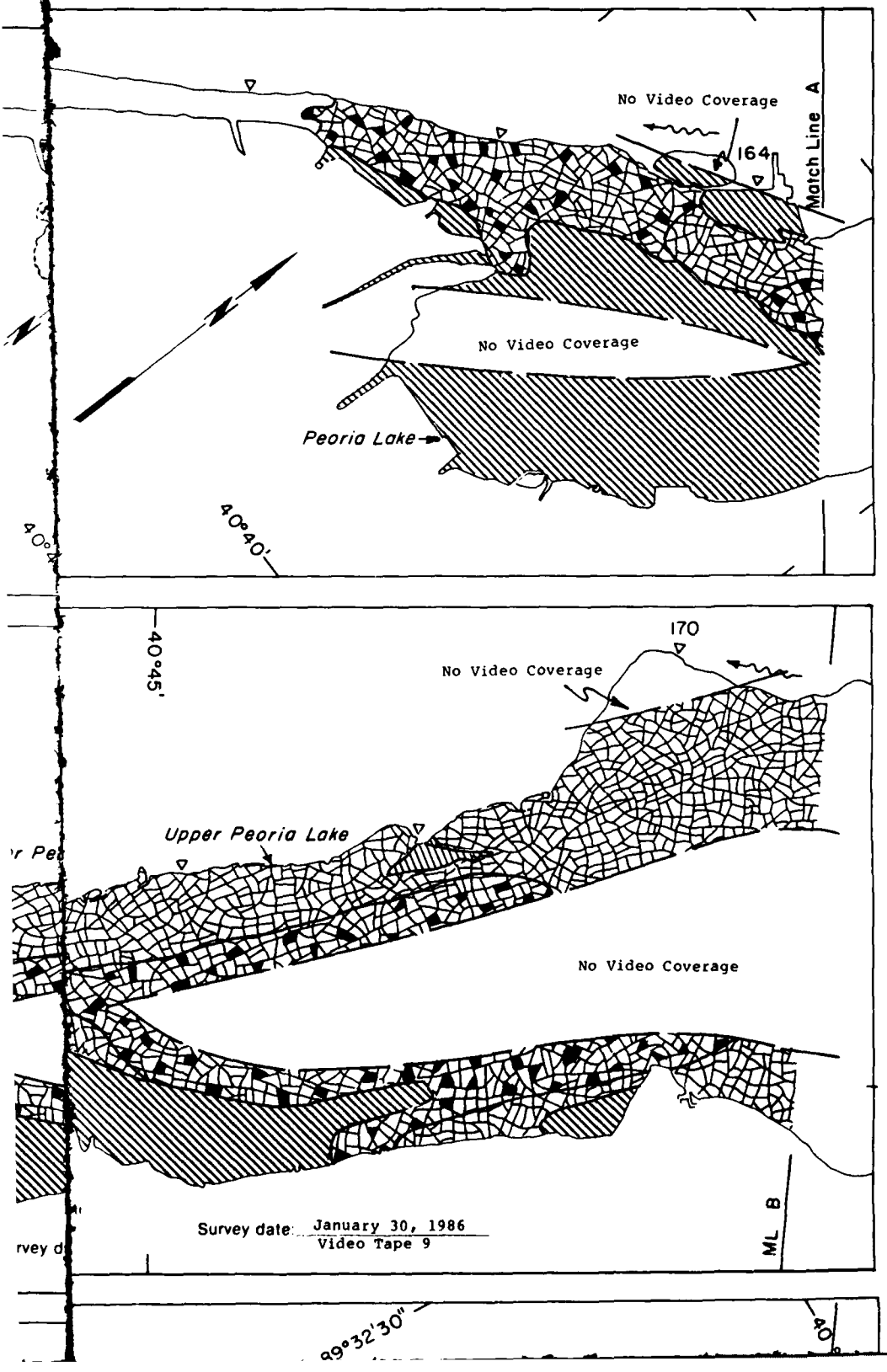
* Includes 0.03×10^6 m^2 of no video coverage

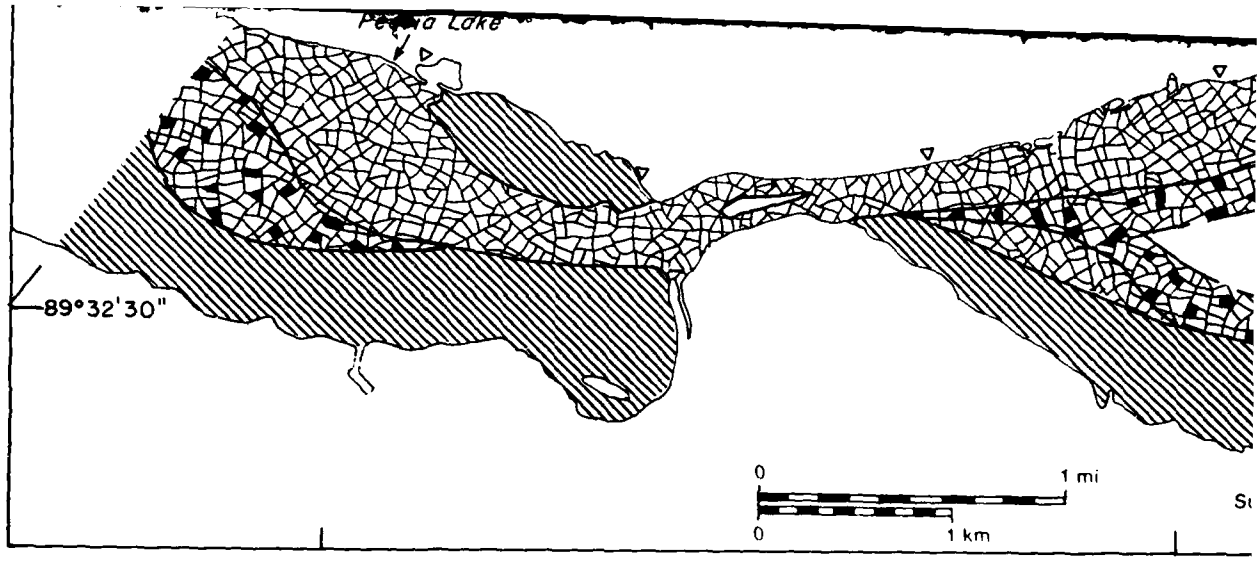

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: January 30, 1986
Video Tape 9
0
1 mi
0
1 km
89°35'

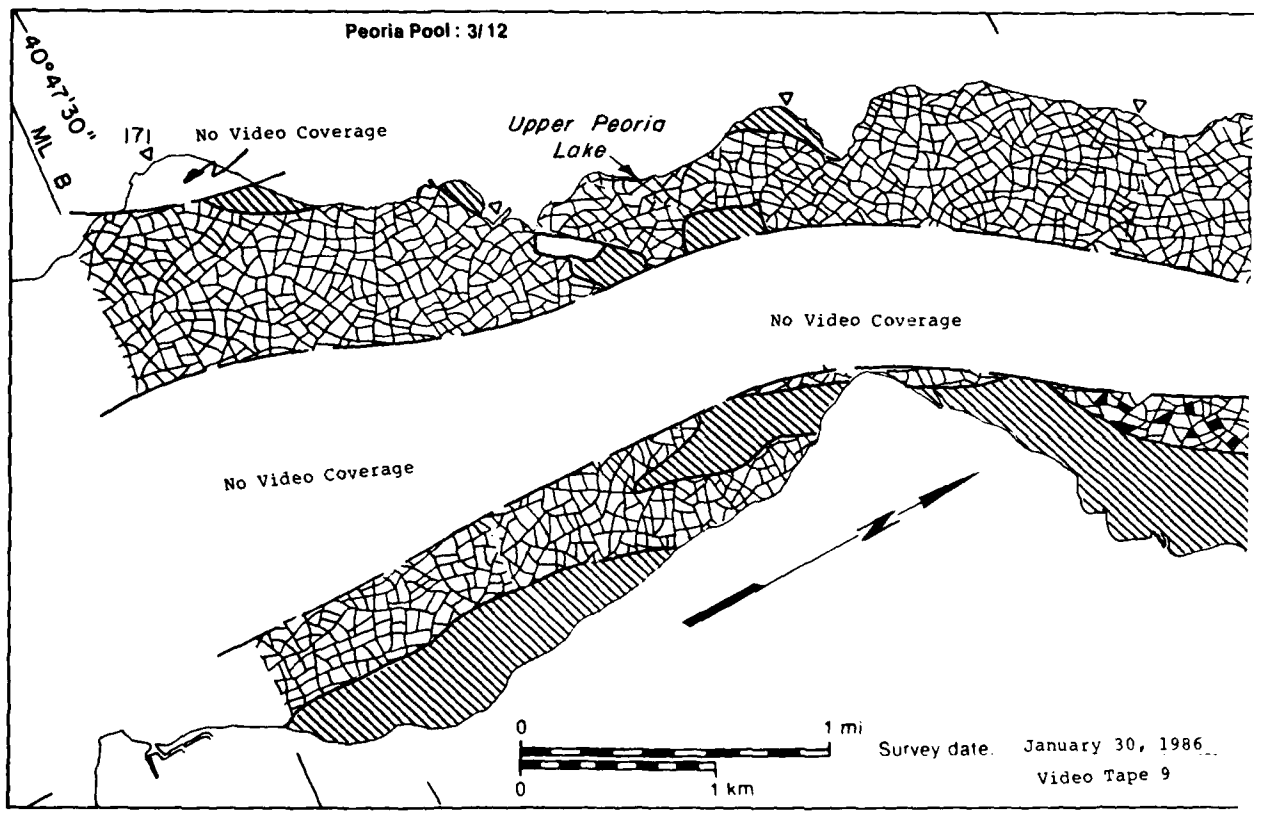

Peoria Pool : 2/12
40°42'30"
164
ML A
Peoria Lake
89°32'30"
0
1 mi
0
1 km

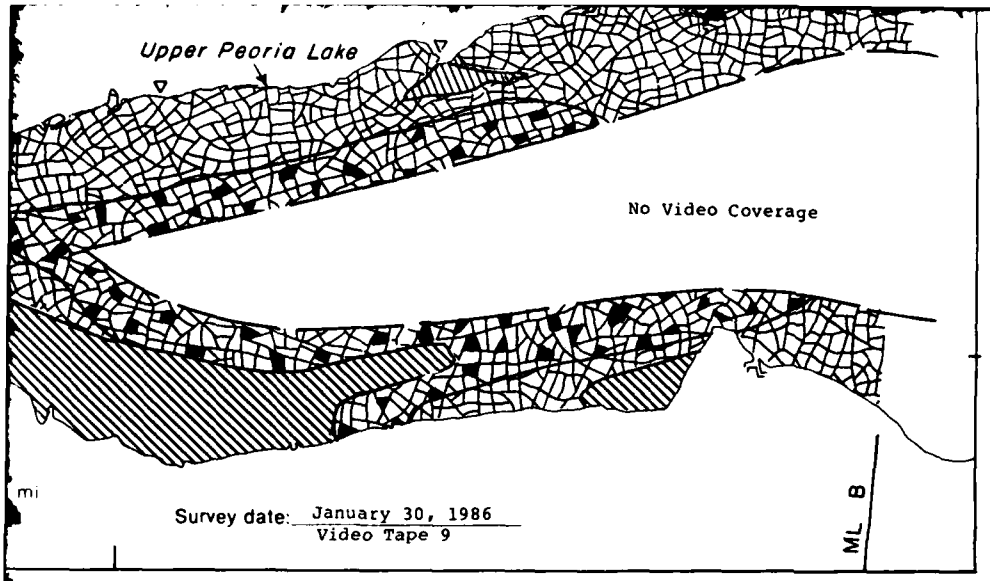

Peoria Pool : 3/12
40°

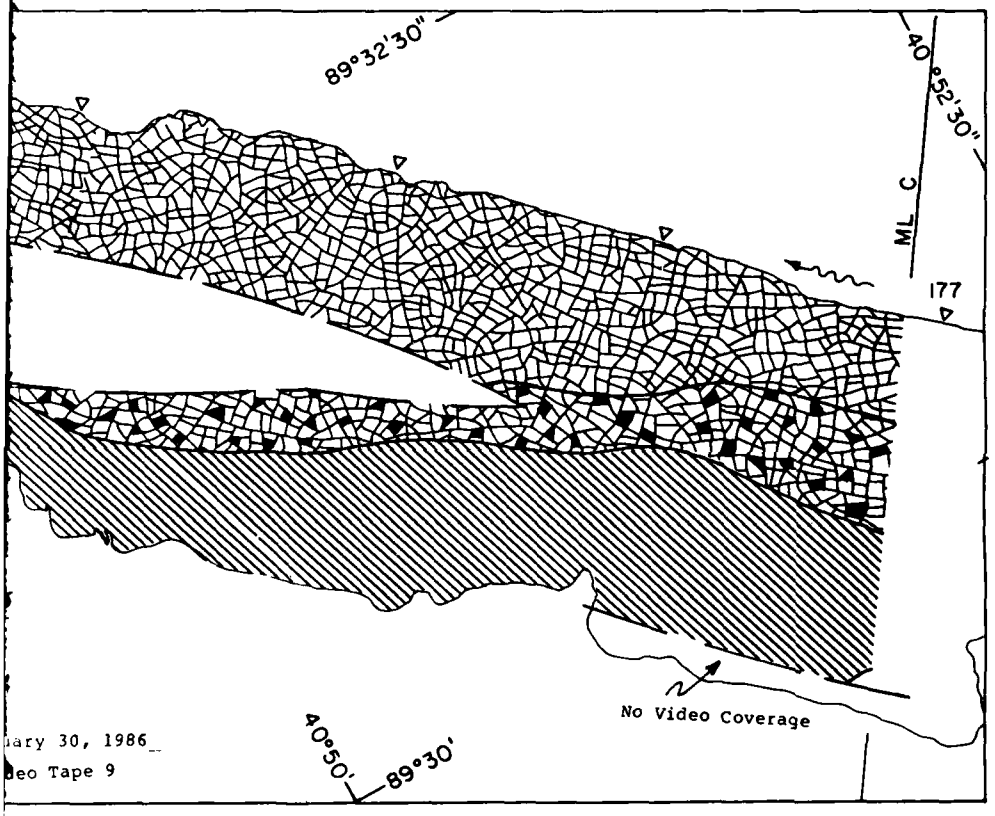
30 January 1986




Peoria Lake
89°32'30"
0
1 mi
0
1 km

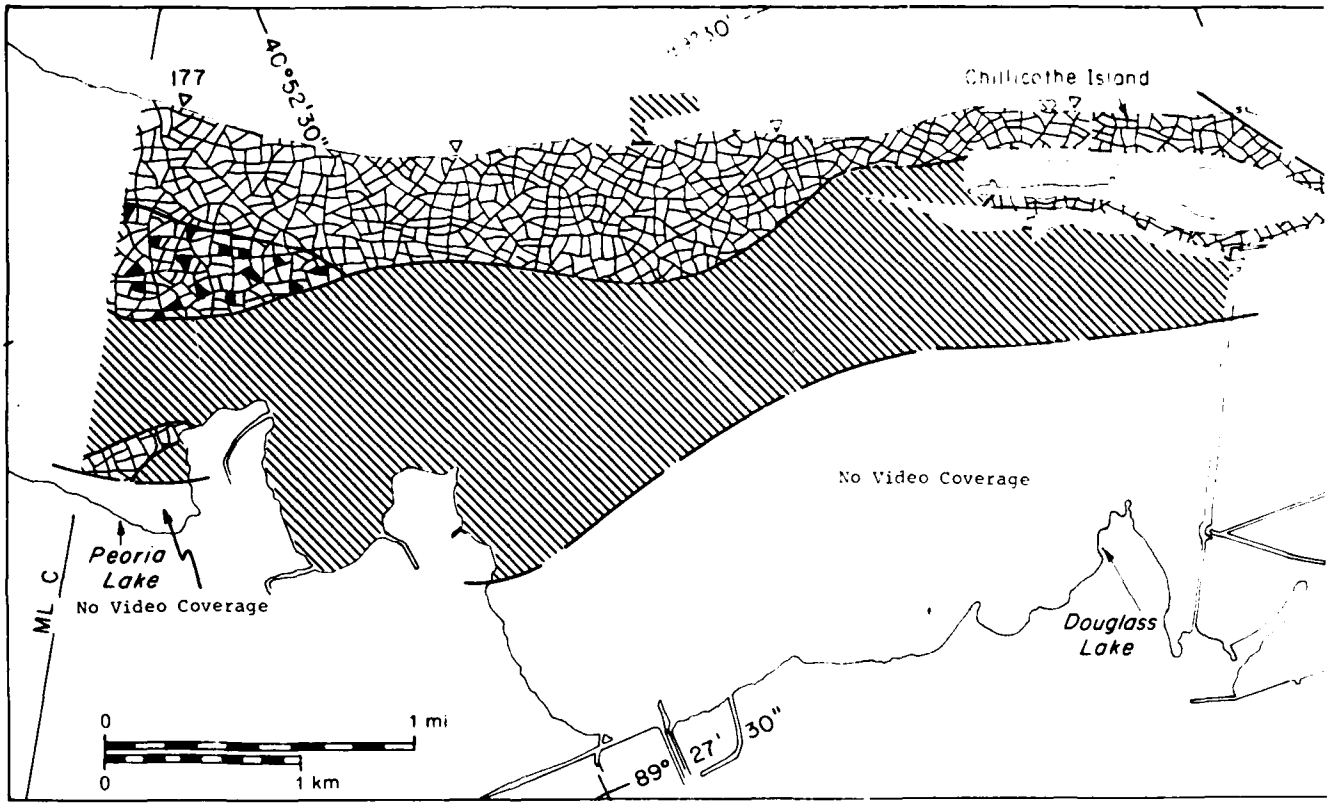

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date. January 30, 1986
Video Tape 9

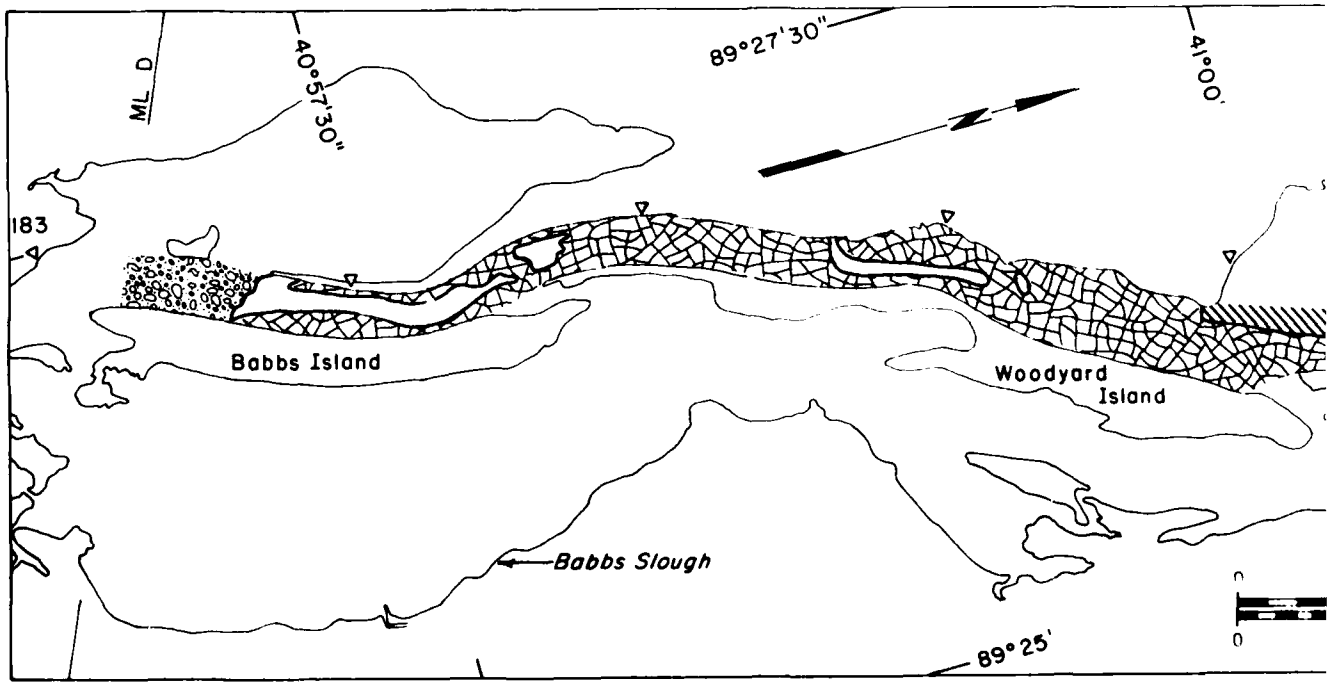

Upper Peoria Lake
No Video Coverage
mi
Survey date: January 30, 1986
Video Tape 9
ML B

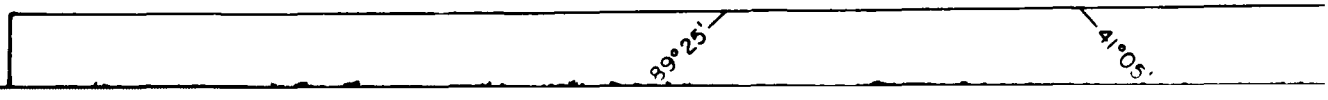

89°32'30"
40°52'30"
ML C
177
No Video Coverage
40°50'
89°30'
ary 30, 1986
eo Tape 9

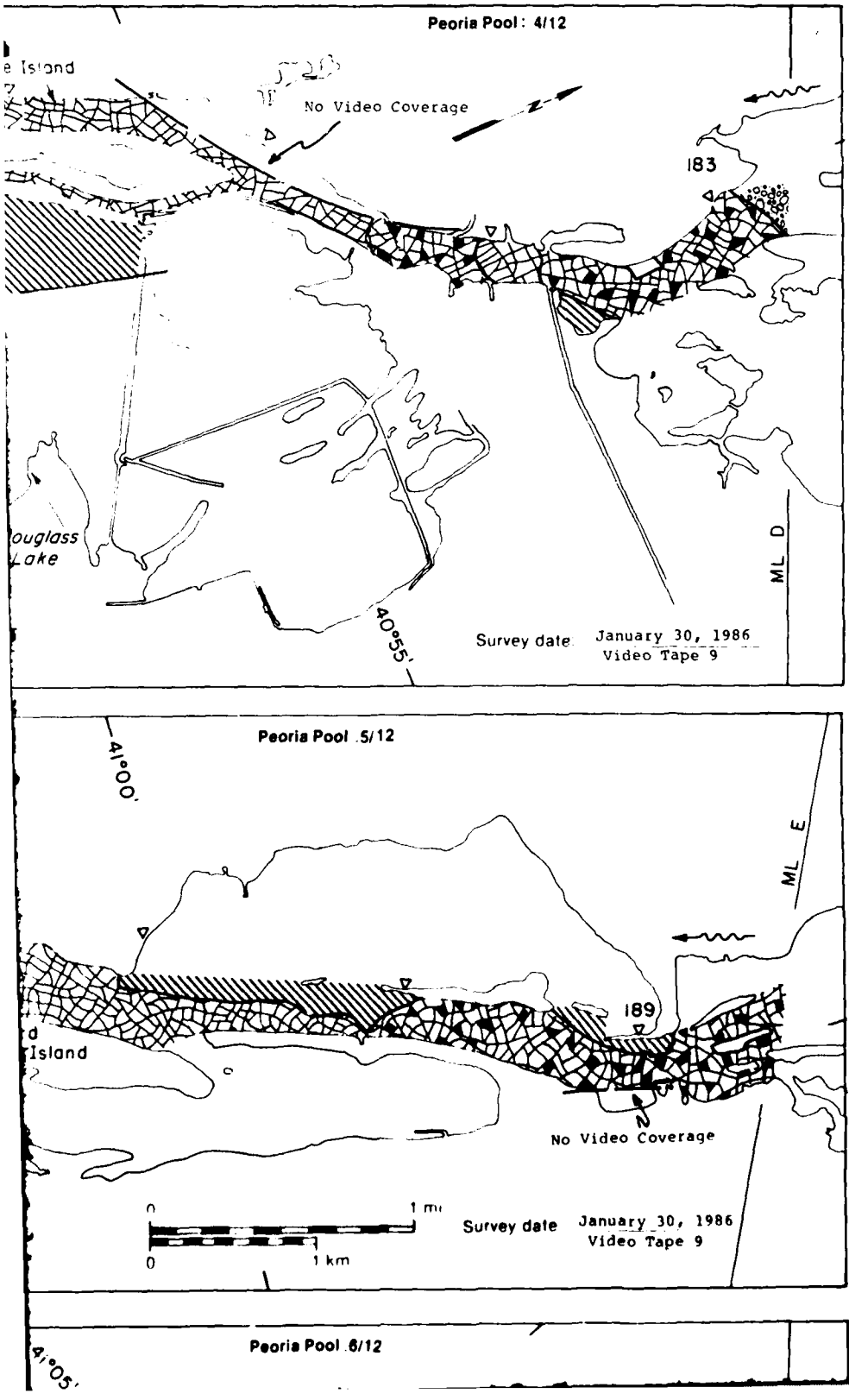
D

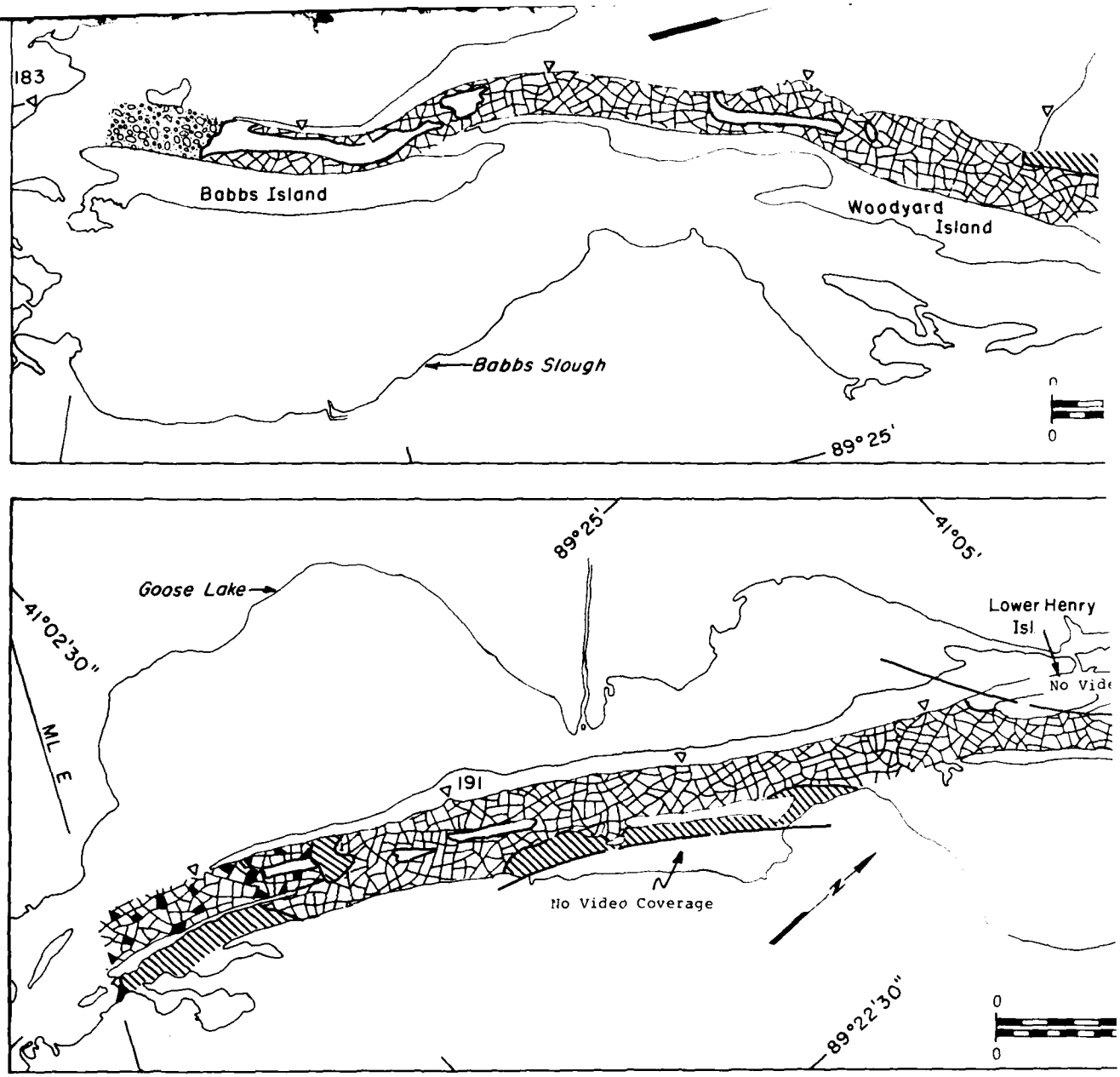
30 January 1986

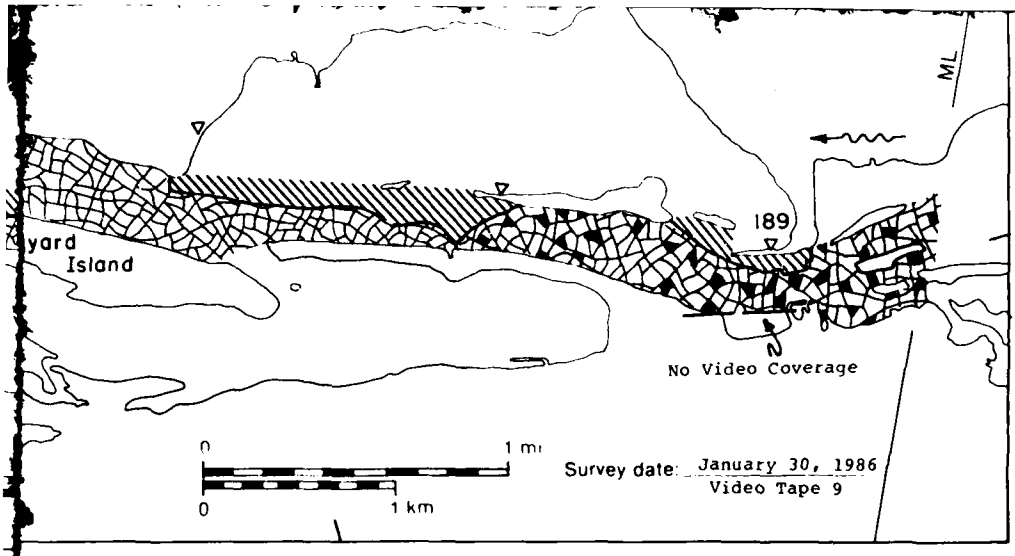


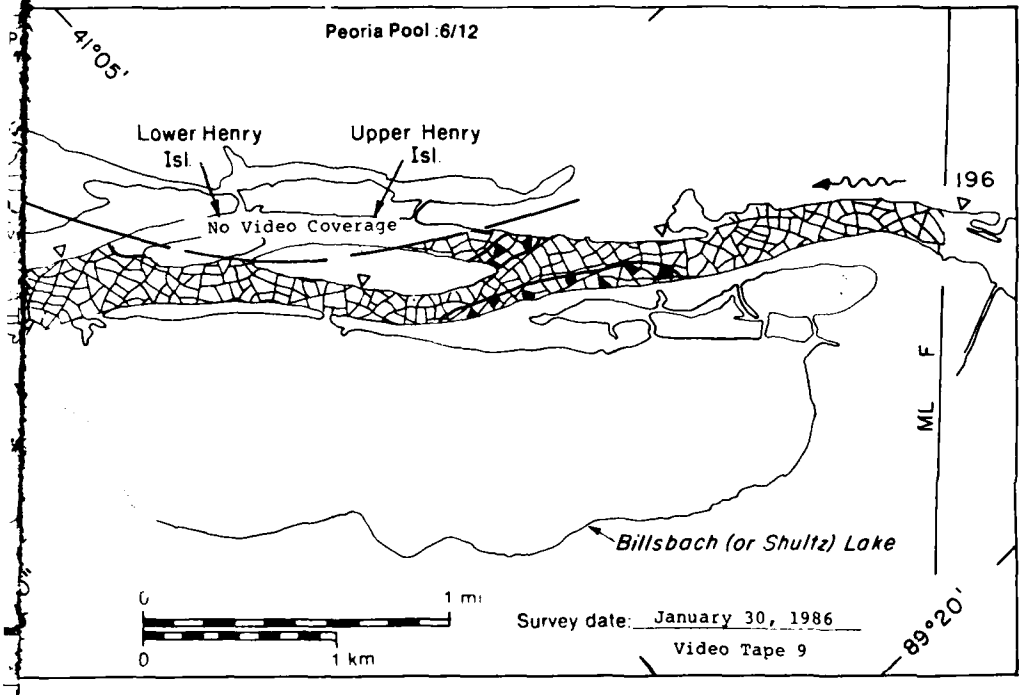


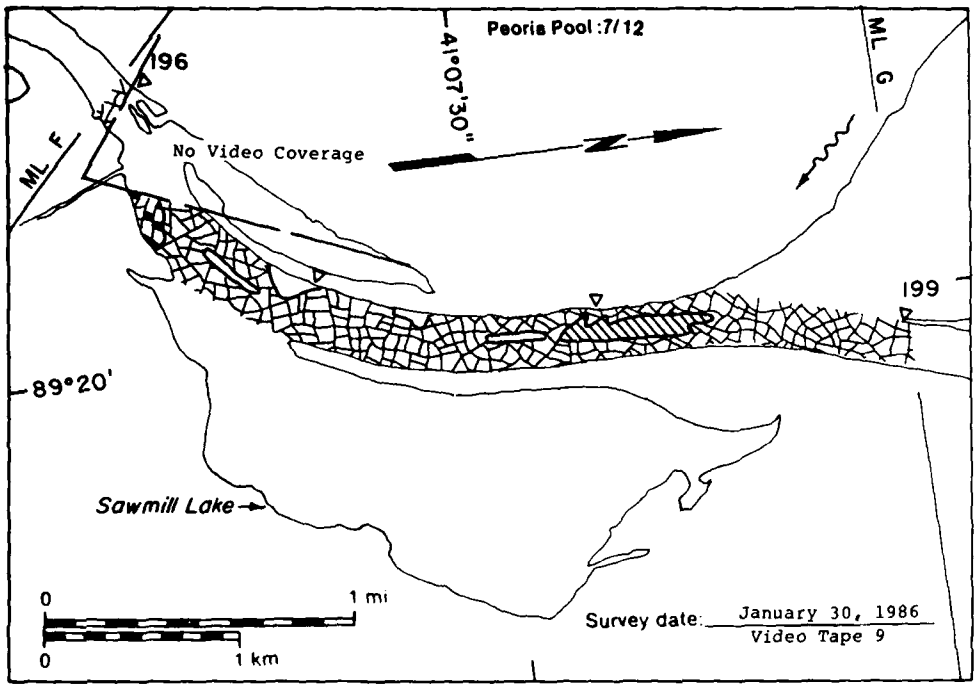


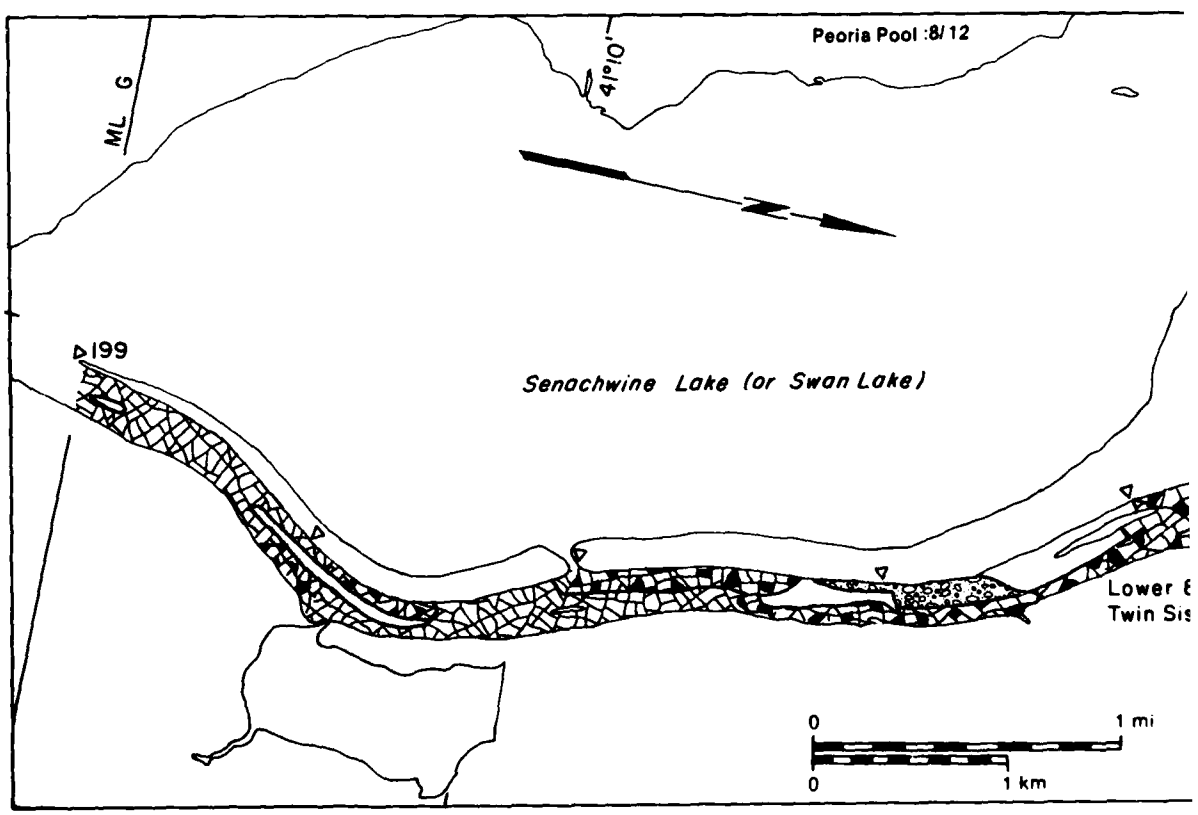

Peoria Pool: 4/12
e Island
No Video Coverage
183
ouglass
Lake
ML D
40°55'
Survey date January 30, 1986
Video Tape 9
Peoria Pool .5/12
41°00'
ML E
189
d
Island
No Video Coverage
0
1 mi
0
1 km
Survey date January 30, 1986
Video Tape 9
Peoria Pool .6/12
41°05'


183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
No Vide
ML E
191
No Video Coverage
89°22'30"
0
0


ML
189
yard
Island
No Video Coverage
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9

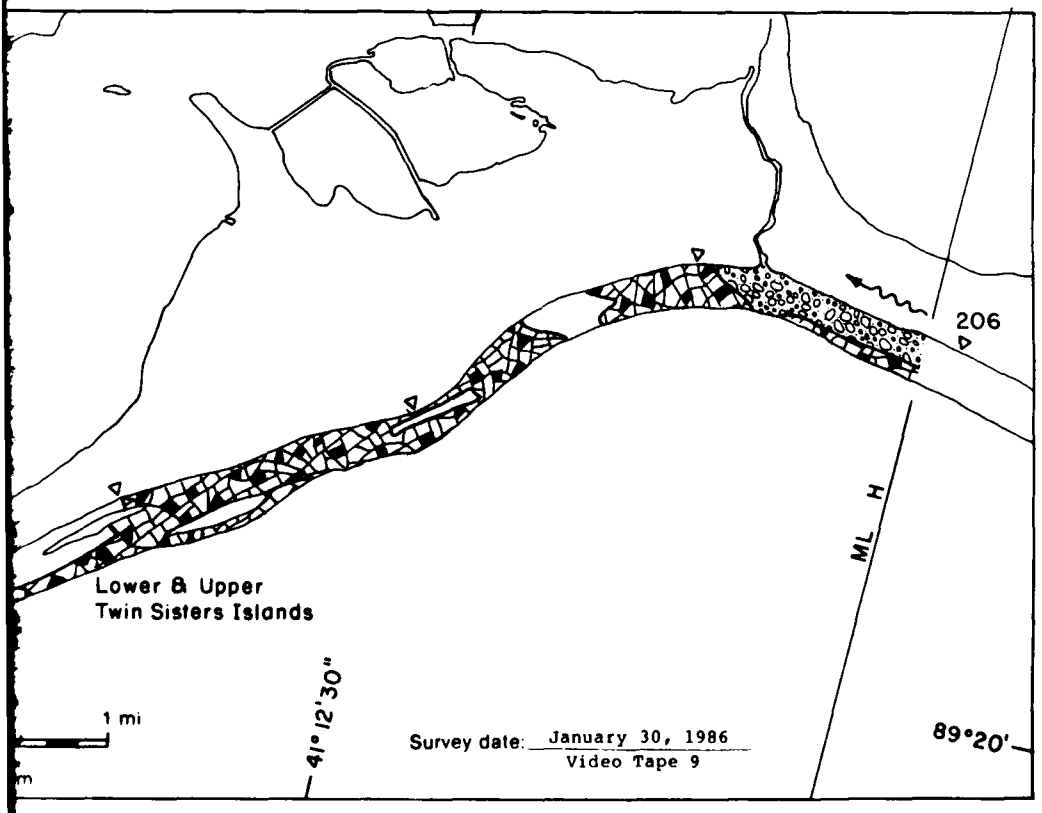

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
No Video Coverage
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9
89°20'

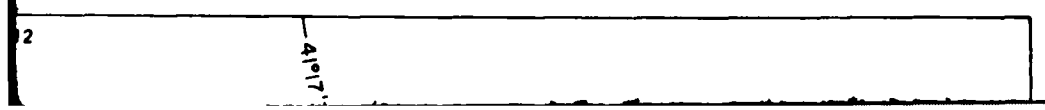

Peoria Pool :7/12
41°07'30"
196
ML G
ML F
No Video Coverage
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9

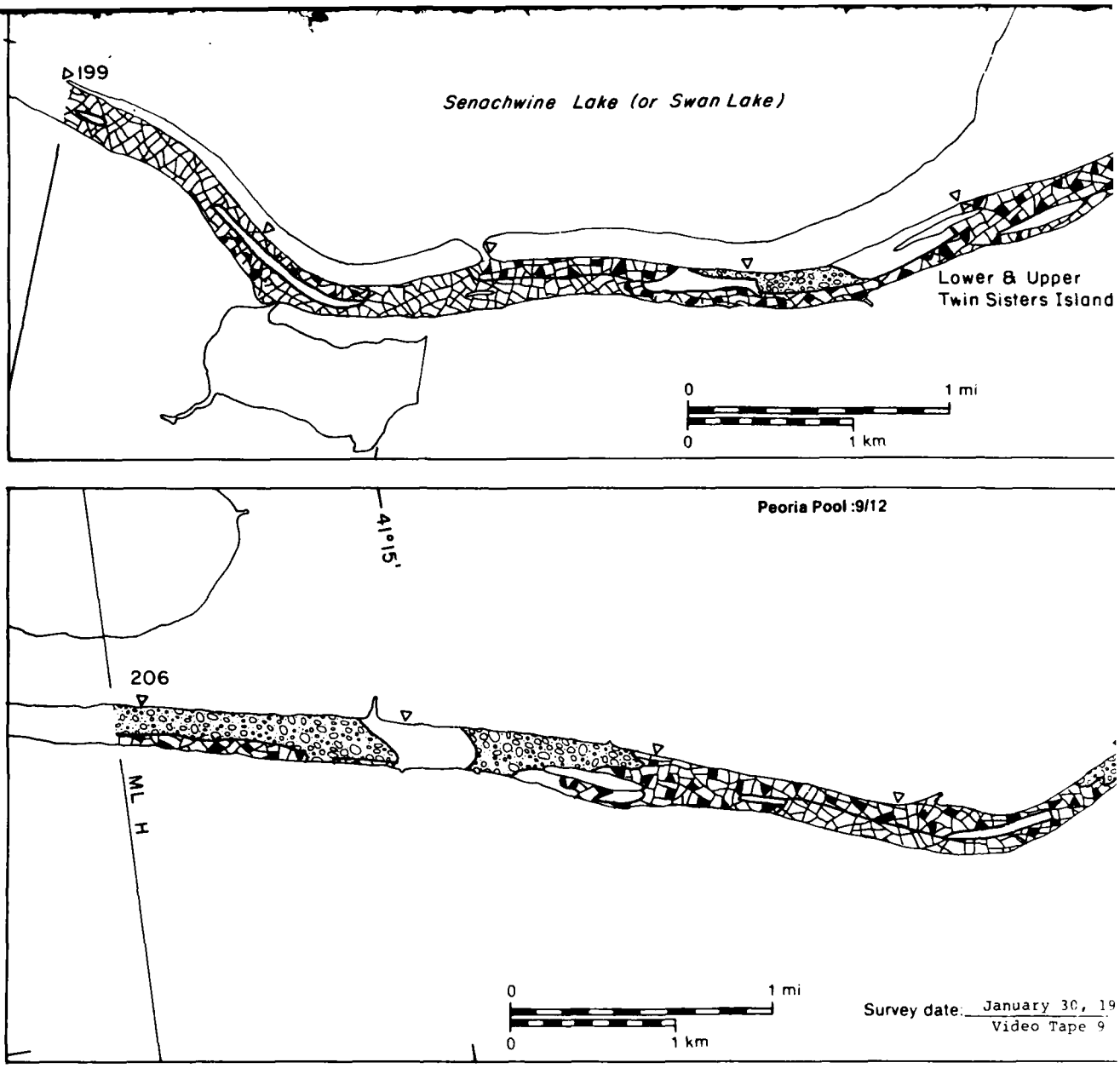

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower
Twin Sis
0
1 mi
0
1 km

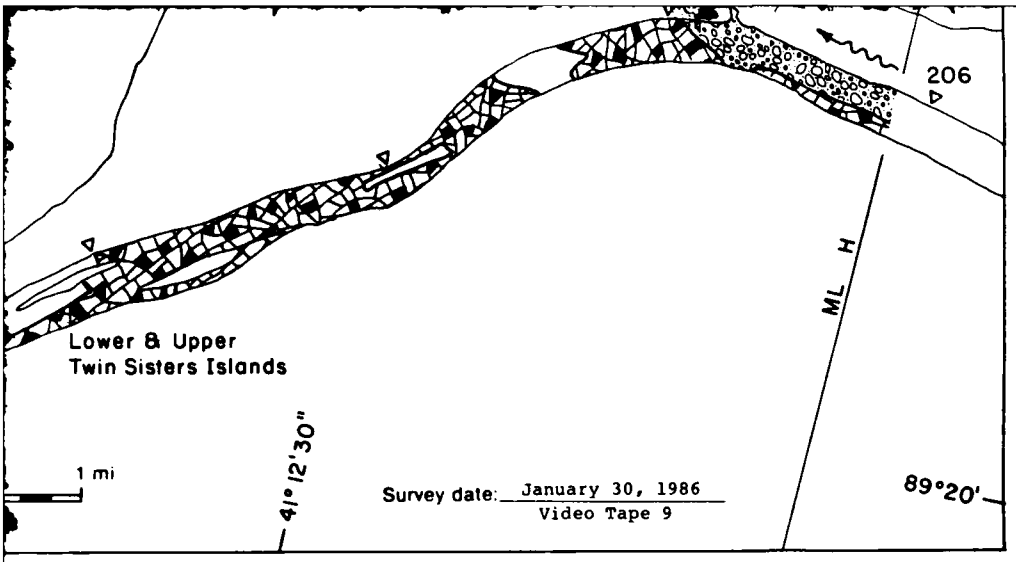
Peoria Pool :9/12
41°15'

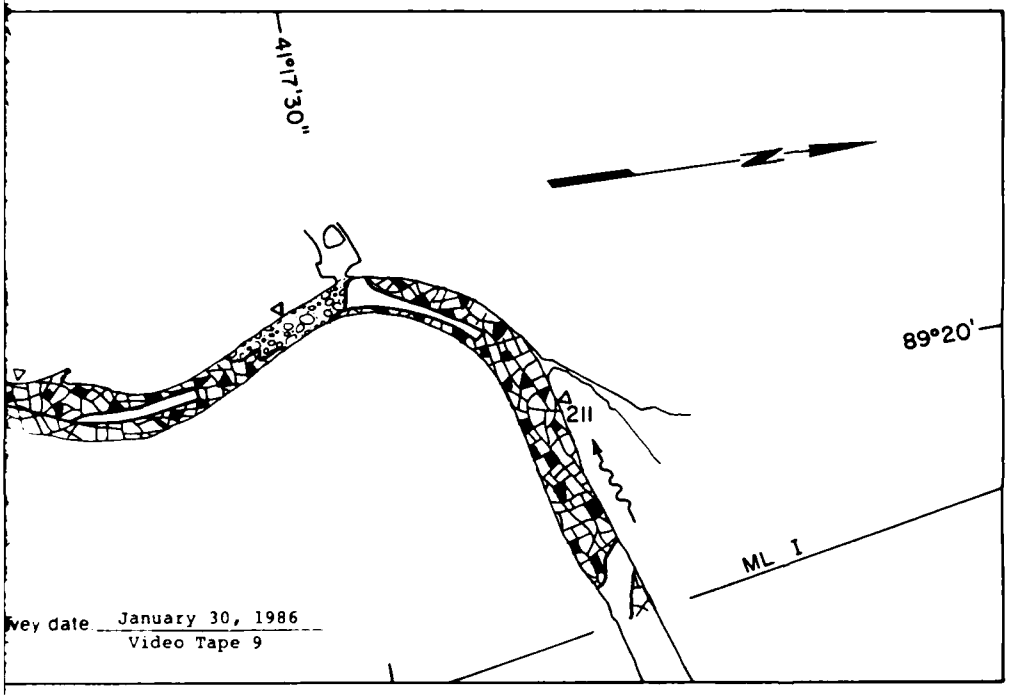
30 January 1986



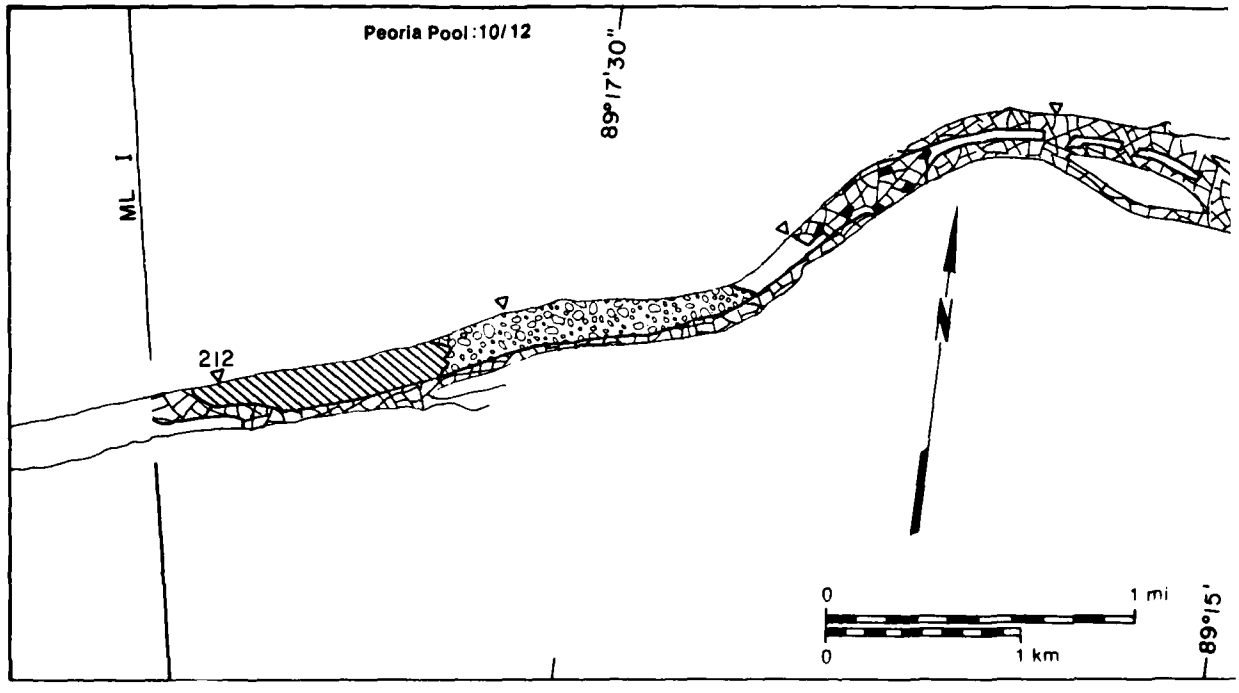


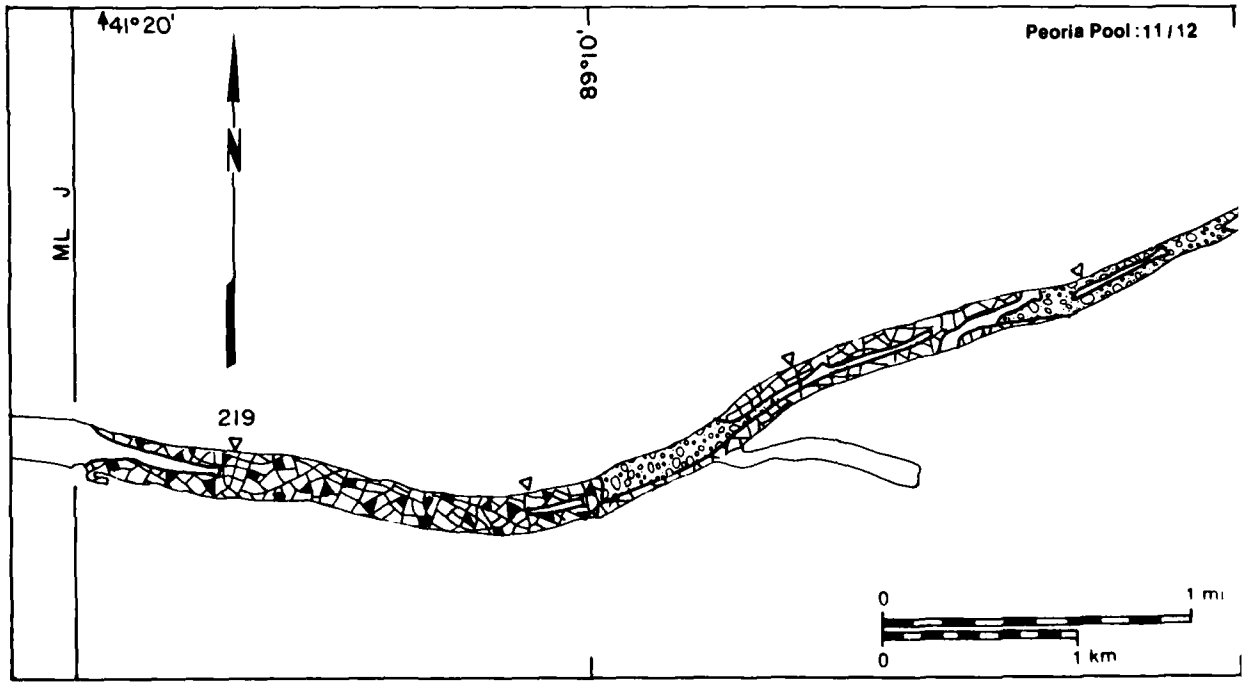

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Island
0
1 mi
0
1 km
Peoria Pool :9/12
41°15'
206
ML H
0
1 mi
0
1 km
Survey date: January 30, 19
Video Tape 9

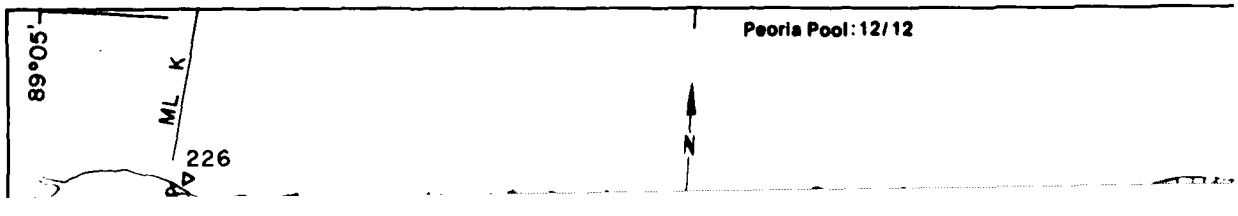

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
41°12'30"
Survey date: January 30, 1986
Video Tape 9
89°20'

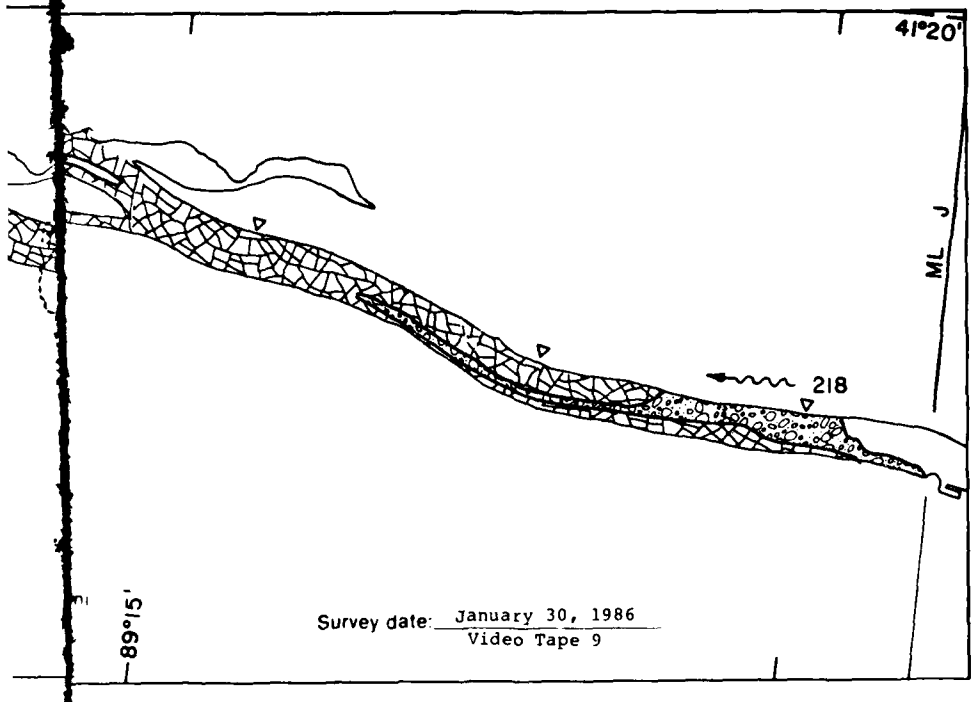

41°17'30"
89°20'
211
ML I
Survey date January 30, 1986
Video Tape 9

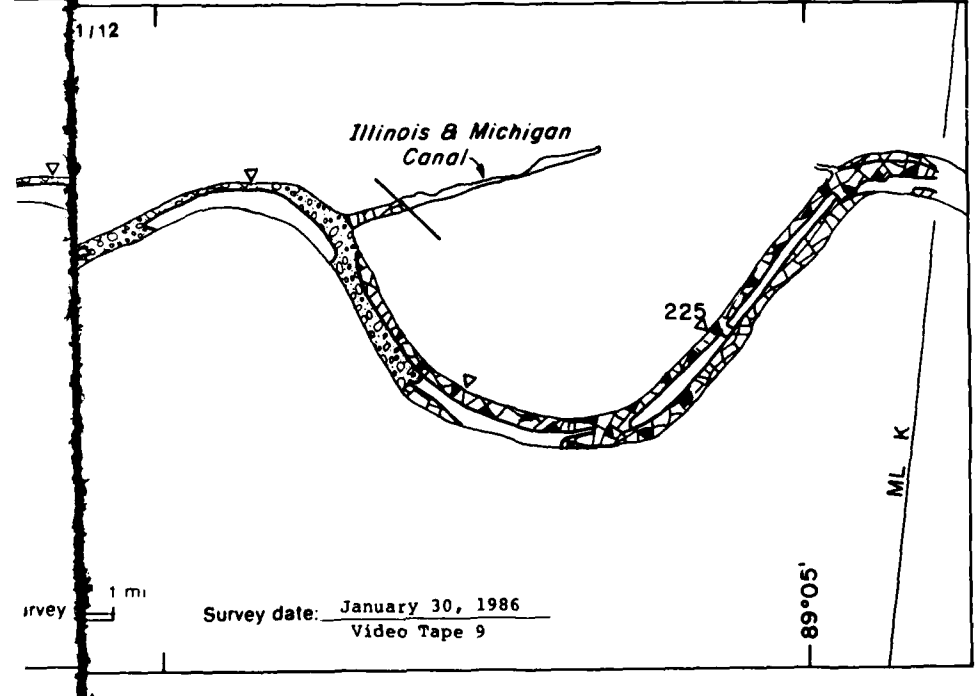
30 January 1986

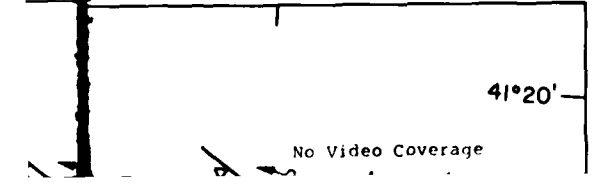


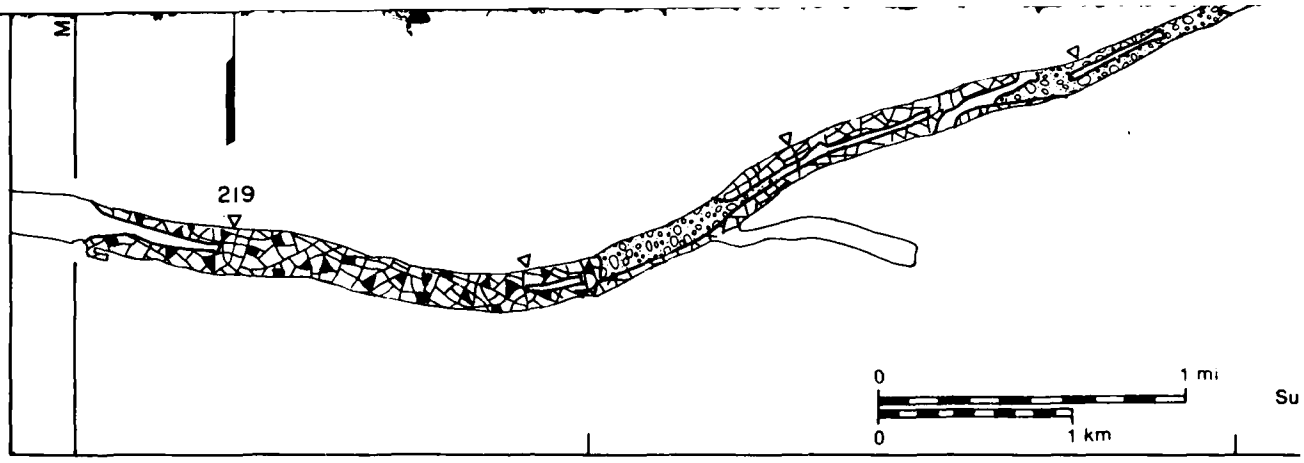


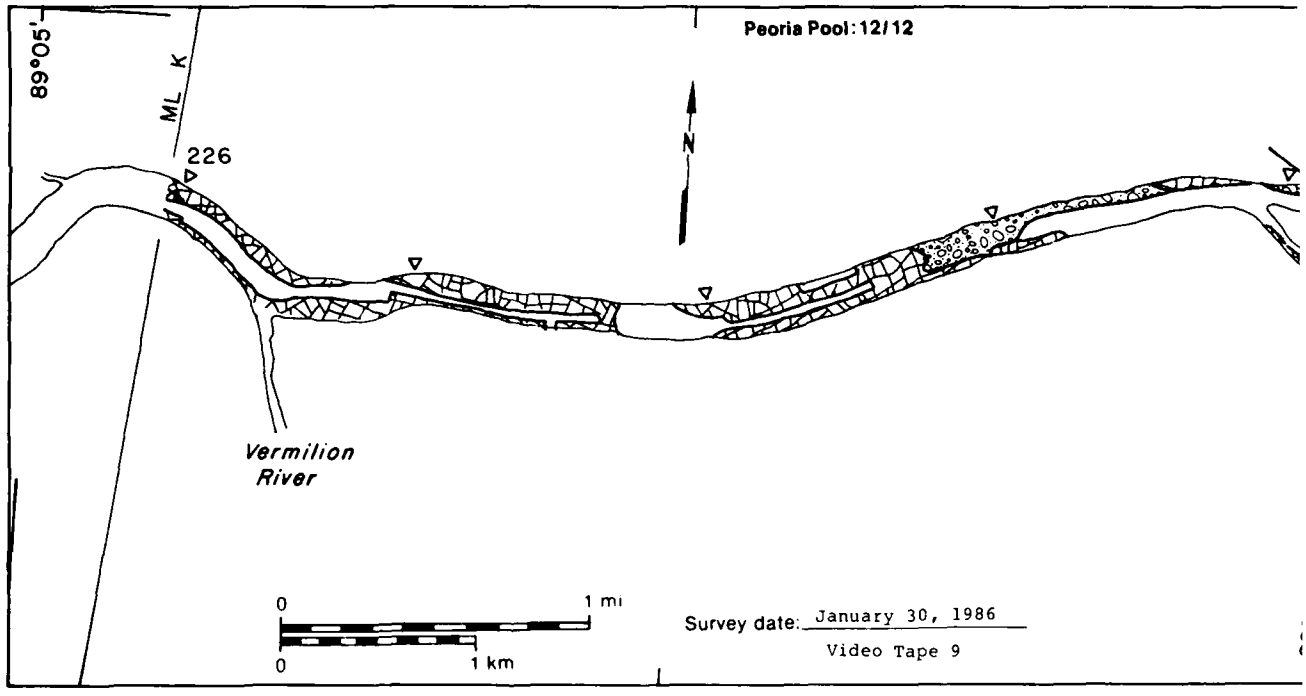



41°20'
ML J
218
89°15'
Survey date: January 30, 1986
Video Tape 9


1/12
Illinois & Michigan Canal
225
ML K
89°05'
1 mi
Survey date: January 30, 1986
Video Tape 9


41°20'
No Video Coverage





Peoria Pool: 12/12

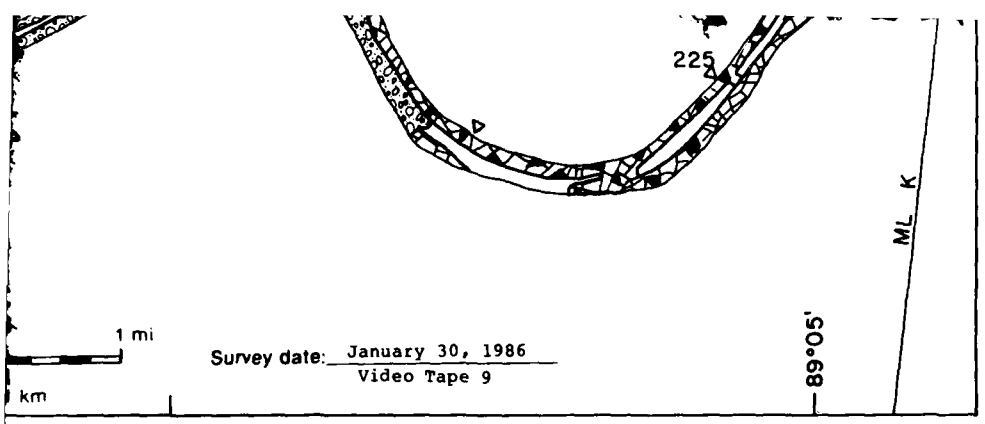
Survey date: January 30, 1986

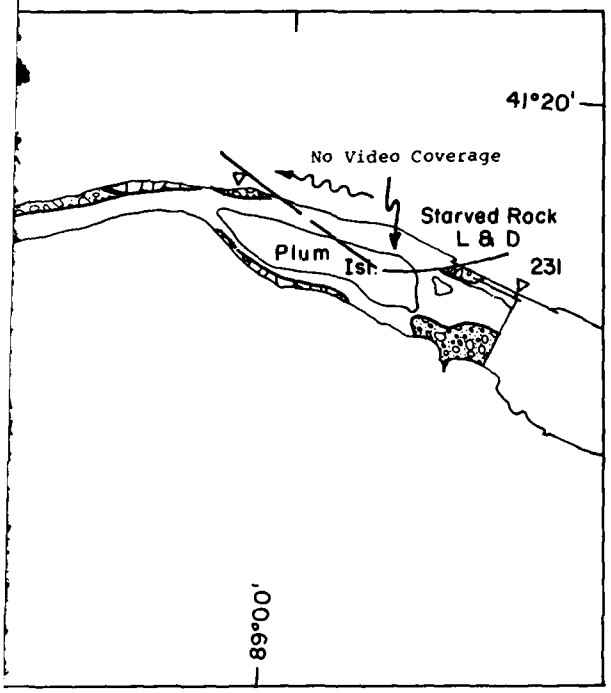
Video Tape 9

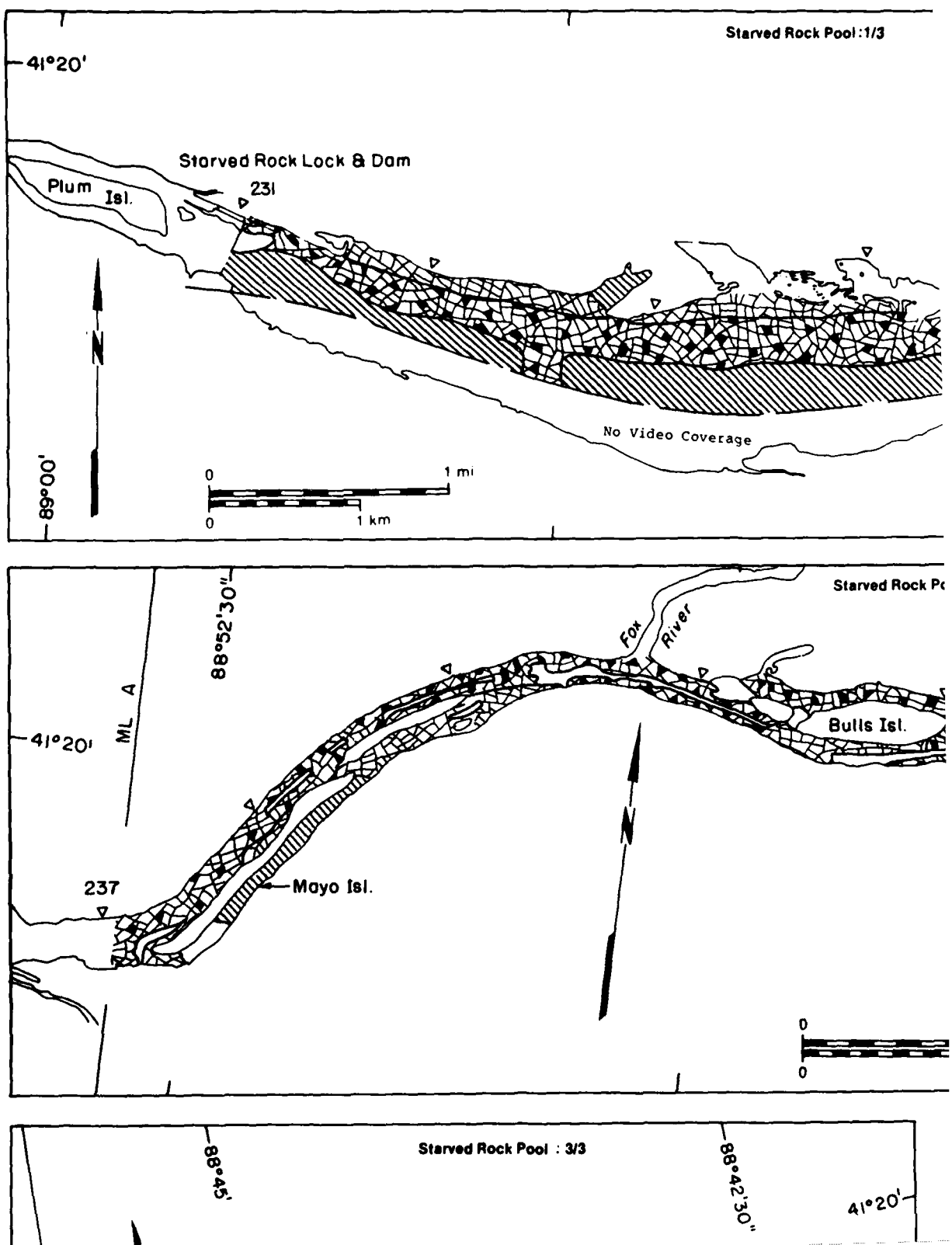
Peoria Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	3.69	NA
Solid ice cover	18.51	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	27.56	NA
Fragmented ice cover with open-water areas	11.49	90
Ice floes or frazil slush and pans	2.30	40
Total area ($m^2 \times 10^6$)	81.33*	

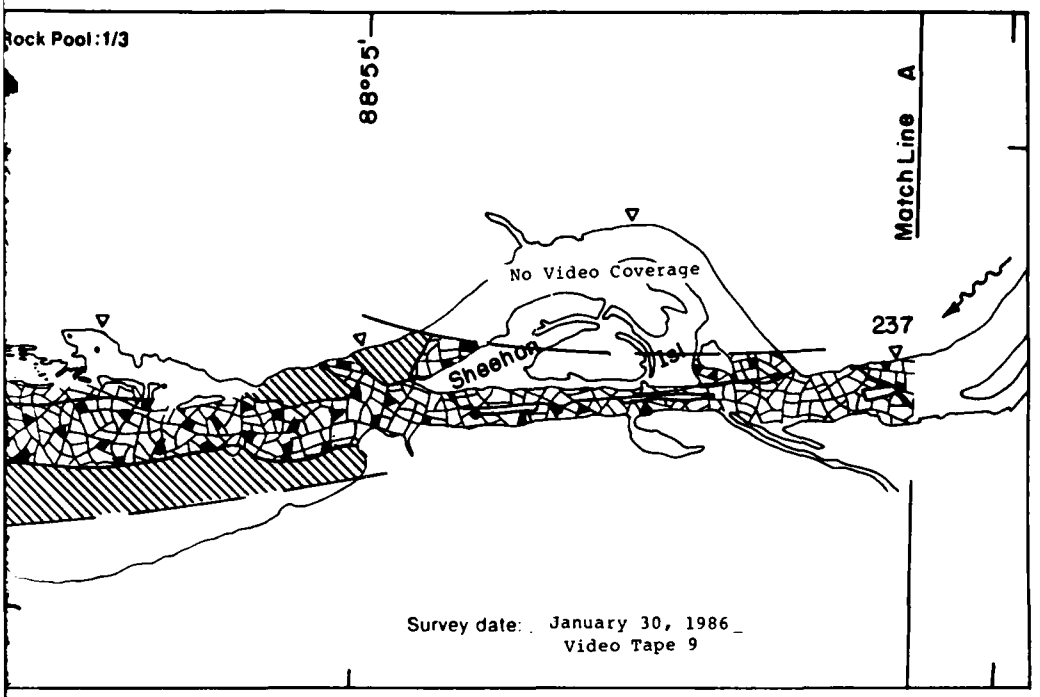
* Includes 17.78×10^6 m^2 of no video coverage

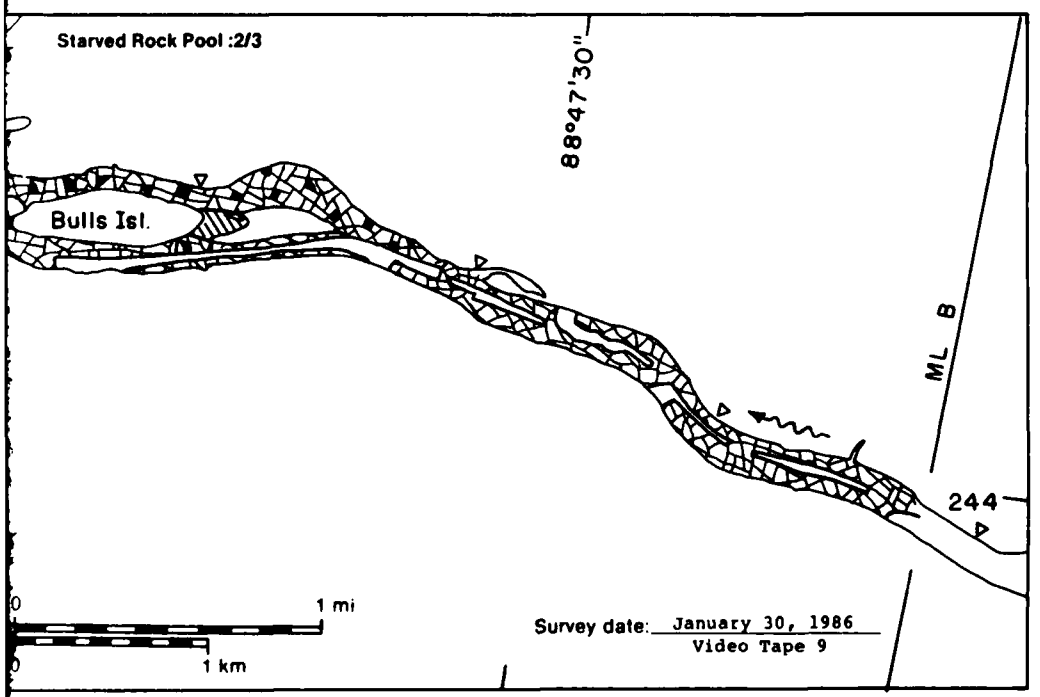

225
ML K
89°05'
1 mi
km
Survey date: January 30, 1986
Video Tape 9


41°20'
No Video Coverage
Starved Rock
L & D
Plum Isl.
231
89°00'


Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
N
No Video Coverage
89°00'
0
1 mi
0
1 km
Starved Rock Pool : 2/3
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
N
0
0
Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

30 January 1986

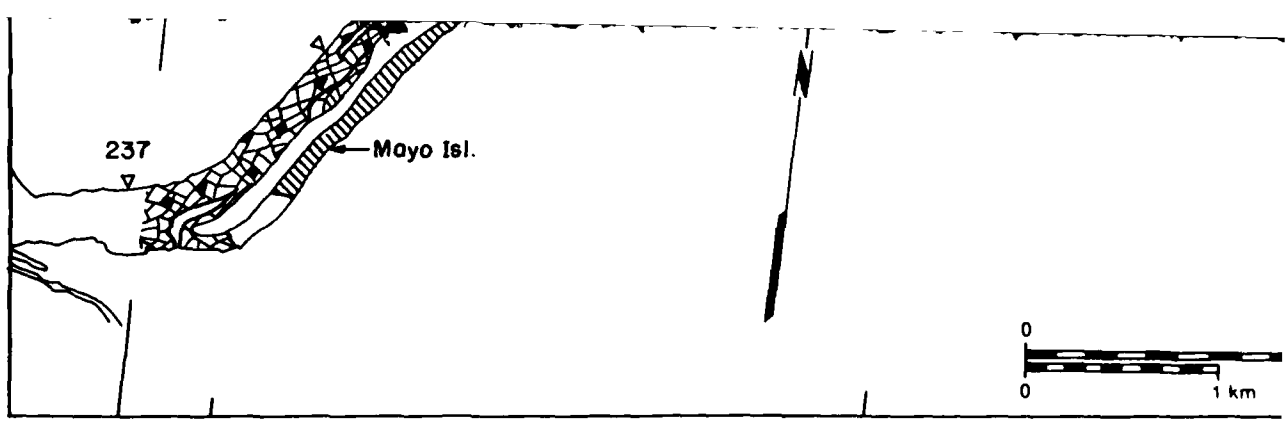


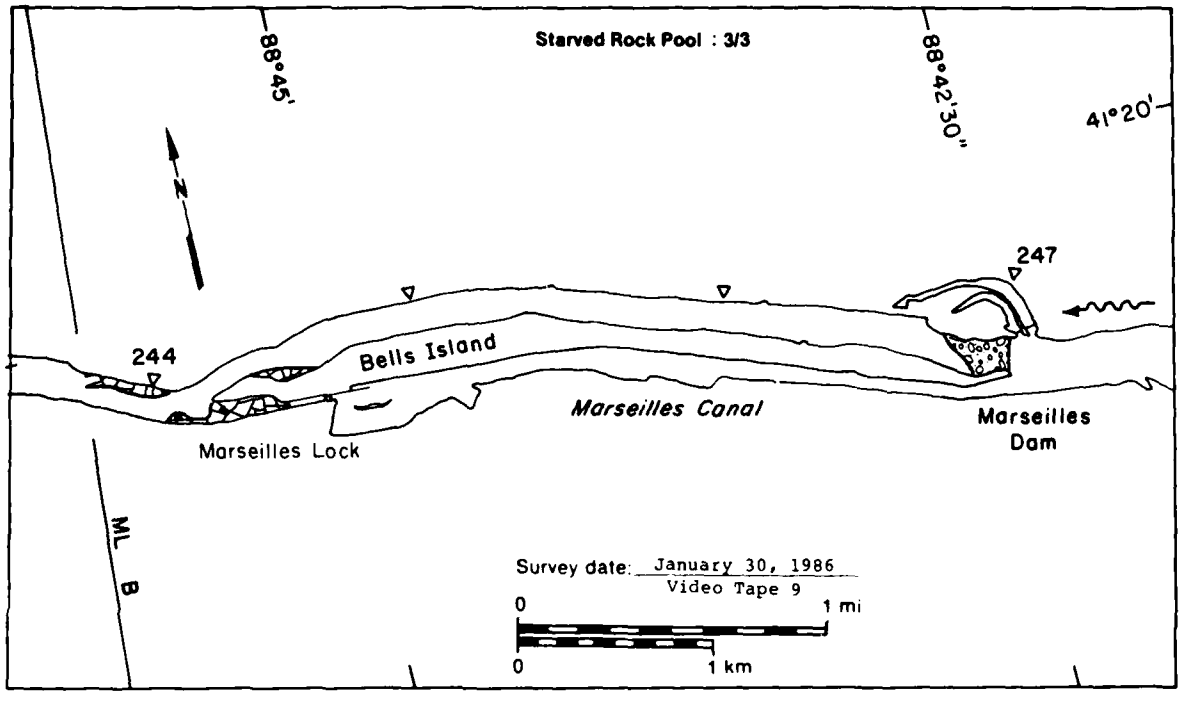


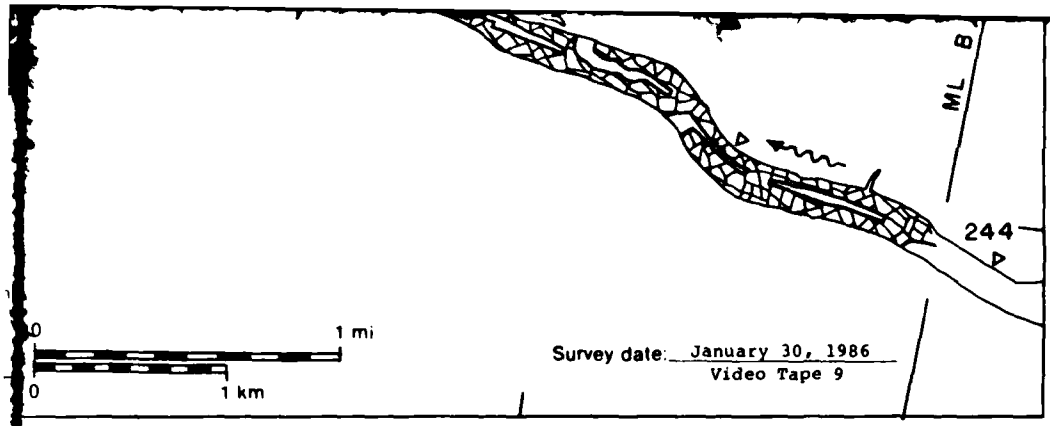
41°20'

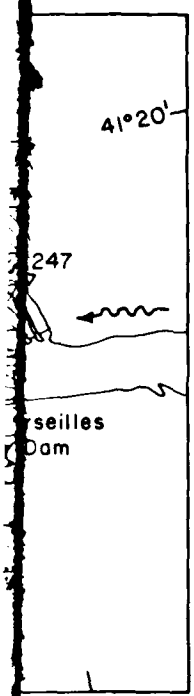
Starved Rock Pool

MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	1.35	NA


237
Mayo Isl.
N
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: January 30, 1986
Video Tape 9
0
1 mi
0
1 km



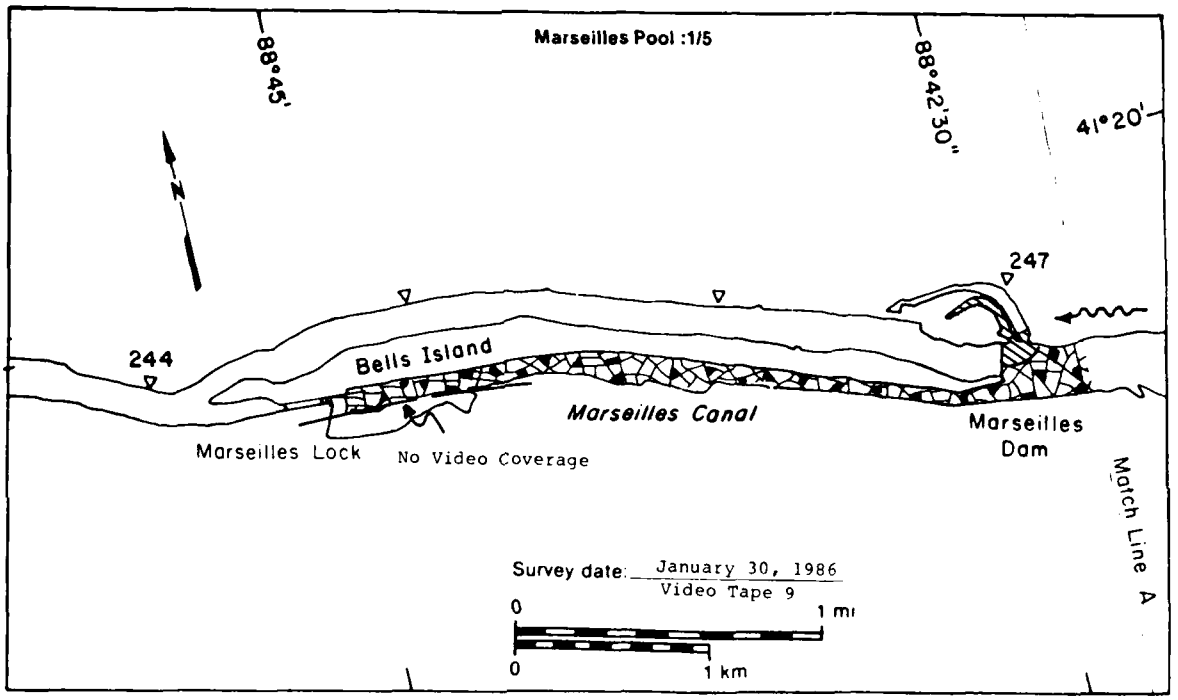


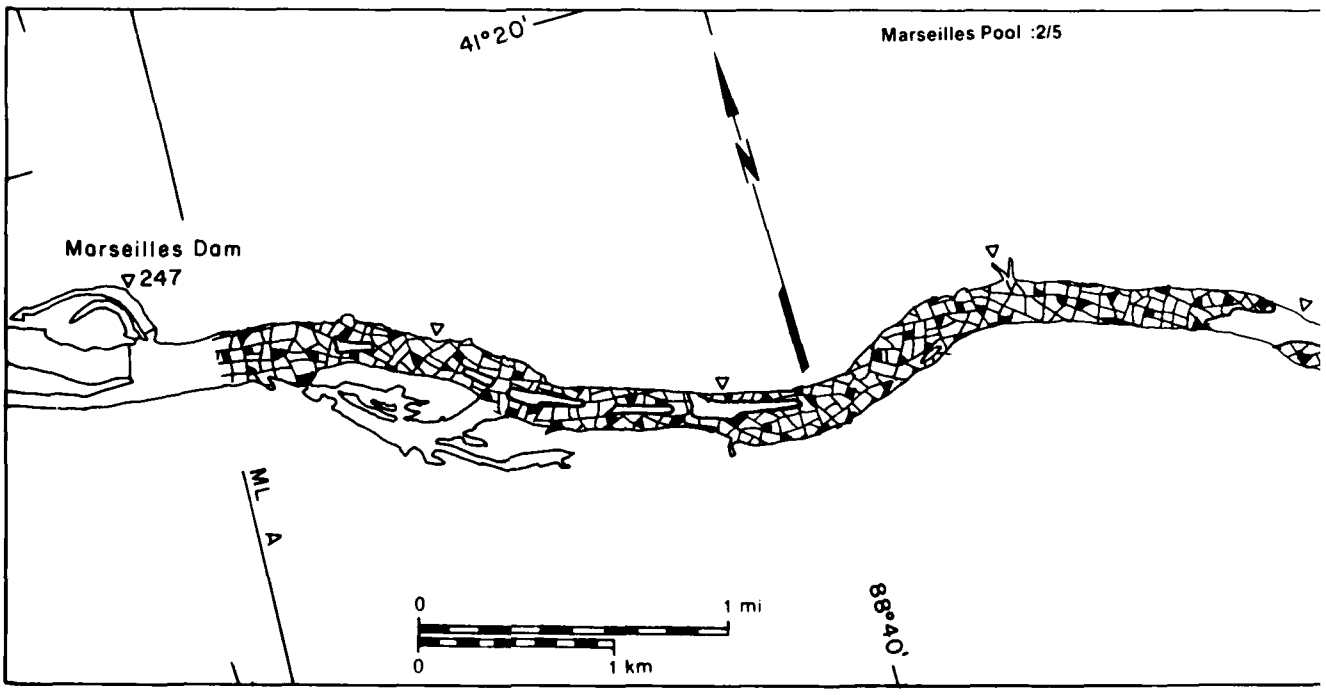
Starved Rock Pool

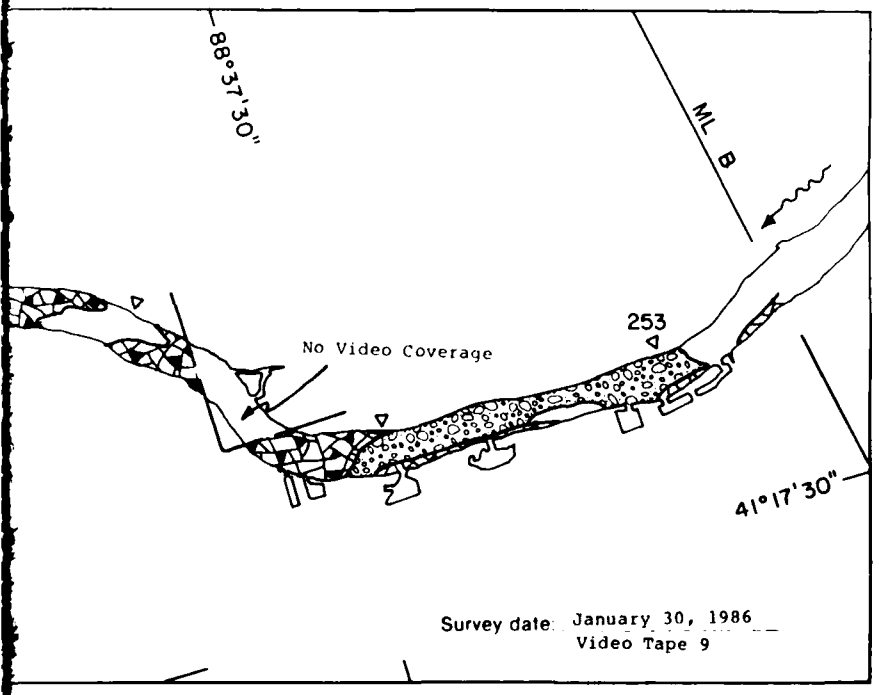
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.35	NA
Solid ice cover	1.77	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	1.75	NA
Fragmented ice cover with open-water areas	3.22	90
Ice floes or frazil slush and pans	0.06	20
Total area ($m^2 \times 10^6$)	10.19*	

* Includes 2.04×10^6 m^2 of no video coverage

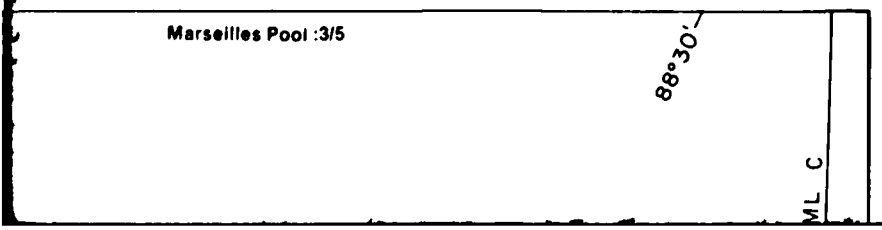
30 January 1986

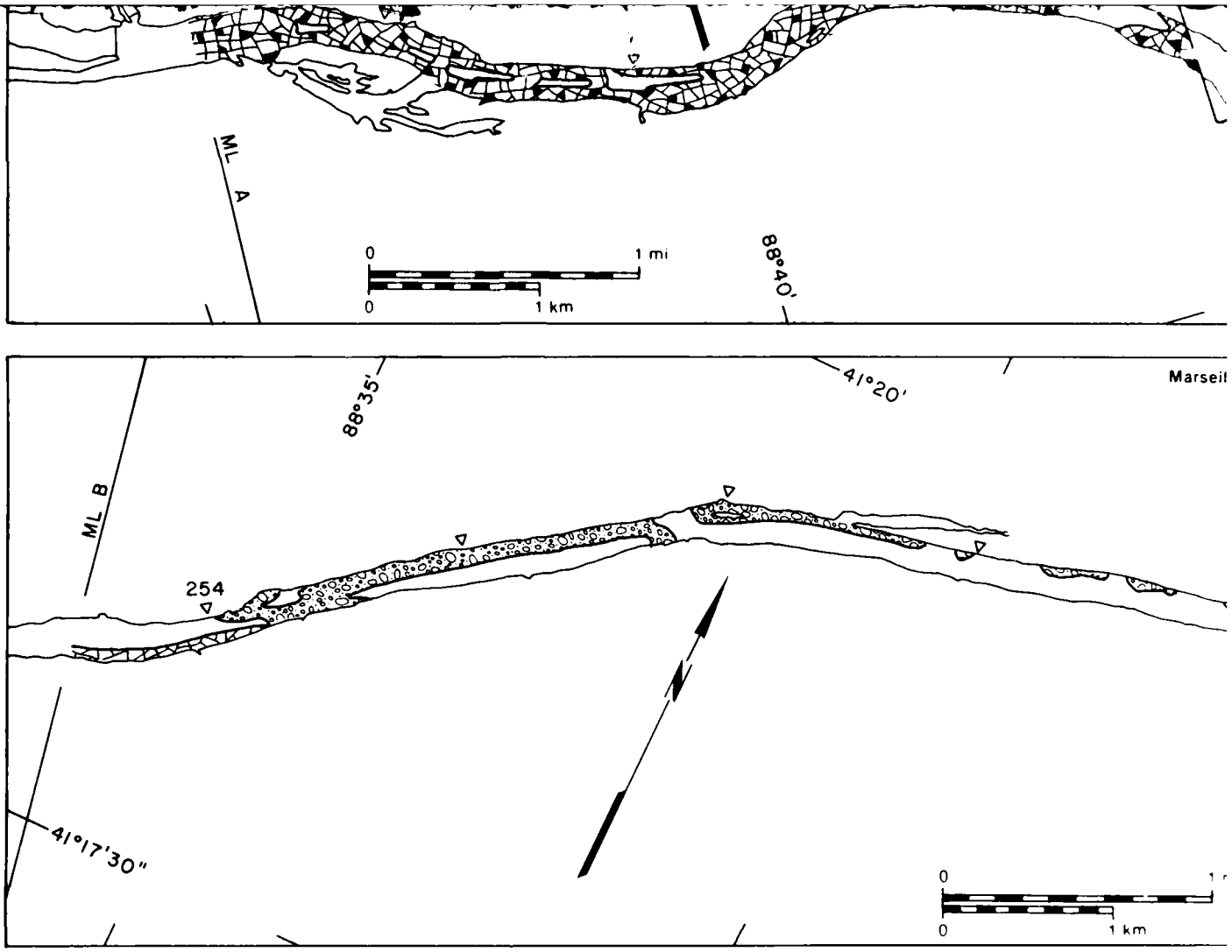


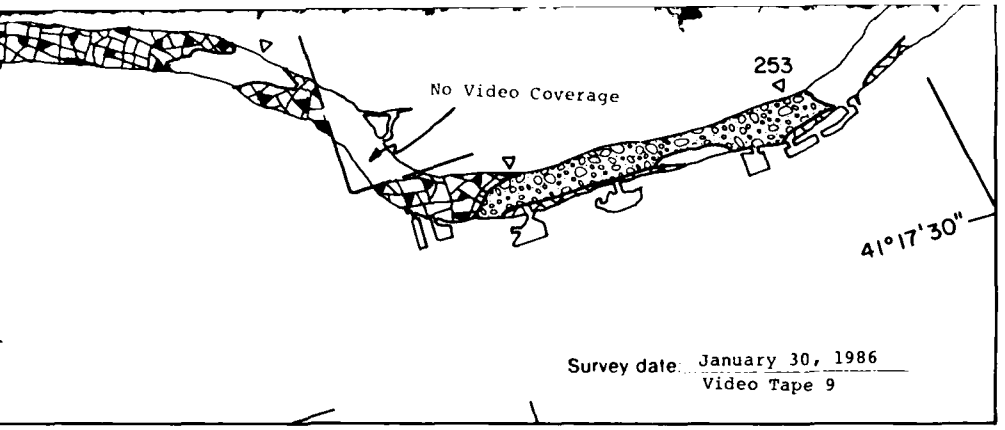


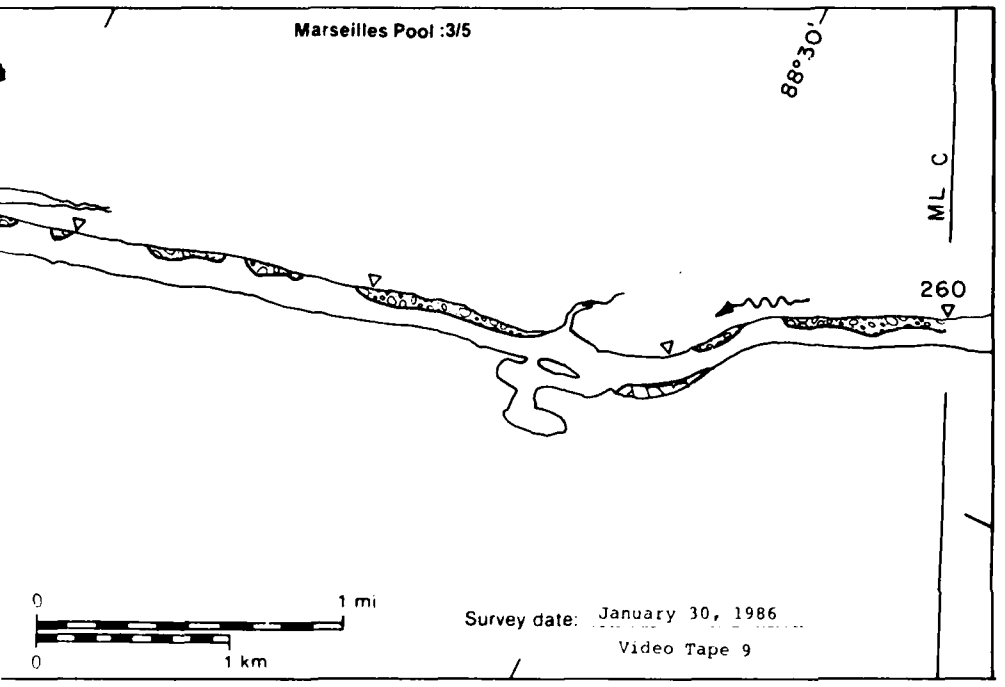


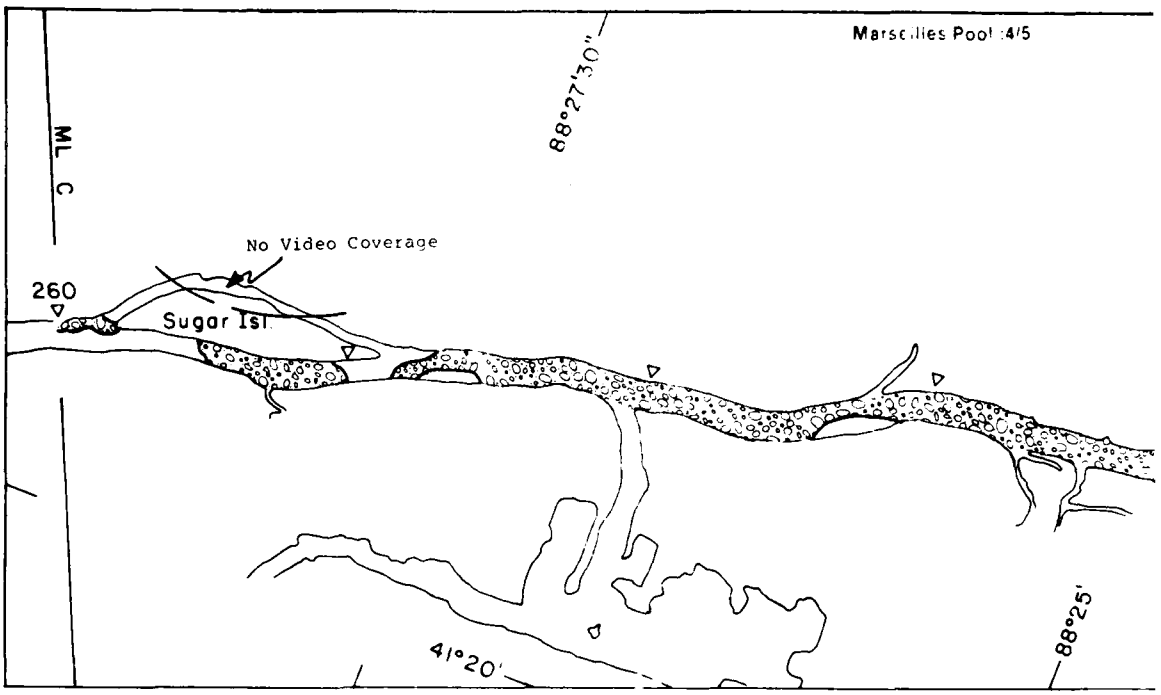
Marseilles Pool :3/5

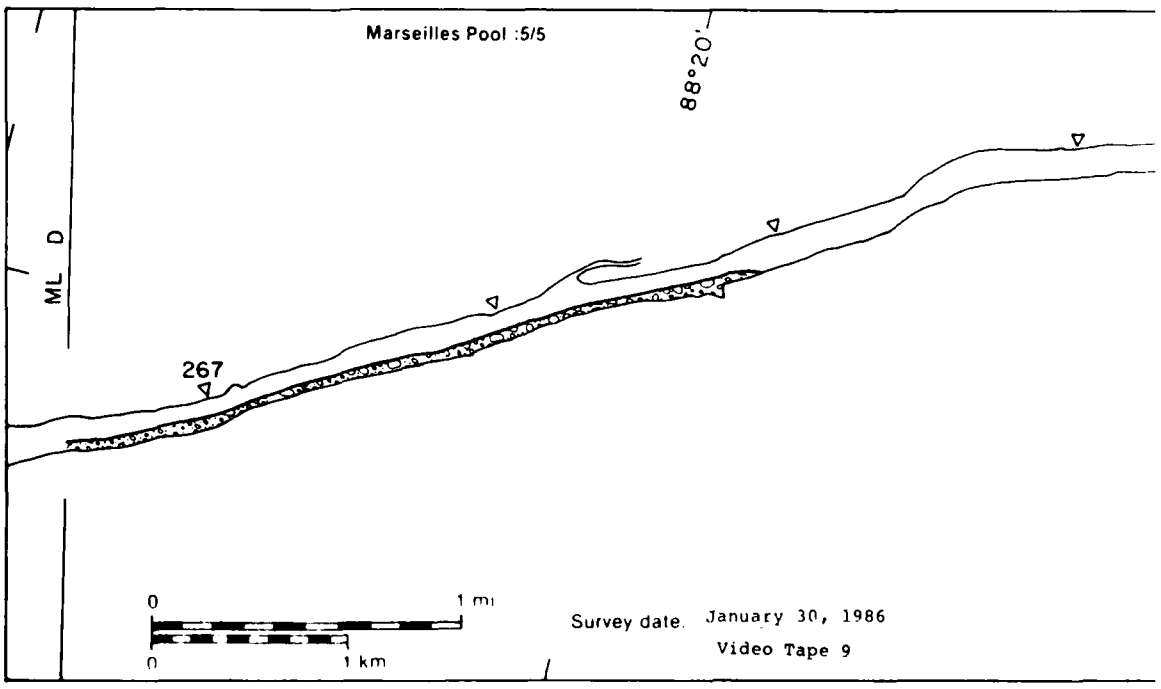



ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
Marseil
ML B
254
41°17'30"
0
1 km


No Video Coverage
253
41°17'30"
Survey date: January 30, 1986
Video Tape 9


Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9

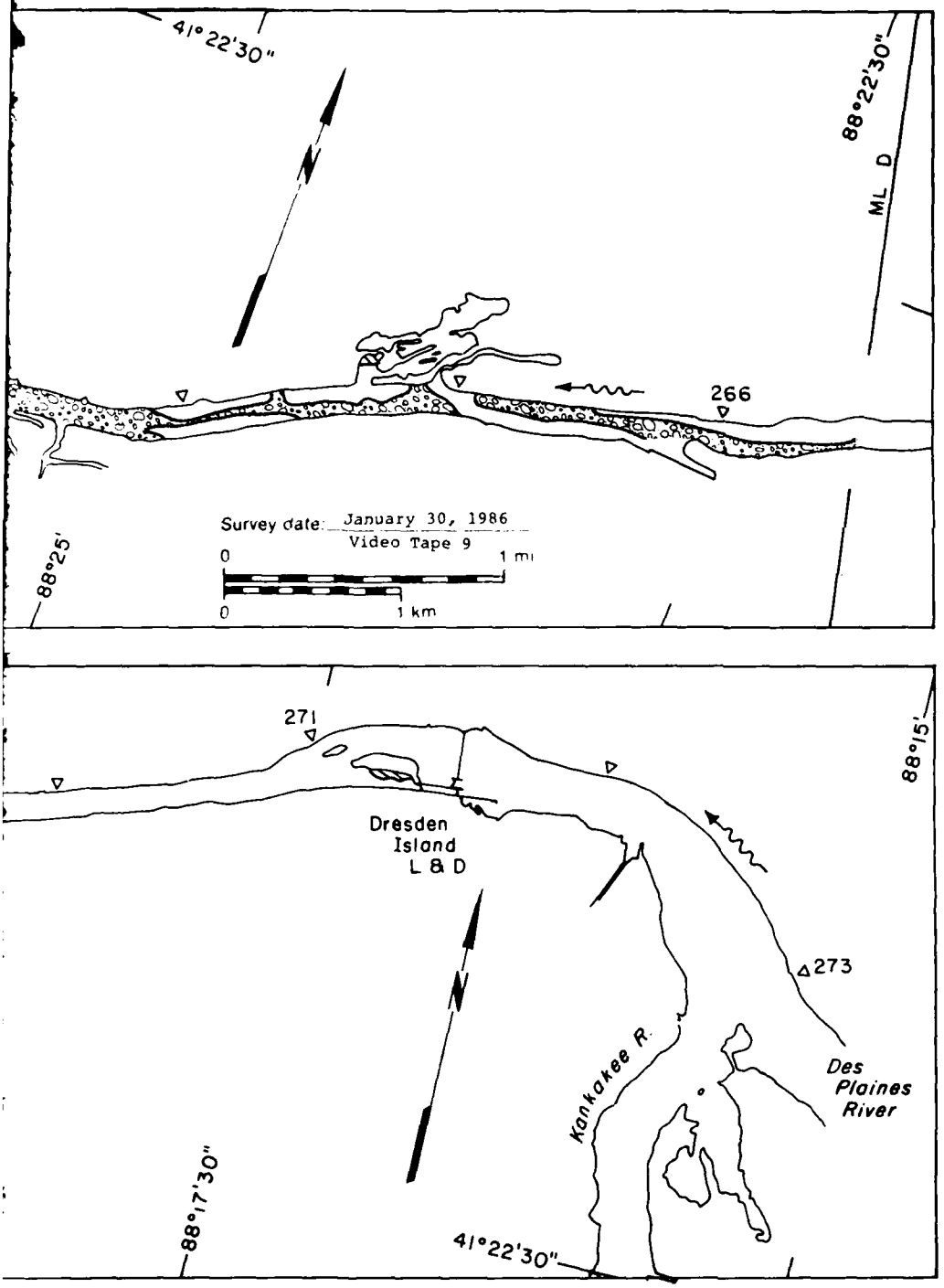


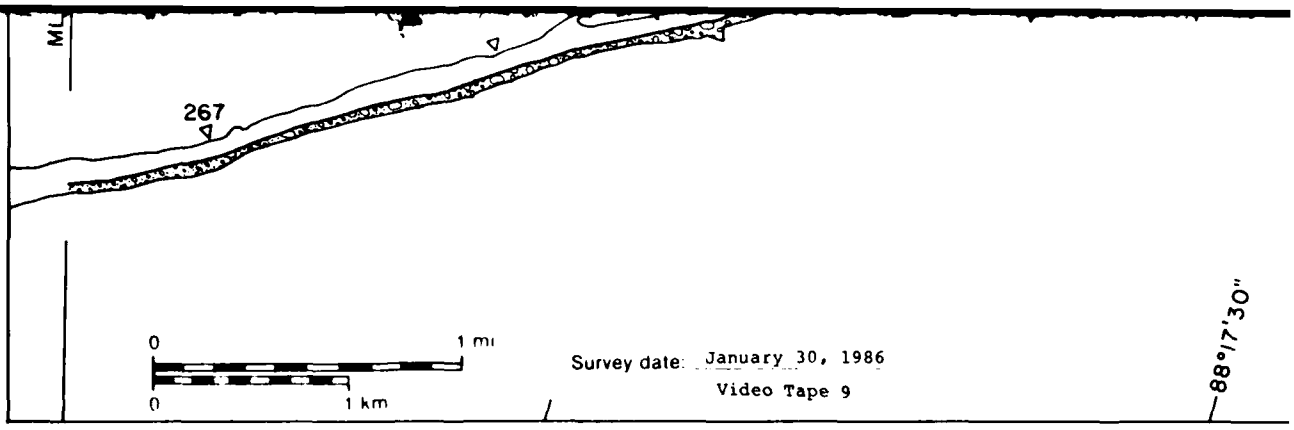


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	3.02	NA
Solid ice cover	0.08	NA

30 January 1986

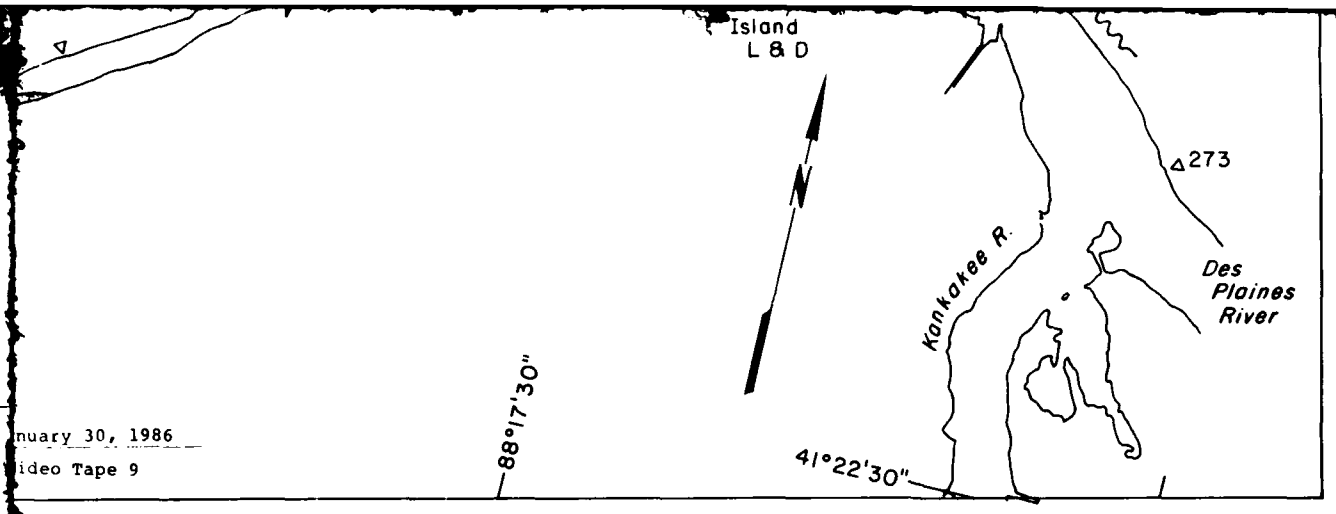




Marseilles Pool

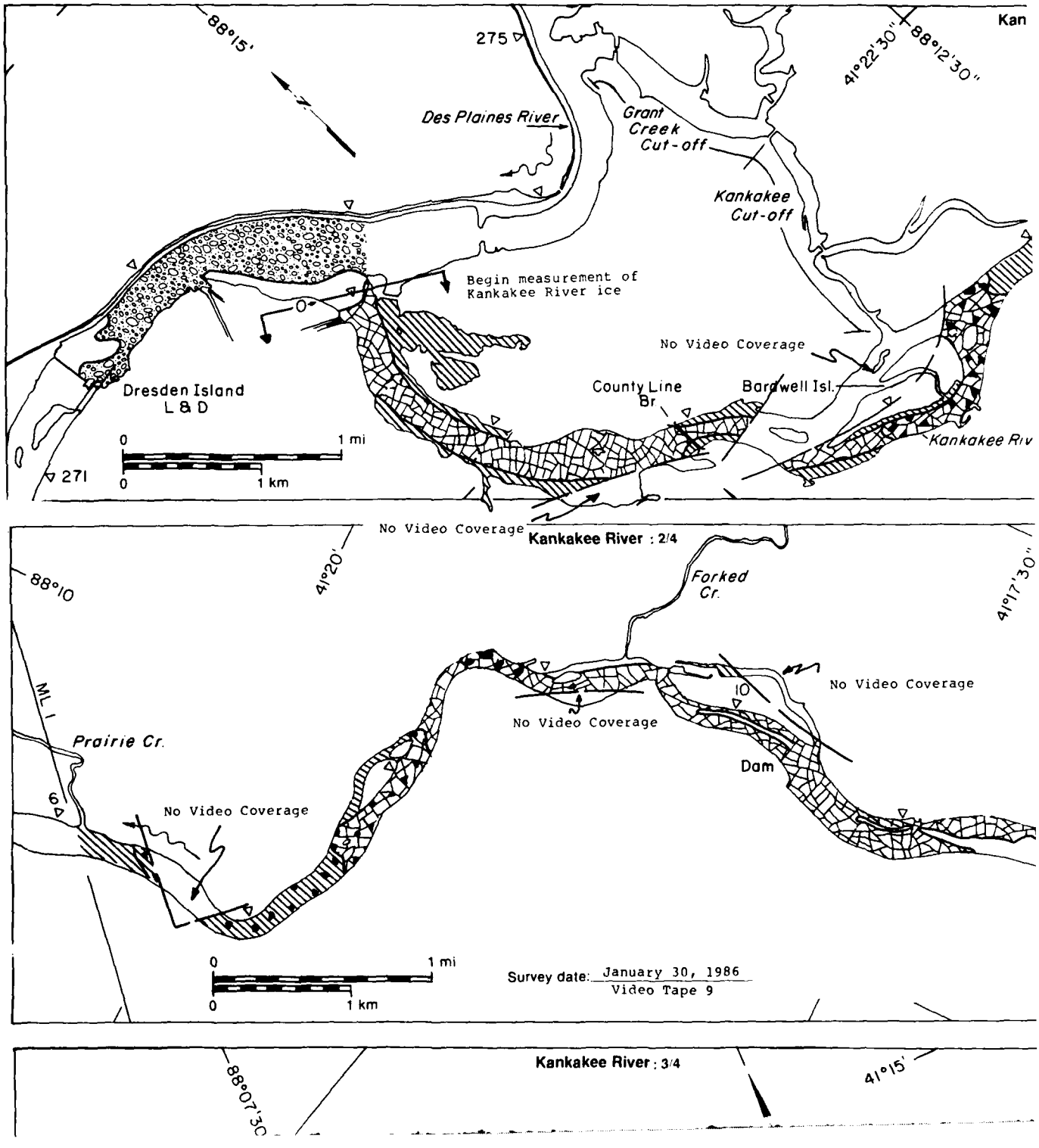
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.02	NA
Solid ice cover	0.08	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.23	NA
Fragmented ice cover with open-water areas	2.50	90
Ice floes or frazil slush and pans	2.15	5
Total area ($m^2 \times 10^6$)	8.19*	

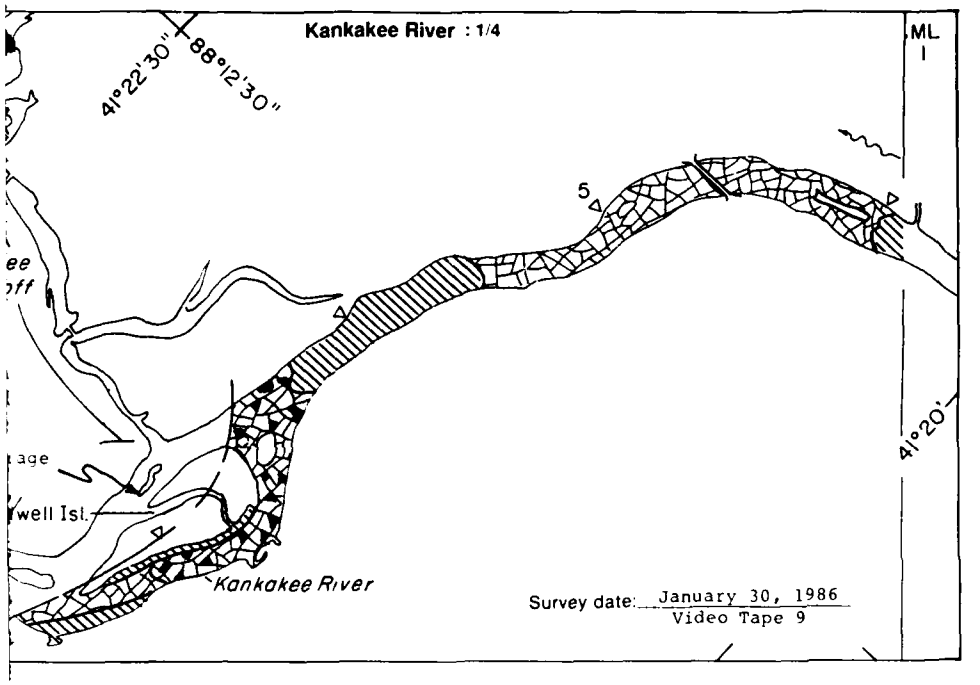
* Includes 0.21×10^6 m^2 of no video coverage

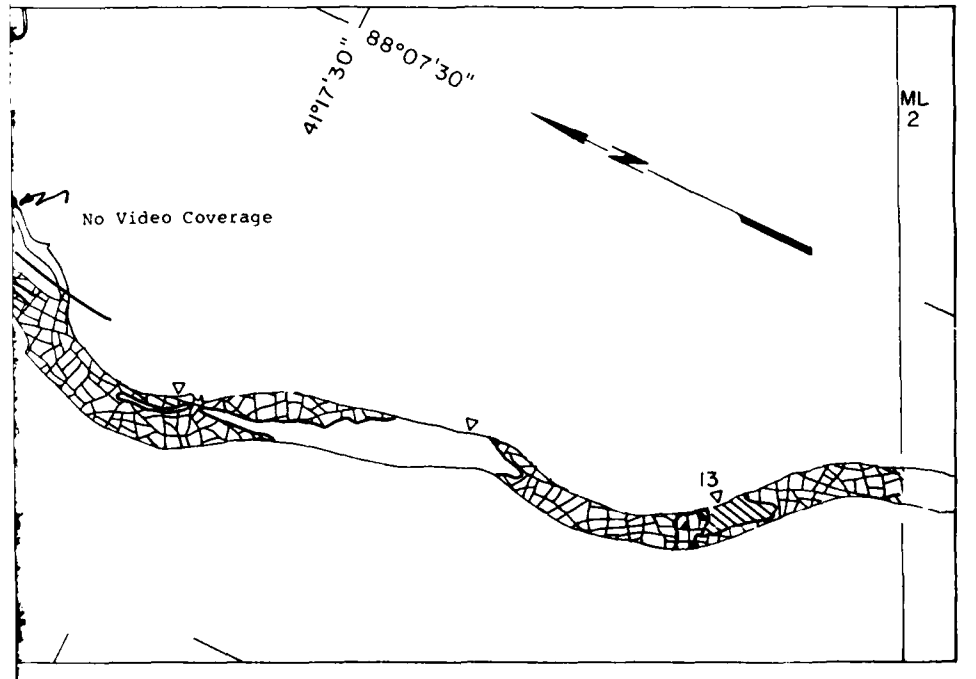


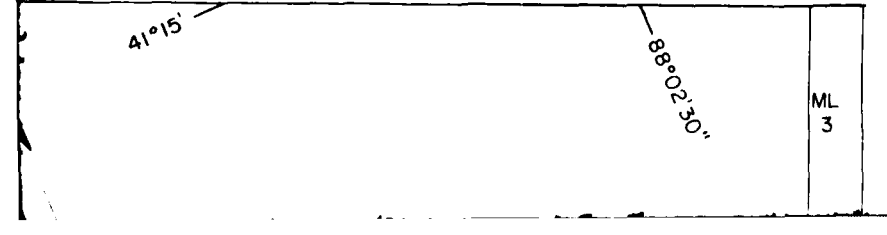
nuary 30, 1986
ideo Tape 9

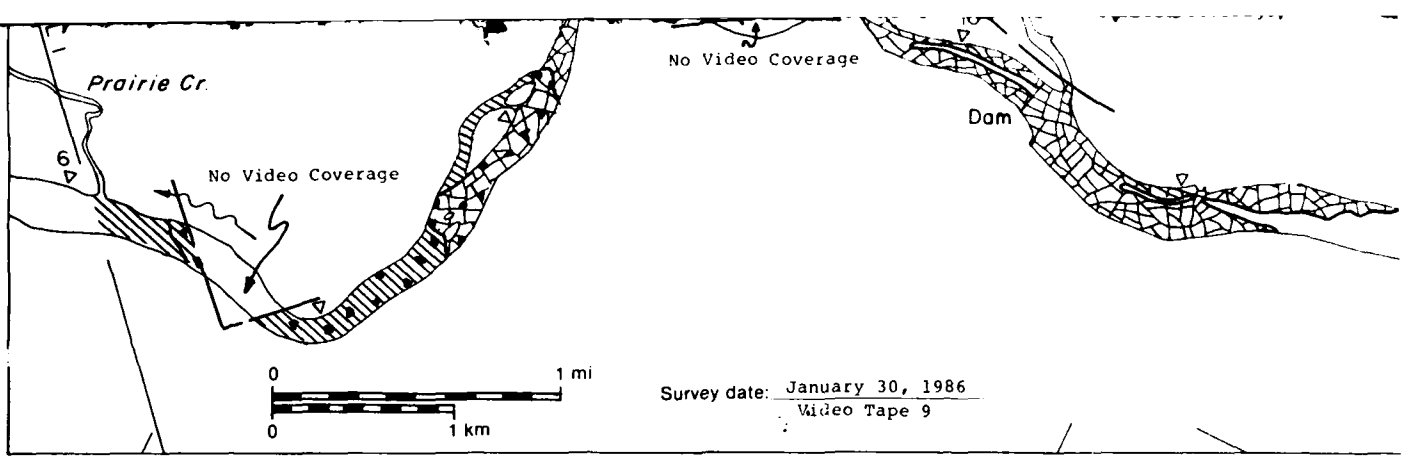
30 January 1986

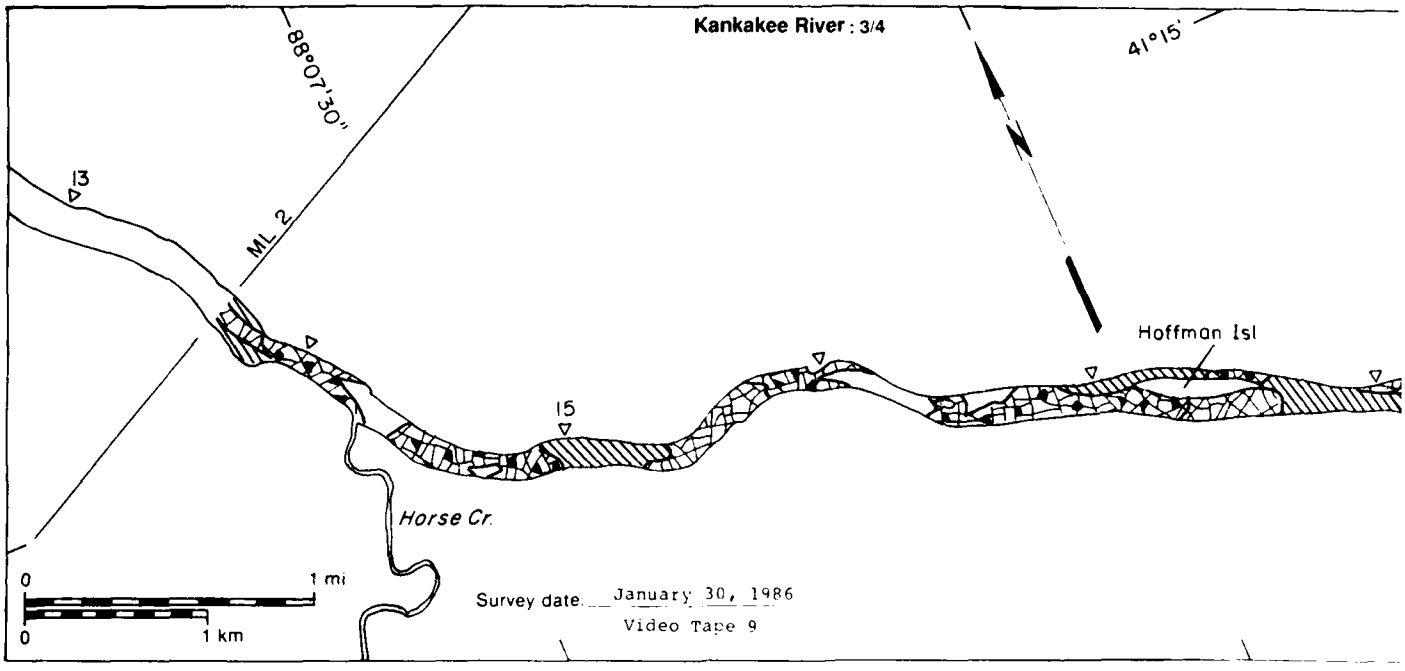


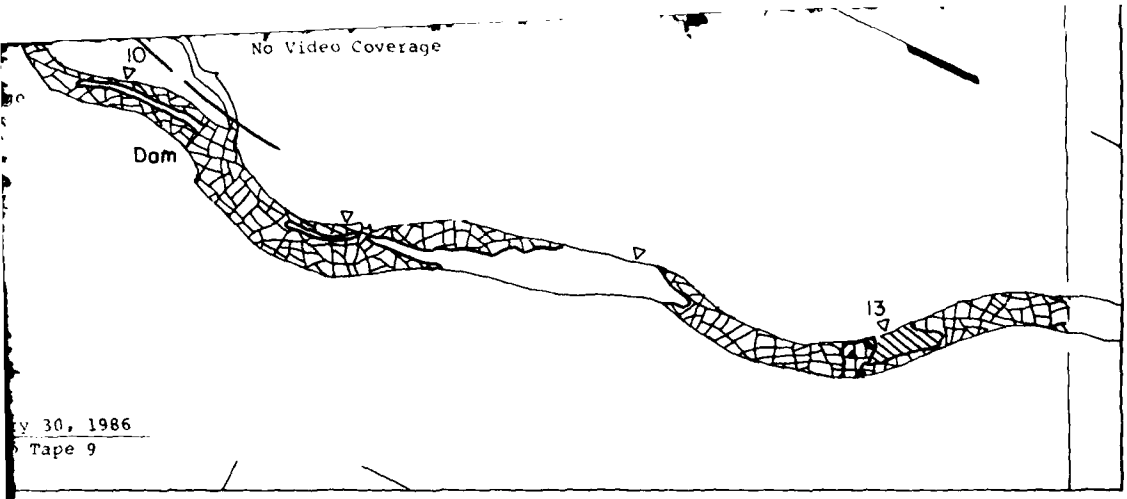

Kankakee River : 1/4
ML 1
41°22'30"
88°12'30"
5
41°20'
Kankakee River
Survey date: January 30, 1986
Video Tape 9


ML 2
41°17'30"
88°07'30"
No Video Coverage
13

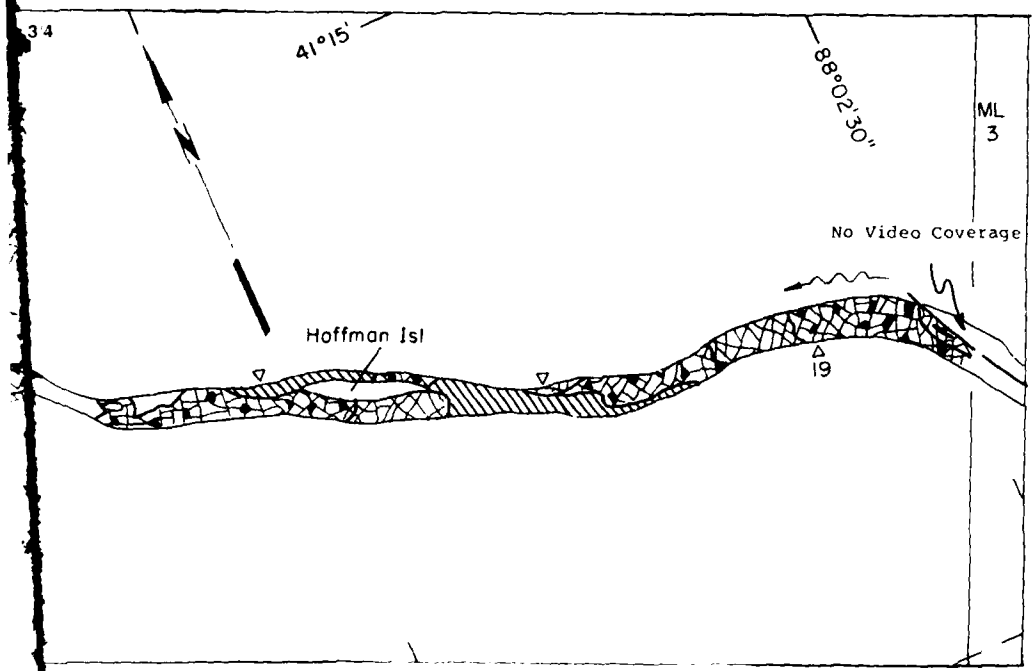

41°15'
88°02'30"
ML 3

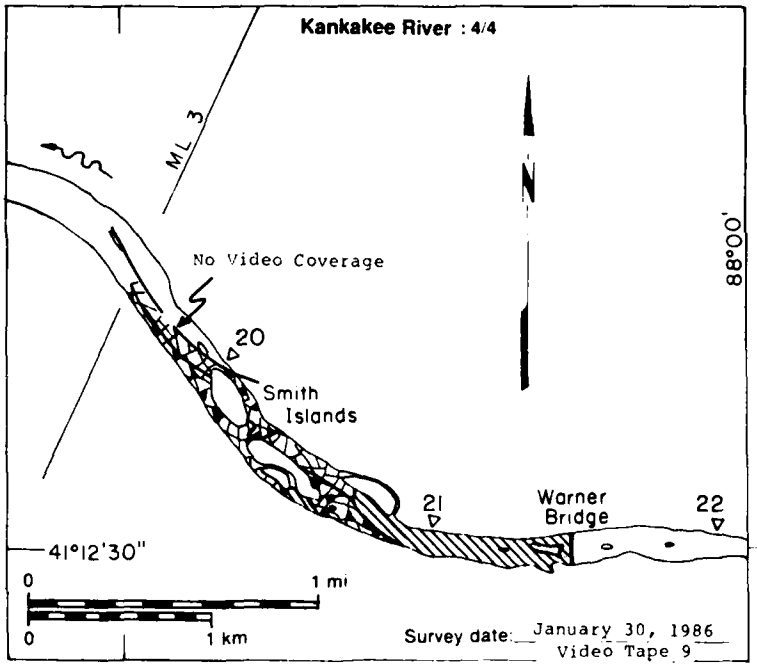

Prairie Cr.
6
No Video Coverage
No Video Coverage
Dam
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: January 30, 1986
Video Tape 9



y 30, 1986
Tape 9





Kankakee River

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slus and pans

Total area (m^2 x

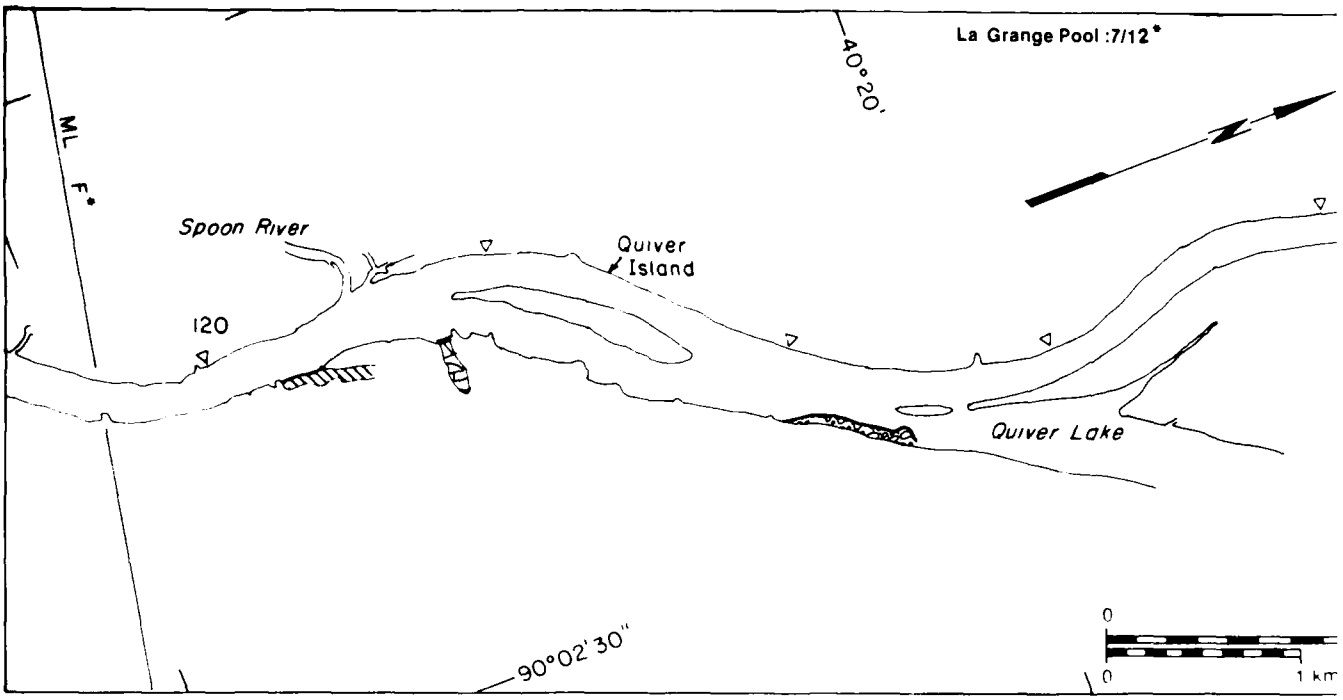
7-

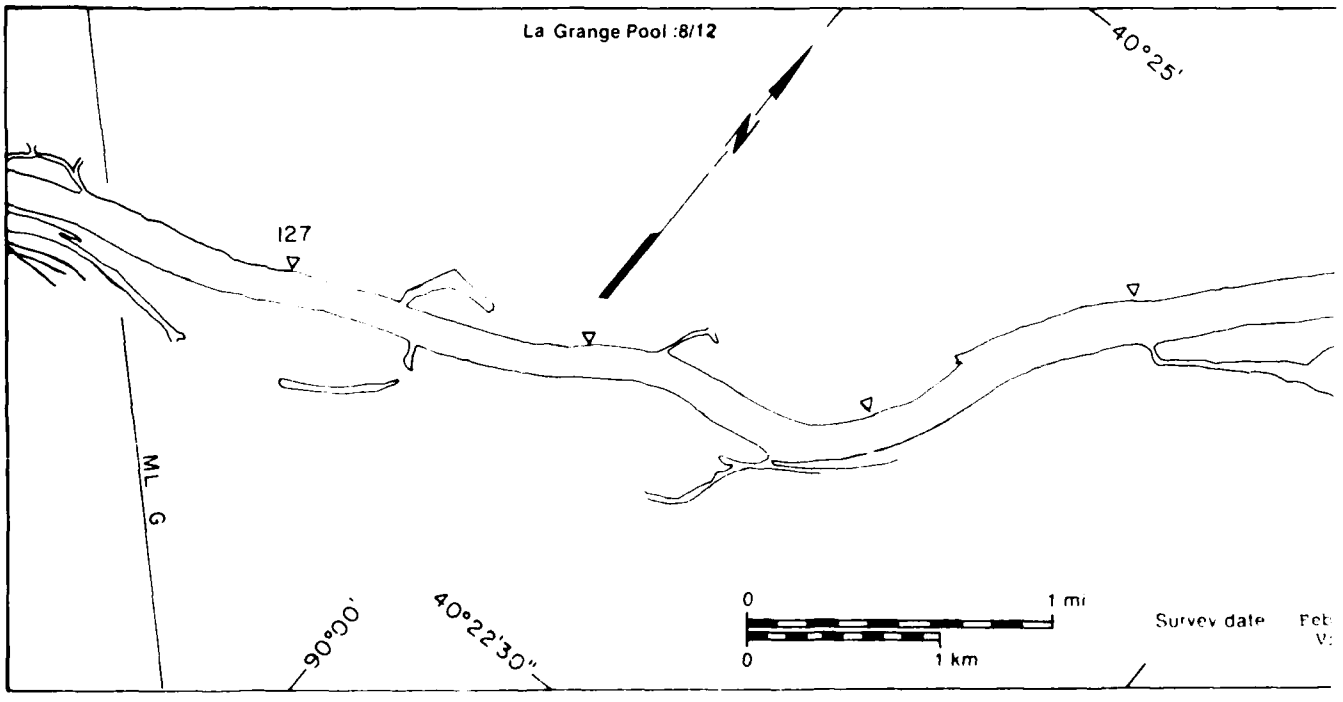
30 January 1986

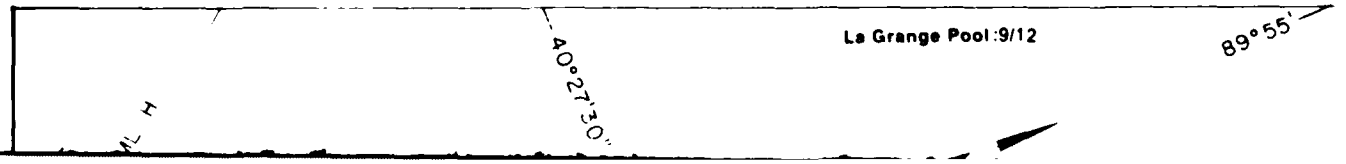
Kankakee River

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.51	NA
Solid ice cover	1.51	NA
Solid ice cover with open-water areas	0.21	95
Fragmented ice cover	2.96	NA
Fragmented ice cover with open-water areas	1.29	90
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	7.30*	

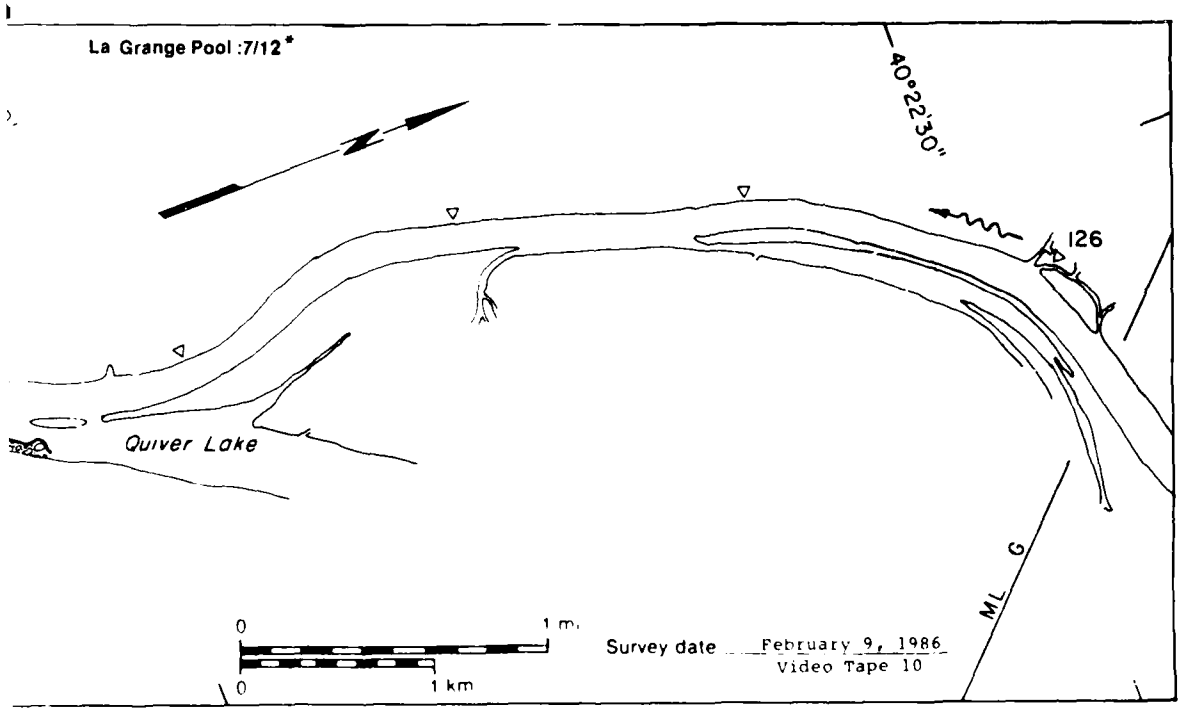
* Includes 0.82×10^6 m^2 of no video coverage

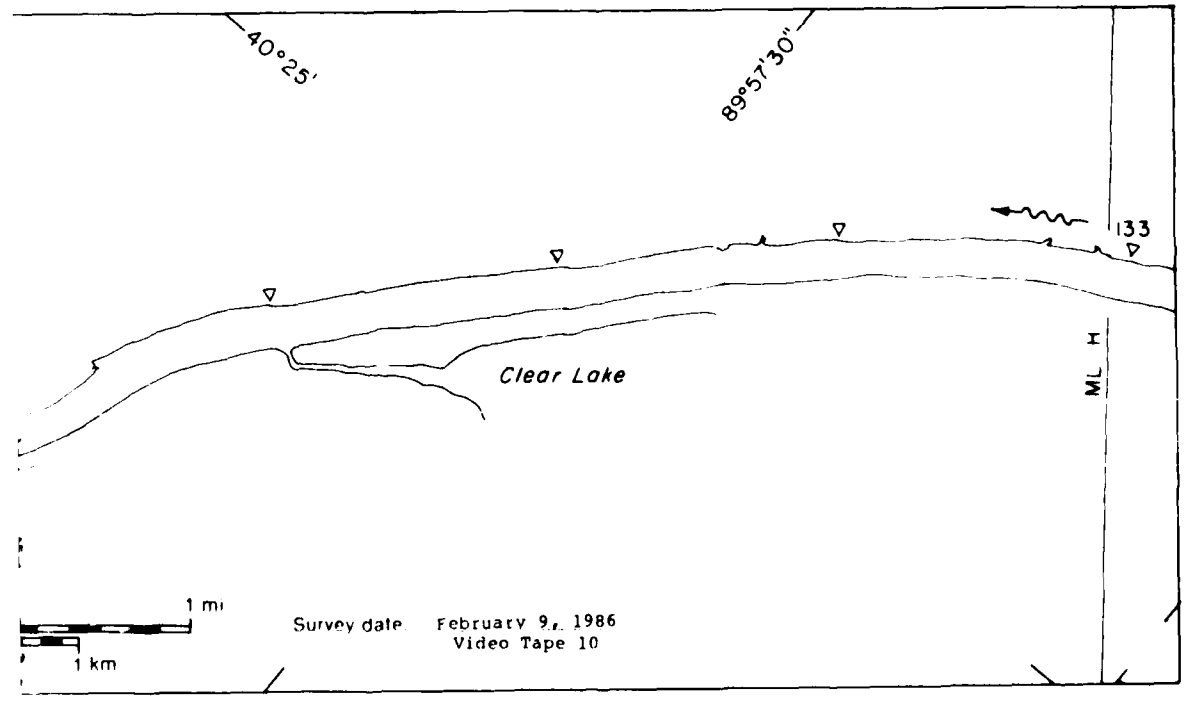

La Grange Pool :7/12*
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0
1 km

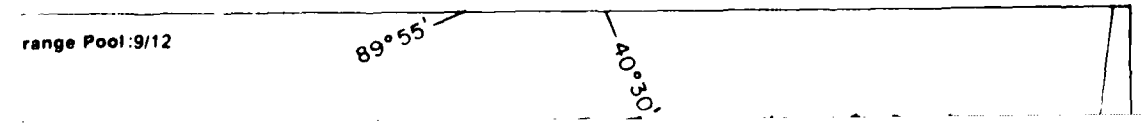

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey date

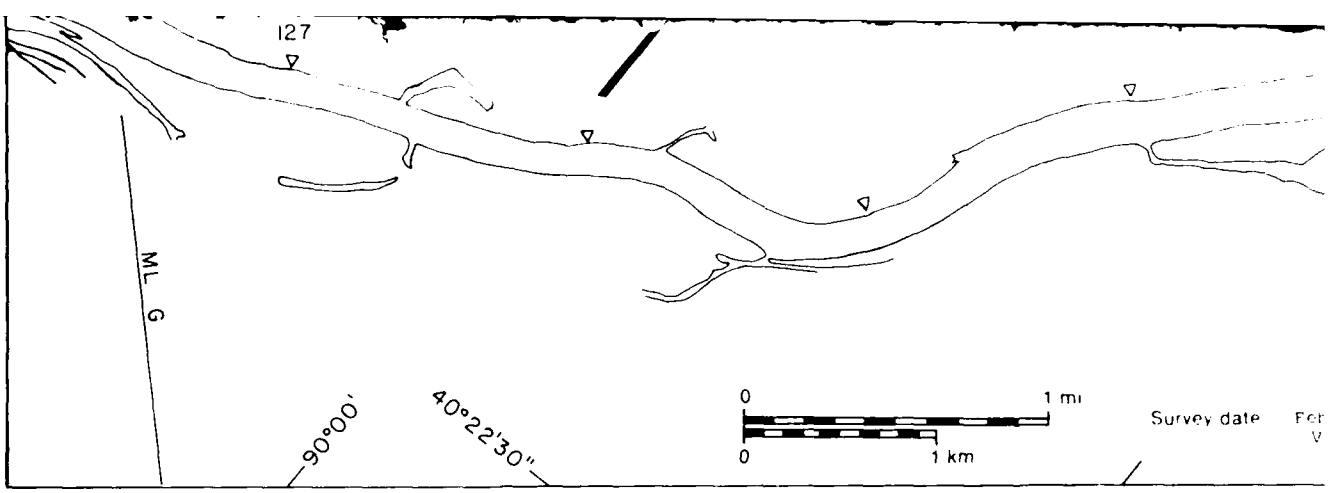

La Grange Pool :9/12
89°55'
40°27'30"

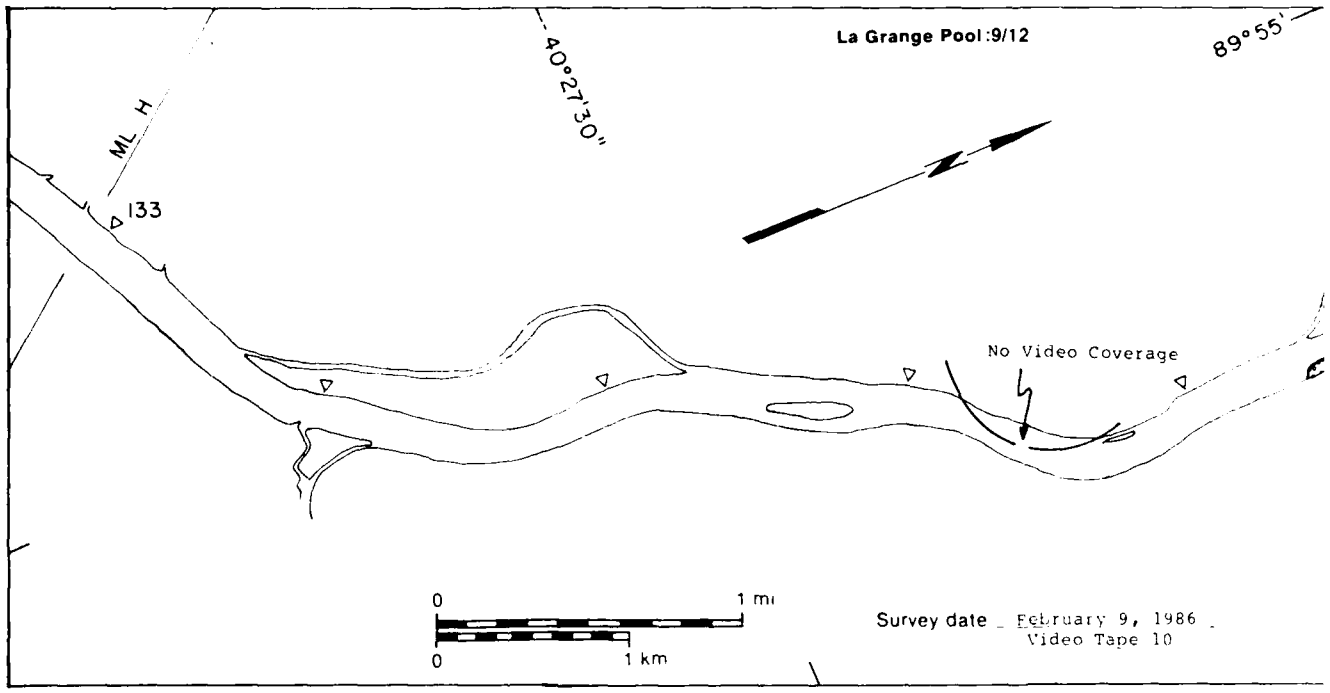
9 February 1986



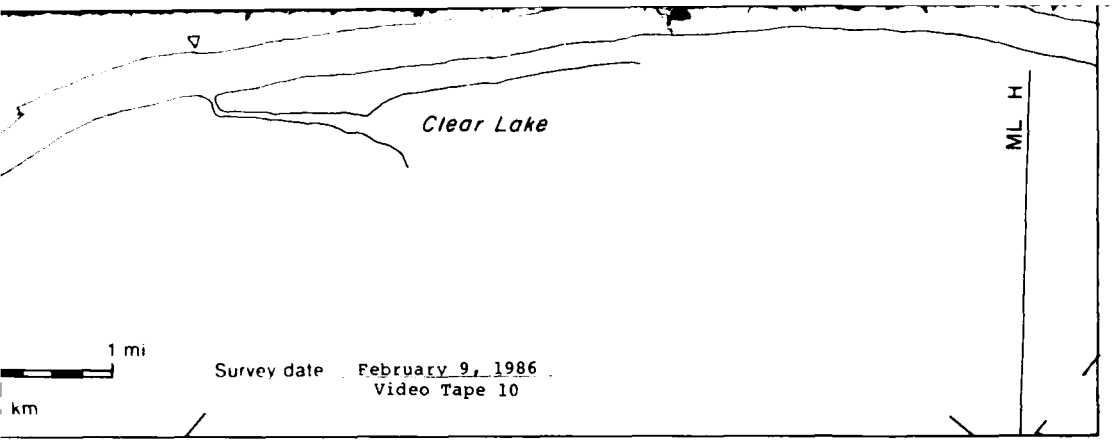


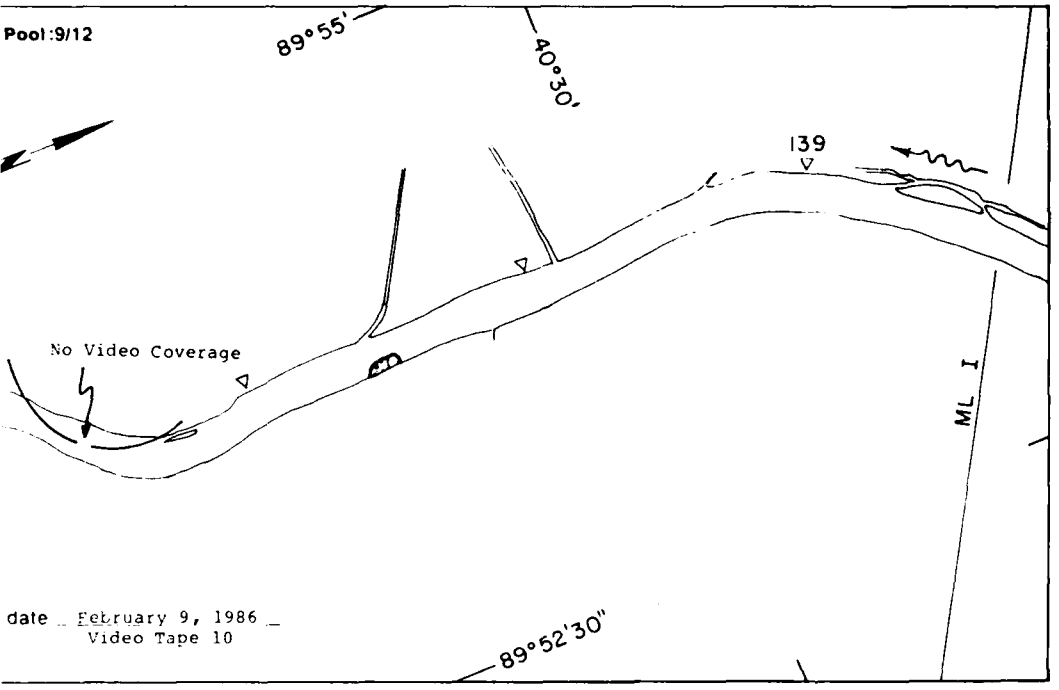




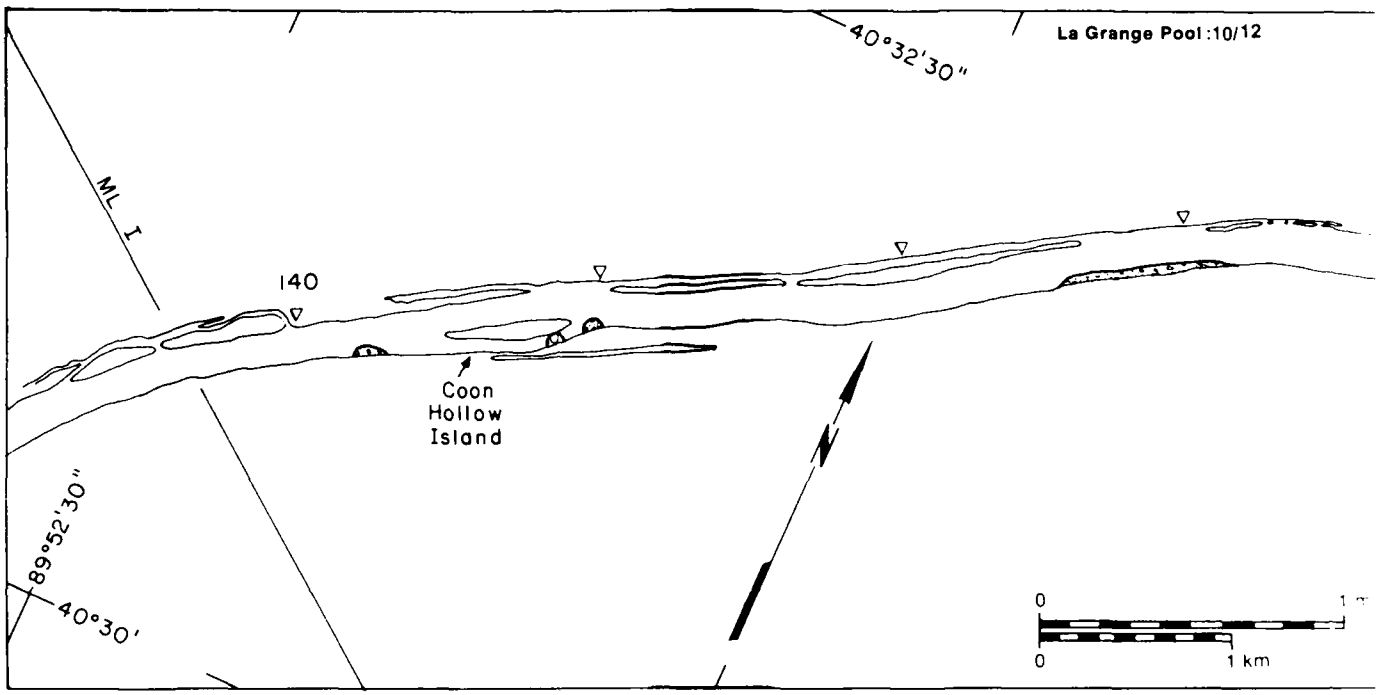


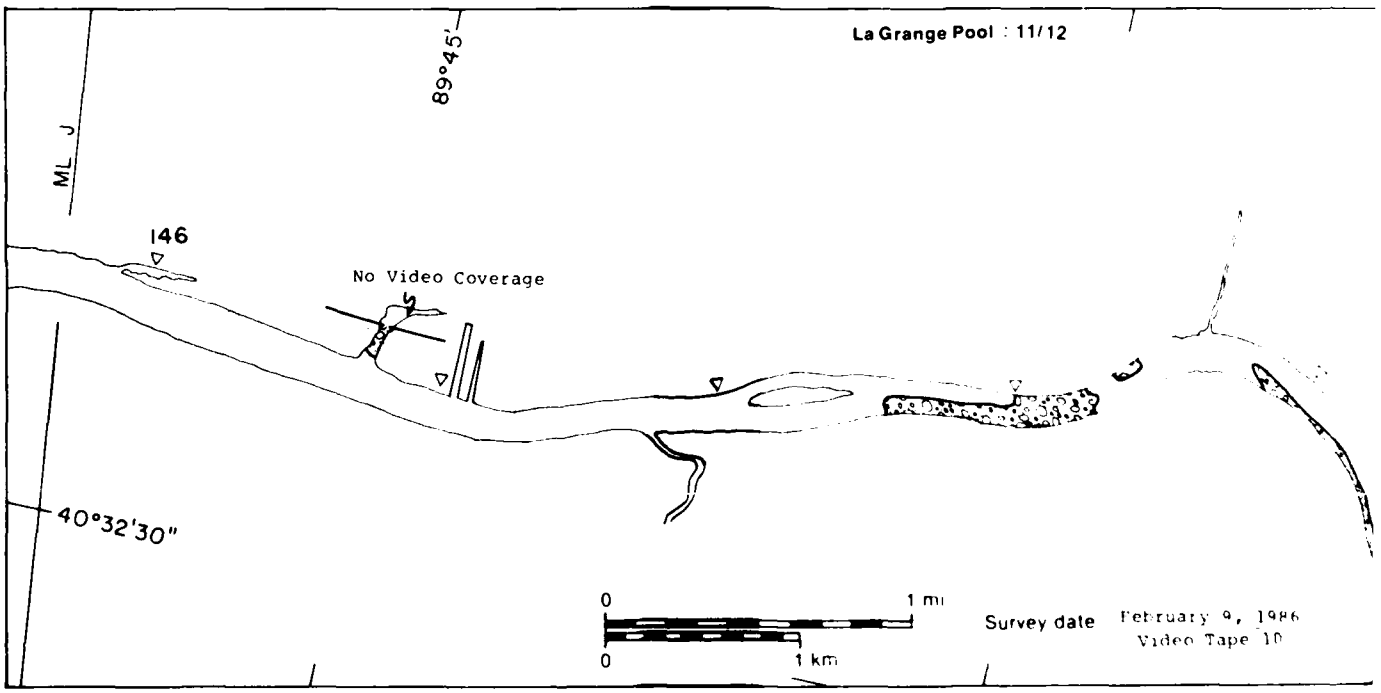
• The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

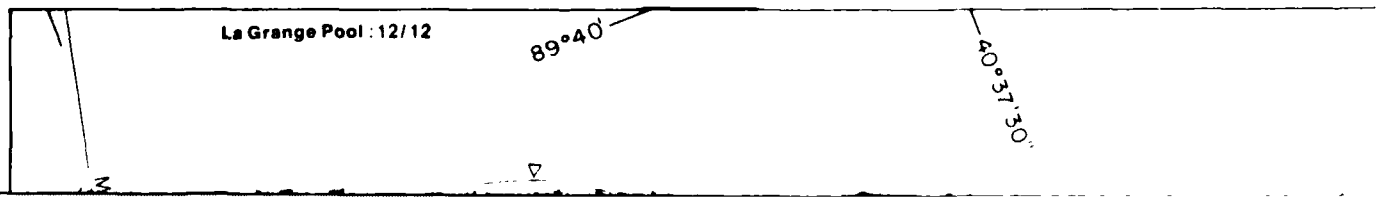

Clear Lake
ML H
1 mi
km
Survey date February 9, 1986
Video Tape 10

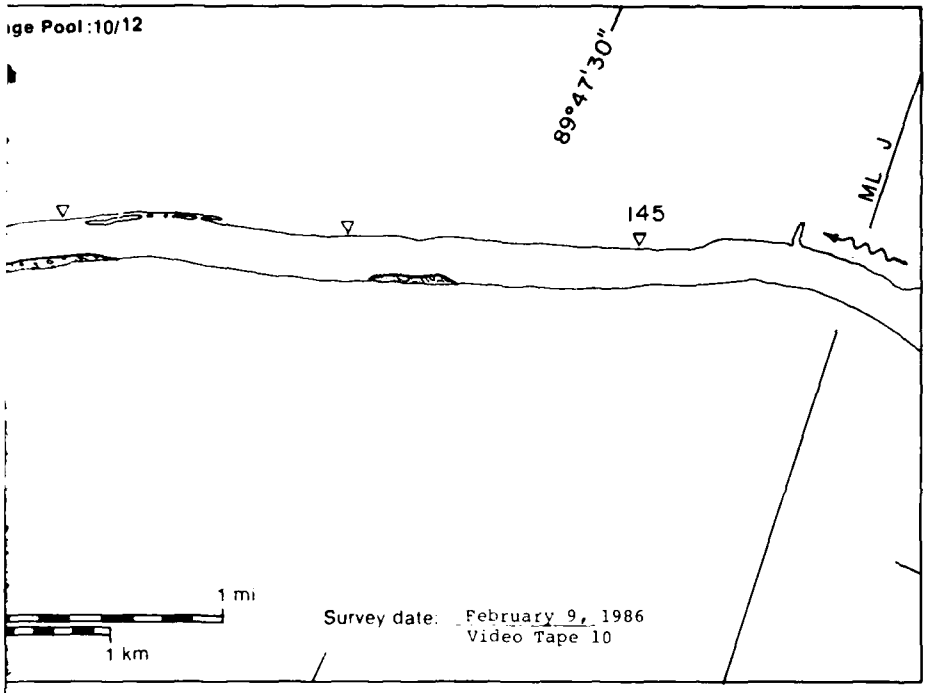

Pool:9/12
89°55'
40°30'
139
No Video Coverage
ML I
date February 9, 1986
Video Tape 10
89°52'30"

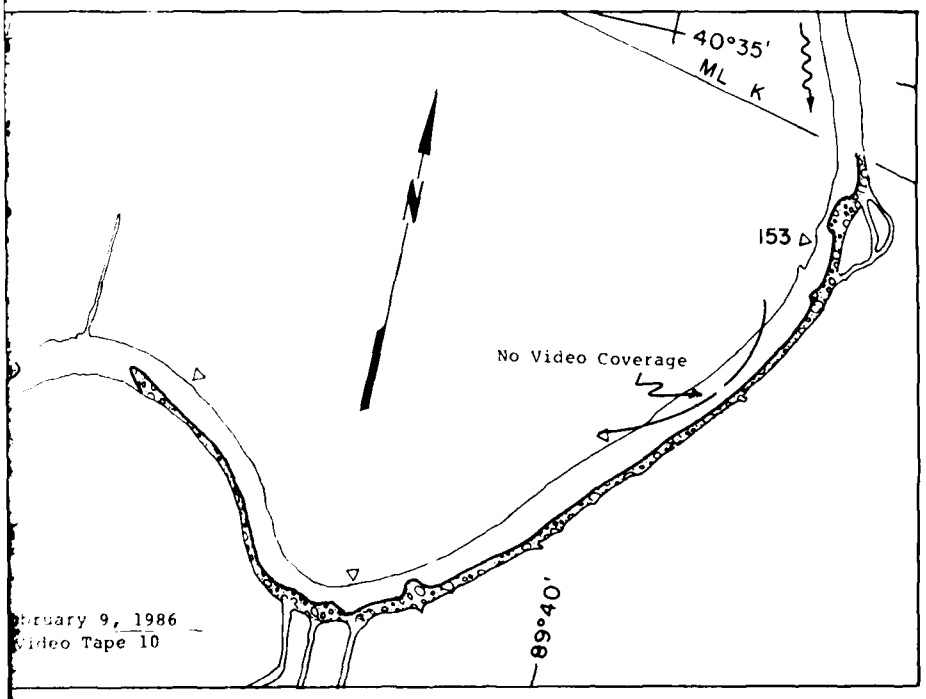
9 February 1986









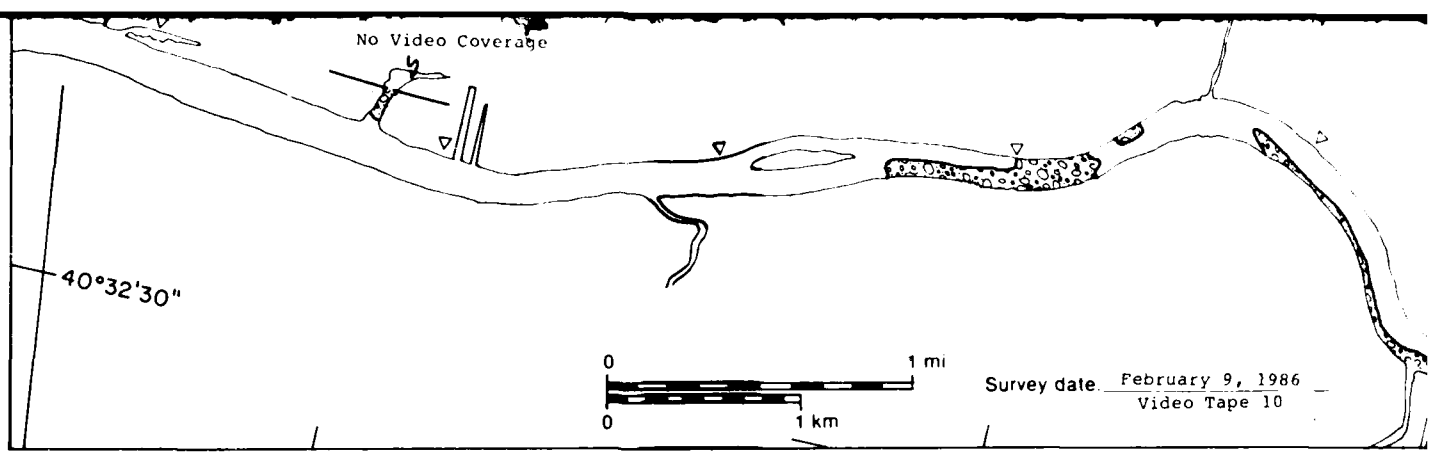


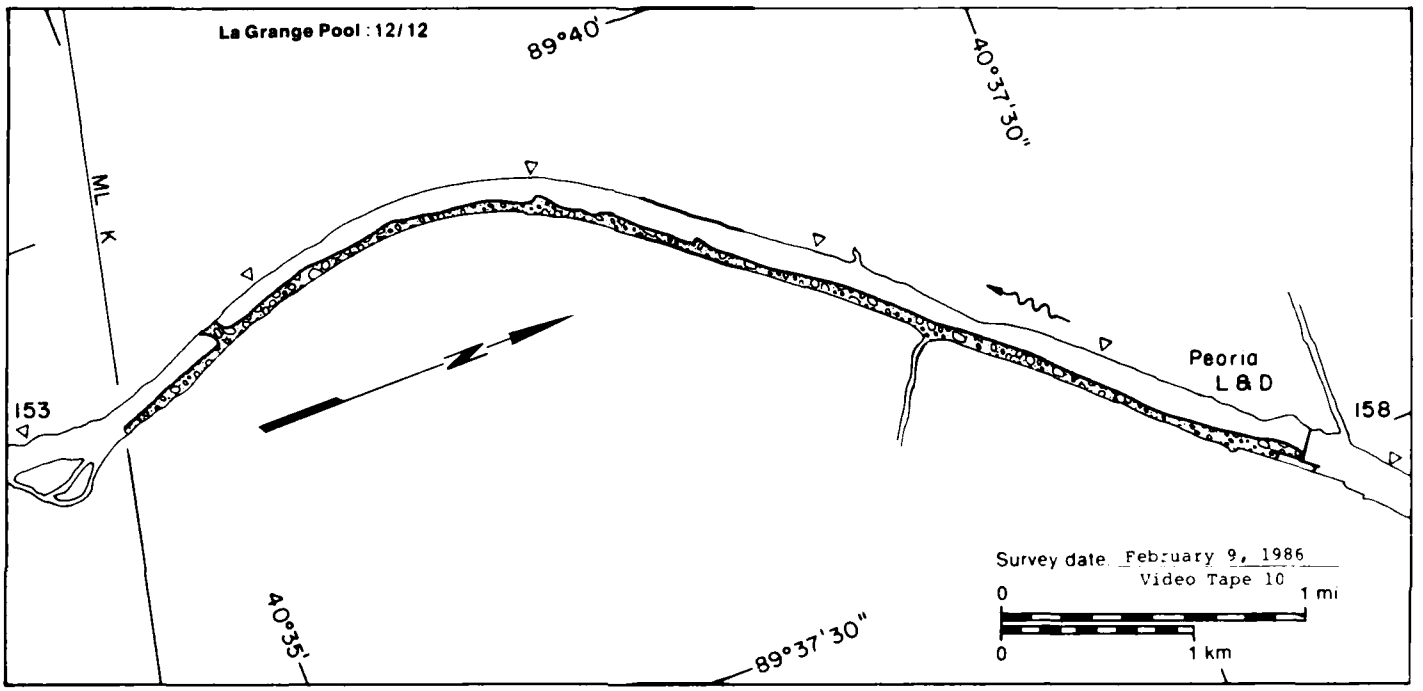
La Grange Pool

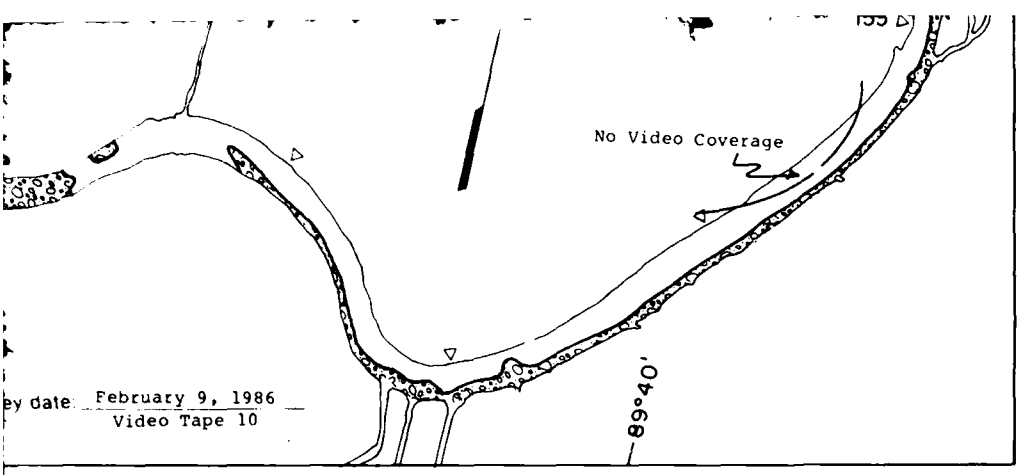
MAP UNITS

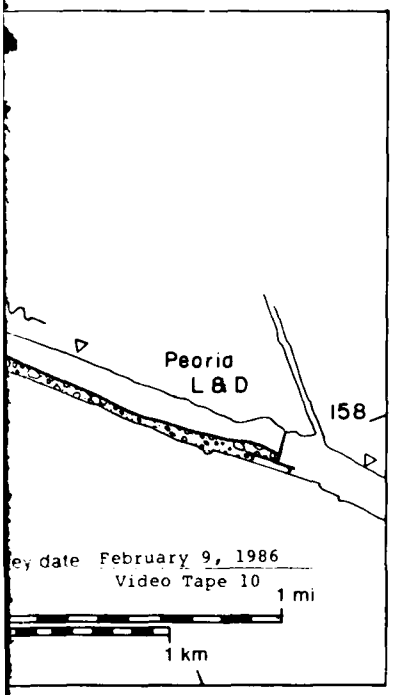
Open water

Area ($m^2 \times 10^6$)	Surface concentration (%)
10.42	NA


No Video Coverage
40°32'30"
0
1 mi
0
1 km
Survey date February 9, 1986
Video Tape 10


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L&D
158
Survey date February 9, 1986
Video Tape 10
0
1 mi
0
1 km
40°35'
89°37'30"

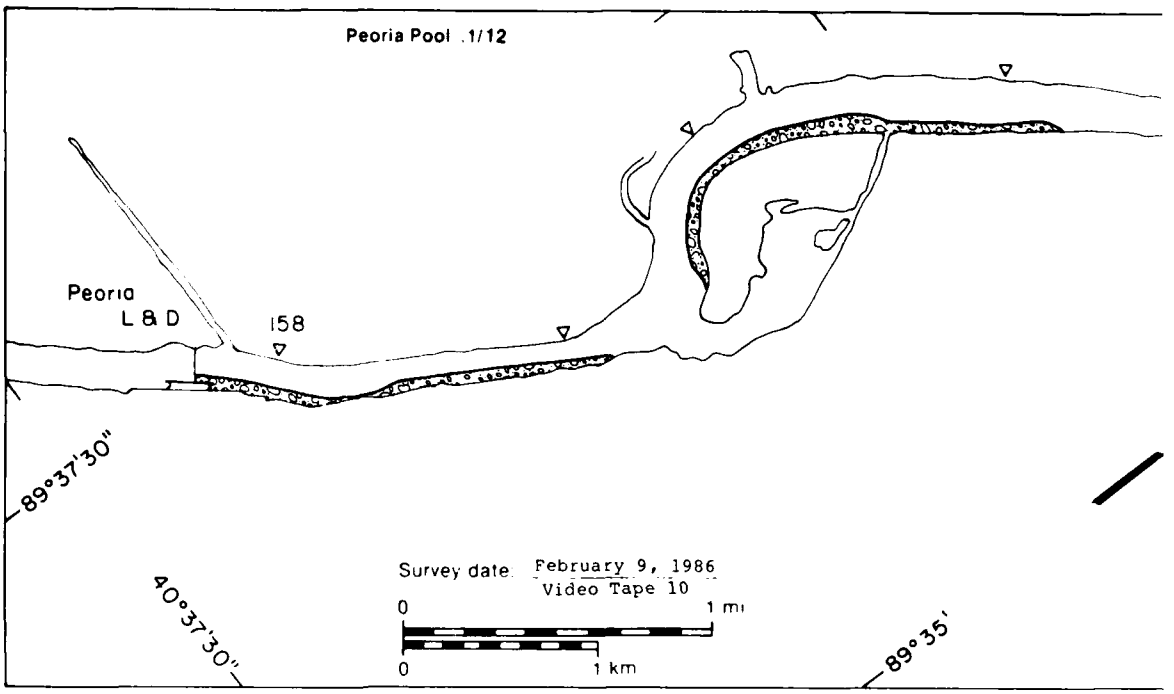


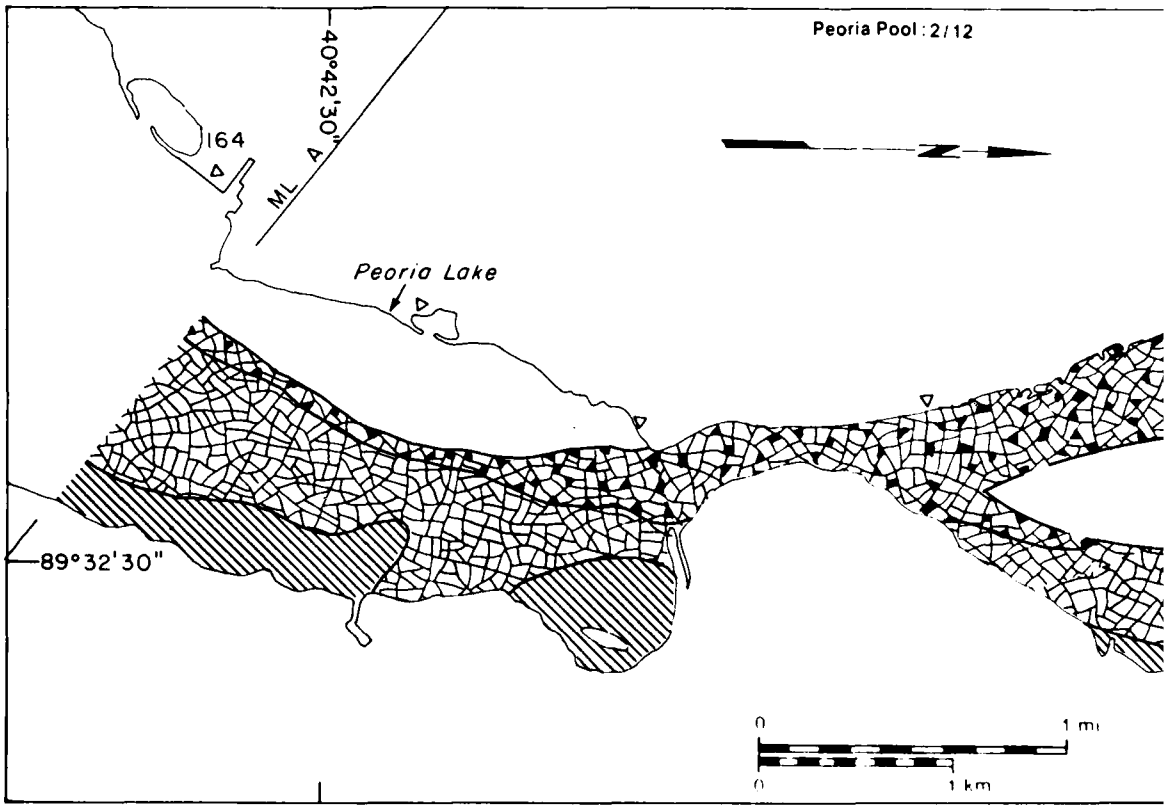


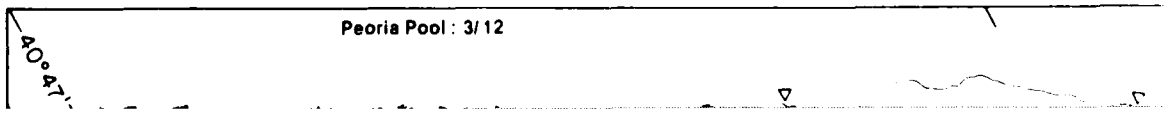
La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.42	NA
Solid ice cover	Trace	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.11	20
Total area ($m^2 \times 10^6$)	11.71*	

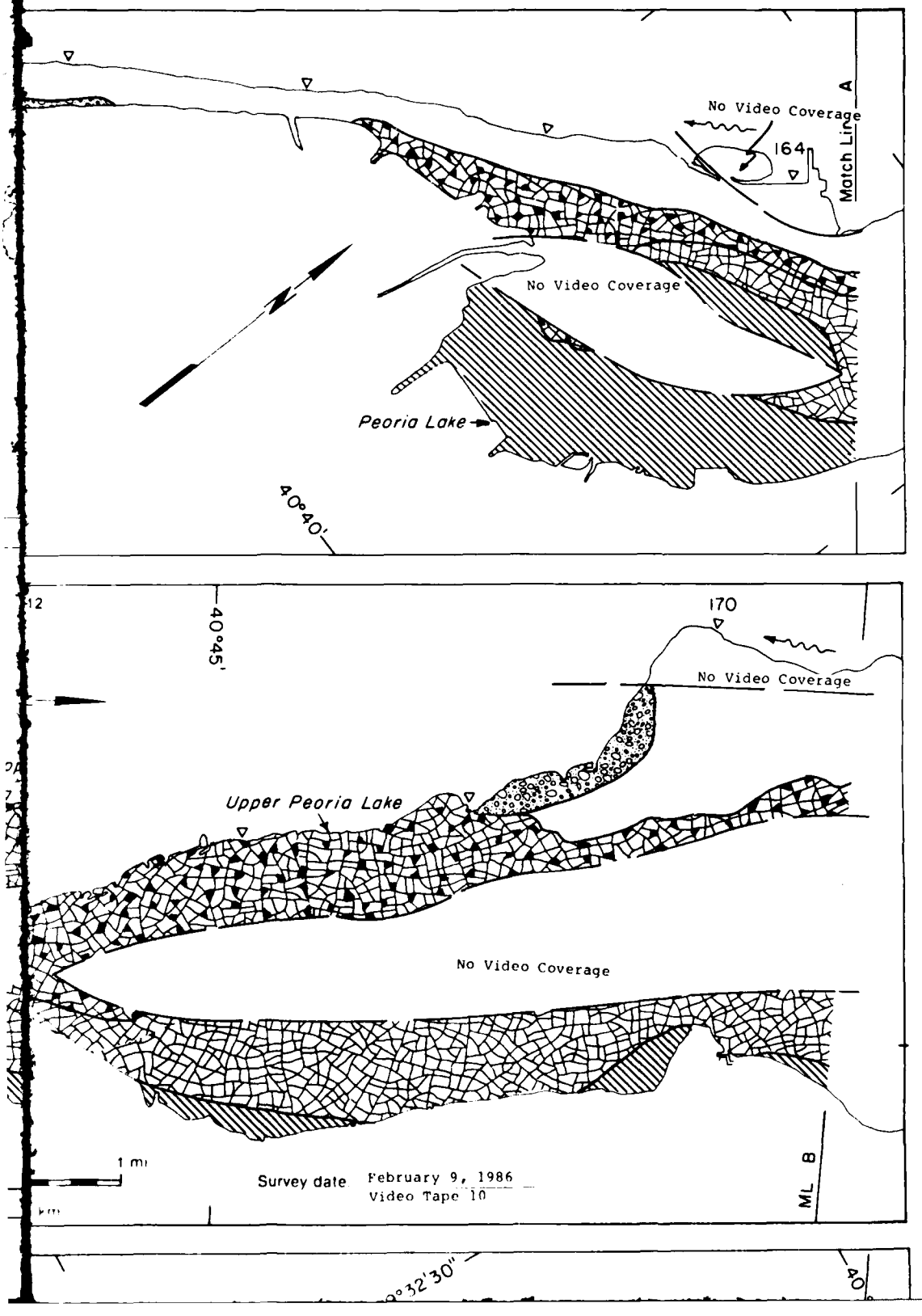
* Includes 0.15×10^6 m^2 of no video coverage

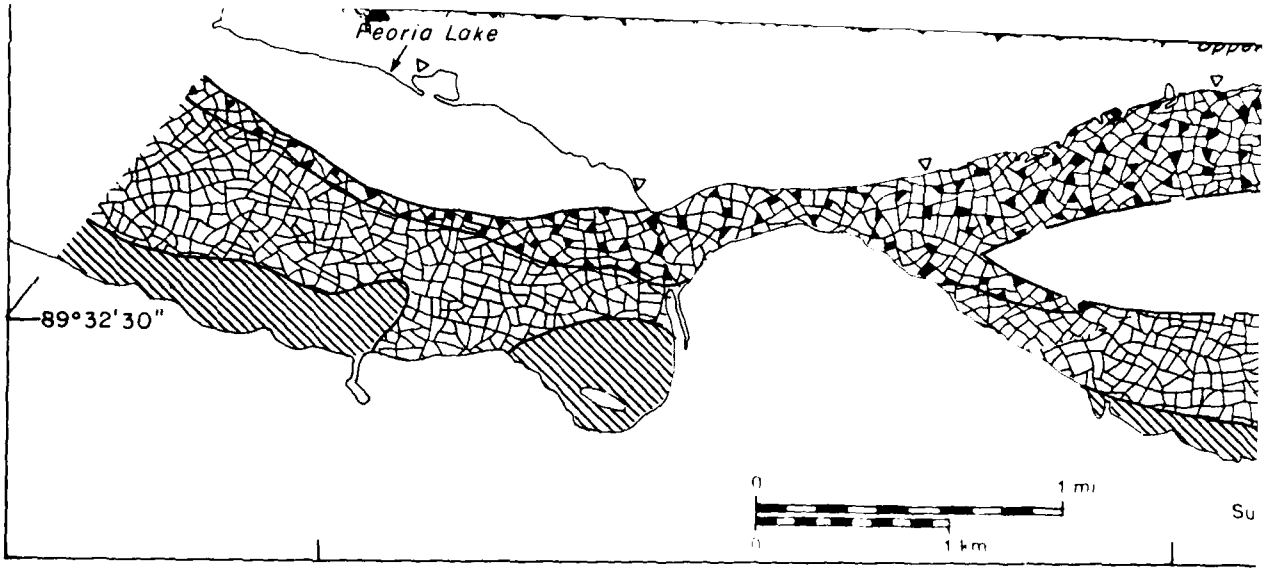

Peoria Pool .1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: February 9, 1986
Video Tape 10
0
1 mi
0
1 km
89°35'

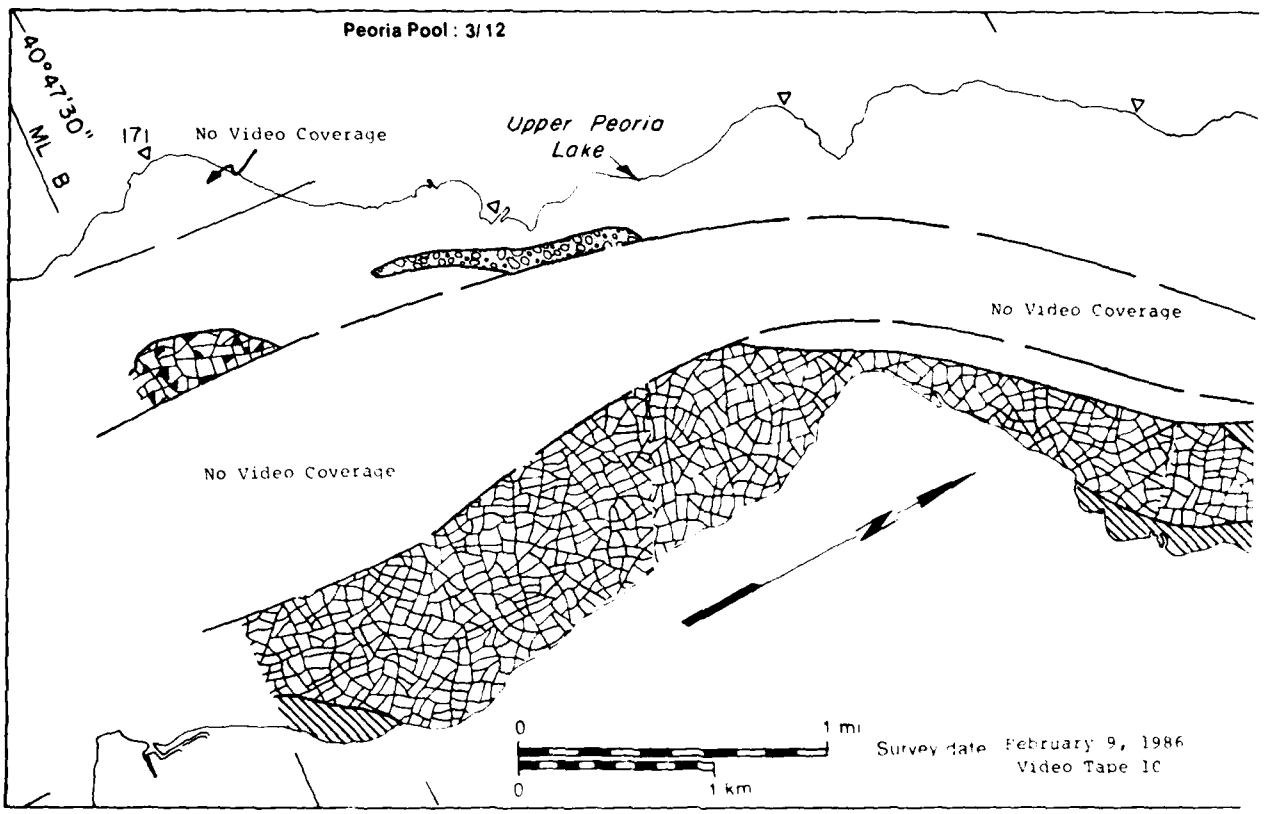

Peoria Pool : 2/12
40°42'30"
164
ML A
Peoria Lake
89°32'30"
0
1 mi
0
1 km

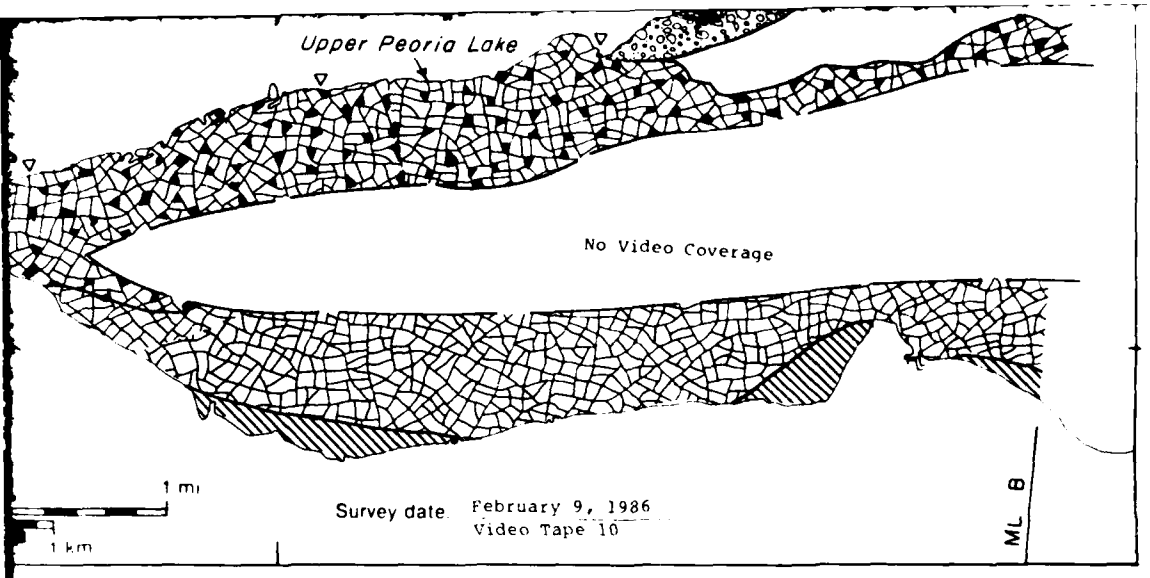

Peoria Pool : 3/12
40°47'

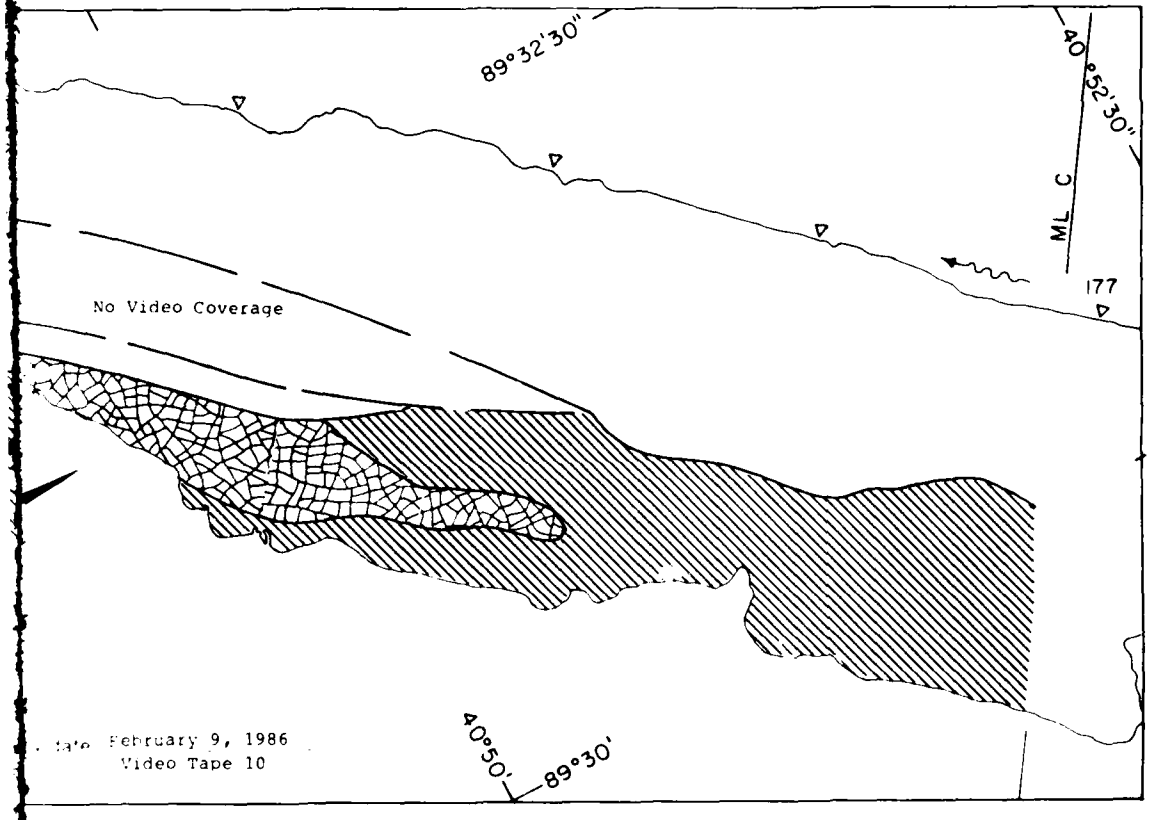
9 February 1986



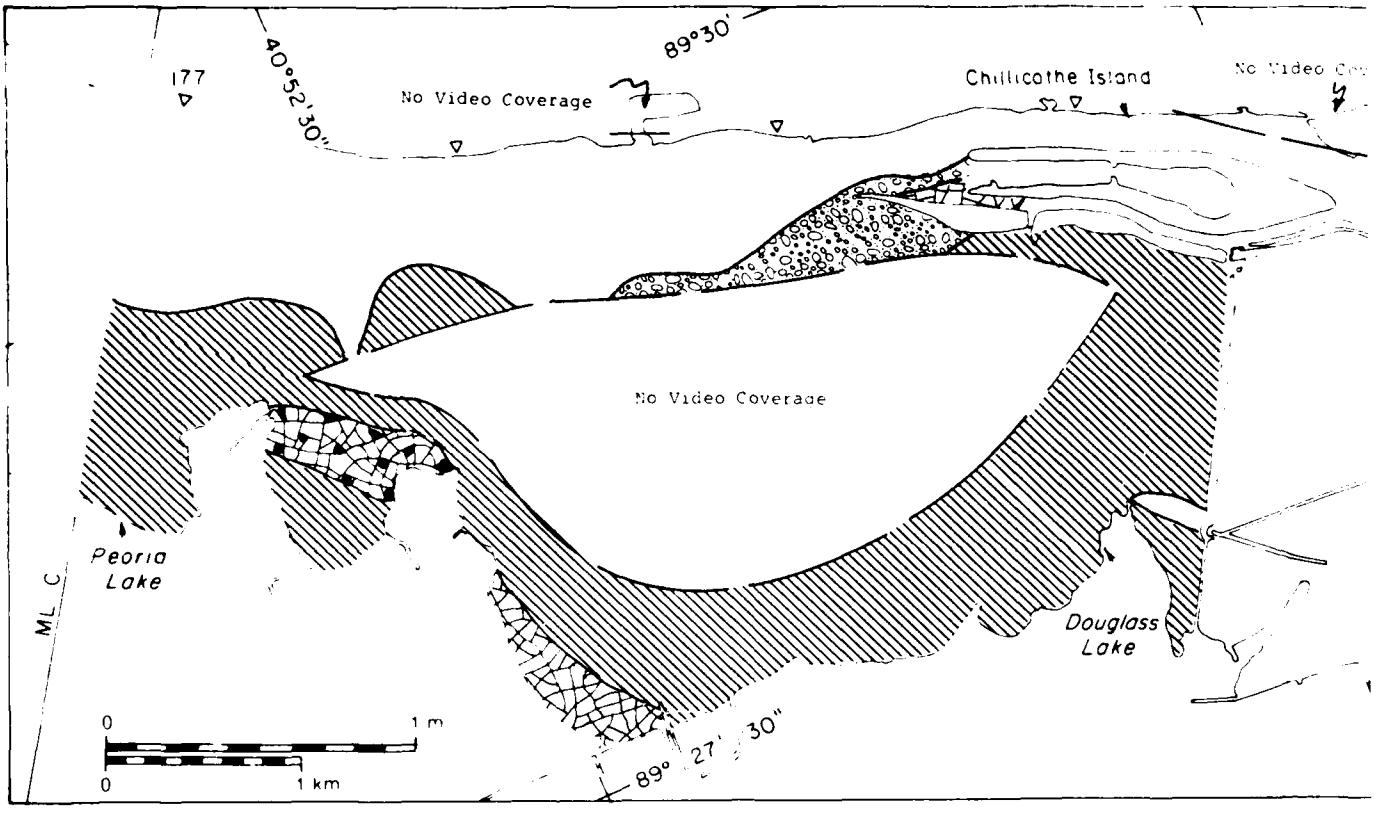

Peoria Lake
89°32'30"
0
1 mi
0
1 km

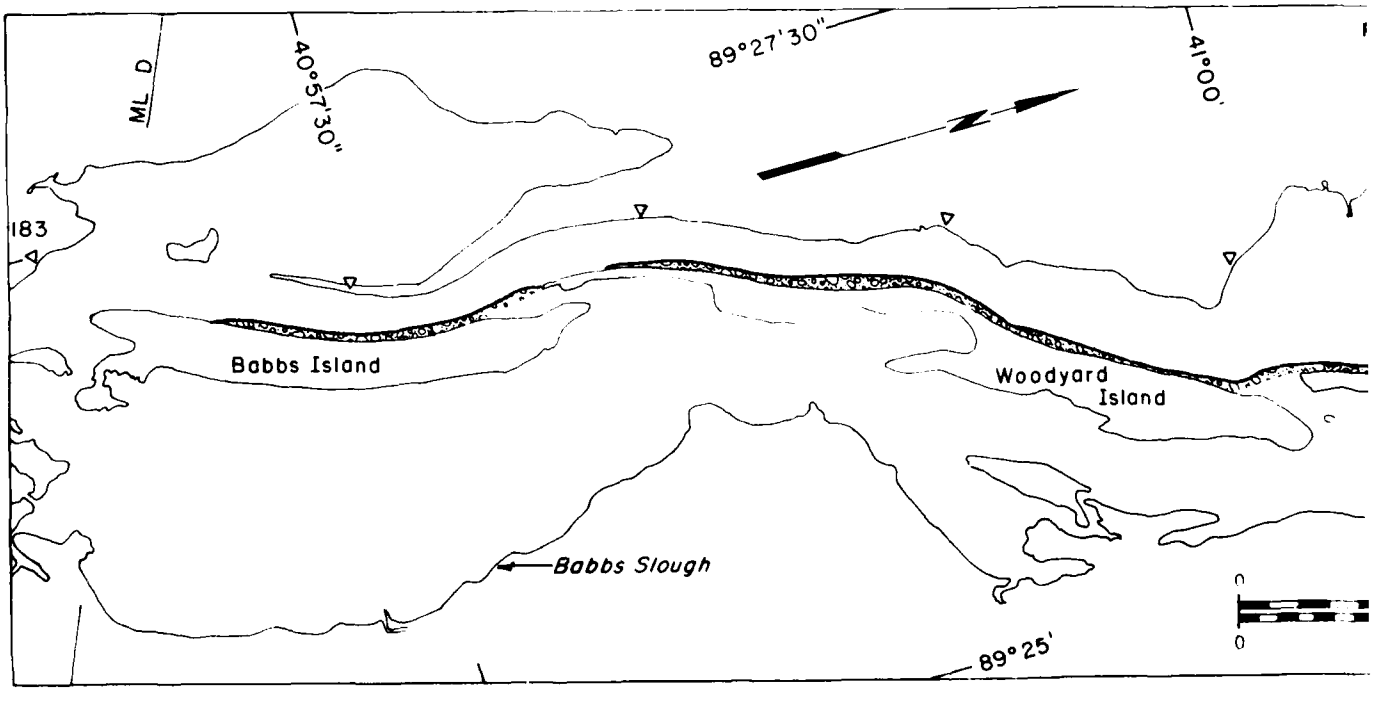

Peoria Pool : 3/12
40°47'30"
ML 8
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date February 9, 1986
Video Tape 10

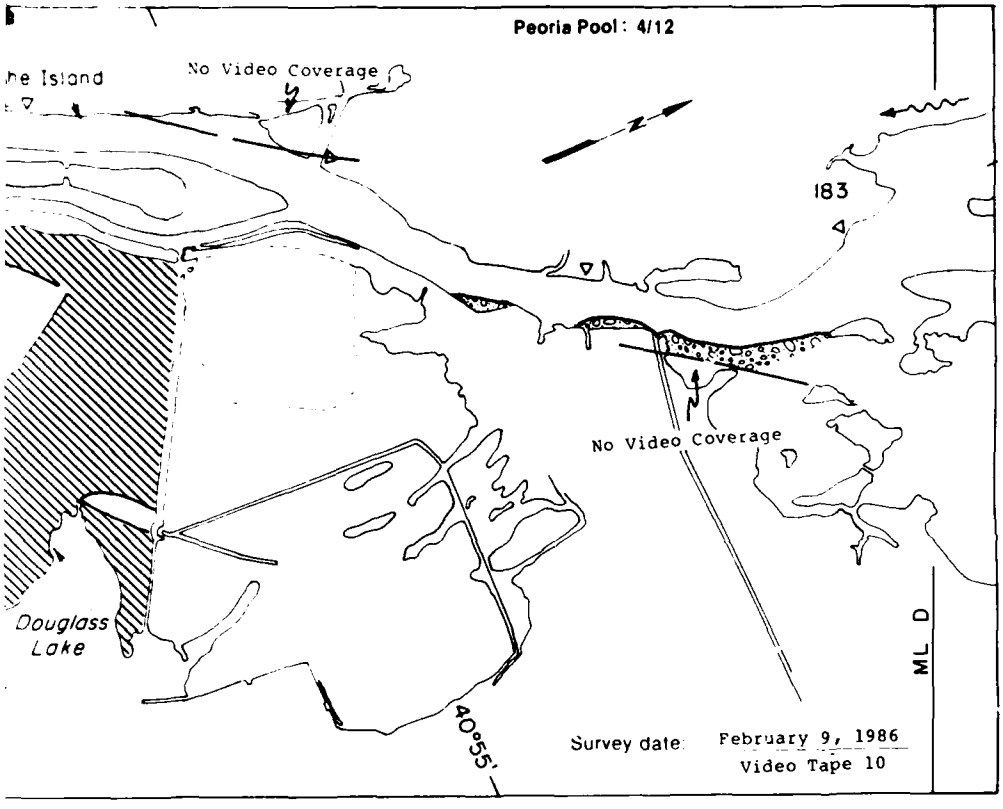

Upper Peoria Lake
No Video Coverage
1 mi
1 km
Survey date February 9, 1986
Video Tape 10
ML B

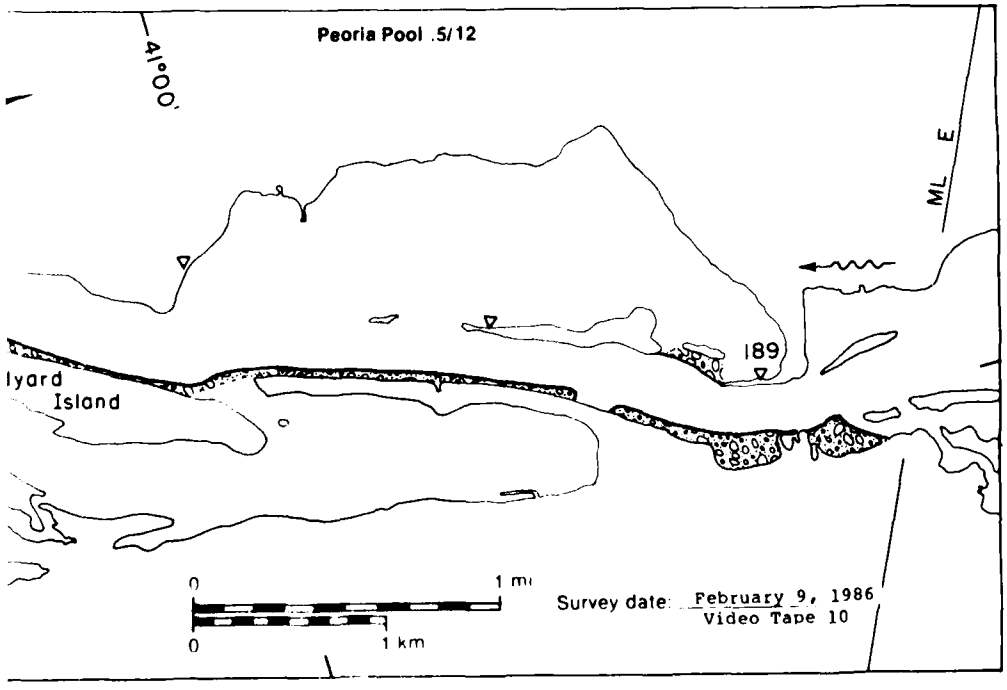

89°32'30"
40°52'30"
ML C
177
No Video Coverage
Survey date February 9, 1986
Video Tape 10
40°50'
89°30'

9 February 1986

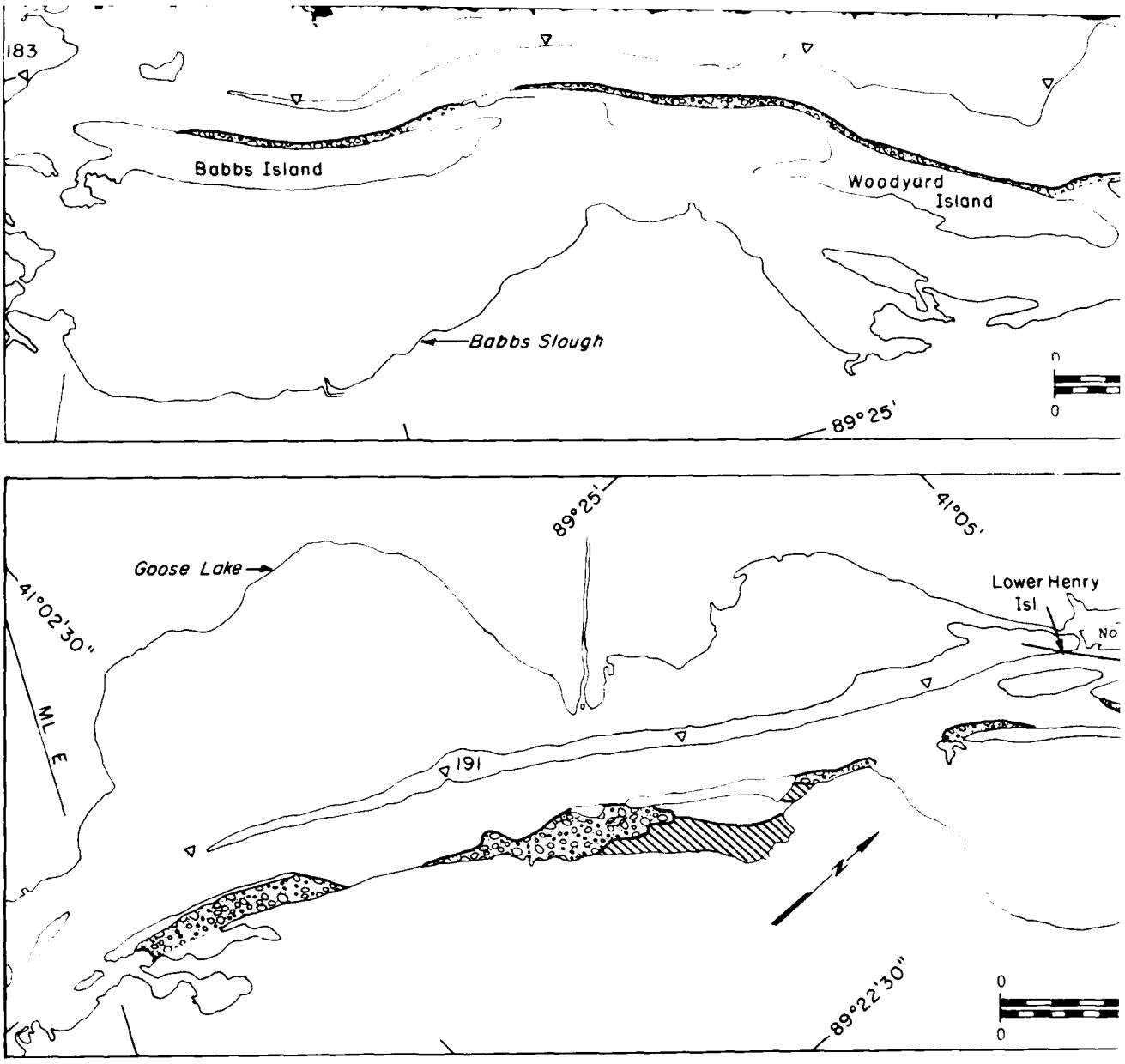


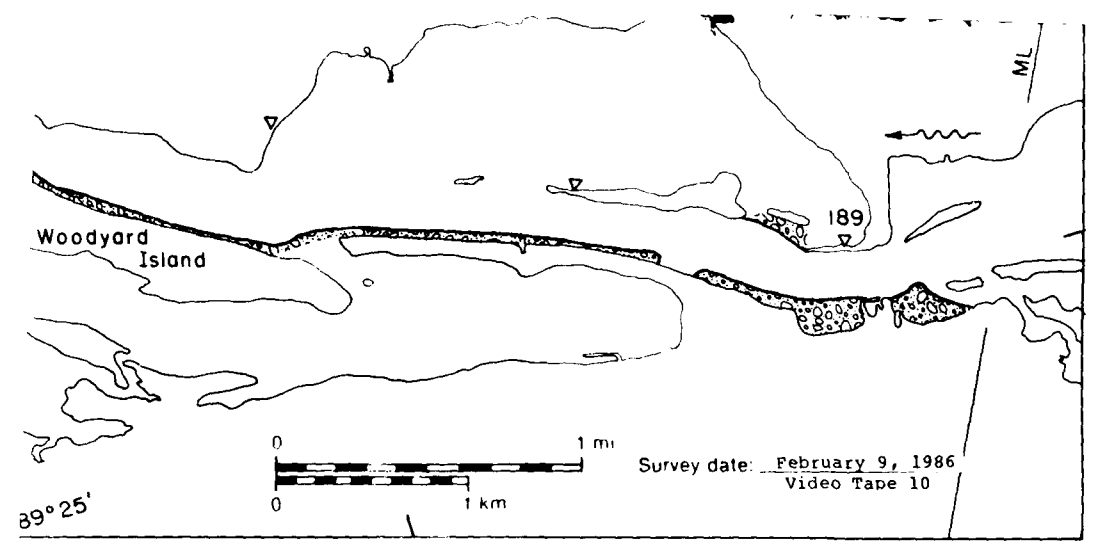


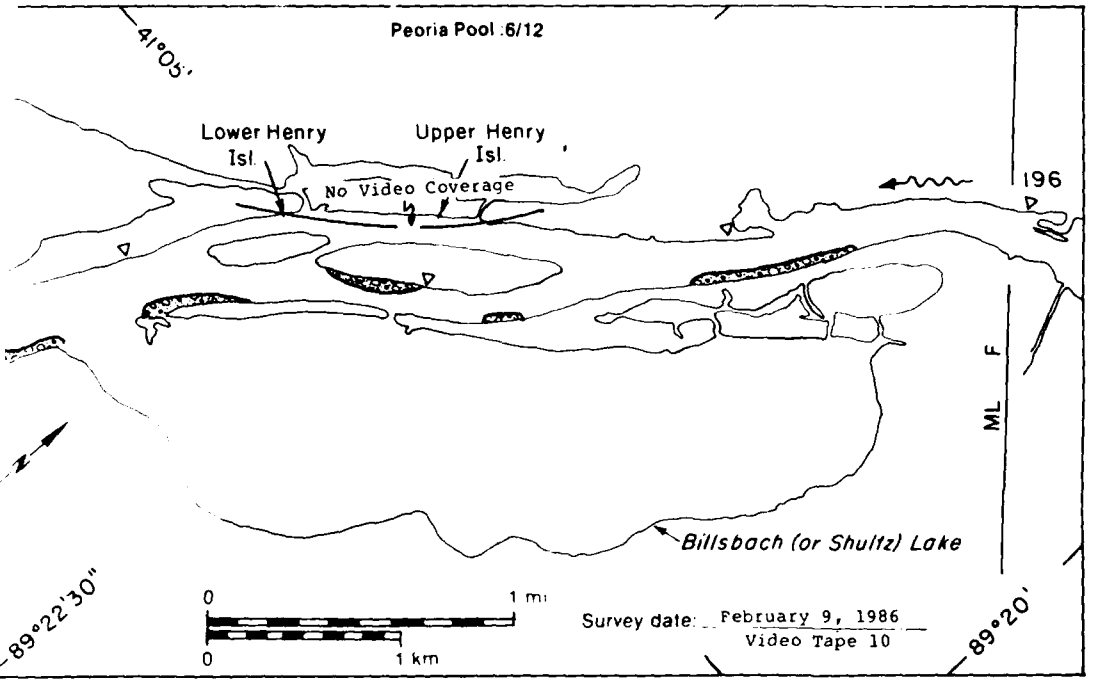

Peoria Pool : 4/12
he Island
No Video Coverage
183
No Video Coverage
Douglass Lake
ML D
40°55'
Survey date: February 9, 1986
Video Tape 10

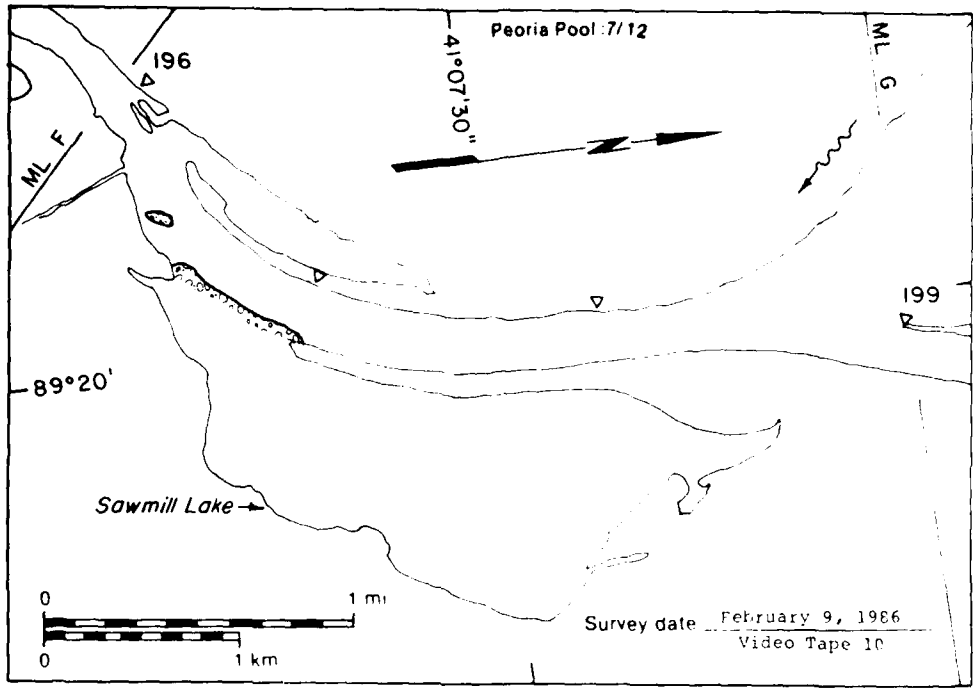

Peoria Pool .5/12
41°00'
ML E
189
lyard Island
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10

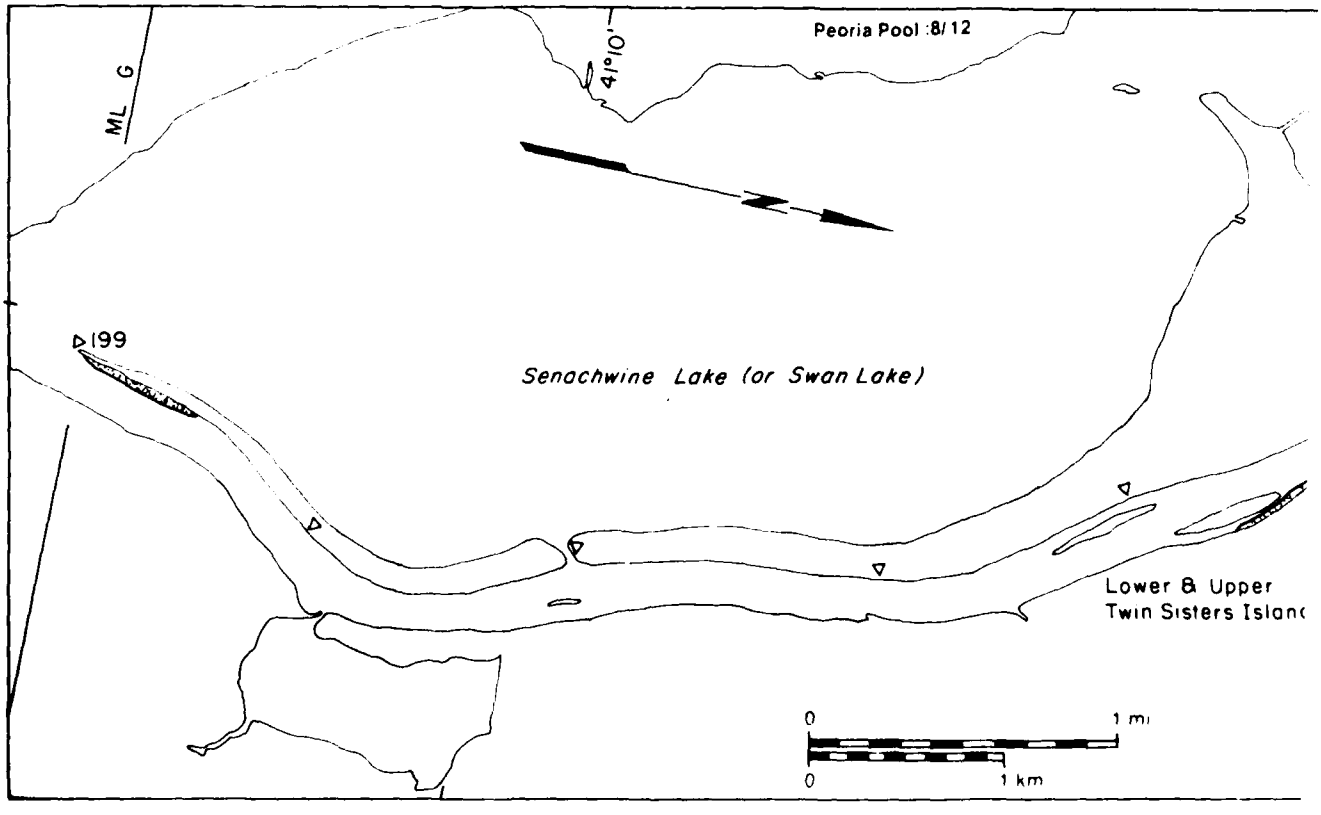
Peoria Pool .6/12


183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
0
89°25'
41°05'
Goose Lake
Lower Henry
Isl
41°02'30"
ML E
191
89°22'30"
0
0


ML
189
Woodyard
Island
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10
89°25'

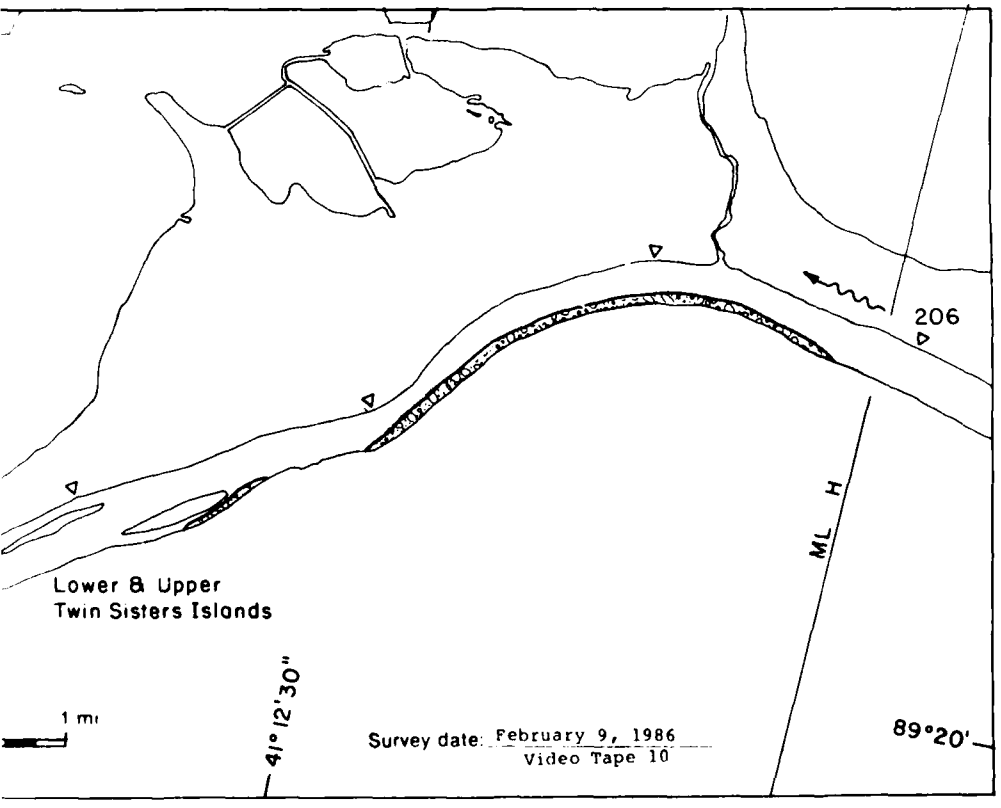

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
No Video Coverage
196
ML
F
Billsboch (or Shultz) Lake
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10
89°22'30"
89°20'

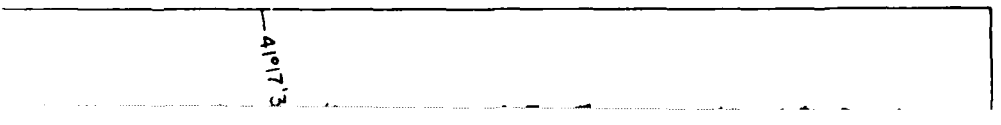

Peoria Pool :7/12
196
41°07'30"
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date February 9, 1986
Video Tape 10

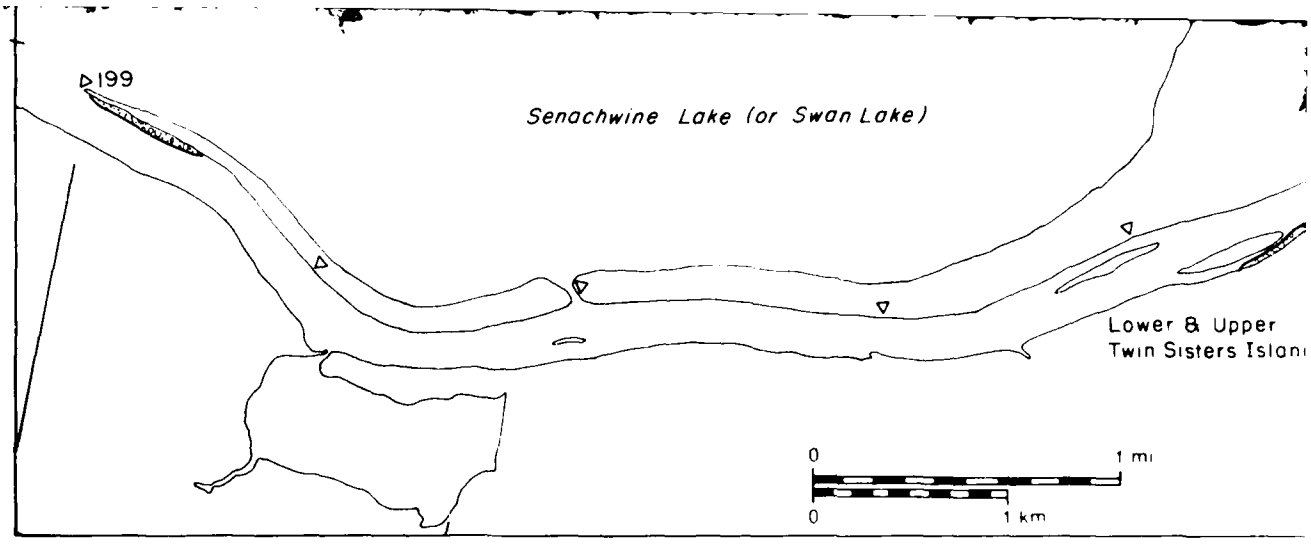

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Island
0
1 mi
0
1 km

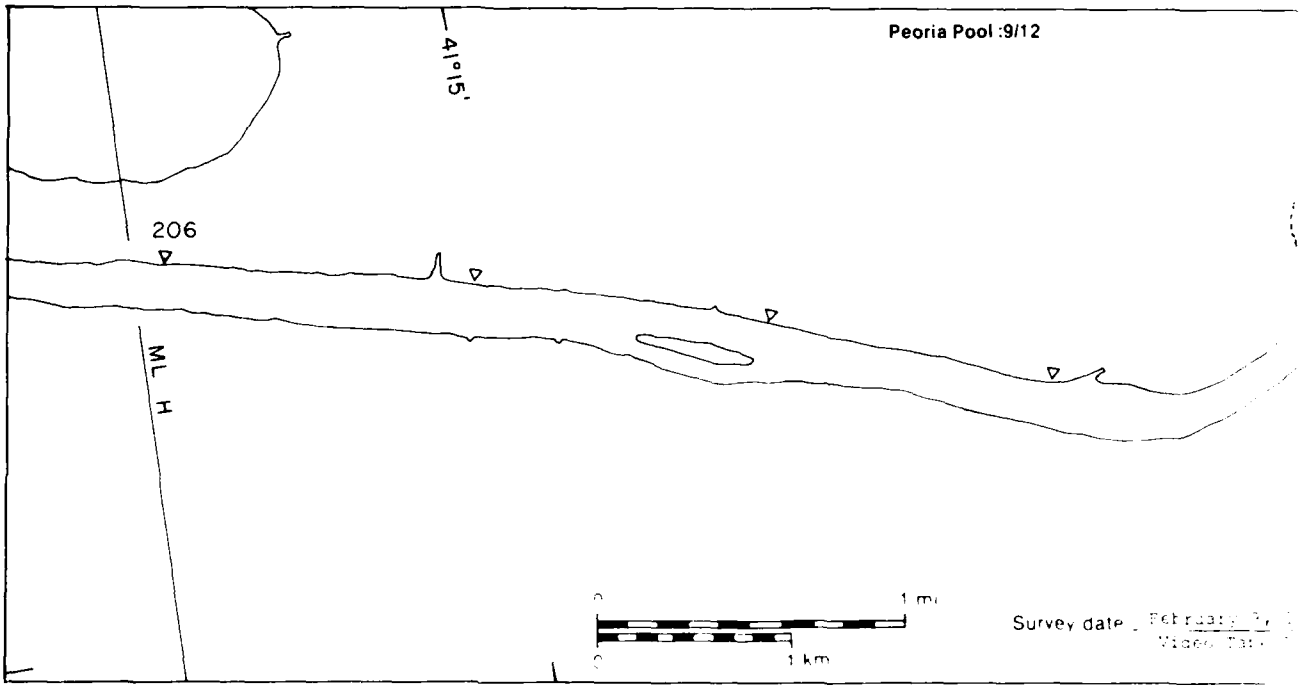
Peoria Pool :9/12

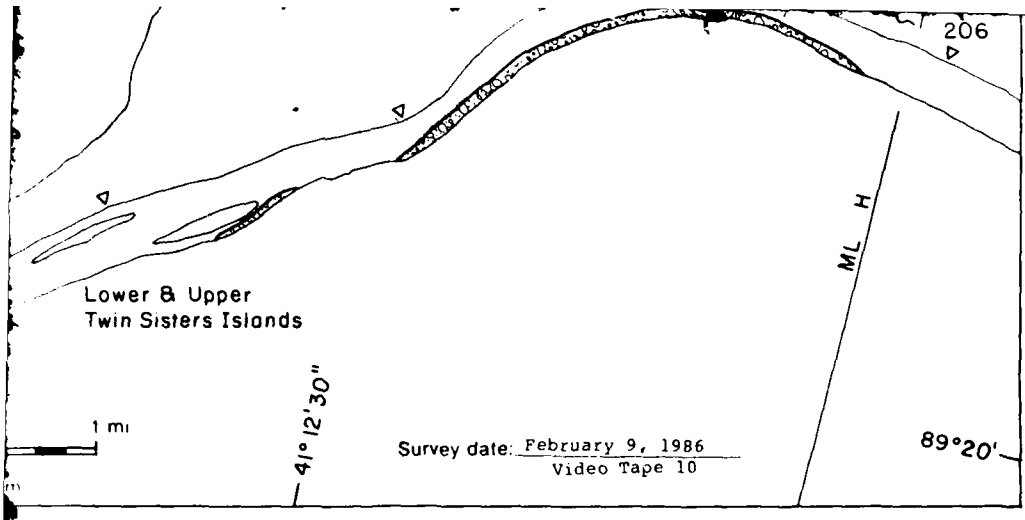
9 February 1986

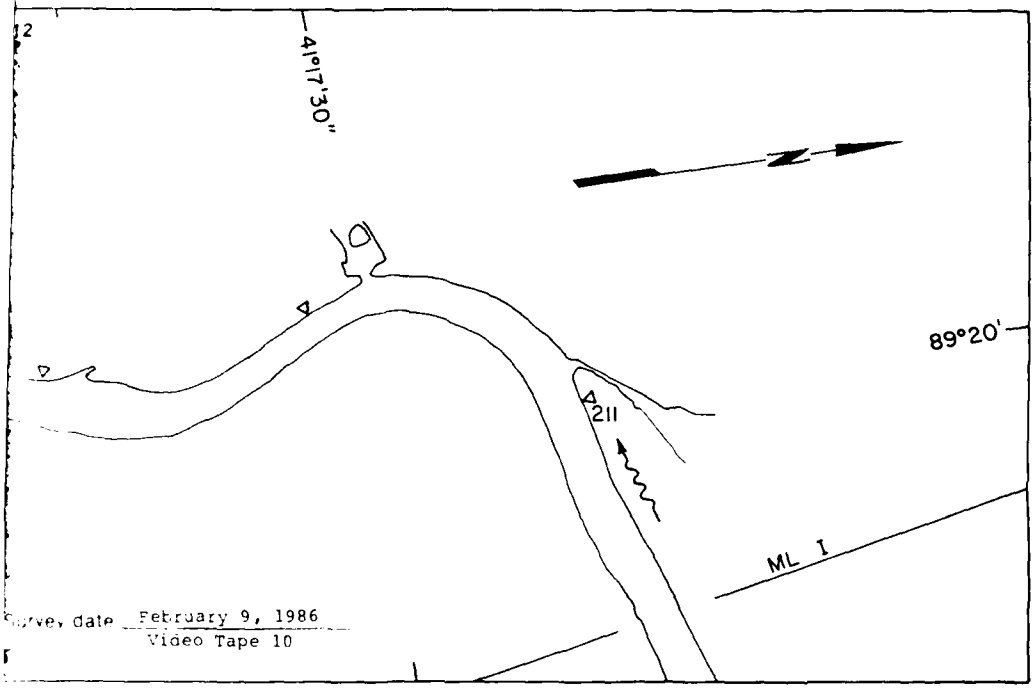




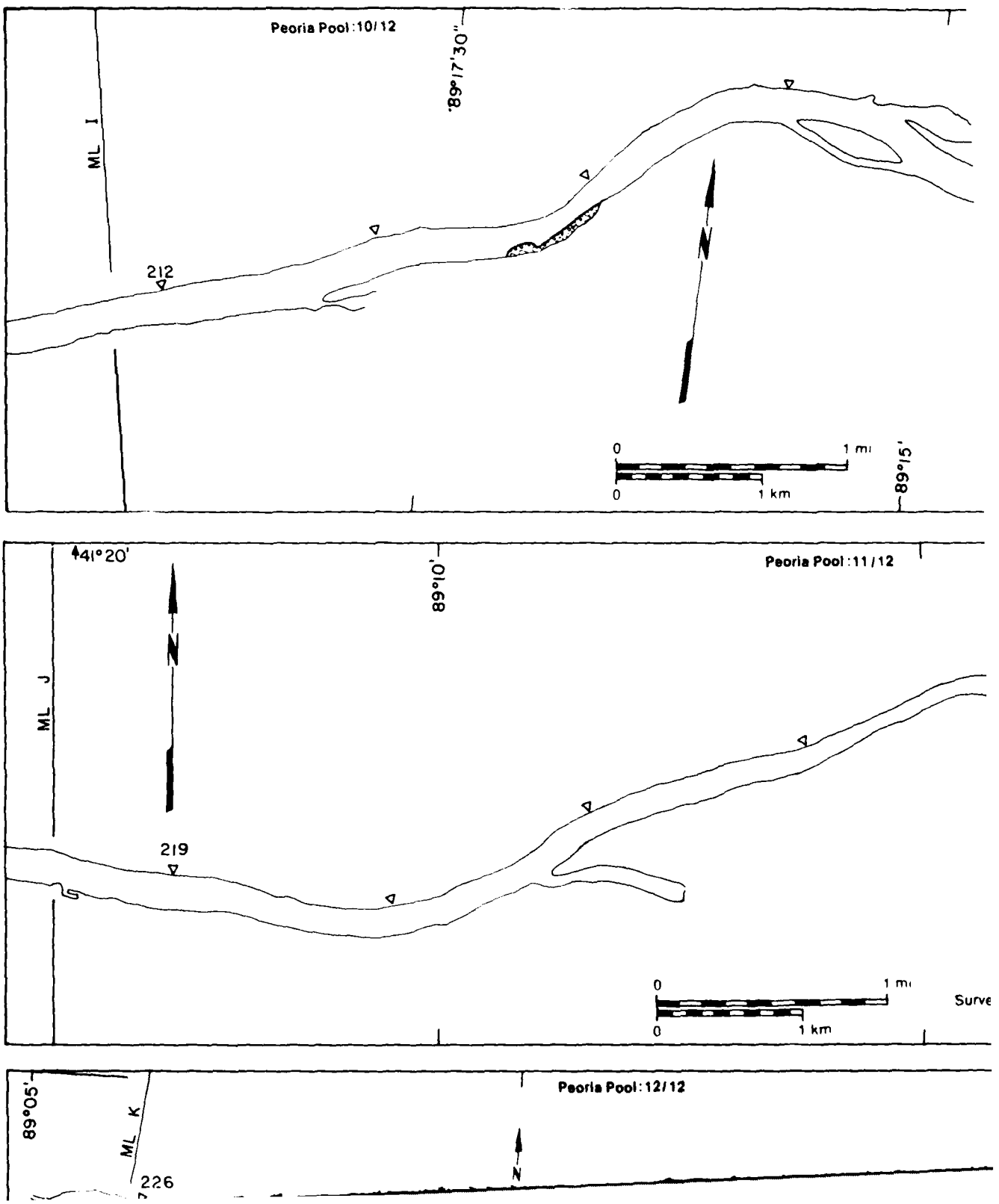

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islan
0
1 mi
0
1 km

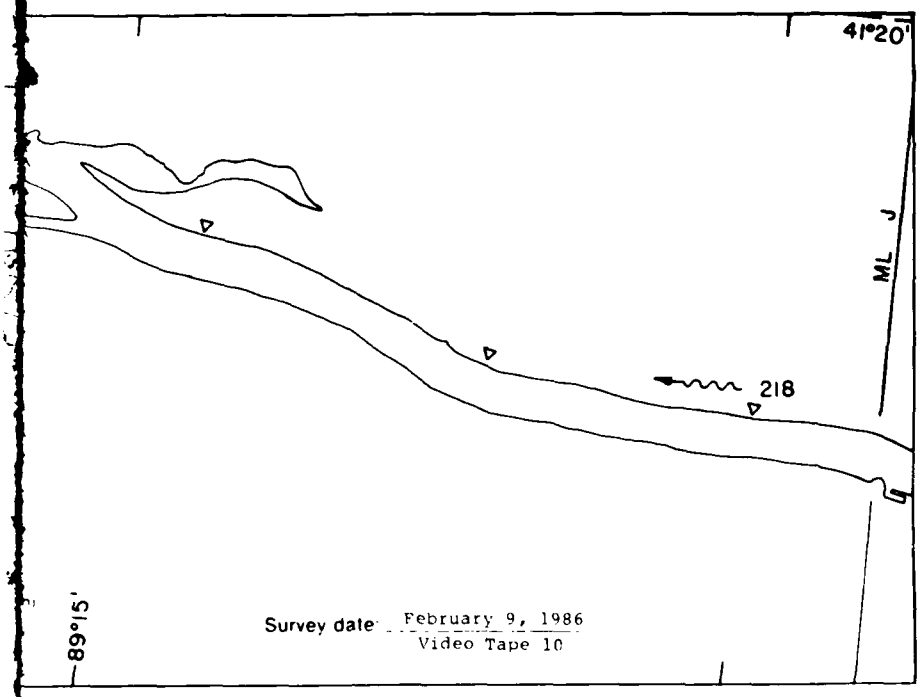

Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date

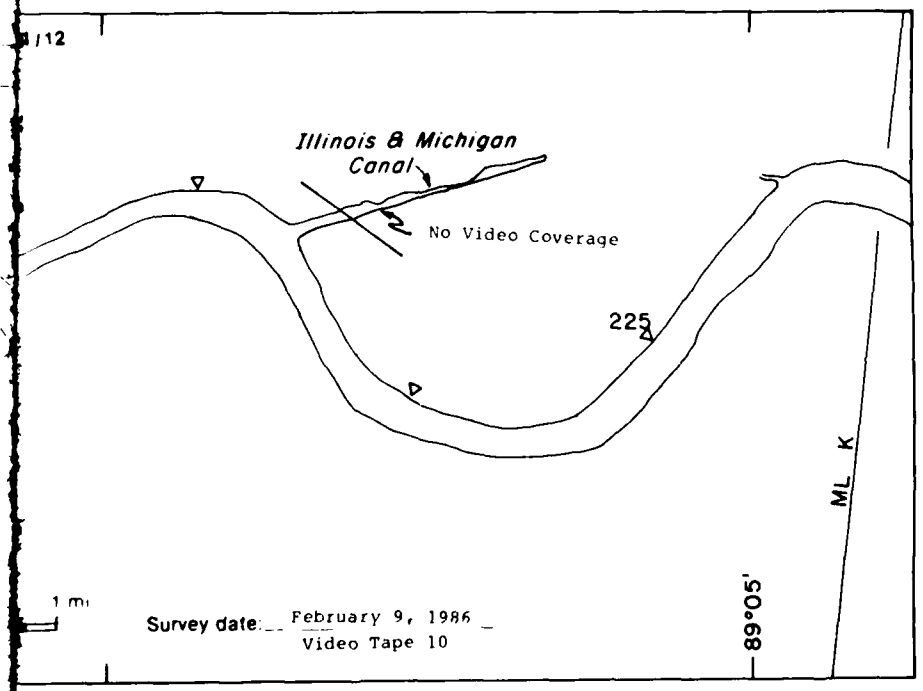

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
41° 12'30"
Survey date: February 9, 1986
Video Tape 10
89°20'

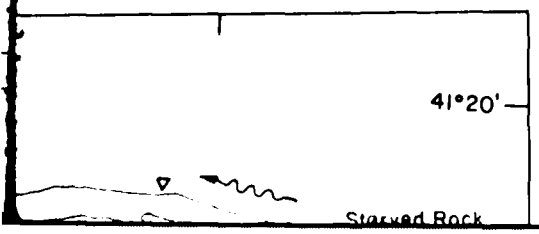

41°17'30"
89°20'
211
ML I
Survey date February 9, 1986
Video Tape 10

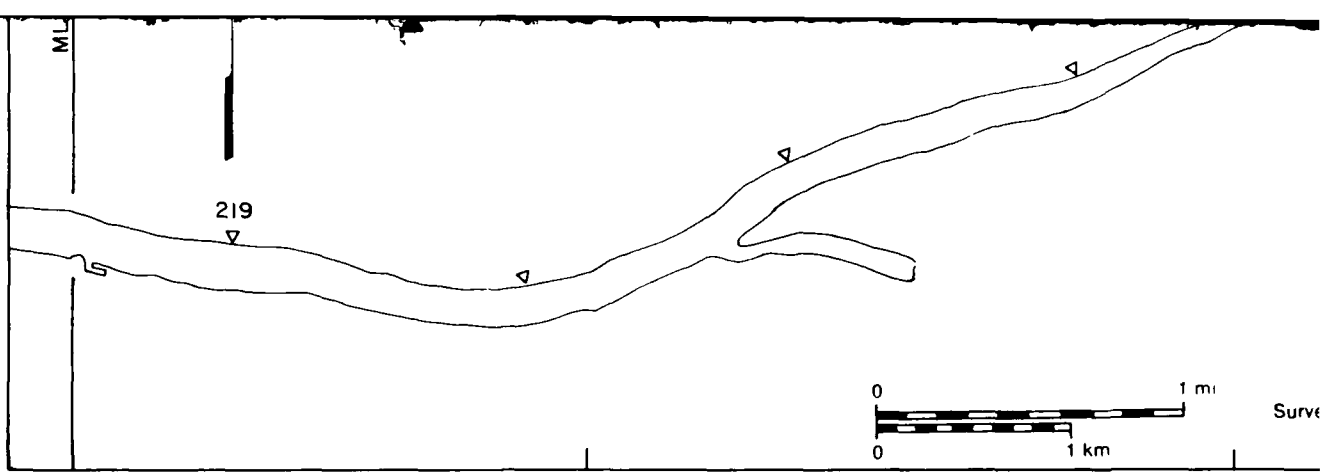
9 February 1986

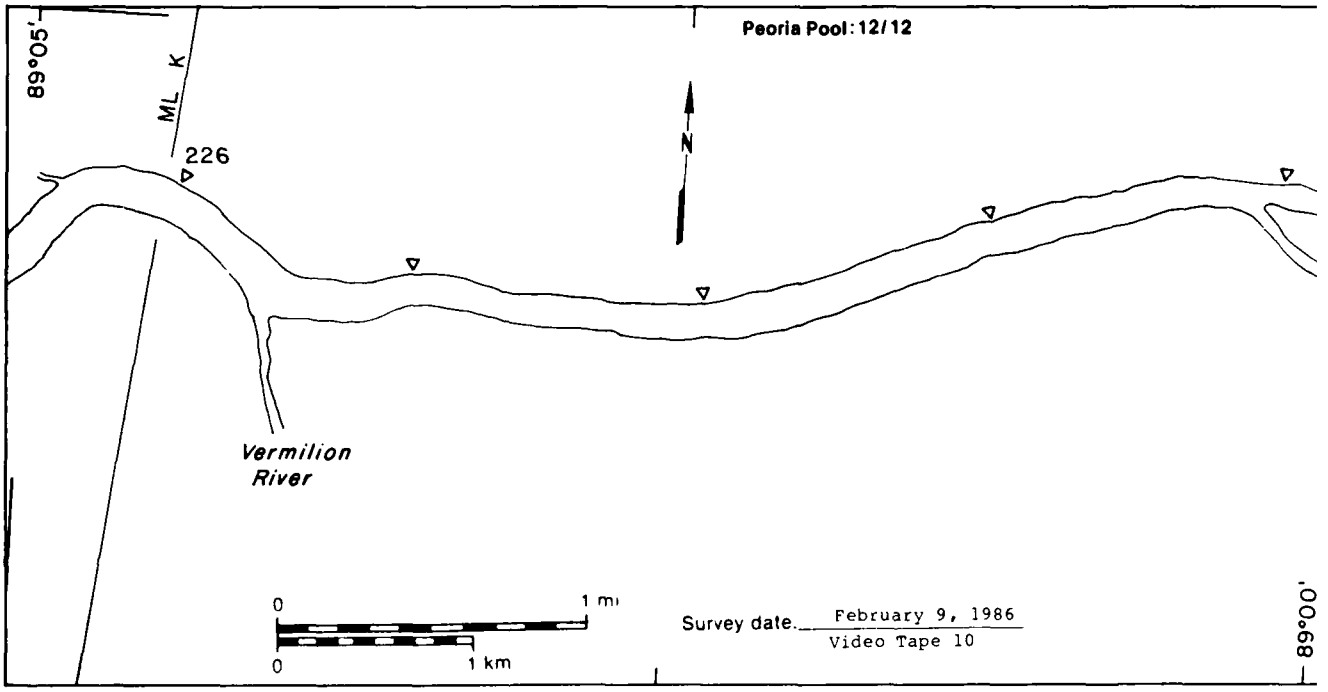



41°20'
ML J
218
89°15'
Survey date: February 9, 1986
Video Tape 10


112
Illinois & Michigan Canal
No Video Coverage
225
ML K
1 mi
Survey date: February 9, 1986
Video Tape 10
89°05'


41°20'
Starved Rock

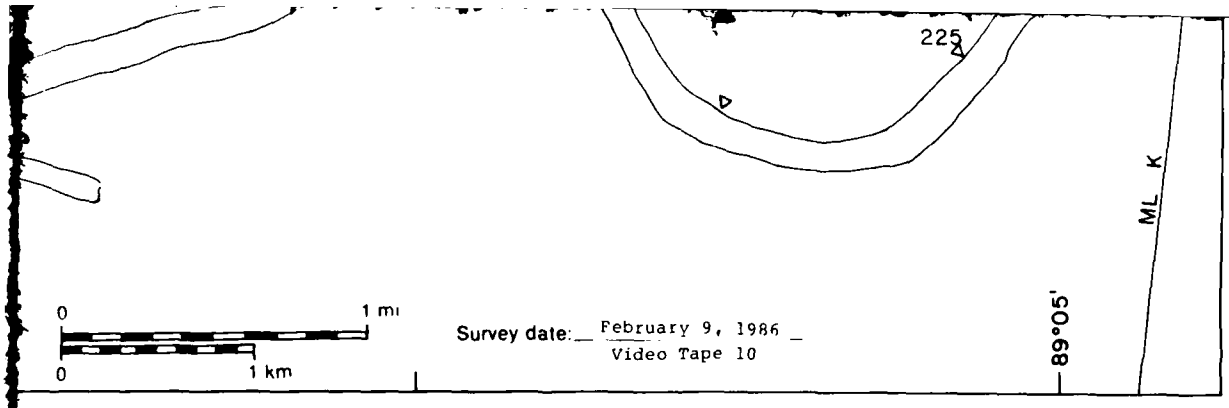


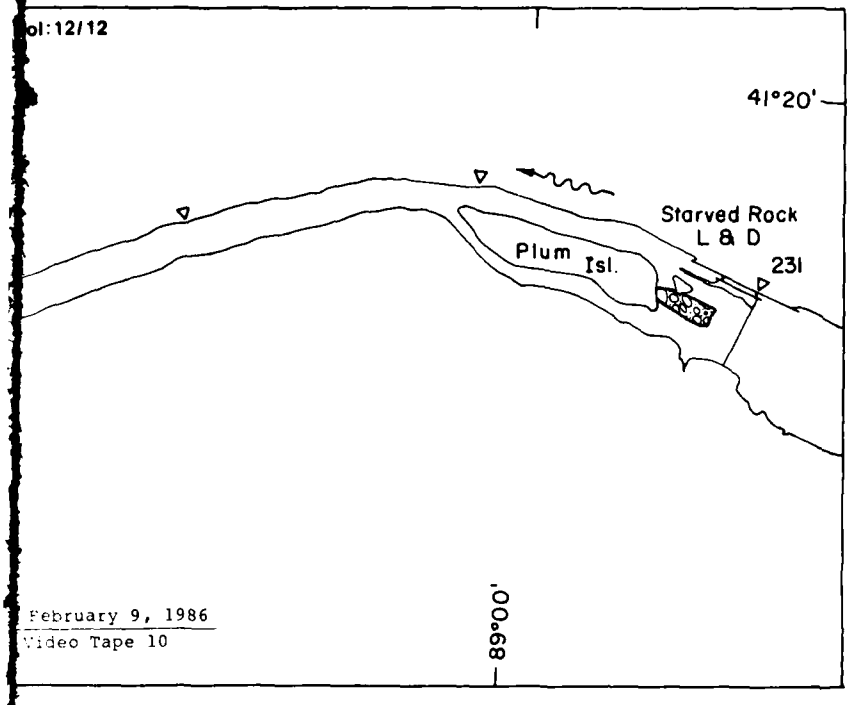


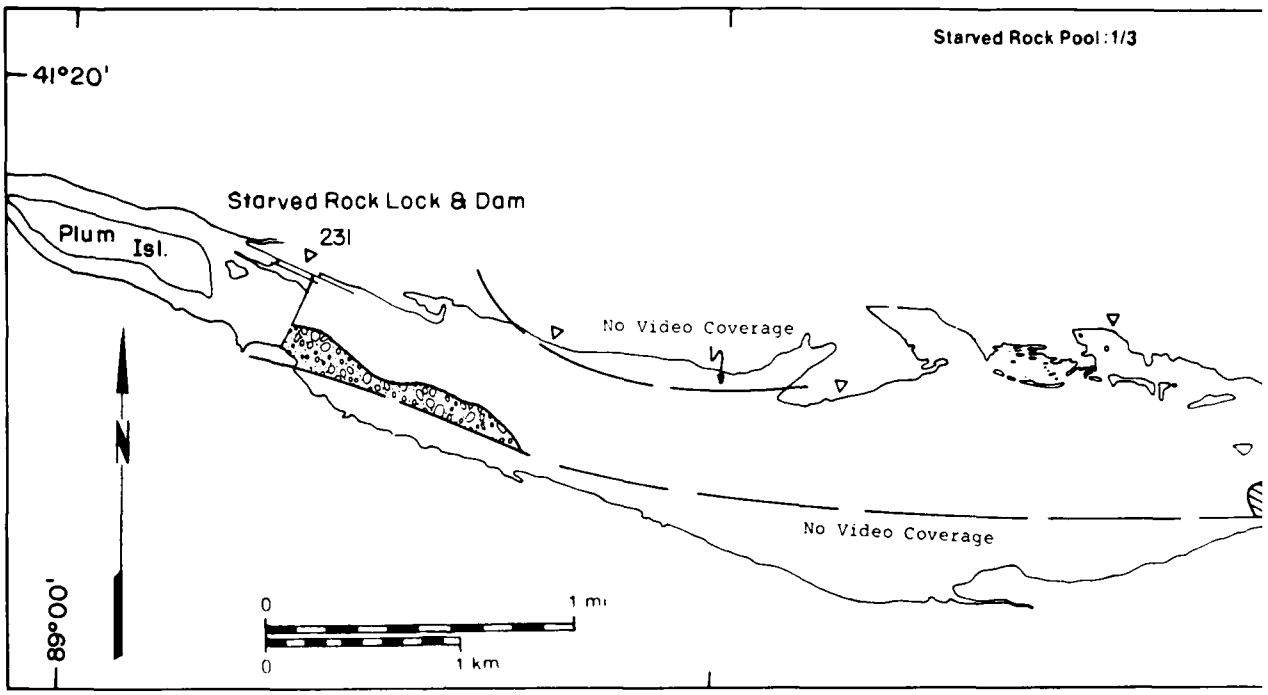
Peoria Pool

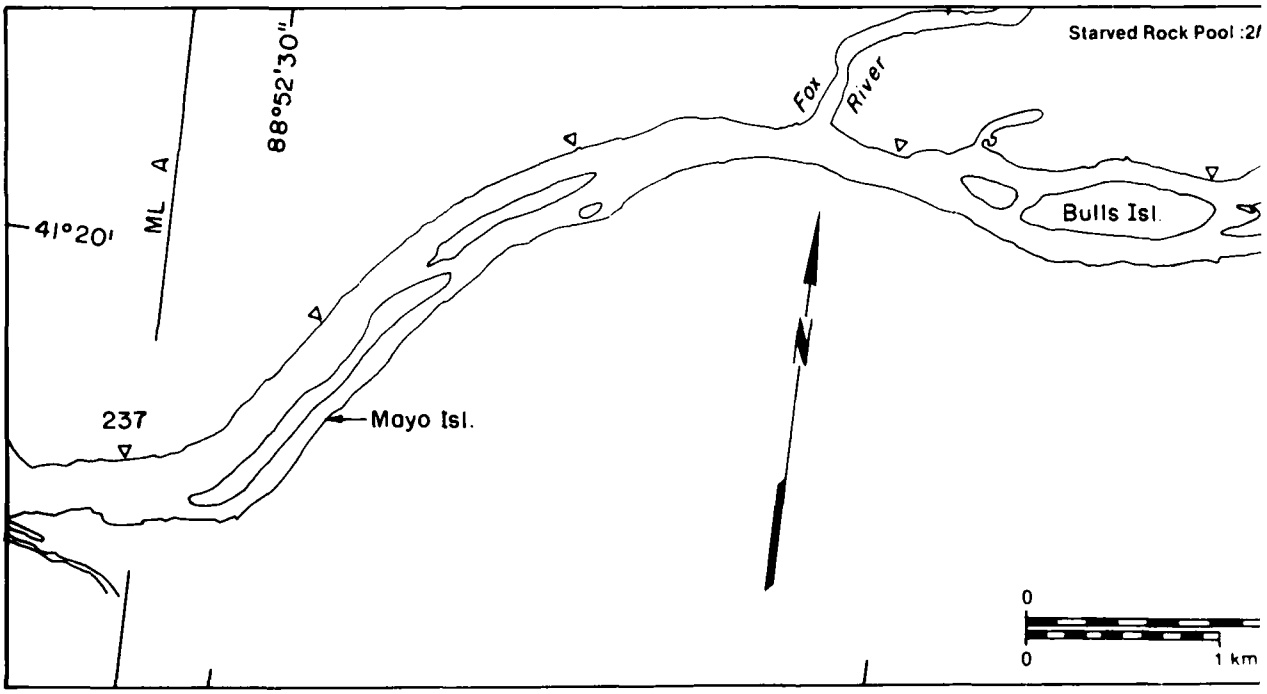
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	37.15	NA
Solid ice cover	12.23	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	8.55	NA
Fragmented ice cover with open water areas	4.63	70
Ice floes or frazil slush and pans	2.73	40
Total area ($m^2 \times 10^6$)	81.33*	

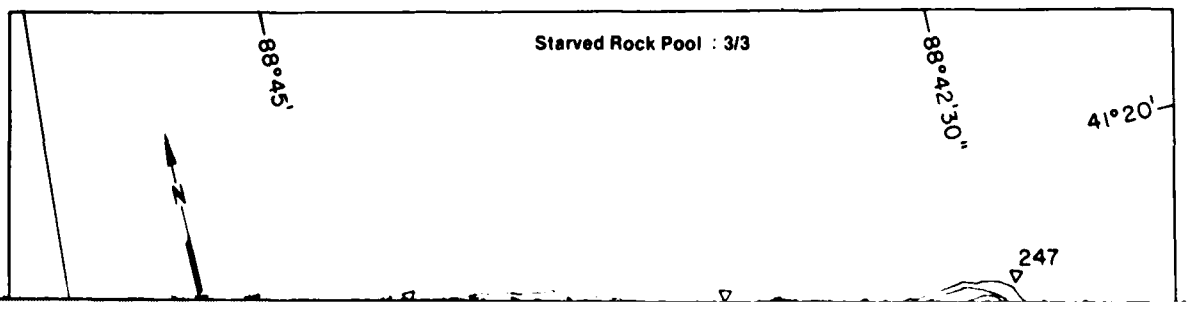
* Includes 16.04×10^6 m^2 of no video coverage


225
ML K
89°05'
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10

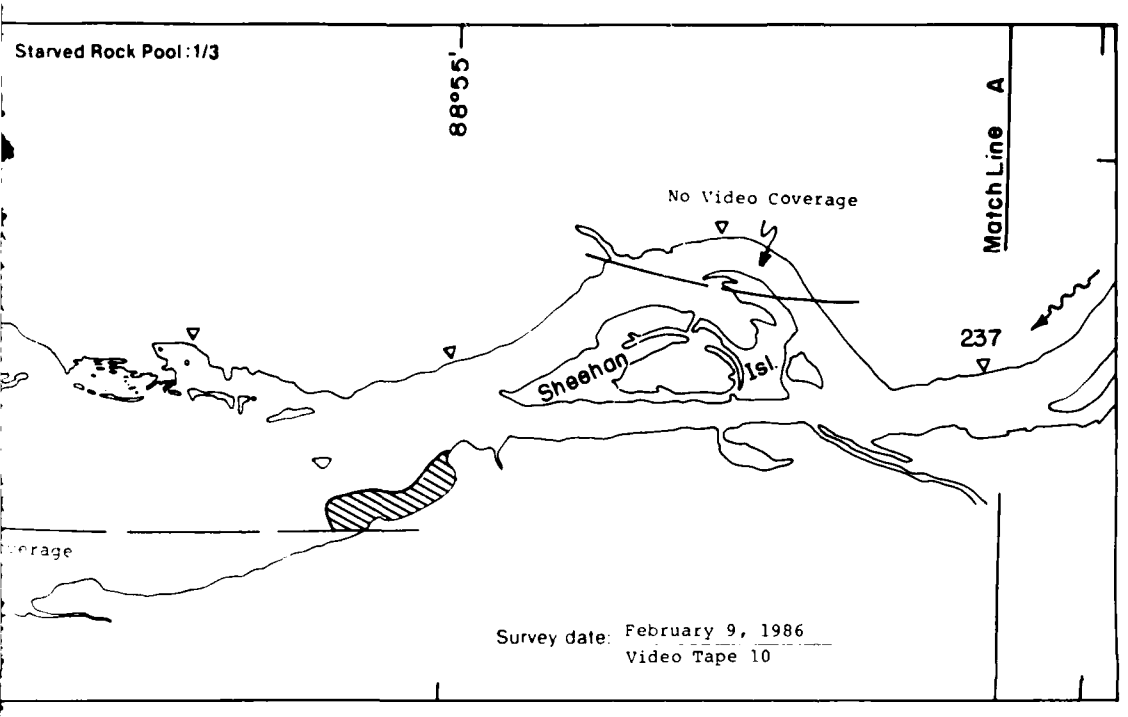

ol:12/12
41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'
February 9, 1986
Video Tape 10

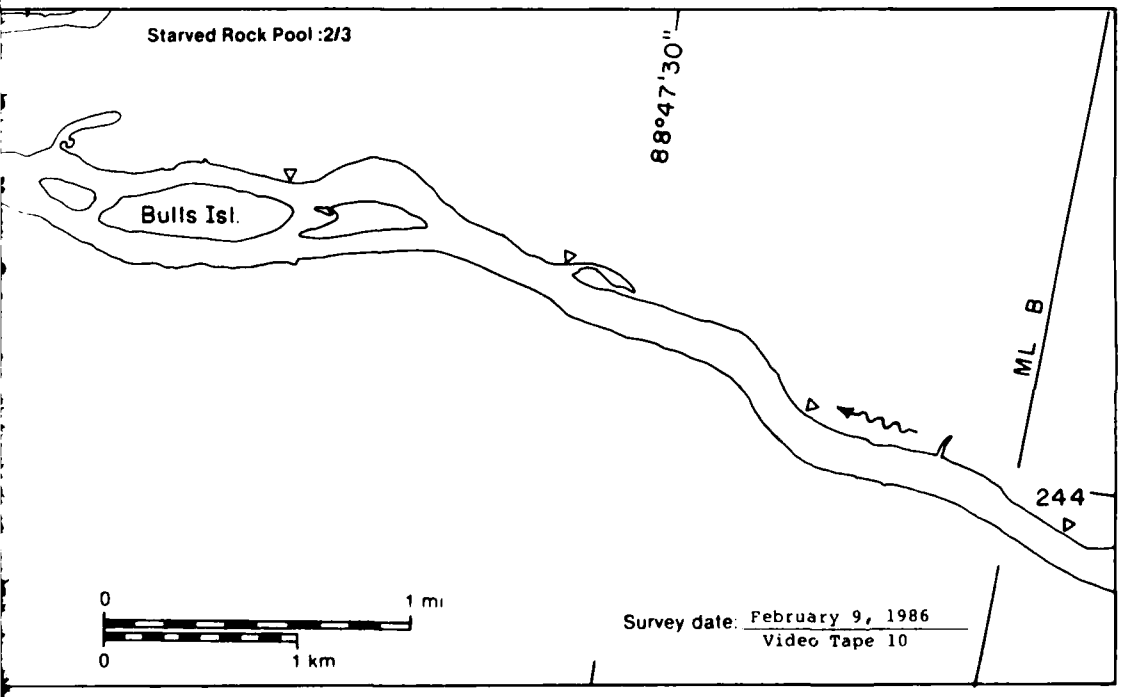

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
No Video Coverage
89°00'
0
1 mi
0
1 km

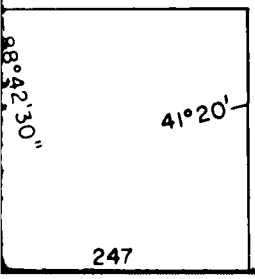

Starved Rock Pool :2/
88°52'30"
Fox River
ML 4
41°20'
Bulls Isl.
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
247

9 February 1986







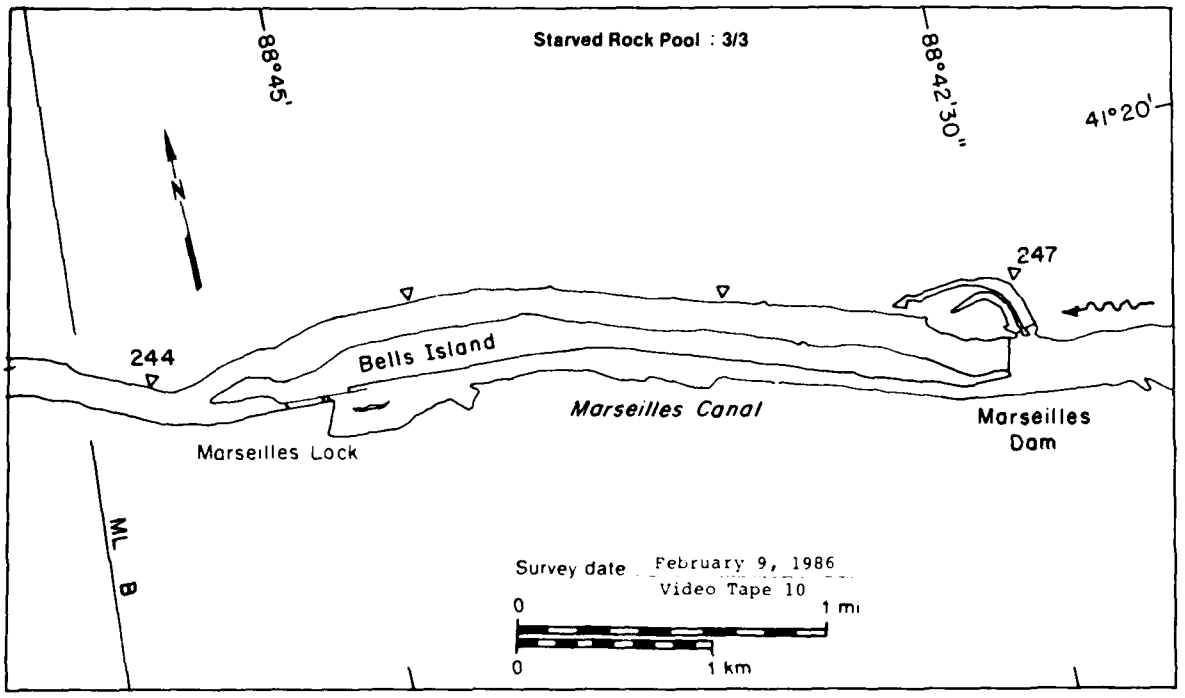
Starved Rock Pool

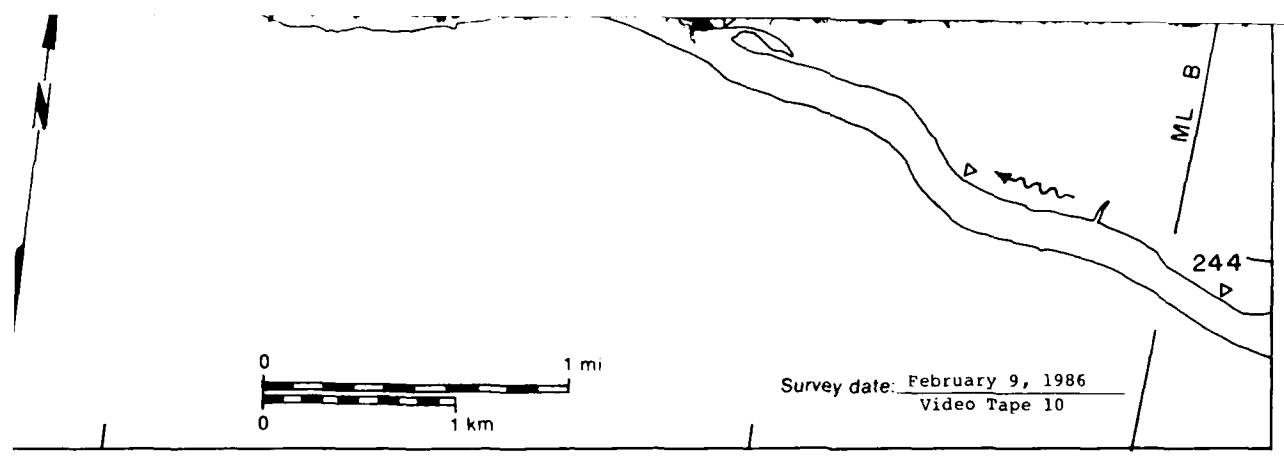
MAP UNITS

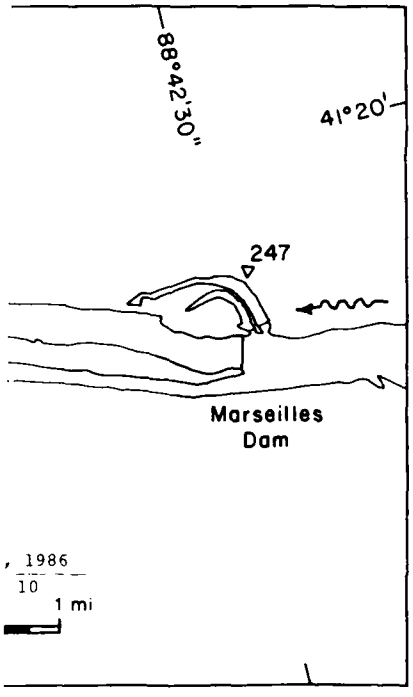
Open water

Area (m^2 x 10^6)	Surface concentration (%)
8.12	NA
[illegible]	NA

237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date February 9, 1986
Video Tape 10
0
1 mi
0
1 km



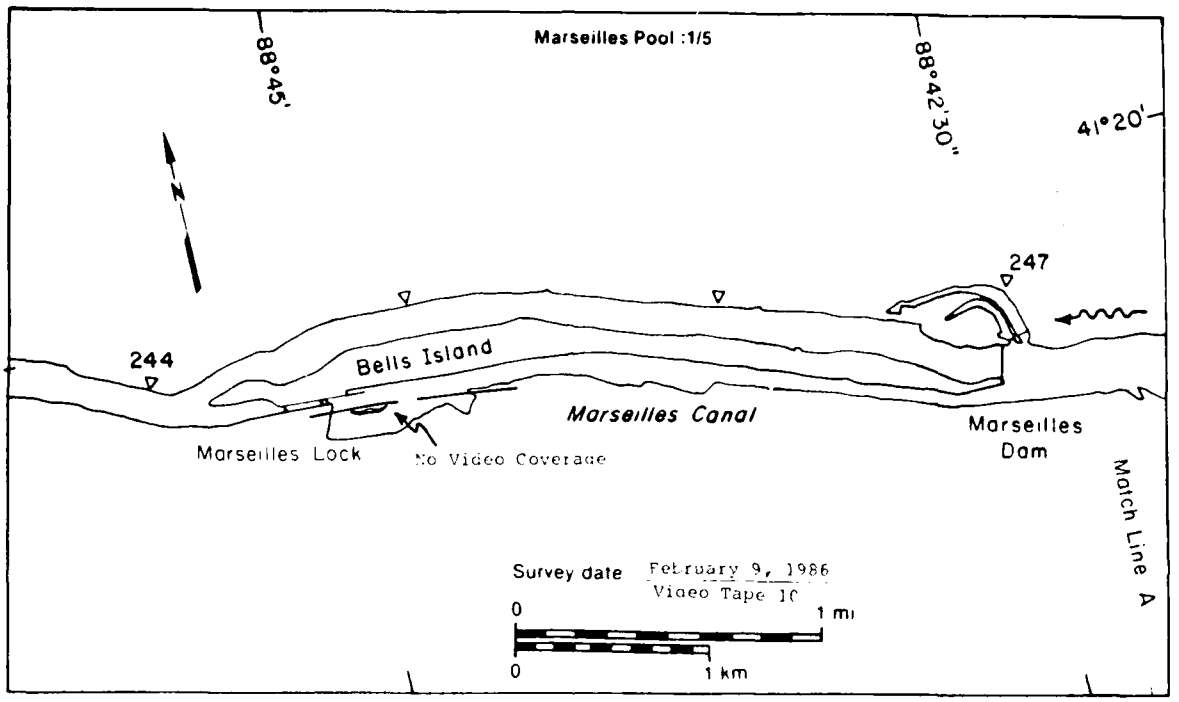


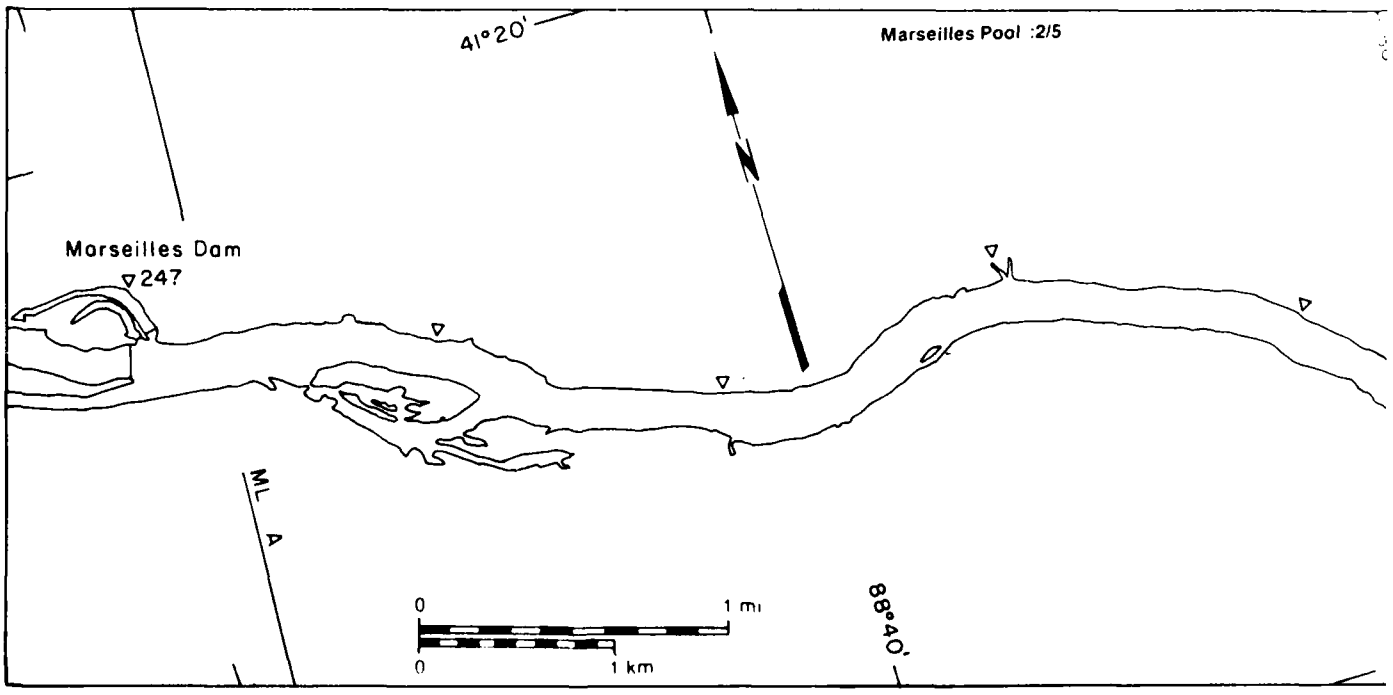
Starved Rock Pool

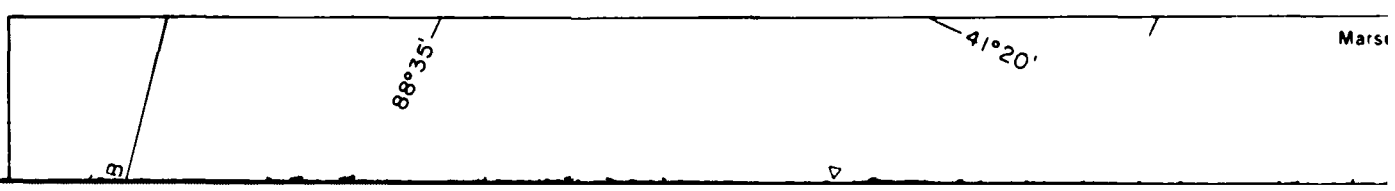
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.12	NA
Solid ice cover	0.12	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.18	20
Total area ($m^2 \times 10^6$)	10.19*	

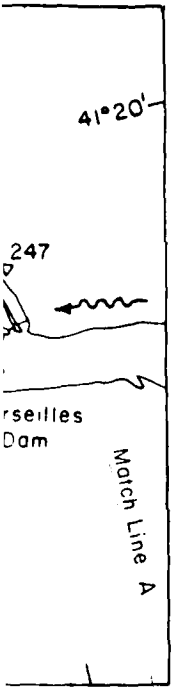
* Includes 1.77×10^6 m^2 of no video coverage

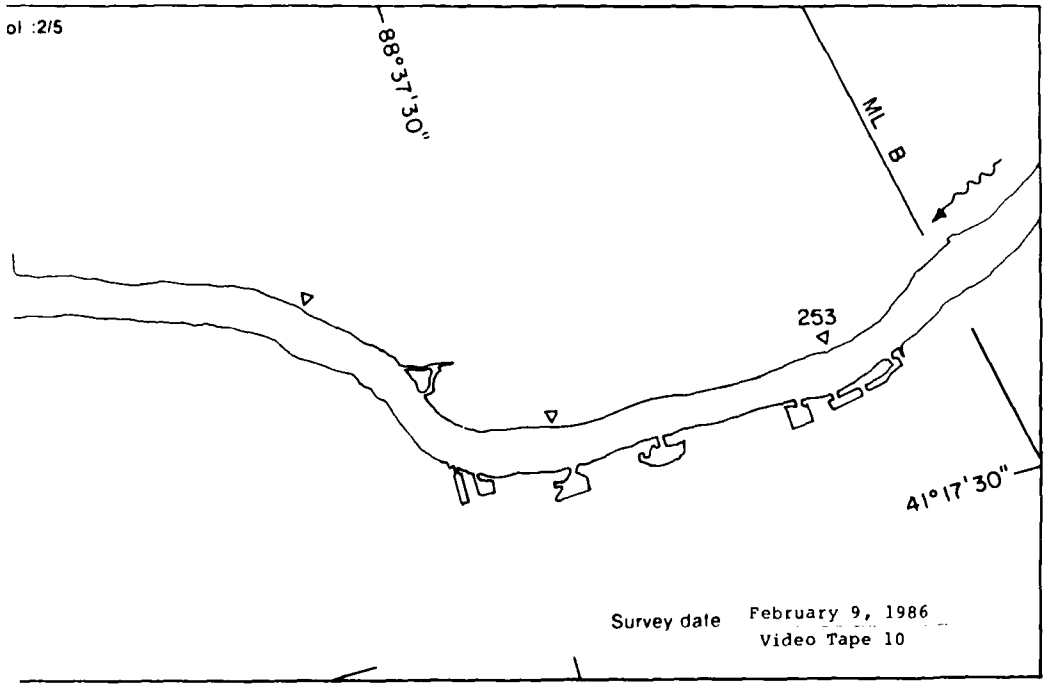
9 February 1986

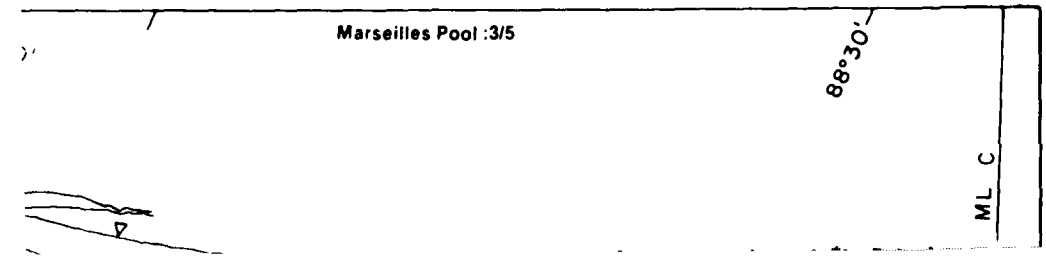


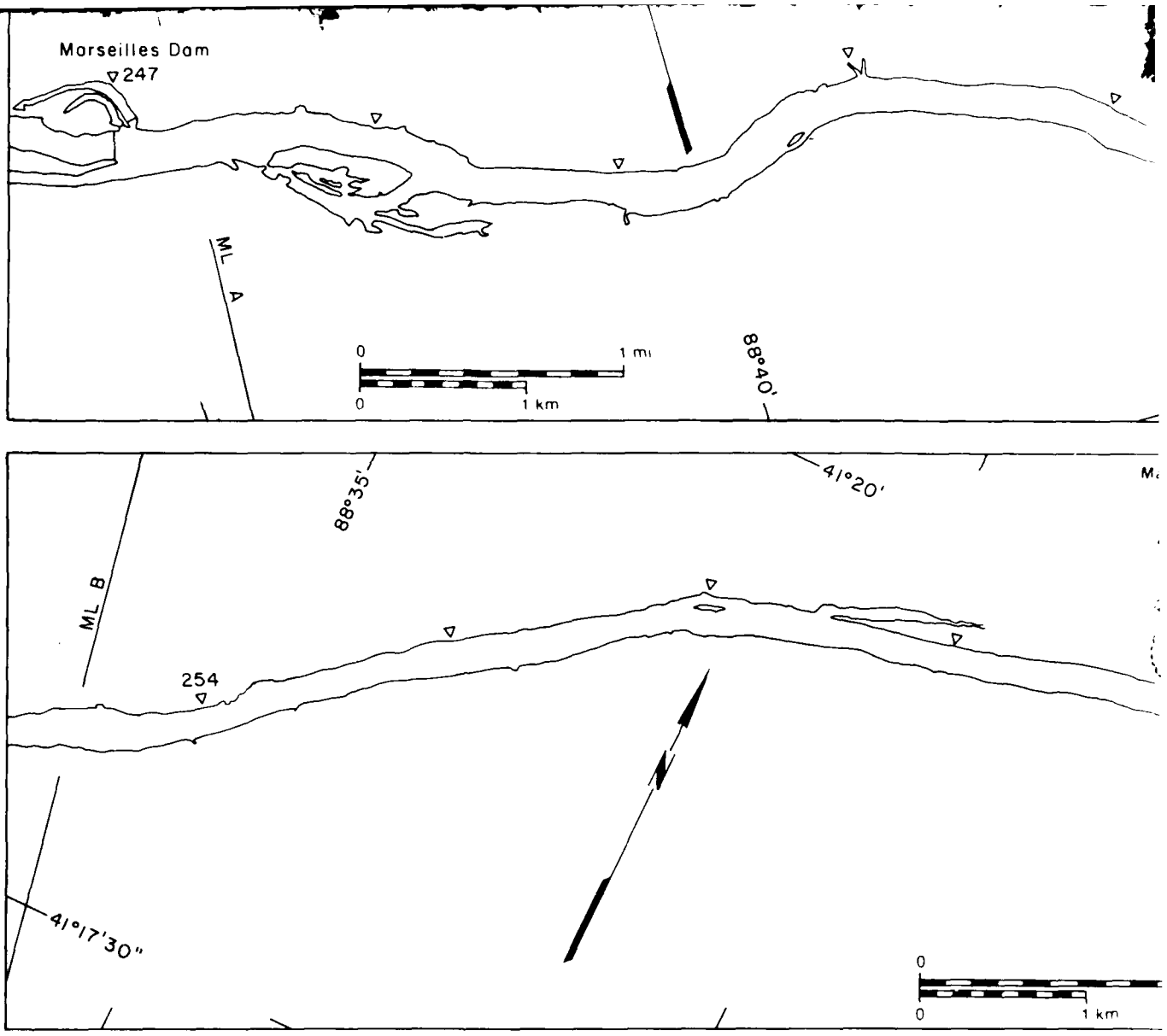


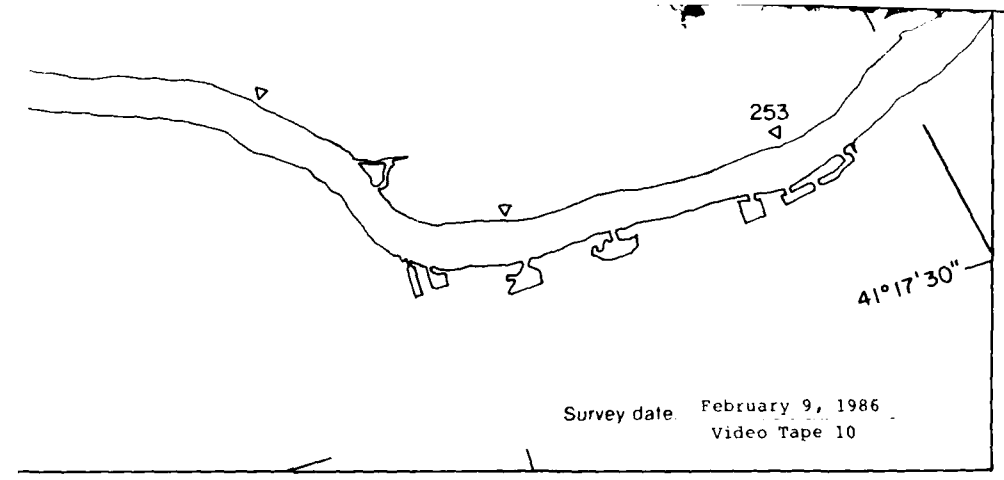


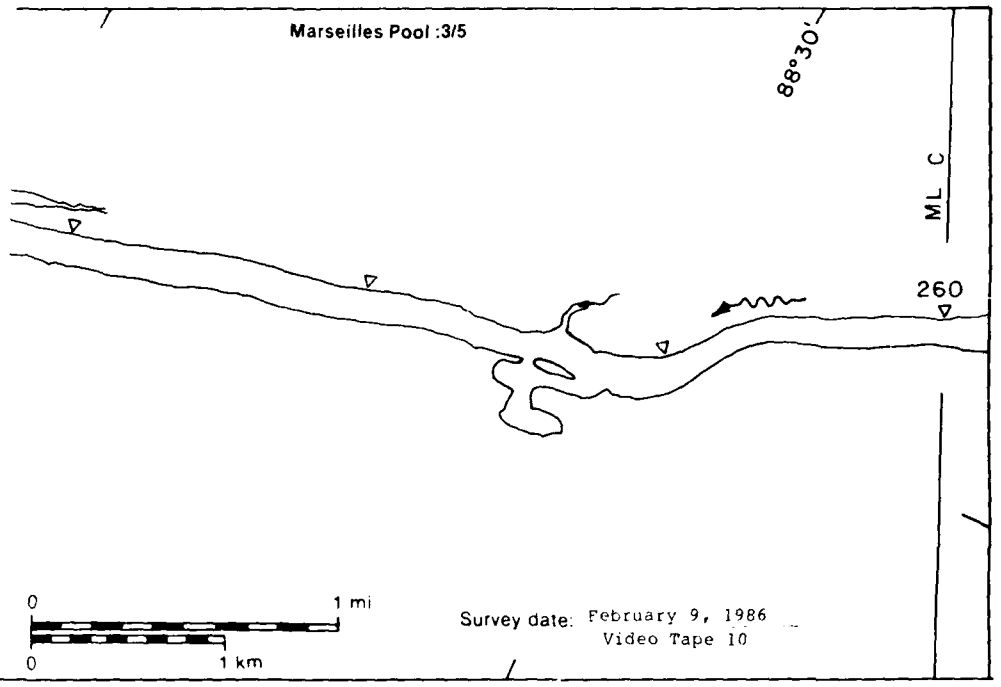

41°20'
247
rseilles
Dam
Match Line A

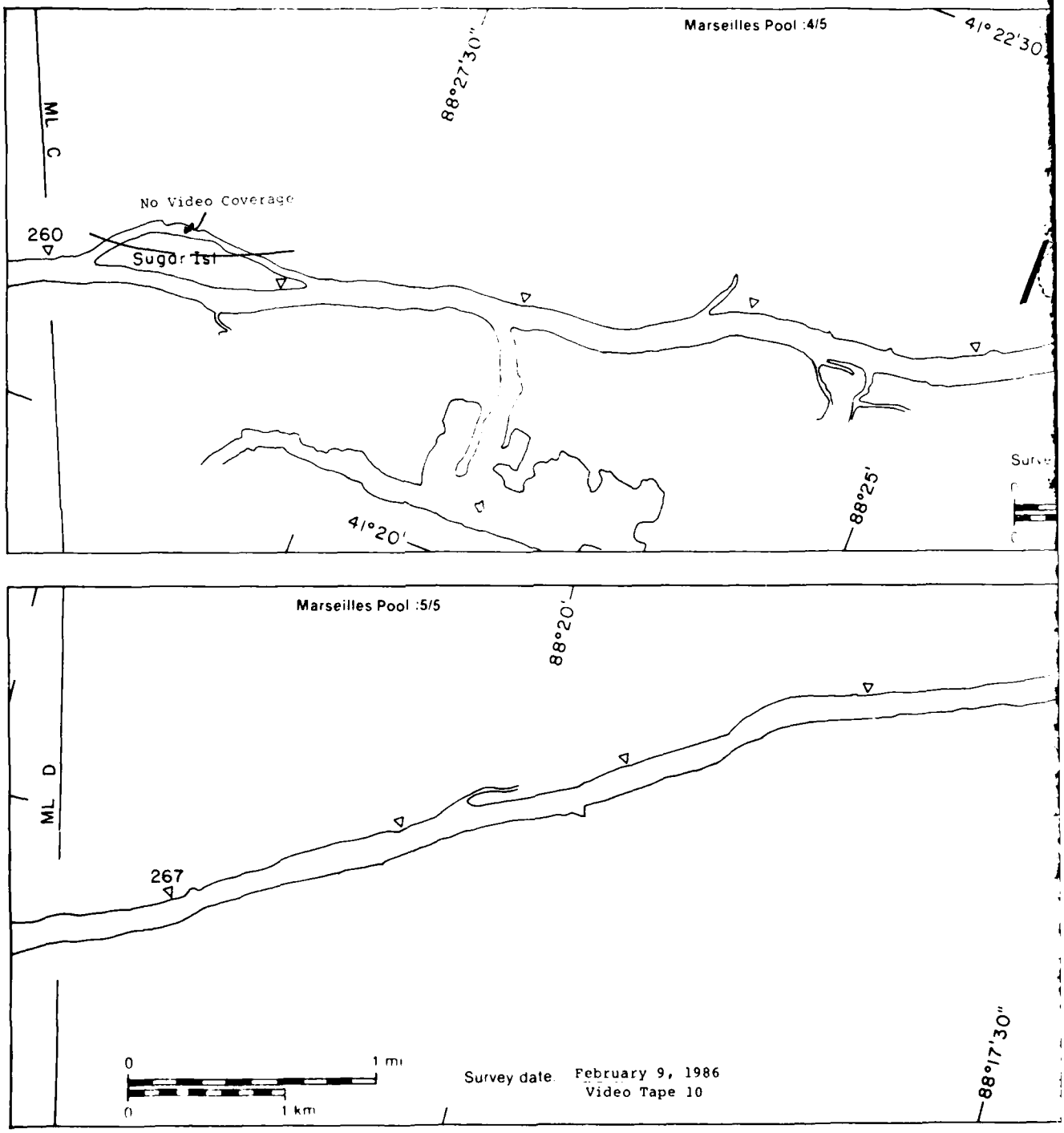

ol :2/5
88°37'30"
ML B
253
41°17'30"
Survey date February 9, 1986
Video Tape 10


Marseilles Pool :3/5
88°30'
ML C


Marseilles Dam
247
ML
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
1 km


253
41°17'30"
Survey date: February 9, 1986
Video Tape 10

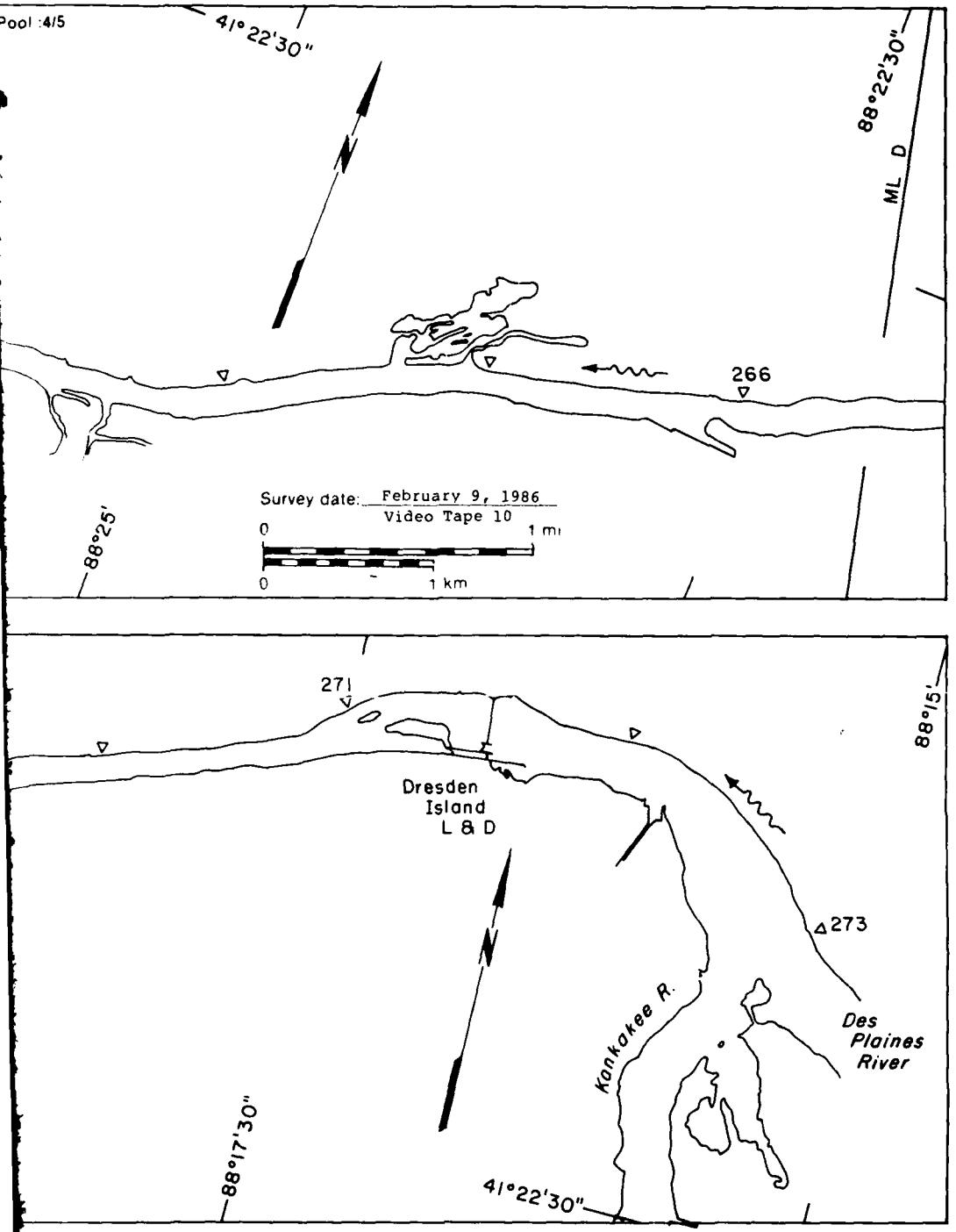

Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10

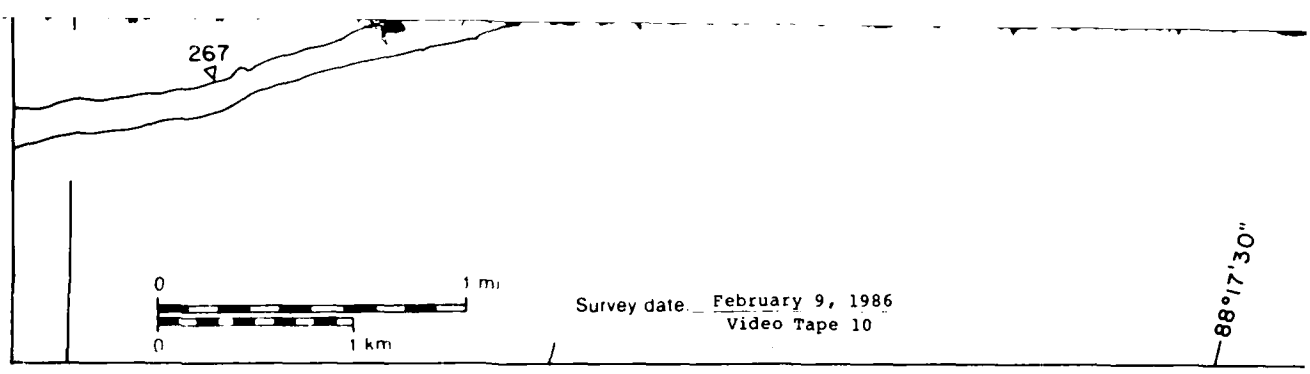


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	8.06	NA
Solid ice cover	0.00	NA

9 February 1986

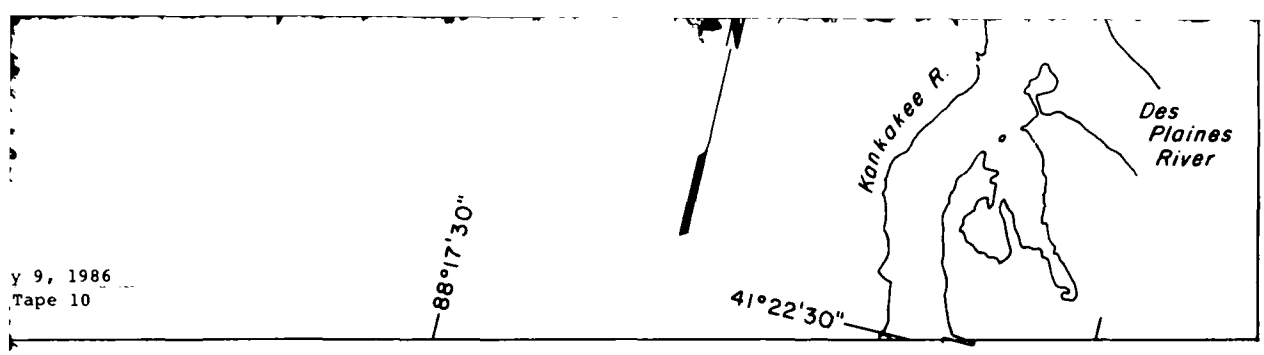




Marseilles Pool

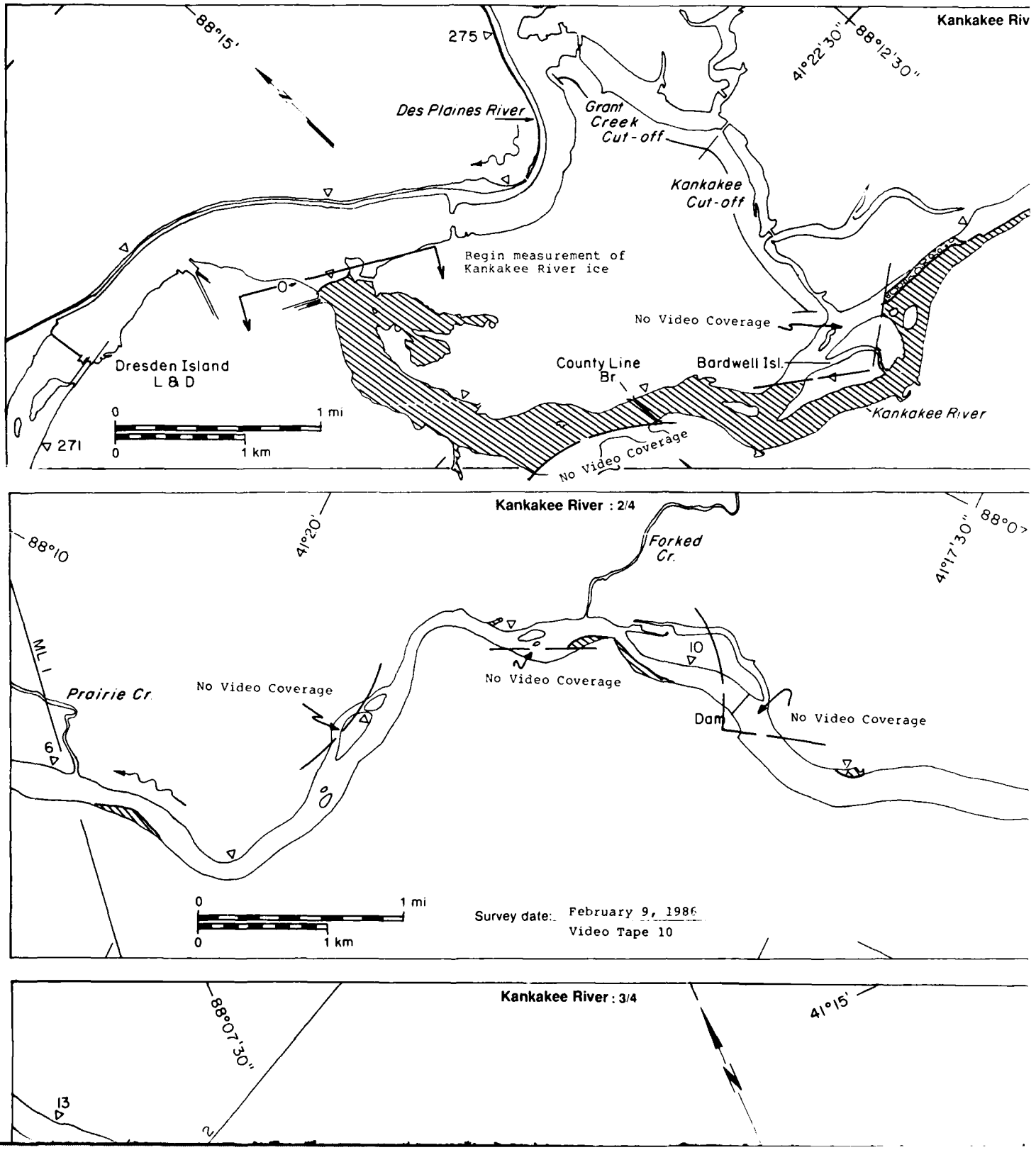
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.06	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	8.19*	

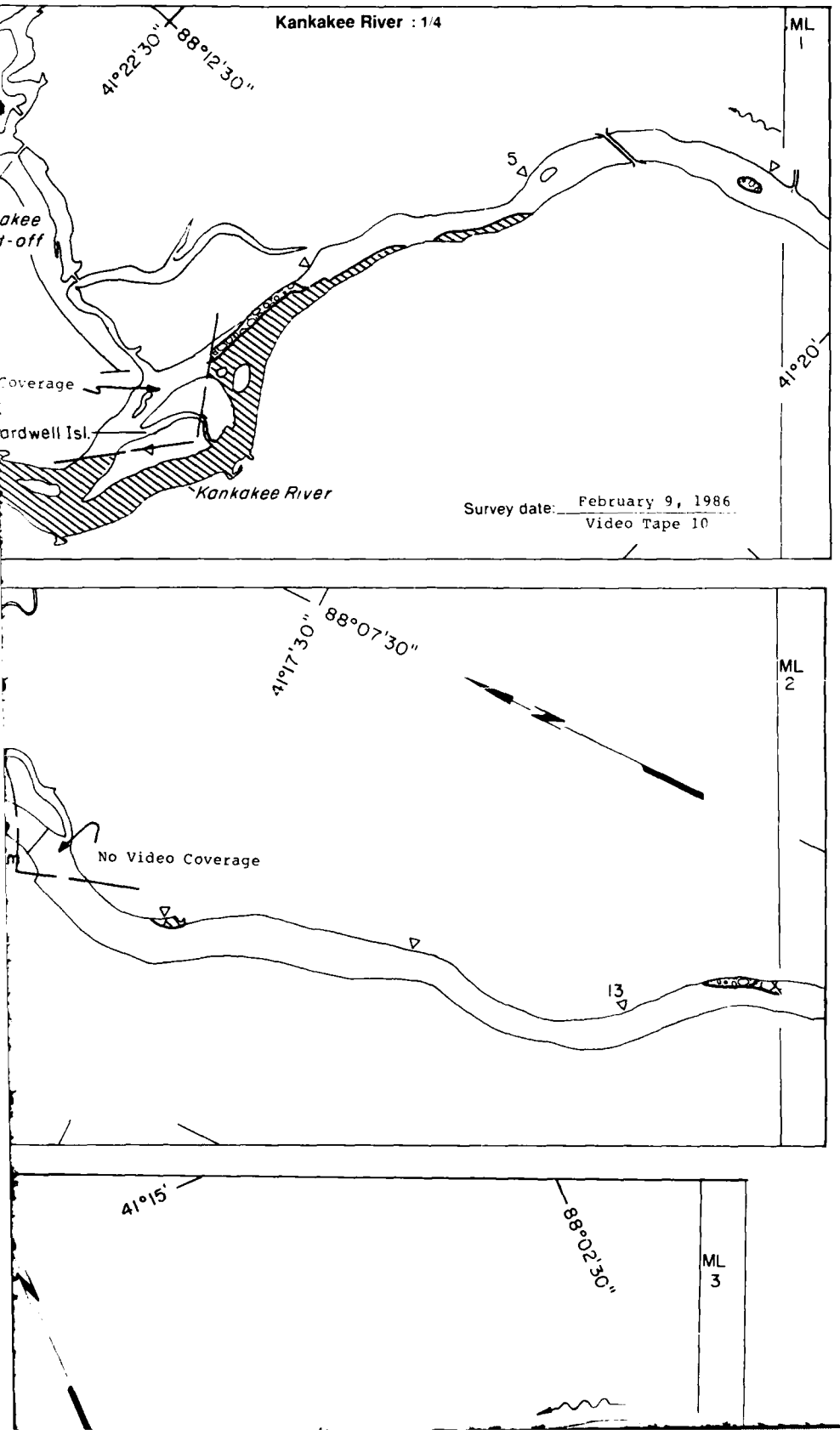
* Includes 0.13×10^6 m^2 of no video coverage

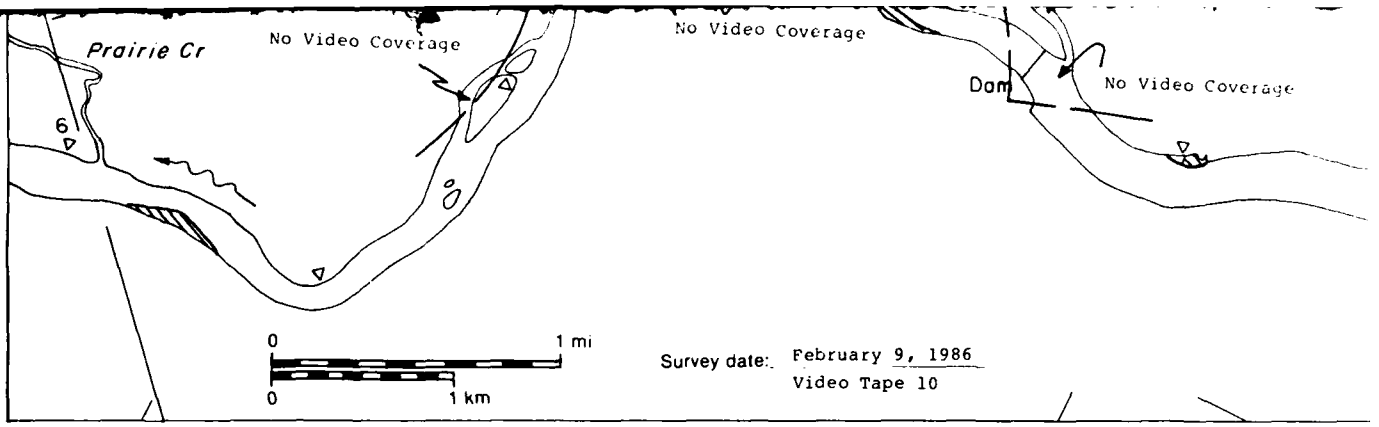


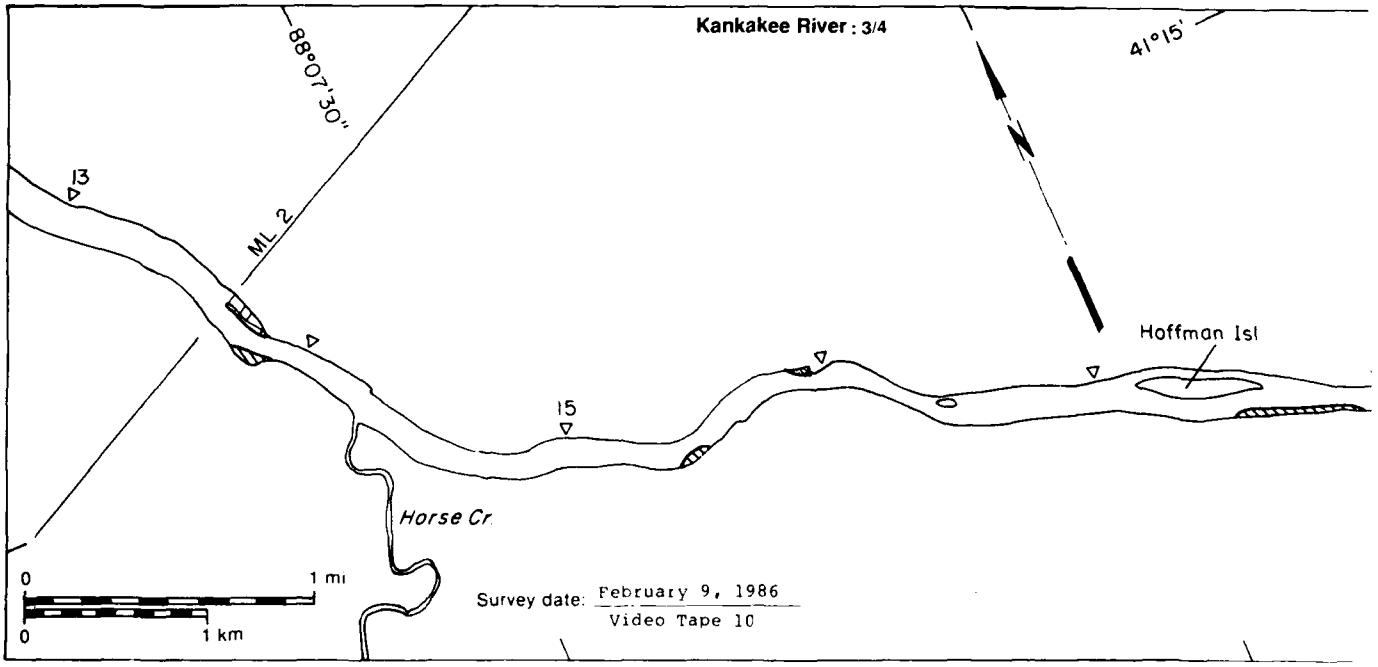
y 9, 1986
Tape 10

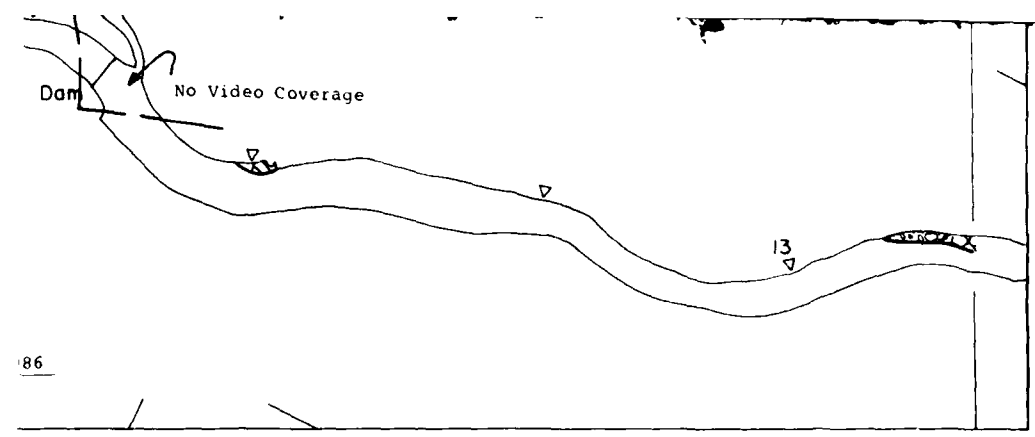
9 February 1986

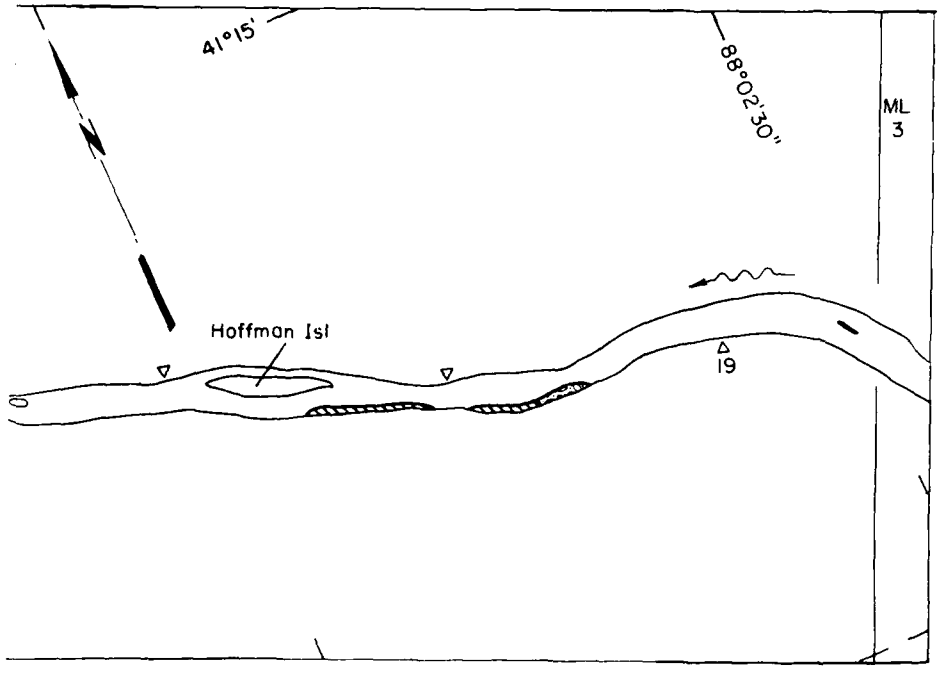


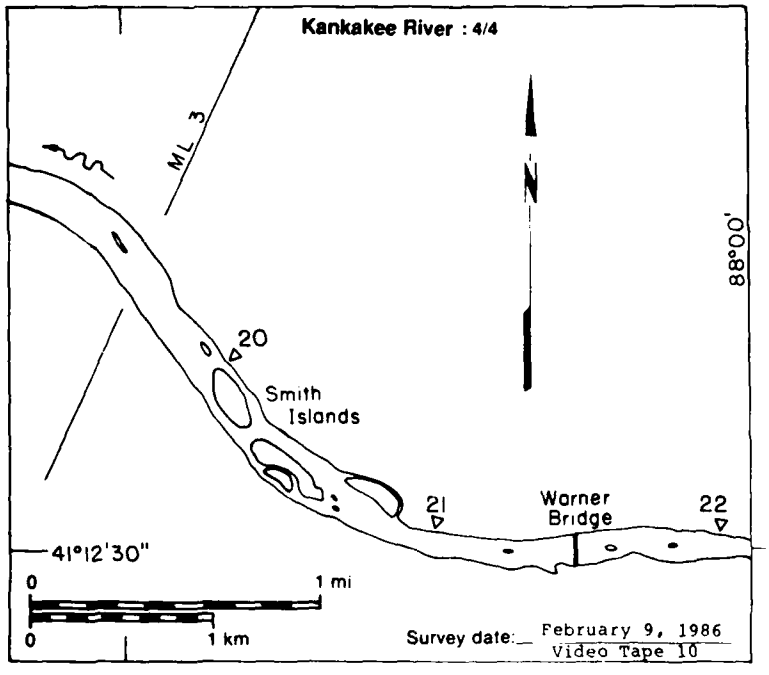

Kankakee River : 1/4
41°22'30"
88°12'30"
ML 1
5
41°20'
Coverage
Kankakee River
Survey date: February 9, 1986
Video Tape 10
41°17'30"
88°07'30"
ML 2
No Video Coverage
13
41°15'
88°02'30"
ML 3

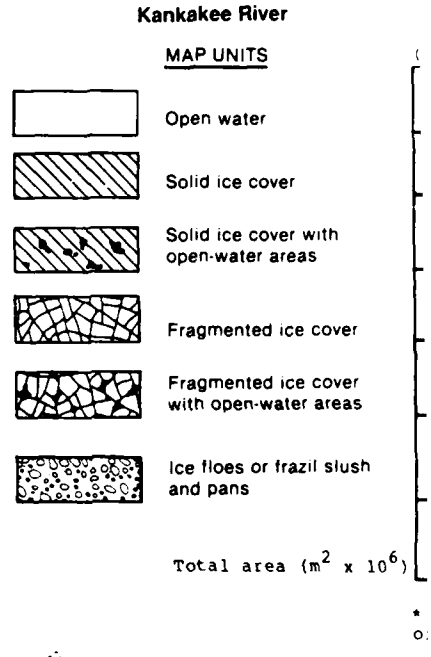

Prairie Cr
No Video Coverage
No Video Coverage
Dam
No Video Coverage
6
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10


Kankakee River: 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10


Dam
No Video Coverage
13
86


41°15'
88°02'30"
ML
3
Hoffman Isl
19


Kankakee River : 4/4
ML 3
88°00'
20
Smith
Islands
21
Worner
Bridge
22
41°12'30"
0
1 mi
0
1 km
Survey date: February 9, 1986
Video Tape 10


Kankakee River
MAP UNITS
Open water
Solid ice cover
Solid ice cover with open-water areas
Fragmented ice cover
Fragmented ice cover with open-water areas
Ice floes or frazil slush and pans
Total area (m2 x 10^6)

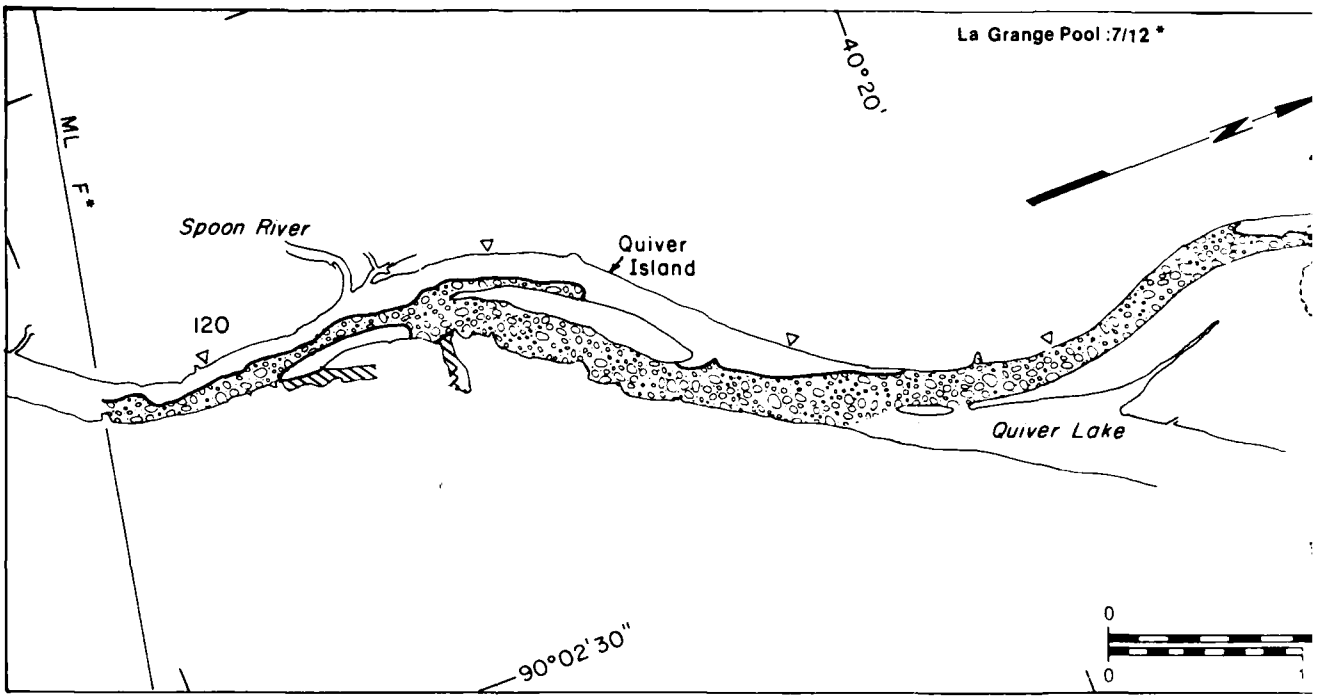
25

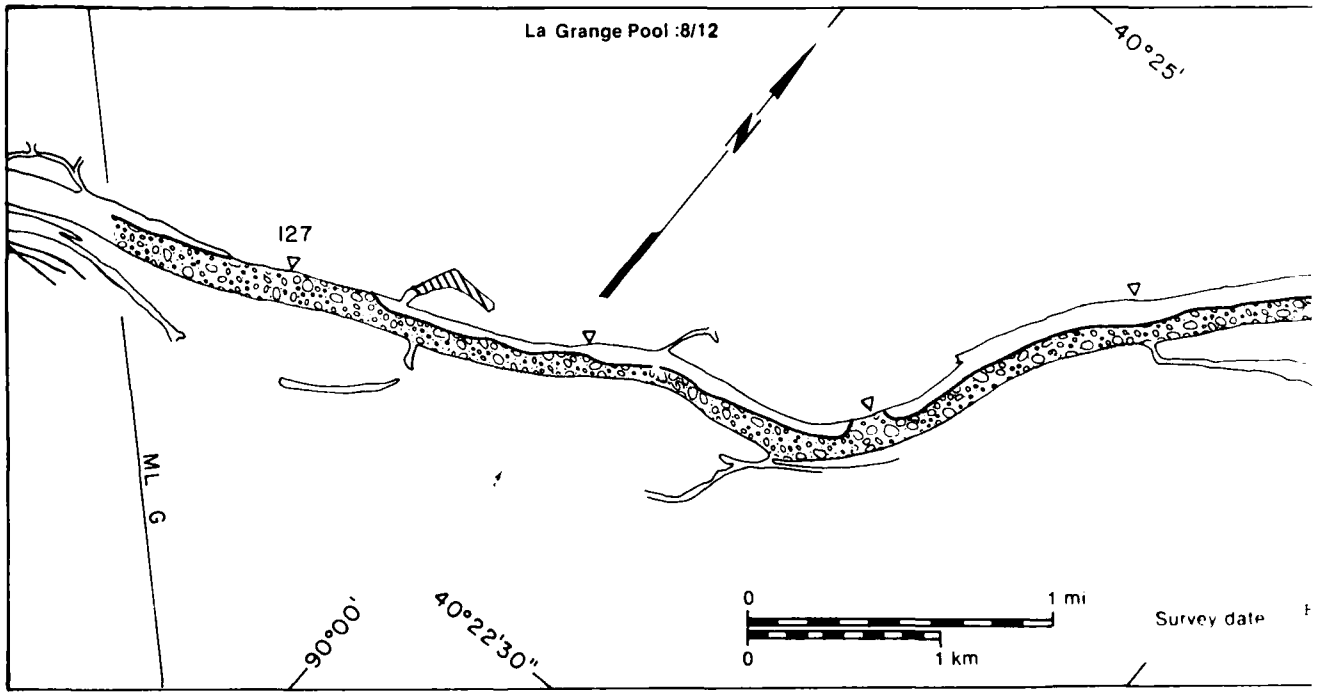
9 February 1986

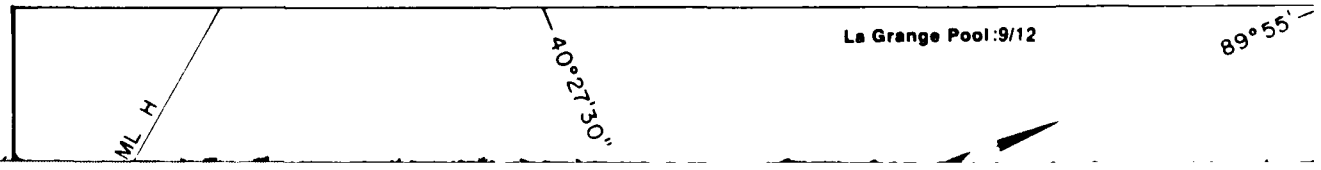
Kankakee River

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.46	NA
Solid ice cover	2.12	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.04	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.09	50
Total area ($m^2 \times 10^6$)	7.30*	

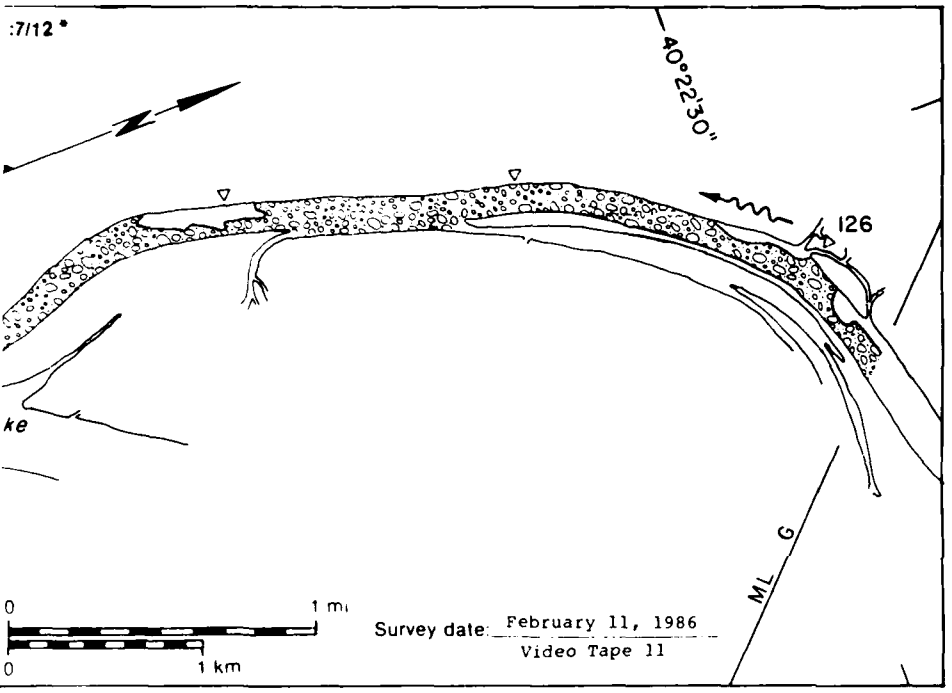
* Includes 0.59×10^6 m^2 of no video coverage

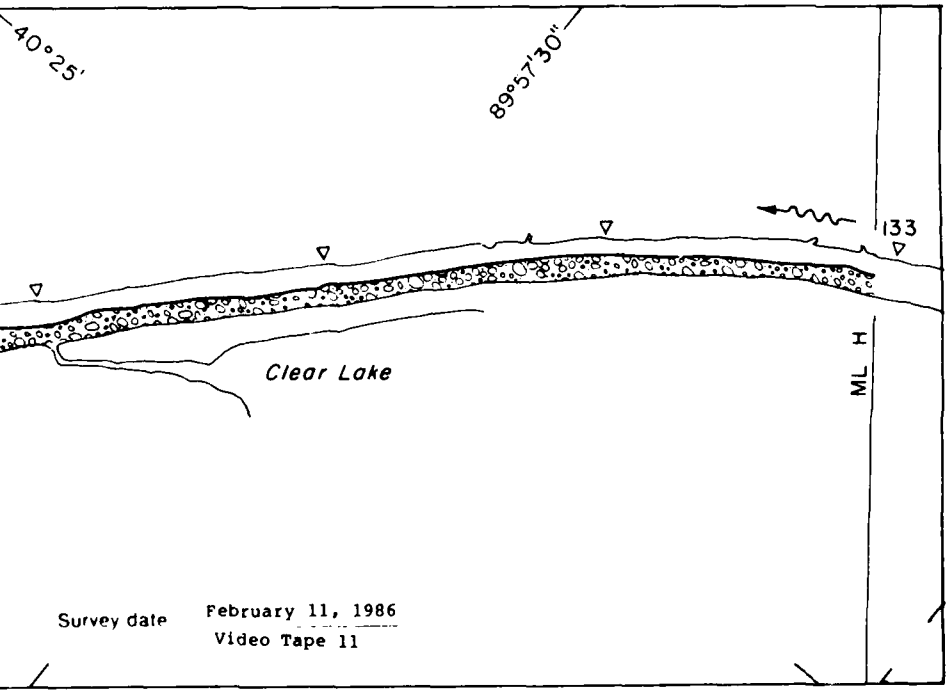

La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0

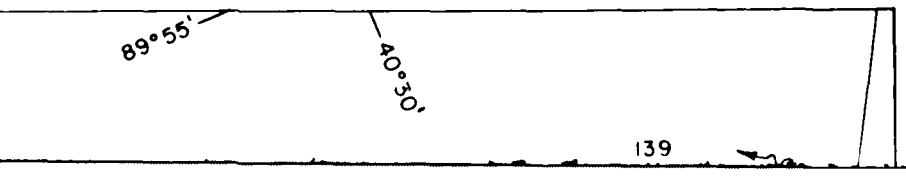

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey date

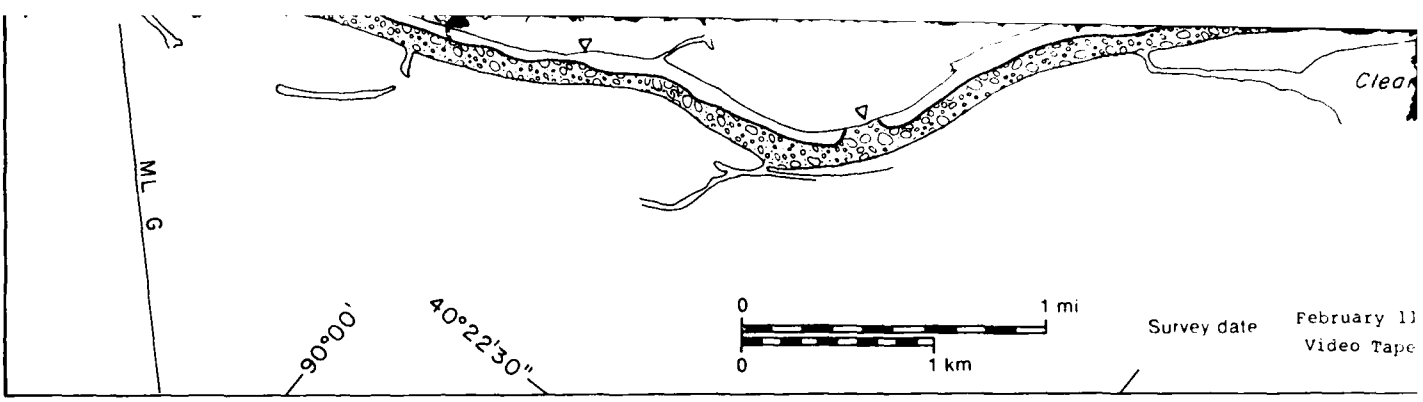

La Grange Pool :9/12
89°55'
40°27'30"
ML H

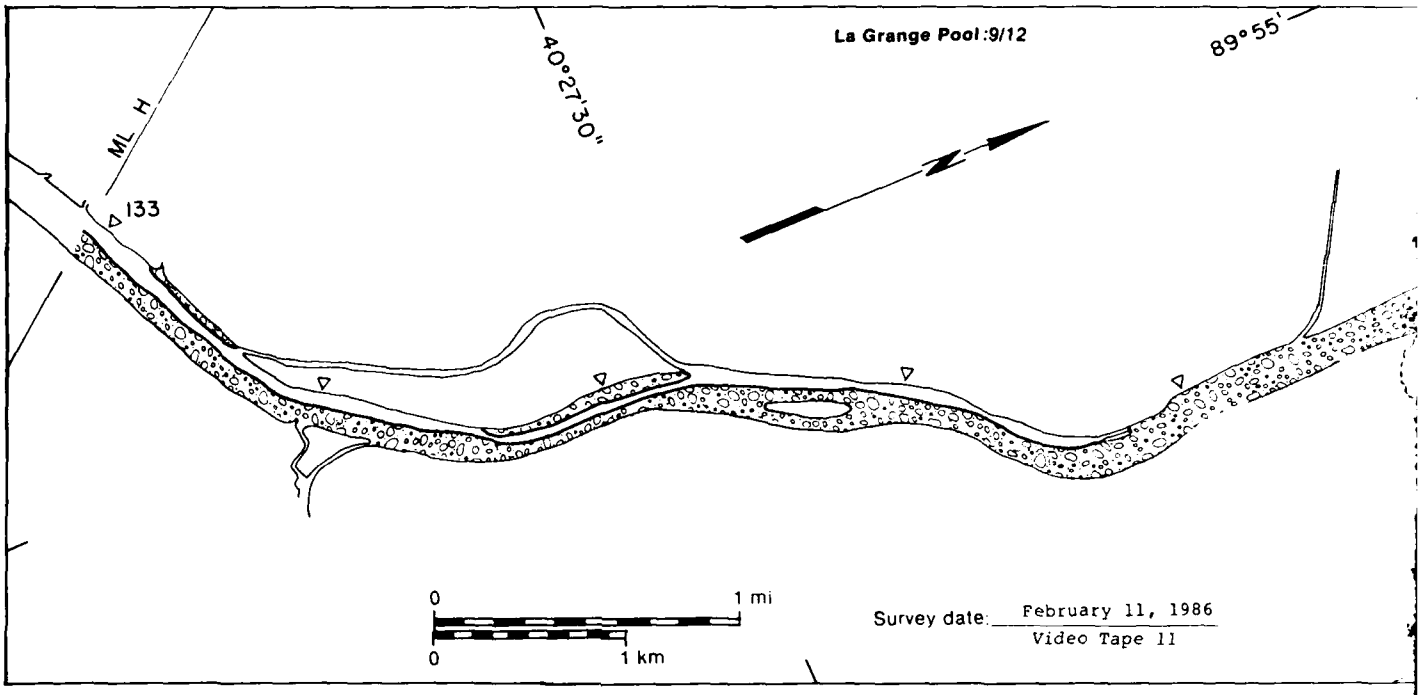
11 February 1986



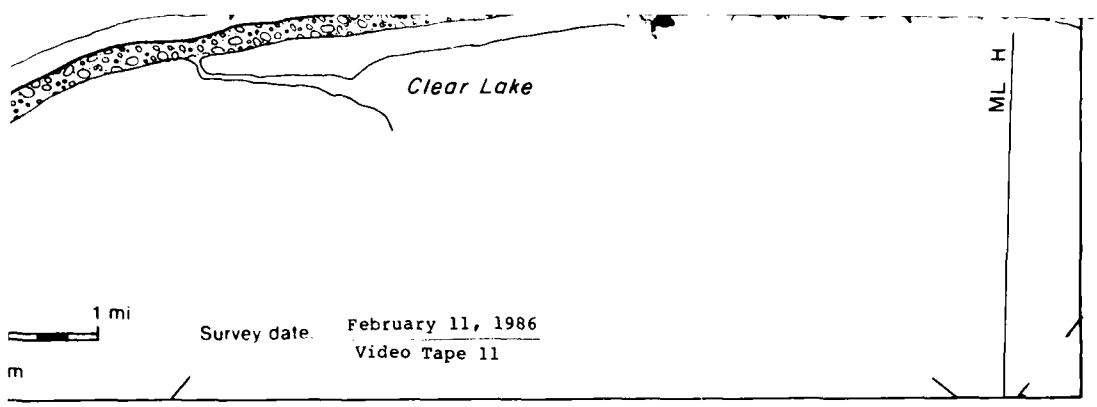


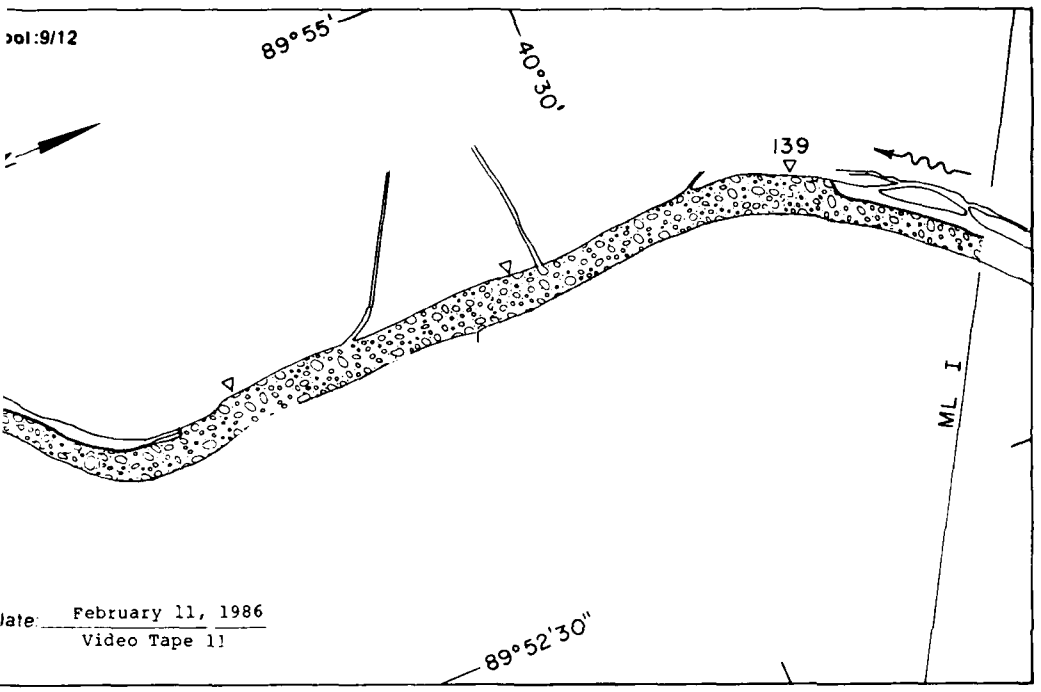




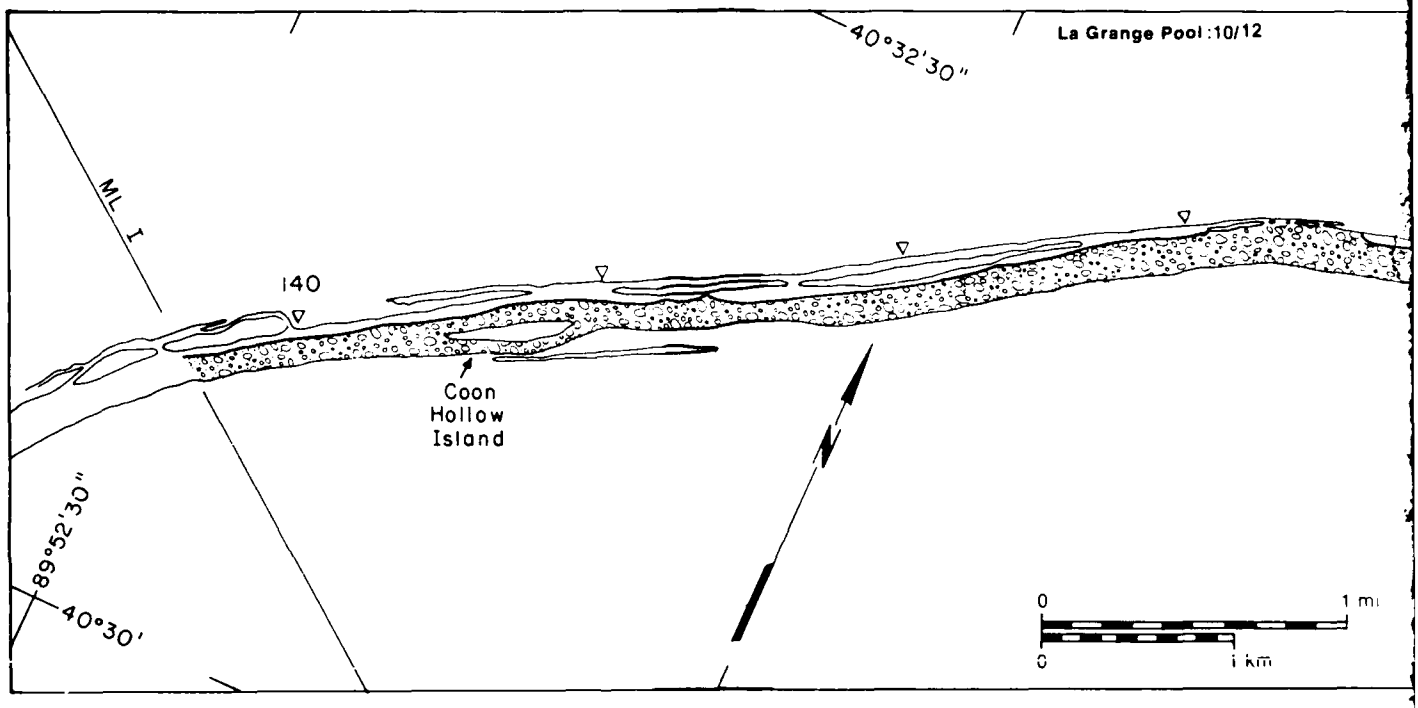


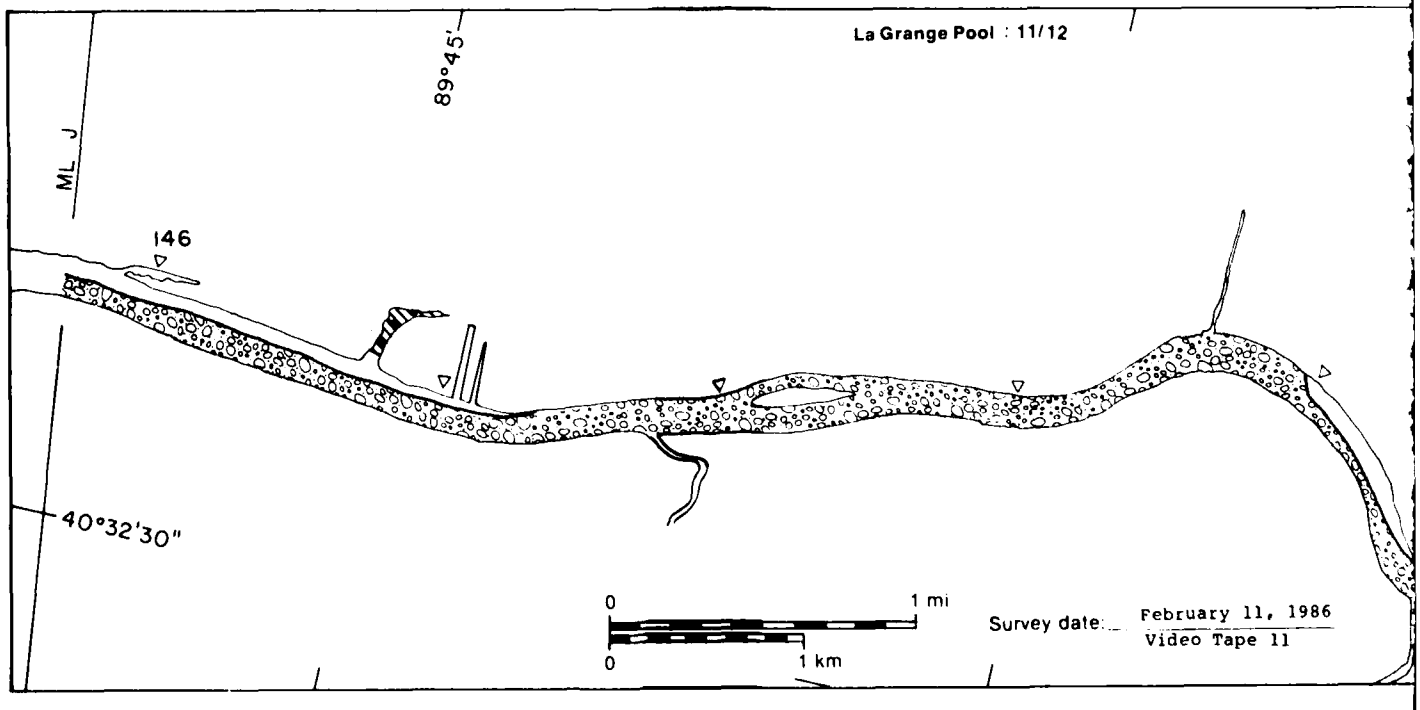
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

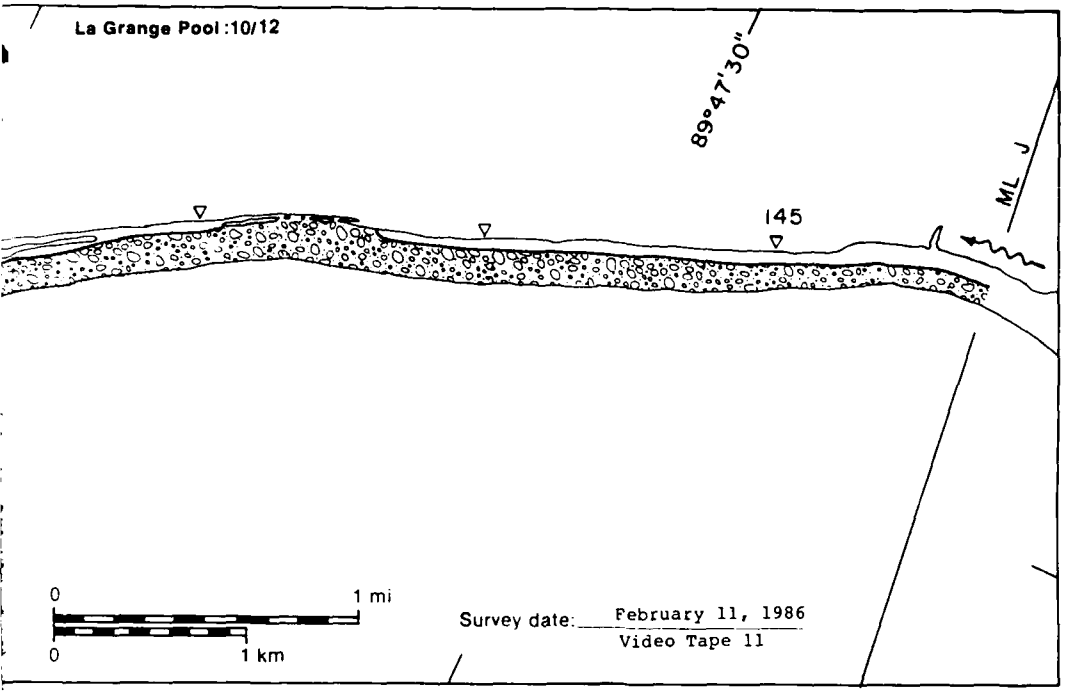

Clear Lake
ML H
1 mi
Survey date
February 11, 1986
Video Tape 11

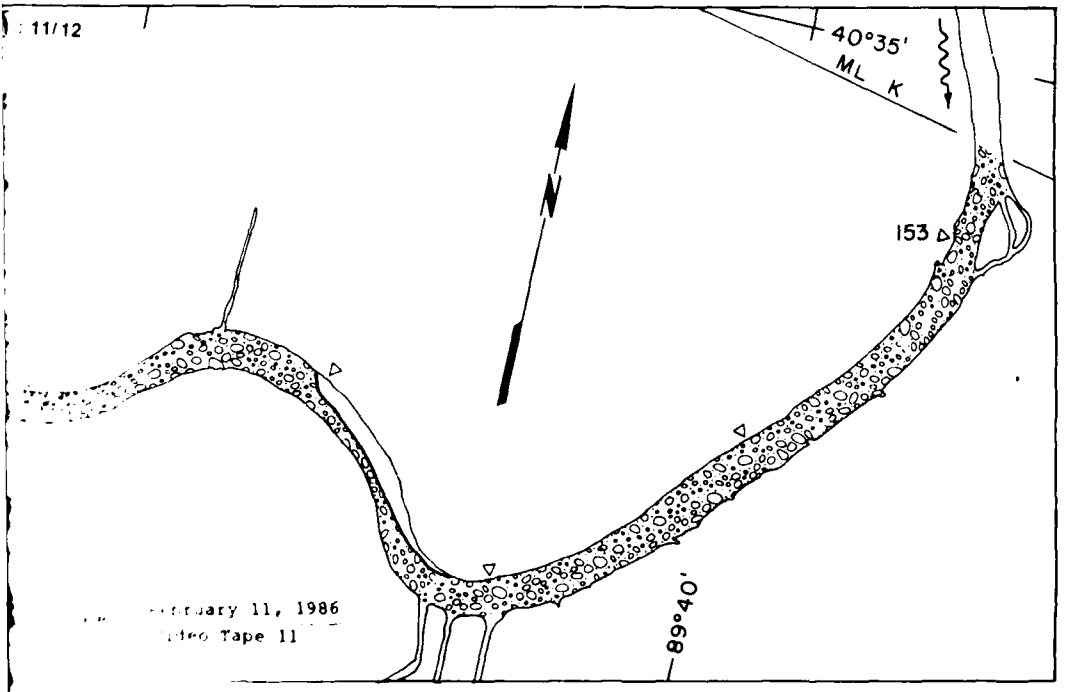

89°55'
40°30'
139
ML I
89°52'30"
February 11, 1986
Video Tape 11

11 February 1986





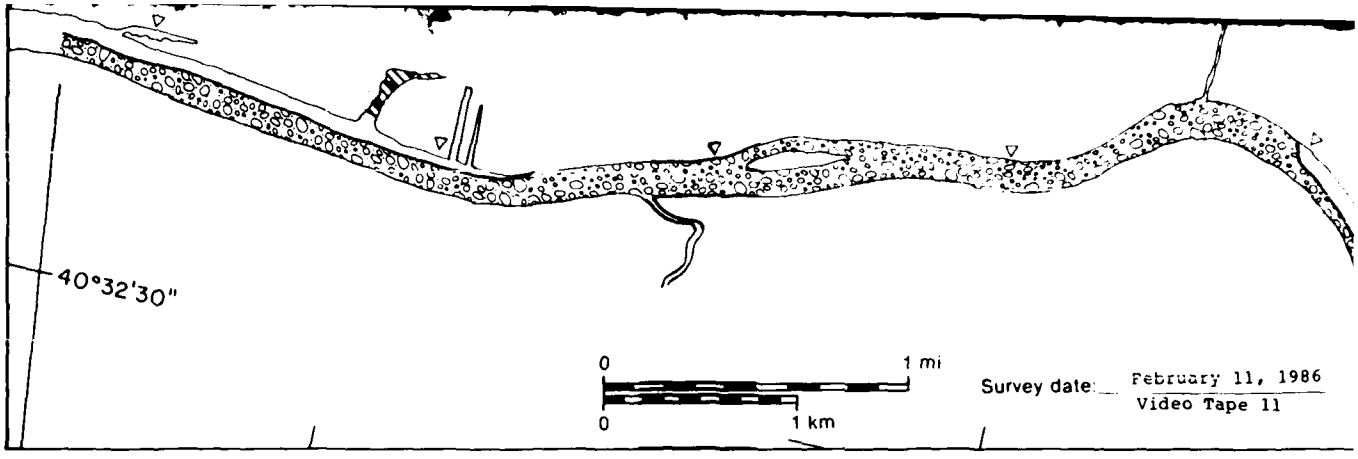


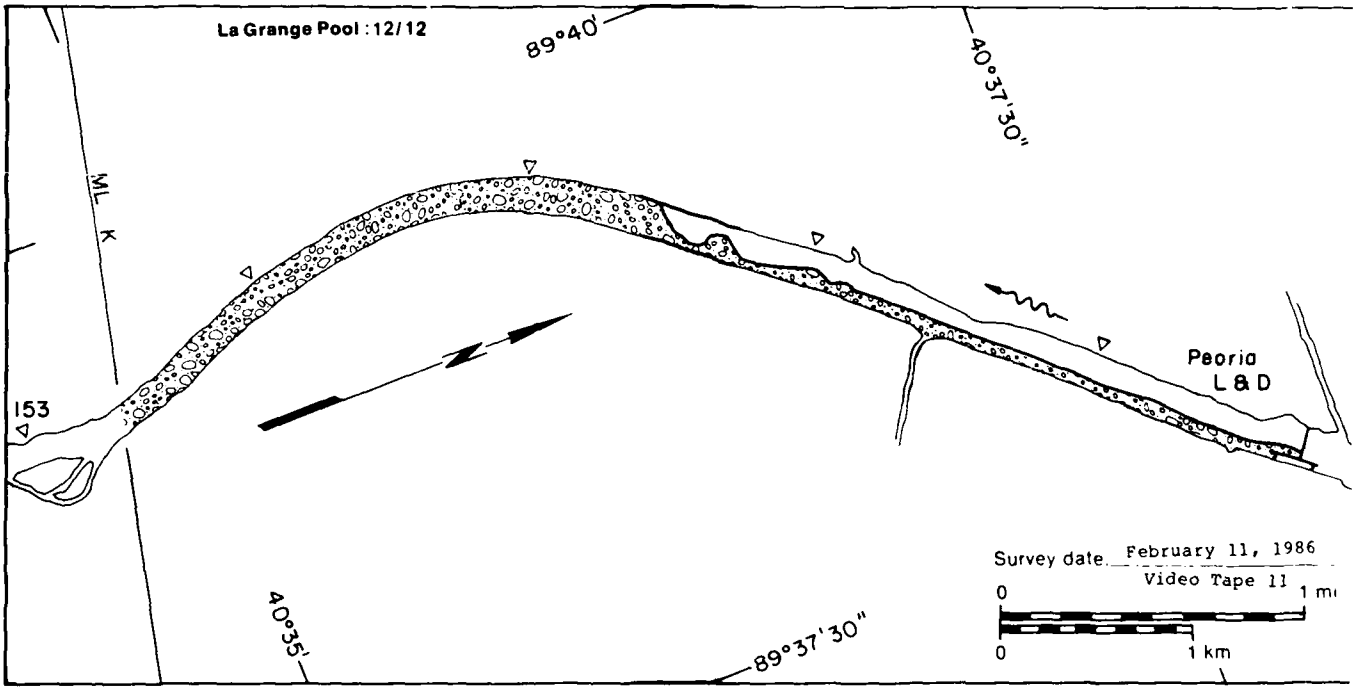


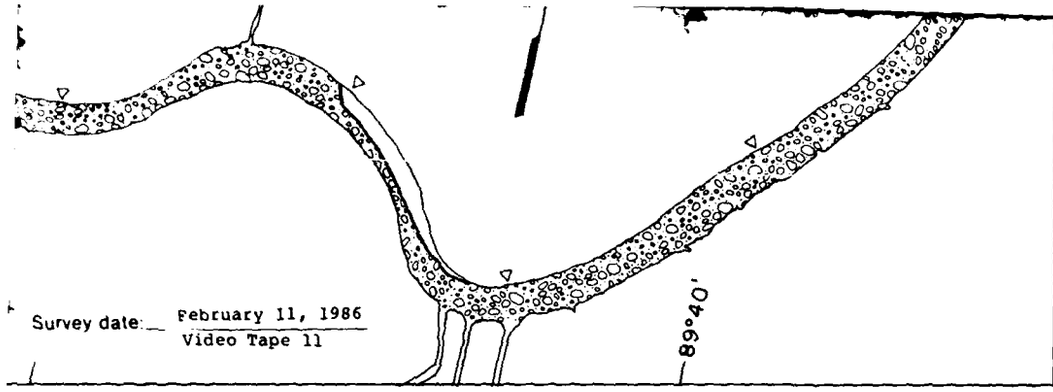
La Grange Pool

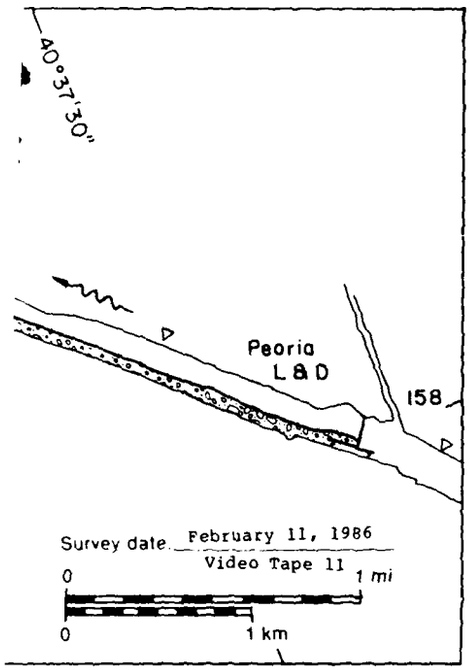
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


40°32'30"
0
1 mi
0
1 km
Survey date: February 11, 1986
Video Tape 11

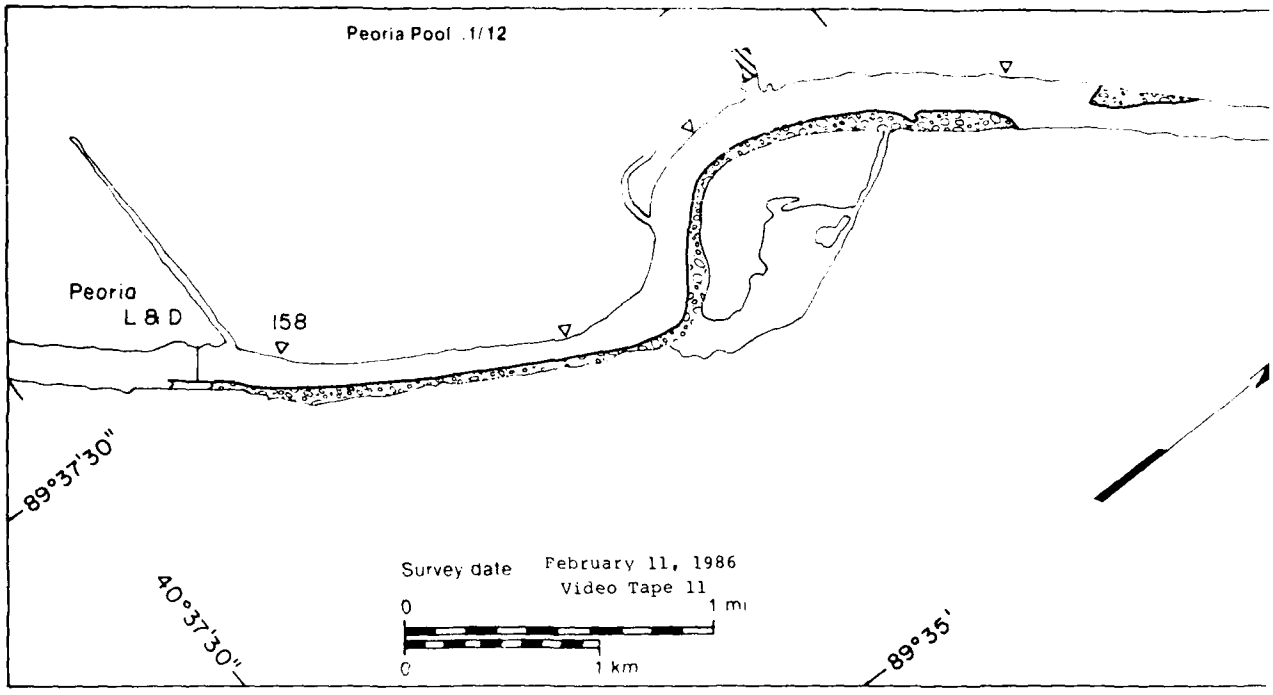

La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L&D
Survey date: February 11, 1986
Video Tape 11
0
1 mi
0
1 km
40°35'
89°37'30"

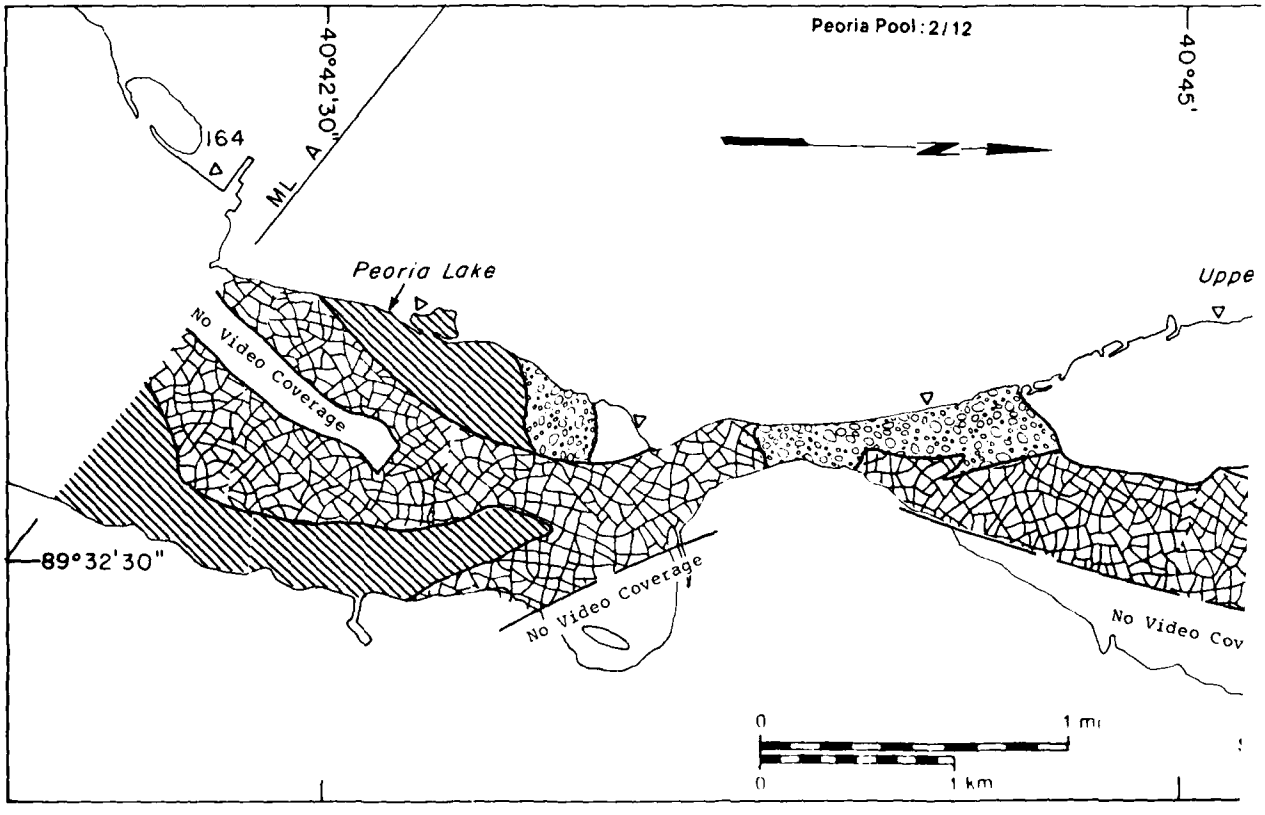




La Grange Pool

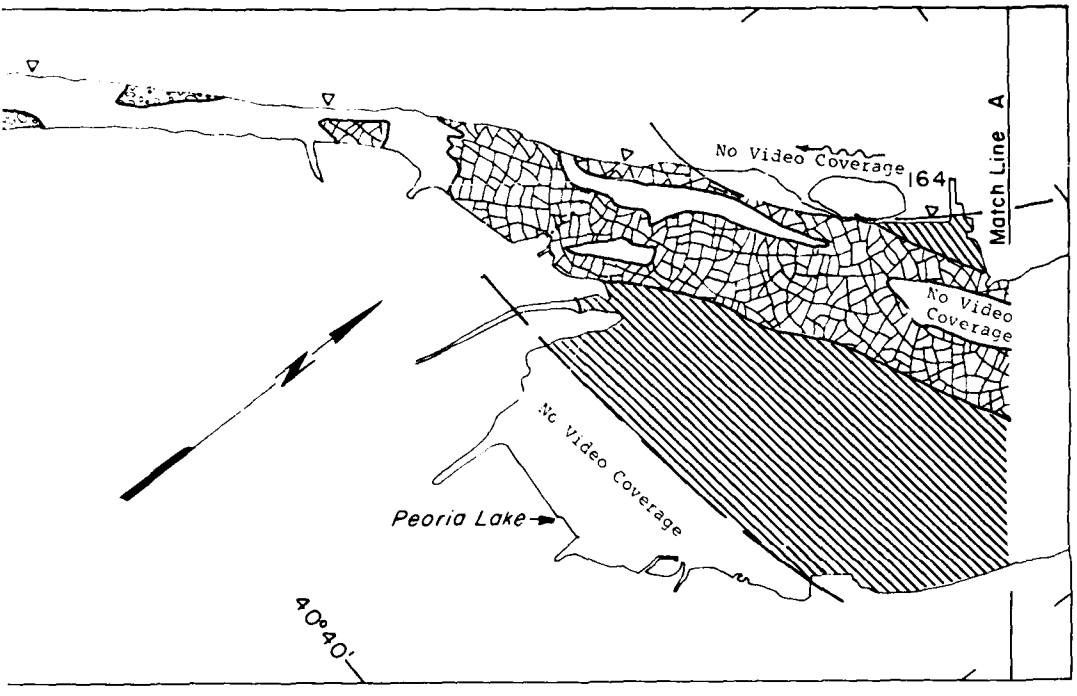
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.73	NA
Solid ice cover	0.08	NA
Solid ice cover with open-water areas	0.03	70
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	7.87	60
Total area ($m^2 \times 10^6$)	11.71	

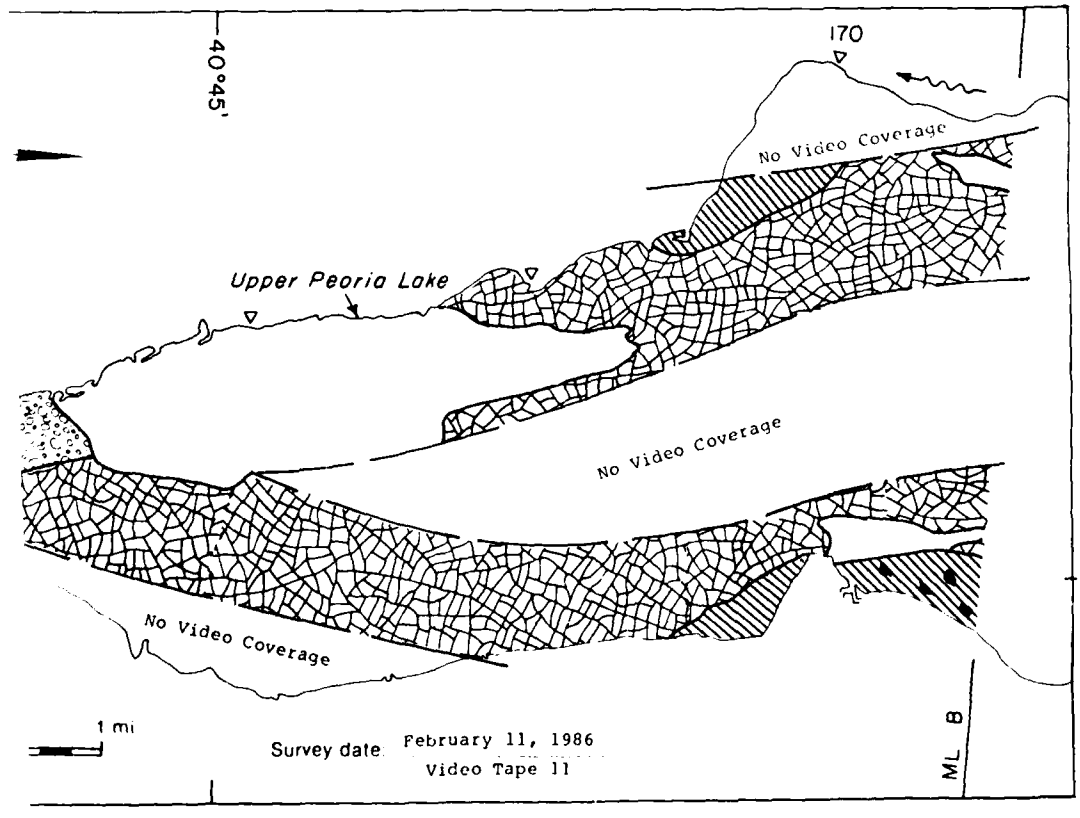

Peoria Pool .1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date February 11, 1986
Video Tape 11
0 1 mi
0 1 km
89°35'

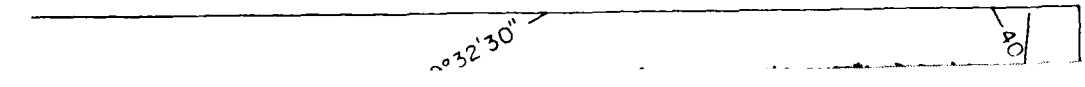

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML
Peoria Lake
Uppe
No Video Coverage
No Video Coverage
No Video Cov
89°32'30"
0 1 mi
0 1 km

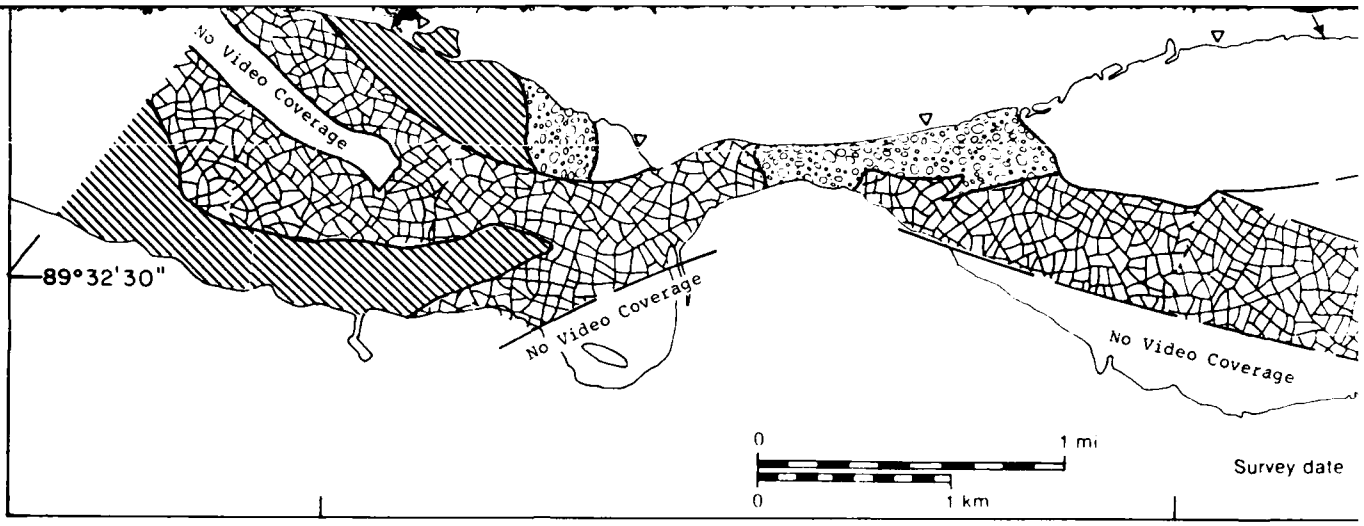
Peoria Pool : 3/12

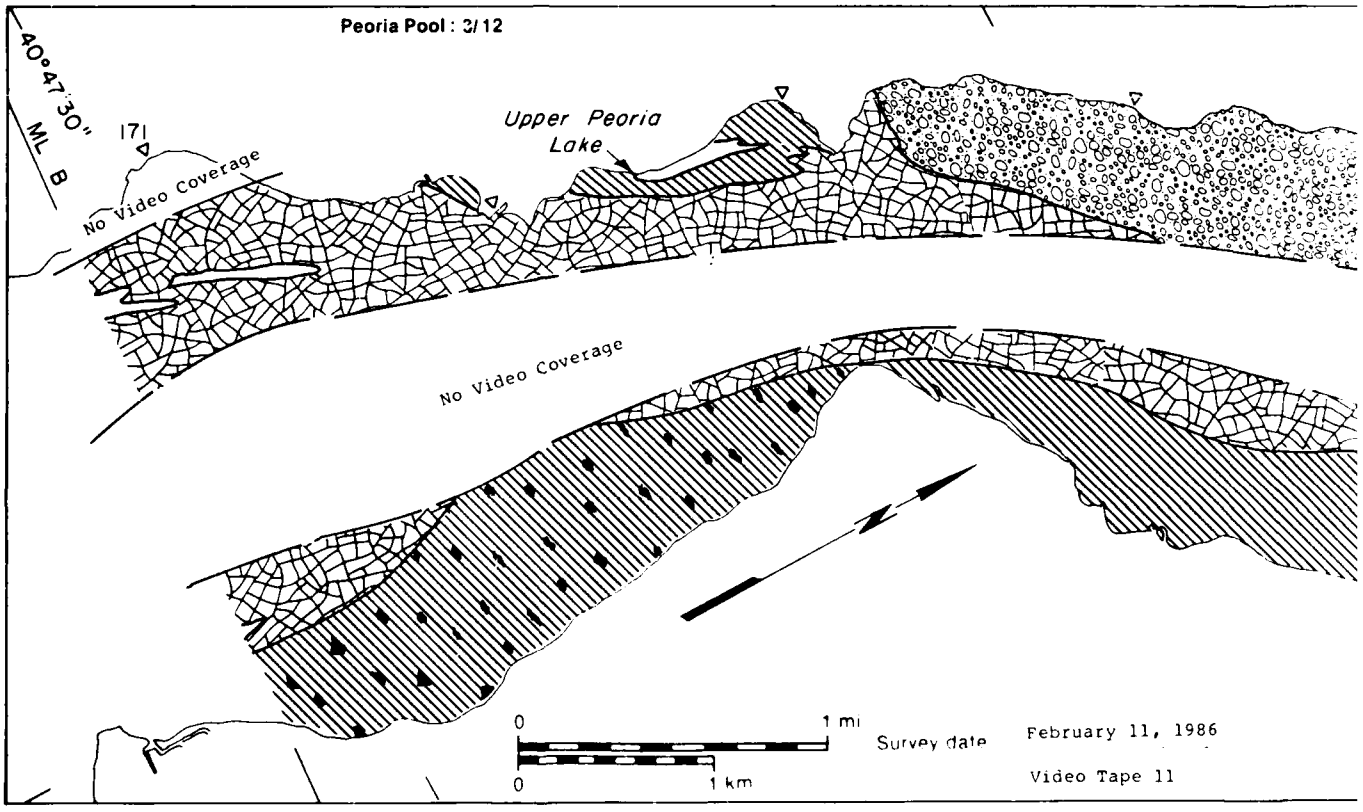
11 February 1986

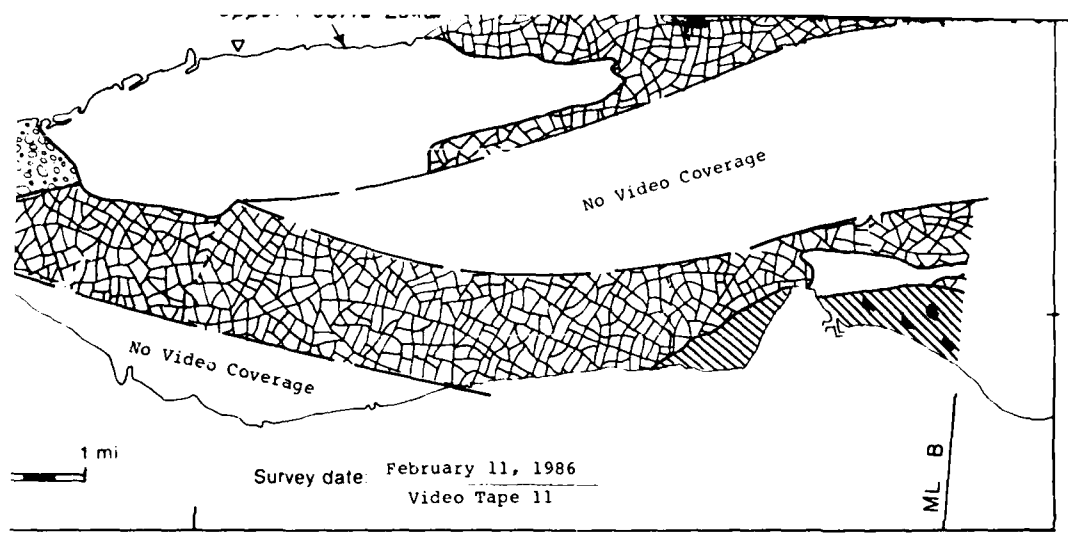


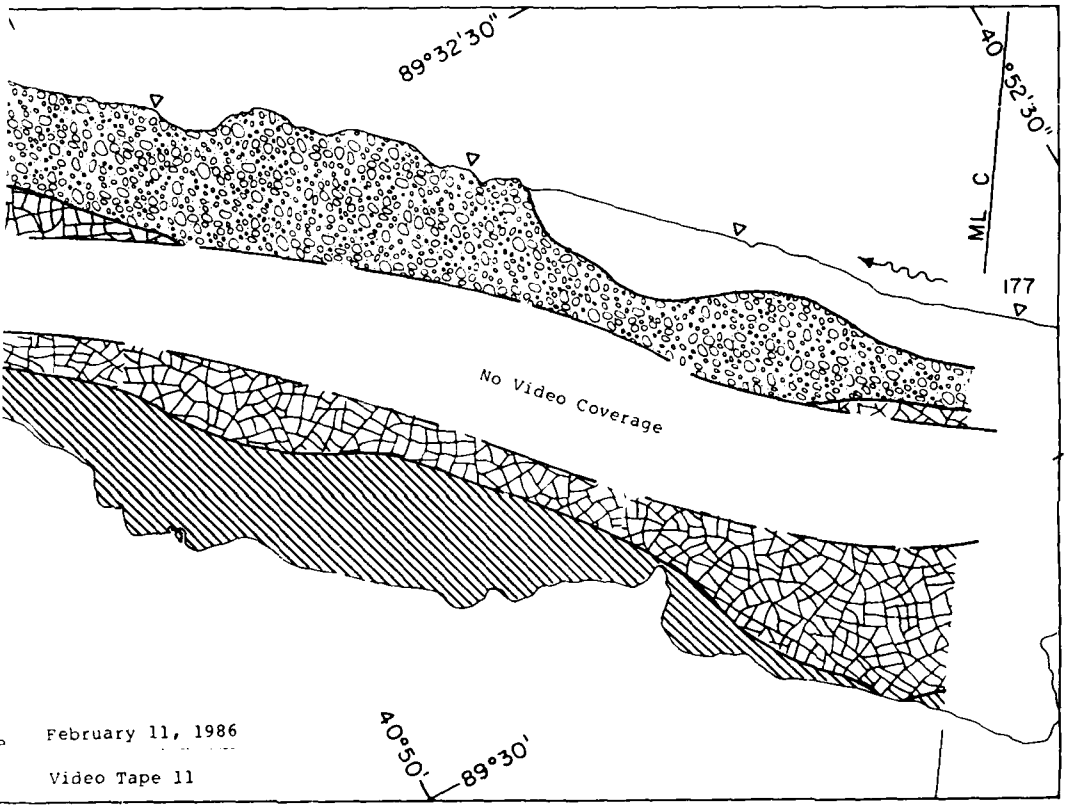




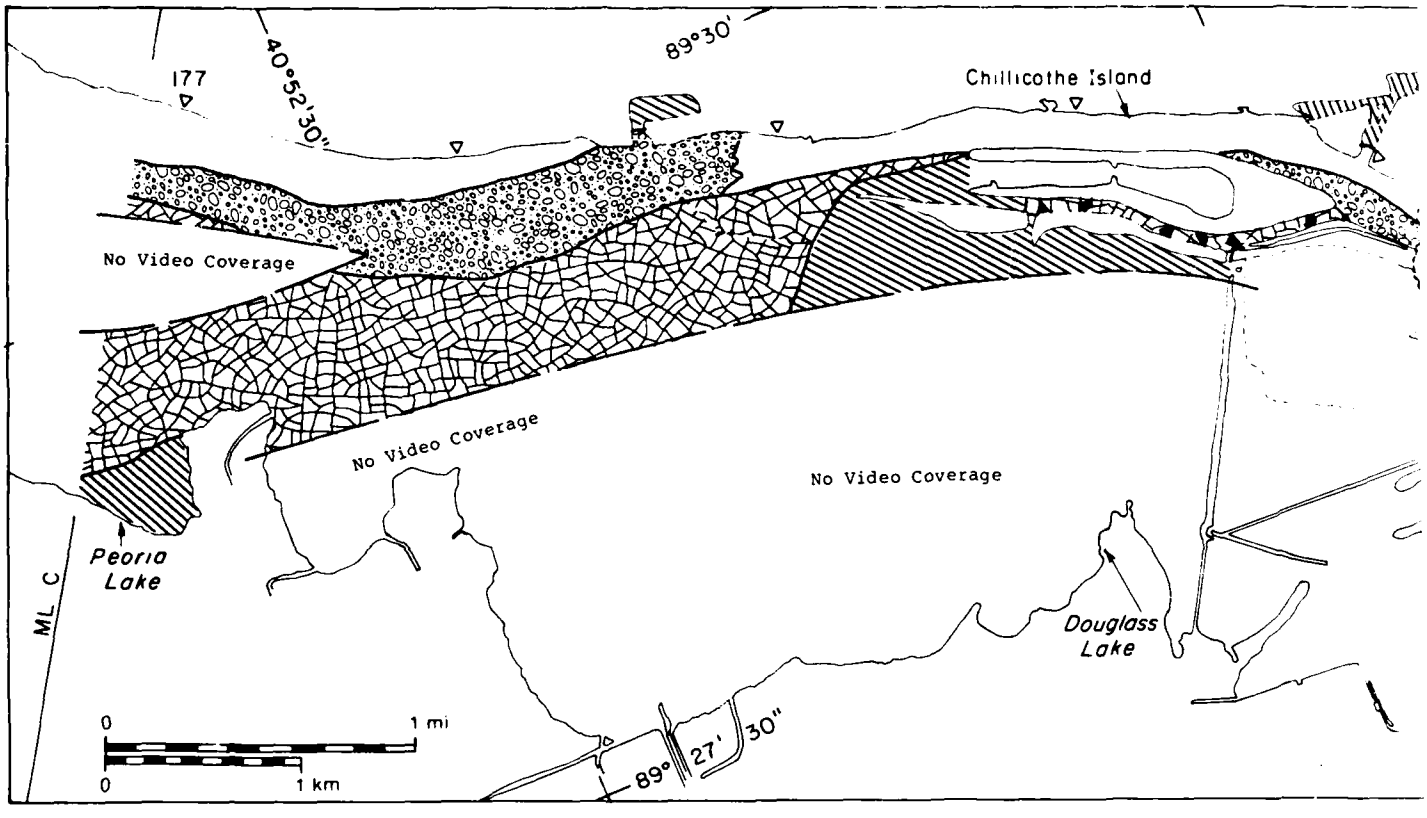

No Video Coverage
89°32'30"
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date

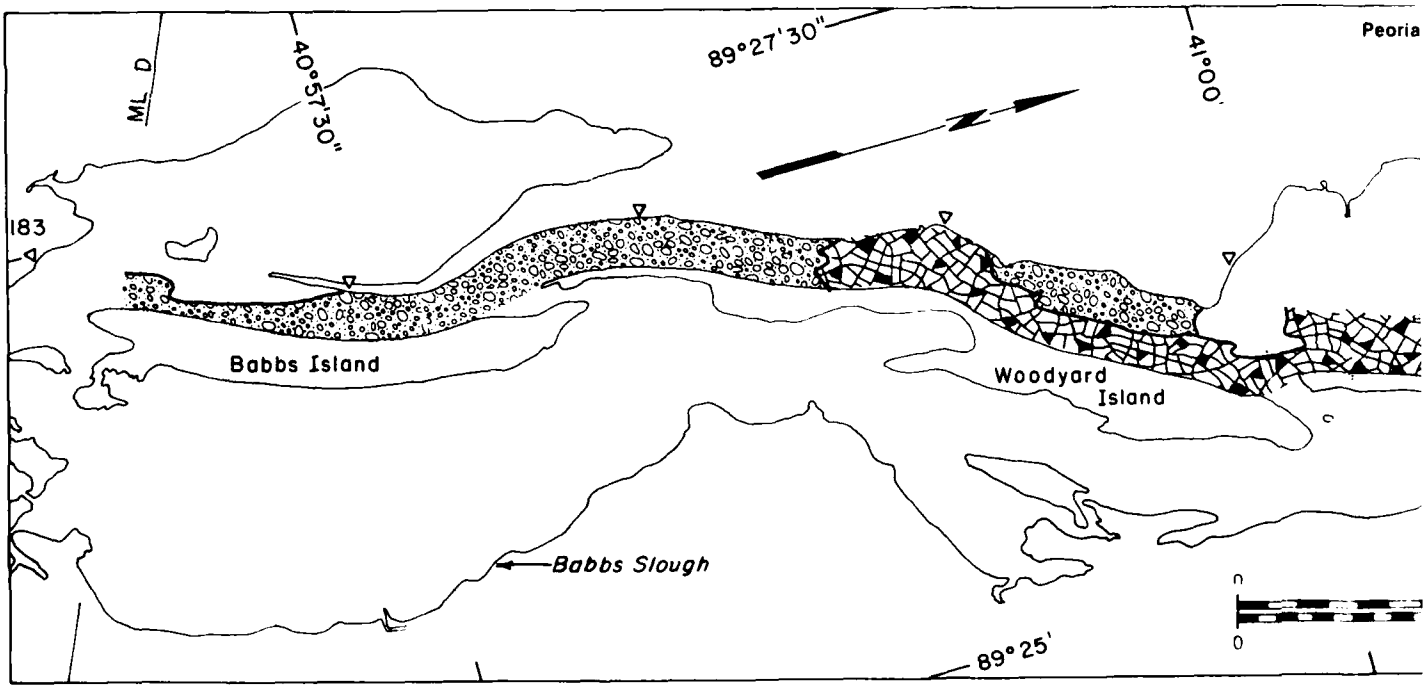

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
0
1 mi
0
1 km
Survey date
February 11, 1986
Video Tape 11

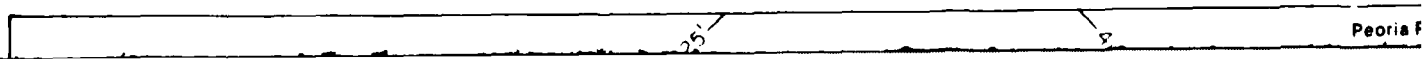

No Video Coverage
No Video Coverage
1 mi
Survey date: February 11, 1986
Video Tape 11
ML B

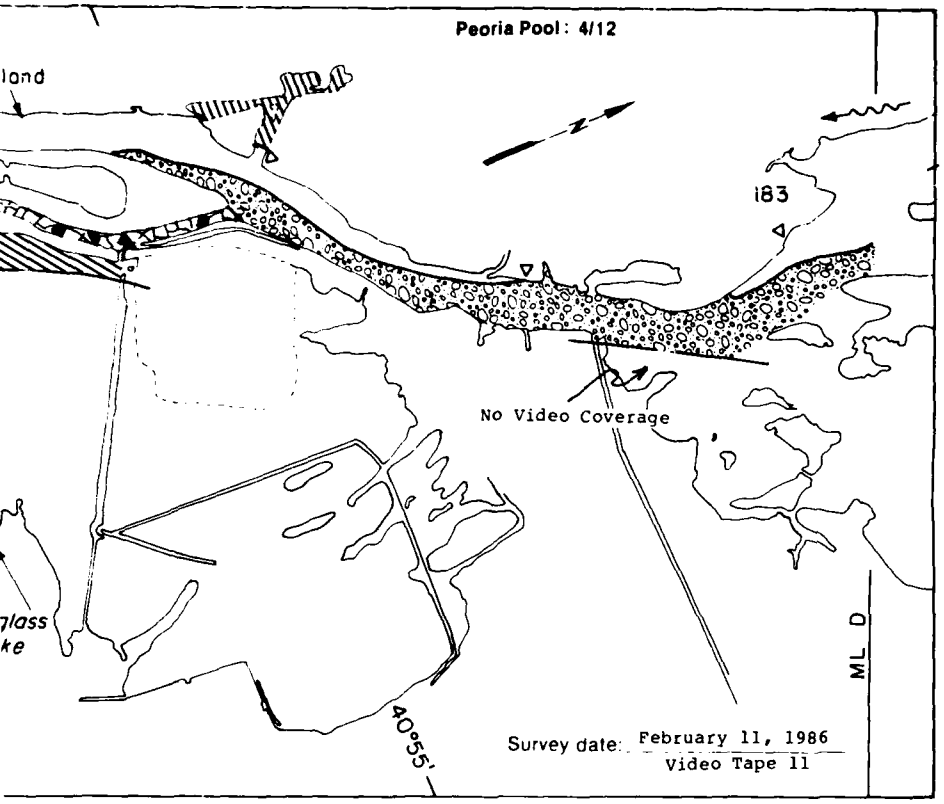

89°32'30"
40°52'30"
ML C
177
No Video Coverage
February 11, 1986
Video Tape 11
40°50'
89°30'

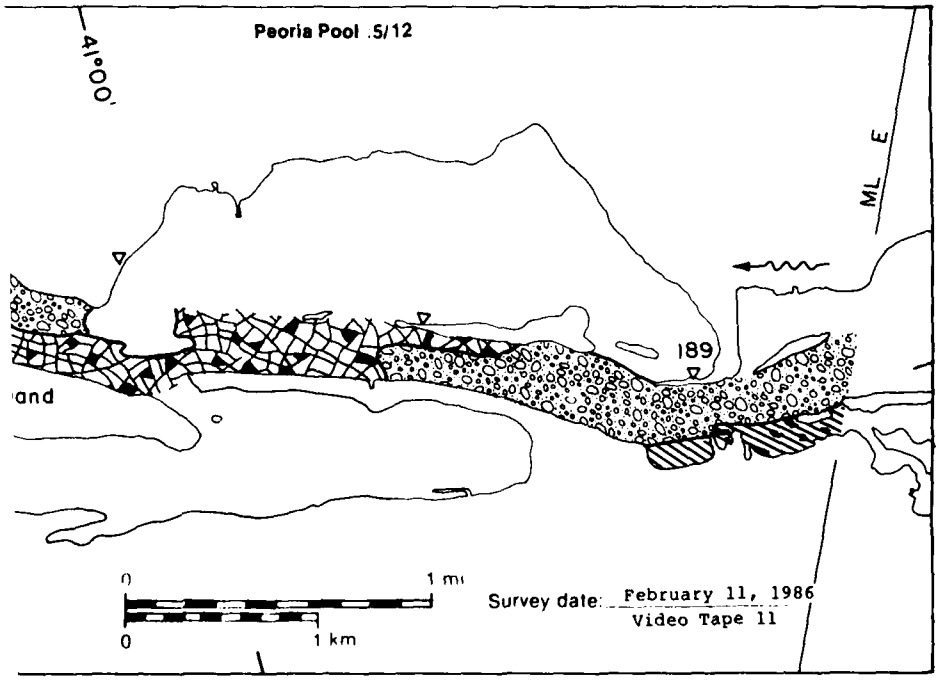
11 February 1986



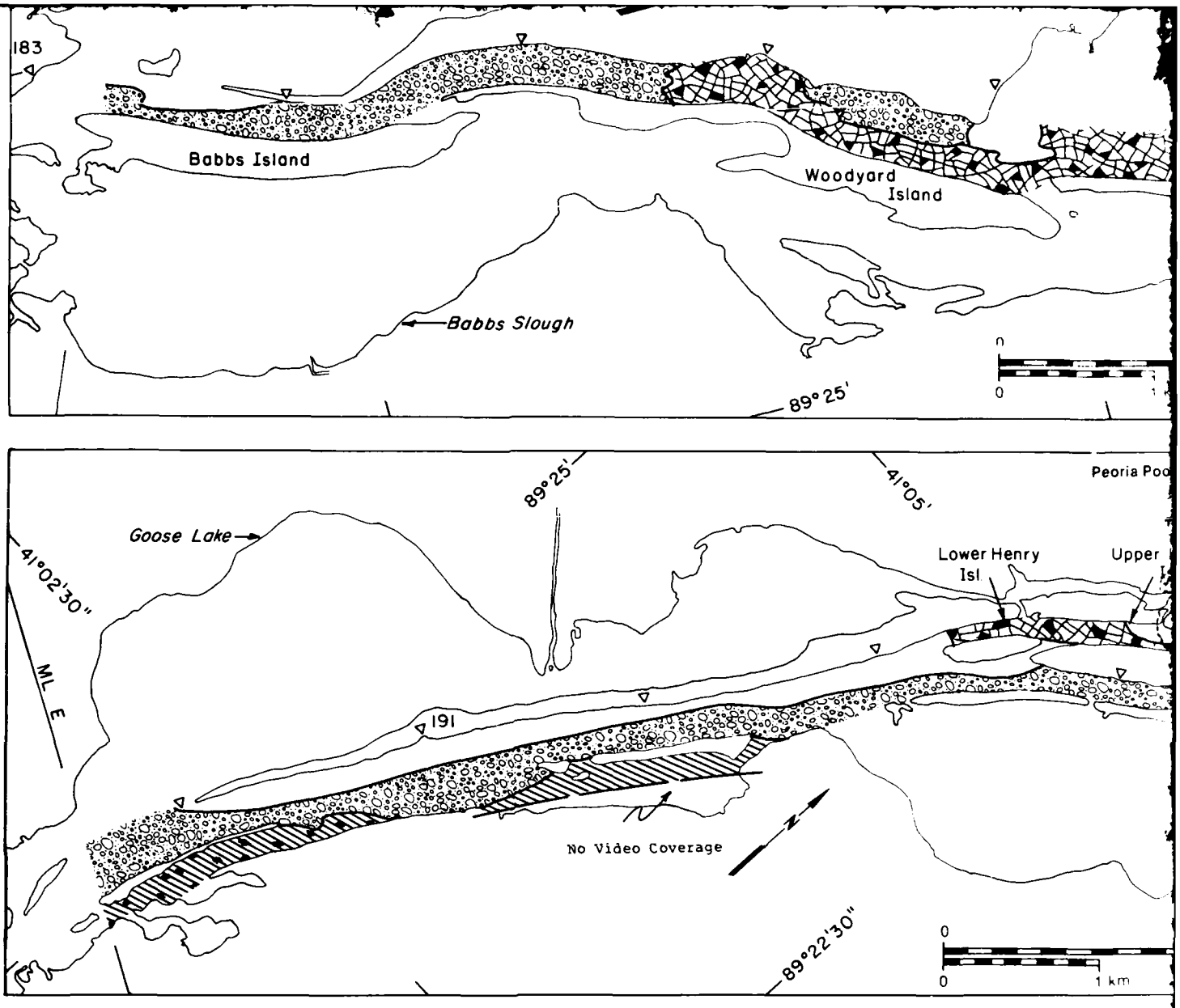


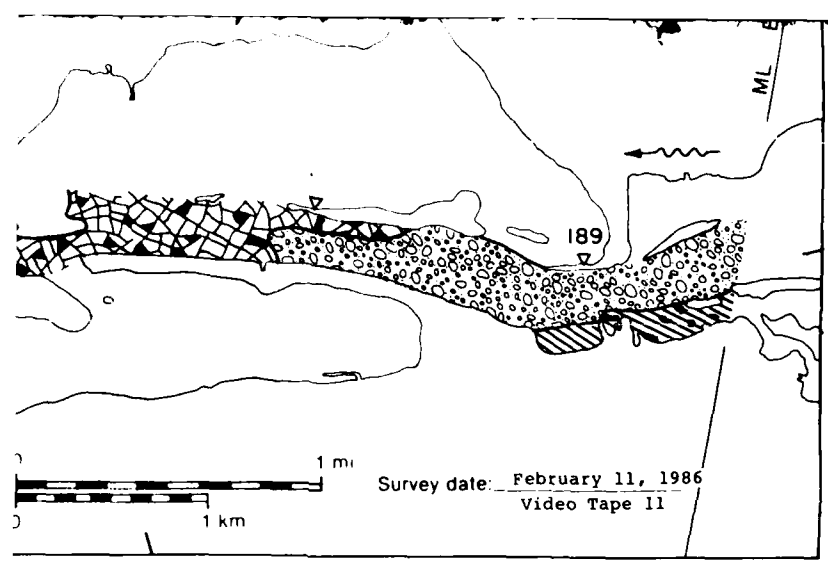


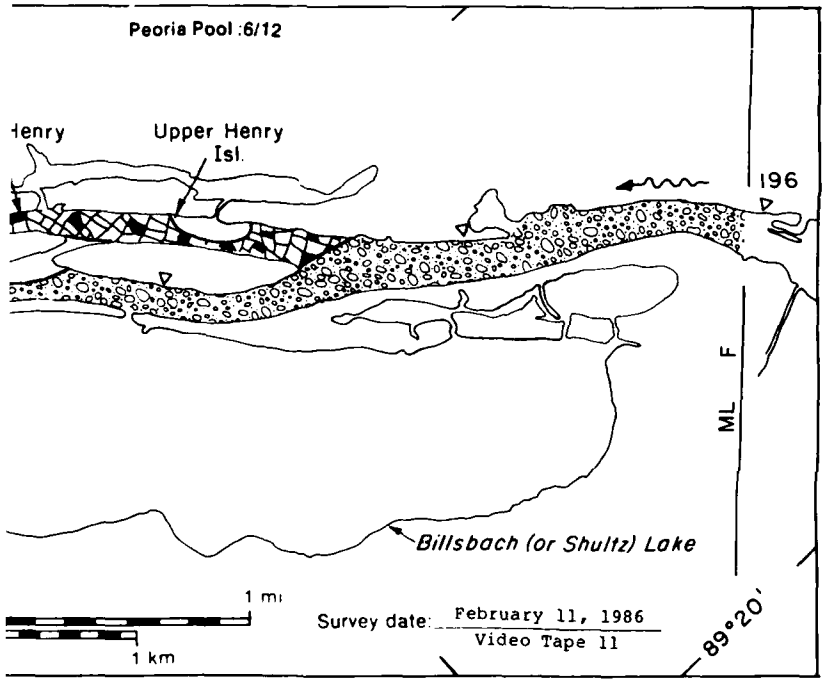

Peoria Pool : 4/12
183
No Video Coverage
ML D
40°55'
Survey date: February 11, 1986
Video Tape 11

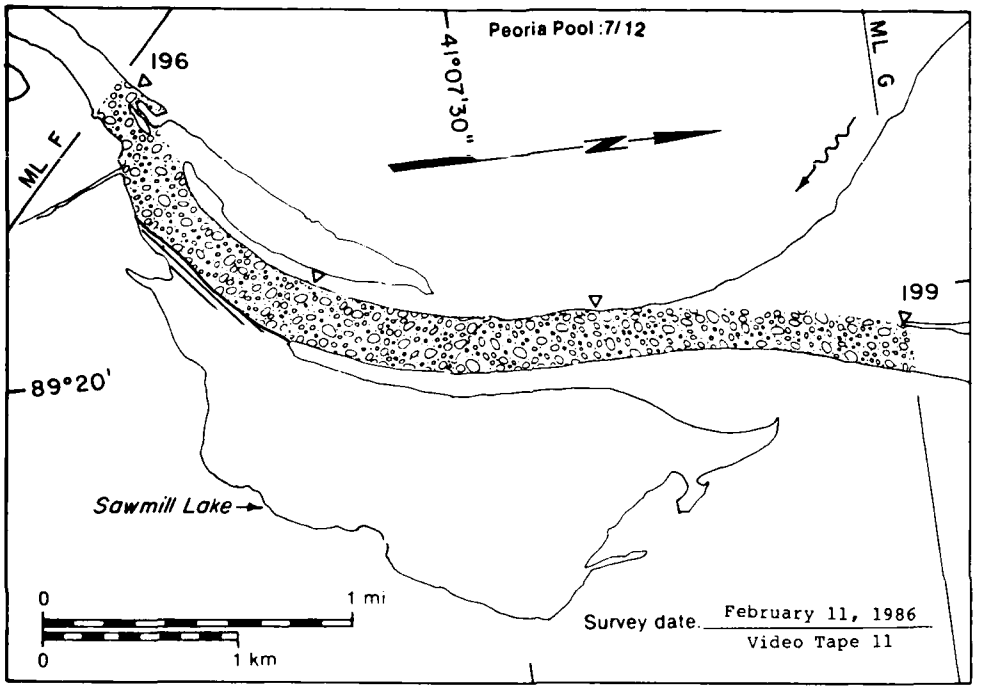

Peoria Pool .5/12
41°00'
ML E
189
0
1 mi
0
1 km
Survey date: February 11, 1986
Video Tape 11

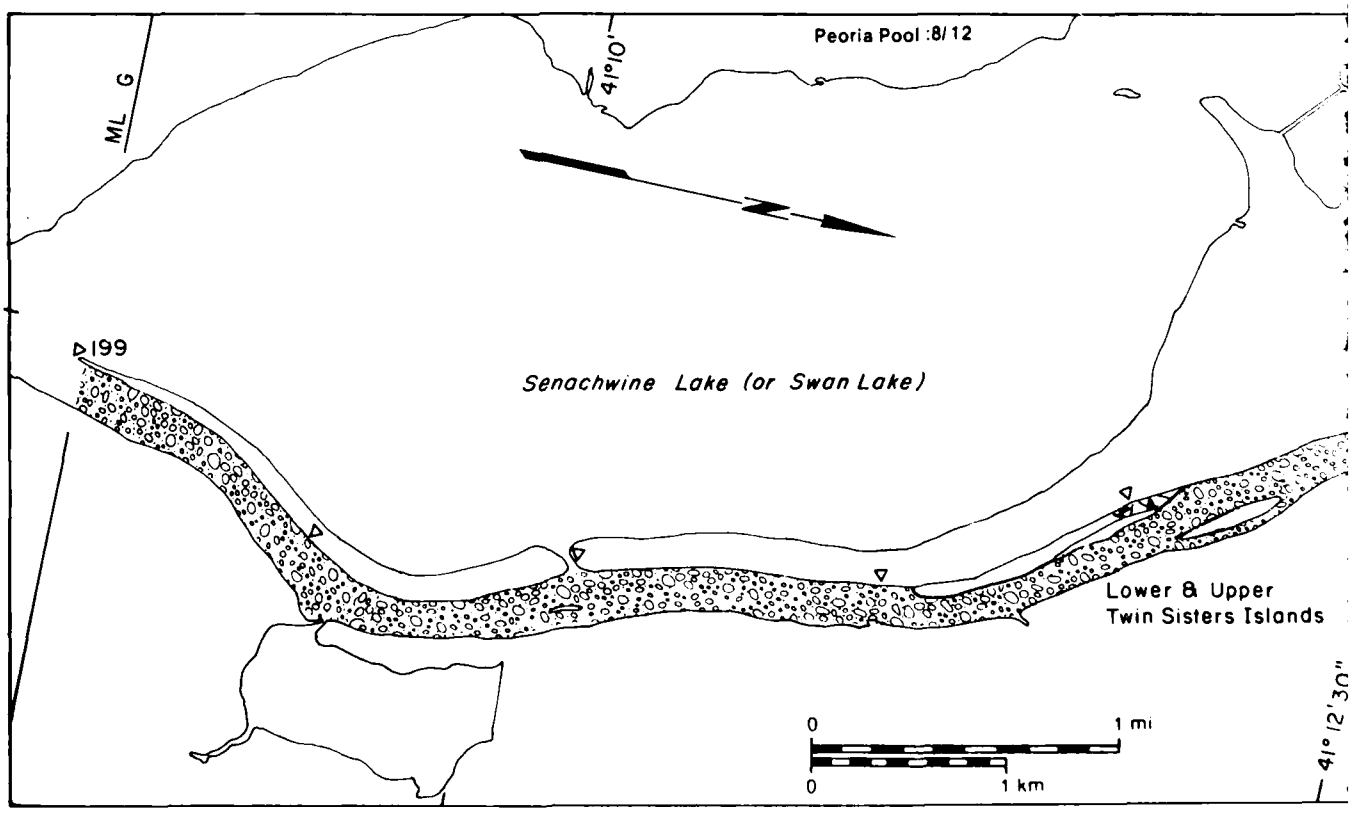
Peoria Pool :6/12

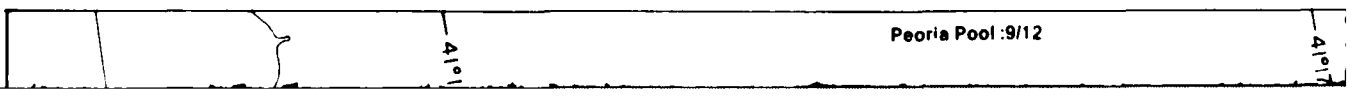

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
0
89°25'
41°05'
Peoria Poo
Goose Lake
41°02'30"
Lower Henry
Isl.
Upper
ML E
191
No Video Coverage
89°22'30"
0
0
1 km


ML
189
1 mi
1 km
Survey date: February 11, 1986
Video Tape 11

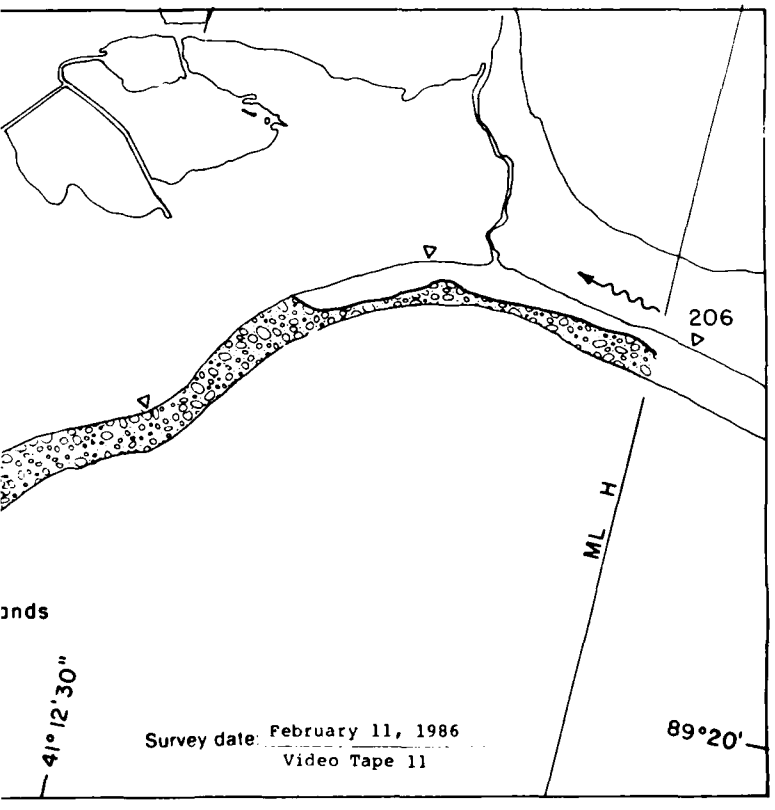

Peoria Pool :6/12
Henry
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
1 mi
1 km
Survey date: February 11, 1986
Video Tape 11
89°20'

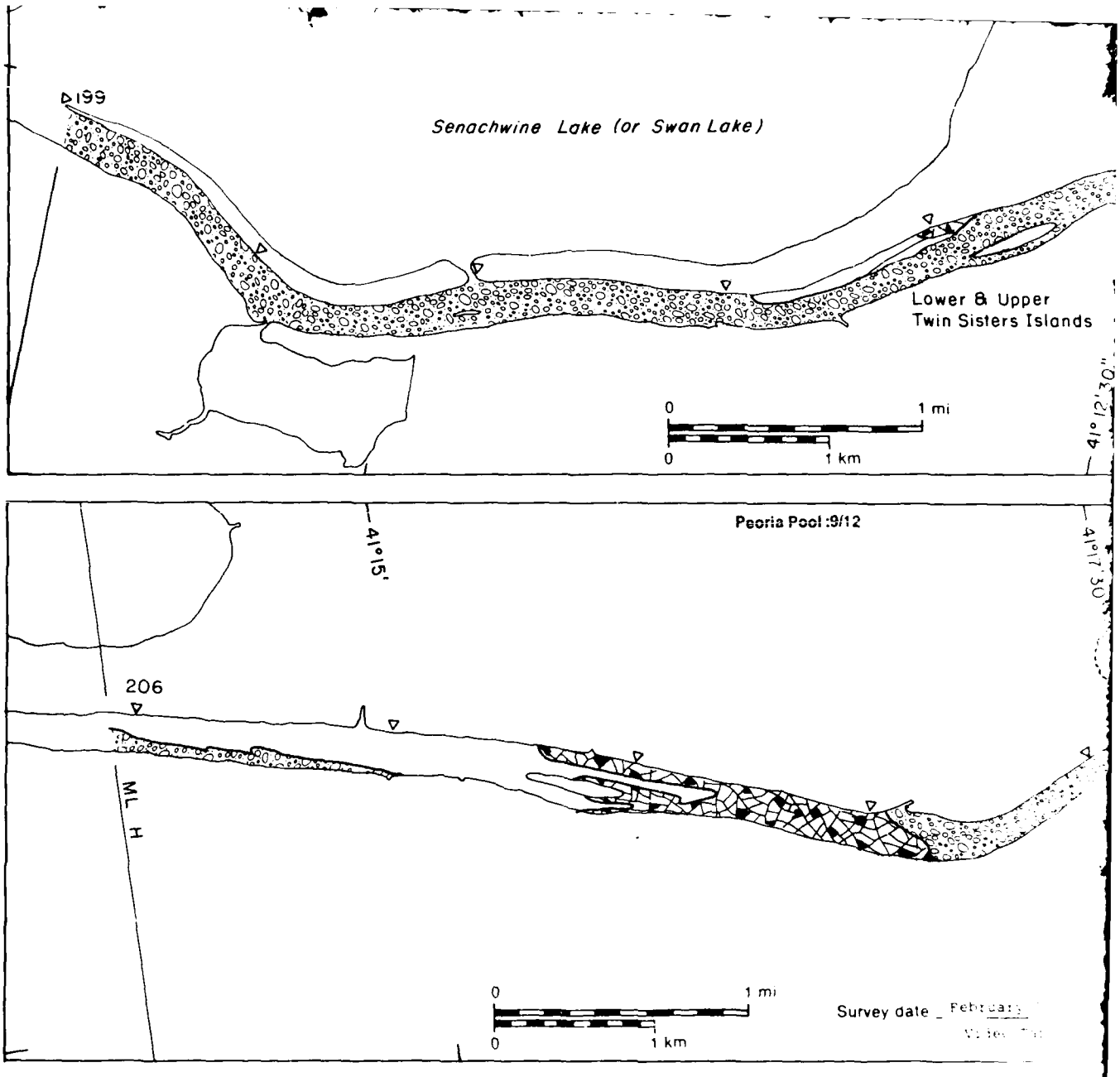

Peoria Pool :7/12
196
ML F
41°07'30"
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date. February 11, 1986
Video Tape 11


Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41°12'30"

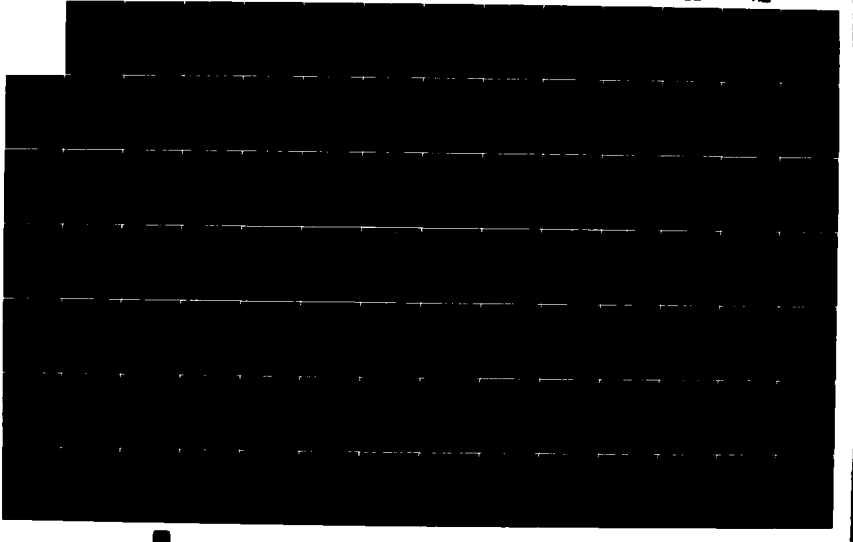

Peoria Pool :9/12
41°1
41°1

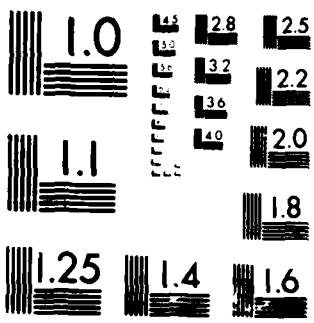
11 February 1986

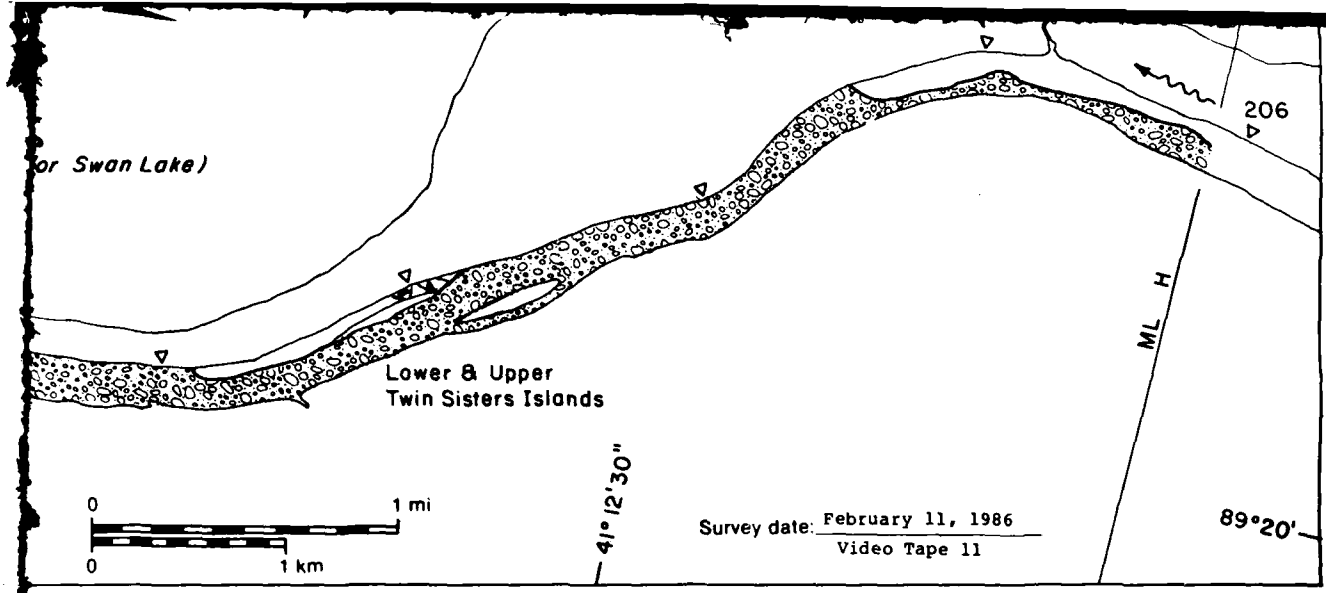


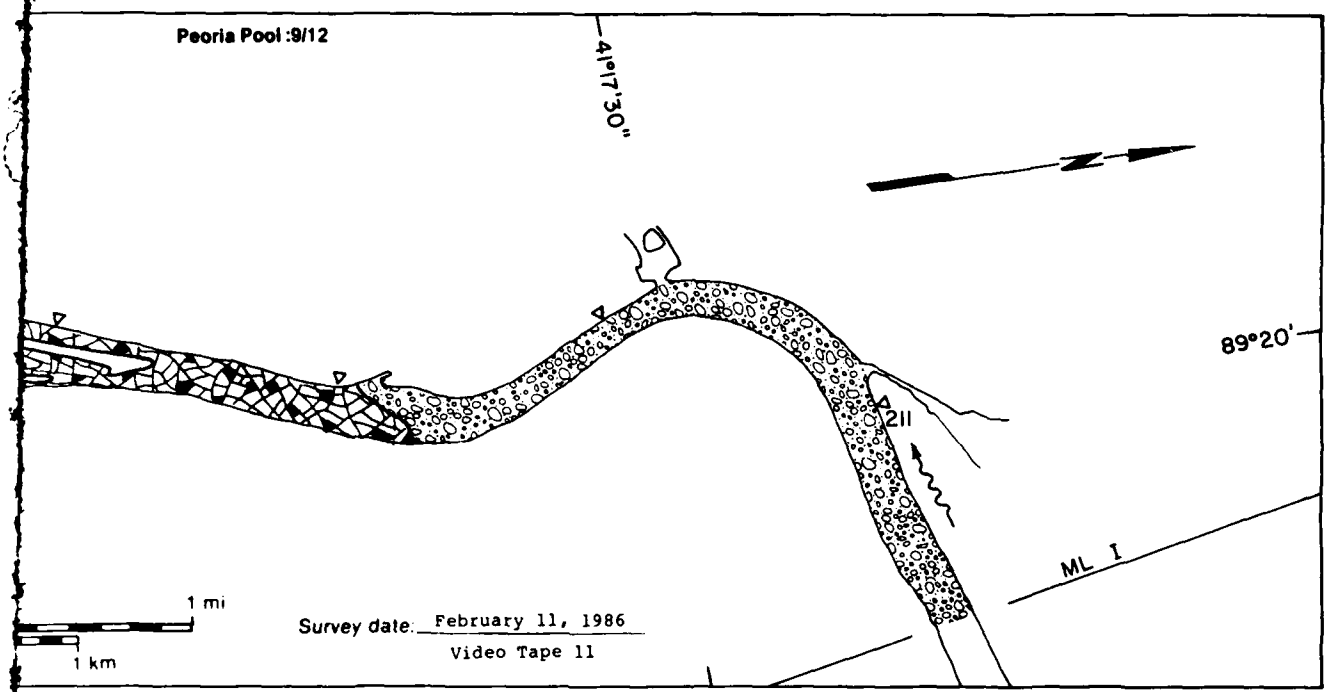

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41°21'30"
Peoria Pool :9/12
41°15'
41°17'30"
206
ML
H
0
1 mi
0
1 km
Survey date _ Febr

AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER 11/14
OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND
ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

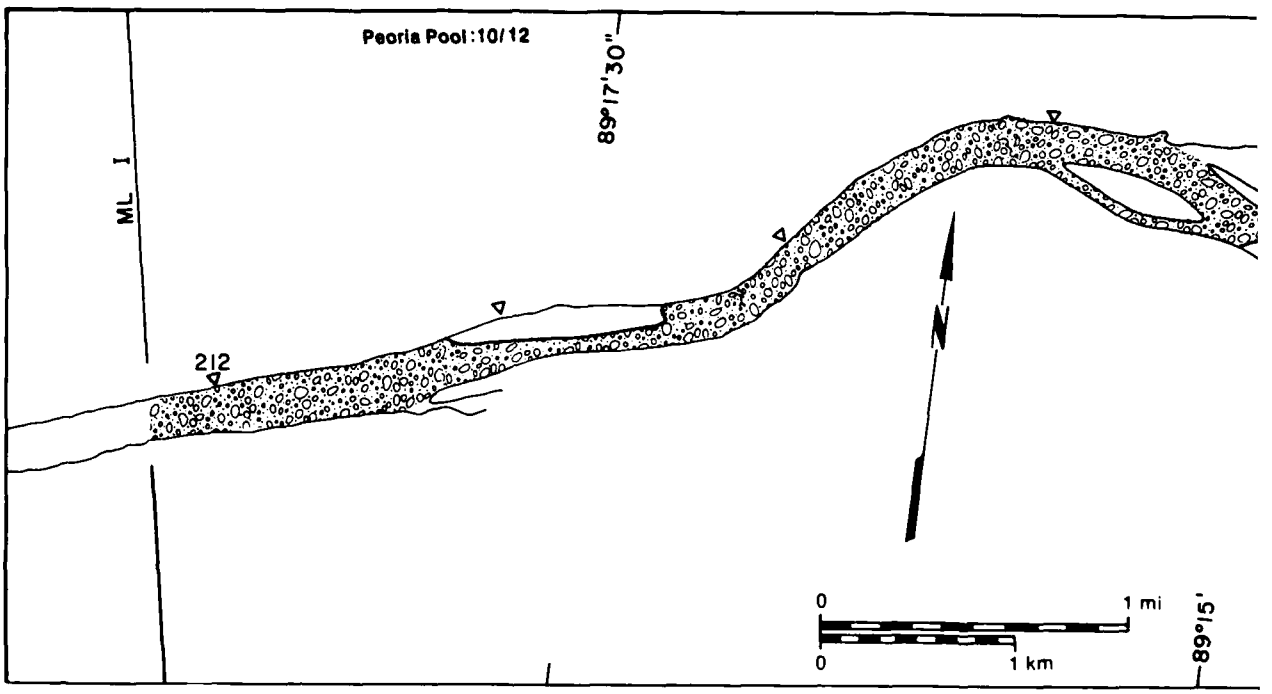


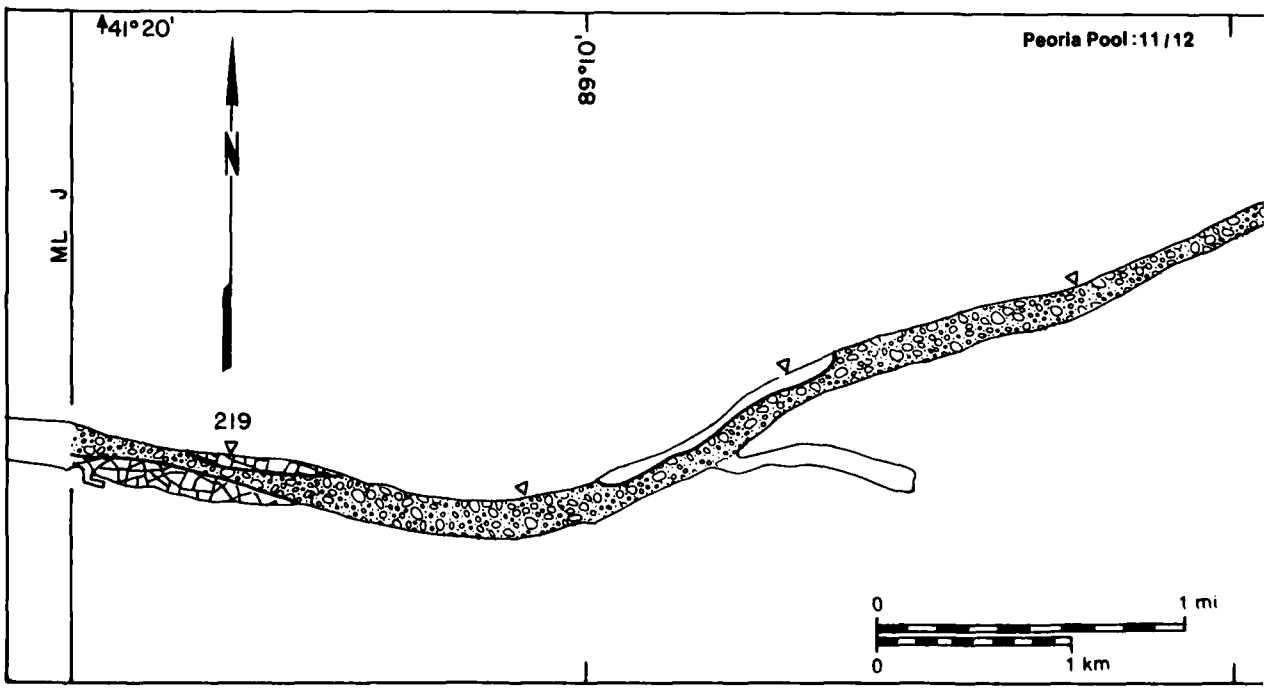

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

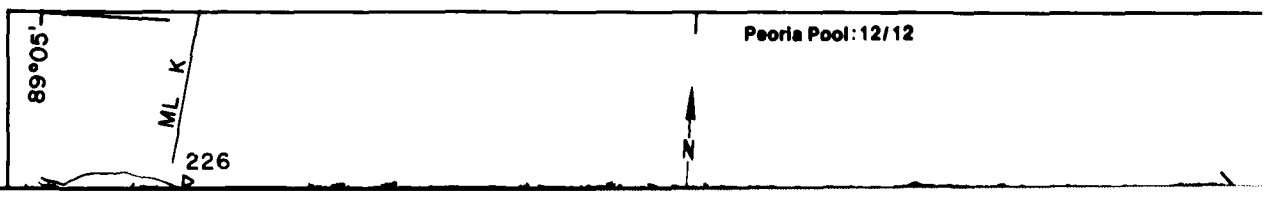

or Swan Lake)
206
Lower & Upper
Twin Sisters Islands
ML H
0
1 mi
0
1 km
41° 12'30"
Survey date: February 11, 1986
Video Tape 11
89°20'

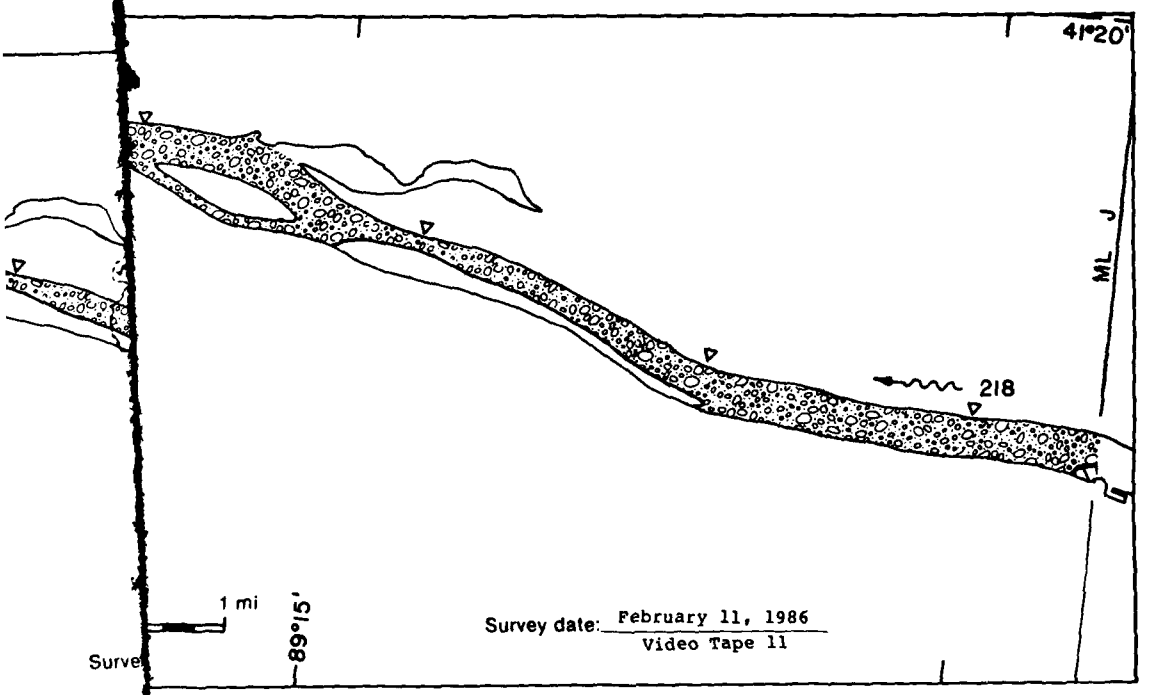

Peoria Pool :9/12
41°17'30"
89°20'
211
ML 1
1 mi
1 km
Survey date: February 11, 1986
Video Tape 11

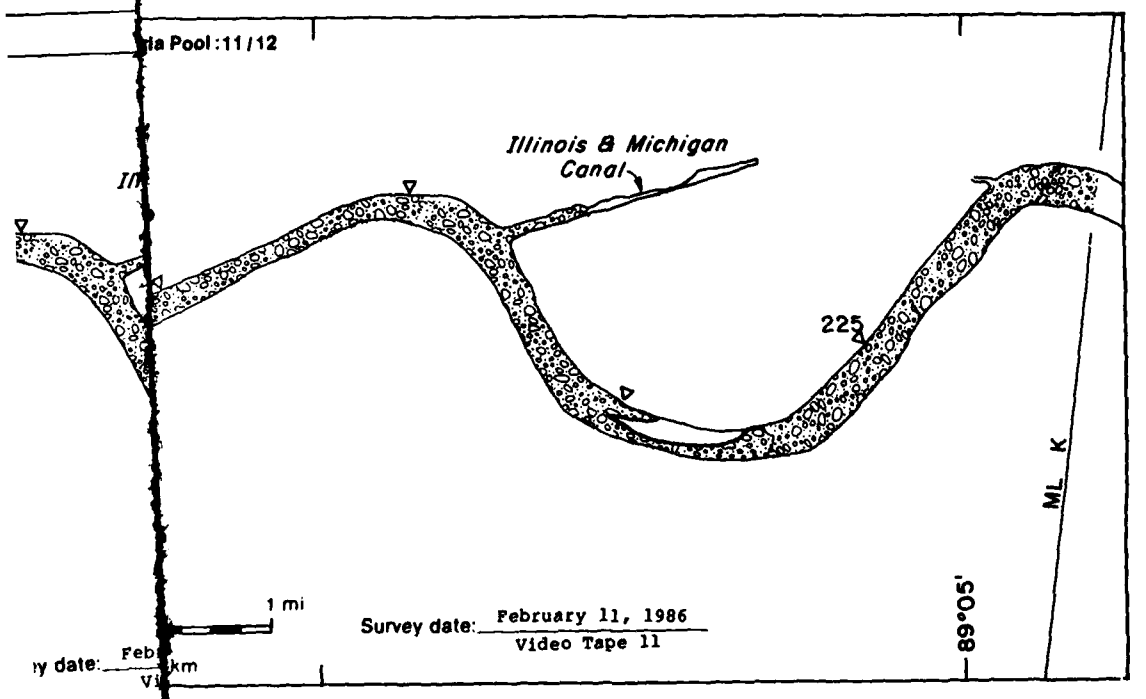
11 February 1986

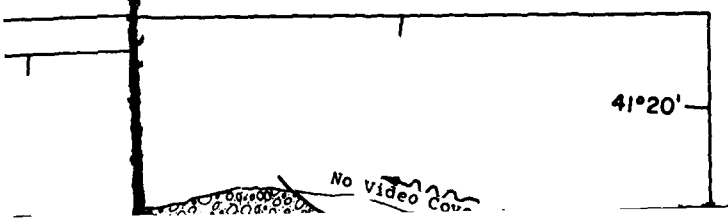


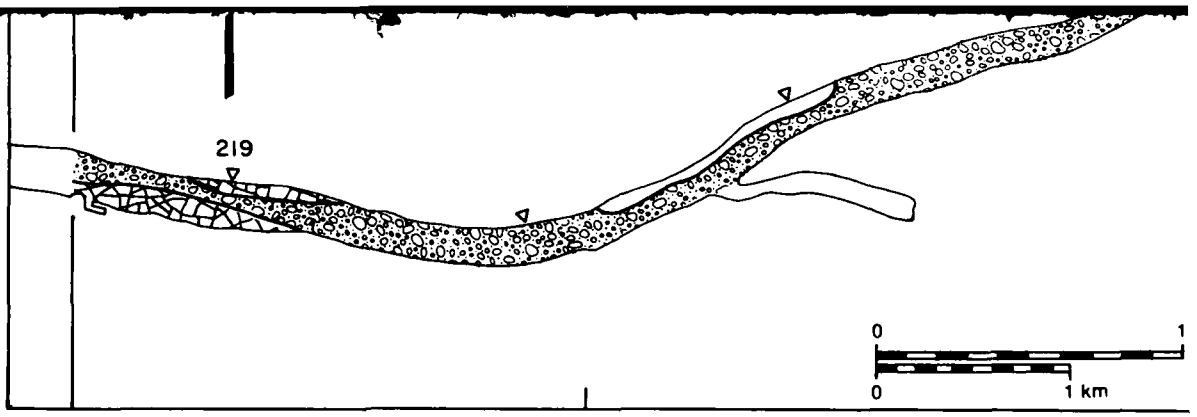


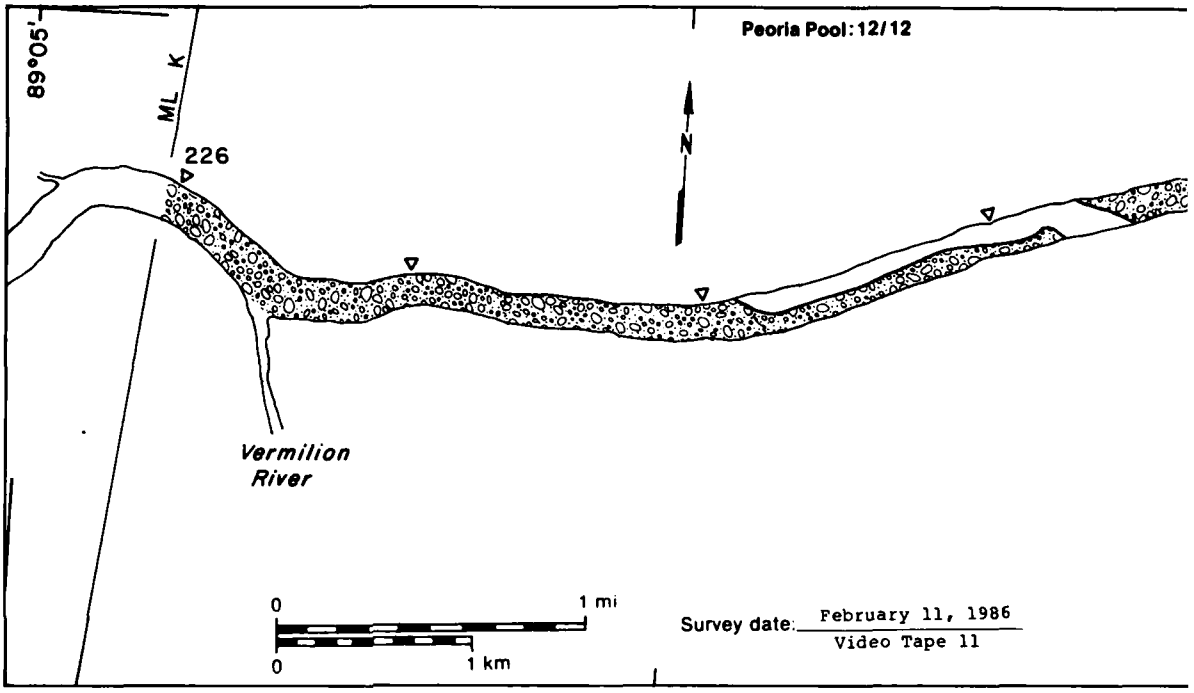



41°20'
ML J
218
1 mi
89°15'
Survey date: February 11, 1986
Video Tape 11


Illinois & Michigan Canal
225
ML K
1 mi
89°05'
Survey date: February 11, 1986
Video Tape 11


41°20'
No Video

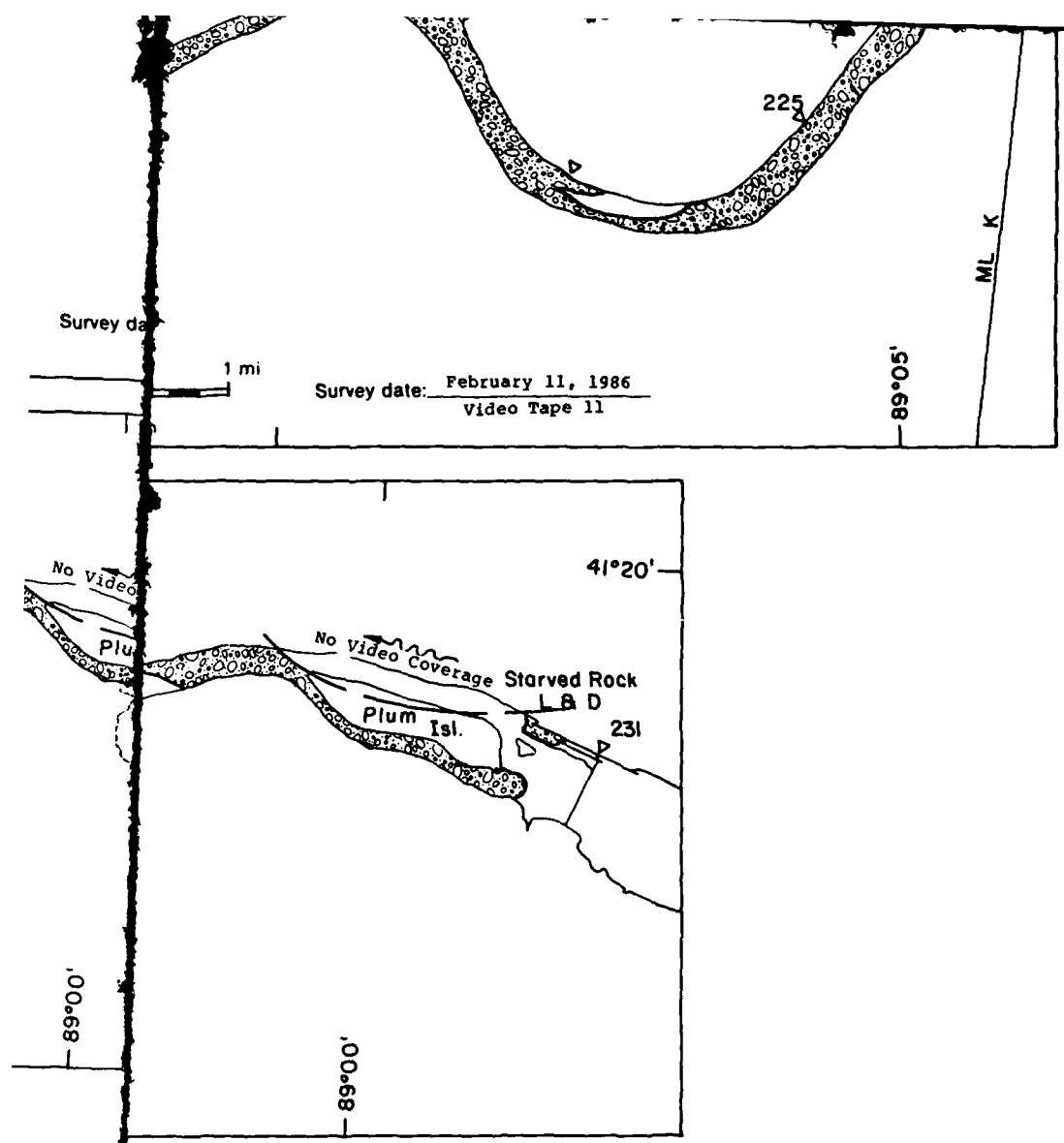




Peoria Pool

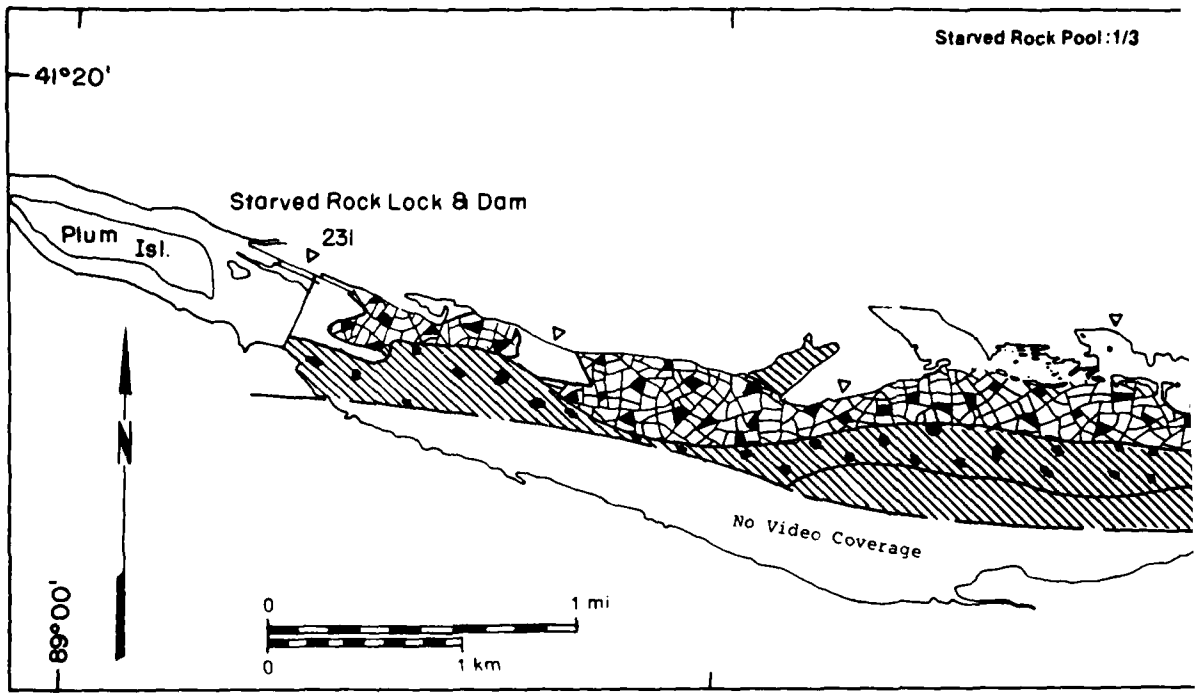
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	10.18	NA
Solid ice cover	8.02	NA
Solid ice cover with open-water areas	2.97	90
Fragmented ice cover	17.25	NA
Fragmented ice cover with open-water areas	1.99	80
Ice floes or frazil slush and pans	19.58	70
Total area ($m^2 \times 10^6$)	81.33*	

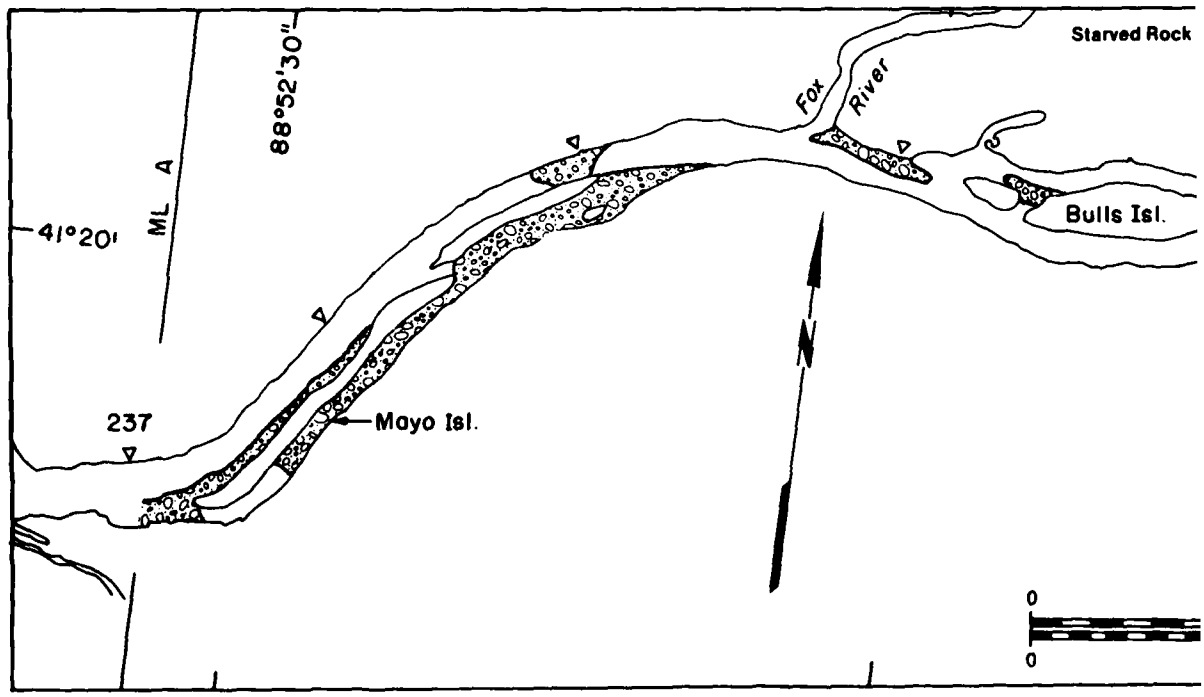
* Includes 21.34×10^6 m^2 of no video coverage

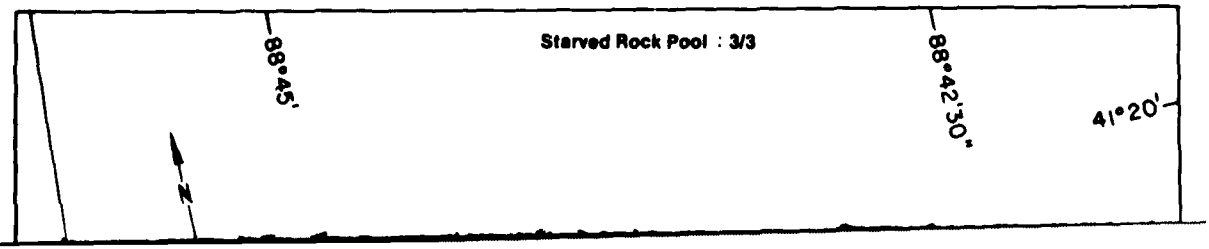

225
ML K
Survey da
1 mi
Survey date: February 11, 1986
Video Tape 11
89°05'
41°20'
No Video
Plu
No Video Coverage
Starved Rock
L & D
Plum Isl.
231
89°00'
89°00'

264

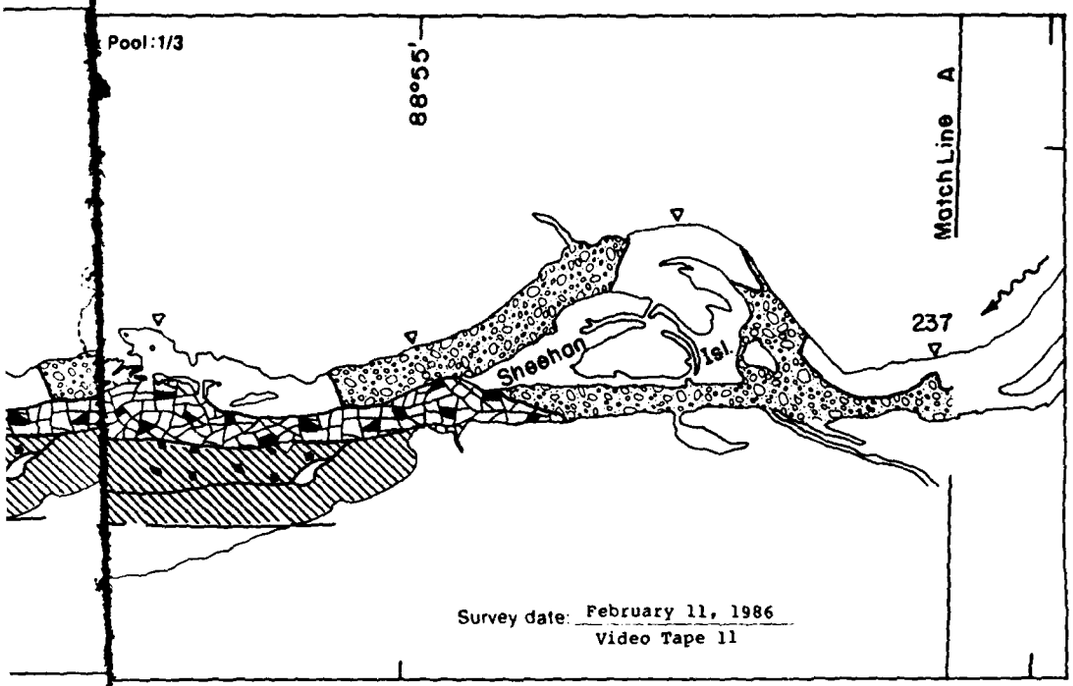
J

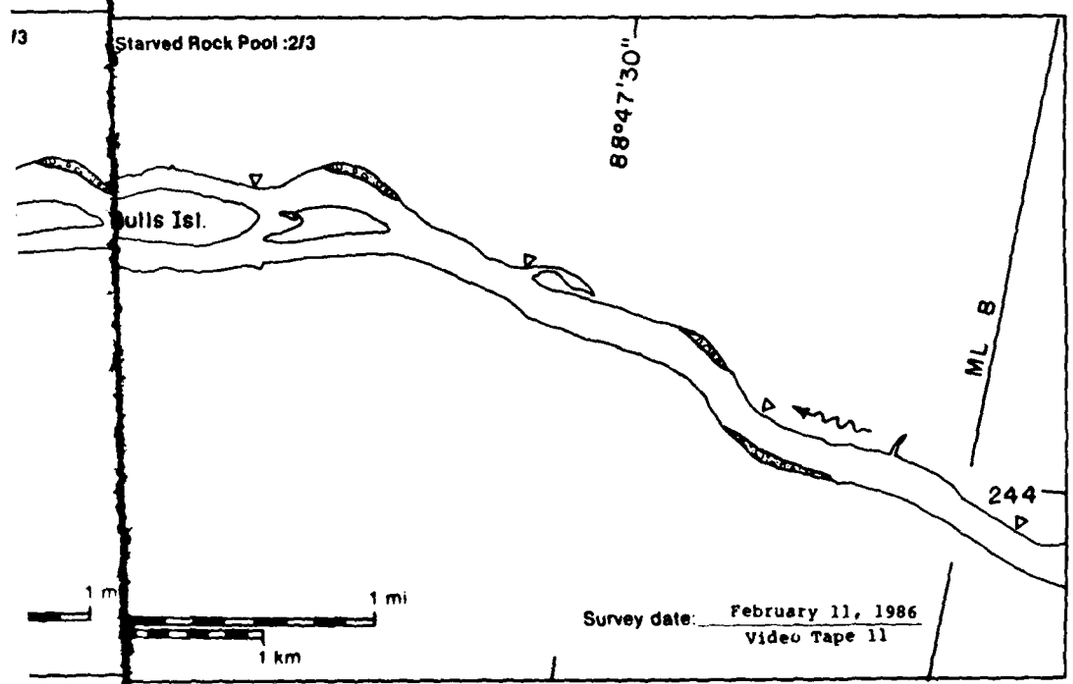

Starved Rock Pool:1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
N
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
N
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N

11 February 1986



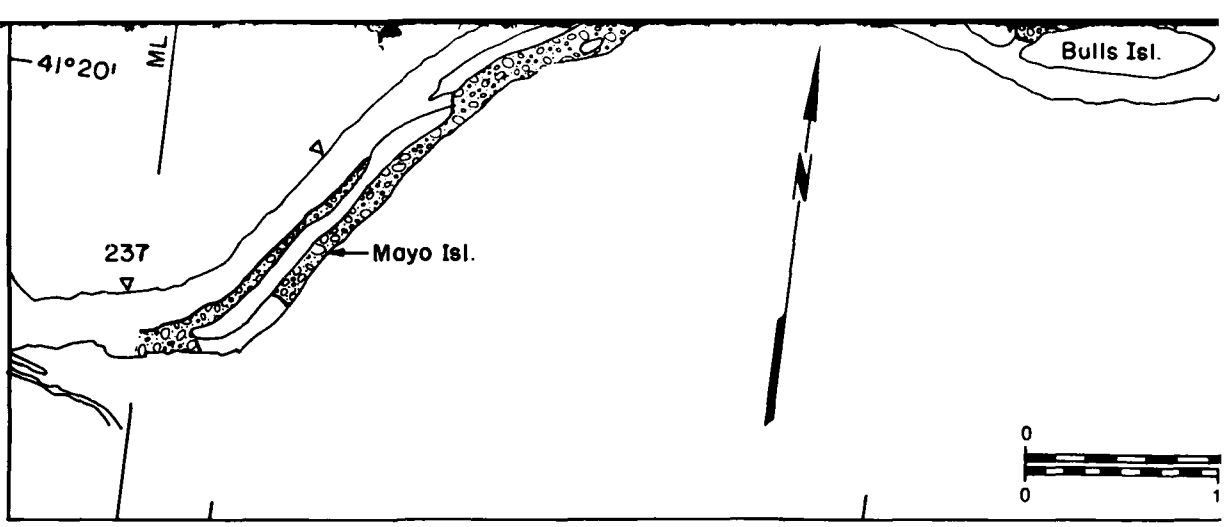


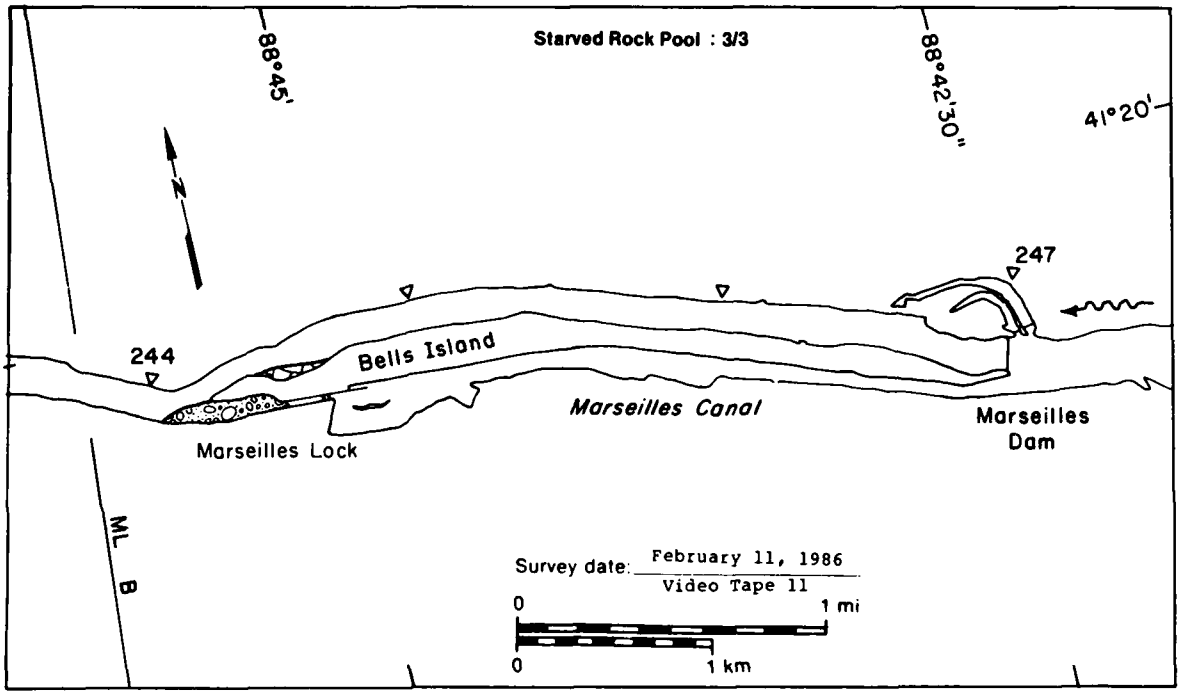
41°20'

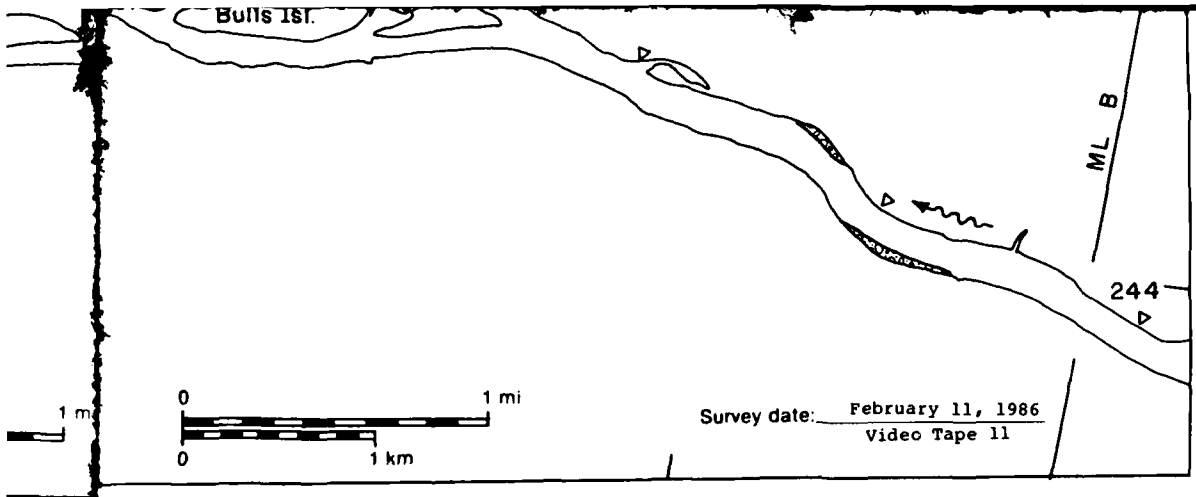
Starved Rock Pool

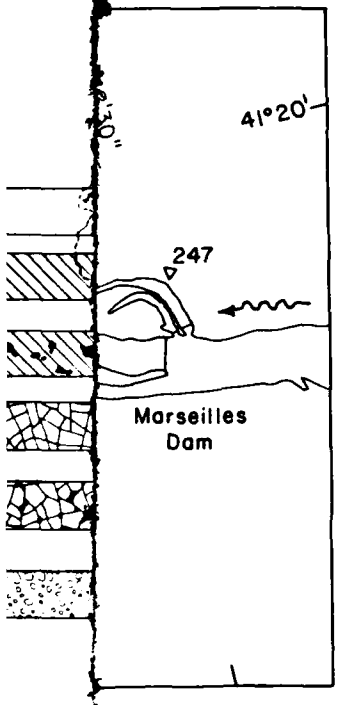
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.53	


41°20'
ML
Bulls Isl.
237
Mayo Isl.
N
0
0
1


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML
B
Survey date: February 11, 1986
Video Tape 11
0
1 mi
0
1 km



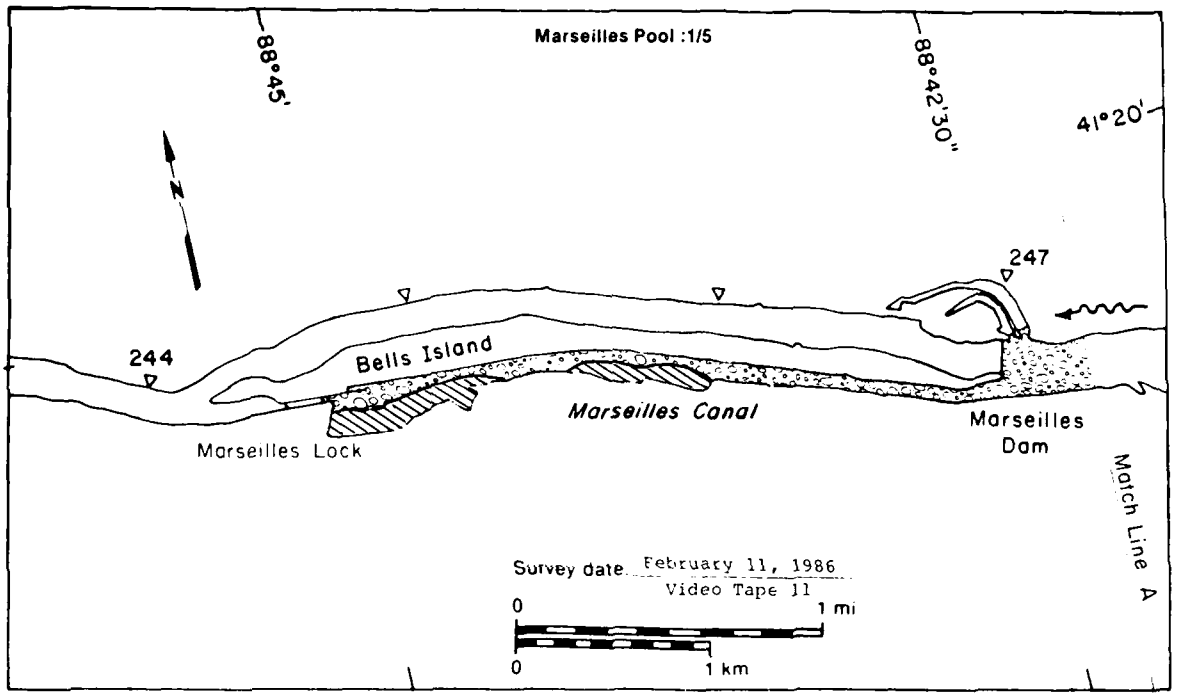


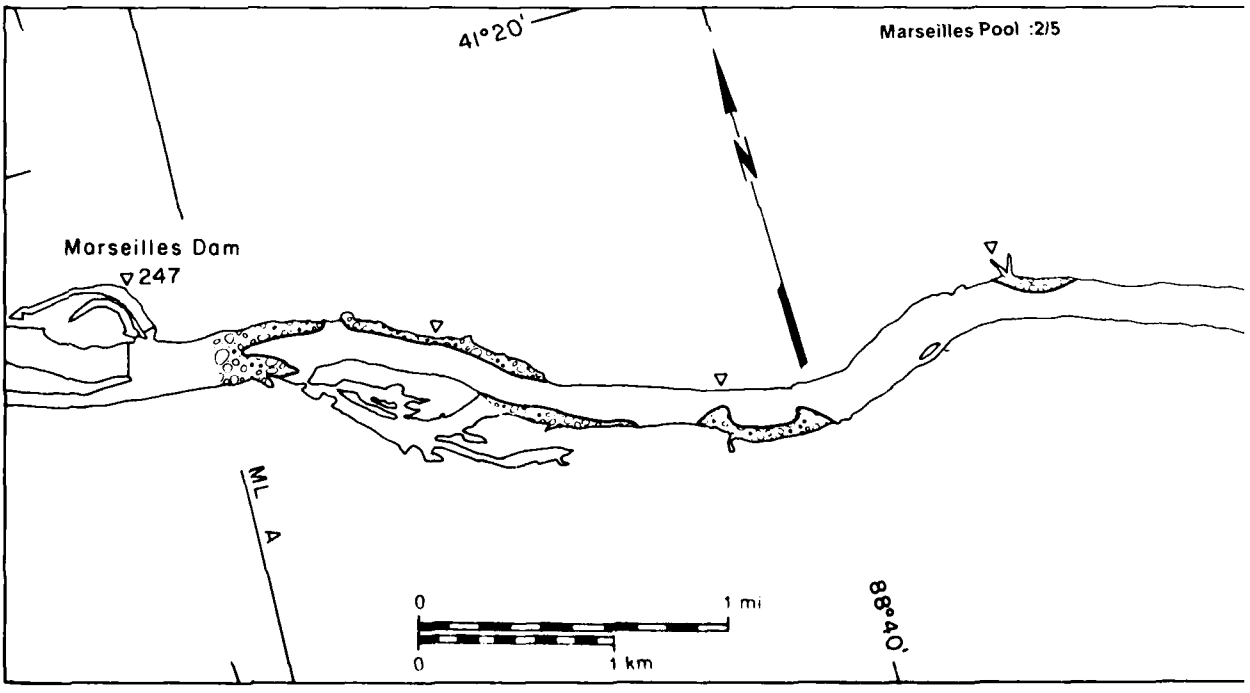
Starved Rock Pool

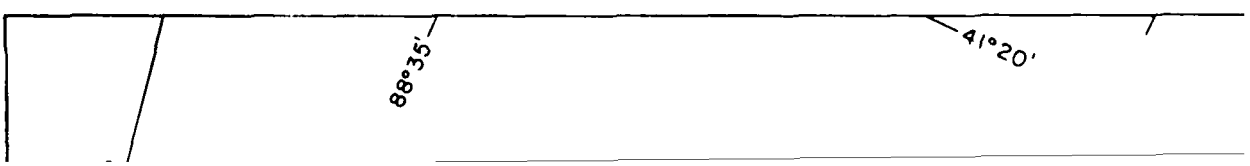
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.53	NA
Solid ice cover	0.80	NA
Solid ice cover with open-water areas	1.20	90
Fragmented ice cover	0.02	NA
Fragmented ice cover with open-water areas	1.46	60
Ice floes or frazil slush and pans	1.63	30
Total area ($m^2 \times 10^6$)	10.19*	

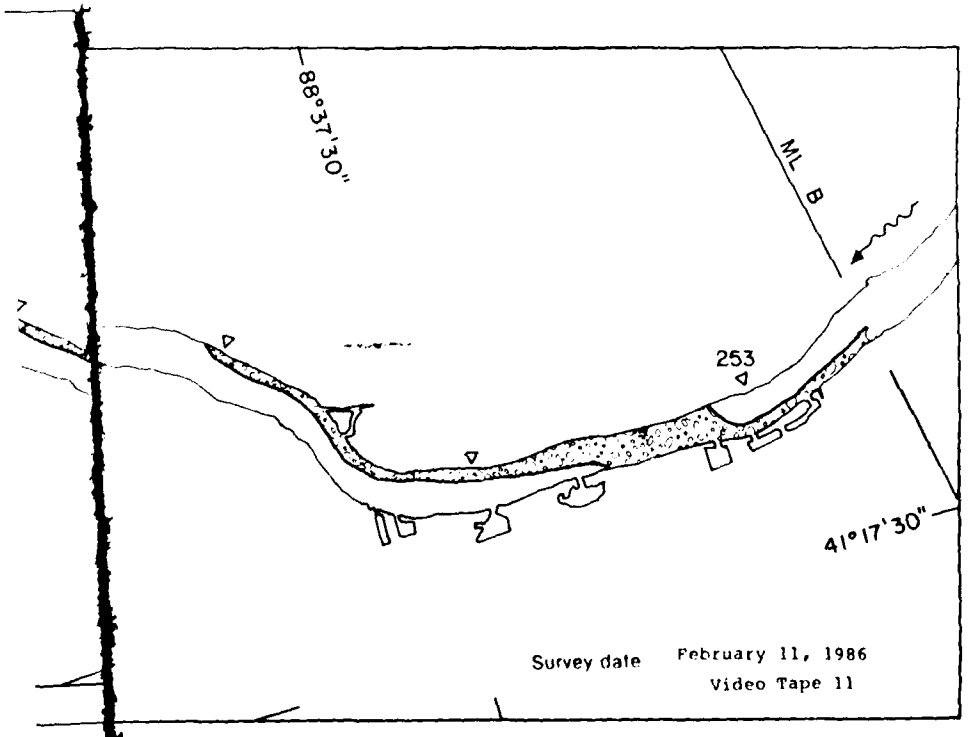
* Includes 1.55×10^6 m^2 of no video coverage

11 February 1986

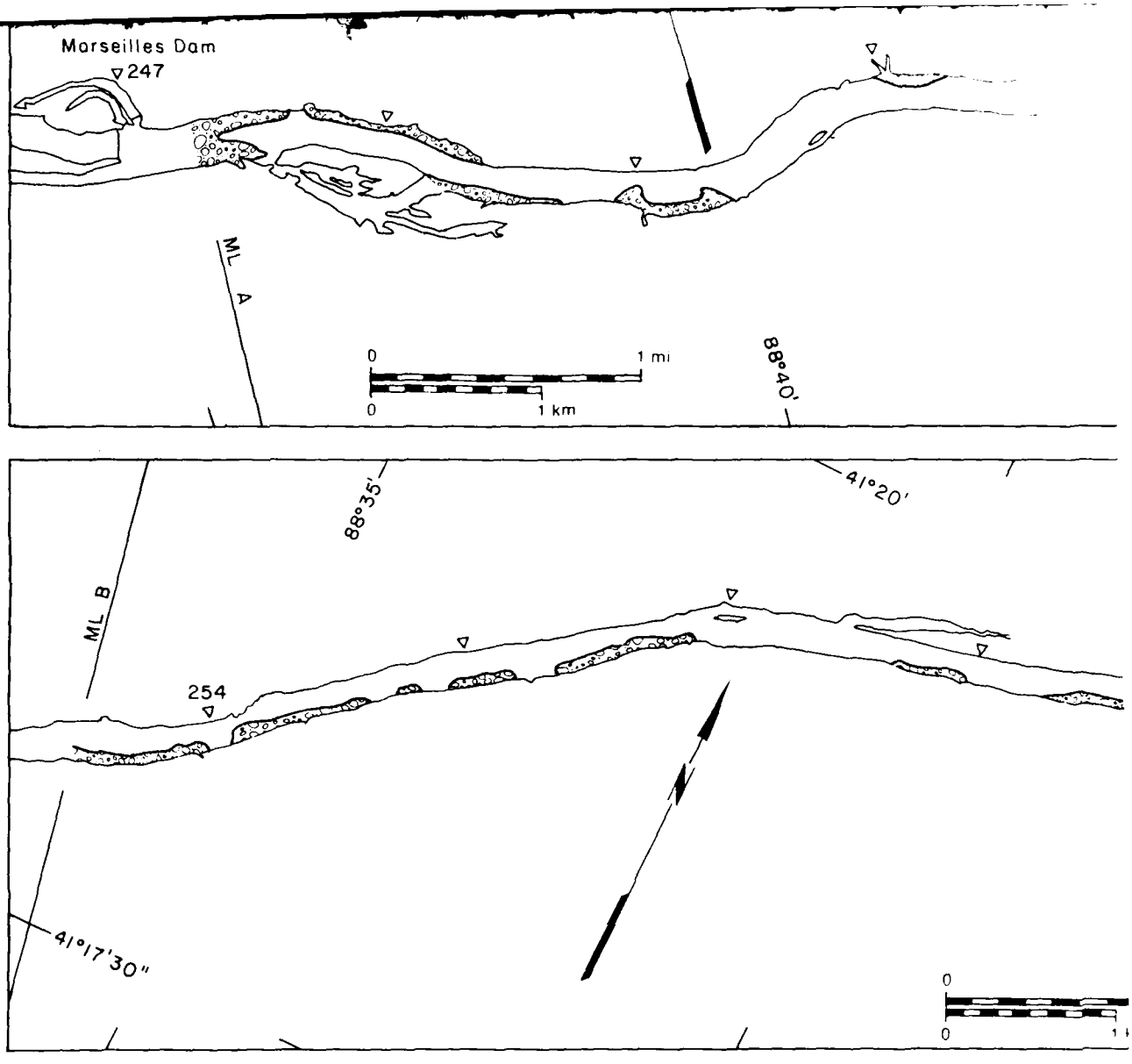


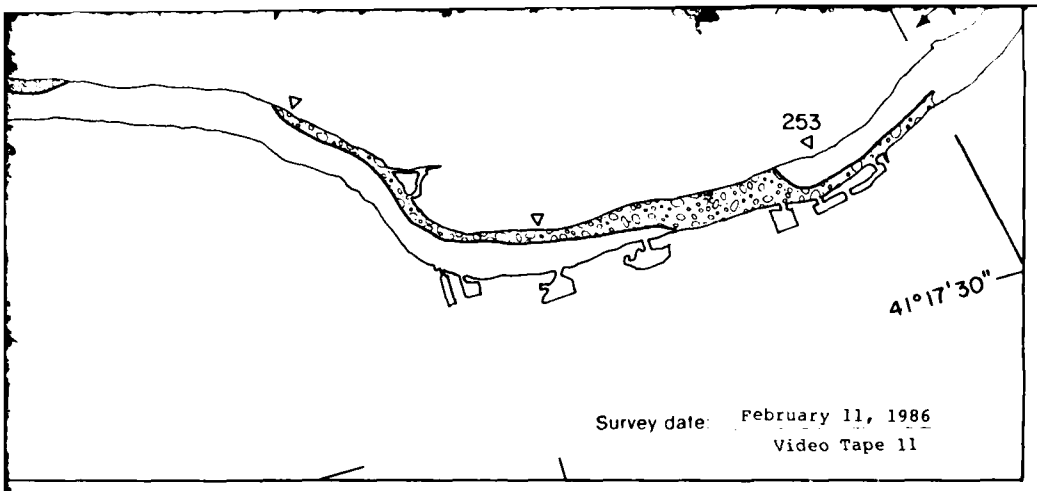


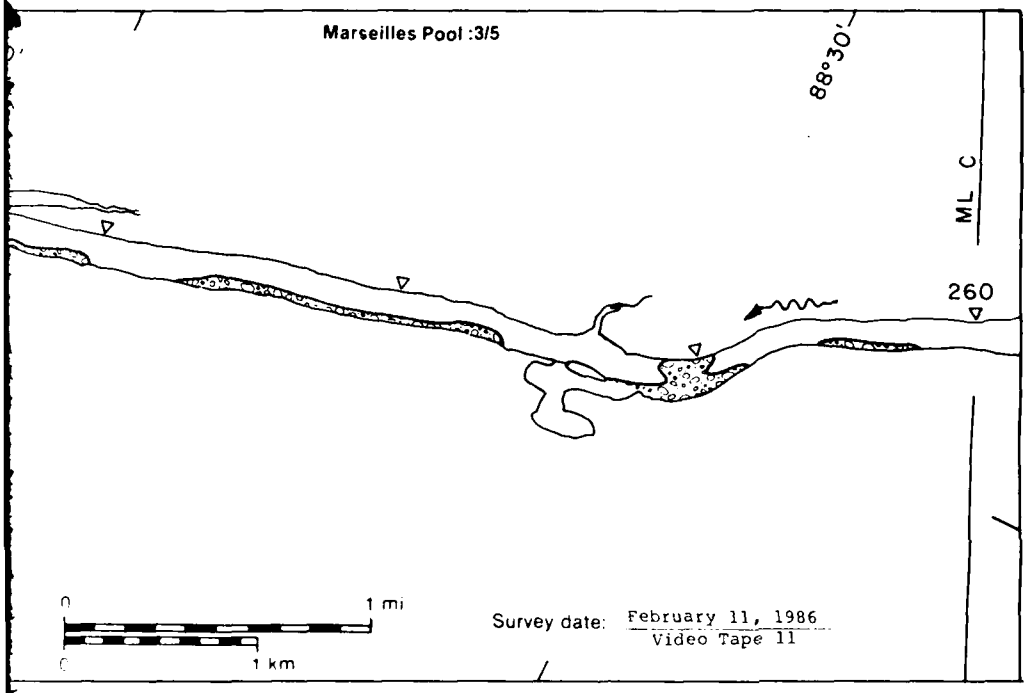


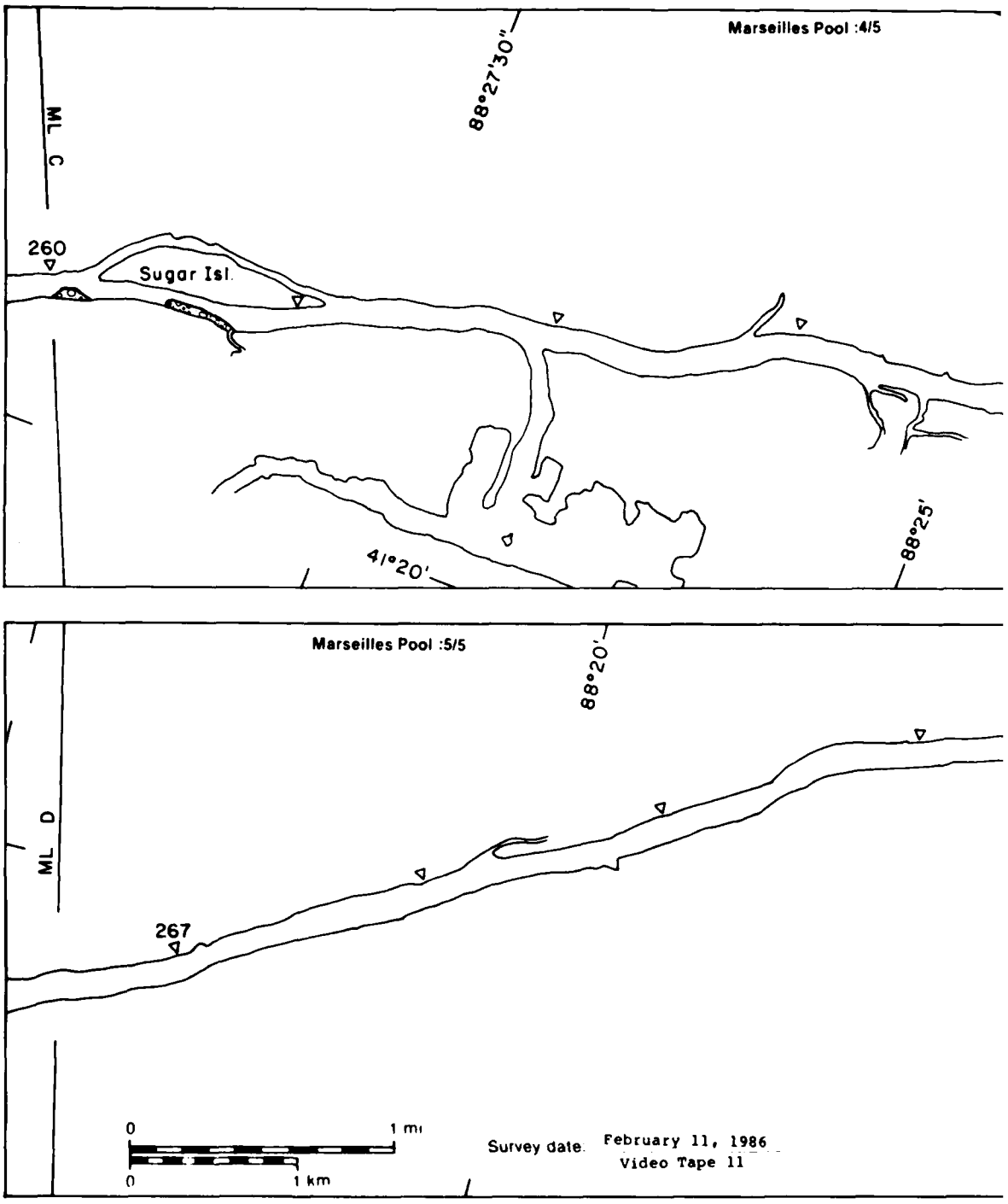


Marseilles Pool :3/5


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
0


253
41°17'30"
Survey date: February 11, 1986
Video Tape 11


Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 11, 1986
Video Tape 11

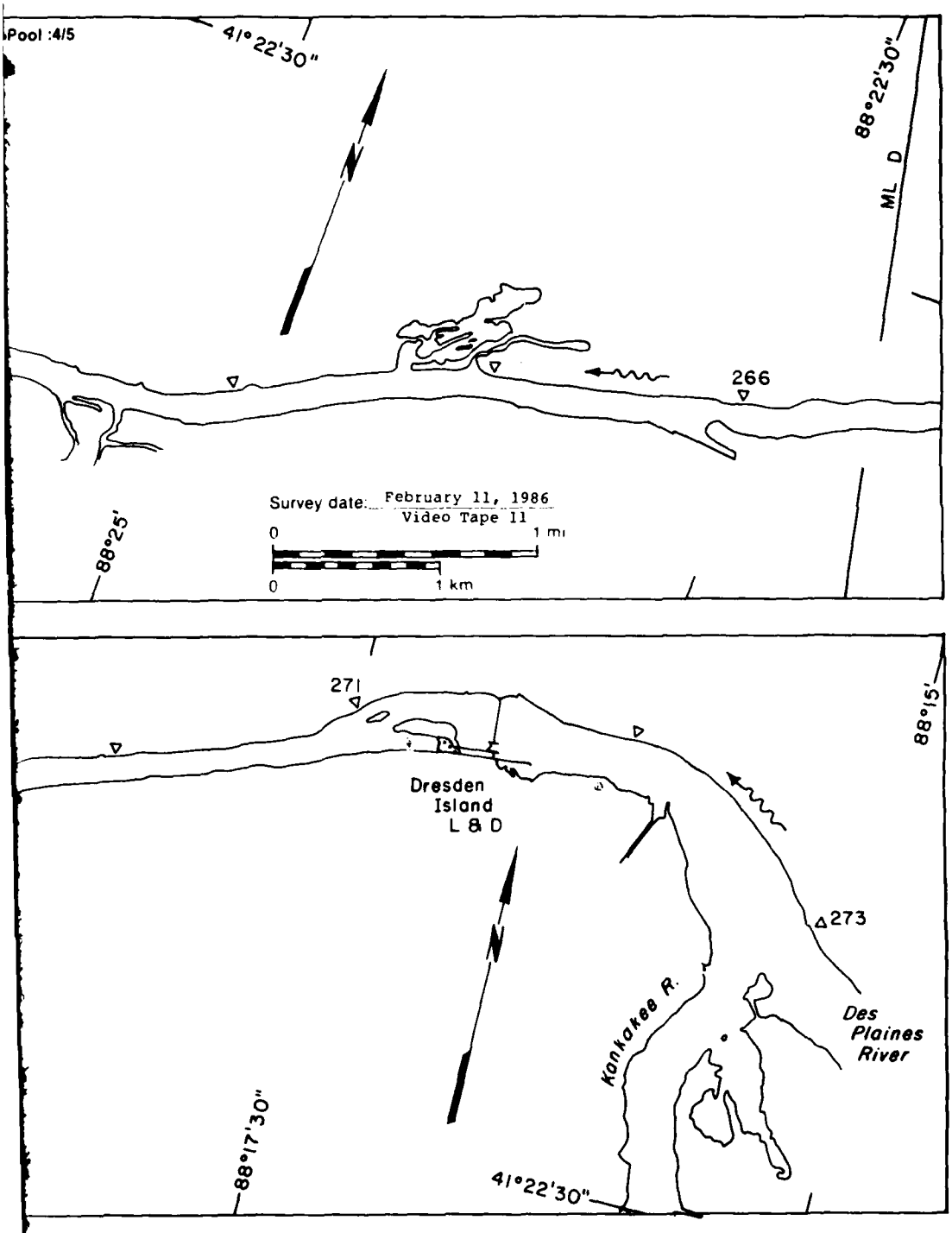


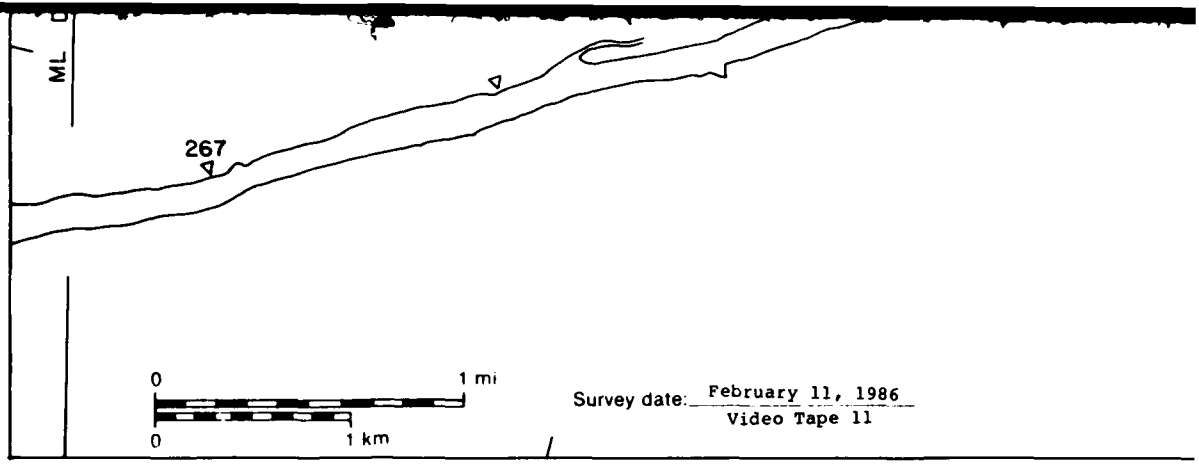
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.52	NA

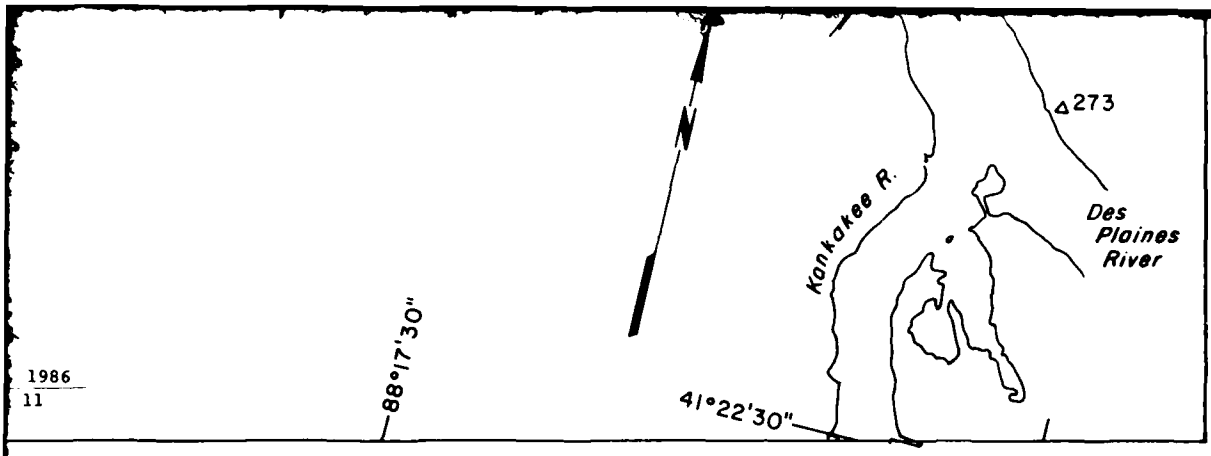
11 February 1986





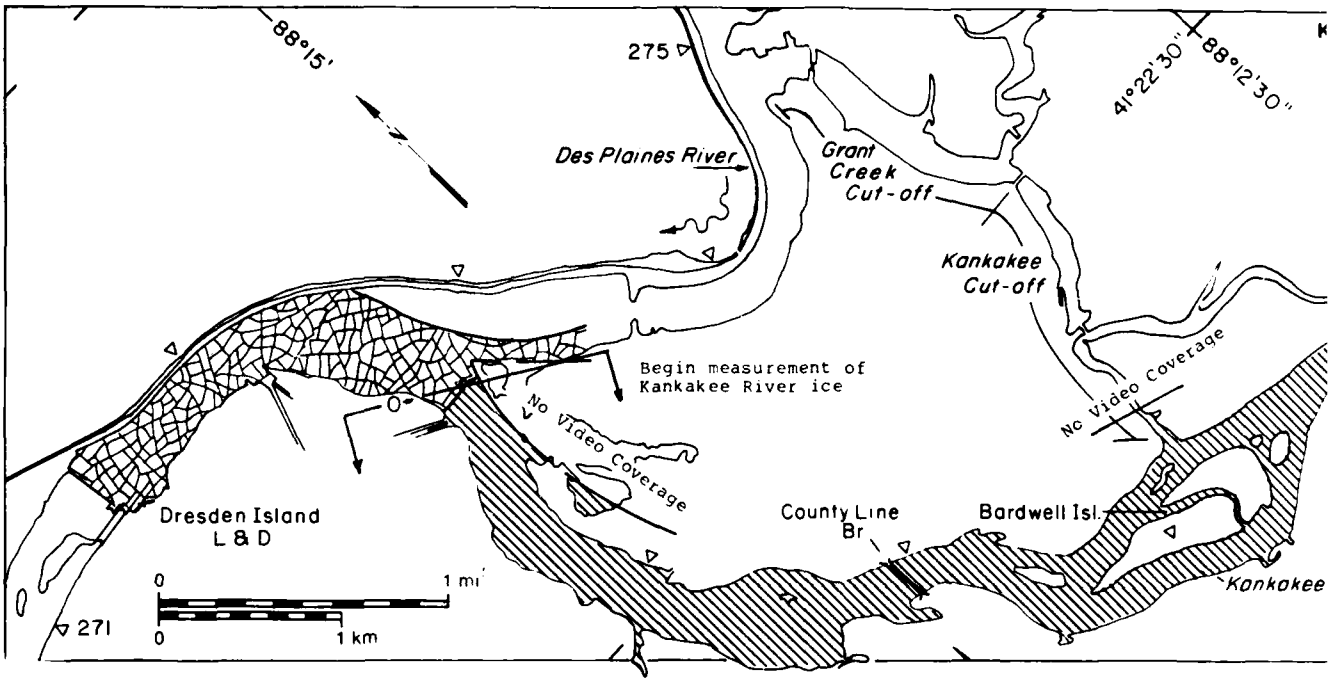
Marseilles Pool

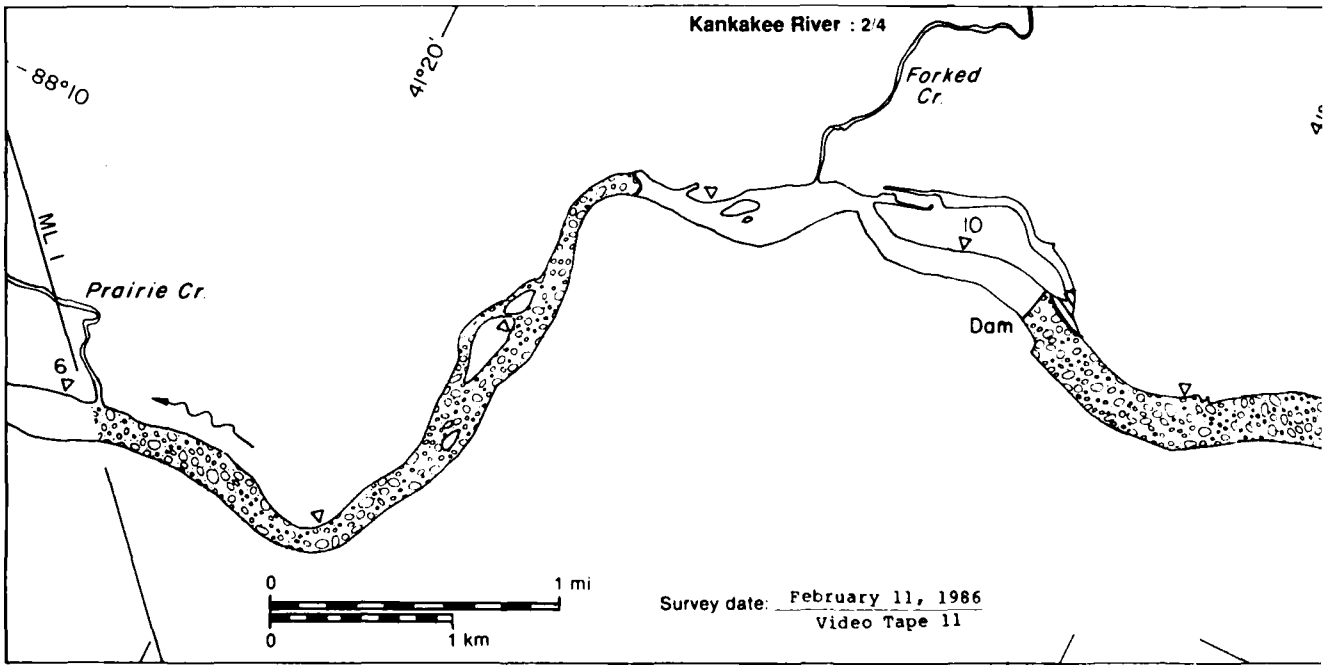
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.52	NA
Solid ice cover	0.15	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.52	10
Total area ($m^2 \times 10^6$)	8.19	

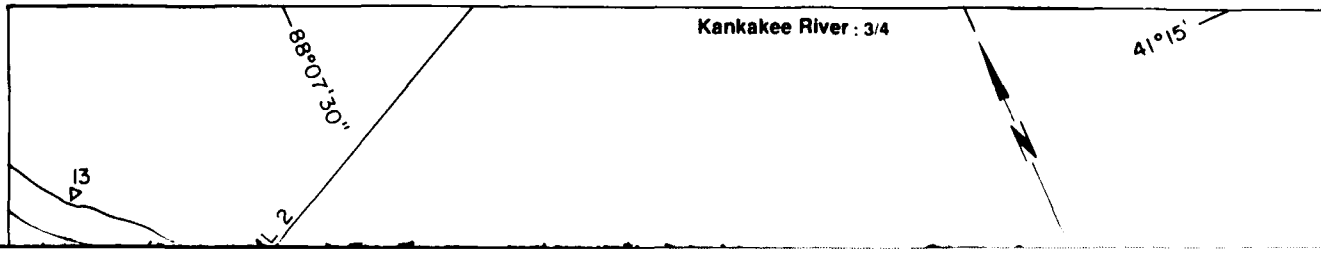


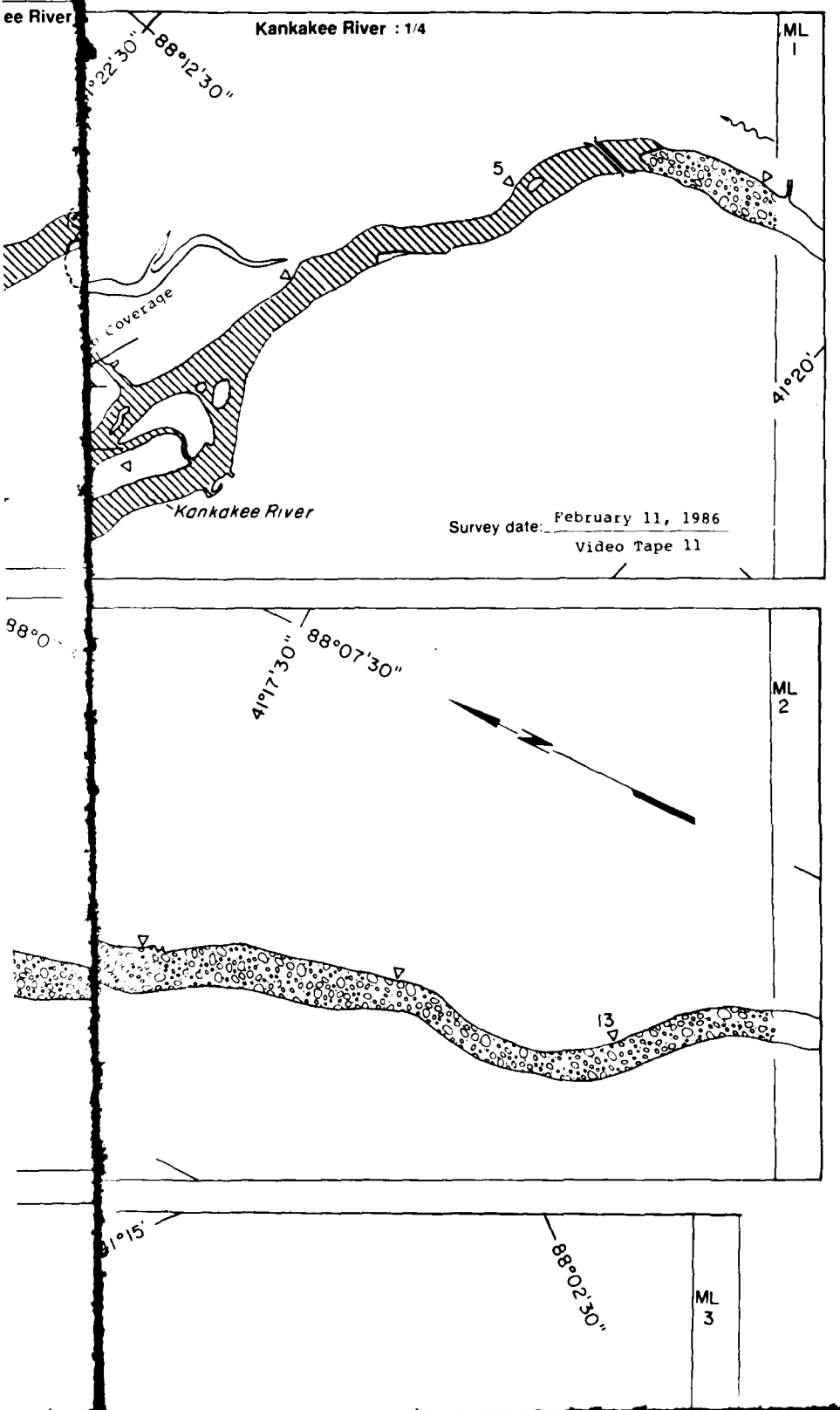
1986
11

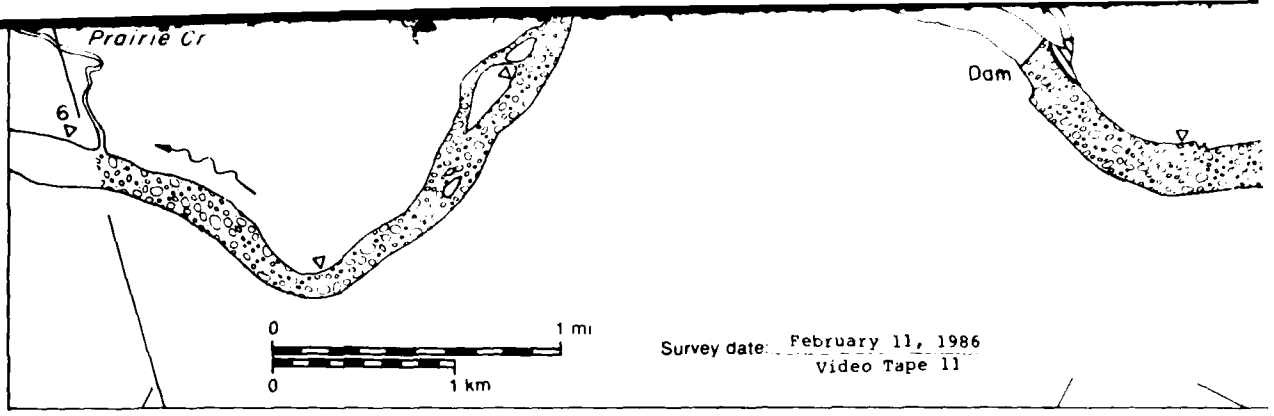
11 February 1986

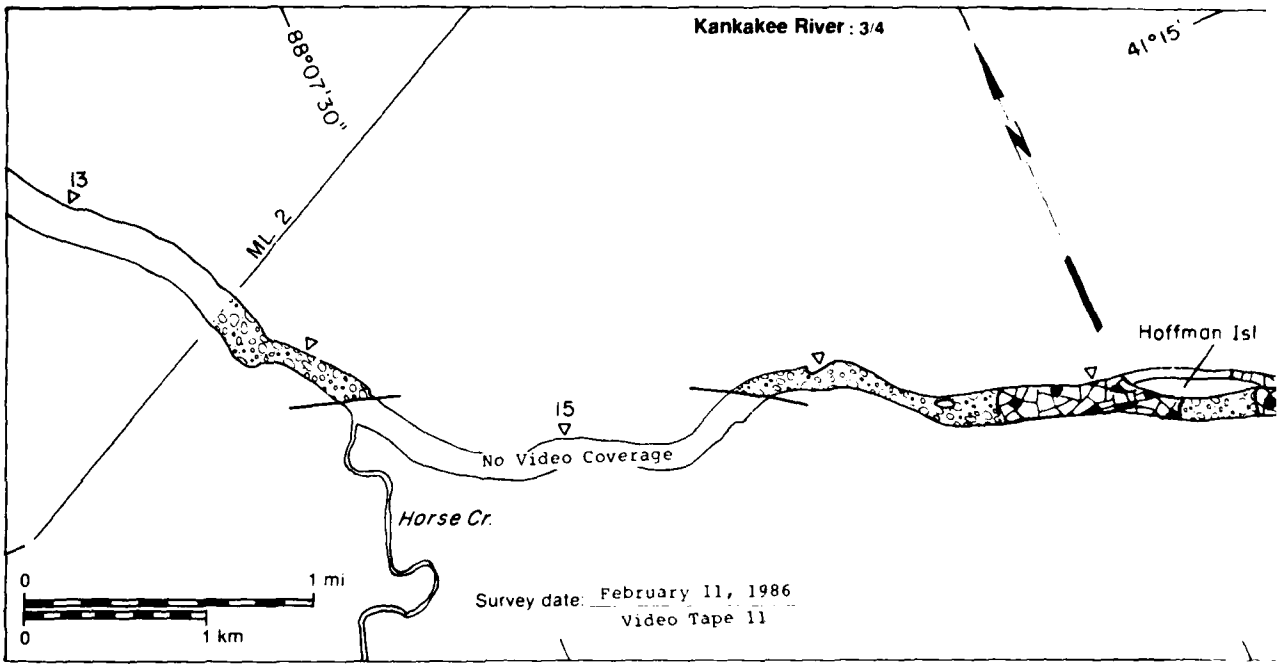


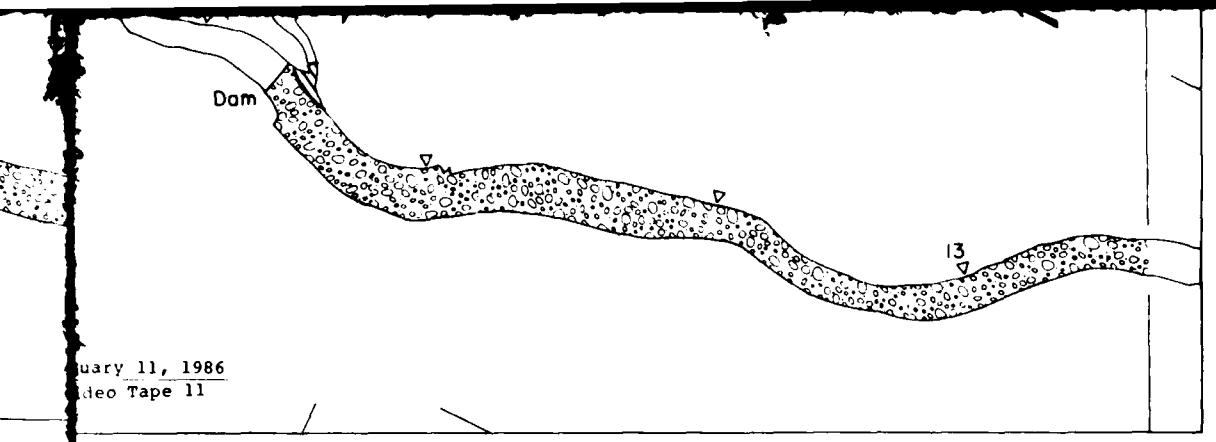




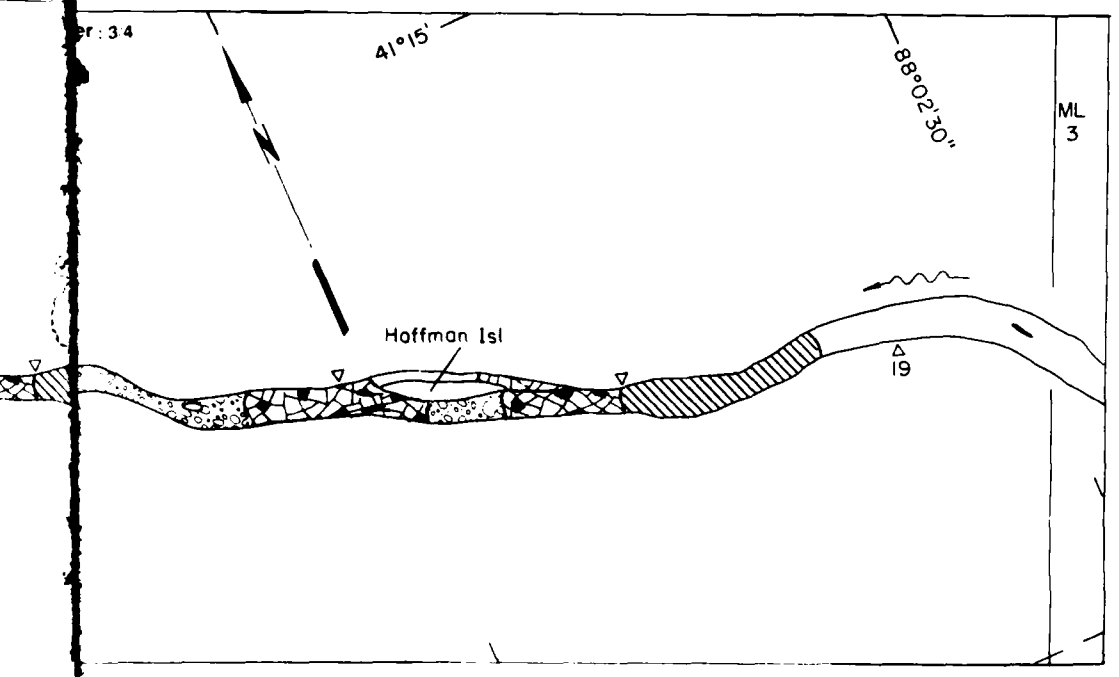

ee River
Kankakee River : 1/4
ML 1
°22'30"
88°12'30"
5
coverage
41°20'
Kankakee River
Survey date: February 11, 1986
Video Tape 11
98°0
41°17'30"
88°07'30"
ML 2
13
1°15'
88°02'30"
ML 3

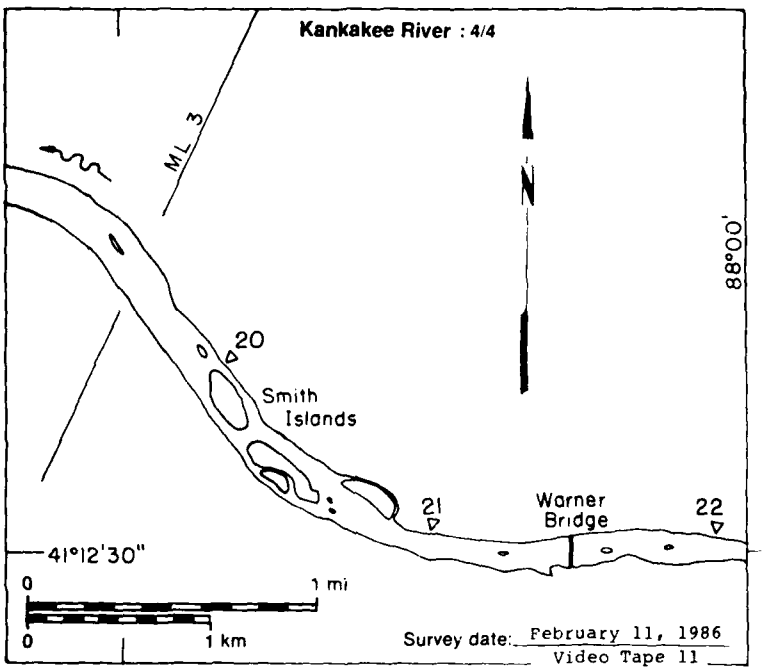

Prairie Cr
6
Dam
0
1 mi
0
1 km
Survey date: February 11, 1986
Video Tape 11


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
Hoffman Isl
15
No Video Coverage
Horse Cr.
0
1 mi
0
1 km
Survey date: February 11, 1986
Video Tape 11



uary 11, 1986
ideo Tape 11





Kankakee River

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

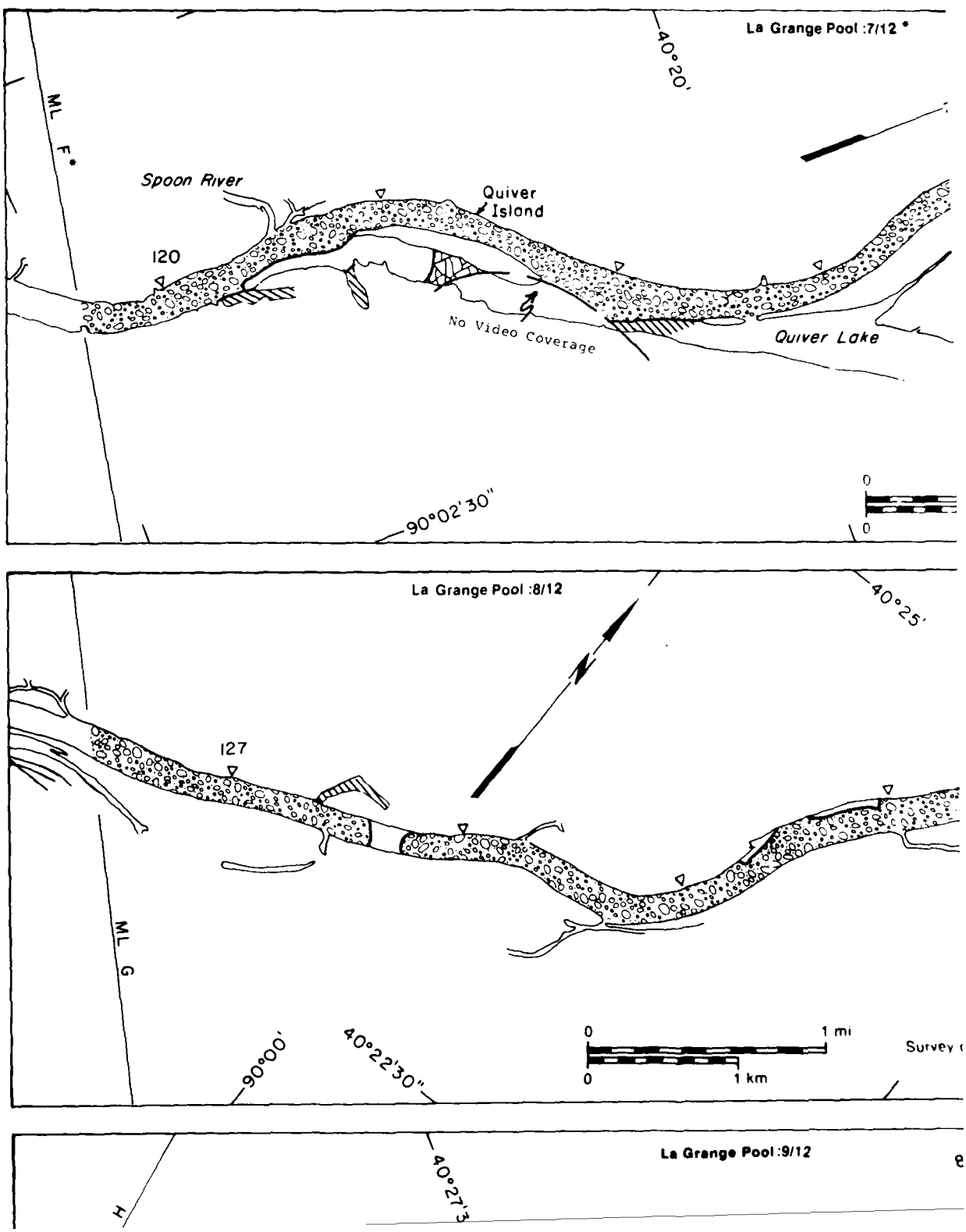
Total area (m^2 x 1

11 February 1986

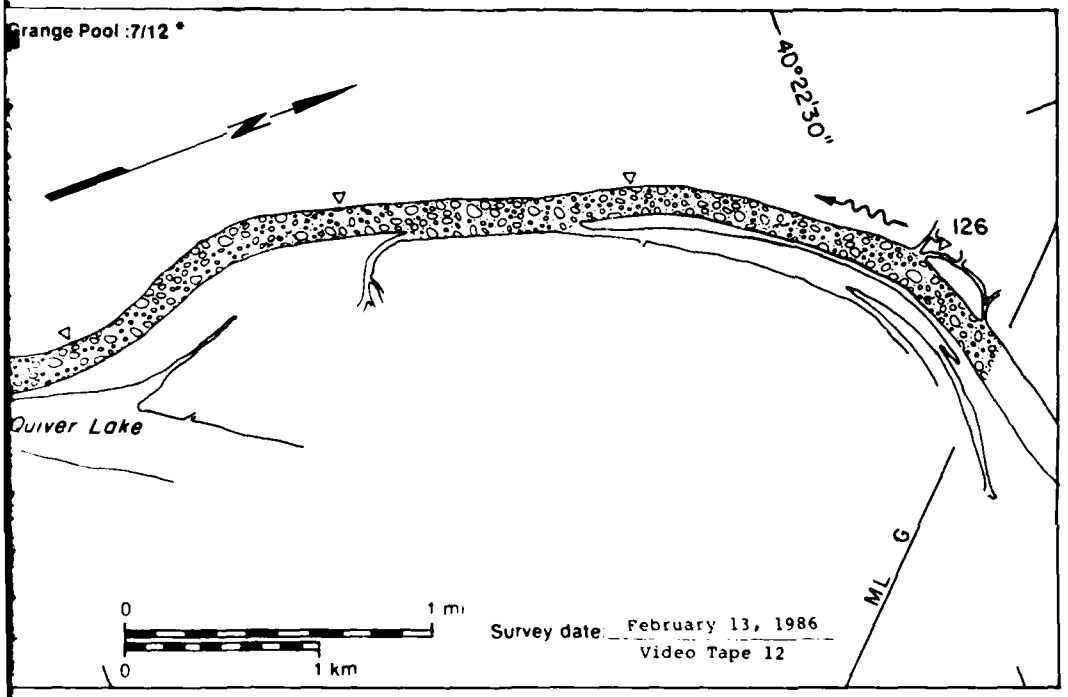
Kankakee River

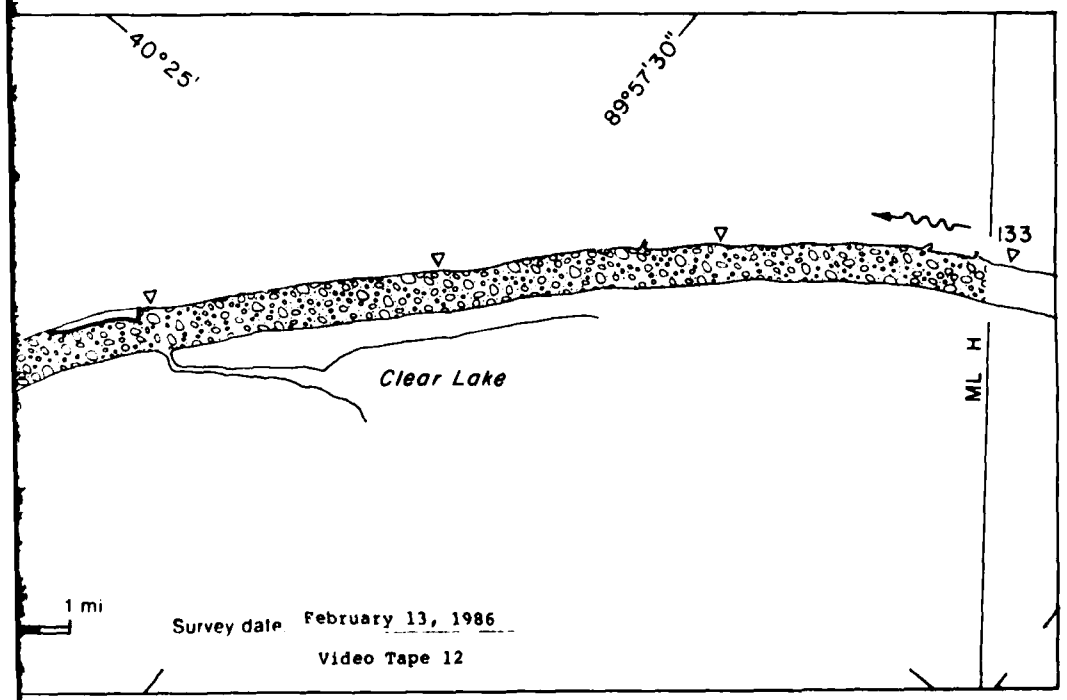
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.37	NA
Solid ice cover	2.71	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.03	NA
Fragmented ice cover with open-water areas	0.25	60
Ice floes or frazil slush and pans	2.31	70
Total area ($m^2 \times 10^6$)	7.30*	

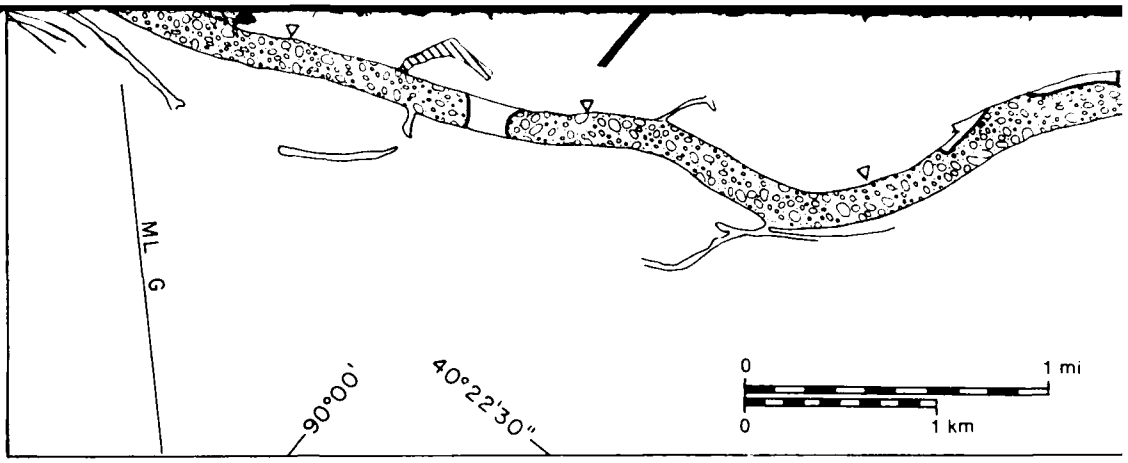
* Includes 0.63×10^6 m^2 of no video coverage

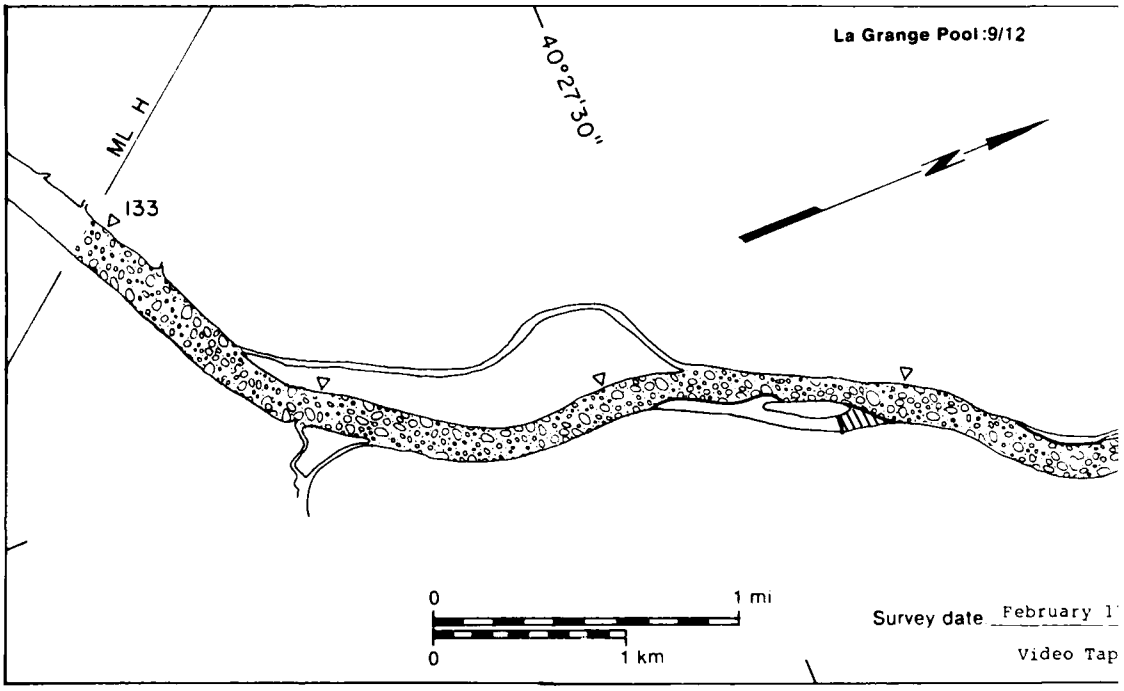

La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0
0
La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
La Grange Pool :9/12
40°27'3
H

13 February 1986

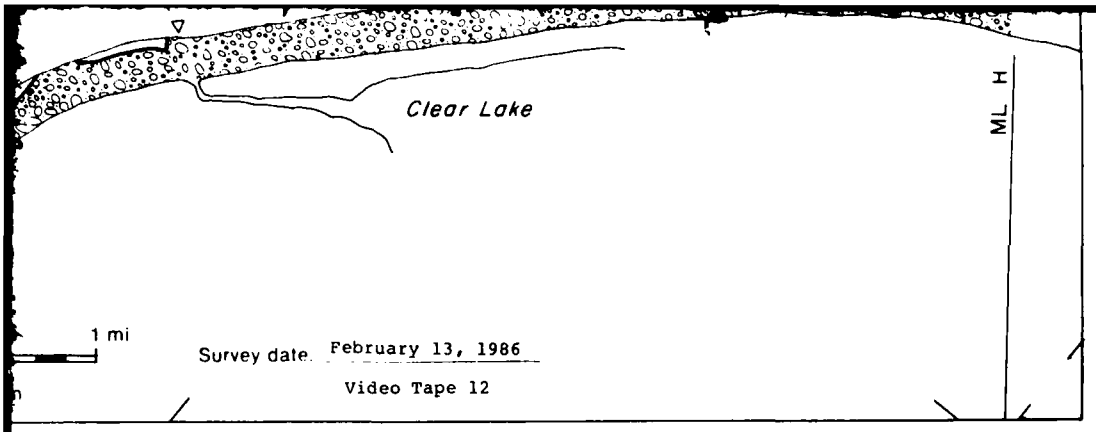


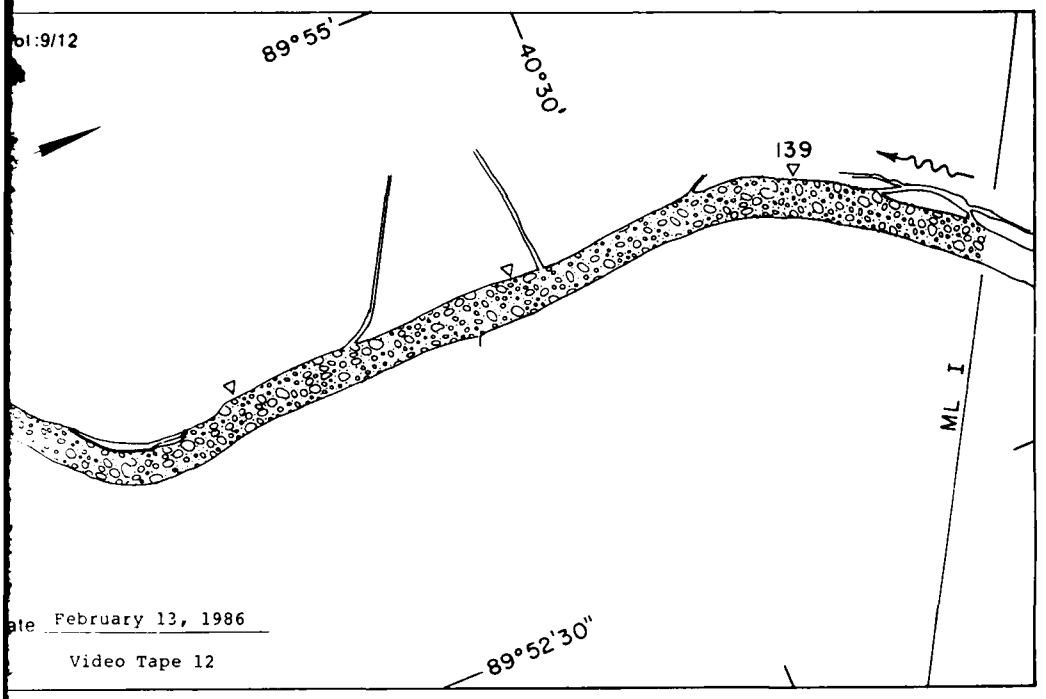




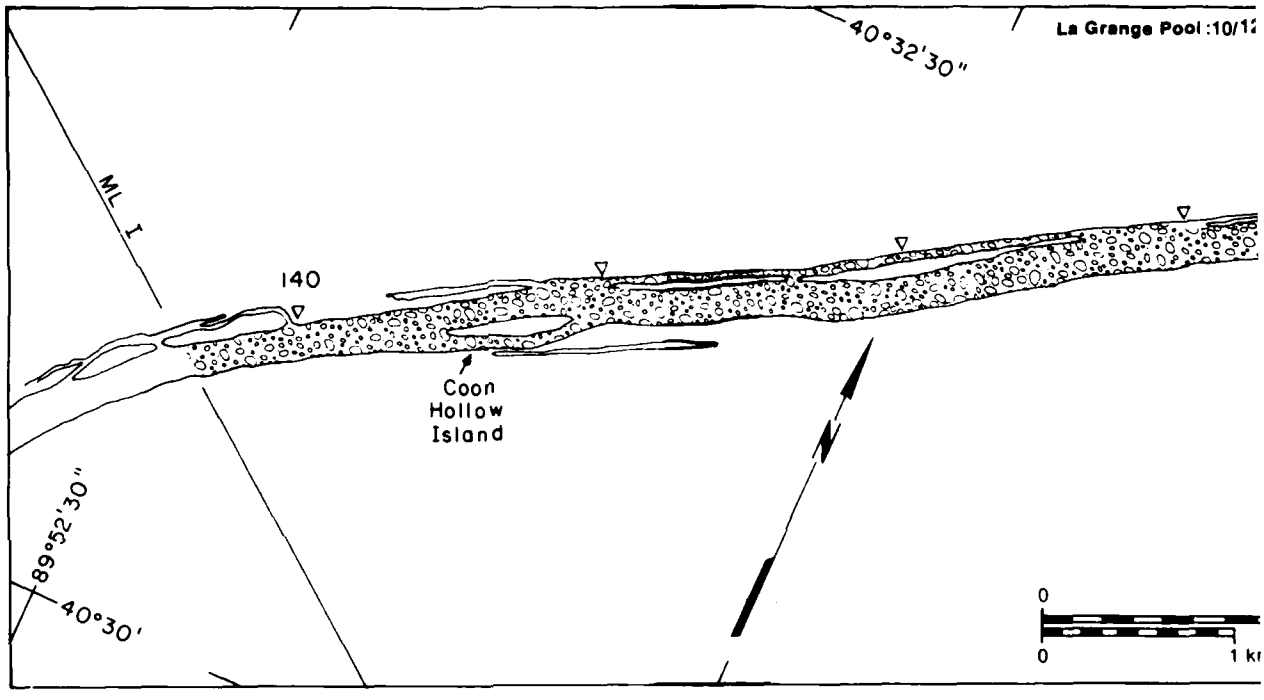


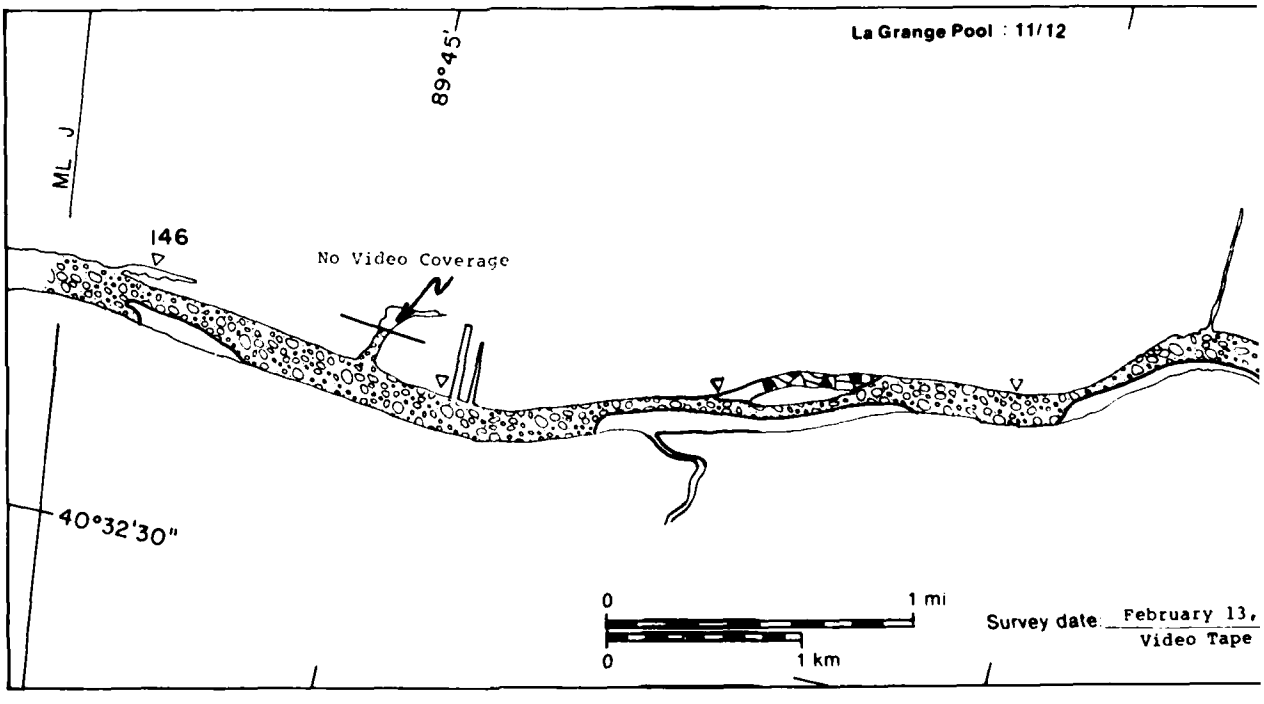
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

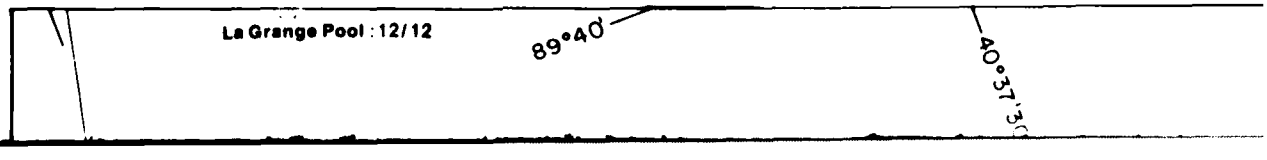

Clear Lake
ML H
1 mi
Survey date February 13, 1986
Video Tape 12

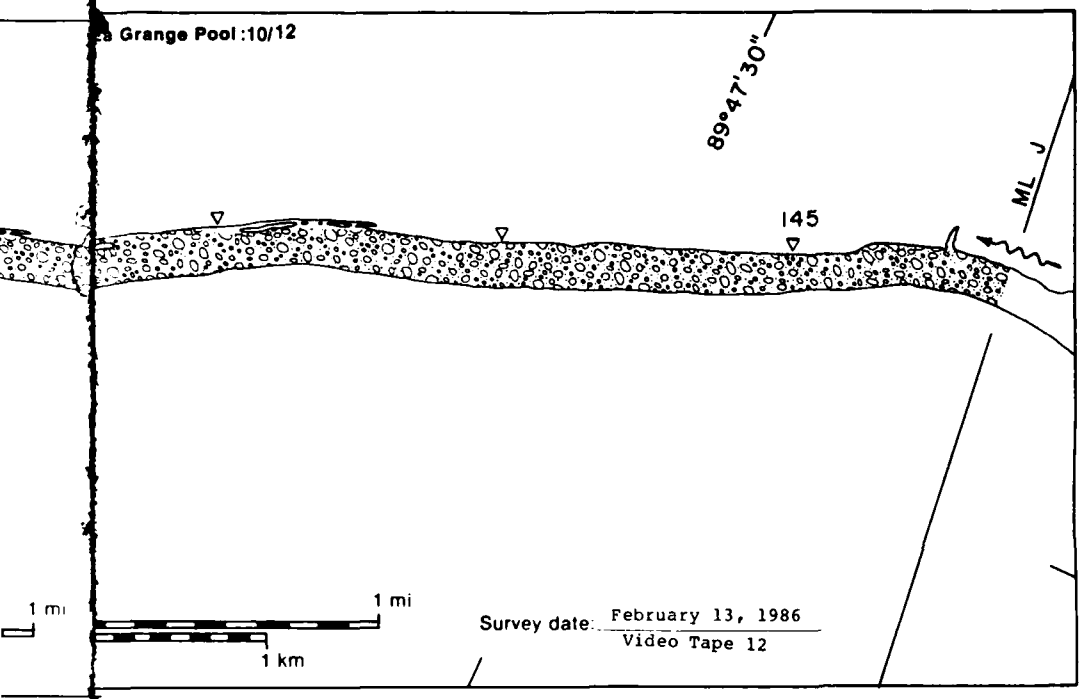

ol:9/12
89°55'
40°30'
139
ML I
ate February 13, 1986
Video Tape 12
89°52'30"

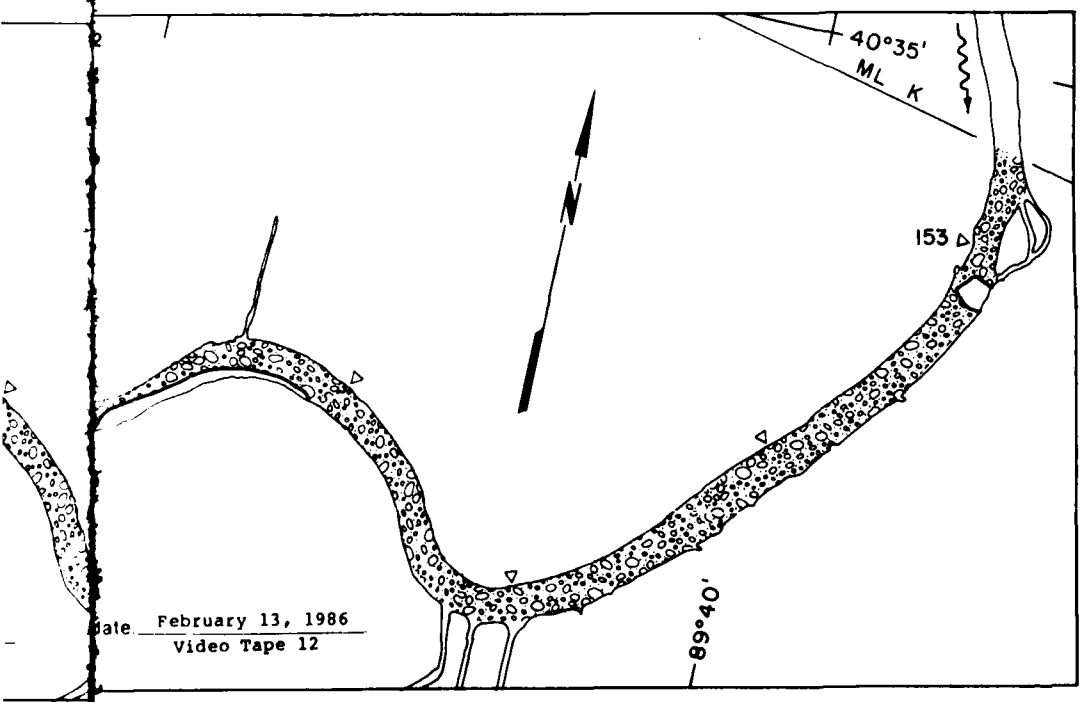
13 February 1986







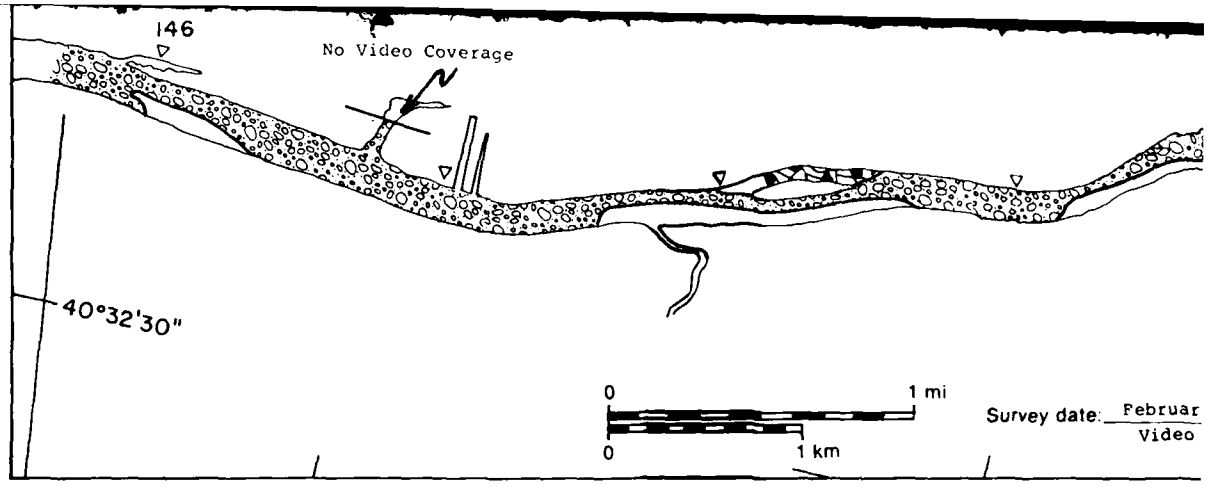


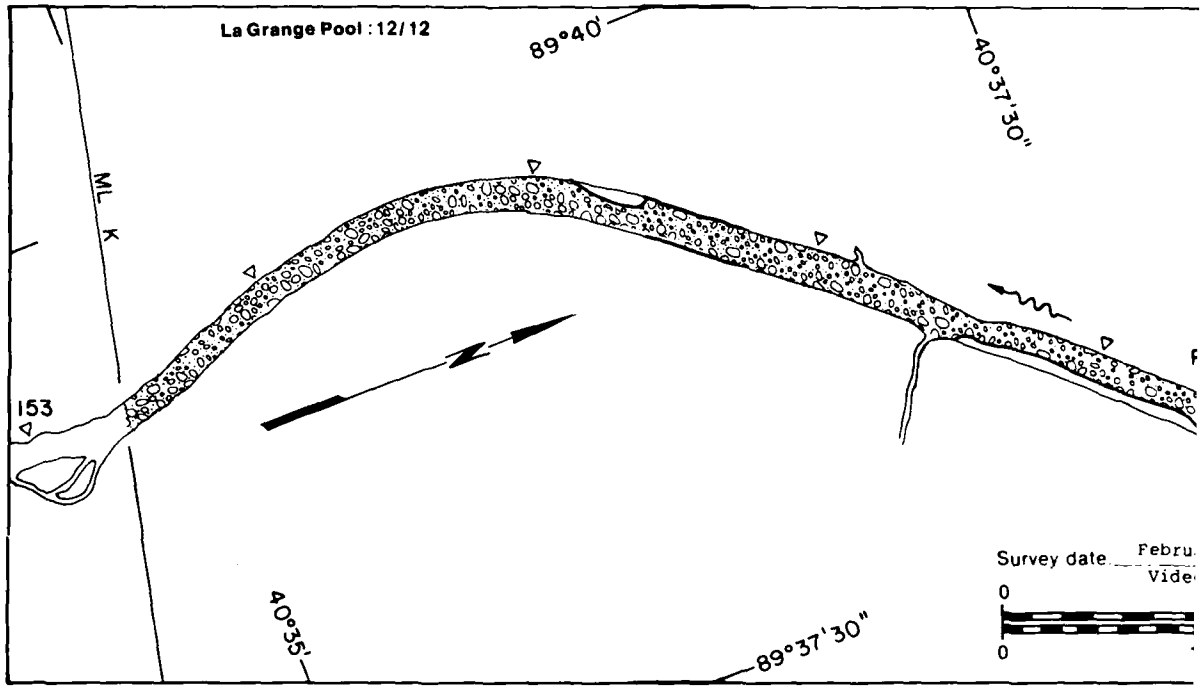


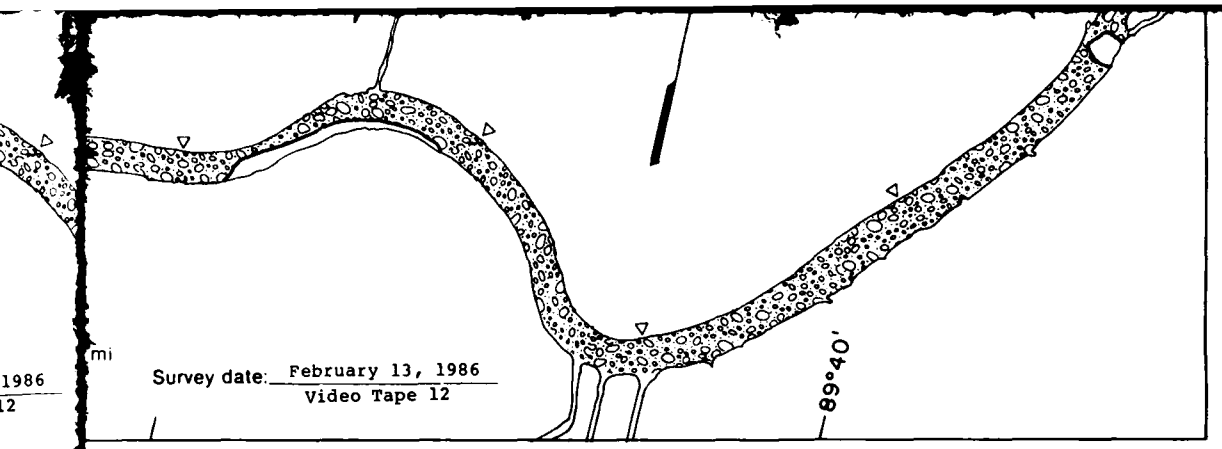
La Grange Pool

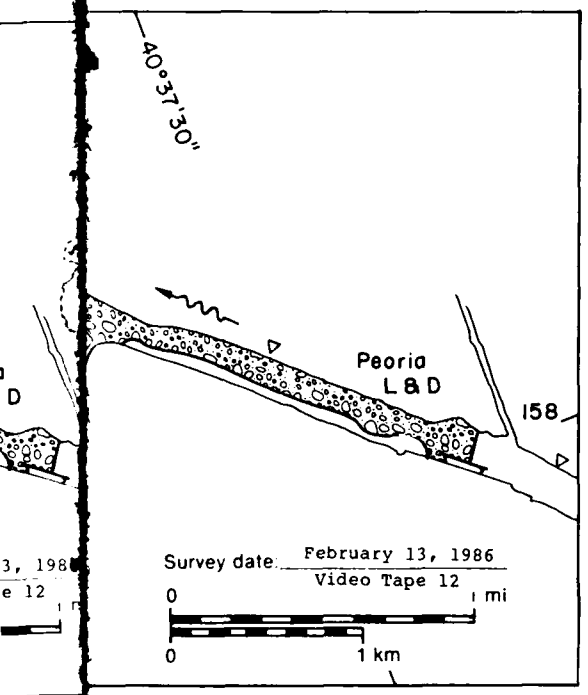
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


146
No Video Coverage
40°32'30"
0
1 mi
0
1 km
Survey date: Februar
Video


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Survey date Febru
Vide
0
0
40°35'
89°37'30"



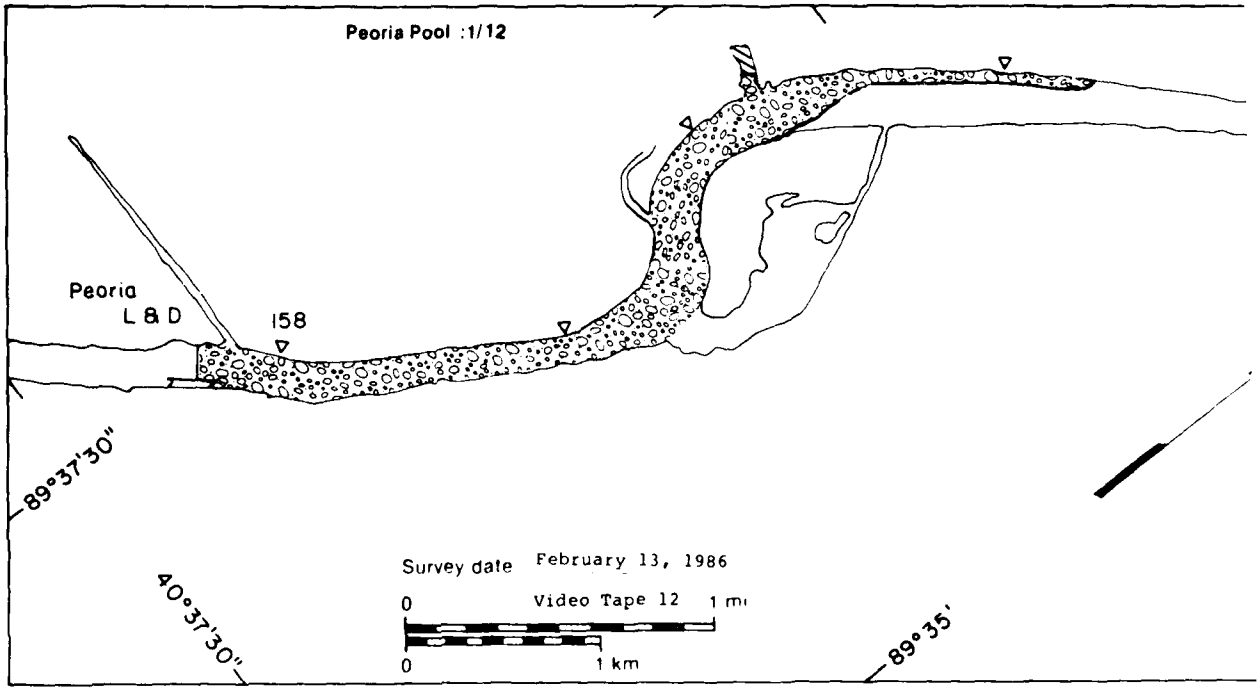


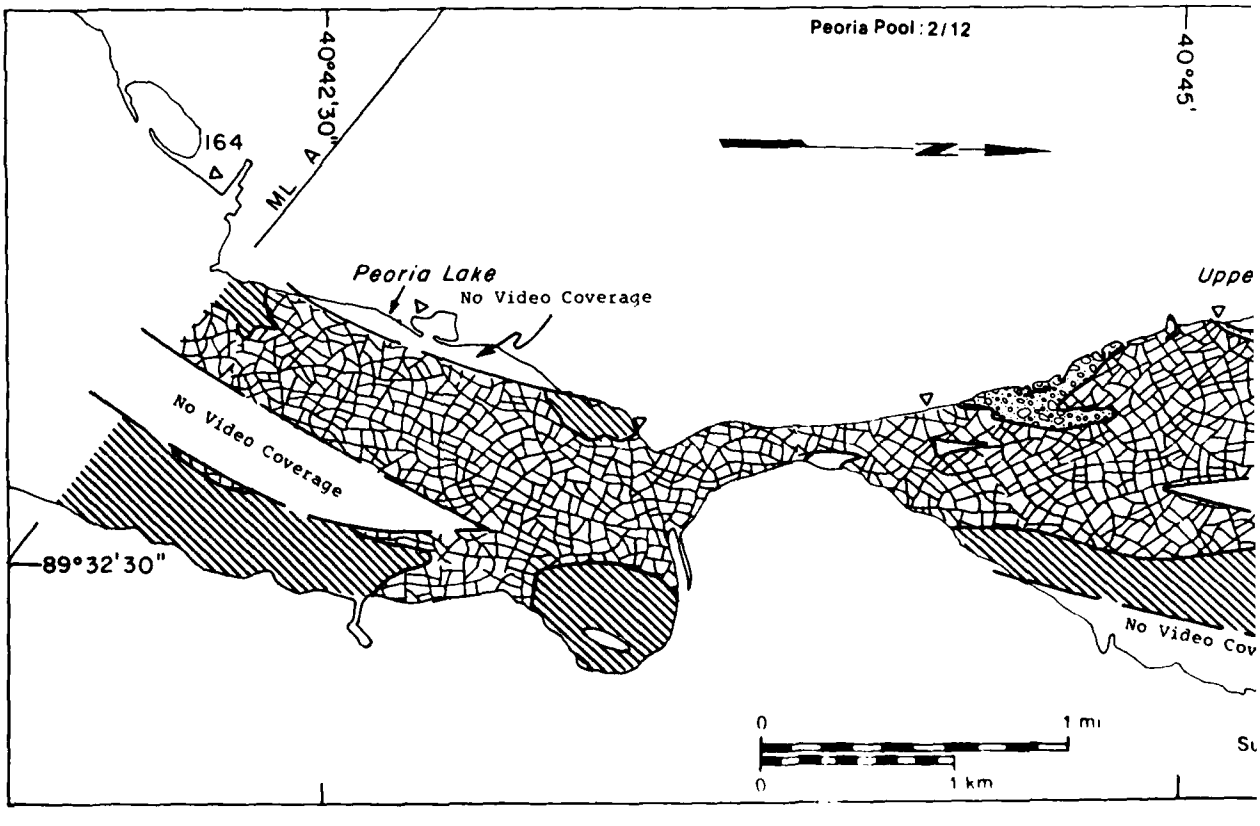
La Grange Pool

MAP UNITS

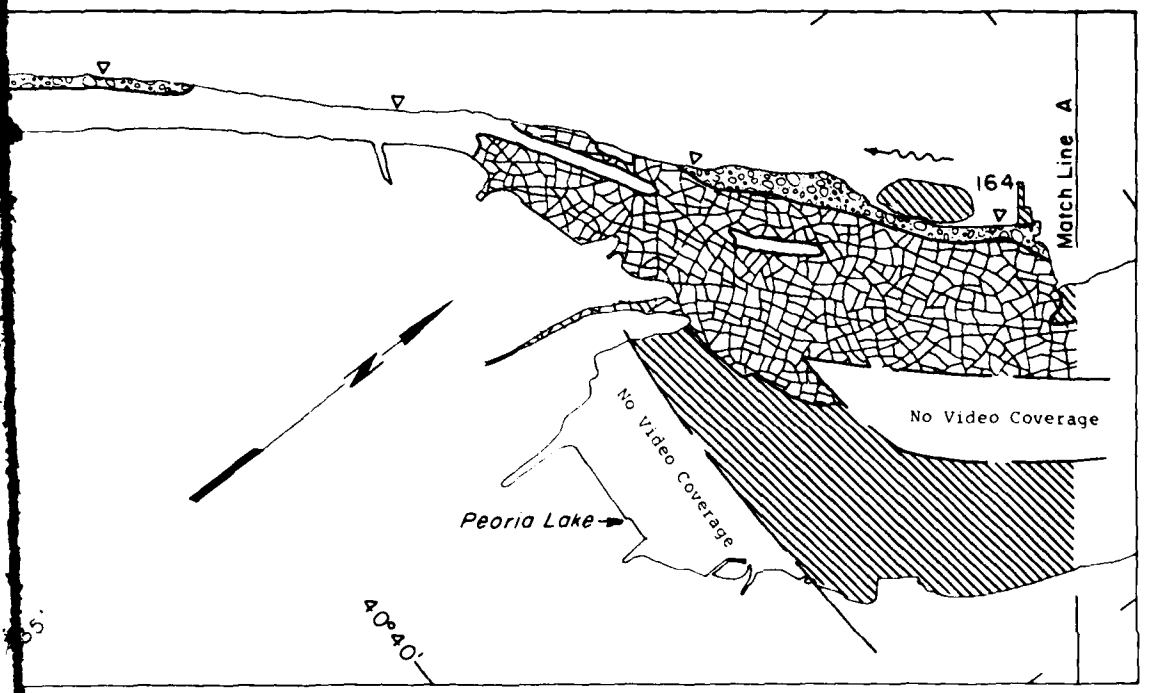
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.87	NA
Solid ice cover	0.11	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.05	NA
Fragmented ice cover with open-water areas	0.03	70
Ice floes or frazil slush and pans	10.43	50
Total area ($m^2 \times 10^6$)	11.71*	

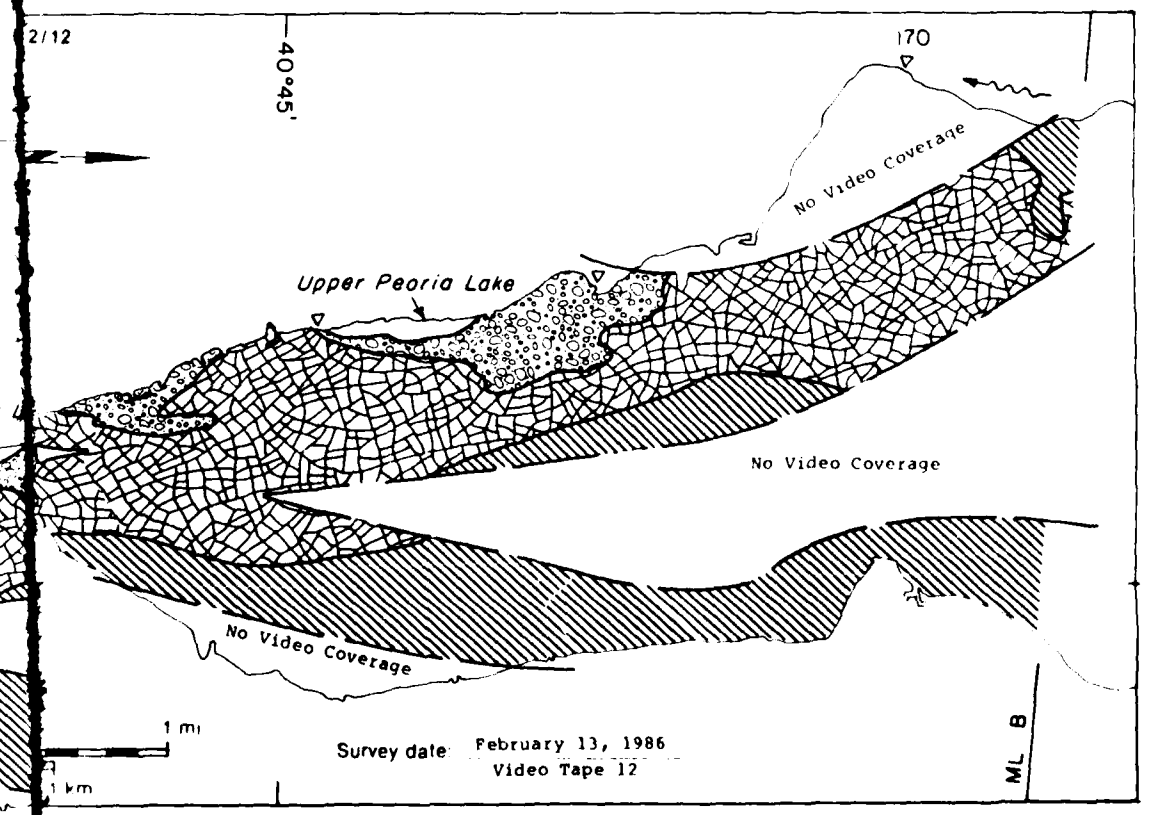
* Includes 0.22×10^6 m^2 of no video coverage

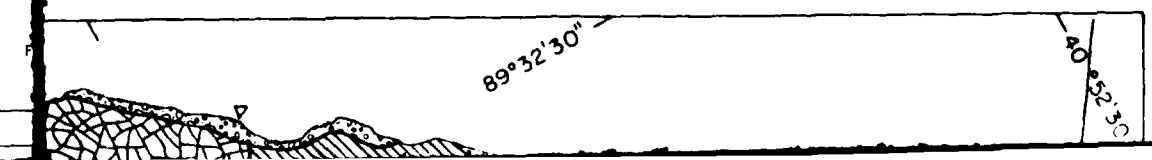

Peoria Pool :1/12
Peoria
L&D
158
89°37'30"
40°37'30"
Survey date February 13, 1986
0
Video Tape 12
1 mi
0
1 km
89°35'

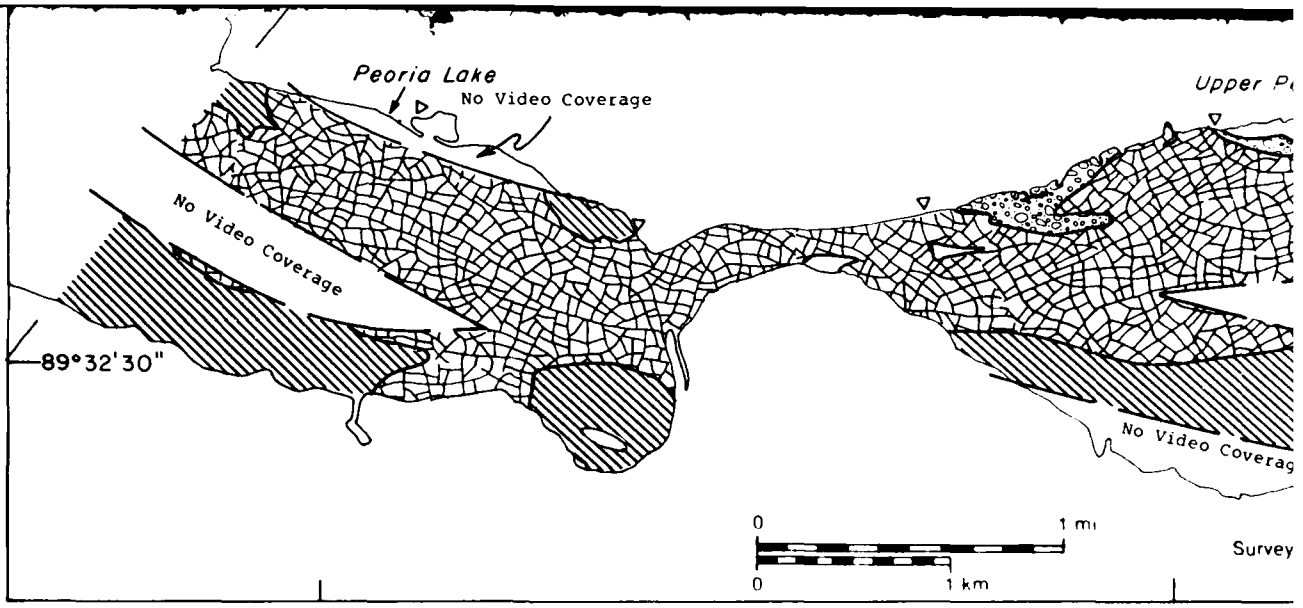

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
No Video Coverage
No Video Coverage
89°32'30"
No Video Cov
0
1 mi
0
1 km

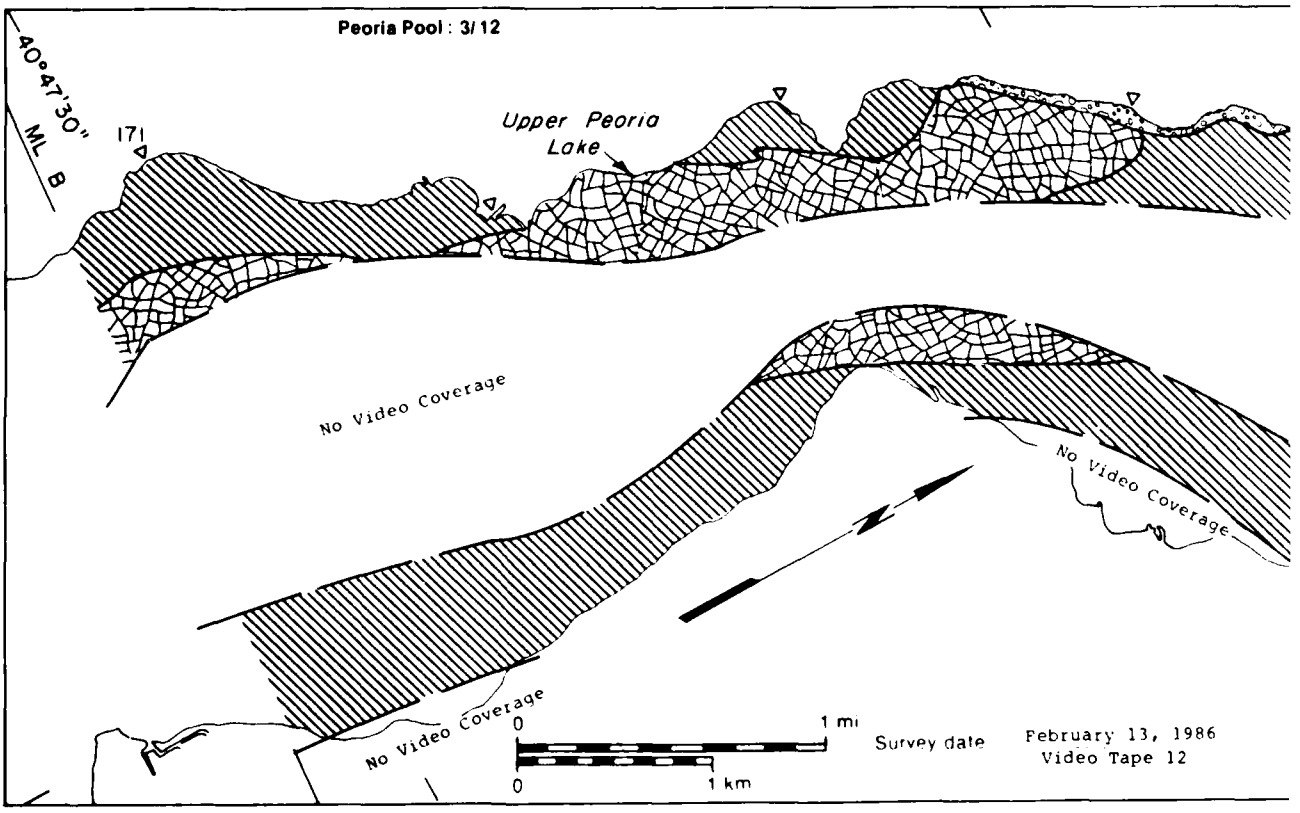
13 February 1986

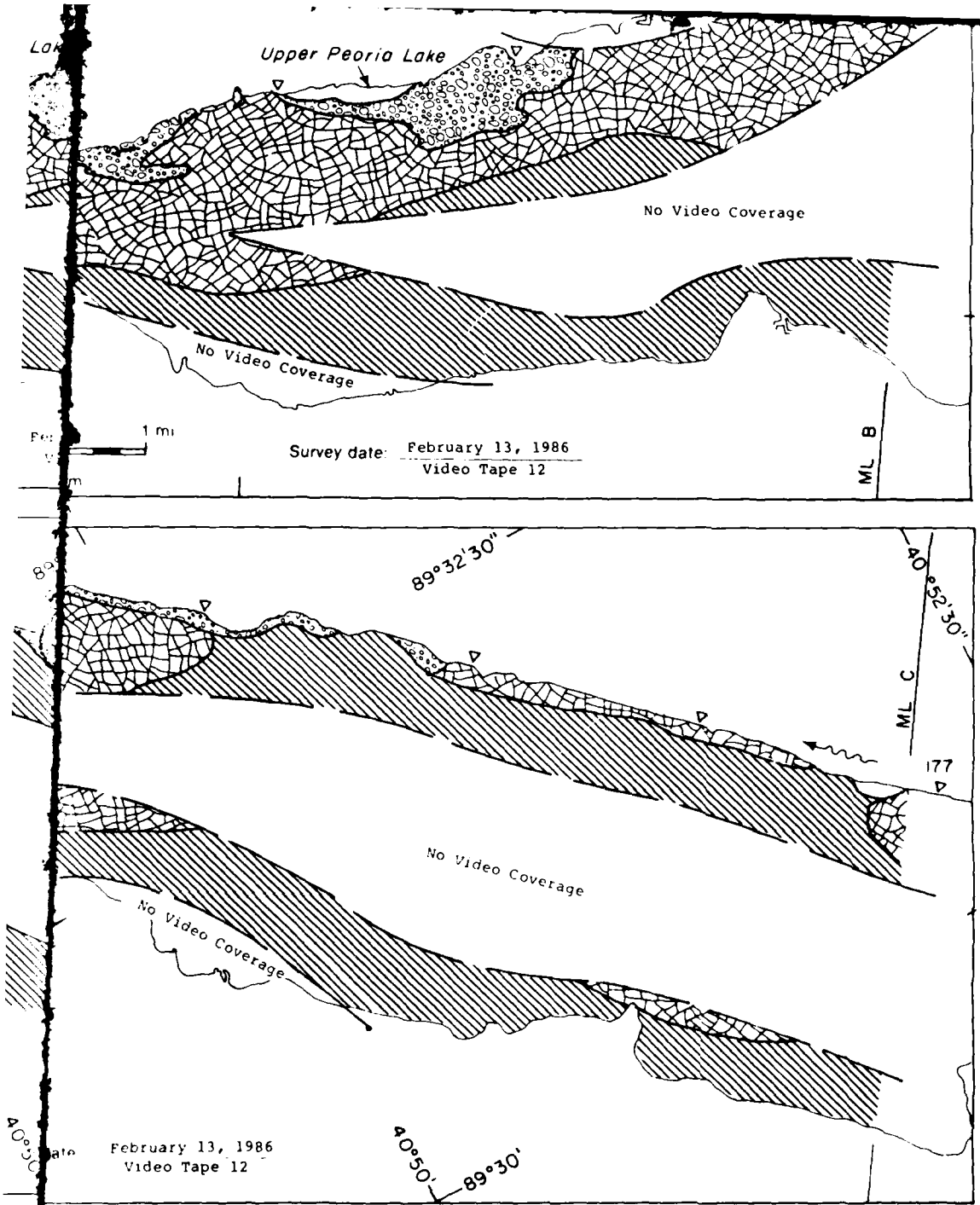




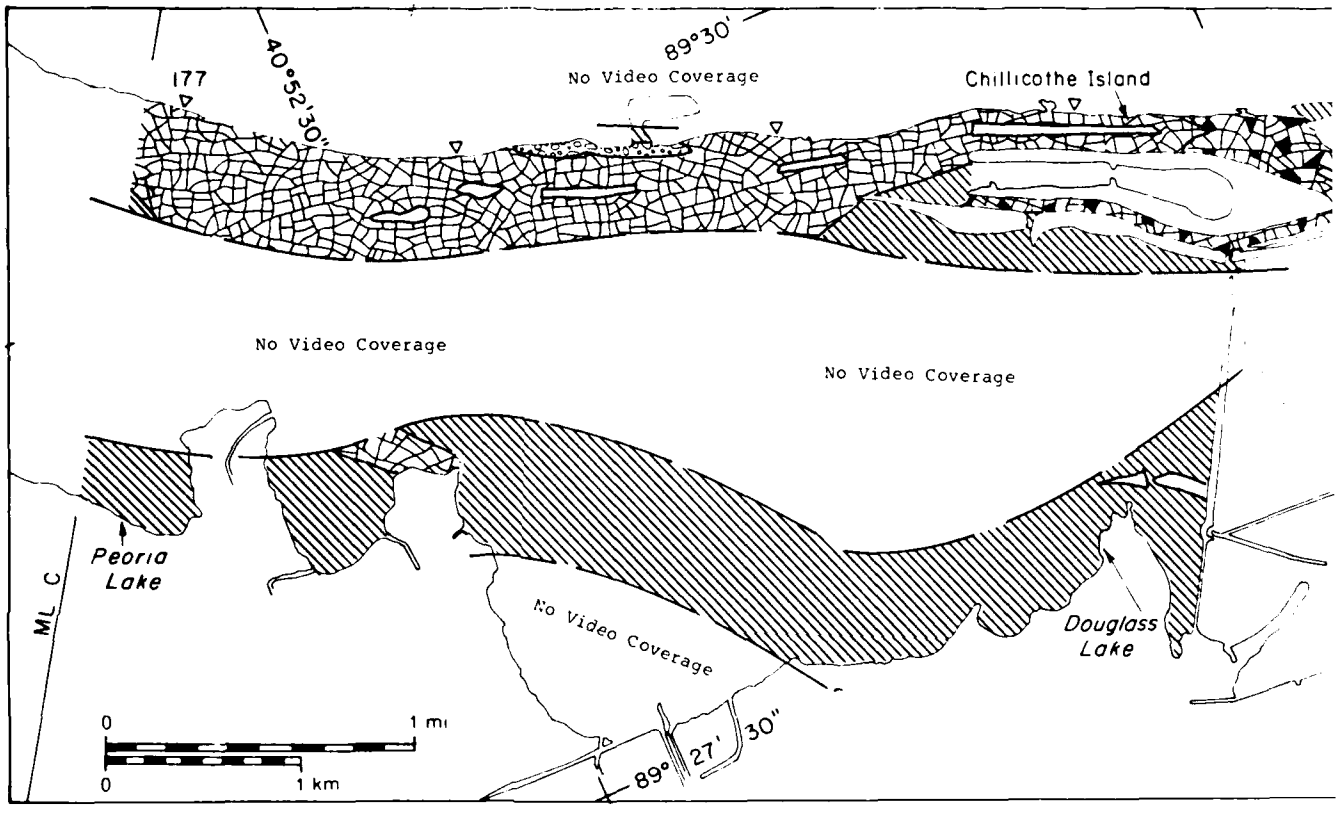


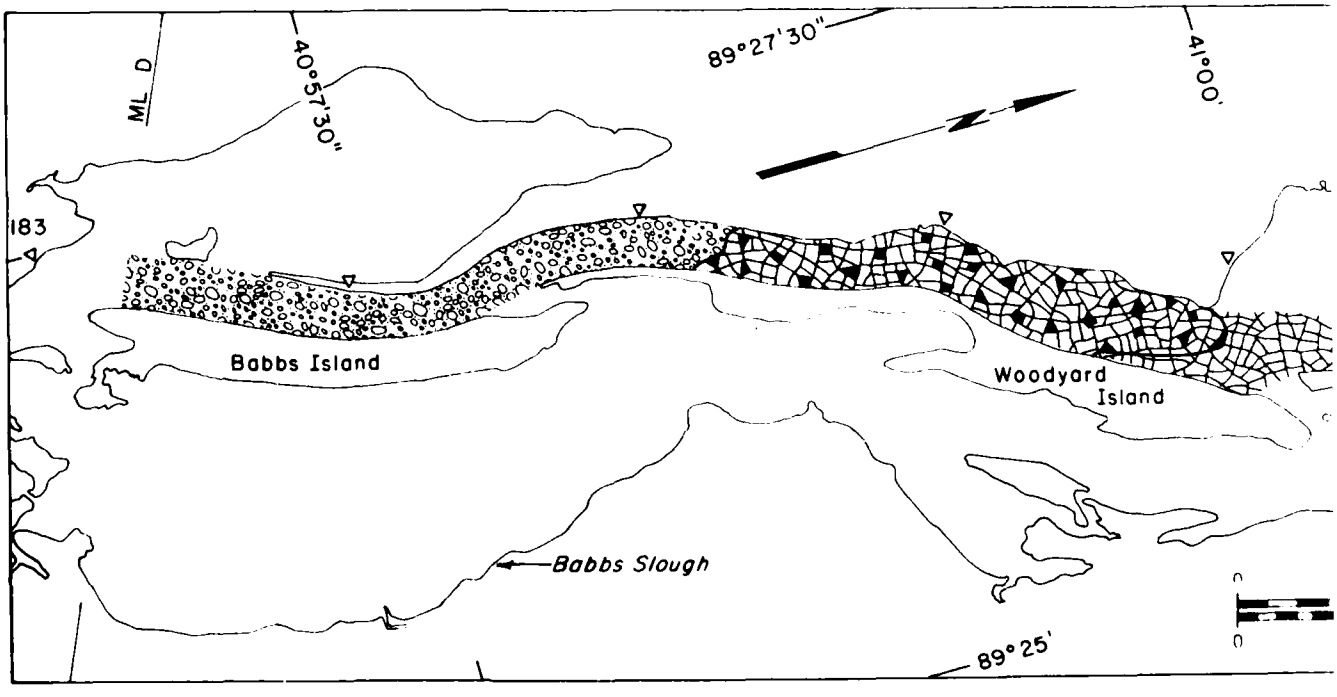

Peoria Lake
No Video Coverage
Upper P
No Video Coverage
89°32'30"
No Video Coverag
0
1 mi
0
1 km
Survey

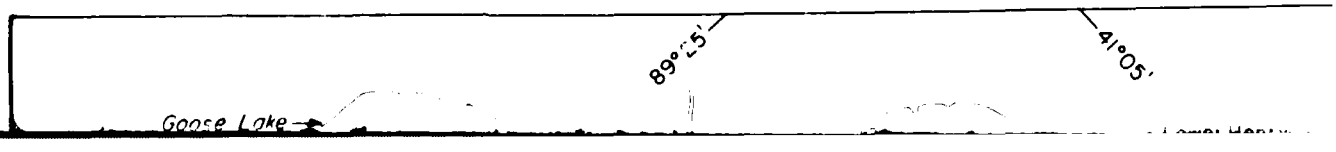

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date
February 13, 1986
Video Tape 12

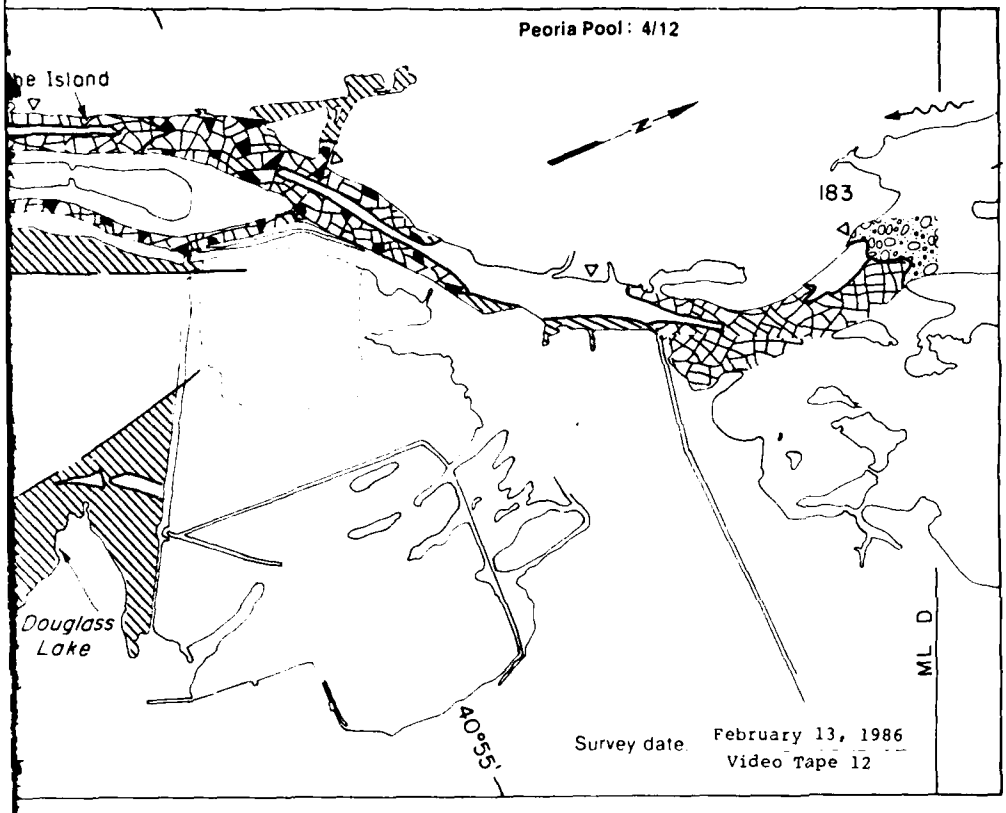

Upper Peoria Lake
No Video Coverage
No Video Coverage
1 mi
Survey date: February 13, 1986
Video Tape 12
ML B
89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
February 13, 1986
Video Tape 12
40°50'
89°30'

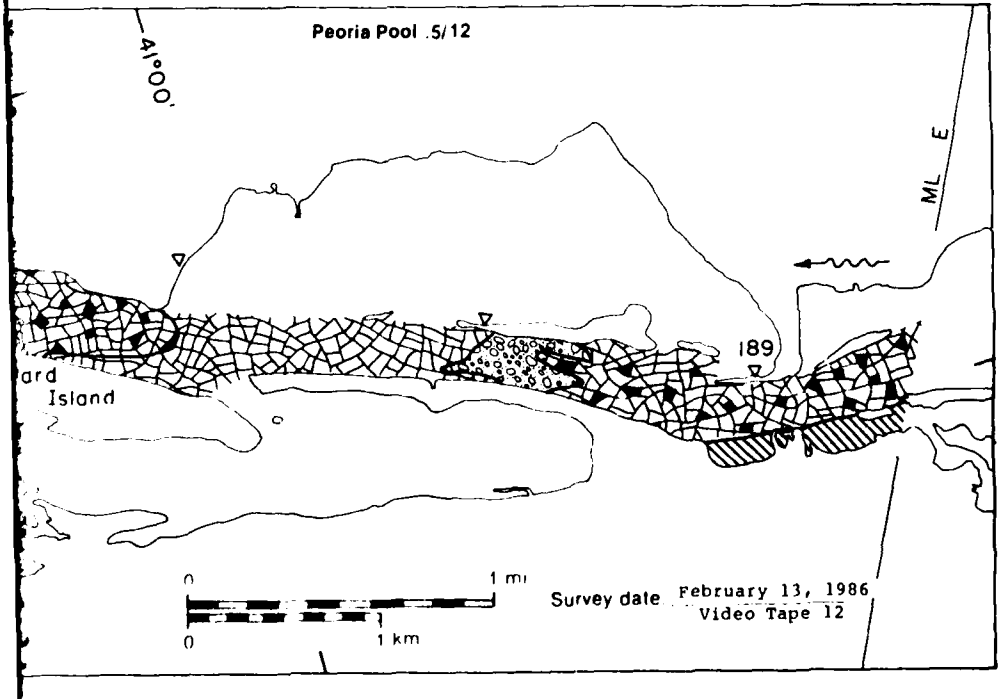
13 February 1986

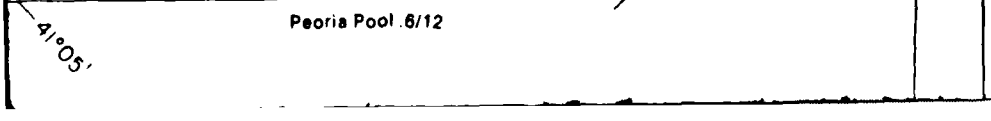


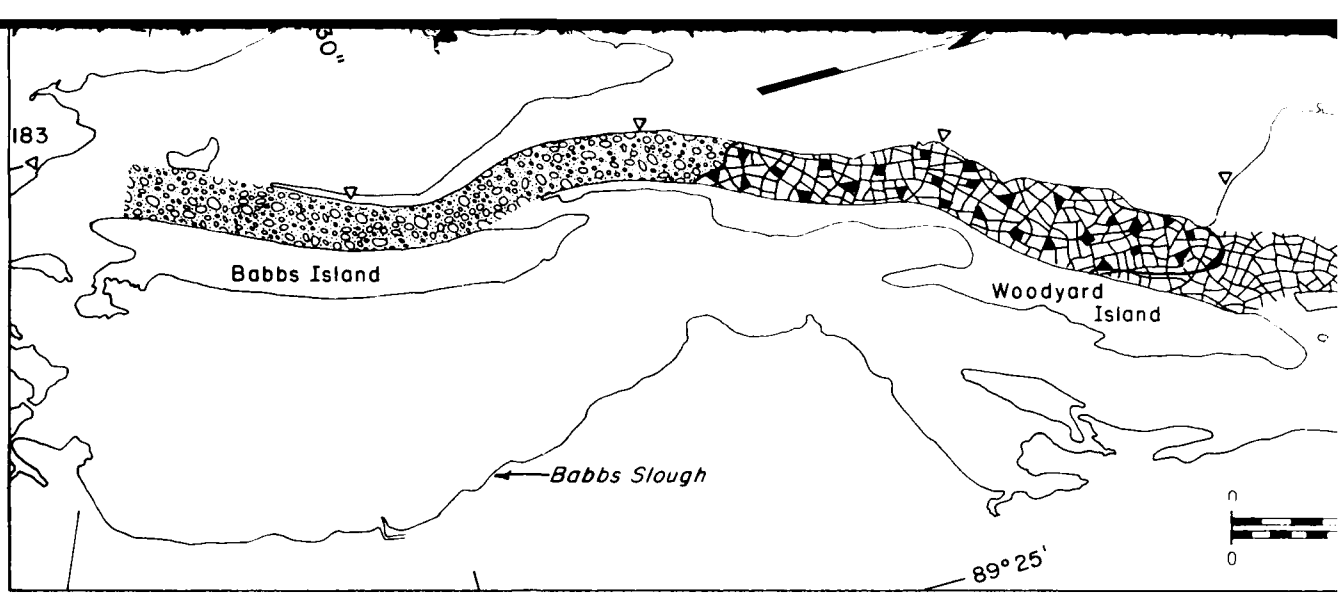


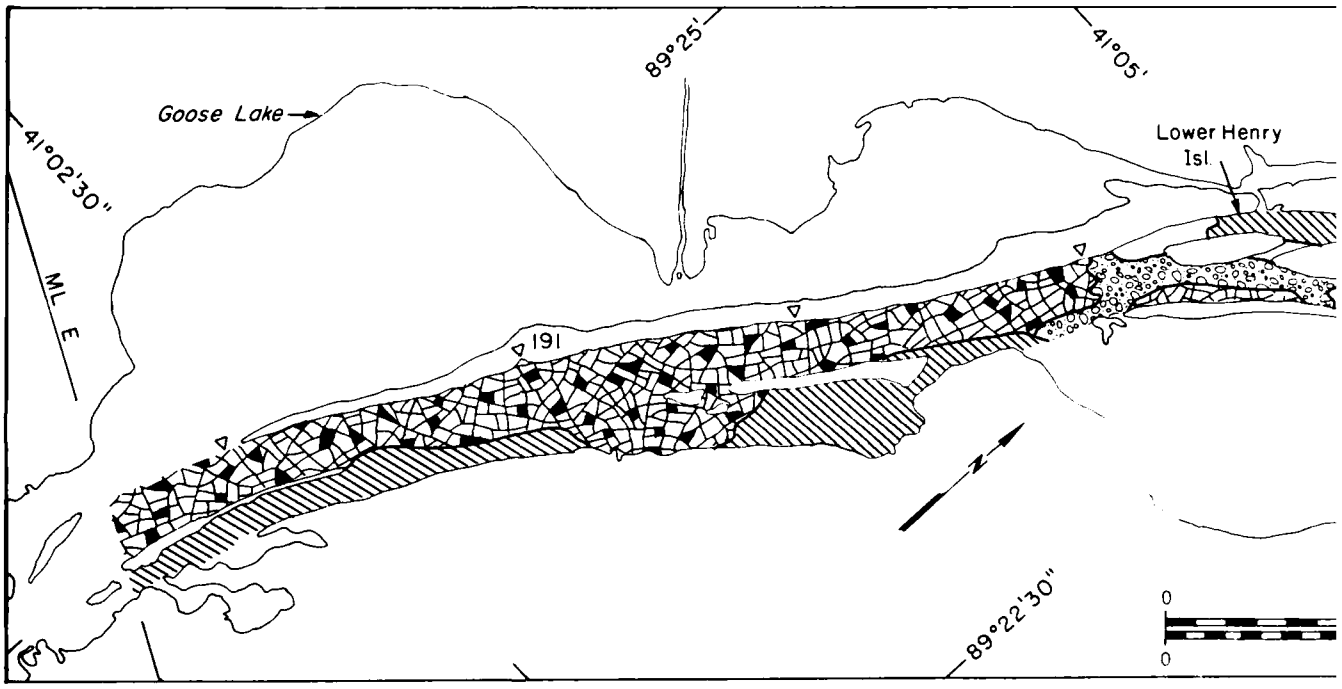


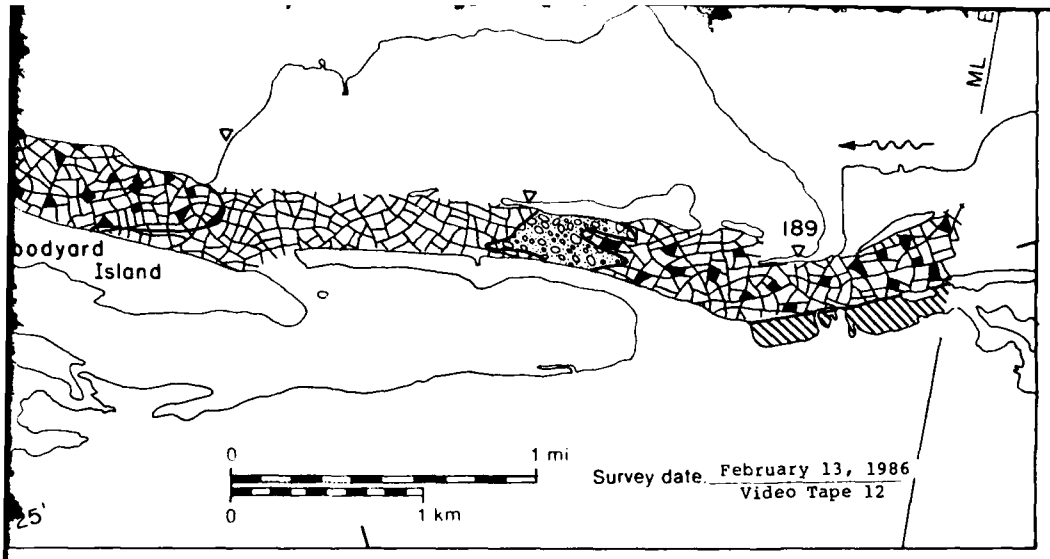

Peoria Pool : 4/12
e Island
183
Douglass
Lake
40°55'
ML D
Survey date February 13, 1986
Video Tape 12

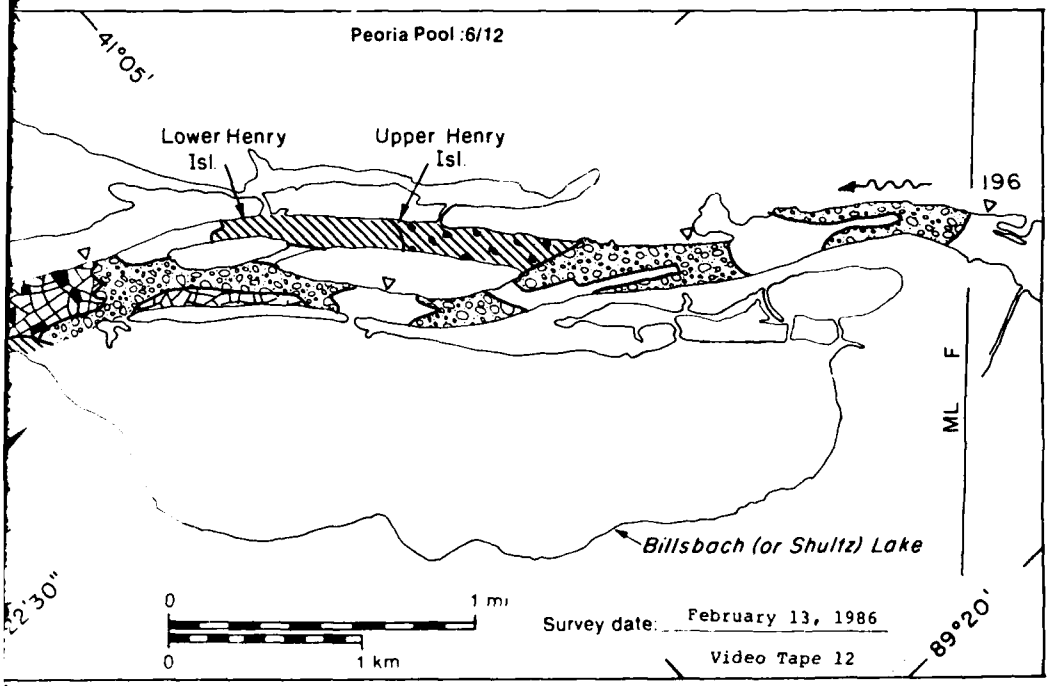

Peoria Pool .5/12
41°00'
ML E
189
ard
Island
0
1 mi
0
1 km
Survey date February 13, 1986
Video Tape 12

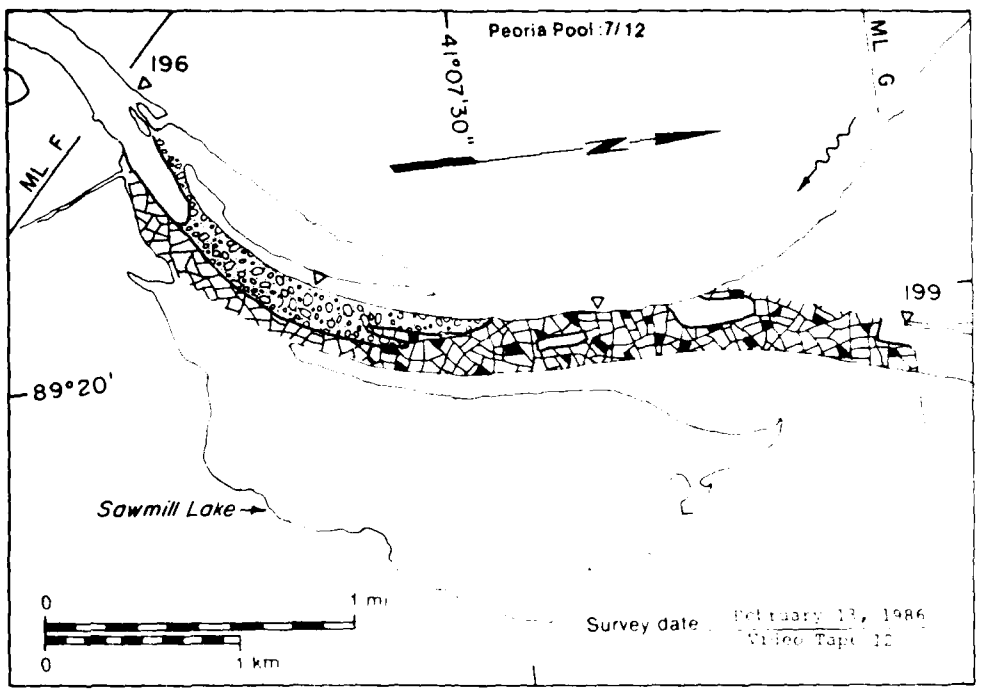

Peoria Pool .6/12
41°05'

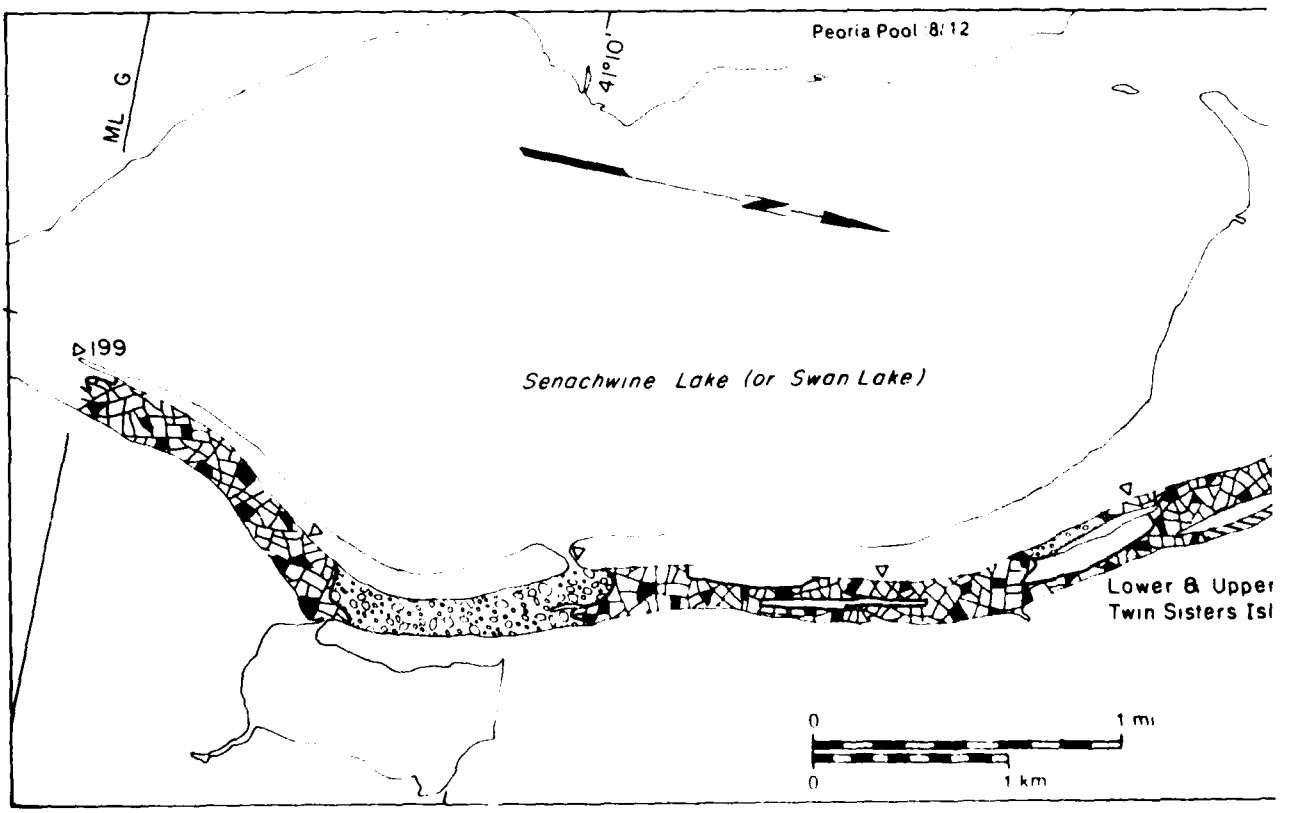

183
Babbs Island
Woodyard
Island
Babbs Slough
89° 25'
0
0


89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl.
ML E
191
89°22'30"
0
0

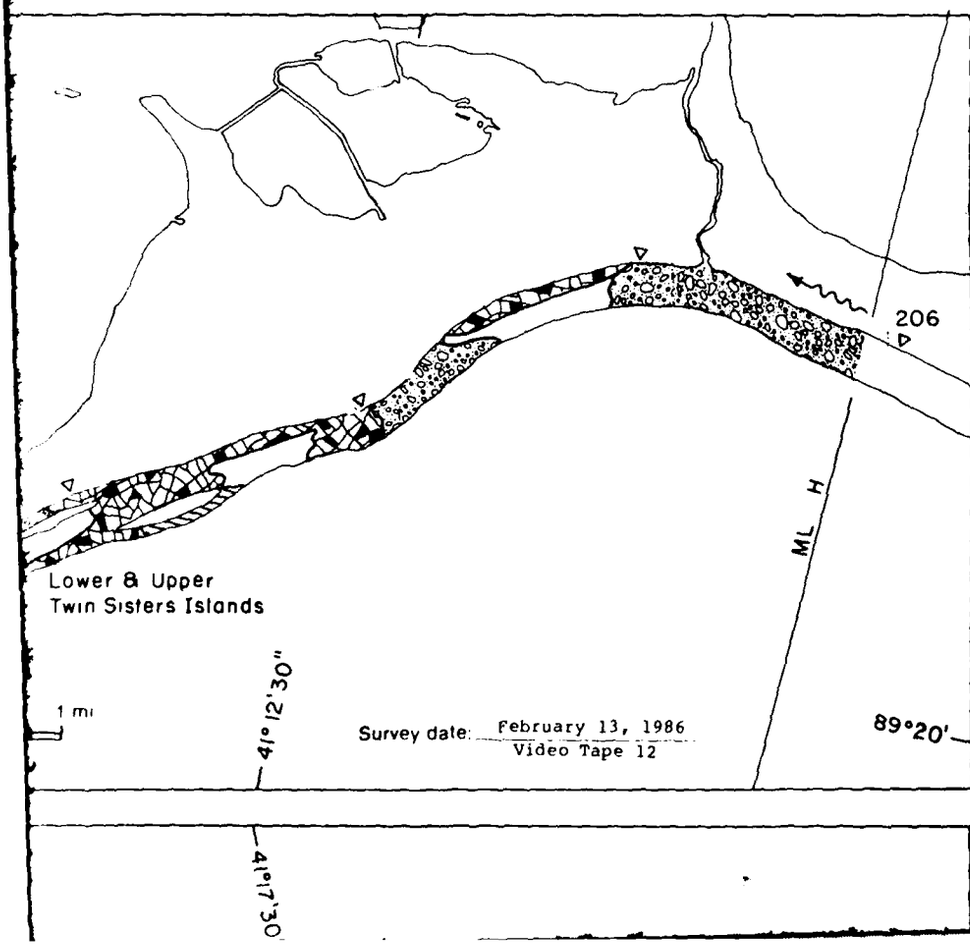

ML E
189
odyard
Island
0
1 mi
0
1 km
Survey date. February 13, 1986
Video Tape 12
25'

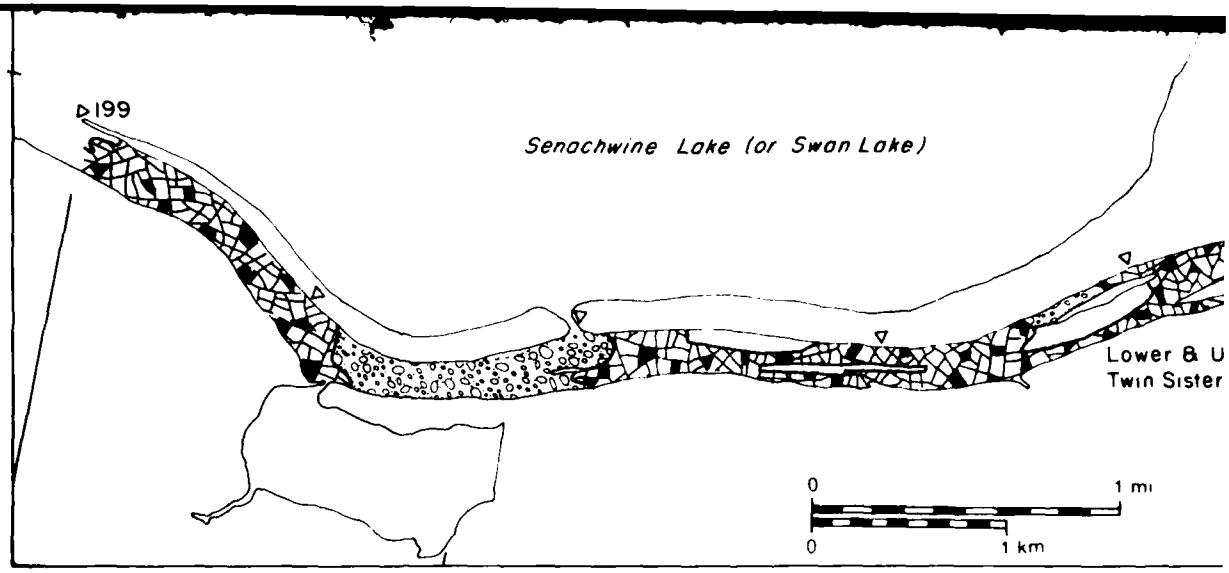

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: February 13, 1986
Video Tape 12
89°20'
22'30"

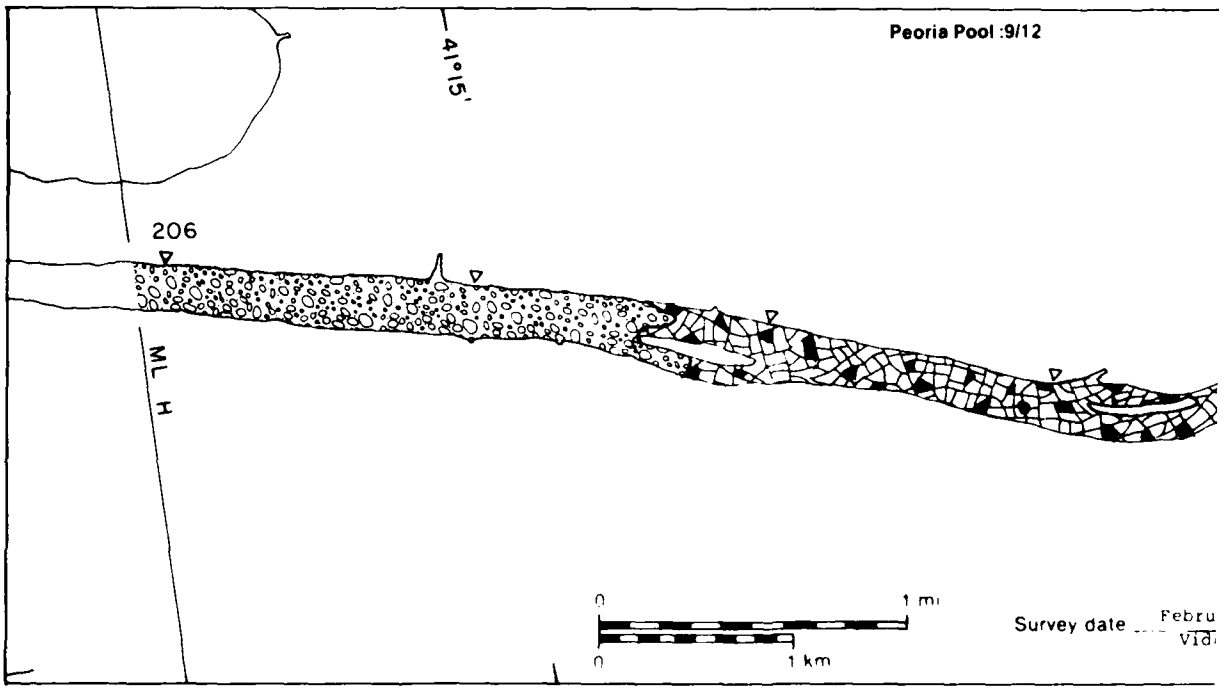

Peoria Pool 7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date

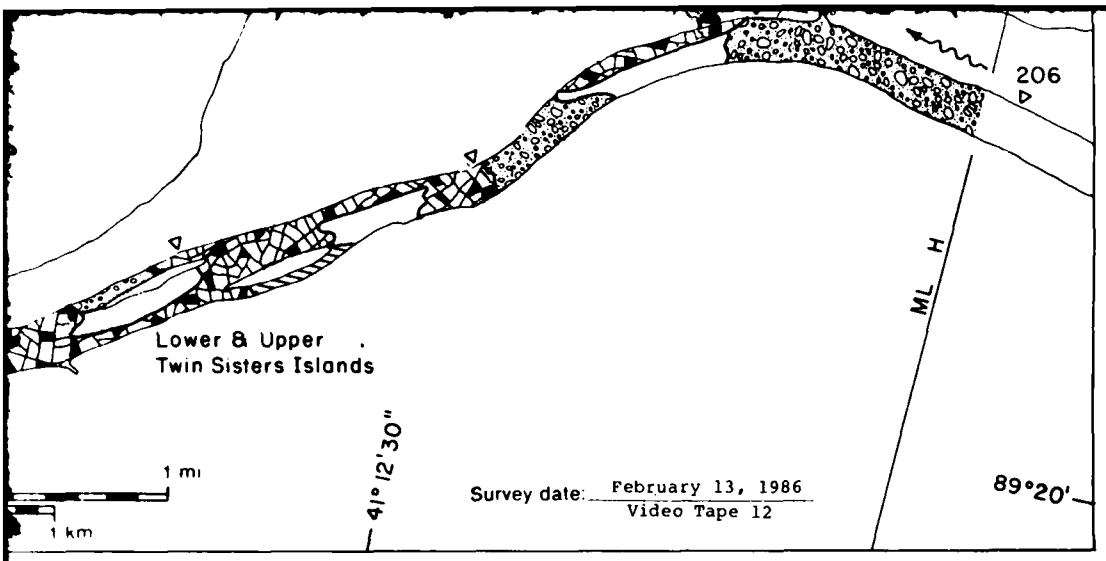

Peoria Pool 8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Isl
0
1 mi
0
1 km

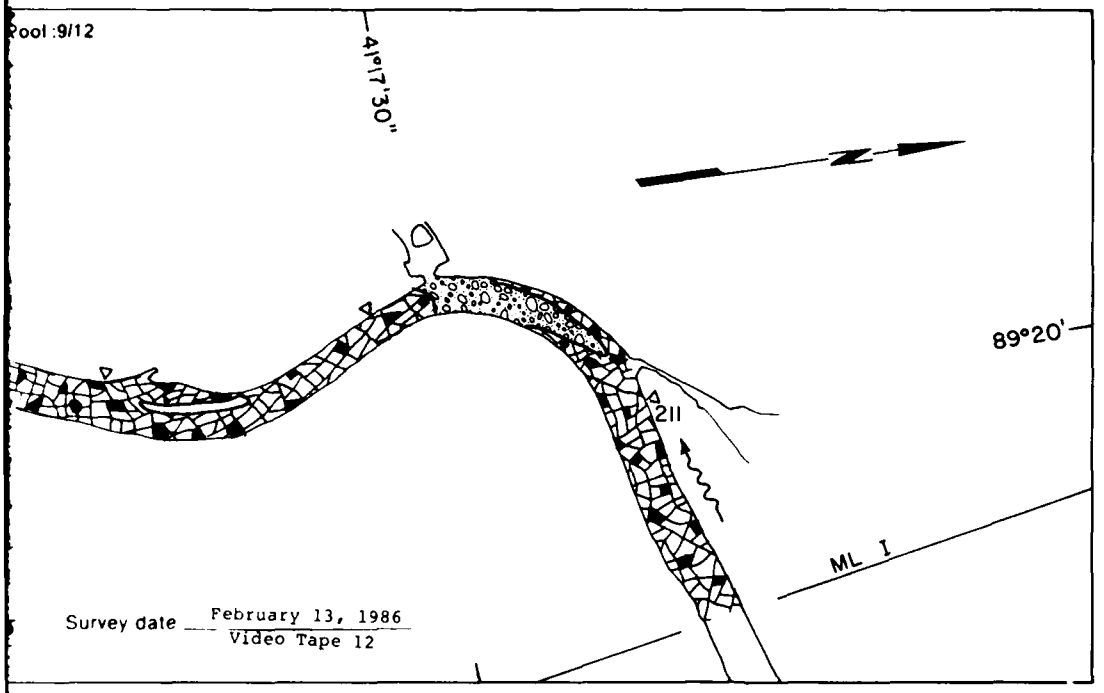
13 February 1986



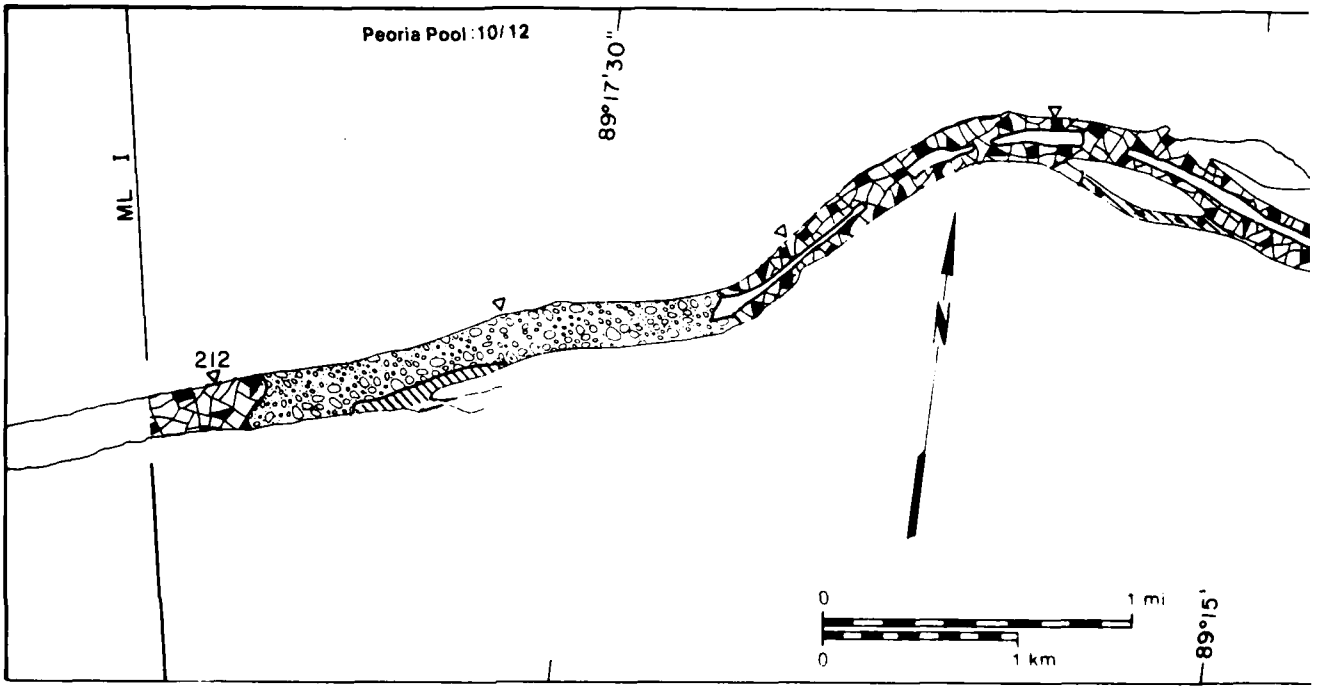

199
Senachwine Lake (or Swan Lake)
Lower & U
Twin Sister
0
1 mi
0
1 km

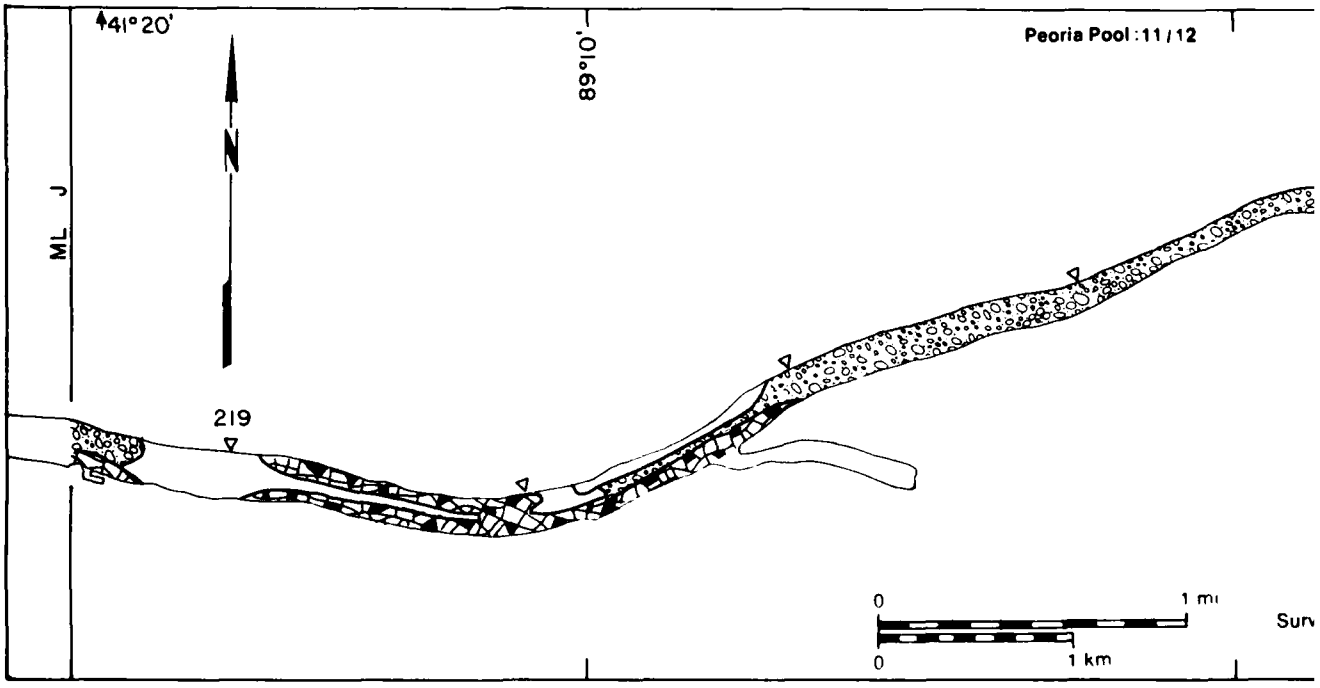

Peoria Pool :9/12
41°15'
206
ML H
0
1 mi
0
1 km
Survey date

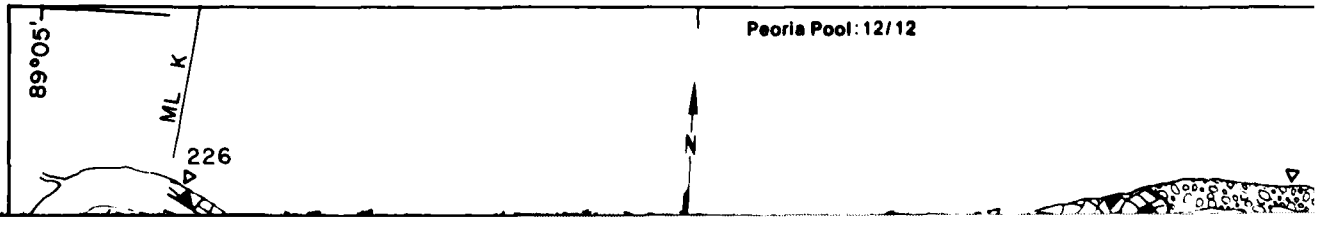

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: February 13, 1986
Video Tape 12
89°20'

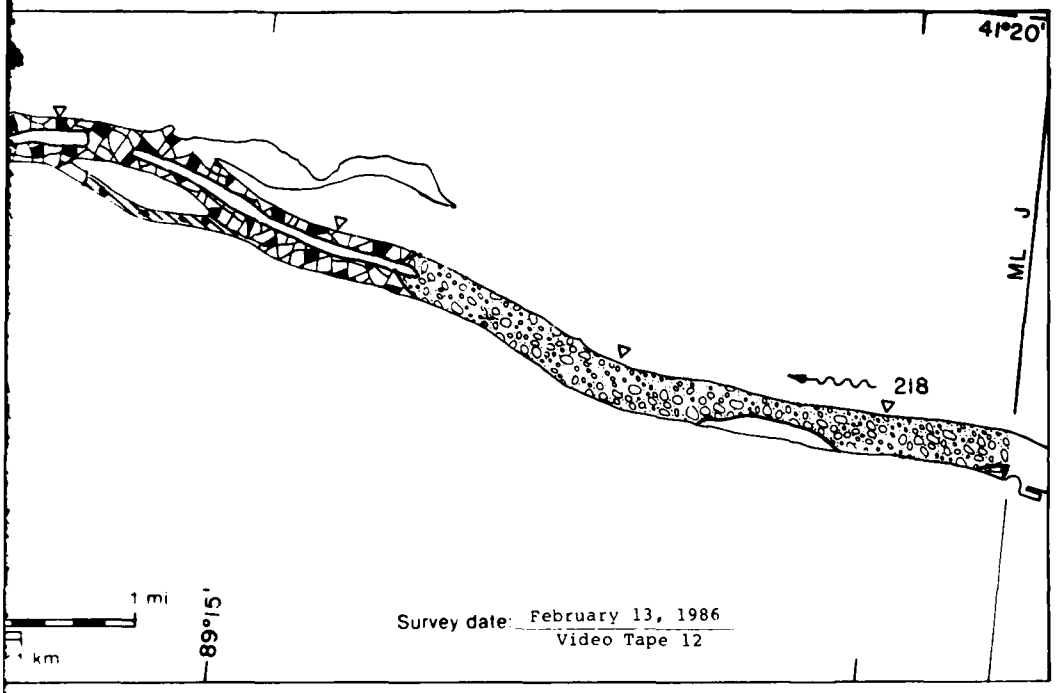

Pool :9/12
41°17'30"
89°20'
211
ML I
Survey date February 13, 1986
Video Tape 12

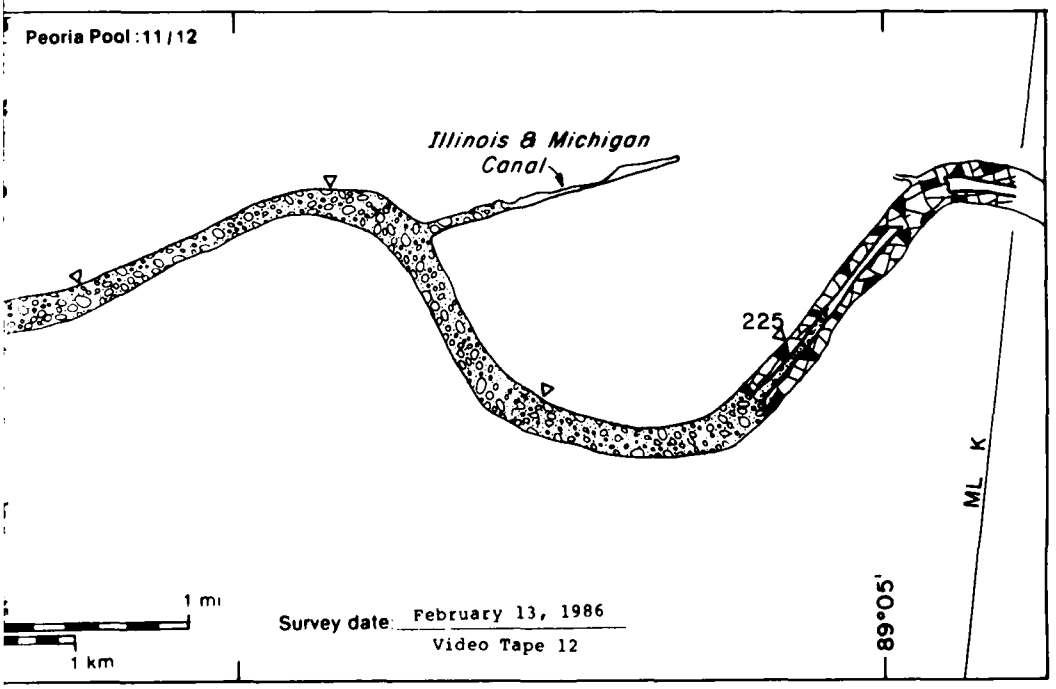
13 February 1986

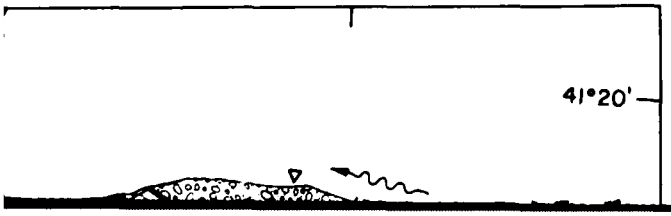


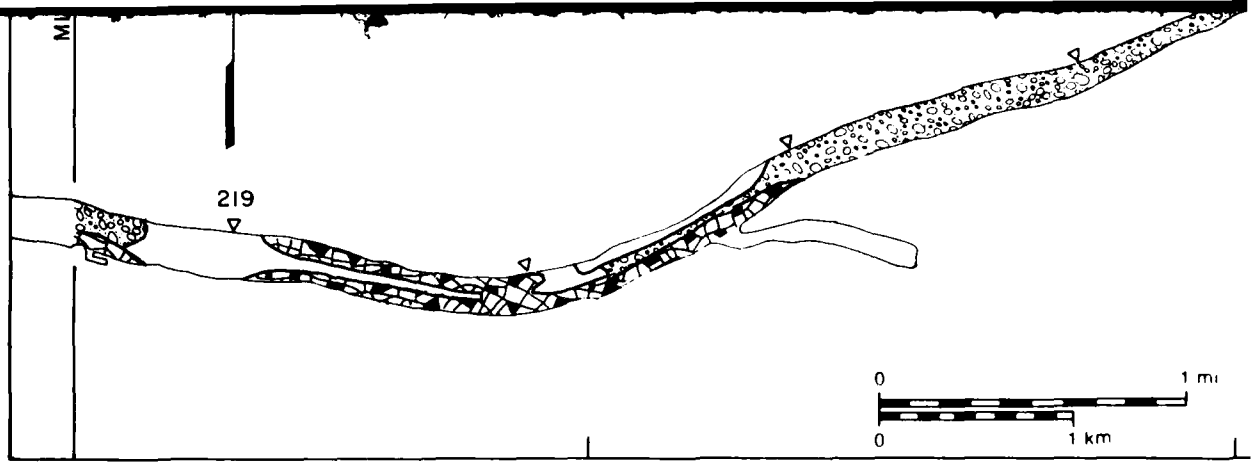


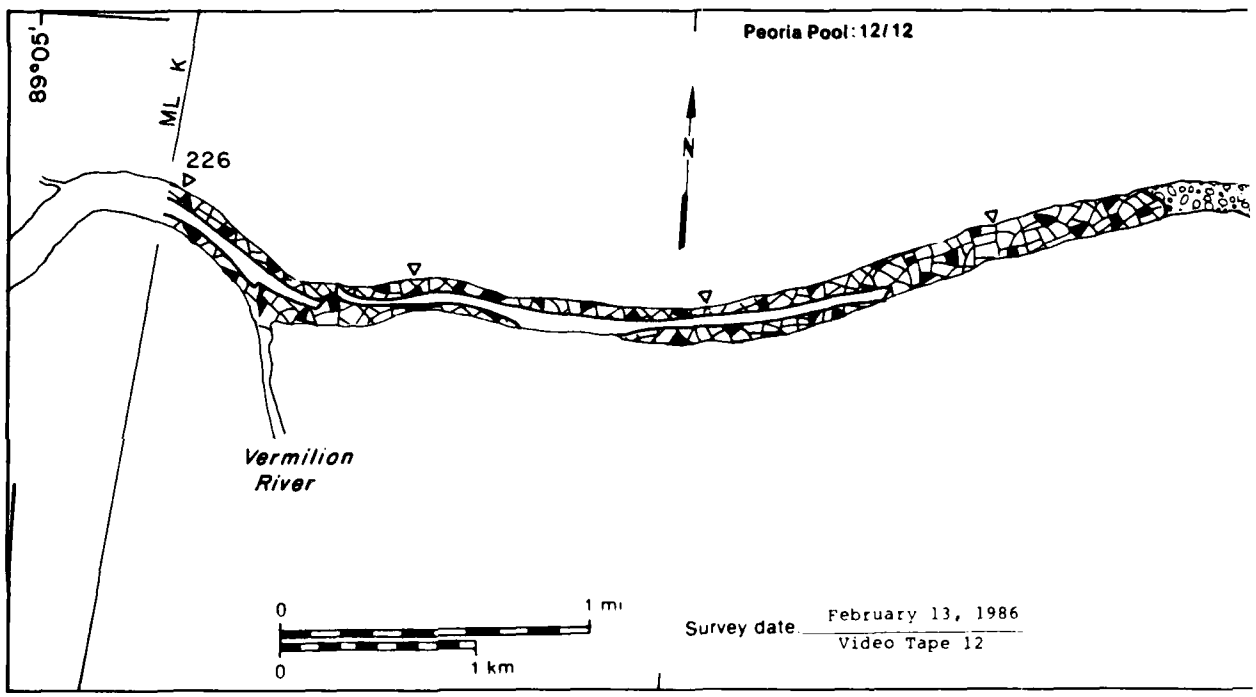



41°20'
ML J
218
1 mi
1 km
89°15'
Survey date: February 13, 1986
Video Tape 12


Peoria Pool : 11 / 12
Illinois & Michigan Canal
225
ML K
1 mi
1 km
Survey date: February 13, 1986
Video Tape 12
89°05'


41°20'





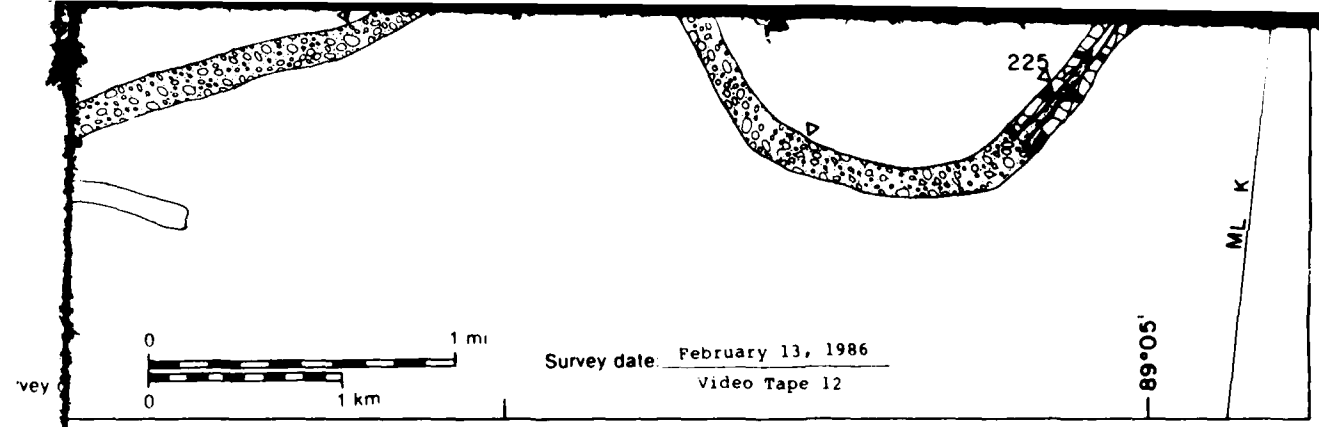
Peoria Pool: 12/12

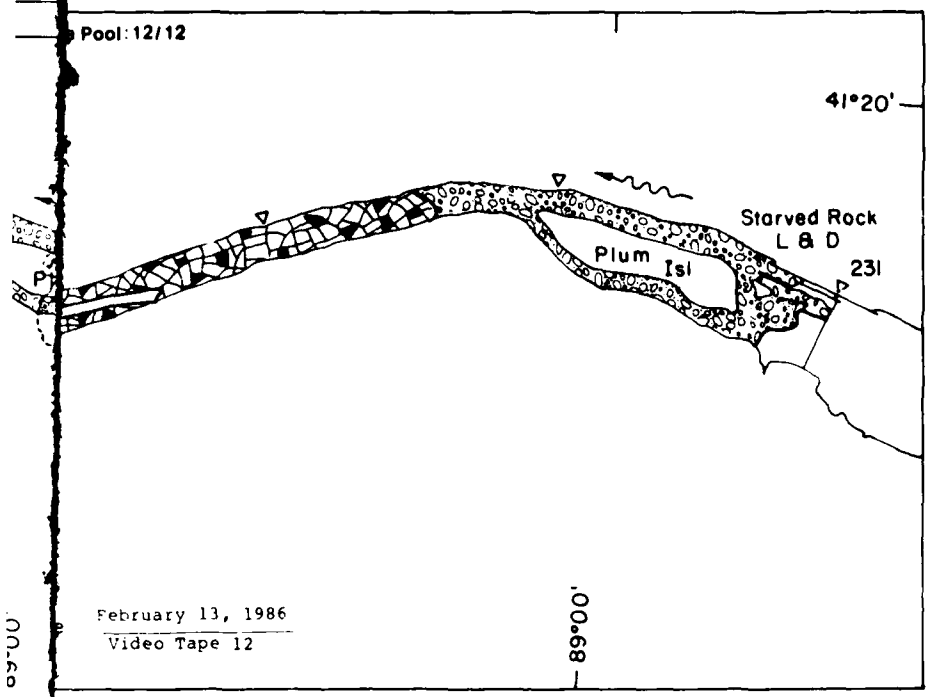
Survey date February 13, 1986
Video Tape 12

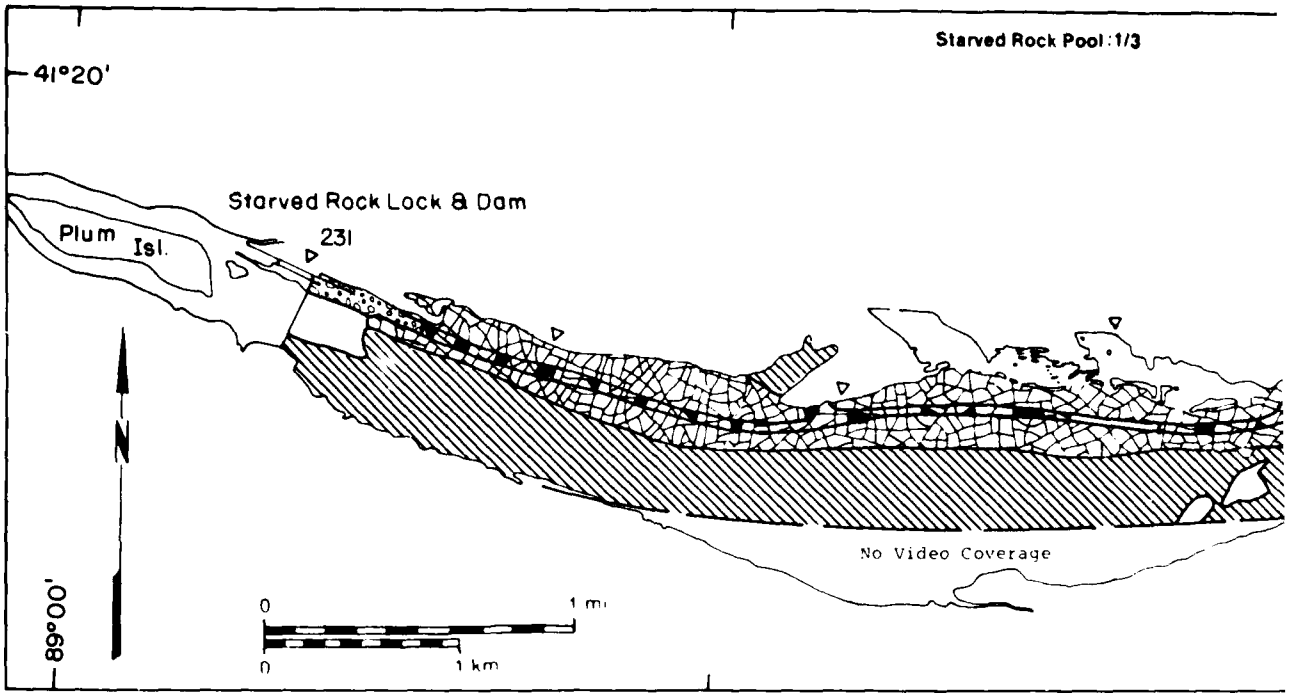
Peoria Pool

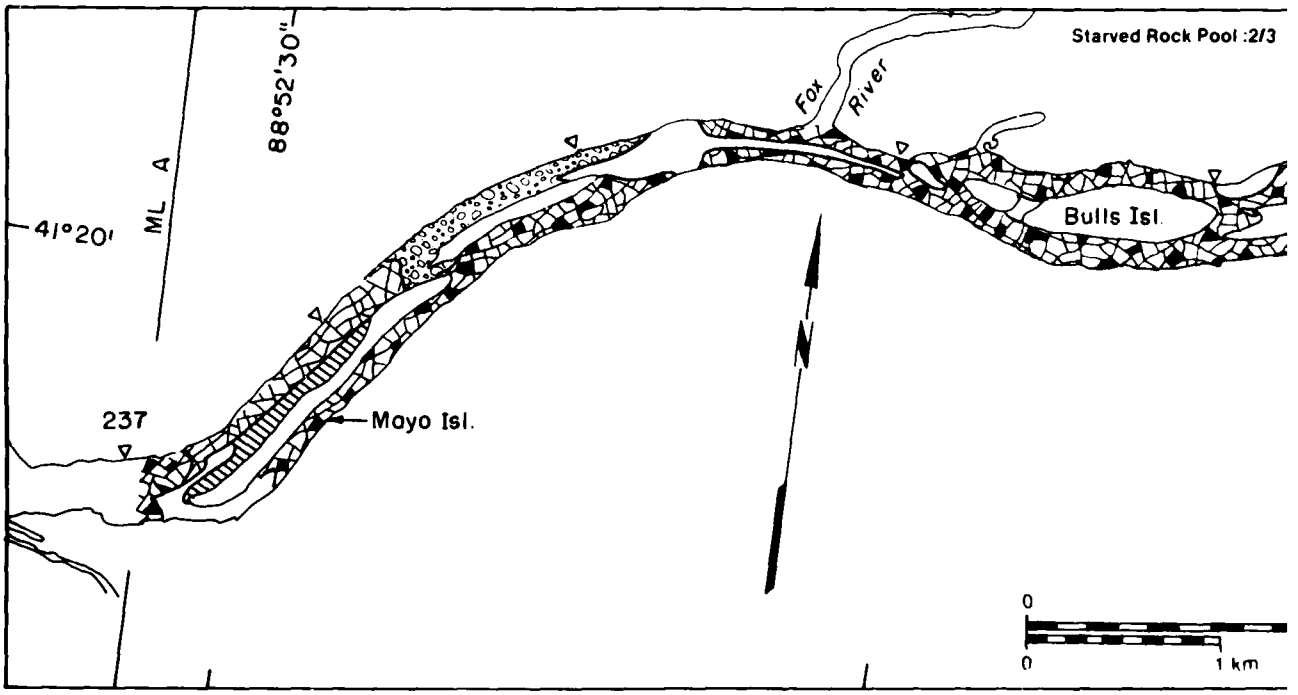
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	3.29	NA
Solid ice cover	17.93	NA
Solid ice cover with open-water areas	0.16	80
Fragmented ice cover	14.78	NA
Fragmented ice cover with open-water areas	10.62	90
Ice floes or frazil slush and pans	8.81	40
Total area ($m^2 \times 10^6$)	81.33*	

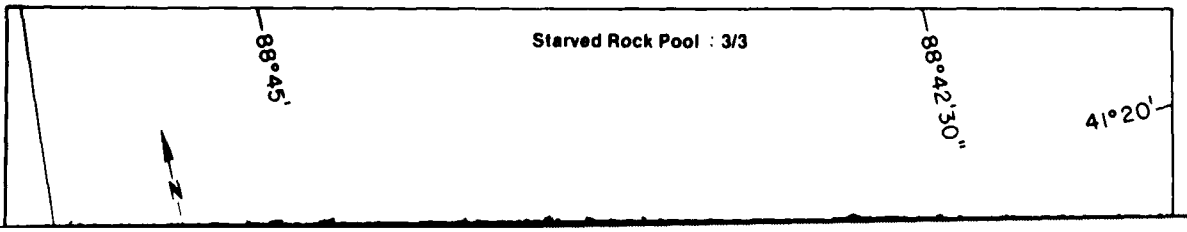
* Includes 25.74×10^6 m^2 of no video coverage


225
ML K
0
1 mi
0
1 km
Survey date: February 13, 1986
Video Tape 12
89°05'

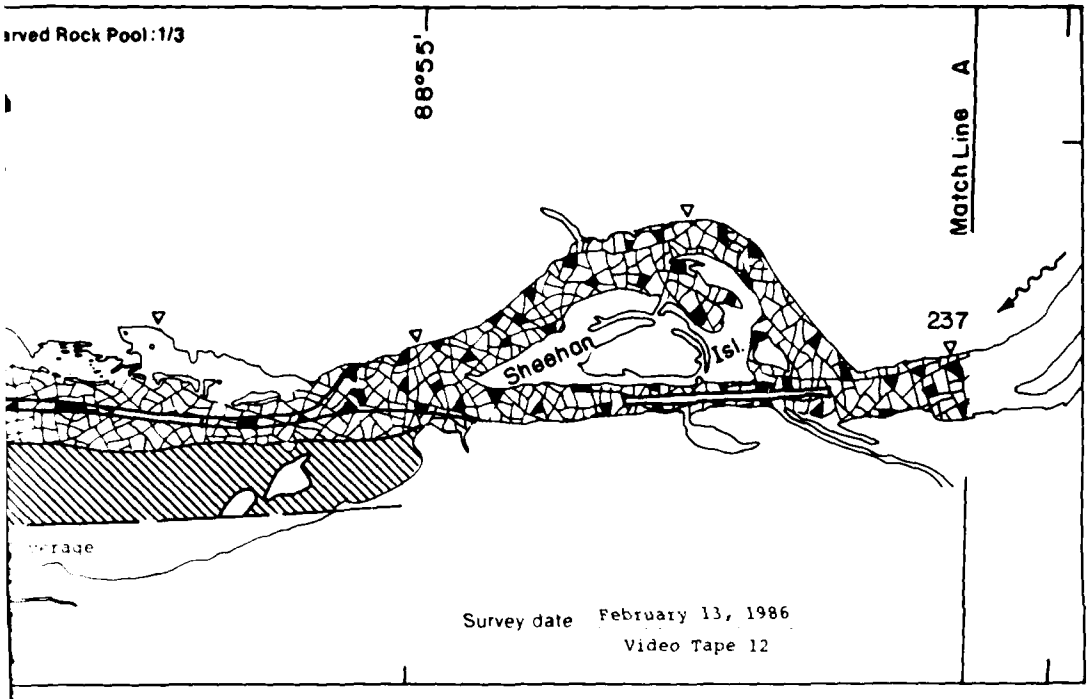

Pool: 12/12
41°20'
Starved Rock
L & D
Plum Isl
231
February 13, 1986
Video Tape 12
89°00'

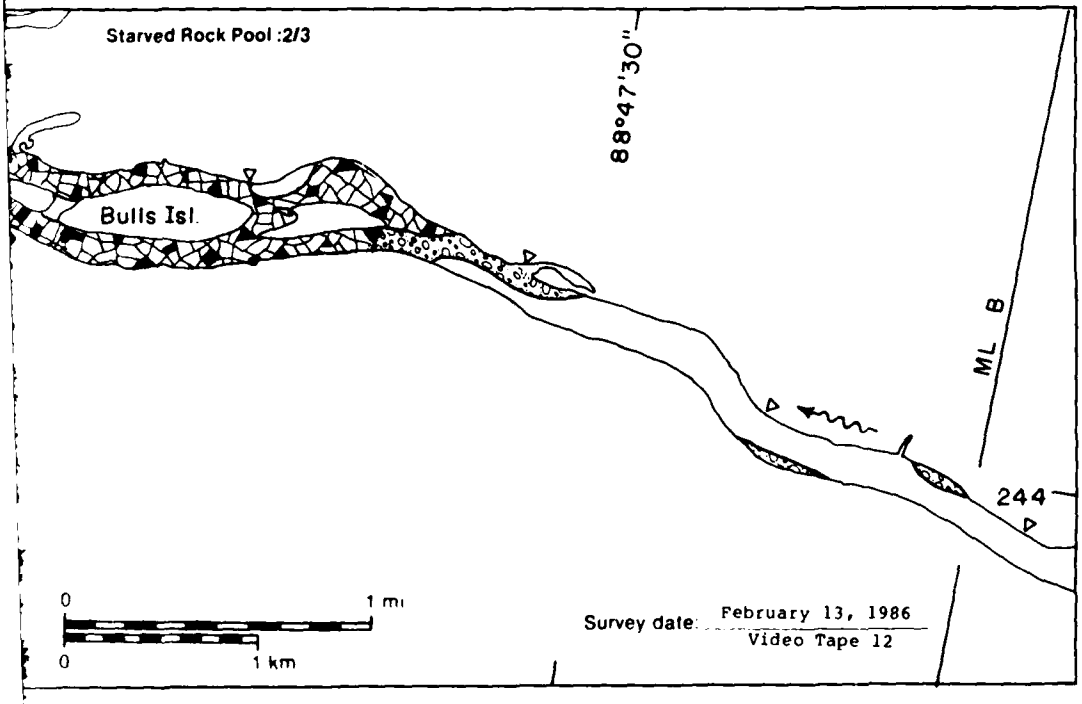

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock Pool :2/3
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

13 February 1986



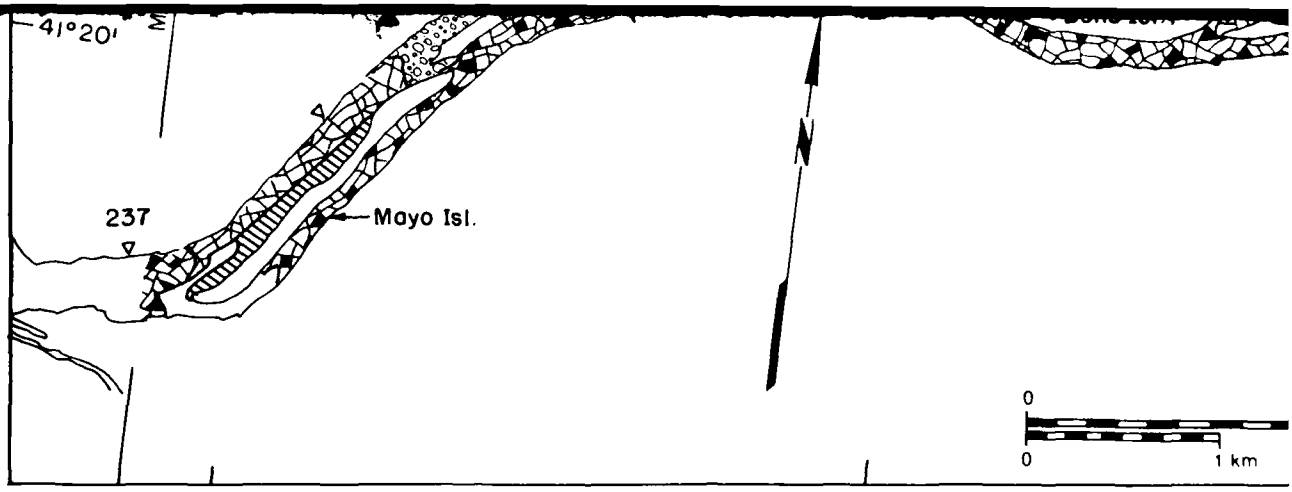


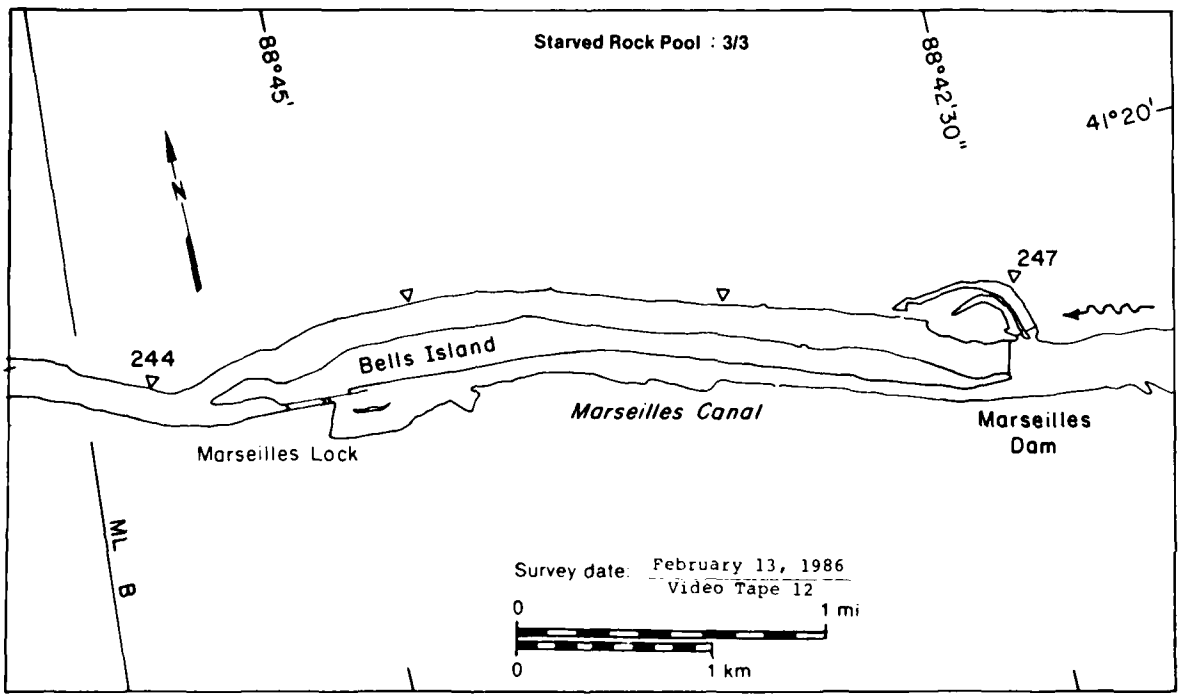
41°20'

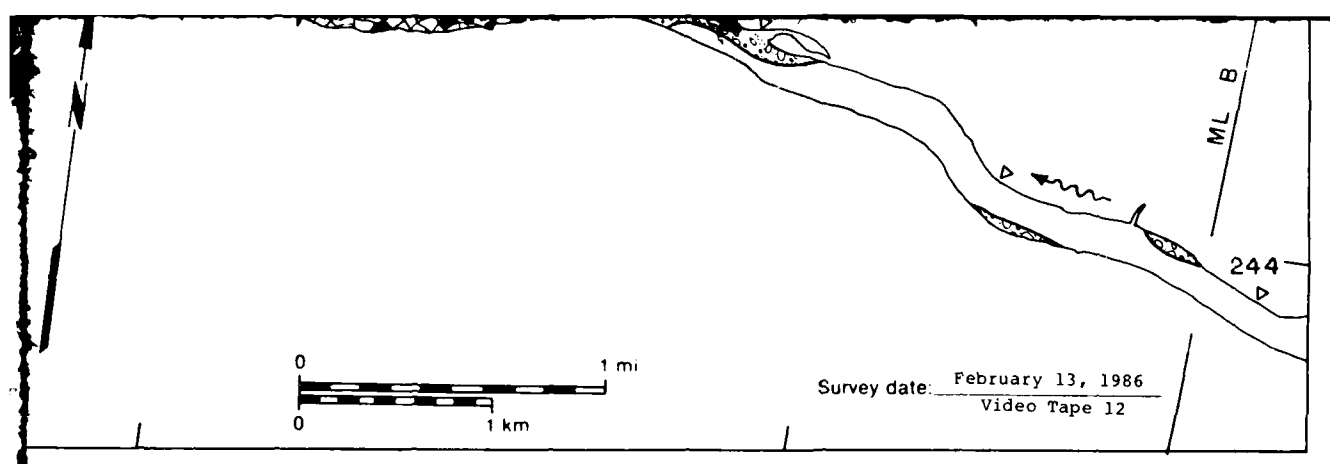
Starved Rock Pool

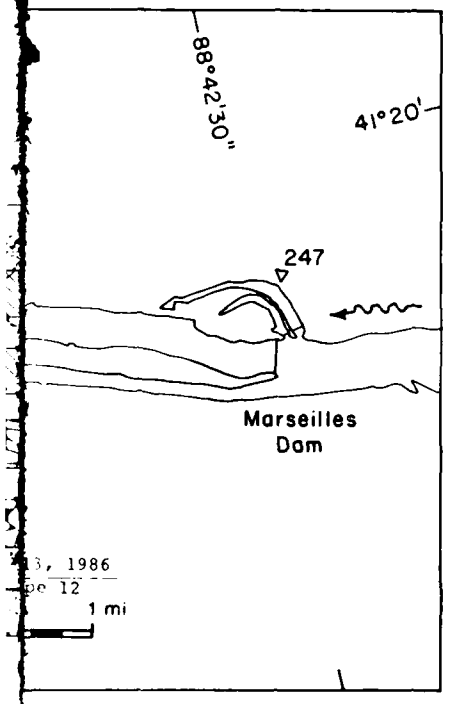
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.16	NA


41°20'
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: February 13, 1986
Video Tape 12
0
1 mi
0
1 km





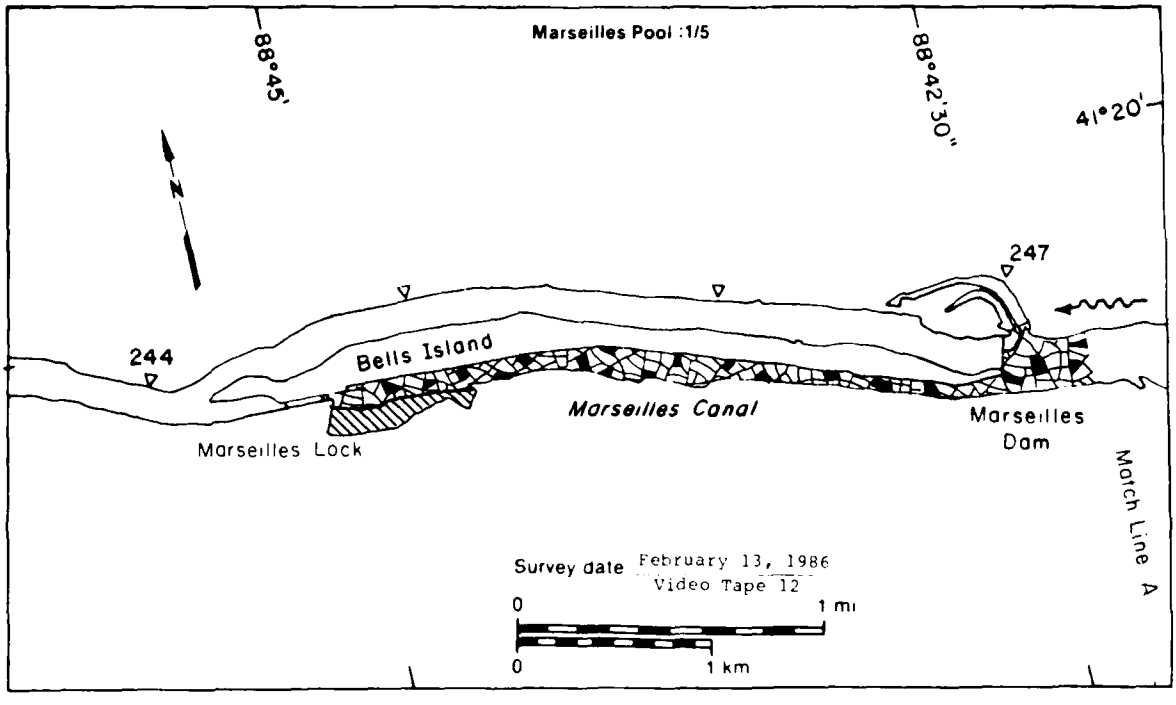
Starved Rock Pool

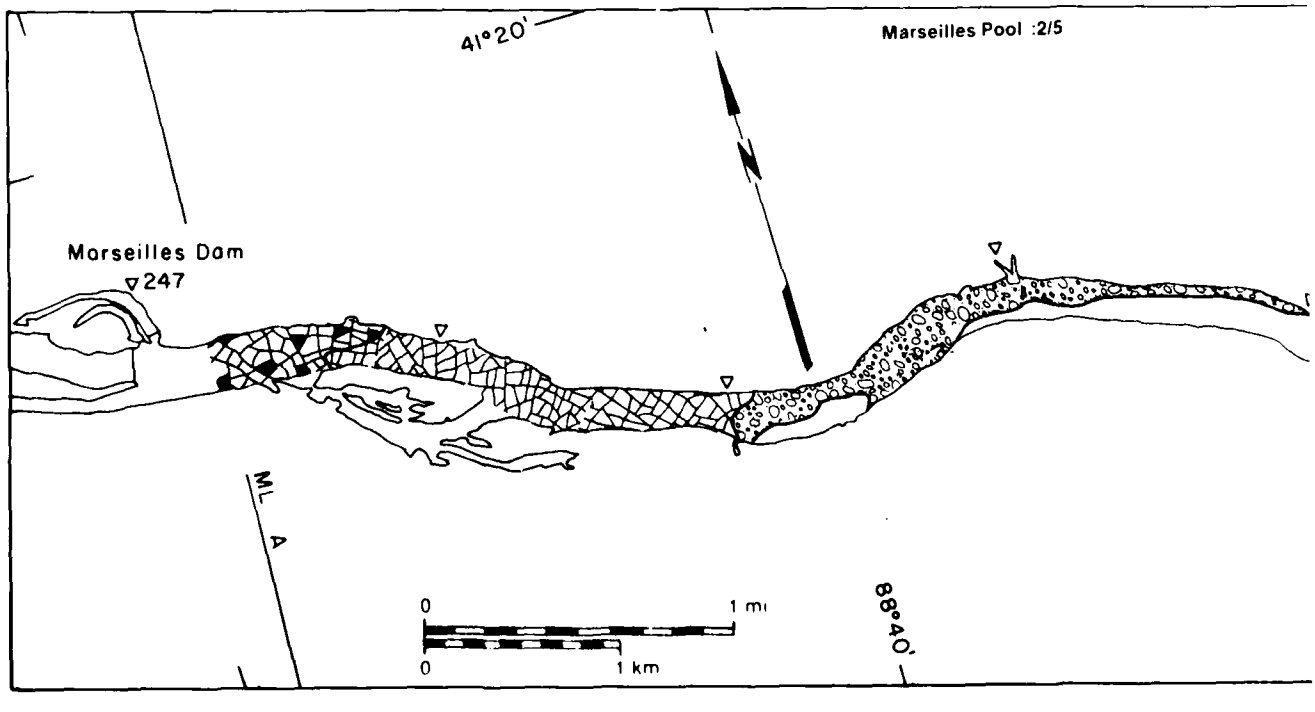
MAP UNITS

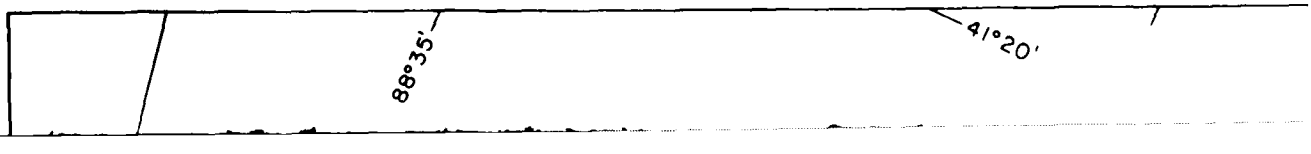
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.16	NA
Solid ice cover	2.15	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	1.54	NA
Fragmented ice cover with open-water areas	2.90	80
Ice floes or frazil slush and pans	0.47	50
Total area ($m^2 \times 10^6$)	10.19*	

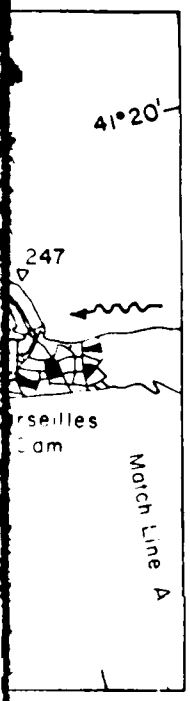
* Includes 0.97×10^6 m^2 of no video coverage

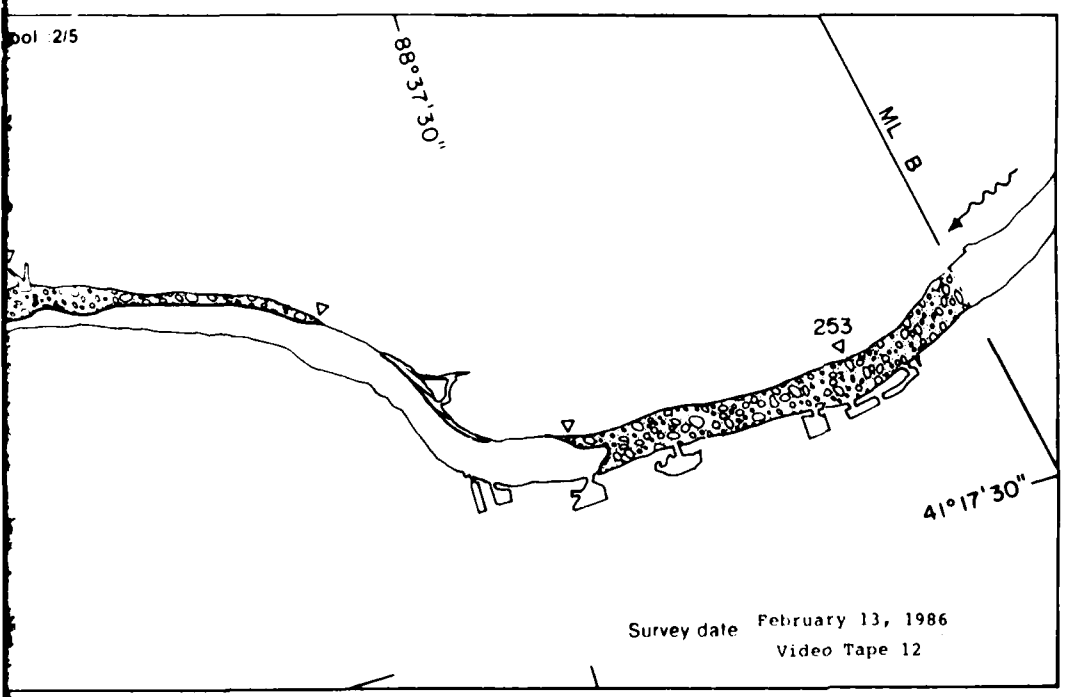
13 February 1986

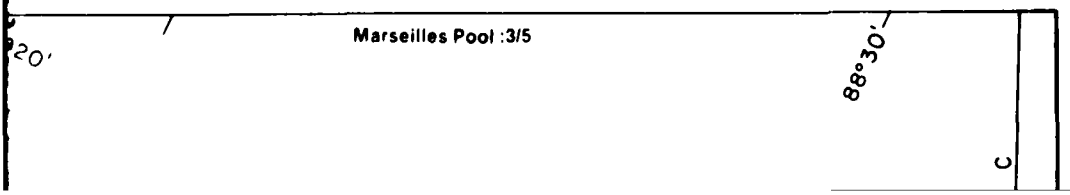


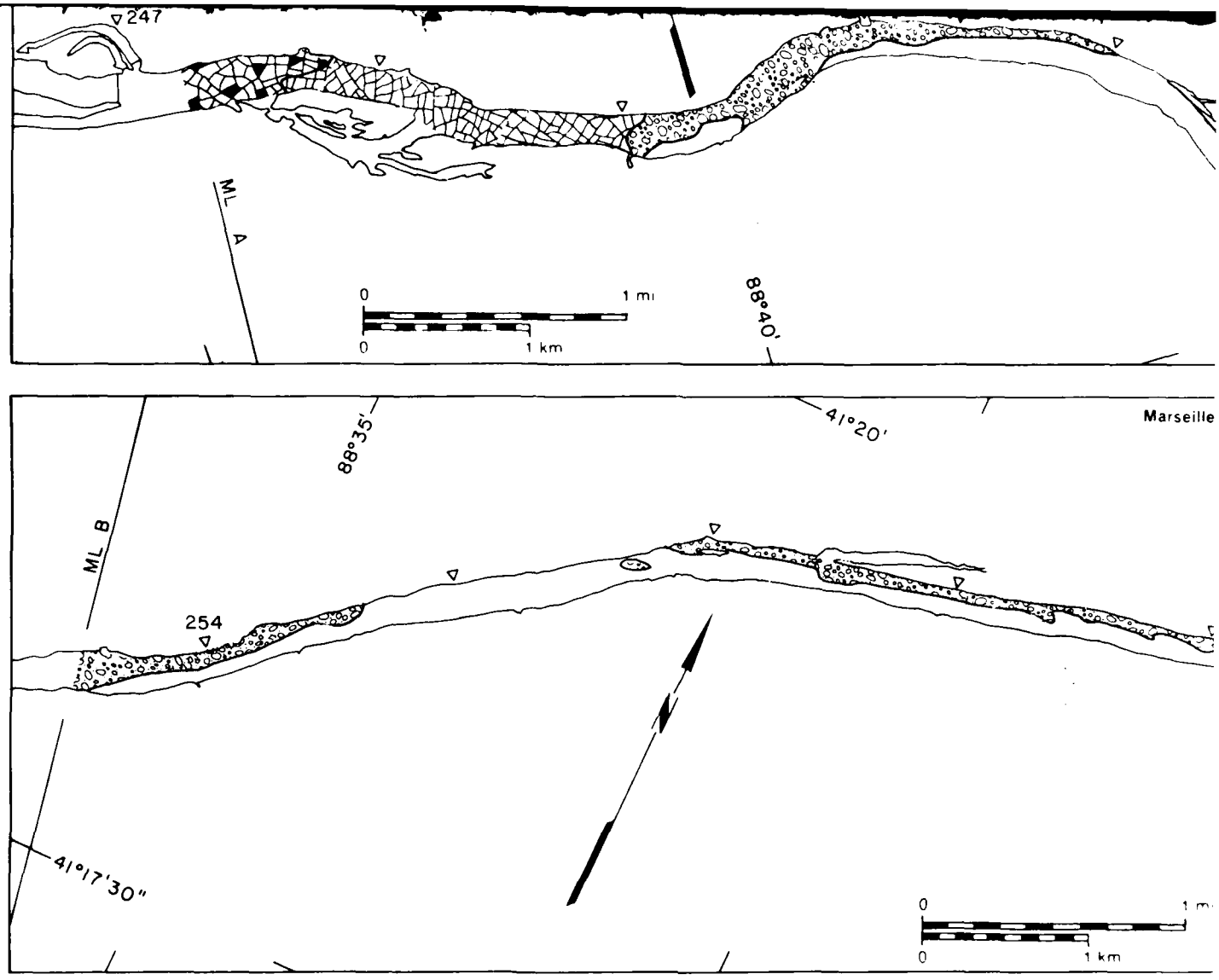


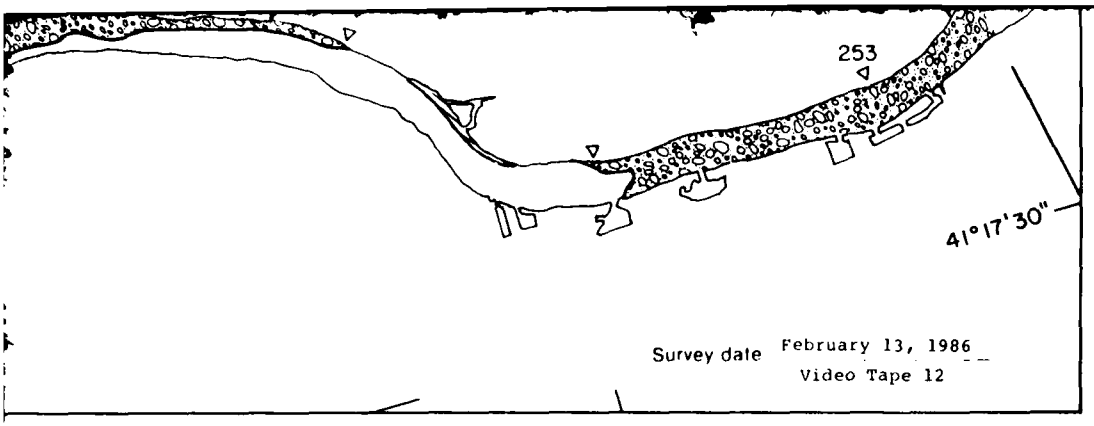


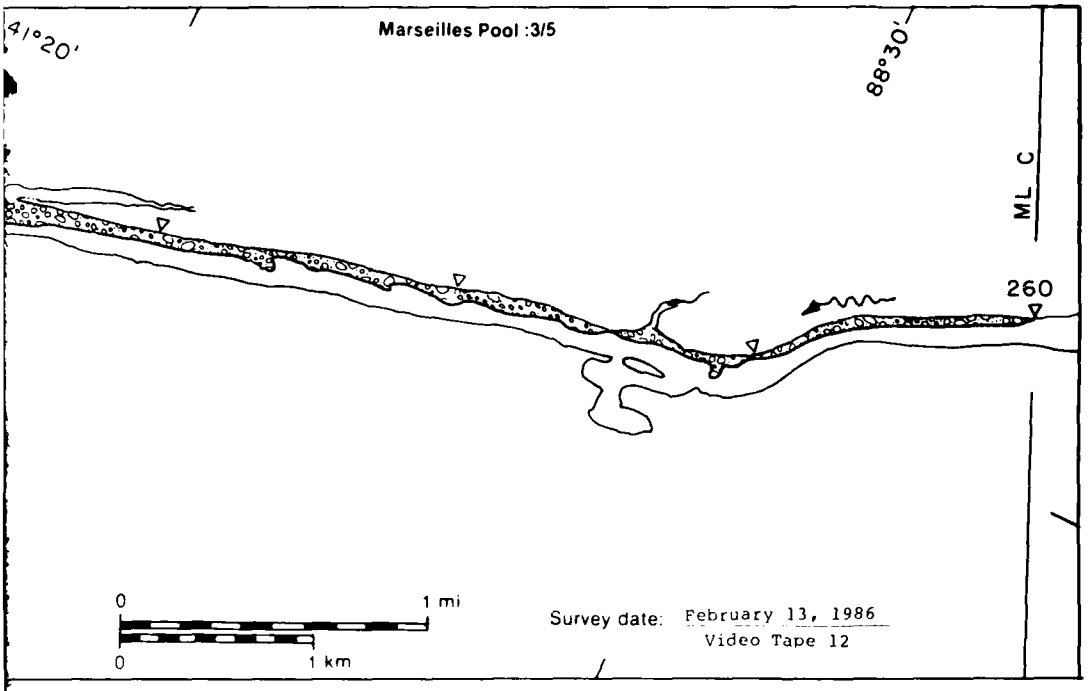

41°20'
247
rseilles
am
March Line A

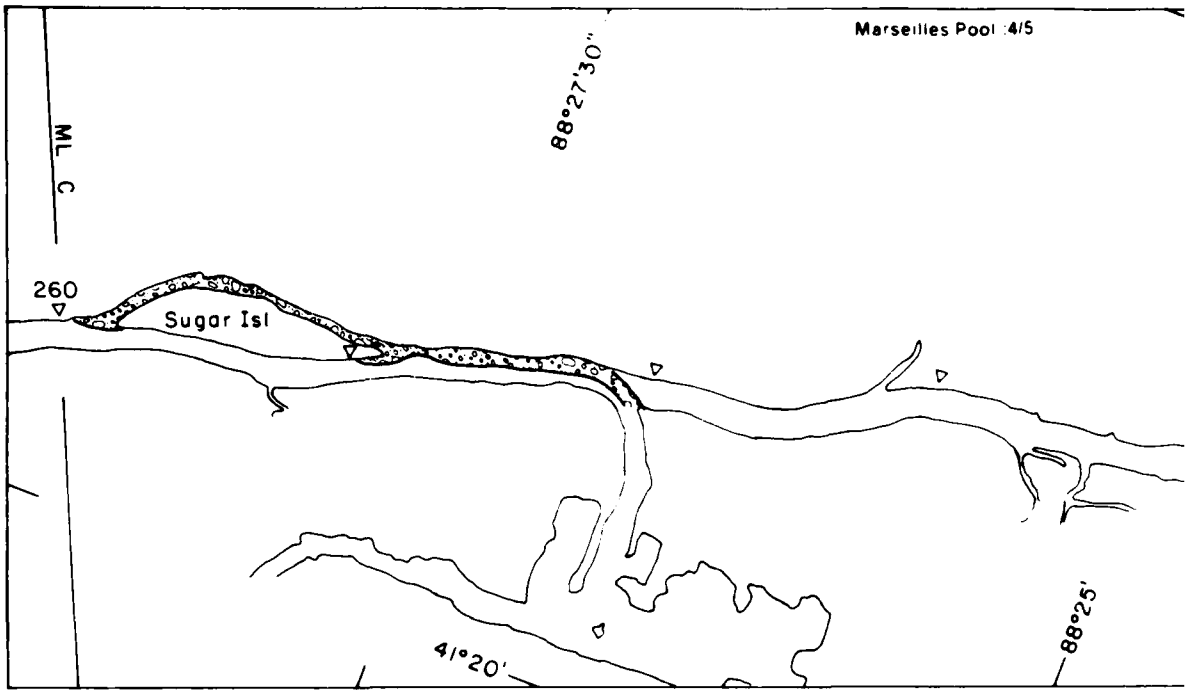

ool :2/5
88°37'30"
ML B
253
41°17'30"
Survey date February 13, 1986
Video Tape 12

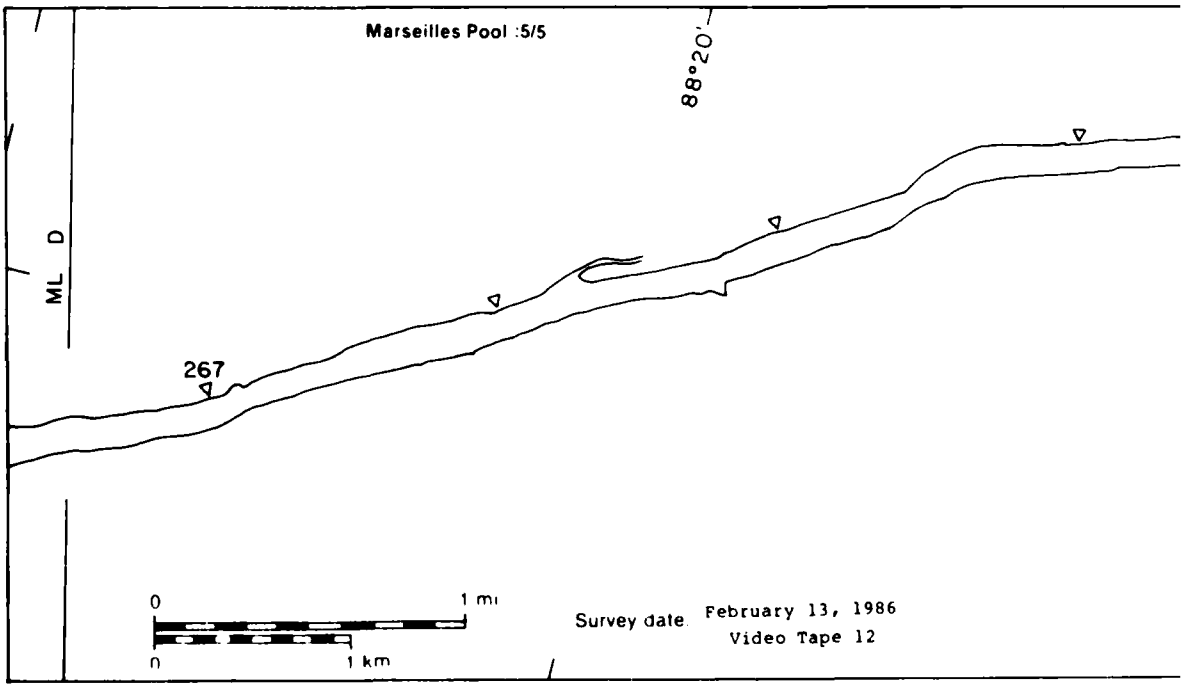

Marseilles Pool :3/5
88°30'


247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
Marseille
ML B
254
41°17'30"
0
1 km


253
41°17'30"
Survey date February 13, 1986
Video Tape 12


Marseilles Pool :3/5
41°20'
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 13, 1986
Video Tape 12



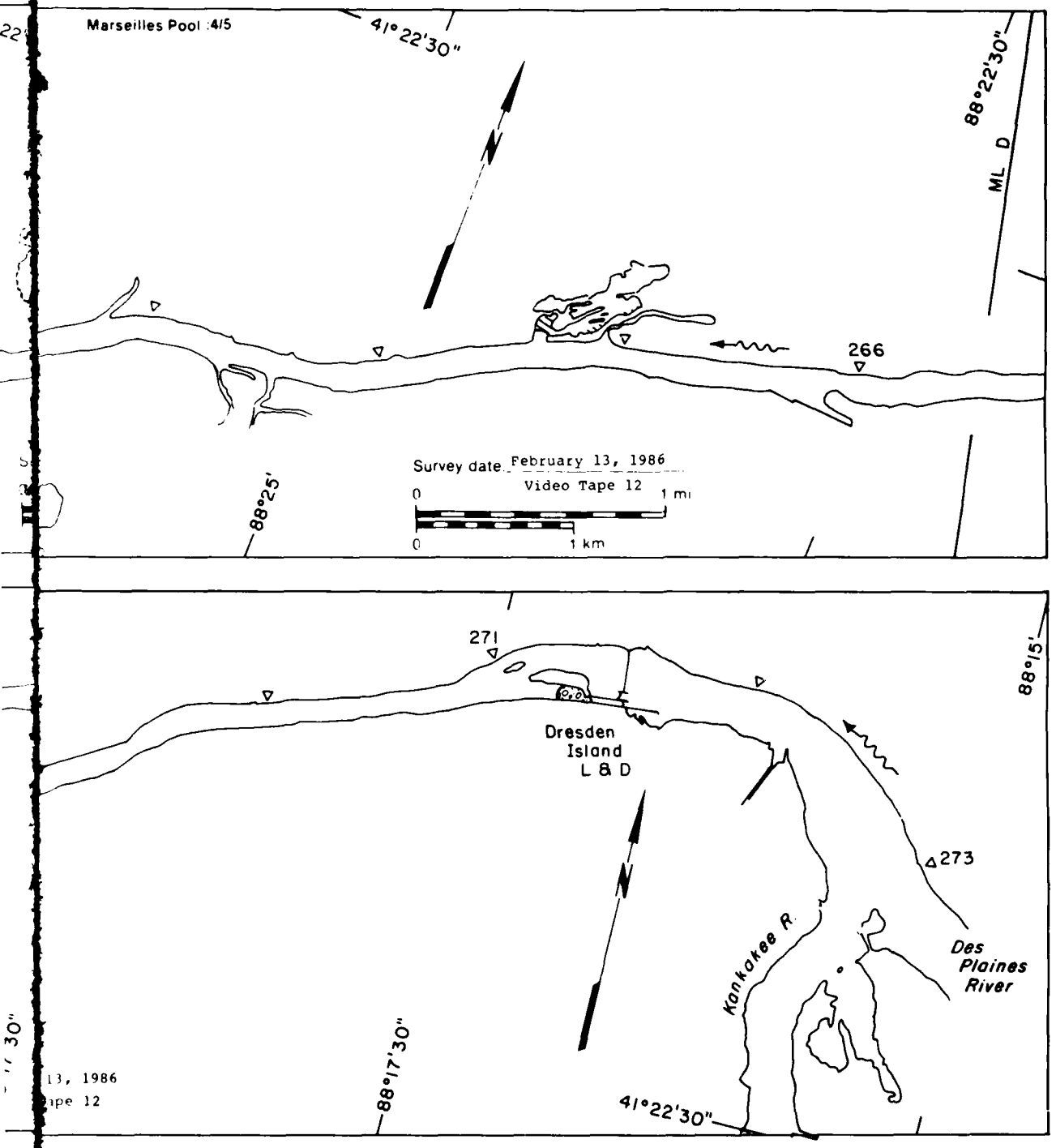


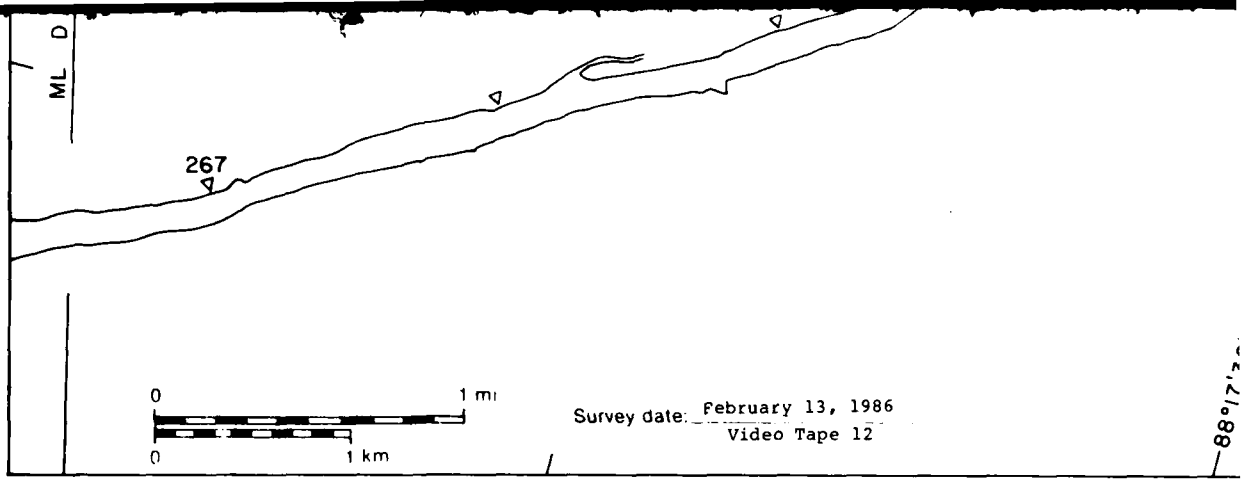
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	4.70	NA
Solution cavity	0.28	NA

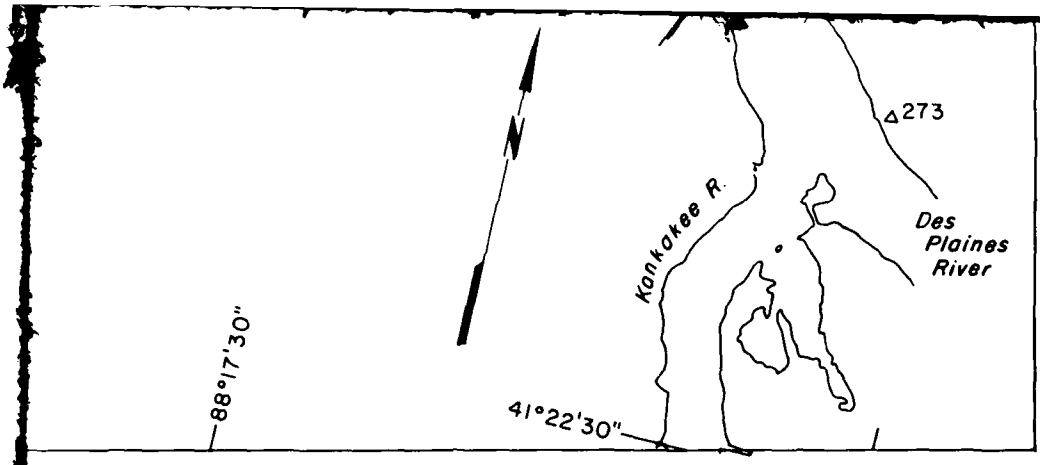
13 February 1986



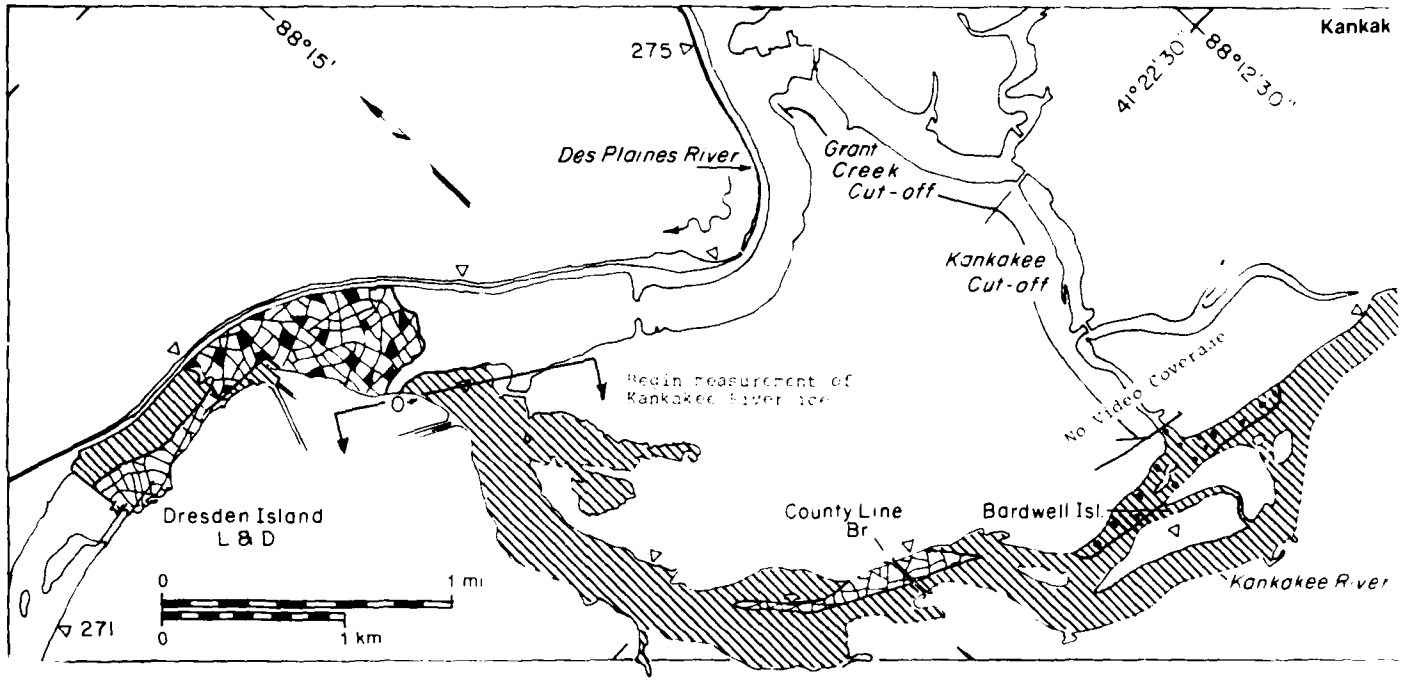


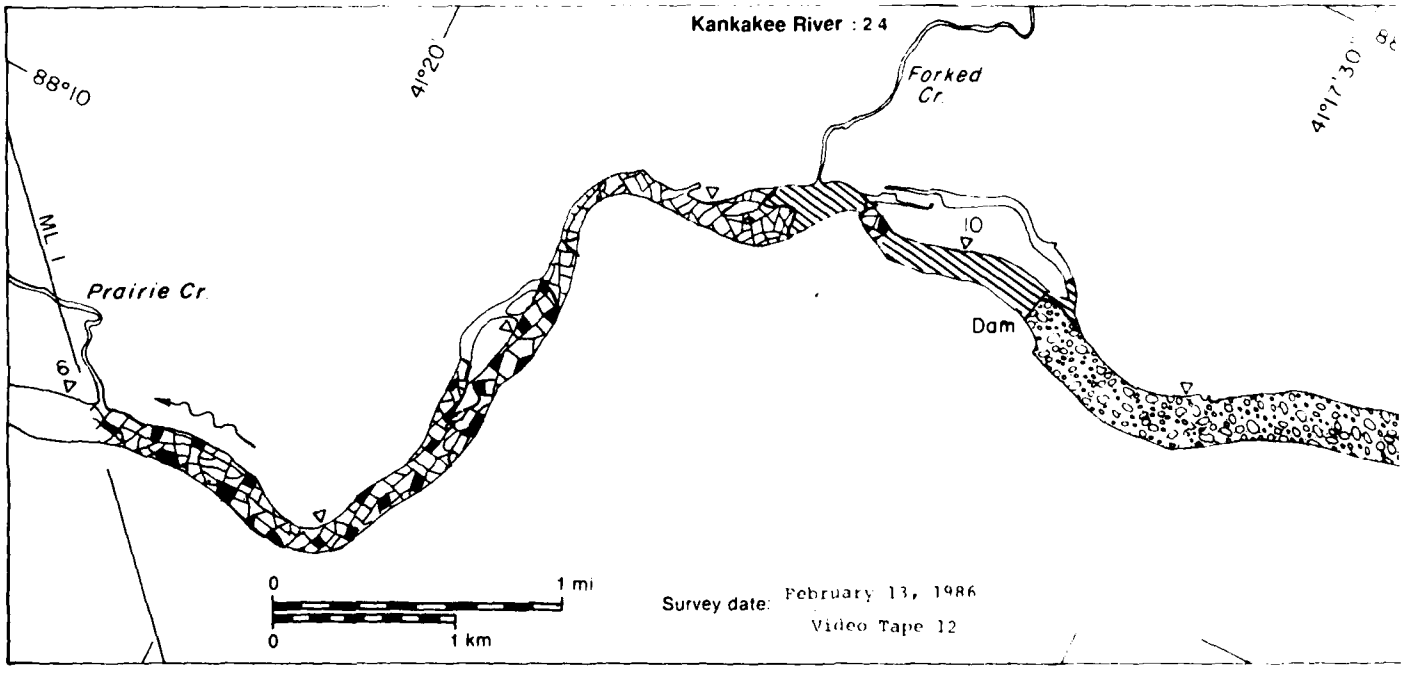
Marseilles Pool

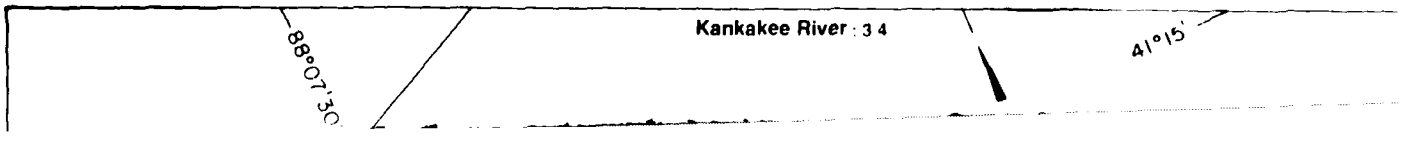
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	4.70	NA
Solid ice cover	0.28	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.88	NA
Fragmented ice cover with open-water areas	0.70	90
Ice floes or frazil slush and pans	1.63	20
Total area ($m^2 \times 10^6$)	8.19	

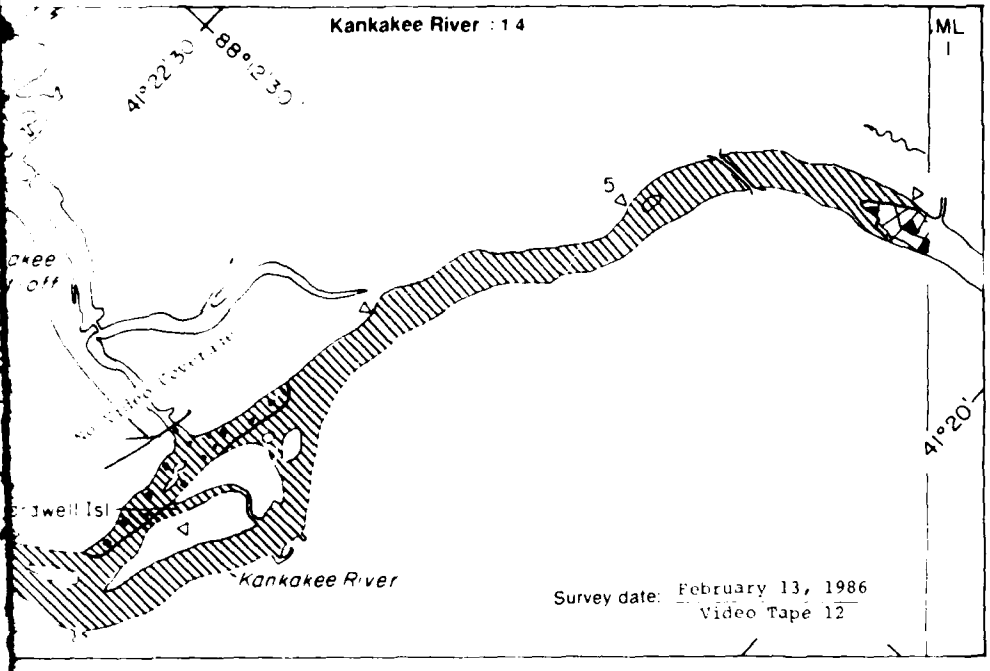

△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

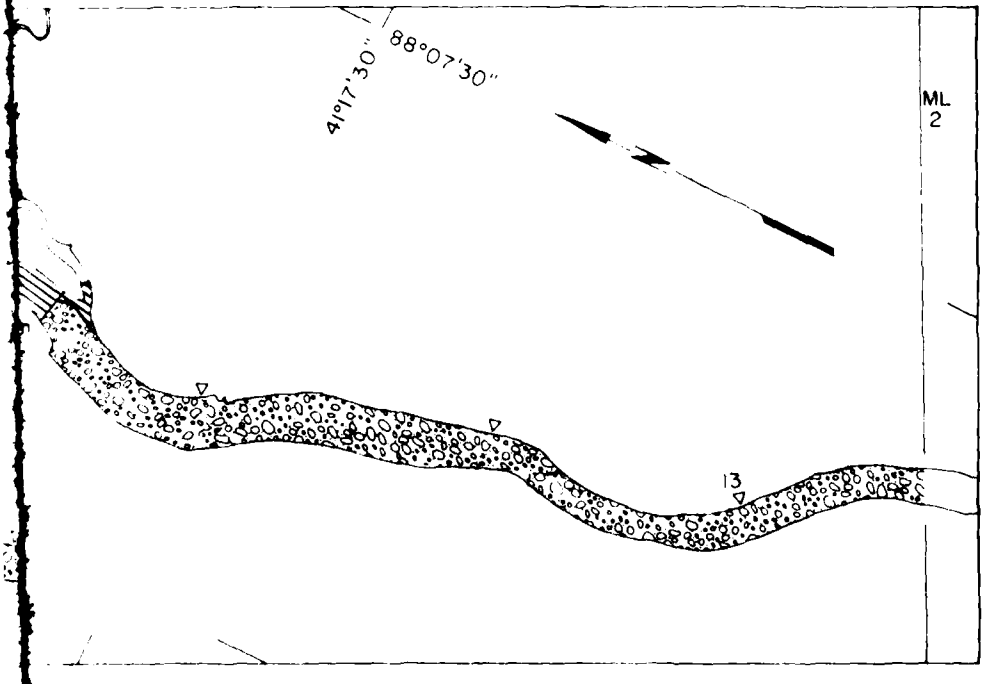
13 February 1986

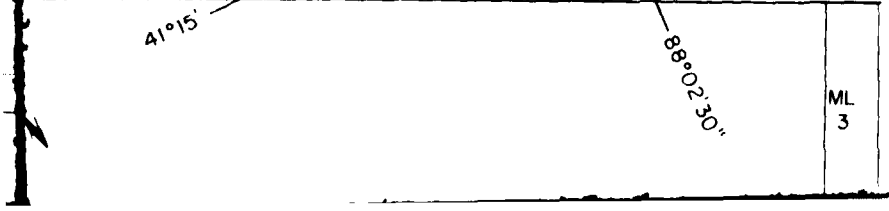


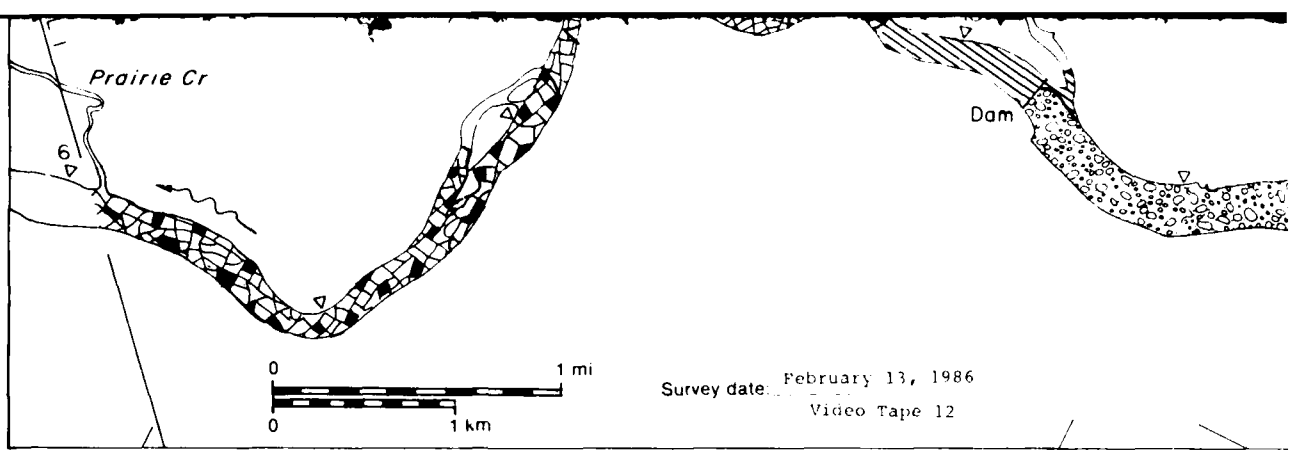


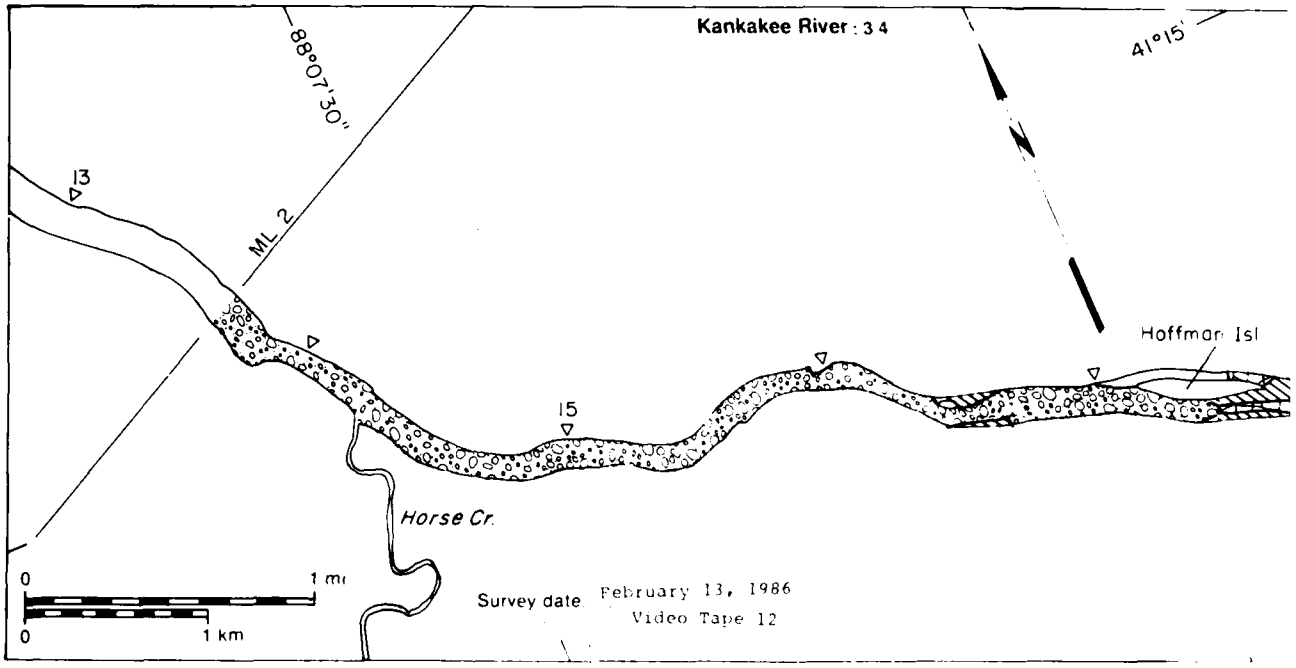


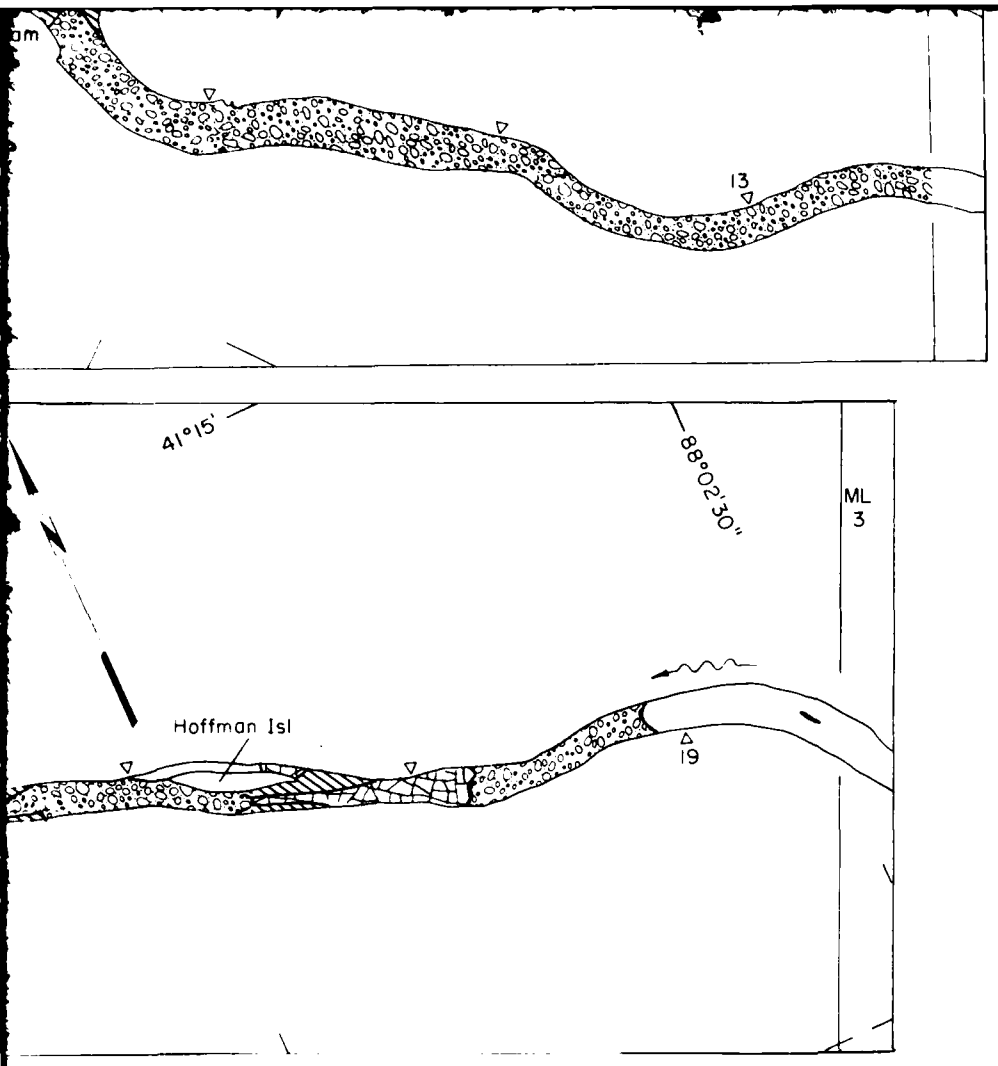

Kankakee River : 1 4
41°22'30"
88°12'30"
ML
1
5
41°20'
Kankakee River
Survey date: February 13, 1986
Video Tape 12

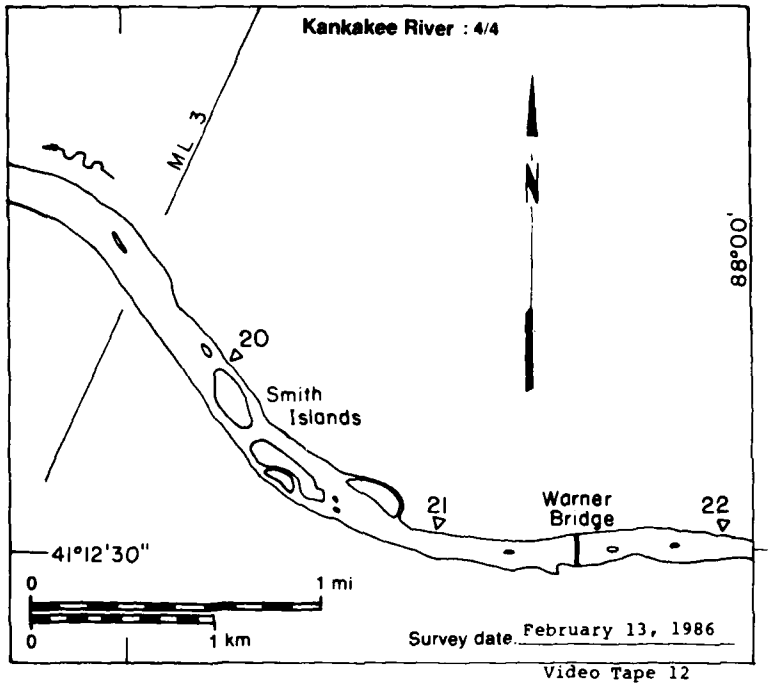

41°17'30"
88°07'30"
ML
2
13


41°15'
88°02'30"
ML
3


Prairie Cr
6
Dam
0
1 mi
0
1 km
Survey date: February 13, 1986
Video Tape 12


Kankakee River : 3 4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date February 13, 1986
Video Tape 12


13
41°15'
88°02'30"
ML
3
Hoffman Isl
19



Kankakee River

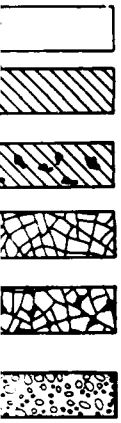
MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

Total area (m^2 x 1(

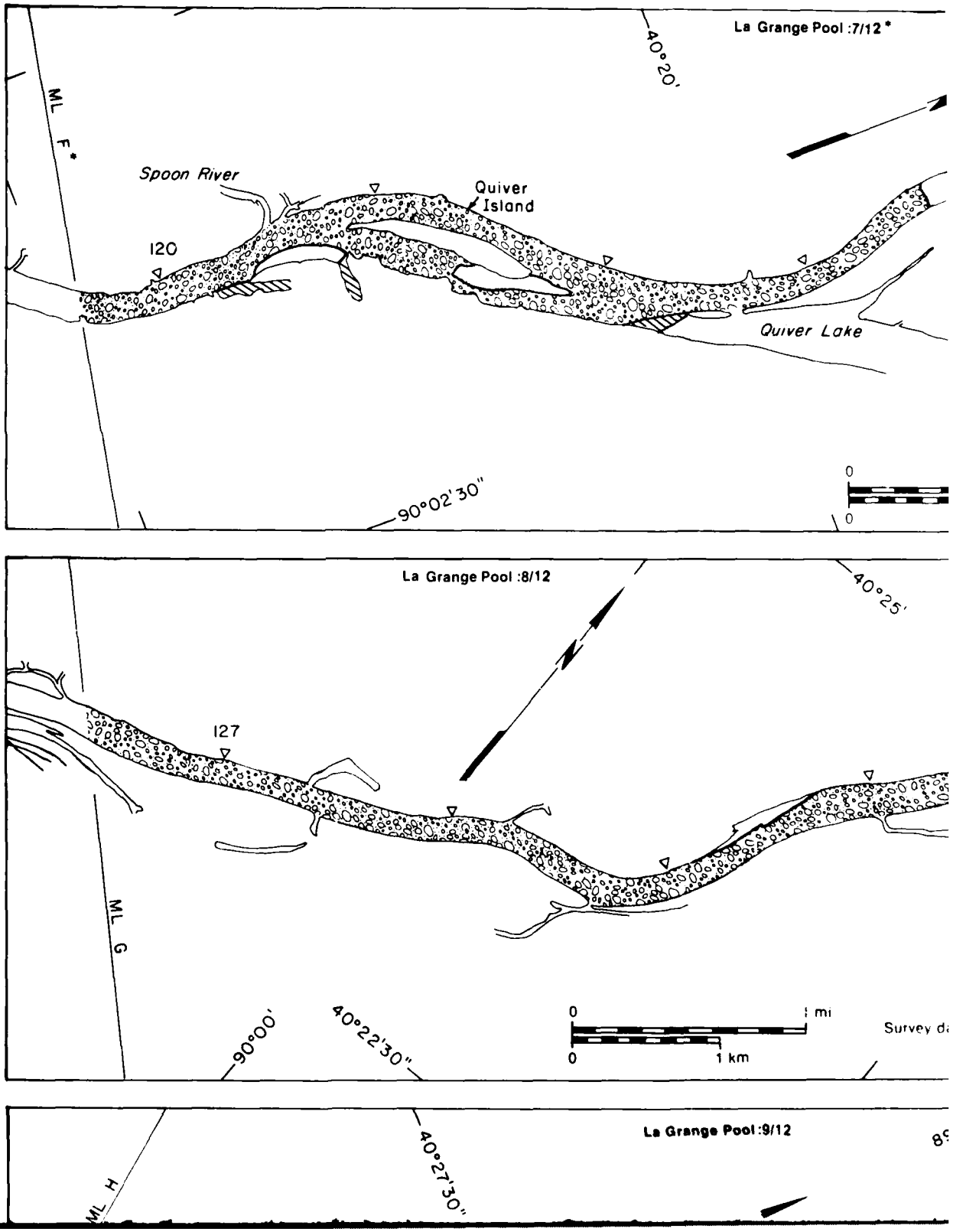
13 February 1986

Kankakee River

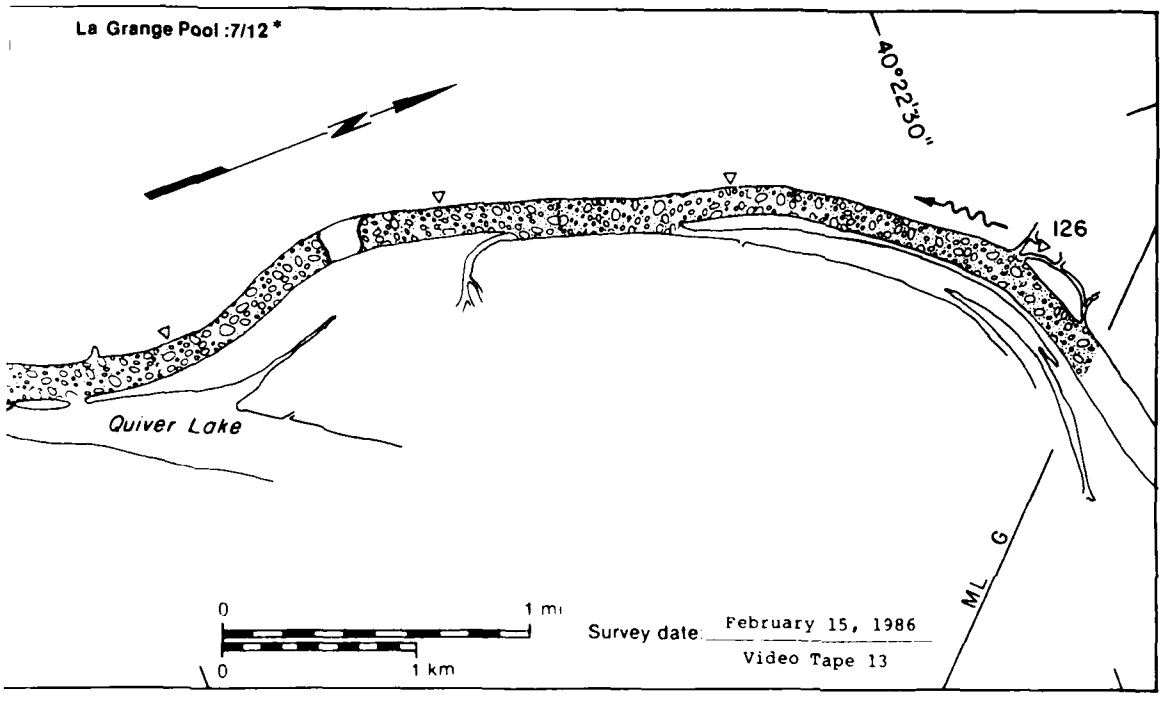


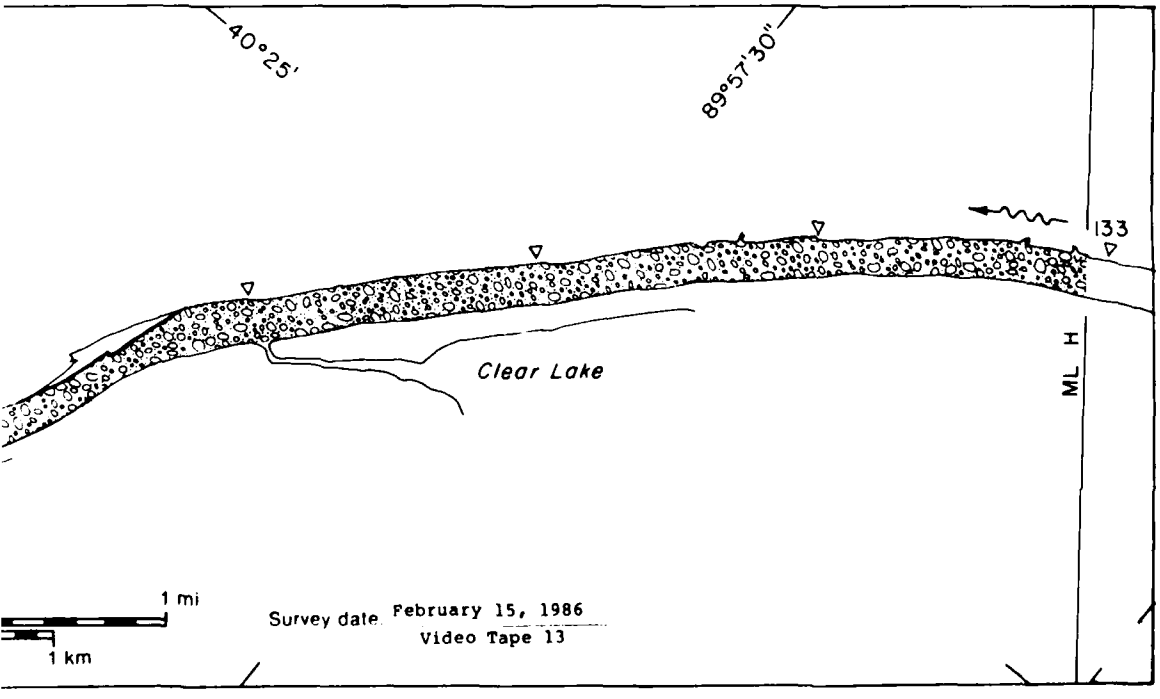
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.90	NA
Solid ice cover	2.59	NA
Solid ice cover with open-water areas	0.17	95
Fragmented ice cover	0.46	NA
Fragmented ice cover with open-water areas	0.65	90
Ice floes or frazil slush and pans	2.48	50
Total area ($m^2 \times 10^6$)	7.30*	

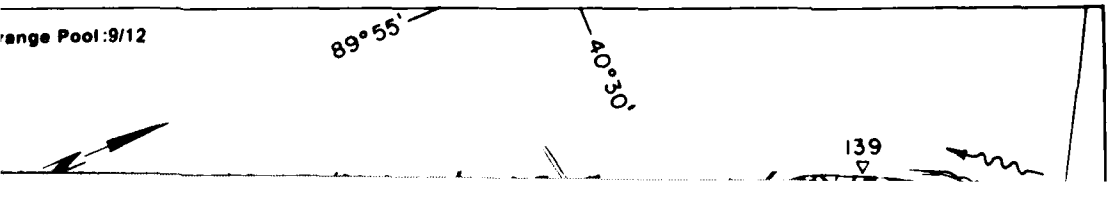
* Includes 0.05×10^6 m^2 of no video coverage

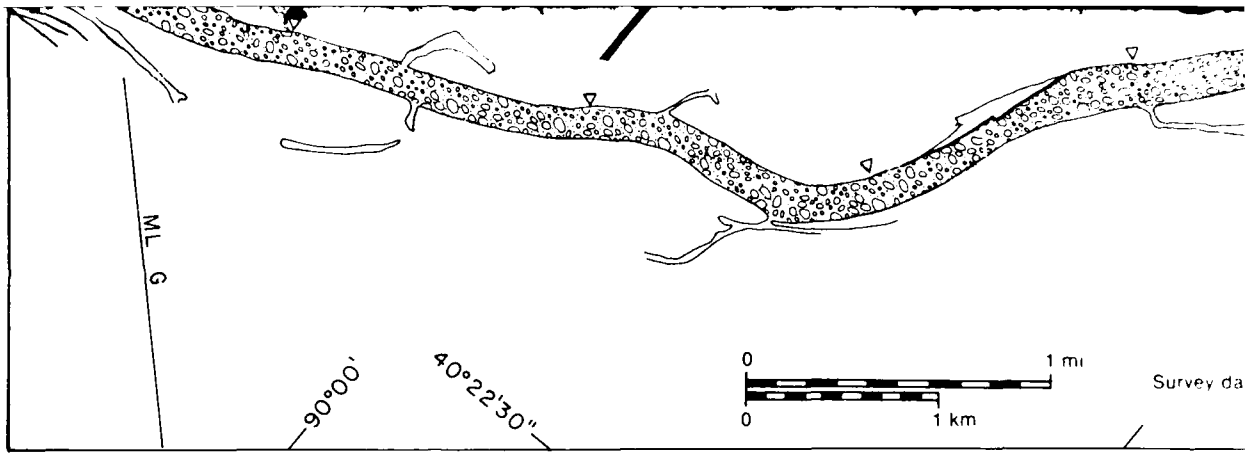

La Grange Pool :7/12 *
40°20'
ML F *
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0
La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey da
La Grange Pool :9/12
40°27'30"
ML H

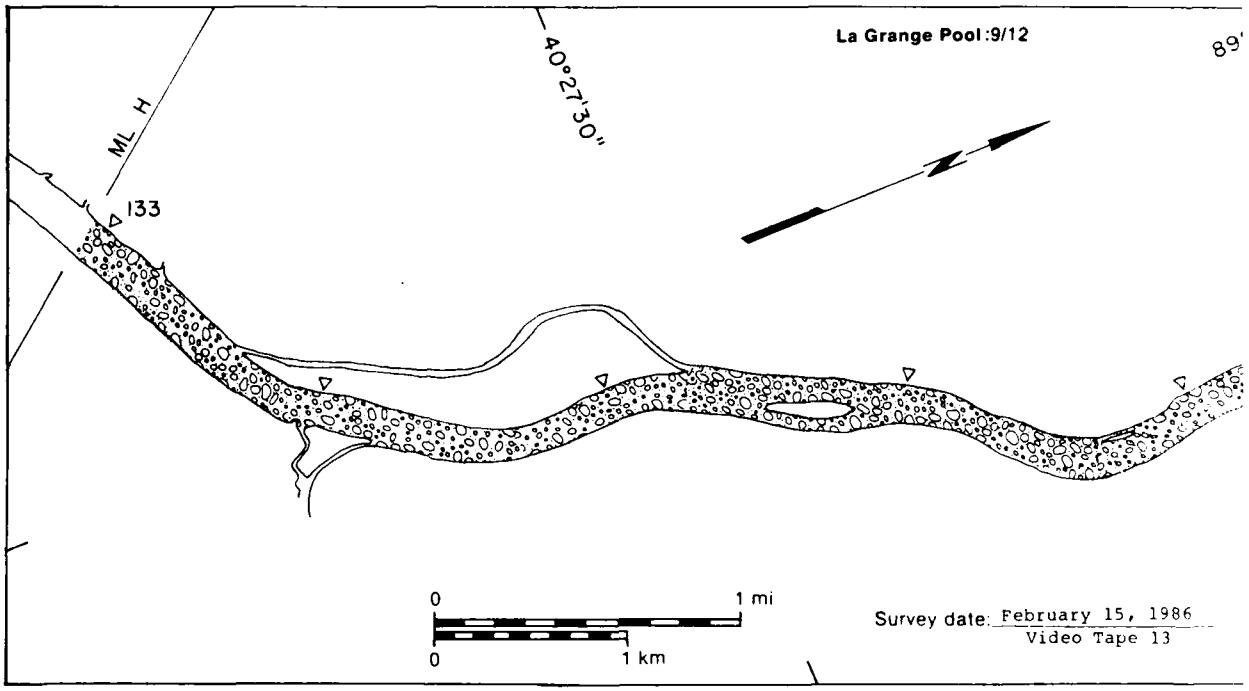
15 February 1986



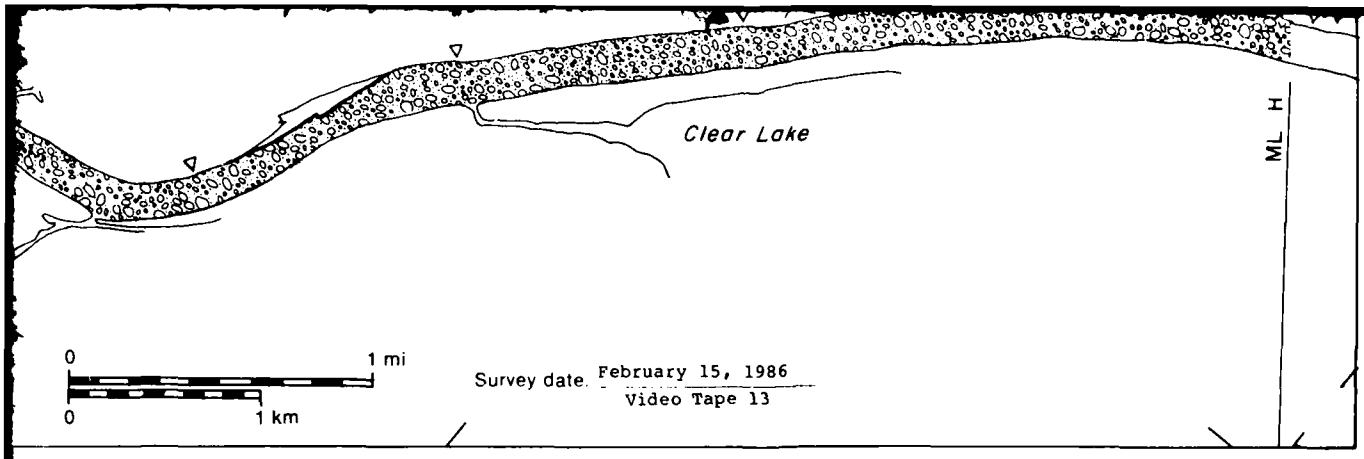


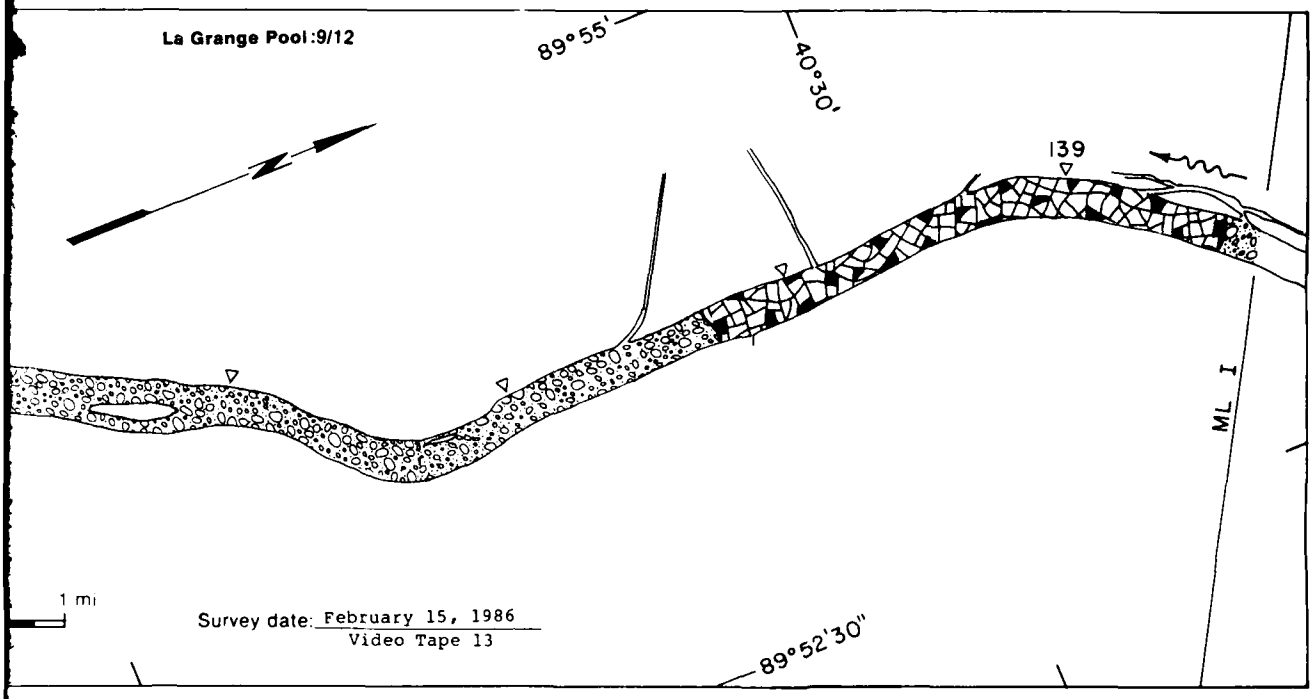






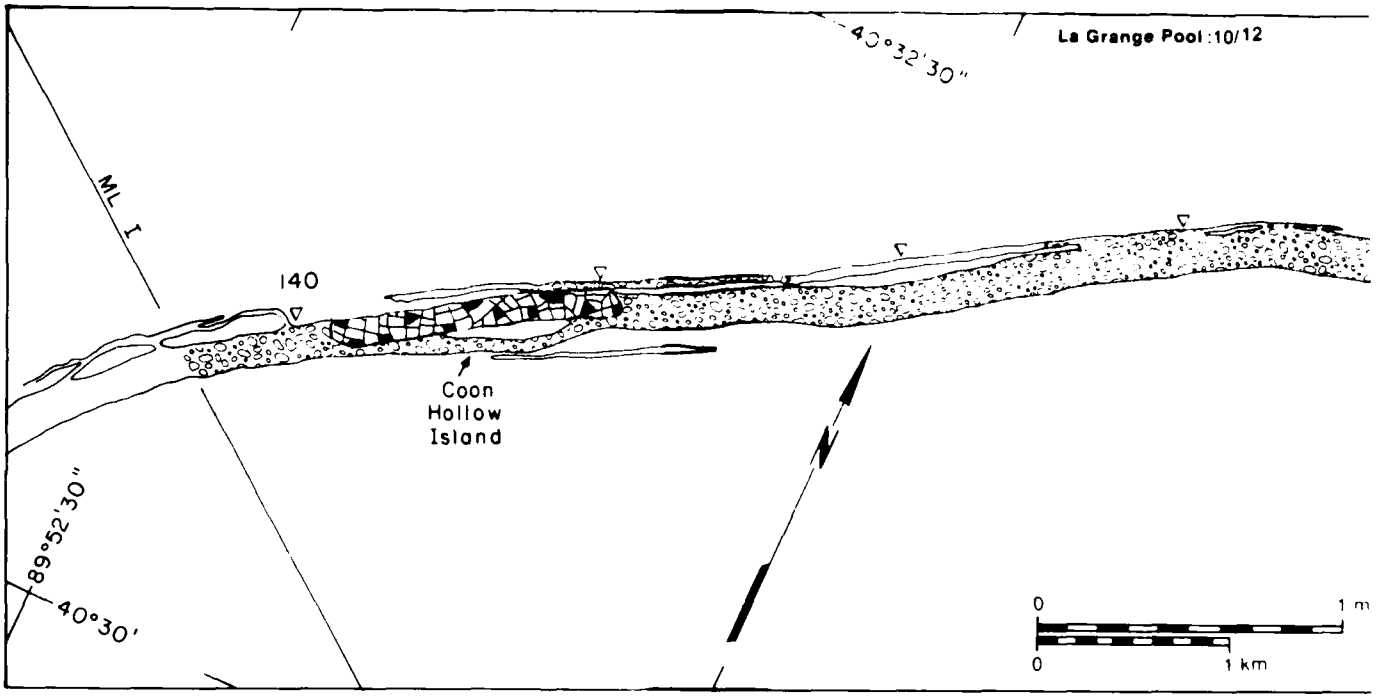
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 :hrough 6/12 (match lines A through E).

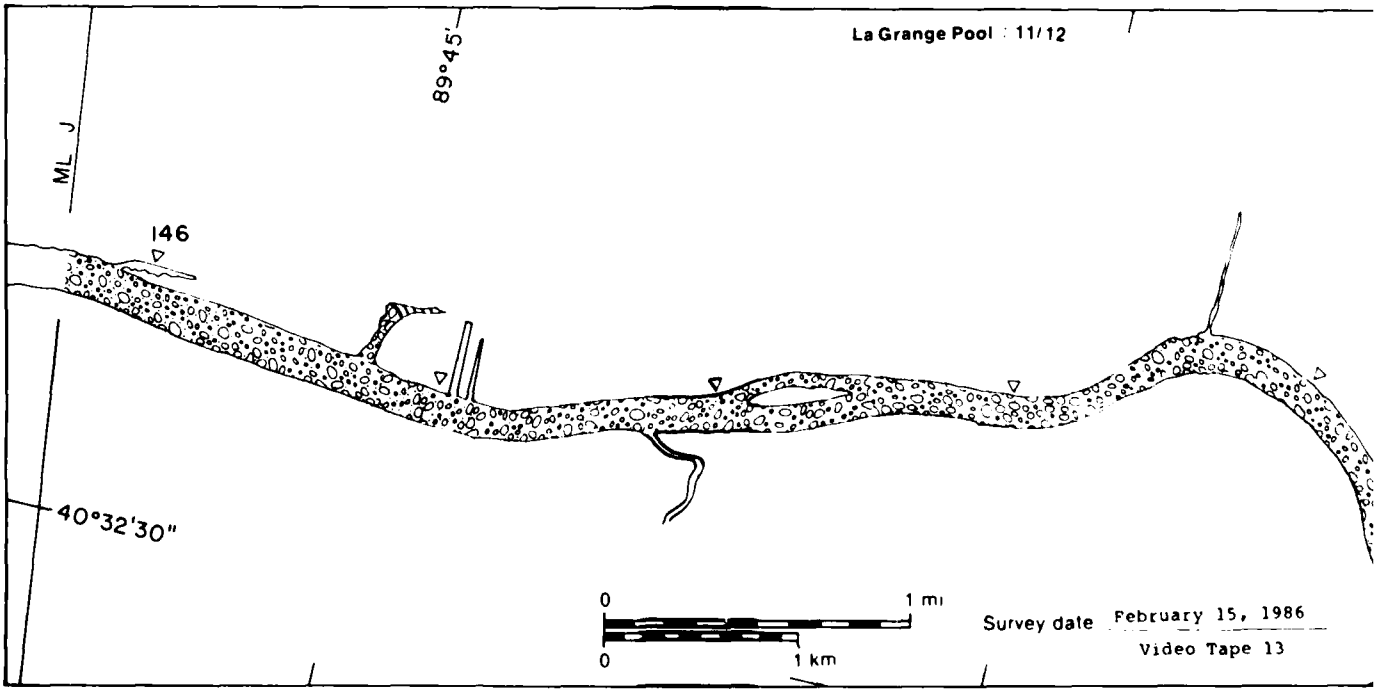


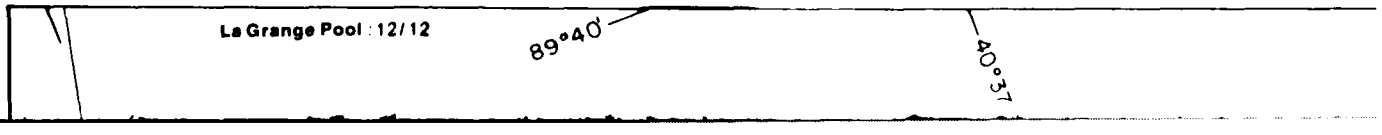


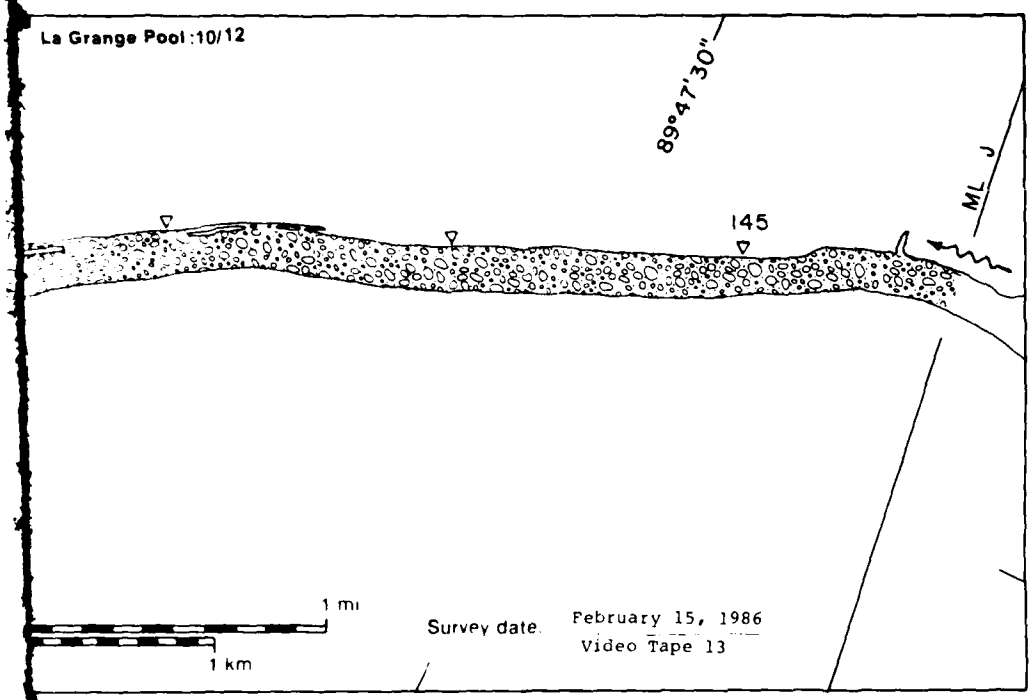
ity of mile 120 at
aps 1/12 through

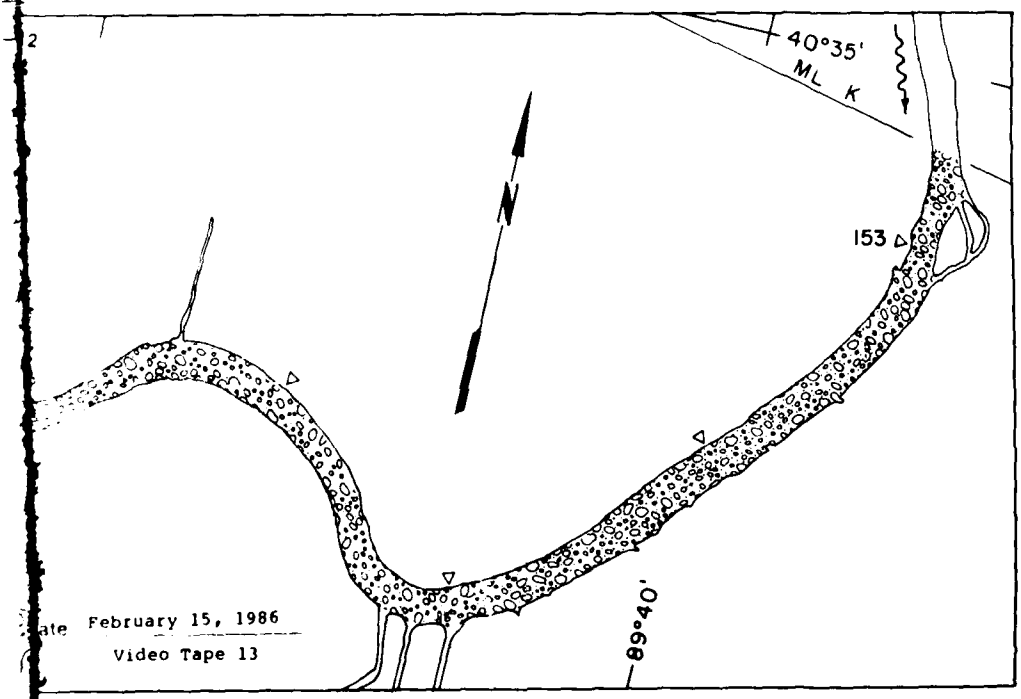
15 February 1986





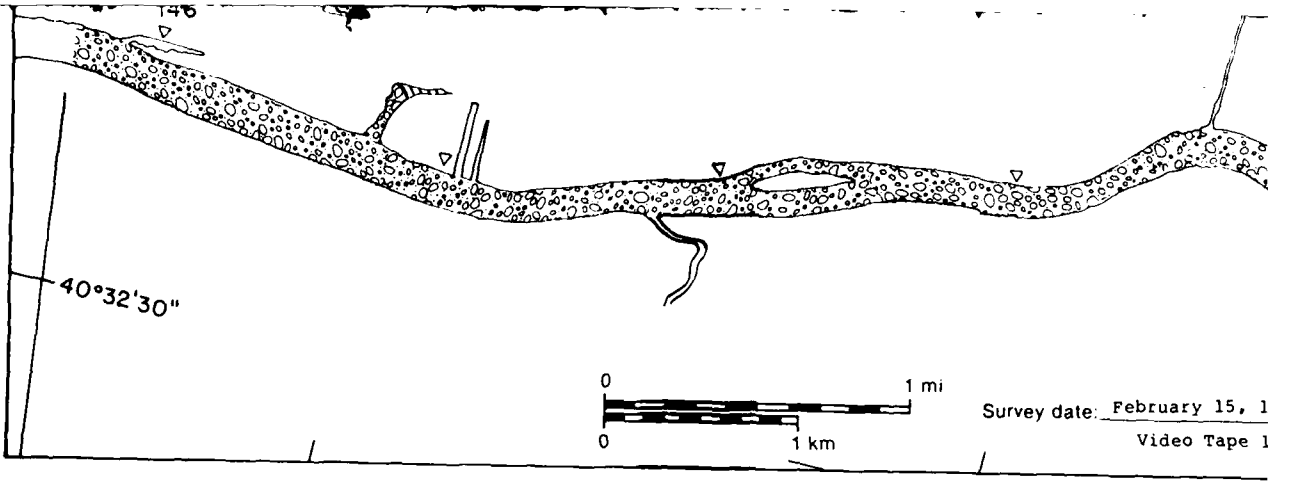


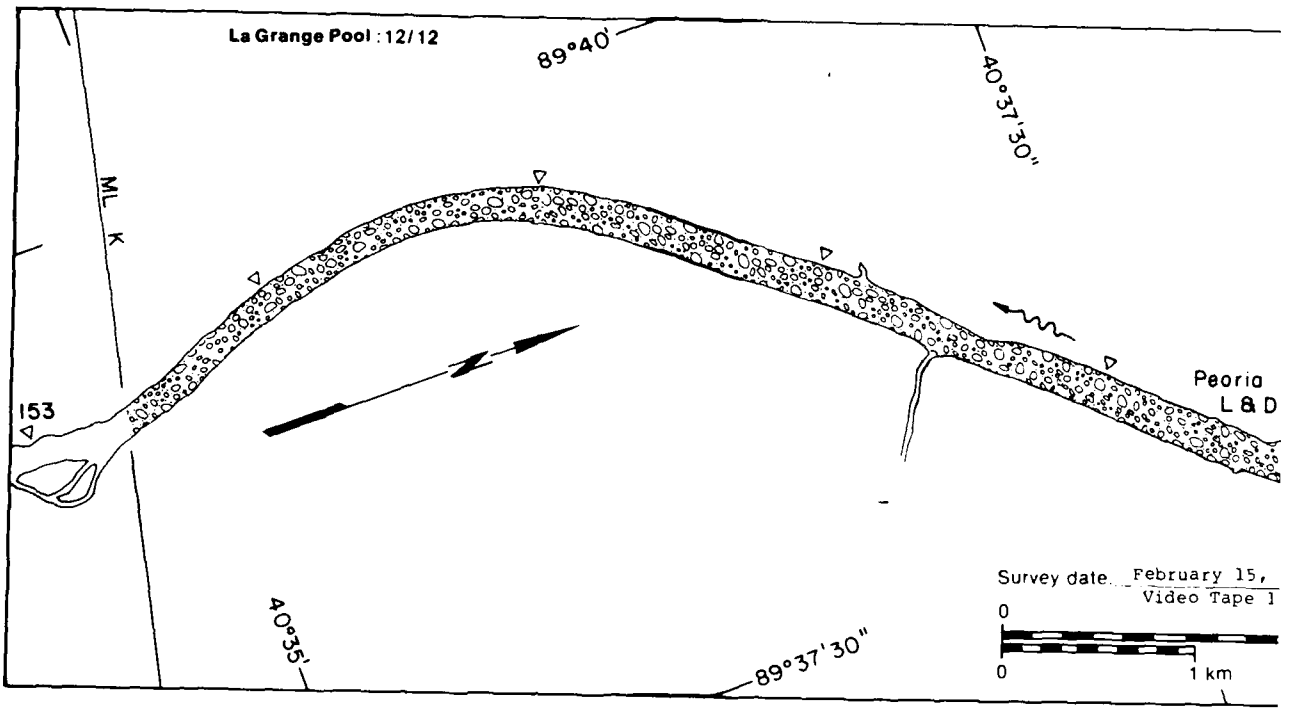


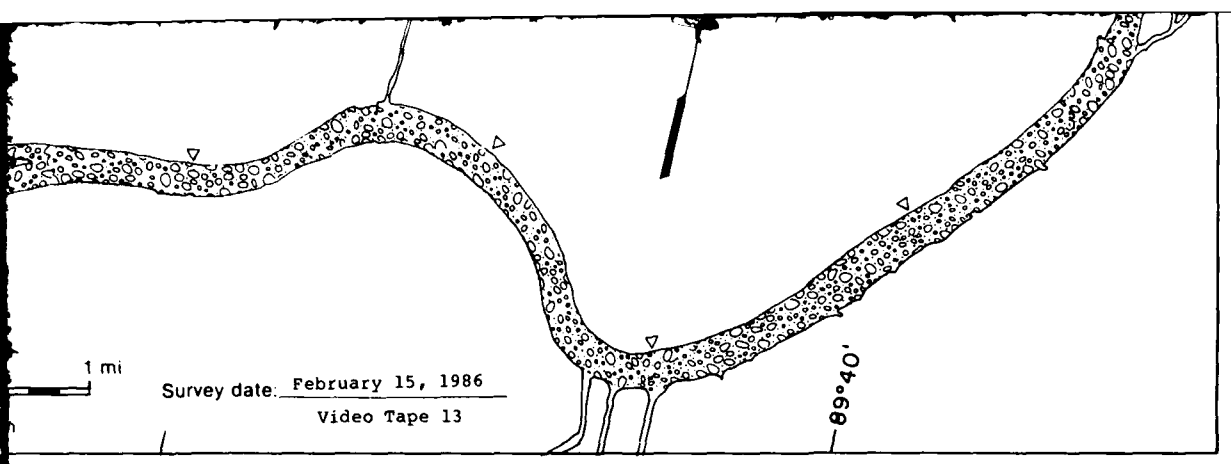


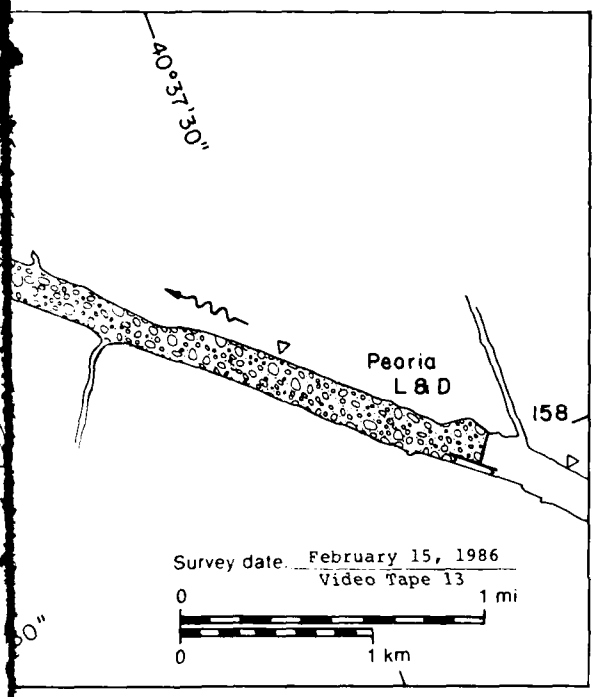
La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration


146
40°32'30"
0
1 mi
0
1 km
Survey date: February 15, 1
Video Tape 1

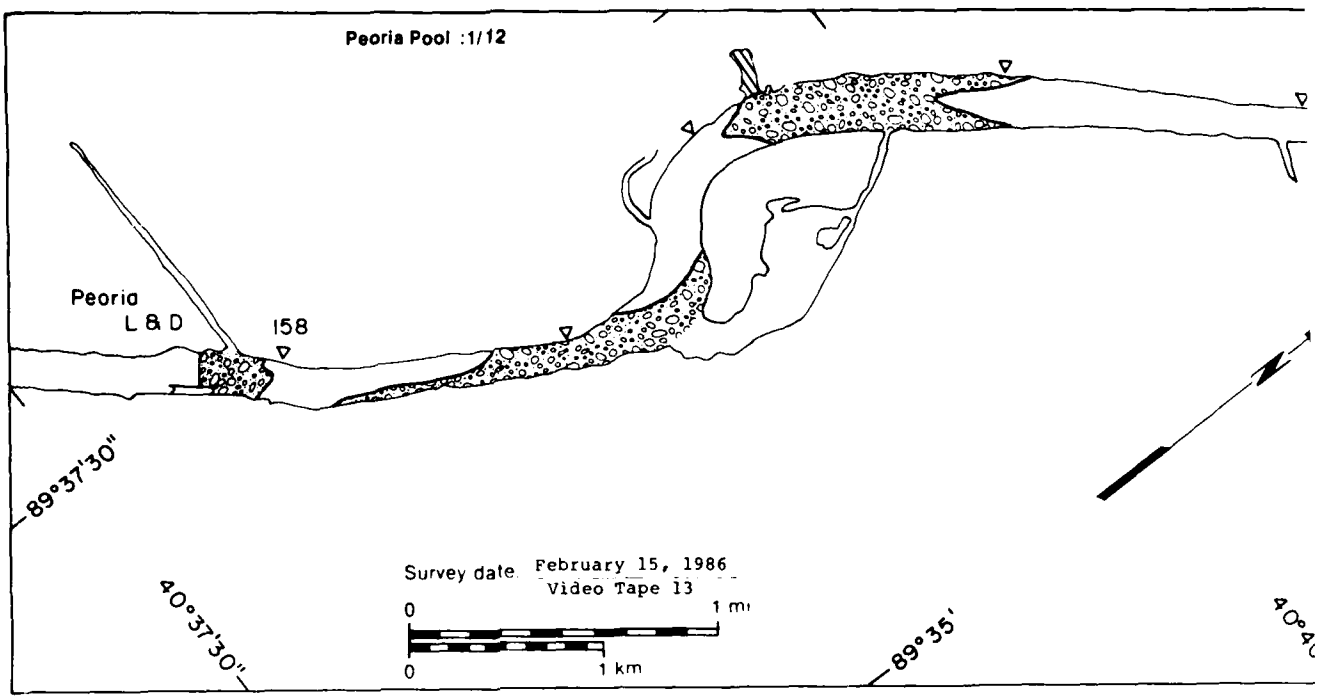

La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L & D
Survey date: February 15,
Video Tape 1
0
0
1 km
40°35'
89°37'30"

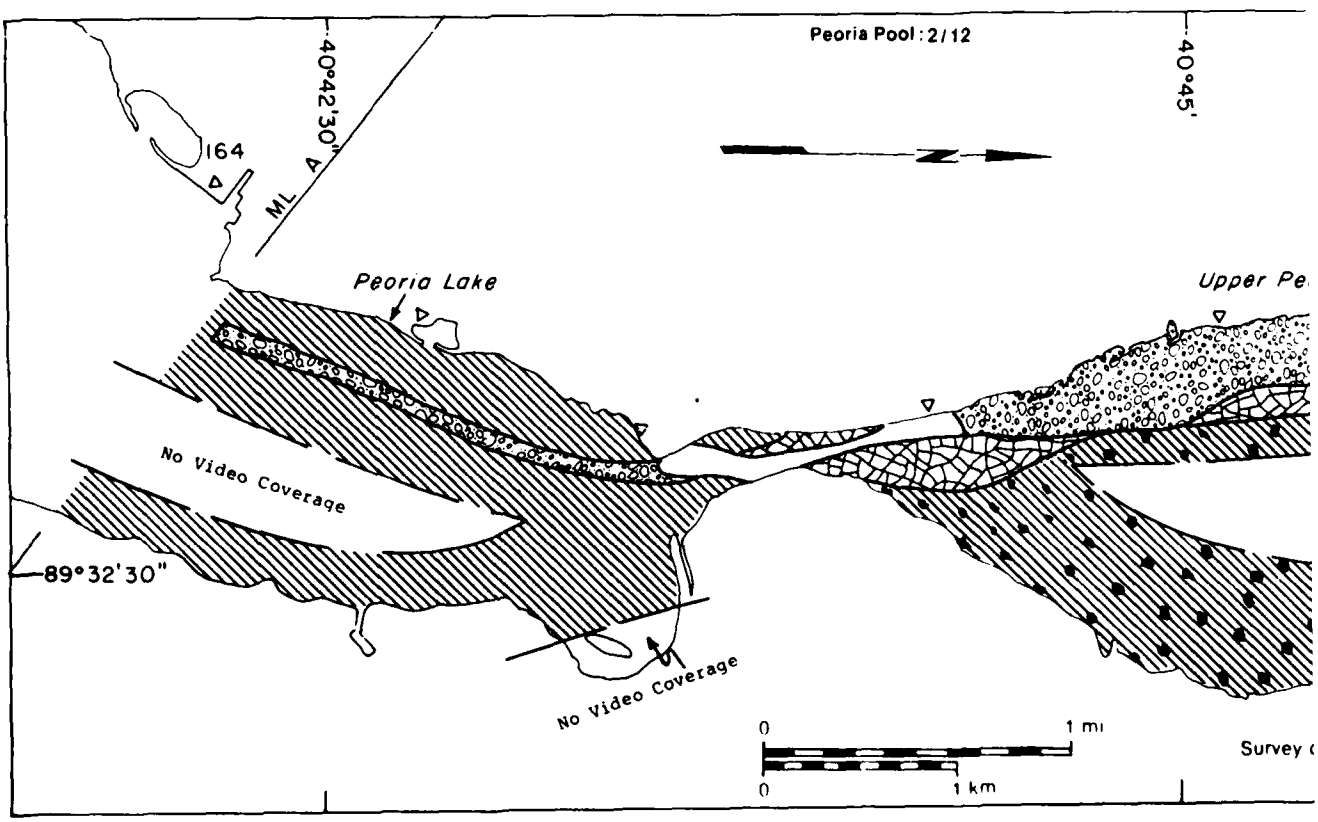


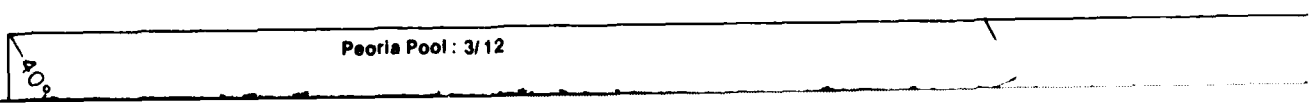


La Grange Pool

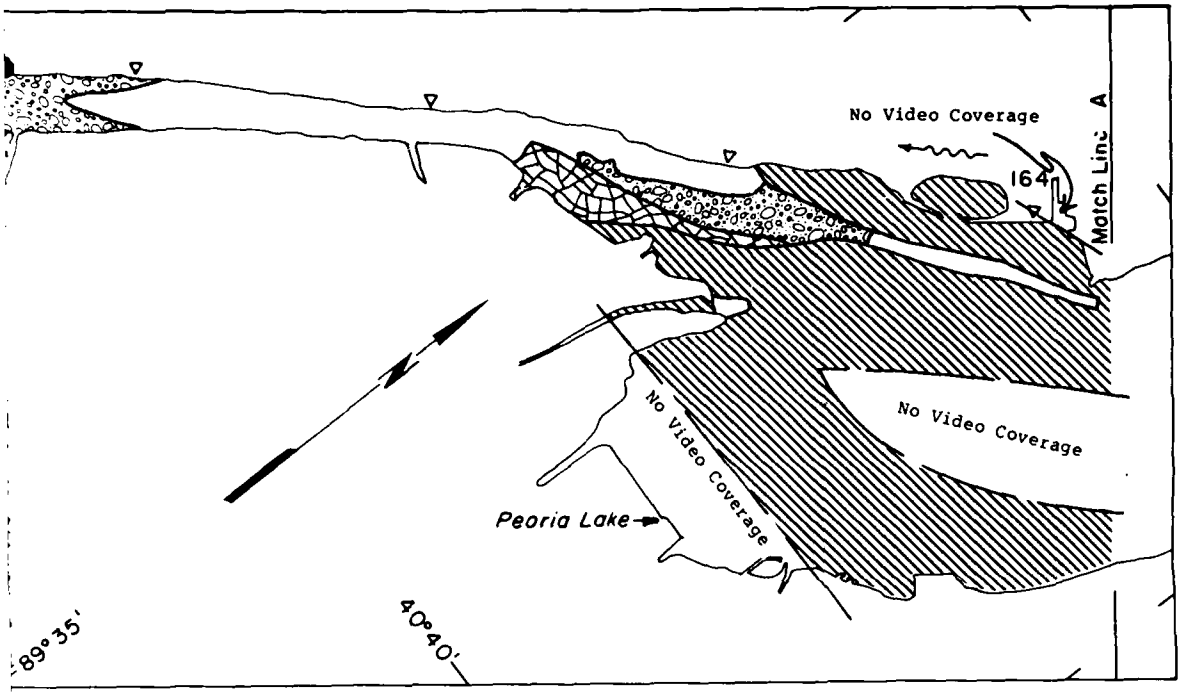
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.31	NA
Solid ice cover	0.10	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.78	70
Ice floes or frazil slush and pans	10.52	30
Total area ($m^2 \times 10^6$)	11.71	

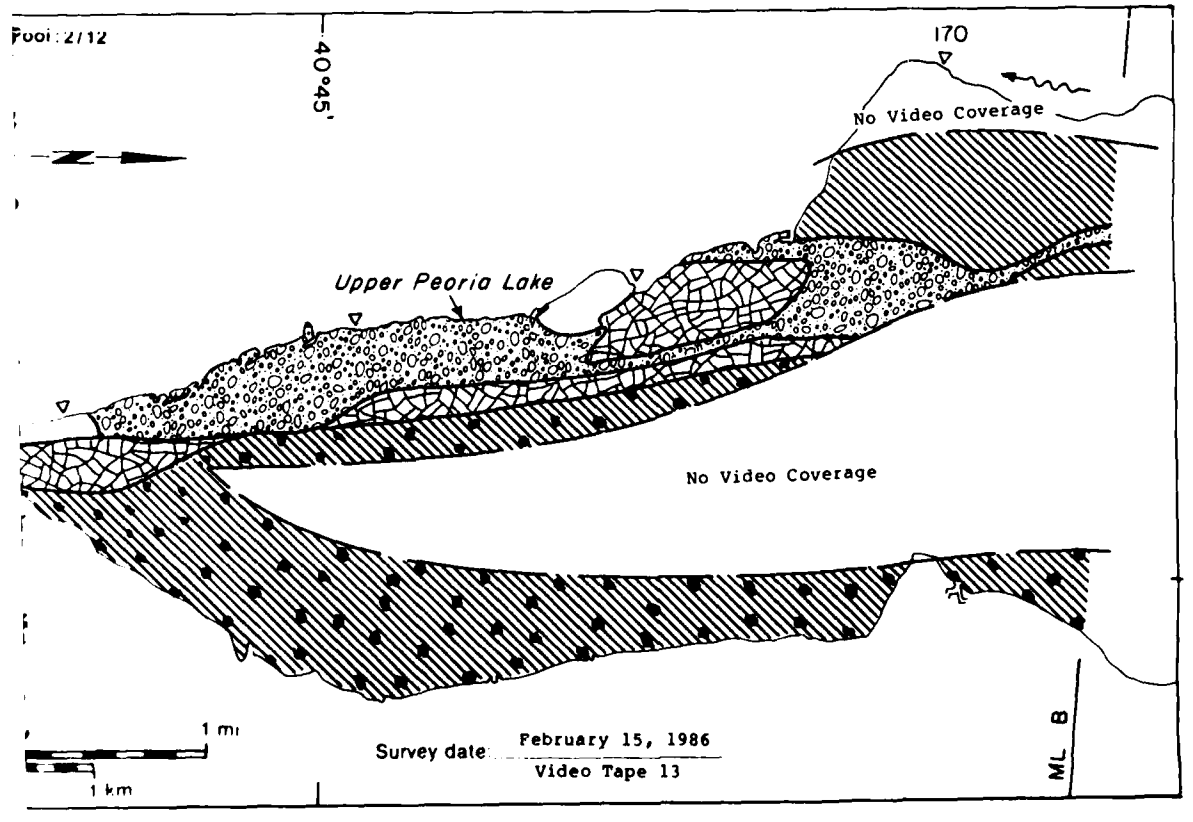

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date February 15, 1986
Video Tape 13
0
1 mi
0
1 km
89°35'

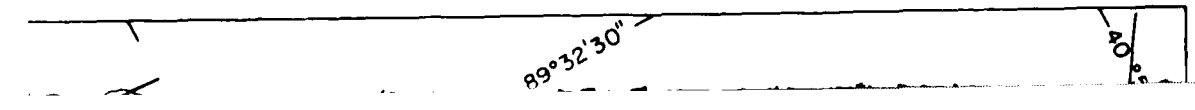

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
Upper Pe
No Video Coverage
89°32'30"
No Video Coverage
0
1 mi
0
1 km
Survey

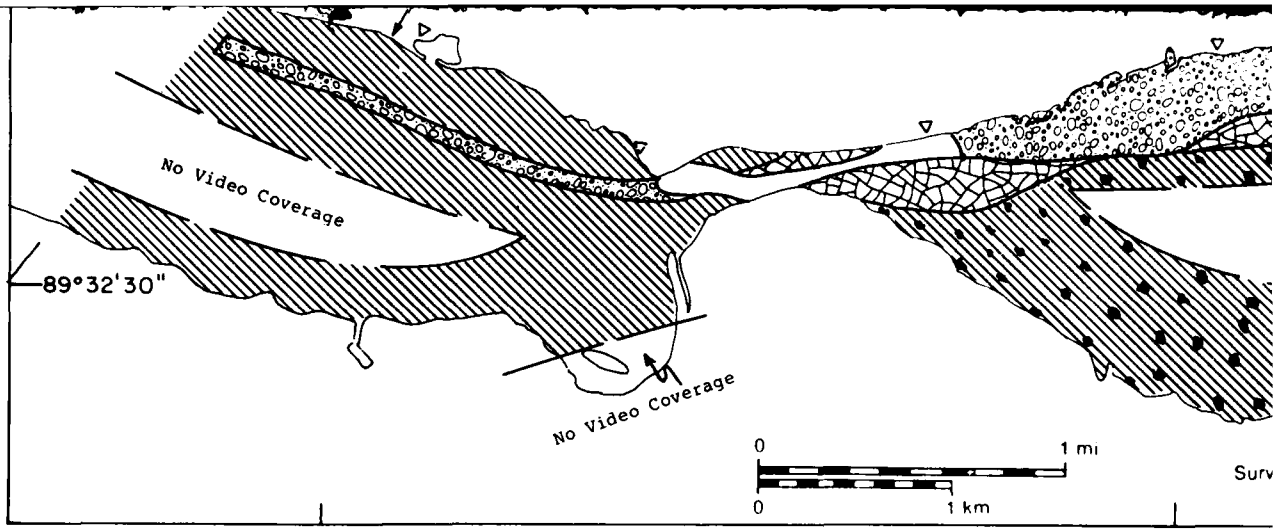

Peoria Pool : 3/12

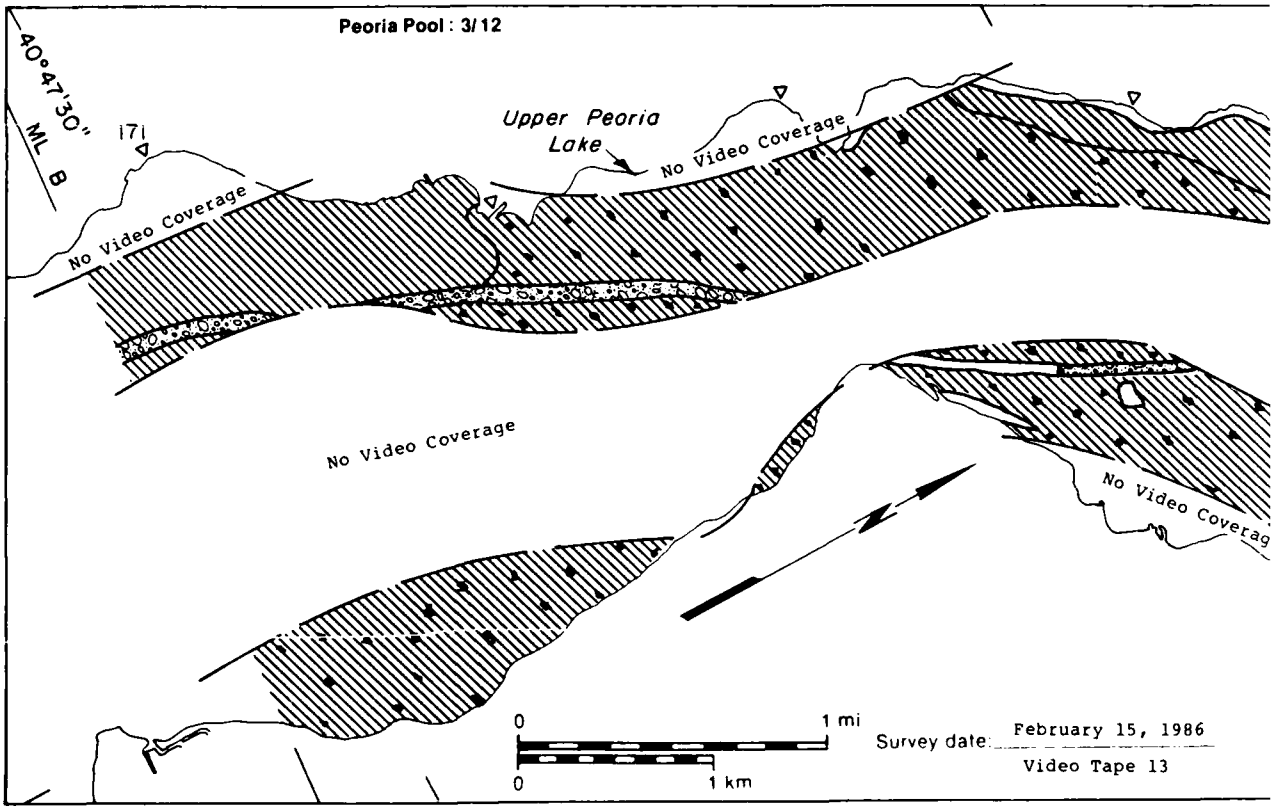
15 February 1986

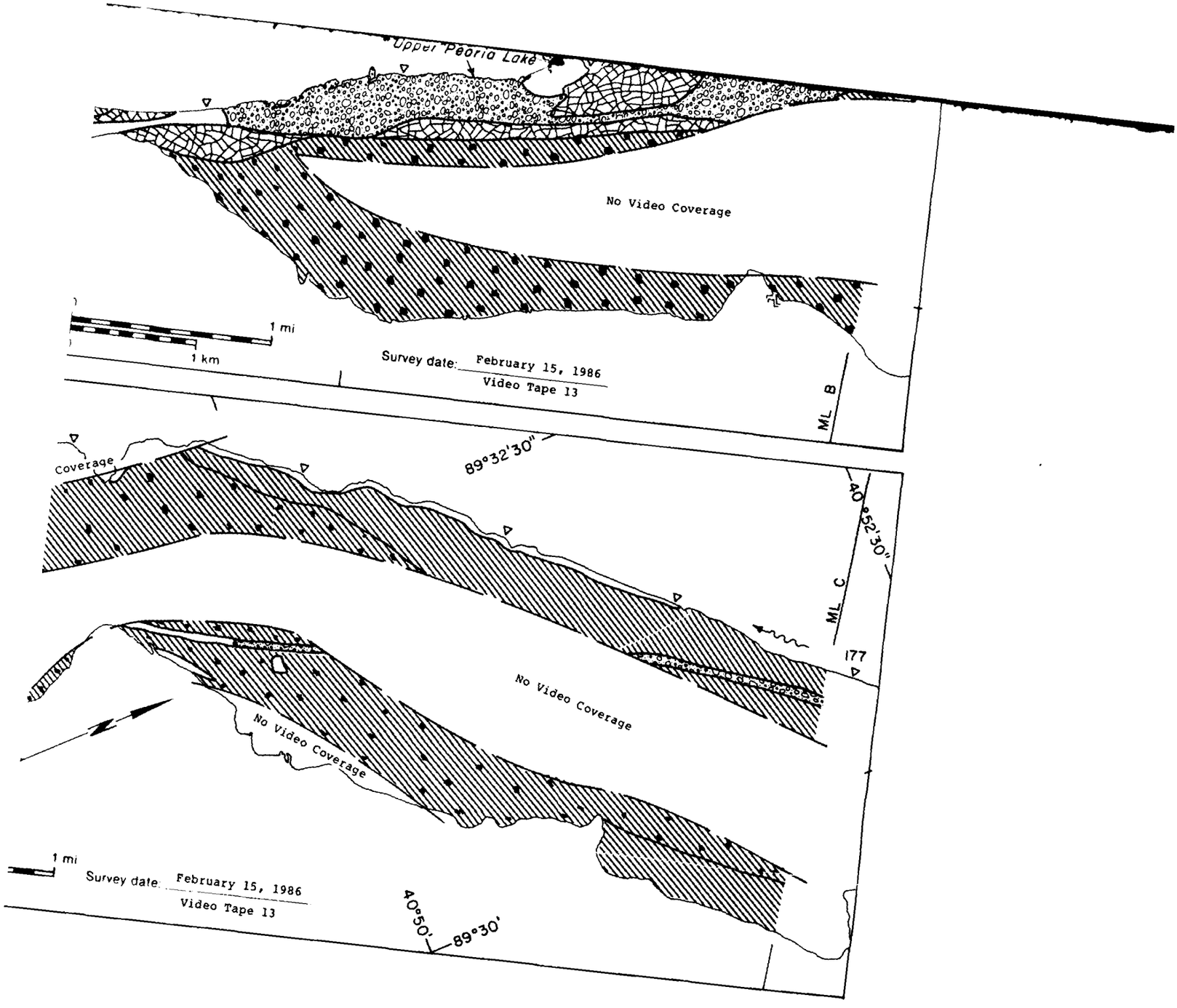




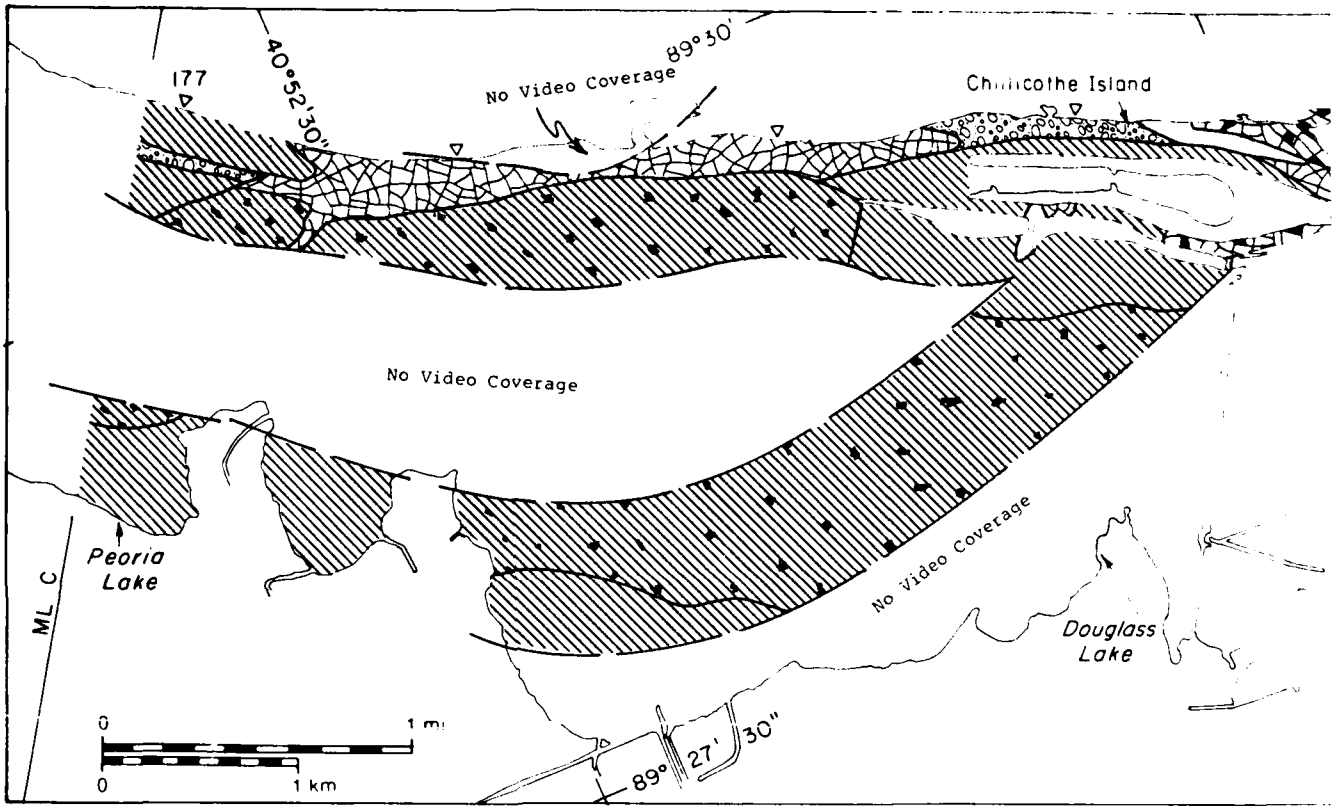


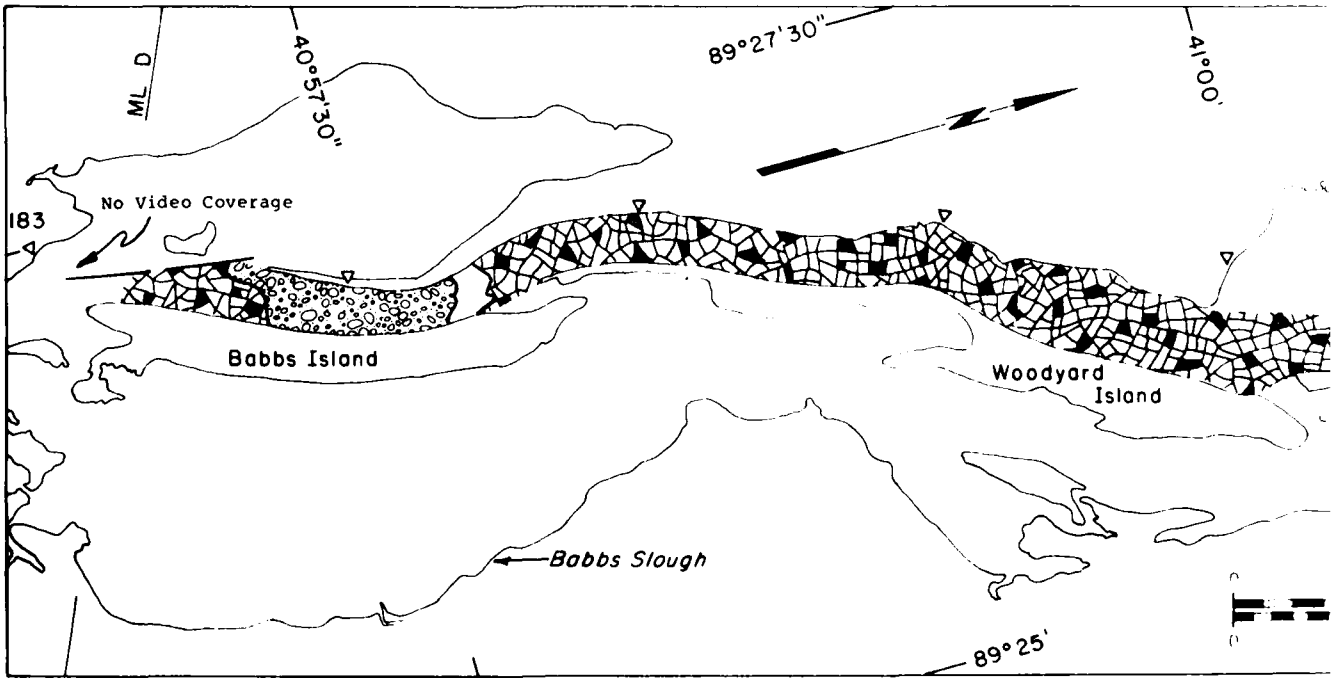

No Video Coverage
89°32'30"
No Video Coverage
0
1 mi
0
1 km

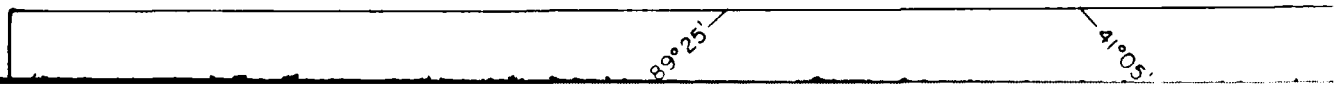

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date: February 15, 1986
Video Tape 13

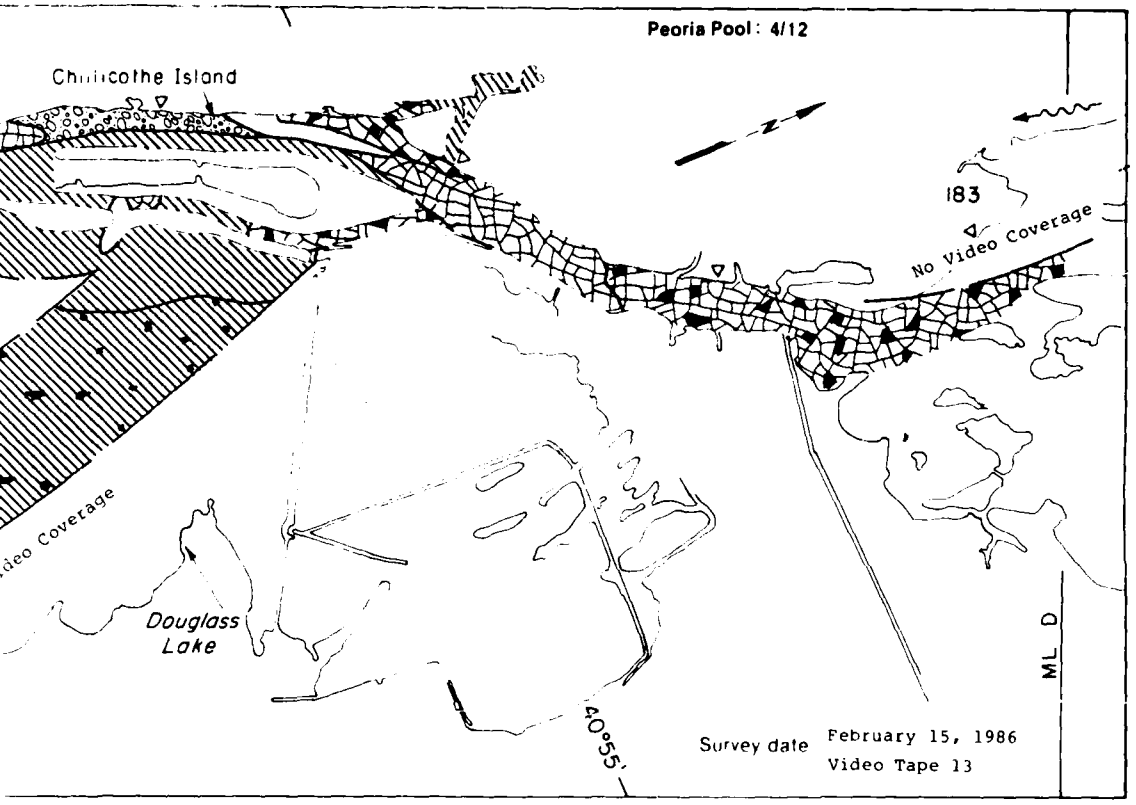

Upper Peoria Lake
No Video Coverage
1 mi
1 km
Survey date: February 15, 1986
Video Tape 13
ML B
Coverage
89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
No Video Coverage
1 mi
Survey date: February 15, 1986
Video Tape 13
40°50'
89°30'

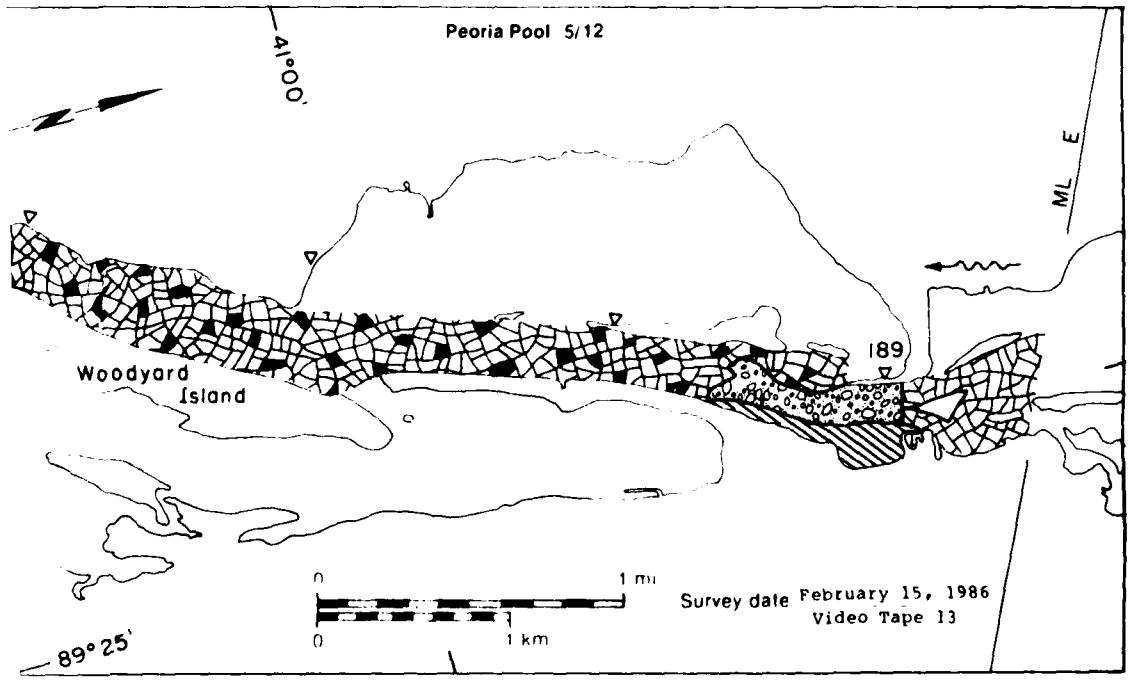
15 February 1986

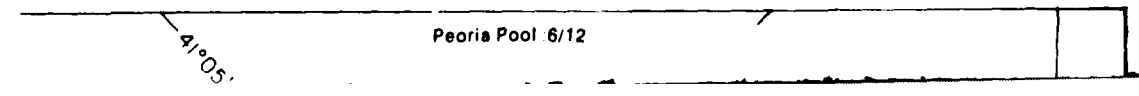


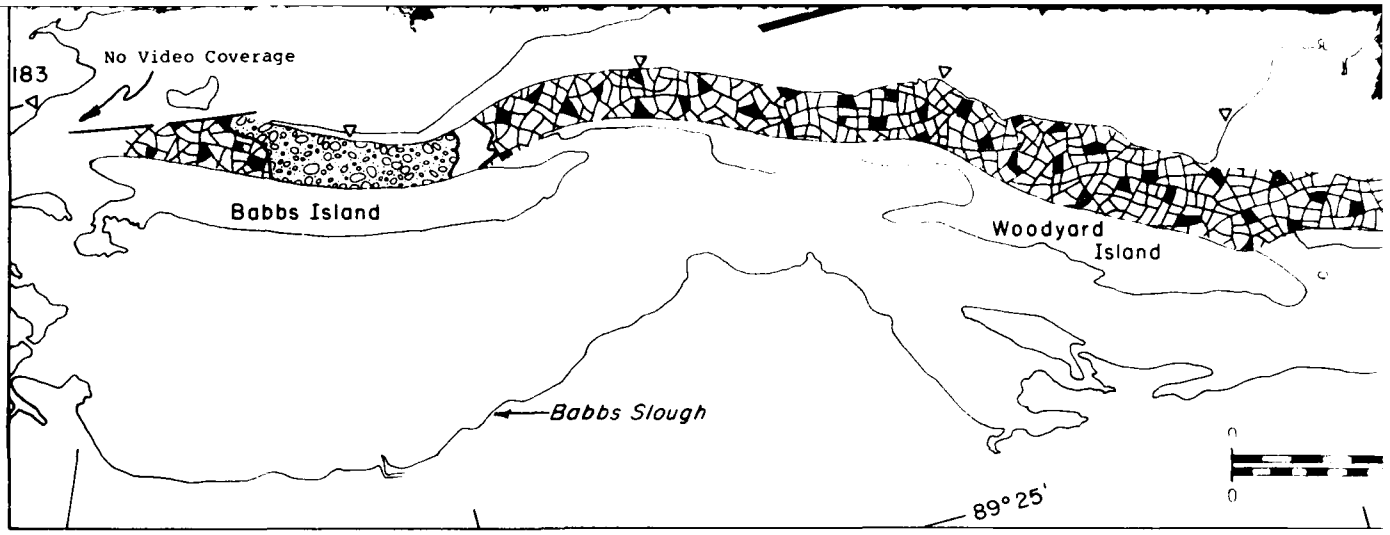


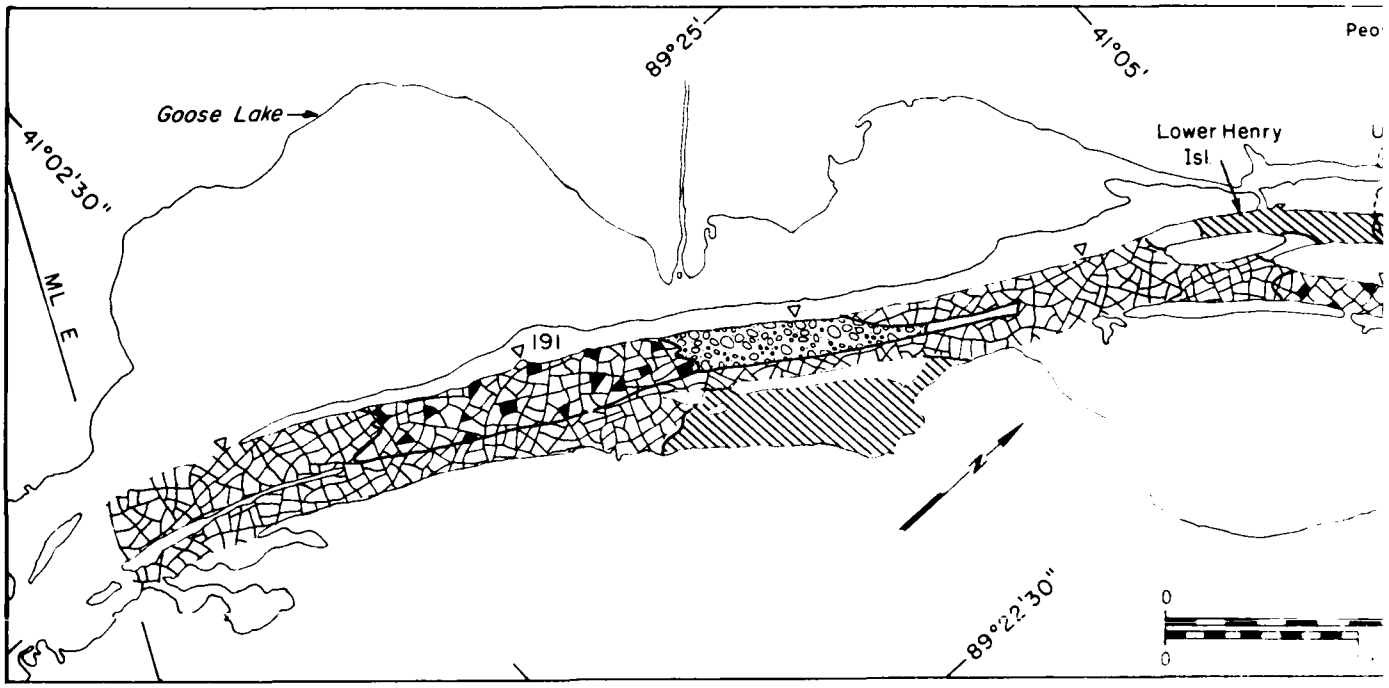


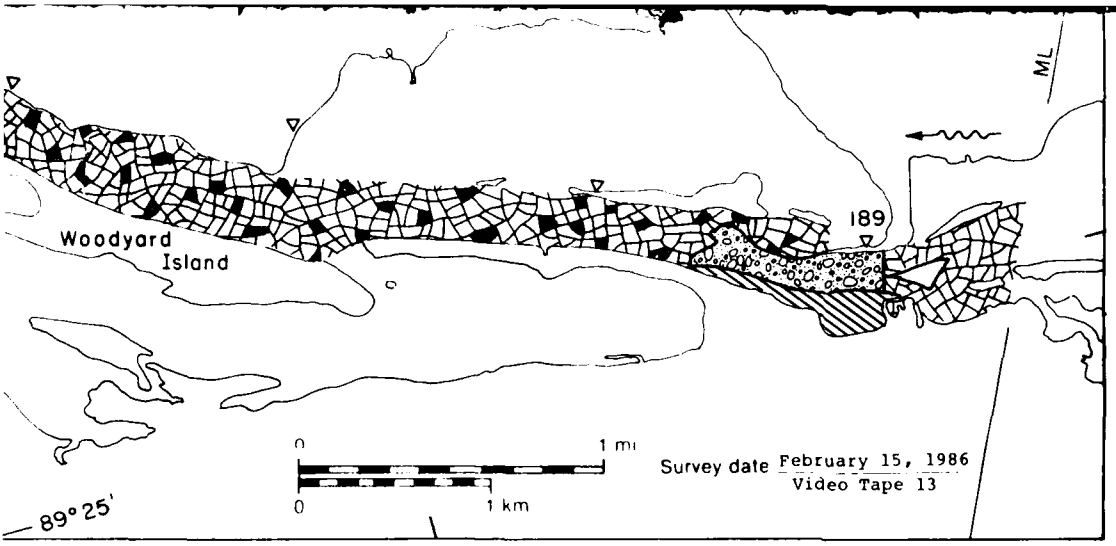

Peoria Pool : 4/12
Chillicothe Island
183
No Video Coverage
Douglass Lake
ML D
40°55'
Survey date February 15, 1986
Video Tape 13

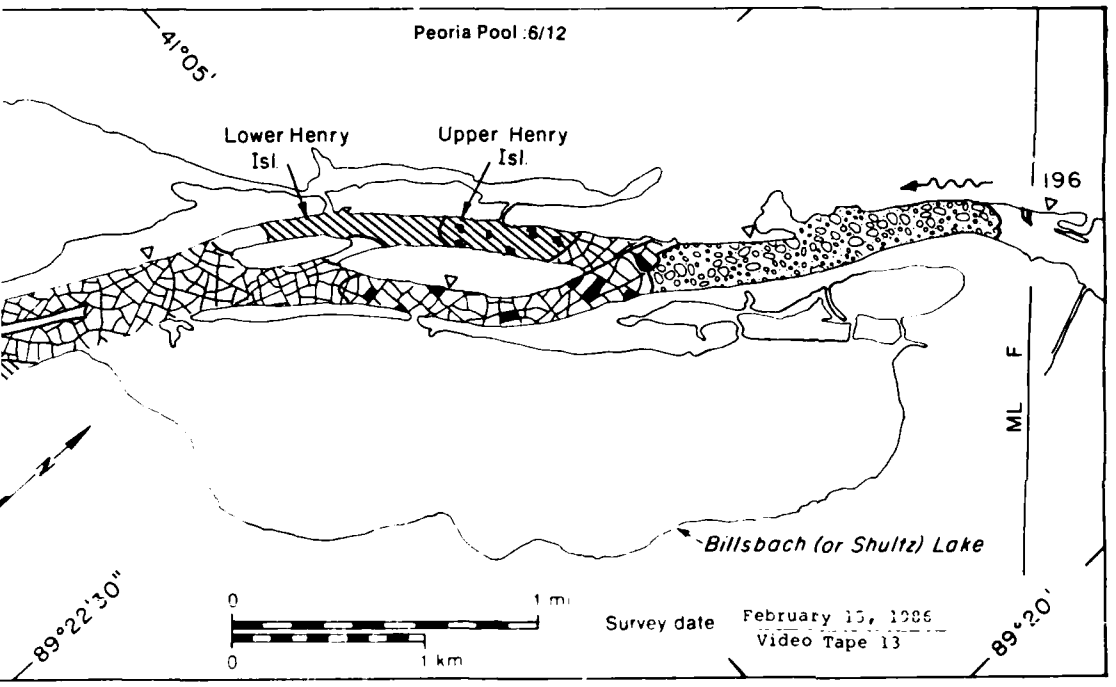

Peoria Pool 5/12
41°00'
ML E
189
Woodyard Island
0 1 mi
0 1 km
Survey date February 15, 1986
Video Tape 13
89°25'

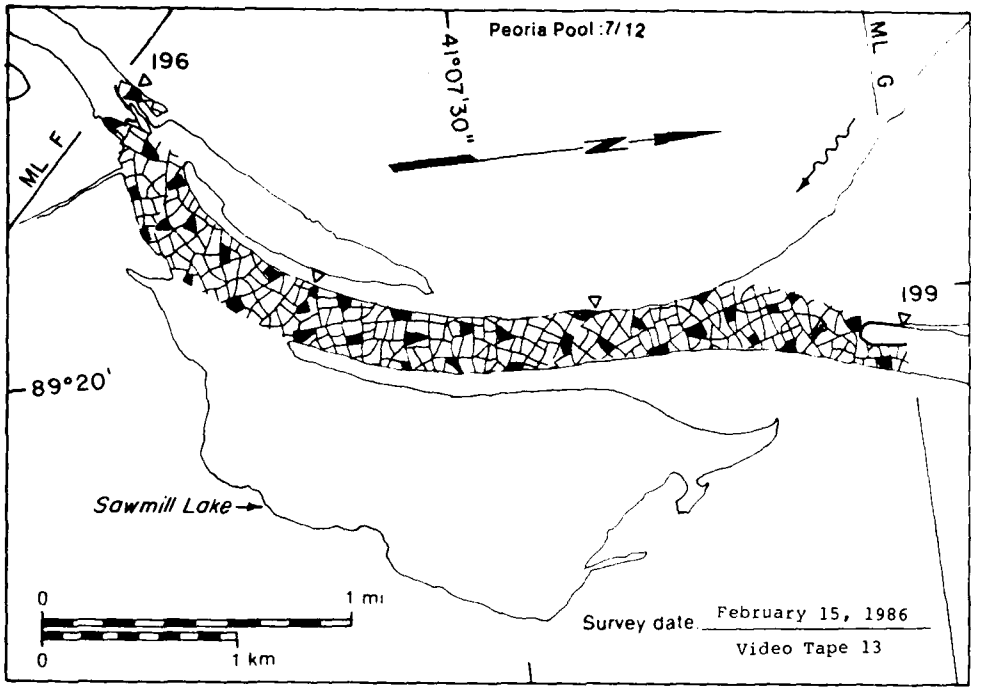

Peoria Pool 6/12
41°05'

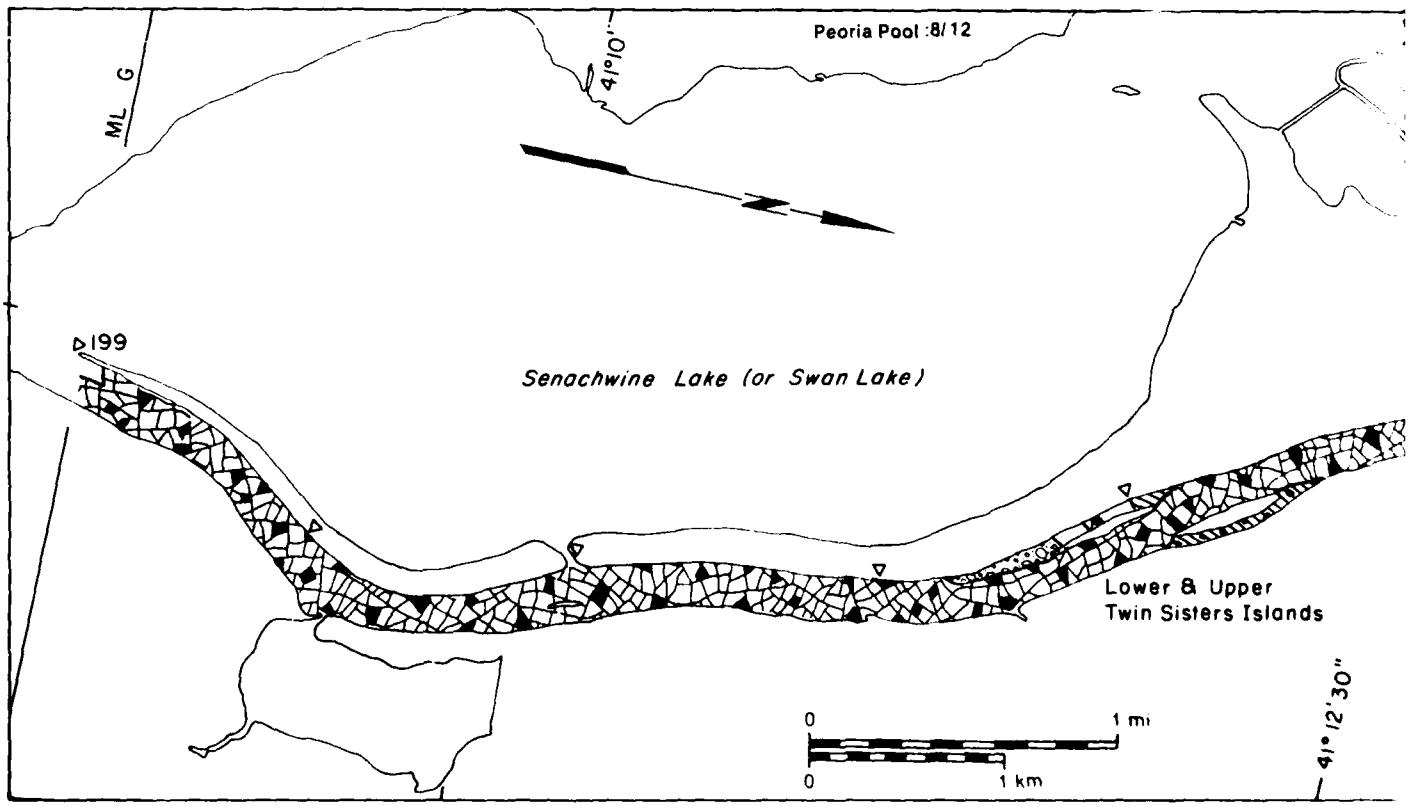

No Video Coverage
183
Babbs Island
Woodyard
Island
Babbs Slough
89° 25'
0
0


89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
N
89°22'30"
0
0


ML
189
Woodyard
Island
0
1 mi
0
1 km
Survey date February 15, 1986
Video Tape 13
89°25'

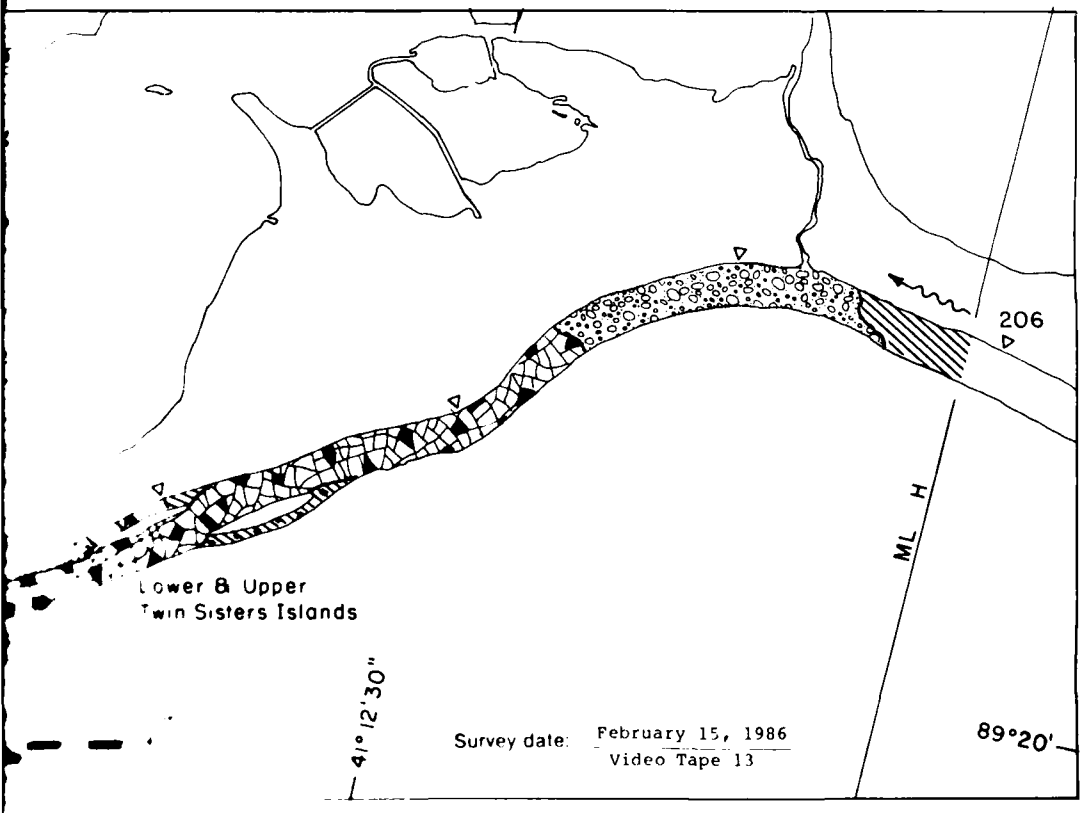

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date February 15, 1986
Video Tape 13
89°22'30"
89°20'

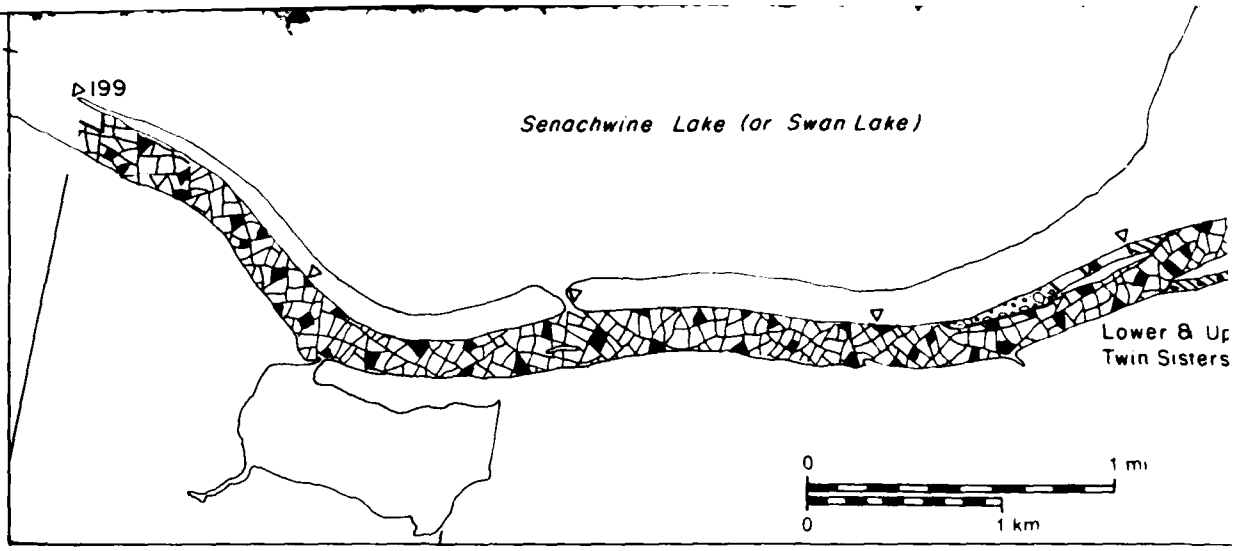

Peoria Pool :7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date February 15, 1986
Video Tape 13

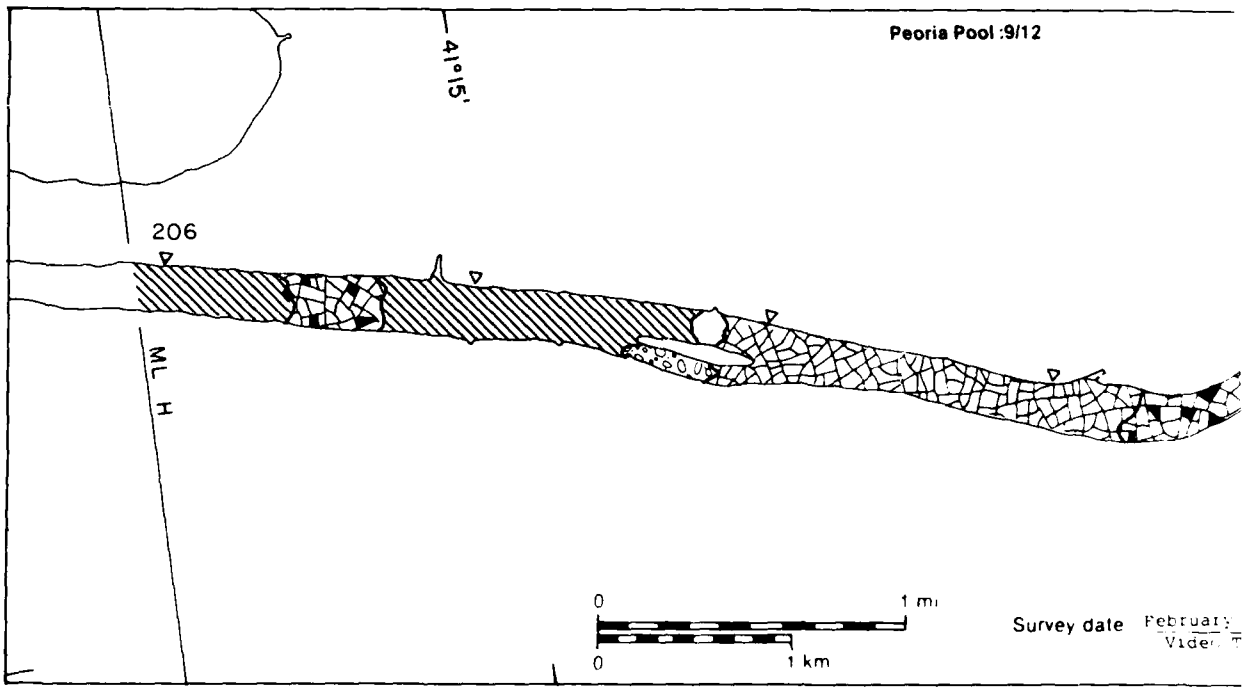

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41°12'30"

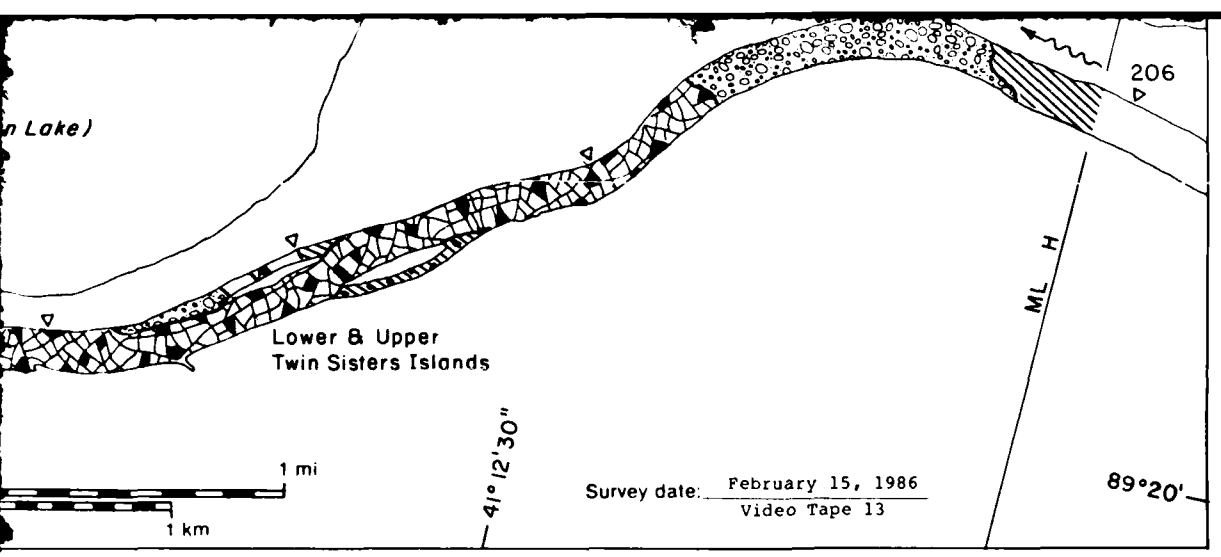
Peoria Pool :9/12
41°15'

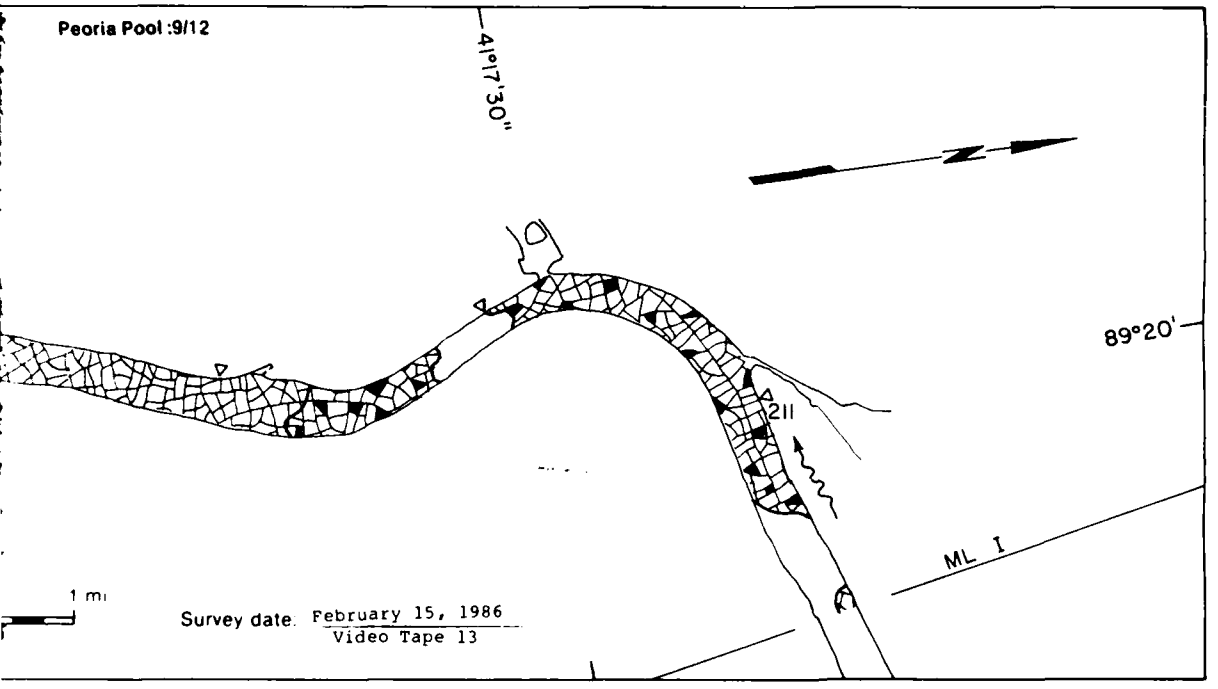
15 February 1986



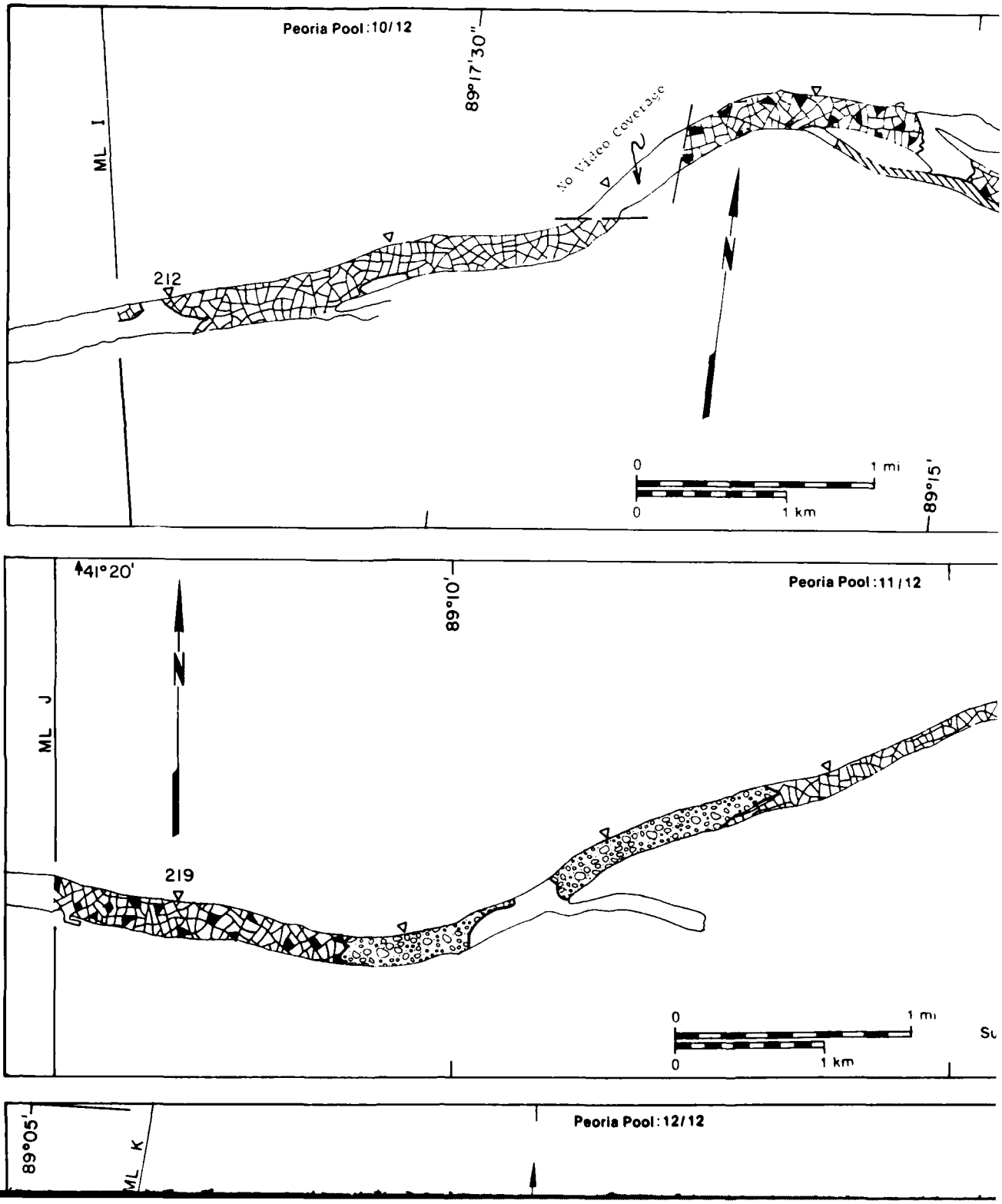

199
Senachwine Lake (or Swan Lake)
Lower & Up
Twin Sisters
0
1 mi
0
1 km

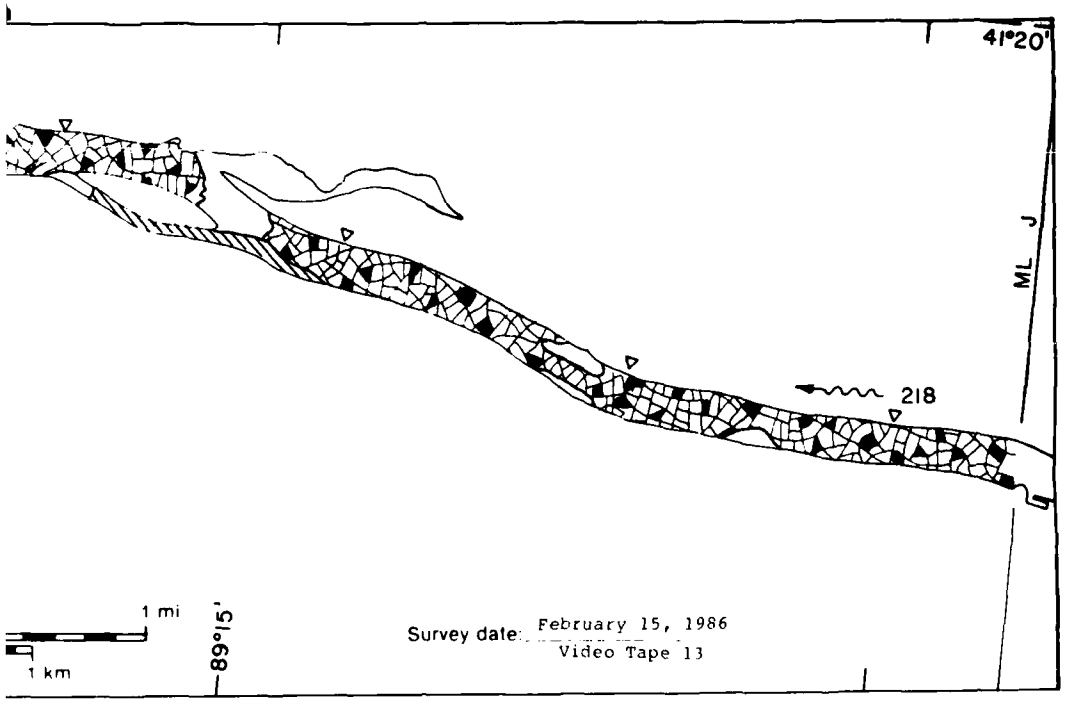

Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date

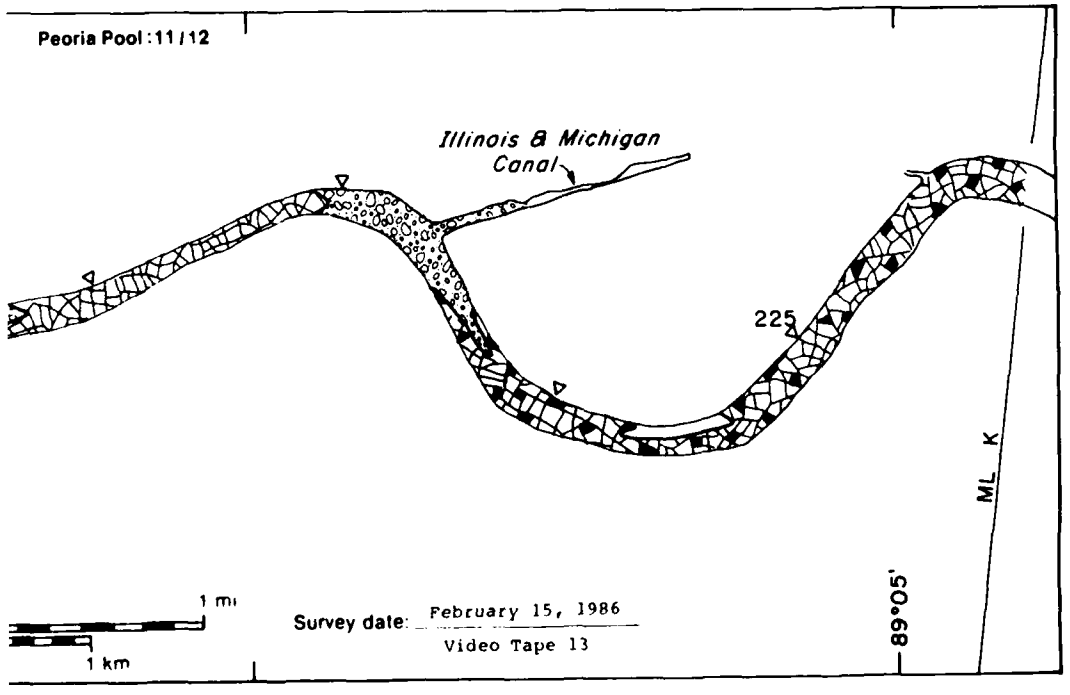

n Lake)
206
Lower & Upper
Twin Sisters Islands
ML H
1 mi
1 km
41° 12' 30"
Survey date: February 15, 1986
Video Tape 13
89°20'

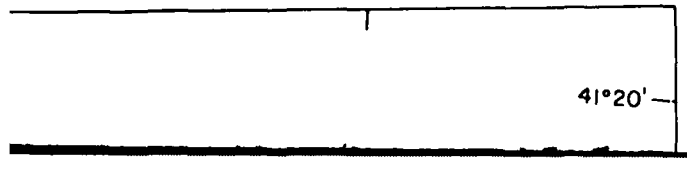

Peoria Pool :9/12
41°17'30"
89°20'
211
ML I
1 mi
Survey date: February 15, 1986
Video Tape 13

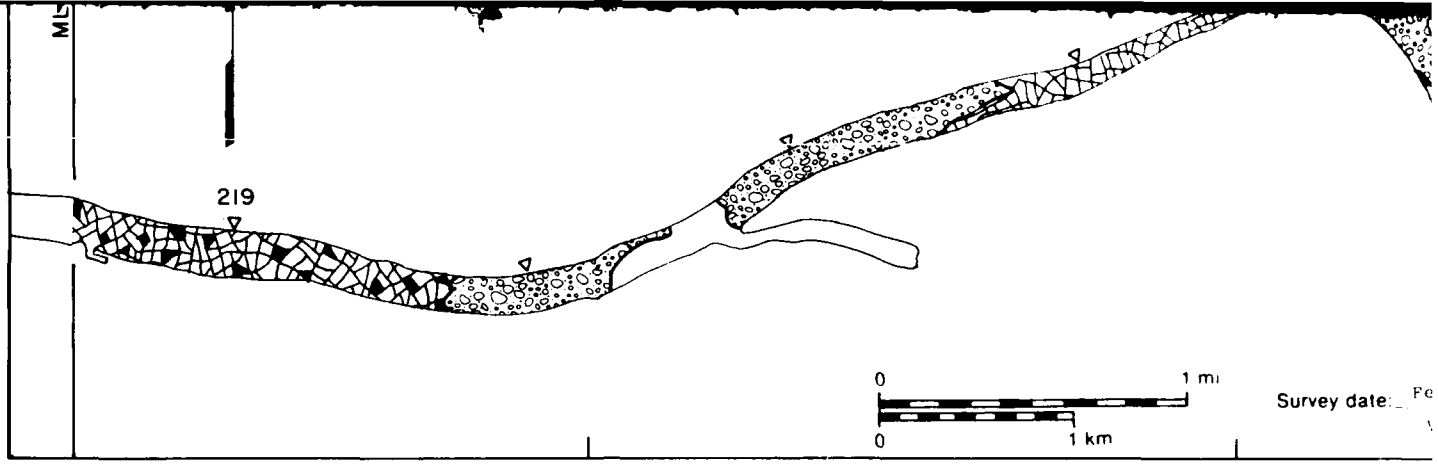
15 February 1986

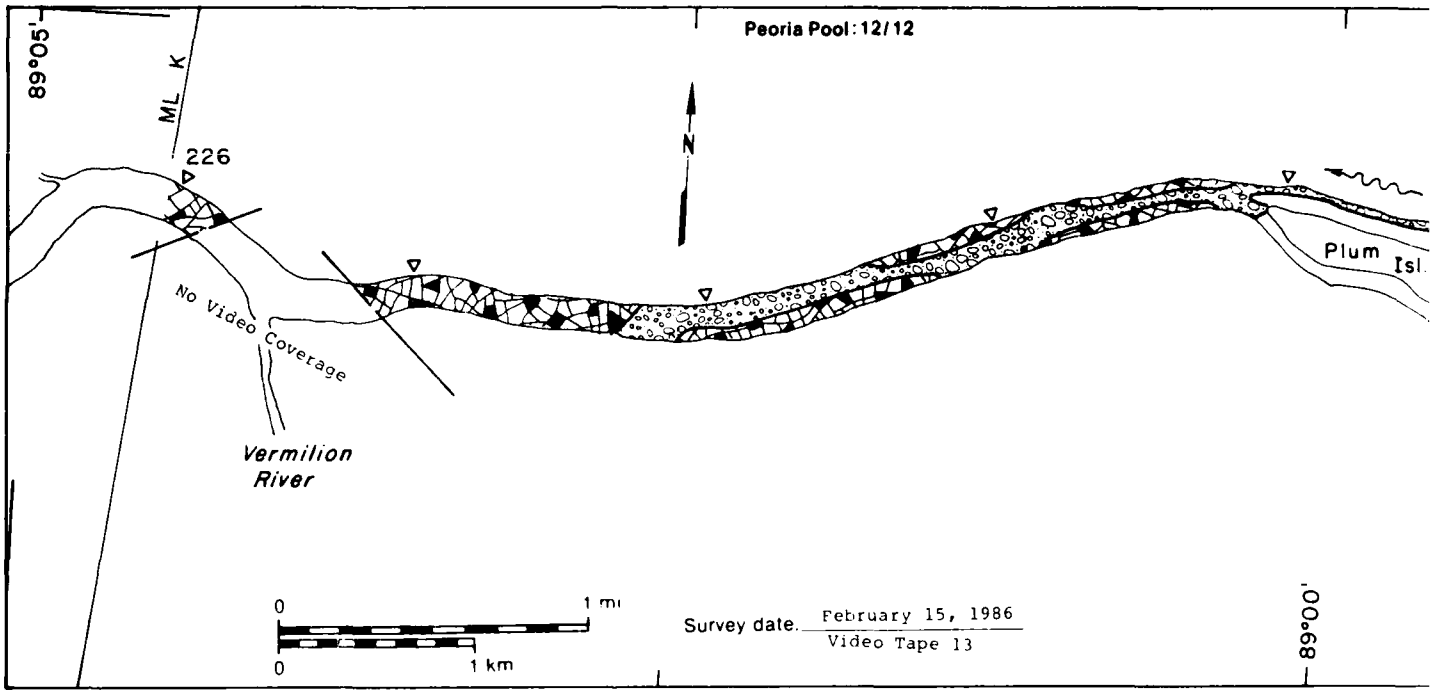



41°20'
ML J
218
1 mi
1 km
89°15'
Survey date: February 15, 1986
Video Tape 13


Peoria Pool : 11 / 12
Illinois & Michigan Canal
225
ML K
1 mi
1 km
89°05'
Survey date: February 15, 1986
Video Tape 13


41°20'

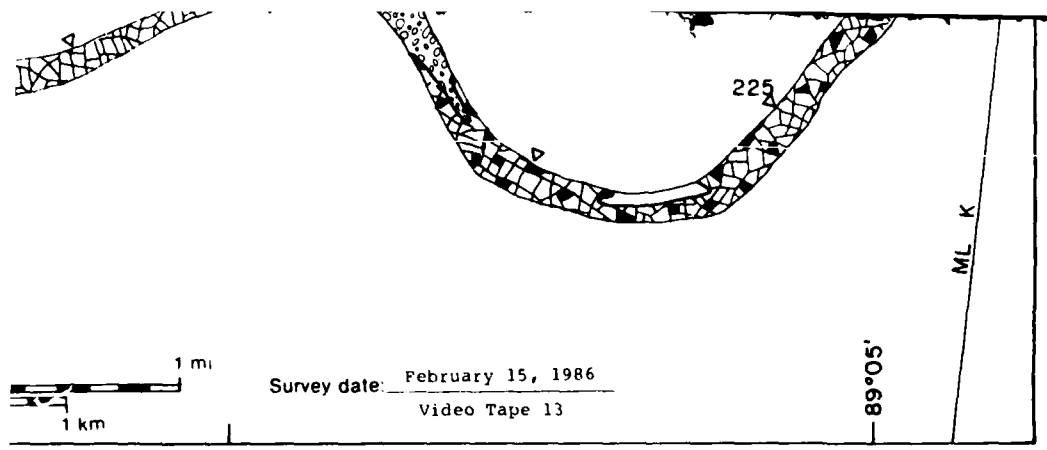


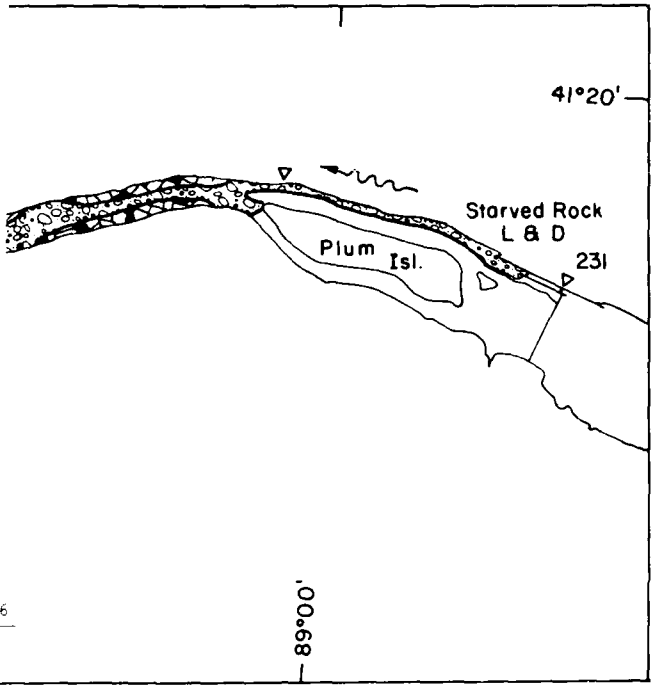


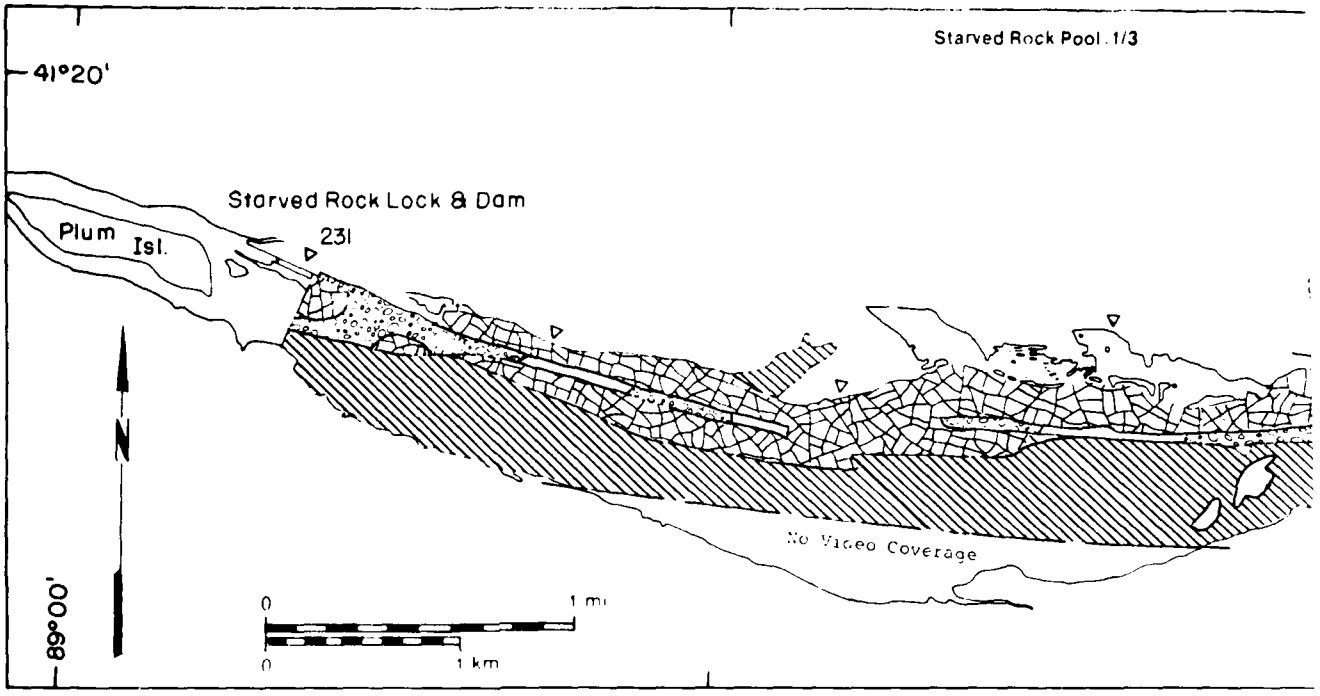
Peoria Pool

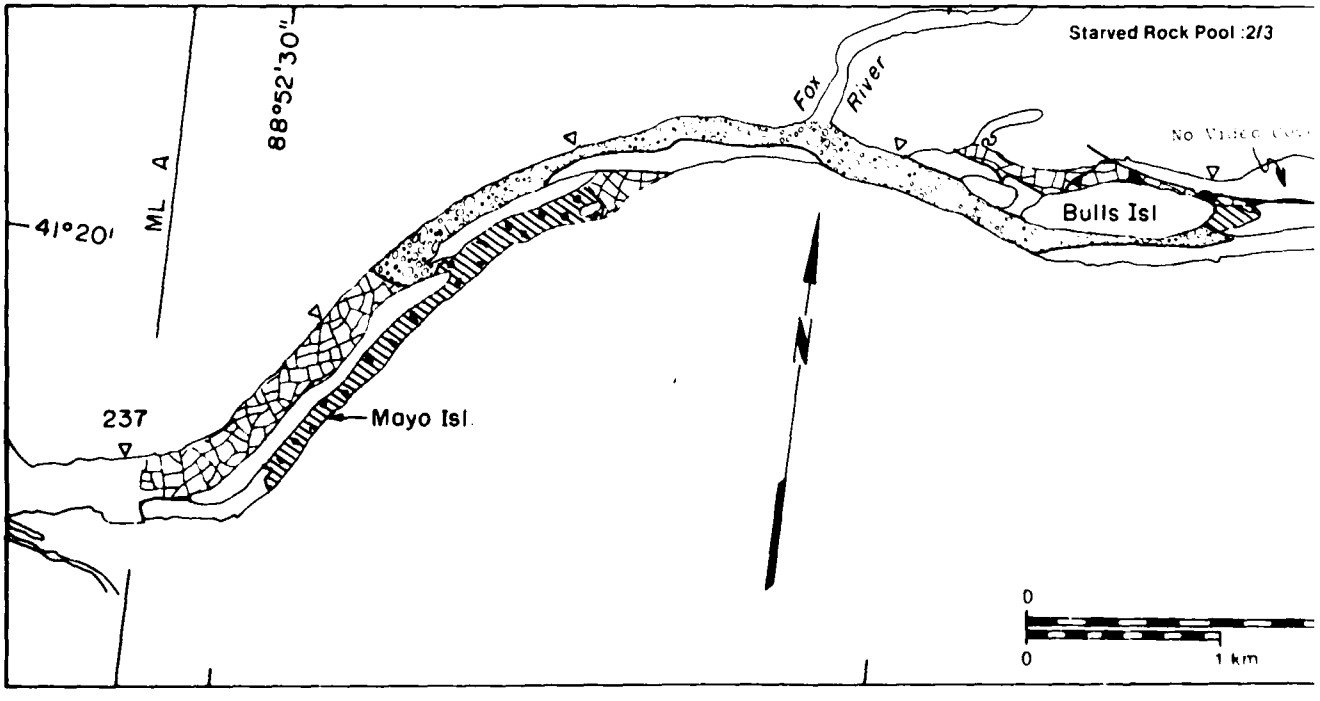
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	3.26	NA
Solid ice cover	14.41	NA
Solid ice cover with open-water areas	12.39	95
Fragmented ice cover	5.94	NA
Fragmented ice cover with open-water areas	12.80	80
Ice floes or frazil slush and pans	6.24	40
Total area ($m^2 \times 10^6$)	81.33*	

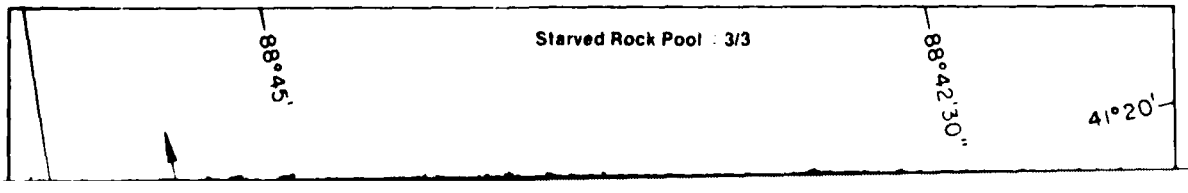
* Includes 26.29×10^6 m^2 of no video coverage


225
ML K
1 mi
1 km
Survey date: February 15, 1986
Video Tape 13
89°05'

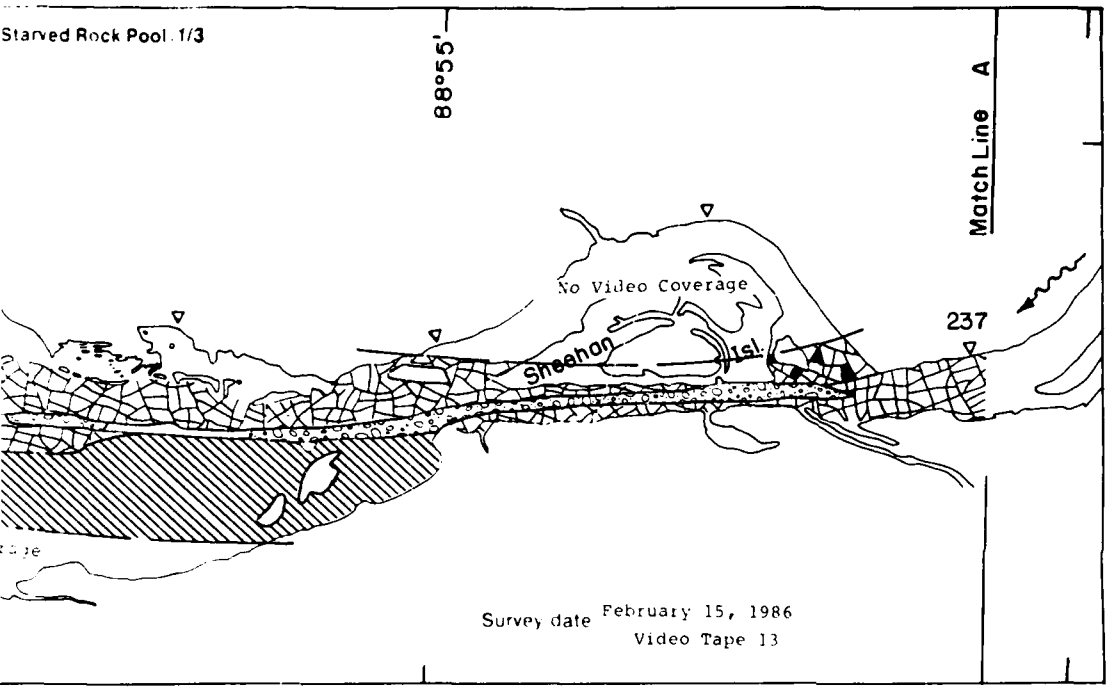

41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'

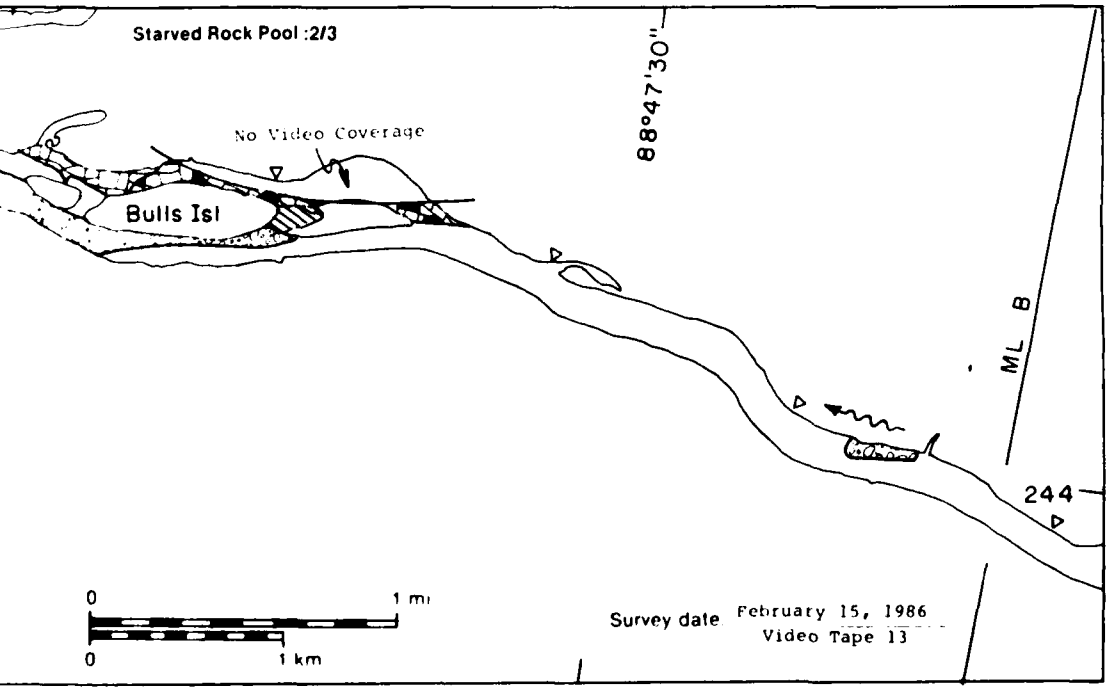

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km

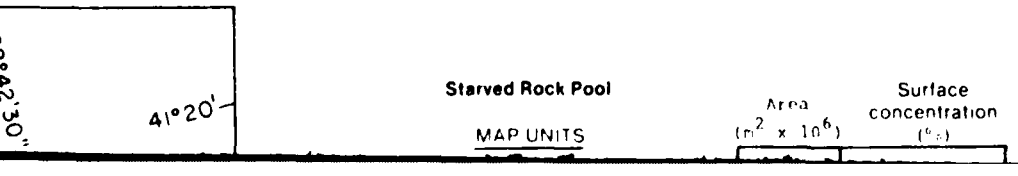

Starved Rock Pool :2/3
88°52'30"
ML 4
Fox River
41°20'
Bulls Isl
237
Mayo Isl.
0
0
1 km

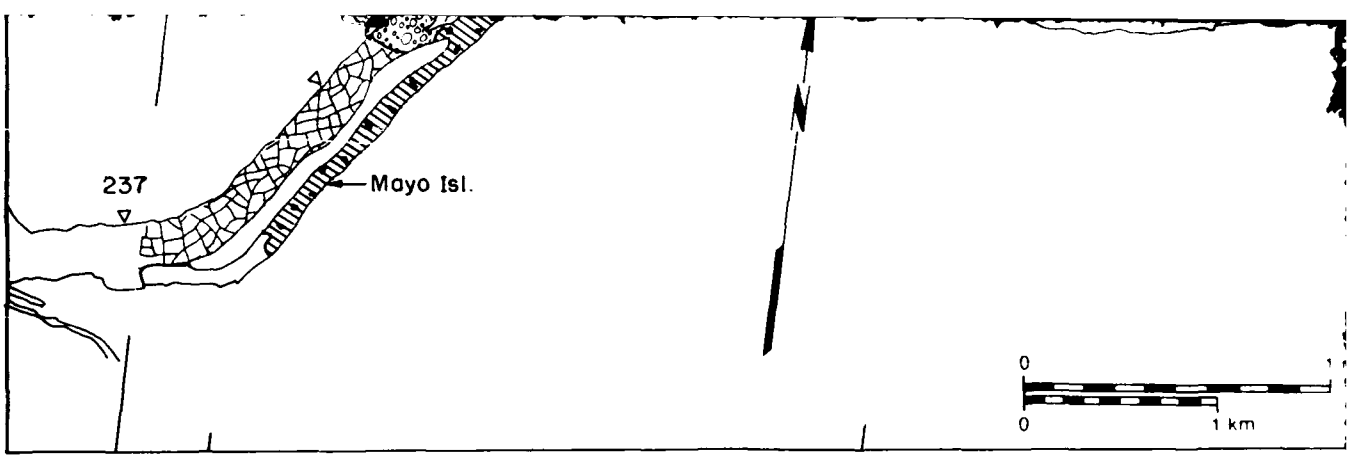

Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

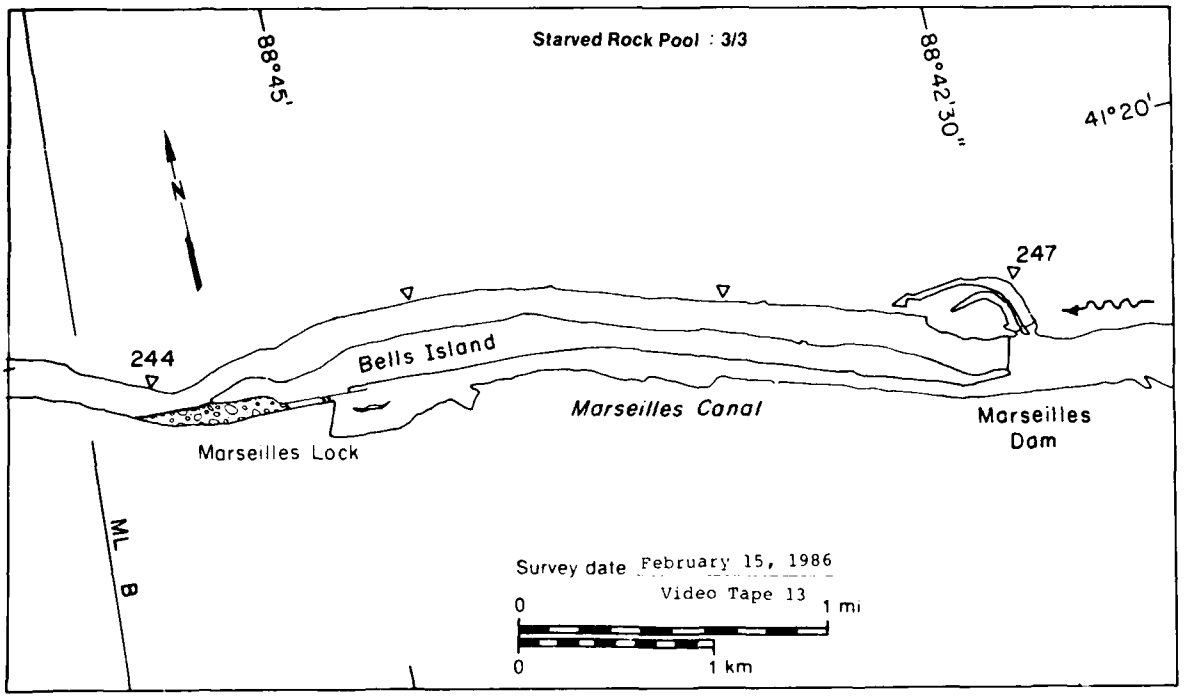
15 February 1986

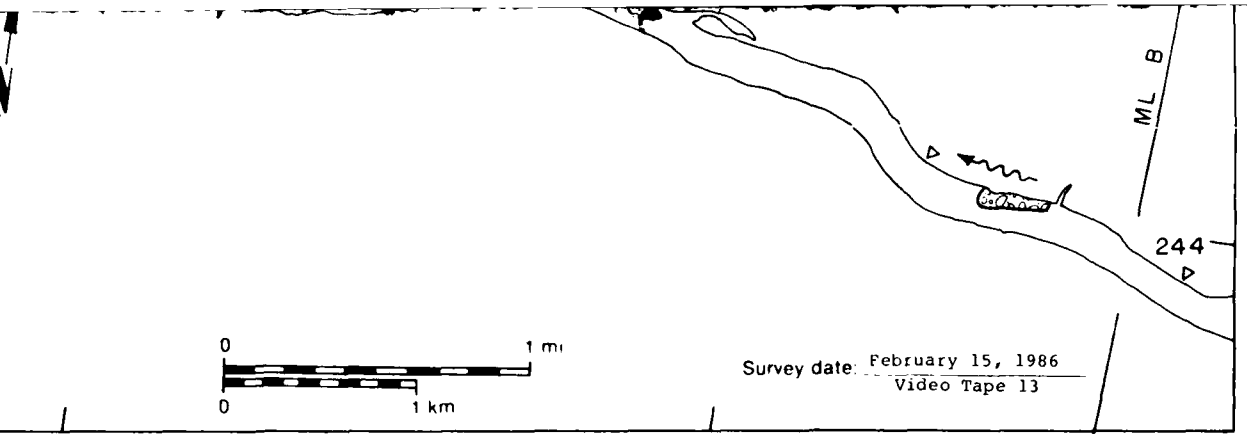


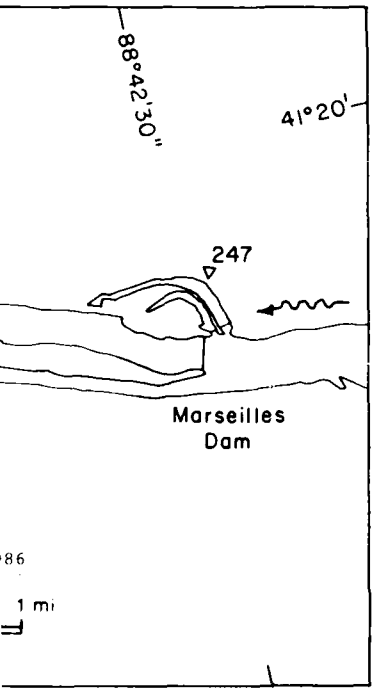





237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date February 15, 1986
Video Tape 13
0
1 mi
0
1 km





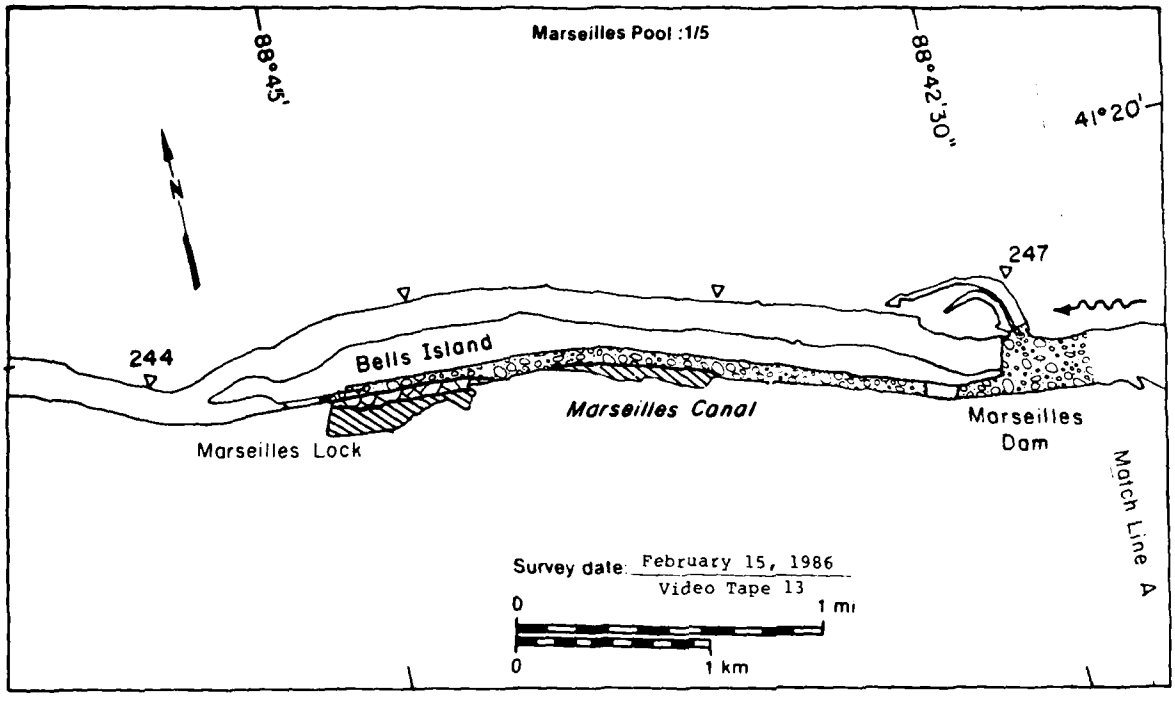
Starved Rock Pool

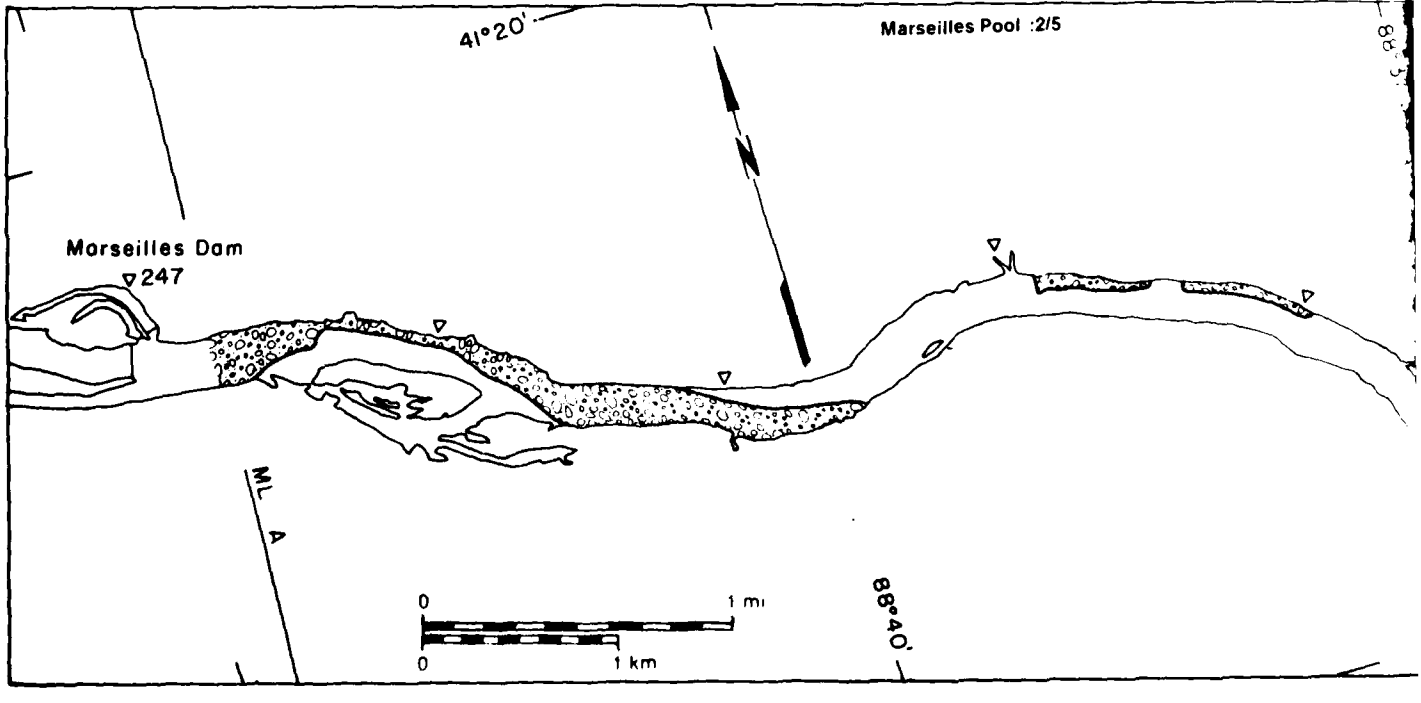
MAP UNITS

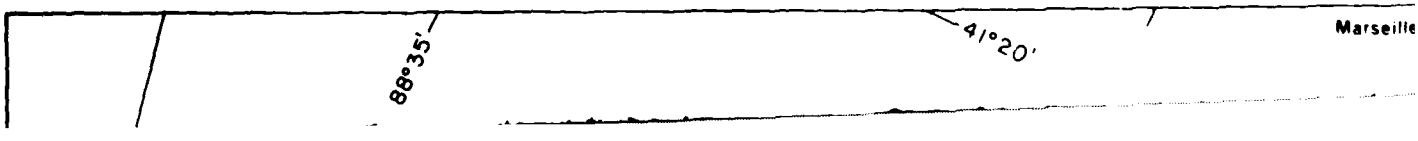
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.16	NA
Solid ice cover	2.49	NA
Solid ice cover with open-water areas	0.29	80
Fragmented ice cover	3.10	NA
Fragmented ice cover with open-water areas	0.18	80
Ice floes or frazil slush and pans	1.11	20
Total area ($m^2 \times 10^6$)	10.19*	

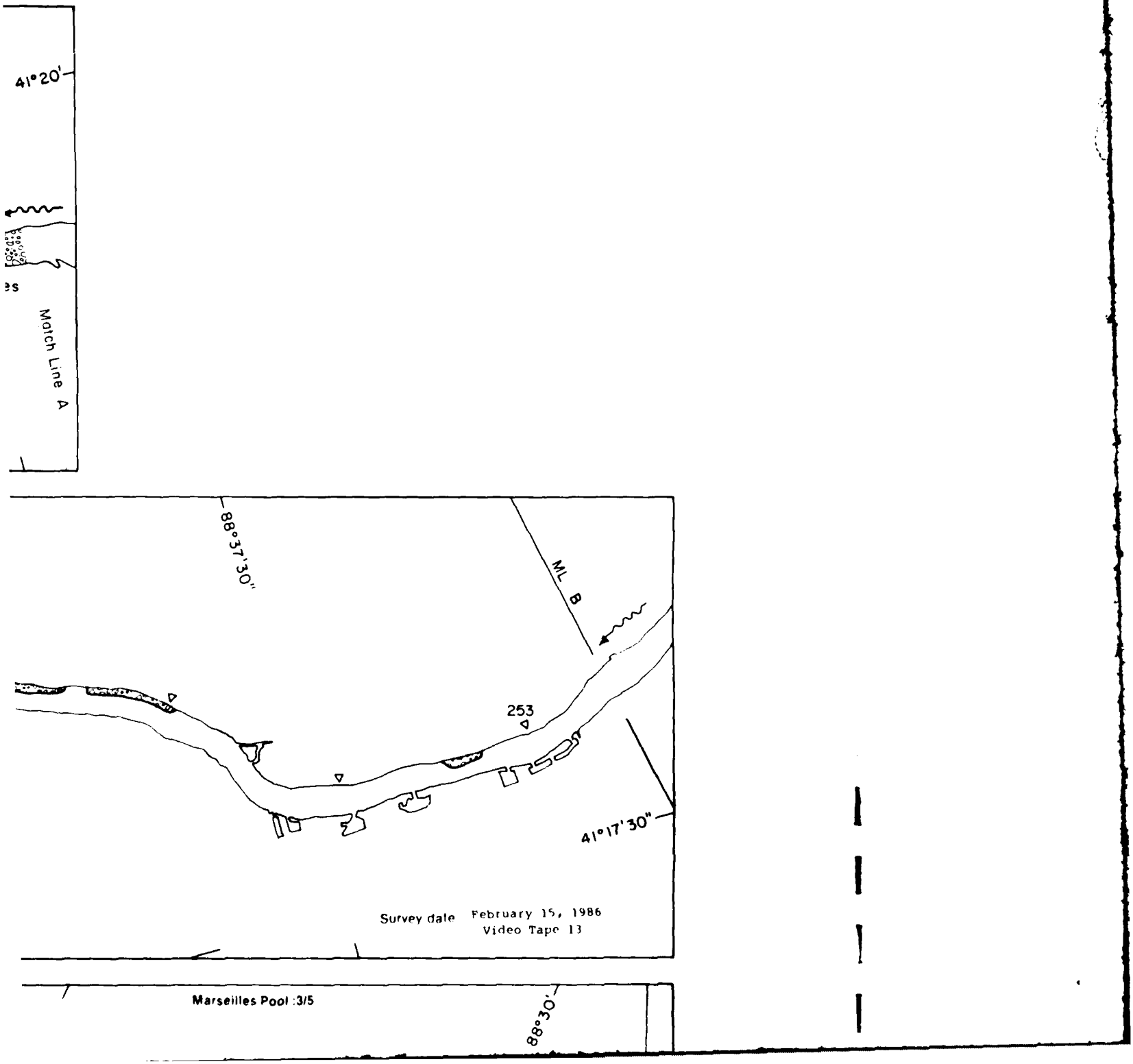
* Includes 0.86×10^6 m^2 of no video coverage

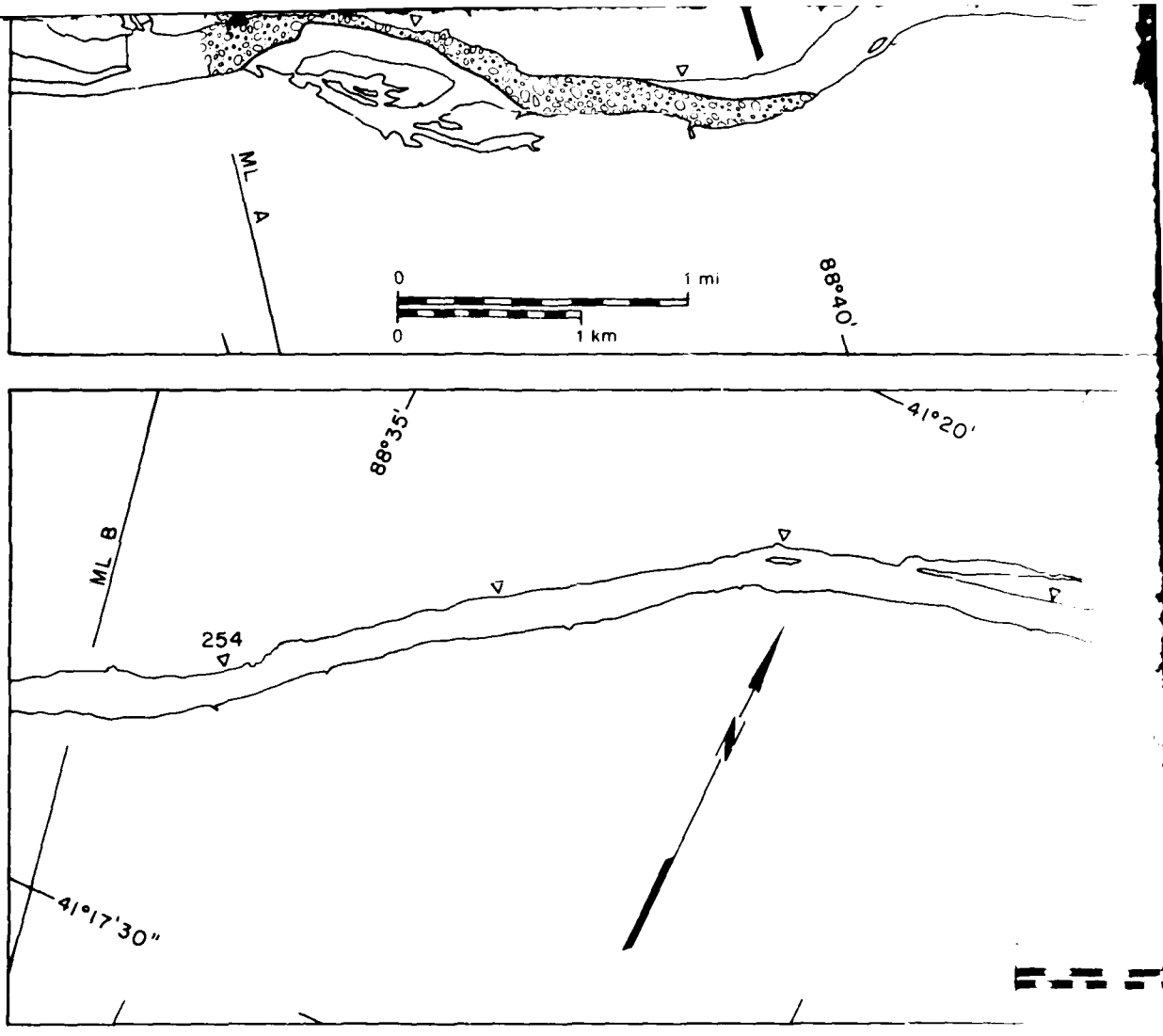
15 February 1986



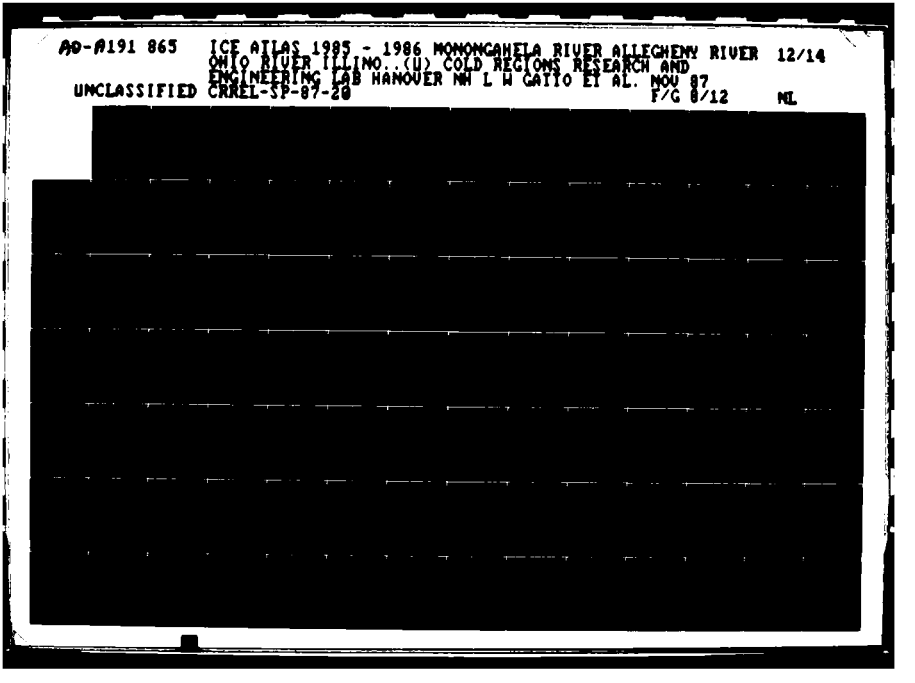


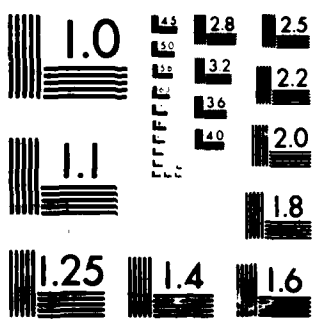


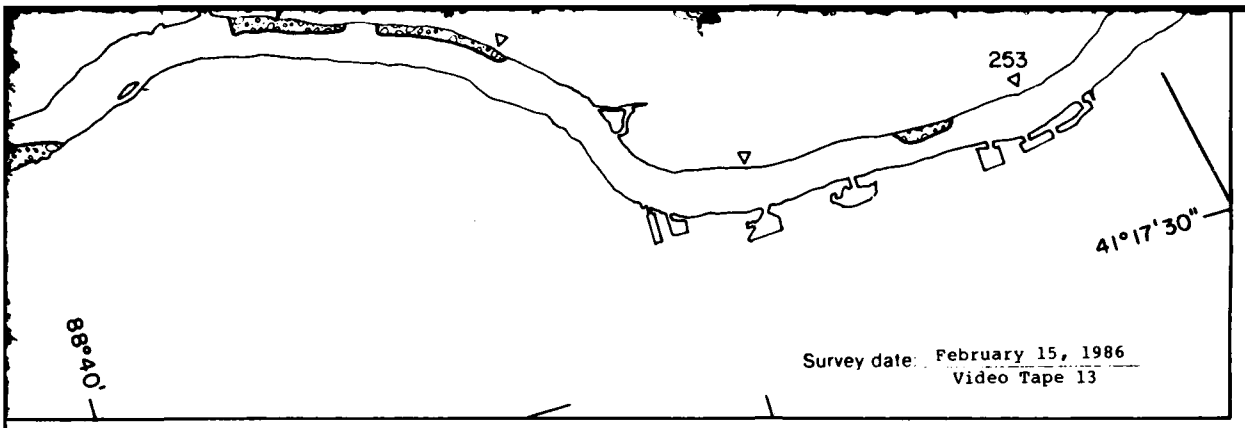

41°20'
Match Line A
88°37'30"
ML B
253
41°17'30"
Survey date February 15, 1986
Video Tape 13
Marseilles Pool :3/5
88°30'

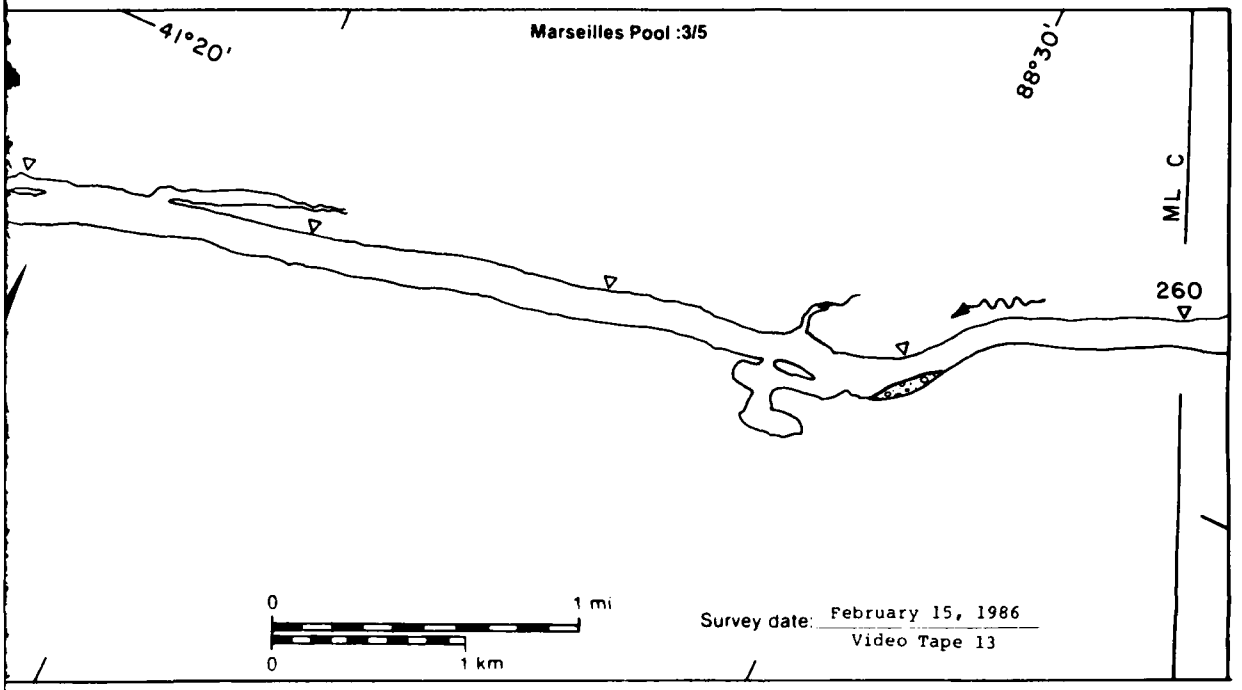

ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"

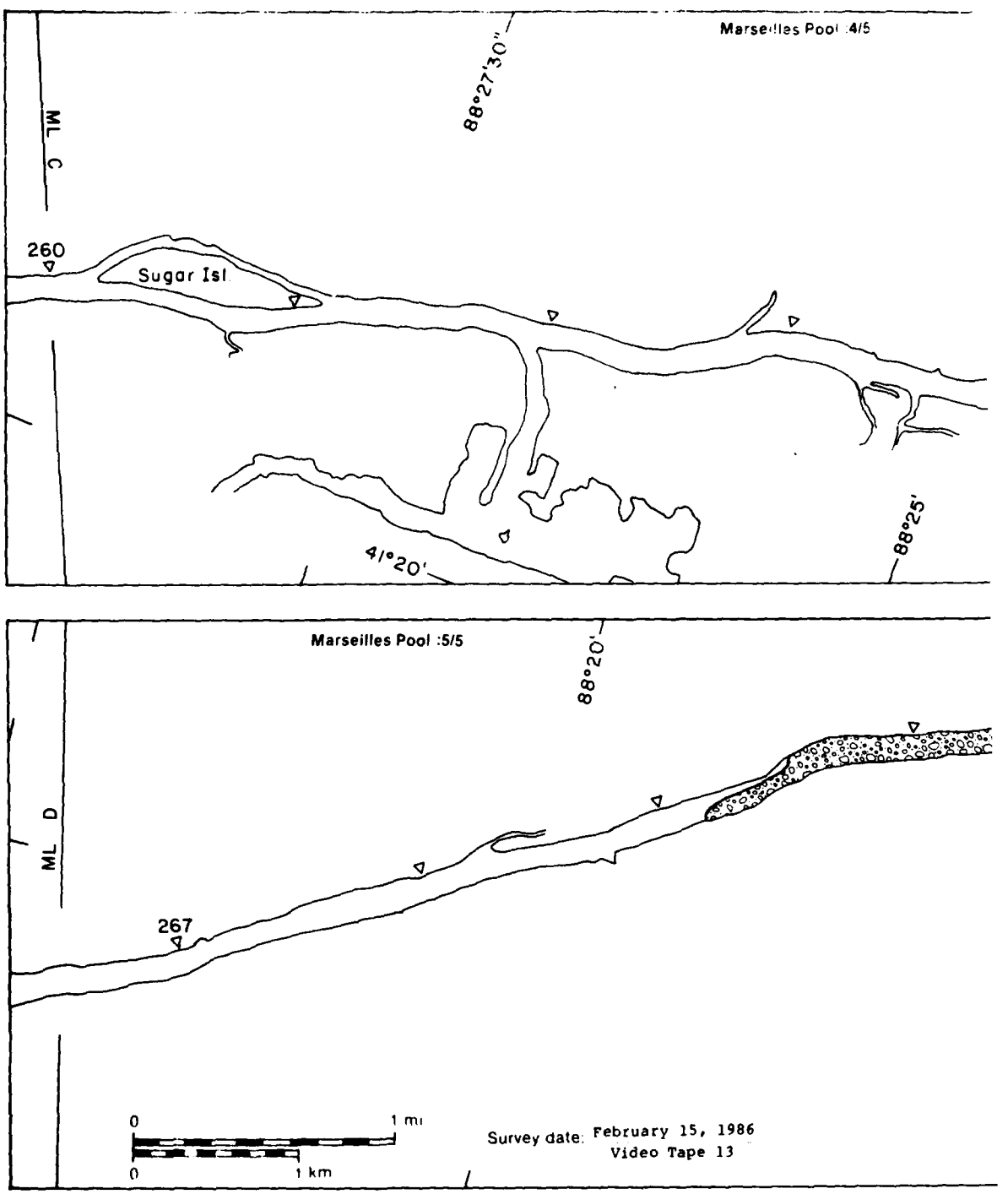
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER 12/14
OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND
ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL



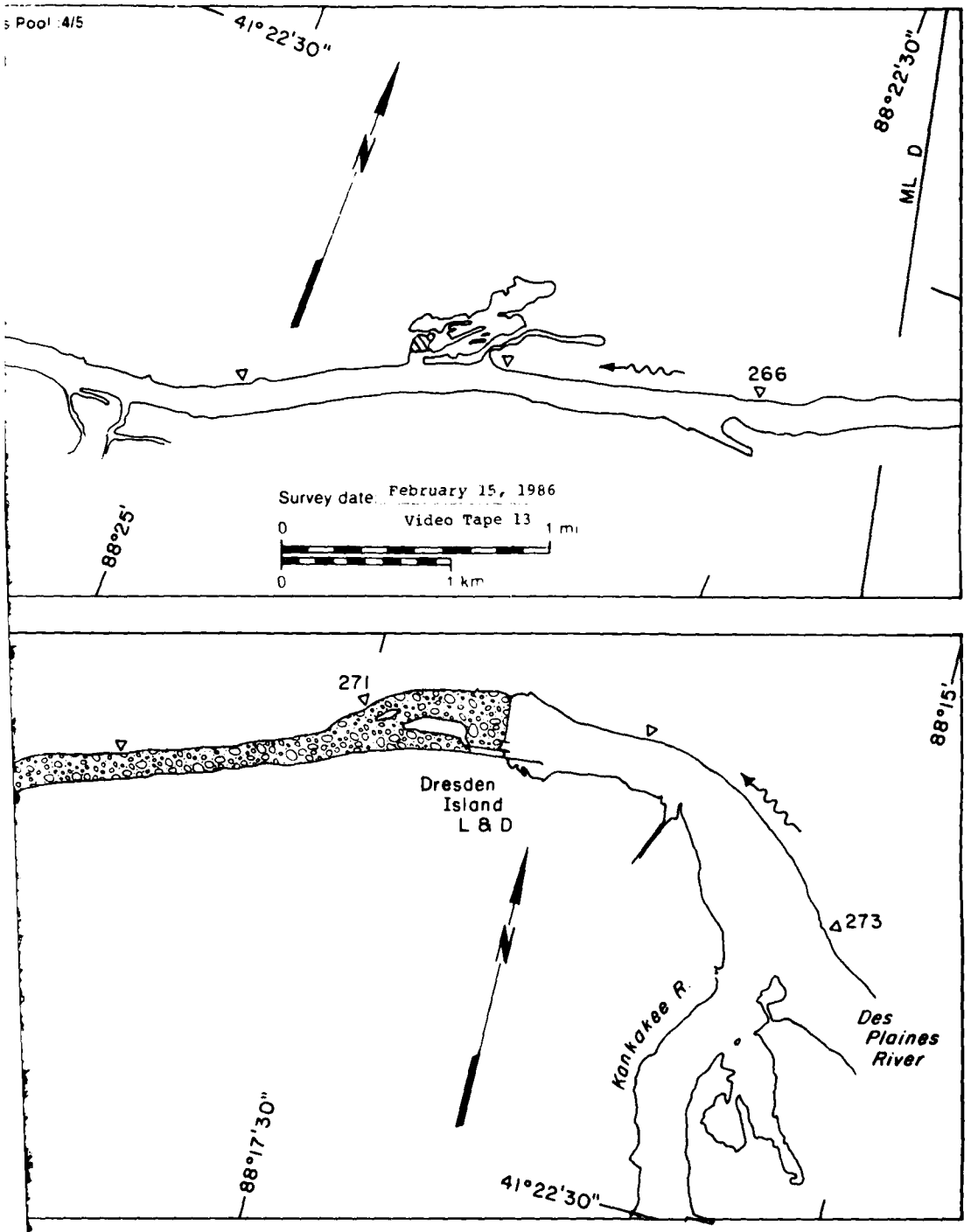

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

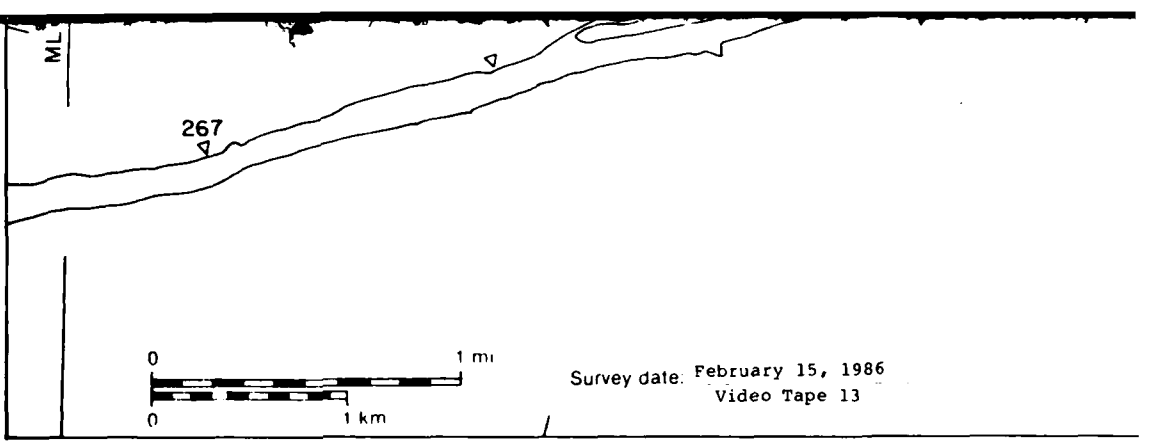

253
41°17'30"
88°40'
Survey date: February 15, 1986
Video Tape 13


Marseilles Pool :3/5
41°20'
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 15, 1986
Video Tape 13


Marseilles Pool :4/5
88°27'30"
ML C
260
Sugar Isl
88°25'
Marseilles Pool :5/5
88°20'
ML D
267
0
1 mi
0
1 km
Survey date: February 15, 1986
Video Tape 13
Marseilles Pool
MAP UNITS
Area
(m^2 x 10^6)
Surface
concentration
(‰)

15 February 1986

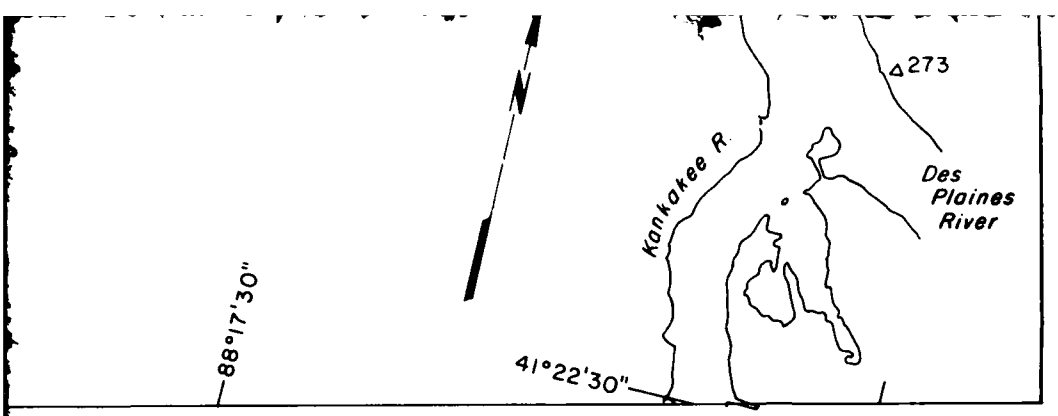




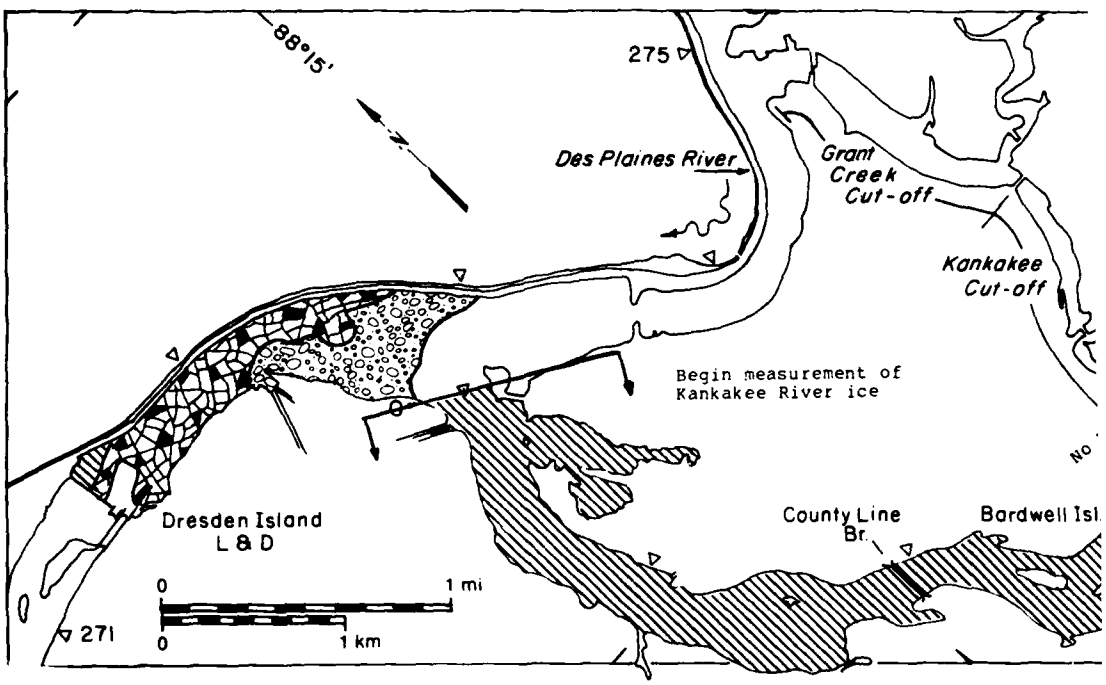
Marseilles Pool

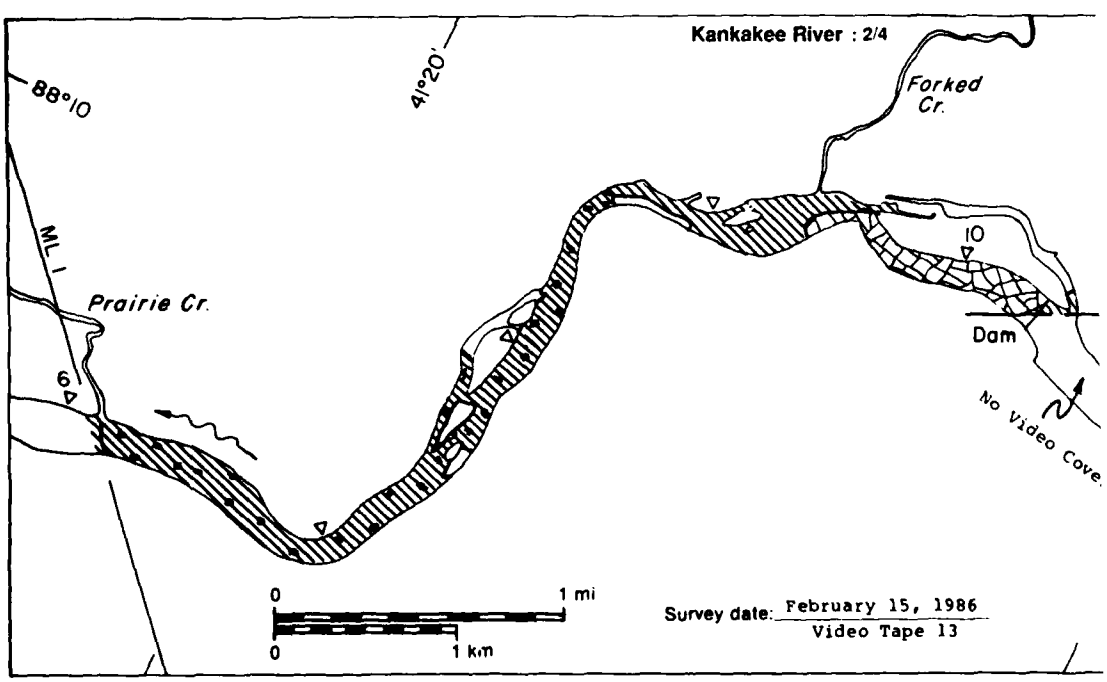
MAP UNITS

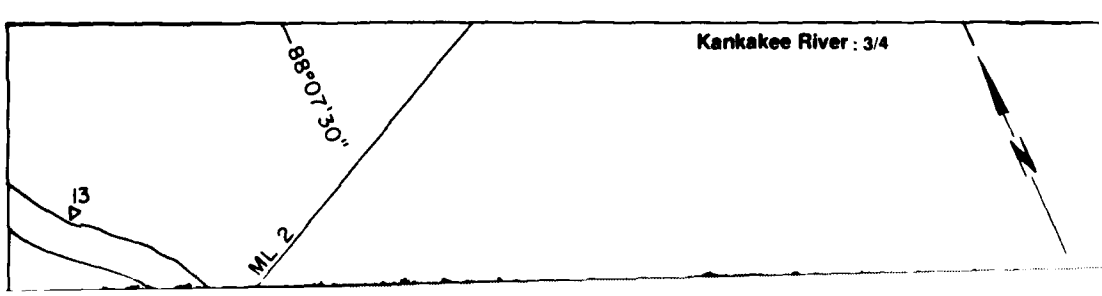
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.15	NA
Solid ice cover	0.16	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.05	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	1.83	10
Total area ($m^2 \times 10^6$)	8.19	

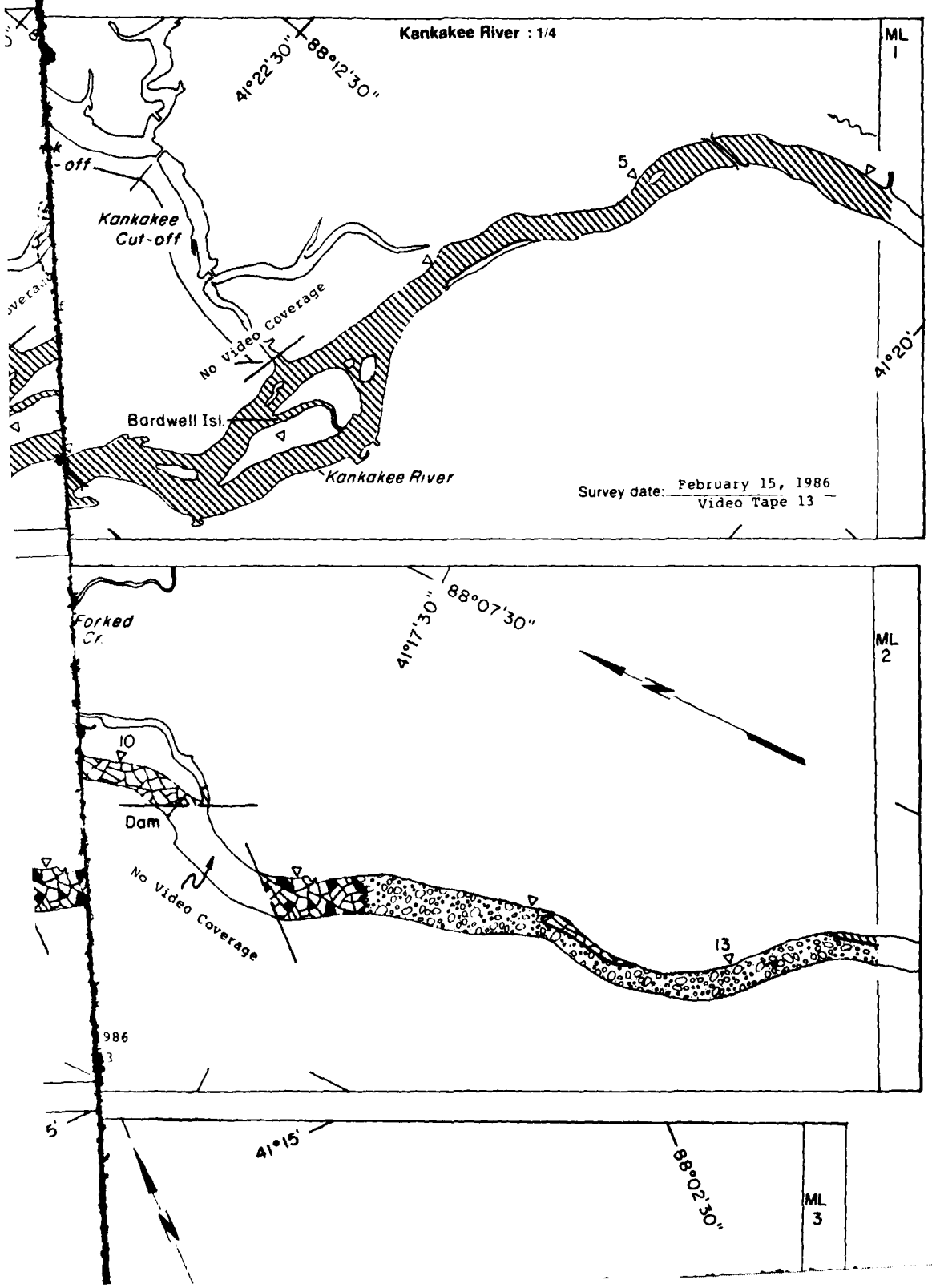

△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

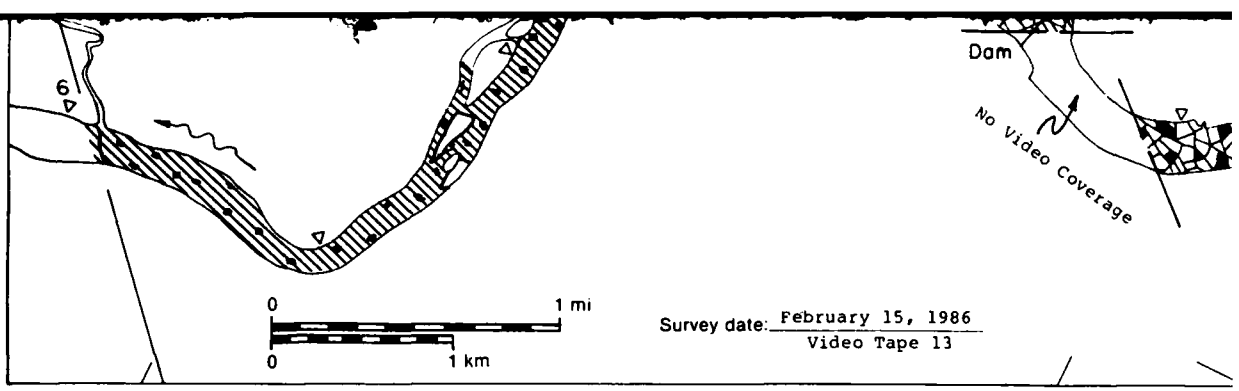
15 February 1986

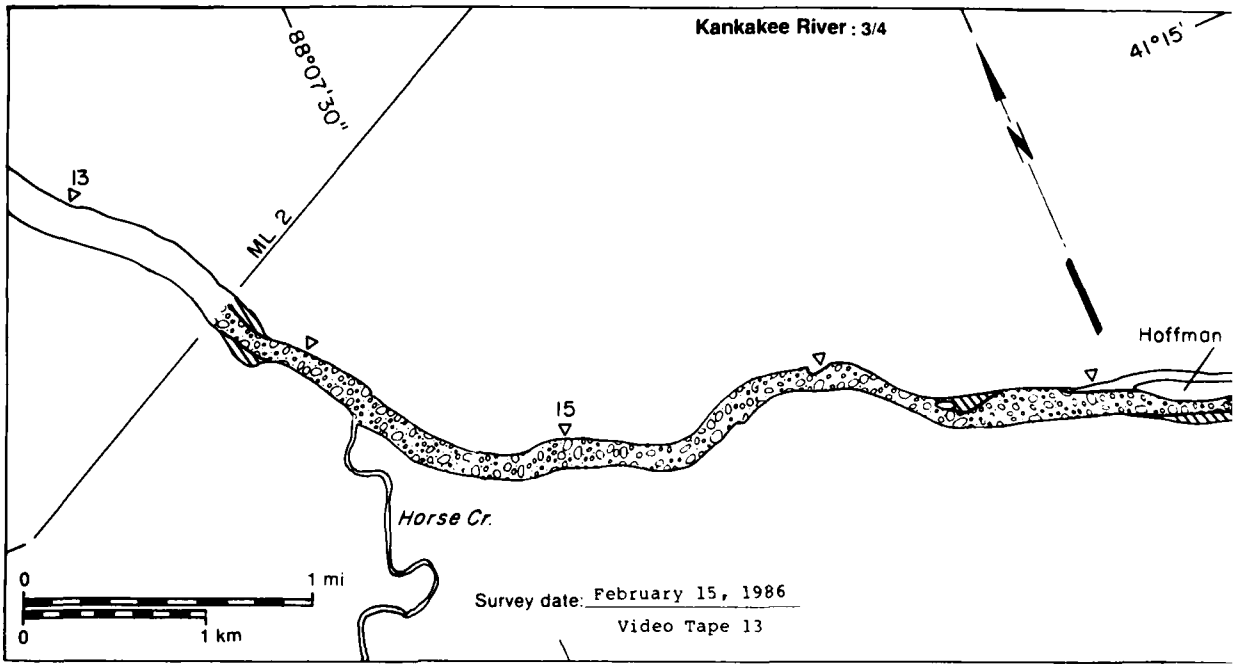


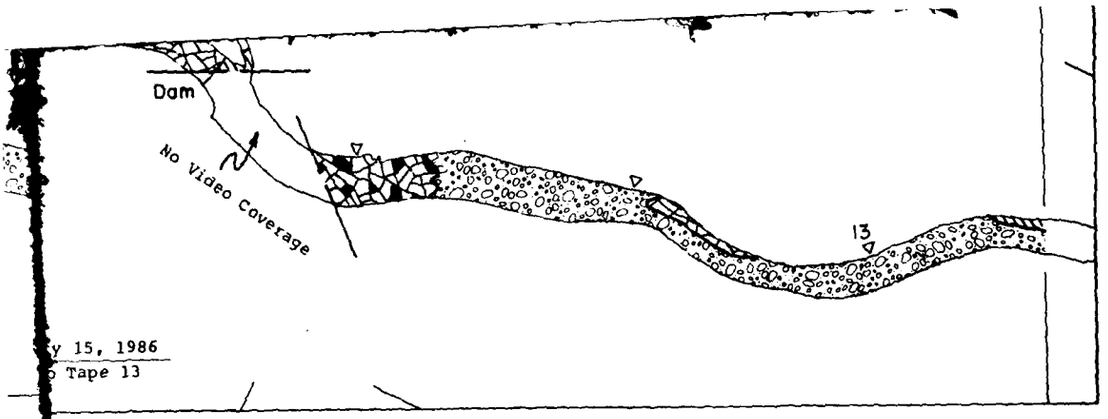




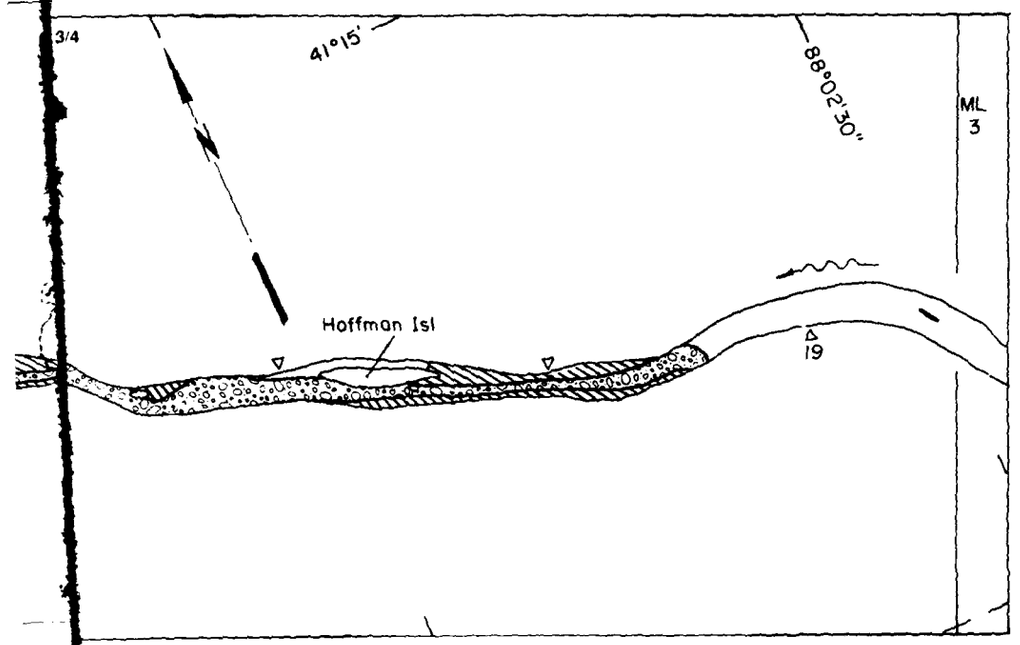

Kankakee River : 1/4
41°22'30"
88°12'30"
ML 1
-off
Kankakee Cut-off
5
No Video Coverage
41°20'
Bardwell Isl.
Kankakee River
Survey date: February 15, 1986
Video Tape 13
Forked Cr.
41°17'30"
88°07'30"
ML 2
10
Dam
No Video Coverage
13
1986
41°15'
88°02'30"
ML 3

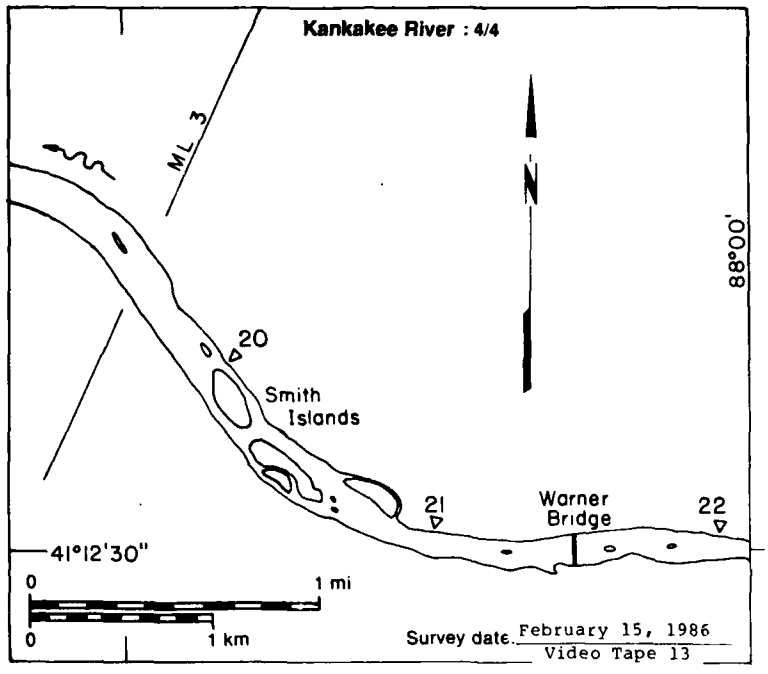

6
Dam
No Video Coverage
0
1 mi
0
1 km
Survey date: February 15, 1986
Video Tape 13


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman
Horse Cr.
0
1 mi
0
1 km
Survey date: February 15, 1986
Video Tape 13



y 15, 1986
o Tape 13





Kankakee River

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

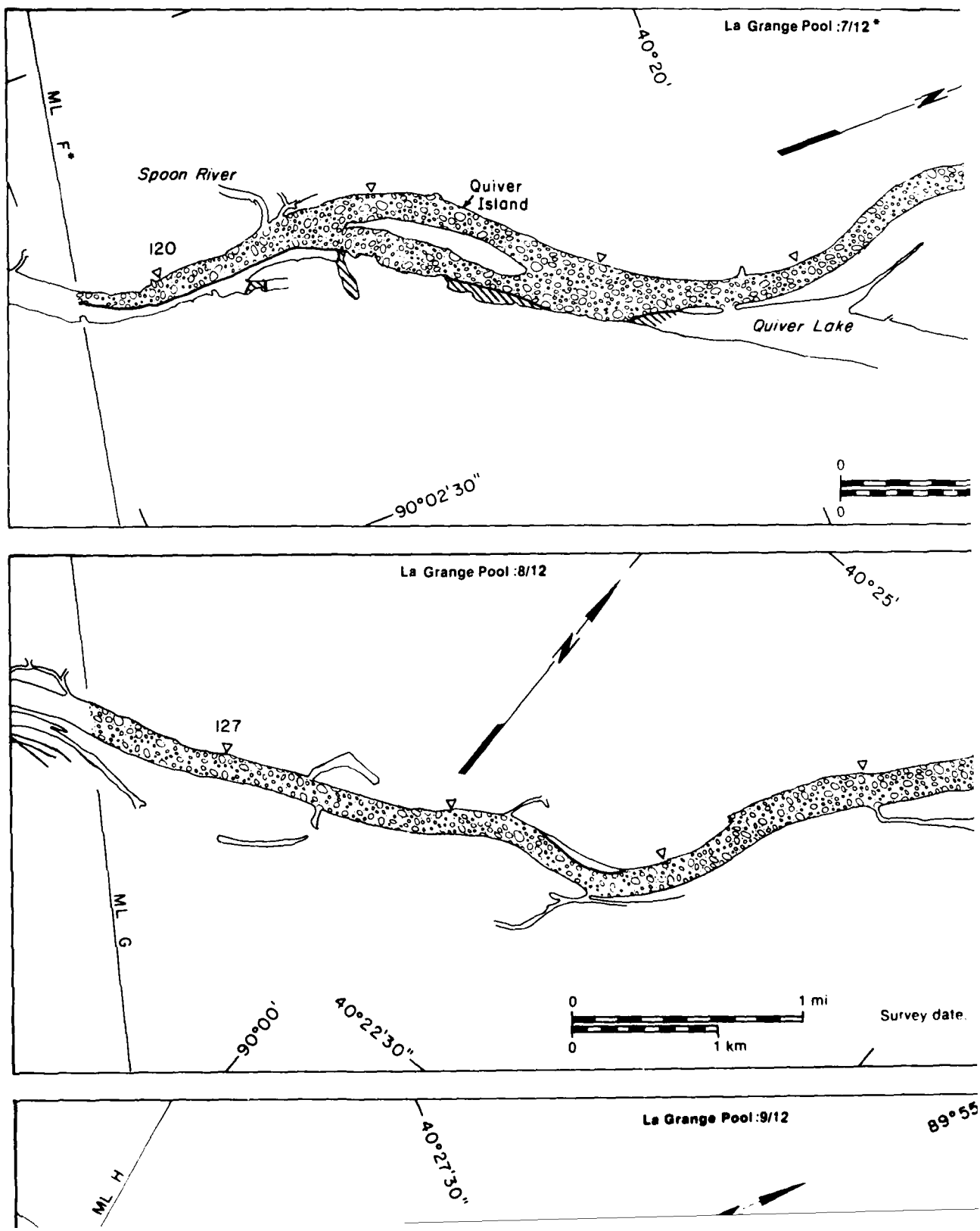
Total area (m^2 x 10

15 February 1986

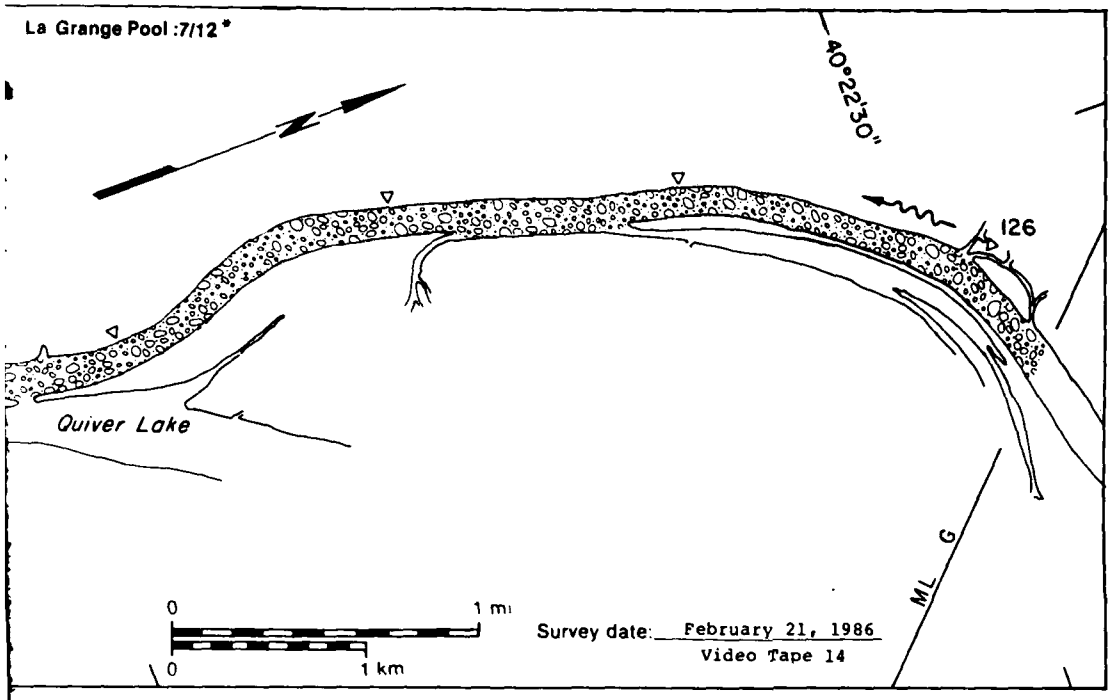
Kankakee River

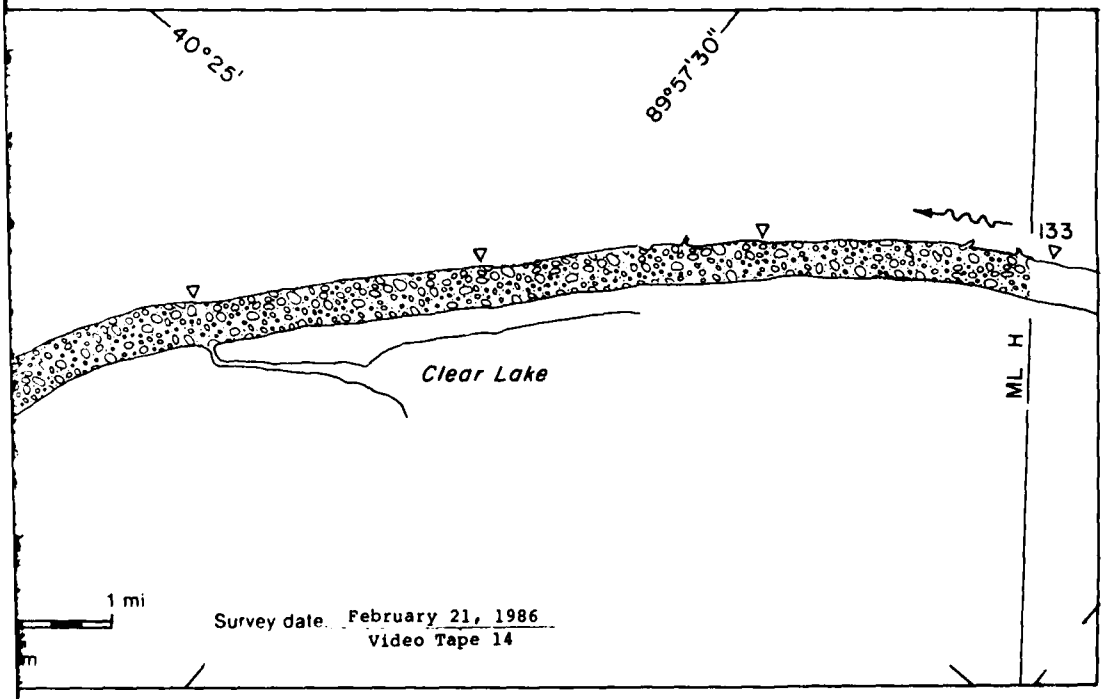
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	1.00	NA
Solid ice cover	3.70	NA
Solid ice cover with open-water areas	0.58	90
Fragmented ice cover	0.22	NA
Fragmented ice cover with open-water areas	0.17	90
Ice floes or frazil slush and pans	1.33	30
Total area ($m^2 \times 10^6$)	7.30*	

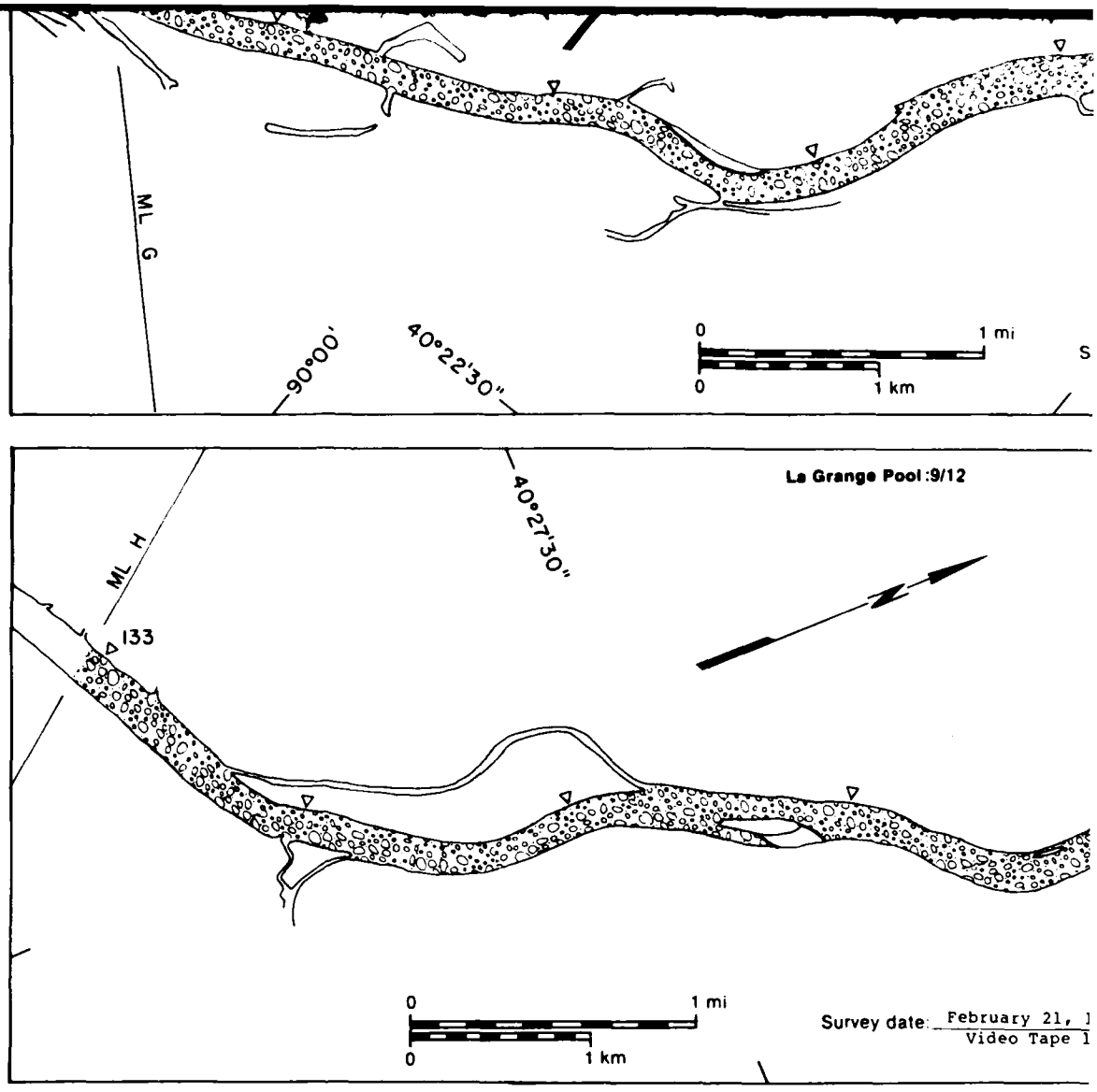
* Includes 0.30×10^6 m^2 of no video coverage


La Grange Pool :7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0
0
La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey date.
La Grange Pool :9/12
89°55
40°27'30"
ML H

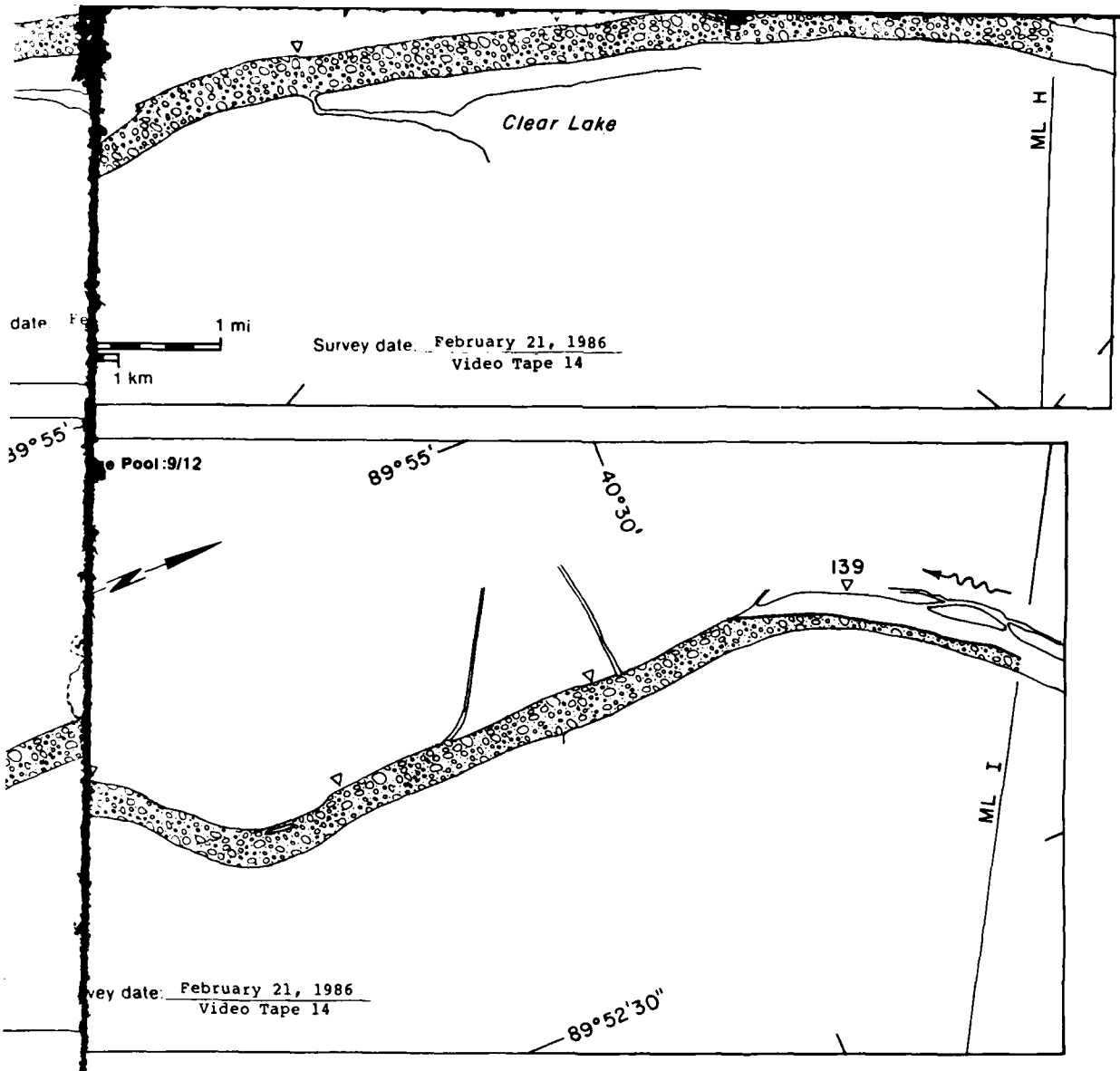
21 February 1986



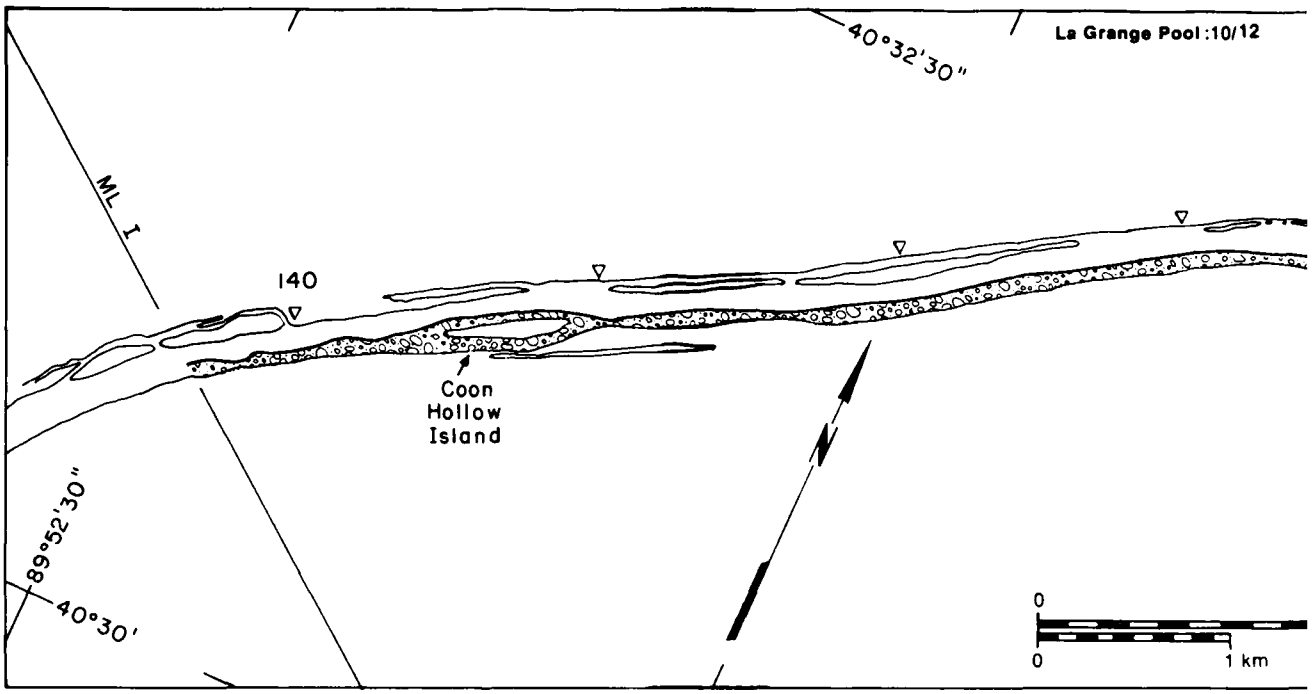


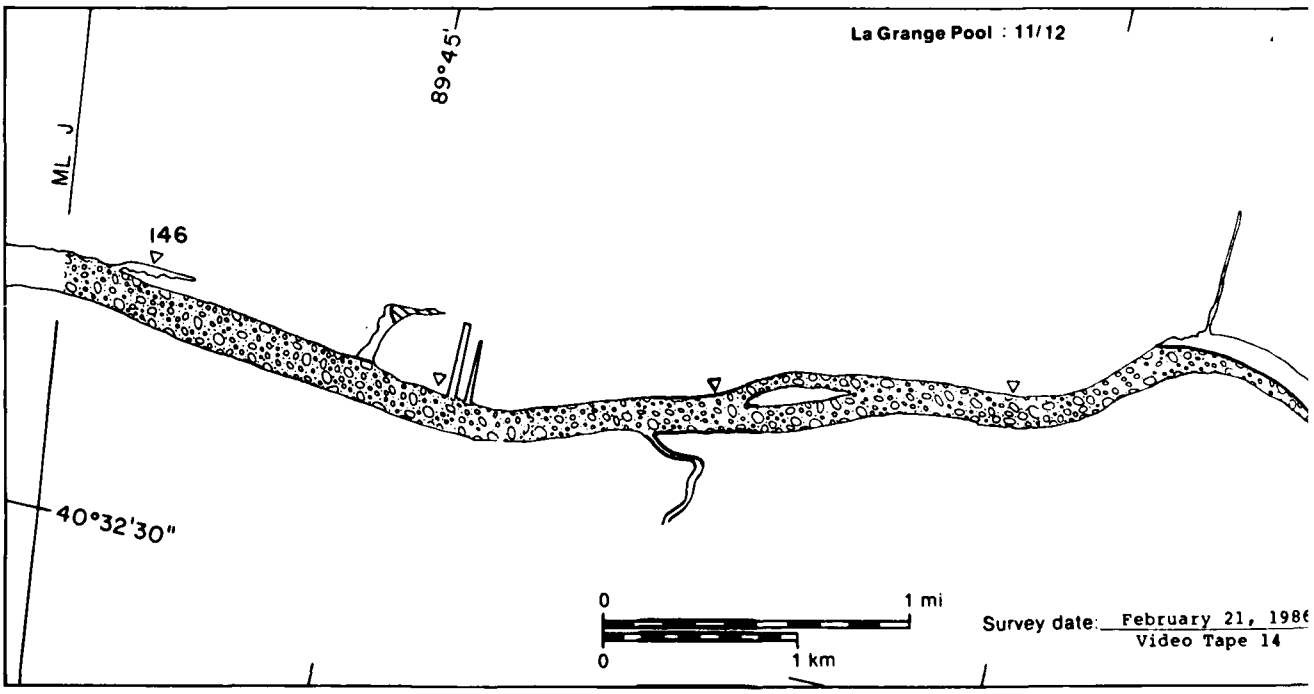


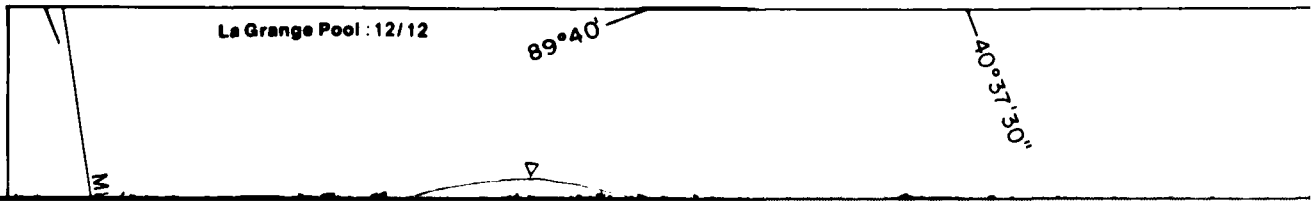
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

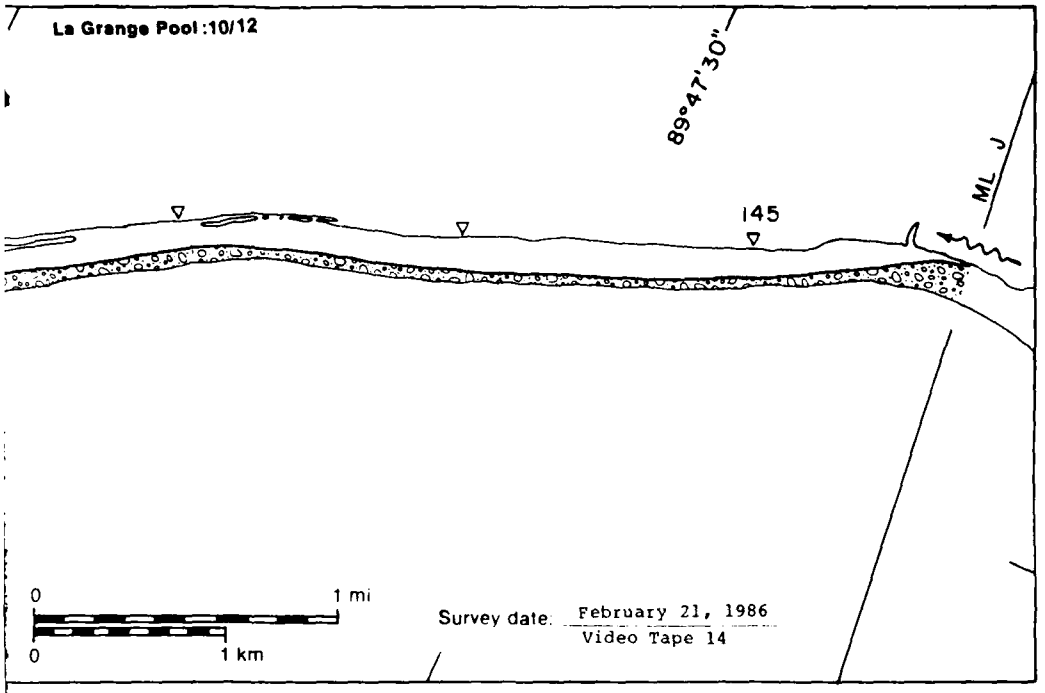

Clear Lake
ML H
1 mi
1 km
Survey date: February 21, 1986
Video Tape 14
89°55'
40°30'
139
ML I
89°52'30"
Survey date: February 21, 1986
Video Tape 14

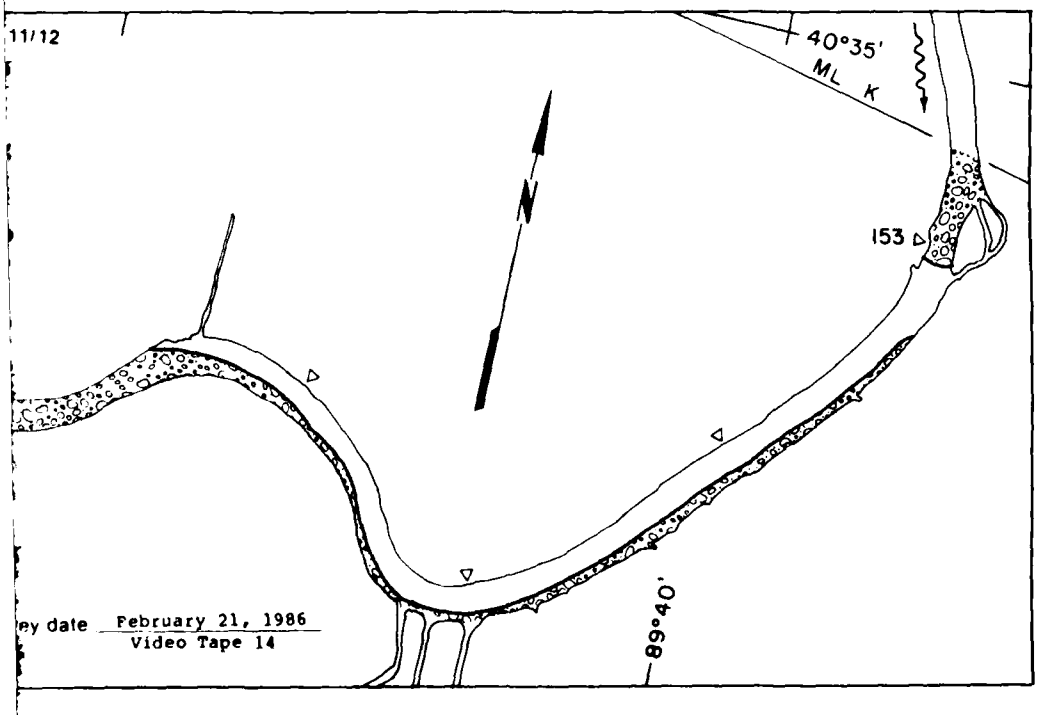
21 February 1986





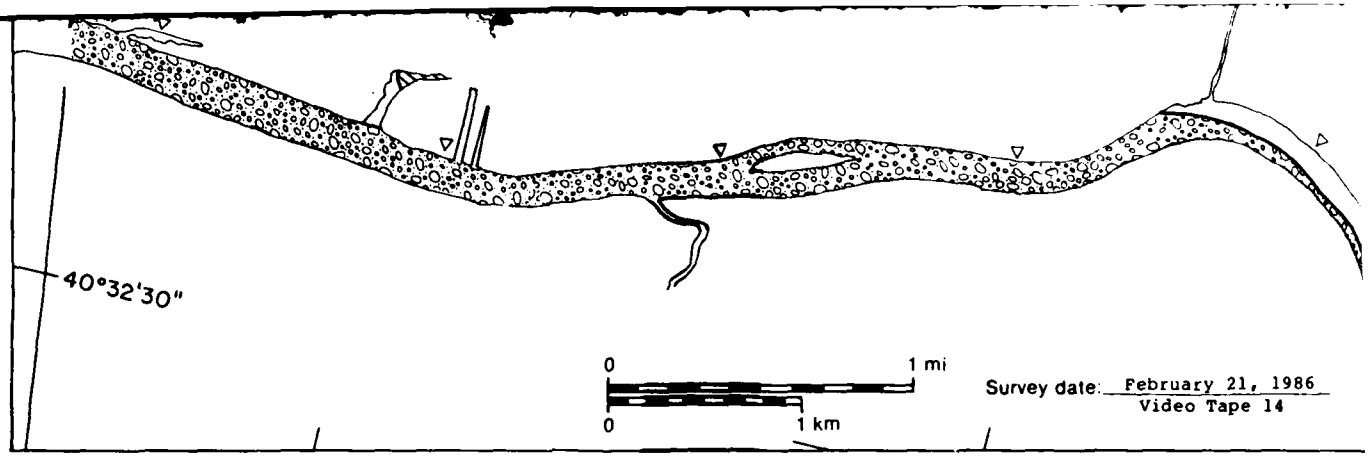


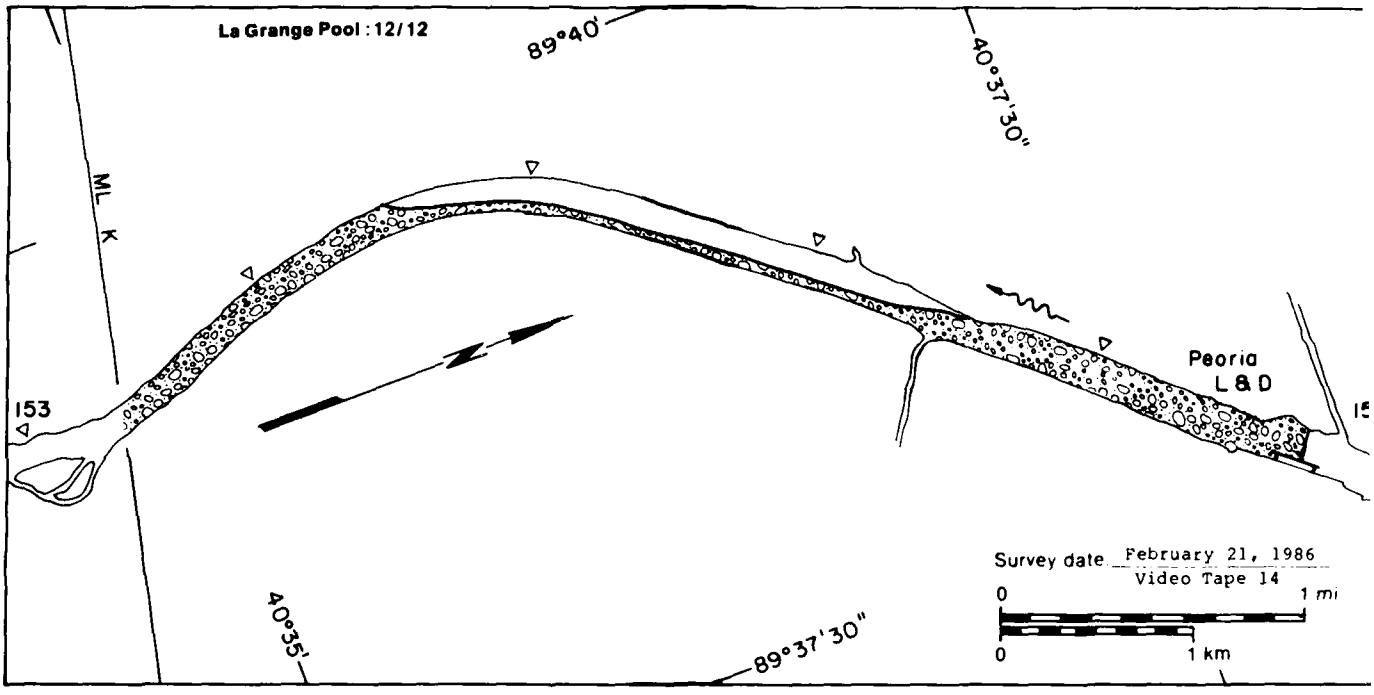


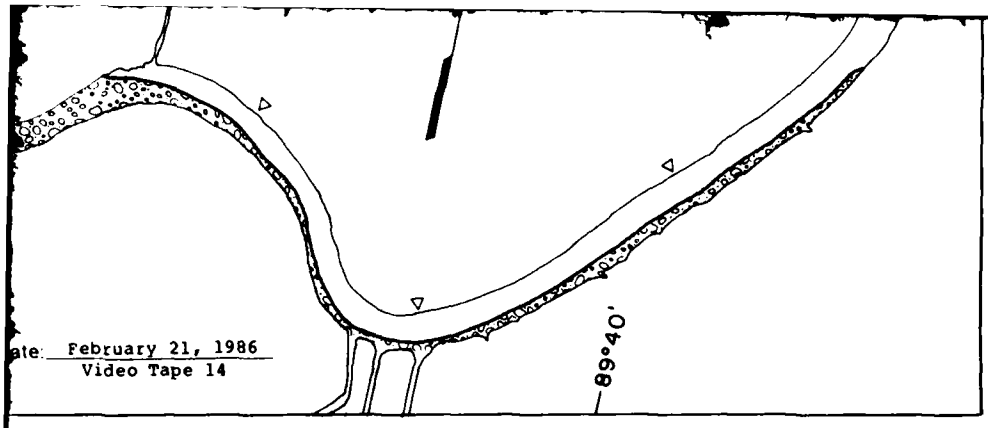


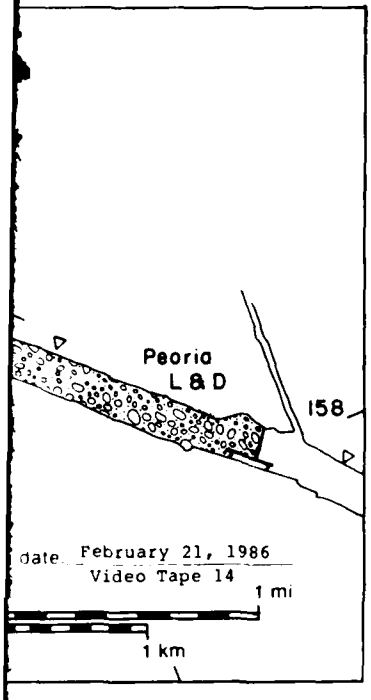
La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.71	NA


40°32'30"
0
1 mi
0
1 km
Survey date: February 21, 1986
Video Tape 14

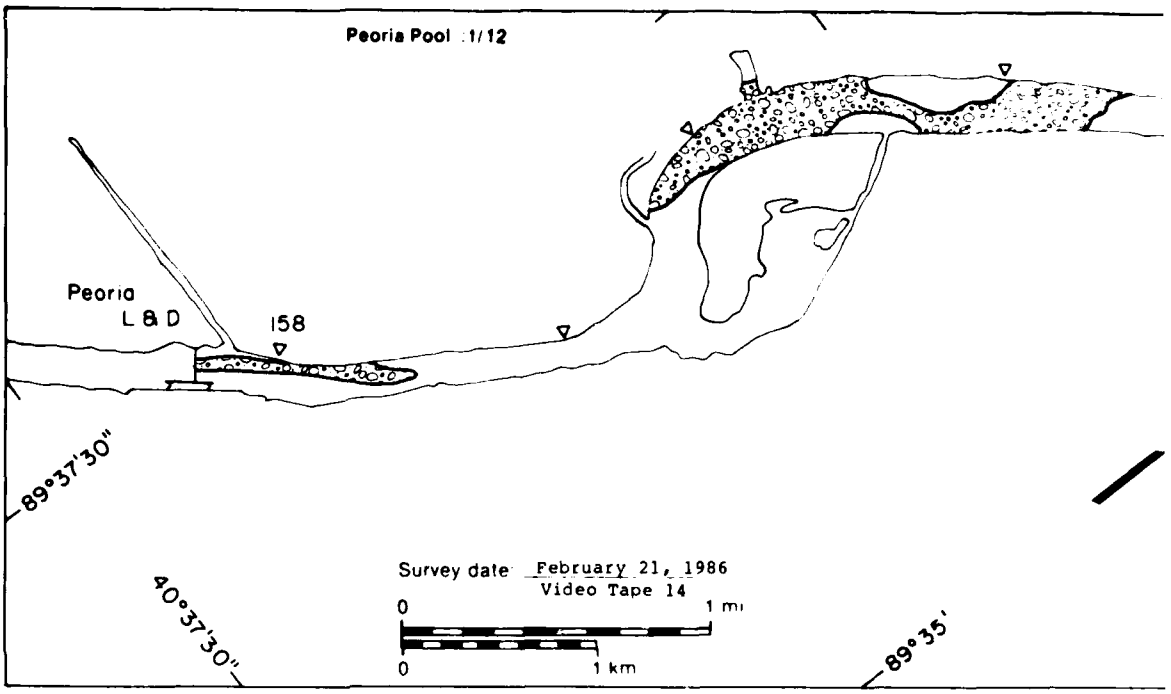

La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L & D
Survey date February 21, 1986
Video Tape 14
0
1 mi
0
1 km
40°35'
89°37'30"

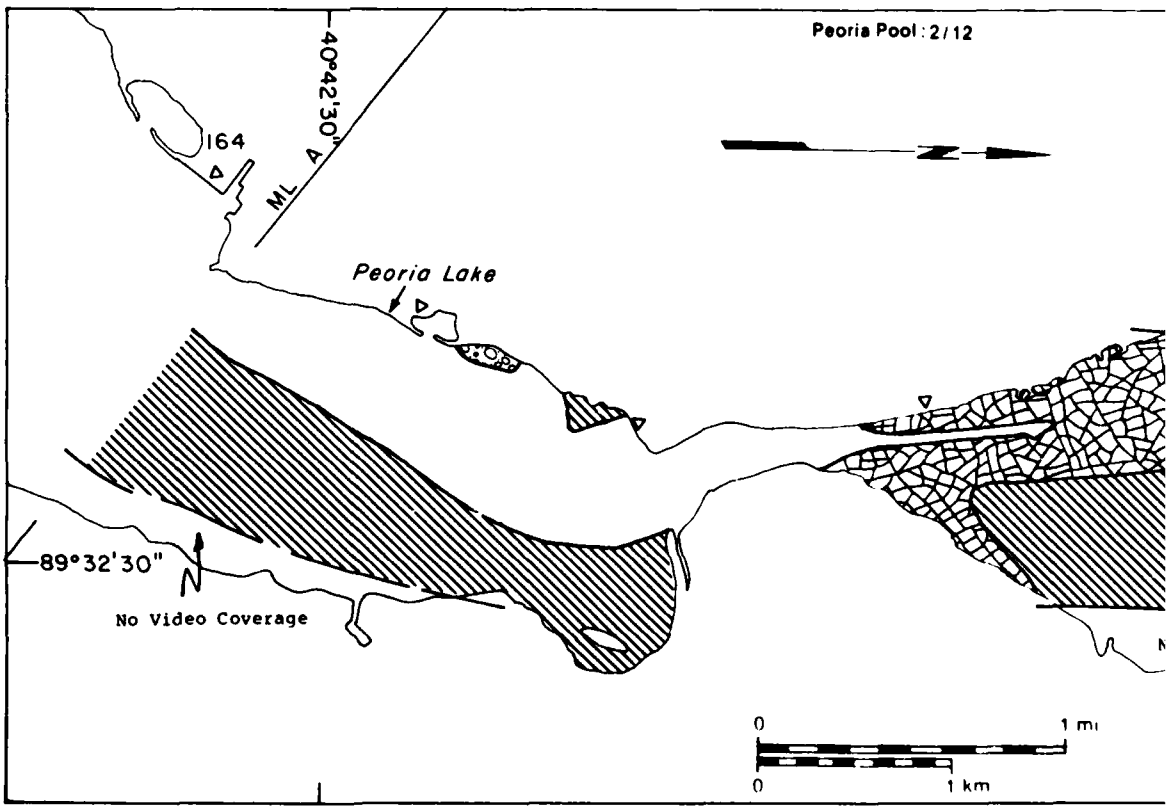


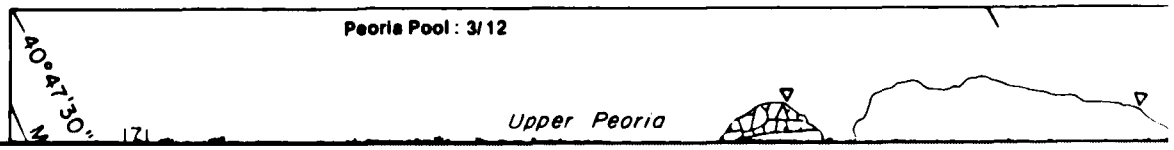


La Grange Pool

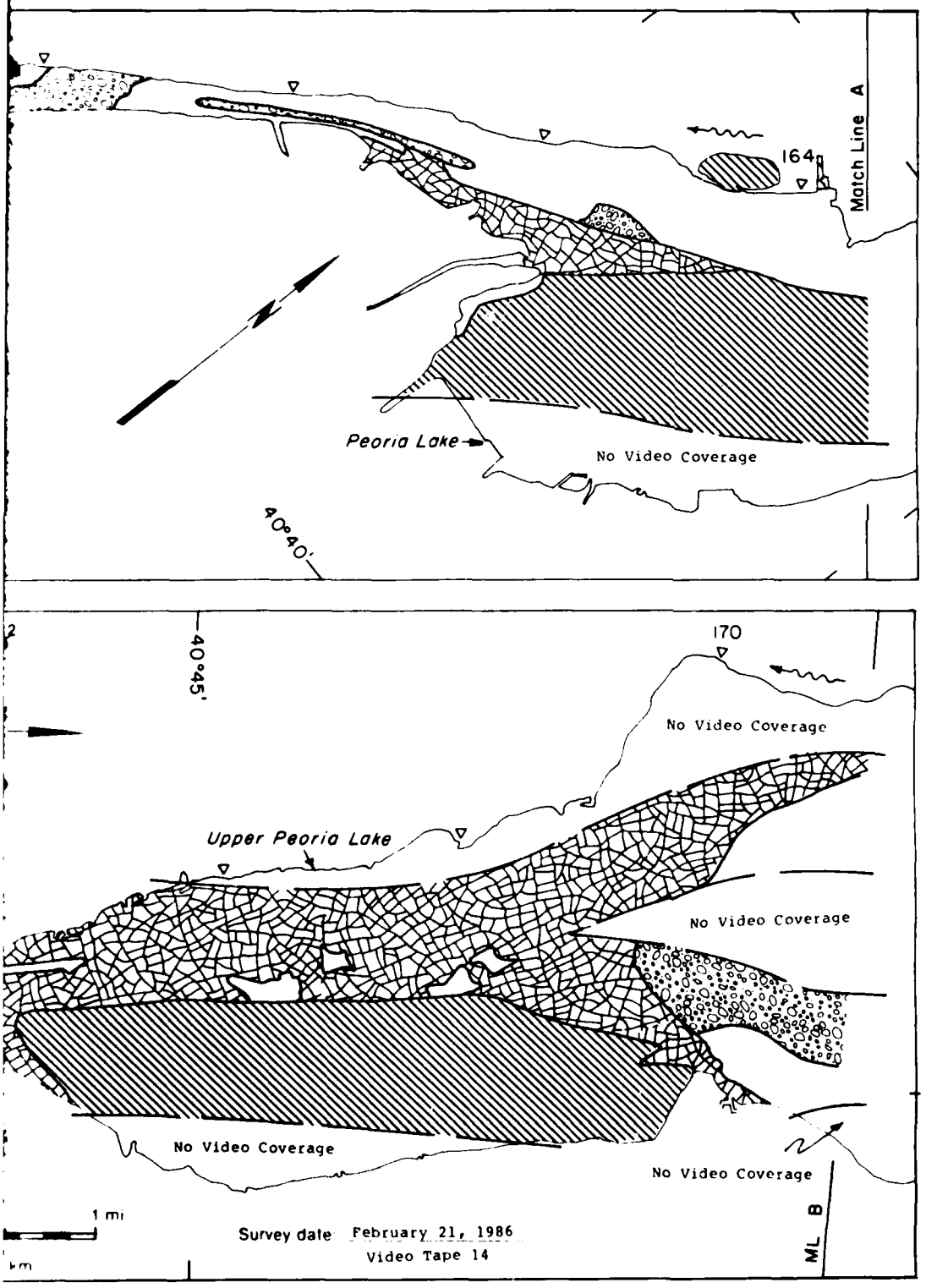
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	2.71	NA
Solid ice cover	0.15	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	8.85	40
Total area ($m^2 \times 10^6$)	11.71	

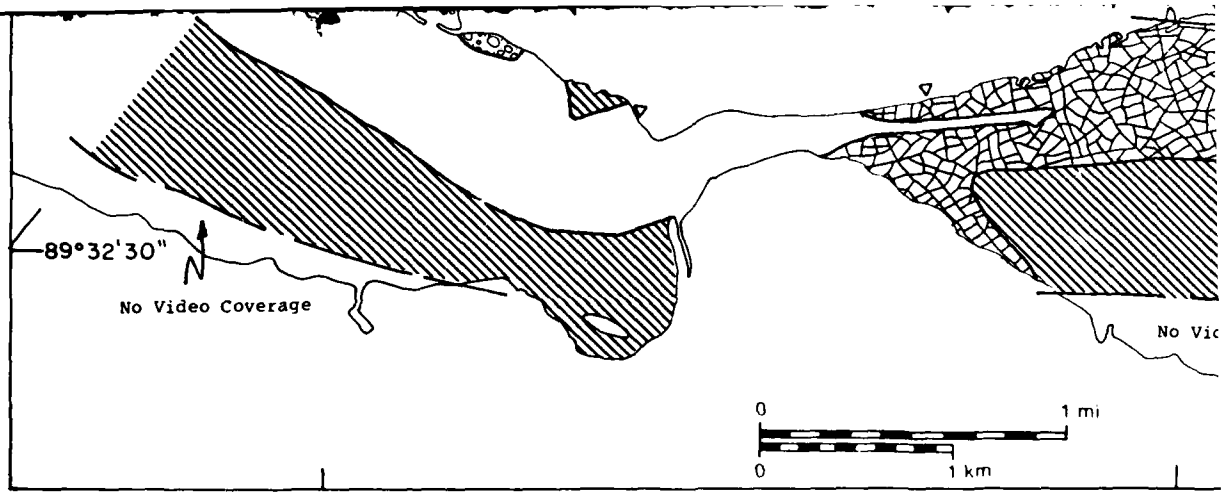

Peoria Pool : 1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: February 21, 1986
Video Tape 14
0
1 mi
0
1 km
89°35'

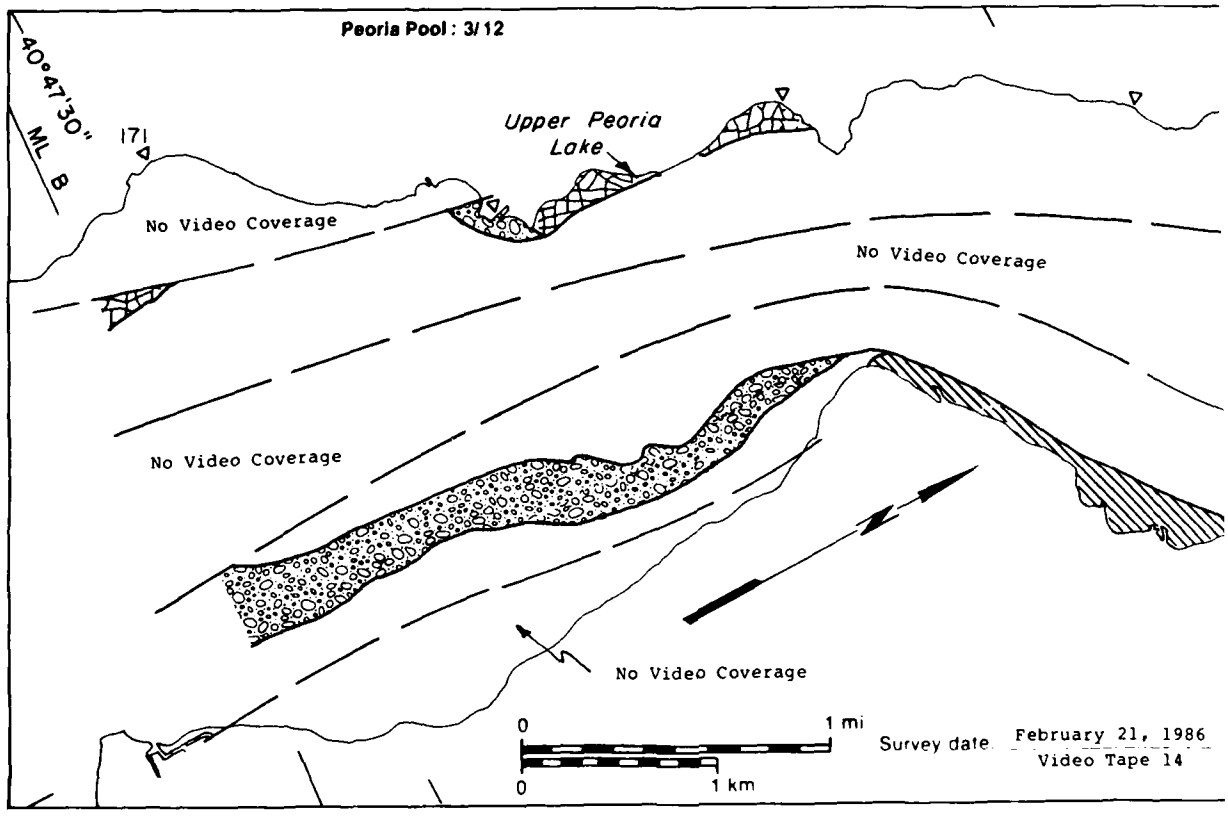

Peoria Pool : 2/12
40°42'30"
ML A
164
Peoria Lake
89°32'30"
N
No Video Coverage
0
1 mi
0
1 km

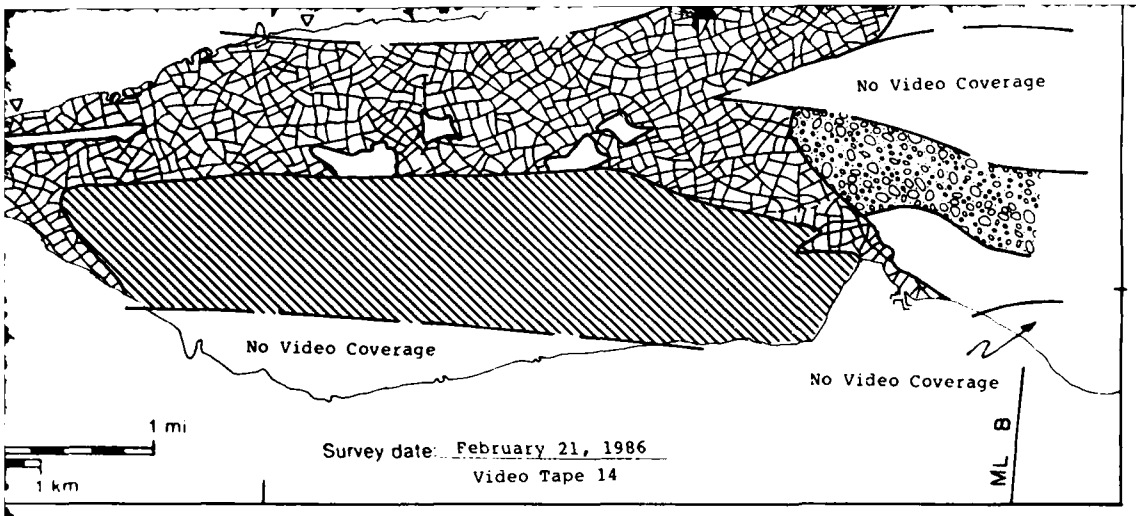

Peoria Pool : 3/12
40°47'30"
N
Upper Peoria

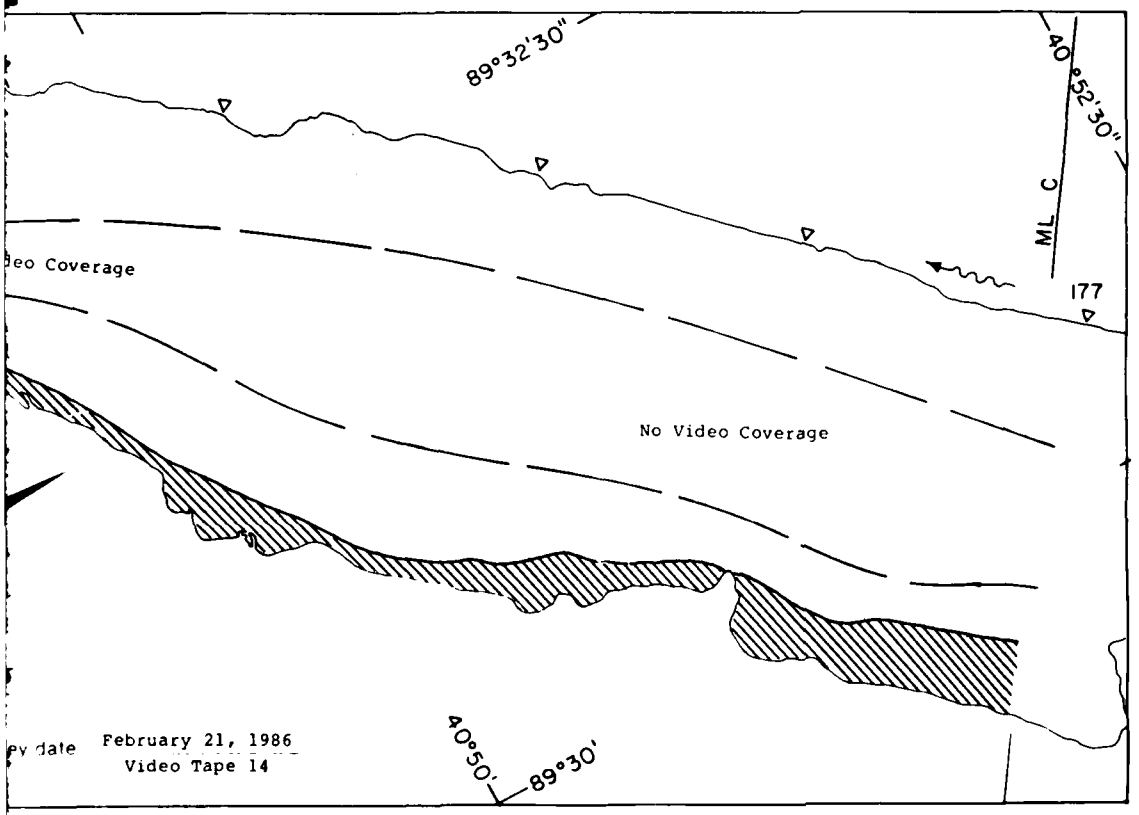
21 February 1986



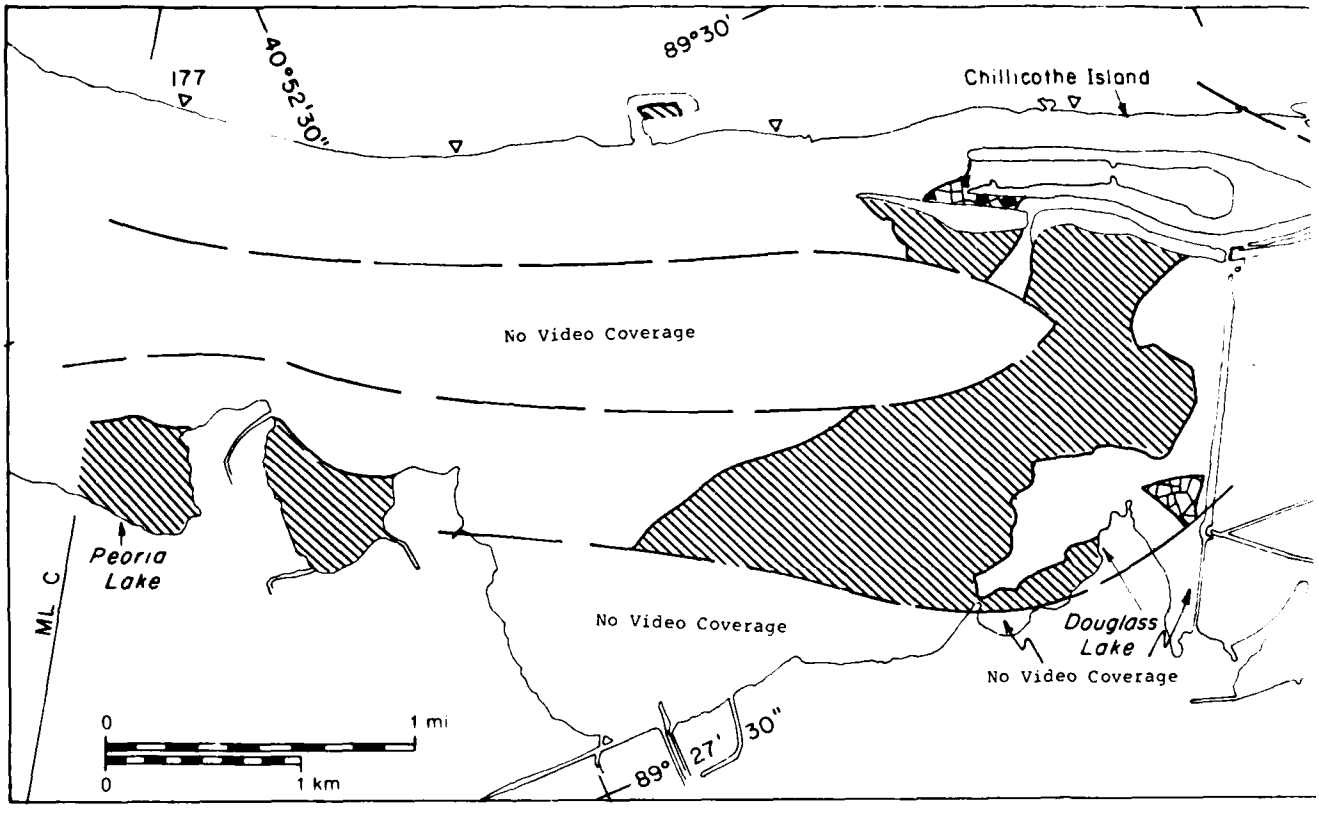

89°32'30"
No Video Coverage
No Vic
0
1 mi
0
1 km

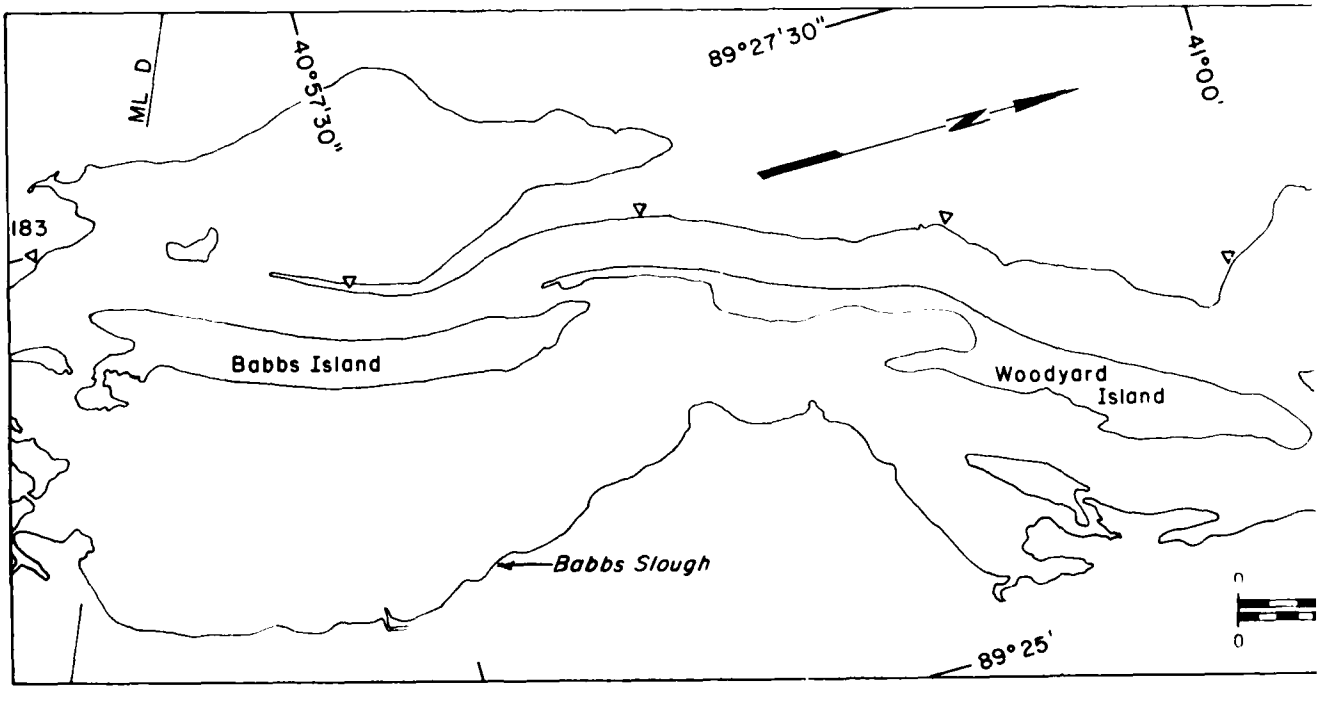

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date February 21, 1986
Video Tape 14

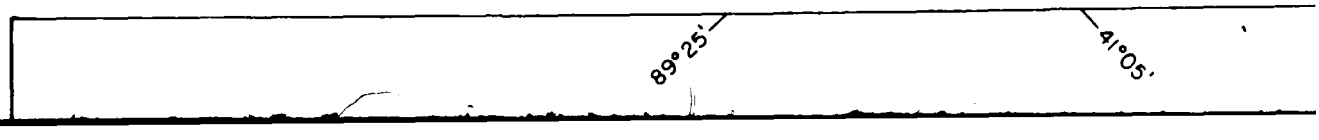

No Video Coverage
No Video Coverage
No Video Coverage
1 mi
1 km
Survey date: February 21, 1986
Video Tape 14
ML B

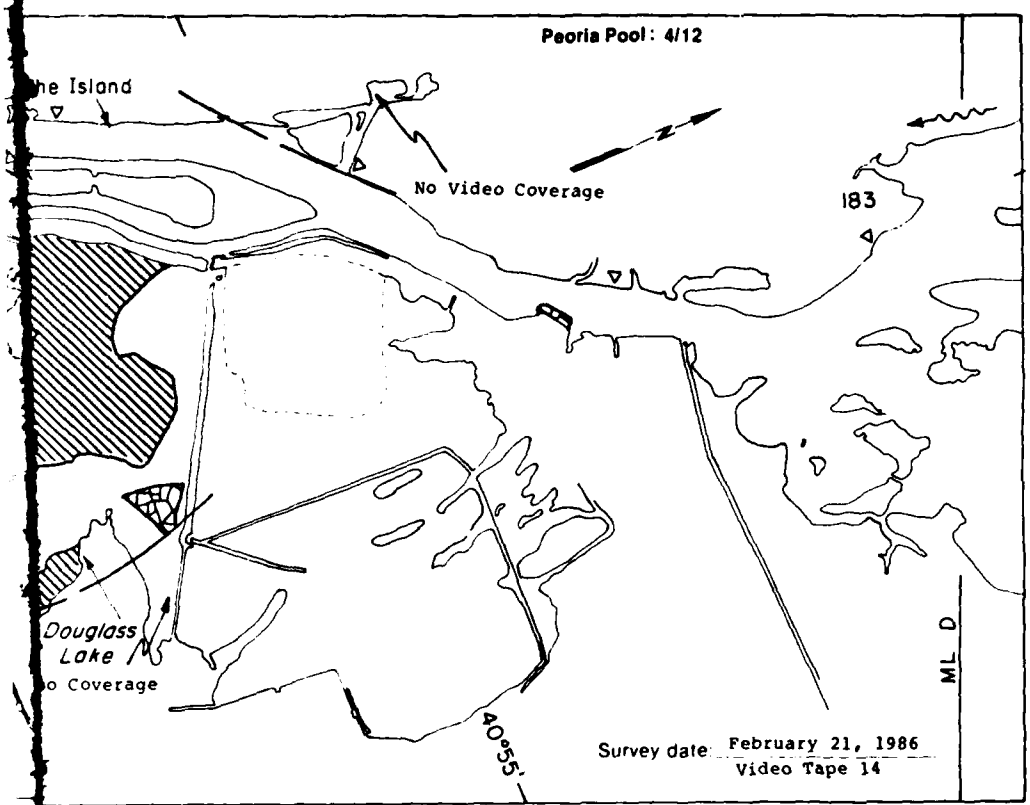

89°32'30"
40°52'30"
ML C
177
No Video Coverage
February 21, 1986
Video Tape 14
40°50'
89°30'

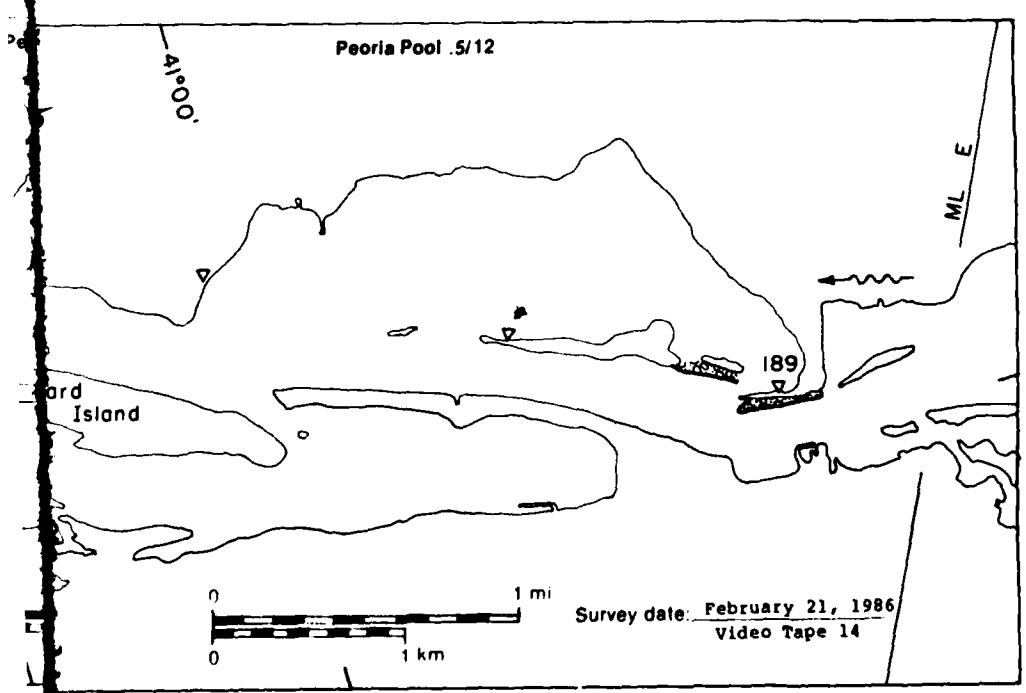
21 February 1986

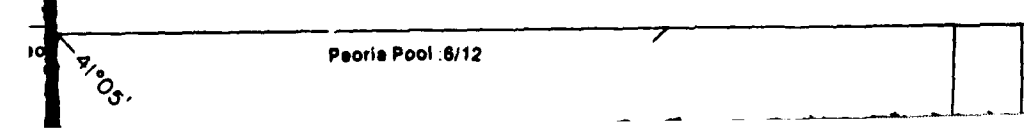


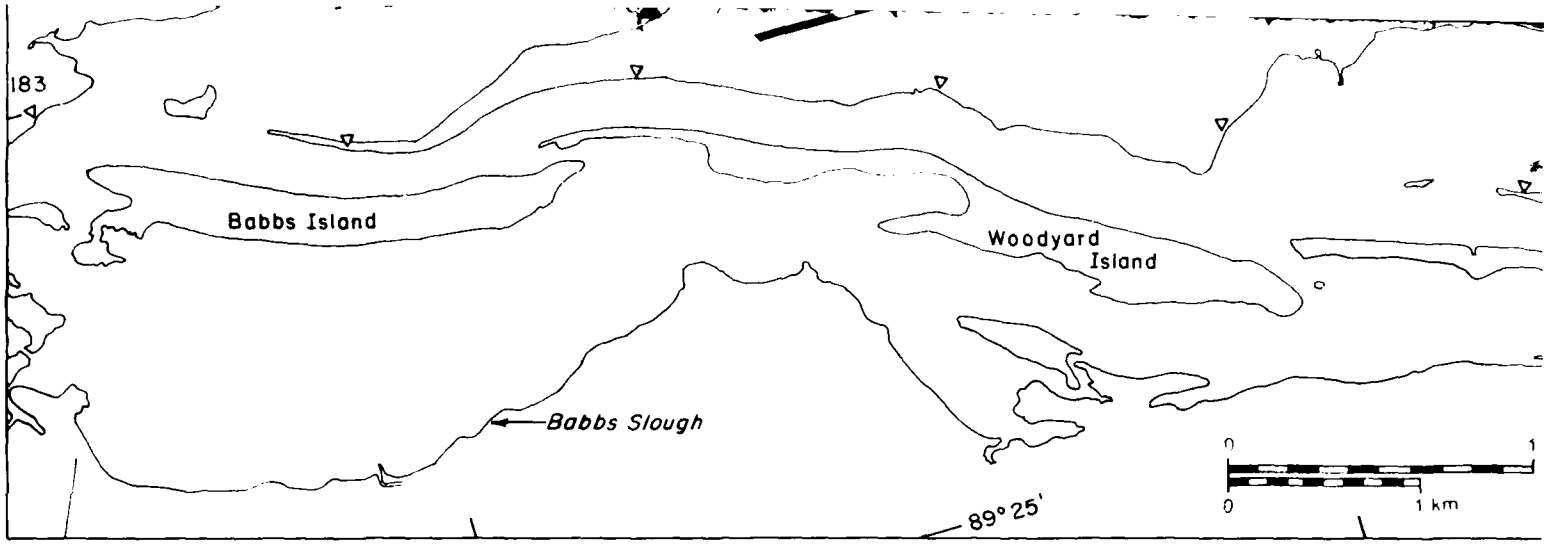


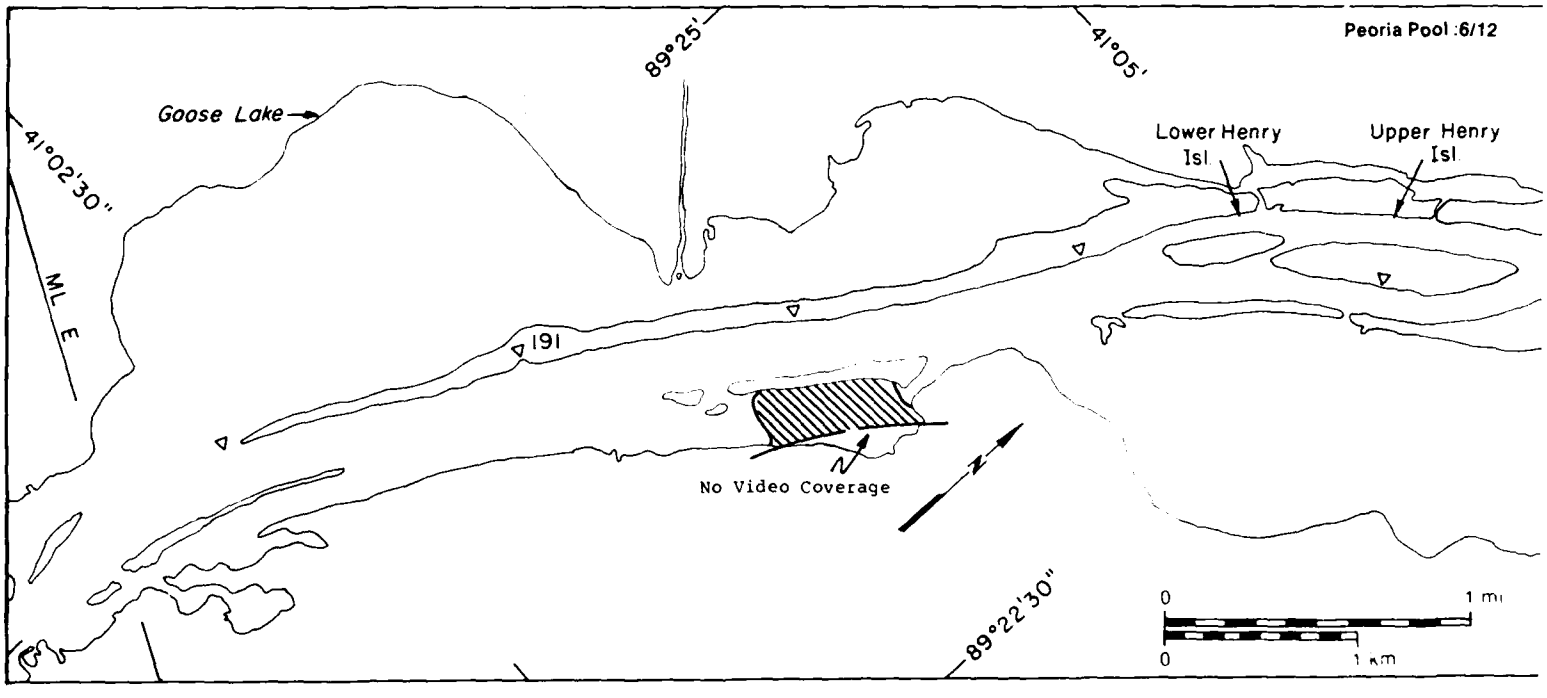


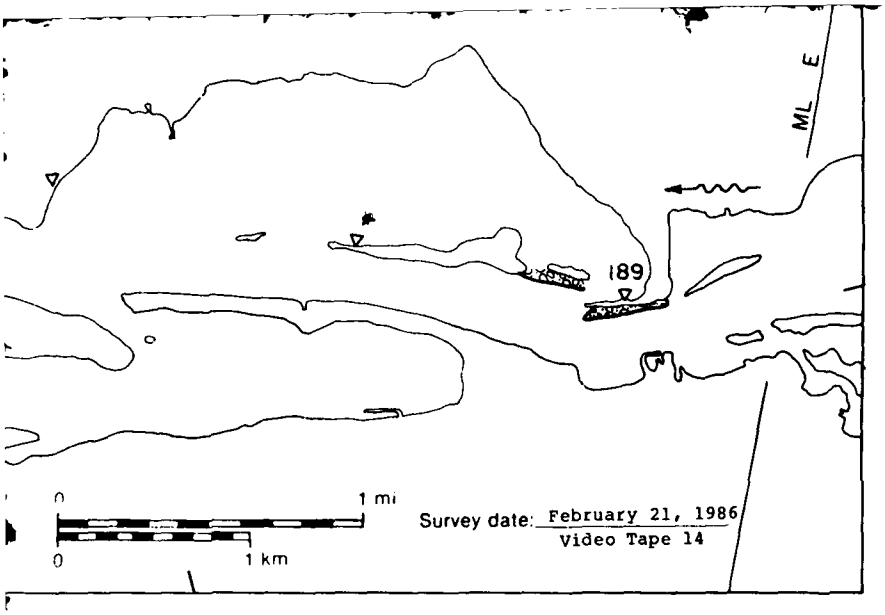

Peoria Pool : 4/12
No Video Coverage
183
Douglass Lake
ML D
40°55'
Survey date: February 21, 1986
Video Tape 14

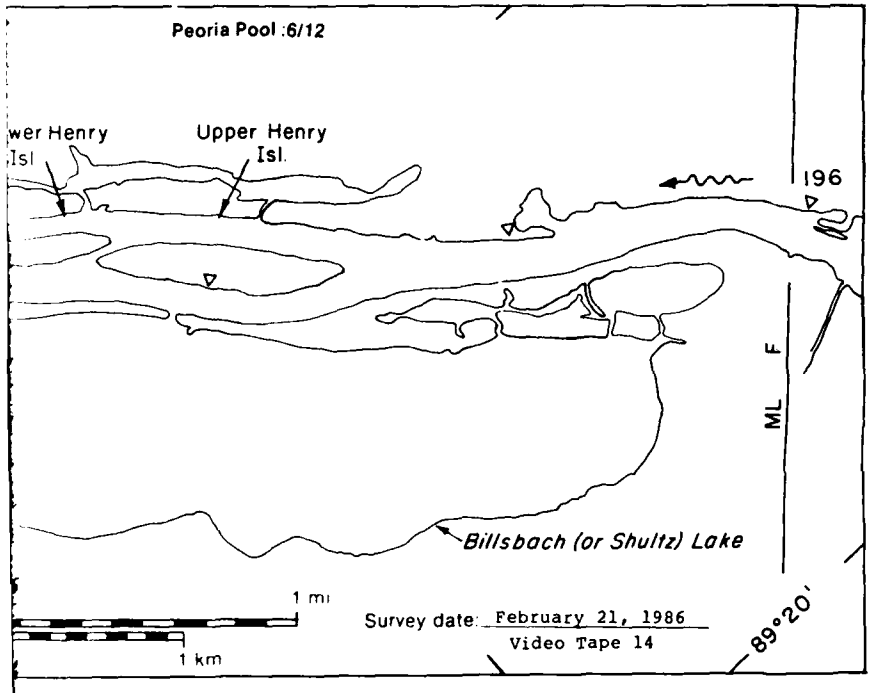

Peoria Pool .5/12
41°00'
ML E
189
Island
0
1 mi
0
1 km
Survey date: February 21, 1986
Video Tape 14

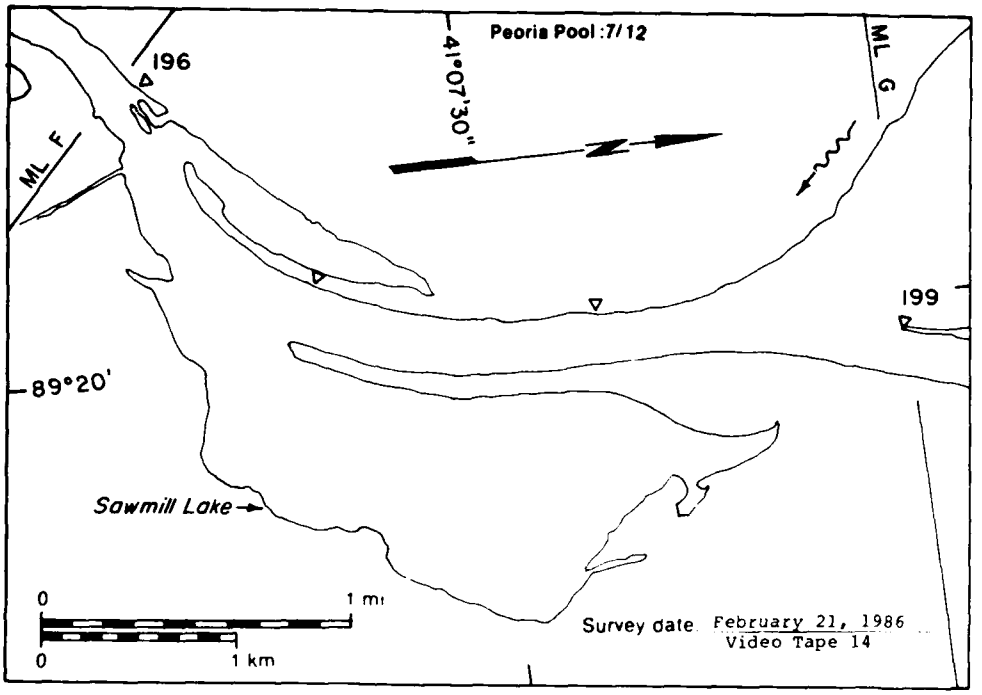

Peoria Pool :6/12
41°05'

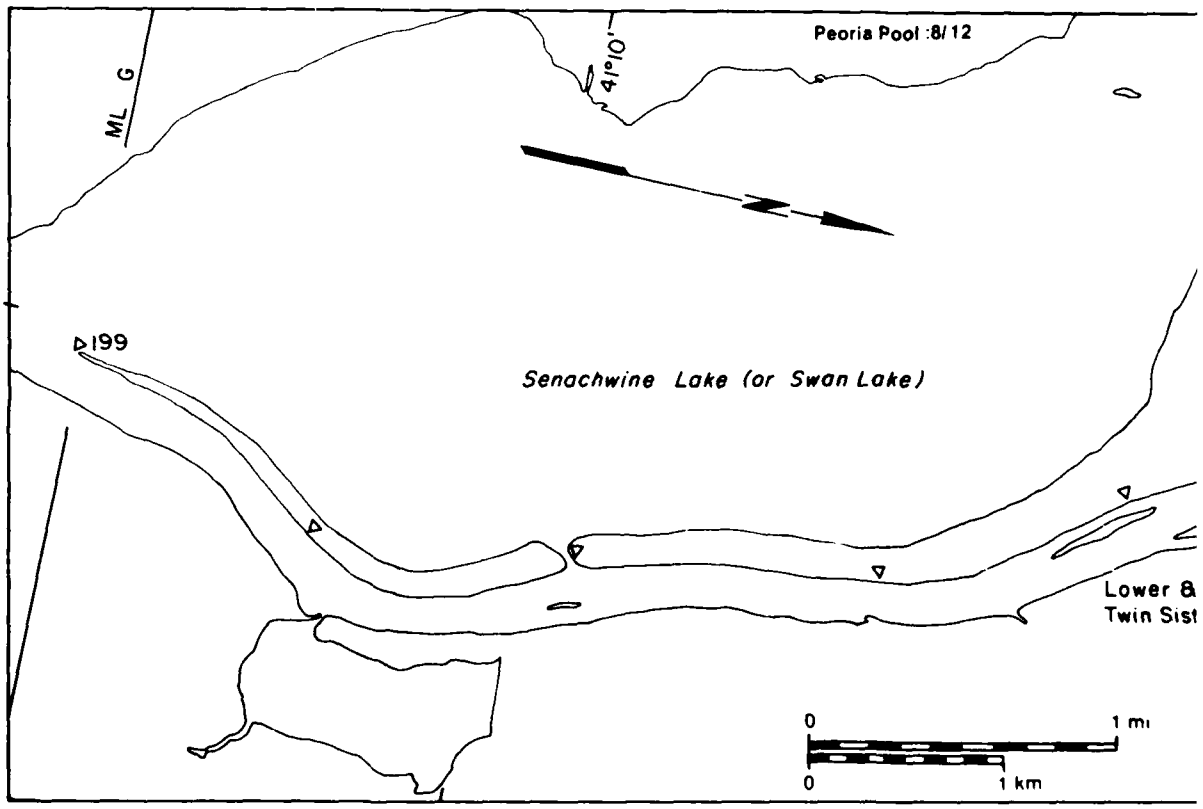

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
1
0
1 km


Peoria Pool :6/12
89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl.
Upper Henry
Isl.
ML E
191
No Video Coverage
89°22'30"
0
1 mi
0
1 km


ML E
189
0
1 mi
0
1 km
Survey date: February 21, 1986
Video Tape 14

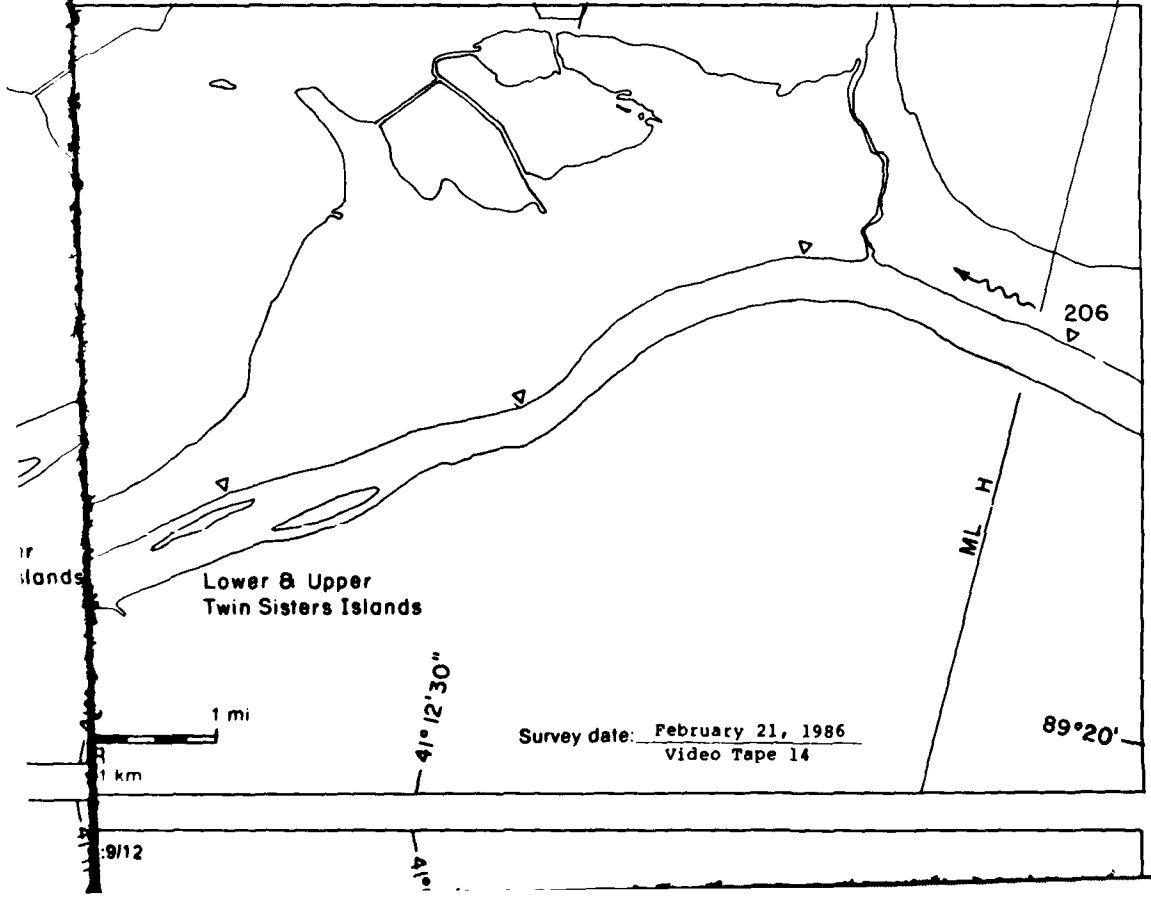

Peoria Pool :6/12
wer Henry
Isl
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
1 mi
1 km
Survey date: February 21, 1986
Video Tape 14
89°20'

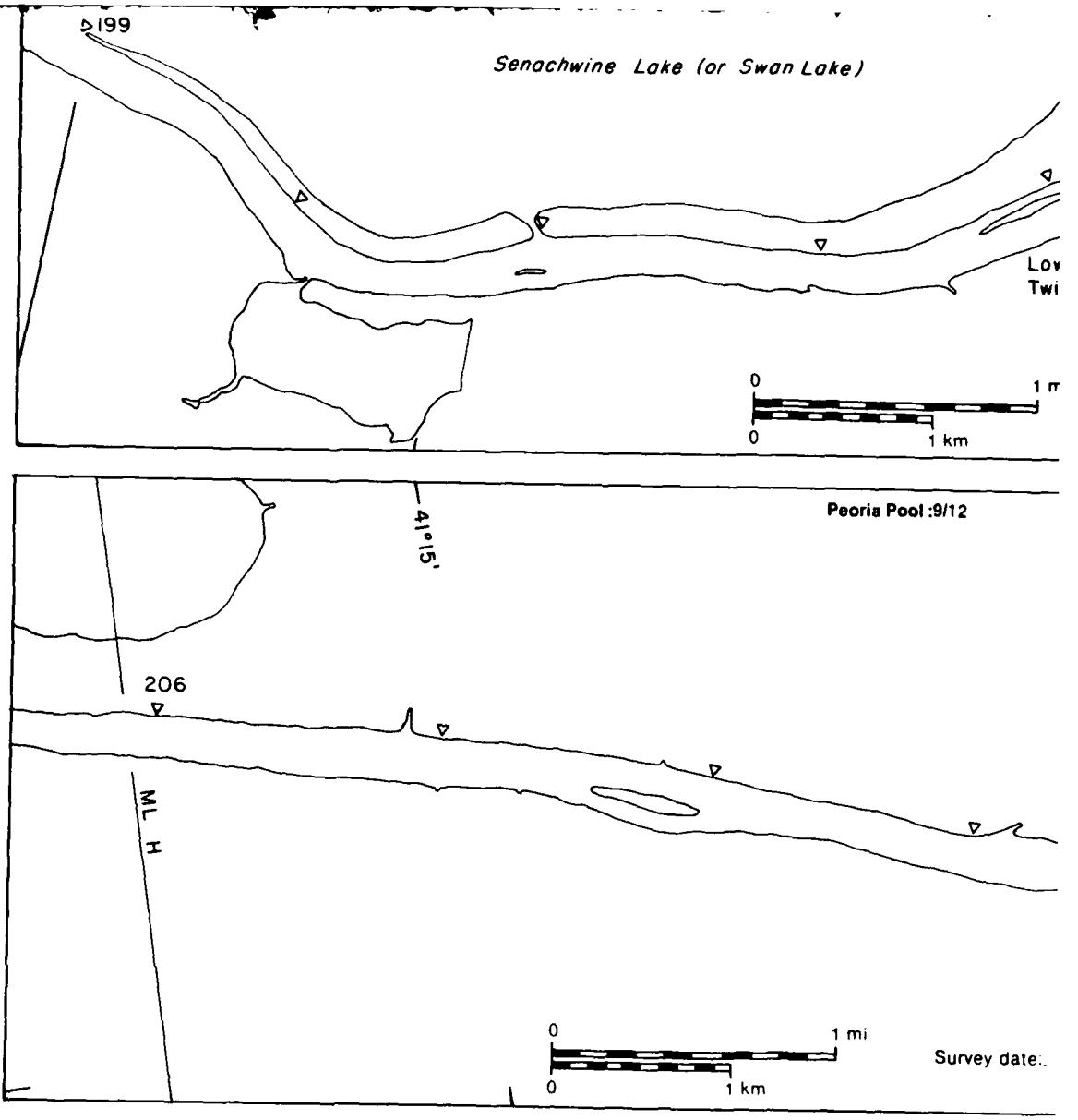

Peoria Pool :7/12
196
41°07'30"
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date February 21, 1986
Video Tape 14

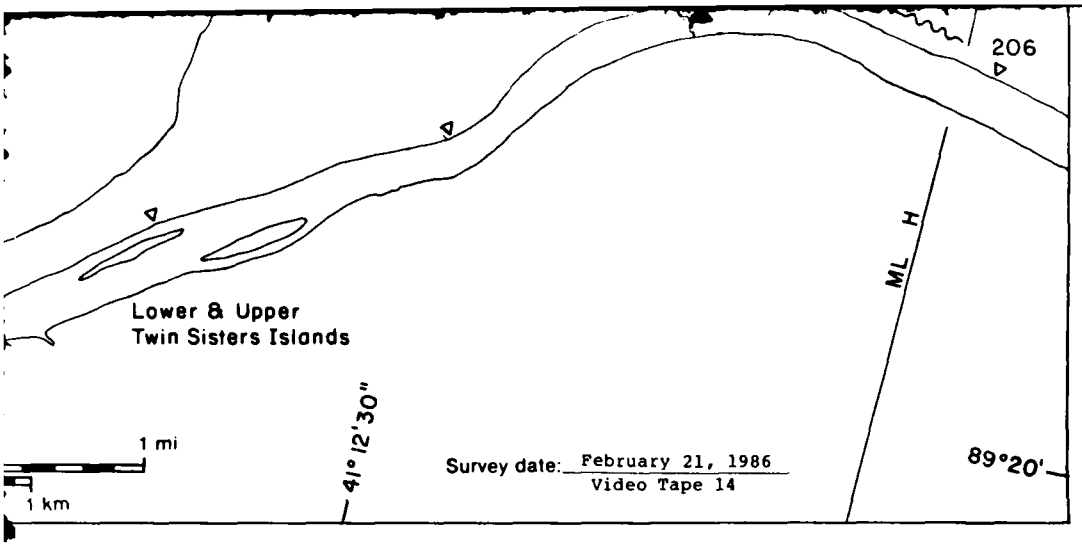

Peoria Pool :8/12
ML G
41°10'
199
Senachwine Lake (or Swan Lake)
Lower &
Twin Sist
0
1 mi
0
1 km

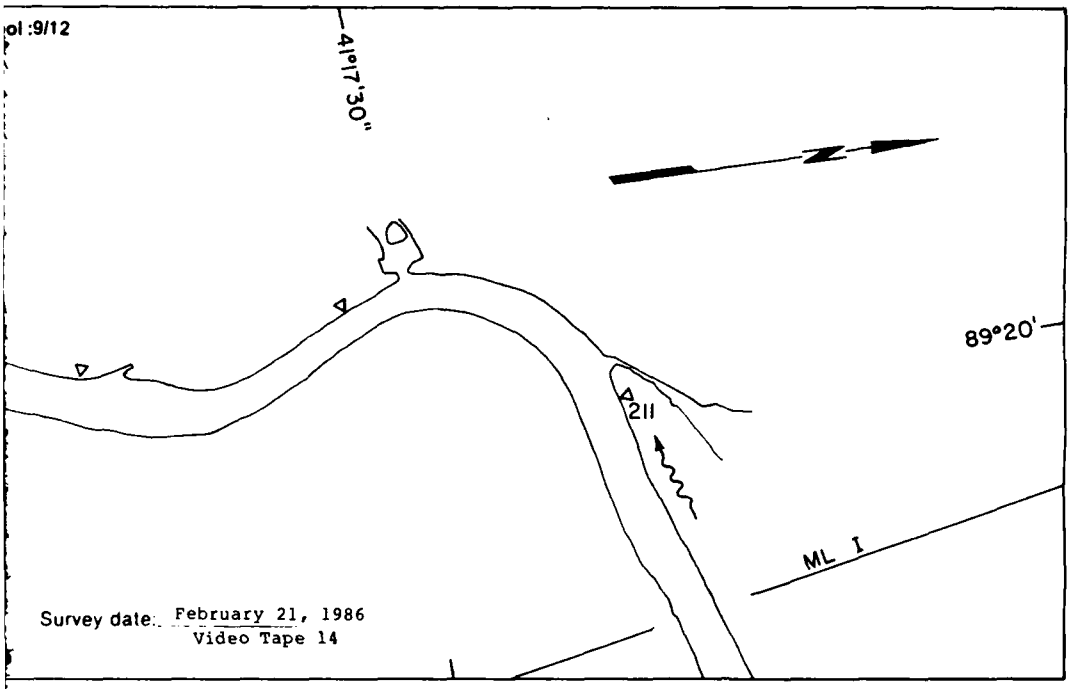
Peoria Pool :9/12
41°15'

21 February 1986

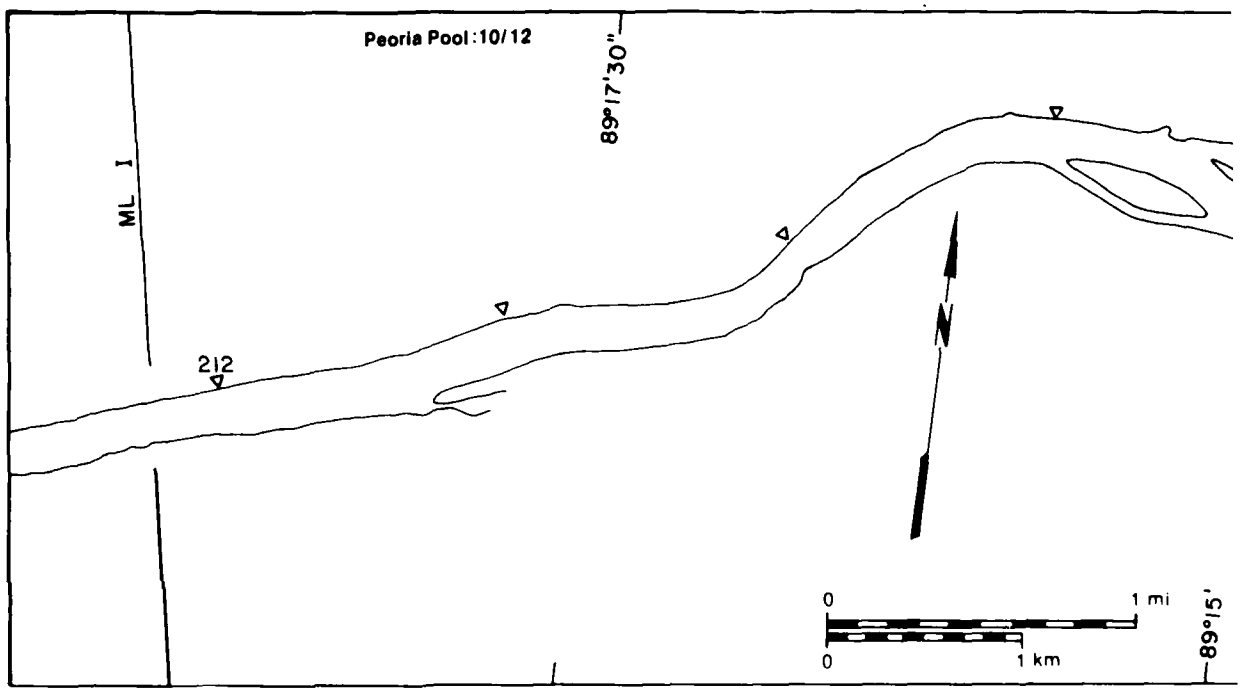


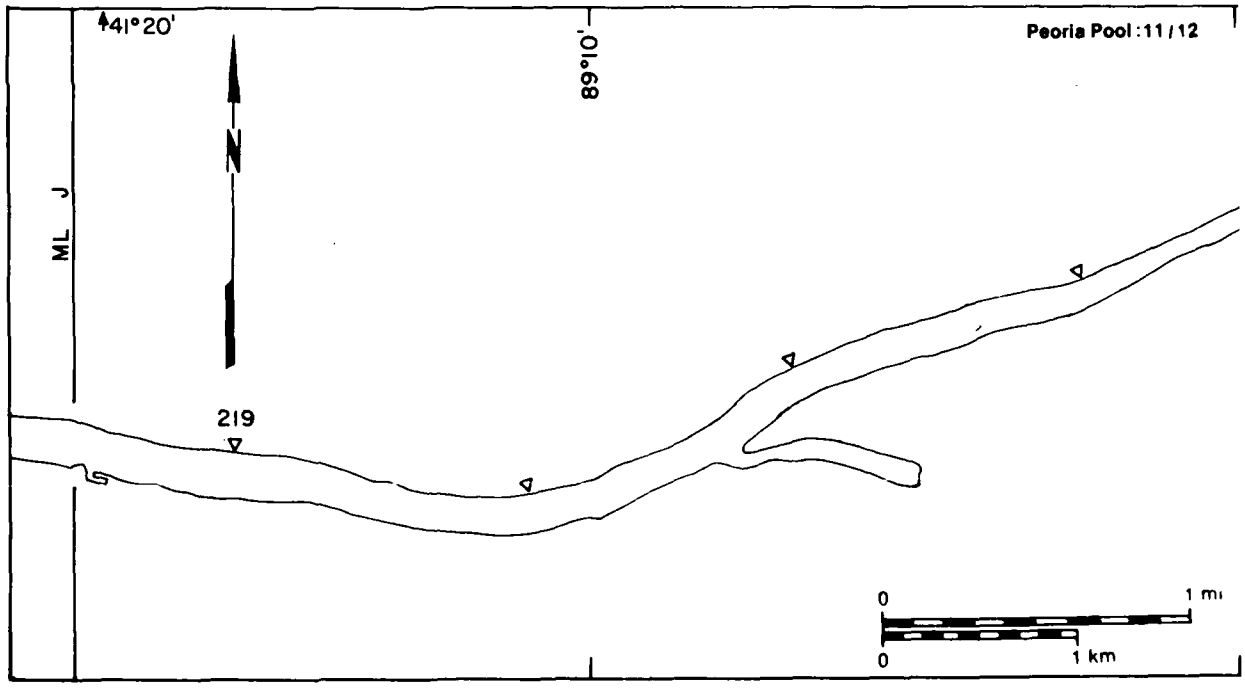

199
Senachwine Lake (or Swan Lake)
Lov
Twi
0
1 m
0
1 km
41°15'
Peoria Pool :9/12
206
ML H
0
1 mi
0
1 km
Survey date:

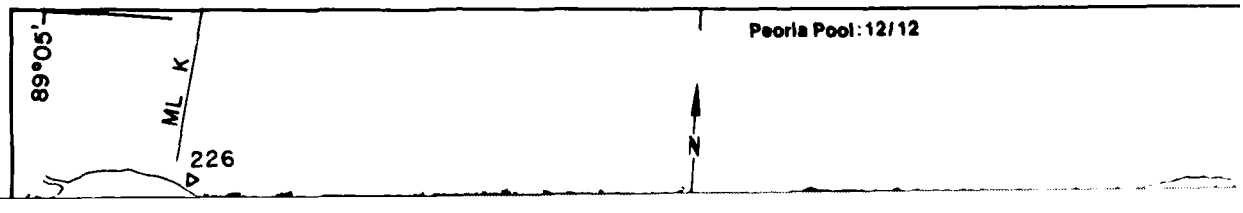

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: February 21, 1986
Video Tape 14
89°20'

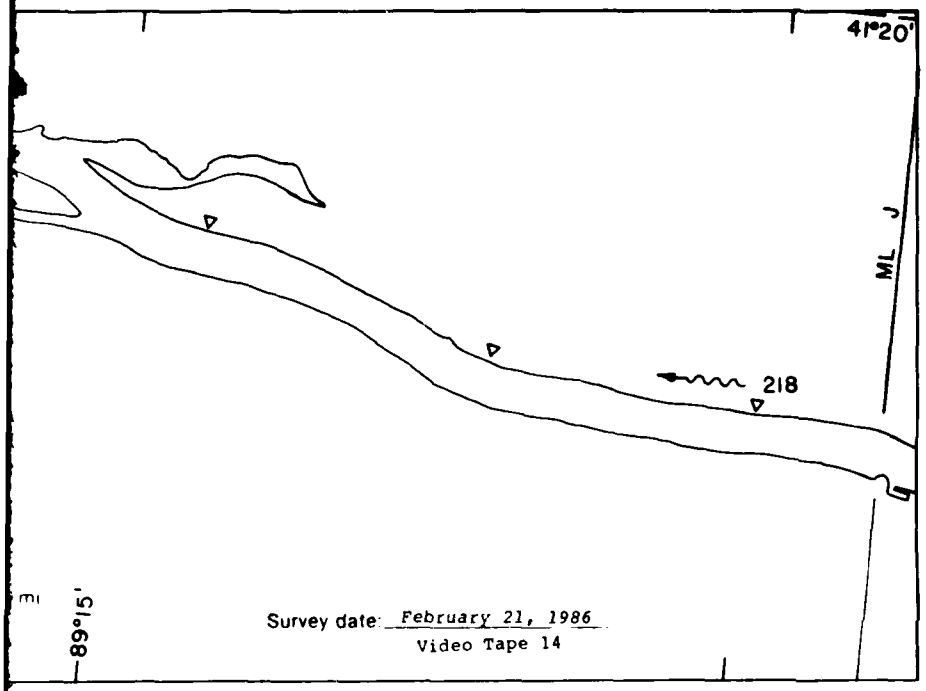

ol :9/12
41°17'30"
89°20'
211
ML I
Survey date: February 21, 1986
Video Tape 14

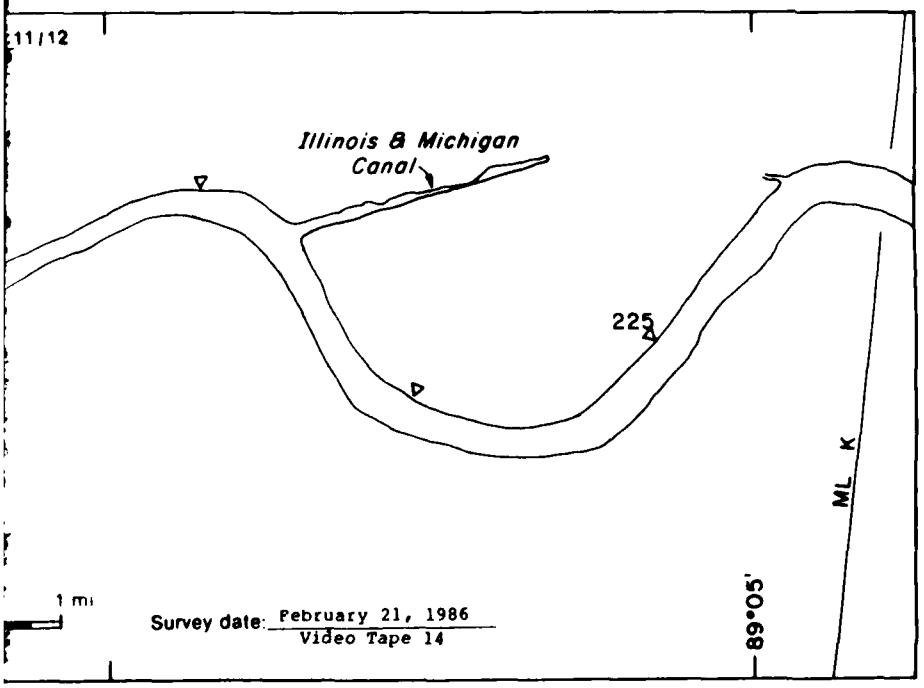
21 February 1986

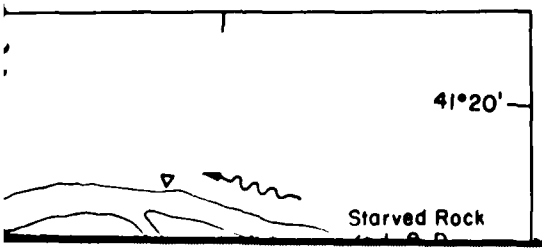


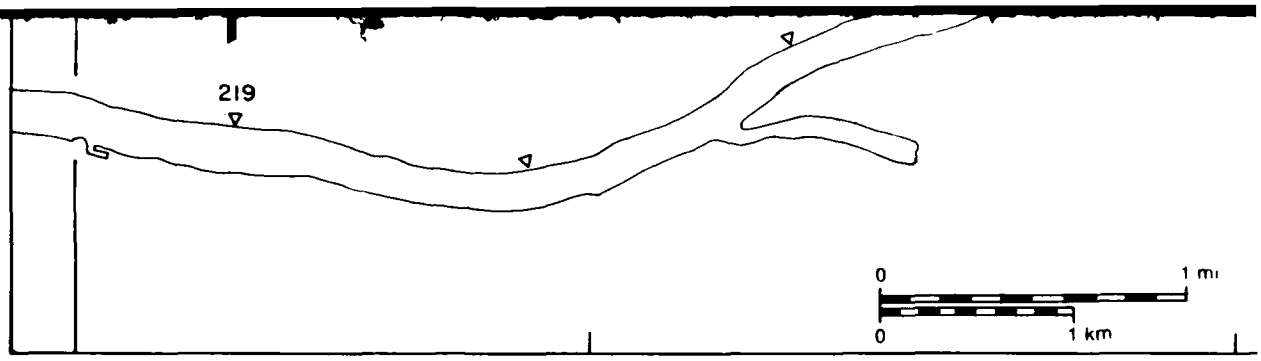


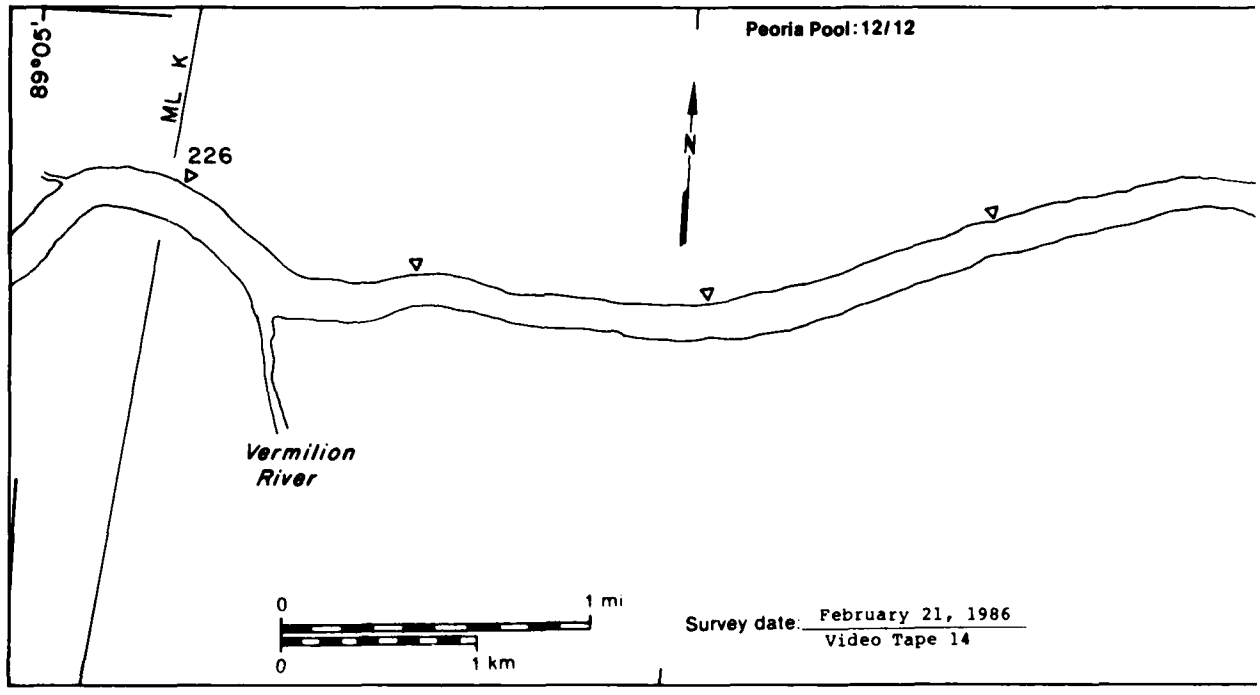



41°20'
ML J
218
mi
89°15'
Survey date: February 21, 1986
Video Tape 14


11/12
Illinois & Michigan Canal
225
ML K
1 mi
Survey date: February 21, 1986
Video Tape 14
89°05'


41°20'
Starved Rock

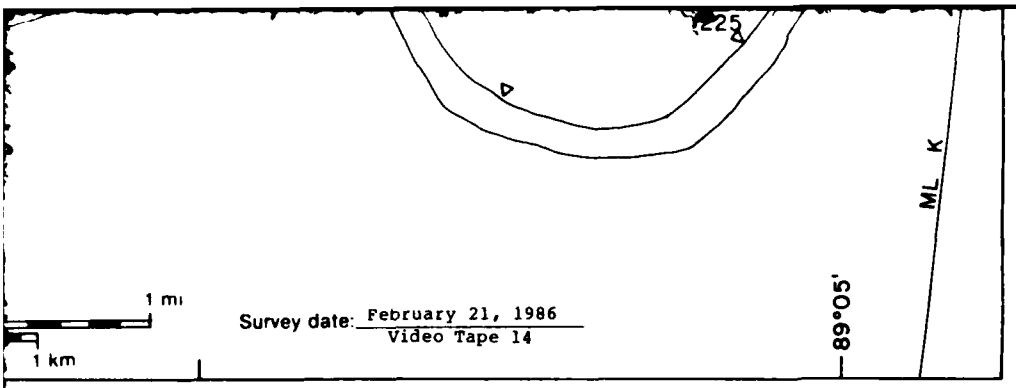


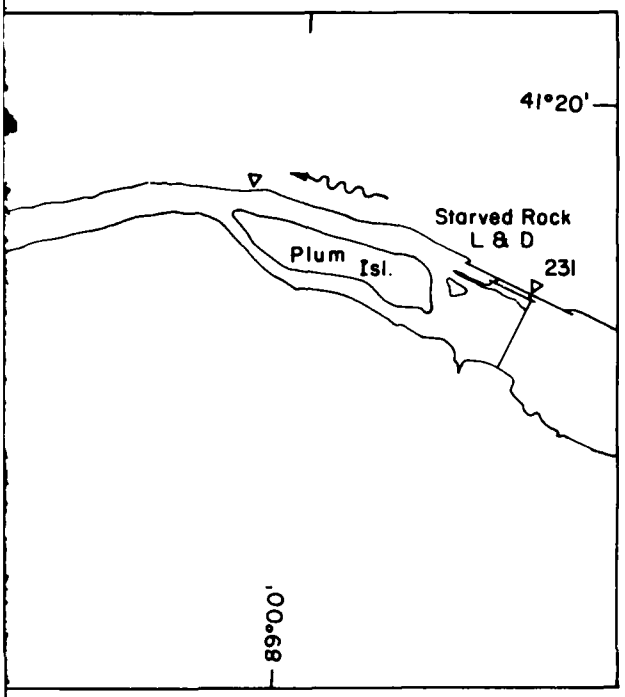


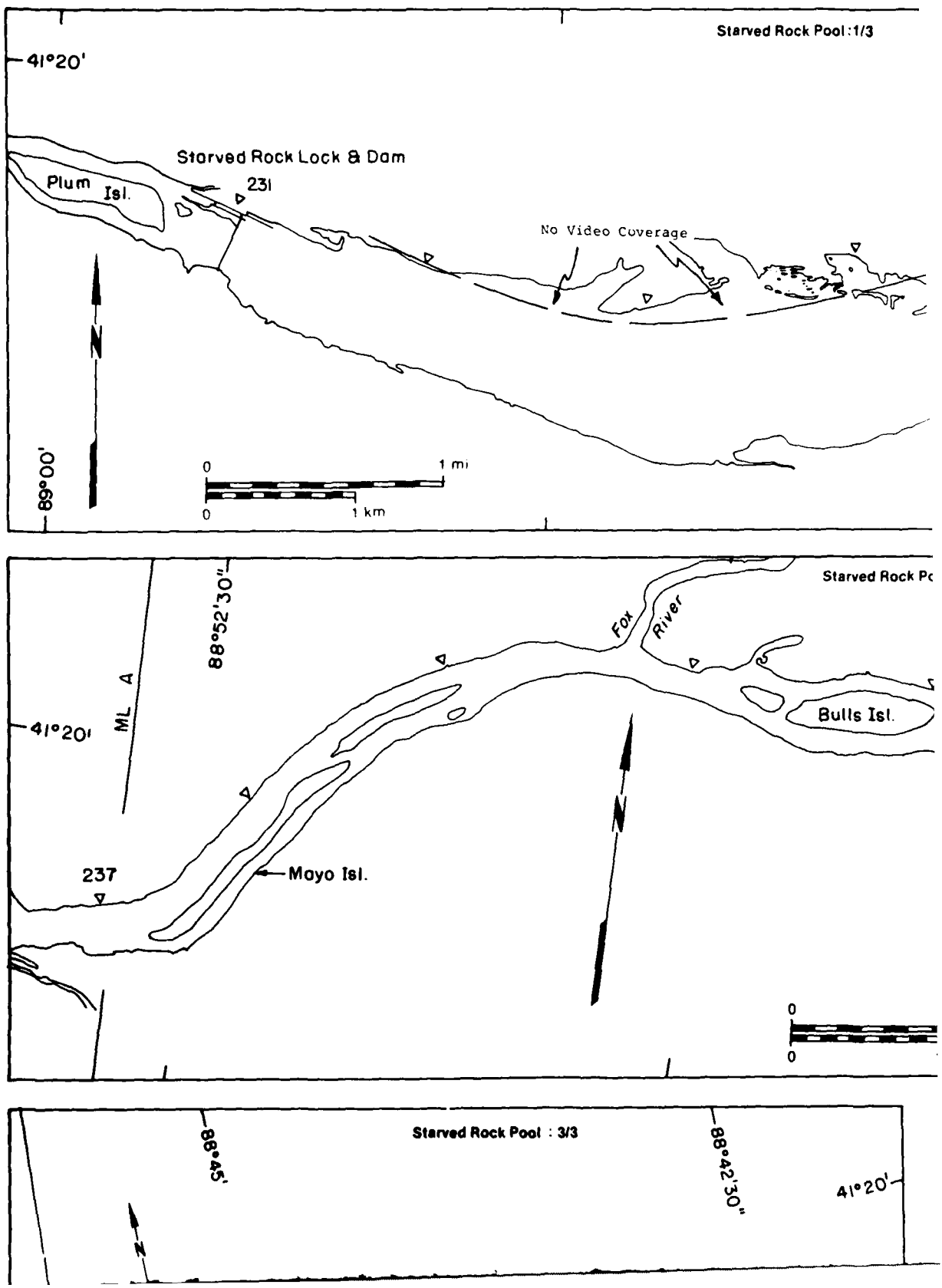
Peoria Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	43.77	NA
Solid ice cover	12.66	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	4.86	NA
Fragmented ice cover with open-water areas	0.06	70
Ice floes or frazil slush and pans	2.36	5
Total area ($m^2 \times 10^6$)	81.33*	

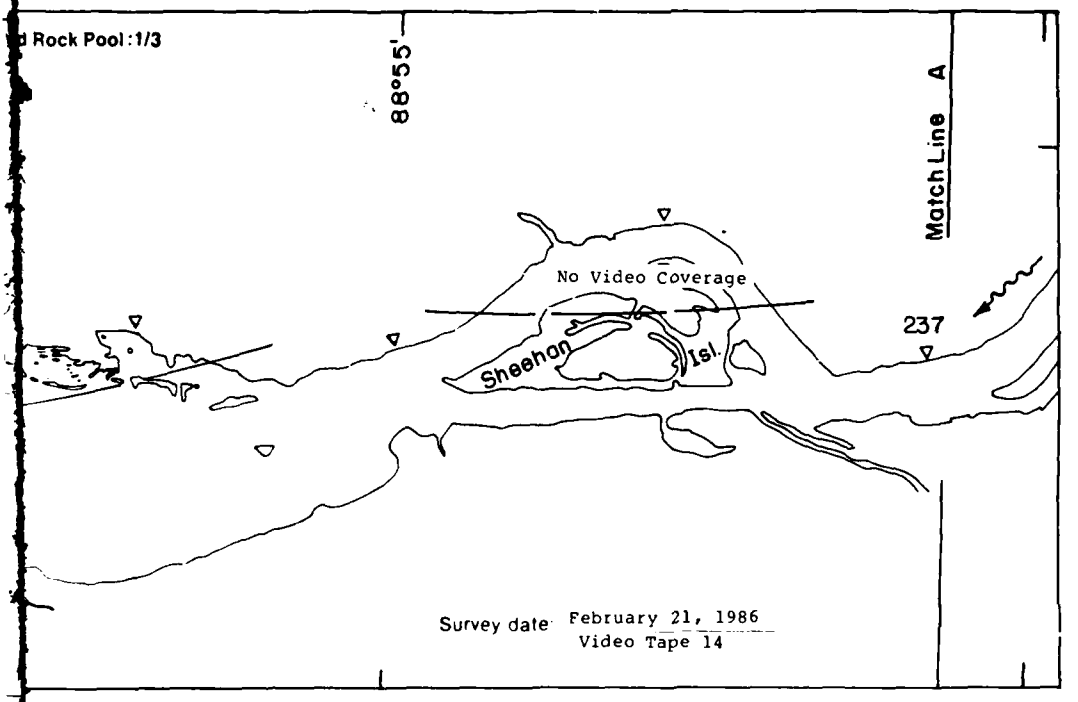
* Includes 17.62 x 10^6 m^2 of no video coverage

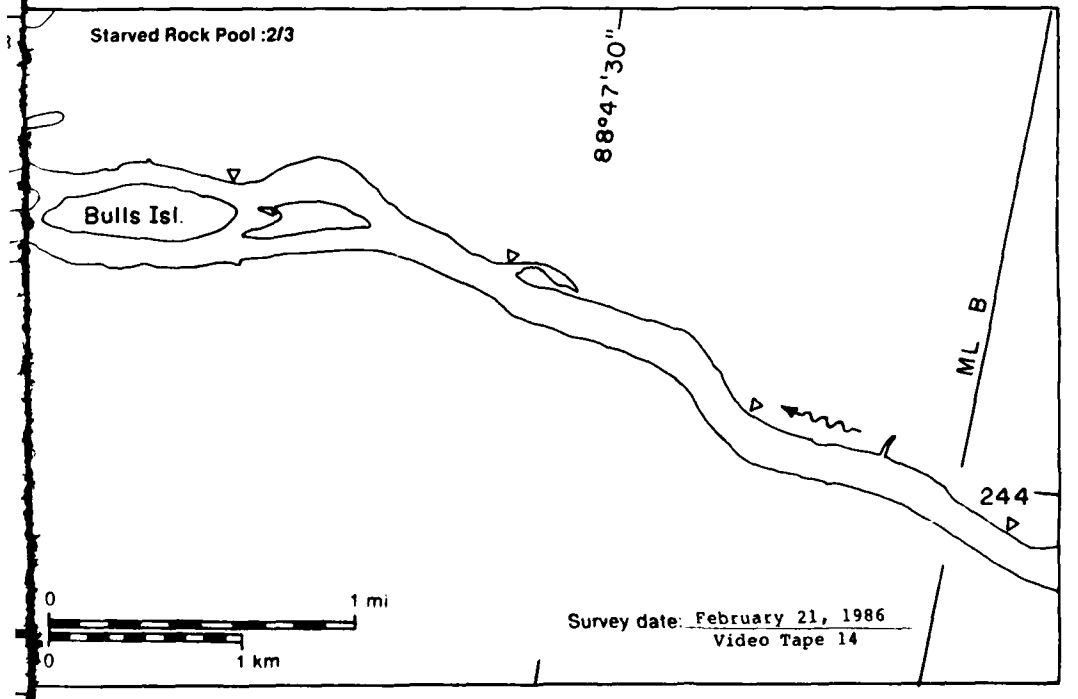

225
ML K
89°05'
1 mi
1 km
Survey date: February 21, 1986
Video Tape 14


41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'


Starved Rock Pool : 1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
N
89°00'
0
1 mi
0
1 km
Starved Rock Pool
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
N
0
0
Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N

21 February 1986



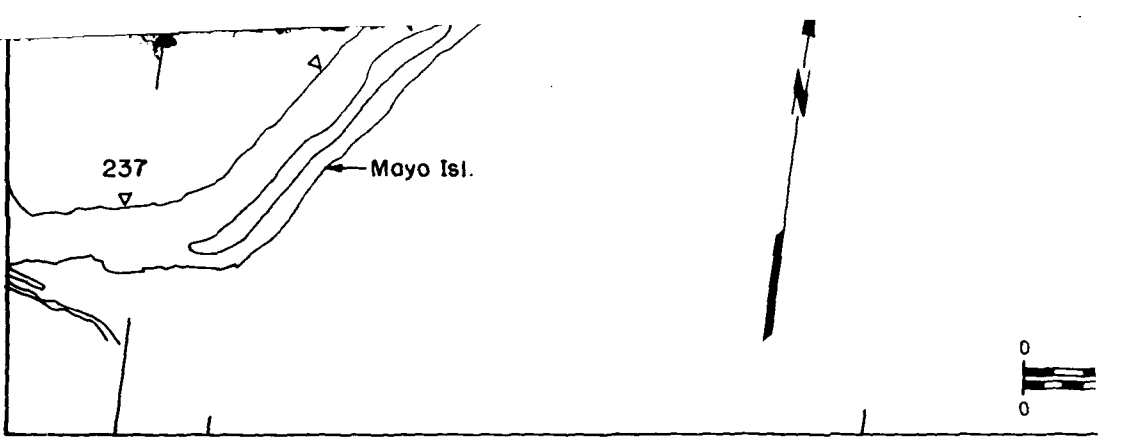


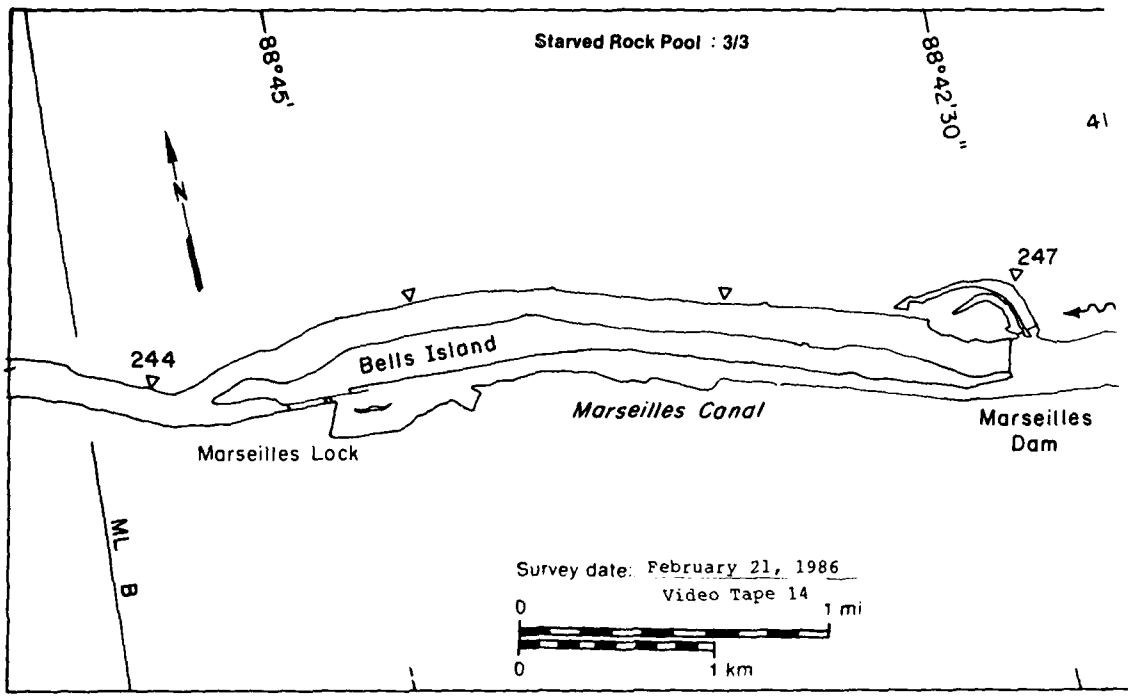
41°20'

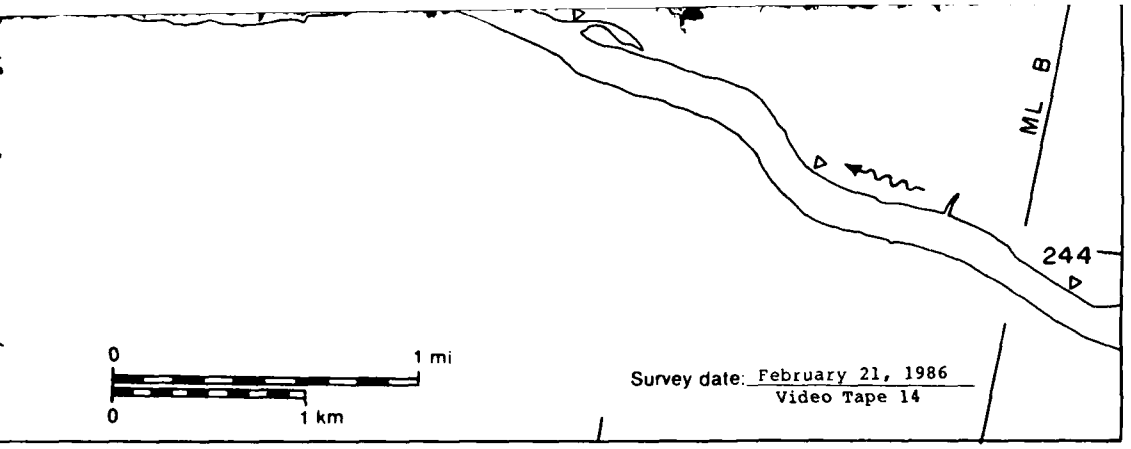
Starved Rock Pool

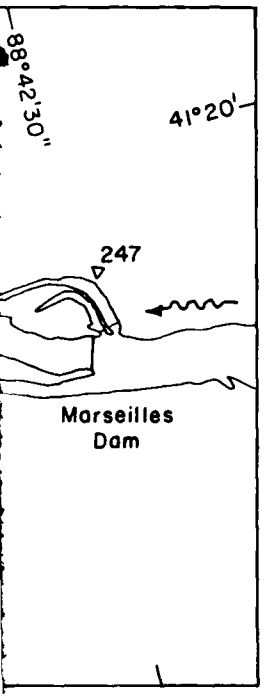
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	0.16	NA


237
Mayo Isl.
N
0
0


Starved Rock Pool : 3/3
88°45'
88°42'30"
41
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: February 21, 1986
Video Tape 14
0
1 mi
0
1 km





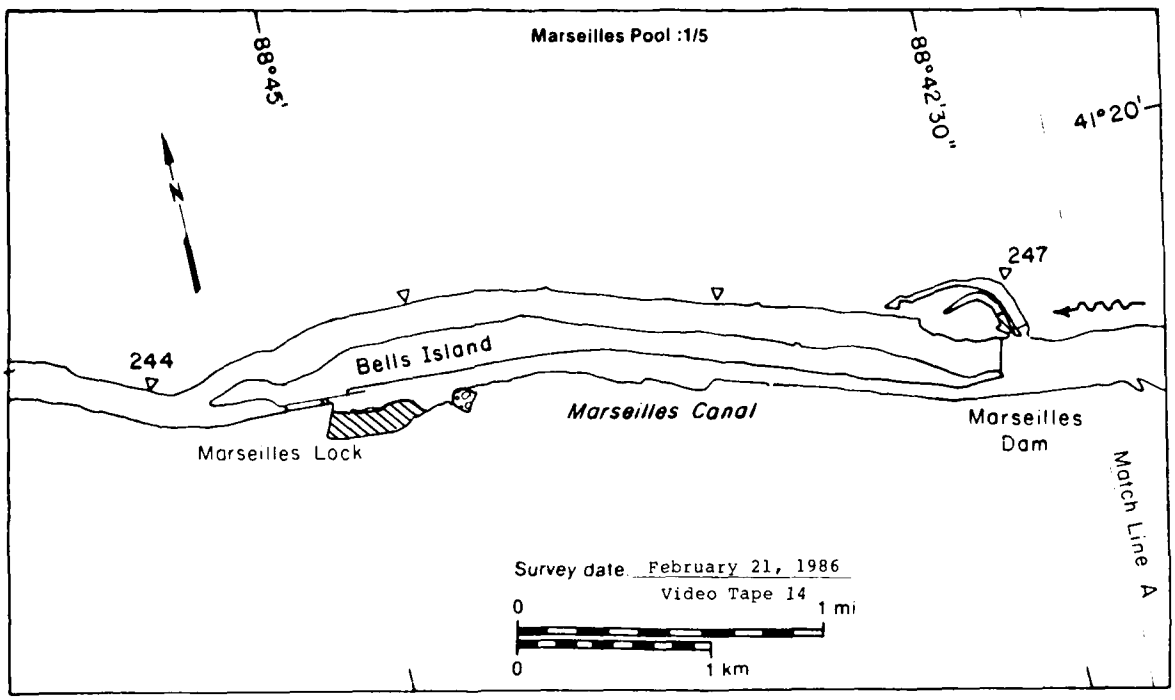
Starved Rock Pool

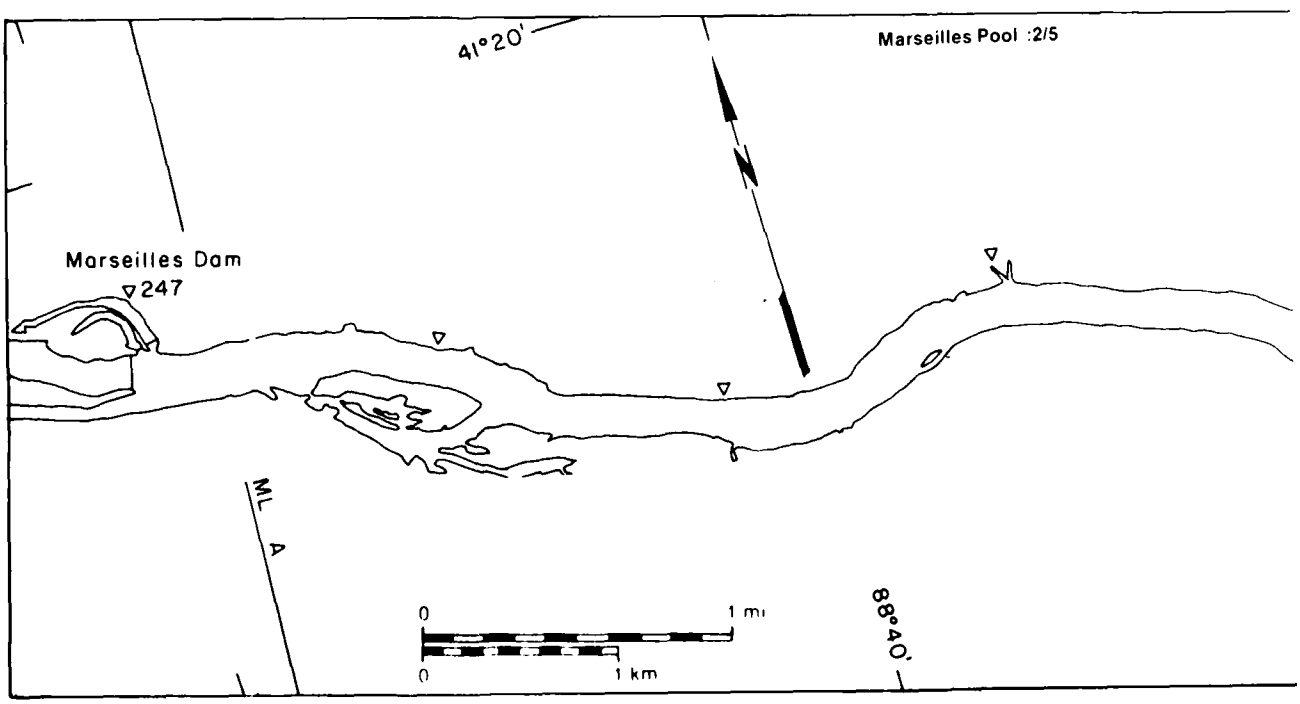
MAP UNITS

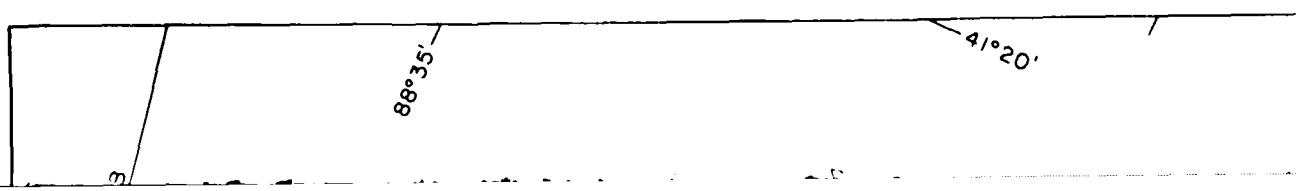
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	9.16	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	10.19*	

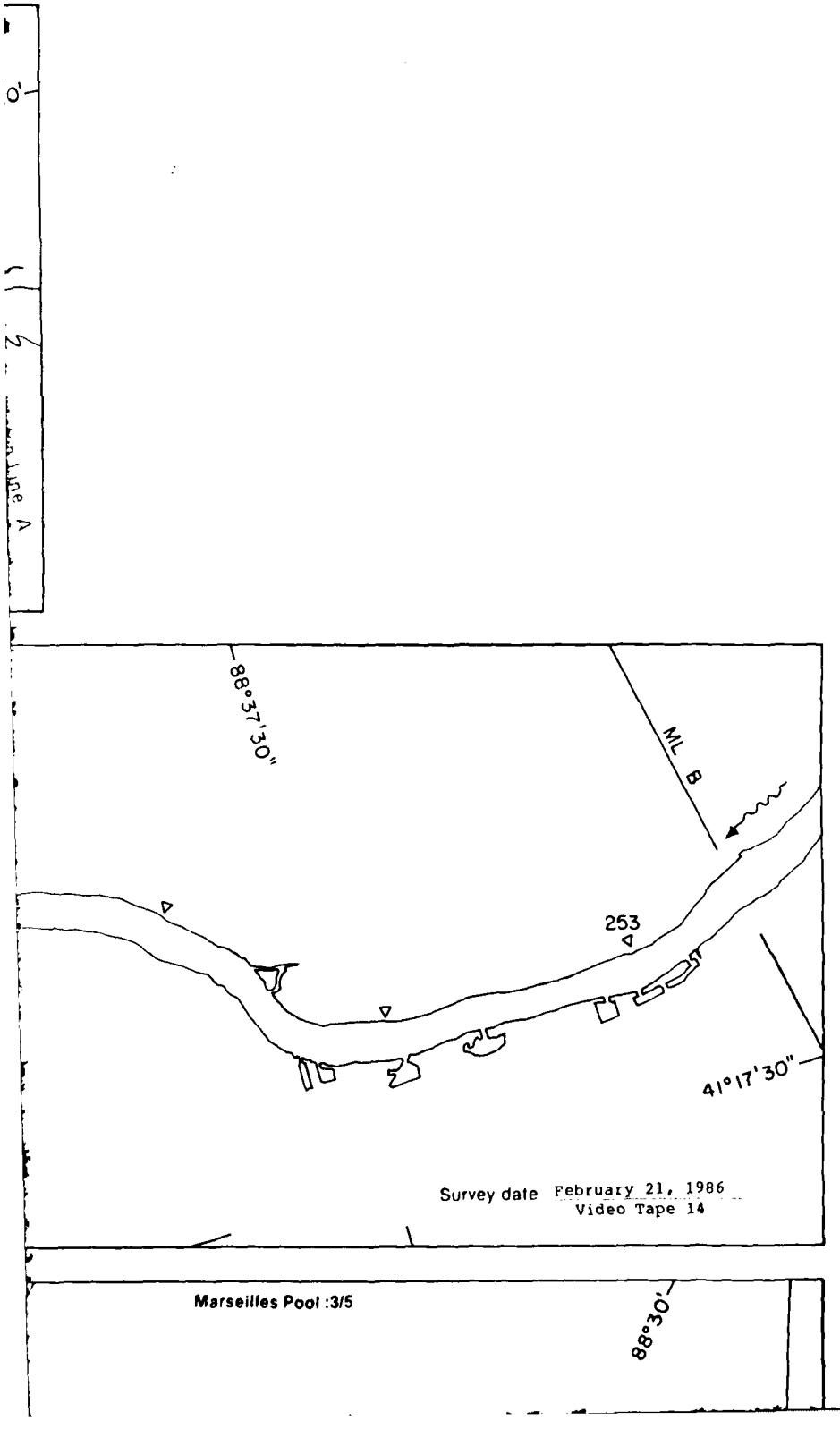
* Includes 1.03×10^6 m^2 of no video coverage

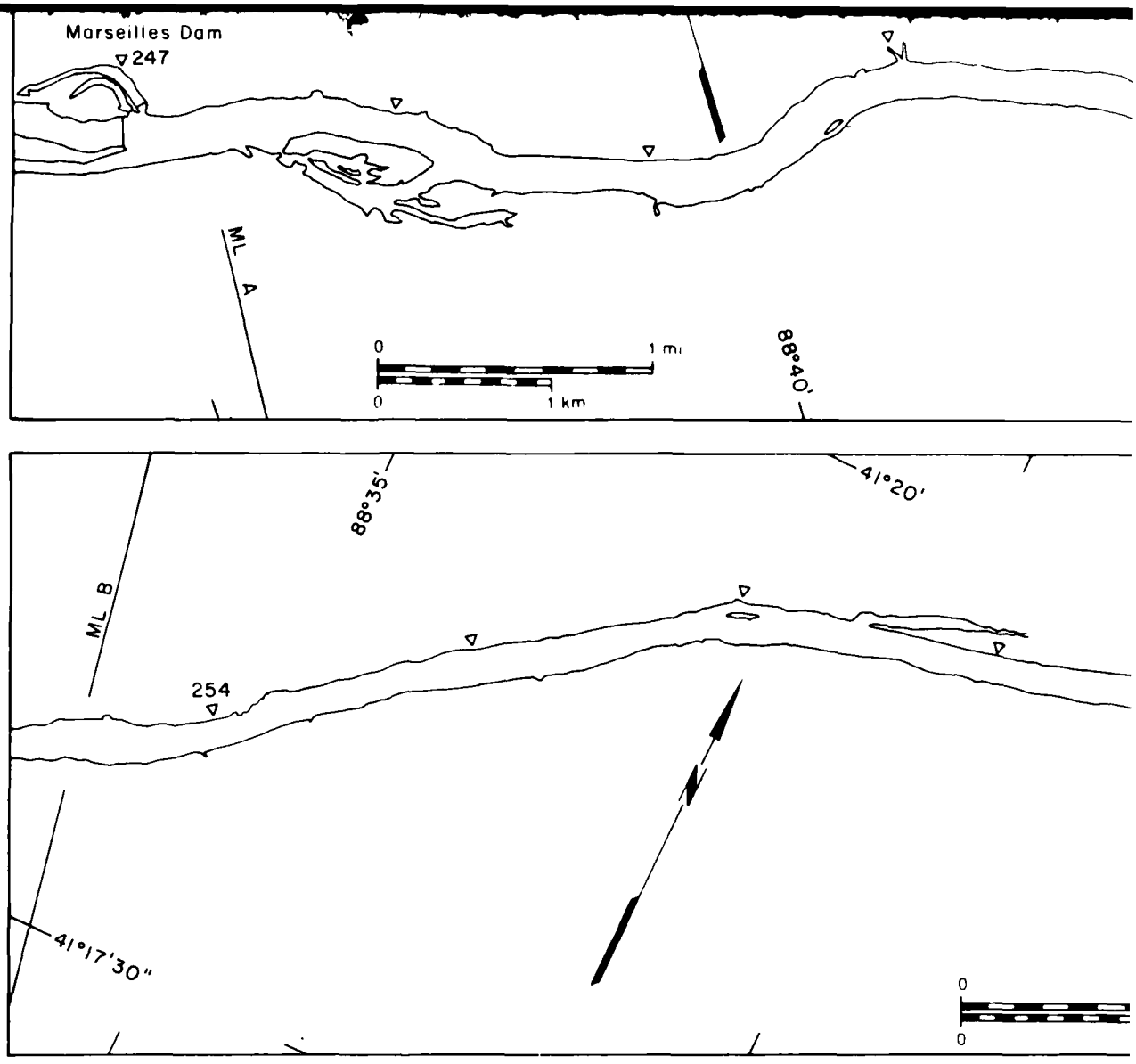
21 February 1986

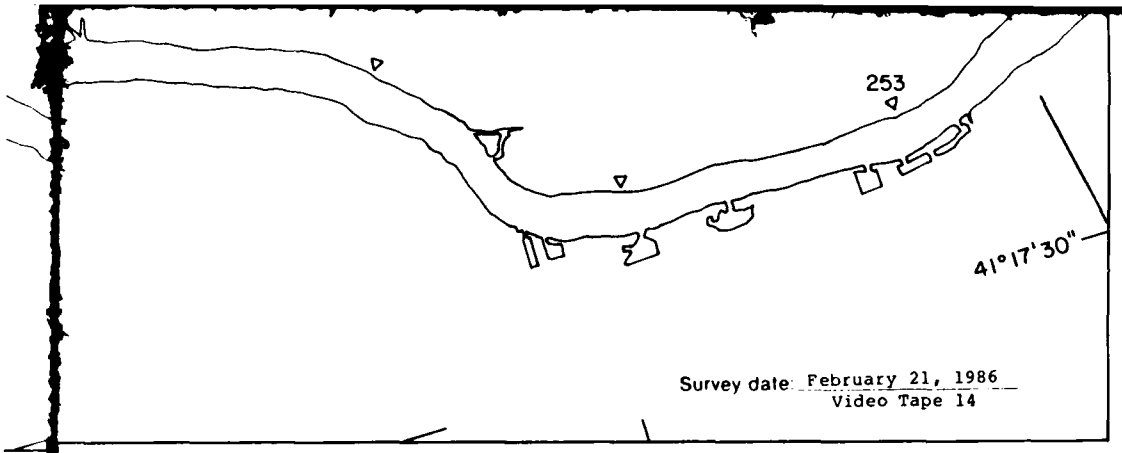


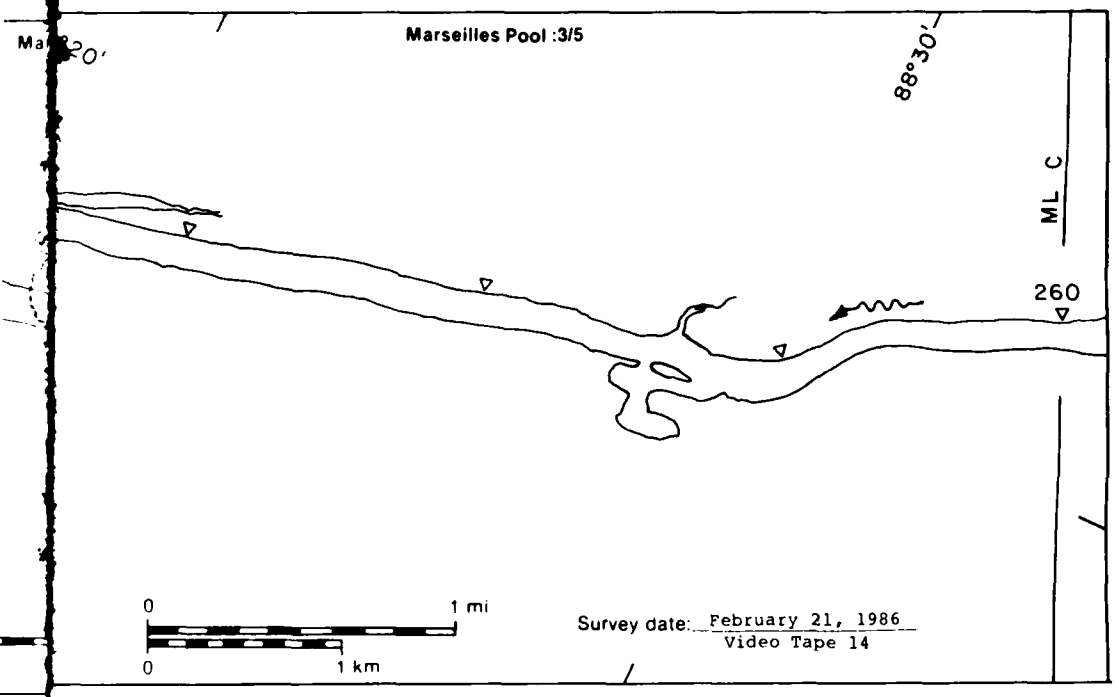


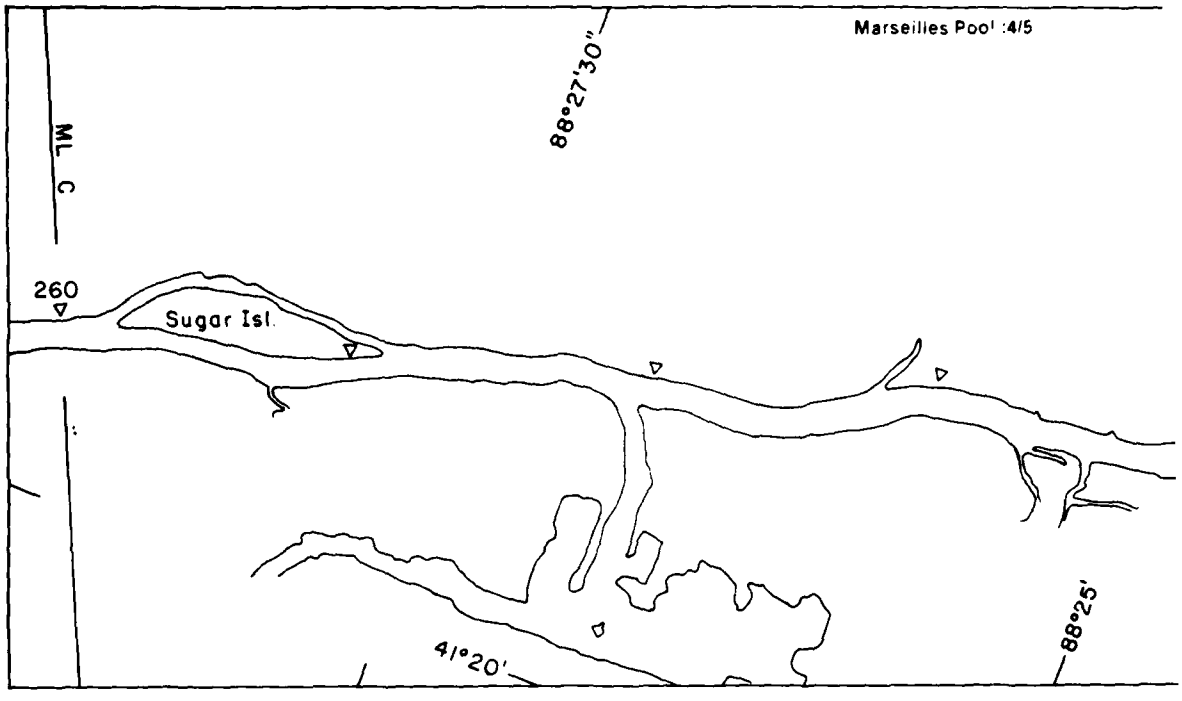


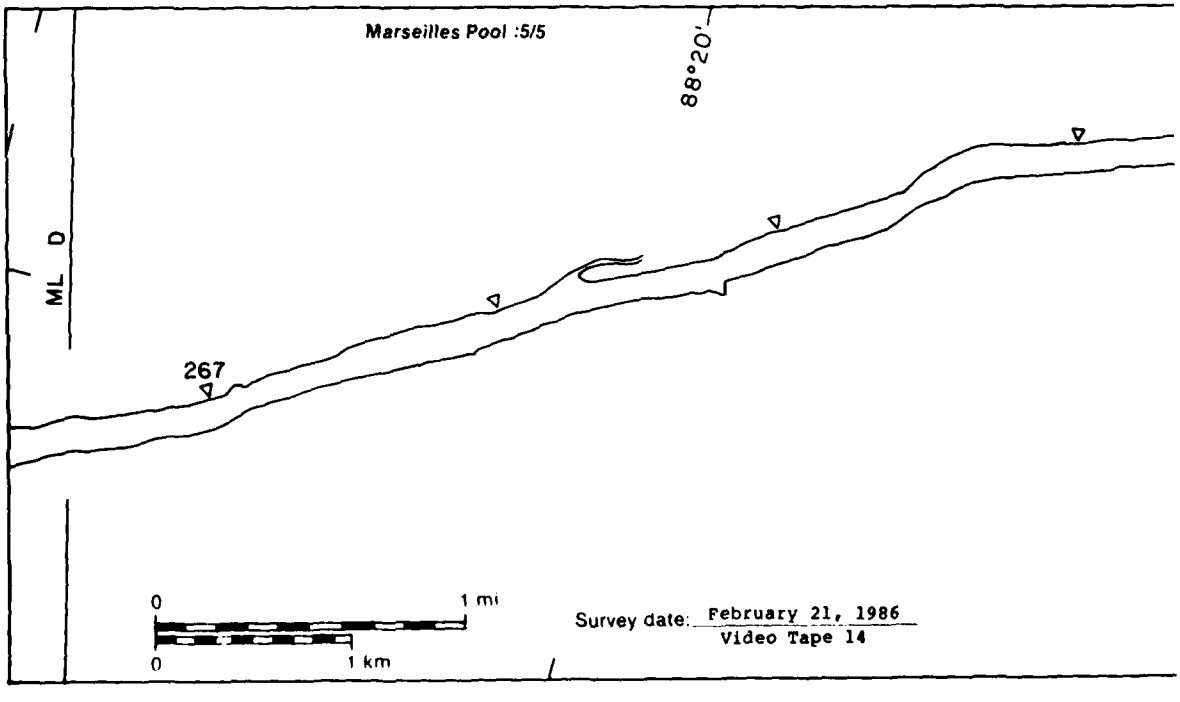

0'
½
June A
88°37'30"
ML B
253
41°17'30"
Survey date February 21, 1986
Video Tape 14
Marseilles Pool :3/5
88°30'


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'
88°35'
41°20'
ML B
254
41°17'30"
0
0


253
41°17'30"
Survey date: February 21, 1986
Video Tape 14


Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 21, 1986
Video Tape 14



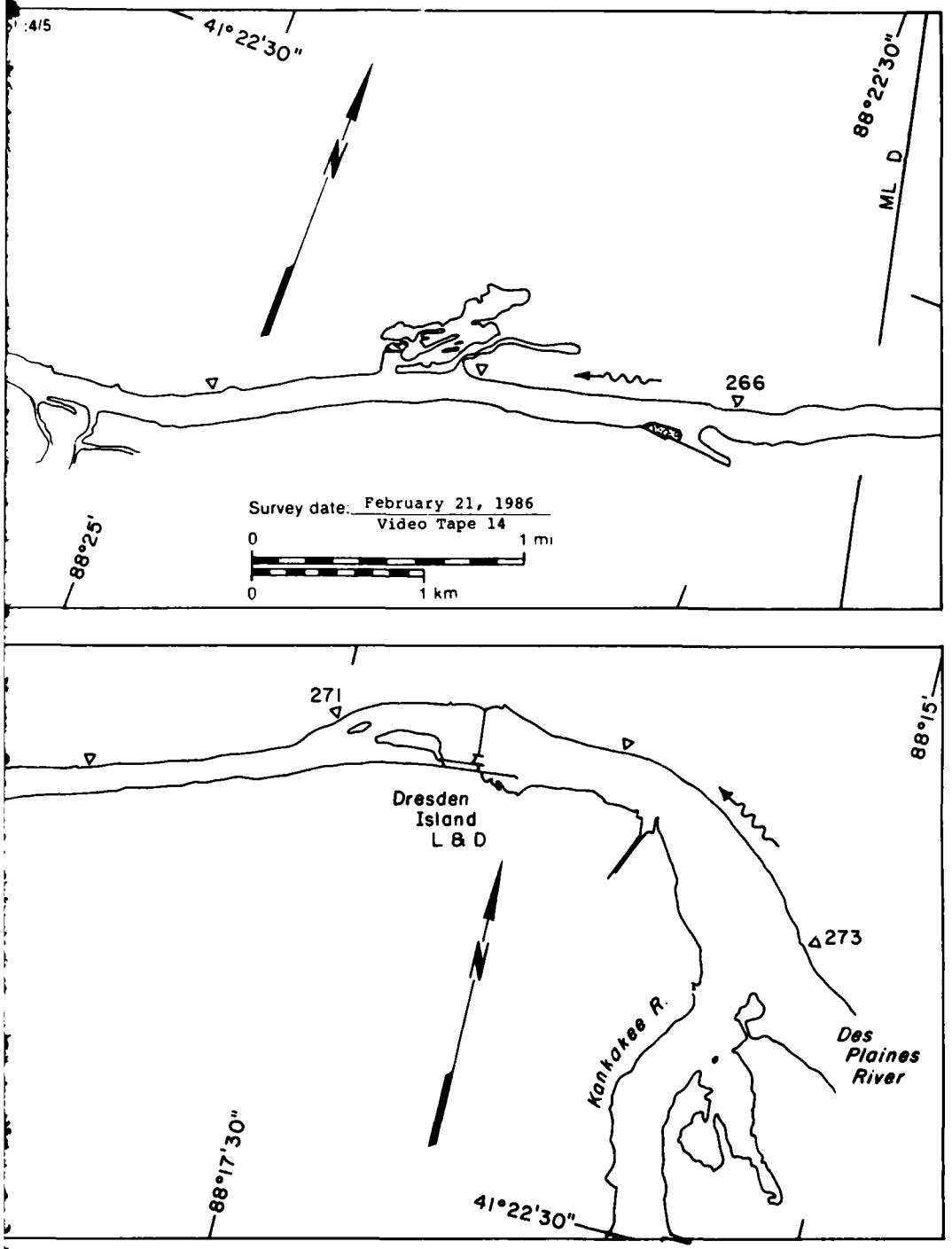


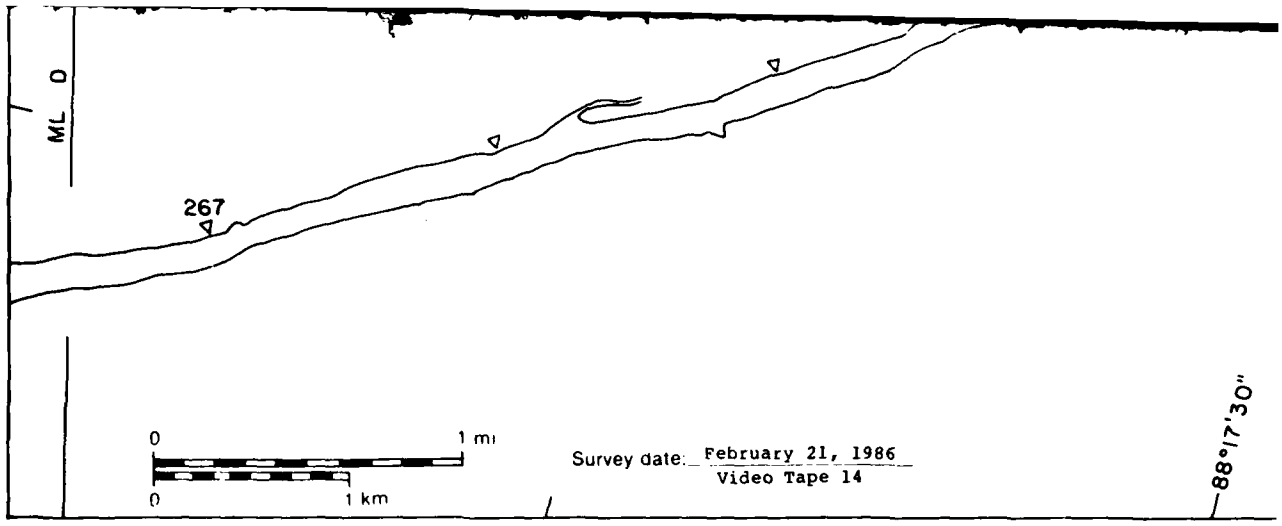
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water		

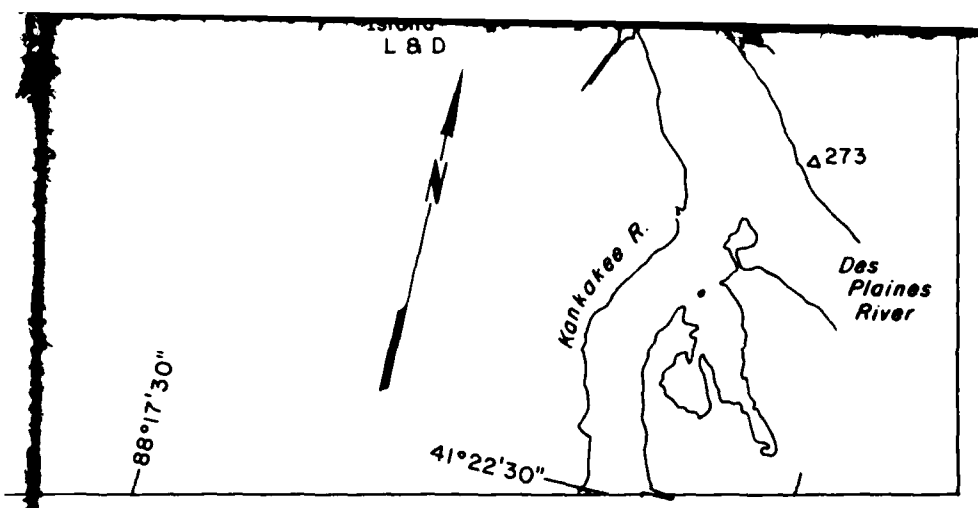
21 February 1986



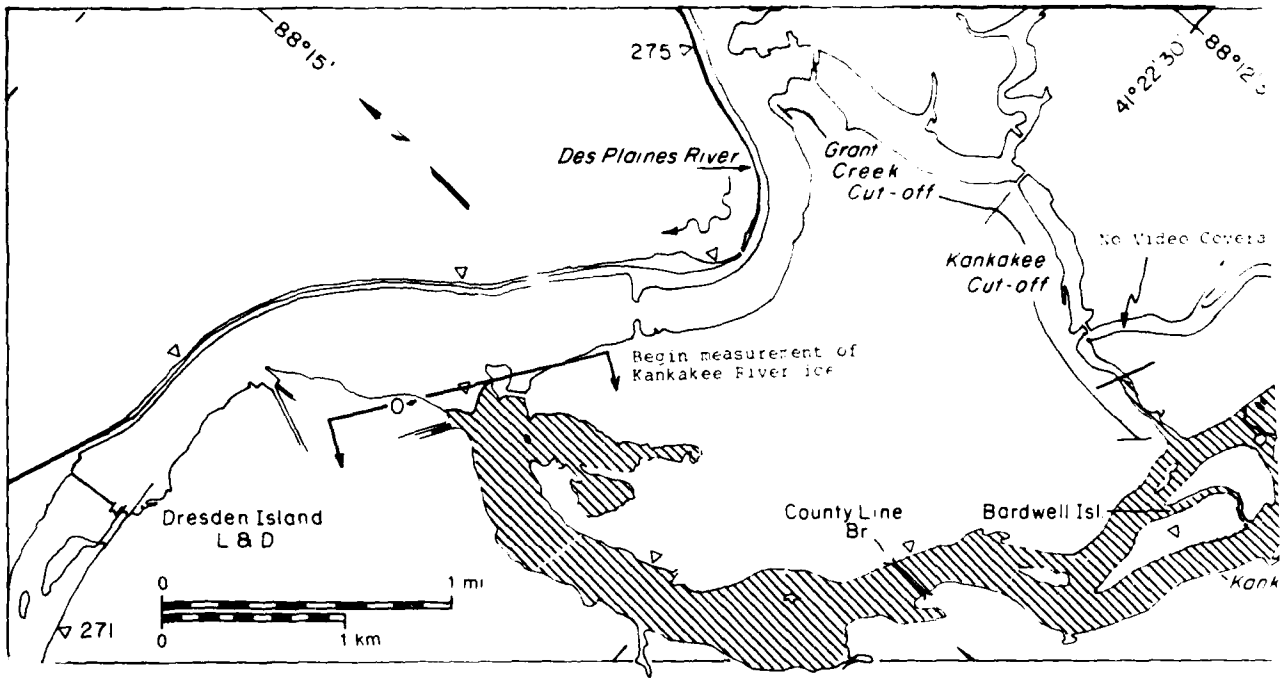


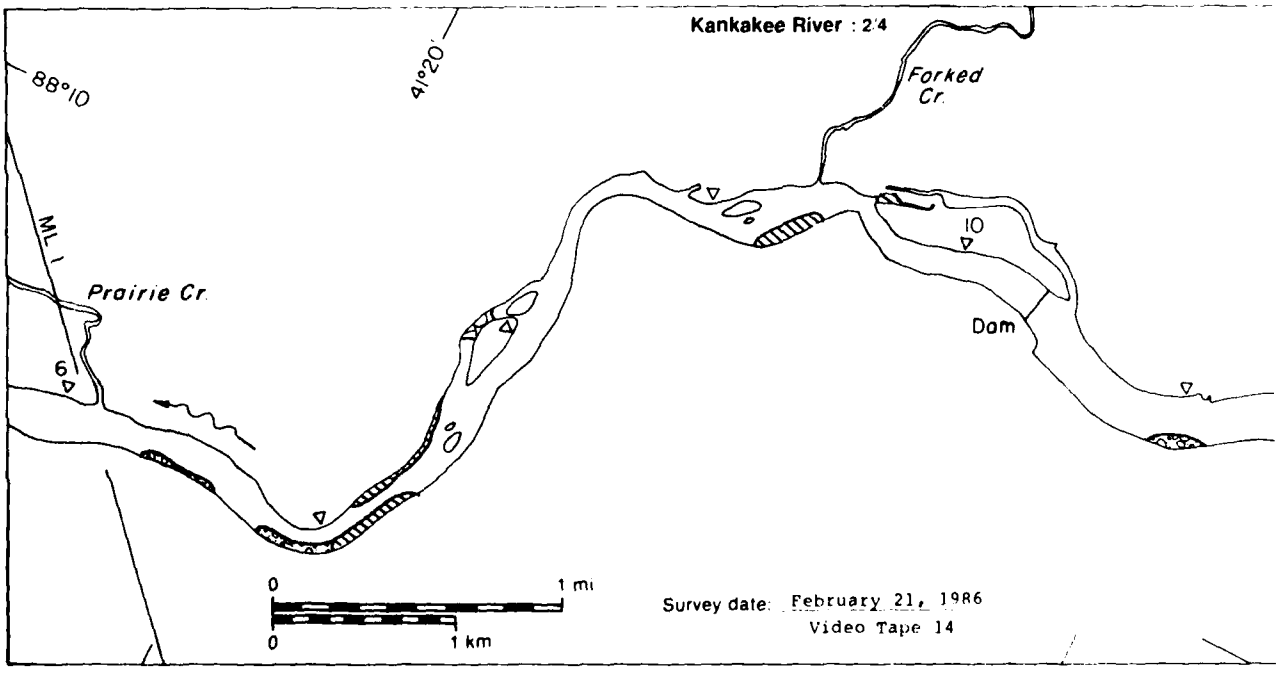
Marseilles Pool

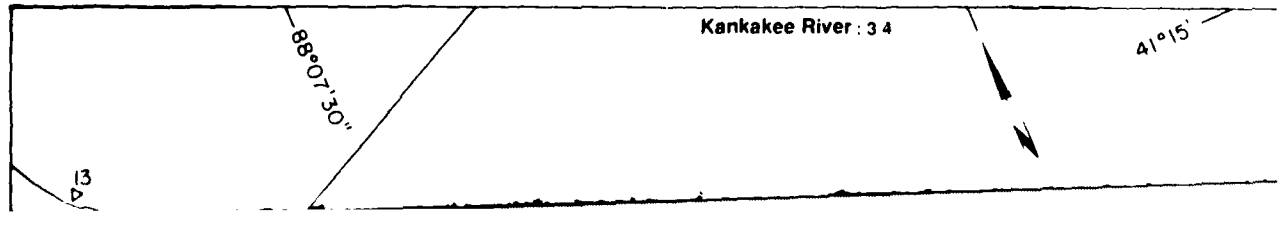
MAP UNITS	Area (m^2 x 10^6)	Surface concentration (%)
Open water	8.11	NA
Solid ice cover	0.07	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.01	10
Total area (m^2 x 10^6)	8.19	

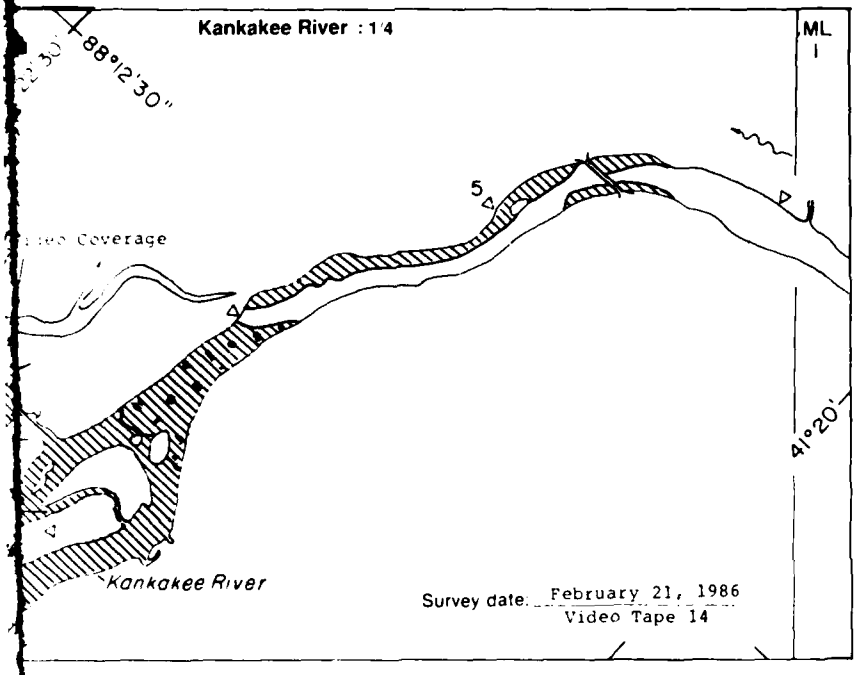

L & D
N
273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

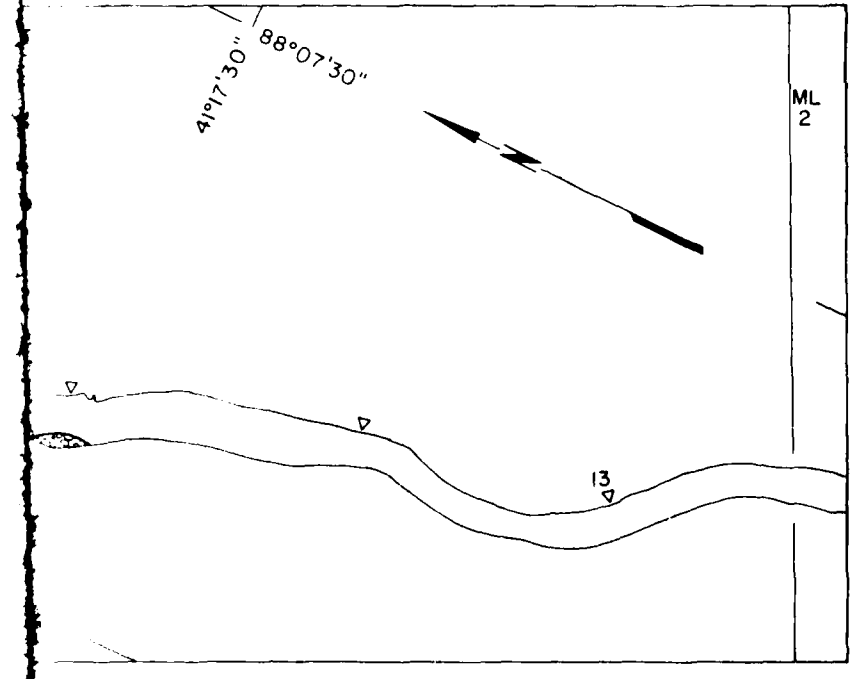
21 February 1986

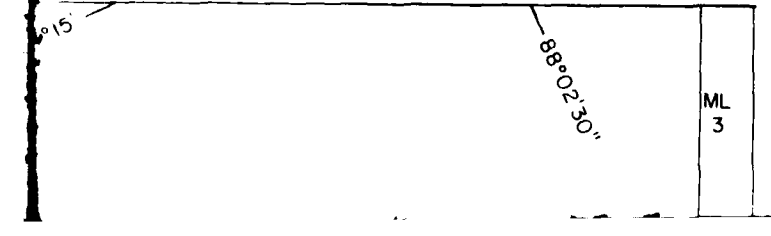


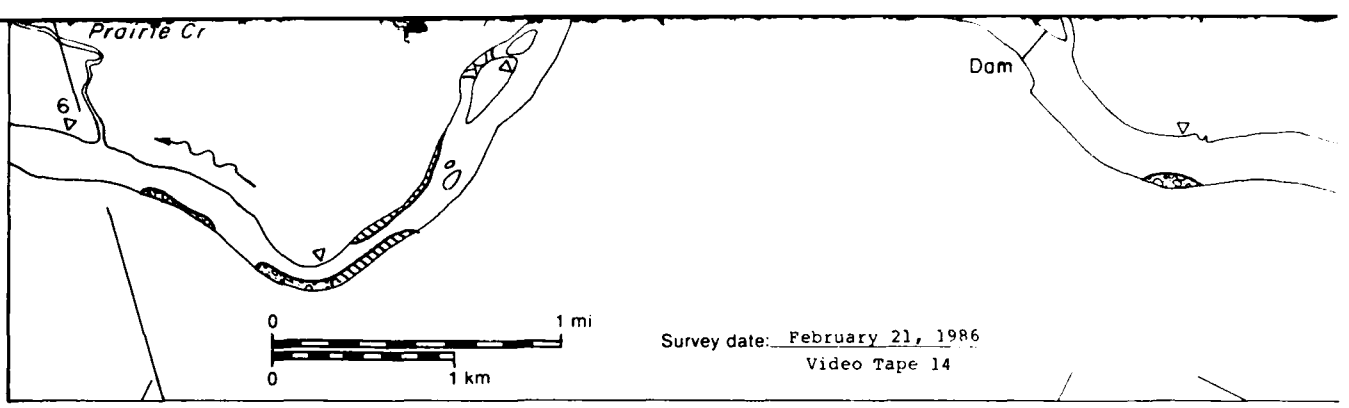


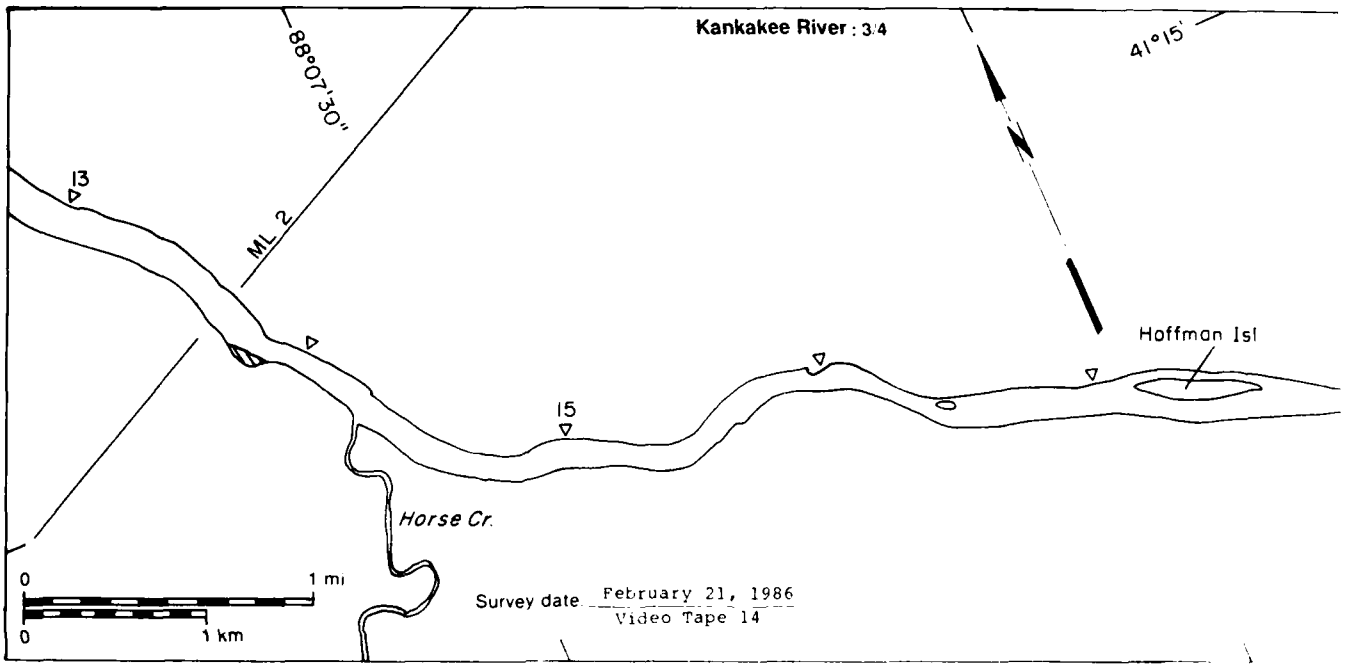


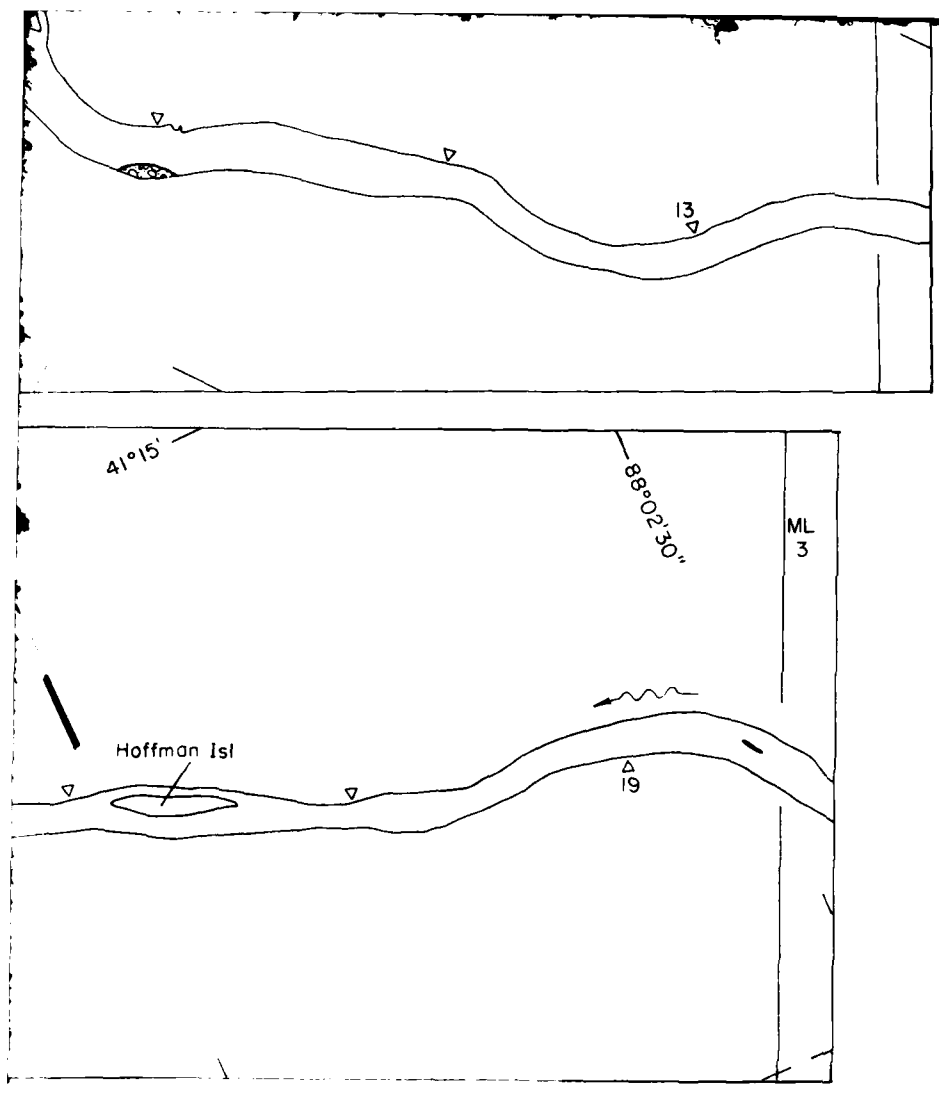

Kankakee River : 1/4
ML
1
88°12'30"
5
Coverage
41°20'
Kankakee River
Survey date. February 21, 1986
Video Tape 14

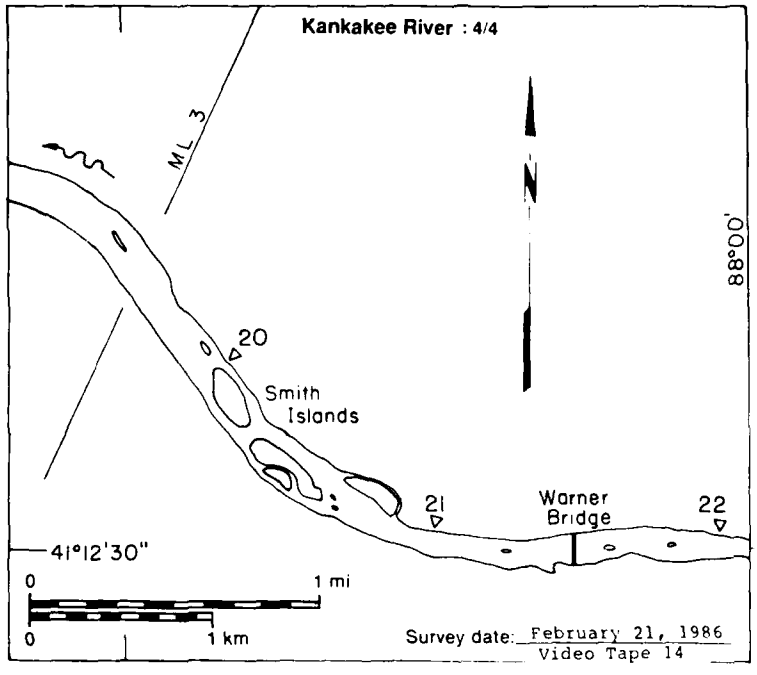

41°17'30"
88°07'30"
ML
2
13


88°02'30"
ML
3


Prairie Cr
6
Dam
0
1 mi
0
1 km
Survey date: February 21, 1986
Video Tape 14


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date February 21, 1986
Video Tape 14


13
41°15'
88°02'30"
ML
3
Hoffman Isl
19



Kankakee River

MAP UNITS	Are (m² x
Open water	4.
Solid ice cover	2.
Solid ice cover with open-water areas	0.
Fragmented ice cover	0.
Fragmented ice cover with open-water areas	0.0
Ice floes or frazil slush and pans	0.
Total area (m^2 x 10^6)	7.3

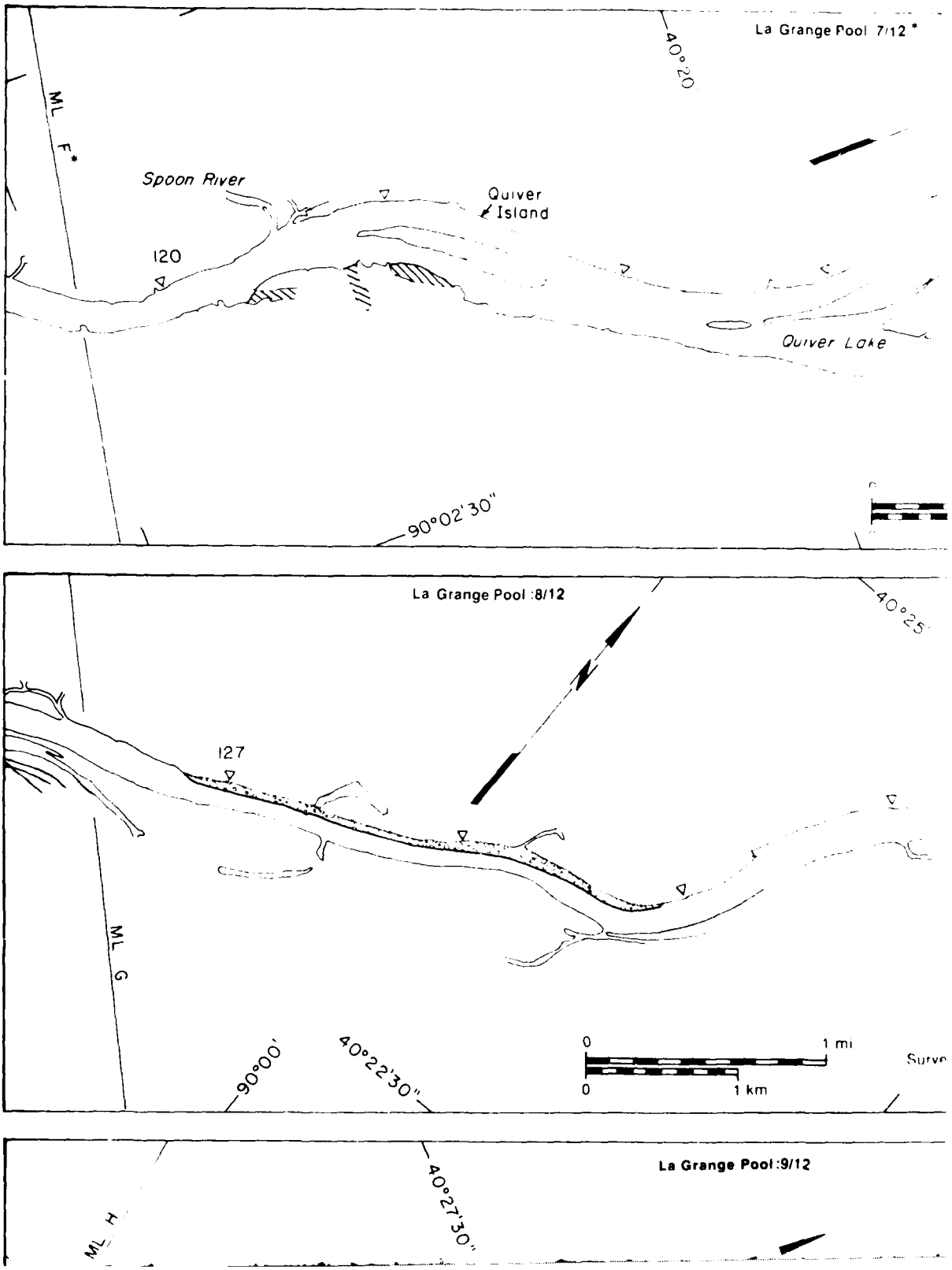
* Inc
of n

21 February 1986

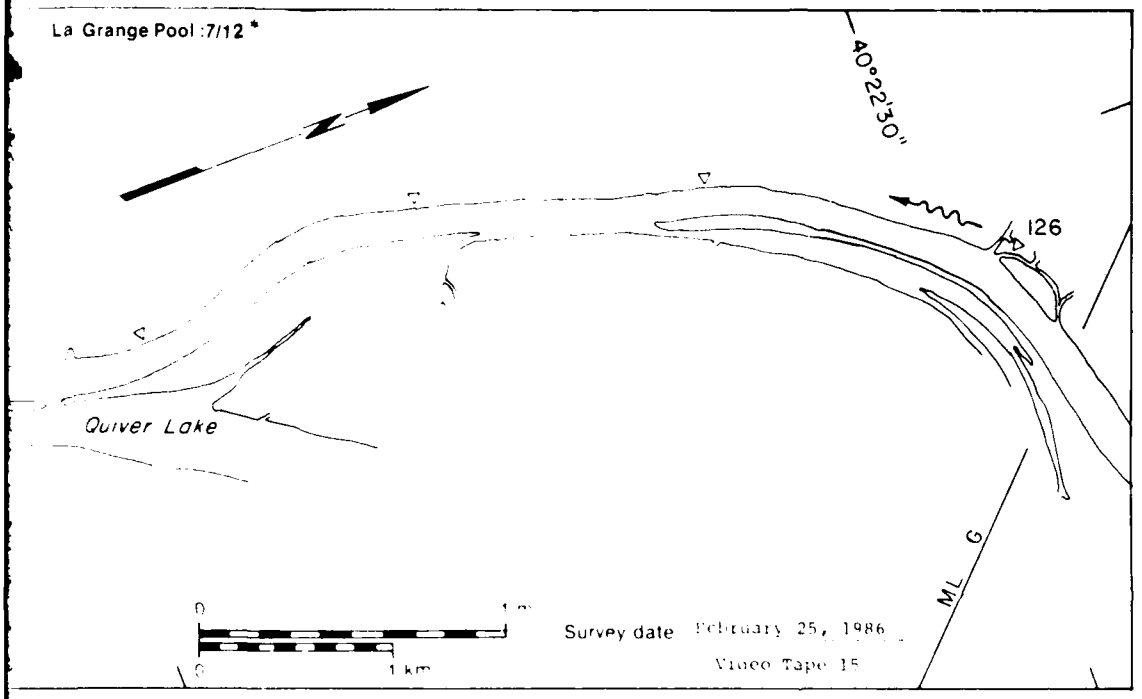
Kankakee River

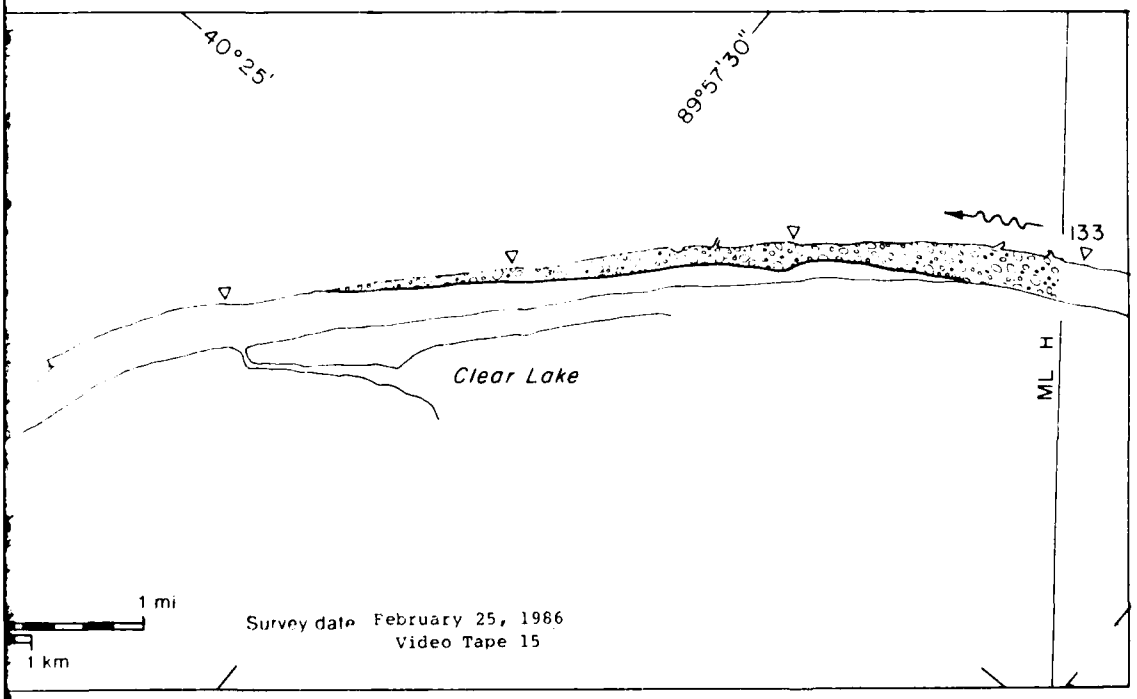
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (°c)
Open water	4.52	NA
Solid ice cover	2.39	NA
Solid ice cover with open-water areas	0.22	90
Fragmented ice cover	0.02	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.09	10
Total area ($m^2 \times 10^6$)	7.30*	

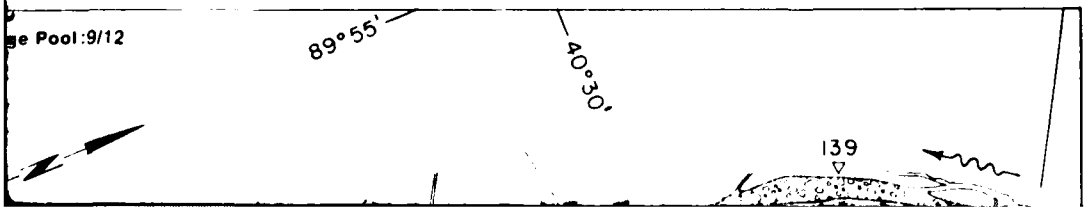
* Includes 0.06×10^6 m^2 of no video coverage

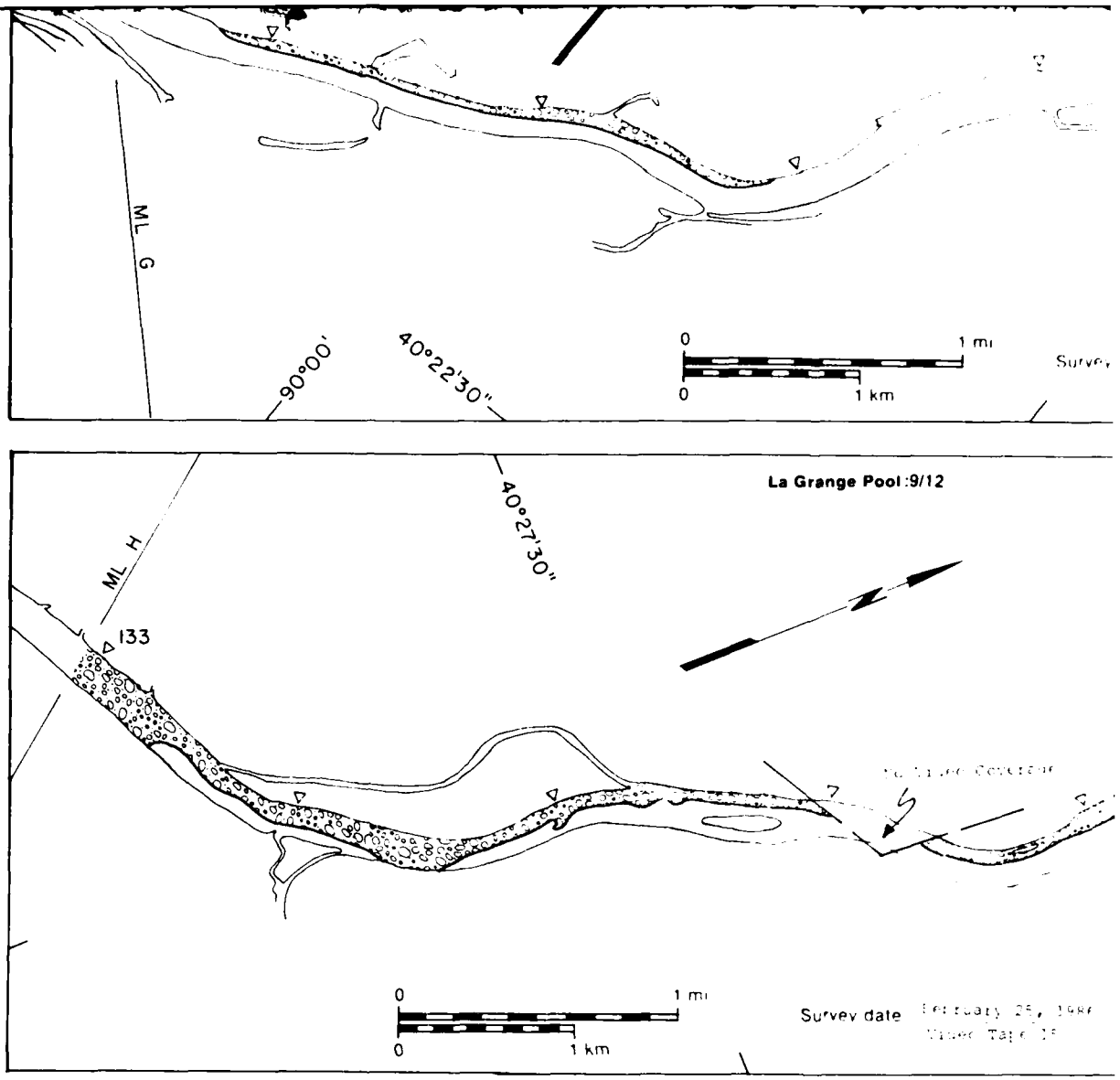

La Grange Pool 7/12 *
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
La Grange Pool :9/12
40°27'30"
ML H

25 February 1986

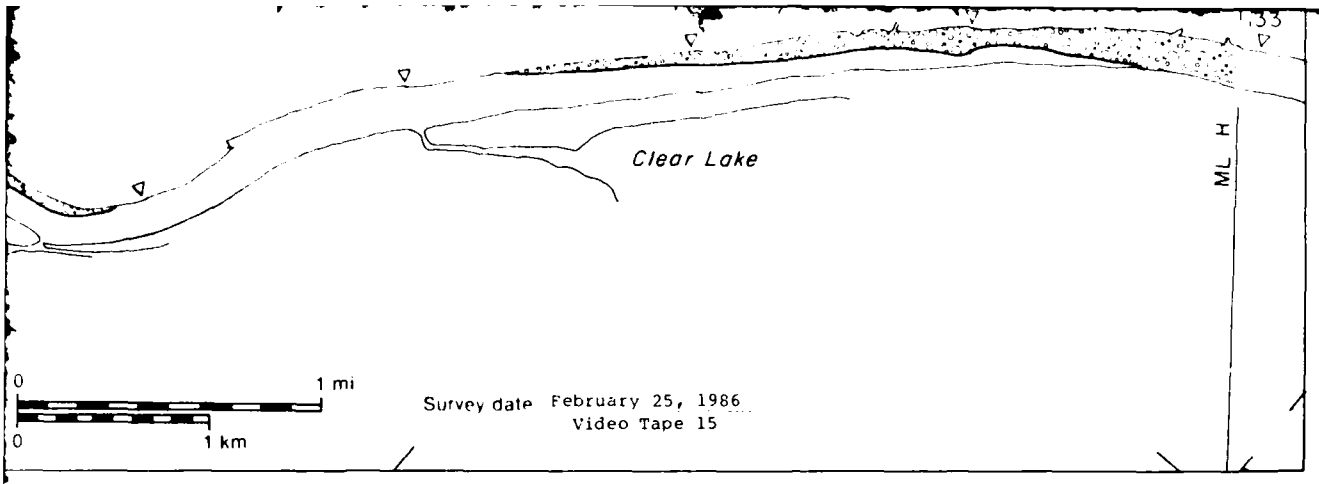


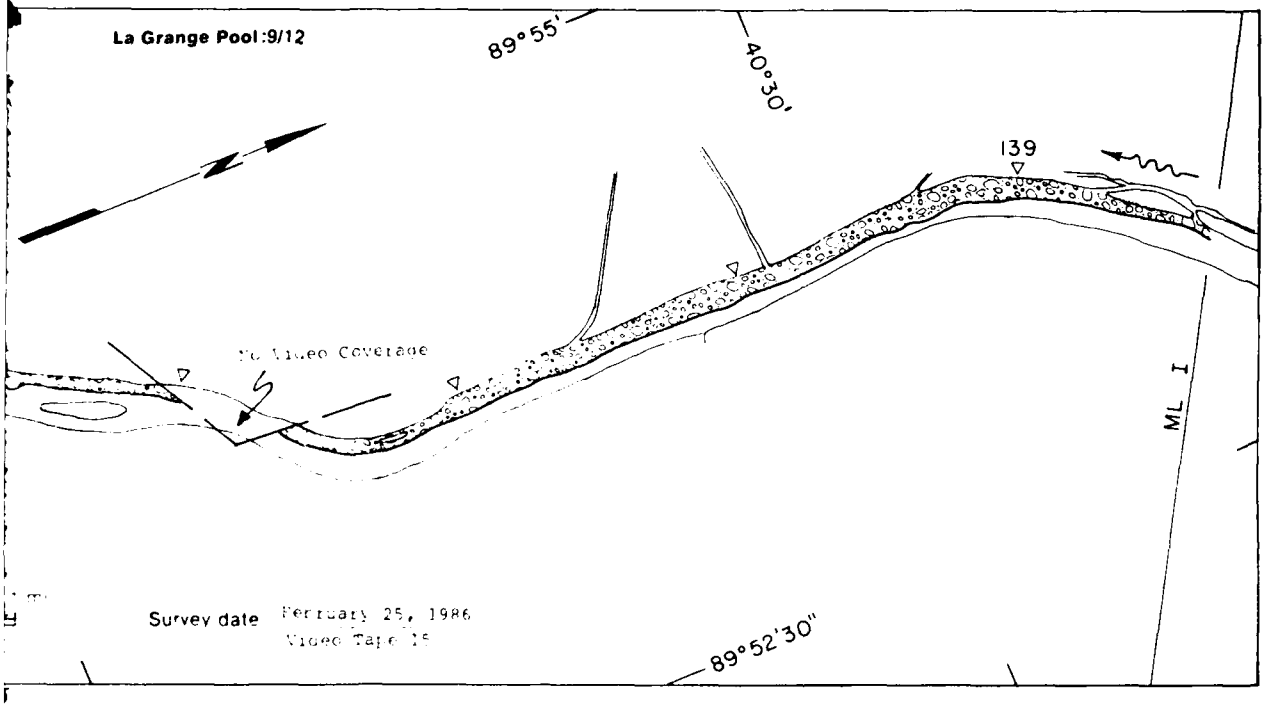






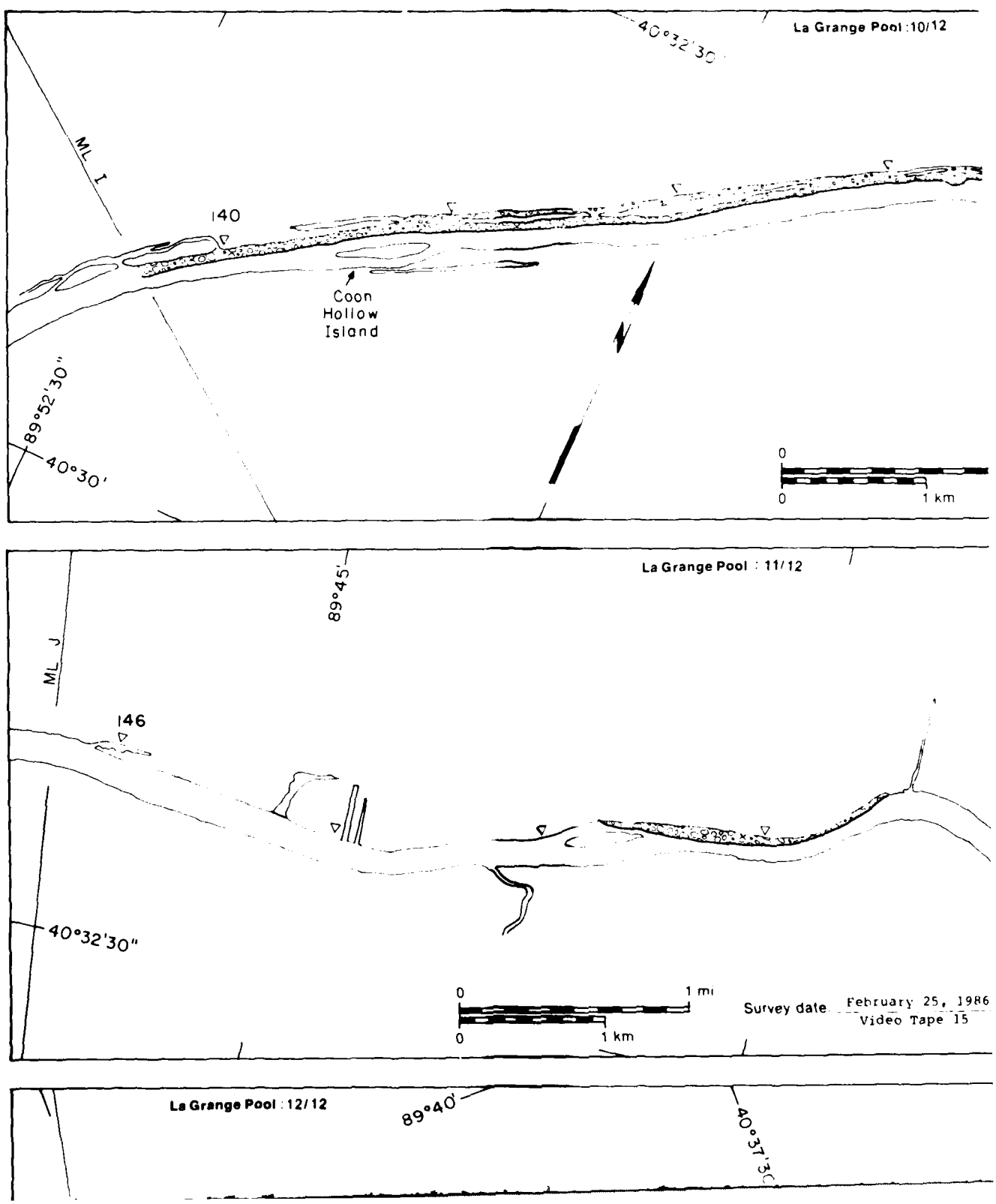
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

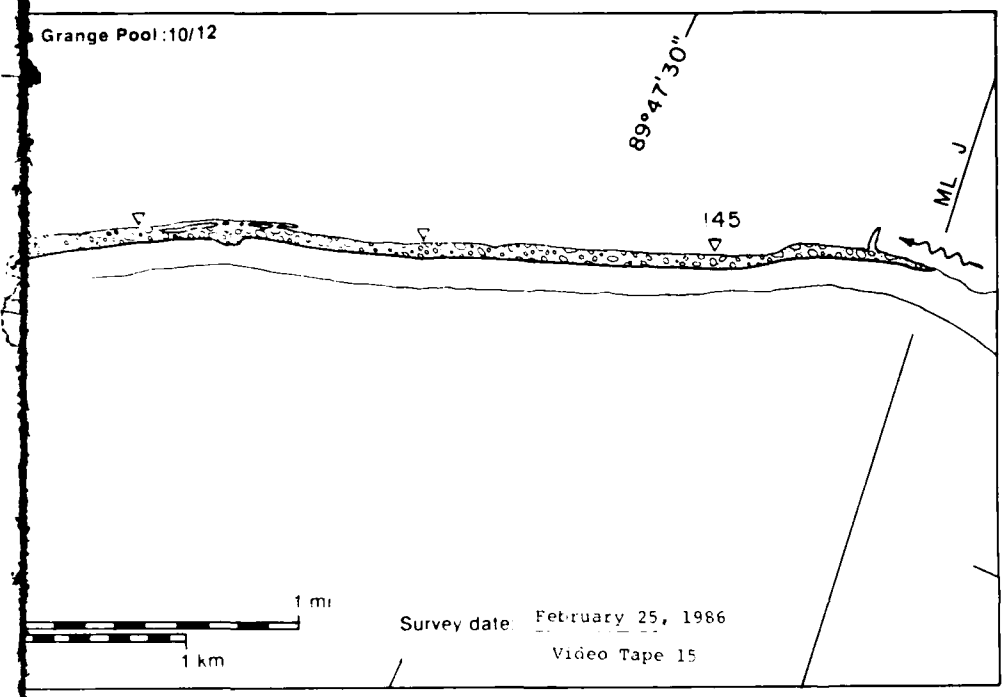


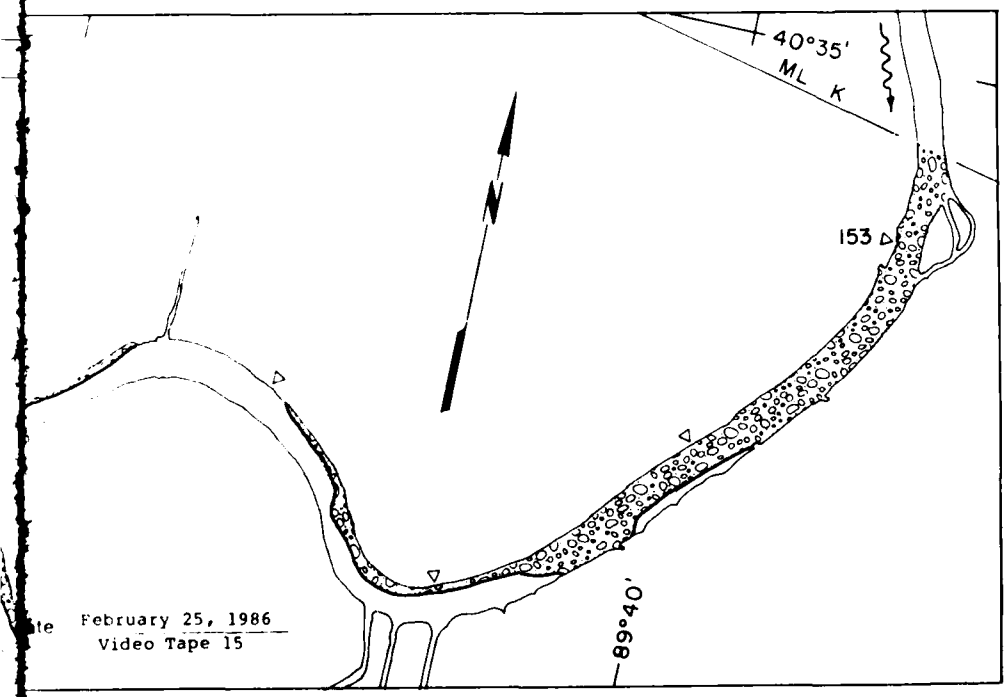


mile 120 at
12 through

25 February 1986



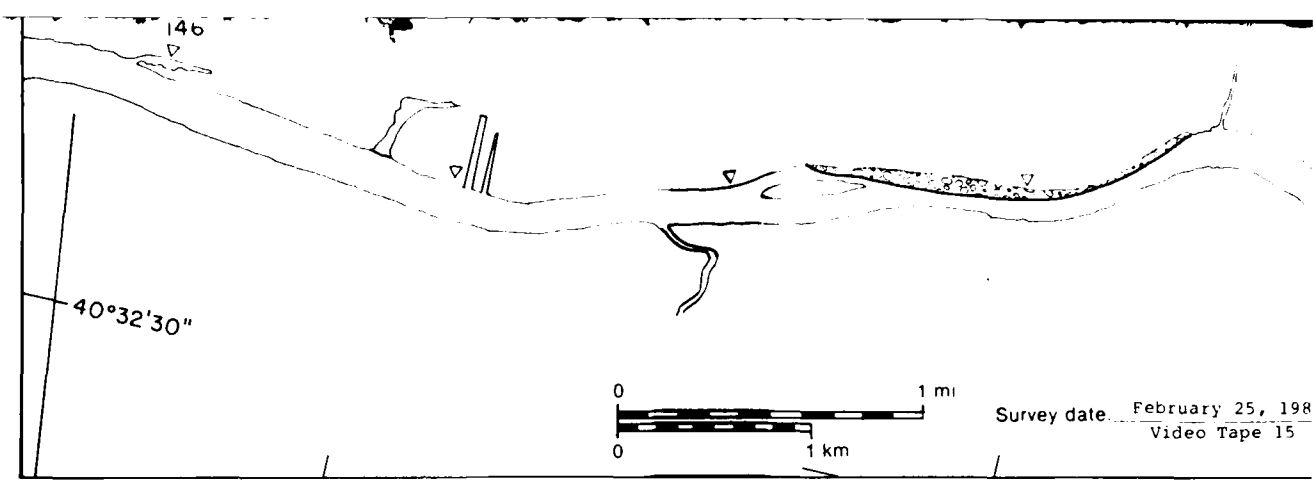


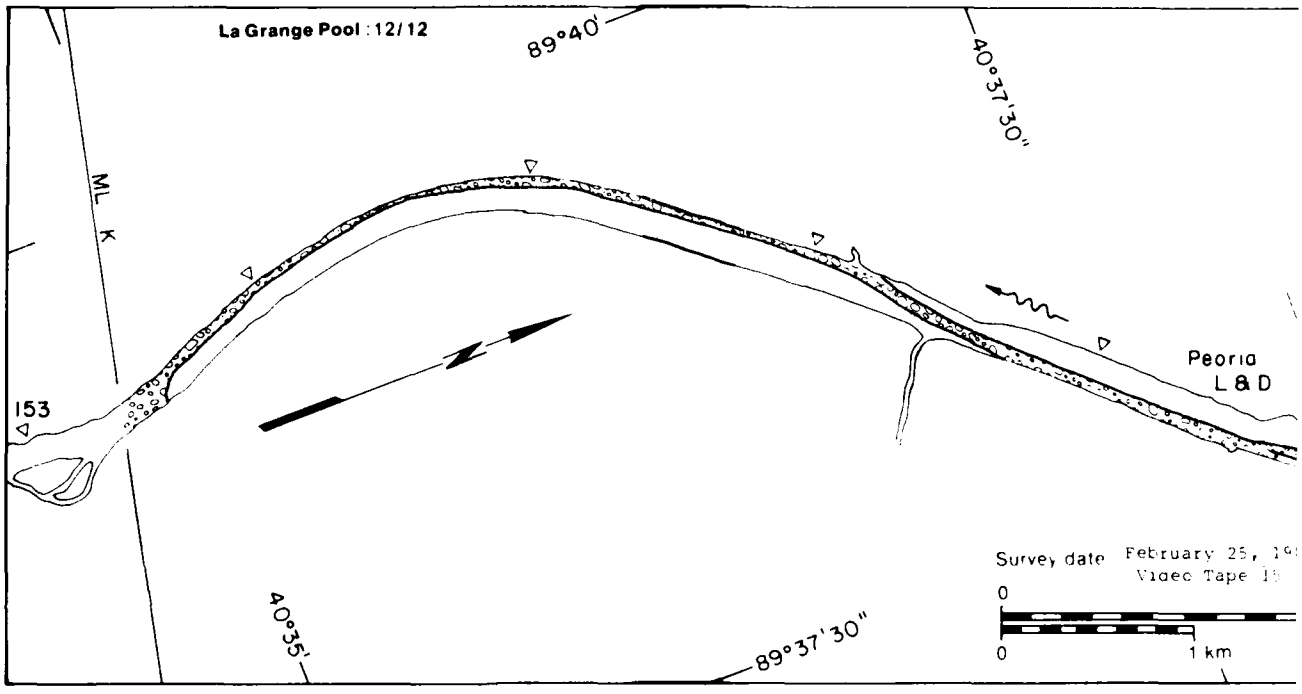


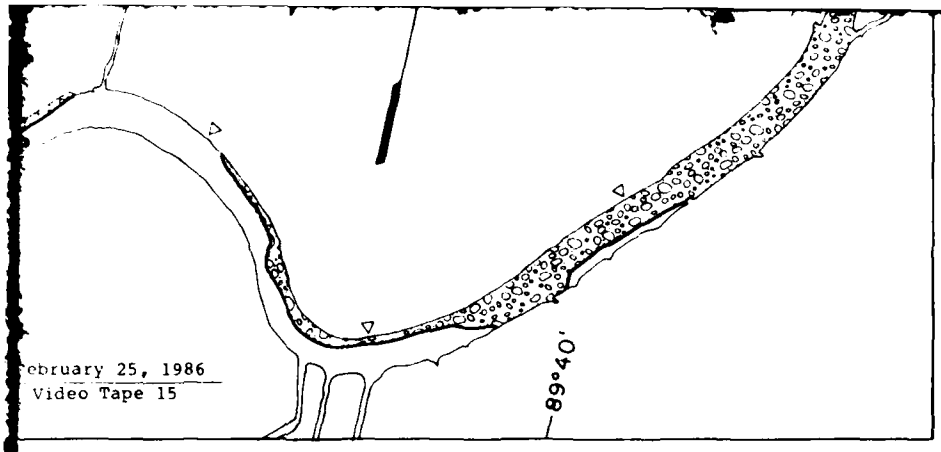
La Grange Pool

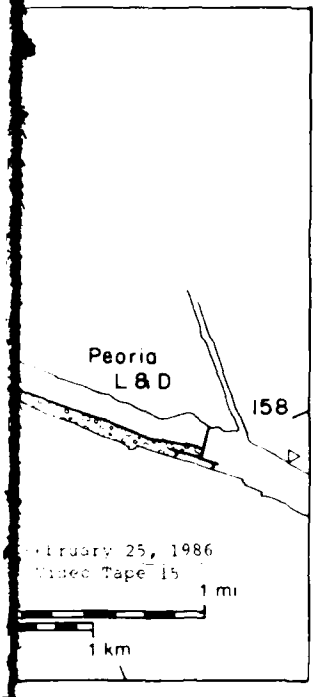
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.02	NA


146
40°32'30"
0
1 mi
0
1 km
Survey date February 25, 198
Video Tape 15


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L & D
Survey date February 25, 19
Video Tape 15
0
1 km
40°35'
89°37'30"

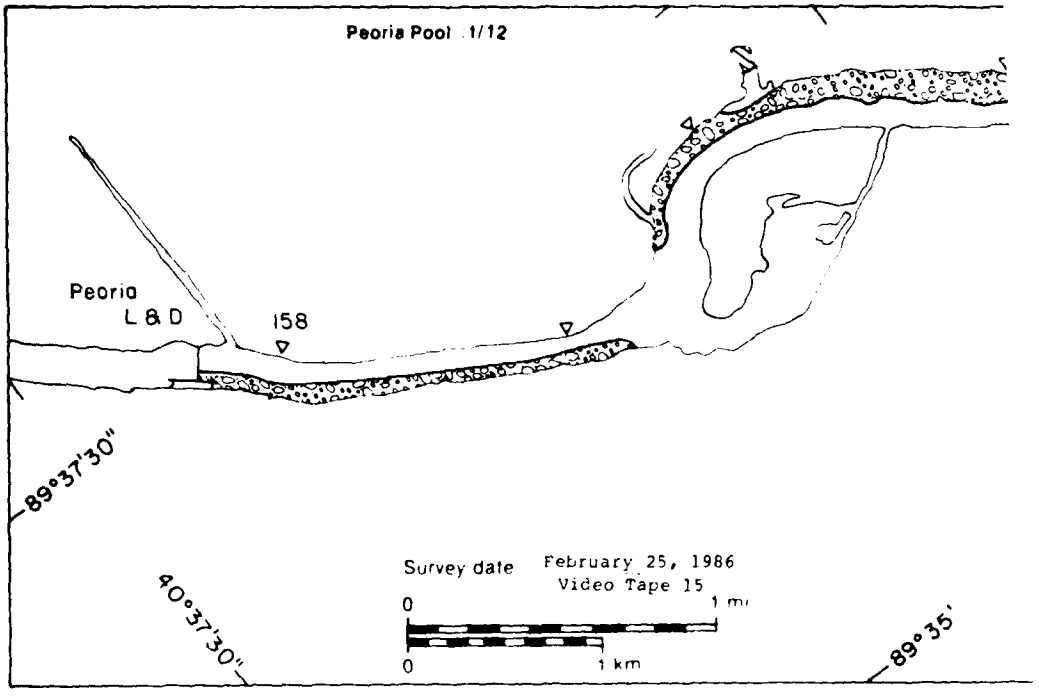


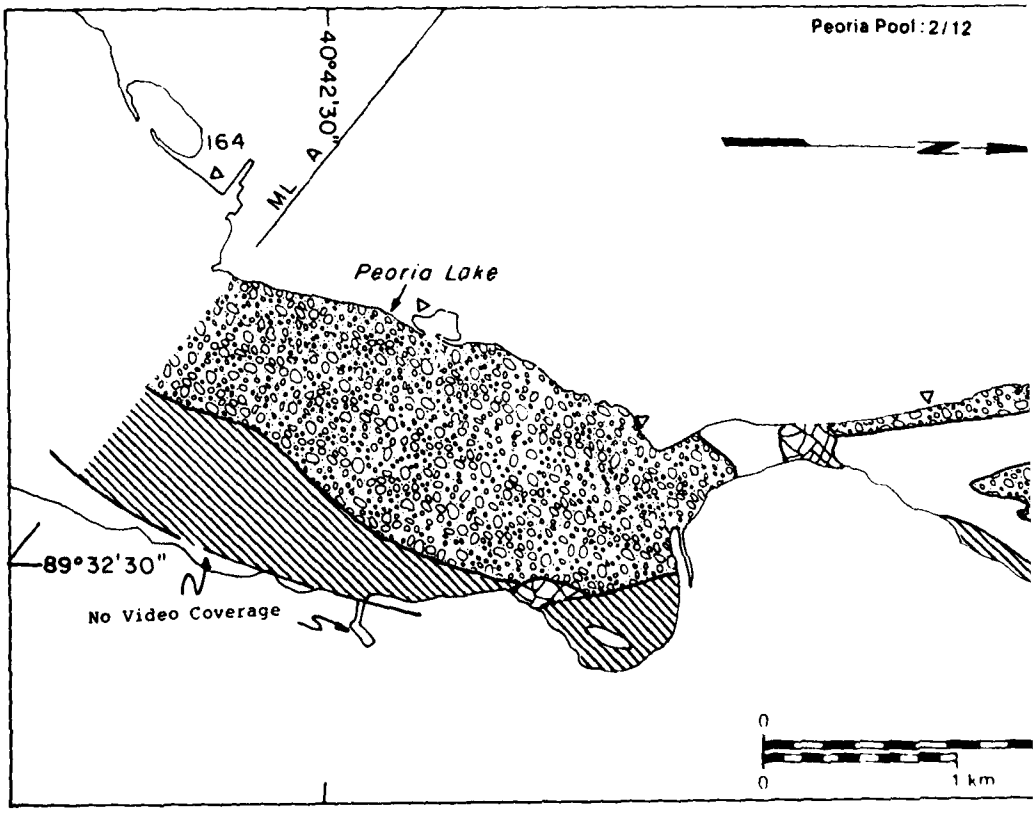


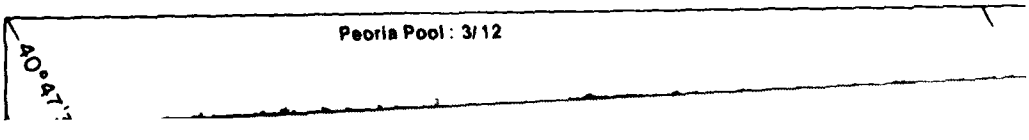
La Grange Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.02	NA
Solid ice cover	0.10	NA
Solid ice cover with open water areas	0.00	—
Fragmented ice cover	0.04	NA
Fragmented ice cover with open water areas	0.00	—
Ice floes or frazil slush and pans	3.47	20
Total area ($m^2 \times 10^6$)	11.71*	

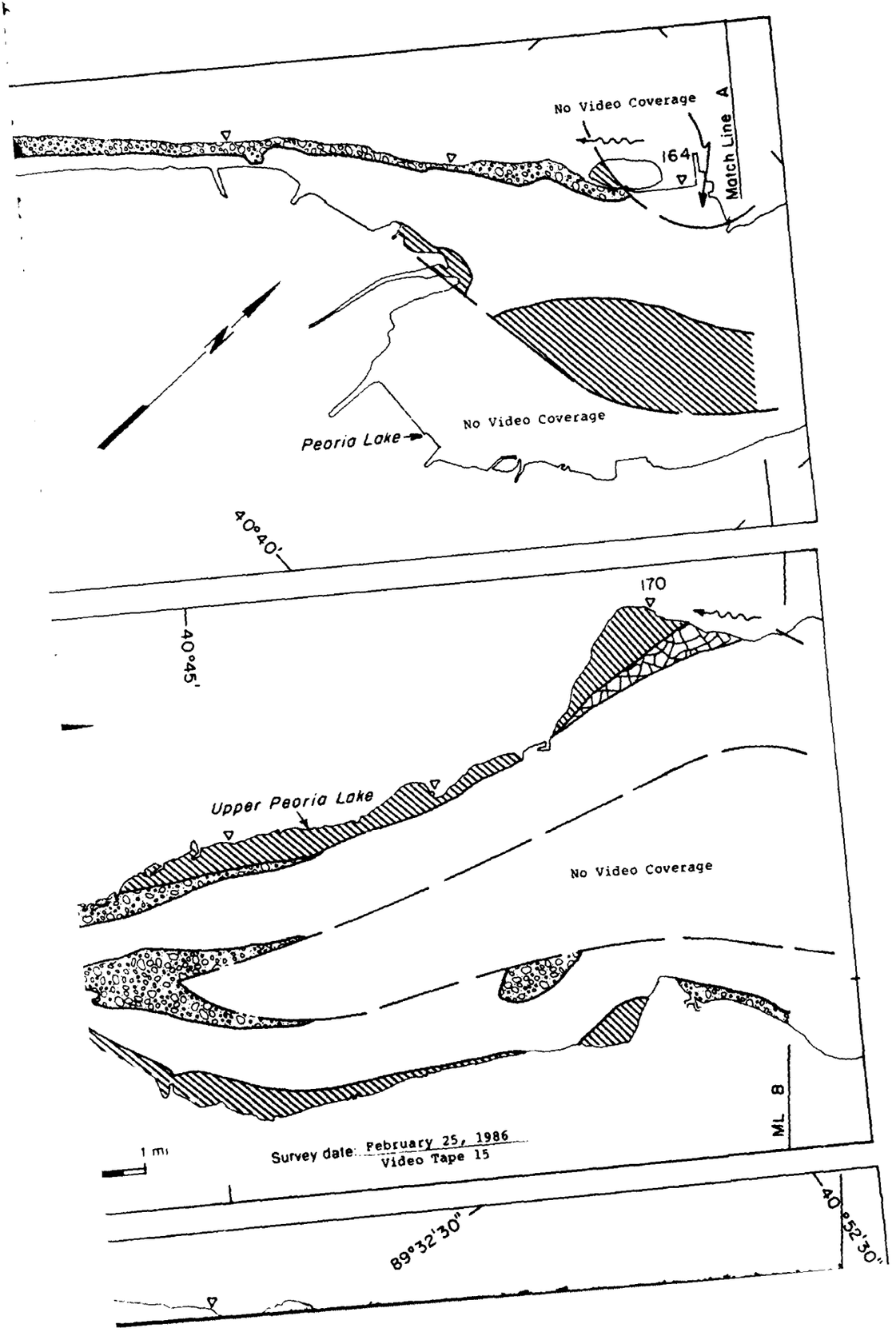
* Includes 0.08×10^6 m^2 of no video coverage

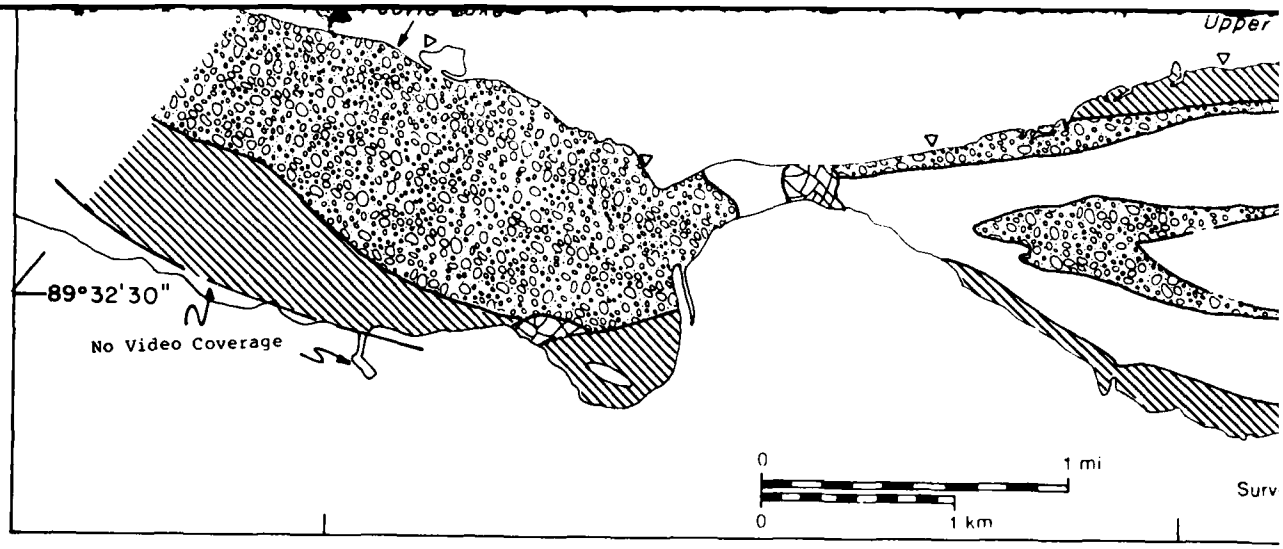

Peoria Pool : 1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date February 25, 1986
Video Tape 15
0
1 mi
0
1 km
89°35'

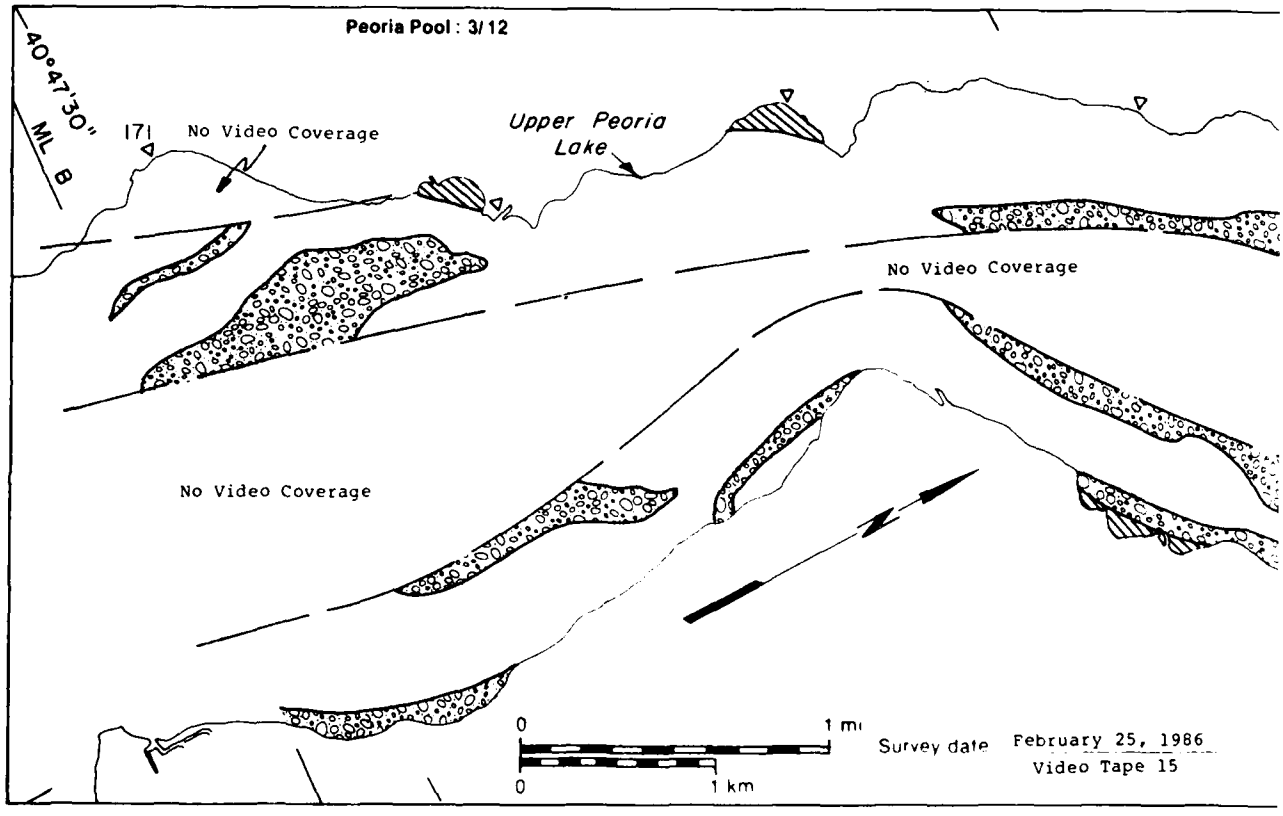

Peoria Pool : 2/12
40°42'30"
164
ML A
Peoria Lake
89°32'30"
No Video Coverage
0
0
1 km

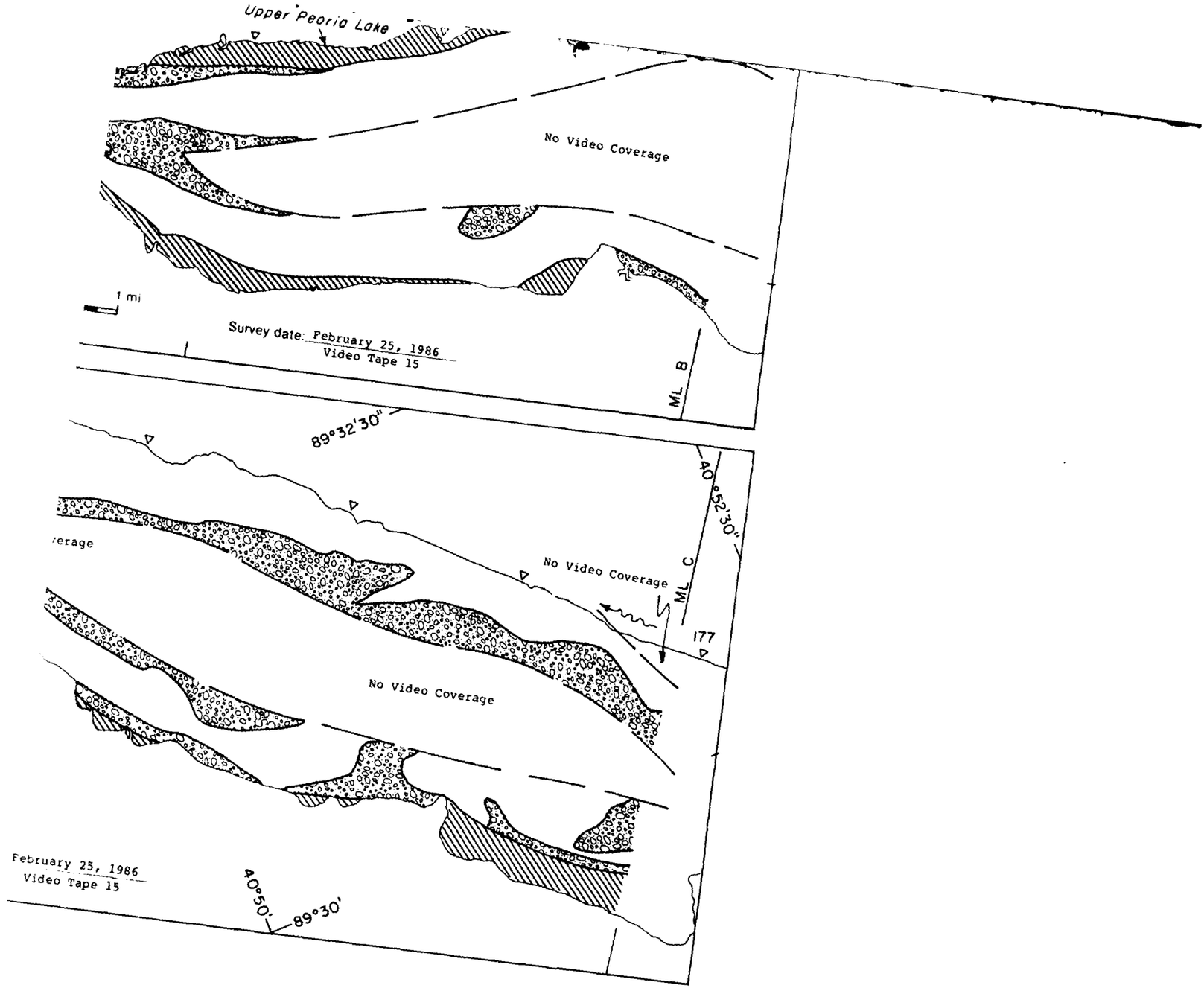

Peoria Pool : 3/12
40°47'

25 February 1986

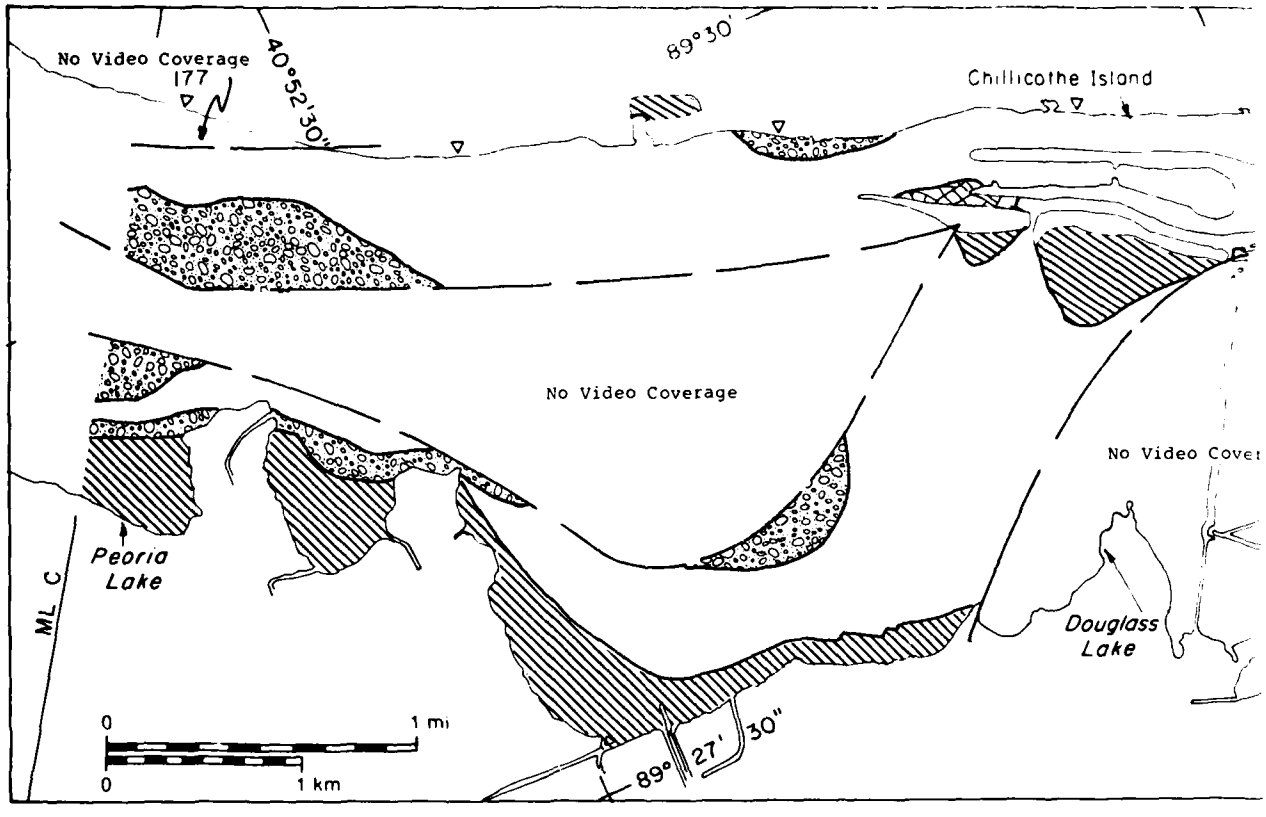


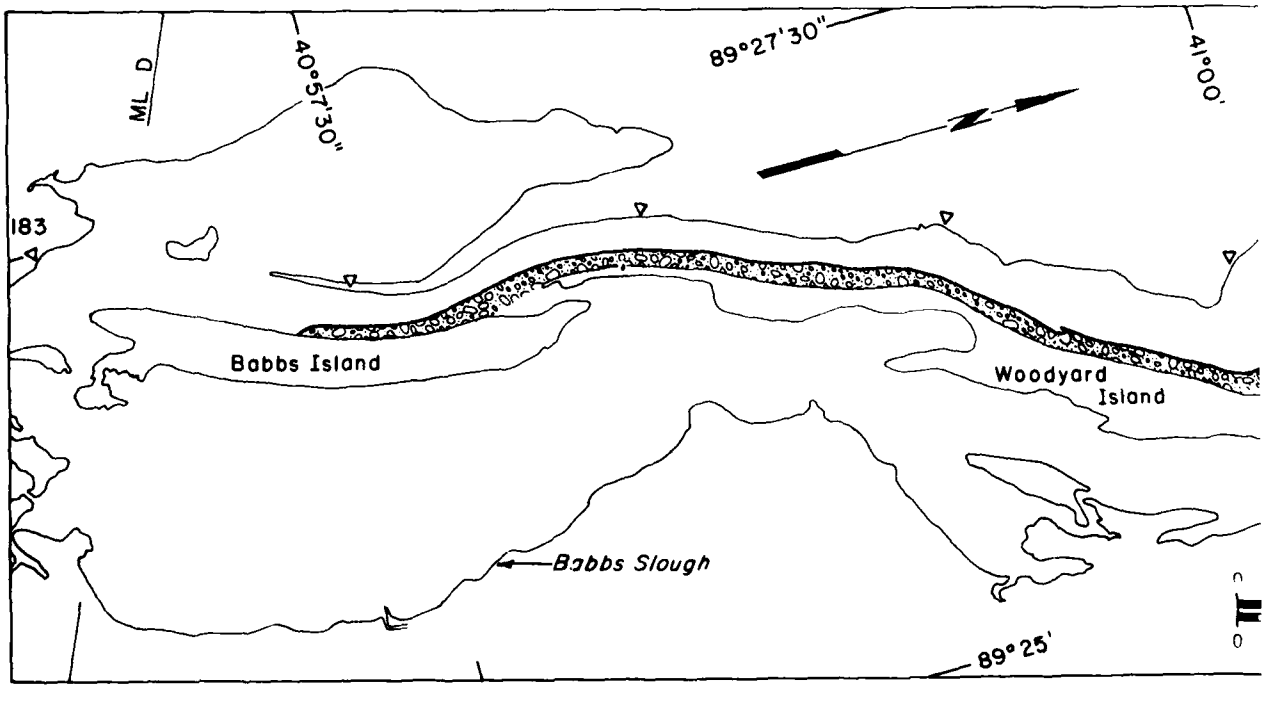

Upper
89°32'30"
No Video Coverage
0
1 mi
0
1 km
Surv

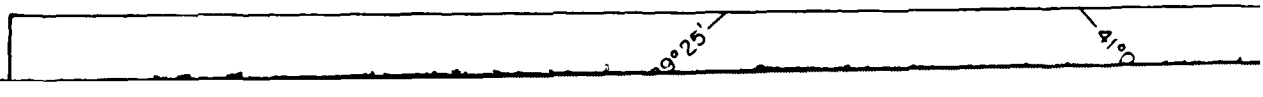

Peoria Pool : 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date February 25, 1986
Video Tape 15

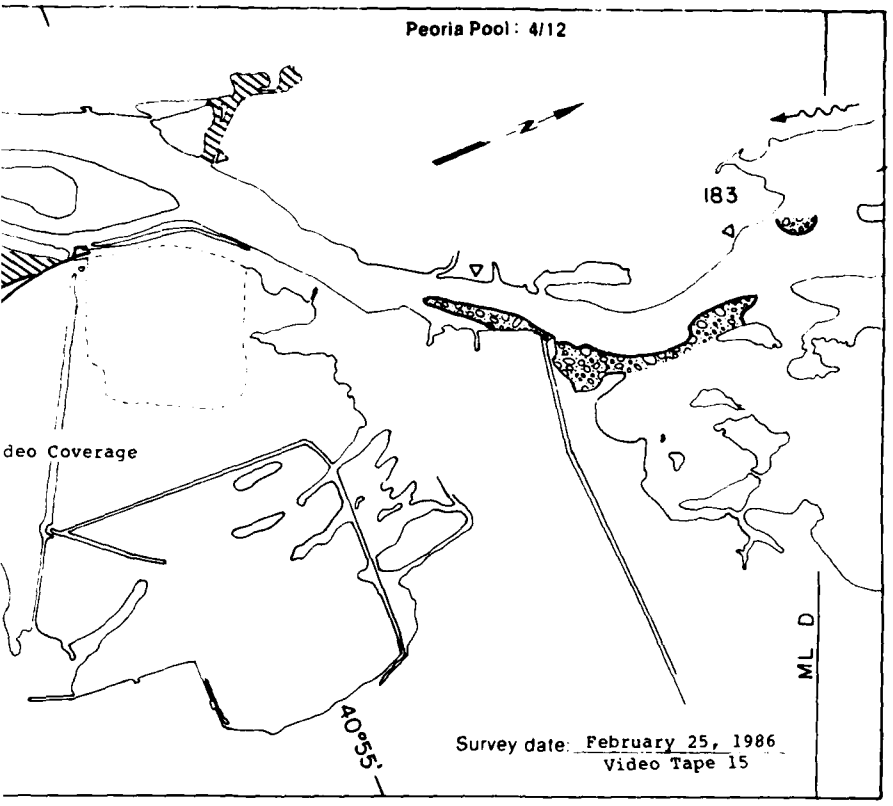

Upper Peoria Lake
No Video Coverage
1 mi
Survey date: February 25, 1986
Video Tape 15
ML B
89°32'30"
40°52'30"
erage
No Video Coverage
ML C
177
No Video Coverage
February 25, 1986
Video Tape 15
40°50'
89°30'

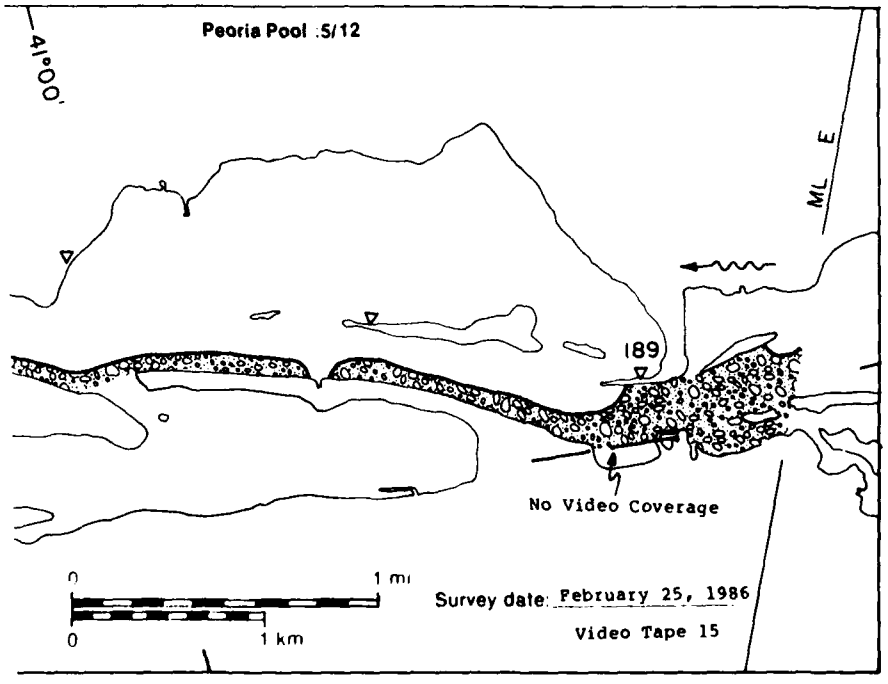
25 February 1986



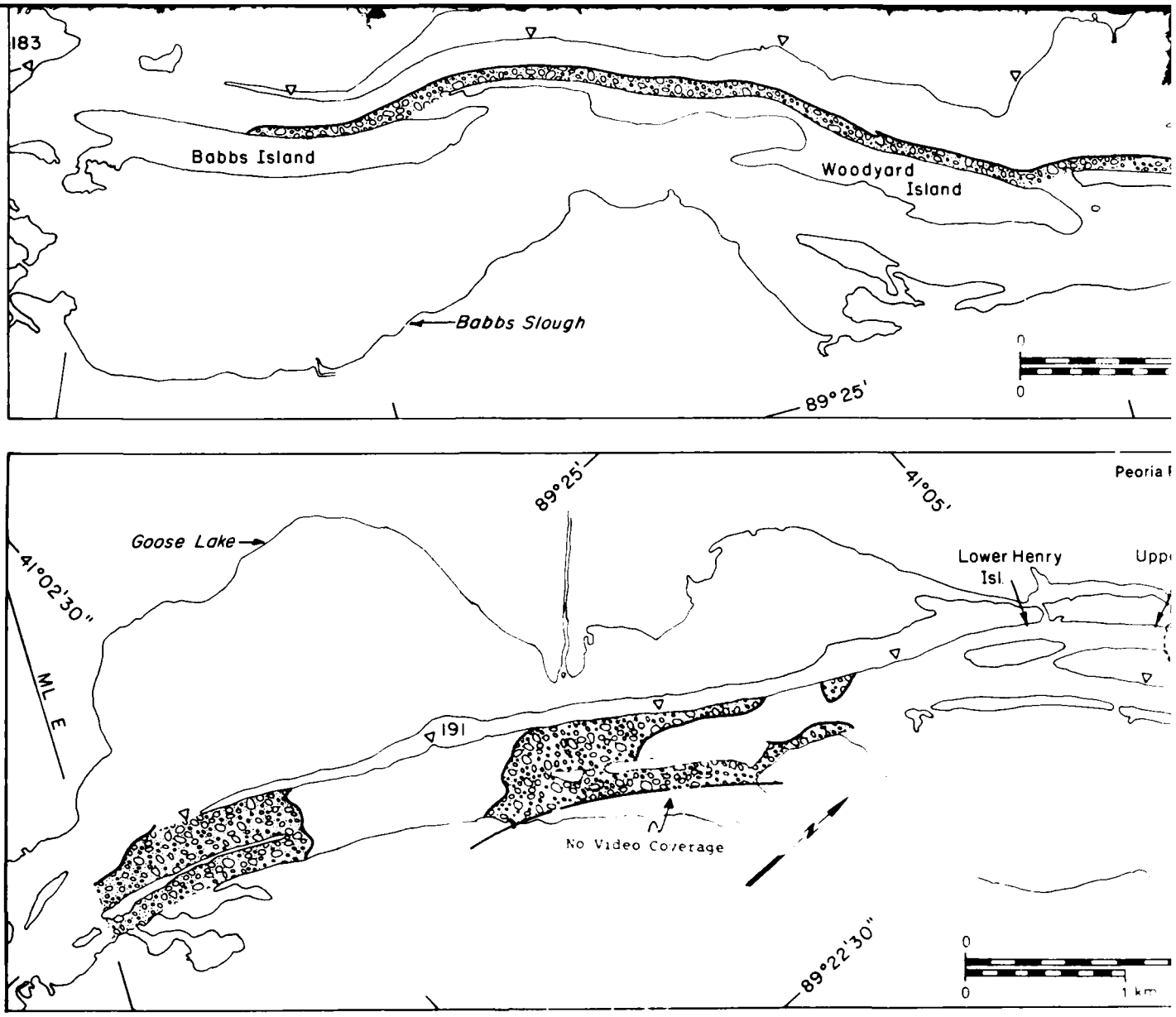


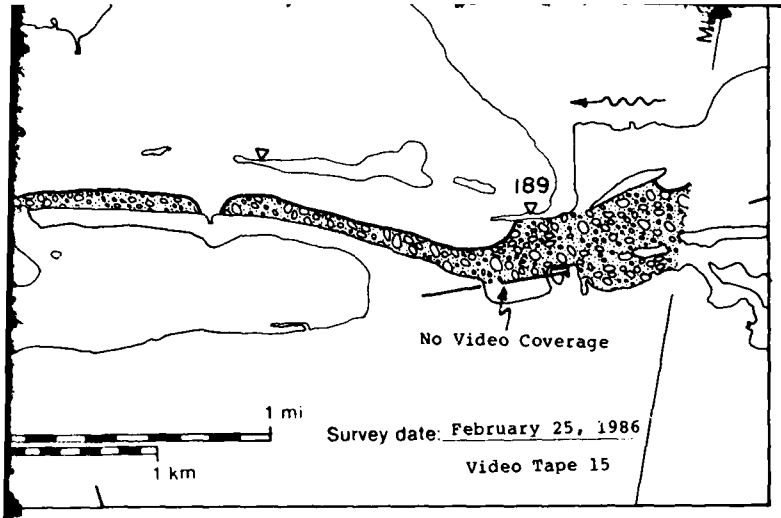


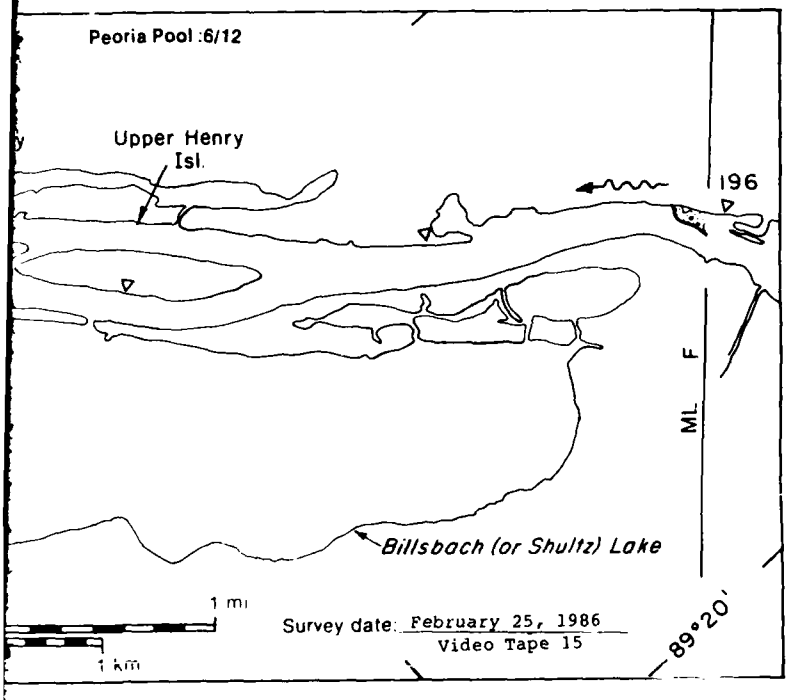

Peoria Pool : 4/12
183
deo Coverage
ML D
40°55'
Survey date: February 25, 1986
Video Tape 15

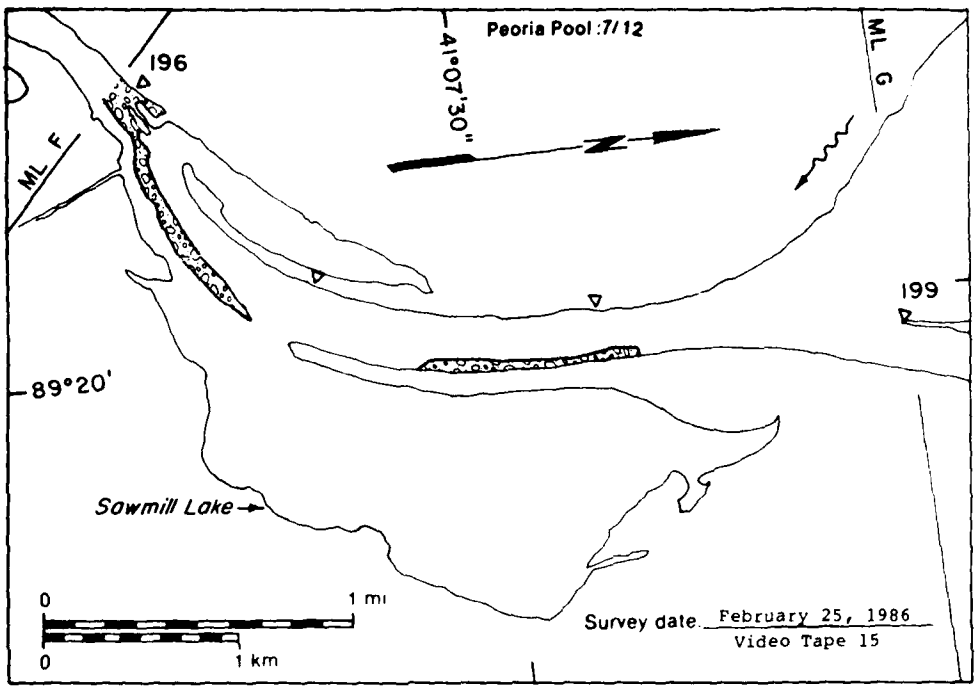

Peoria Pool :5/12
41°00'
ML E
189
No Video Coverage
0
1 mi
0
1 km
Survey date: February 25, 1986
Video Tape 15

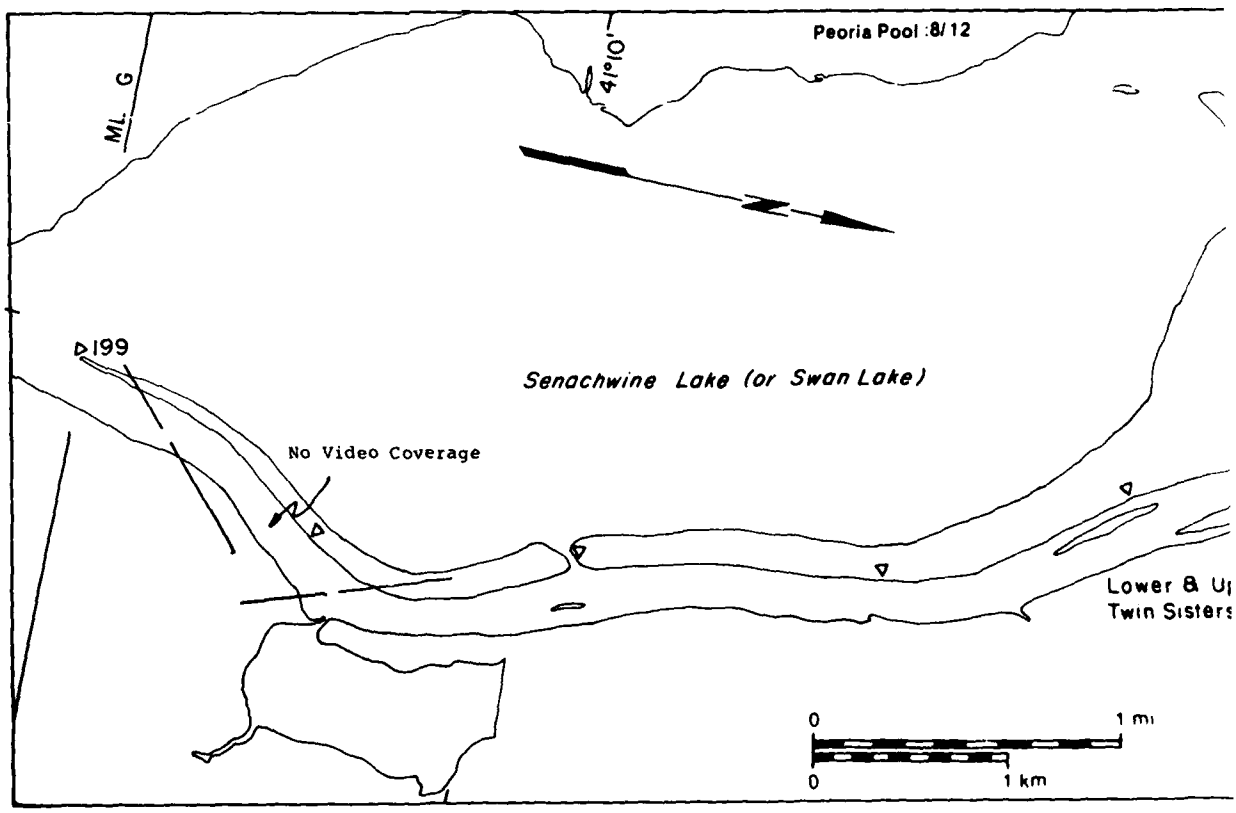
Peoria Pool :6/12
wer Henry
Upper Henry

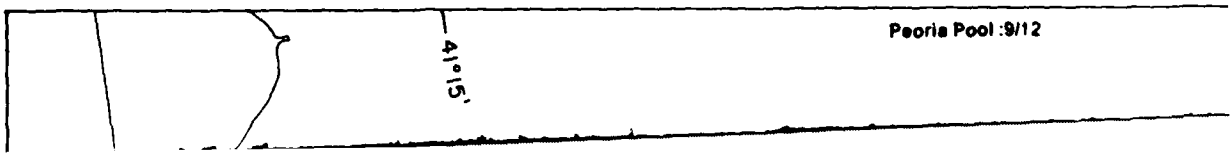

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
0
89°25'
41°05'
Peoria
Goose Lake
41°02'30"
Lower Henry
Isl.
Upp
ML E
191
No Video Coverage
89°22'30"
0
0
1 km


189
No Video Coverage
1 mi
1 km
Survey date: February 25, 1986
Video Tape 15

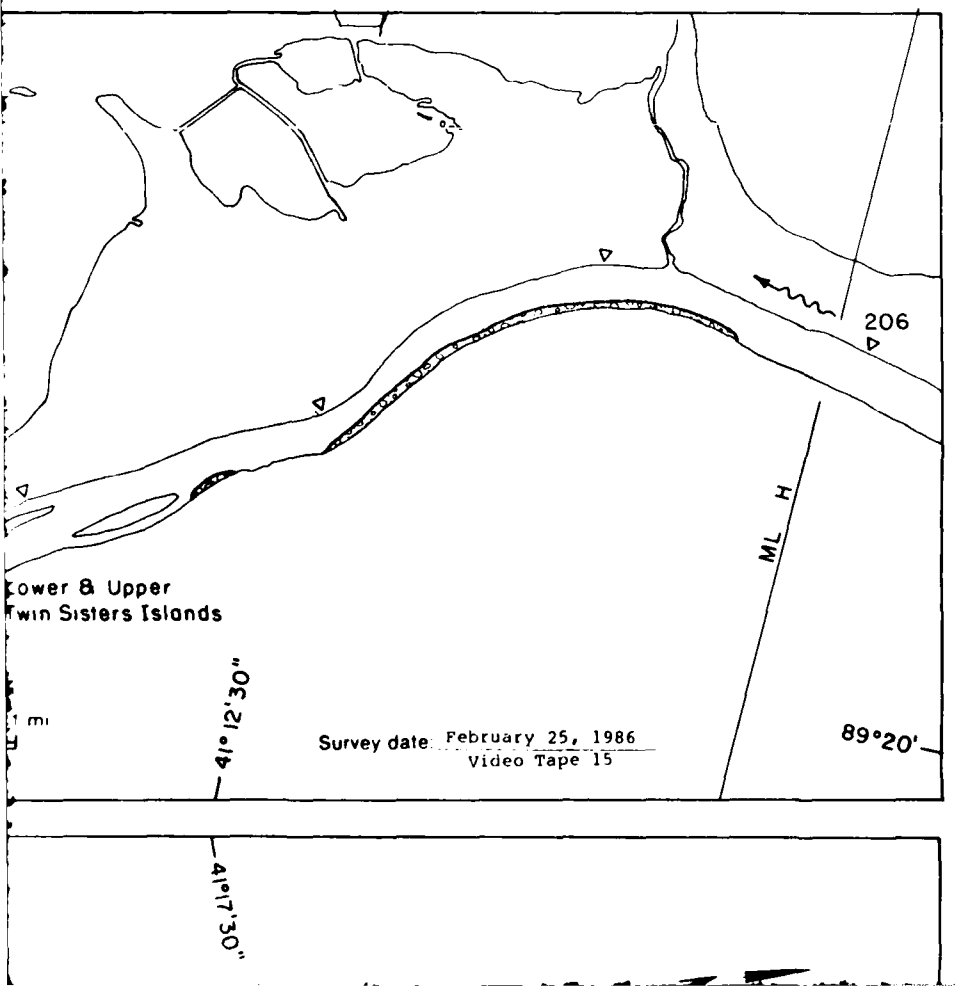

Peoria Pool :6/12
Upper Henry Isl.
196
ML F
Billsbach (or Shultz) Lake
1 mi
1 km
Survey date: February 25, 1986
Video Tape 15
89°20'

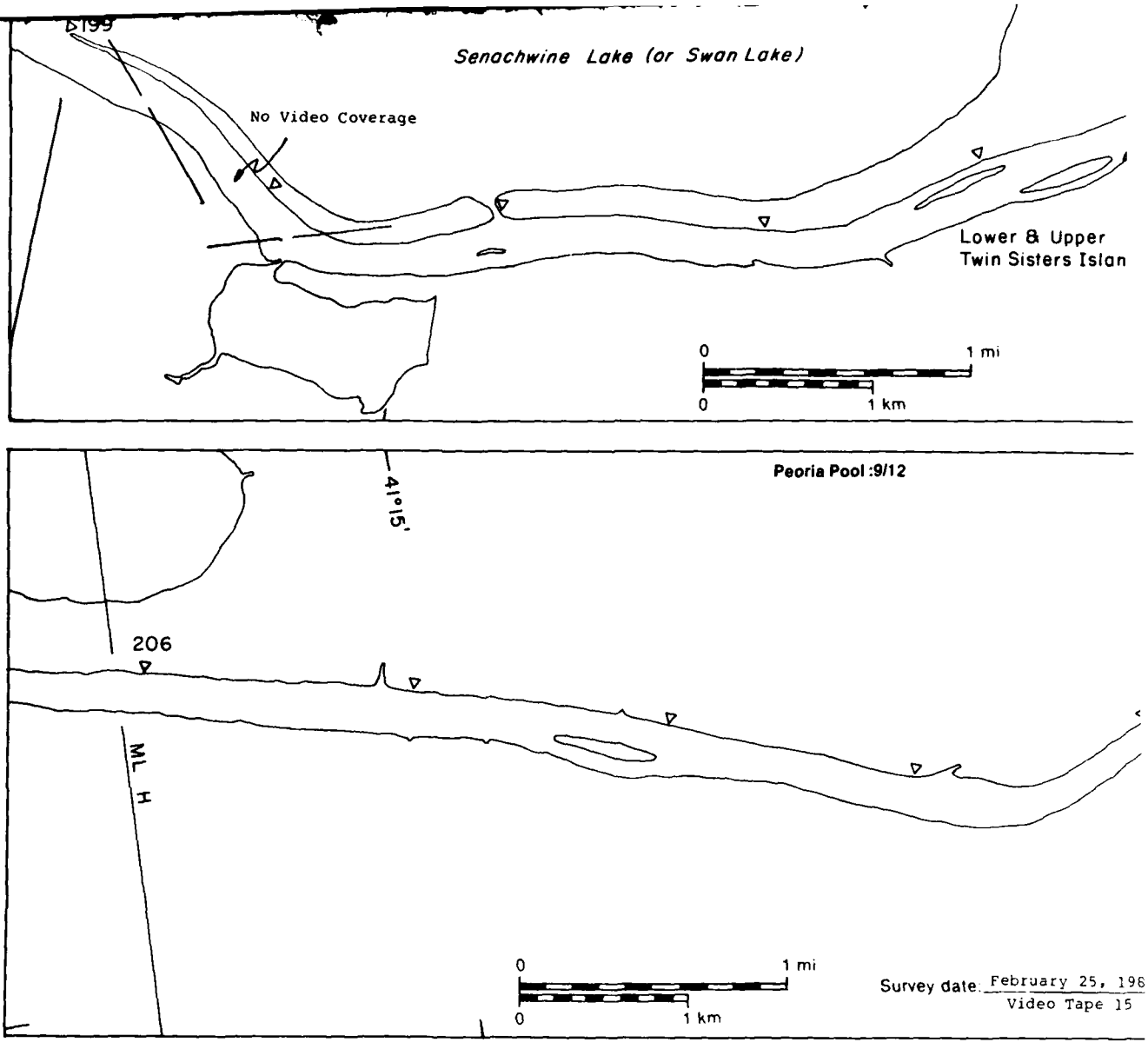

Peoria Pool :7/12
41°07'30"
196
ML F
ML G
199
89°20'
Sowmill Lake
0
1 mi
0
1 km
Survey date February 25, 1986
Video Tape 15

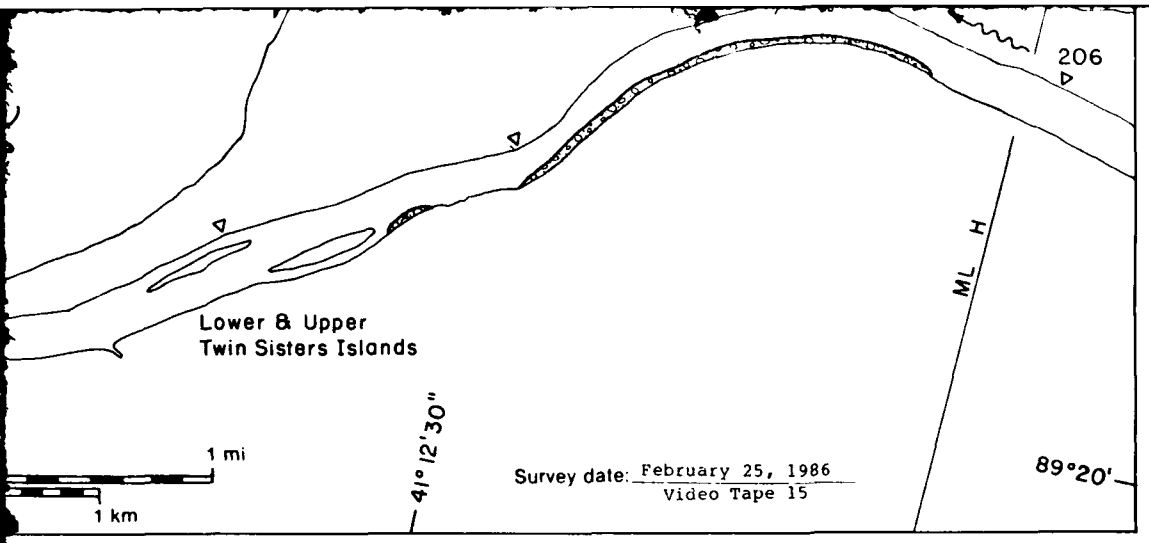

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
No Video Coverage
Lower & U
Twin Sisters
0
1 mi
0
1 km

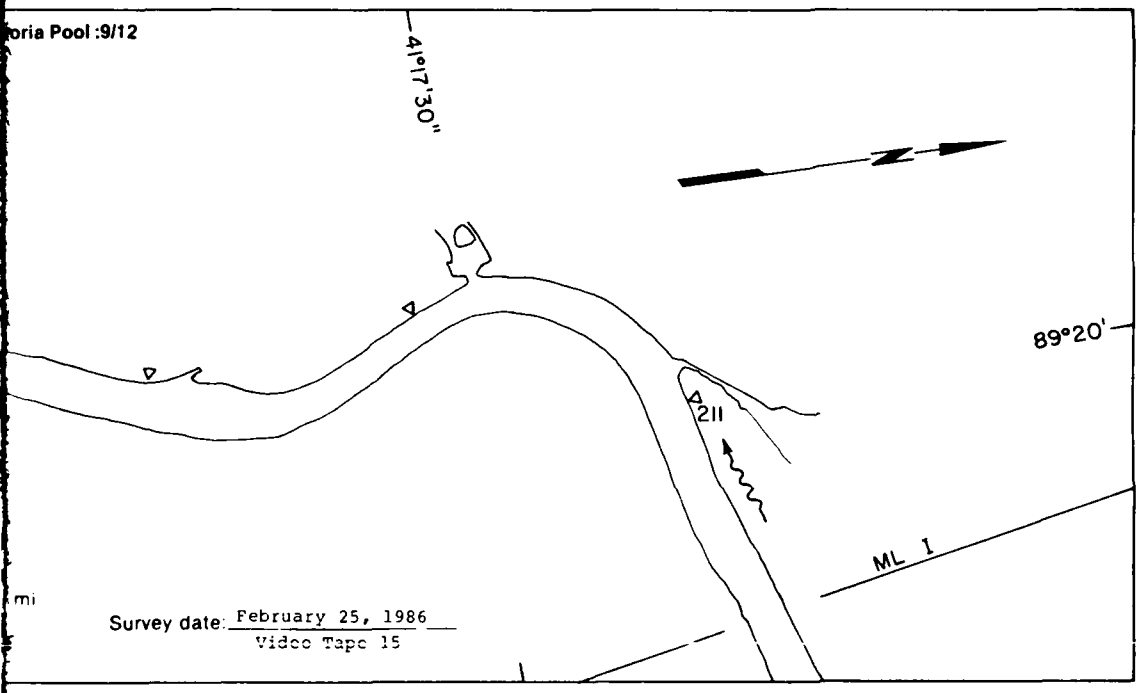

Peoria Pool :9/12
41°15'

25 February 1986

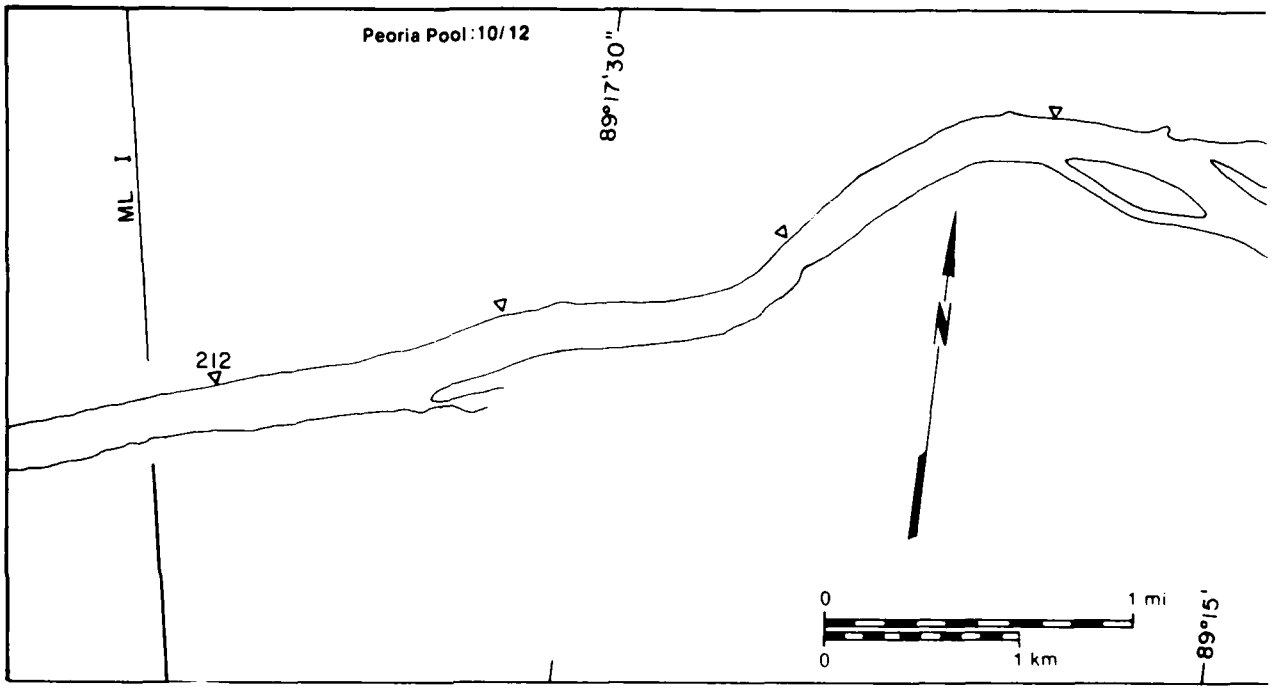


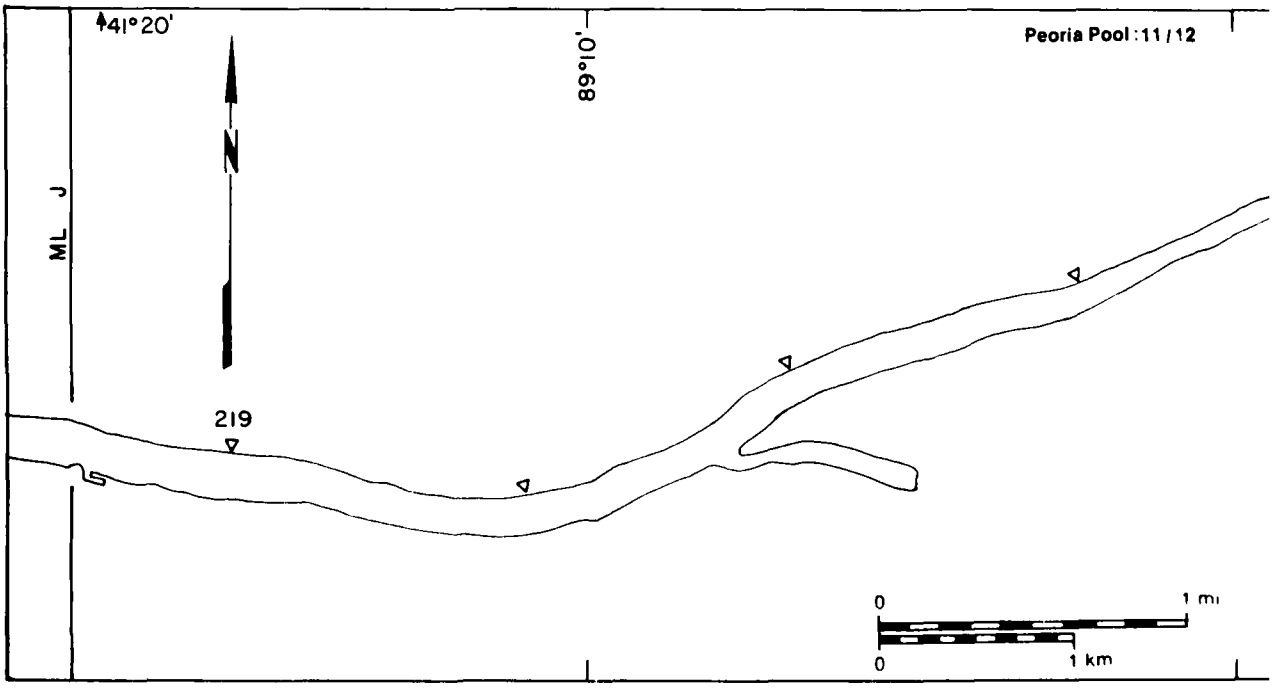

199
Senachwine Lake (or Swan Lake)
No Video Coverage
Lower & Upper
Twin Sisters Islan
0
1 mi
0
1 km
Peoria Pool :9/12
41°15'
206
ML H
0
1 mi
0
1 km
Survey date: February 25, 198
Video Tape 15

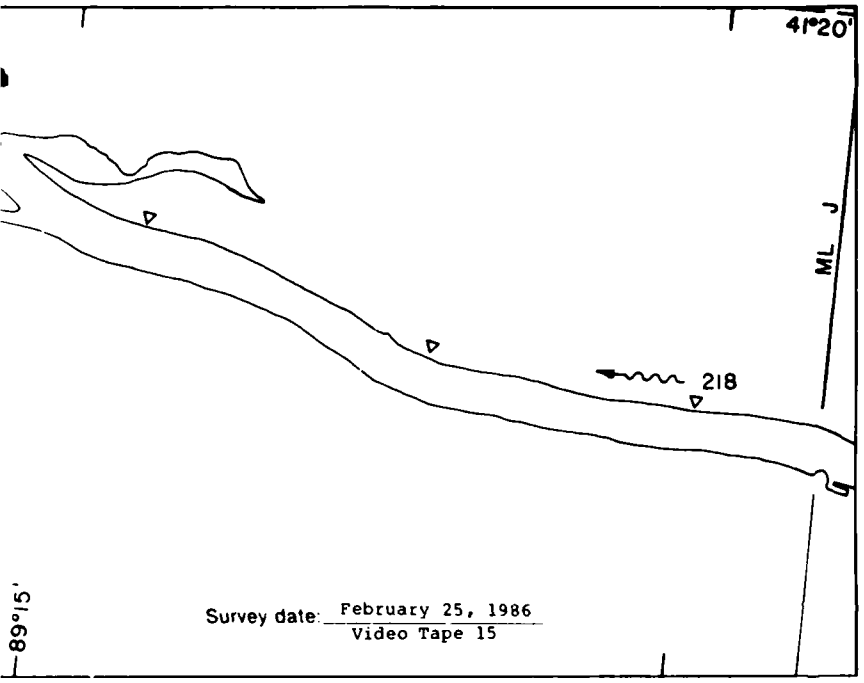

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: February 25, 1986
Video Tape 15
89°20'

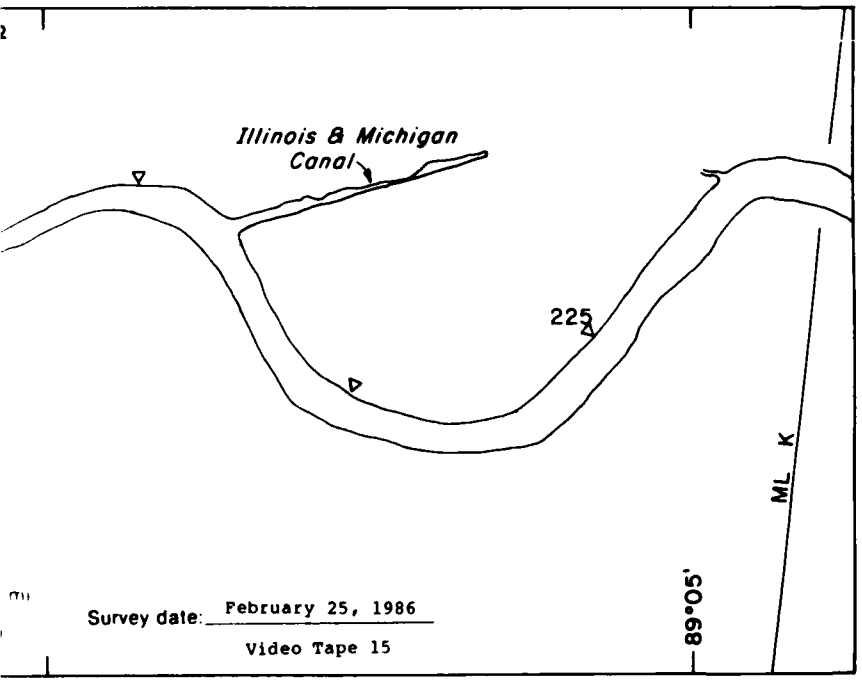

oria Pool :9/12
41°17'30"
89°20'
211
ML 1
mi
Survey date: February 25, 1986
Video Tape 15

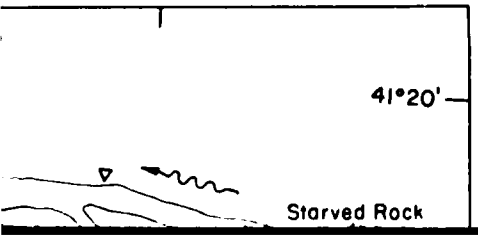
25 February 1986

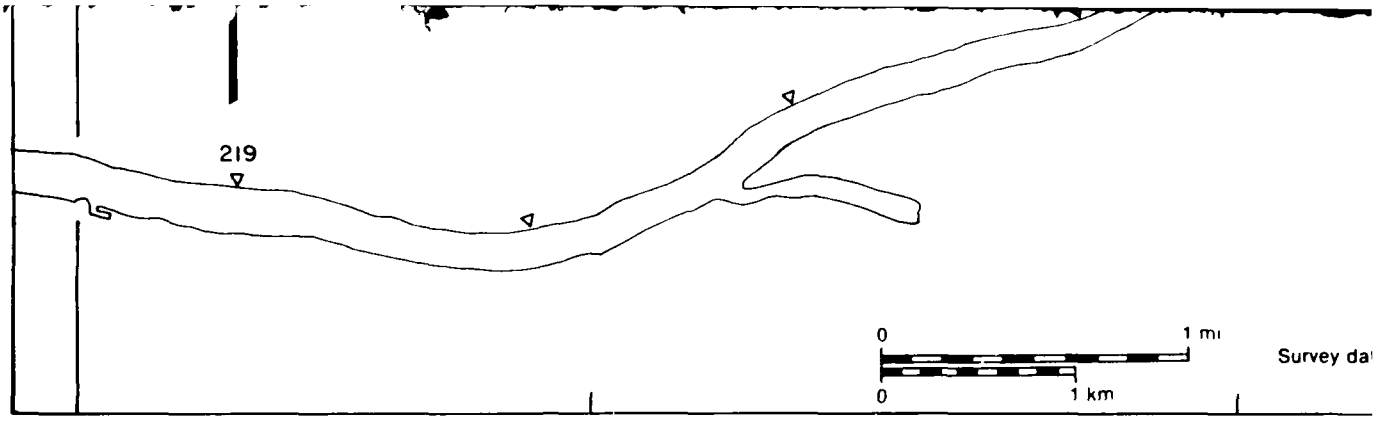


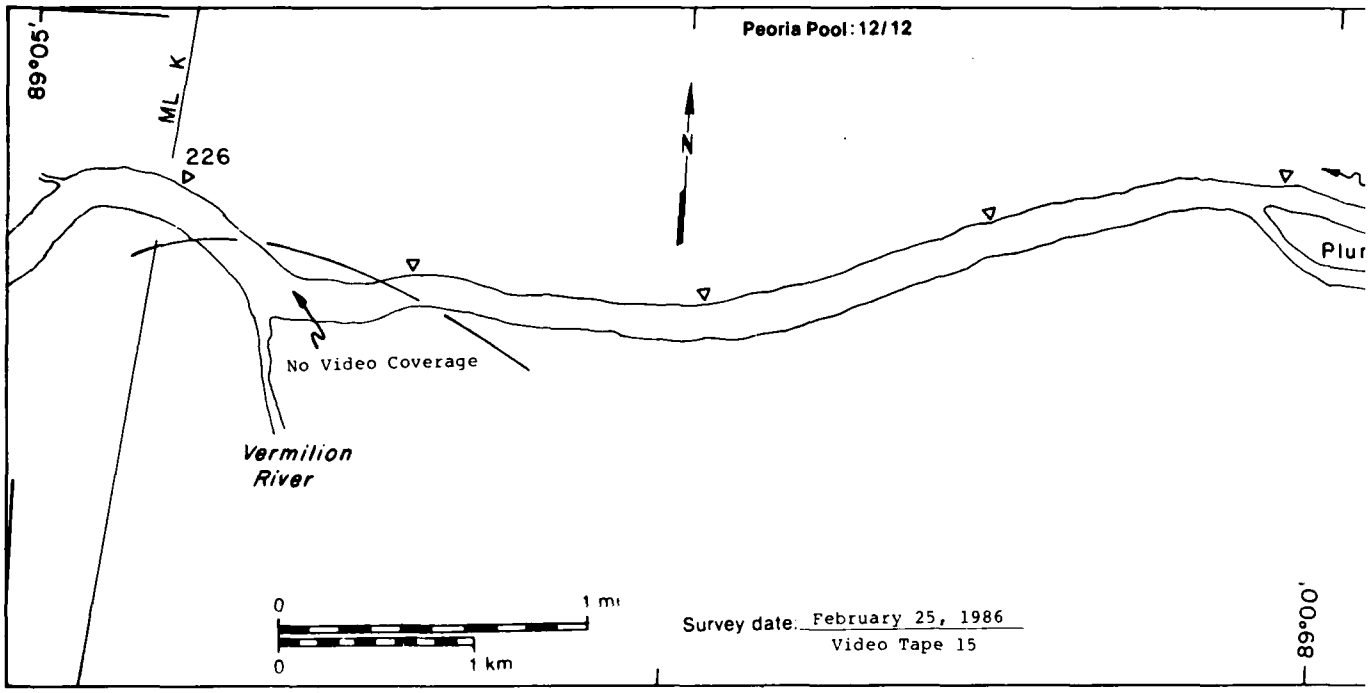



41°20'
ML J
218
89°15'
Survey date: February 25, 1986
Video Tape 15


Illinois & Michigan Canal
225
ML K
89°05'
Survey date: February 25, 1986
Video Tape 15


41°20'
Starved Rock

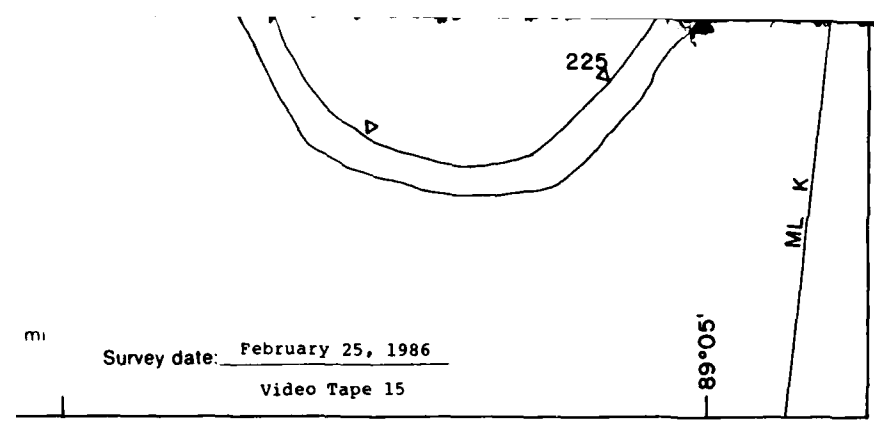


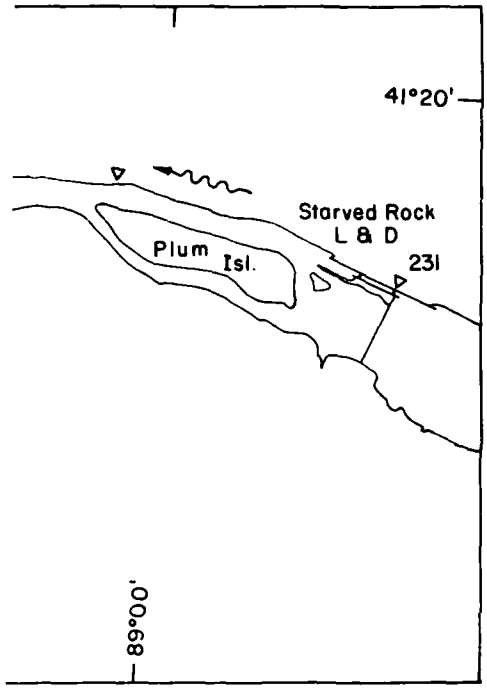


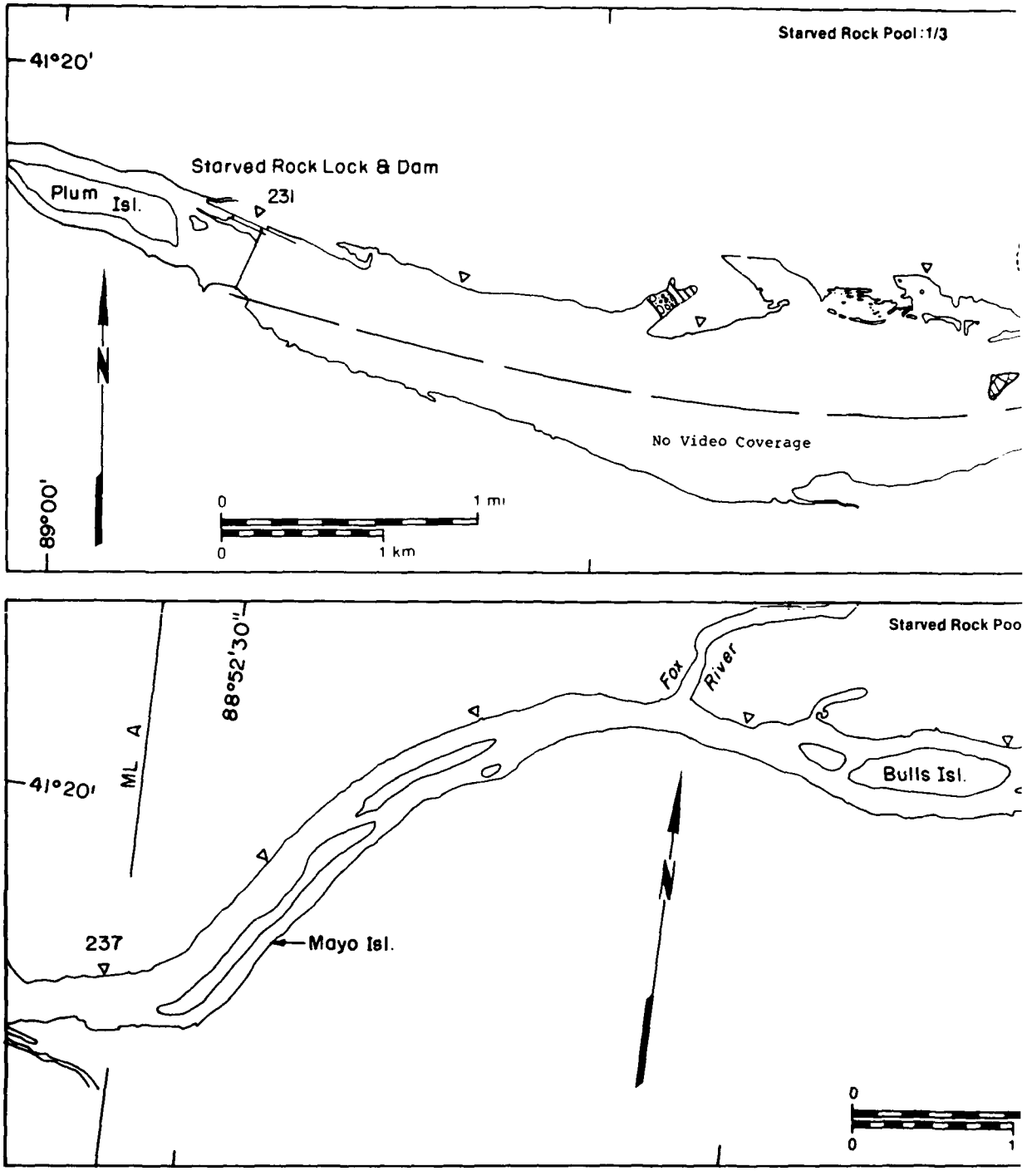
Peoria Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	42.14	NA
Solid ice cover	6.05	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.33	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	12.38	5
Total area ($m^2 \times 10^6$)	81.33*	

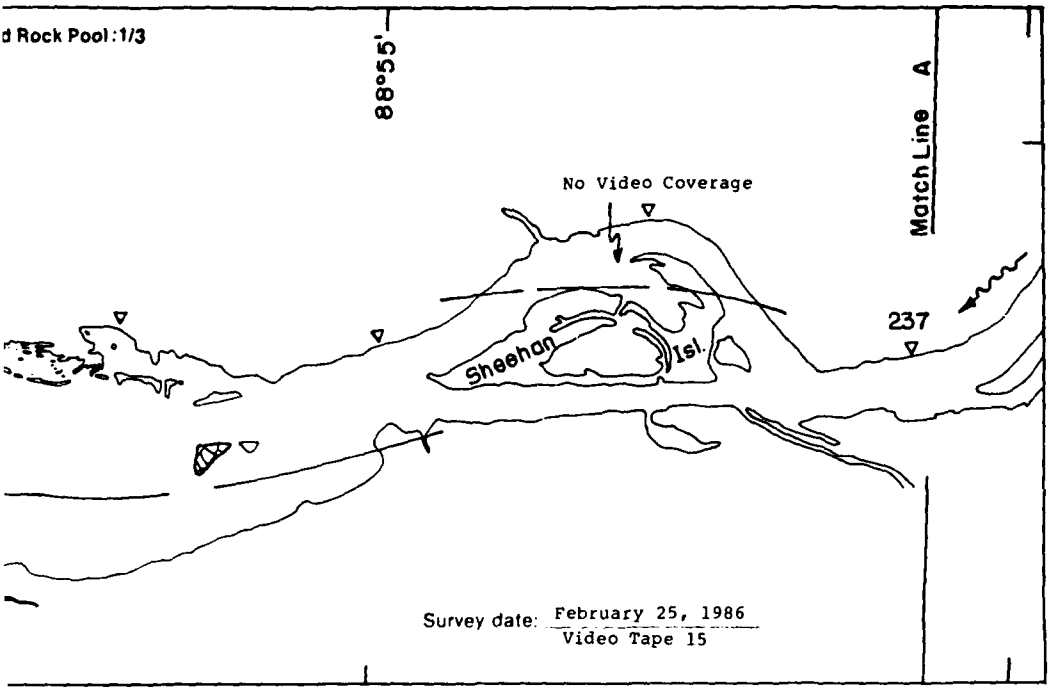
* Includes 20.43×10^6 m^2 of no video coverage

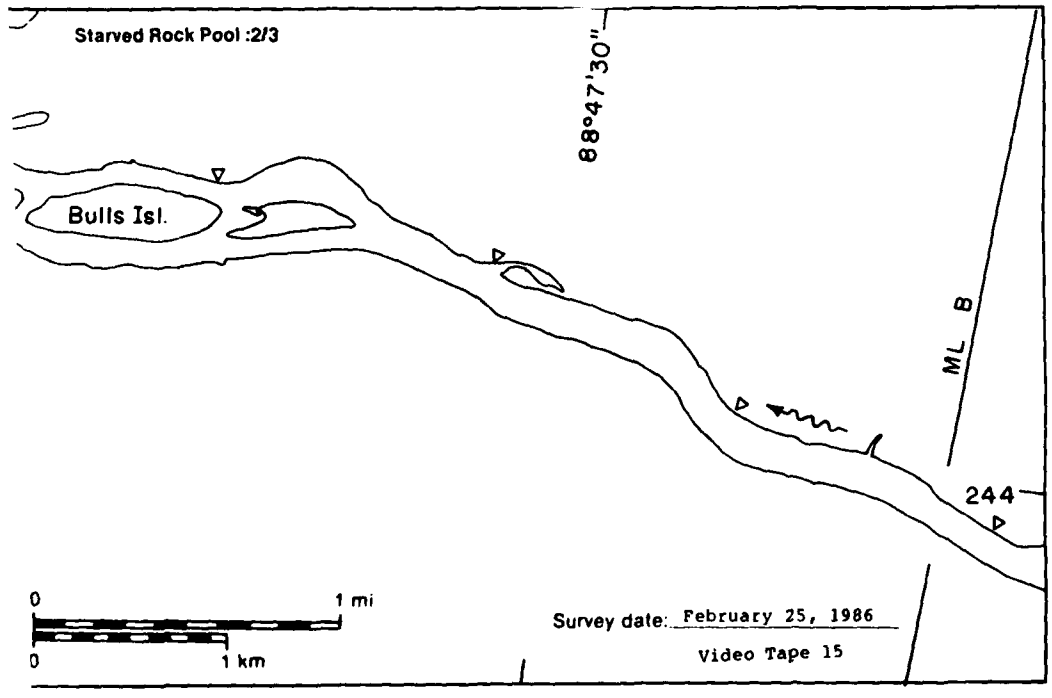

225
ML K
89°05'
mi
Survey date: February 25, 1986
Video Tape 15


41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'


Starved Rock Pool:1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km
Starved Rock Poo
88°52'30"
ML A
Fox River
41°20'
Bulls Isl.
237
Mayo Isl.
0
0
Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

25 February 1986



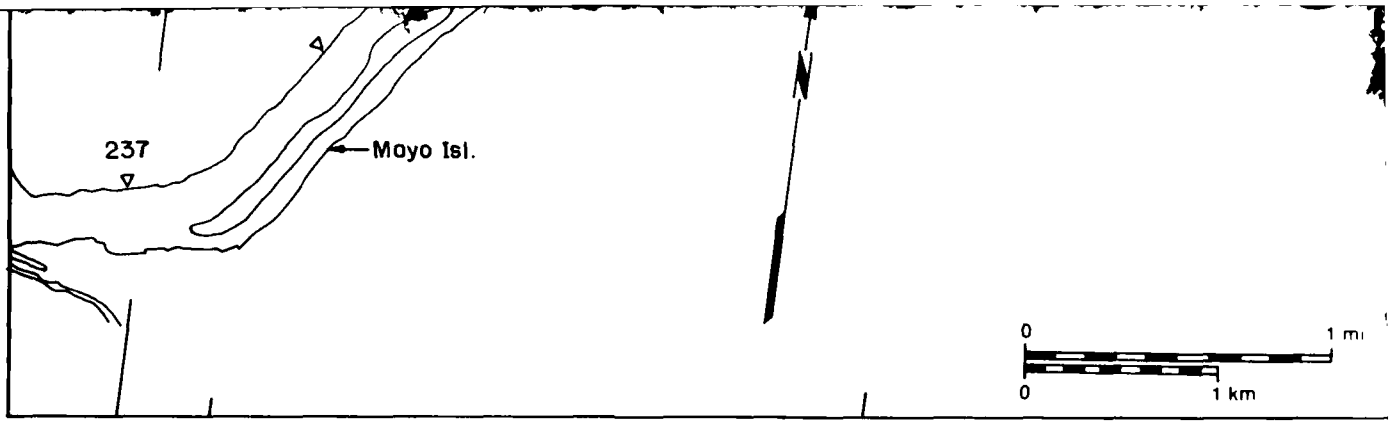


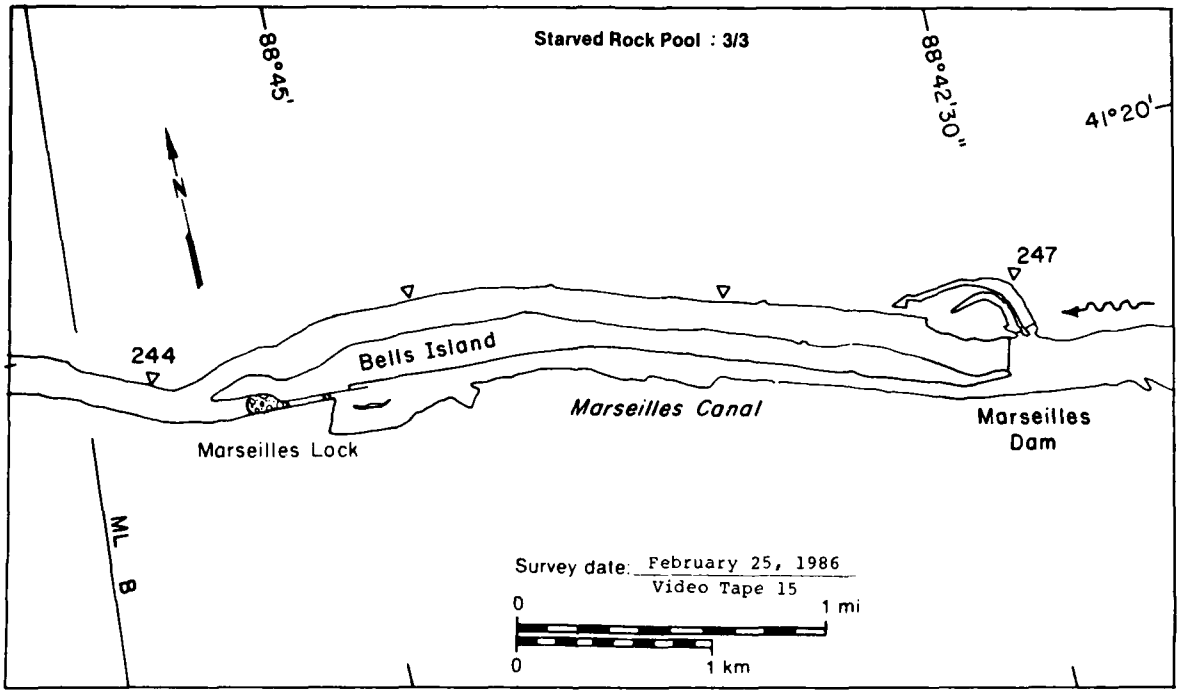
41°20'

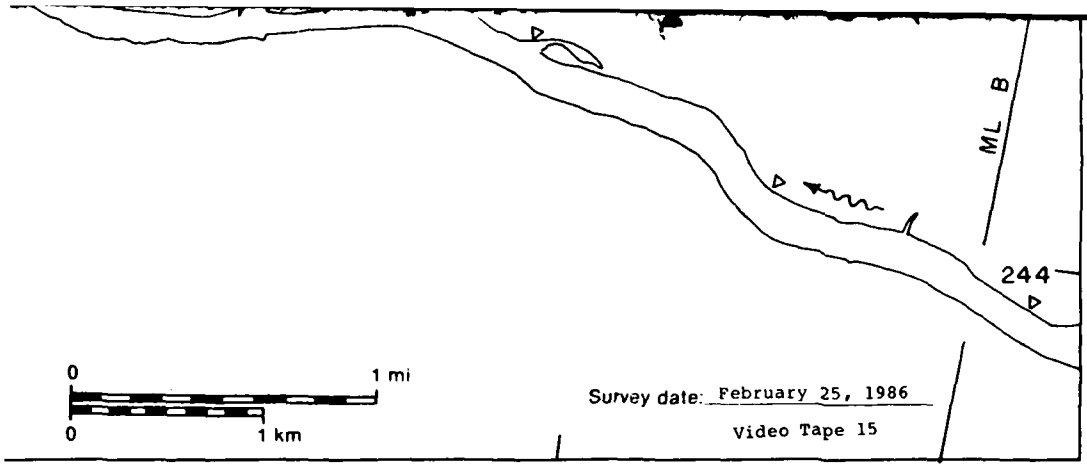
Starved Rock Pool

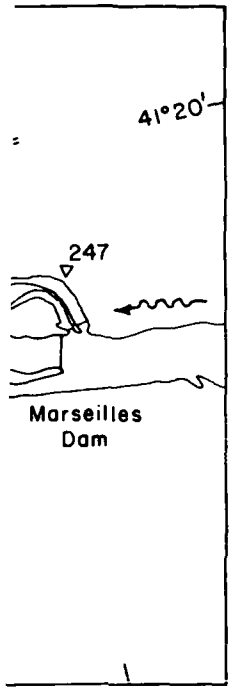
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)


237
Moyo Isl.
0
1 mi
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: February 25, 1986
Video Tape 15
0
1 mi
0
1 km



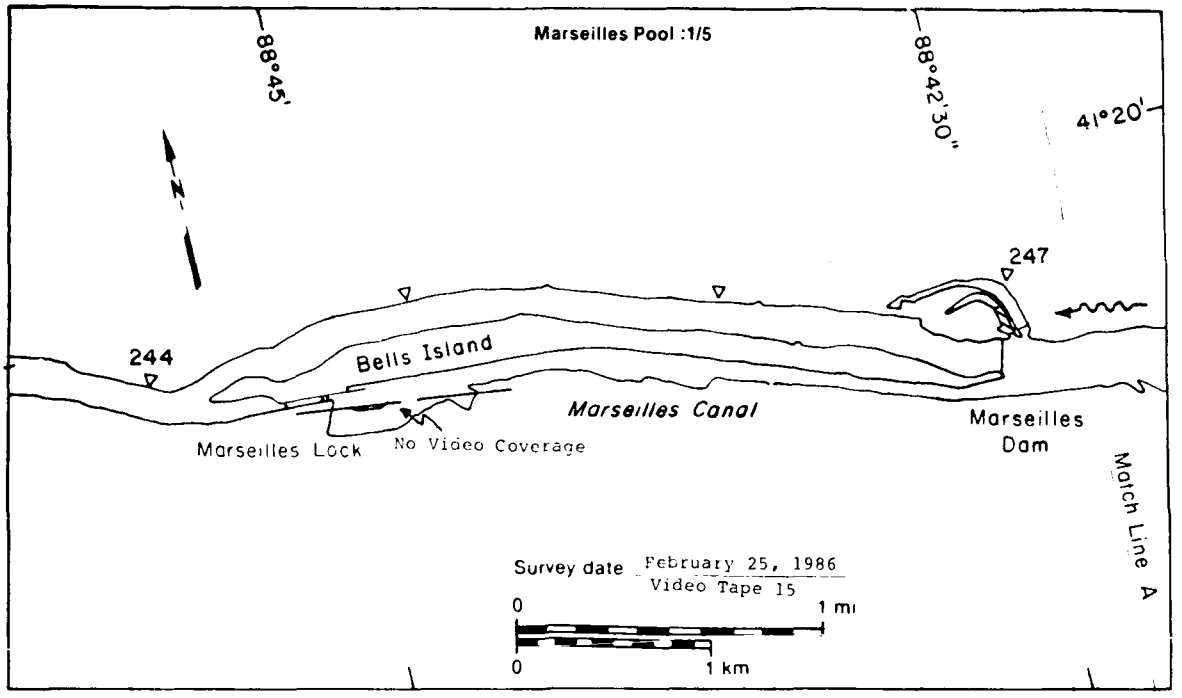


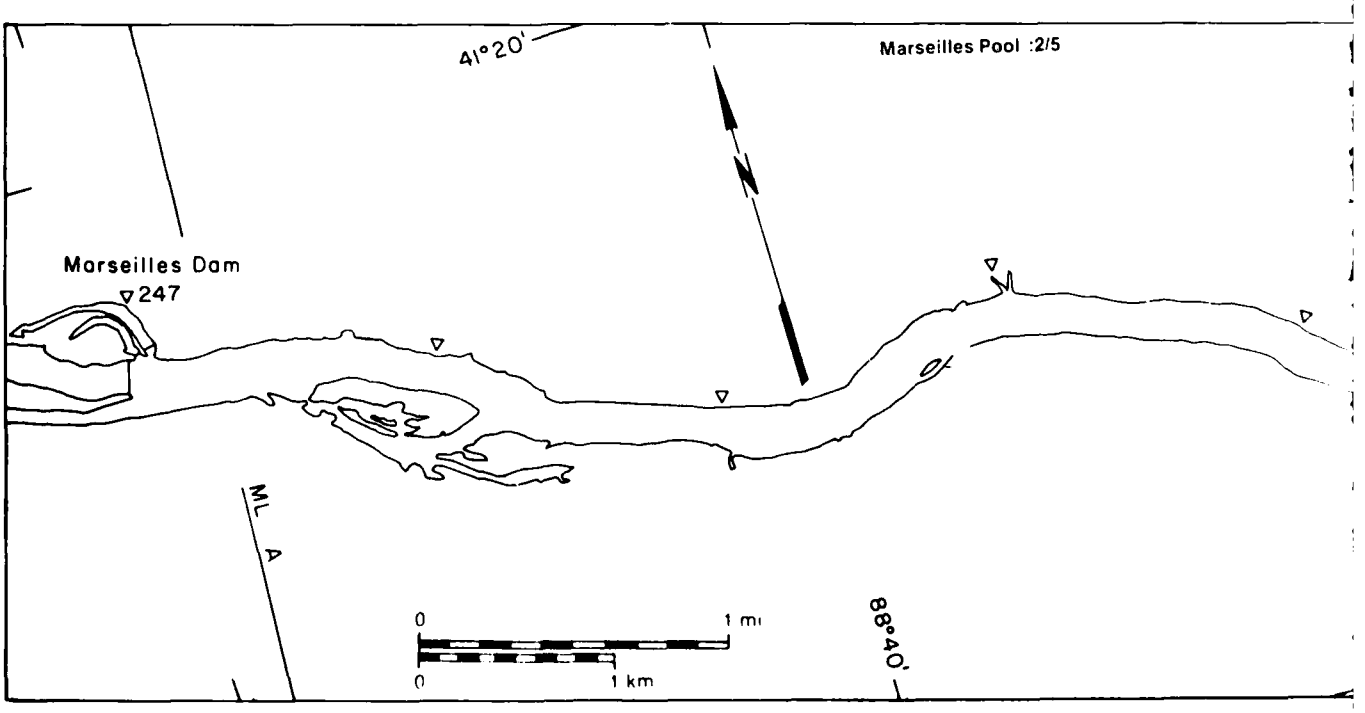
Starved Rock Pool

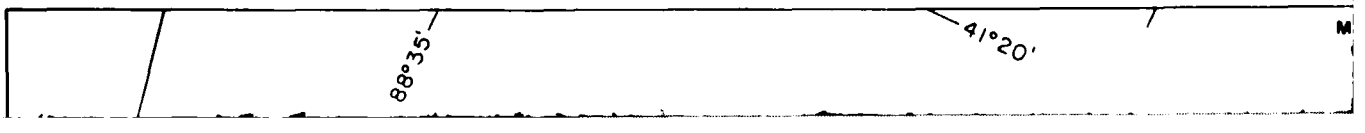
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.93	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.07	30
Total area ($m^2 \times 10^6$)	10.19*	

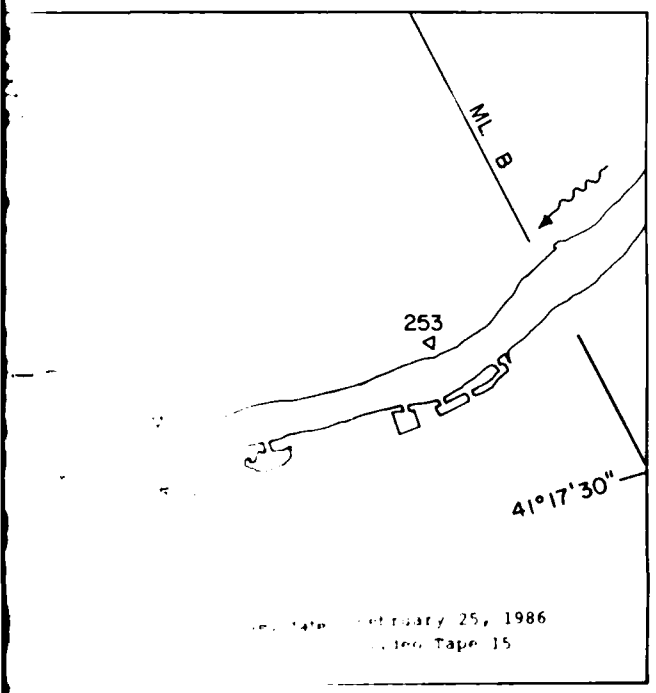
* Includes 2.17×10^6 m^2 of no video coverage

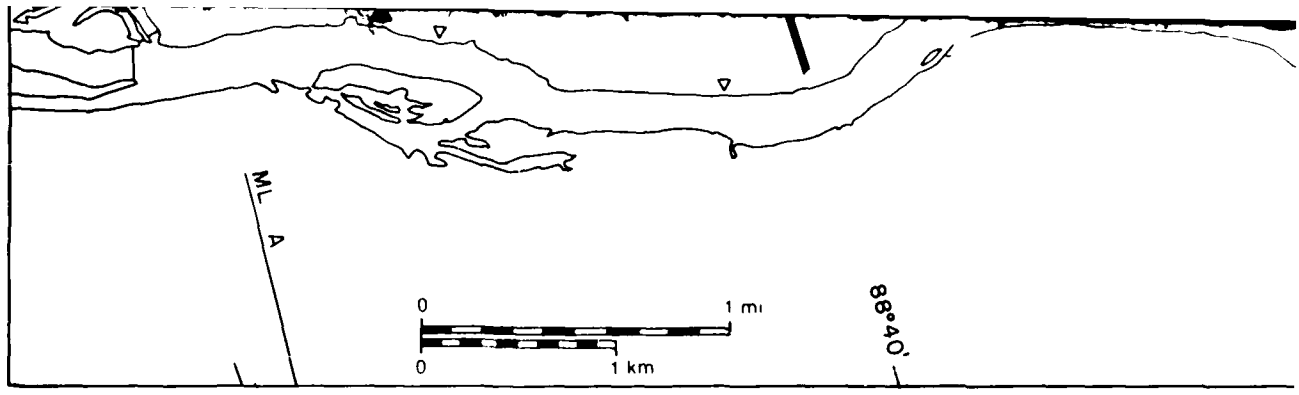
25 February 1986

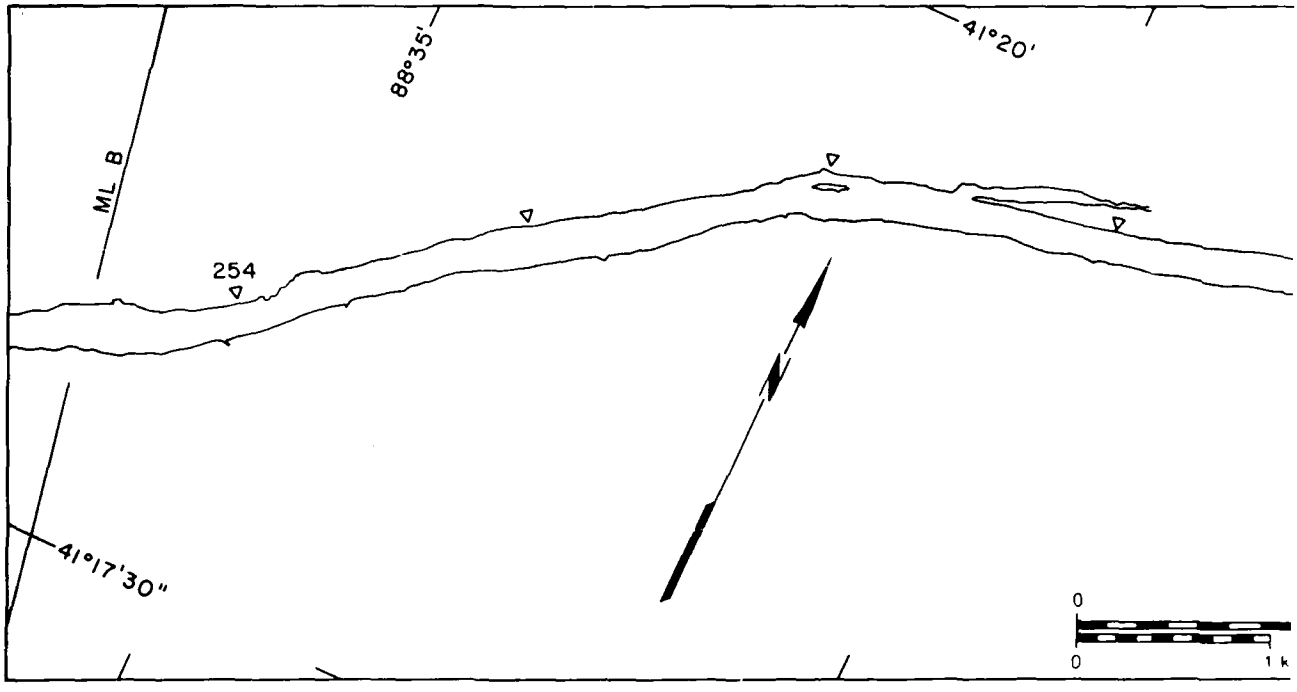


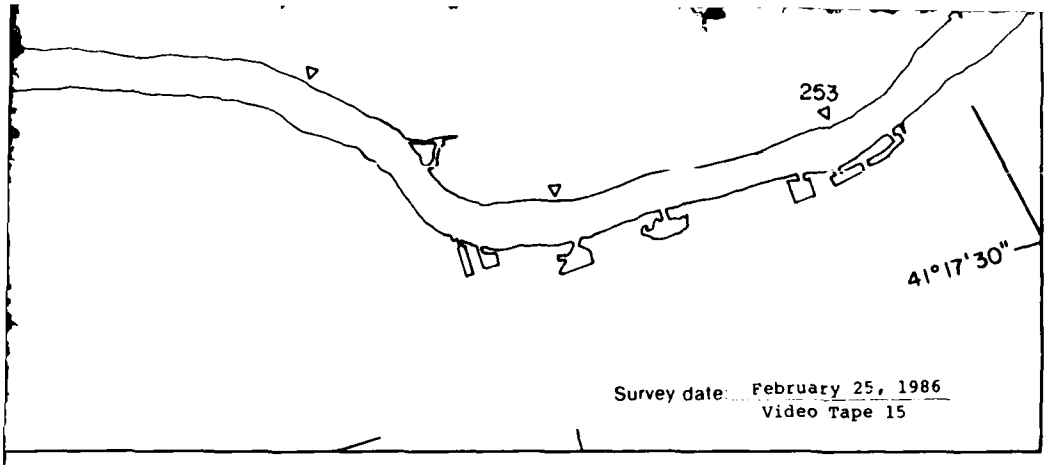


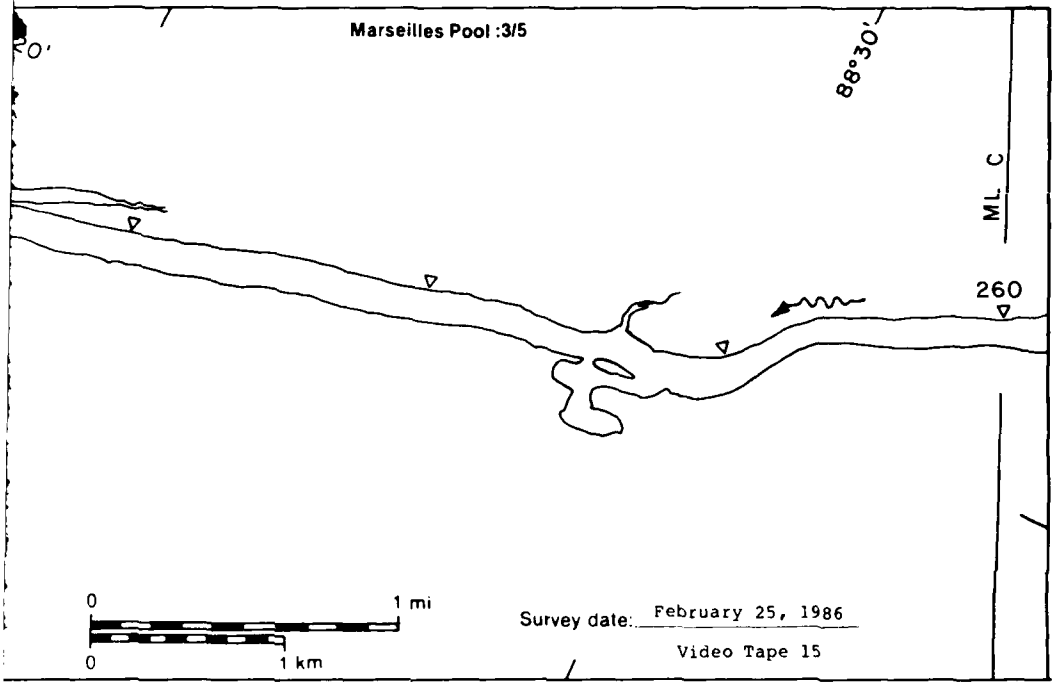


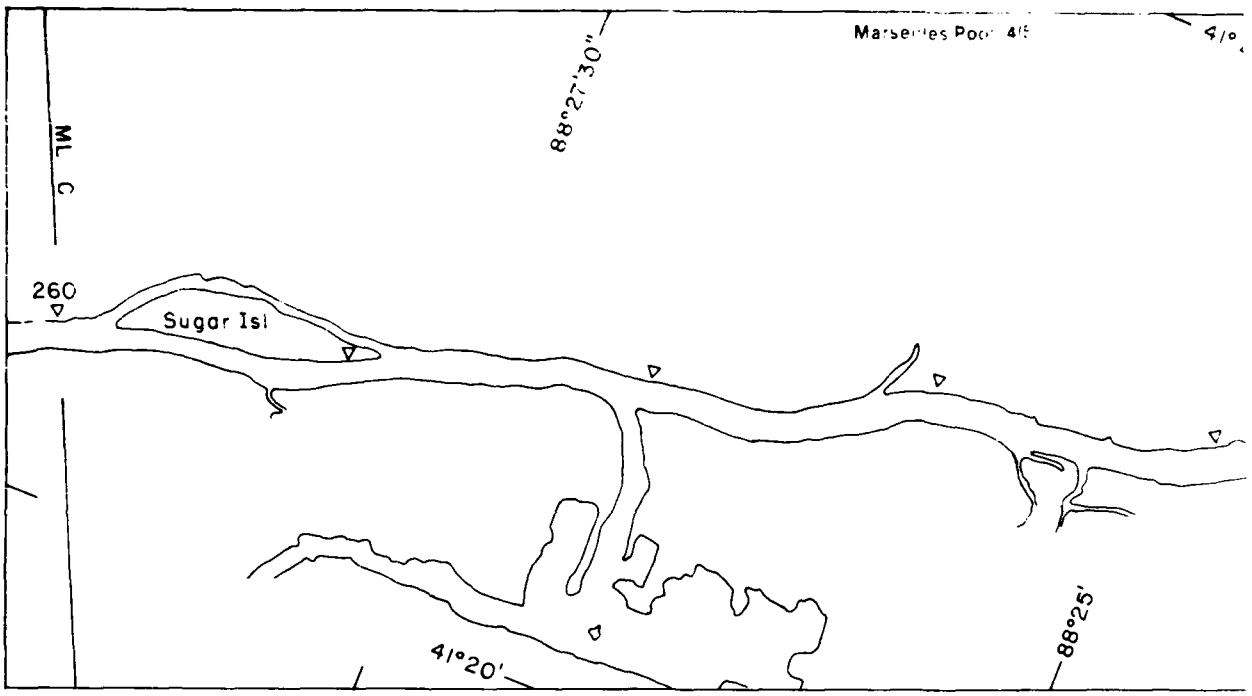

ML B
253
41°17'30"
February 25, 1986
Tape 15

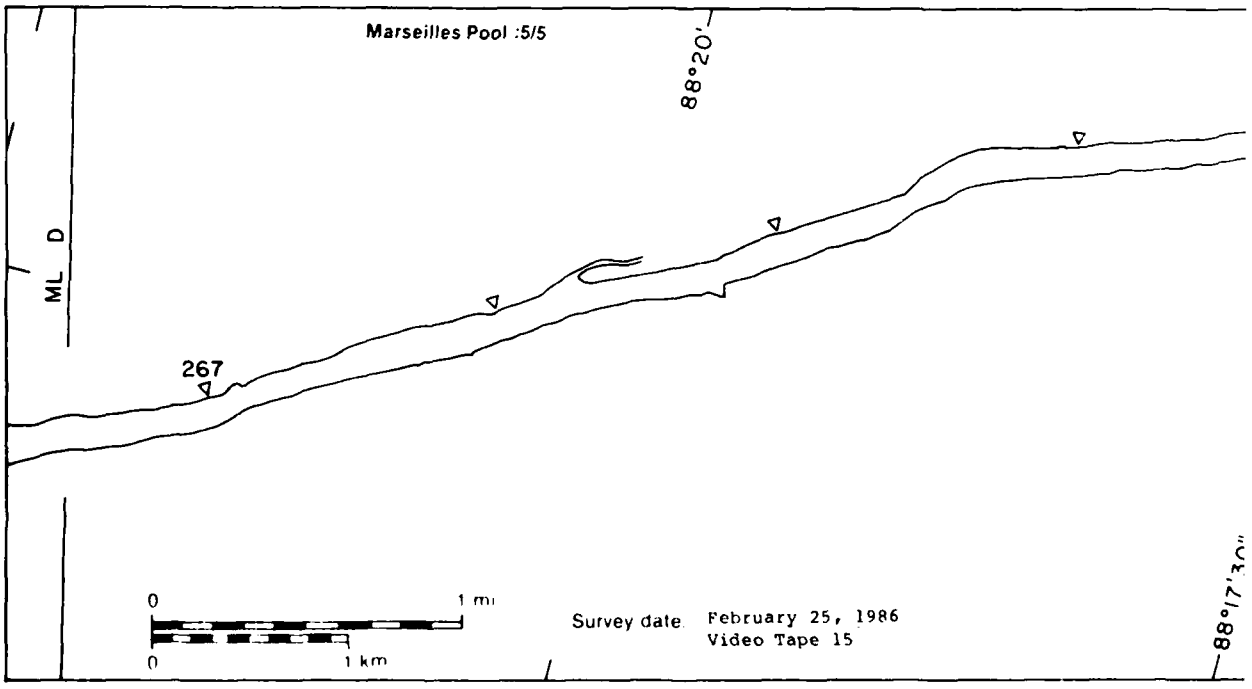

ML A
0
1 mi
0
1 km
88°40'


88°35'
41°20'
ML B
254
41°17'30"
0
0
1 k


253
41°17'30"
Survey date: February 25, 1986
Video Tape 15


Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: February 25, 1986
Video Tape 15



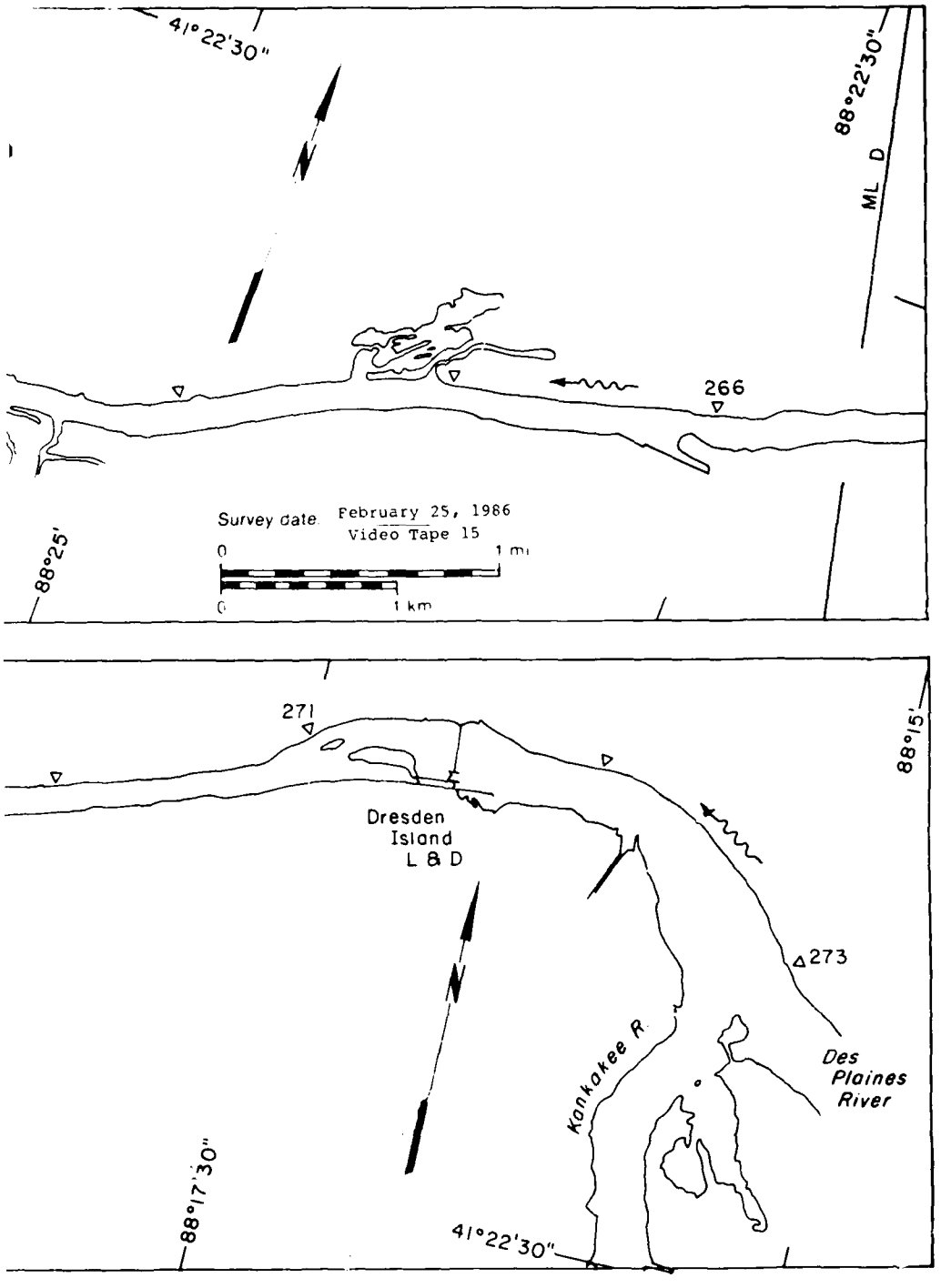


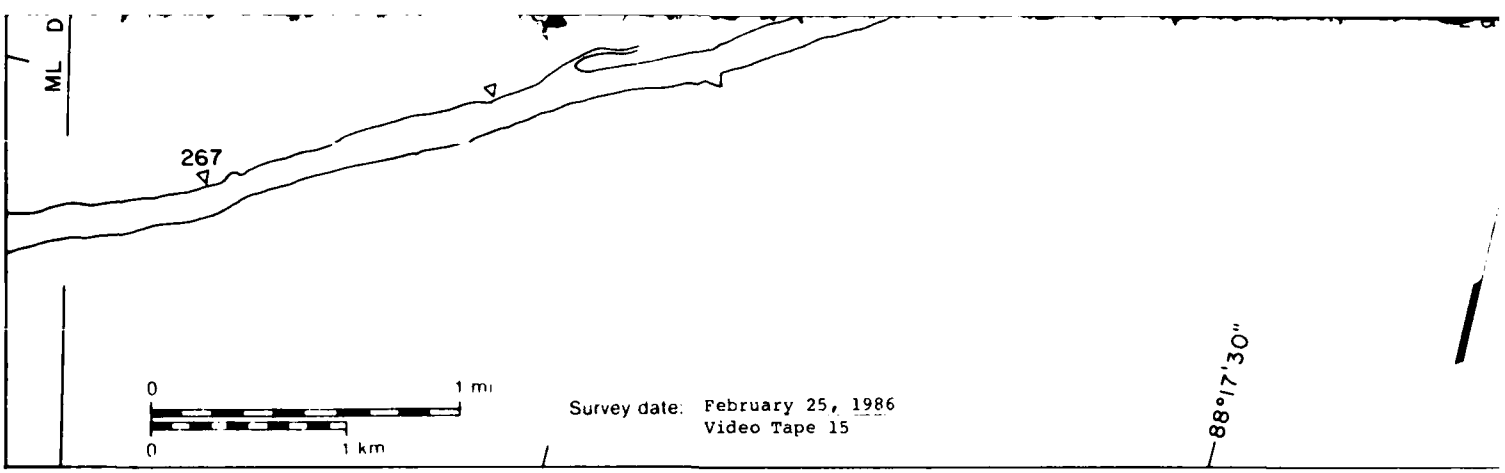
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)

25 February 1986



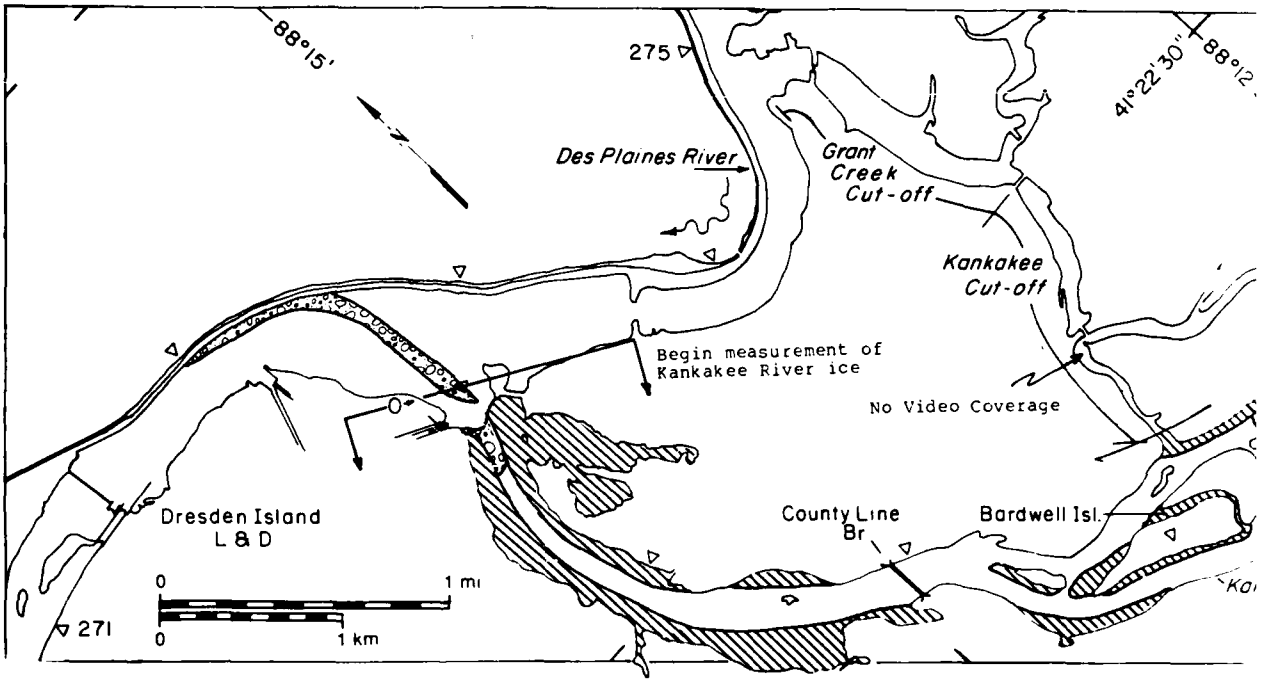


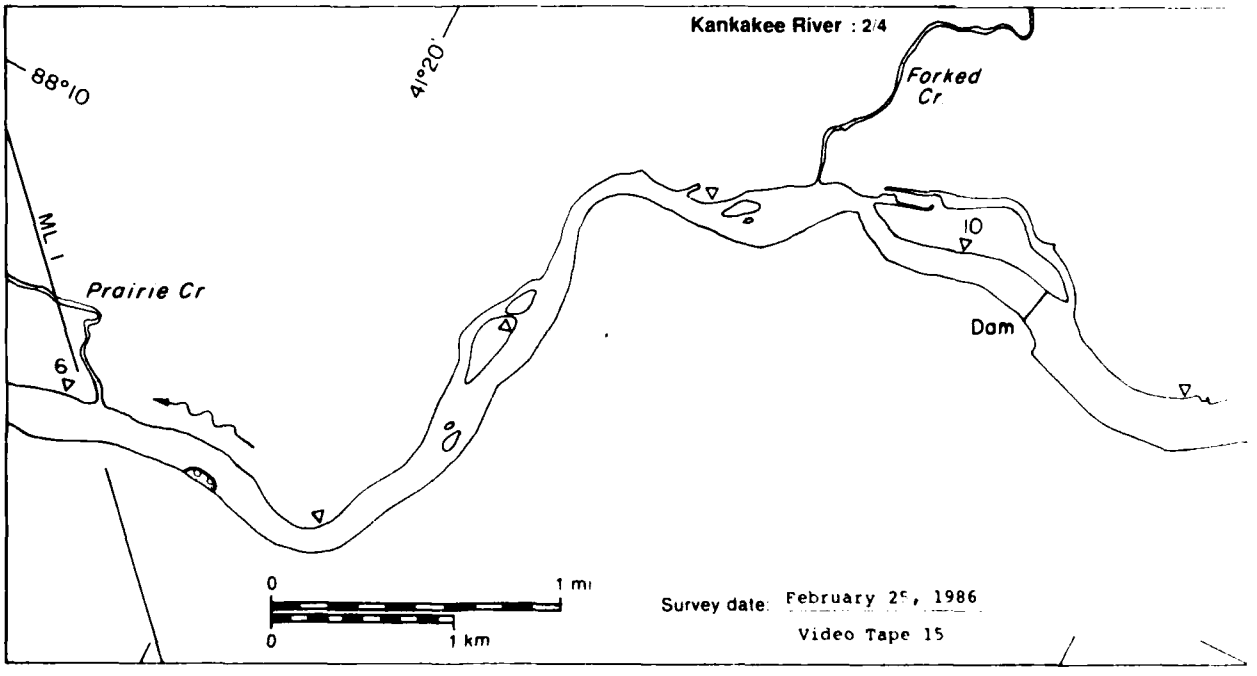
Marseilles Pool

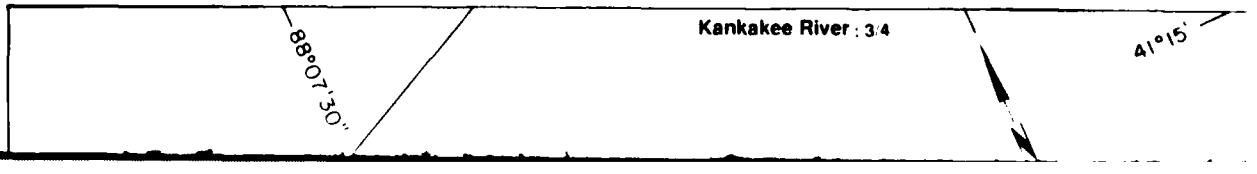
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (‰)
Open water	8.10	NA
Solid ice cover	Trace	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	8.19*	

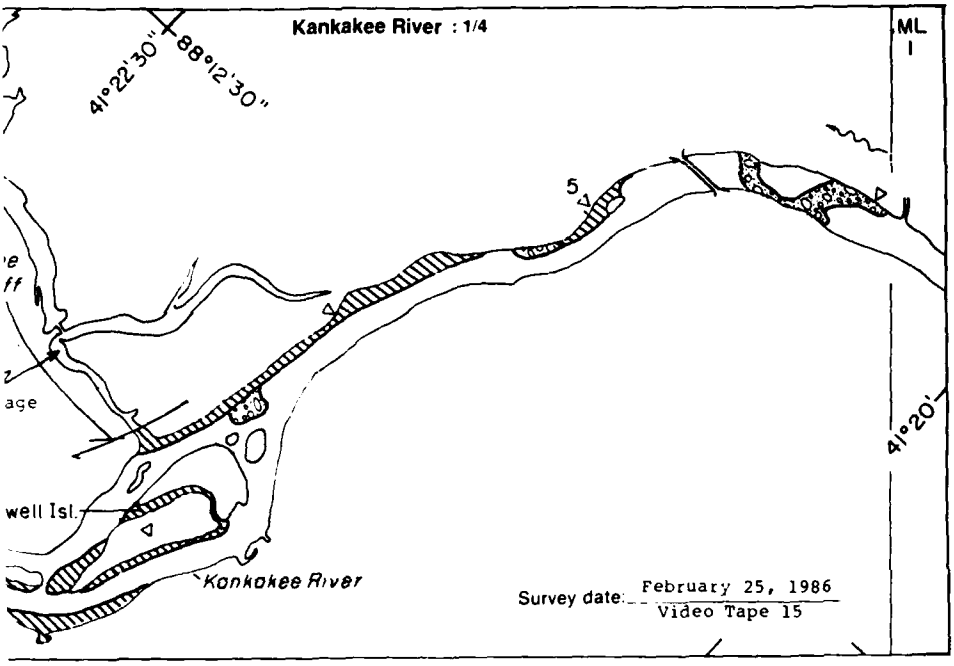
* Includes 0.09×10^6 m^2 of no video coverage

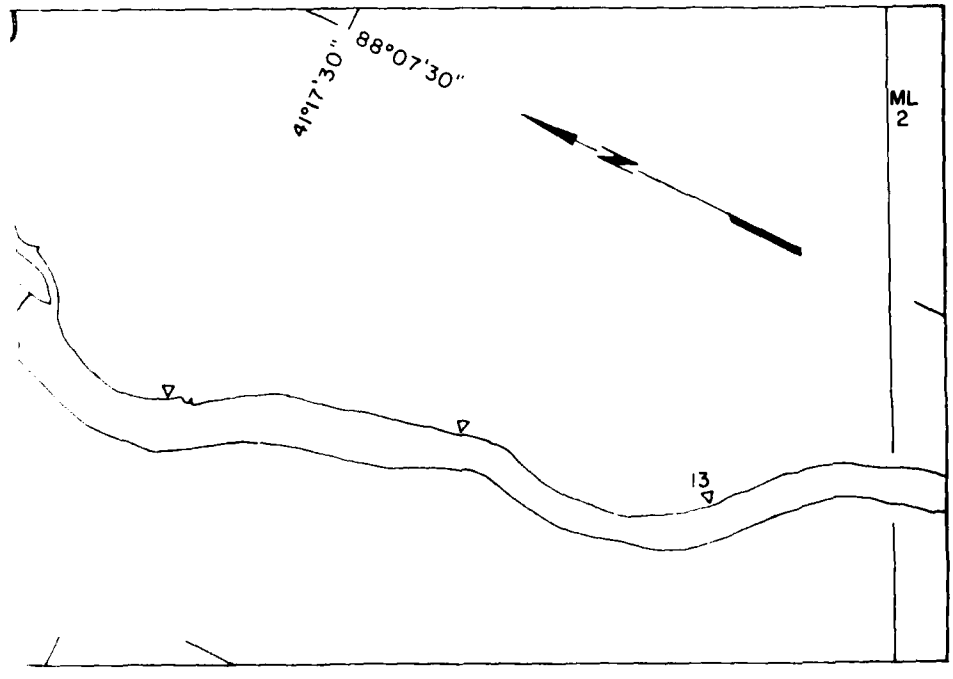
25 February 1986

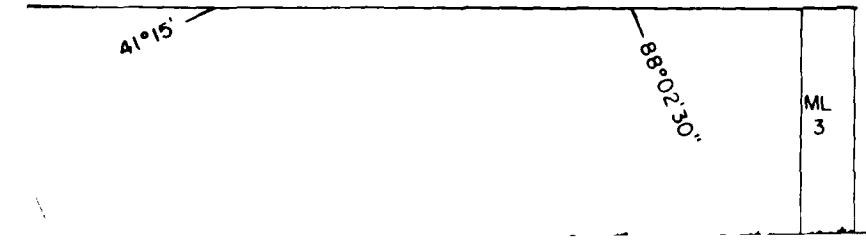


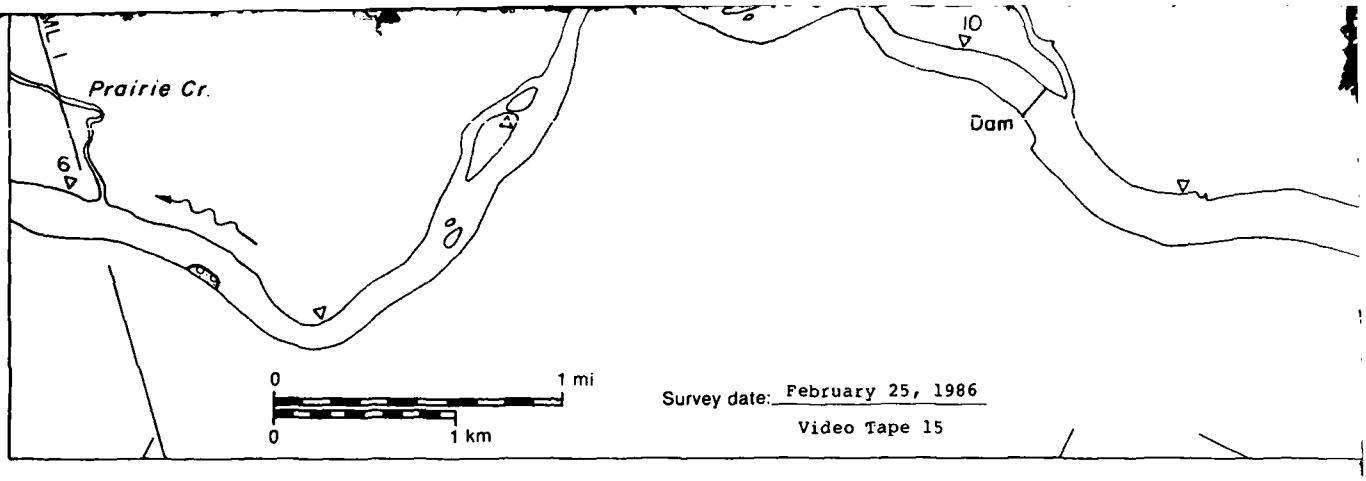


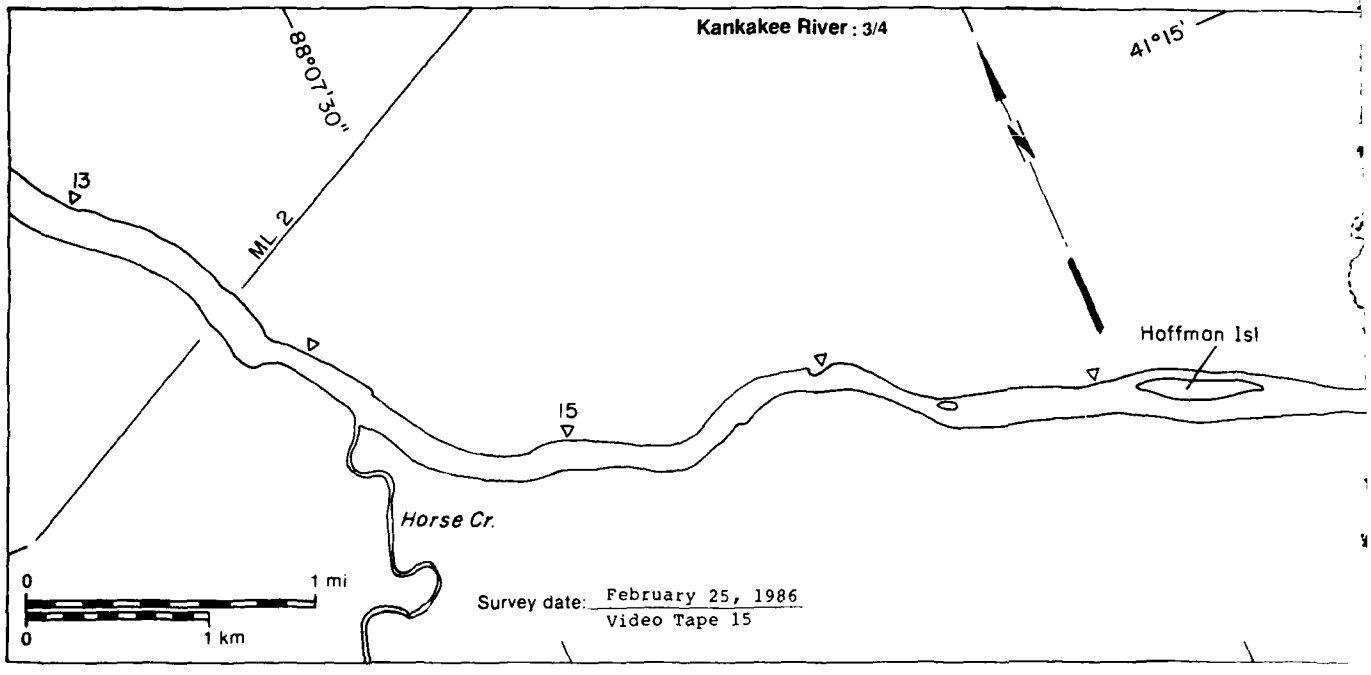


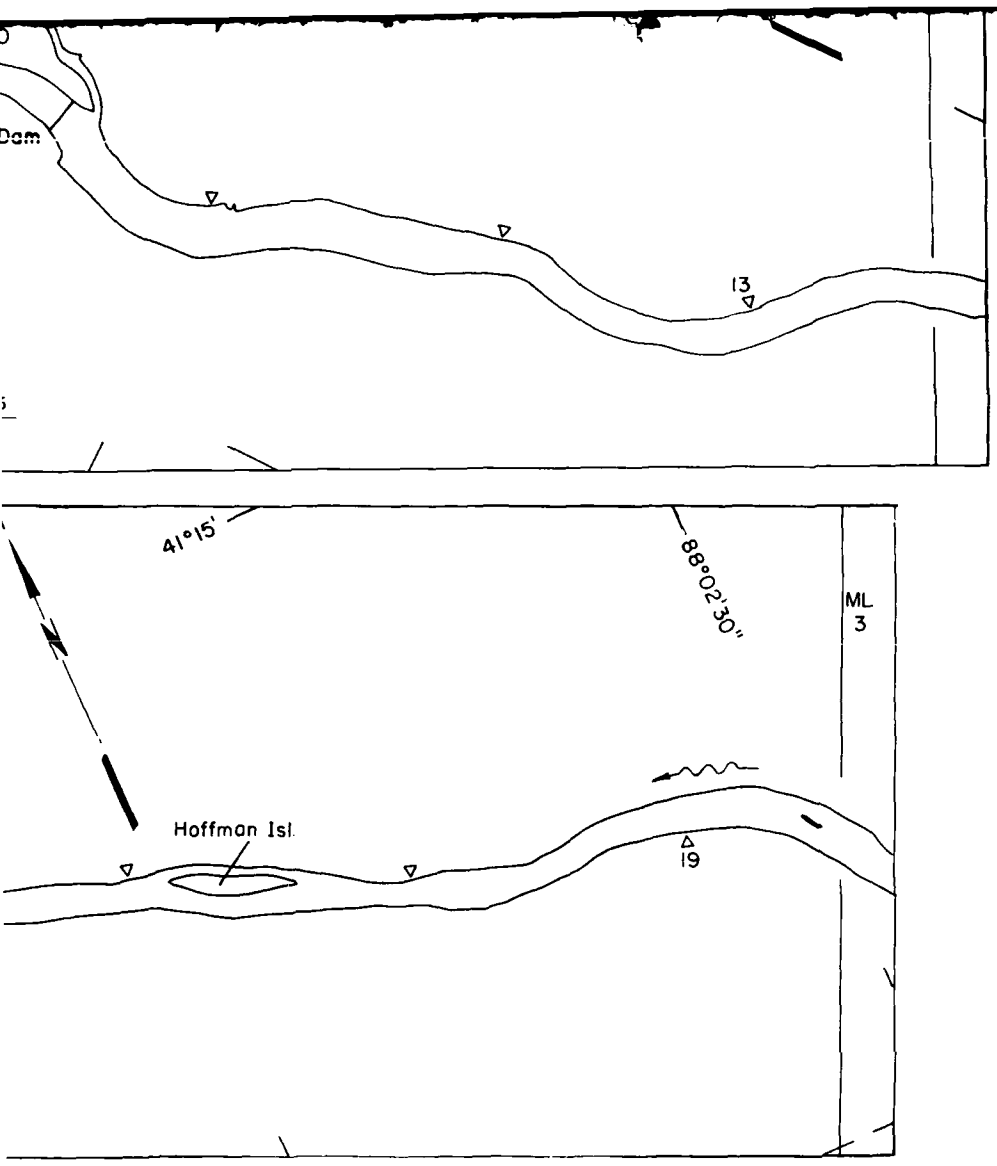

Kankakee River : 1/4
41°22'30"
88°12'30"
ML
1
5
41°20'
well Isl.
Kankakee River
Survey date: February 25, 1986
Video Tape 15

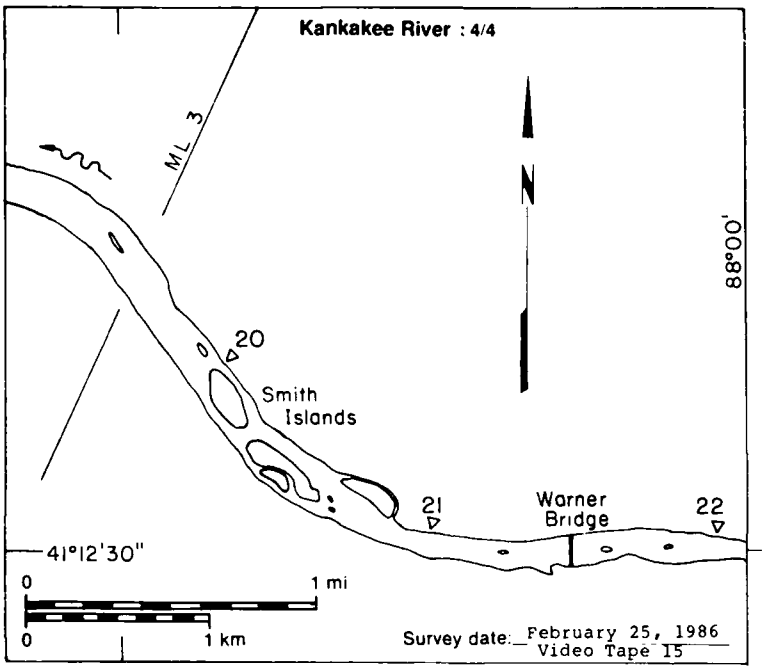

41°17'30"
88°07'30"
ML
2
13


41°15'
88°02'30"
ML
3


Prairie Cr.
6
10
Dam
0
1 mi
0
1 km
Survey date: February 25, 1986
Video Tape 15


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffmon Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: February 25, 1986
Video Tape 15


Dam
13
41°15'
88°02'30"
ML
3
Hoffman Isl.
19



Kankakee River

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with open-water areas
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

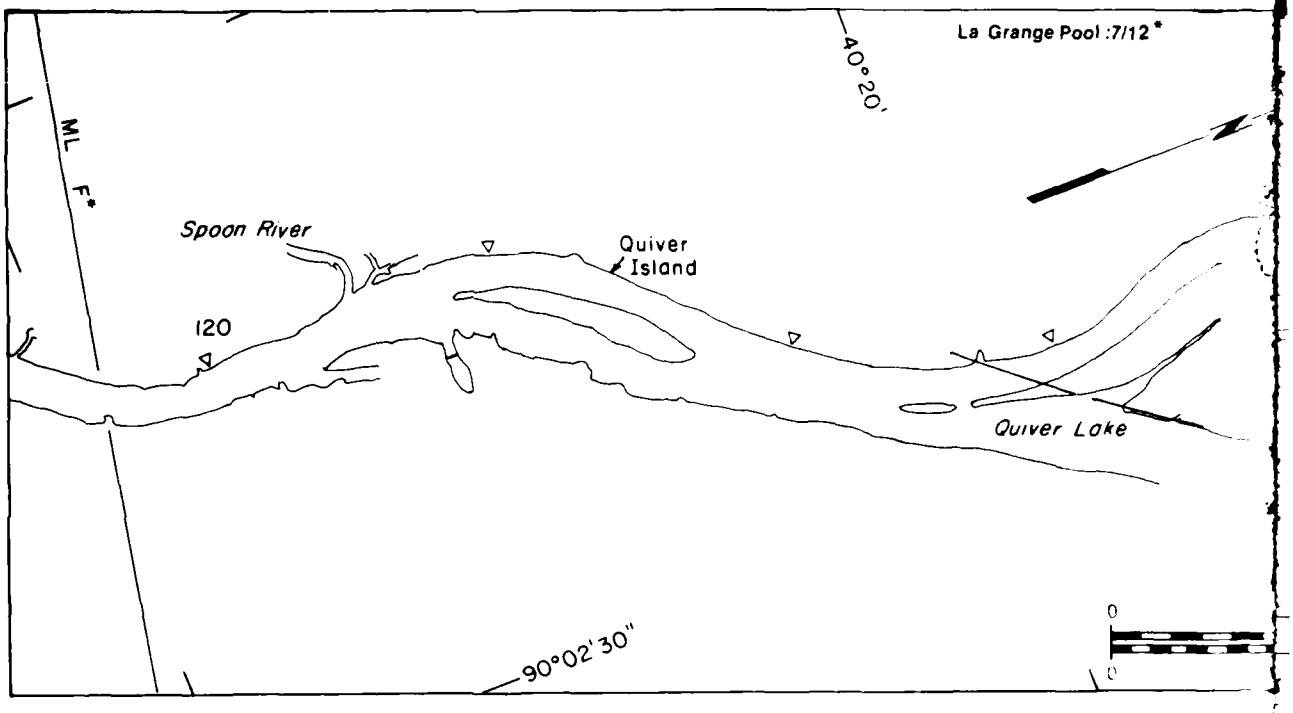
Total area ($m^2 \times 10^6$)

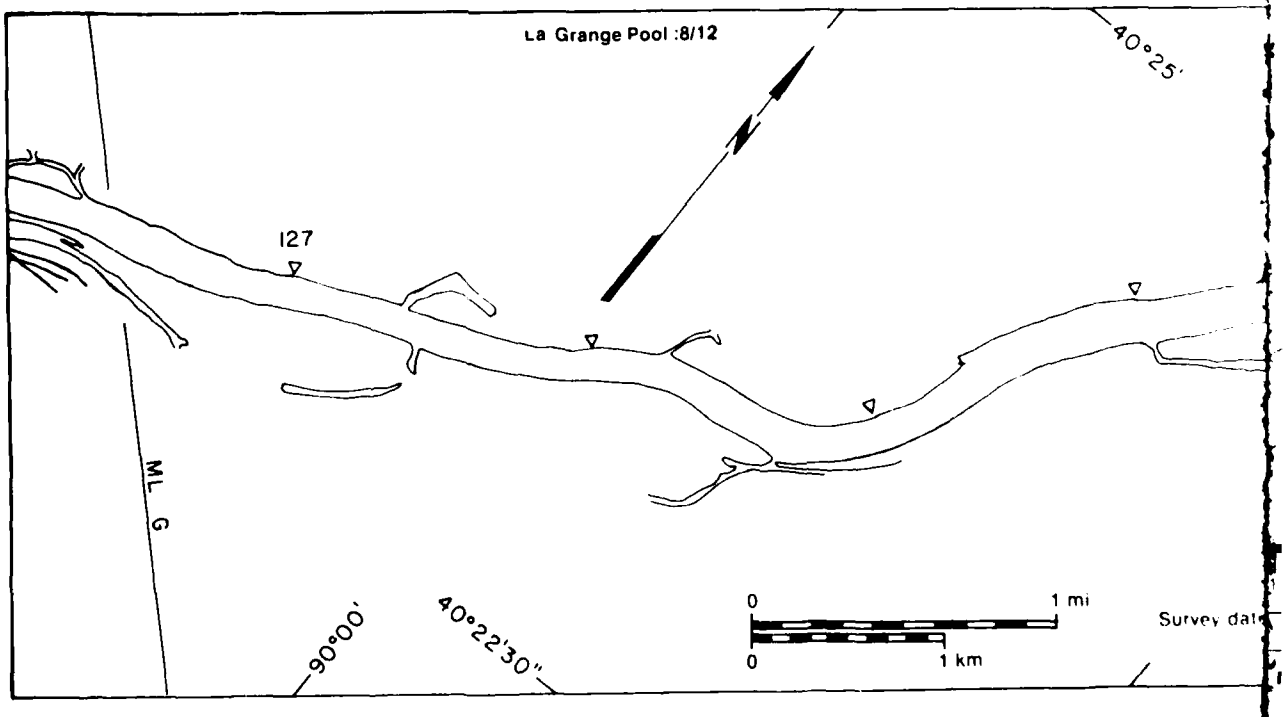
25 February 1986

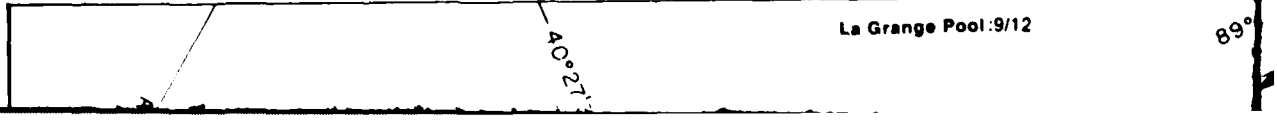
kee River

UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
n water	5.85	NA
d ice cover	1.23	NA
d ice cover with n-water areas	0.00	—
gmented ice cover	0.00	NA
gmented ice cover open-water areas	0.00	—
floes or frazil slush pans	0.15	1
cal area ($m^2 \times 10^6$)	7.30*	

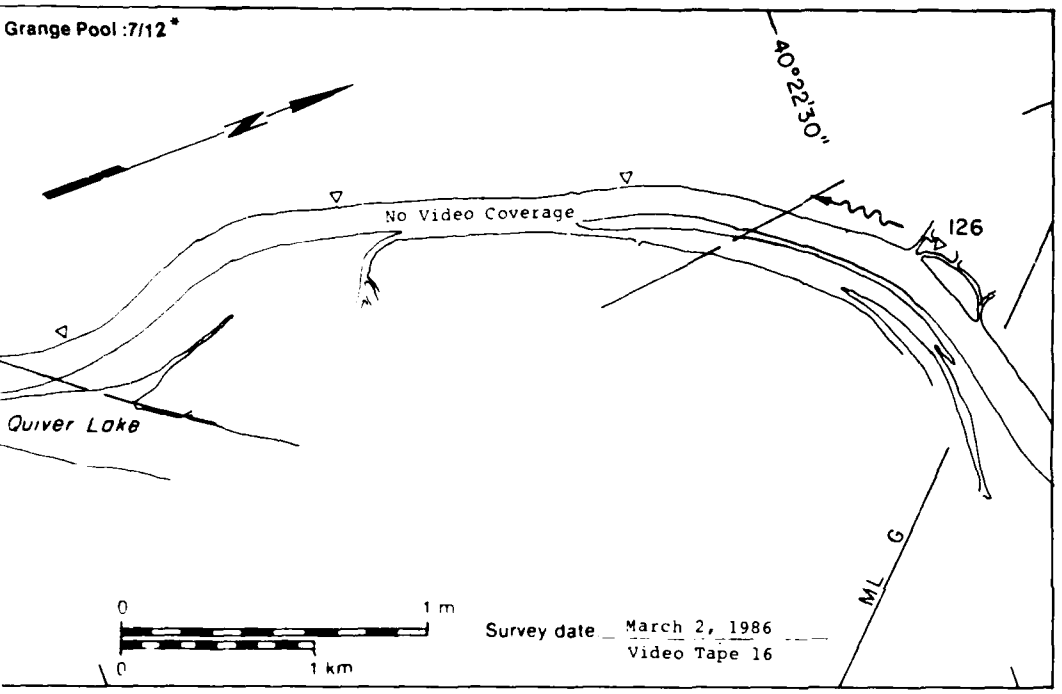
* Includes 0.07×10^6 m^2 of no video coverage

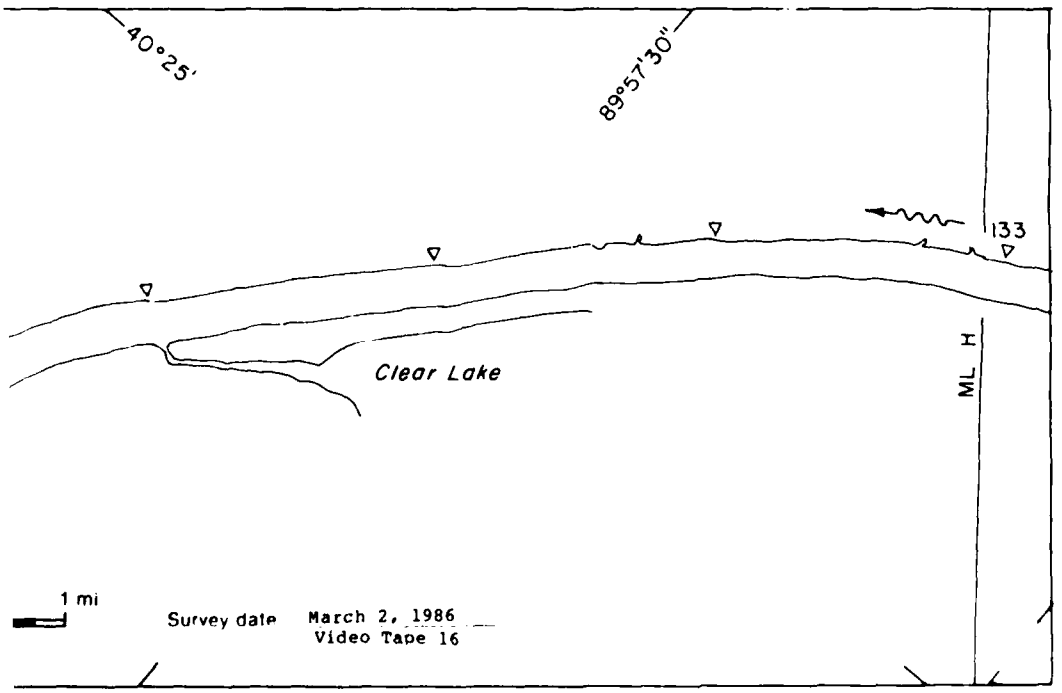

La Grange Pool :7/12*
40°20'
ML F*
Spoon River
Quiver Island
120
Quiver Lake
90°02'30"
0

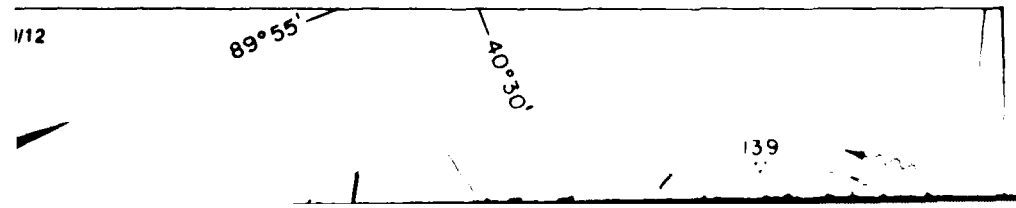

La Grange Pool :8/12
40°25'
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km
Survey dat


La Grange Pool :9/12
40°27'
89°

2 March 1986

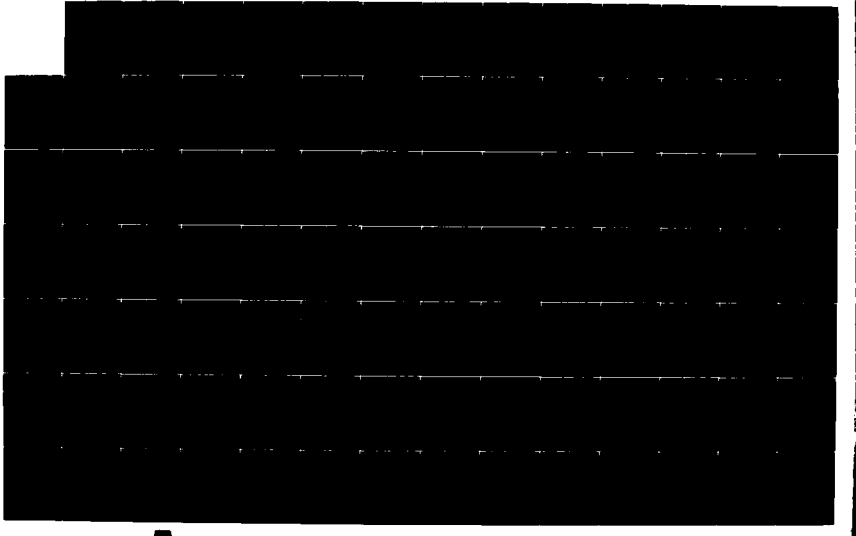

Grange Pool :7/12*
40°22'30"
No Video Coverage
126
Quiver Lake
ML G
0
1 m
0
1 km
Survey date March 2, 1986
Video Tape 16

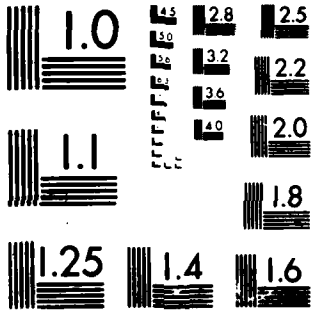

40°25'
89°57'30"
133
Clear Lake
ML H
1 mi
Survey date March 2, 1986
Video Tape 16

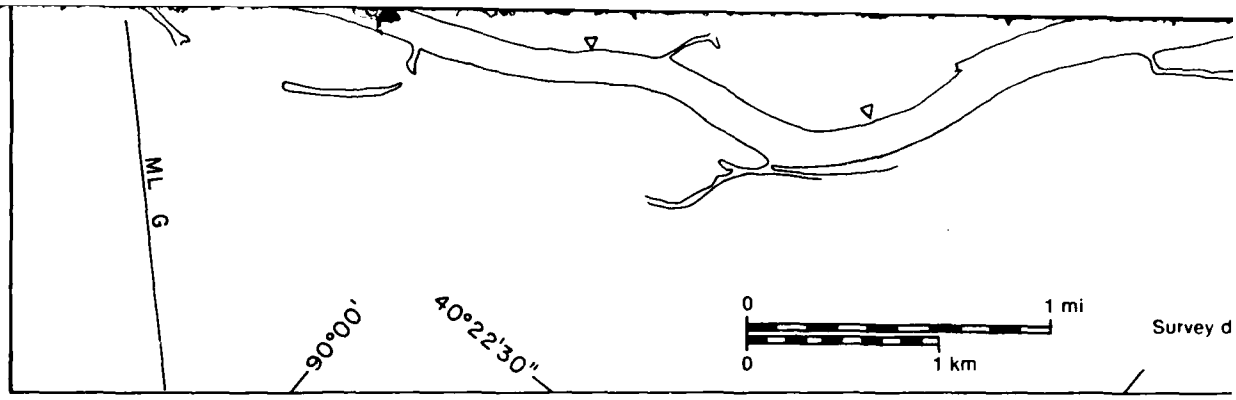

1/12
89°55'
40°30'

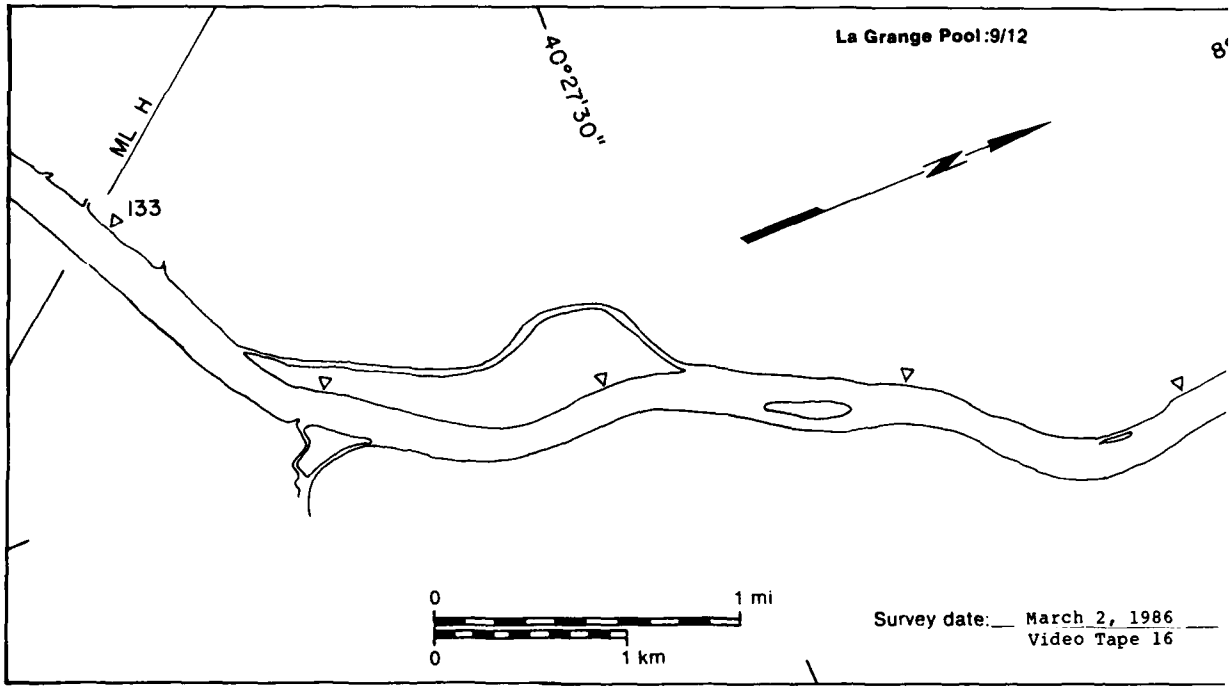
AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87 13/14

UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL

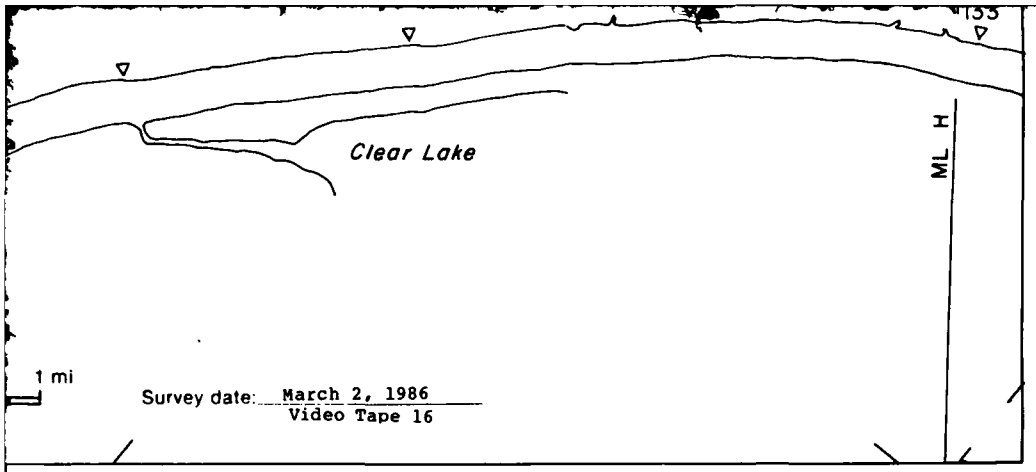


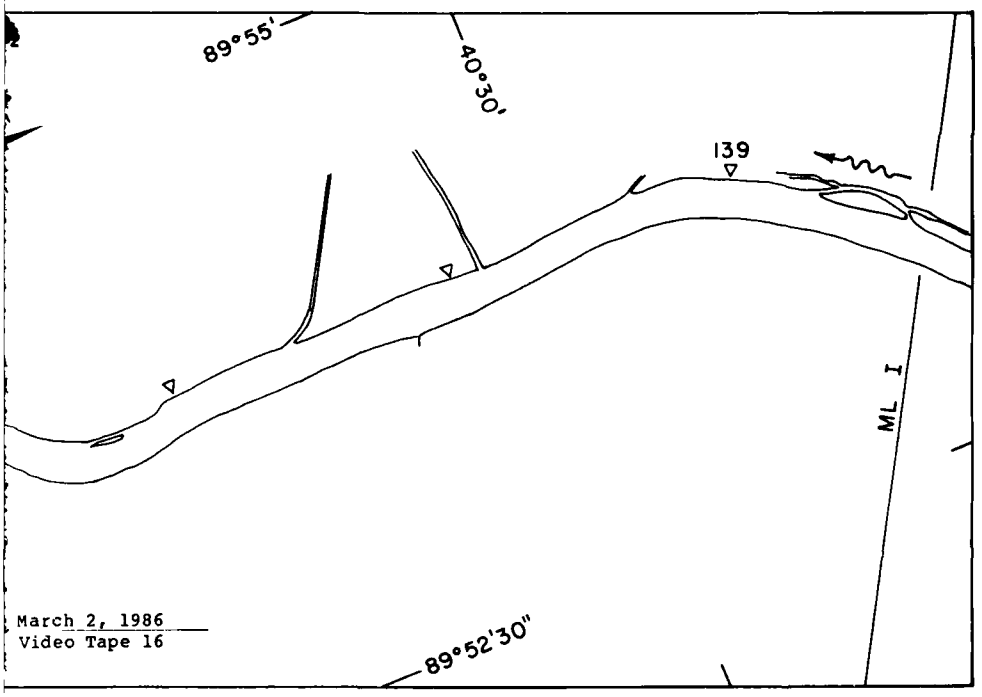

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6





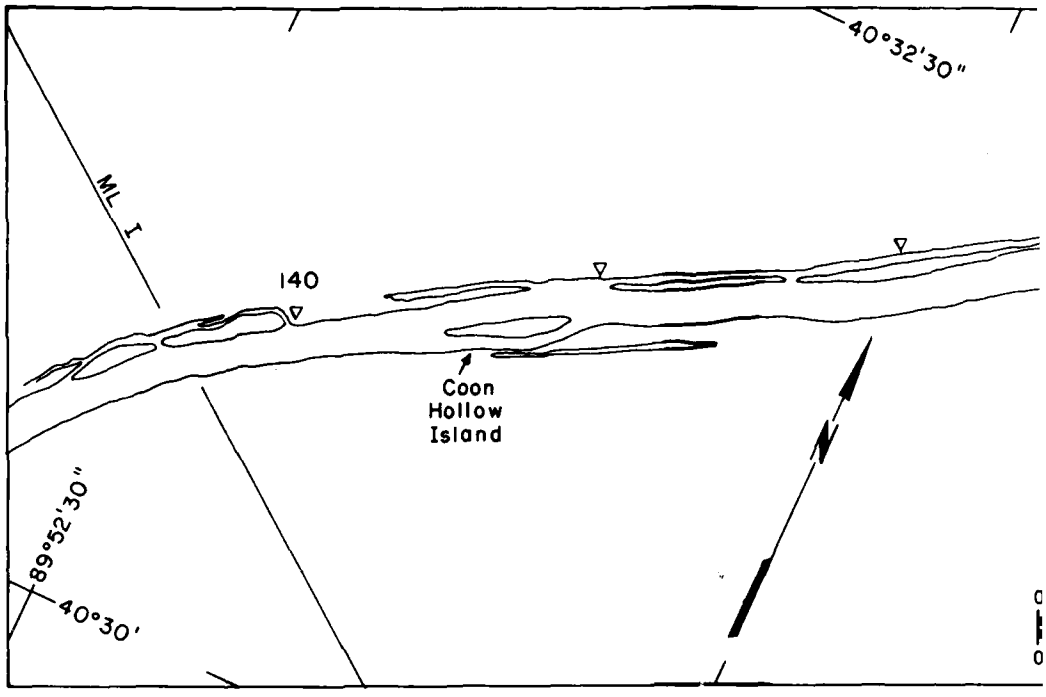
• **The downstream** limit of Illinois River video coverage was in the vicinity of mile 120 at **Havana, Illinois, on all dates.** There is no coverage of La Grange Pool maps 1/12 through **6/12 (match lines A** through E).

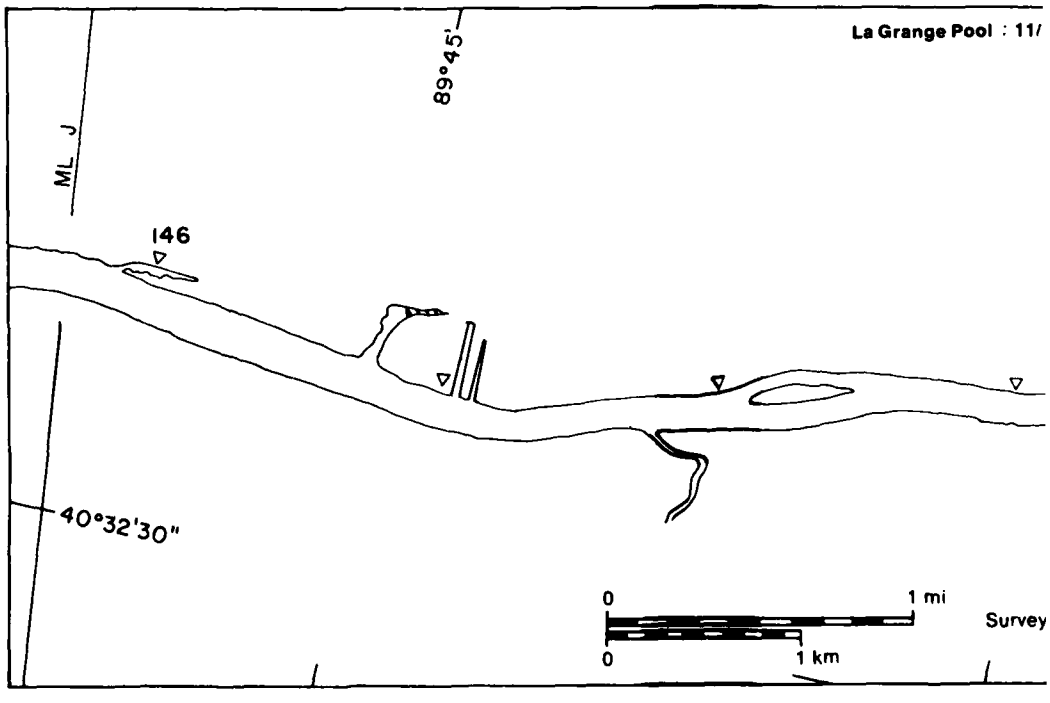

Clear Lake
ML H
1 mi
Survey date: March 2, 1986
Video Tape 16

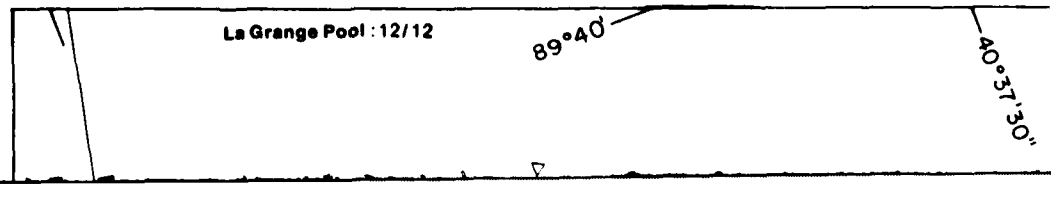

89°55'
40°30'
139
ML I
March 2, 1986
Video Tape 16
89°52'30"

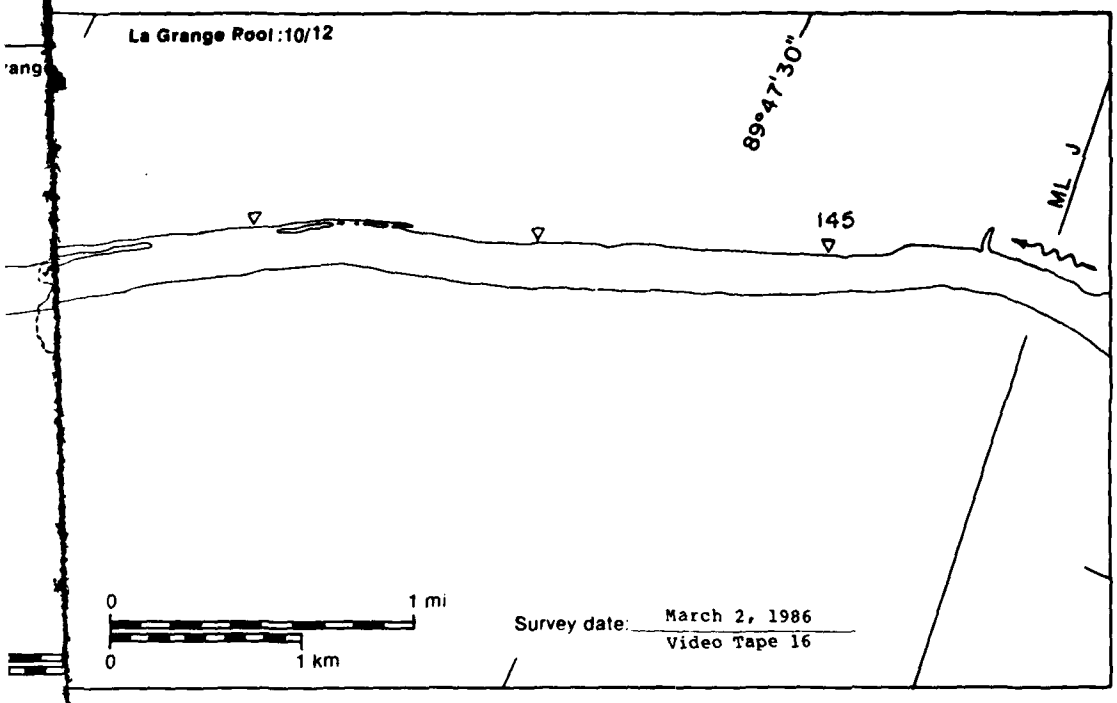
D

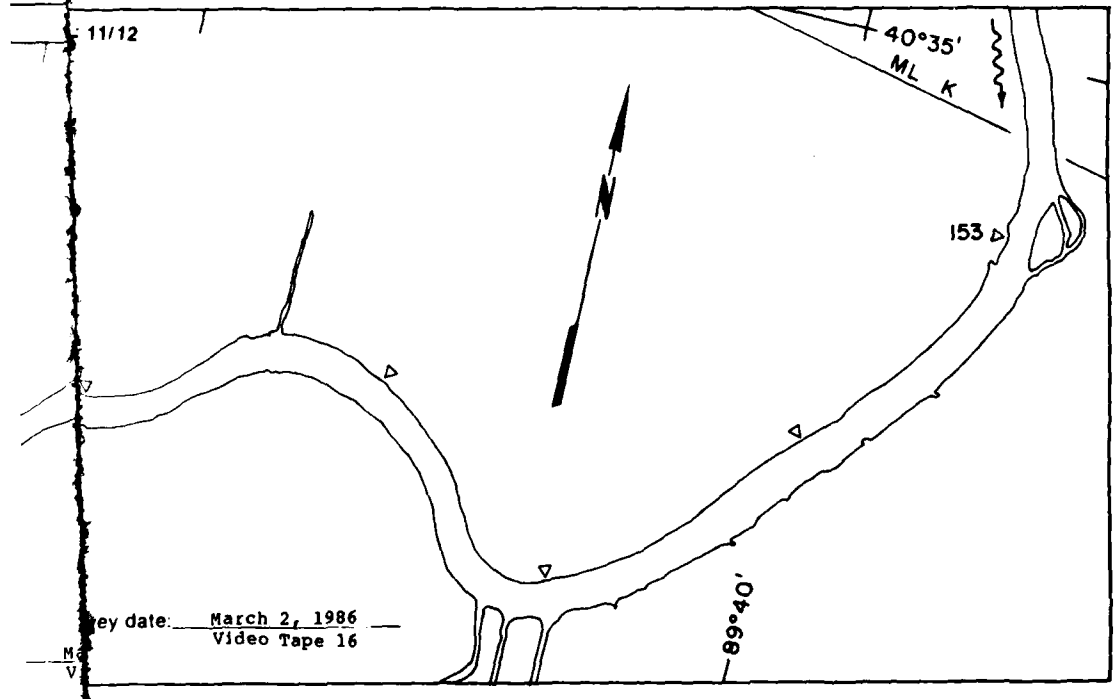
2 March 1986


40°32'30"
ML I
140
Coon
Hollow
Island
89°52'30"
40°30'


La Grange Pool : 11/
89°45'
ML J
146
40°32'30"
0
1 mi
0
1 km
Survey


La Grange Pool : 12/12
89°40'
40°37'30"

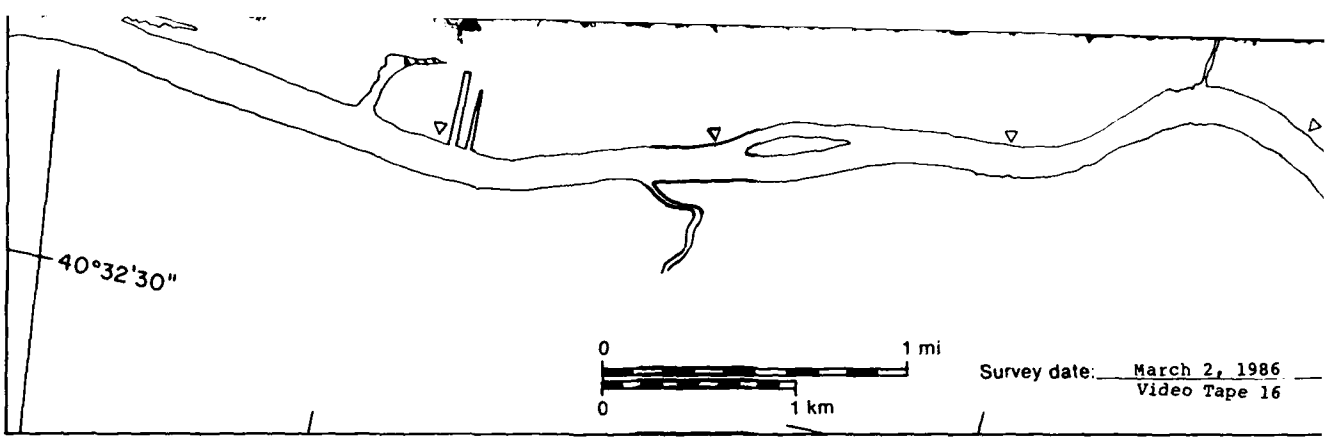


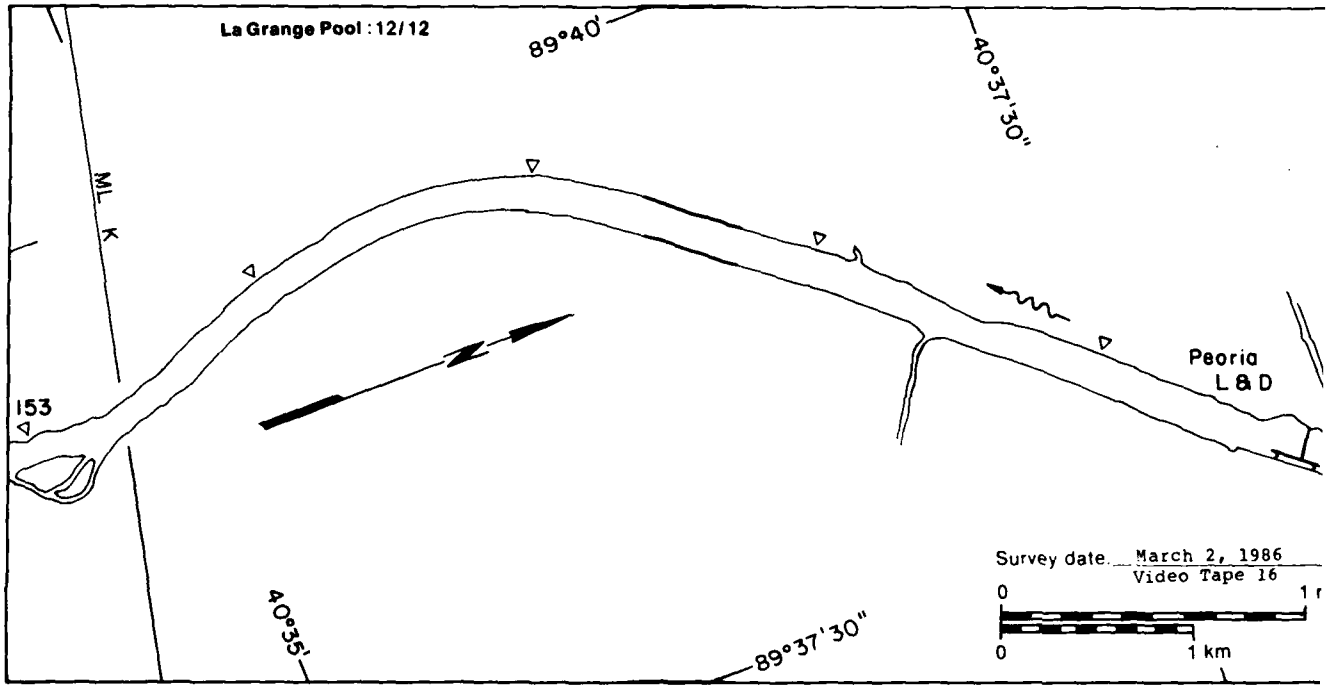


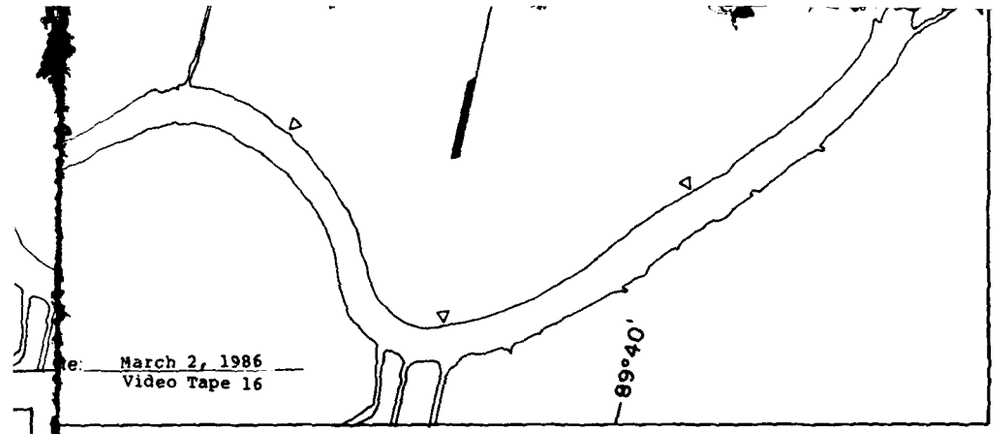
La Grange Pool

MAP UNITS

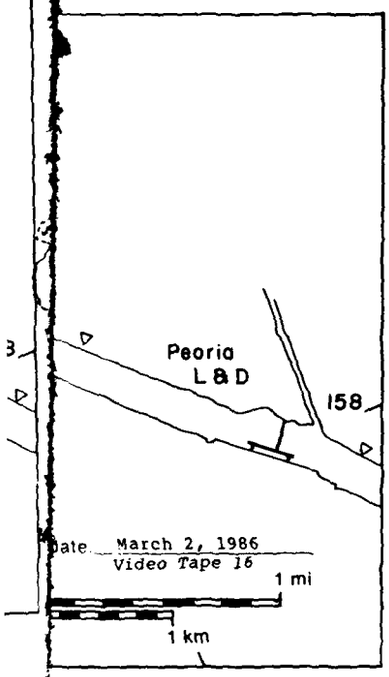
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water		


40°32'30"
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L&D
Survey date: March 2, 1986
Video Tape 16
0
1 km
40°35'
89°37'30"



Date: March 2, 1986
Video Tape 16

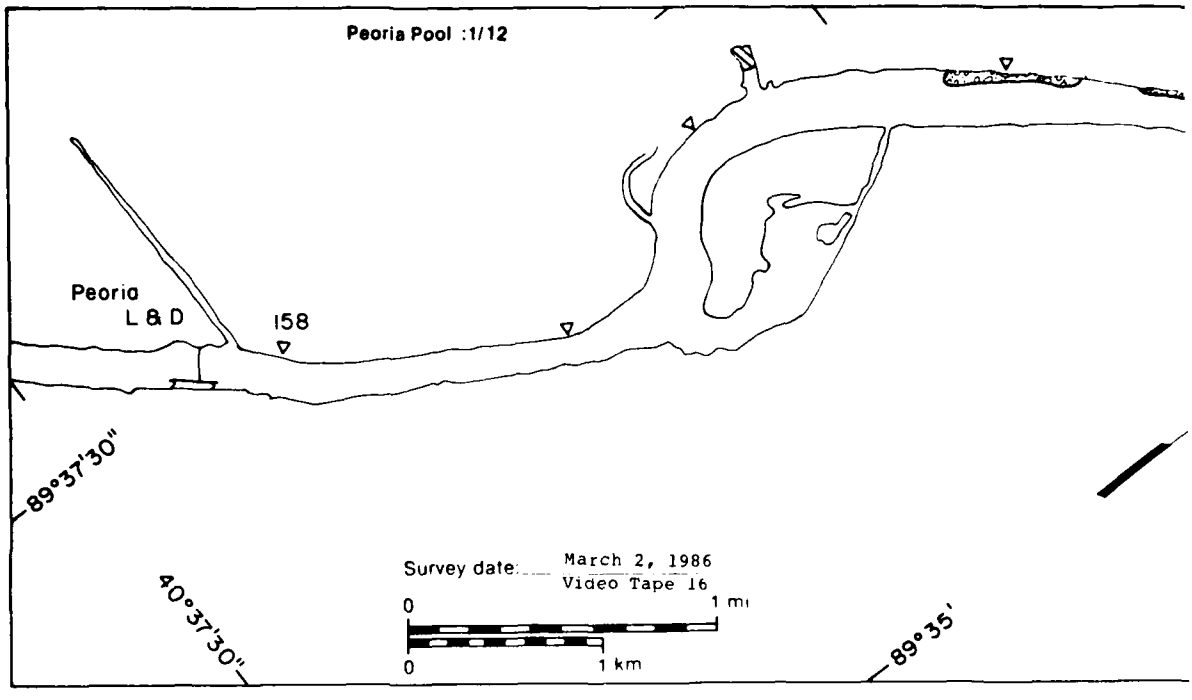


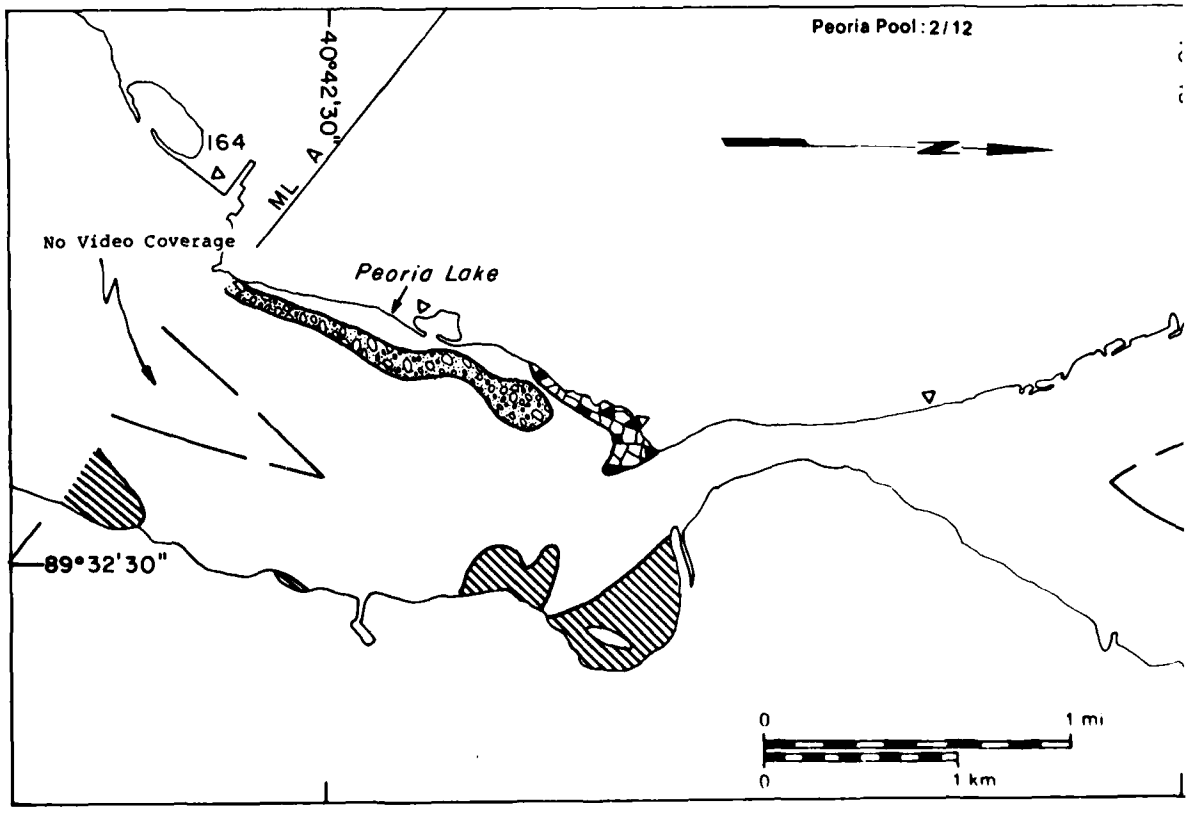
La Grange Pool

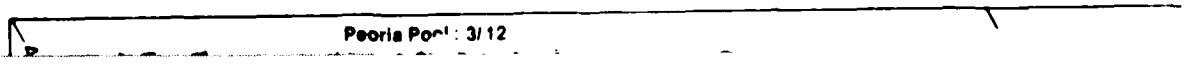
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.81	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.71*	

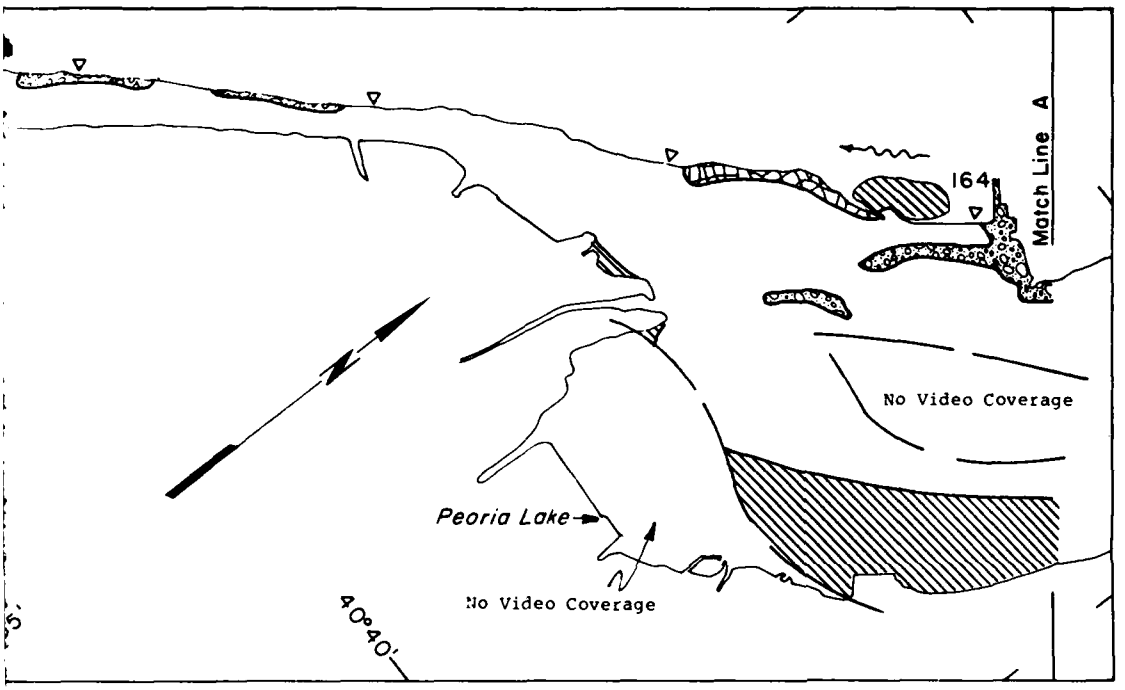
* Includes 0.88×10^6 m^2 of no video coverage

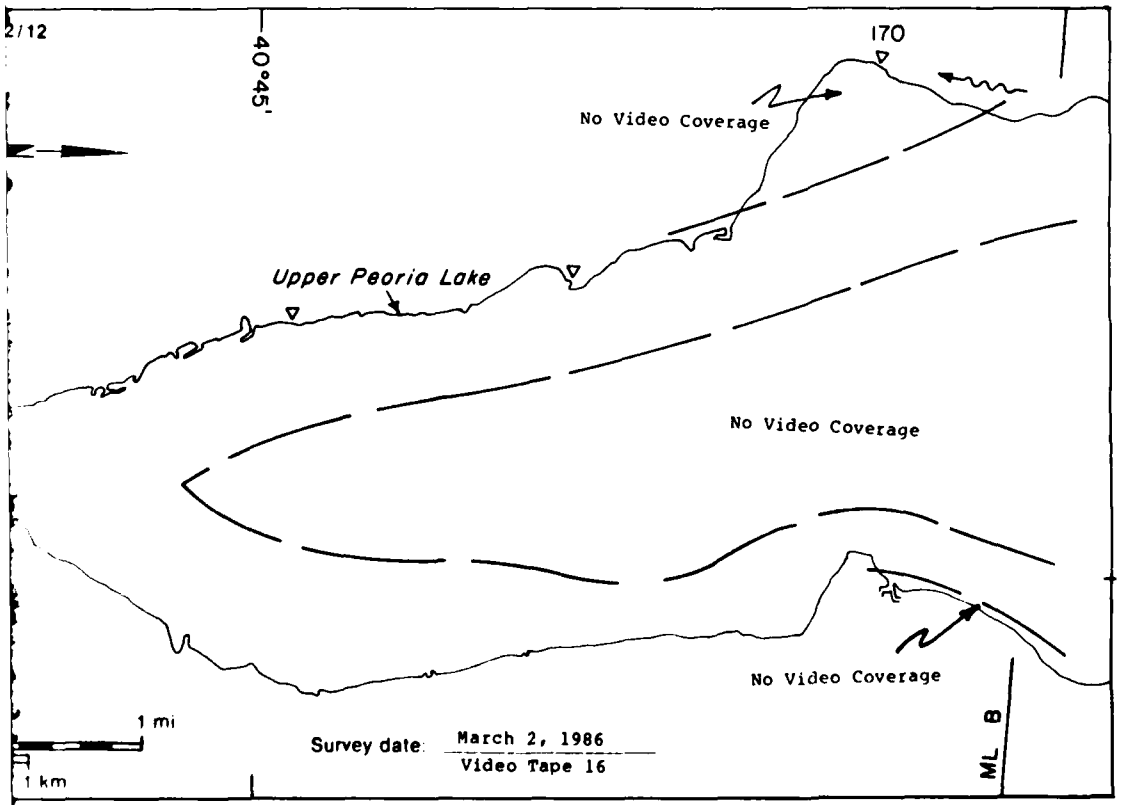

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: March 2, 1986
Video Tape 16
0
1 mi
0
1 km
89°35'

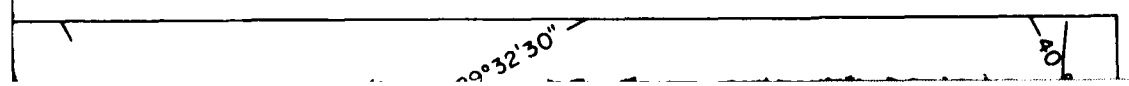

Peoria Pool : 2/12
40°42'30"
ML A
164
No Video Coverage
Peoria Lake
89°32'30"
0
1 mi
0
1 km

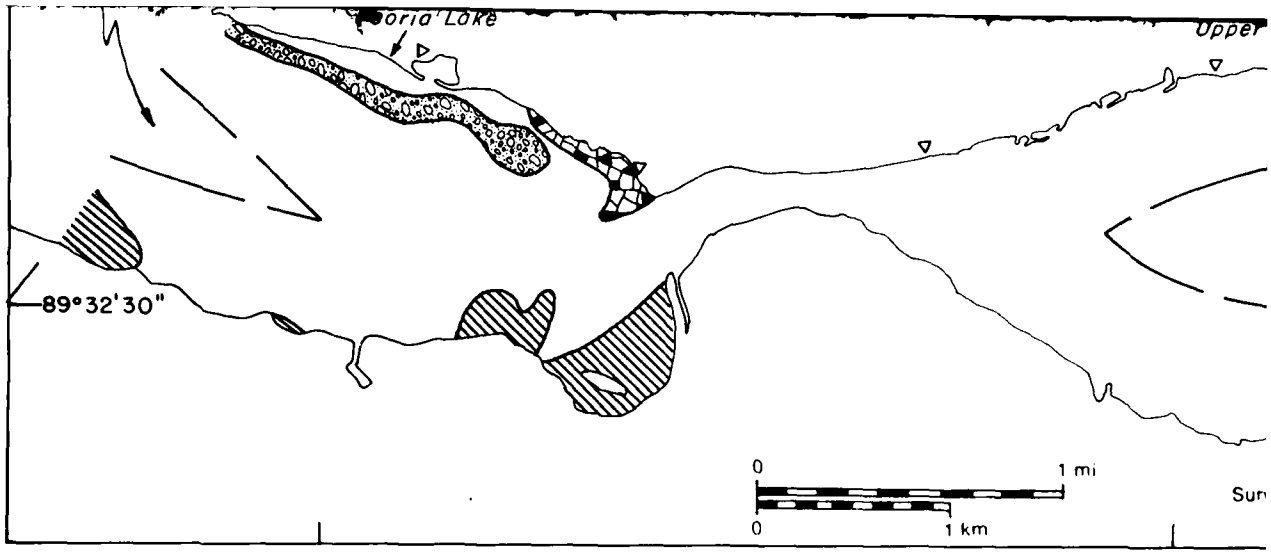

Peoria Pool : 3/12

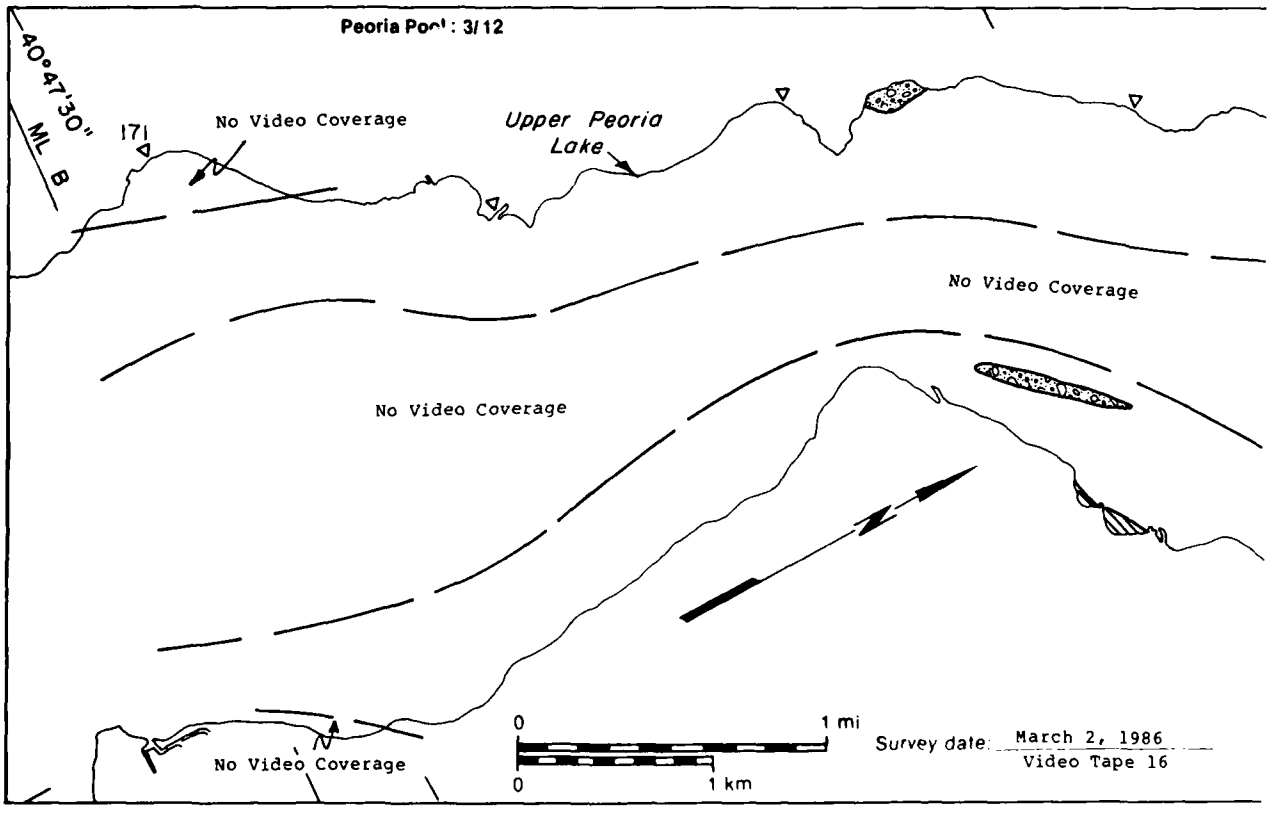
2 March 1986

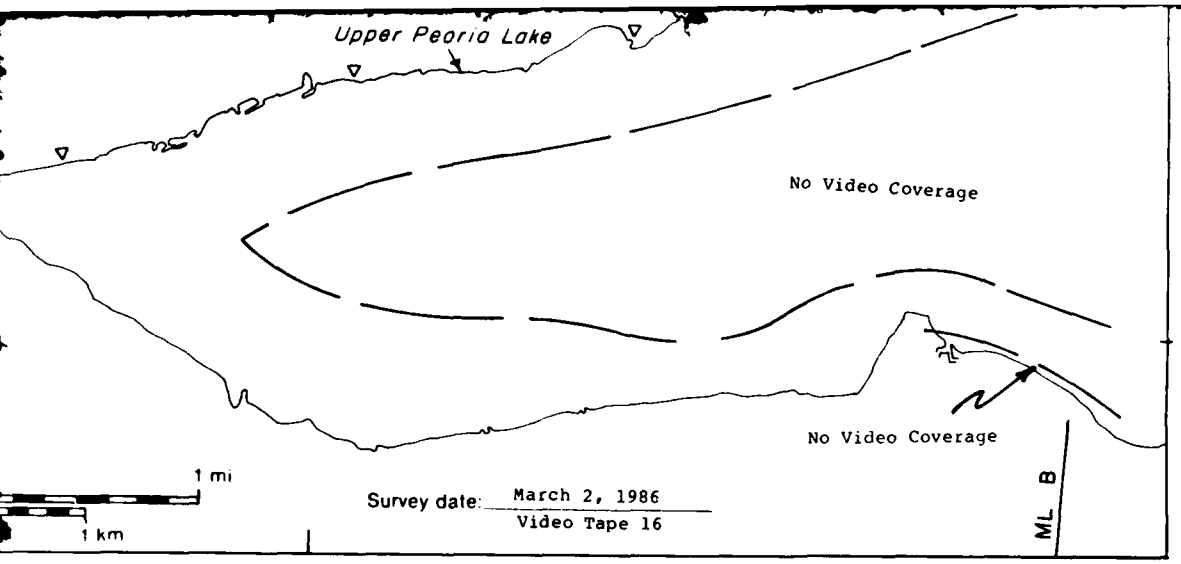

164
Match Line A
No Video Coverage
Peoria Lake
No Video Coverage
40°40'

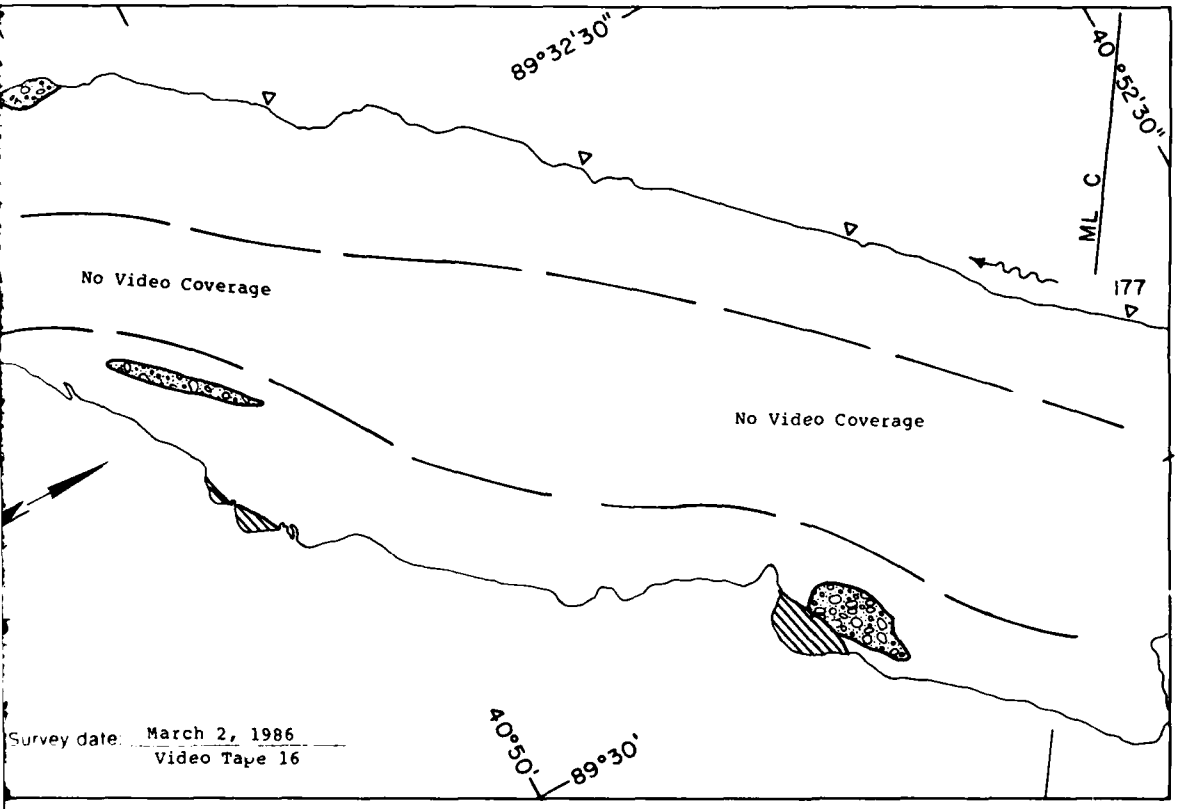

2/12
40°45'
170
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
1 mi
1 km
Survey date: March 2, 1986
Video Tape 16
ML B


89°32'30"

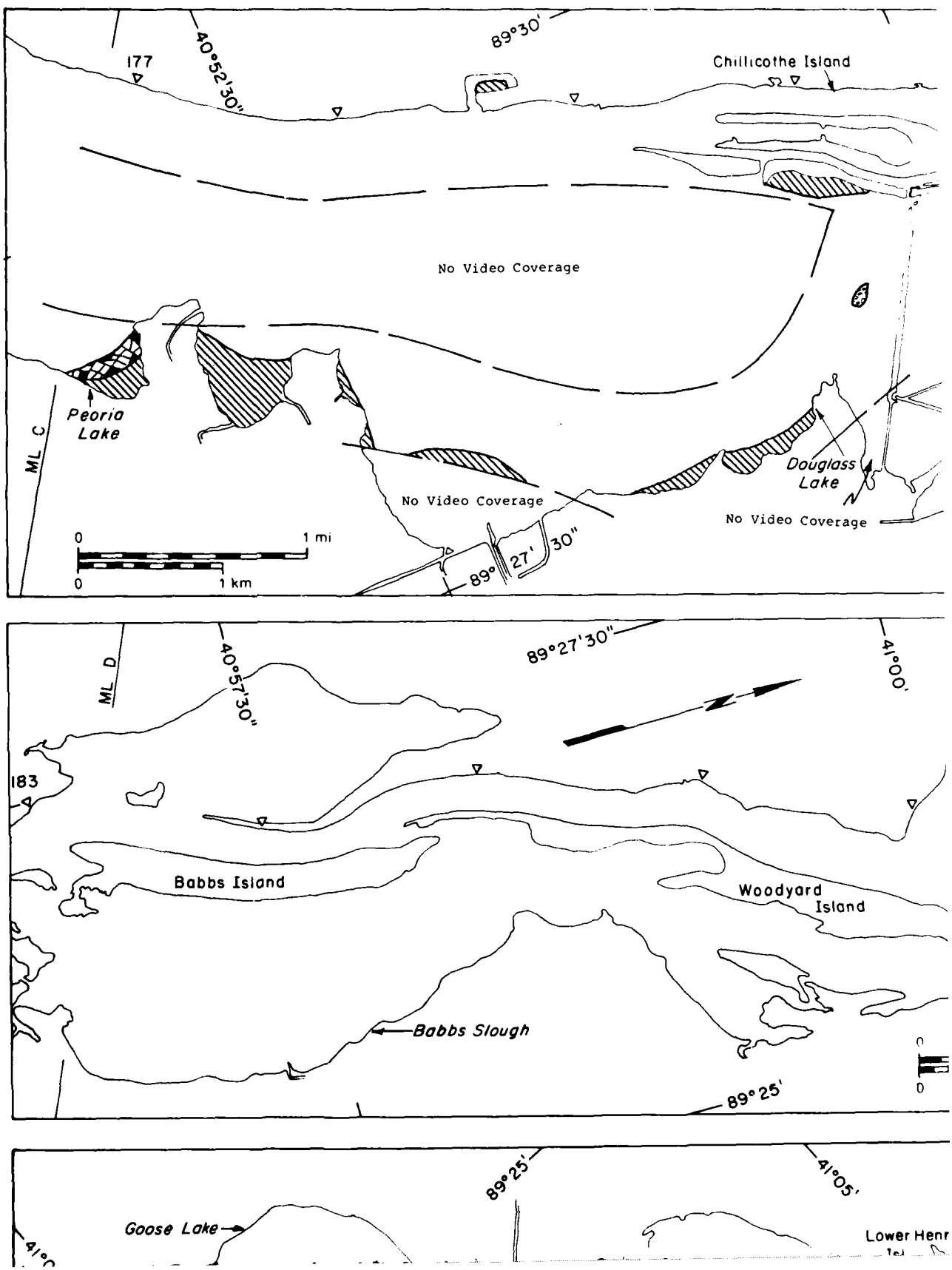

Peoria Lake
Upper
89°32'30"
0
1 mi
0
1 km

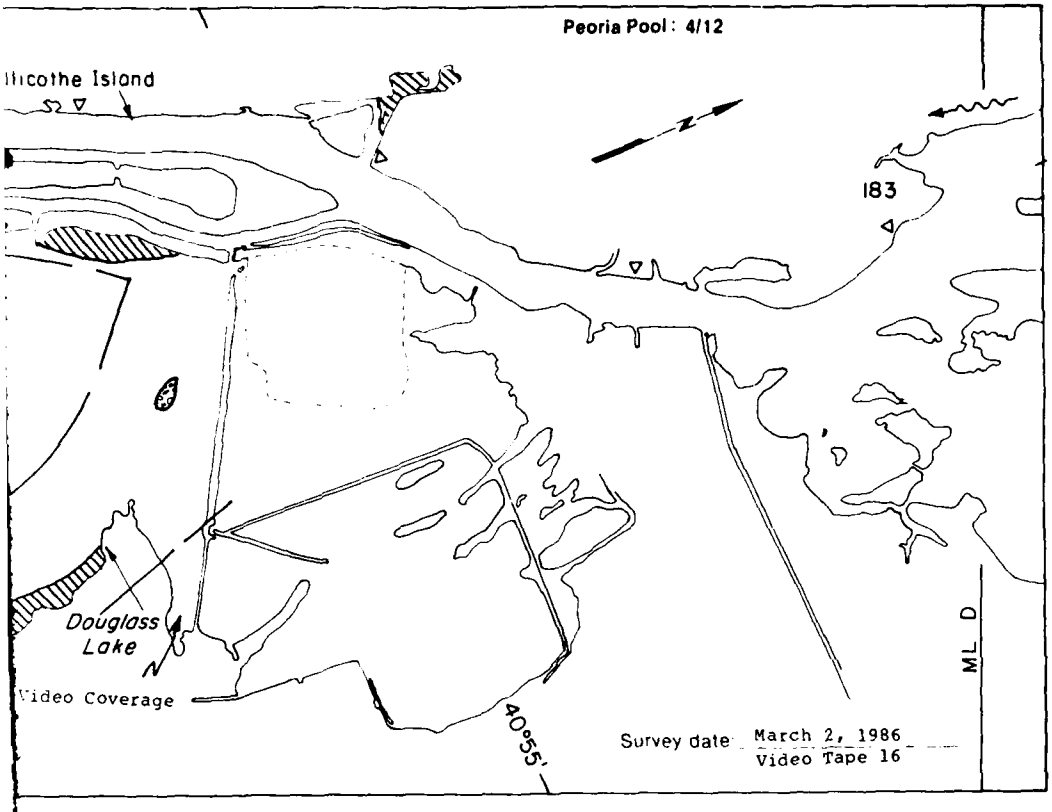

Peoria Pool: 3/12
40°47'30"
ML B
171
No Video Coverage
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
N
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

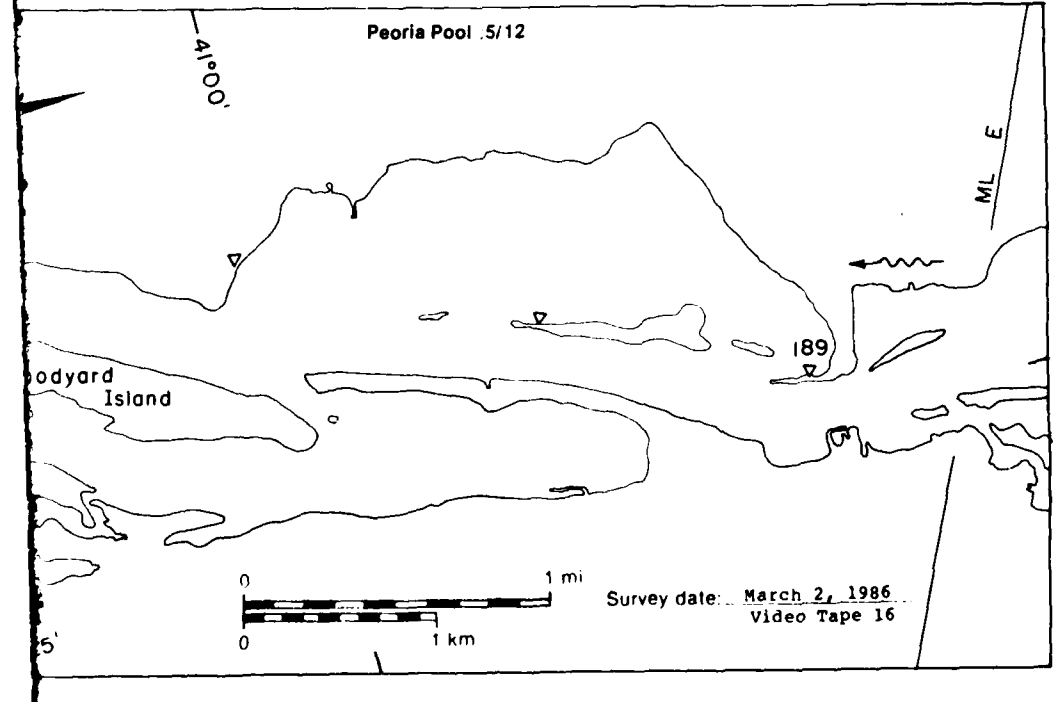

Upper Peoria Lake
No Video Coverage
No Video Coverage
ML B
1 mi
1 km
Survey date: March 2, 1986
Video Tape 16

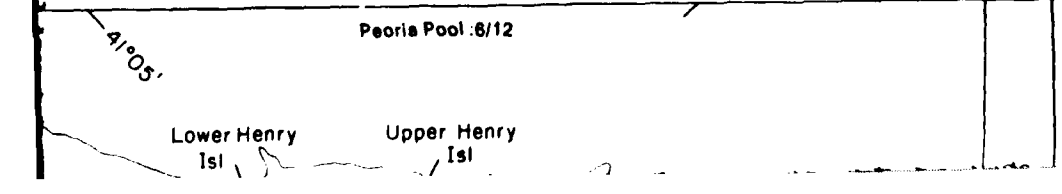

89°32'30"
40°52'30"
ML C
177
No Video Coverage
No Video Coverage
Survey date: March 2, 1986
Video Tape 16
40°50'
89°30'

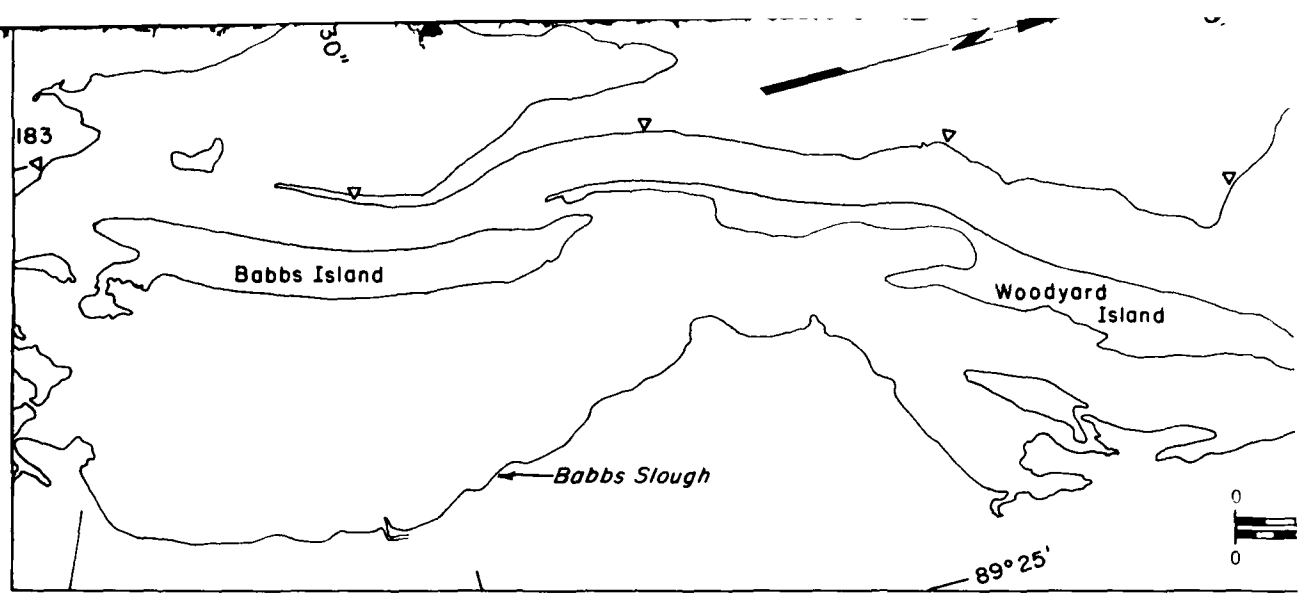
2 March 1986

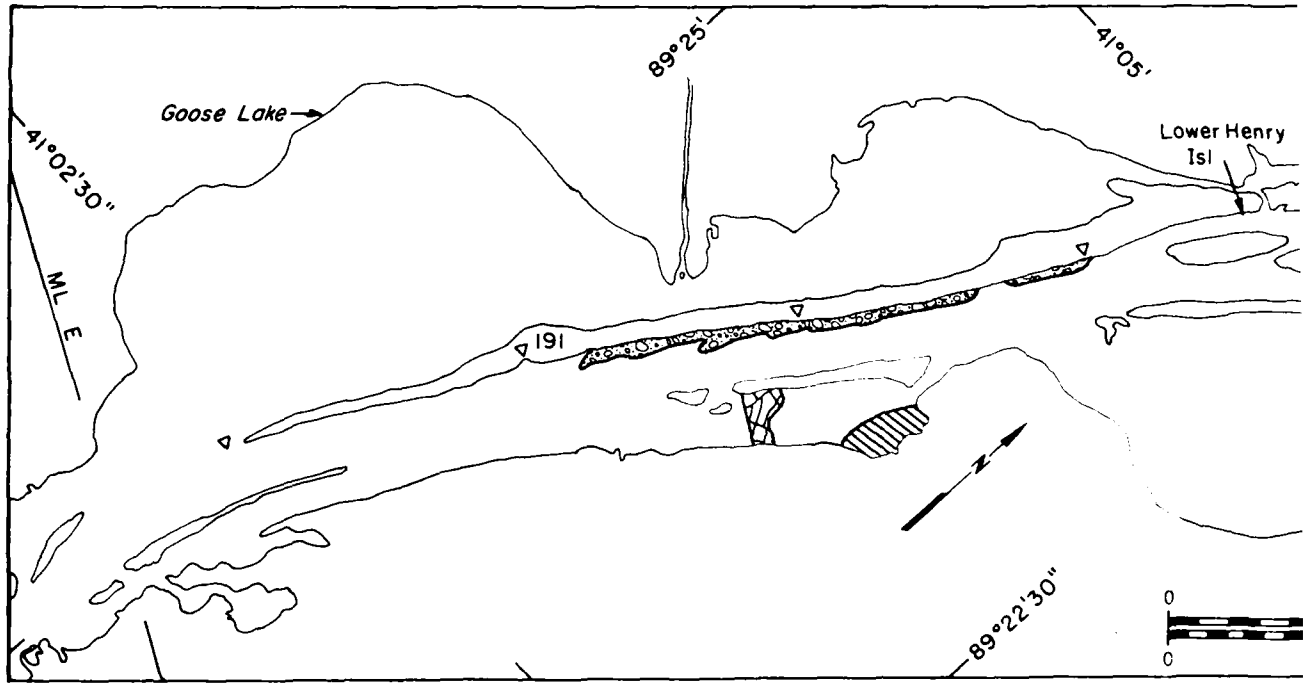

40°52'30"
89°30'
177
Chillicothe Island
No Video Coverage
Peoria Lake
ML C
No Video Coverage
Douglass Lake
No Video Coverage
0
1 mi
0
1 km
89°
27'
30"
ML D
40°57'30"
89°27'30"
41°00'
183
Babbs Island
Woodyard Island
Babbs Slough
89°25'
89°25'
41°05'
Goose Lake
Lower Henr

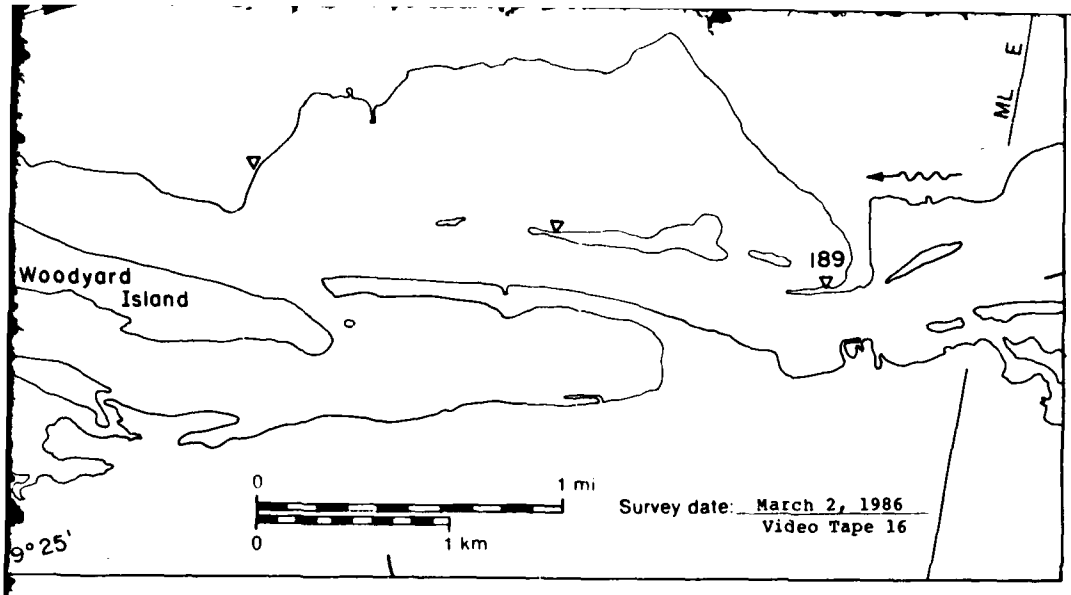

Peoria Pool : 4/12
licothe Island
183
Douglass Lake
Video Coverage
40°55'
ML D
Survey date: March 2, 1986
Video Tape 16

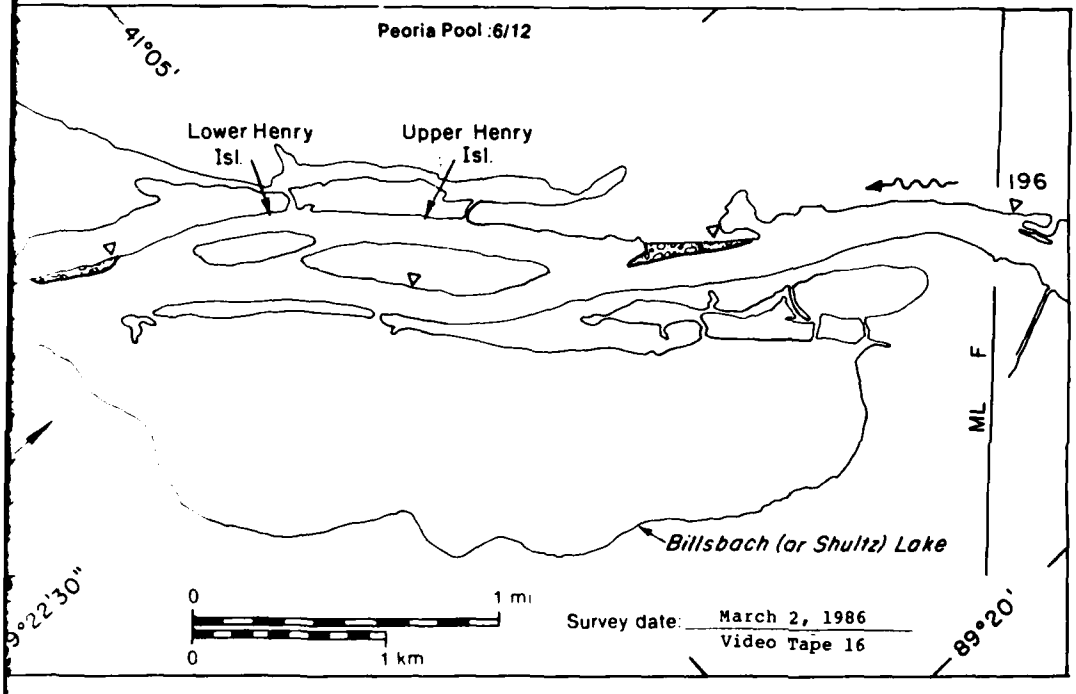

Peoria Pool .5/12
41°00'
ML E
189
odyard Island
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

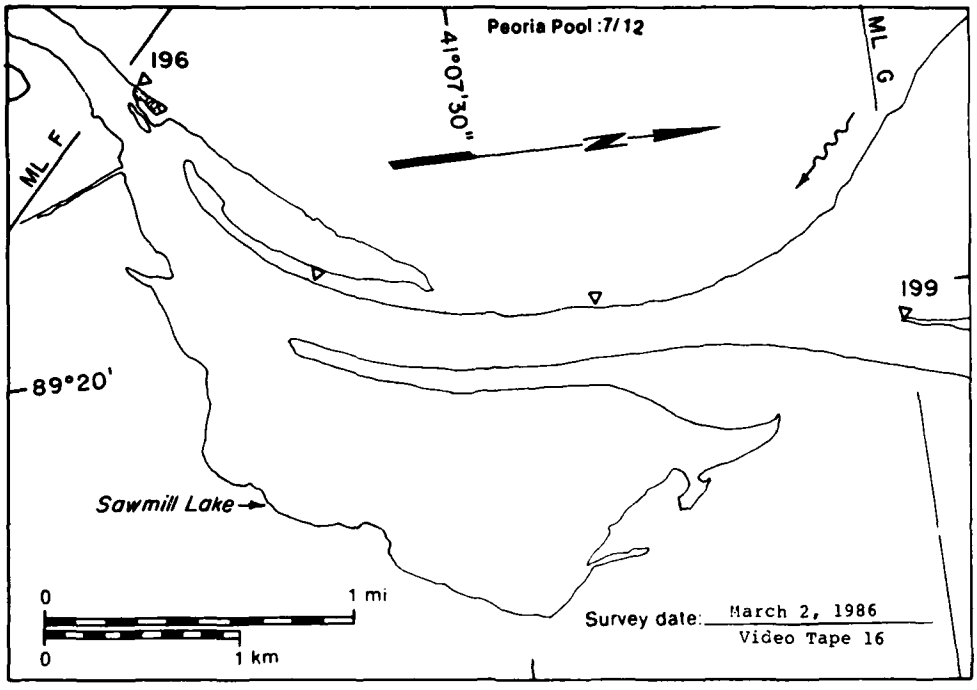

Peoria Pool :6/12
41°05'
Lower Henry Isl
Upper Henry Isl

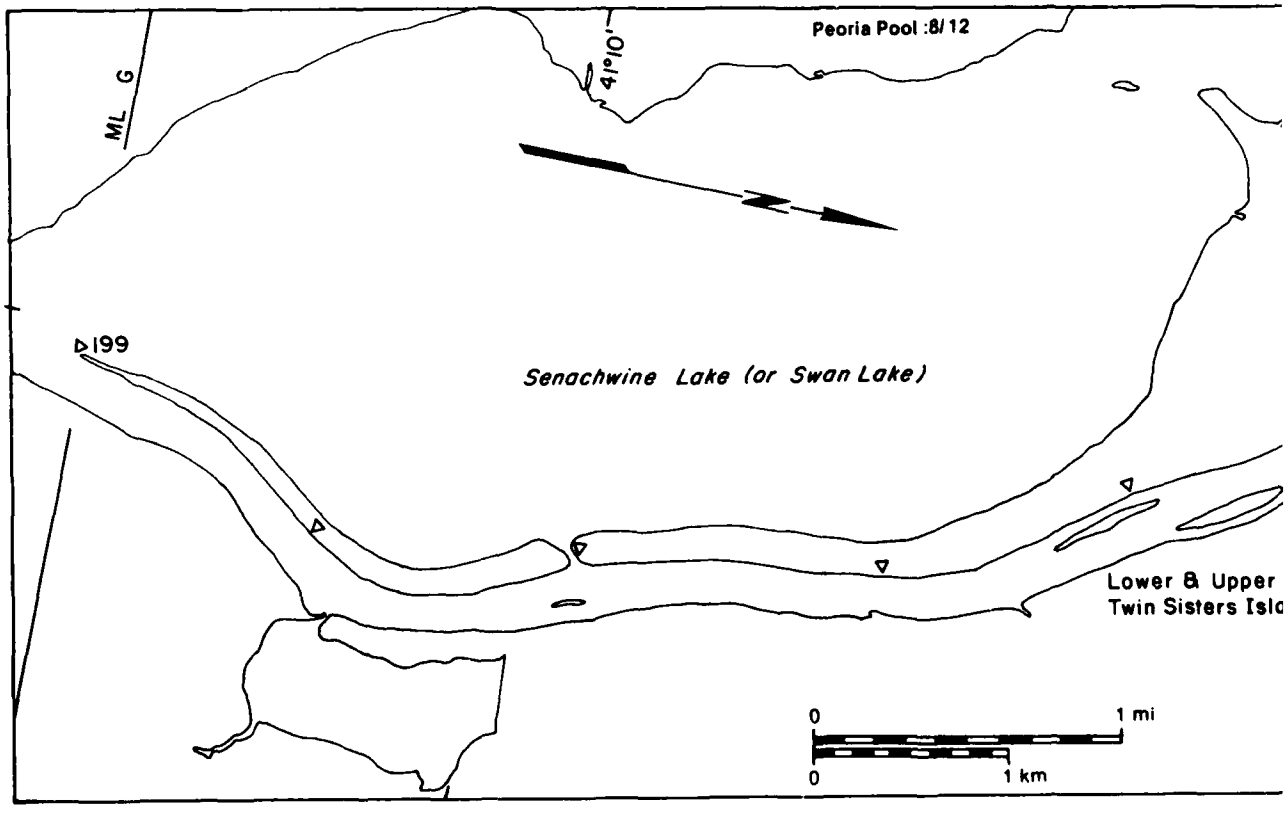

30"
183
Babbs Island
Woodyard
Island
Babbs Slough
0
0
89° 25'

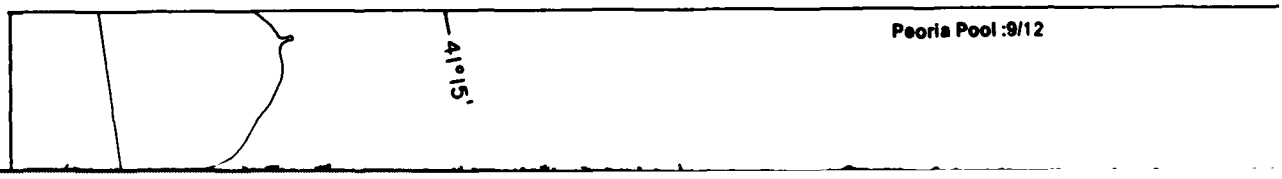

89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
N
89°22'30"
0
0


ML E
Woodyard
Island
189
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16
9°25'

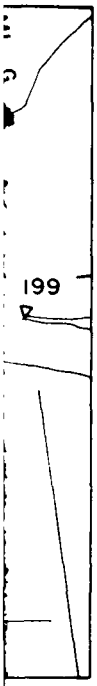

Peoria Pool :6/12
41°05'
Lower Henry
Isl.
Upper Henry
Isl.
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16
9°22'30"
89°20'

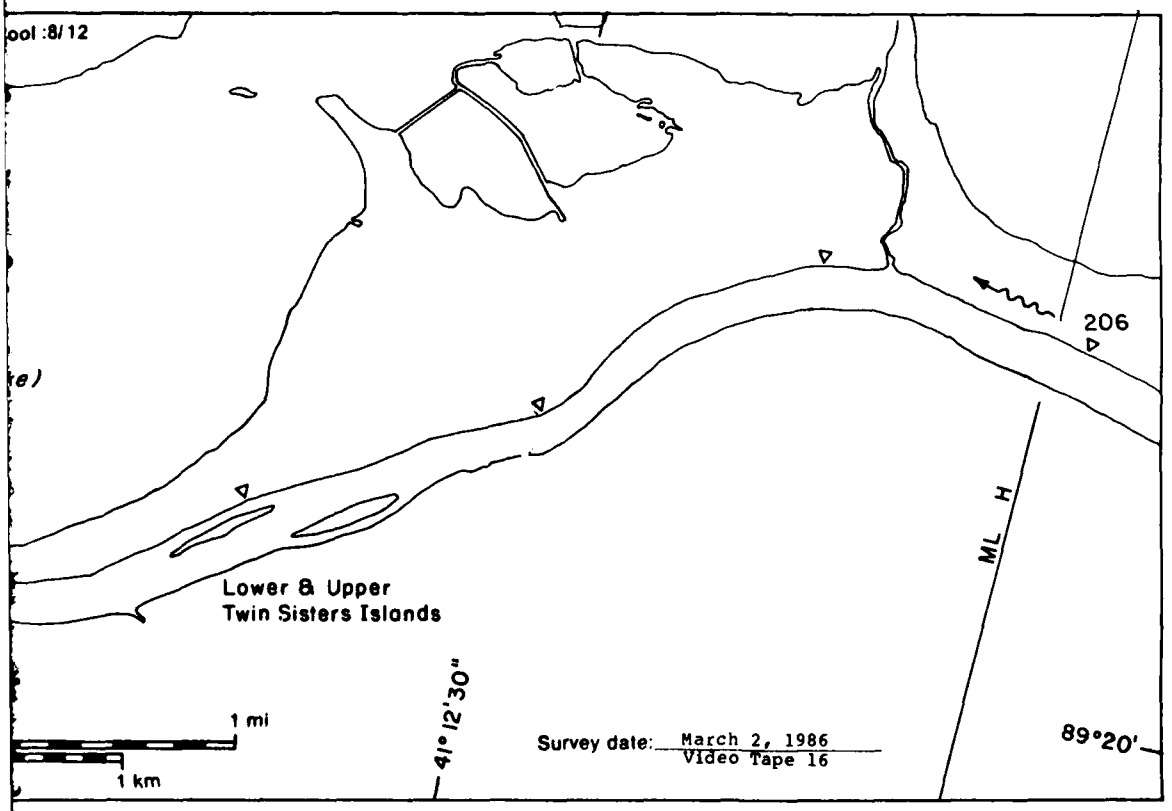

Peoria Pool :7/12
41°07'30"
196
ML G
ML F
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

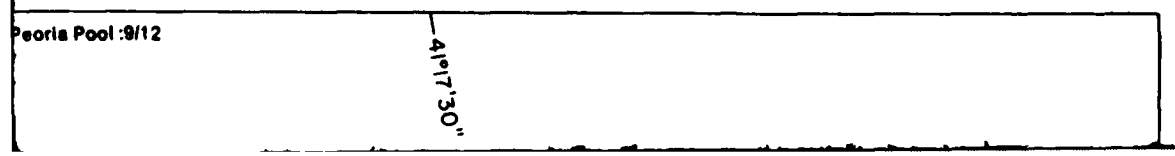

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Isl
0
1 mi
0
1 km

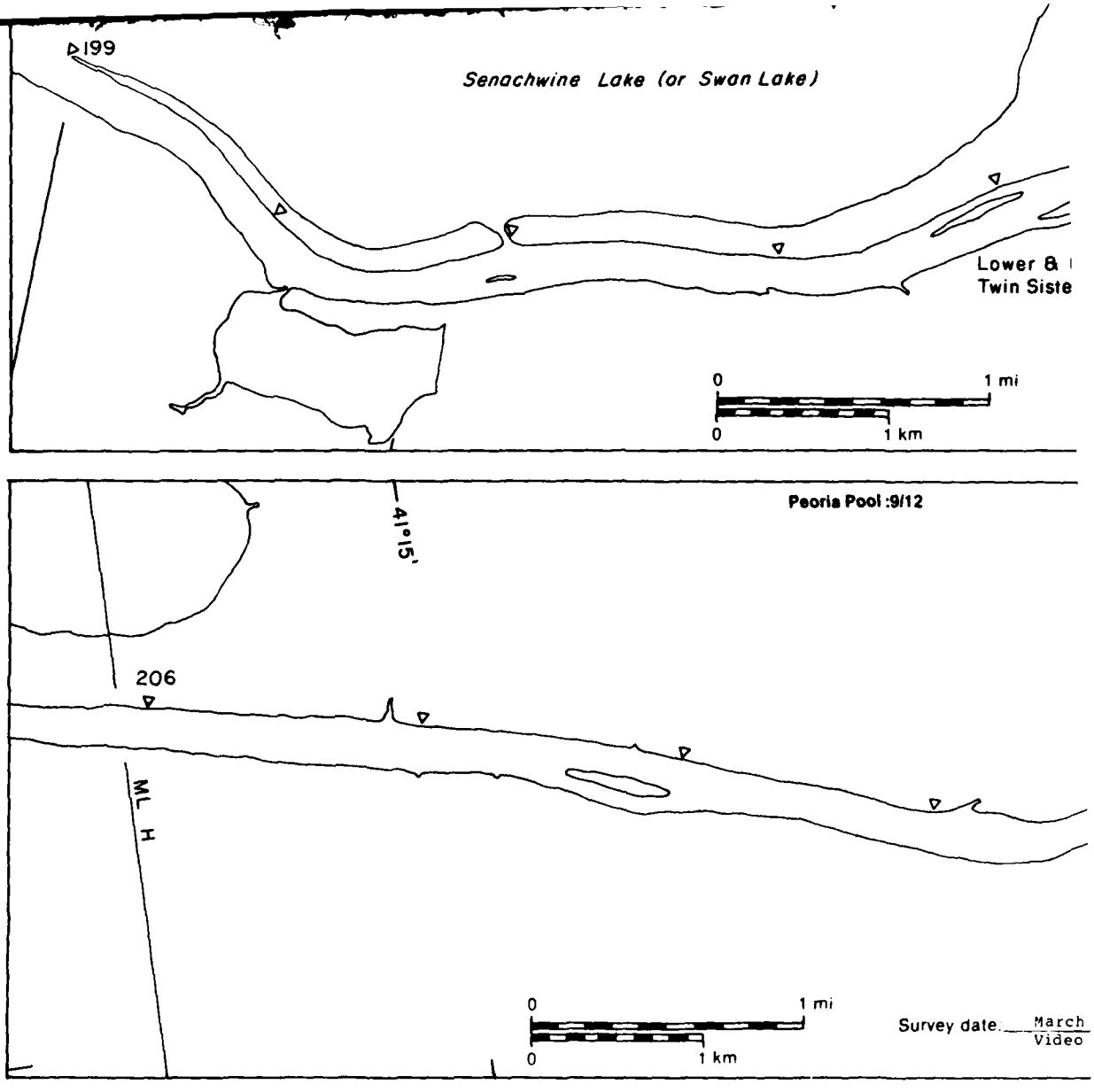

Peoria Pool :9/12
41°15'

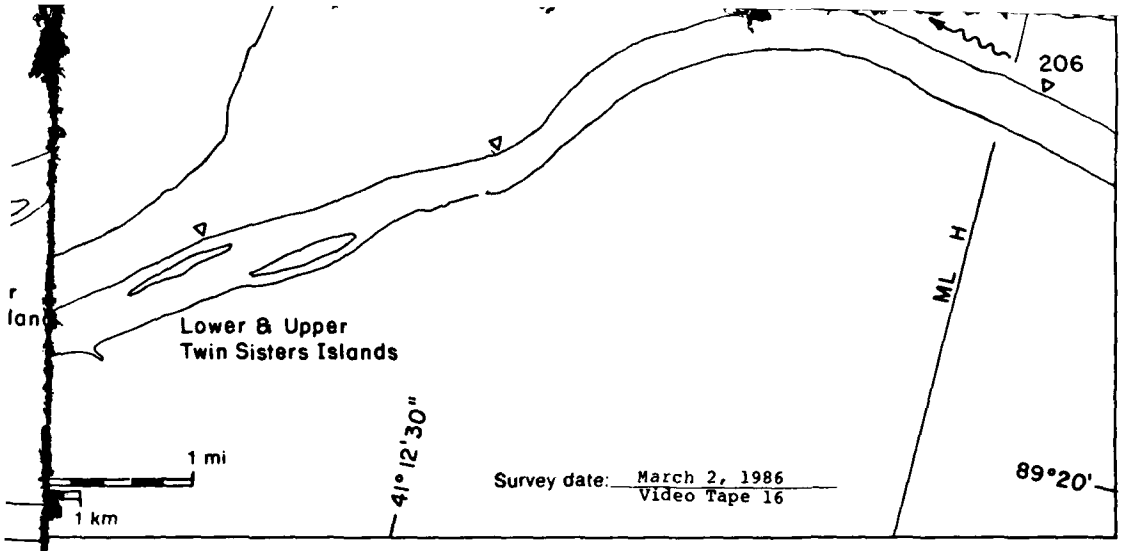
2 March 1986

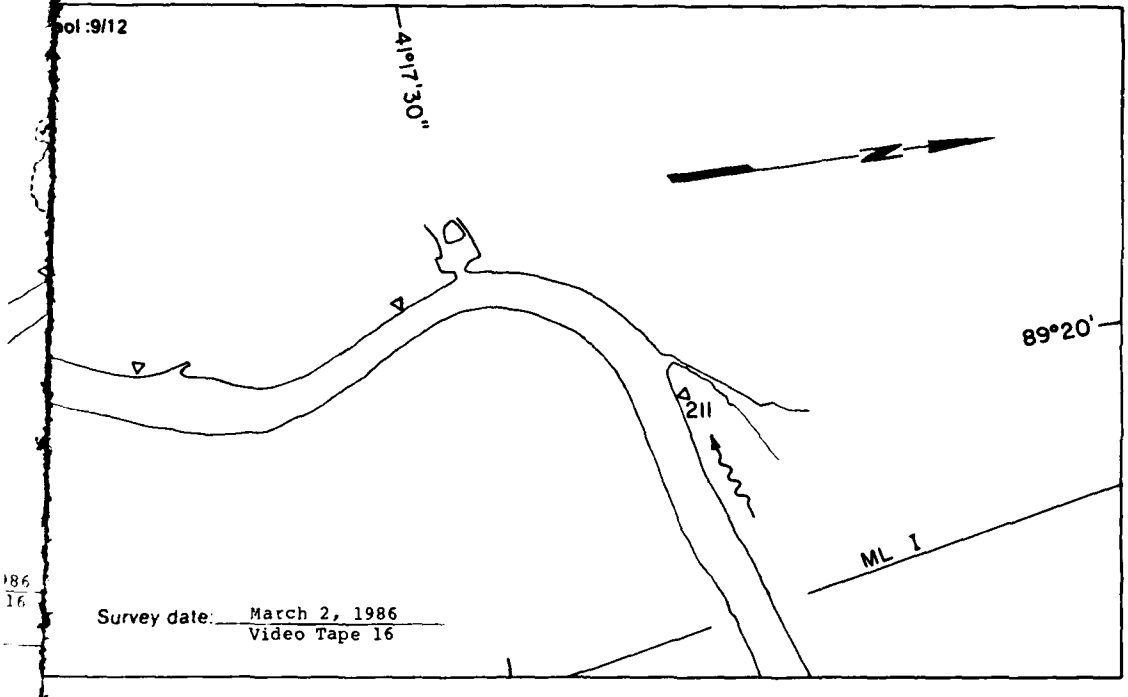

199


ool :8/12
206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12' 30"
Survey date: March 2, 1986
Video Tape 16
89°20'

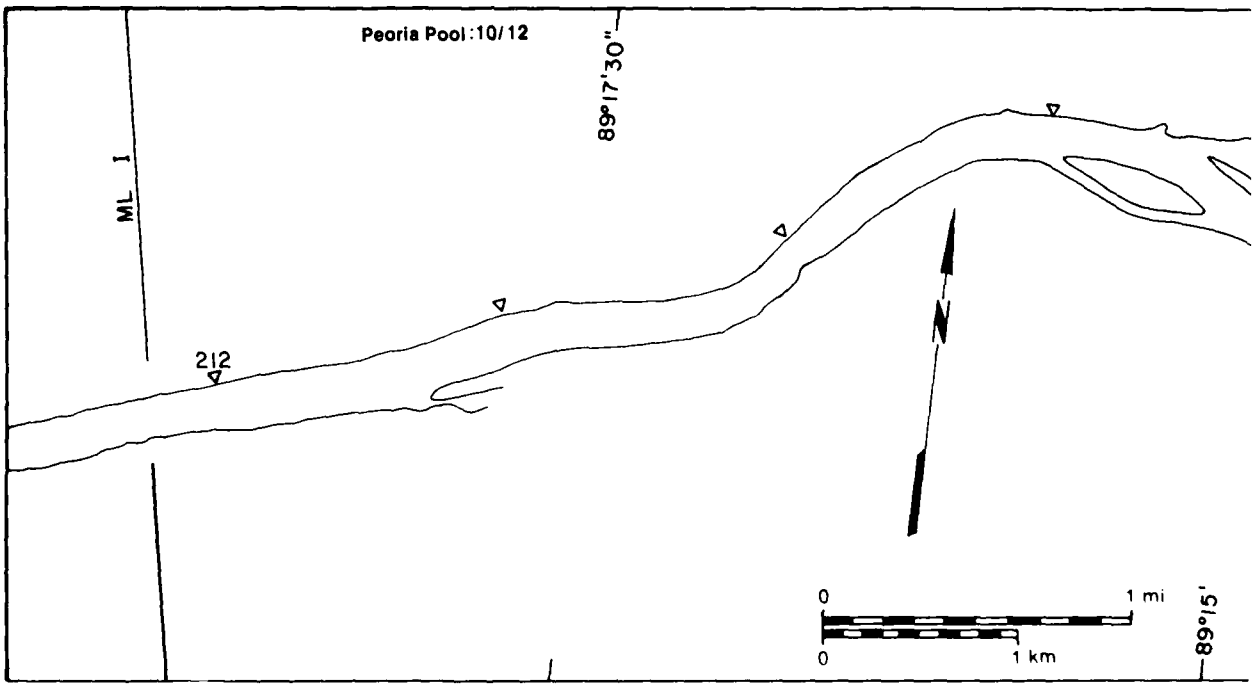

Peoria Pool :9/12
41°17'30"

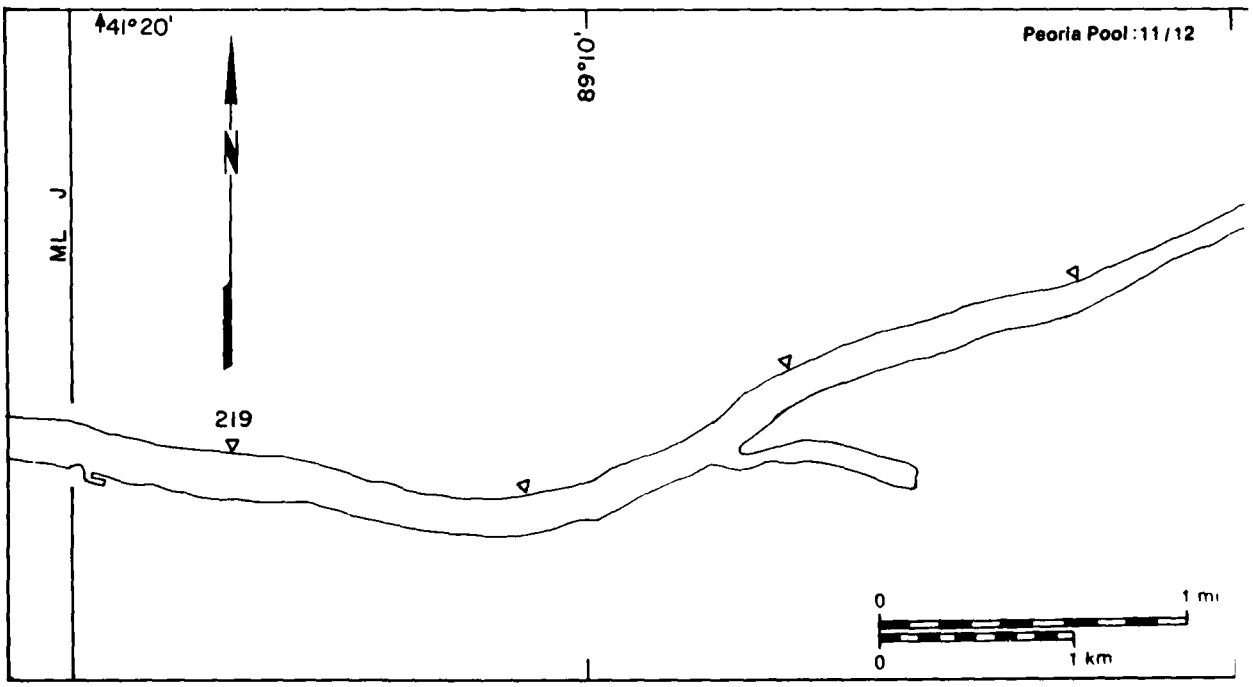

199
Senachwine Lake (or Swan Lake)
Lower &
Twin Siste
0
1 mi
0
1 km
Peoria Pool :9/12
41°15'
206
ML
H
0
1 mi
0
1 km
Survey date. March
Video


206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: March 2, 1986
Video Tape 16
89°20'

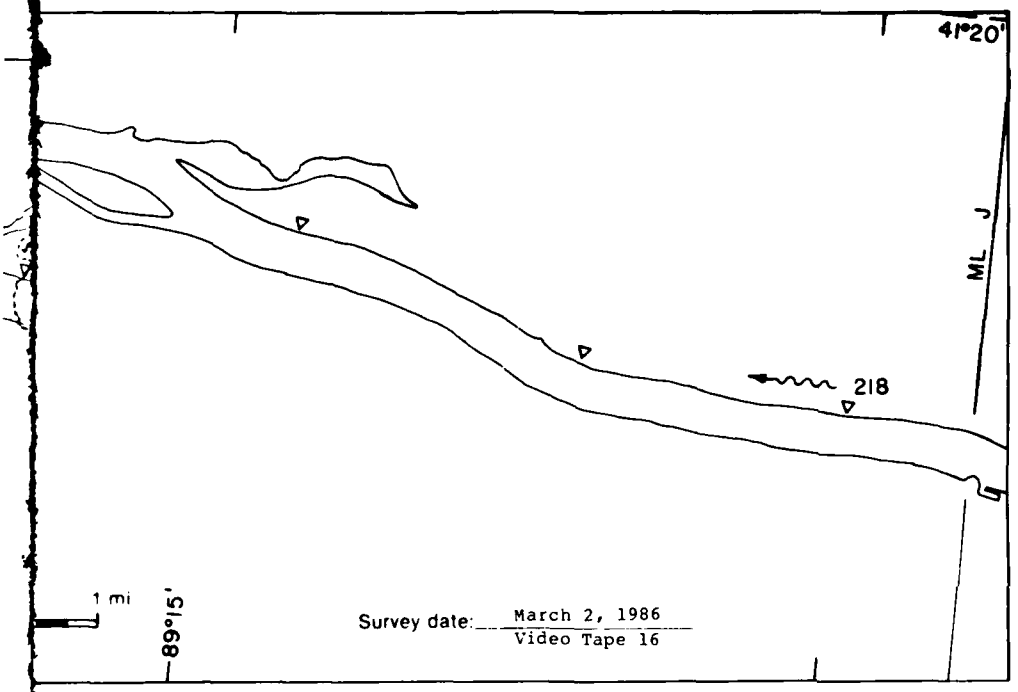

41°17'30"
89°20'
211
ML 1
Survey date: March 2, 1986
Video Tape 16

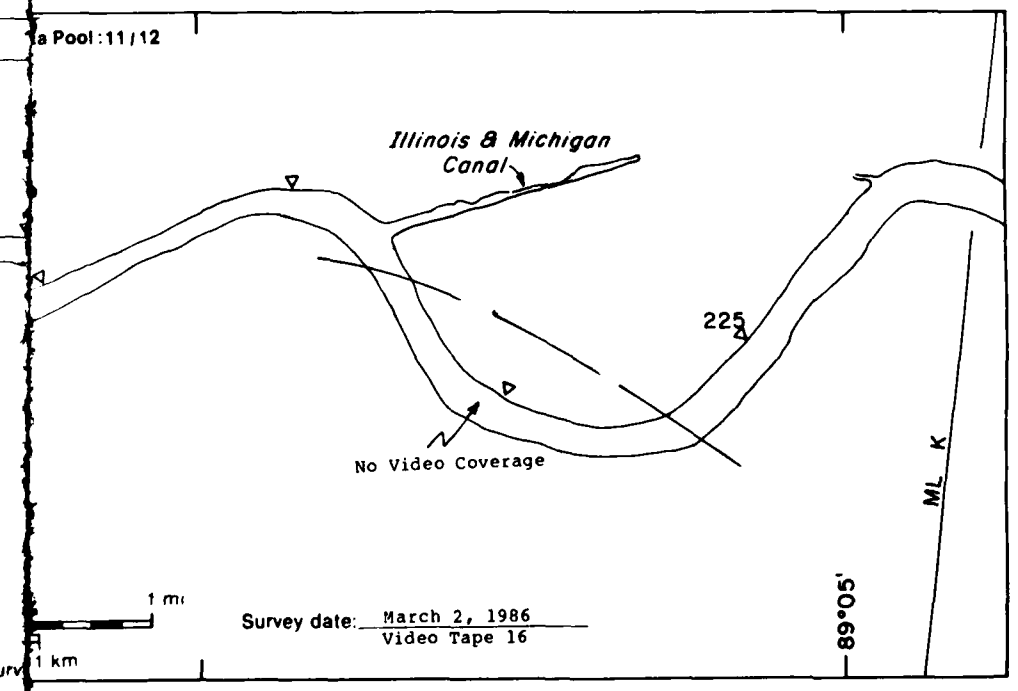
2 March 1986

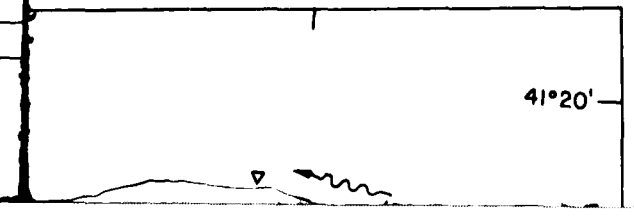

Peoria Pool:10/12
89°17'30"
ML I
212
0
1 mi
0
1 km
89°15'

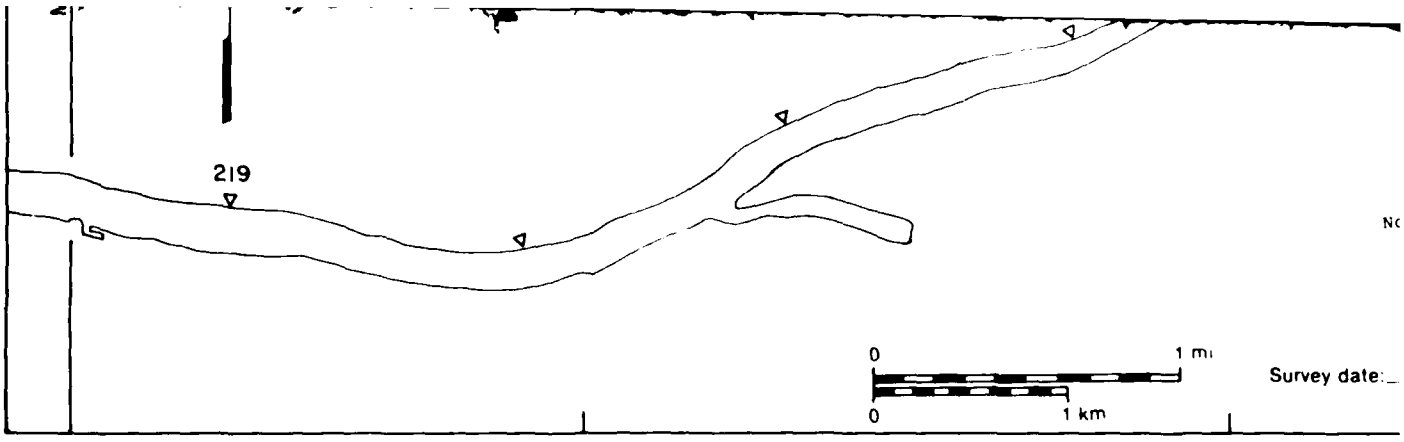

41°20'
Peoria Pool:11/12
89°10'
ML J
219
0
1 mi
0
1 km

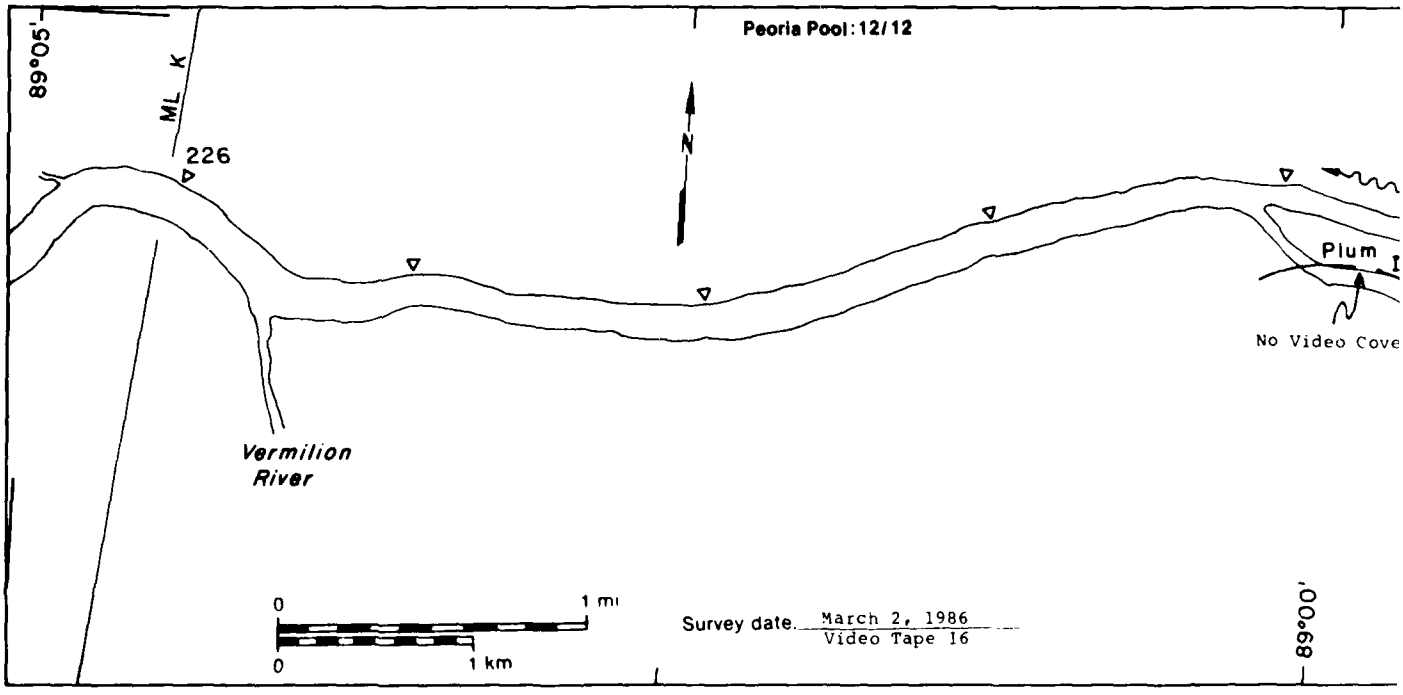
89°05'
ML K
Peoria Pool:12/12


41°20'
ML J
218
1 mi
89°15'
Survey date: March 2, 1986
Video Tape 16


a Pool: 11/12
Illinois & Michigan Canal
225
No Video Coverage
ML K
1 mi
1 km
Survey date: March 2, 1986
Video Tape 16
89°05'


41°20'

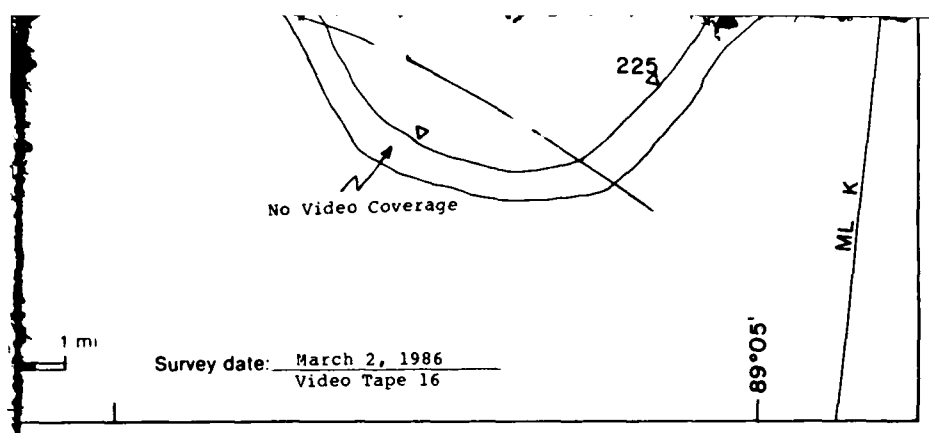


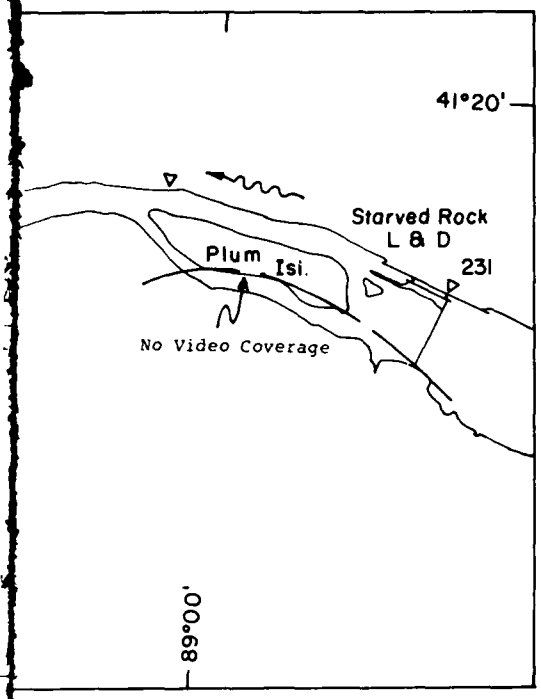


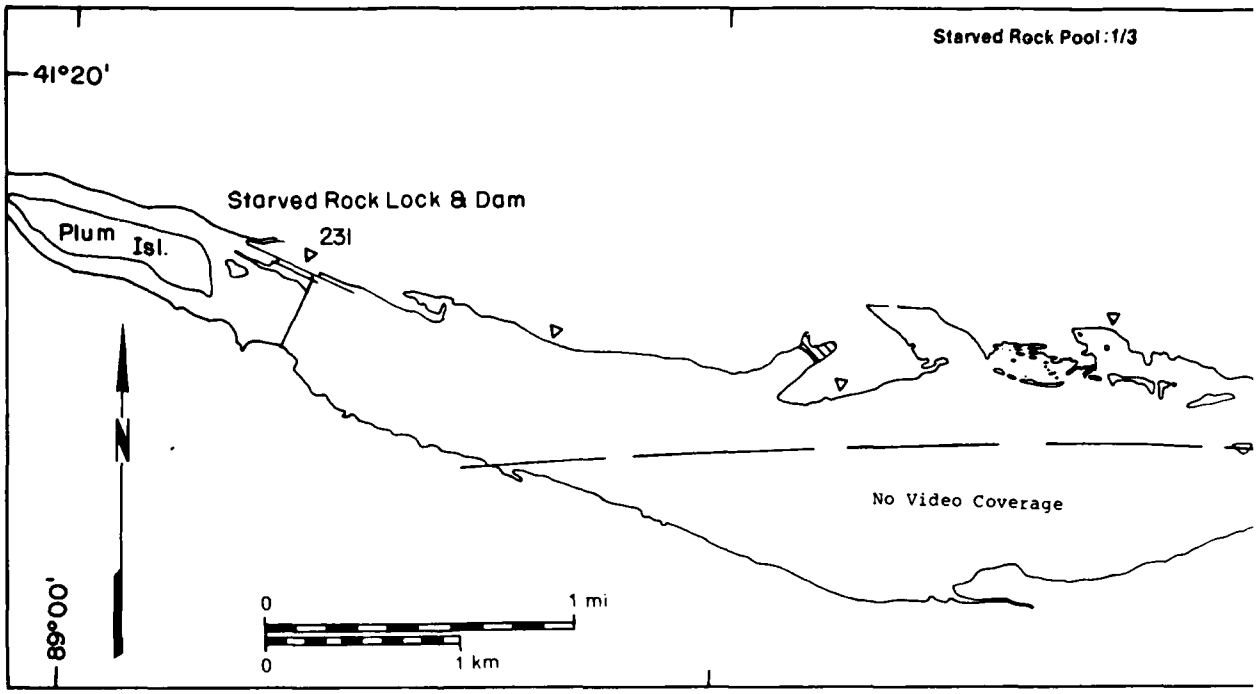
Peoria Pool

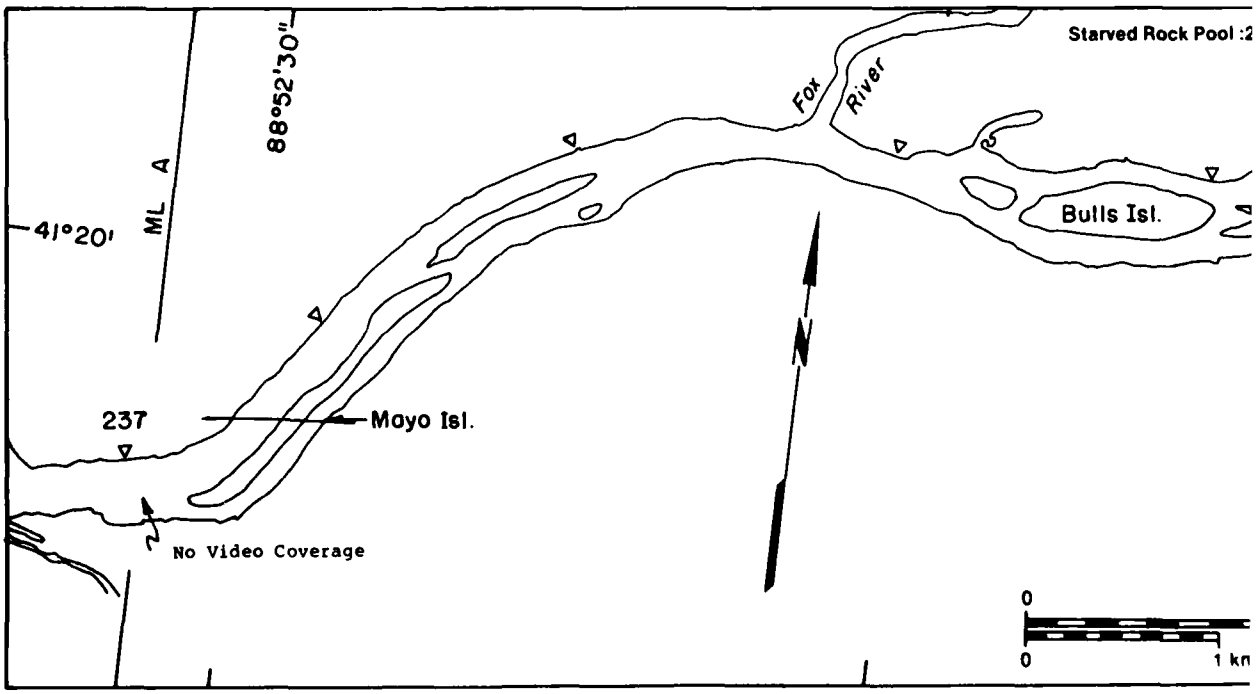
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration
Open water	52.89	NA
Solid ice cover	2.31	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.15	NA
Fragmented ice cover with open-water areas	0.14	70
Ice floes or frazil slush and pans	0.88	5
Total area ($m^2 \times 10^6$)	81.33*	

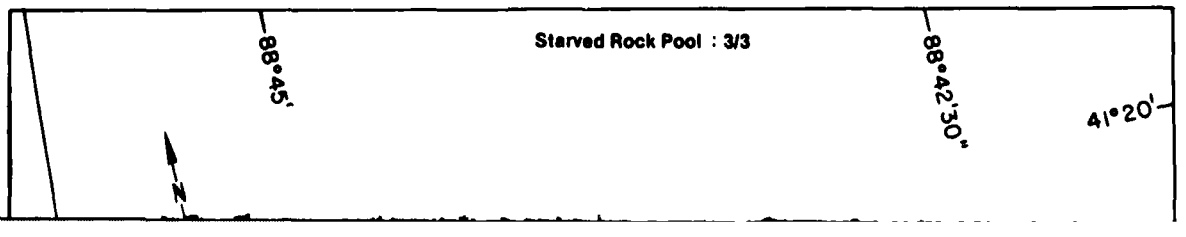
* Includes 24.96×10^6 m^2 of no video coverage


225
No Video Coverage
ML K
89°05'
1 mi
Survey date: March 2, 1986
Video Tape 16

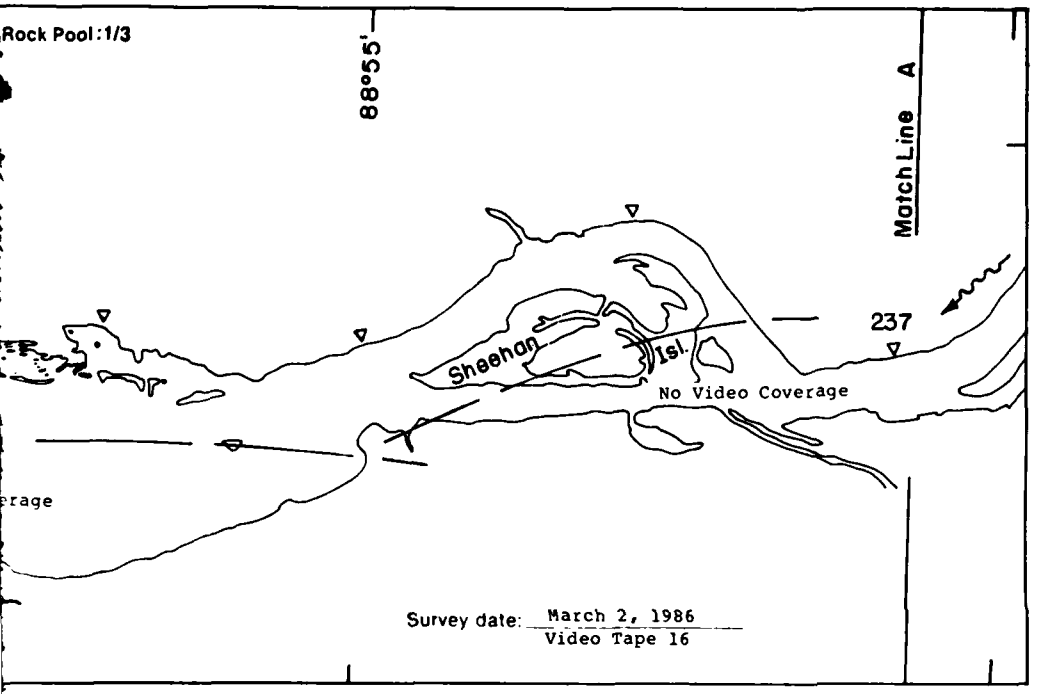

41°20'
Starved Rock
L & D
231
Plum Isl.
No Video Coverage
89°00'

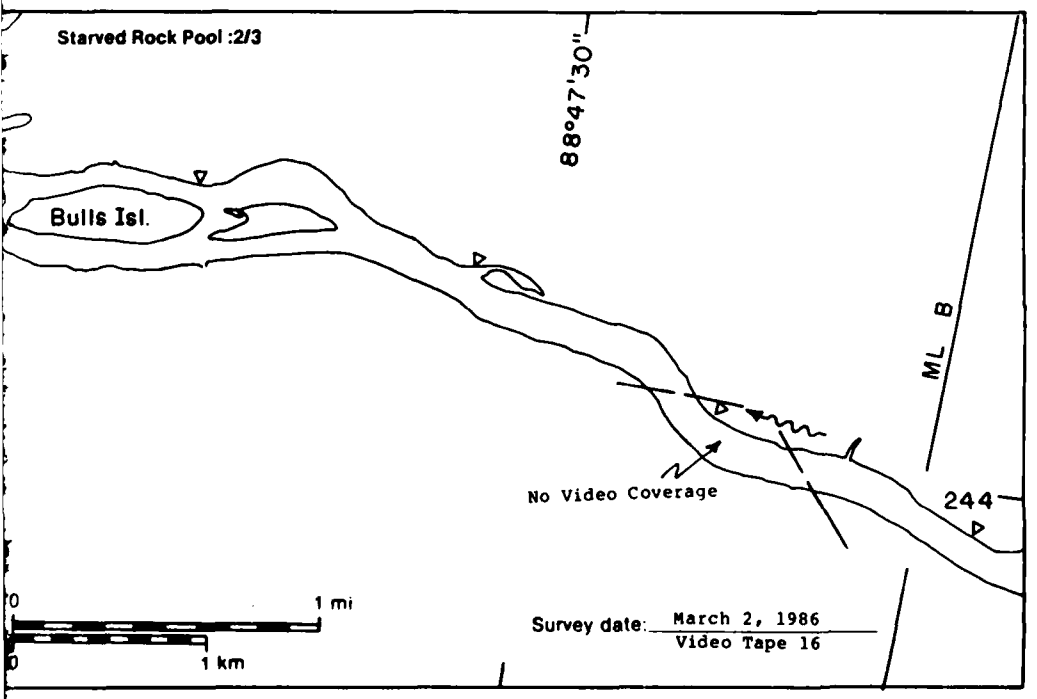

Starved Rock Pool:1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
N
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock Pool :2
88°52'30"
ML A
Fox
River
41°20'
Bulls Isl.
N
237
Moyo Isl.
No Video Coverage
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N

2 March 1986



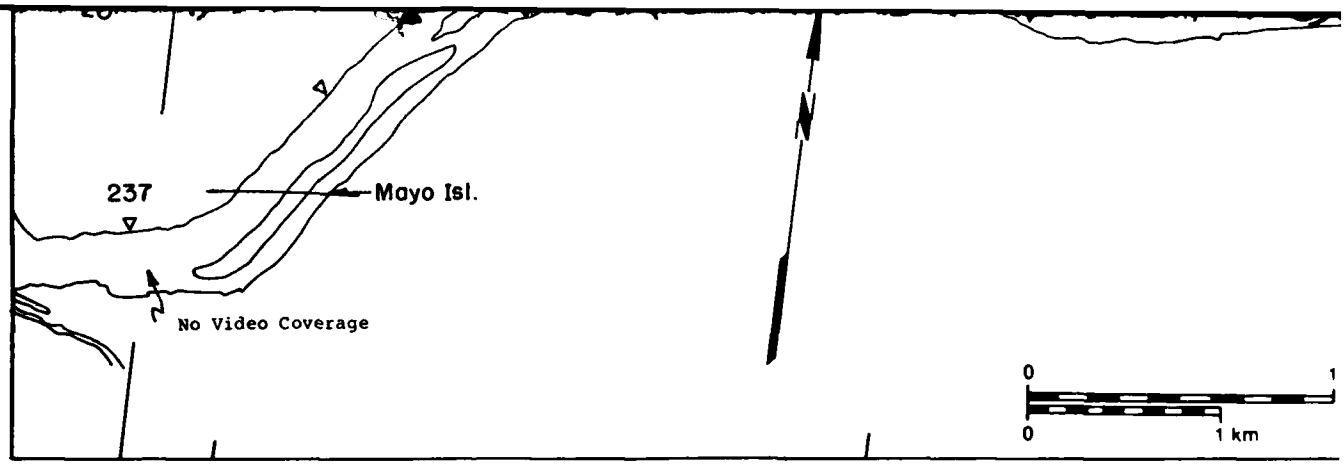


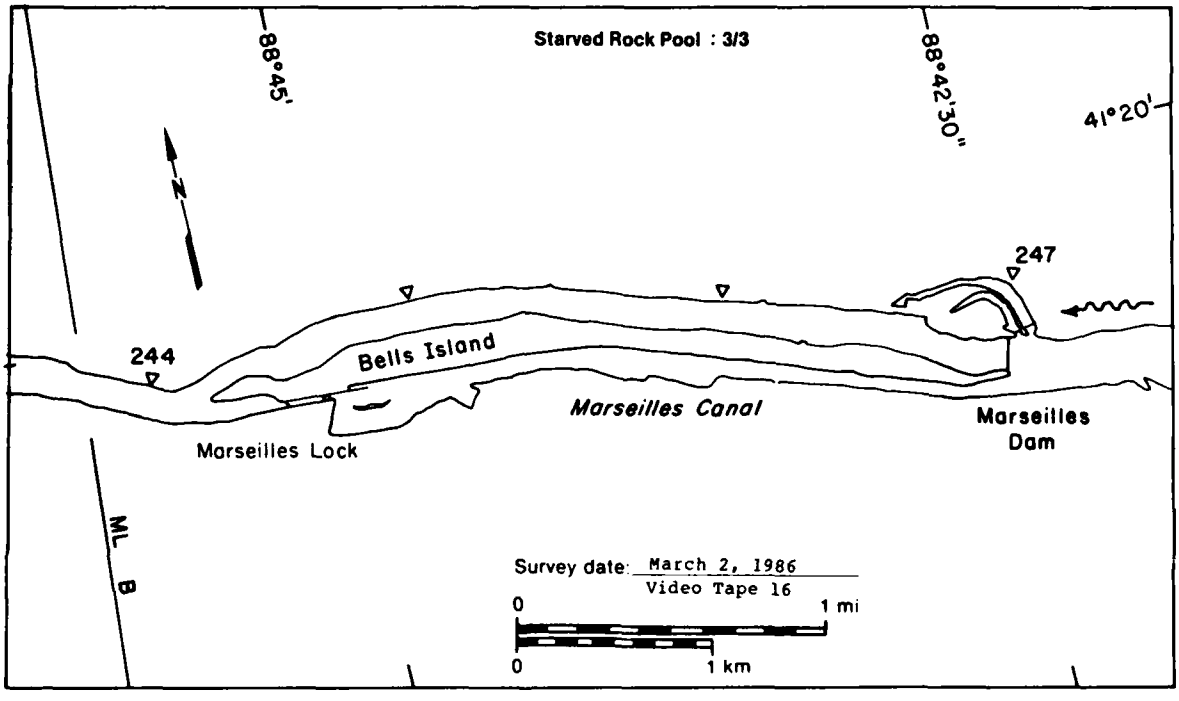
41°20'

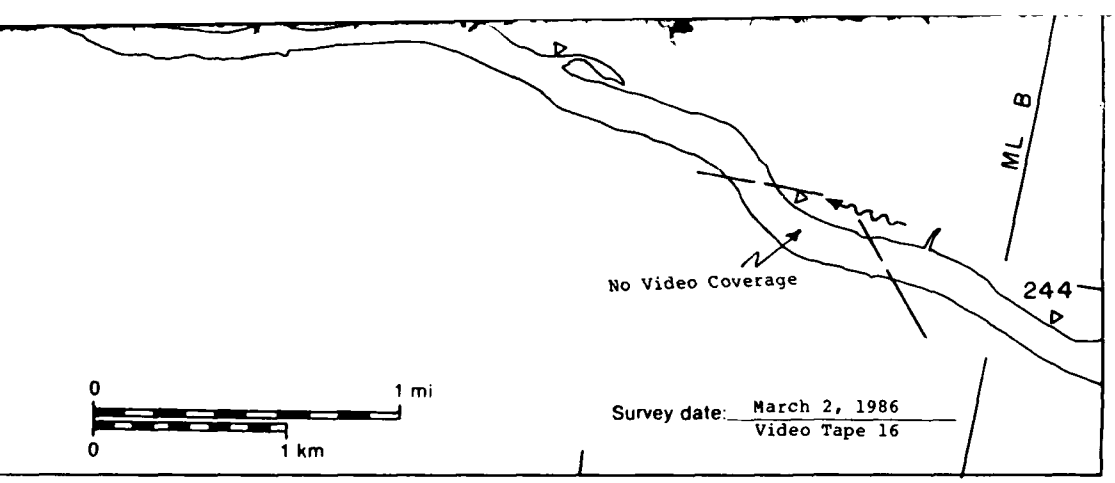
Starved Rock Pool

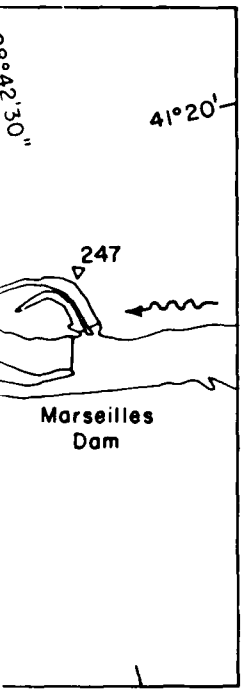
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.39	NA


237
Mayo Isl.
No Video Coverage
0
1
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: March 2, 1986
Video Tape 16
0
1 mi
0
1 km





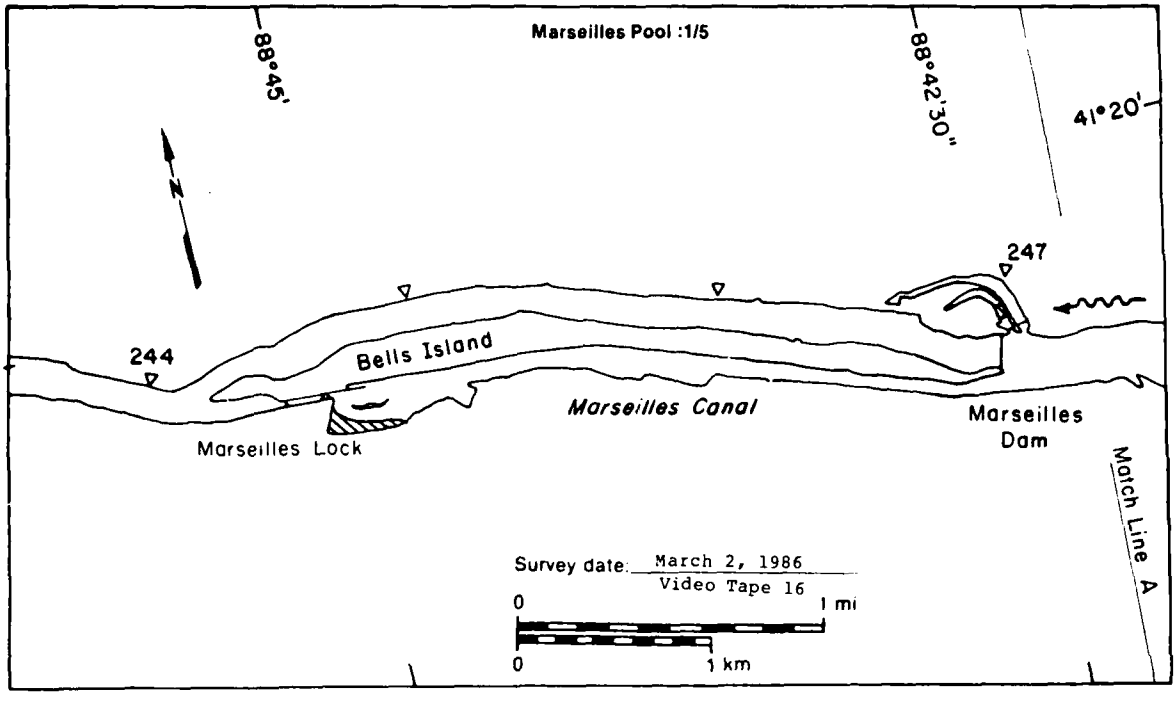
Starved Rock Pool

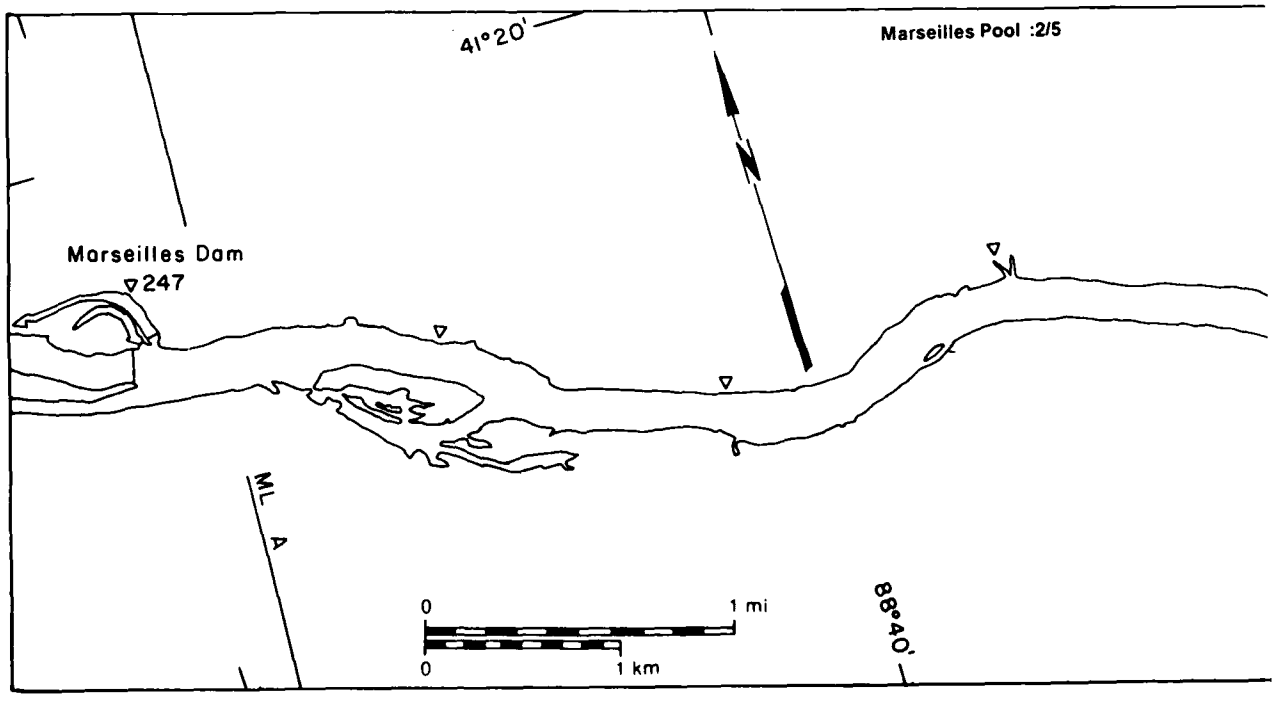
MAP UNITS

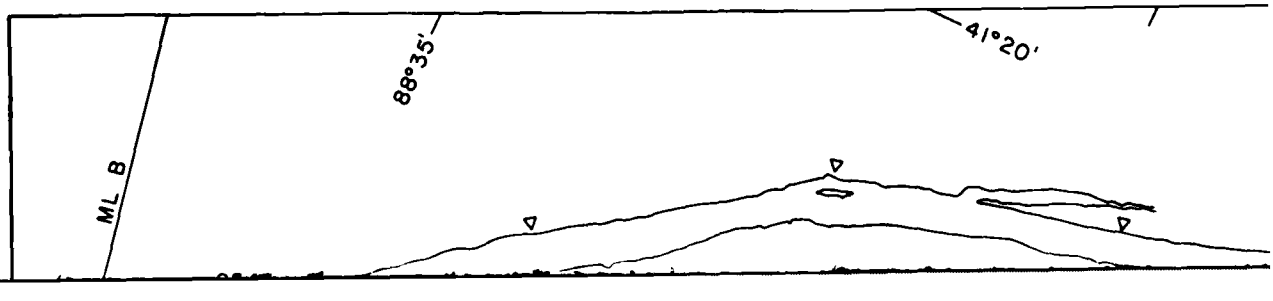
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.39	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	10.19*	

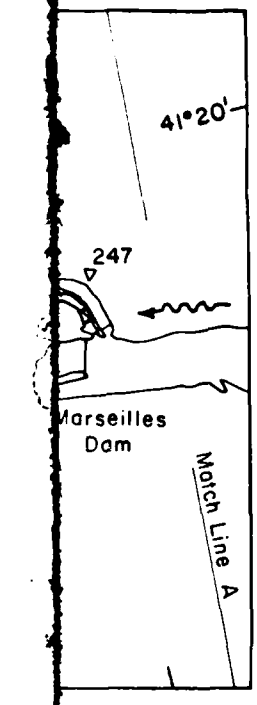
* Includes 2.78×10^6 m^2 of no video coverage

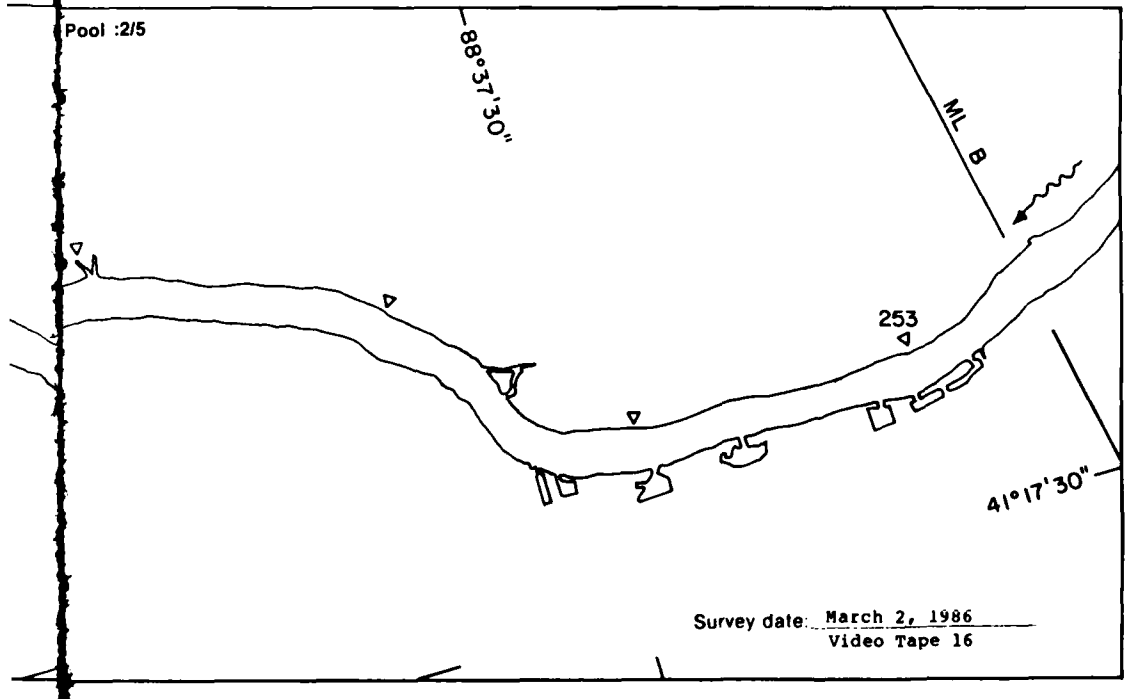
2 March 1986

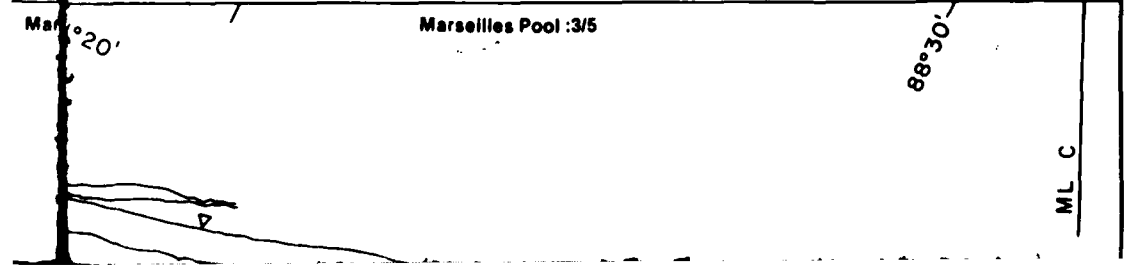

Marseilles Pool :1/5
88°45'
88°42'30"
41°20'
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
Match Line A
Survey date: March 2, 1986
Video Tape 16
0
1 mi
0
1 km

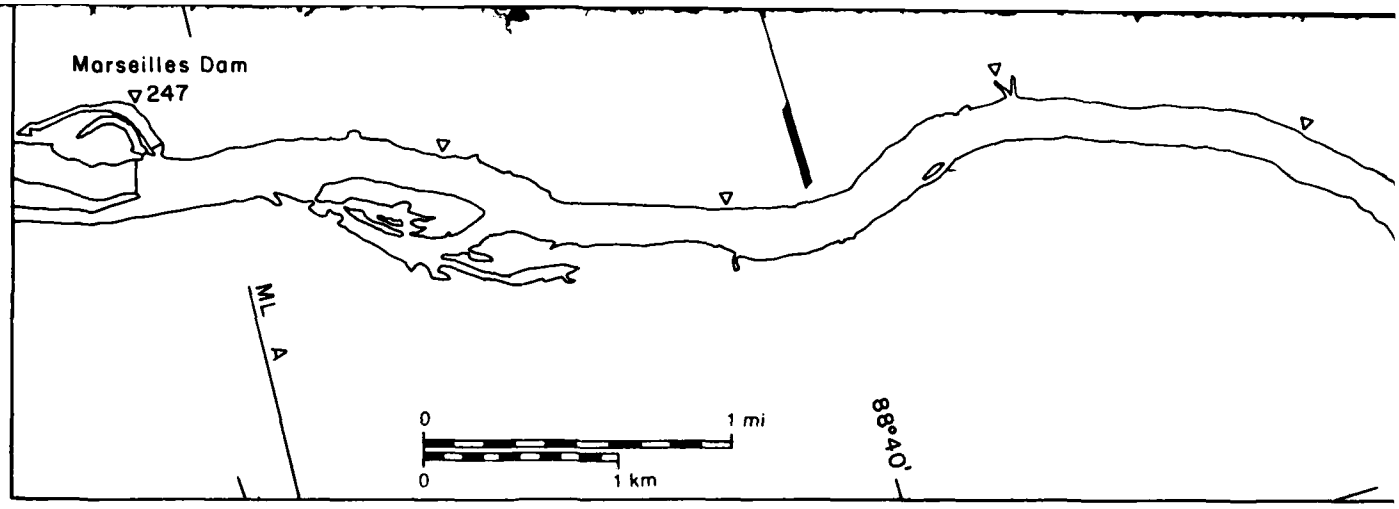

41°20'
Marseilles Pool :2/5
Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'

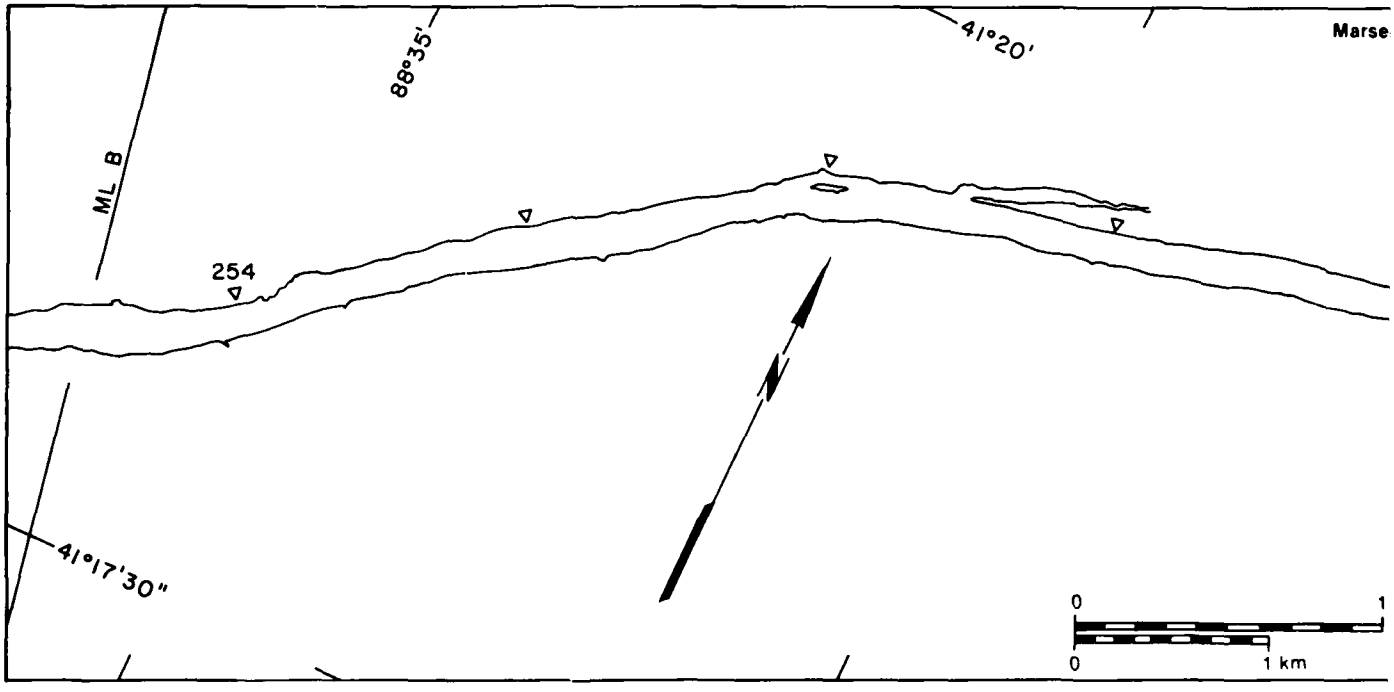

88°35'
41°20'
ML B

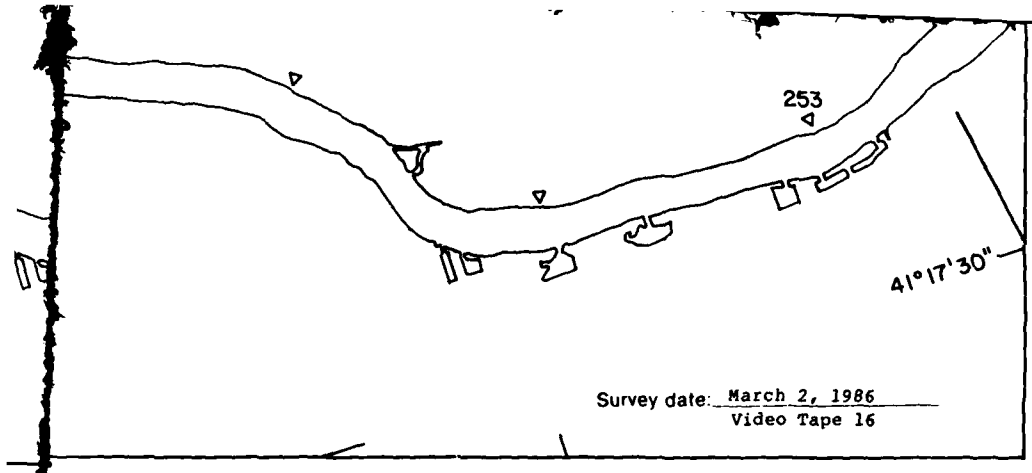

41°20'
247
Marseilles
Dam
Match Line A

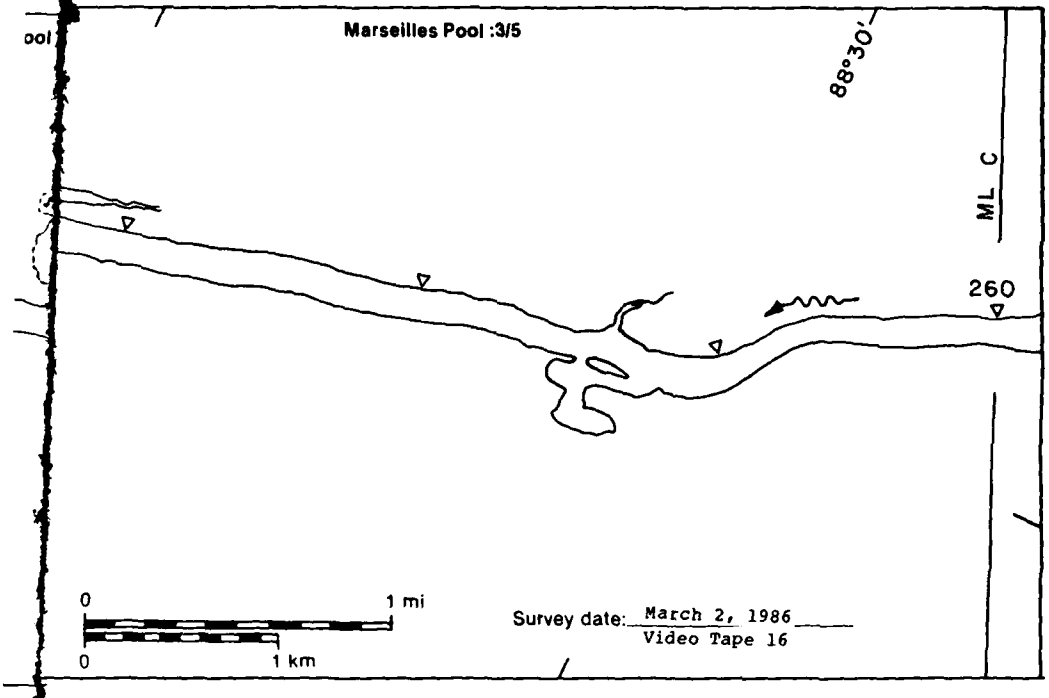

Pool :2/5
88°37'30"
ML B
253
41°17'30"
Survey date: March 2, 1986
Video Tape 16

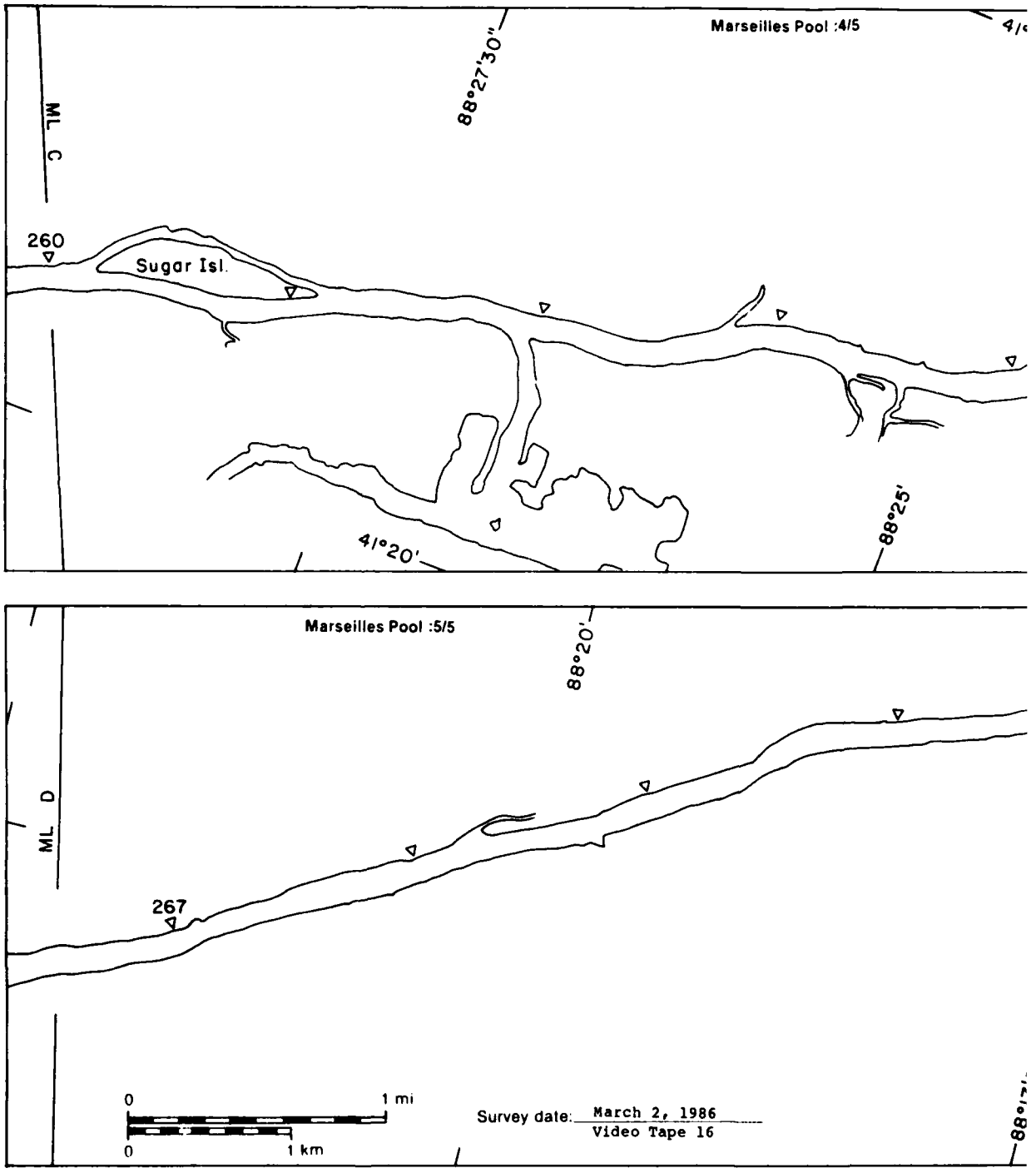

Marseilles Pool :3/5
88°30'
ML C


Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'


88°35'
41°20'
Marse
ML B
254
41°17'30"
0
1
0
1 km


253
41°17'30"
Survey date: March 2, 1986
Video Tape 16


ool
Marseilles Pool :3/5
88°30'
ML C
260
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

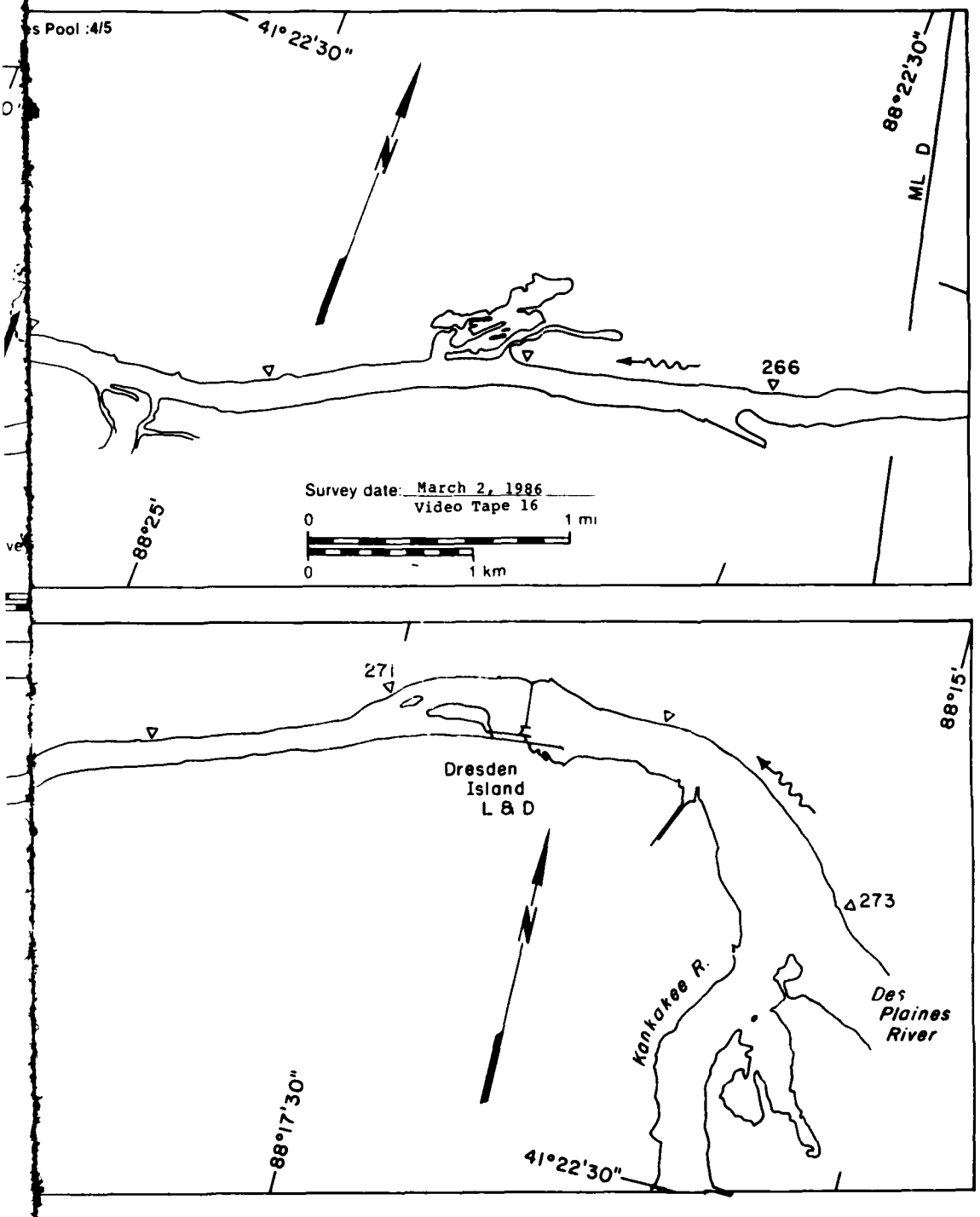


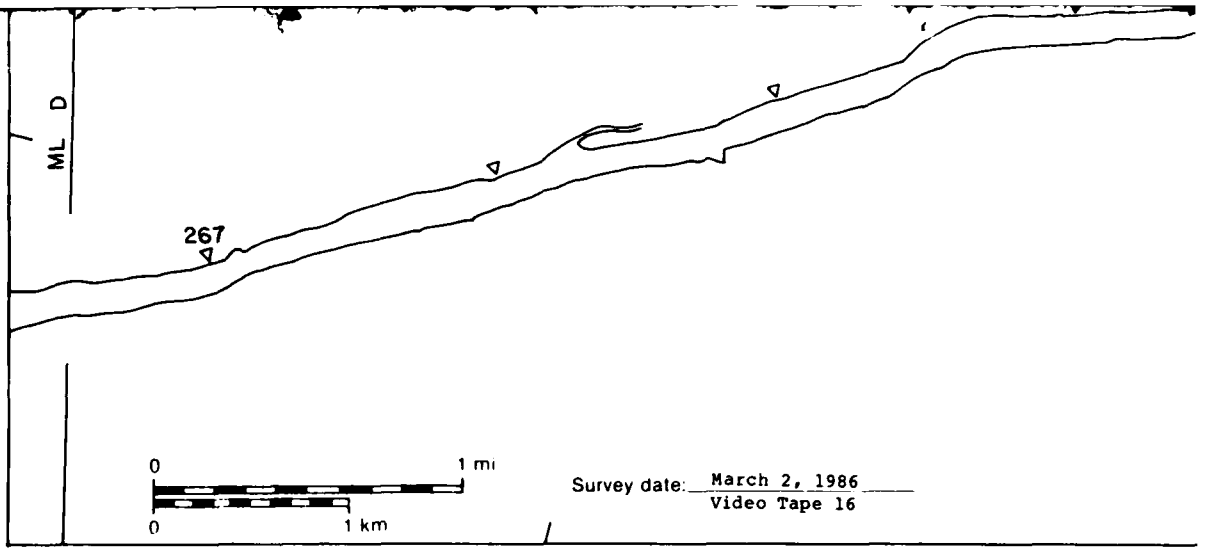
Marseilles Pool

MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.16	NA

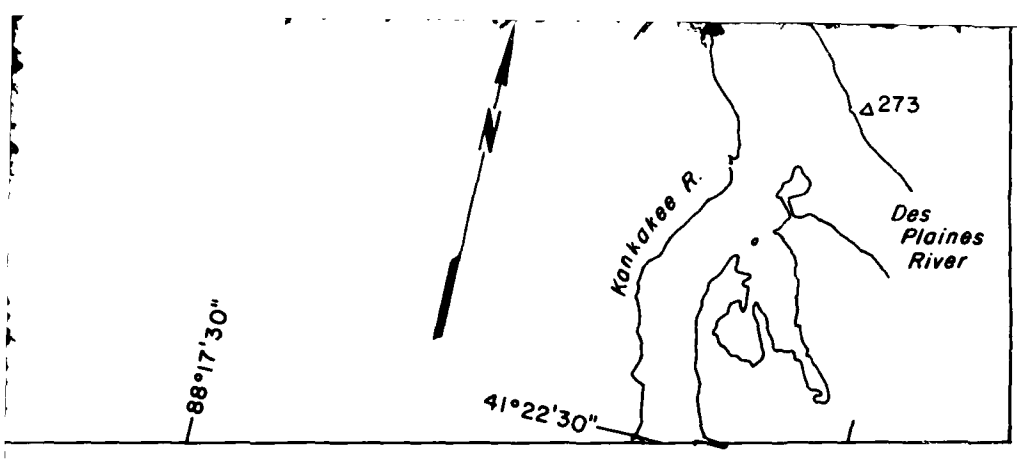
2 March 1986


s Pool :4/5
41°22'30"
88°22'30"
ML D
266
Survey date: March 2, 1986
Video Tape 16
0
1 mi
0
1 km
88°25'
271
88°15'
Dresden
Island
L & D
273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

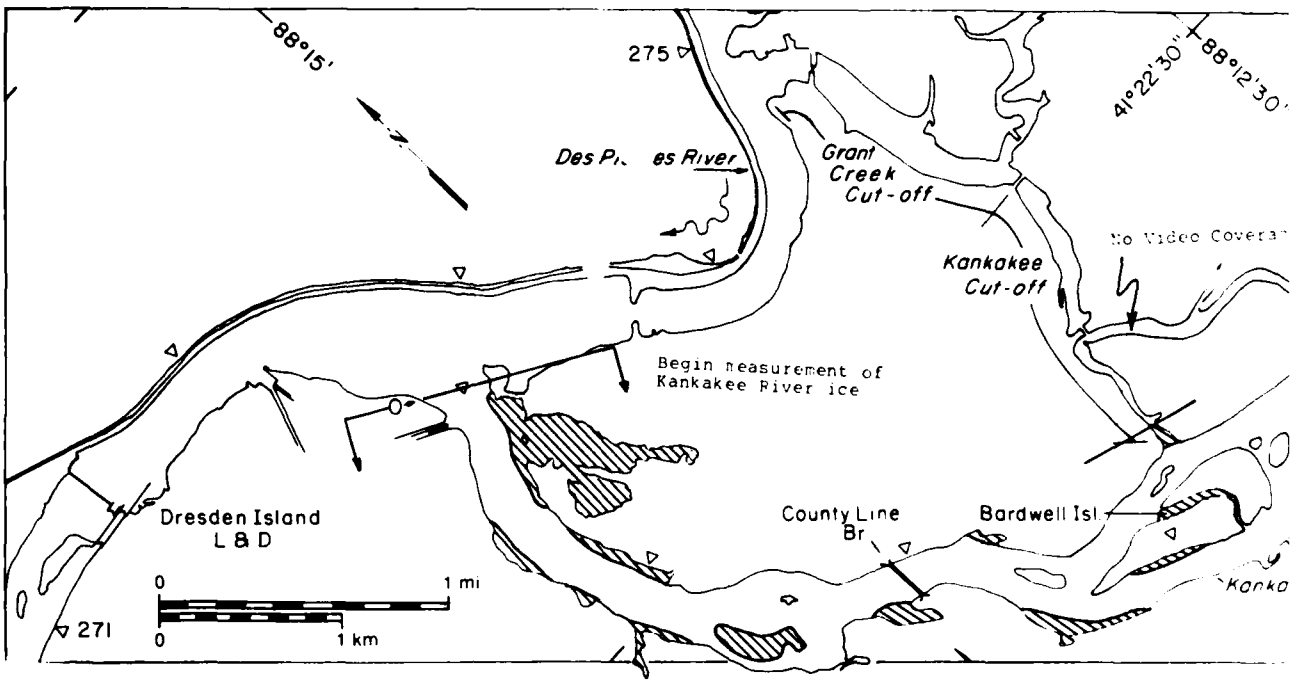


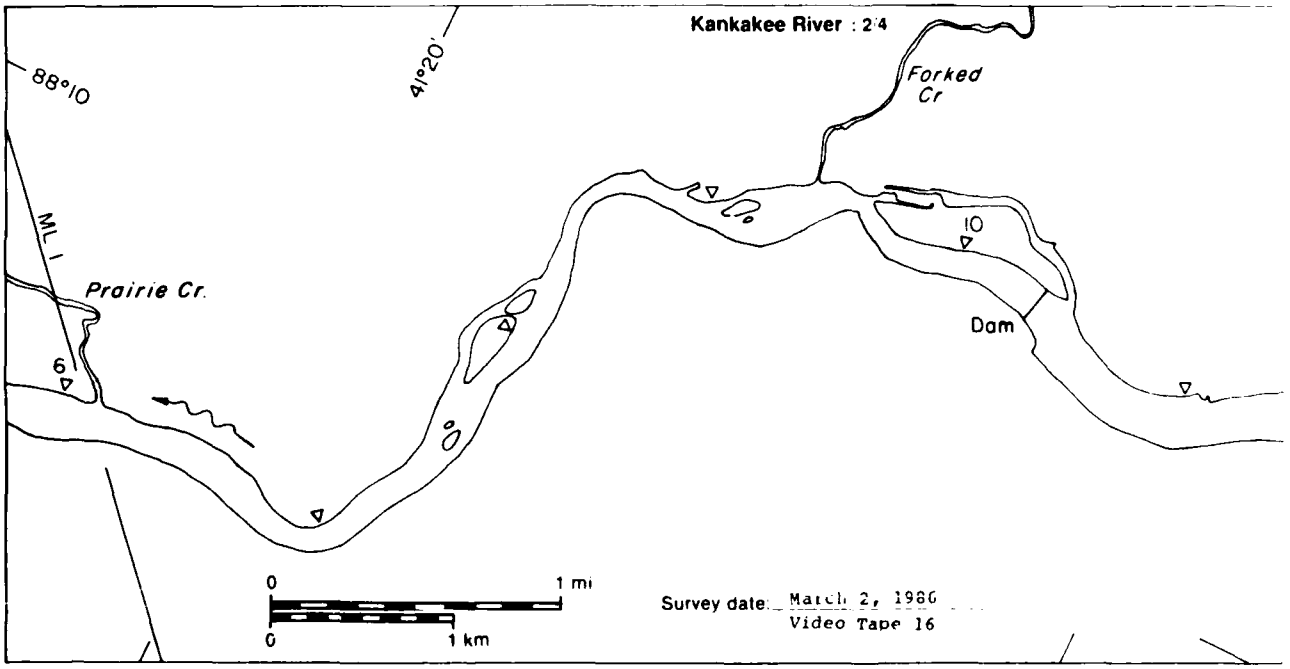
Marseilles Pool

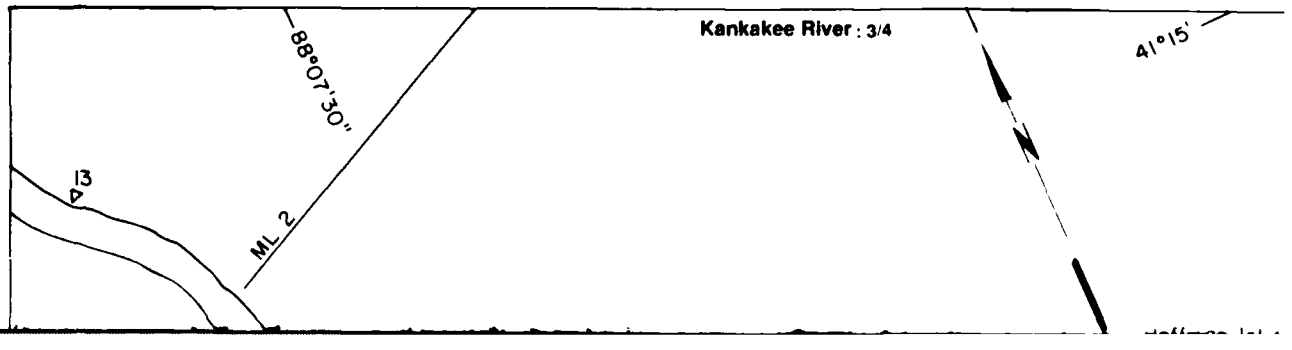
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.16	NA
Solid ice cover	0.03	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	8.19	

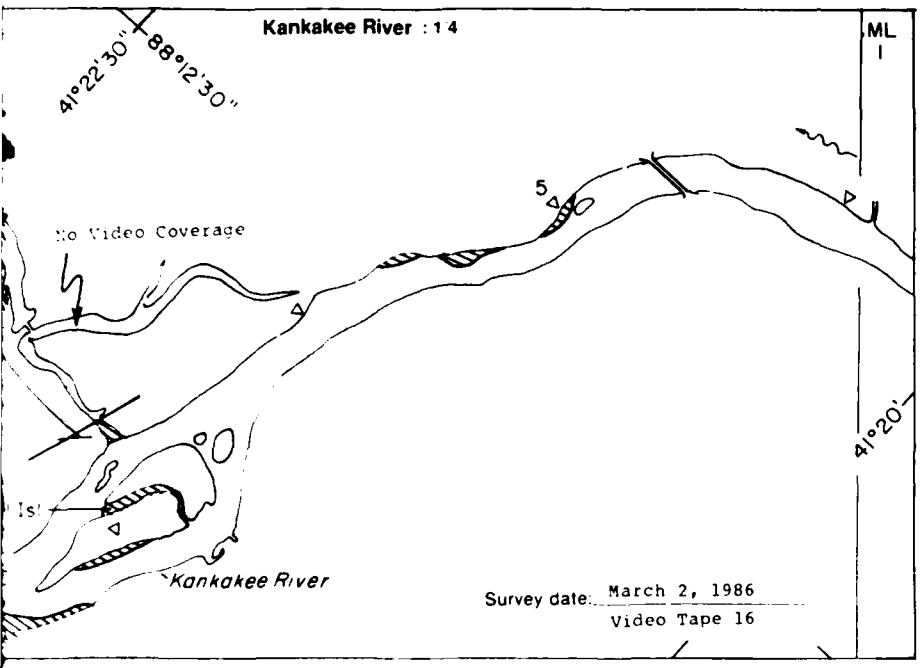

△273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"

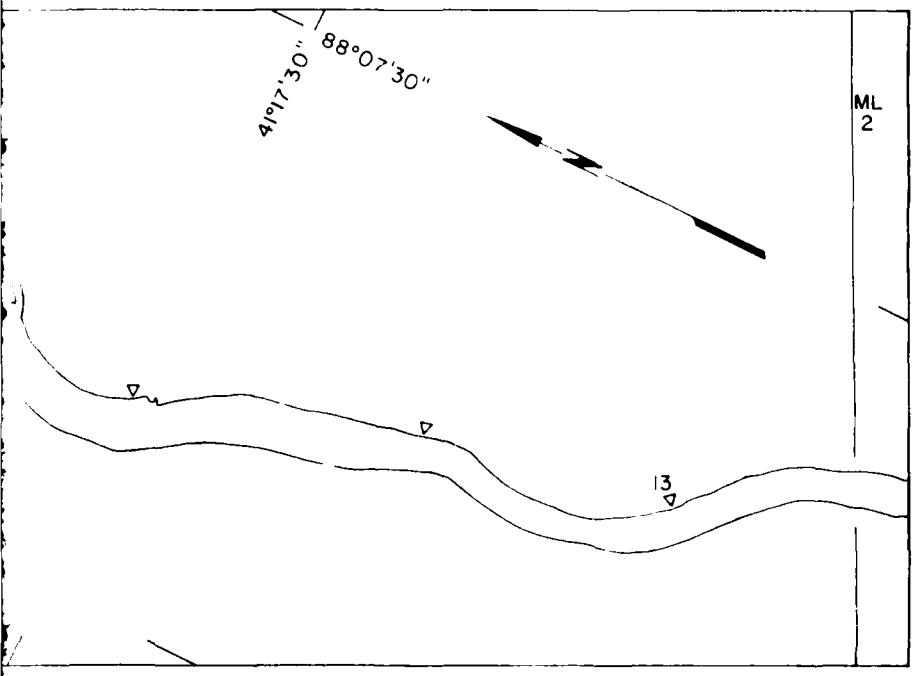
2 March 1986

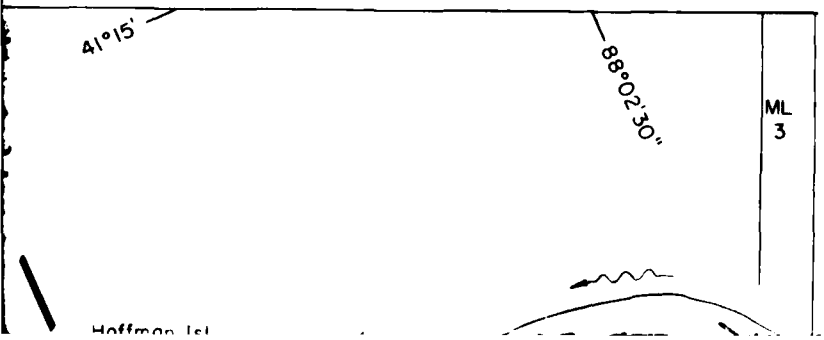

88°15'
275
41°22'30"
88°12'30"
Des Plaines River
Grant Creek Cut-off
Kankakee Cut-off
No Video Coverage
Begin measurement of Kankakee River ice
Dresden Island L & D
County Line Br
Bardwell Isl
0
1 mi
0
1 km
271

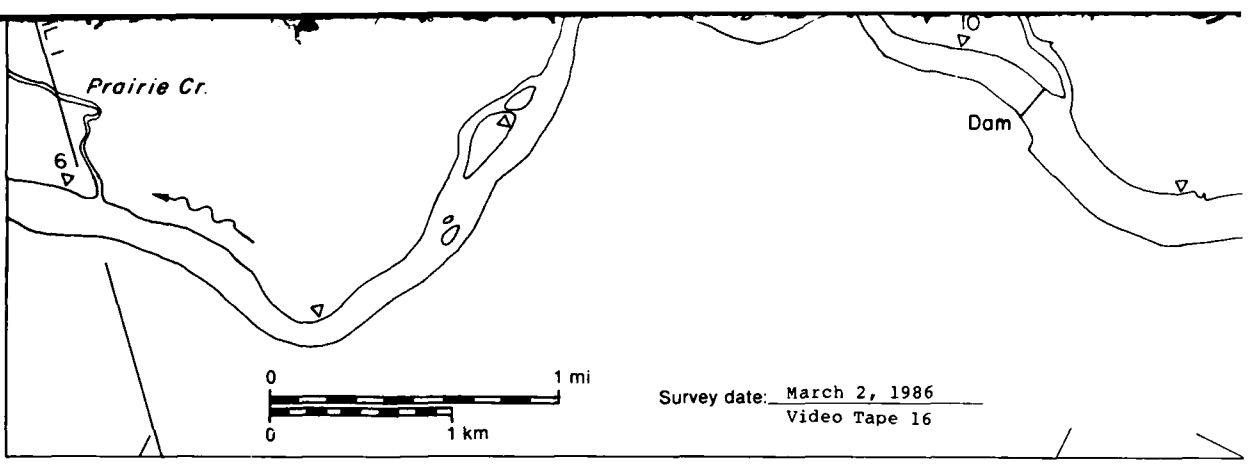

Kankakee River : 2/4
88°10
41°20'
Forked Cr
ML 1
Prairie Cr.
6
10
Dam
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

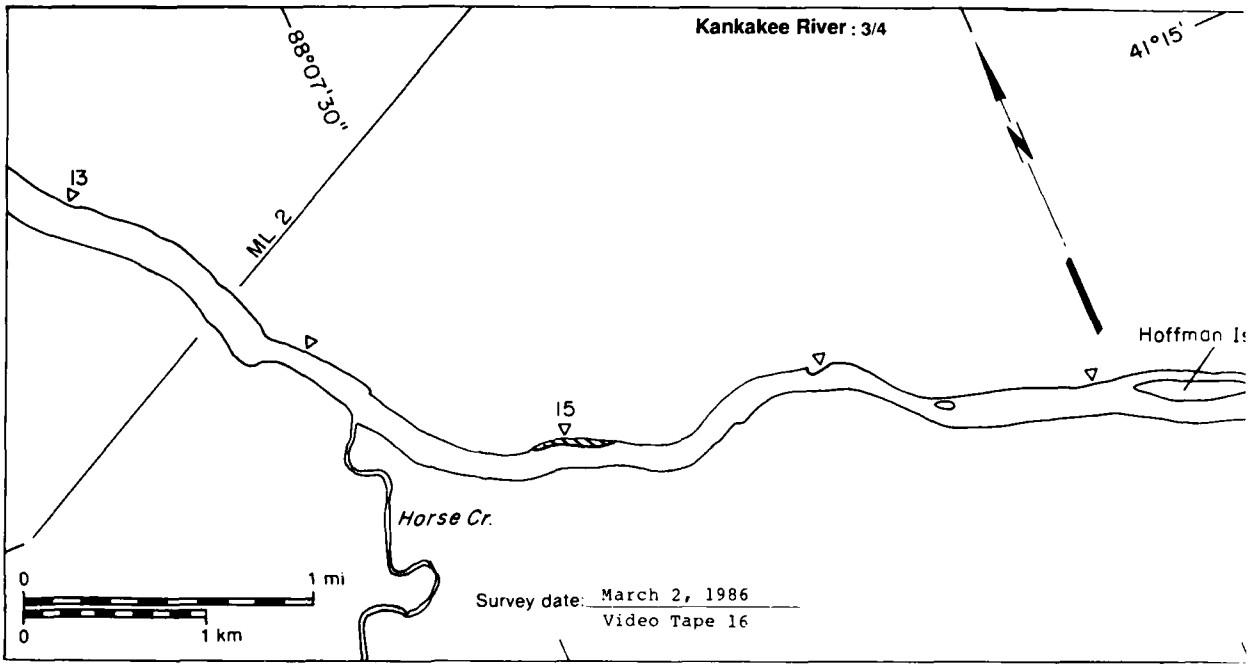

Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2

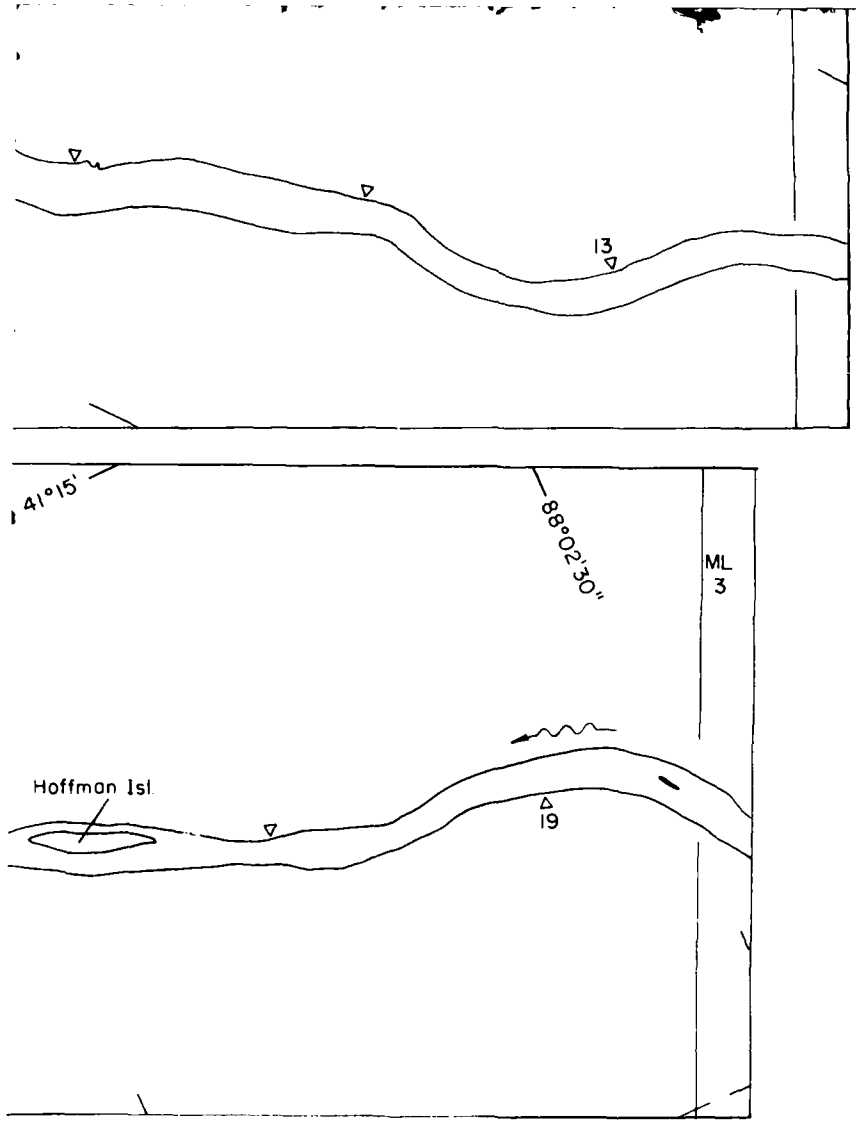

Kankakee River : 1 4
41°22'30"
88°12'30"
ML
1
5
No Video Coverage
41°20'
Kankakee River
Survey date: March 2, 1986
Video Tape 16

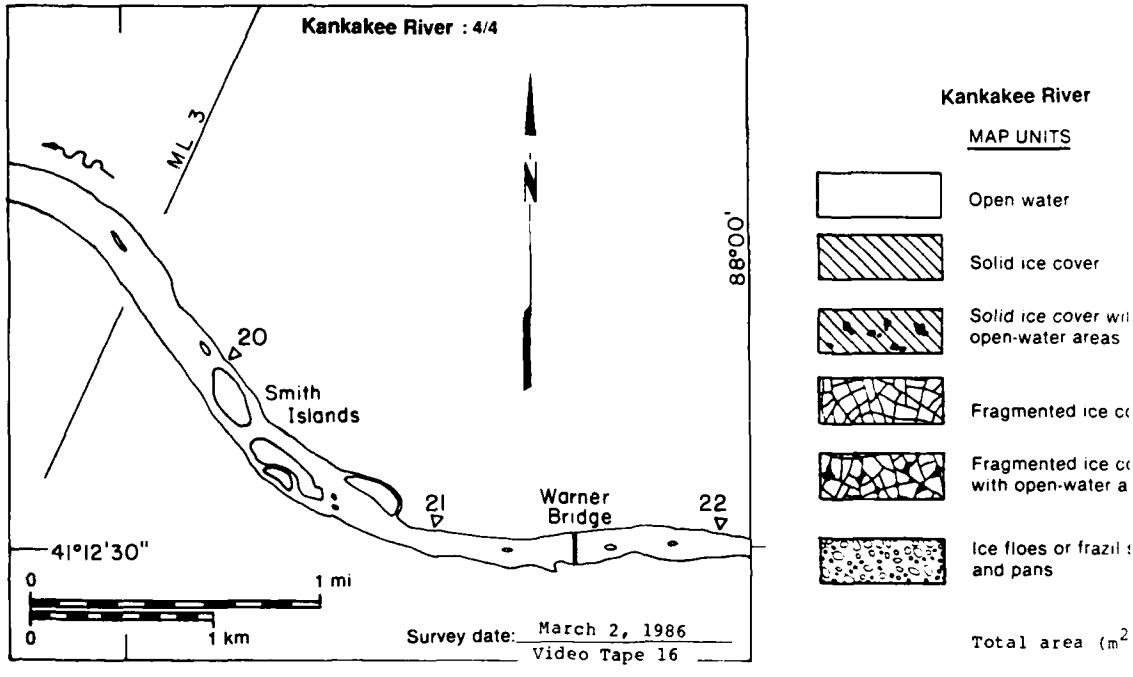

41°17'30"
88°07'30"
ML
2
13


41°15'
88°02'30"
ML
3
Hoffman Isl


Prairie Cr.
6
10
Dam
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Is
Horse Cr.
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16

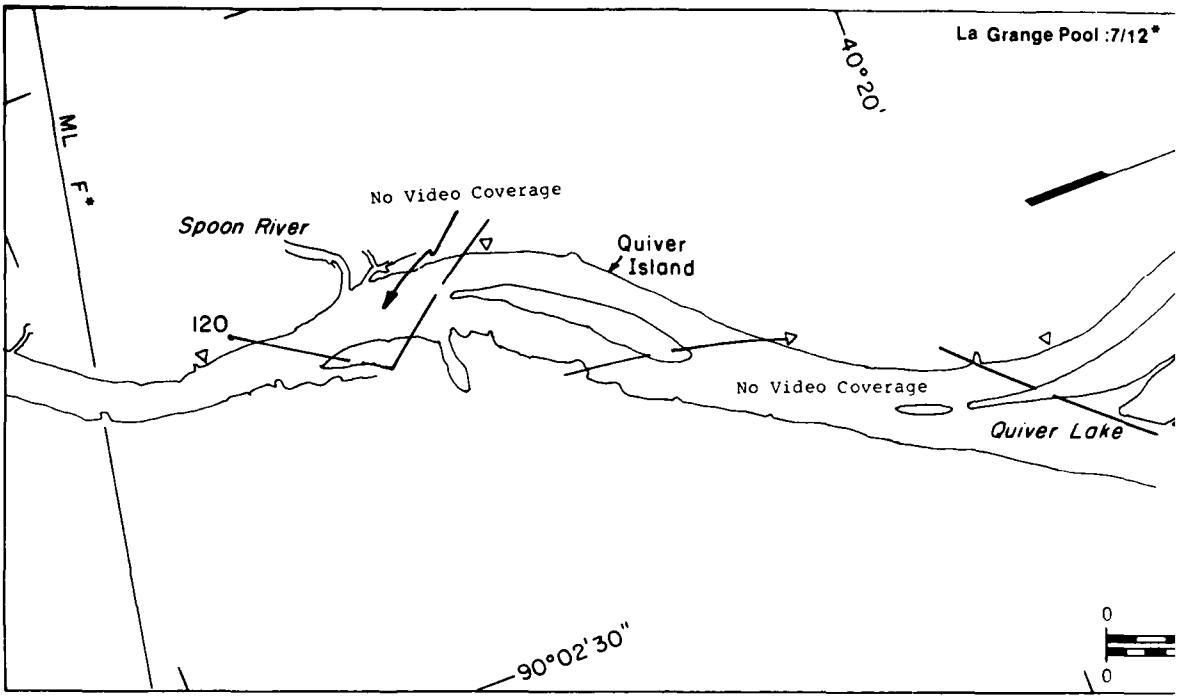

13
41°15'
88°02'30"
ML
3
Hoffman Isl.
19

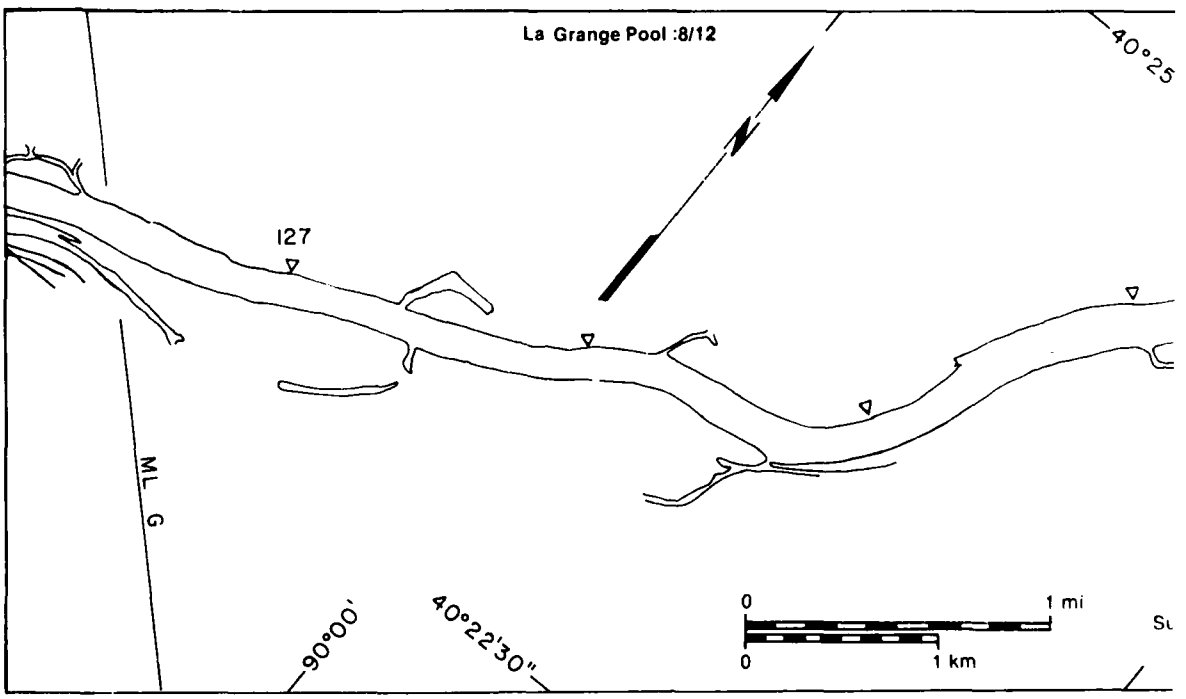

Kankakee River : 4/4
ML 3
88°00'
20
Smith
Islands
21
Warner
Bridge
22
41°12'30"
0
1 mi
0
1 km
Survey date: March 2, 1986
Video Tape 16
Kankakee River
MAP UNITS
Open water
Solid ice cover
Solid ice cover wi
open-water areas
Fragmented ice c
Fragmented ice c
with open-water a
Ice floes or frazil
and pans
Total area (m2

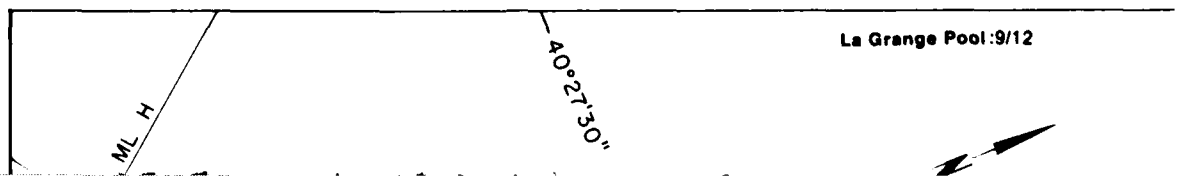
2 March 1986

Kankakee River

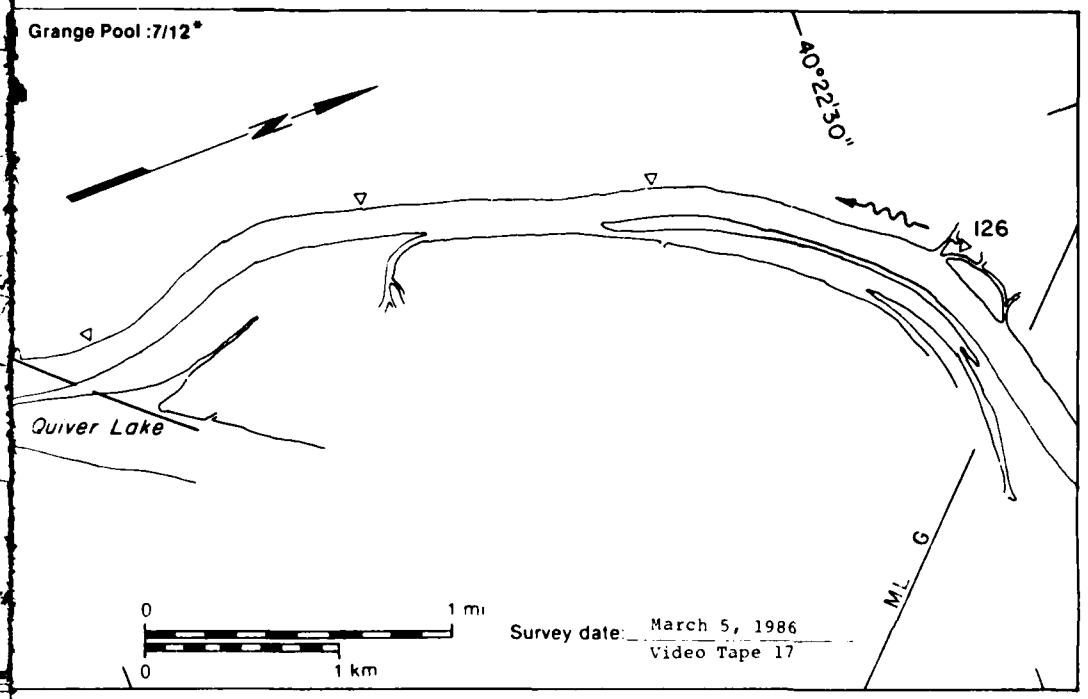
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.82	NA
Solid ice cover	0.48	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	7.30	

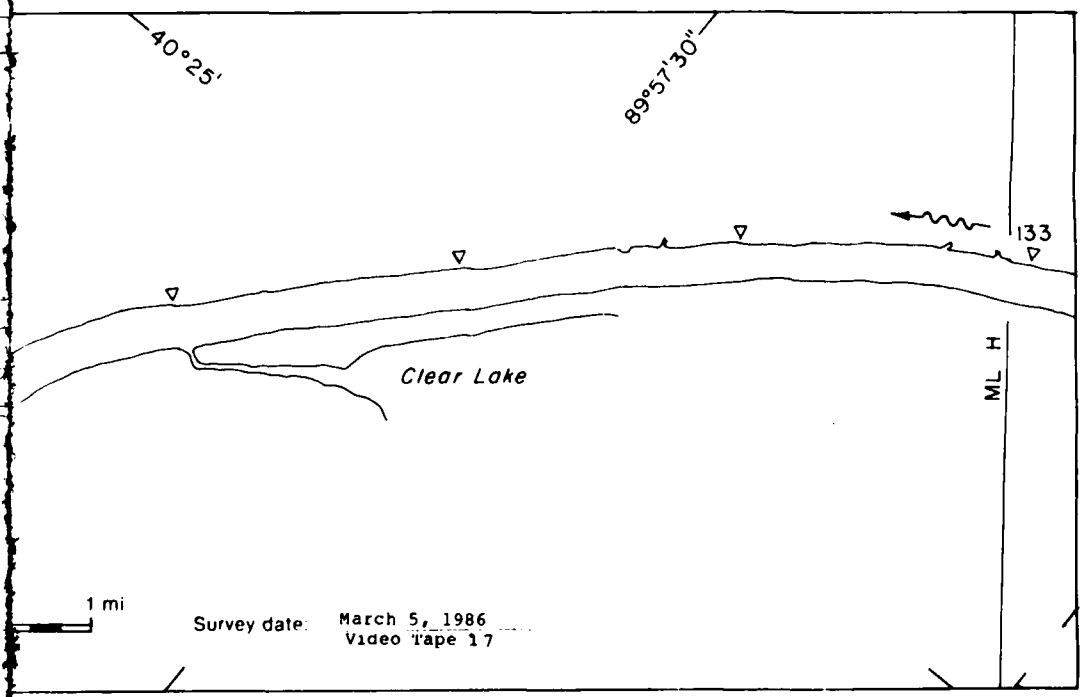

La Grange Pool :7/12*
40°20'
ML F*
No Video Coverage
Spoon River
Quiver Island
120
No Video Coverage
Quiver Lake
90°02'30"
0
0

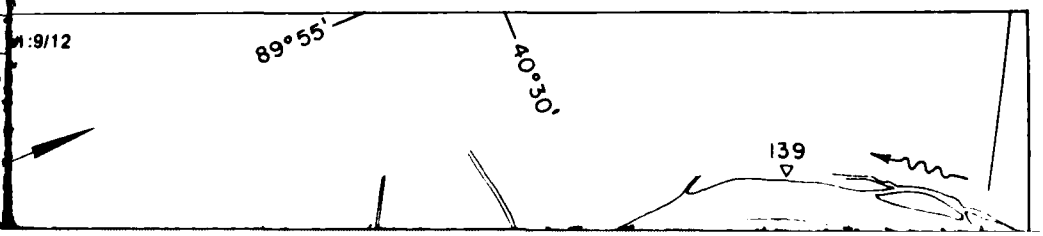

La Grange Pool :8/12
40°25
127
ML G
90°00'
40°22'30"
0
1 mi
0
1 km

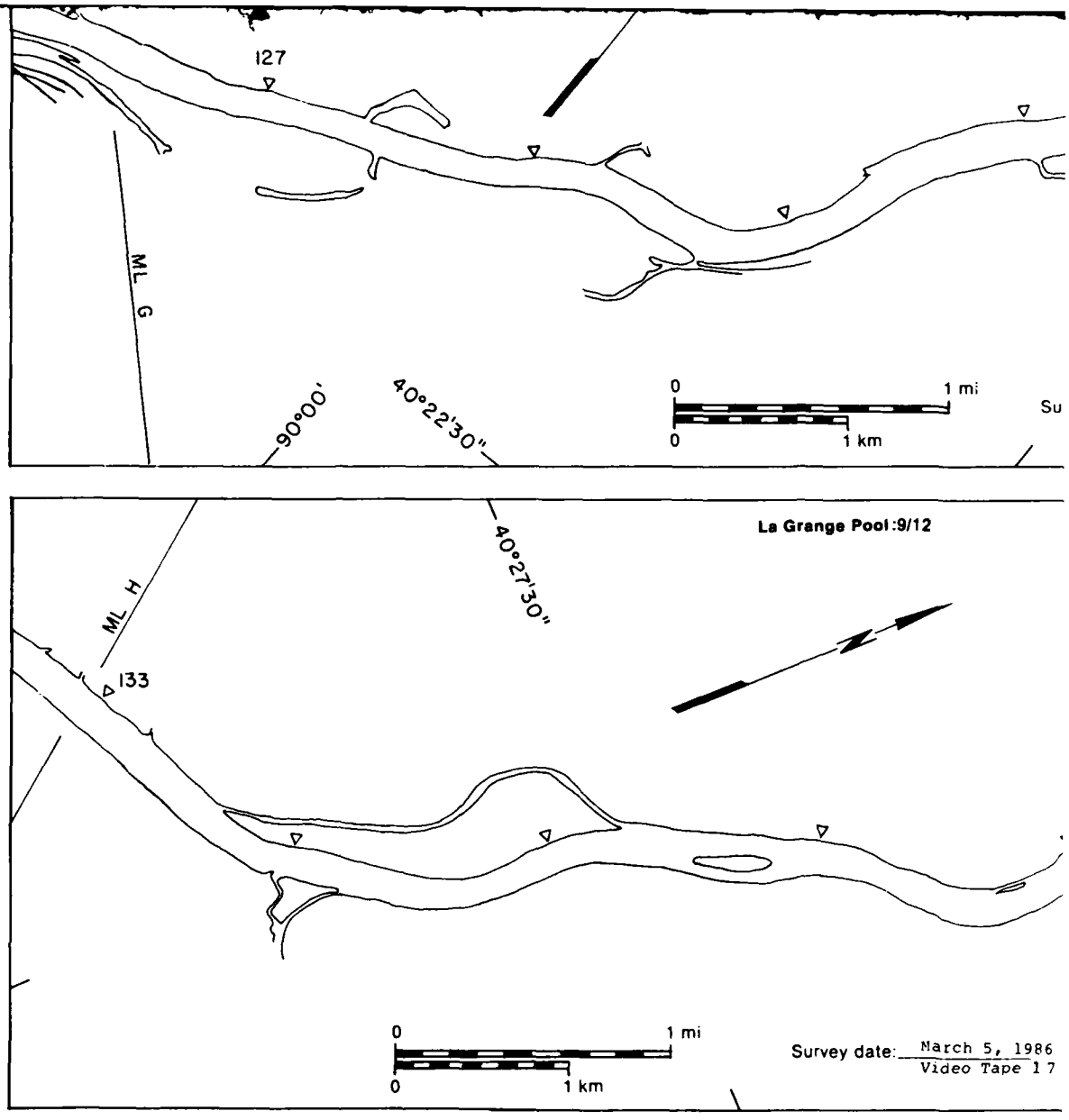

La Grange Pool :9/12
40°27'30"
ML H

5 March 1986

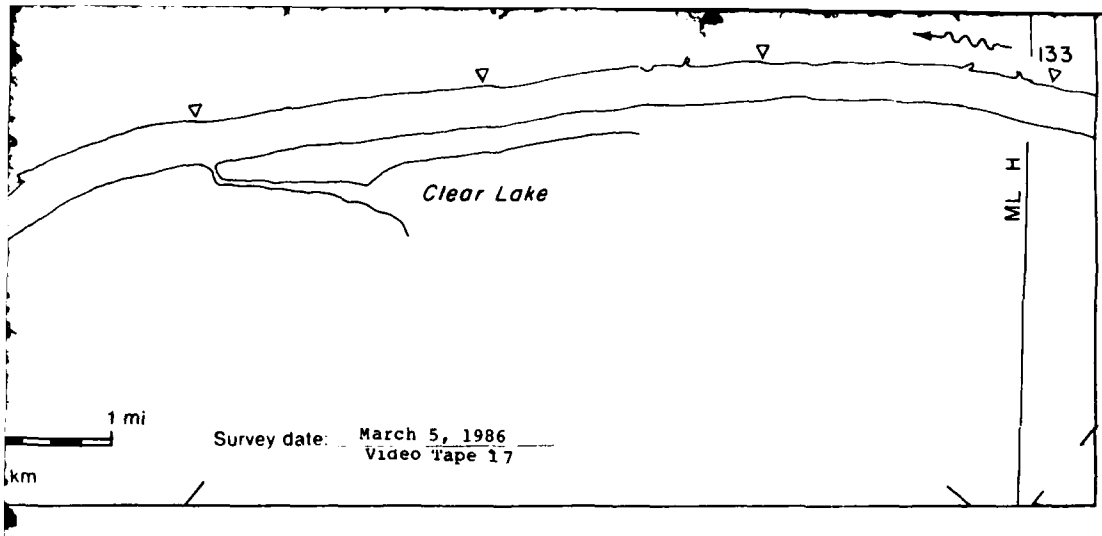

Grange Pool :7/12*
40°22'30"
126
Quiver Lake
ML G
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

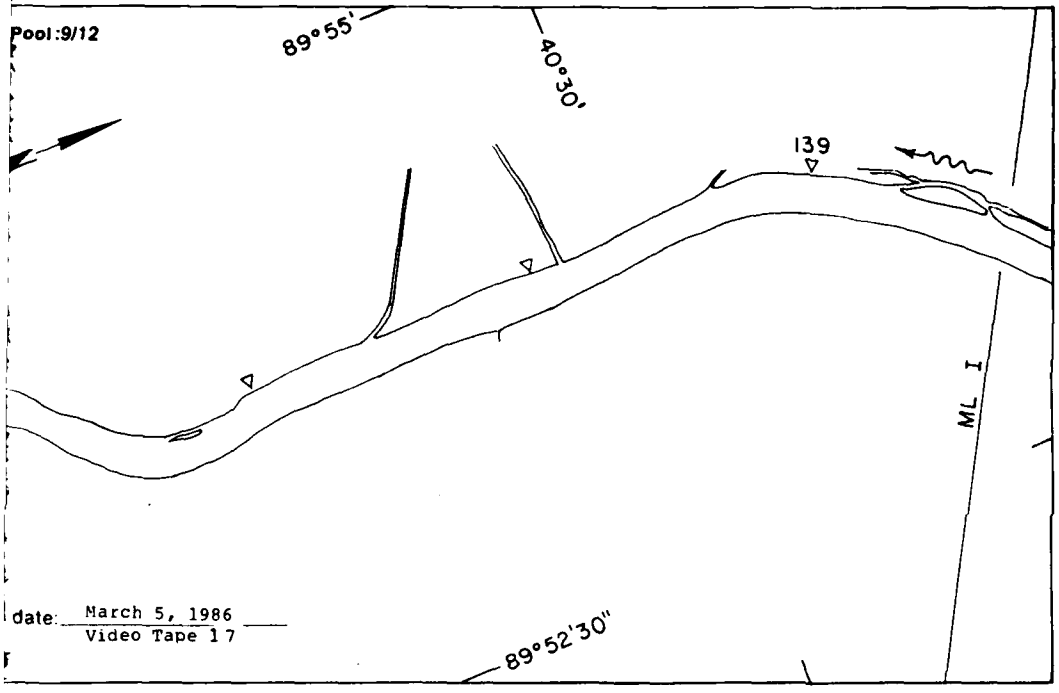

40°25'
89°57'30"
133
Clear Lake
ML H
1 mi
Survey date: March 5, 1986
Video Tape 17


1:9/12
89°55'
40°30'
139

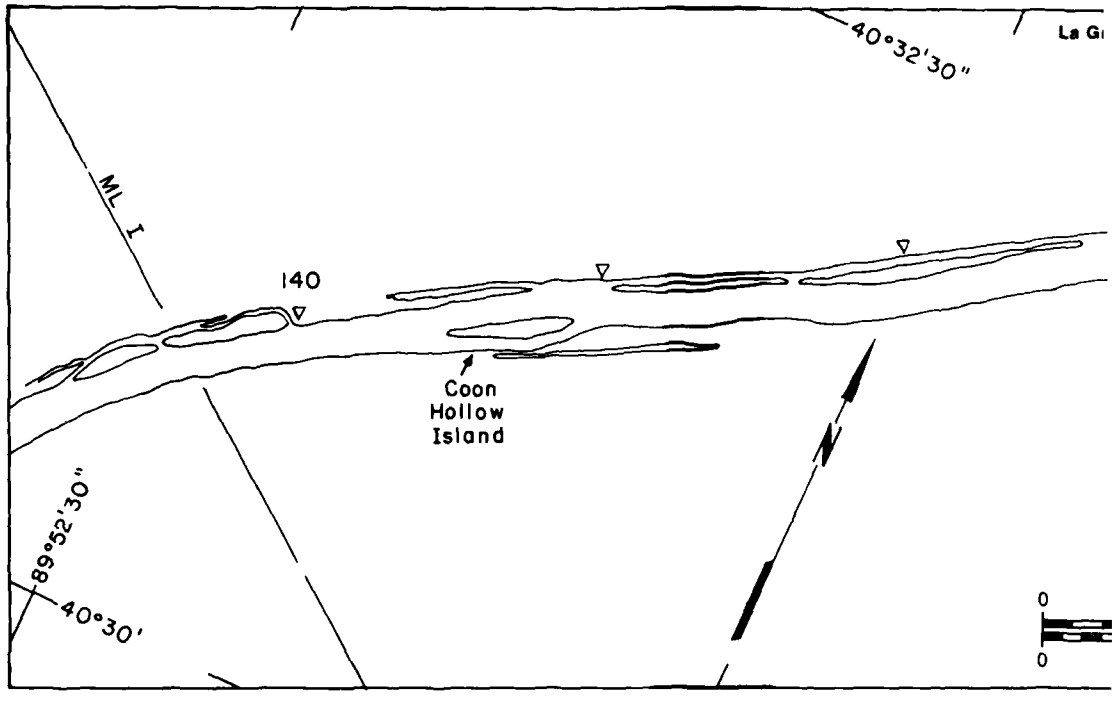


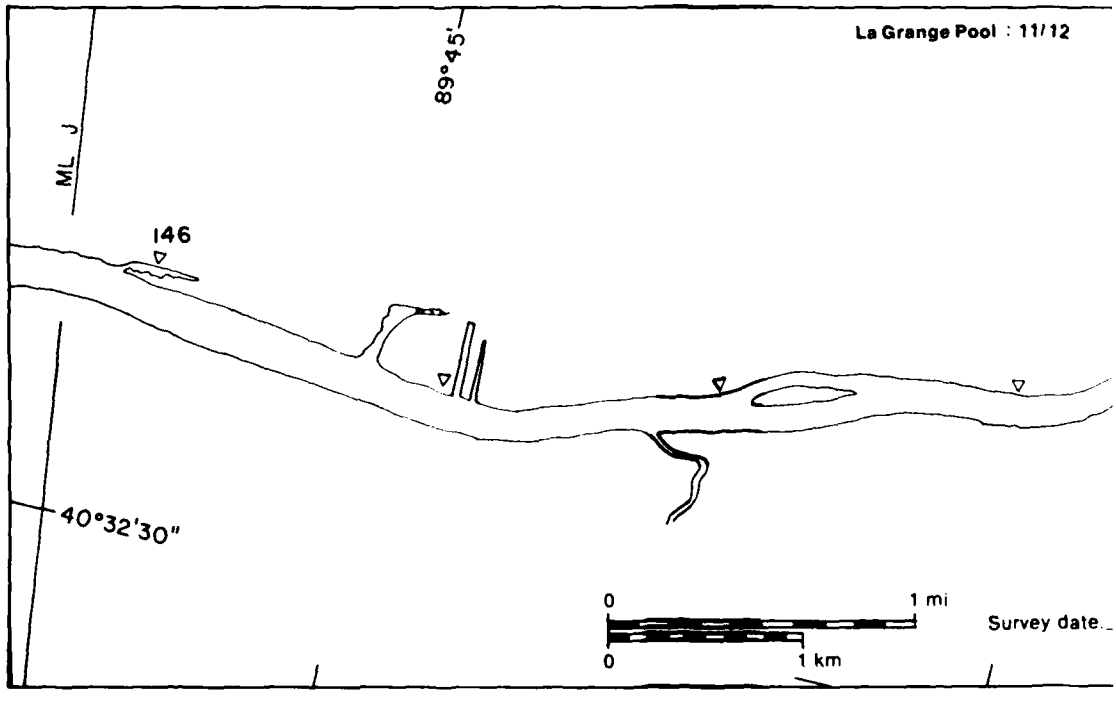
* The downstream limit of Illinois River video coverage was in the vicinity of mile 120 at Havana, Illinois, on all dates. There is no coverage of La Grange Pool maps 1/12 through 6/12 (match lines A through E).

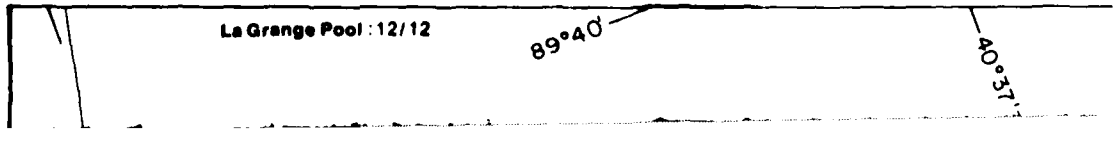

133
Clear Lake
ML H
1 mi
Survey date: March 5, 1986
Video Tape 17
km

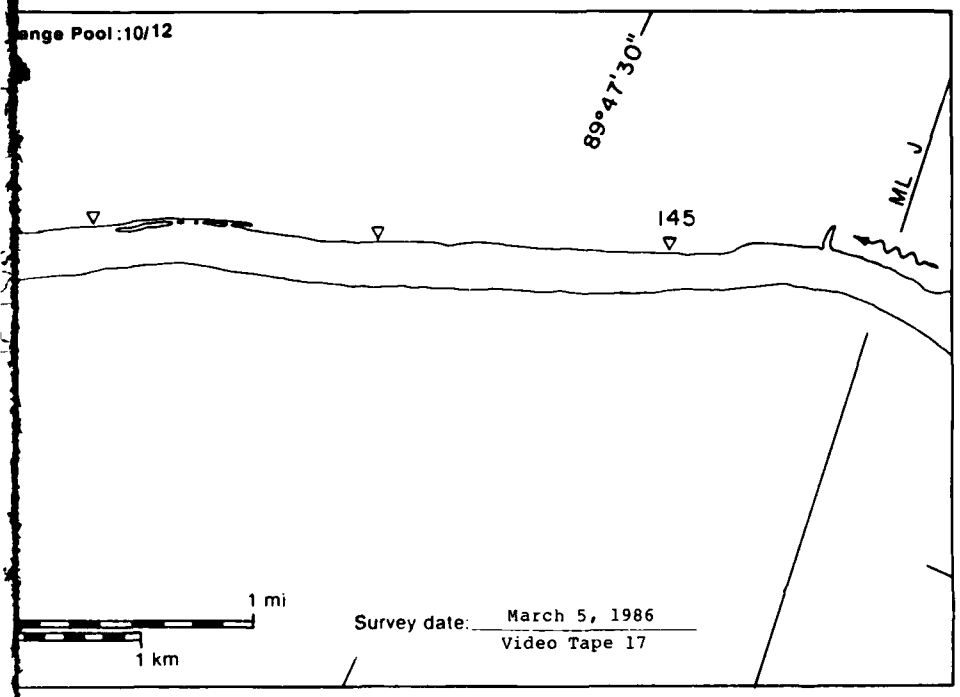

Pool:9/12
89°55'
40°30'
139
ML I
date: March 5, 1986
Video Tape 17
89°52'30"

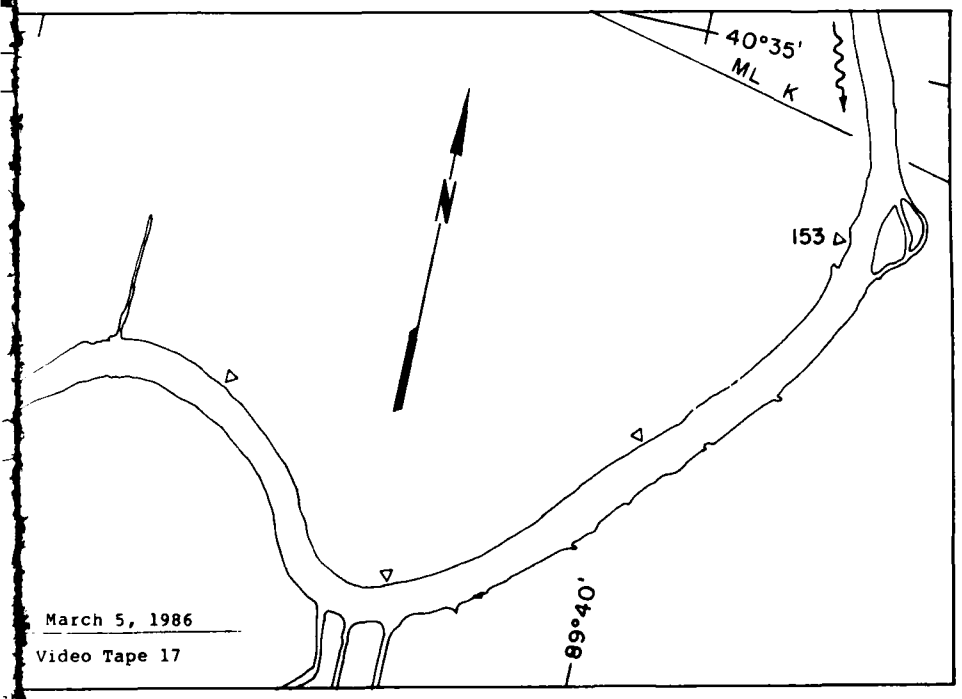
5 March 1986


40°32'30"
La Gi
ML I
140
Coon
Hollow
Island
89°52'30"
40°30'
0
0


La Grange Pool : 11/12
89°45'
ML J
146
40°32'30"
0
1 mi
0
1 km
Survey date


La Grange Pool : 12/12
89°40'
40°37'



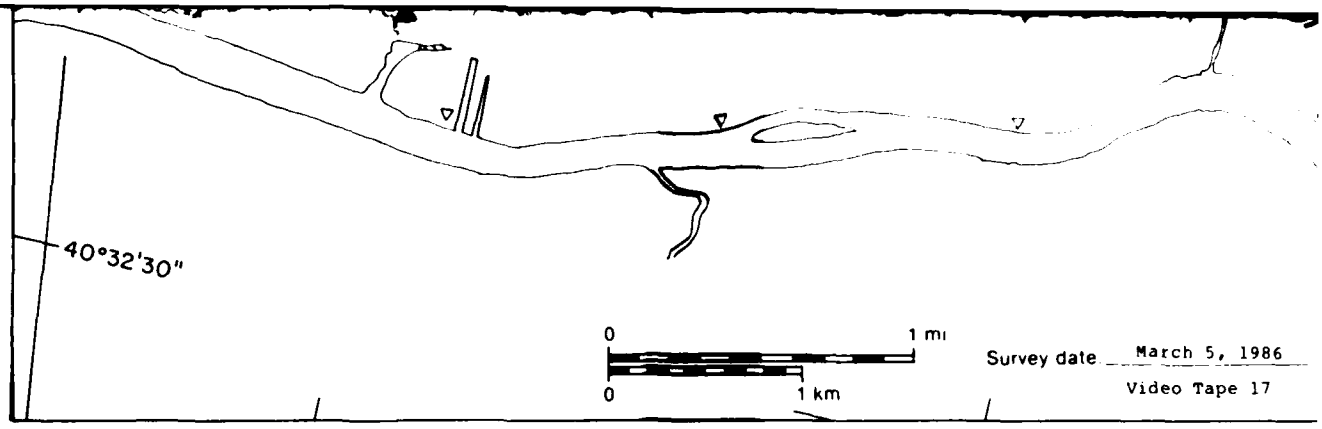


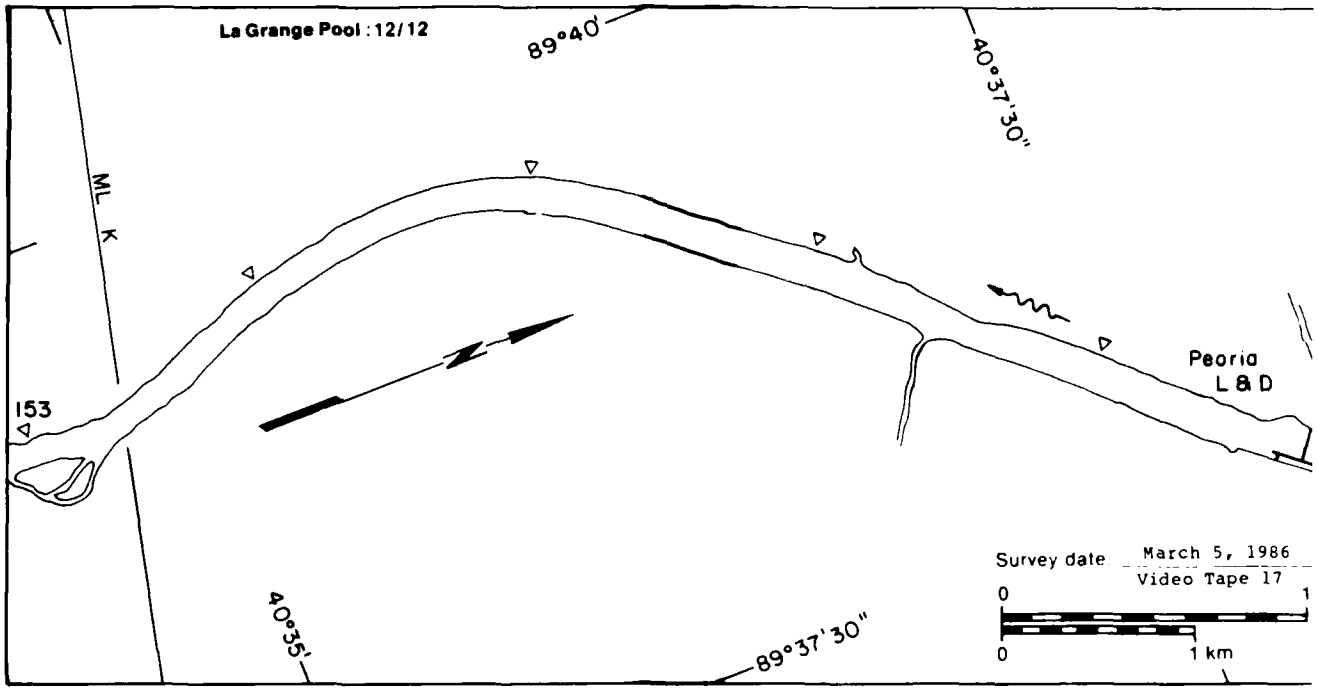
La Grange Pool

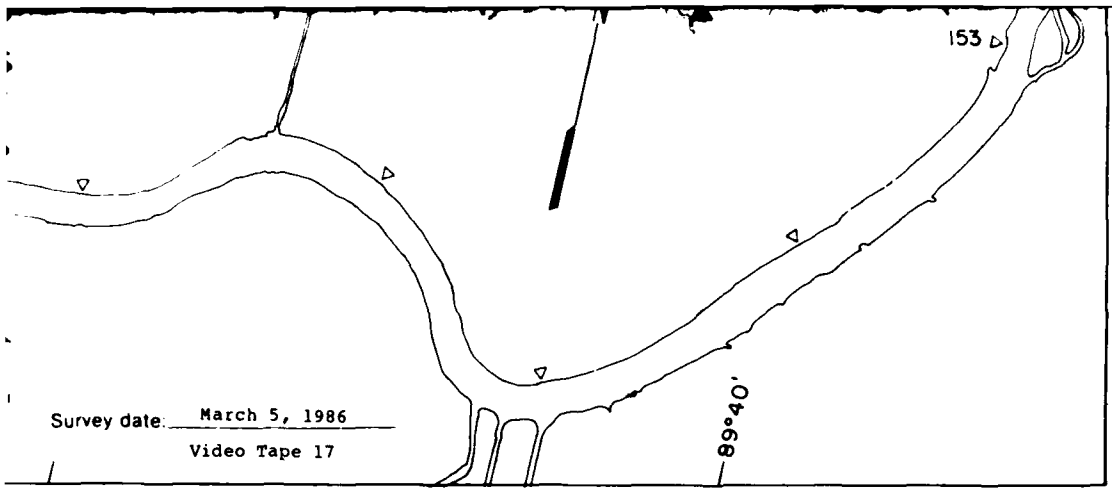
MAP UNITS

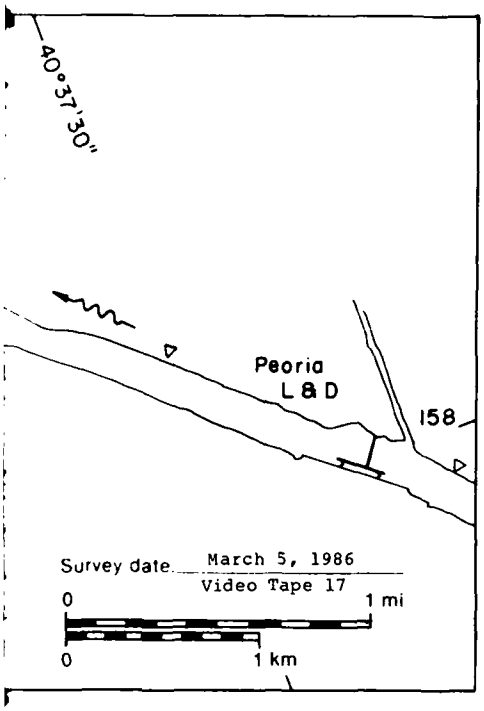
Open water

Area ($m^2 \times 10^6$)	Surface concentration (%)
10.91	NA


40°32'30"
0
1 mi
0
1 km
Survey date March 5, 1986
Video Tape 17


La Grange Pool : 12/12
89°40'
40°37'30"
ML K
153
Peoria
L & D
Survey date March 5, 1986
Video Tape 17
0
1
0
1 km
40°35'
89°37'30"



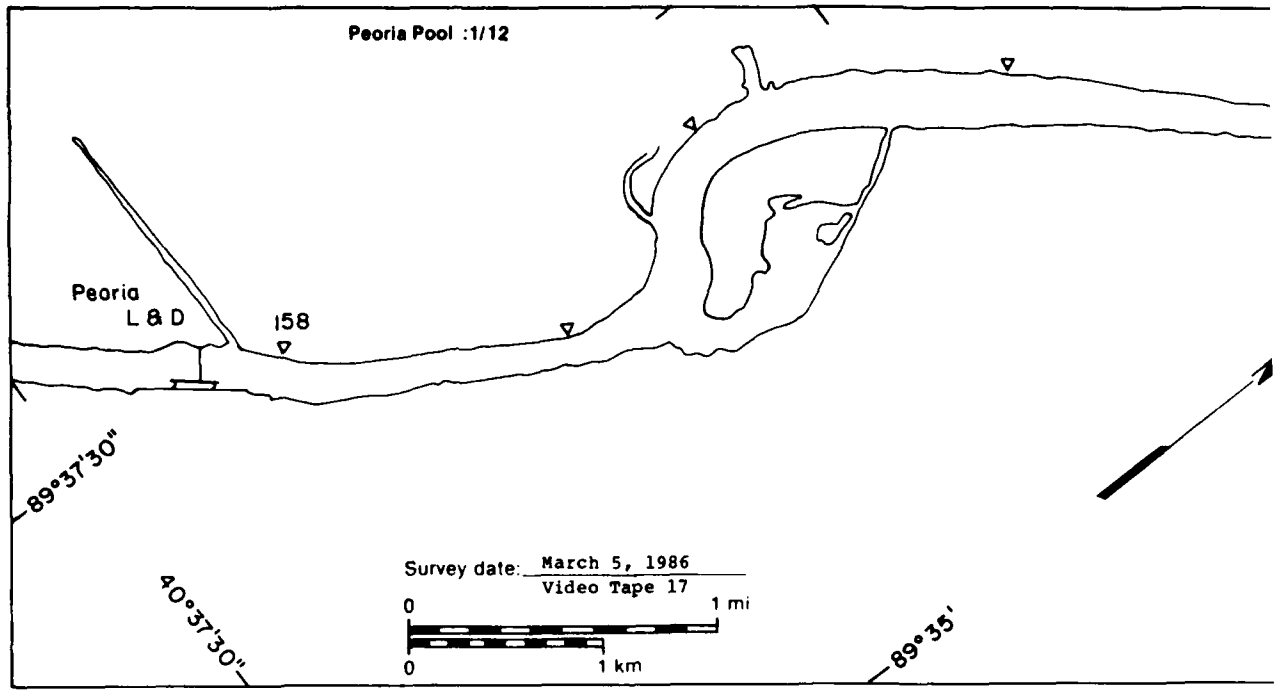


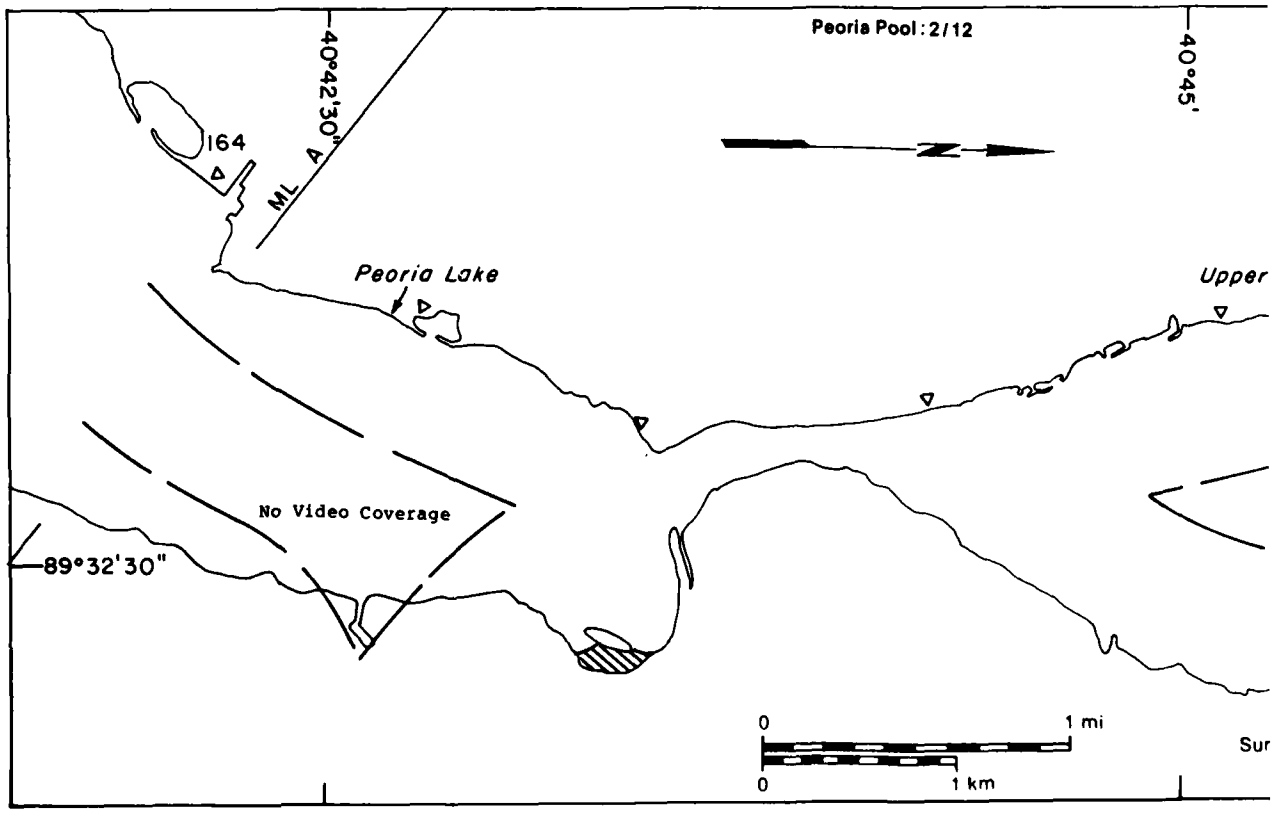
La Grange Pool

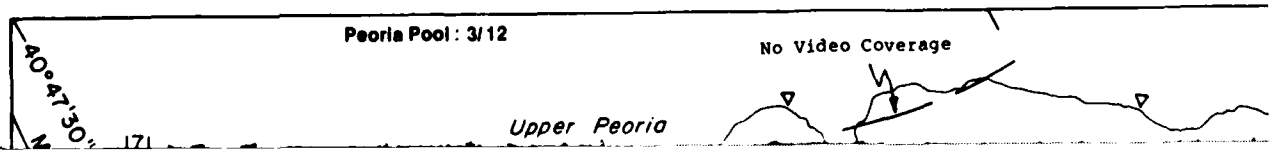
MAP UNITS

	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	10.91	NA
Solid ice cover	Trace	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	11.71*	

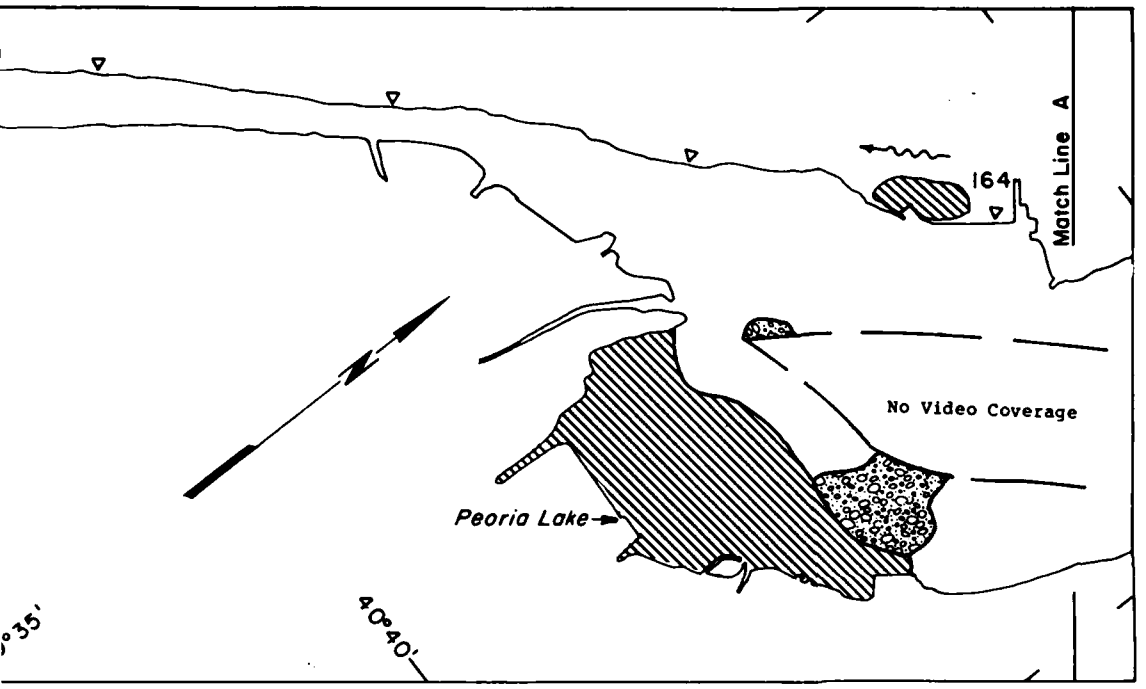
* Includes 0.80×10^6 m^2 of no video coverage

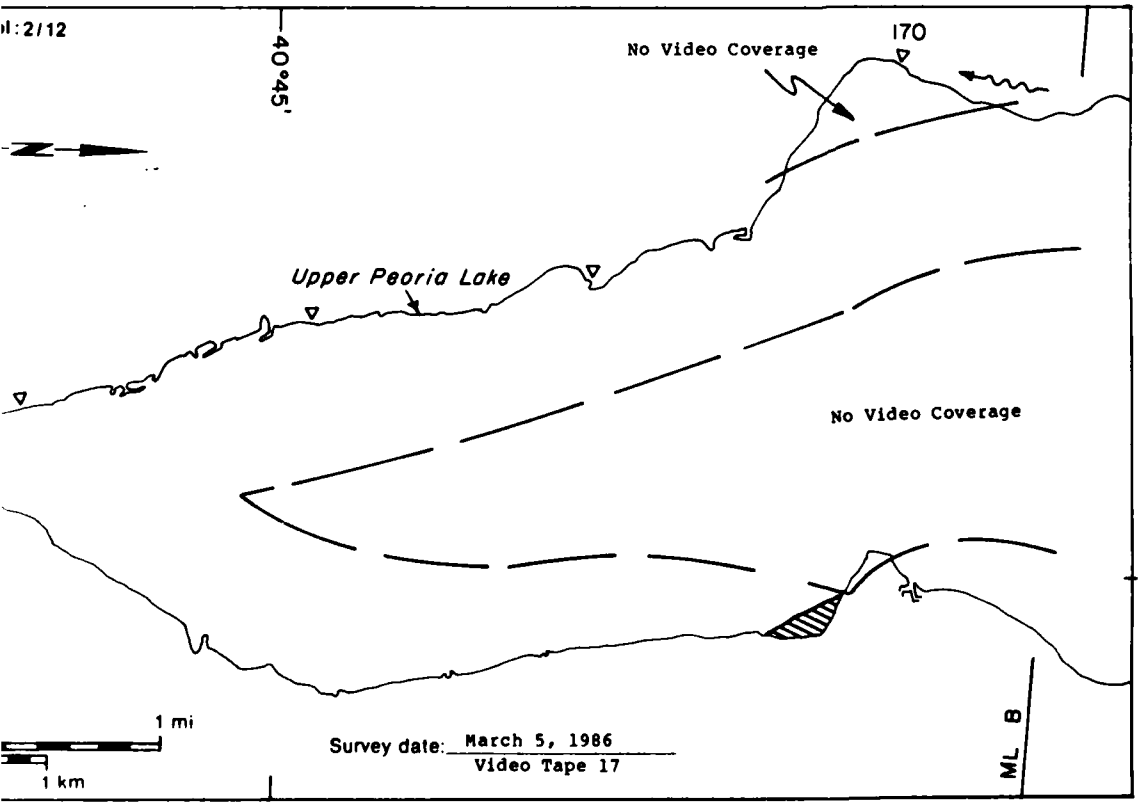

Peoria Pool :1/12
Peoria
L & D
158
89°37'30"
40°37'30"
Survey date: March 5, 1986
Video Tape 17
0
1 mi
0
1 km
89°35'

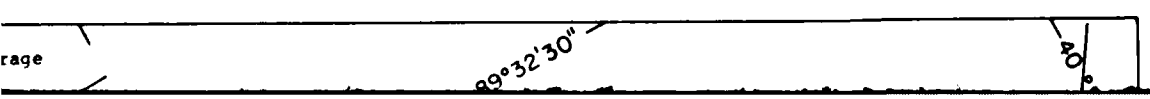

Peoria Pool : 2/12
40°42'30"
40°45'
164
ML A
Peoria Lake
Upper
No Video Coverage
89°32'30"
0
1 mi
0
1 km
Sur

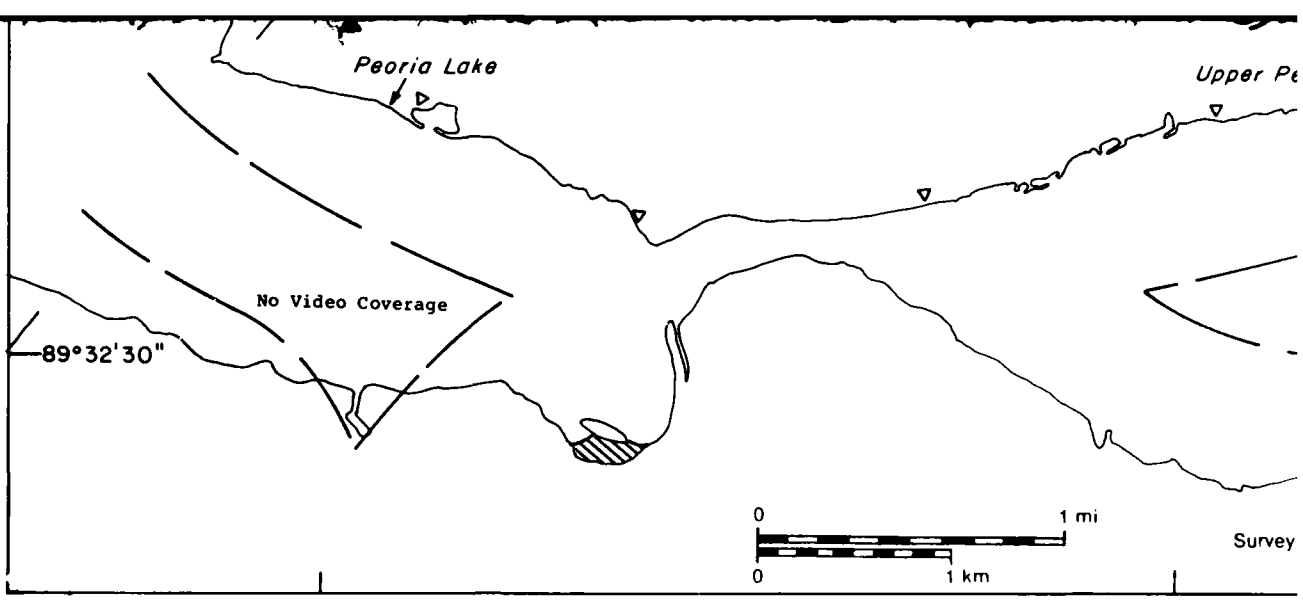

Peoria Pool : 3/12
40°47'30"
No Video Coverage
Upper Peoria

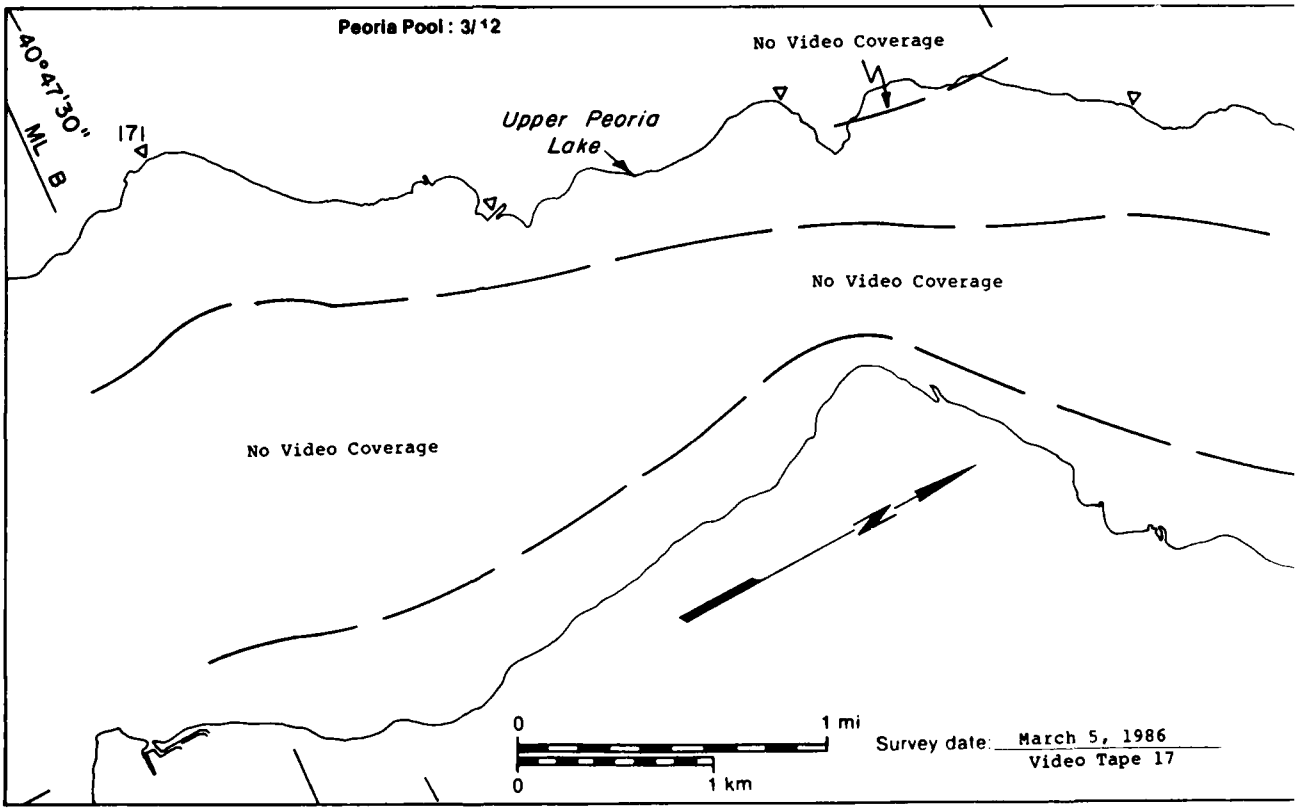
5 March 1986

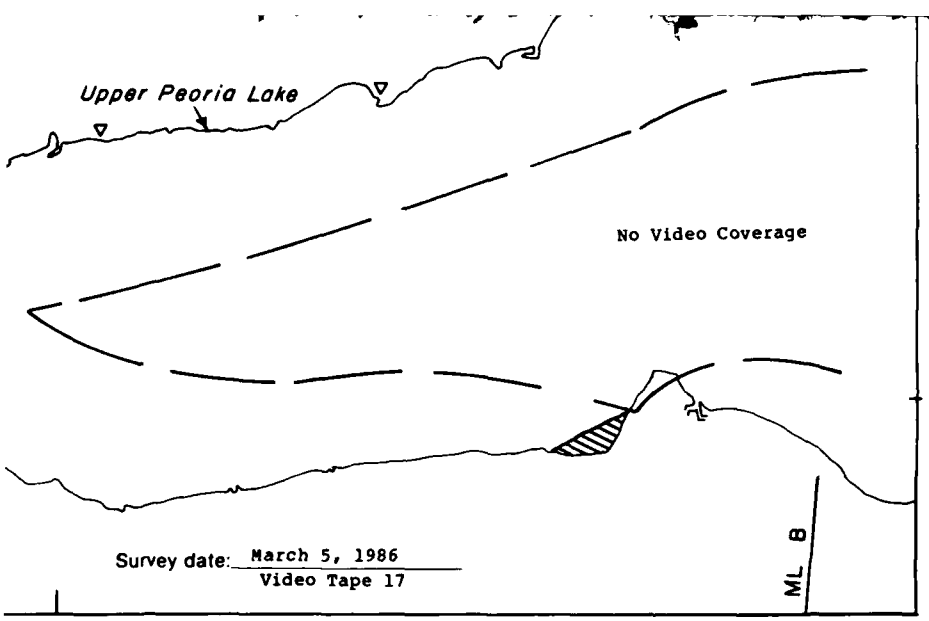

164
Match Line A
No Video Coverage
Peoria Lake
40°40'

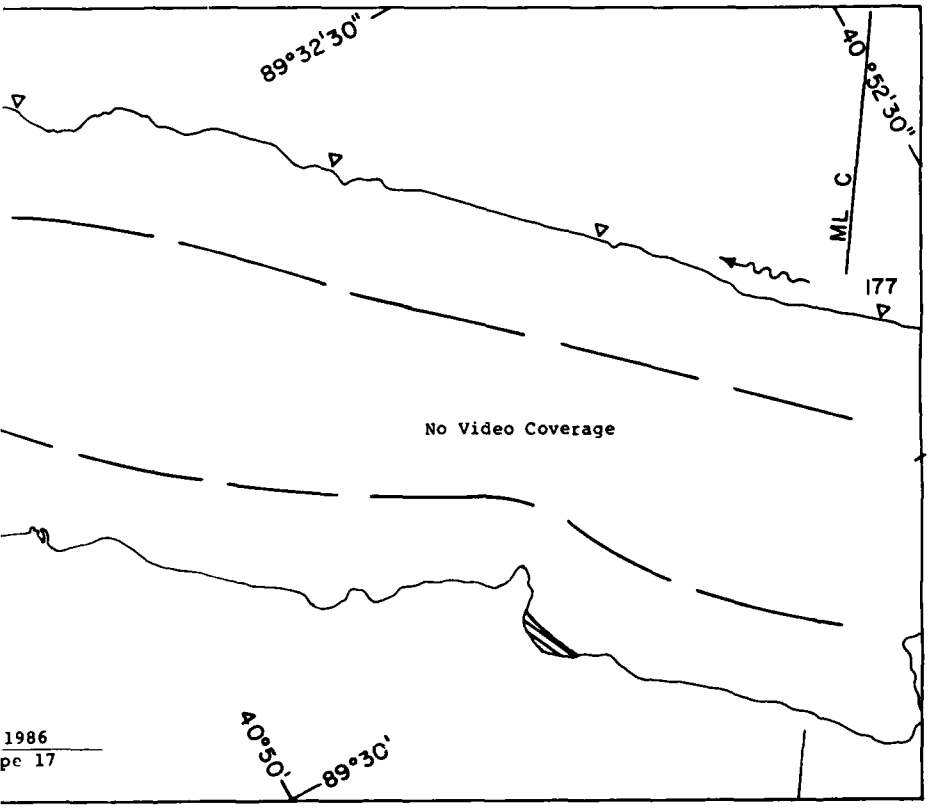

40°45'
No Video Coverage
170
Upper Peoria Lake
No Video Coverage
1 mi
1 km
Survey date: March 5, 1986
Video Tape 17
ML B


89°32'30"
40°

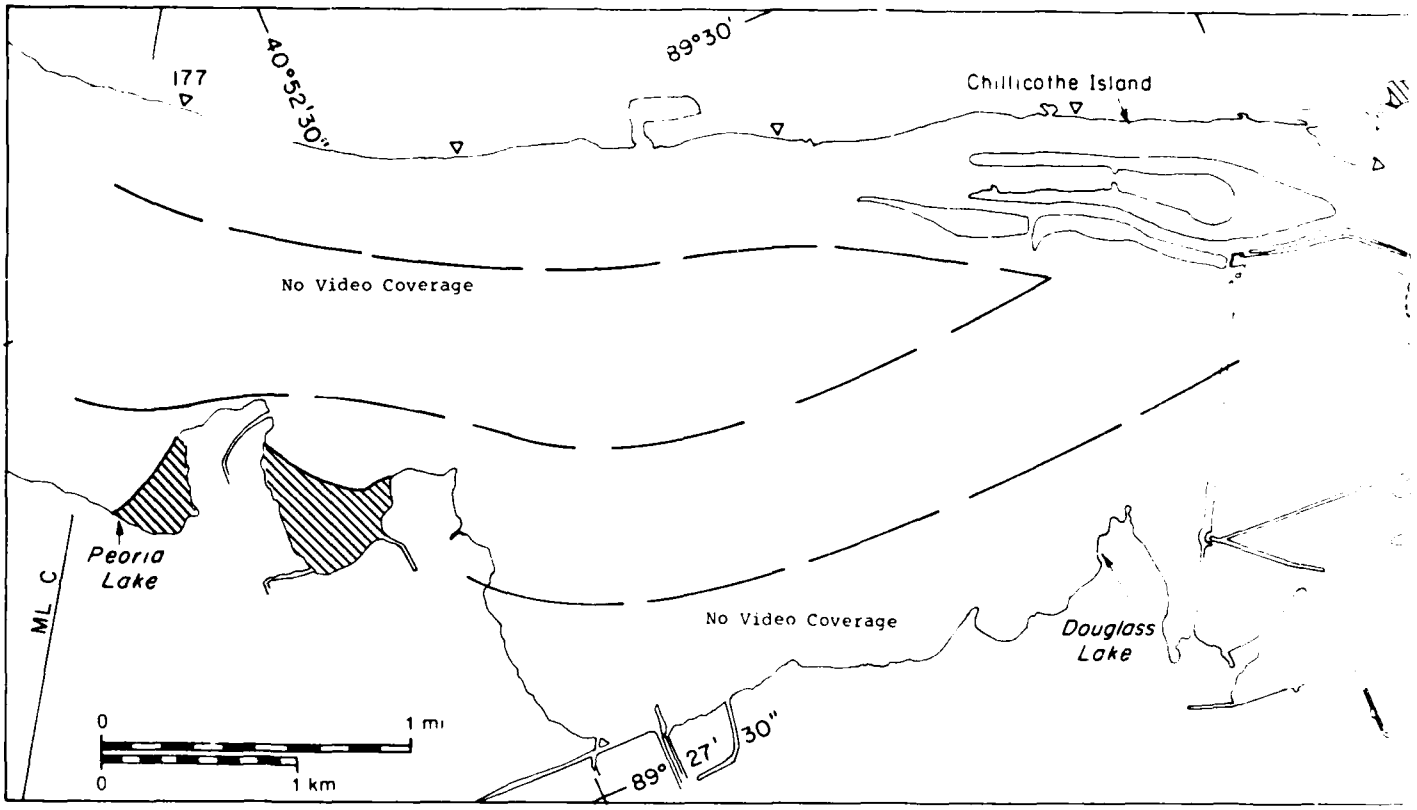

Peoria Lake
Upper Pe
No Video Coverage
89°32'30"
0
1 mi
0
1 km
Survey

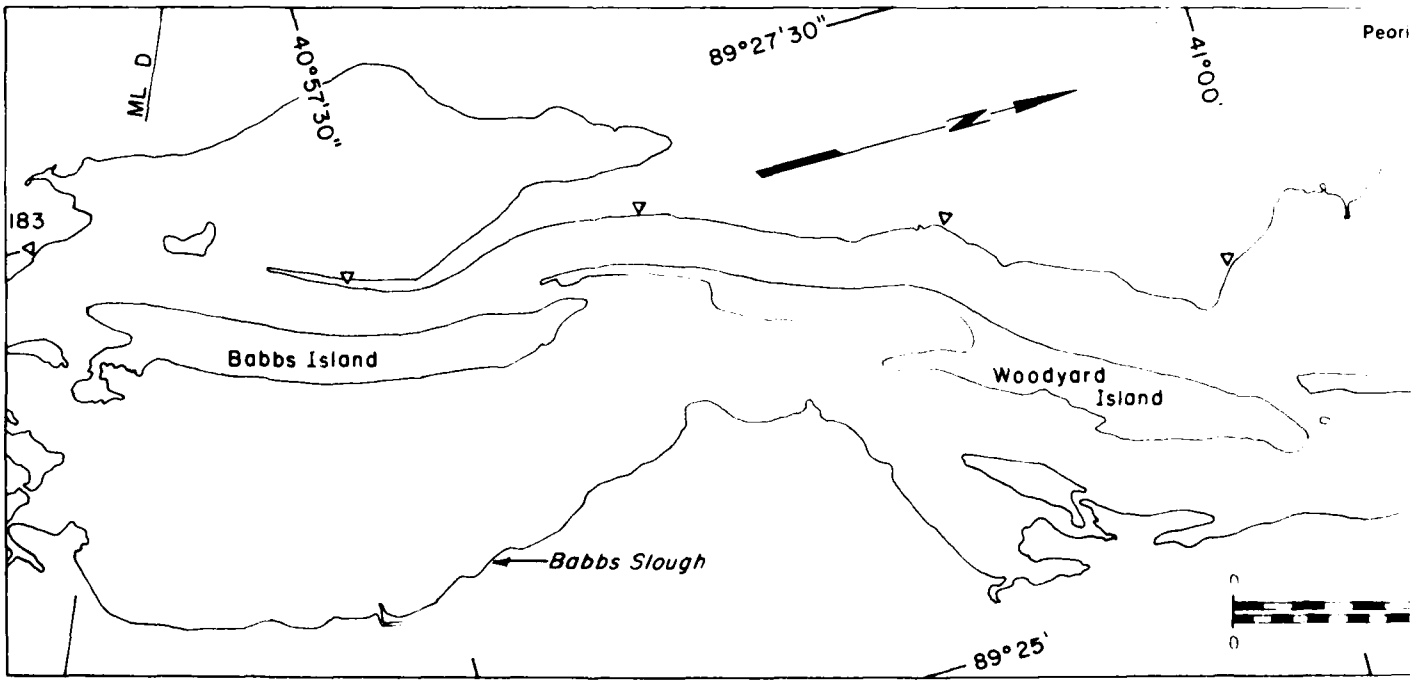

Peoria Pool : 3/12
40°47'30"
ML B
171
Upper Peoria Lake
No Video Coverage
No Video Coverage
No Video Coverage
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

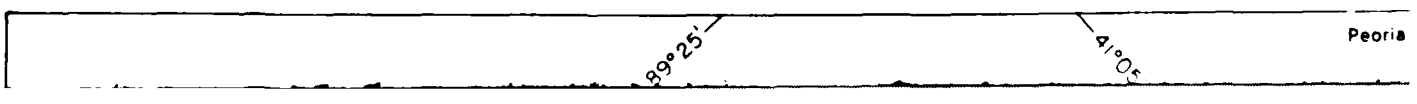

Upper Peoria Lake
No Video Coverage
ML B
Survey date: March 5, 1986
Video Tape 17

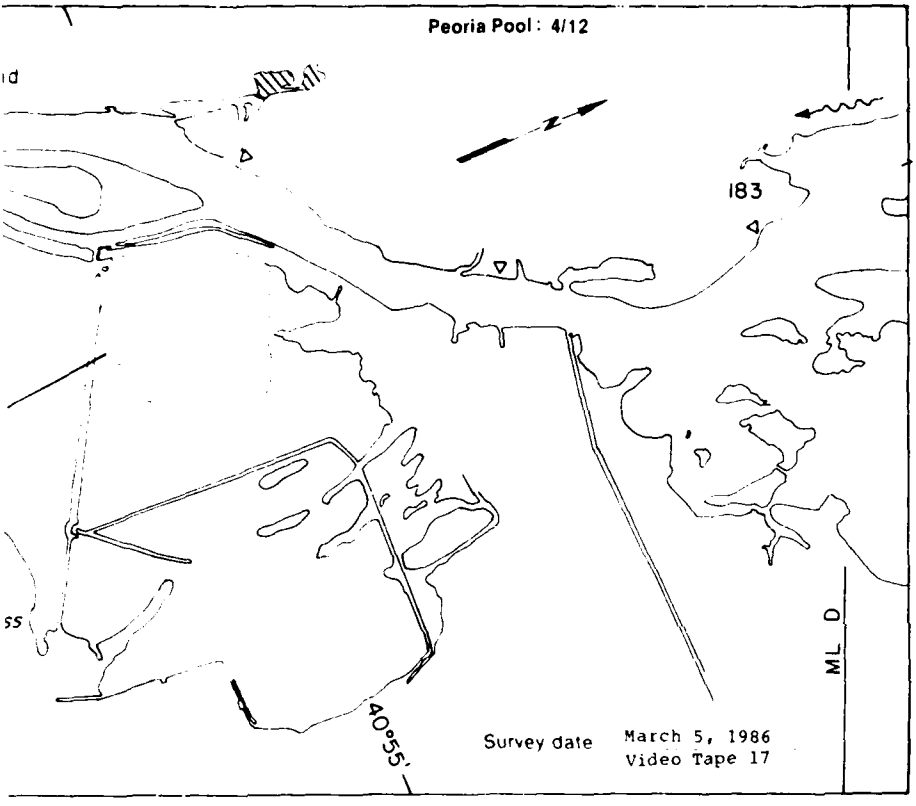

89°32'30"
40°52'30"
ML C
177
No Video Coverage
40°50'
89°30'
1986
pe 17

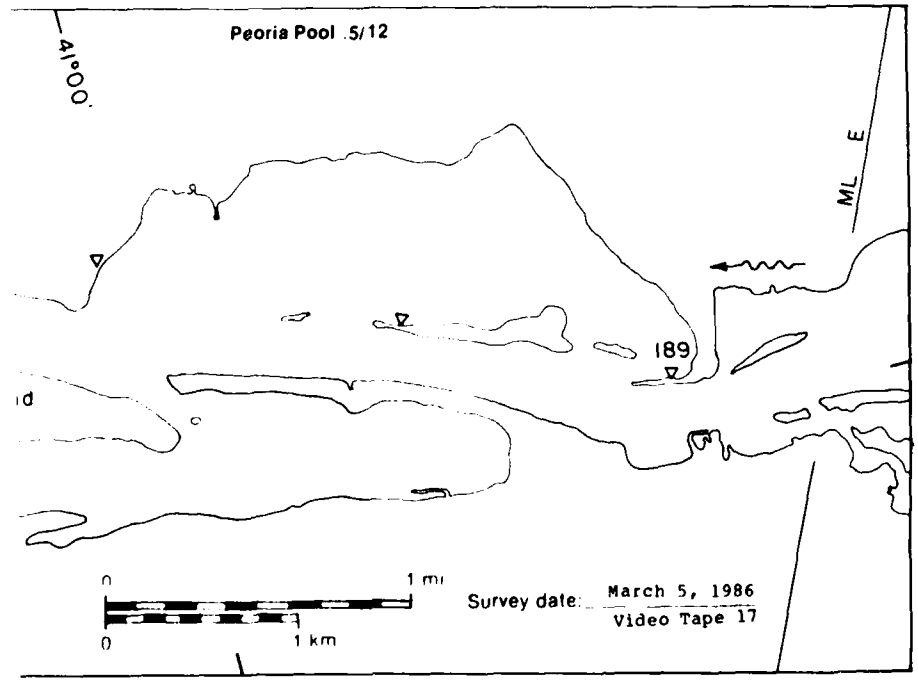
5 March 1986


177
40°52'30"
89°30'
Chillicothe Island
No Video Coverage
Peoria Lake
ML C
No Video Coverage
Douglass Lake
0
1 mi
0
1 km
89°
27'
30"

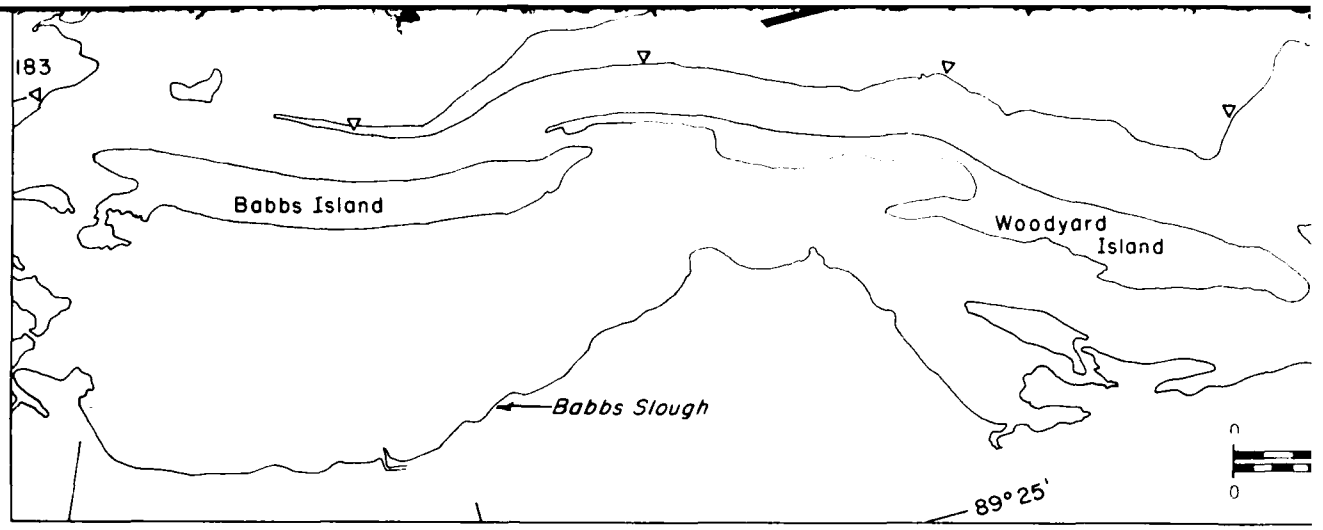

ML D
40°57'30"
89°27'30"
41°00'
183
Babbs Island
Woodyard Island
Babbs Slough
89°25'

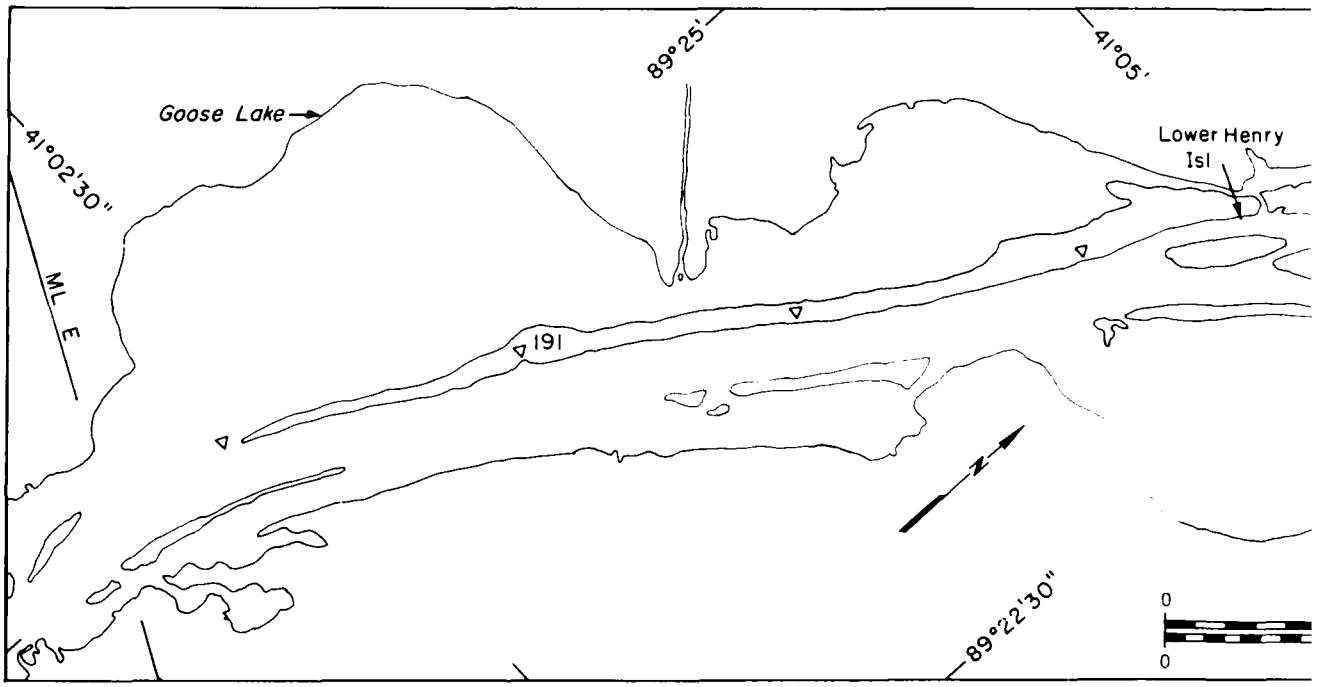

89°25'
41°05'

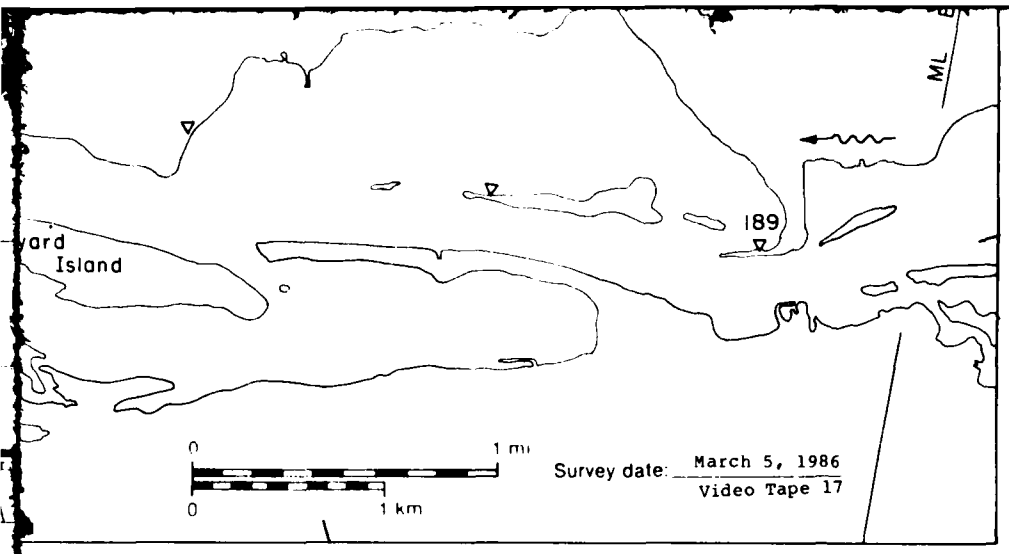

Peoria Pool : 4/12
183
ML D
40°55'
Survey date March 5, 1986
Video Tape 17

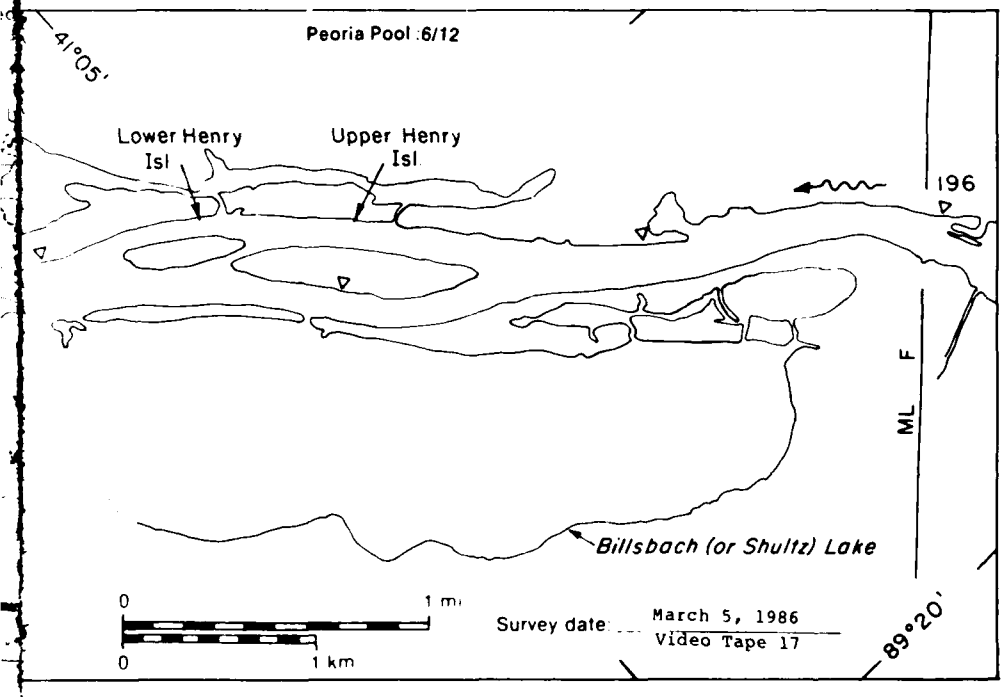

Peoria Pool .5/12
41°00'
ML E
189
0 1 mi
0 1 km
Survey date: March 5, 1986
Video Tape 17

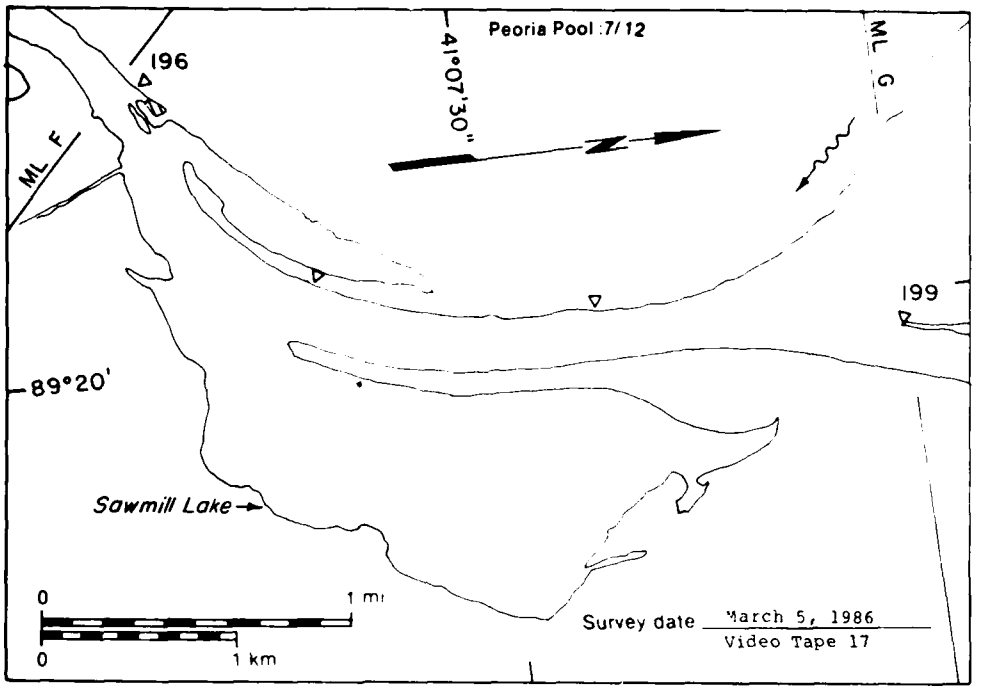
Peoria Pool :6/12
Lower Henry
Upper Henry

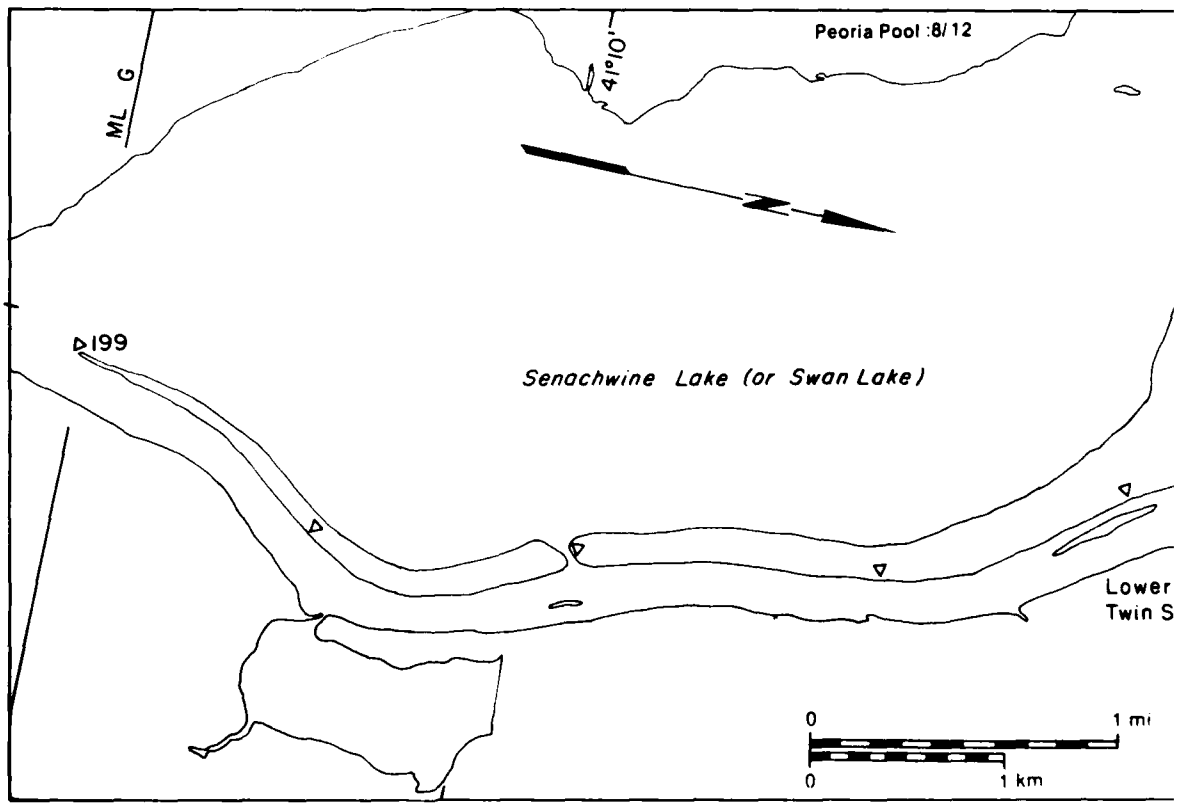

183
Babbs Island
Woodyard
Island
Babbs Slough
89°25'
0
0

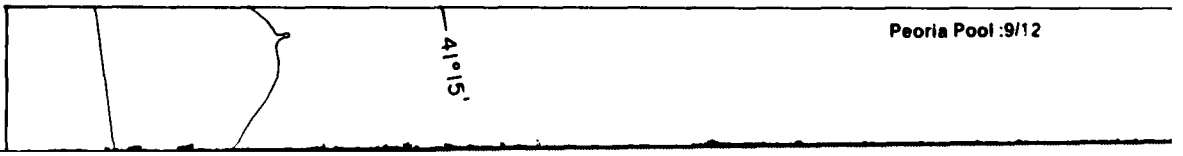

89°25'
41°05'
Goose Lake
41°02'30"
Lower Henry
Isl
ML E
191
89°22'30"
0
0


ML
189
ard
Island
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

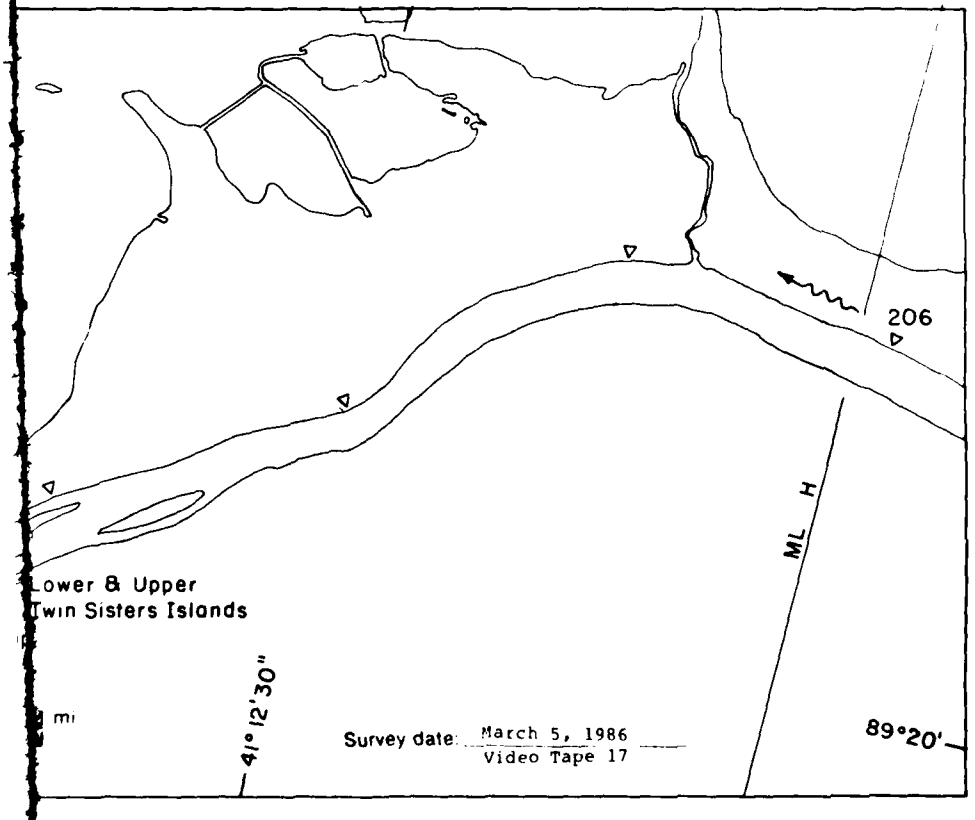

Peoria Pool :6/12
41°05'
Lower Henry
Isl
Upper Henry
Isl
196
ML F
Billsbach (or Shultz) Lake
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17
89°20'

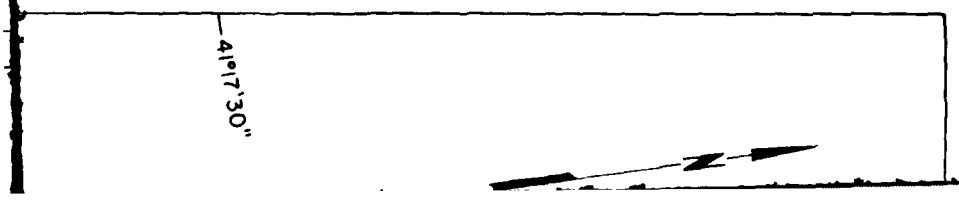

Peoria Pool :7/12
196
41°07'30"
ML F
ML G
199
89°20'
Sawmill Lake
0
1 mi
0
1 km
Survey date March 5, 1986
Video Tape 17

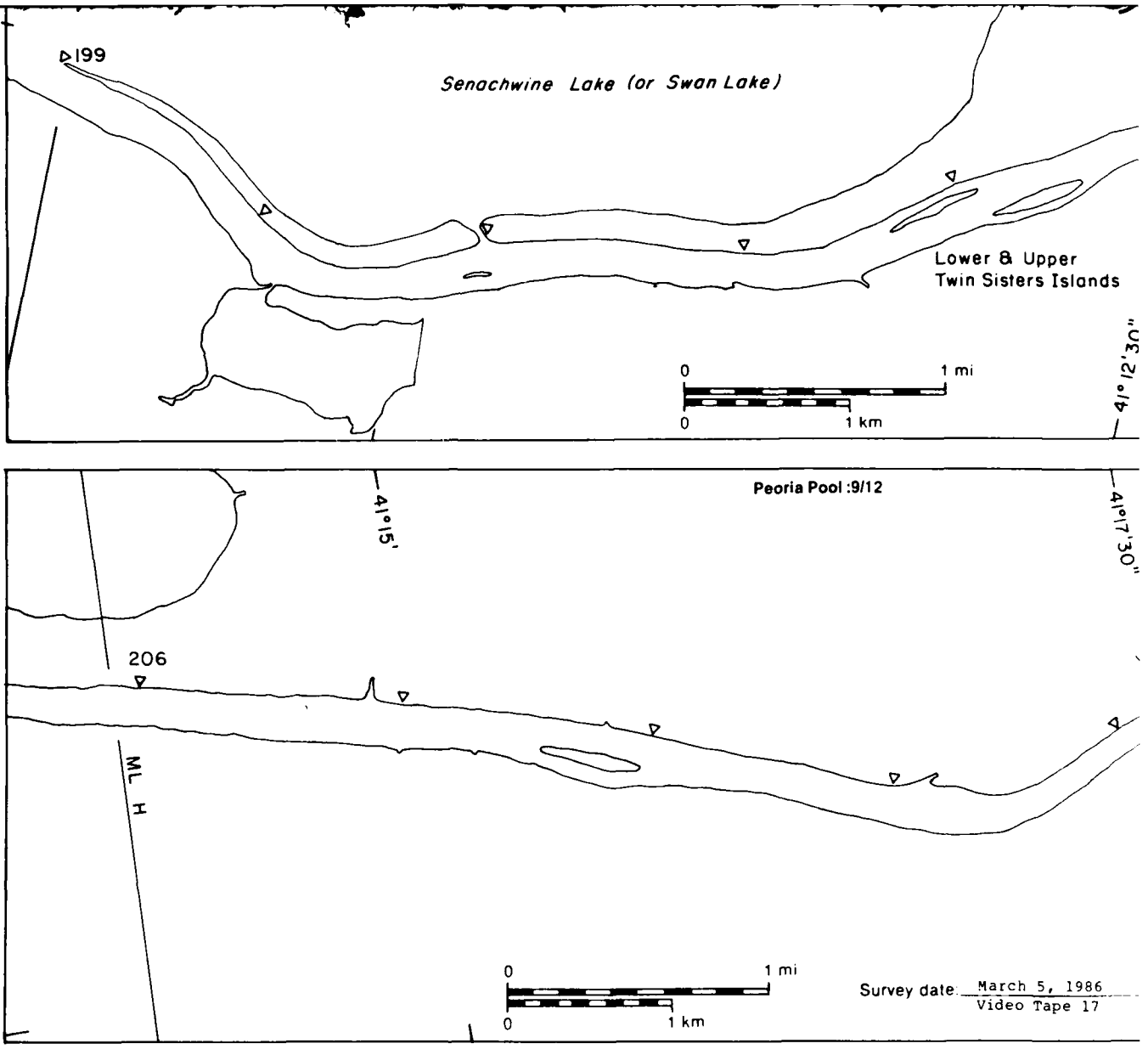

Peoria Pool :8/12
41°10'
ML G
199
Senachwine Lake (or Swan Lake)
Lower
Twin S
0
1 mi
0
1 km

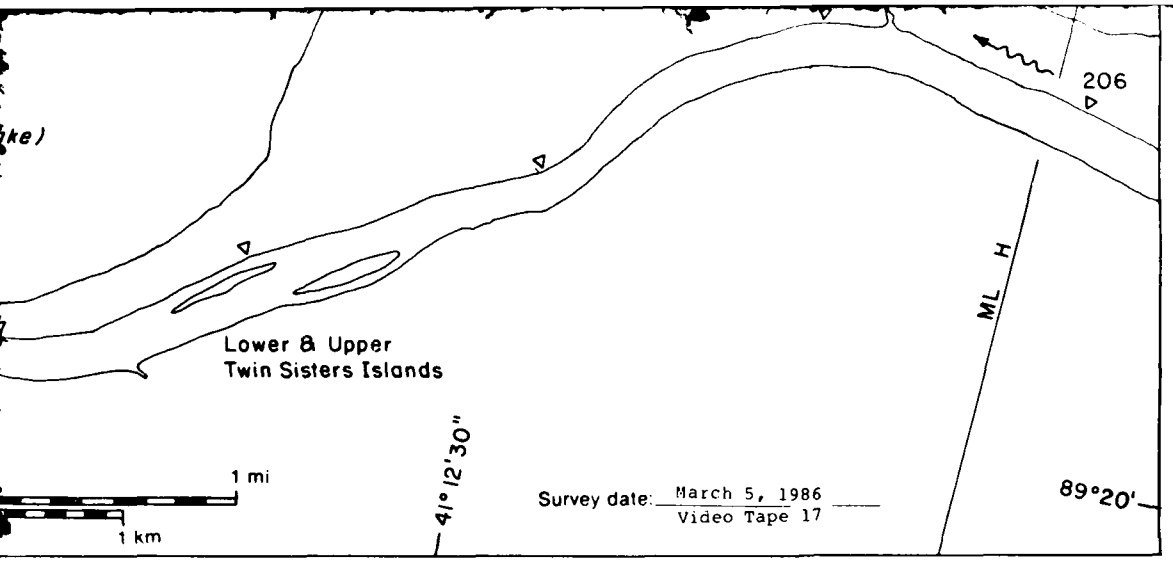

Peoria Pool :9/12
41°15'

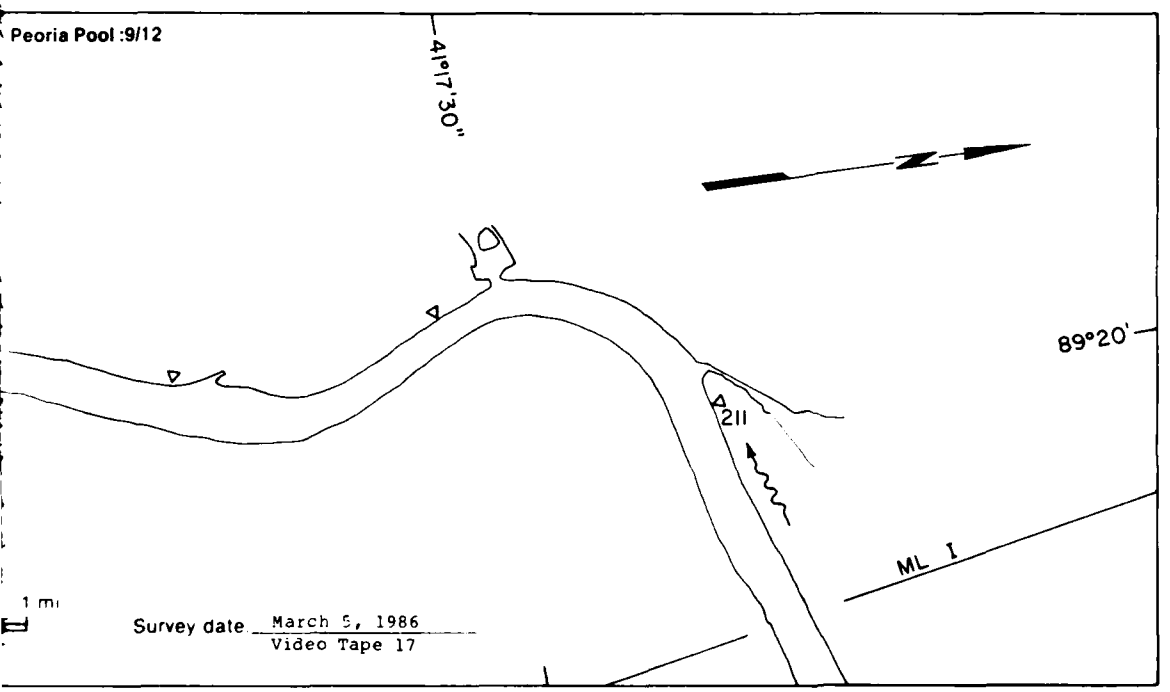
5 March 1986


206
ML H
Lower & Upper
Twin Sisters Islands
41° 12' 30"
Survey date: March 5, 1986
Video Tape 17
89°20'

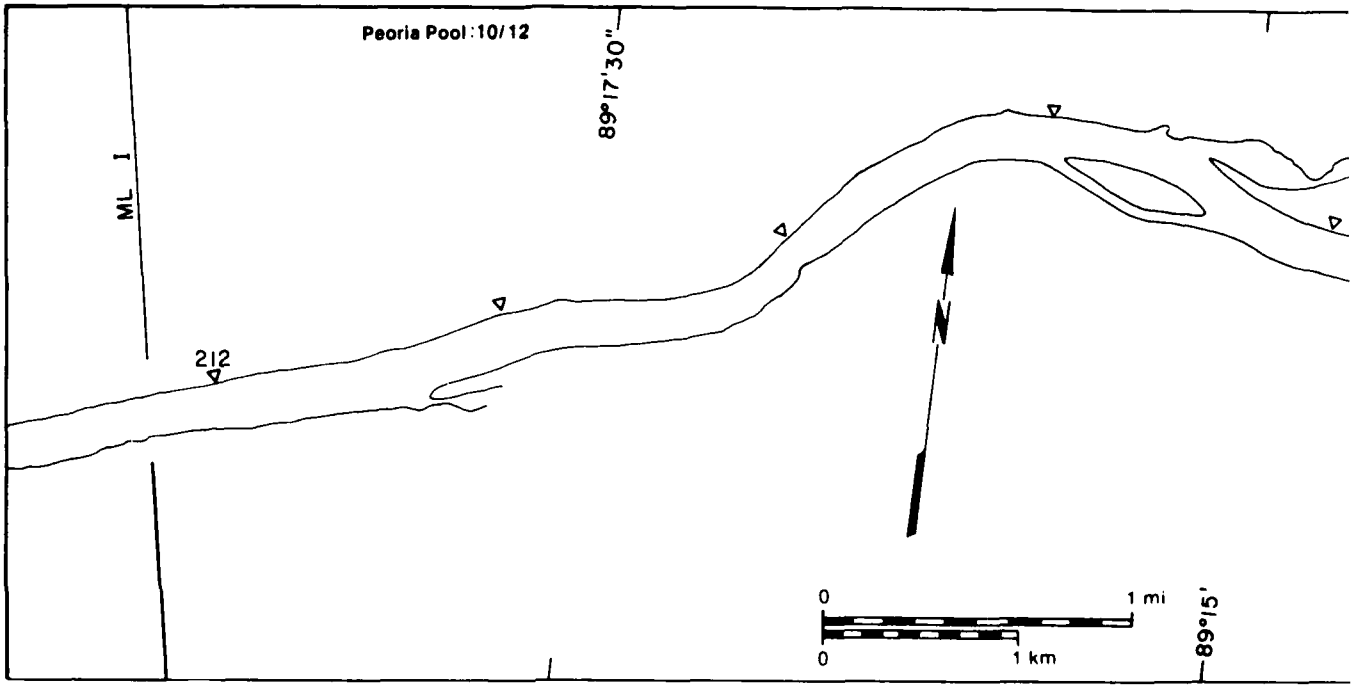

41°17'30"

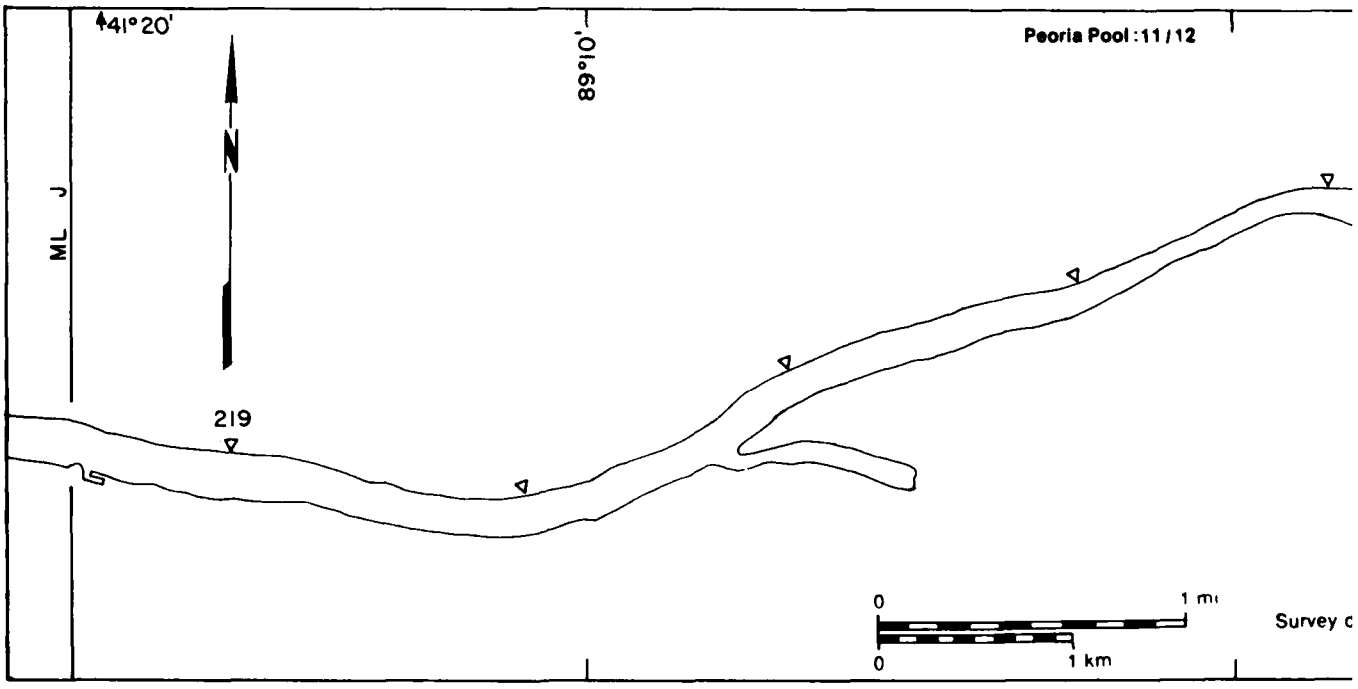

199
Senachwine Lake (or Swan Lake)
Lower & Upper
Twin Sisters Islands
0
1 mi
0
1 km
41°21'30"
Peoria Pool :9/12
41°15'
41°17'30"
206
ML H
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

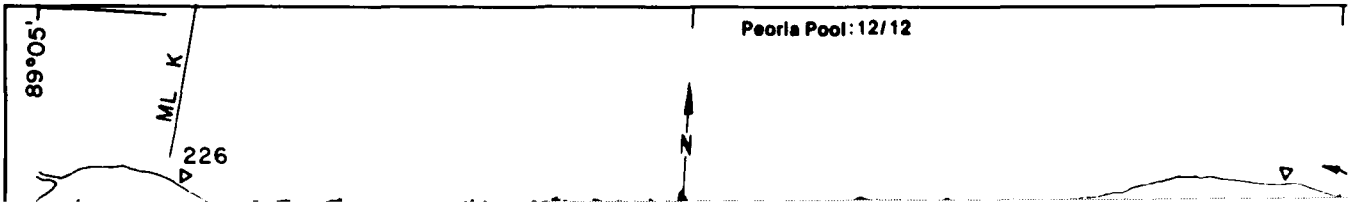

206
ML H
Lower & Upper
Twin Sisters Islands
1 mi
1 km
41° 12'30"
Survey date: March 5, 1986
Video Tape 17
89°20'

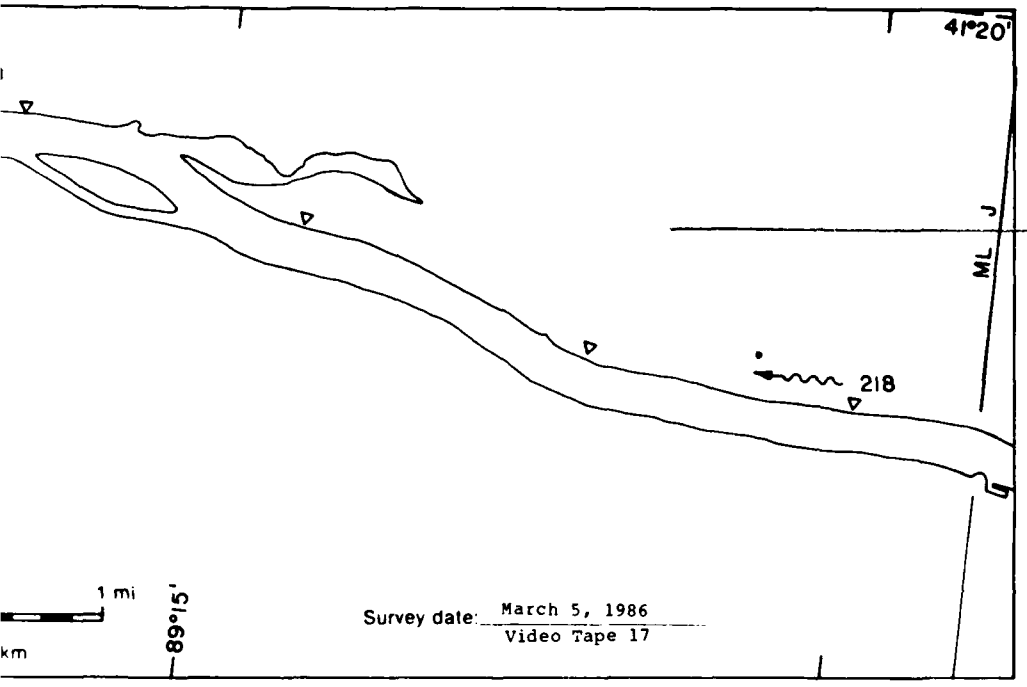

Peoria Pool :9/12
41°17'30"
89°20'
211
ML I
1 mi
Survey date March 5, 1986
Video Tape 17

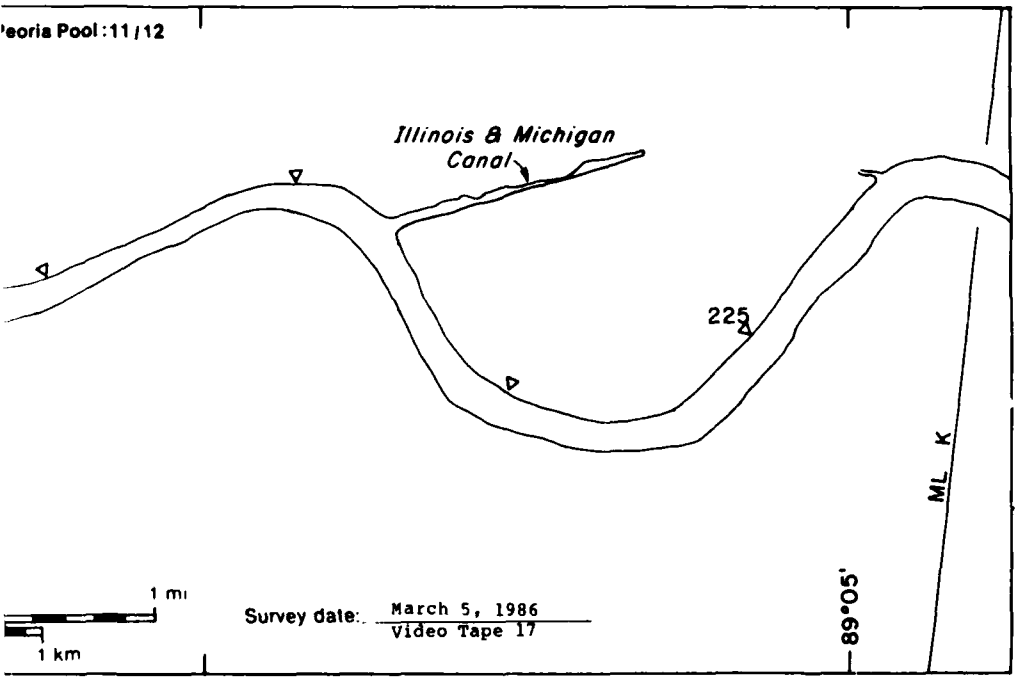
5 March 1986

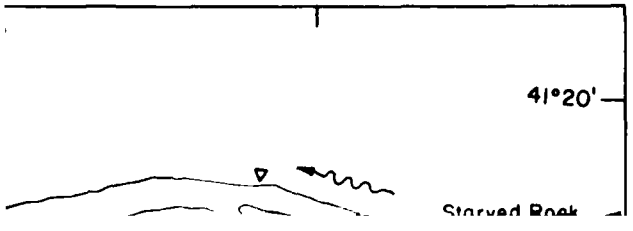

Peoria Pool: 10/12
89°17'30"
ML I
212
N
0
1 mi
0
1 km
89°15'

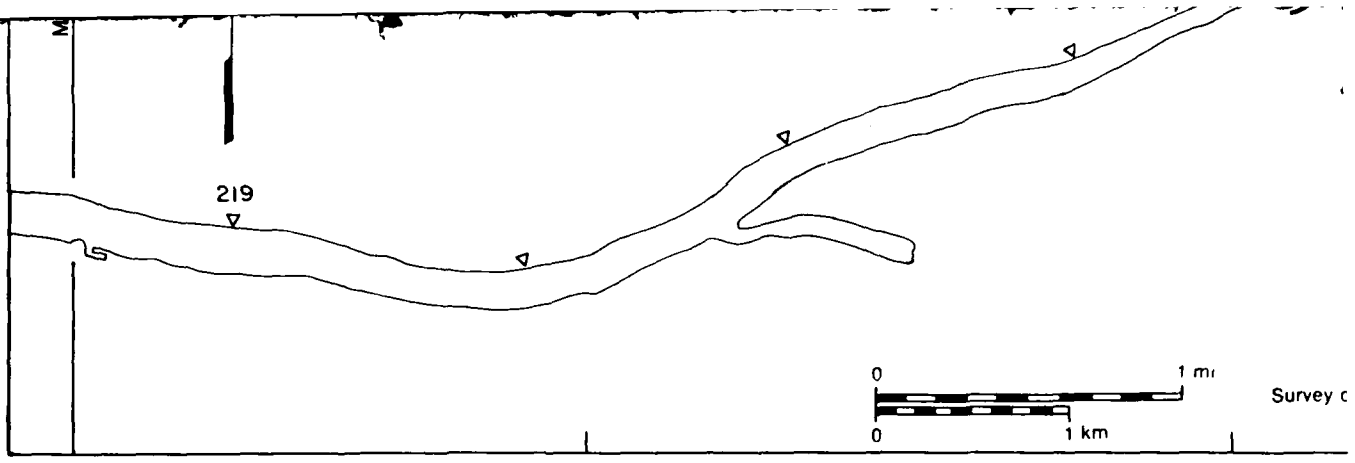

41°20'
89°10'
Peoria Pool: 11/12
ML J
N
219
0
1 mi
0
1 km
Survey c

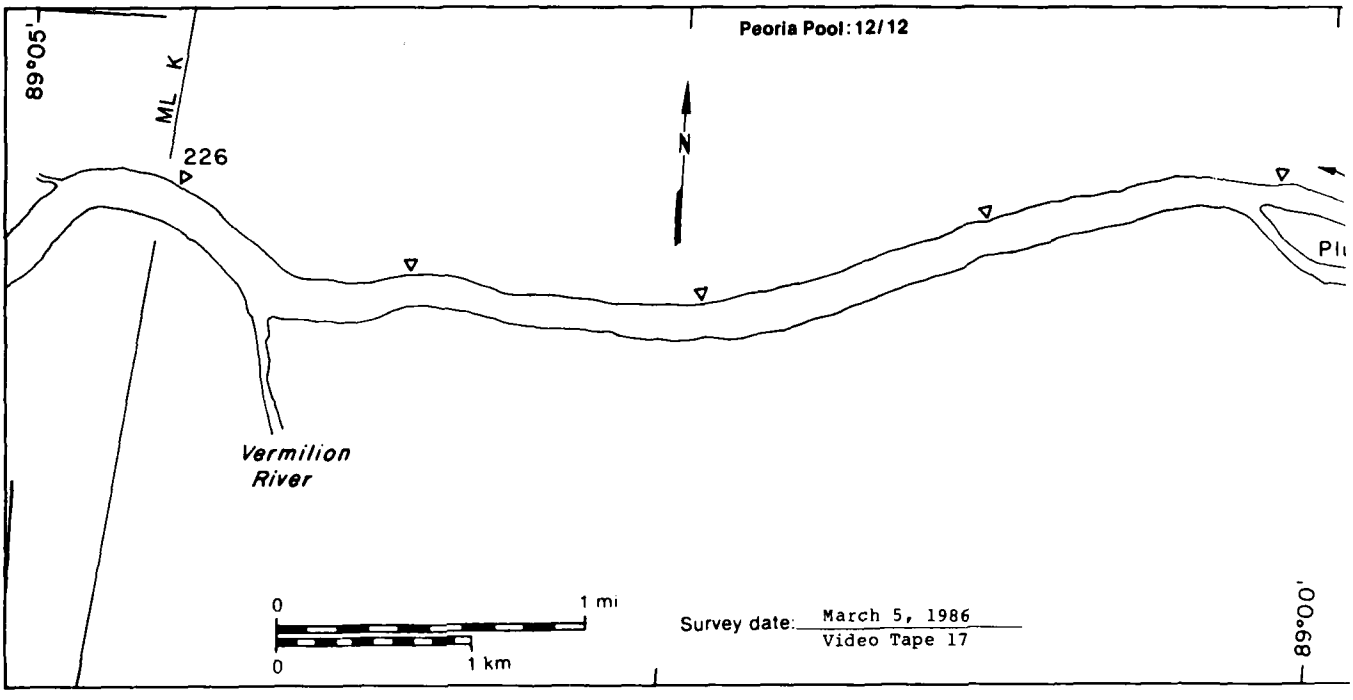

89°05'
Peoria Pool: 12/12
ML K
226
N


41°20'
ML J
218
1 mi
1 km
89°15'
Survey date: March 5, 1986
Video Tape 17


eoria Pool : 11 / 12
Illinois & Michigan Canal
225
ML K
89°05'
1 mi
1 km
Survey date: March 5, 1986
Video Tape 17


41°20'
Starved Rock

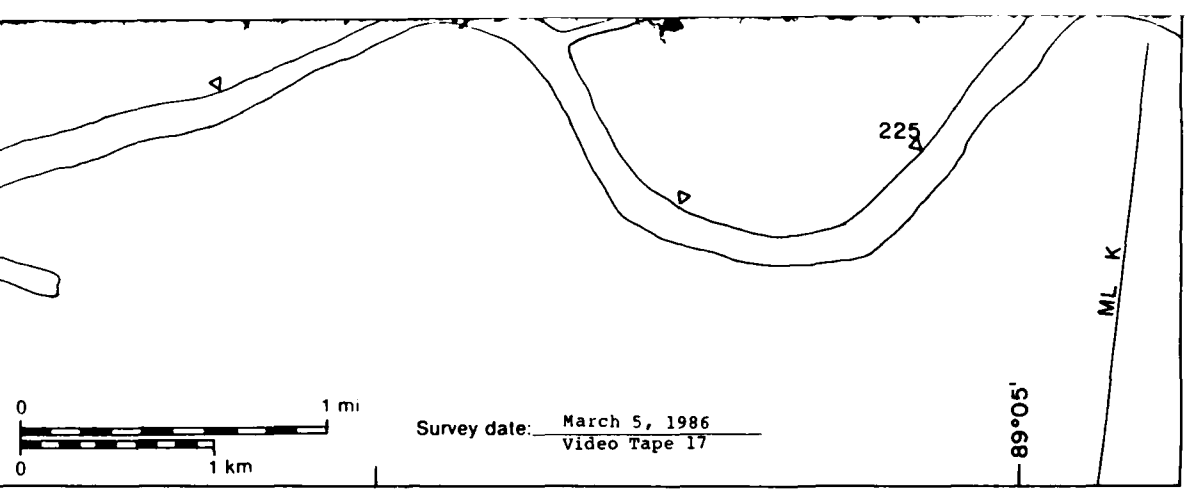


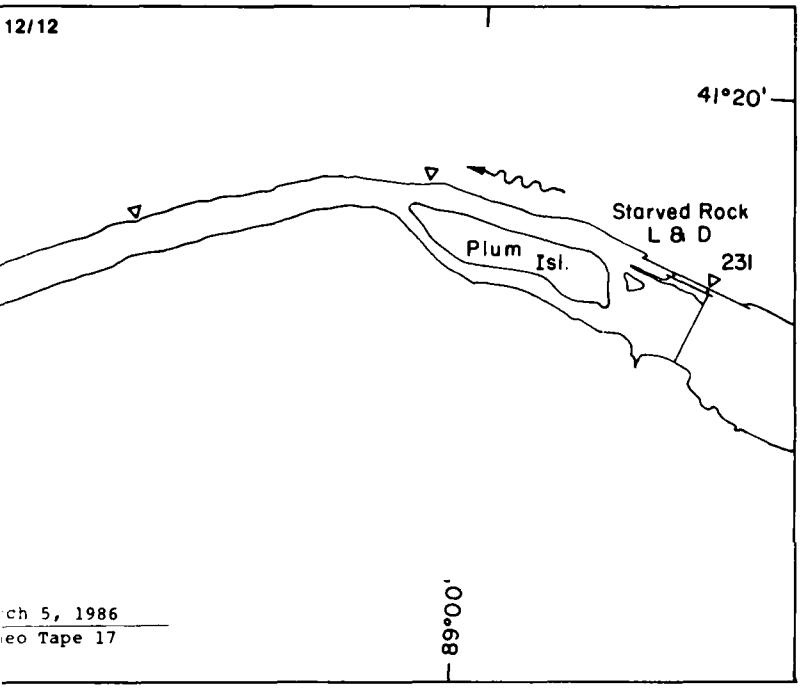


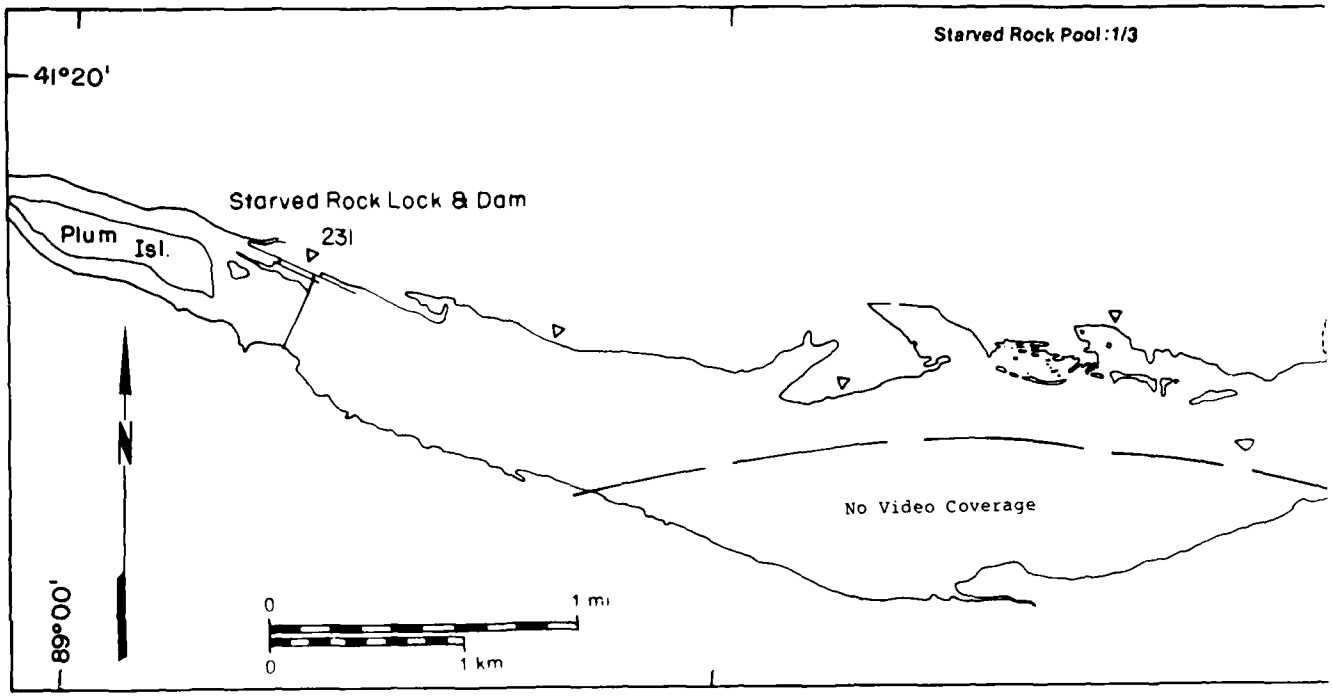
Peoria Pool

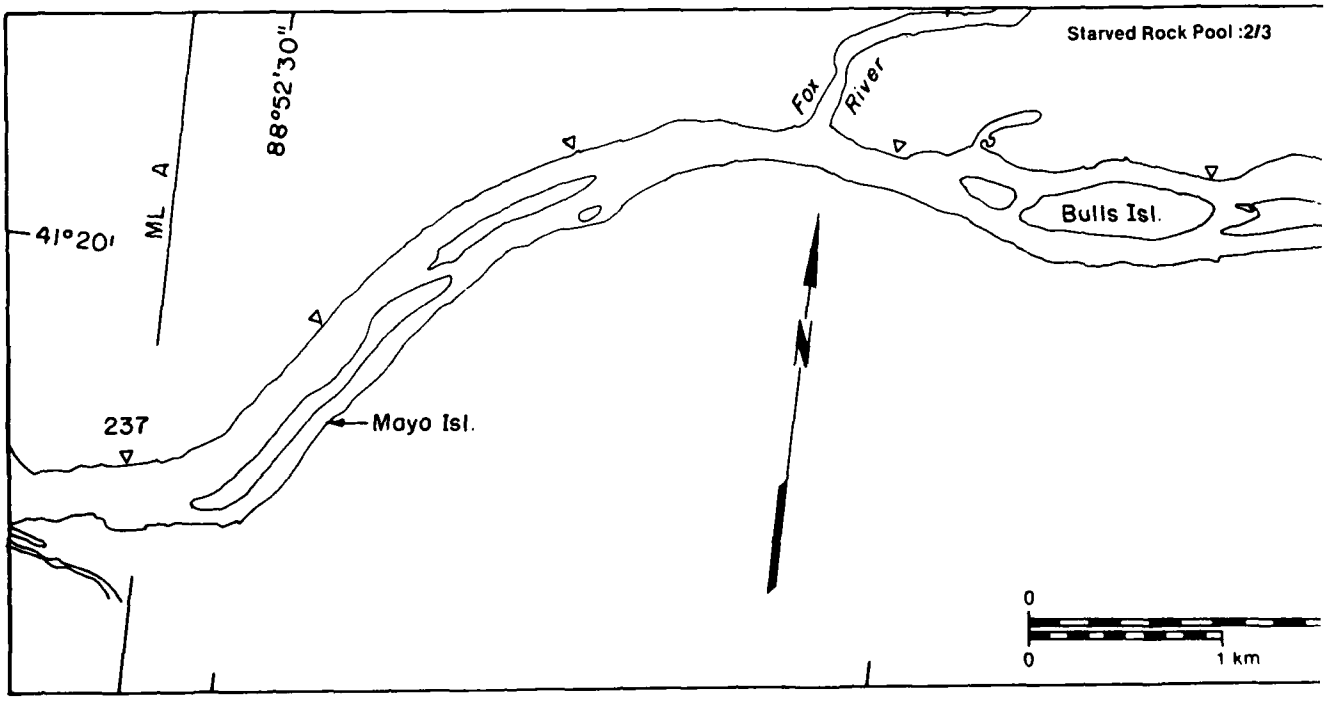
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (^{137}Cs)
Open water	54.83	NA
Solid ice cover	1.89	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.28	5
Total area ($m^2 \times 10^6$)	81.33*	

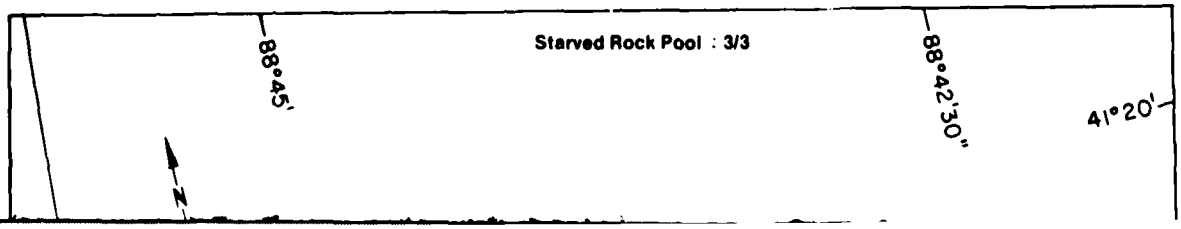
* Includes 24.33×10^6 m^2 of no video coverage


225
ML K
89°05'
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

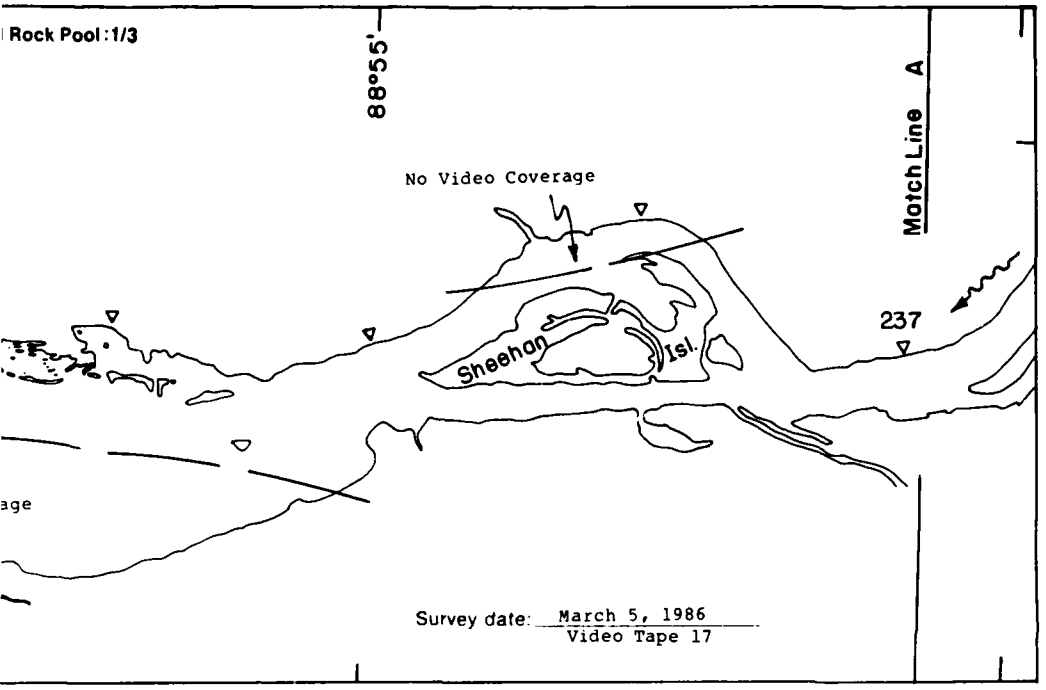

12/12
41°20'
Starved Rock
L & D
Plum Isl.
231
89°00'
ch 5, 1986
eo Tape 17

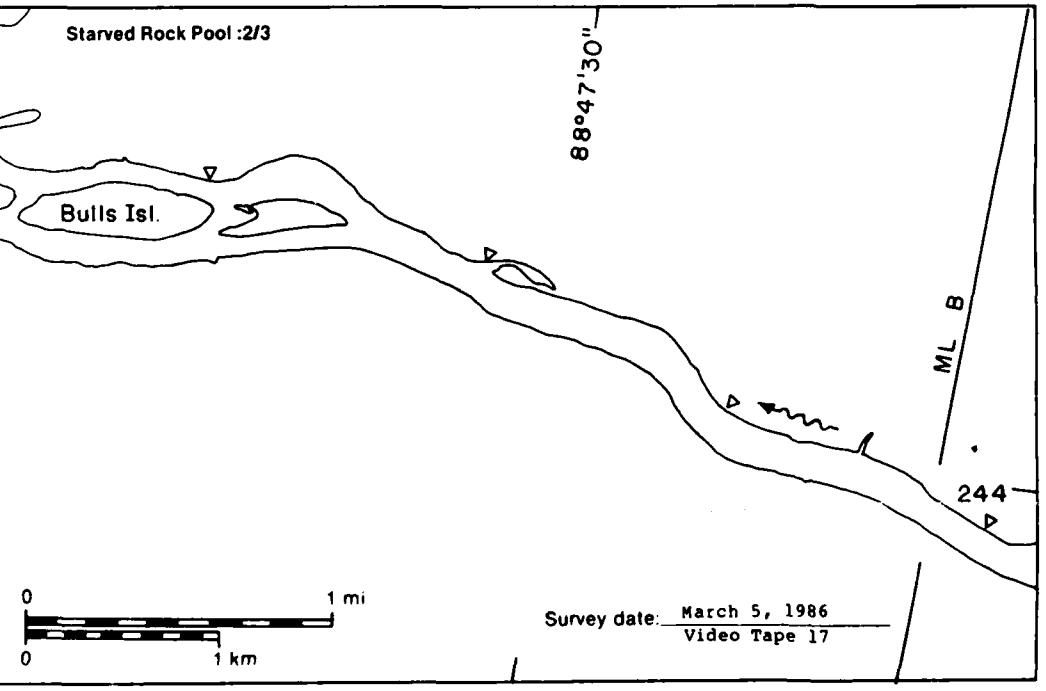

Starved Rock Pool :1/3
41°20'
Starved Rock Lock & Dam
Plum Isl.
231
No Video Coverage
89°00'
0
1 mi
0
1 km


Starved Rock Pool :2/3
88°52'30"
Fox River
ML 4
41°20'
Bulls Isl.
237
Mayo Isl.
0
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'

5 March 1986





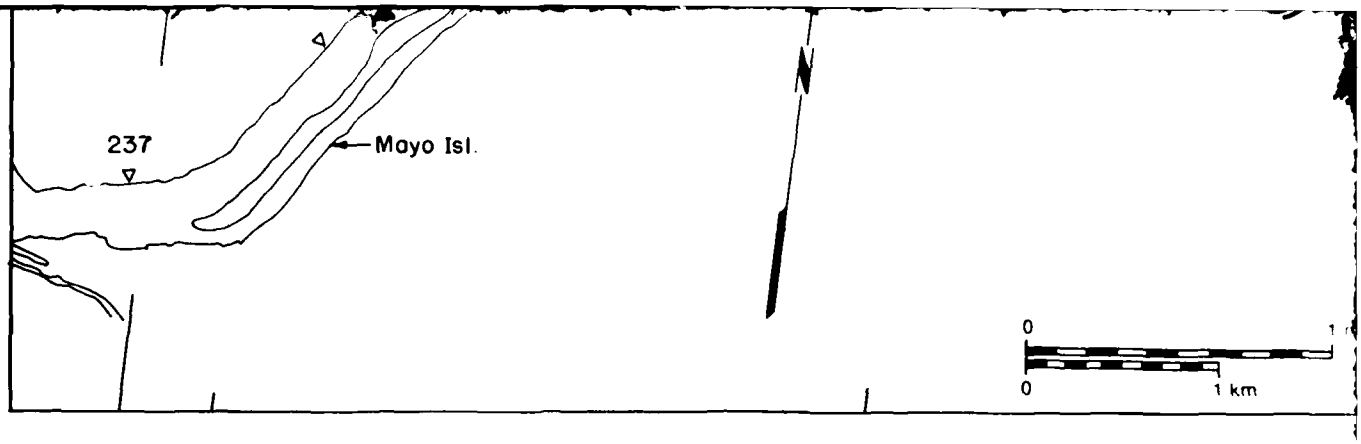
41°20'

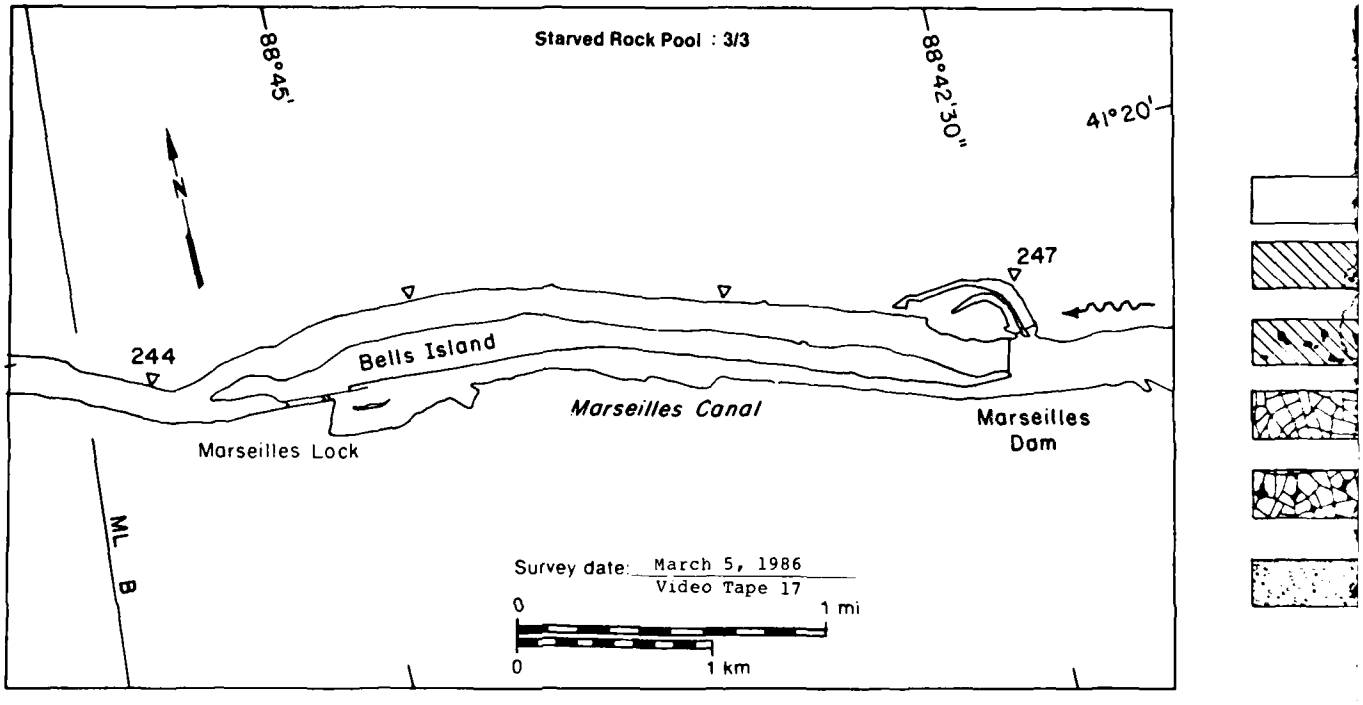
Starved Rock Pool

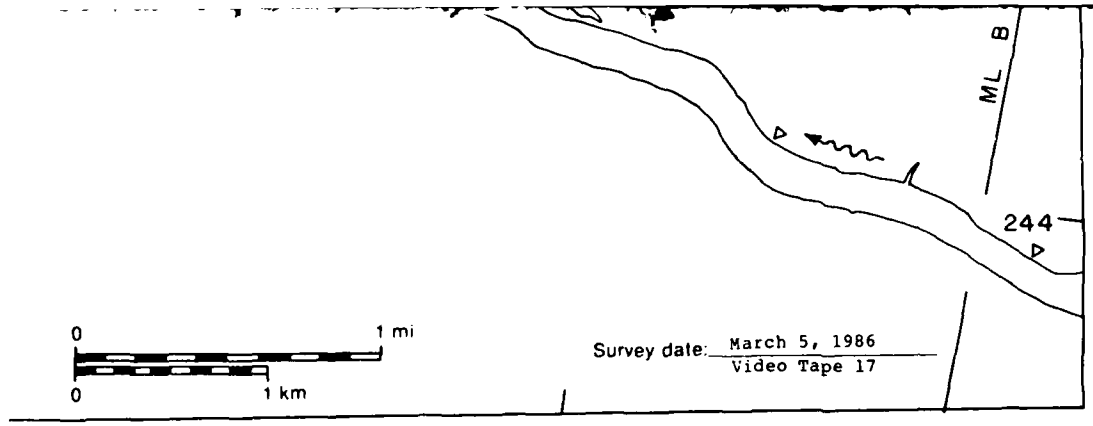
MAP UNITS

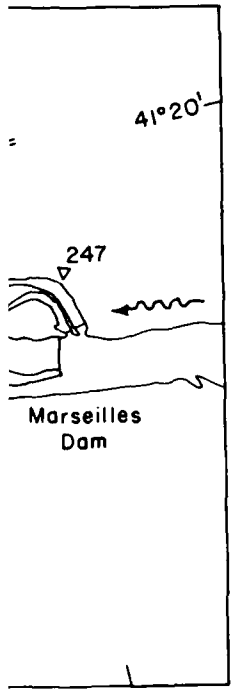
Open water

	Area (m^2 x 10^6)	Surface concentration (%)
	7.97	NA


237
Mayo Isl.
N
0
1
0
1 km


Starved Rock Pool : 3/3
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
ML B
Survey date: March 5, 1986
Video Tape 17
0
1 mi
0
1 km





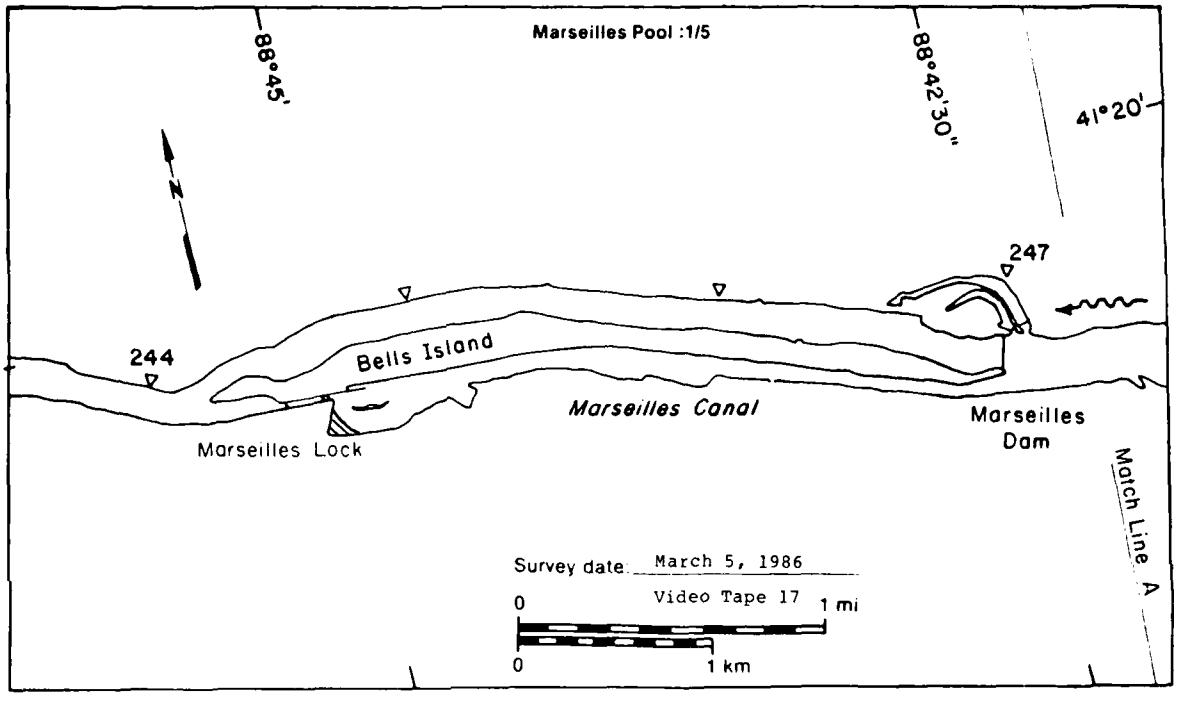
Starved Rock Pool

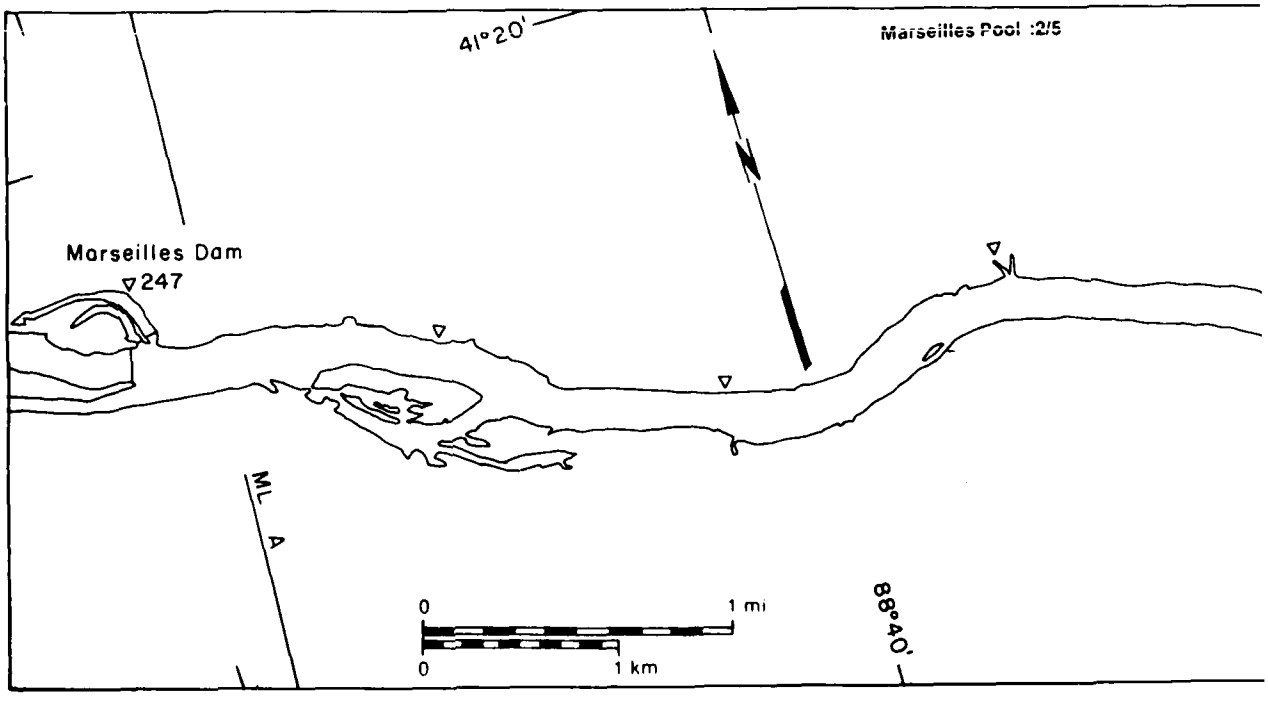
MAP UNITS

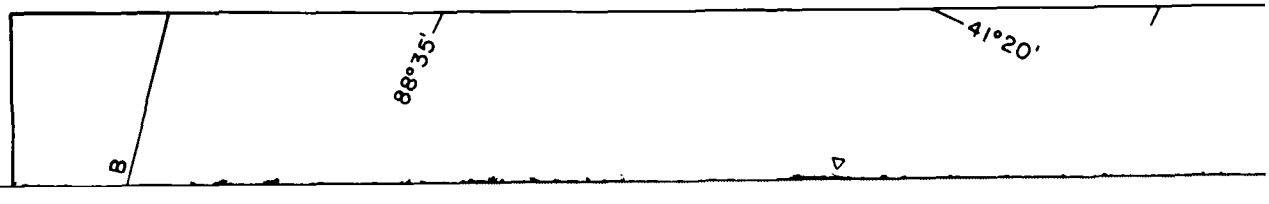
	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	7.97	NA
Solid ice cover	0.00	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	10.19*	

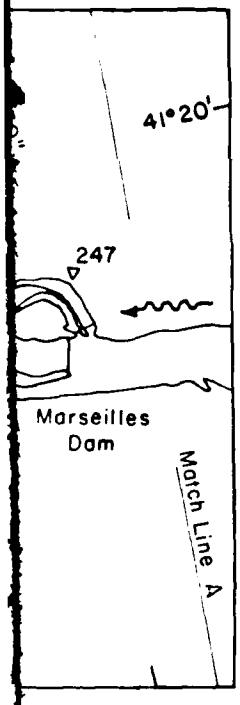
* Includes 2.22×10^6 m^2 of no video coverage

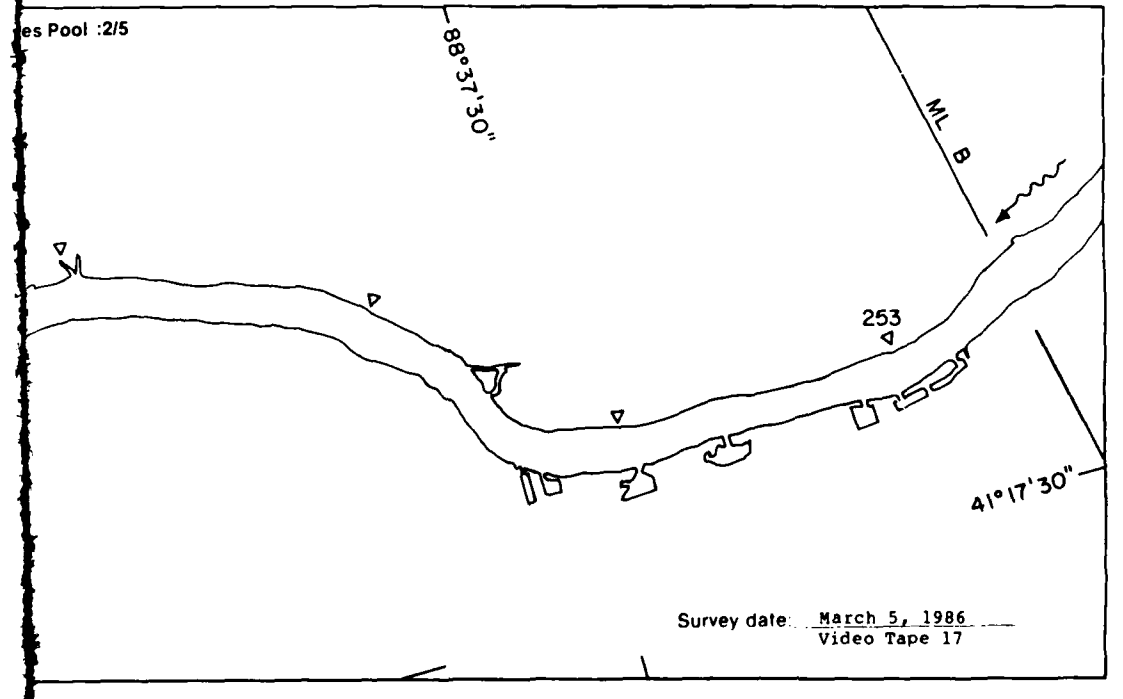
5 March 1986

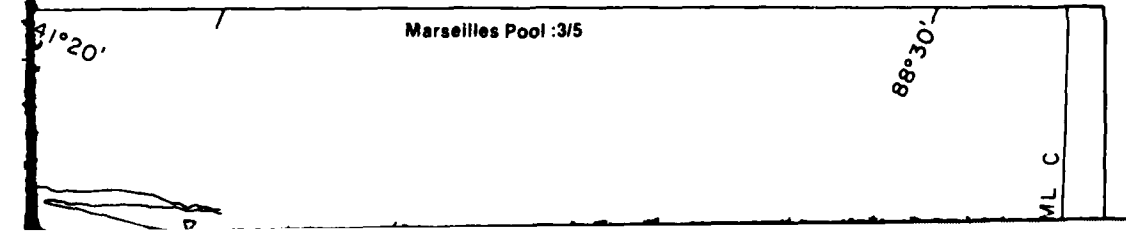

Marseilles Pool :1/5
88°45'
88°42'30"
41°20'
N
247
244
Bells Island
Marseilles Canal
Marseilles Lock
Marseilles Dam
Match Line A
Survey date: March 5, 1986
Video Tape 17
0
1 mi
0
1 km

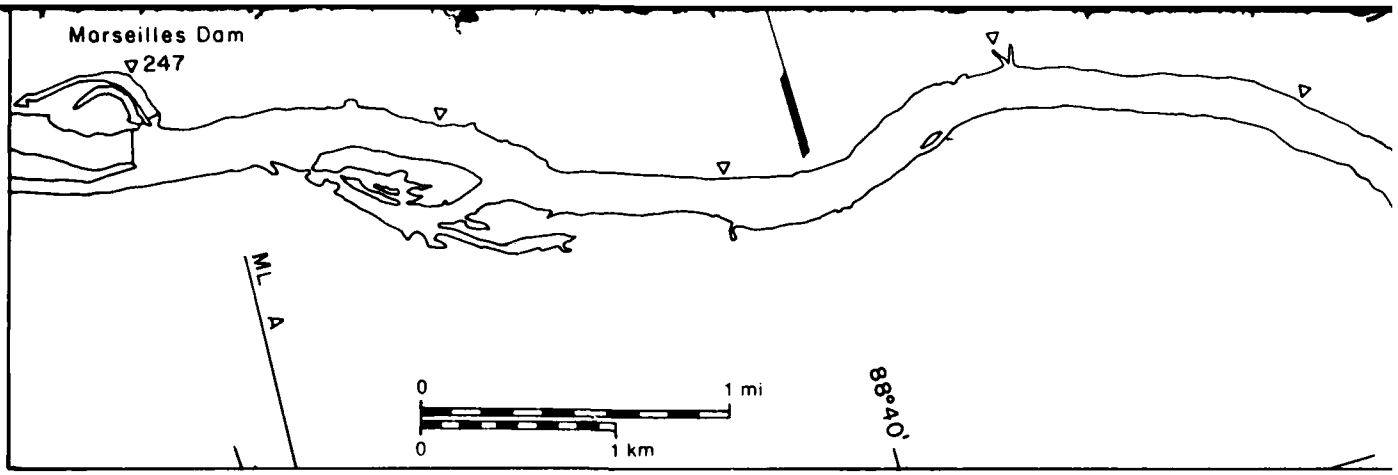

41°20'
Marseilles Pool :2/5
Marseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'

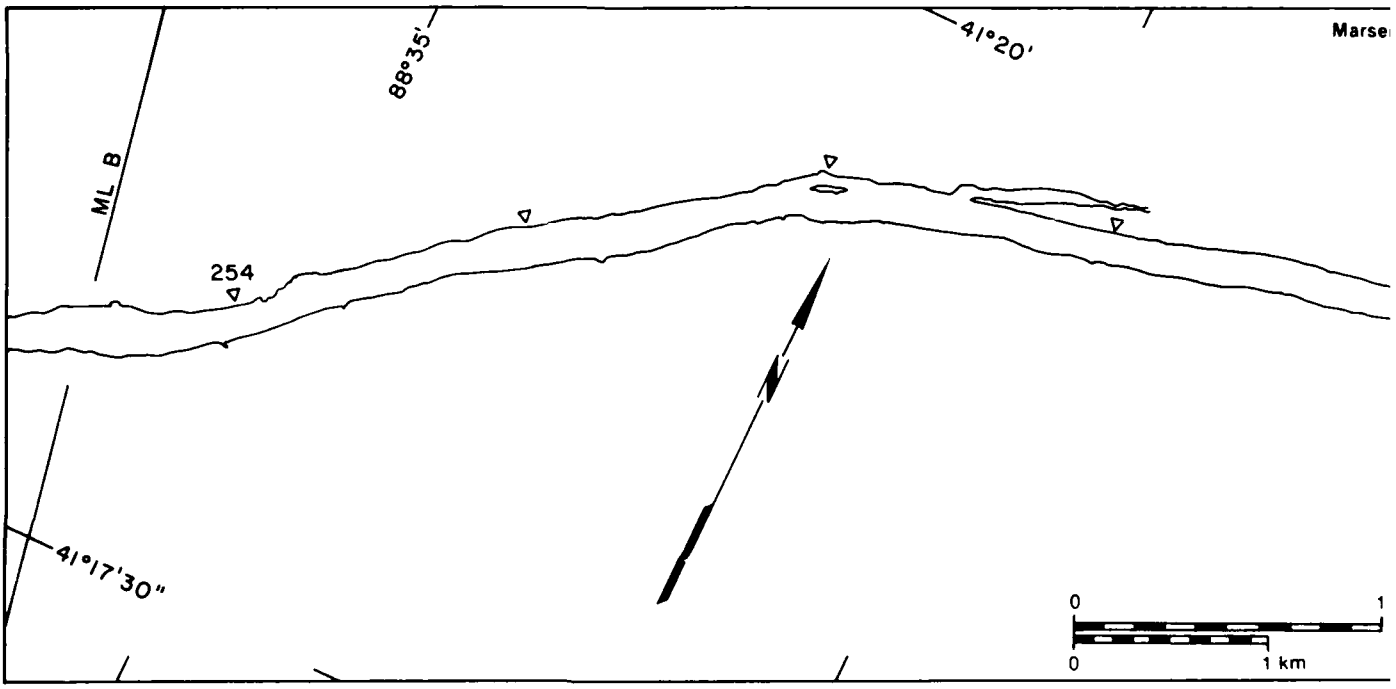

88°35'
41°20'
B

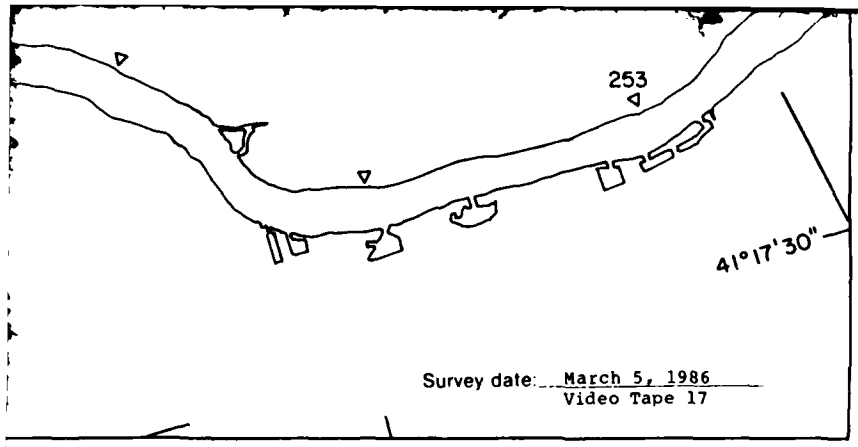

41°20'
247
Marseilles
Dam
March Line A

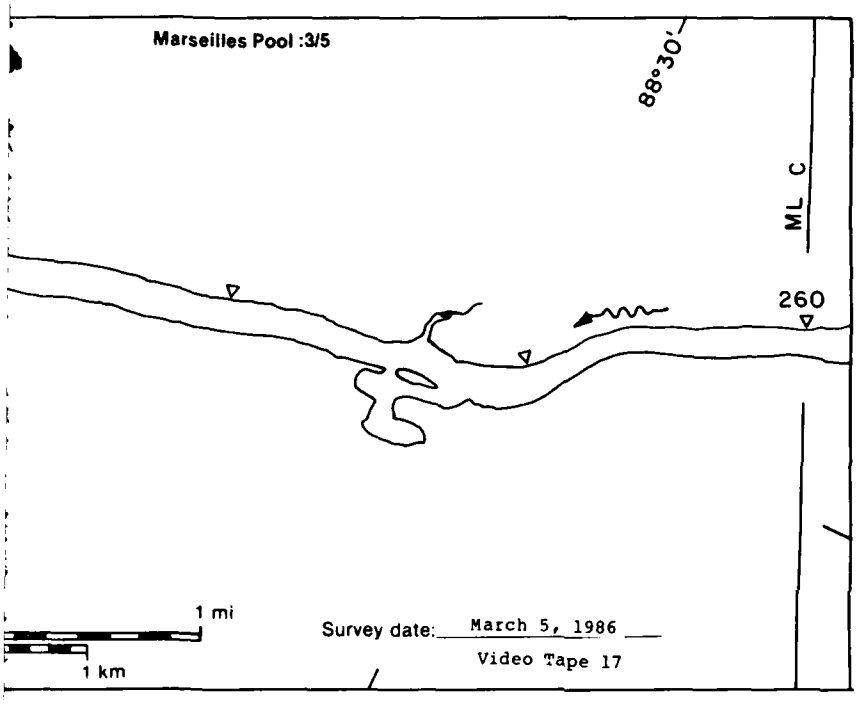

es Pool :2/5
88°37'30"
ML B
253
41°17'30"
Survey date: March 5, 1986
Video Tape 17

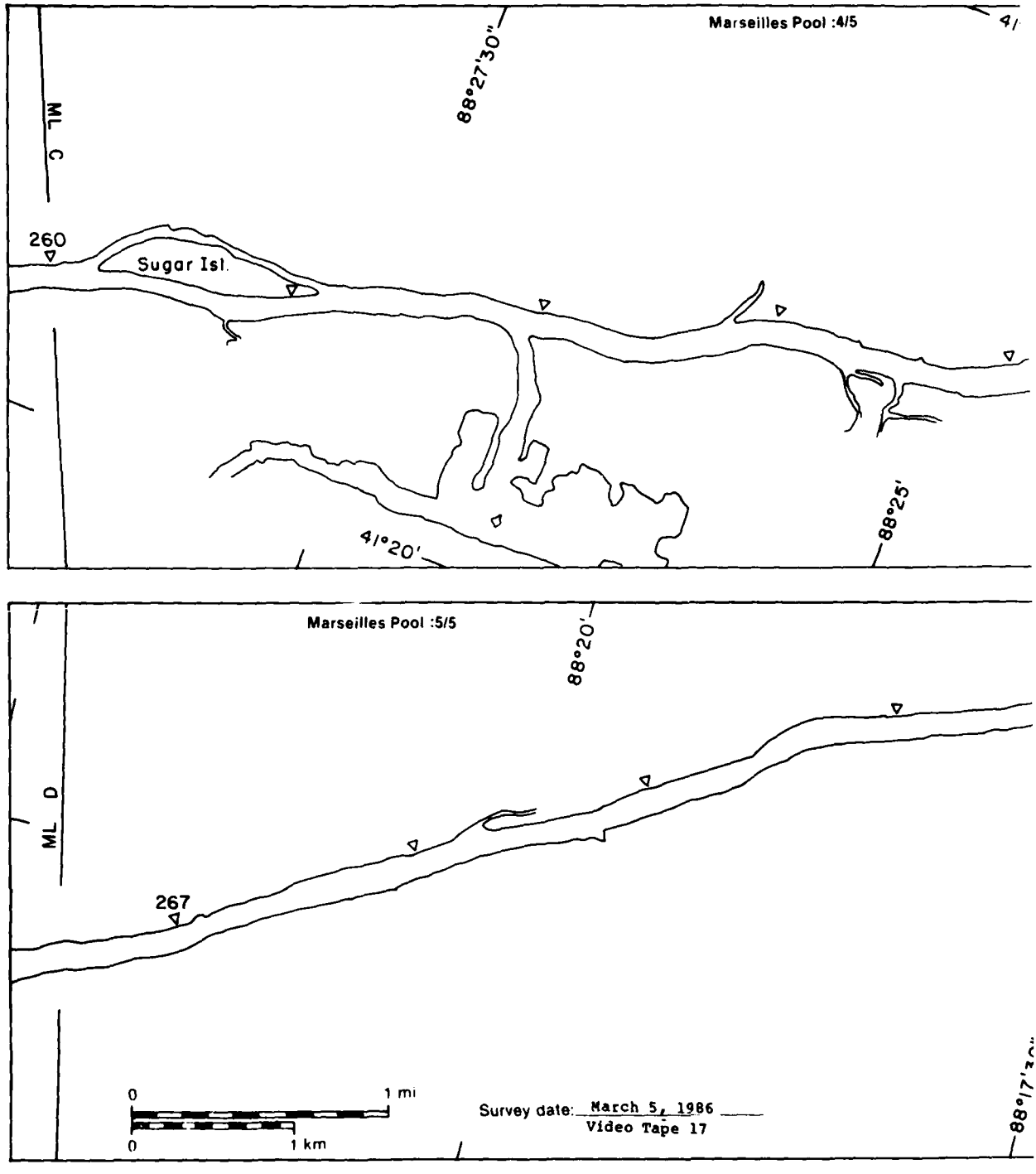

Marseilles Pool :3/5
41°20'
88°30'
ML C


Morseilles Dam
247
ML A
0
1 mi
0
1 km
88°40'


88°35'
41°20'
ML B
254
41°17'30"
0
1
0
1 km


253
41°17'30"
Survey date: March 5, 1986
Video Tape 17

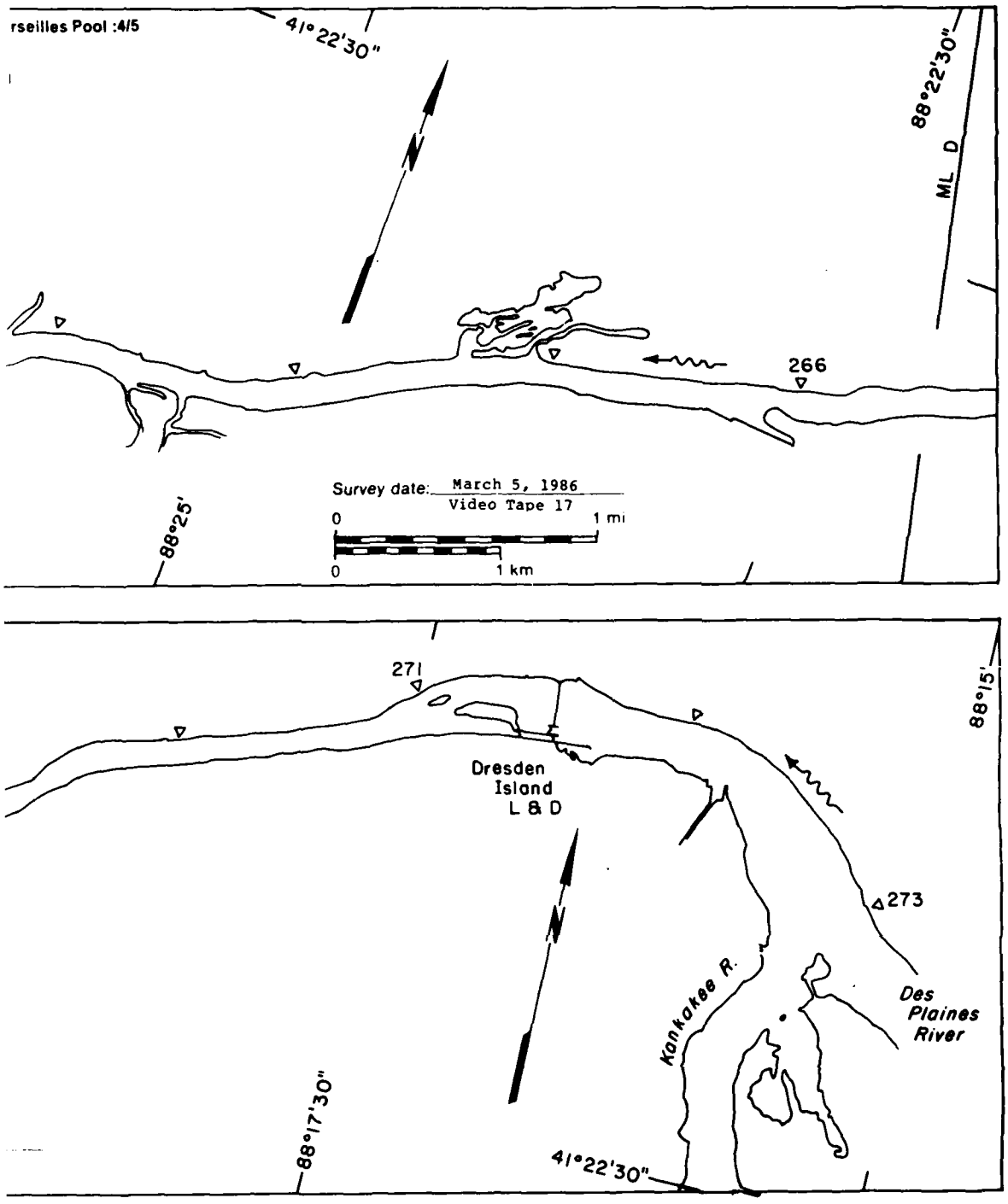

Marseilles Pool :3/5
88°30'
ML C
260
1 mi
1 km
Survey date: March 5, 1986
Video Tape 17

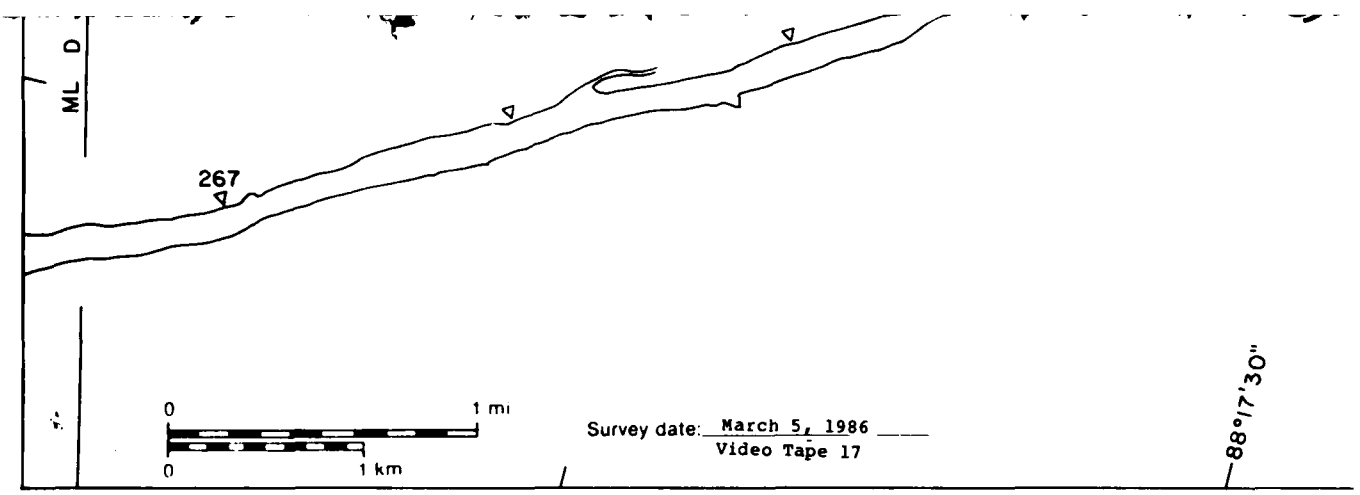


Marseilles Pool

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.17	NA

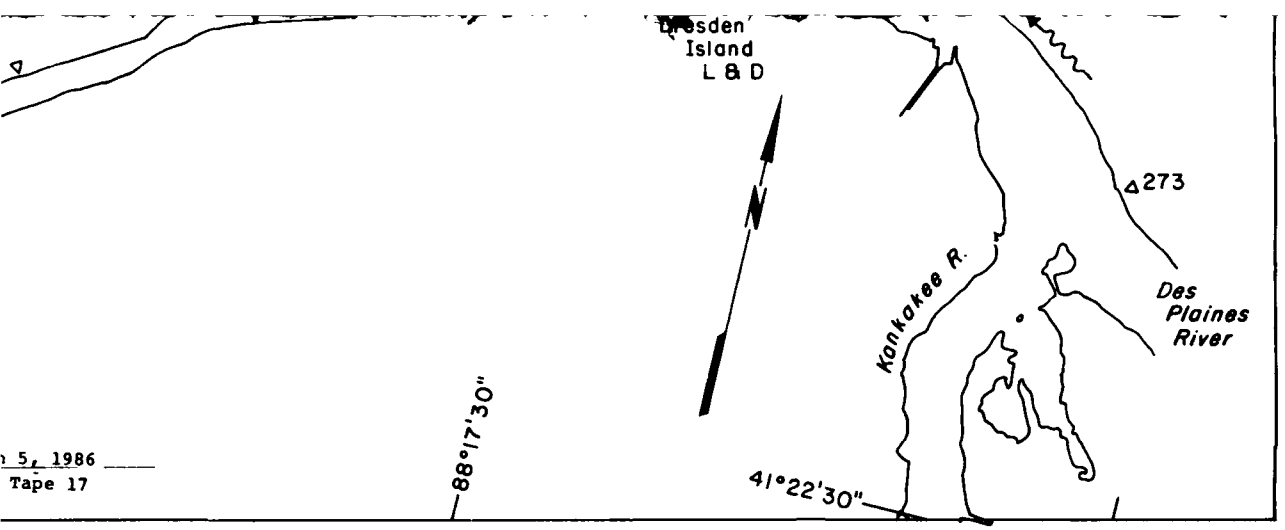
5 March 1986


rseilles Pool :4/5
41°22'30"
88°22'30"
ML D
266
Survey date: March 5, 1986
Video Tape 17
0
1 mi
0
1 km
88°25'
271
88°15'
Dresden
Island
L & D
273
Kankakee R.
Des
Plaines
River
88°17'30"
41°22'30"



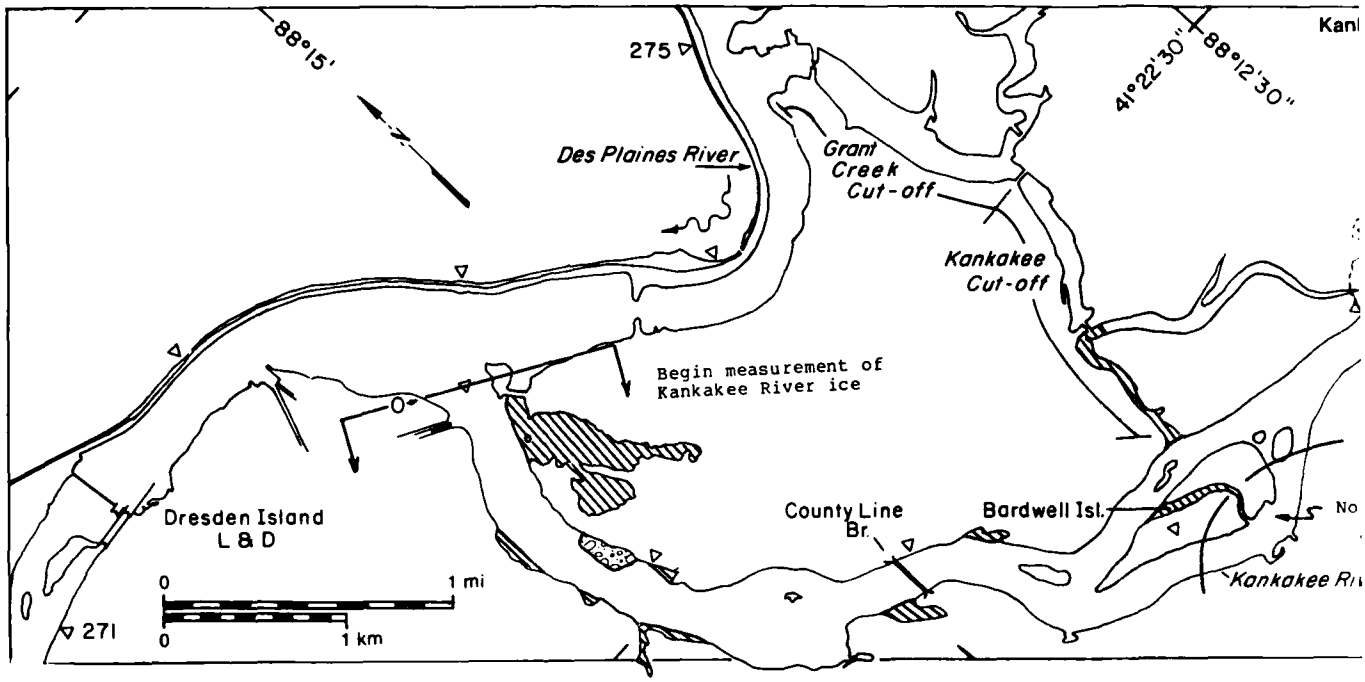
Marseilles Pool

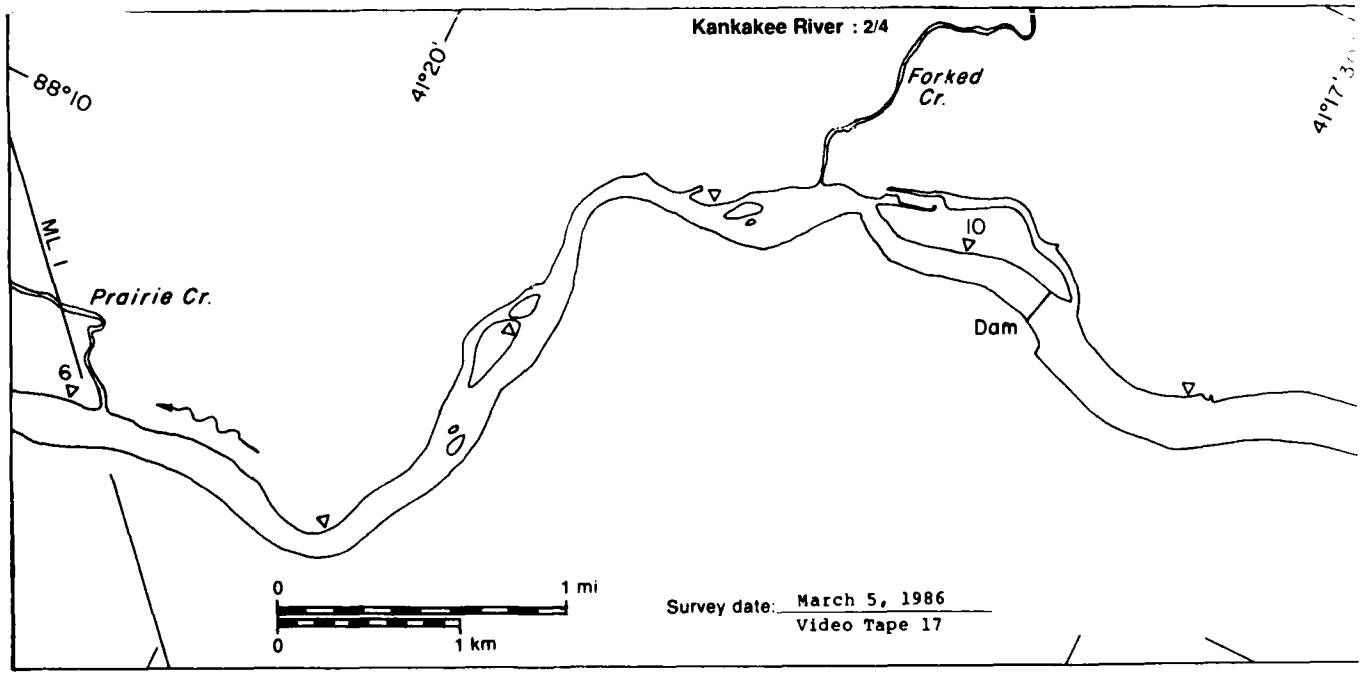
MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	8.17	NA
Solid ice cover	0.02	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.00	—
Total area ($m^2 \times 10^6$)	8.19	

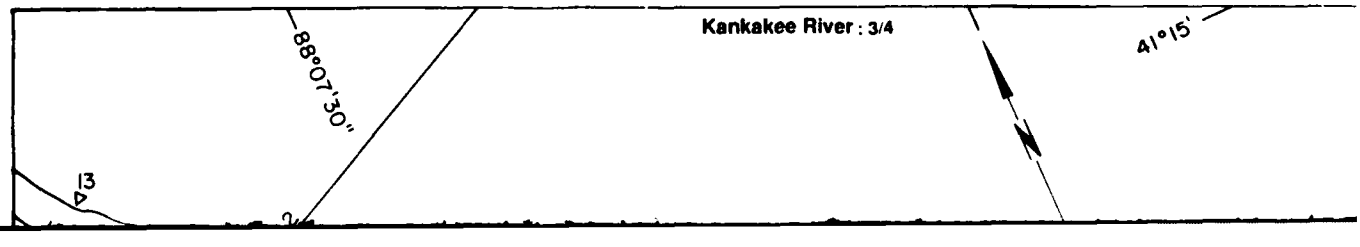


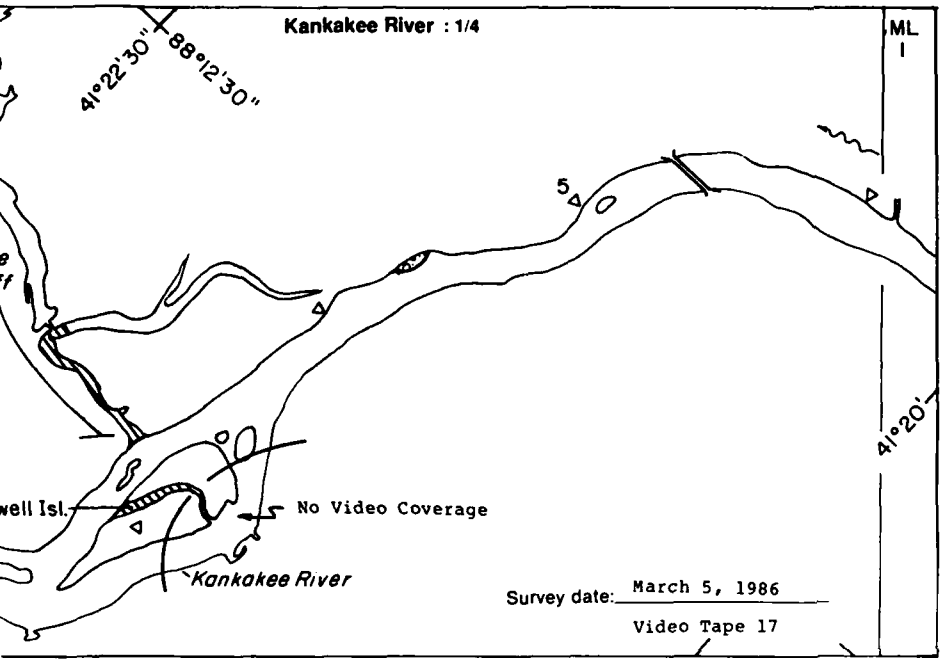
5, 1986
Tape 17

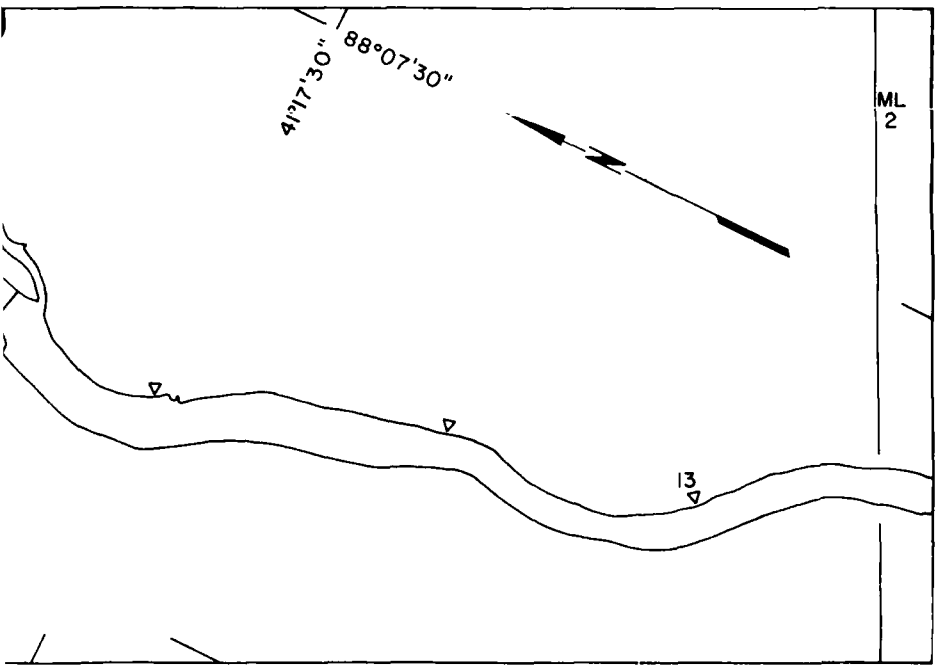
5 March 1986

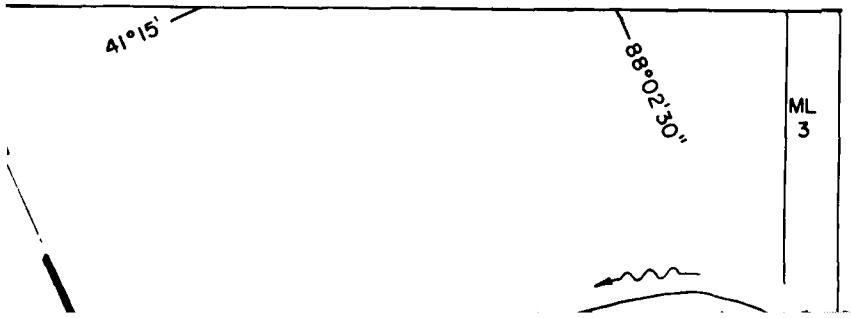

88°15'
275
Des Plaines River
Grant Creek Cut-off
41°22'30"
88°12'30"
Kankakee Cut-off
Begin measurement of Kankakee River ice
Dresden Island L & D
County Line Br.
Bardwell Isl.
0
1 mi
0
1 km
271

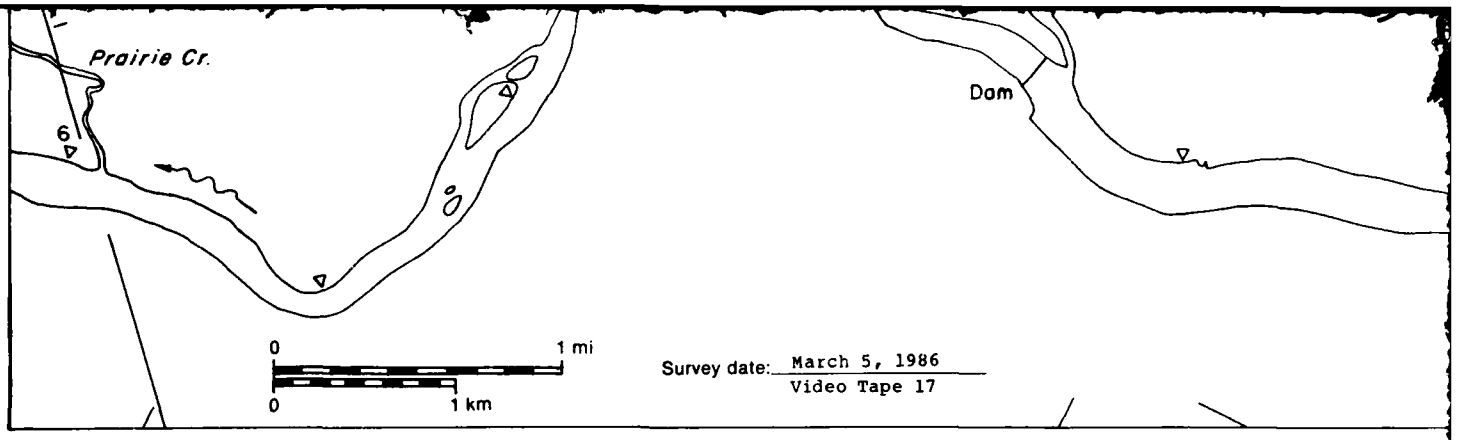

Kankakee River : 2/4
88°10
41°20'
Forked Cr.
ML 1
Prairie Cr.
6
10
Dam
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17

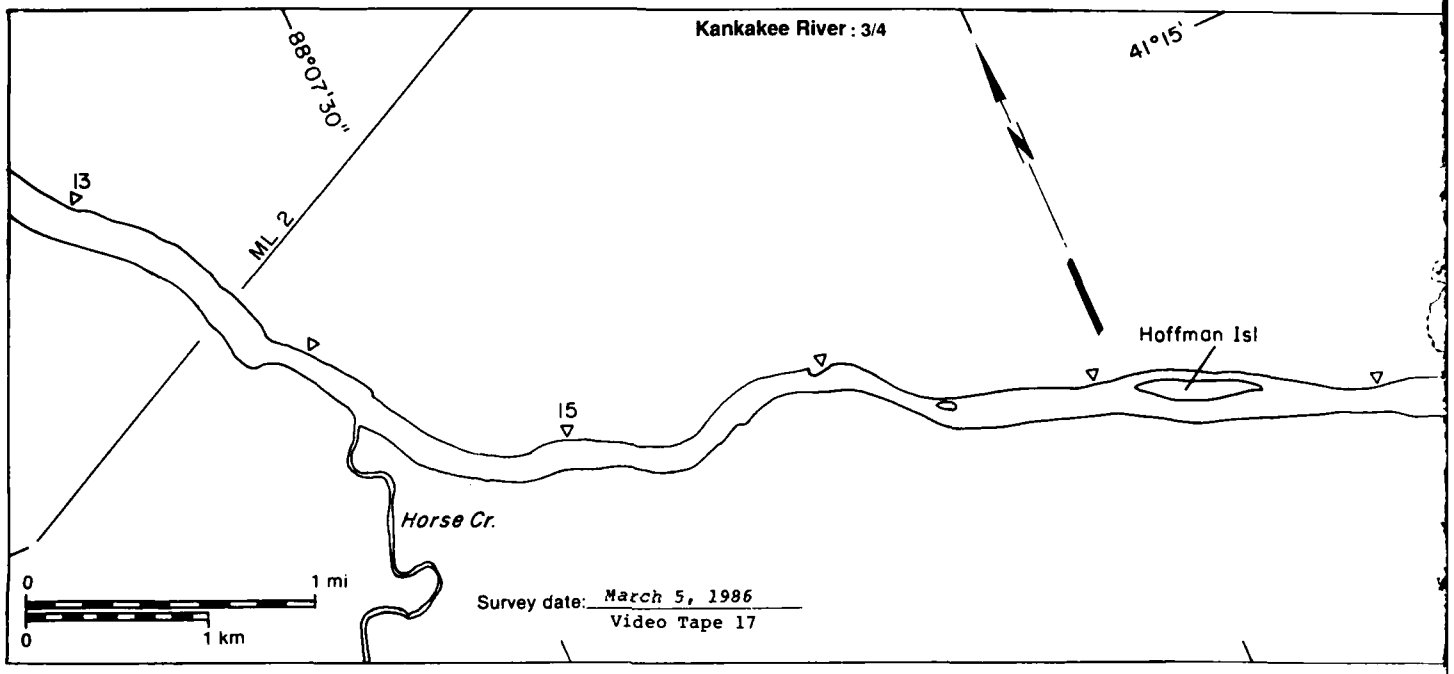

Kankakee River : 3/4
88°07'30"
41°15'
13

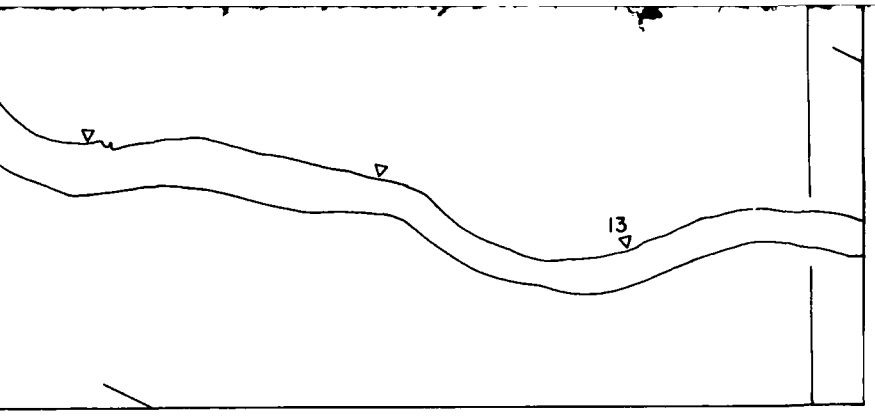

Kankakee River : 1/4
41°22'30"
88°12'30"
ML
1
5
41°20'
well Isl.
No Video Coverage
Kankakee River
Survey date: March 5, 1986
Video Tape 17

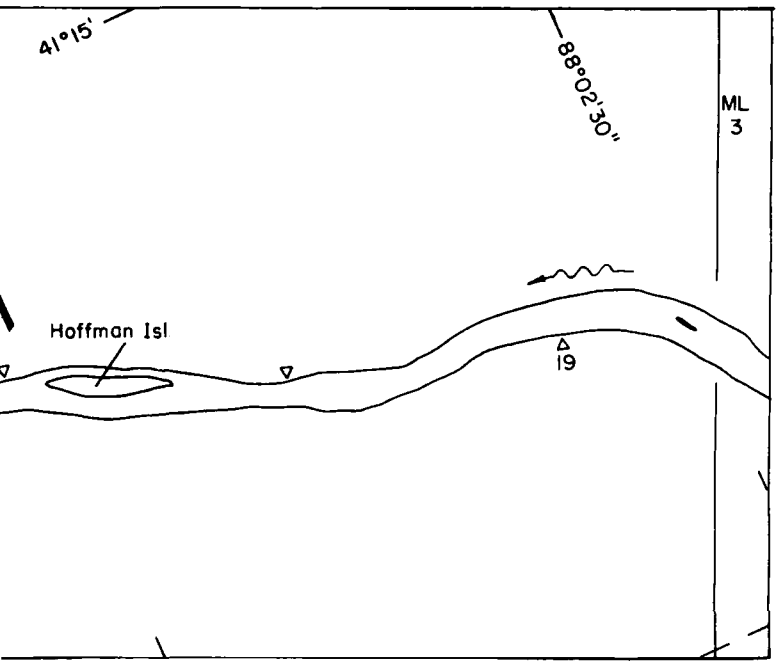

41°17'30"
88°07'30"
ML
2
13

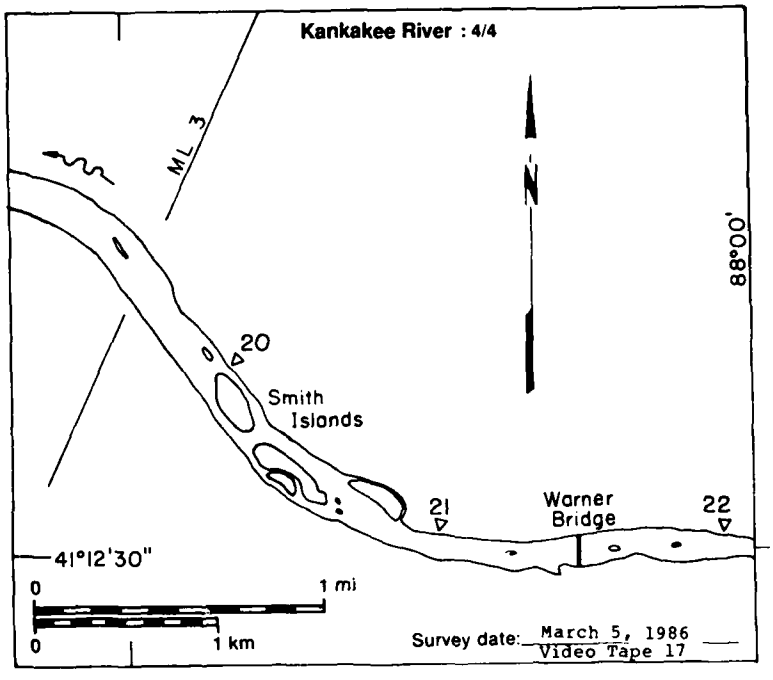

41°15'
88°02'30"
ML
3


Prairie Cr.
6
Dam
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17


Kankakee River : 3/4
88°07'30"
41°15'
13
ML 2
15
Hoffman Isl
Horse Cr.
0
1 mi
0
1 km
Survey date: March 5, 1986
Video Tape 17


13


41°15'
88°02'30"
ML
3
Hoffman Isl
19



Kankakee River

MAP UNITS

- Open water
- Solid ice cover
- Solid ice cover with *open-water areas*
- Fragmented ice cover
- Fragmented ice cover with open-water areas
- Ice floes or frazil slush and pans

Total area (m^2 x

5 March 1986

Kankakee River

MAP UNITS	Area ($m^2 \times 10^6$)	Surface concentration (%)
Open water	6.73	NA
Solid ice cover	0.39	NA
Solid ice cover with open-water areas	0.00	—
Fragmented ice cover	0.00	NA
Fragmented ice cover with open-water areas	0.00	—
Ice floes or frazil slush and pans	0.05	30
Total area ($m^2 \times 10^6$)	7.30*	

* Includes 0.13×10^6 m^2 of no video coverage

APPENDIX A: AREAS OF MAPPED IC

Emsworth Pool - Monongahela River (area =

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented wit open wate	
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ic co (%
December 18, '85	0	0	0			0	0	
December 28, '85	3.15	0	0			0	0	
January 2, '86	5.16	0	0			0	0	
January 7, '86	5.11	0	0			0.05	0	
January 8, '86	5.06	0	0			0.03	0	
January 10, '86	4.95	0	0			0	0	
January 15, '86	4.34	0	0			0	0	
January 22, '86	5.16	0	0			0	0	
January 23, '86	5.16	0	0			0	0	
January 28, '86	4.90	0	0			0	0	
February 27, '86	5.16	0	0			0	0	

*Total area equals ice area.

**Sum of all ice areas for all map units.

Emsworth Pool - Allegheny River (area = 3.07 x 1

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cov with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	I a (10
December 18, '85	3.07	0	0			0	0		
December 28, '85	0.91	0.41	0			0.16	1.45	80	1
January 2, '86	2.23	0	0			0.04	0.03	50	0
January 7, '86	0.58	0.06	0			0.02	0.47	70	0
January 8, '86	1.20	0.08	0			0.78	1.01	90	0
January 10, '86	2.02	0	0			0.16	0.48	90	0

EAS OF MAPPED ICE UNITS

ahela River (area = 5.16 x 10^6 m^2)

ag. ce ver	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
tal rea* 10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	5.16
	0			2.01	40	0.80	0.80	-
	0			0			0	-
.05	0			0			0.05	-
.03	0			0.07	5	0.00	0.03	-
	0			0.21	60	0.13	0.13	-
	0			0.82	40	0.33	0.33	-
	0			0			0	-
	0			0			0	-
	0			0.26	20	0.05	0.05	-
	0			0			0	-

ver (area = 3.07 x 10^6 m^2)

Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0			0			0	-
1.45	80	1.16	0.14	20	0.03	1.76	-
0.03	50	0.02	0.77	10	0.08	0.14	-
0.47	70	0.33	1.94	40	0.77	1.18	-
1.01	90	0.91	0			1.77	-
0.48	90	0.43	0.41	60	0.25	0.84	-
1.42	80	1.14	0.14	10	0.01	1.27	-

Emsworth Pool - Allegheny River (area = 3.07 x 10^6 m^2)

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)
December 18, '85	3.07	0	0			0	0		
December 28, '85	0.91	0.41	0			0.16	1.45	80	1.16
January 2, '86	2.23	0	0			0.04	0.03	50	0.02
January 7, '86	0.58	0.06	0			0.02	0.47	70	0.33
January 8, '86	1.20	0.08	0			0.78	1.01	90	0.91
January 10, '86	2.02	0	0			0.16	0.48	90	0.43
January 15, '86	1.39	0.10	0			0.02	1.42	80	1.14
January 22, '86	0.80	0	0			0	0		
January 23, '86	2.54	0	0			0	0		
January 28, '86	3.01	0	0			0	0		
February 27, '86	3.07	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

Lock and Dam 2 Pool - Allegheny River (area = 4.02 x

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cove with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ic ar (10^6
December 18, '85	1.90	0	0			0	0		
December 28, '85	2.47	0.09	0.28	90	0.25	0.44	0.74	80	0.
January 2, '86	2.02	0.16	0			0	0		
January 7, '86	2.02	0.82	0			0.03	0.20	70	0.
January 8, '86	1.83	0.23	0			0.09	1.82	90	1.
January 10, '86	3.07	0.14	0			0.15	0.05	90	0.
January 15, '86	1.51	0.03	0.23	80	0.18	0.05	1.42	70	0.
January 22, '86	1.50	0.03	0			0	0		
January 23, '86	1.99	0	0			0	0		
January 28, '86	3.86	0.03	C			0	0		
February 27, '86	4.02	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

ɔny River (area = 3.07 x 10^6 m^2)

). e ar	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
al ea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	-
16	1.45	80	1.16	0.14	20	0.03	1.76	-
04	0.03	50	0.02	0.77	10	0.08	0.14	-
02	0.47	70	0.33	1.94	40	0.77	1.18	-
78	1.01	90	0.91	0			1.77	-
16	0.48	90	0.43	0.41	60	0.25	0.84	-
02	1.42	80	1.14	0.14	10	0.01	1.27	-
	0			2.27	10	0.23	0.23	-
	0			0.53	5	0.03	0.03	-
	0			0.06	50	0.03	0.03	-
	0			0			0	-

- Allegheny River (area = 4.02 x 10^6 m^2)

)	Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0	0			0			0	2.12
	0.44	0.74	80	0.59	0			1.37	-
	0	0			1.84	40	0.74	0.90	-
	0.03	0.20	70	0.14	0.95	40	0.38	1.37	-
	0.09	1.82	90	1.64	0.05	50	0.03	1.99	-
	0.15	0.05	90	0.05	0.61	40	0.24	0.58	-
	0.05	1.42	70	0.99	0.78	30	0.23	1.48	-
	0	0			2.49	5	0.12	0.15	-
	0	0			2.03	5	0.10	0.10	-
	0	0			0.13	10	0.01	0.04	-
	0	0			0			0	-

Lock and Dam 3 Pool[†] - Allegheny River (area =

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ic with open water	
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc (%)
December 18, '85	0	0	0			0	0	
December 28, '85	0.17	0	0.93	80	0.74	0	0	
January 2, '86	0.75	0	0			0.03	0.36	60
January 7, '86	0.20	0.04	0			0	0.90	90
January 8, '86	0.30	0.04	0			0.38	0.42	95
January 10, '86	0.39	0	0			0.40	0.35	90
January 15, '86	0.49	0.28	0.30	80	0.24	0	0	
January 22, '86	0.69	0	0			0	0	
January 23, '86	0.41	0	0			0	0	
January 28, '86	1.09	0	0			0	0	
February 27, '86	1.14	0	0			0	0	

*Total area equals ice area.

**Sum of all ice areas for all map units.

[†]Up to mile 17 only.

Emsworth Pool - Ohio River (area = 4.49 x

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ic with open water	
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc (%)
December 19, '85	4.01	0	0			0	0	
December 30, '85	0.16	0	0			0	0	
January 8, '86	1.20	0.07	0.15	90	0.14	0	0.39	80
January 10, '86	2.53	0.14	0			0.53	0.06	80
January 16, '86	0.30	0.99	0			0.30	1.20	90
January 22, '86	0	0	0			0	0	
January 23, '86	0	0	0			0	0	

legheny River (area = 1.14 x 10^6 m^2)

ag. ce ver	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
tal rea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	1.14
	0			0.04	10	0.00	0.74	-
.03	0.36	60	0.22	0			0.25	-
	0.90	90	0.81	0			0.85	-
.38	0.42	95	0.40	0			0.82	-
.40	0.35	90	0.32	0			0.72	-
	0			0.07	50	0.04	0.56	-
	0			0.45	10	0.05	0.05	-
	0			0.73	5	0.04	0.04	-
	0			0.05	10	0.01	0.01	-
	0			0			0	-

River (area = 4.49 x 10^6 m^2)

g. e er	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
al ea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	0.48
	0			0.10	1	0.00	0.00	4.23
	0.39	80	0.31	0.65	40	0.26	0.78	2.03
53	0.06	80	0.05	0.38	10	0.04	0.76	0.85
50	1.20	90	1.08	0.86	55	0.47	2.84	0.84
	0			0			0	4.49
	0			0			0	4.49
	0			0			0	4.49

Up 75 mile 17 only.

Emsworth Pool - Ohio River (area = 4.49 x 10^6 m^2)

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Tot ar (10^6
December 19, '85	4.01	0	0			0	0			0
December 30, '85	0.16	0	0			0	0			0.
January 8, '86	1.20	0.07	0.15	90	0.14	0	0.39	80	0.31	0.
January 10, '86	2.53	0.14	0			0.53	0.06	80	0.05	0.
January 16, '86	0.30	0.99	0			0.30	1.20	90	1.08	0.
January 22, '86	0	0	0			0	0			0
January 23, '86	0	0	0			0	0			0
February 28, '86	0	0	0			0	0			0

*Total area equals ice area.
**Sum of all ice areas for all map units.

Dashields Pool - Ohio River (area = 5.00 x 10^6 m^2)

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Tot ar (10^6
December 19, '85	5.00	0	0			0	0			0
December 30, '85	0	0	0			0	0			0
January 8, '86	0	0	0			0	0			0
January 10, '86	1.24	0.02	0			0	0			0
January 16, '86	0.93	0.43	0			0.05	0			0.
January 22, '86	0	0	0			0	0			0
January 23, '86	0	0	0			0	0			0
February 28, '86	0	0	0			0	0			0

*Total area equals ice area.
**Sum of all ice areas for all map units.

hio River (area = 4.49 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	0.48
0	0			0.10	1	0.00	0.00	4.23
0	0.39	80	0.31	0.65	40	0.26	0.78	2.03
0.53	0.06	80	0.05	0.38	10	0.04	0.76	0.85
0.30	1.20	90	1.08	0.86	55	0.47	2.84	0.84
0	0			0			0	4.49
0	0			0			0	4.49
0	0			0			0	4.49

Ohio River (area = 5.00 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	-
0	0			0			0	5.00
0	0			0			0	5.00
0	0			0			0.02	3.74
0.05	0			0.41	50	0.21	0.69	3.18
0	0			0			0	5.00
0	0			0			0	5.00
0	0			0			0	5.00

Montgomery Pool - Ohio River (area = 11.

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented wi open wate Total area (10^6 m^2)	Ic co (%
December 19, '85	10.99	0	0			0	0	
December 30, '85	0.53	0.28	0			2.74	1.73	8
January 10, '86	0	0	0			0	0	
January 16, '86	0.38	1.14	0			0	3.20	7
January 22, '86	1.43	0	0			0	0	
January 23, '86	2.78	0	0			0	0	
February 28, '86	5.76	0	0			0	0	

*Total area equals ice area.
**Sum of all ice areas for all map units.

New Cumberland Pool - Ohio River (area = 14

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented wit open wate Total area (10^6 m^2)	Ic co (%
December 19, '85	13.16	0	0			0	0	
December 30, '85	2.19	0.46	0			5.83	2.17	90
January 10, '86	5.37	0	0			0	1.32	90
January 16, '86	4.61	2.86	0			0	2.42	90
January 22, '86	5.13	0	0			0	0	
January 23, '86	14.44	0	0			0	0	
February 28, '86	14.87	0	0			0	0	

*Total area equals ice area.

Ohio River (area = 11.27 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	0.28
2.74	1.73	80	1.38	0.43	40	0.17	4.57	5.56
0	0			0			0	11.27
0	3.20	70	2.24	0			3.38	6.55
0	0			5.82	80	4.66	4.66	4.02
0	0			1.53	1	0.02	0.02	6.96
0	0			0			0	5.51

Ohio River (area = 14.87 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	1.71
5.83	2.17	90	1.95	3.18	30	0.95	9.19	1.04
0	1.32	90	1.19	1.43	20	0.29	1.48	6.75
0	2.42	90	2.18	4.98	50	2.49	7.53	-
0	0			9.74	20	1.95	1.95	-
0	0			0.43	1	0.00	0.00	-
0	0			0			0	-

New Cumberland Pool - Ohio River (area = 14.87 x 10^6 m^2)

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)
December 19, '85	13.16	0	0			0	0		
December 30, '85	2.19	0.46	0			5.83	2.17	90	1.95
January 10, '86	5.37	0	0			0	1.32	90	1.19
January 16, '86	4.61	2.86	0			0	2.42	90	2.18
January 22, '86	5.13	0	0			0	0		
January 23, '86	14.44	0	0			0	0		
February 28, '86	14.87	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

Pike Island Pool - Ohio River (area = 18.92 x 10^6 m^2)

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)
December 19, '85	18.92	0	0			0	0		
December 30, '85	0.90	0	0			0	0		
January 10, '86	18.74	0	0			0	0		
January 16, '86	17.34	0	0			0	0		
January 22, '86	12.21	0	0			0	0		
January 23, '86	8.96	0	0			0.33	0		
February 28, '86	18.92	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

ool - Ohio River (area = 14.87 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	1.71
5.83	2.17	90	1.95	3.18	30	0.95	9.19	1.04
0	1.32	90	1.19	1.43	20	0.29	1.48	6.75
0	2.42	90	2.18	4.98	50	2.49	7.53	-
0	0			9.74	20	1.95	1.95	-
0	0			0.43	1	0.00	0.00	-
0	0			0			0	-

l - Ohio River (area = 18.92 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0	0			0			0	-
0	0			0			0	18.02
0	0			0.18	10	0.02	0.02	-
0	0			1.58	10	0.16	0.16	-
0	0			6.71	10	0.67	0.67	-
0.33	0			9.63	20	1.93	2.26	-
0	0			0			0	-

Hannibal Pool - Ohio River (area = 22.46 x 10^6

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	(10
December 19, '85	22.46	0	0			0	0		
December 30, '85	3.34	0	0			0	0		
January 10, '86	22.38	0.04	0			0	0		
January 16, '86	22.44	0.02	0			0	0		
January 22, '86	22.46	0	0			0	0		
January 23, '86	22.31	0	0			0	0		
February 28, '86	22.46	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

Willow Island Pool - Ohio River (area = 21.24 x 1

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	ic
December 19, '85	21.24	0	0			0	0		
December 30, '85	8.08	0	0			0	0		
January 16, '86	21.02	0.03	0.09	70	0.06	0	0.10	50	0.
February 28, '86	10.21	0	0			0	0		

*Total area equal's ice area.
**Sum of all ice areas for all map units.

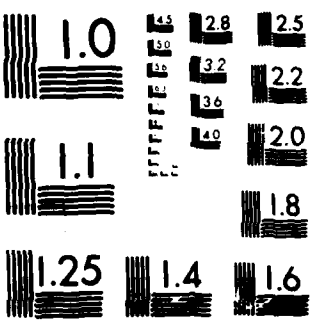
m^2)

r	Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
e ea m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0	-
	0.12	20	0.02	0.02	19.00
	0.04	40	0.02	0.06	-
	0			0.02	-
	0			0	-
	0.15	20	0.03	0.03	-
	0			0	-

m^2)

	Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
ea m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0	-
	0.66	10	0.07	0.07	12.50
05	0			0.14	-
	0			0	11.03

AD-A191 865 ICE ATLAS 1985 - 1986 MONONGAHELA RIVER ALLEGHENY RIVER 14/14
OHIO RIVER ILLINO..(U) COLD REGIONS RESEARCH AND
ENGINEERING LAB HANOVER NH L W GATTO ET AL. NOV 87
UNCLASSIFIED CRREL-SP-87-20 F/G 8/12 NL


1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0

Arrow Island Pool - Ohio River (area = 21.24 x 10^6 m^2)

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m
December 19, '85	21.24	0	0			0	0		
December 30, '85	8.08	0	0			0	0		
January 16, '86	21.02	0.03	0.09	70	0.06	0	0.10	50	0.05
February 28, '86	10.21	0	0			0	0		

*Total area equals ice area.

**Sum of all ice areas for all map units.

Belleville Pool - Ohio River (area = 27.28 x 10^6

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice are (10^6
December 19, '85	27.28	0	0			0	0		
December 30, '85	25.01	0	0			0	0		
January 16, '86	24.97	0	0			0	0		

*Total area equals ice area.

**Sum of all ice areas for all map units.

$\times 10^6 m^2$)

cover areas	Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Ice area ($10^6 m^2$)	Total area ($10^6 m^2$)	Ice conc. (%)	Ice area ($10^6 m^2$)	($10^6 m^2$)	($10^6 m^2$)
	0			0	-
	0.66	10	0.07	0.07	12.50
0.05	0			0.14	-
	0			0	11.03

$8 \times 10^6 m^2$)

ice cover areas		Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
nc.	Ice area ($10^6 m^2$)	Total area ($10^6 m^2$)	Ice conc. (%)	Ice area ($10^6 m^2$)	($10^6 m^2$)	($10^6 m^2$)
		0			0	-
		2.27	10	0.23	0.23	-
		2.31	5	0.12	0.12	-

Racine Pool - Ohio River (area = 19.89 x

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented ice with open water a Total area (10^6 m^2)	Ice conc. (%)
December 19, '85	19.89	0	0			0	0	
December 30, '85	16.18	0	0			0	0	
January 16, '86	18.52	0	0			0	0	

*Total area equals ice area.
**Sum of all ice areas for all map units.

Gallipolis Pool - Ohio River (area = 24.65

Video acquisition date	Open water Total area (10^6 m^2)	Solid ice cover Total area* (10^6 m^2)	Solid ice cover with open water areas Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover Total area* (10^6 m^2)	Fragmented ic with open water Total area (10^6 m^2)	Ice conc (%)
December 19, '85	24.26	0	0			0	0	
December 30, '85	24.36	0	0			0	0	
January 16, '86	24.65	0	0			0	0	

*Total area equals ice area.
**Sum of all ice areas for all map units.

Greenup Pool - Ohio River (area = 41.19 x

Open	Solid ice	Solid ice cover with	Frag. ice	Fragmented ice with

B

River (area = 19.89 x 10^6 m^2)

ag. ce ver	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
al ea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	-
	0			3.17	20	0.74	0.74	-
	0			1.37	10	0.14	0.14	-

o River (area = 24.65 x 10^6 m^2)

g. e er	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
al ea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	0			0			0	0.39
	0			0.29	10	0.03	0.03	-
	0			0			0	-

ver (area = 41.19 x 10^6 m^2)

r	Fragmented ice cover with			Ice floes or frazil			Total ice	No Video

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	(1
December 19, '85	24.26	0	0			0	0		
December 30, '85	24.36	0	0			0	0		
January 16, '86	24.65	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

Greenup Pool - Ohio River (area = 41.19 x 10^6

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice cov with open water areas: Total area (10^6 m^2)	Ice conc. (%)	(1
December 19, '85	41.19	0	0			0	0		
December 30, '85	41.19	0	0			0	0		
January 16, '86	41.19	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

Meldahl Pool - Ohio River (area = 73.77 x 10^6

Video acquisition date	Open water: Total area (10^6 m^2)	Solid ice cover: Total area* (10^6 m^2)	Solid ice cover with open water areas: Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Frag. ice cover: Total area* (10^6 m^2)	Fragmented ice co with open water area: Total area (10^6 m^2)	Ice conc. (%)	(1
December 19, '85	73.77	0	0			0	0		
December 30, '85	43.44	0	0			0	0		
January 16, '86	73.77	0	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

ice cover h r areas		Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
e nc.)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
		0			0	0.39
		0.29	10	0.03	0.03	-
		0			0	-

) x 10^6 m^2)

ice cover th er areas		Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
ce onc. %)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
		0			0	-
		0			0	-
		0			0	-

7 x 10^6 m^2)

ice cover ith ter areas		Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
		0			0	-
		0			0	30.33
		0			0	-

La Grange Pool† - Illinois River (area = 11.71 x 10^6 m

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^5 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^5 m^2)	Ice conc. (%)	Ice area (10^6 m^2)
January 7, '86	3.53	0	0			0.52	0		
January 10, '86	8.24	0	0			0.24	0		
January 15, '86	5.26	0.04	0			0.04	0		
January 17, '86	8.63	0.02	0			0.03	0		
January 21, '86	10.26	0	0			0.02	0		
January 24, '86	10.14	0.02	0			0	0		
January 27, '86	3.88	0.02	0			0.73	0.41	80	0.33
January 30, '86	4.94	0.04	0			0.27	0.04	80	0.03
February 9, '86	10.42	trace	0			0.03	0		
February 11, '86	3.73	0.08	0.03	70	0.02	0	0		
February 13, '86	0.87	0.11	0			0.05	0.03	70	0.02
February 15, '86	0.31	0.10	0			0	0.78	70	0.55
February 21, '86	2.71	0.15	0			0	0		
February 25, '86	8.02	0.10	0			0.04	0		
March 2, '86	10.81	0.02	0			0	0		
March 5, '86	10.91	trace	0			0	0		

*Total area equals ice area.

**Sum of all ice areas for all map units.

†Starts at mile 120.

)is River (area = 11.71 x 10^6 m^2)

ig. ce er	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
al ea* m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
.52	0			7.46	40	2.98	3.50	0.20
.24	0			3.06	60	1.84	2.08	0.17
04	0			6.06	30	1.82	1.90	0.31
03	0			2.49	10	0.25	2.54	0.54
02	0			0.69	50	0.35	0.37	0.74
	0			0.08	10	0.01	0.03	1.47
73	0.41	80	0.33	6.67	30	2.00	3.08	-
27	0.04	80	0.03	6.39	40	2.56	2.90	0.03
33	0			1.11	20	0.22	0.25	0.15
	0			7.87	60	4.72	4.82	-
05	0.03	70	0.02	10.43	50	5.22	5.40	0.22
	0.78	70	0.55	10.52	30	3.16	3.81	-
	0			8.85	40	3.54	3.69	-
4	0			3.47	20	0.69	0.83	0.08
	0			0			0.02	0.88
	0			0			0	0.80

March	5, '86	10.91	Trace	0			0	0		

*Total area equals ice area.

**Sum of all ice areas for all map units.

†Starts at mile 120.

Peoria Pool - Illinois River (area = 81.33 x 10^6

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice ar (10^6
January 7, '86	2.72	20.61	0			29.71	11.92	90	10.
January 9, '86	1.34	26.04	0			25.96	9.00	90	8.
January 10, '86	5.25	23.10	0			26.41	4.24	80	3.
January 15, '86	5.73	18.85	0			34.24	6.81	80	5.
January 17, '86	9.47	16.16	0			26.93	3.18	75	2.
January 21, '86	32.13	8.45	0			11.69	2.46	70	1.
January 24, '86	43.53	4.52	0			2.41	1.44	70	1.
January 27, '86	4.58	15.84	0			9.40	29.63	80	23.
January 30, '86	3.69	18.51	0			27.56	11.49	90	10.
February 9, '86	37.15	12.23	0			8.55	4.63	70	3.
February 11, '86	10.18	8.02	2.97	90	2.67	17.25	1.99	80	1.
February 13, '86	3.29	17.93	0.16	80	0.13	14.78	10.62	90	9.
February 15, '86	3.26	14.41	12.39	95	11.77	5.94	12.80	80	10.
February 21, '86	43.77	12.66	0			4.86	0.06	70	0.
February 25, '86	42.14	6.05	0			0.33	0		
March 2, '86	52.89	2.31	0			0.15	0.14	70	0.
March 5, '86	54.83	1.89	0			0	0		

*Total area equals ice area.

**Sum of all ice areas for all map units.

0	0	0	0.02	0.88
0	0	0	0	0.80

Illinois River (area = 81.33 x 10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
29.71	11.92	90	10.73	0.40	80	0.32	61.37	15.97
25.96	9.00	90	8.10	0.29	50	0.15	60.25	18.70
26.41	4.24	80	3.39	1.27	20	0.25	53.15	21.06
34.24	6.81	80	5.45	2.85	20	0.57	49.11	12.85
26.93	3.18	75	2.39	5.16	30	1.55	47.03	20.43
11.69	2.46	70	1.72	1.83	70	1.28	23.14	24.77
2.41	1.44	70	1.01	1.01	30	0.30	8.24	28.42
9.40	29.63	80	23.70	0.82	40	0.33	49.27	21.06
27.56	11.49	90	10.34	2.30	40	0.92	57.33	17.78
8.52	4.63	70	3.24	2.73	40	1.09	25.11	16.04
17.25	1.99	80	1.59	19.58	70	13.71	43.24	21.43
14.78	10.62	90	9.56	8.81	40	3.52	45.92	25.74
5.94	12.80	80	10.24	6.24	40	2.50	44.86	26.29
4.86	0.06	70	0.04	2.36	5	0.12	17.68	17.62
0.33	0			12.38	5	0.62	7.00	20.43
0.15	0.14	70	0.10	0.88	5	0.04	2.60	24.96
0	0			0.28	5	0.01	1.90	24.33

Starved Rock Pool - Illinois River (area = 10.

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice with open water a	
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)
January 7, '86	1.50	2.03	0.85	90	0.77	1.06	0.72	90
January 9, '86	0.63	2.01	0			3.25	0.61	80
January 10, '86	1.73	3.28	0			1.65	0.31	90
January 15, '86	5.20	0.40	0			2.10	0.98	80
January 17, '86	7.30	1.46	0			1.03	0	
January 21, '86	9.75	0.09	0			0	0	
January 24, '86	9.91	0.04	0			0	0	
January 27, '86	1.86	1.14	0			0.37	5.04	75
January 30, '86	1.35	1.77	0			1.75	3.22	90
February 9, '86	8.12	0.12	0			0	0	
February 11, '86	3.53	0.80	1.20	90	1.08	0.02	1.46	60
February 13, '86	2.16	2.15	0			1.54	2.90	80
February 15, '86	2.16	2.49	0.29	80	0.23	3.10	0.18	80
February 21, '86	9.16	0	0			0	0	
February 25, '86	7.93	0.02	0			0	0	
March 2, '86	7.39	0.02	0			0	0	
March 5, '86	7.97	0	0			0	0	

*Total area equals ice area.

**Sum of all ice areas for all map units.

s River (area = 10.19 x 10^6 m^2)

Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0.72	90	0.65	1.28	80	1.02	5.53	2.75
0.61	80	0.49	1.10	60	0.66	6.41	2.59
0.31	90	0.28	1.65	60	0.99	6.20	1.57
0.98	80	0.78	0.07	50	0.04	3.32	1.44
0			0.04	20	0.01	2.50	0.36
0			0			0.09	0.35
0			0			0.04	0.24
5.04	75	3.78	0.15	40	0.06	5.35	1.63
3.22	90	2.90	0.06	20	0.01	6.43	2.04
0			0.18	20	0.04	0.16	1.77
1.46	60	0.88	1.63	30	0.49	3.27	1.55
2.90	80	2.32	0.47	50	0.24	6.25	0.97
0.18	80	0.14	1.11	20	0.22	6.18	0.86
0			0			0	1.03
0			0.07	30	0.02	0.04	2.17
0			0			0.02	2.78
0			0			0	2.22

tiver (area = 8.19 x 10^6 m^2)

March	2, '86	[illegible]	[illegible]				
March	5, '86	7.97	0	0		0	0

*Total area equals ice area.
**Sum of all ice areas for all map units.

Marseilles Pool - Illinois River (area = 8.19 x 10^6 m^2)

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented ice cover with open water areas		
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)
January 7, '86	5.40	0	0.21	70	0.15	0.04	0.07	90	0.06
January 9, '86	5.66	0	0			0	0		
January 10, '86	7.30	trace	0			0	0		
January 15, '86	7.32	trace	0			0.40	0		
January 17, '86	7.96	0.14	0			0	0		
January 21, '86	8.13	0.06	0			0	0		
January 24, '86	8.00	0.03	0			0	0		
January 27, '86	6.44	0.21	0			0.84	0.39	80	0.31
January 30, '86	3.02	0.08	0			0.23	2.50	90	2.25
February 9, '86	8.06	0	0			0	0		
February 11, '86	6.52	0.15	0			0	0		
February 13, '86	4.70	0.28	0			0.88	0.70	90	0.63
February 15, '86	6.15	0.16	0			0.05	0		
February 21, '86	8.11	0.07	0			0	0		
February 25, '86	8.10	trace	0			0	0		
March 2, '86	8.16	trace	0			0	0		
March 5, '86	8.17	0.02	0			0	0		

*Total area equals ice area.
**Sum of all ice areas for all map units.

0	0	0	0.02	2.78
0	0	0	0	2.22

Illinois River (area = 8.19×10^6 m^2)

Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
0.04	0.07	90	0.06	1.86	50	0.93	1.18	0.61
0	0			2.03	60	1.22	1.22	0.50
0	0			0.84	60	0.50	0.50	0.05
0.40	0			0.21	30	0.06	0.46	0.26
0	0			0.06	30	0.02	0.16	0.03
0	0			0			0.06	-
0	0			0.16	1	0.00	0.03	-
0.84	0.39	80	0.31	0.23	40	0.09	1.45	0.08
0.23	2.50	90	2.25	2.15	5	0.11	2.67	0.21
0	0			0			0	0.13
0	0			1.52	10	0.15	0.30	-
0.88	0.70	90	0.63	1.63	20	0.33	2.12	-
0.05	0			1.83	10	0.18	0.39	-
0	0			0.01	10	0.00	0.07	-
0	0			0			0	0.09
0	0			0			0.03	-
0	0			0			0.02	-

Kankakee River† (area = 7.30 x 10

Video acquisition date	Open water	Solid ice cover	Solid ice cover with open water areas			Frag. ice cover	Fragmented wit open wate	
	Total area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ic co (%
January 7, '86	0.38	1.07	0.09	95	0.09	1.65	2.94	90
January 10, '86	0.24	0.75	0			3.37	2.38	80
January 15, '86	0.26	1.07	0			3.18	2.67	90
January 17, '86	0.29	1.05	0			3.39	2.45	80
January 21, '86	0.44	0.68	0			3.72	2.43	90
January 24, '86	1.42	1.54	0			1.81	2.21	80
January 27, '86	0.39	1.28	0.10	90	0.09	2.79	2.24	90
January 30, '86	0.51	1.51	0.21	95	0.20	2.96	1.29	90
February 9, '86	4.46	2.12	0			0.04	0	
February 11, '86	1.37	2.71	0			0.03	0.25	60
February 13, '86	0.90	2.59	0.17	95	0.16	0.46	0.65	90
February 15, '86	1.00	3.70	0.58	90	0.52	0.22	0.17	90
February 21, '86	4.52	2.39	0.22	90	0.20	0.02	0	
February 25, '86	5.85	1.23	0			0	0	
March 2, '86	6.82	0.48	0			0	0	
March 5, '86	6.73	0.39	0			0	0	

*Total area equals ice area.

**Sum of all ice areas for all map units.

†Up to mile 21, Warner Bridge.

kee River[†] (area = 7.30 x 10^6 m^2)

	Frag. ice cover	Fragmented ice cover with open water areas			Ice floes or frazil slush and pans			Total ice area**	No Video Coverage
m^2)	Total area* (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	Total area (10^6 m^2)	Ice conc. (%)	Ice area (10^6 m^2)	(10^6 m^2)	(10^6 m^2)
	1.65	2.94	90	2.65	0			5.46	1.17
	3.37	2.38	80	1.90	0			6.02	0.56
	3.18	2.67	90	2.40	0			6.65	0.12
	3.39	2.45	80	1.96	0			6.40	0.12
	3.72	2.43	90	2.19	0			6.59	0.03
	1.81	2.21	80	1.77	0.18	1	0.00	5.12	0.14
	2.79	2.24	90	2.02	0.13	20	0.03	6.21	0.37
	2.96	1.29	90	1.16	0			5.83	0.82
	0.04	0			0.09	50	0.05	2.21	0.59
	0.03	0.25	60	0.15	2.31	70	1.62	4.51	0.63
	0.46	0.65	90	0.59	2.48	50	1.24	5.04	0.05
	0.22	0.17	90	0.15	1.33	30	0.40	4.99	0.30
	0.02	0			0.09	10	0.01	2.62	0.06
	0	0			0.15	1	0.00	1.23	0.07
	0	0			0			0.48	-
	0	0			0.05	30	0.02	0.41	0.13

APPENDIX B: VIDEO TAPE COVER

Monongahela, Allegheny and Ohio Rivers

Tape Number	River	River Miles	Date	Tape Numb
1	Allegheny	0-10	18 December 85	1
	Ohio	0-127	19 December 85	
2	Ohio	126-314	19 December 85	2
3	Ohio	311-437	19 December 85	3
4	Allegheny	0-18	28 December 85	
	Monongahela	0-13	28 December 85	4
	Ohio	22-173	30 December 85	
5	Ohio	172-374	30 December 85	5
6	Ohio	374-401	30 December 85	6
7	Allegheny	0-18	2 January 86	
	Monongahela	0-12	2 January 86	
	Allegheny	0-18	7 January 86	7
	Monongahela	0-13	7 January 86	
8	Allegheny	0-19	8 January 86	8
	Monongahela	0-13	8 January 86	
	Ohio	0-3	8 January 86	
	Ohio	0-10	10 January 86	9
	Ohio	43-128	10 January 86	
	Allegheny	0-19	10 January 86	
	Monongahela	0-13	10 January 86	10
9	Allegheny	0-19	15 January 86	
	Monongahela	0-12	15 January 86	11
	Ohio	0-9	16 January 86	
	Ohio	24-165	16 January 86	12
10	Ohio	165-368	16 January 86	
11	Ohio	369-436	16 January 86	13
12	Allegheny	0-19	22 January 86	
	Monongahela	0-13	22 January 86	14
	Ohio	21-127	22 January 86	
	Allegheny	0-18	23 January 86	

DIX B: VIDEO TAPE COVERAGE

Illinois and Kankakee Rivers

e	Tape Number	River	River Miles	Date
nber 85	1	Kankakee	22-0	7 January 86
ber 85		Illinois	273-120	7 January 86
ber 85	2	Illinois	274-163	9 January 86
ber 85	3	Kankakee	22-0	10 January 86
		Illinois	274-119	10 January 86
ber 85				
ber 85	4	Illinois	118-273	15 January 86
ber 85		Kankakee	0-22	15 January 86
ber 85	5	Illinois	119-273	17 January 86
		Kankakee	0-22	17 January 86
ber 85				
	6	Illinois	119-273	21 January 86
ry 86		Kankakee	0-22	21 January 86
ry 86				
ry 86	7	Illinois	119-273	24 January 86
ry 86		Kankakee	0-22	24 January 86
ry 86	8	Kankakee	22-0	27 January 86
ry 86		Illinois	273-119	27 January 86
ry 86				
y 86	9	Kankakee	22-0	30 January 86
ry 86		Illinois	273-119	30 January 86
ry 86				
ry 86	10	Kankakee	24-0	9 February 86
		Illinois	273-119	9 February 86
y 86				
y 86	11	Kankakee	24-0	11 February 86
ry 86		Illinois	273-119	11 February 86
y 86				
	12	Illinois	119-273	13 February 86
y 86		Kankakee	0-23	13 February 86
y 86	13	Illinois	119-273	15 February 86
		Kankakee	0-23	15 February 86
y 86				
y 86	14	Kankakee	22-0	21 February 86
y 86		Illinois	273-119	21 February 86
y 86				
y 86	15	Kankakee	22-0	25 February 86

	Monongahela	0-12	2 January 86		
	Allegheny	0-18	7 January 86	7	Illinois
	Monongahela	0-13	7 January 86		Kankakee
8	Allegheny	0-19	8 January 86	8	Kankakee
	Monongahela	0-13	8 January 86		Illinois
	Ohio	0-3	8 January 86		
	Ohio	0-10	10 January 86	9	Kankakee
	Ohio	43-128	10 January 86		Illinois
	Allegheny	0-19	10 January 86		
	Monongahela	0-13	10 January 86	10	Kankakee
					Illinois
9	Allegheny	0-19	15 January 86		
	Monongahela	0-12	15 January 86	11	Kankakee
	Ohio	0-9	16 January 86		Illinois
	Ohio	24-165	16 January 86		
				12	Illinois
10	Ohio	165-368	16 January 86		Kankakee
11	Ohio	369-436	16 January 86	13	Illinois
					Kankakee
12	Allegheny	0-19	22 January 86		
	Monongahela	0-13	22 January 86	14	Kankakee
	Ohio	21-127	22 January 86		Illinois
	Allegheny	0-18	23 January 86		
	Monongahela	0-13	23 January 86	15	Kankakee
					Illinois
13	Ohio	25-127	23 January 86		
				16	Illinois
14	Allegheny	0-18	28 January 86		Kankakee
	Monongahela	0-13	28 January 86		
				17	Illinois
15	Allegheny	0-19	27 February 86		Kankakee
	Monongahela	0-13	27 February 86		
	Ohio	22-144	28 February 86		

uary 86	8	Kankakee	22-0	27 January 86
uary 86		Illinois	273-119	27 January 86
uary 86				
uary 86	9	Kankakee	22-0	30 January 86
uary 86		Illinois	273-119	30 January 86
uary 86				
uary 86	10	Kankakee	24-0	9 February 86
		Illinois	273-119	9 February 86
uary 86				
uary 86	11	Kankakee	24-0	11 February 86
uary 86		Illinois	273-119	11 February 86
uary 86				
	12	Illinois	119-273	13 February 86
uary 86		Kankakee	0-23	13 February 86
uary 86	13	Illinois	119-273	15 February 86
		Kankakee	0-23	15 February 86
uary 86				
uary 86	14	Kankakee	22-0	21 February 86
uary 86		Illinois	273-119	21 February 86
uary 86				
uary 86	15	Kankakee	22-0	25 February 86
		Illinois	273-119	25 February 86
uary 86				
	16	Illinois	119-273	2 March 86
uary 86		Kankakee	0-22	2 March 86
uary 86				
	17	Illinois	119-273	5 March 86
ruary 86		Kankakee	0-22	5 March 86
ruary 86				
ruary 86				

APPENDIX C: ICE CONDITIONS AS OBSERVED ON

Landsat images

Ice conditions on the Monongahela, Allegheny, Ohio and Illinois Rivers (Fig. C1; Table C1) were also observed using Landsat-5 images. Landsat-5 has two imaging sensors, a Multispectral Scanner (MSS) and a Thematic Mapper (TM). Based on a previous visual comparison of Landsat images, MSS band 2 images (0.6–0.7 mm, visible red) and TM band 3 images (0.63–0.69 mm, visible red) were used because they show more gray tones in river ice than the other spectral bands available from each sensor.

Each Landsat image covers about 114 miles on a side, is designated by a path and row number (Table C2) that corresponds to a particular geographic location, is taken of the same location every 16 days (Table C3) and has a specific identification number (Fig. C4, C6, C8 and C9). One image covers the area of interest on the Allegheny River (Table C2), three cover the Monongahela River, eleven cover the Ohio River and six cover the Illinois River. Not all images taken during the winter are useful because clouds obscure the river (Table C3).

Image interpretation

Black and white film positives, 9 by 9 in. in size, were analyzed using traditional photographic interpretation techniques. No special computer enhancements or analytical techniques were used. The images were viewed on a light table with a 7–10 power magnifier, but the spatial and spectral resolutions of Landsat imagery are insufficient to differentiate as many river-ice types as are apparent on the low-altitude, aerial video tapes. Only three general ice conditions could be observed with confidence, ice-free (black), gray ice, and white ice with textures and patterns sometimes apparent.

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Table C1. River pools monitored with Landsa

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Pool start to stop points (river miles)
Ohio River
Pittsburgh Point (0) to Emsworth (6.2)
Emsworth to Dashields (13.3)
Dashields to Montgomery (31.7)
Montgomery to New Cumberland (54.4)
New Cumberland to Pike Island (84.2)
Pike Island to Hannibal (126.4)
Hannibal to Willow Island (161.7)
Willow Island to Belleville (203.9)
Belleville to Racine (237.5)

TIONS AS OBSERVED ON LANDSAT IMAGERY

If the river appeared black on the images and had no discernible textures or patterns, the river was classified as open, i.e., ice-free. It was possible that black ice (thin, transparent ice) was present at the time but was not discernible on Landsat images.

Gray ice on Landsat images could vary from thin, solid ice or thin fragmented ice with a few large open-water areas or many small areas to ice floes or slush. The gray tone was often patchy or mottled or showed textures or patterns.

White ice on the images could vary from solid or fragmented ice (usually thicker than gray ice) with no open areas to open areas that are smaller or occur less often than those that occur when a gray tone is produced. A white tone could also mean that the river ice was snow-covered. A navigation track in a complete ice cover occasionally appeared black because the track was ice-free. More often, the track appeared gray on the Landsat images because it was filled with slush, floes or brash ice.

Ice mapping and measurements

The upstream and downstream limits of reaches with gray ice and white ice as observed on Landsat images were transferred to base maps (Fig. C2, C3, C5 and C7). Since the distinction between the three conditions was frequently subtle and they usually grade one into another, a "best-guess" based on experience was required to map the limits of the ice-covered reaches. Consequently, ice at specific locations within a reach could have been different than shown on the maps. The lengths of open water gray ice and white ice within each pool were measured and converted to percentages of each pool (Tables C4, C5, C6 and C7).

onitored with Landsat imagery, 1985-1986.

ver miles)	Length (mi)	Pool surface area (10^6 ft^2)	Pool surface area (10^6 m^2)
Ohio River			
rth (6.2)	6.2	48.33	4.49
	7.1	53.82	5.00
')	18.4	121.31	11.27
(54.4)	22.7	160.06	14.87
(84.2)	29.8	203.65	18.92
.4)	42.2	241.76	22.46
51.7)	35.3	228.63	21.24
(203.9)	42.2	293.64	27.28
	33.6	214.10	19.89

as many river-ice types are apparent on the low-altitude, aerial video tapes. Only three general ice conditions could be observed with confidence, ice-free (black), gray ice, and white ice with textures and patterns sometimes apparent.

open water gray ice and white converted to percentages of ea

Table C1. River pools monitored with Landsat imagery, 1985-

Pool start to stop points (river miles)	Length (mi)	Pool su (10^6 ft
Ohio River		
Pittsburgh Point (0) to Emsworth (6.2)	6.2	48.33
Emsworth to Dashields (13.3)	7.1	53.82
Dashields to Montgomery (31.7)	18.4	121.31
Montgomery to New Cumberland (54.4)	22.7	160.06
New Cumberland to Pike Island (84.2)	29.8	203.65
Pike Island to Hannibal (126.4)	42.2	241.76
Hannibal to Willow Island (161.7)	35.3	228.63
Willow Island to Belleville (203.9)	42.2	293.64
Belleville to Racine (237.5)	33.6	214.10
Racine to Gallipolis (279.2)	41.7	265.33
Gallipolis to Greenup (341.0)	61.8	443.37
Greenup to Meldahl (436.2)	95.2	794.06
Meldahl to Markland (531.5)	95.3	828.44
Markland to McAlpine (606.8)	75.3	816.48
McAlpine to Cannelton (720.7)	113.9	1020.29
Cannelton to Newburgh (776.1)	55.4	724.84
Newburgh to Uniontown (846.0)	69.9	803.38
Uniontown to Smithland (918.5)	72.5	1073.13
Smithland to Dam 52 (938.9)	20.4	394.86
Dam 52 to Dam 53 (962.6)	23.7	492.60
Dam 53 to Ohio-Mississippi confluence (981)	18.4	276.64
Allegheny River		
River Mile 72 to Dam 9 (62.2)	9.8	38.81
Dam 9 to Dam 8 (52.6)	9.6	43.09
Dam 8 to Dam 7 (45.7)	6.9	34.61
Dam 7 to Dam 6 (36.3)	9.4	47.15
Dam 6 to Dam 5 (30.4)	5.9	24.92
Dam 5 to Dam 4 (24.2)	6.2	31.10
Dam 4 to Dam 3 (14.5)	9.7	56.34
Dam 3 to Dam 2 (6.7)	7.8	43.22
Dam 2 to Pittsburgh Point (0)	6.7	33.05
Monongahela River		
River mile 128.7 to Opekiska (115.4)	13.3	31.60
Opekiska to Hildebrand (108)	7.4	17.58
Hildebrand to Morgantown (102)	6.0	17.42
Morgantown to Dam 8 (90.8)	11.2	32.53
Dam 8 to Dam 7 (85)	5.8	19.91
Dam 7 to Maxwell (61.2)	23.8	81.68
Maxwell to Dam 4 (41.5)	19.7	71.04
Dam 4 to Dam 3 (23.8)	17.7	71.47
Dam 3 to Dam 2 (11.2)	12.6	51.34
Dam 2 to Pittsburgh Point (0)	11.2	50.91

open water gray ice and white ice within each pool were measured and converted to percentages of each pool (Tables C4, C5, C6 and C7).

ɔred with Landsat imagery, 1985-1986.

miles)	Length (mi)	Pool surface area (10^6 ft^2)	(10^6 m^2)
Ohio River			
(6.2)	6.2	48.33	4.49
	7.1	53.82	5.00
	18.4	121.31	11.27
4)	22.7	160.06	14.87
.2)	29.8	203.65	18.92
	42.2	241.76	22.46
)	35.3	228.63	21.24
.9)	42.2	293.64	27.28
	33.6	214.10	19.89
	41.7	265.33	24.65
	61.8	443.37	41.19
	95.2	794.06	73.77
	95.3	828.44*	76.96*
	75.3	816.48*	75.85*
	113.9	1020.29*	94.79*
	55.4	724.84*	67.34*
	69.9	803.38*	74.64*
	72.5	1073.13*	99.70*
	20.4	394.86*	36.68*
	23.7	492.60*	45.76*
.uence (981)	18.4	276.64*	25.70*
.legheny River			
	9.8	38.81*	3.61*
	9.6	43.09*	4.00*
	6.9	34.61*	3.22*
	9.4	47.15*	4.38*
	5.9	24.92*	2.32*
	6.2	31.10*	2.89*
	9.7	56.34*	5.23*
	7.8	43.22	4.02
	6.7	33.05	3.07
ıongahela River			
5.4)	13.3	31.60*	2.94*
	7.4	17.58*	1.63*
	6.0	17.42*	1.62*
	11.2	32.53*	3.02*
	5.8	19.91*	1.85*
	23.8	81.68*	7.59*
	19.7	71.04	6.60
	17.7	71.47	6.64
	12.6	51.34	4.77
	11.2	50.91	4.73

Table C1 (cont'd).

Illinois River	
Lockport (291) to Brandon Road (286)	5.0
Brandon Road to Dresden Island (271.3)	14.7
Dresden Island to Marseilles Lock (244.3)	27.0
Marseilles Lock to Starved Rock (231.1)	13.2
Starved Rock to Peoria (157.6)	73.5
Peoria to LaGrange (80.1)	77.5
La Grange to Illinois-Mississippi confluence (0)	80.1

* Estimated
-- Areas not calculated

Table C2. Landsat-5 imagery coverage in 1985-1986.

Landsat-5 Path - Row	River	Approximate coverage (river miles)
17 - 32	Ohio	0 to 116
	Allegheny	0 to 85
	Monongahela	0 to 103
17 - 33	Ohio	107 to 120
	Monongahela	95 to Tygart Lake
18 - 32	Ohio	0 to 140
	Monongahela	0 to 10
18 - 33	Ohio	130 to 320
19 - 33	Ohio	235 to 430
20 - 33	Ohio	420 to 626
20 - 34	Ohio	598 to 628
21 - 33	Ohio	543 to 623
21 - 34	Ohio	618 to 776
22 - 31	Illinois	Lake Michigan to 299
22 - 34	Ohio	748 to 981
23 - 31	Illinois	Lake Michigan to 198
23 - 32	Illinois	202 to 133
23 - 34	Ohio	950 to 981
24 - 31	Illinois	235 to 180
24 - 32	Illinois	183 to 53
24 - 33	Illinois	59 to Mississippi River

C1 (cont'd).

ois River

)	5.0	--	--
.3)	14.7	--	--
244.3)	27.0	88.16	8.19
1.1)	13.2	109.69	10.19
	73.5	875.44	81.33
	77.5	--	--
onfluence (0)	80.1	--	--

Table C3 (cont'd).

	Percent cloud cover
Path 18-Row 32	
23 November	10
9 December†	40
25 December	80
10 January*	90
26 January*	90
27 February*	90
15 March	70
Path 18-Row 33	
23 November	20
9 December†	20
25 December	90
10 January†*	40
26 January	90
27 February*	90
15 March	80
Path 19-Row 33	
30 November	90
16 December	80
1 January†*	0
17 January*	90
2 February	90
18 February	90
6 March	90
22 March	40
Path 20-Row 33	

		Monongahela	0 to 10
18	- 33	Ohio	130 to 320
19	- 33	Ohio	235 to 430
20	- 33	Ohio	420 to 626
20	- 34	Ohio	598 to 628
21	- 33	Ohio	543 to 623
21	- 34	Ohio	618 to 776
22	- 31	Illinois	Lake Michigan to 299
22	- 34	Ohio	748 to 981
23	- 31	Illinois	Lake Michigan to 198
23	- 32	Illinois	202 to 133
23	- 34	Ohio	950 to 981
24	- 31	Illinois	235 to 180
24	- 32	Illinois	183 to 53
24	- 33	Illinois	59 to Mississippi River

Table C3. Landsat-5 imagery taken during the 1985-1986 winter.

	Percent cloud cover
Path 17-Row 32	
16 November	90
2 December	90
18 December†*	40
3 January*	90
19 January	90
4 February	90
20 February	90
8 March†	0
24 March†	30
Path 17-Row 33	
16 November	90
2 December	90
18 December†*	30
3 January	80
19 January	90
4 February	90
20 February	90
8 March†	40
24 March†	20

15 March	70

Path 18-Row 33

23 November	20
9 December†	20
25 December	90
10 January†*	40
26 January	90
27 February*	90
15 March	80

Path 19-Row 33

30 November	90
16 December	80
1 January†*	0
17 January*	90
2 February	90
18 February	90
6 March	90
22 March	40

Path 20-Row 33

21 November	60
7 December	90
23 December	90
8 January†	10
24 January†	40
13 March	90

Path 20-Row 34

21 November	70
7 December	90
23 December	90
8 January†	10
24 January†	60
13 March	90

Path 21-Row 33

28 November	90
14 December	90
30 December†	0
15 January†	10
31 January	90
16 February	90
20 March	90

Path 21-Row 34

28 November	90
14 December†	30
30 December†	0
15 January†	10
31 January	80
16 February†	40
20 March	90

Table C3 (cont'd).

	Percent cloud cover
Path 22-Row 31	
5 December	80
21 December†	50
6 January†	60
22 January	90
23 February	90
Path 22-Row 34	
5 December	80
21 December†	30
6 January	90
22 January	90
23 February	80
11 March	90
Path 23-Row 31	
26 November	90
12 December†	10
28 December†	10
13 January†*	0
29 January†*	60
14 February*	90
2 March*	90
18 March	90
Path 23-Row 32	
26 November	90
12 December†	20
28 December†	10
13 January†*	0
29 January*	90
14 February*	90
2 March†*	40
18 March	90
Path 23-Row 34	
26 November	90
12 December	90
28 December†	70
13 January†	50
29 January	90
14 February	90
2 March†	70
18 March	90
Path 24-Row 31	

Table

	Open	
	Length (mi)	Percer
18 December	9.8	100
8 March		
24 March	9.8	100
18 December	9.6	100
8 March	1.6	17
24 March	9.6	100
18 December	6.9	100
8 March	6.9	100
24 March	6.9	100
18 December	9.4	100
8 March	9.4	100
24 March	9.4	100
18 December	5.9	100
8 March	5.9	100
24 March	5.9	100
18 December	6.2	100
8 March	4.2	68
24 March	6.2	100
18 December	9.7	100
8 March	9.7	100
24 March	9.7	100
18 December	7.8	100
8 March	7.8	100

Table C4. Lineal extent of ice as observed on Landsat-5 imagery of the Allegheny River, 1985-86.

Open		Gray ice		White ice		
Length (mi)	Percent††	Length (mi)	Percent††	Length (mi)	Percent††	Remarks
			Dam 9 Pool (9.8 mi)+			
9.8	100					
		9.8	100			TM; individual floes and slush patches visible.
9.8	100					TM
			Dam 8 Pool (9.6 mi)			
9.6	100					PC
1.6	17	8.0	83			TM; slush patches and stringers visible.
9.6	100					TM
			Dam 7 Pool (6.9 mi)			
6.9	100					PC
6.9	100					TM
6.9	100					TM
			Dam 6 Pool (9.4 mi)			
9.4	100					PC
9.4	100					TM
9.4	100					TM
			Dam 5 Pool (5.9 mi)			
5.9	100					PC
5.9	100					TM
5.9	100					TM
			Dam 4 Pool (6.2 mi)			
6.2	100					PC
4.2	68	2.0	32			TM; slush ice from the Kiskiminetas River.
6.2	100					TM
			Dam 3 Pool (9.7 mi)			
9.7	100					PC
9.7	100					TM
9.7	100					TM
			Dam 2 Pool (7.8 mi)			
7.8	100					PC
7.8	100					TM

18 March	90	

Path 23-Row 32

26 November	90	
12 December†	20	
28 December†	10	
13 January†*	0	
29 January*	90	
14 February*	90	
2 March†*	40	
18 March	90	

Path 23-Row 34

26 November	90	
12 December	90	
28 December†	70	
13 January†	50	
29 January	90	
14 February	90	
2 March†	70	
18 March	90	

Path 24-Row 31

17 November	10	
3 December	90	
19 December†	10	
4 January	90	
20 January*	90	
5 February	90	
21 February†*	60	
9 March	90	

Path 24-Row 32

17 November	0	
3 December	90	
19 December†	60	
4 January	90	
20 January*	80	
5 February	90	
21 February†*	70	
9 March	70	

Path 24-Row 33

17 November	40	
3 December	90	
19 December	90	
4 January	90	
20 January†	10	
5 February	90	
21 February	90	
9 March†	70	

18 December	5.9	100
8 March	5.9	100
24 March	5.9	100
18 December	6.2	100
8 March	4.2	68
24 March	6.2	100
18 December	9.7	100
8 March	9.7	100
24 March	9.7	100
18 December	7.8	100
8 March	7.8	100
24 March	7.8	100
18 December	6.7	100
8 March	6.7	100
24 March	6.7	100

* Video tapes available within two days of the date.
† Images analyzed.

* CC - cloud-covered; PC - part
NT - navigation track visible

+ Only to the end of the naviga

†† Rounded to nearest percent.

ch	9.4	100			TM
			Dam 5 Pool (5.9 mi)		
ember	5.9	100			PC
ch	5.9	100			TM
ch	5.9	100			TM
			Dam 4 Pool (6.2 mi)		
ember	6.2	100			PC
ch	4.2	68	2.0	32	TM; slush ice from the Kiskiminetas River.
ch	6.2	100			TM
			Dam 3 Pool (9.7 mi)		
ember	9.7	100			PC
ch	9.7	100			TM
ch	9.7	100			TM
			Dam 2 Pool (7.8 mi)		
ember	7.8	100			PC
ch	7.8	100			TM
ch	7.8	100			TM
			Emsworth Pool (6.7 mi)		
ember	6.7	100			PC
ch	6.7	100			TM
ch	6.7	100			TM

cloud-covered; PC - partly cloudy; NOI - not on image; TM - Thematic Mapper; navigation track visible.

to the end of the navigation channel at river mile 72.

nded to nearest percent.

Table C5. Lineal extent of ice as obser
Imagery of the Monongahela R.

	Open		Gray ice		White i
	Length (mi)	Percent††	Length (mi)	Percent††	Length (mi) Per
					Opekiska Pool (13.3 mi)+
18 December	13.3	100			
8 March	13.3	100			
24 March	13.3	100			
					Hildebrand Pool (7.4 mi)
18 December	7.4	100			
8 March	7.4	100			
24 March	7.4	100			
					Morgantown Pool (6.0 mi)
18 December	6.0	100			
8 March	6.0	100			
24 March	6.0	100			
					Dam 8 Pool (11.2 mi)
18 December	11.2	100			
8 March	11.2	100			
24 March	11.2	100			
					Dam 7 Pool (5.8 mi)
18 December	5.8	100			
8 March	5.8	100			
24 March	5.8	100			
					Maxwell Pool (23.8 mi)
18 December	23.8	100			
8 March	23.8	100			
24 March	23.8	100			
					Dam 4 Pool (19.7 mi)
18 December	19.7	100			
8 March	19.7	100			
24 March	19.7	100			
					Dam 3 Pool (17.7 mi)
18 December	17.7	100			

l extent of ice as observed on Landsat-5
ry of the Monongahela R., 1985-86.

Gray ice		White ice		
h Percent††	Length (mi)	Percent††	Remarks	
Opekiska Pool (13.3 mi)+				
			PC	
			TM	
			TM	
Hildebrand Pool (7.4 mi)				
			PC	
			TM	
			TM	
Morgantown Pool (6.0 mi)				
			PC	
			TM	
			TM	
Dam 8 Pool (11.2 mi)				
			PC	
			TM	
			TM	
Dam 7 Pool (5.8 mi)				
			TM	
			TM	
Maxwell Pool (23.8 mi)				
			TM	
			TM	
Dam 4 Pool (19.7 mi)				
			TM	
			TM	
Dam 3 Pool (17.7 mi)				

18 December	11.2	100		
8 March	11.2	100		
24 March	11.2	100		
			Dam 7 Pool (5.8 mi)	
18 December	5.8	100		
8 March	5.8	100		
24 March	5.8	100		
			Maxwell Pool (23.8 mi)	
18 December	23.8	100		
8 March	23.8	100		
24 March	23.8	100		
			Dam 4 Pool (19.7 mi)	
18 December	19.7	100		
8 March	19.7	100		
24 March	19.7	100		
			Dam 3 Pool (17.7 mi)	
18 December	17.7	100		
8 March	17.7	100		
24 March	17.7	100		
			Dam 2 Pool (12.6 mi)	
18 December	12.6	100		
8 March	11.2	89	1.4	11
24 March	12.6	100		
			Emsworth Pool (11.2 mi)	
9 December	2.6	23		
18 December	11.2	100		
8 March	11.2	100		
24 March	11.2	100		

* CC - cloud-covered; PC - partly cloudy; NOI - not on image; TM - NT - navigation track visible.

+ Only to the end of the navigation channel at river mile 128.7.

†† Rounded to nearest percent.

	TM
	TM
Dam 7 Pool (5.8 mi)	
	TM
	TM
Maxwell Pool (23.8 mi)	
	TM
	TM
Dam 4 Pool (19.7 mi)	
	TM
	TM
Dam 3 Pool (17.7 mi)	
	TM
	TM
Dam 2 Pool (12.6 mi)	
"	TM; slush ice from Youghiogheny River
	TM
Emsworth Pool (11.2 mi)	
	upper 8.6 mi-NOI
	PC
	TM
	TM

udy; NOI - not on image; TM - Thematic Mapper;

hannel at river mile 128.7.

Table C6. Lineal extent of ice as obser
imagery of the Ohio River, 19

	Open		Gray ice		White i	
	Length (mi)	Percent††	Length (mi)	Percent††	Length (mi)	Per
Emsworth Pool (6.2 mi)						
9 December	6.2	100				
18 December	6.2	100				
8 March	6.2	100				
24 March	6.2	100				
Dashields Pool (7.1 mi)						
9 December	7.1	100				
18 December	7.1	100				
8 March	7.1	100				
24 March	7.1	100				
Montogmery Pool (18.4 mi)						
9 December	18.4	100				
18 December	18.4	100				
8 March	18.4	100				
24 March	18.4	100				
New Cumberland Pool (22.7 m						
9 December	22.7	100				
18 December	14.7	65				
8 March	13.7	60				
24 March	17.7	78				
Pike Island Pool (29.8 mi						
9 December	29.8	100				
18 December	29.8	100				
8 March	29.8	100				
24 March	29.8	100				
Hannibal Pool (42.2 mi)						
9 December	16.2	38				
18 December	39.7	94				
8 March	39.7	94				
24 March	42.2	100				
Willow Island Pool (35.3 m						
9 December	9.2	26				
18 December	4.6	13				
10 January						
8 March	4.6	13				
24 March	6.0	17				

ıt of ice as observed on Landsat-5
:he Ohio River, 1985-86.

:e	White ice		
:entŤŤ	Length (mi)	PercentŤŤ	Remarks
ɾth Pool (6.2 mi)			
			TM
			PC
			TM
			TM
lds Pool (7.1 mi)			
			TM
			PC
			TM
			TM
ery Pool (18.4 mi)			
			TM
			TM
			TM
rland Pool (22.7 mi)			
			TM
			8 mi-NOI
			TM; 9 mi-NOI
			TM; 5 mi-NOI
land Pool (29.8 mi)			
			TM
			TM
			TM; PC
al Pool (42.2 mi)			
			TM; middle 26 mi-CC
			PC; 2.5 mi-NOI
			TM; 2.5 mi-NOI
			TM
sland Pool (35.3 mi)			
			TM; middle 26.1 mi-CC
			low. 30.7 mi-NOI; PC
			TM; upper 8.6 mi-NOI; 26.7 mi-CC
			TM; lower 30.7 mi-NOI
			TM; lower 29.3 mi-NOI

24	March	17.7	78		
				Pike Island Pool (29.8 mi)	
9	December	29.8	100		
18	December	29.8	100		
8	March	29.8	100		
24	March	29.8	100		
				Hannibal Pool (42.2 mi)	
9	December	16.2	38		
18	December	39.7	94		
8	March	39.7	94		
24	March	42.2	100		
				Willow Island Pool (35.3 mi)	
9	December	9.2	26		
18	December	4.6	13		
10	January				
8	March	4.6	13		
24	March	6.0	17		
				Belleville Pool (42.2 mi)	
9	December	42.2	100		
10	January				
				Racine Pool (33.6 mi)	
9	December	33.6	100		
10	January				
				Gallipolis Pool (41.7 mi)	
9	December	41.7	100		
1	January	32.7	78		
10	January				
				Greenup Pool (61.8 mi)	
9	December	51.8	84		
1	January	61.8	100		
10	January				
				Meldahl Pool (95.2 mi)	
1	January	95.2	100		
8	January			34.2	36
24	January	34.2	36		
				Markland Pool (95.3 mi)	
1	January	3.3	4		
8	January	72.8	76	22.5	24
24	January	95.3	100		

	TM; 5 mi-NOI
ke Island Pool (29.8 mi)	
	TM
	TM
	TM; PC
annibal Pool (42.2 mi)	
	TM; middle 26 mi-CC
	PC; 2.5 mi-NOI
	TM; 2.5 mi-NOI
	TM
low Island Pool (35.3 mi)	
	TM; middle 26.1 mi-CC
	low. 30.7 mi-NOI; PC
	TM; upper 8.6 mi-NOI; 26.7 mi-CC
	TM; lower 30.7 mi-NOI
	TM; lower 29.3 mi-NOI
lleville Pool (42.2 mi)	
	TM
	TM; CC
Racine Pool (33.6 mi)	
	TM
	TM; CC
llipolis Pool (41.7 mi)	
	TM
	upper 9 mi-NOI
	TM; CC
Greenup Pool (61.8 mi)	
	TM; lower 10 mi-NOI
	TM; lower 10 mi-NOI; CC
leldahl Pool (95.2 mi)	
36	TM; upper 61 mi-NOI; slush patches and stringers visible
	TM; upper 61 mi-NOI; hazy
rkland Pool (95.3 mi)	
24	lower 92 mi-NOI
	TM; slush patches and stringers visible
	TM; hazy

Table C6 (cont'd).

	Open		Gray ice		White	
	Length (mi)	Percent††	Length (mi)	Percent††	Length (mi)	P
McAlpine Pool (75.3 mi						
30 December	61.8	82				
8 January	75.3	100				
15 January	61.8	82				
24 January	75.3	100				
Cannelton Pool (113.9 m						
14 December	101.7	89				
30 December	101.7	89				
8 January	26.2	23				
15 January	101.7	89				
24 January	26.2	23				
16 February						
Newburgh Pool (55.4 mi						
14 December	55.4	100				
21 December	35.1	63				
30 December	55.4	100				
15 January	55.4	100				
16 February	55.4	100				
Uniontown Pool (69.9 m						
14 December	12.0	17				
21 December	69.9	100				
30 December	12.0	17				
15 January	12.0	17				
16 February	-	-				
Smithland Pool (72.5 m						
21 December	72.5	100				
Dam 52 Pool (20.4 mi)						
21 December	20.4	100				
Dam 53 Pool (23.7 mi)						
21 December	23.7	100				
28 December	18.6	79				
13 January	18.6	79				
2 March	18.6	79				
Ohio-Mississippi confluence Poo						
21 December	18.4	100				

e C6 (cont'd).

e	White ice Length (mi)	Percent††	Remarks
ent††			
nt†			
e Pool (75.3 mi)			
			upper 13.5 mi-NOI
			TM
			TM; upper 13.5 mi-NOI
			TM; hazy
n Pool (113.9 mi)			
			upper 12.2 mi-NOI
			upper 12.2 mi-NOI
			TM; lower 87.7mi-NOI
			TM; upper 12.2 mi-NOI
			TM; lower 87.7 mi-NOI; hazy
			TM; upper 12.2 mi-NOI; CC
n Pool (55.4 mi)			
			PC
			upper 20.3 mi-NOI; PC
			TM
			TM; PC
wn Pool (69.9 mi)			
			lower 57.8 mi-NOI; PC
			PC
			lower 57.9 mi-NOI
			TM; lower 57.9 mi-NOI
			TM; lower 57.9 mi-NOI; CC
nd Pool (72.5 mi)			
			PC
Pool (20.4 mi)			
			PC
Pool (23.7 mi)			
			PC
			upper 5.1 mi-NOI; PC
			TM; upper 5.1 mi-NOI; PC
			TM; upper 5.1 mi-NOI
confluence Pool (18.4 mi)			
3.4			PC
			CC

16 February	55.4	100	
			Uniontown Pool (69.9
14 December	12.0	17	
21 December	69.9	100	
30 December	12.0	17	
15 January	12.0	17	
16 February	-	-	
			Smithland Pool (72.5
21 December	72.5	100	
			Dam 52 Pool (20.4 m
21 December	20.4	100	
			Dam 53 Pool (23.7 m
21 December	23.7	100	
28 December	18.6	79	
13 January	18.6	79	
2 March	18.6	79	
			Ohio-Mississippi confluence P
21 December	18.4	100	
28 December			
13 January	18.4	100	
2 March	18.4	100	

* CC - cloud-covered; PC - partly cloudy; NOI - not on im
NT - navigation track visible.
†† Rounded to nearest percent.

	TM
	TM; PC
Uniontown Pool (69.9 mi)	
	lower 57.8 mi-NOI; PC
	PC
	lower 57.9 mi-NOI
	TM; lower 57.9 mi-NOI
	TM; lower 57.9 mi-NOI; CC
Smithland Pool (72.5 mi)	
	PC
Dam 52 Pool (20.4 mi)	
	PC
Dam 53 Pool (23.7 mi)	
	PC
	upper 5.1 mi-NOI; PC
	TM; upper 5.1 mi-NOI; PC
	TM; upper 5.1 mi-NOI
Ohio-Mississippi confluence Pool (18.4 mi)	
	PC
	CC
	TM; hazy
	TM

artly cloudy; NOI - not on image; TM - Thematic Mapper;
ble.
t.

Table C7. Lineal extent of ice as
imagery of the Illinois

	Open		Gray ice		Wh
	Length (mi)	Percent††	Length (mi)	Percent††	Length (mi)
					Brandon Road Pool (5
12 December	5	100			
28 December	5	100			
13 January	4	80	1	20	
29 January	5	100			
					Dresden Island Pool (1
12 December	14.7	100			
28 December	14.7	100			
13 January	14.7	100			
29 January	14.7	100			
					Marseilles Lock Pool (
12 December	27	100			
28 December	5.3	20	21.7	80	
13 January			27.0	100	
29 January	18.8	70	8.2	30	
					Starved Rock Pool (13
12 December	13.2	100			
19 December					2.4
			13.2	100	
13 January			7.8	59	5.4
29 January	2.3	17	4.0	30	6.9
21 February	2.4	19			
					Peoria Pool (73.5
12 December	39.1	53	34.4	47	
19 December			25.0	34	48.5
28 December					73.5
13 January			29.5	40	44
29 January			14.8	20	
21 February	70.0	95	3.5	5	
2 March	44.4	60			

extent of ice as observed on Landsat-5
of the Illinois River, 1985-86.

y ice	White ice			
Percent††	Length (mi)	Percent†††	Remarks
don Road Pool (5.0 mi)			
20			TM
			TM; PC
n Island Pool (14.7 mi)			
			TM
			TM; PC
lles Lock Pool (27.0 mi)			
80			
100			TM
30			TM; PC
ed Rock Pool (13.2 mi)			
	2.4	19	upper 10.8 mi-NOI28 December
2 100			
59	5.4	41	TM
30	6.9	52	TM; PC
			TM; upper 10.8 mi-NOI; hazy
oria Pool (73.5 mi)			
47			
34	48.5	66	
	73.5	100	
40	44	60	TM; open areas scattered throughout ice
20			TM; lower 40.4 mi-NOI; 18.3 mi-CC
5			TM; PC; solid ice on adjoining lakes
			TM; upper 29.1 mi-NOI; PC; solid ice on portions of

12 December	13.2	100			
19 December					2.4
			13.2	100	
13 January			7.8	59	5.4
29 January	2.3	17	4.0	30	6.9
21 February	2.4	19			

Peoria Pool (73.5 m

12 December	39.1	53	34.4	47	
19 December			25.0	34	48.5
28 December					73.5
13 January			29.5	40	44
29 January			14.8	20	
21 February	70.0	95	3.5	5	
2 March	44.4	60			

La Grange Pool (77.5

12 December			24.6	32	
19 December			68.0	88	9.5
28 December					24.6
13 January	3.6	5	21.0	27	
21 February			77.5	100	
2 March	24.6	32			

Illinois-Mississippi confluence

19 December			17.1	21	
20 January	57.0	71			
21 February			34.9	44	
9 March	57.0	71			

* CC - cloud-covered; PC - partly cloudy; NOI - not on in
NT - navigation track visible.

†† Rounded to nearest percent.

	2.4	19	upper 10.8 mi-NOI28 December
2	100		
59	5.4	41	TM
30	6.9	52	TM; PC
			TM; upper 10.8 mi-NOI; hazy

oria Pool (73.5 mi)

47			
34	48.5	66	
	73.5	100	
40	44	60	TM; open areas scattered throughout ice
20			TM; lower 40.4 mi-NOI; 18.3 mi-CC
5			TM; PC; solid ice on adjoining lakes
			TM; upper 29.1 mi-NOI; PC; solid ice on portions of adjoining lakes

Grange Pool (77.5 mi)

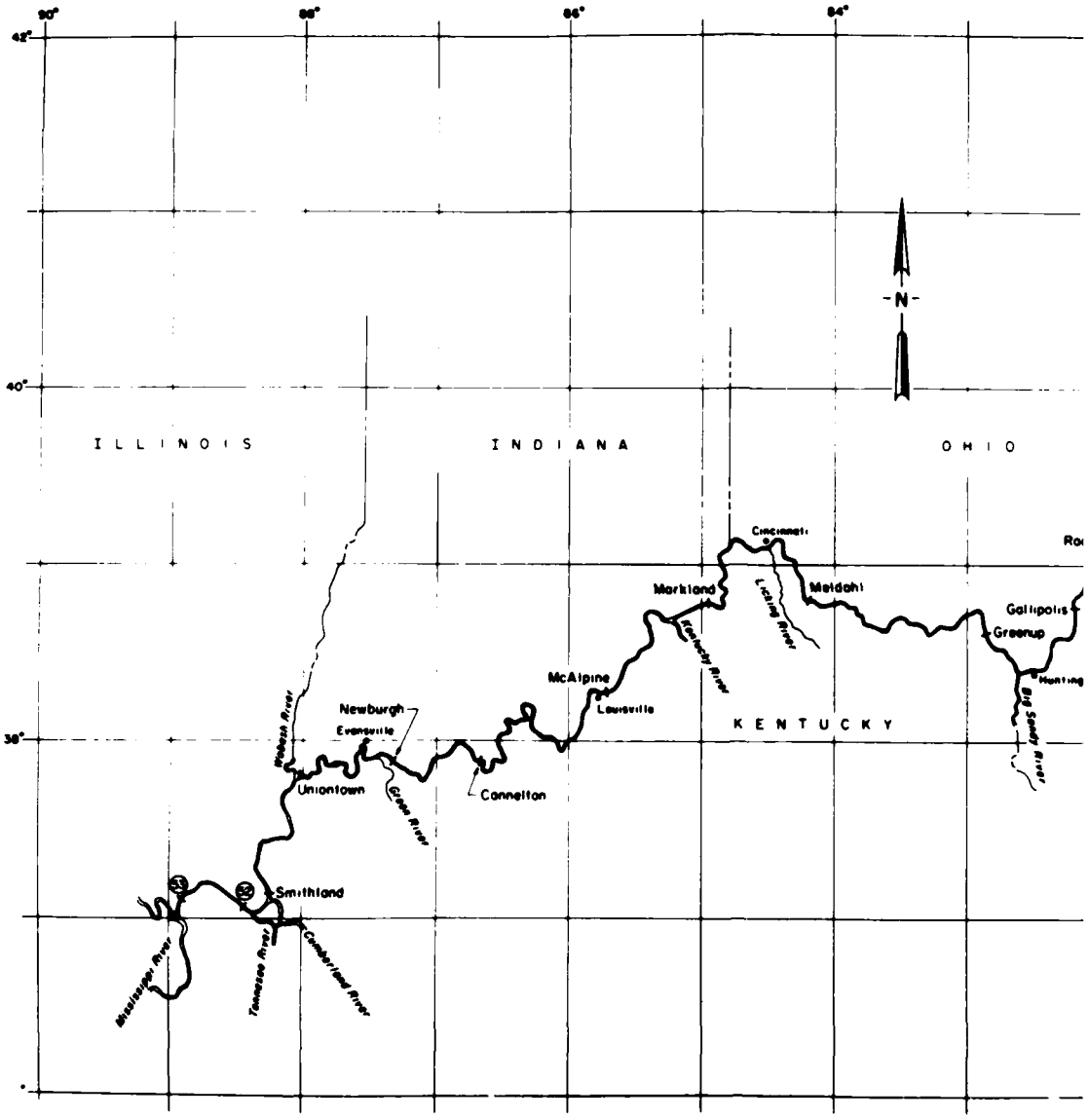
32			lower 52.9 mi-NOI
88	9.5	12	lower 23.9 mi-PC
	24.6	32	lower 52.9 mi-NOI
27			TM; lower 52.9 mi-NOI
100			TM; PC
			TM; lower 52.9 mi-NOI; PC

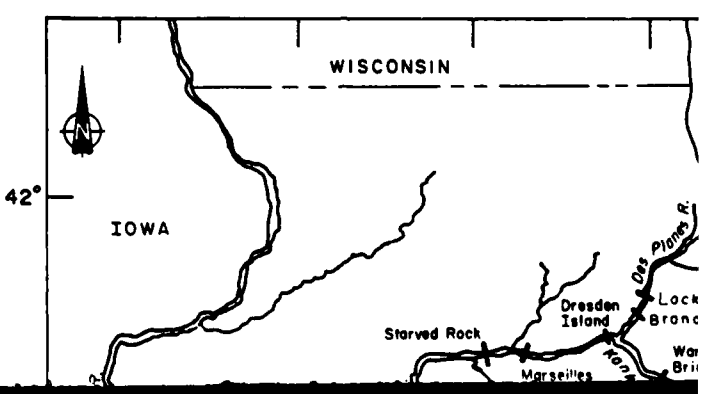
issippi confluence Pool (80.1 mi)

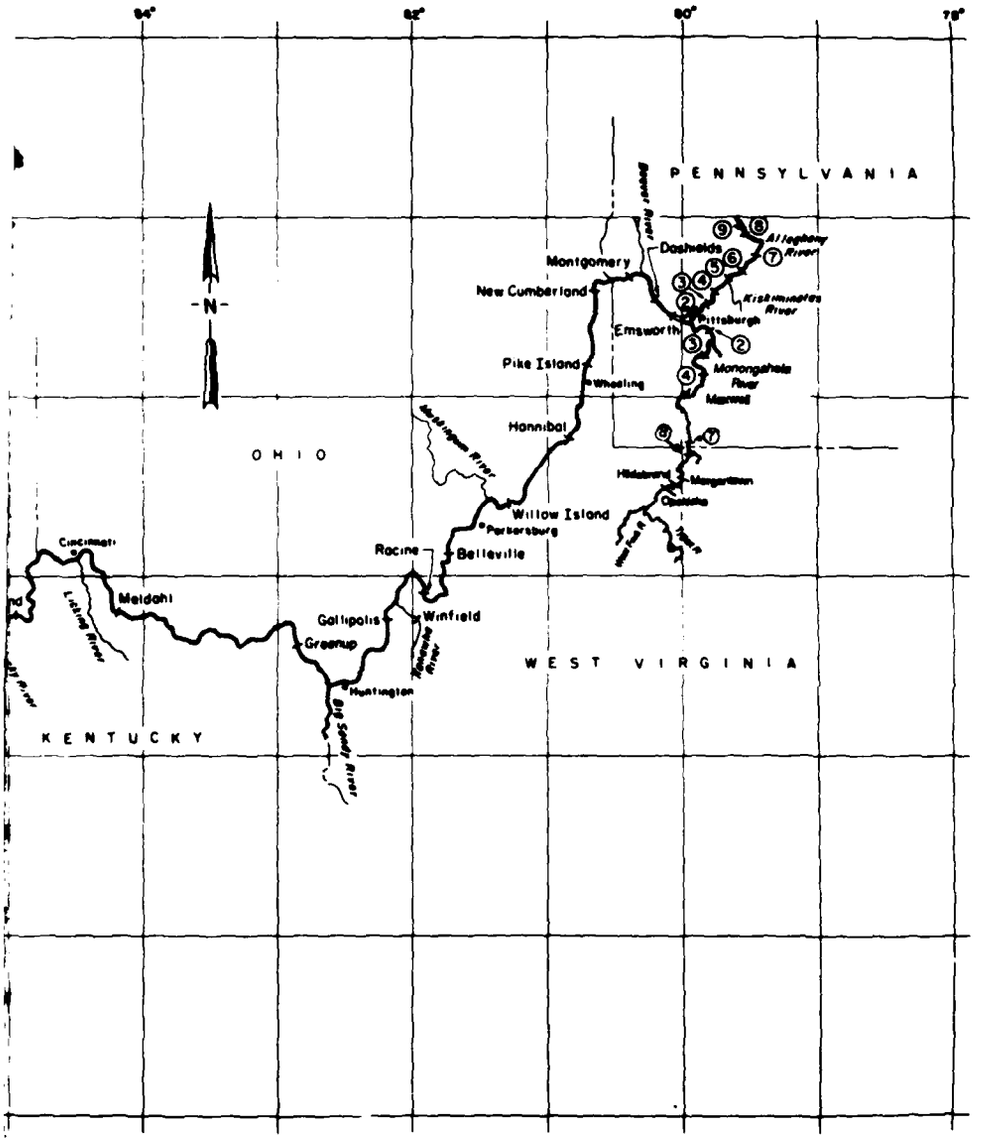
21			lower 55 mi-NOI; 8 mi-CC
			TM; upper 23.1 mi-NOI
44			TM; lower 55 mi-NOI; PC
			TM; upper 23.1 mi-NOI; PC

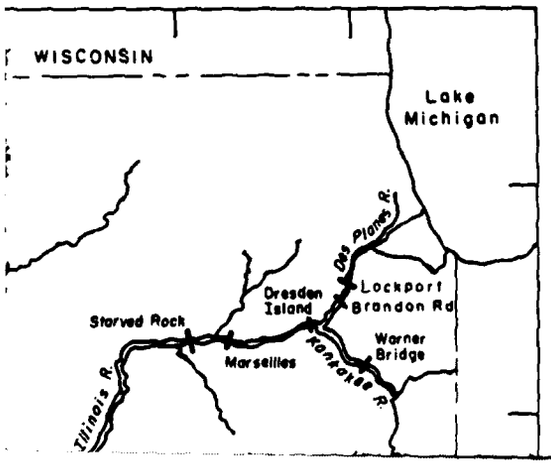
---

v; NOI - not on image; TM - Thematic Mapper;


90°
88°
86°
84°
42°
40°
38°
N
ILLINOIS
INDIANA
OHIO
KENTUCKY
Cincinnati
Markland
Meldahl
Gallipolis
Greenup
McAlpine
Louisville
Newburgh
Evansville
Uniontown
Cannelton
Smithland
Wabash River
Green River
Kentucky River
Licking River
Big Sandy River
Mississippi River
Tennessee River
Cumberland River


WISCONSIN
42°
IOWA
Dresden Island
Starved Rock
Marseilles


84°
82°
80°
78°
PENNSYLVANIA
N
OHIO
WEST VIRGINIA
KENTUCKY
Beaver River
Montgomery
New Cumberland
Dashields
Allegheny River
Kiskiminetas River
Pittsburgh
Emsworth
Pike Island
Wheeling
Monongahela River
Hannibal
Muskingum River
Willow Island
Parkersburg
Racine
Belleville
Cincinnati
Meldahl
Gallipolis
Greenup
Winfield
Kanawha River
Huntington
Big Sandy River
Hildebrand
Morgantown
Clarksburg


WISCONSIN
Lake Michigan
Des Plaines R.
Dresden Island
Lockport
Brandon Rd
Starved Rock
Marseilles
Warner Bridge
Illinois R.
Kankakee R.

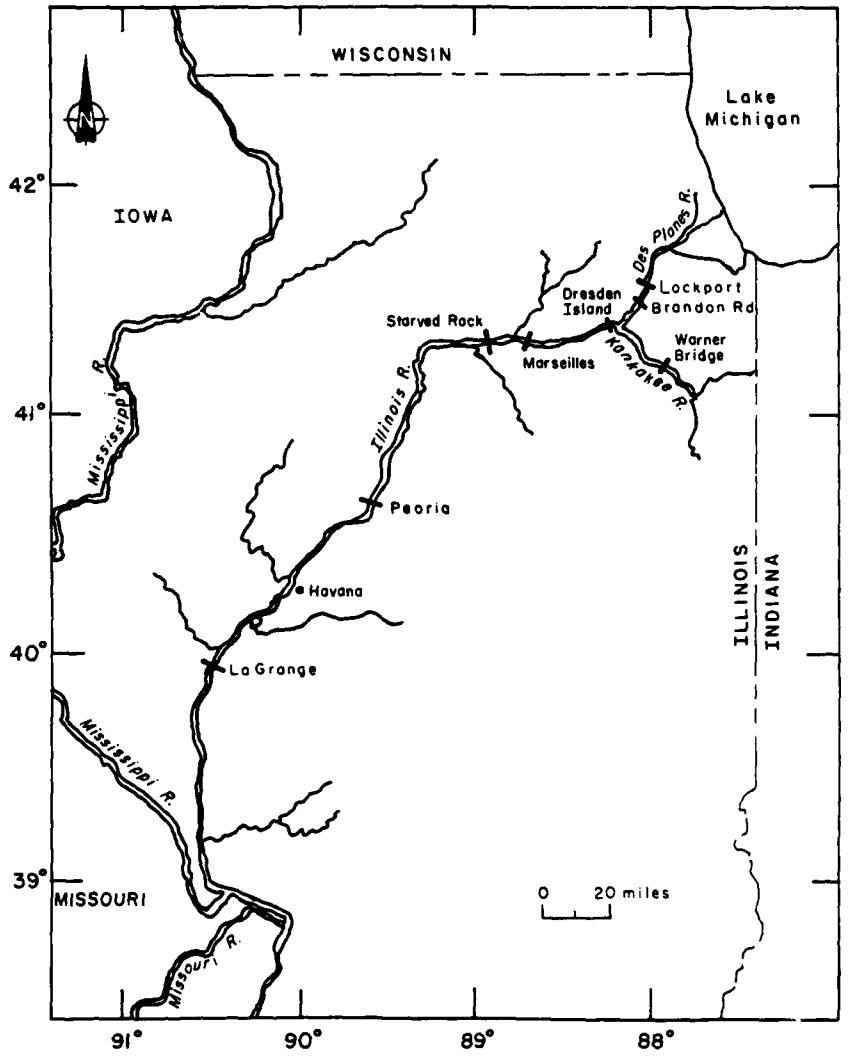


Figure C1. River areas for which Landsat-5 imagery was obtained.

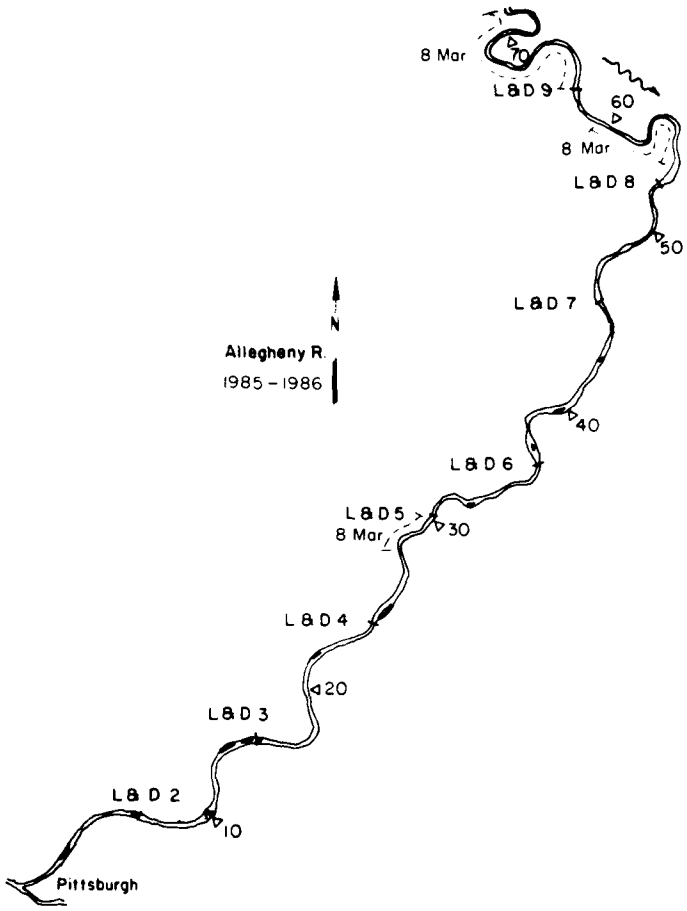


Figure C2. Ice observed on the Allegheny River with Landsat-5 imagery (dashed line indicates gray ice, solid line white ice).

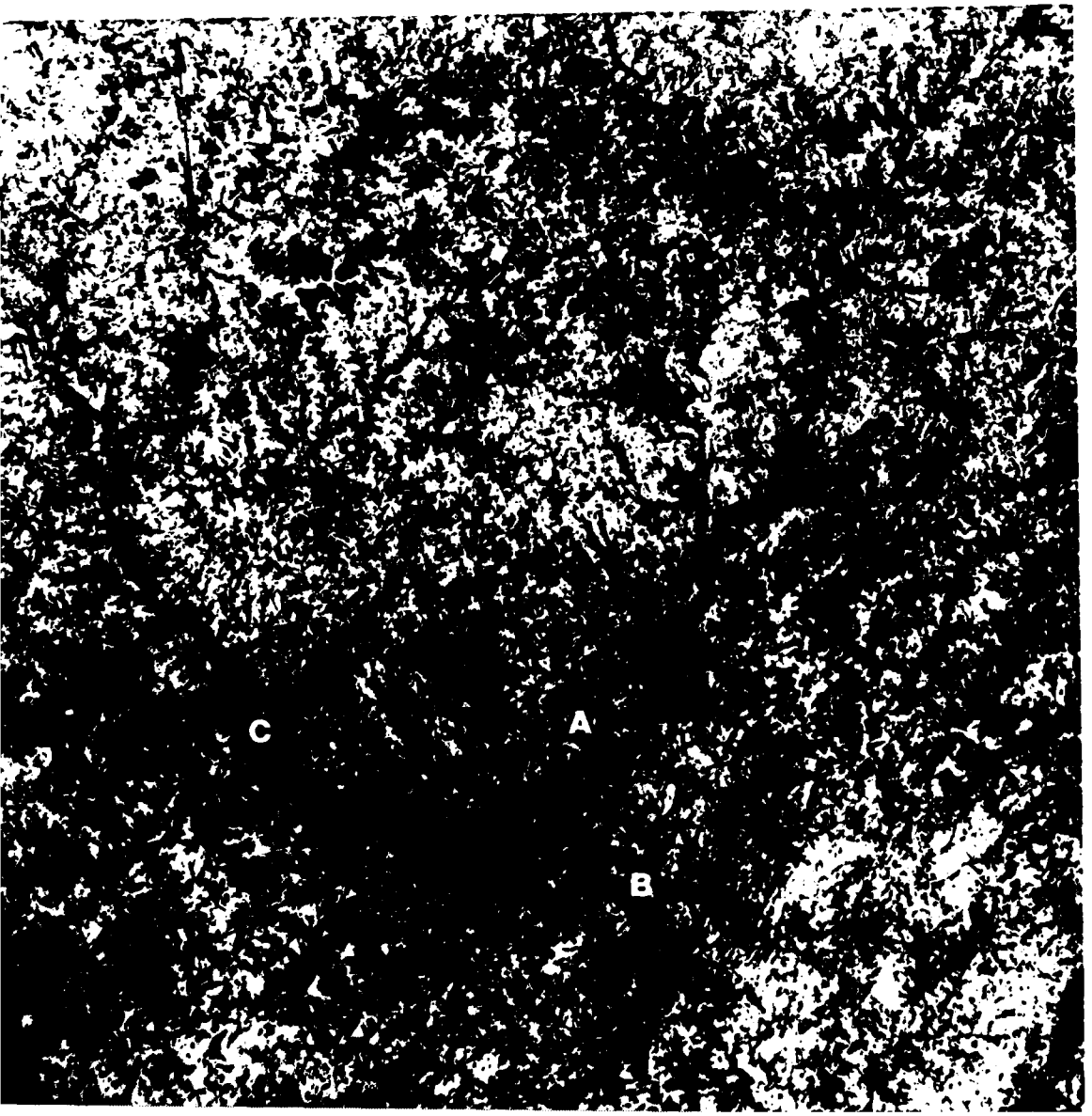

C
A
B

Figure C2. Ice observed on the Allegheny River with Landsat-5 imagery (dashed line indicates gray ice, solid line white ice).

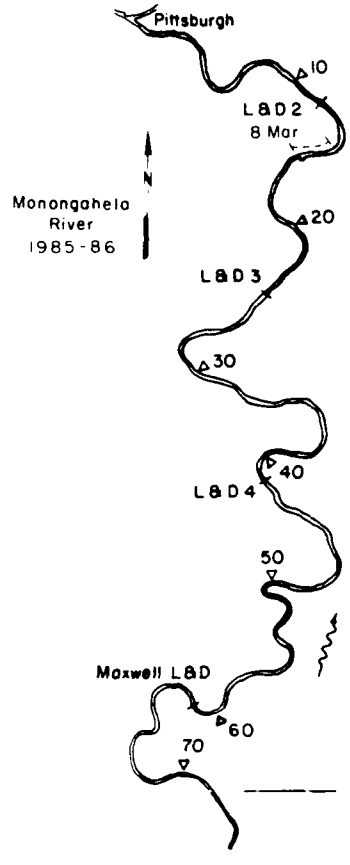


Figure C3. Ice observed on the Monongahela River with Landsat-5 imagery (dashed line indicates gray ice, solid line white ice).

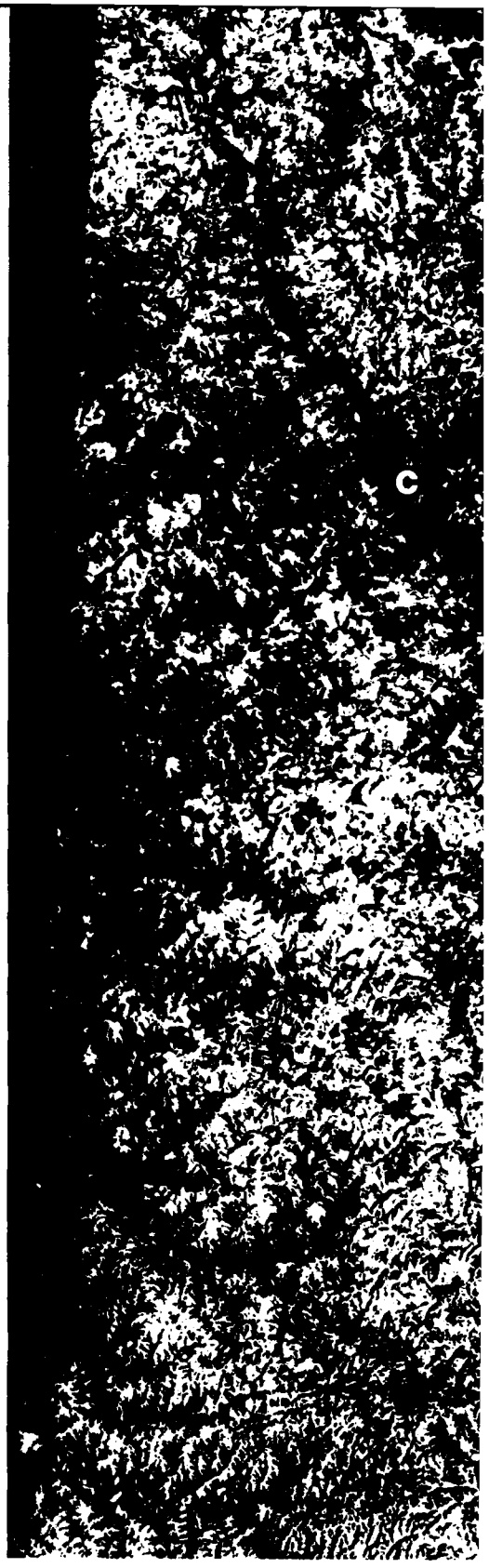


Figure C4. Landsat-5 TM band 3 im
(A) and Monongahela (B) Rivers; no ic

Figure C4. Landsat-5 TM band 3 image 50737-15243, 8 March 1986. Arrows show ice on the Allegheny (A) and Monongahela (B) Rivers; no ice is on the Ohio (C).

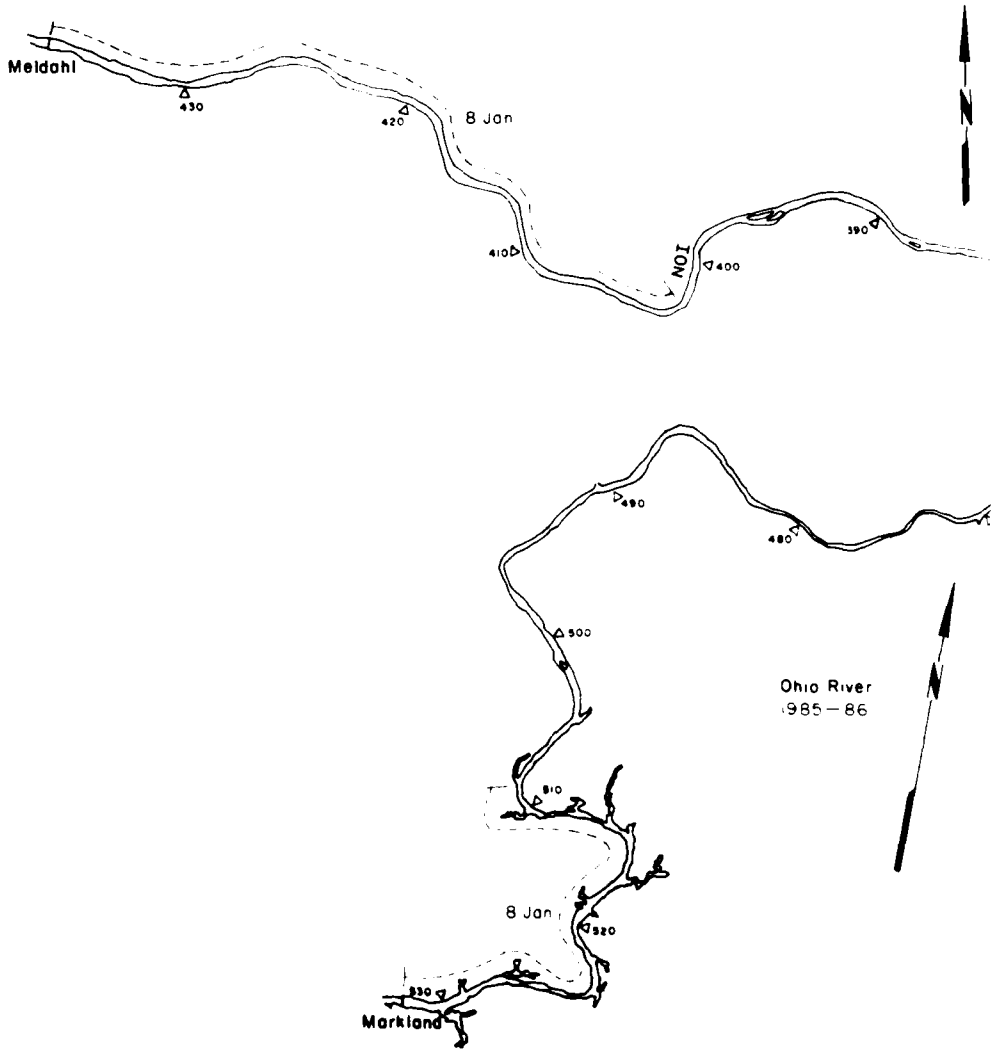
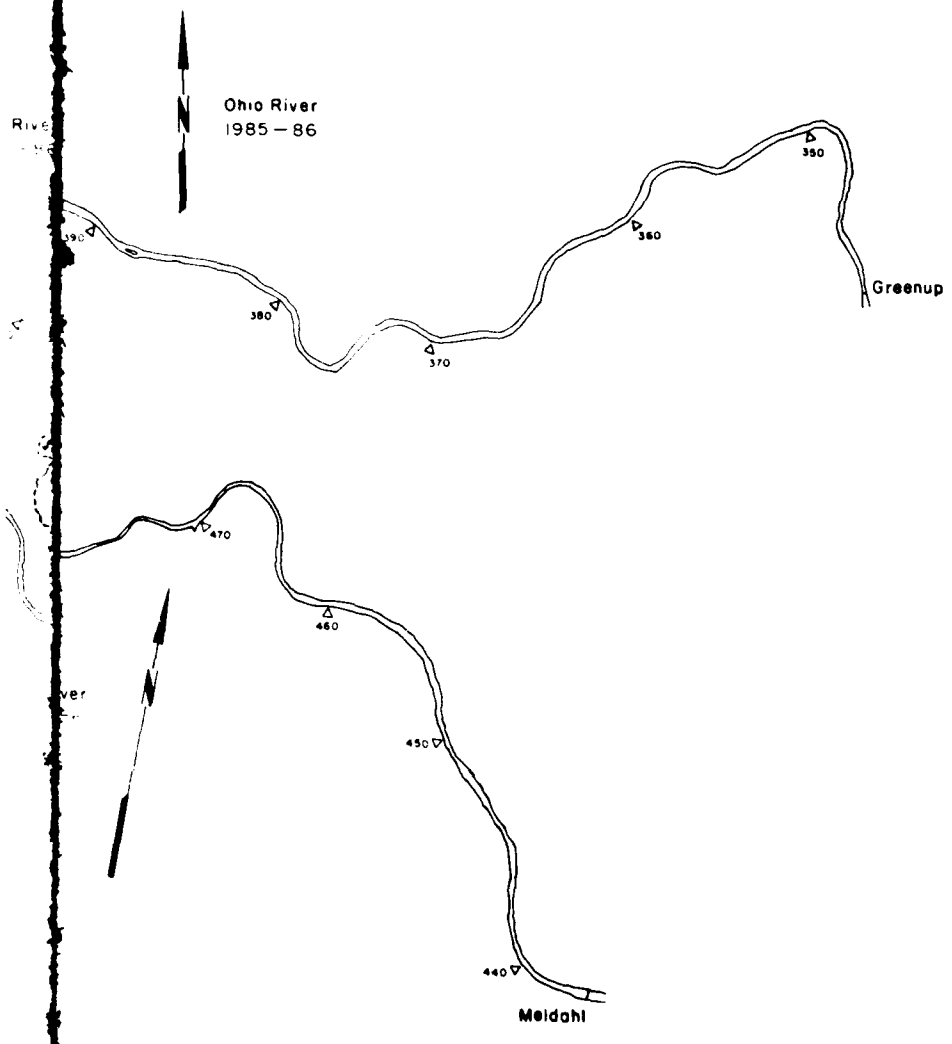


Figure C5. Ice observed on the Ohio River with Landsat-5 imagery (da



line *5 imagery (dashed line indicates gray ice, solid line white ice).*

Figure C5. Ice observed on the Ohio River with Landsat-5 imagery (dashed

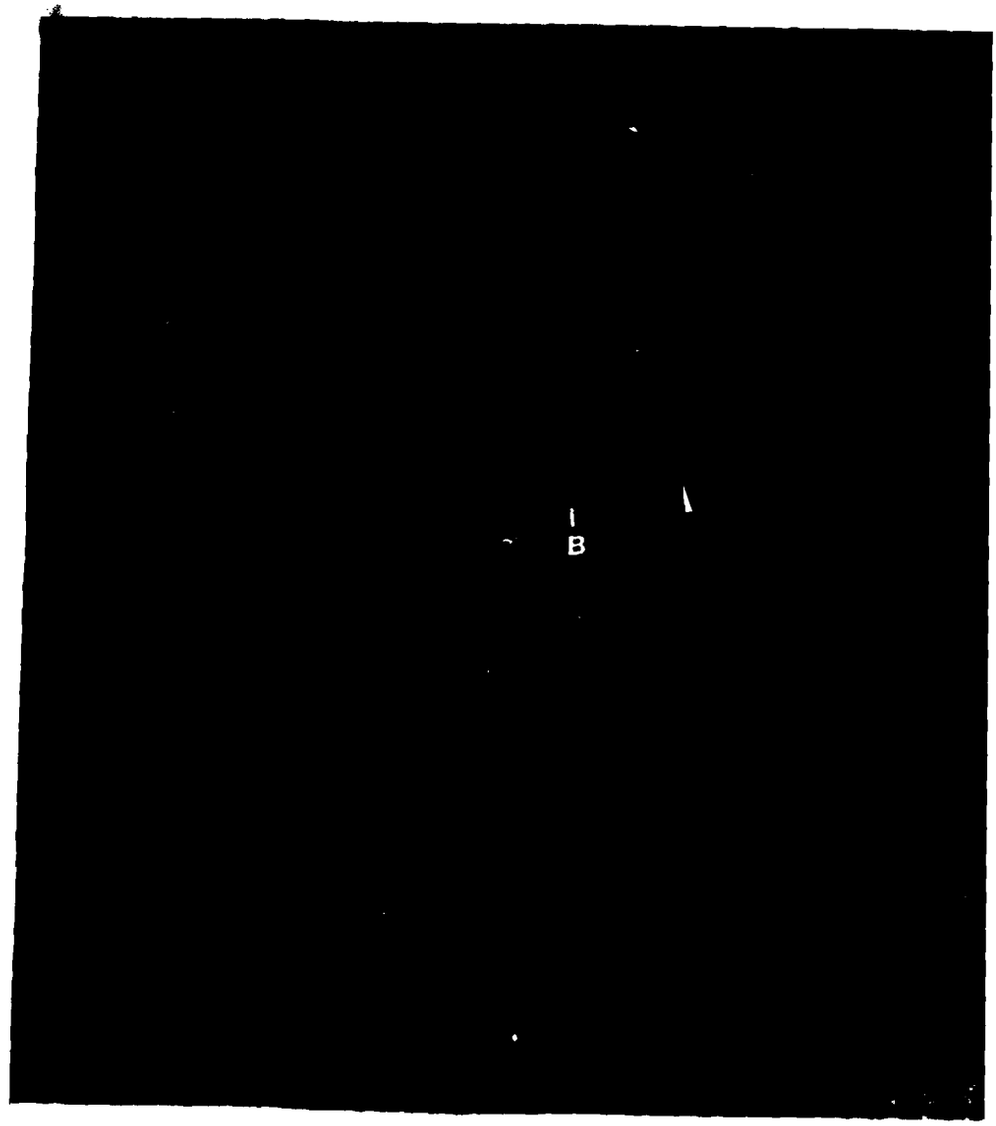
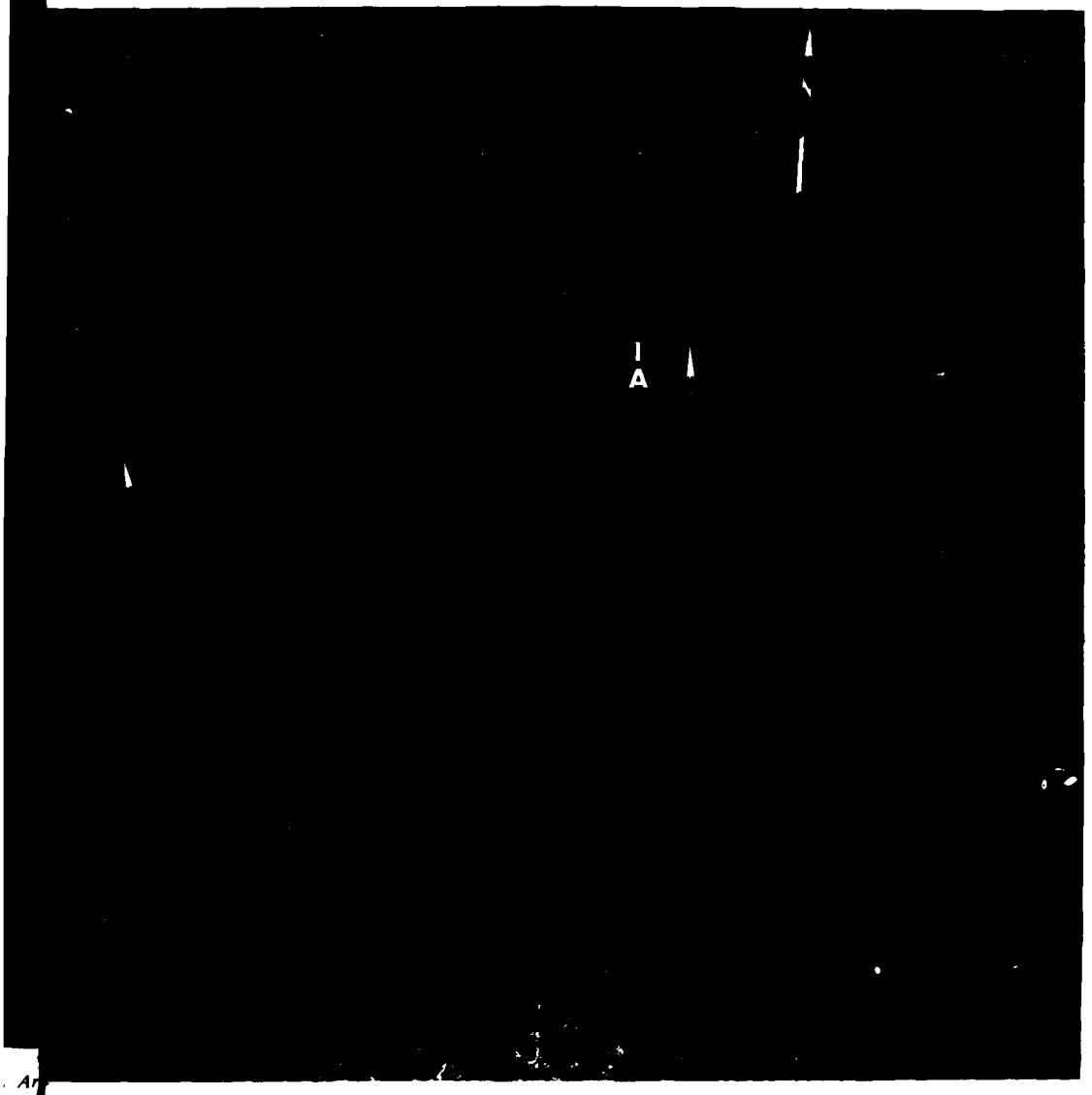


***Figure C6. Landsat-5 TM band 3 image 50678-15443, 8 January** upstream of Meldahl Dam (A) and Markland Dam (B) on the Ohio River.*

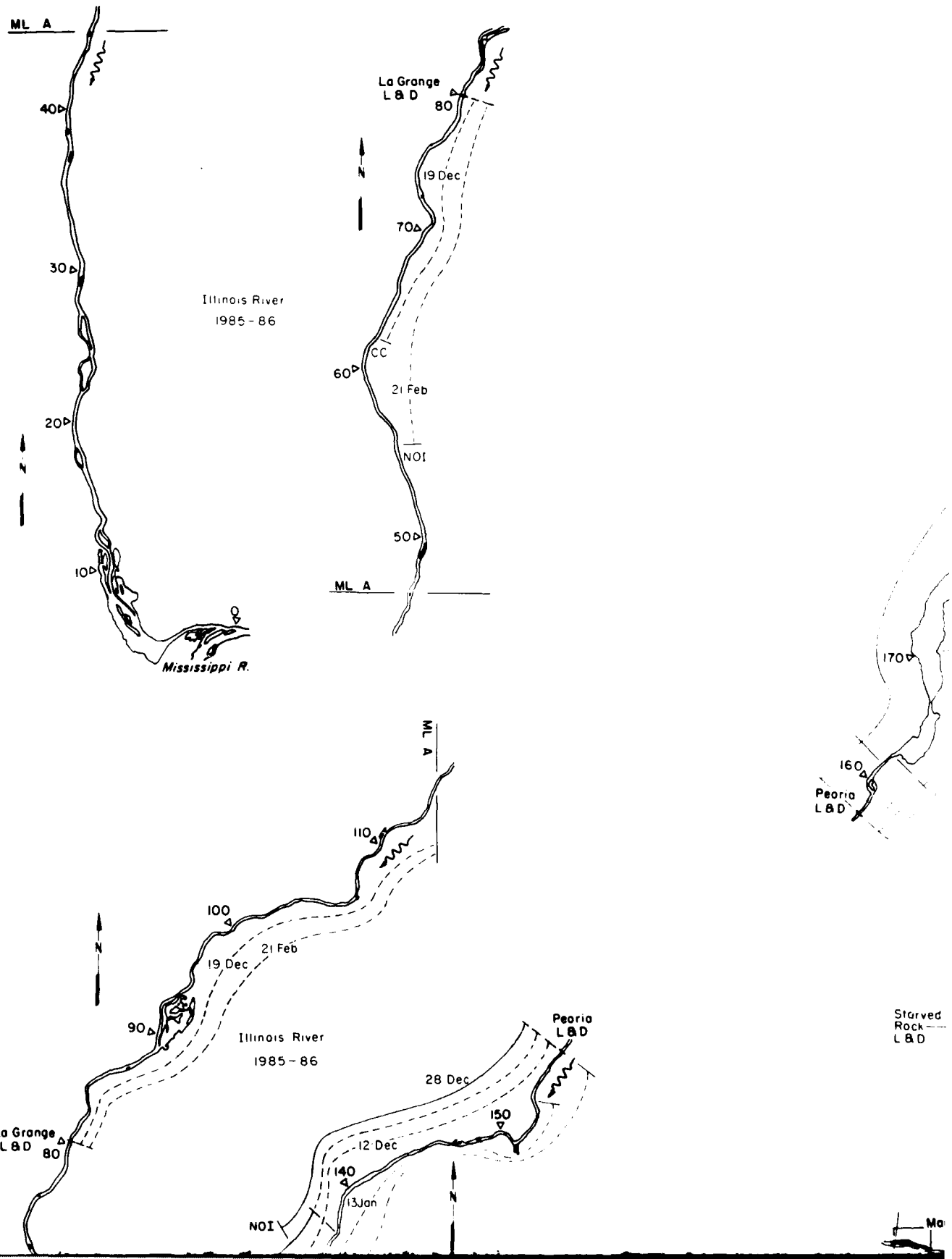
	January			29.5	40
29	January			14.8	20
21	February	70.0	95	3.5	5
2	March	44.4	60		

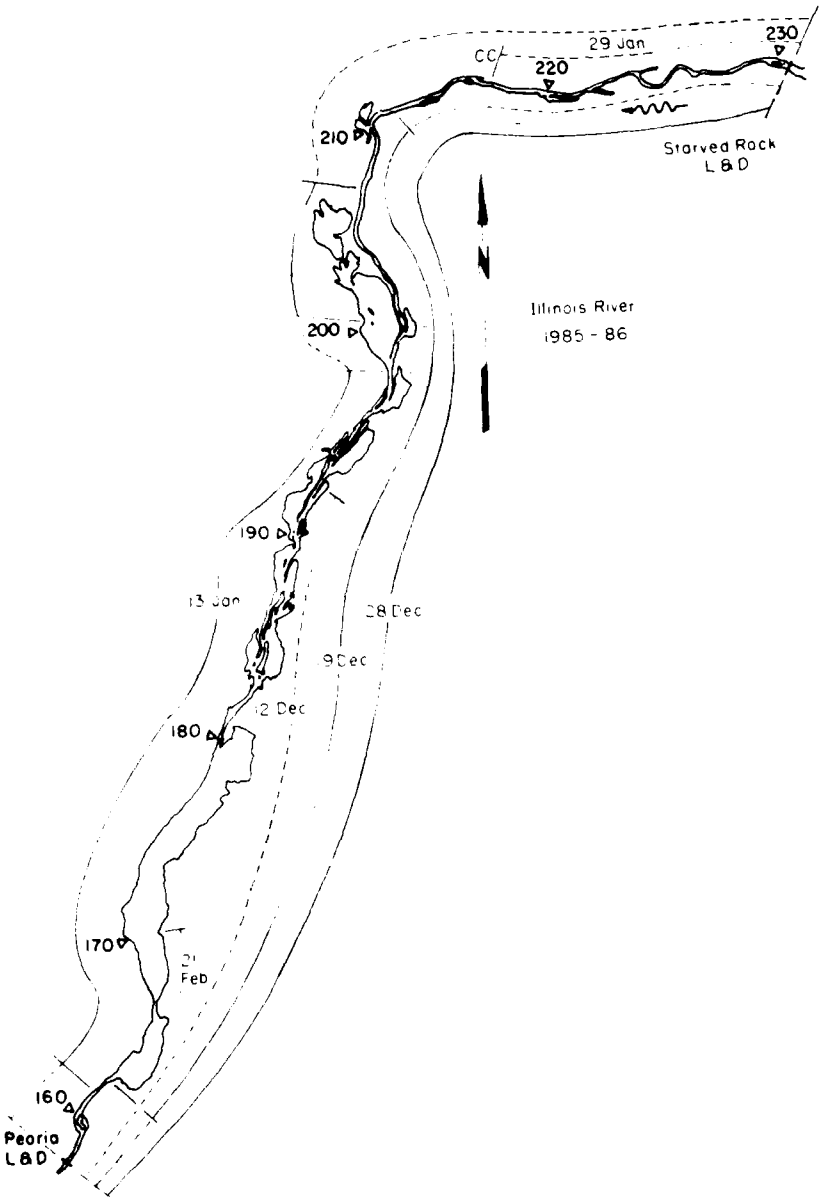
Meldahl

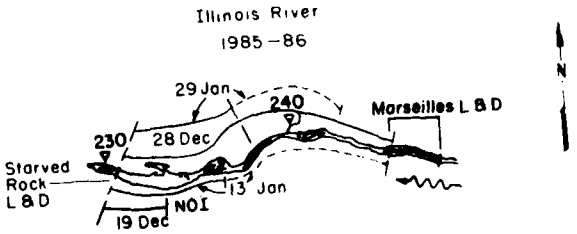
hio River with Landsat-5 imagery (dashed line indicates gray ice, solid line white ice).

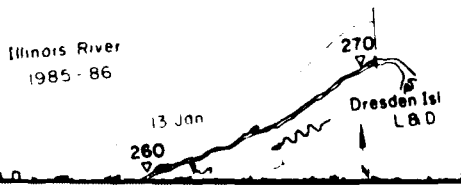


TM band 3 image 50678-15445, 8 January 1986. Arrows show the gray ice (A) and Markland Dam (B) on the Ohio River.


ML A
40
30
20
10
Mississippi R.
Illinois River
1985-86
La Grange
L&D
80
19 Dec
70
CC
60
21 Feb
NOI
50
ML A
170
160
Peoria
L&D
ML A
110
100
19 Dec
21 Feb
90
Illinois River
1985-86
La Grange
L&D
80
Peoria
L&D
28 Dec
150
12 Dec
140
13 Jan
NOI
Starved
Rock
L&D


29 Jan
230
220
210
Starved Rock
L&D
Illinois River
1985 - 86
200
190
13 Jan
28 Dec
9 Dec
2 Dec
180
170
160
Peoria
L&D


Illinois River
1985 – 86
29 Jan
240
Marseilles L&D
230
28 Dec
Starved
Rock
L&D
13 Jan
19 Dec
NOI


Illinois River
1985 - 86
270
Dresden Isl
L&D
13 Jan
260

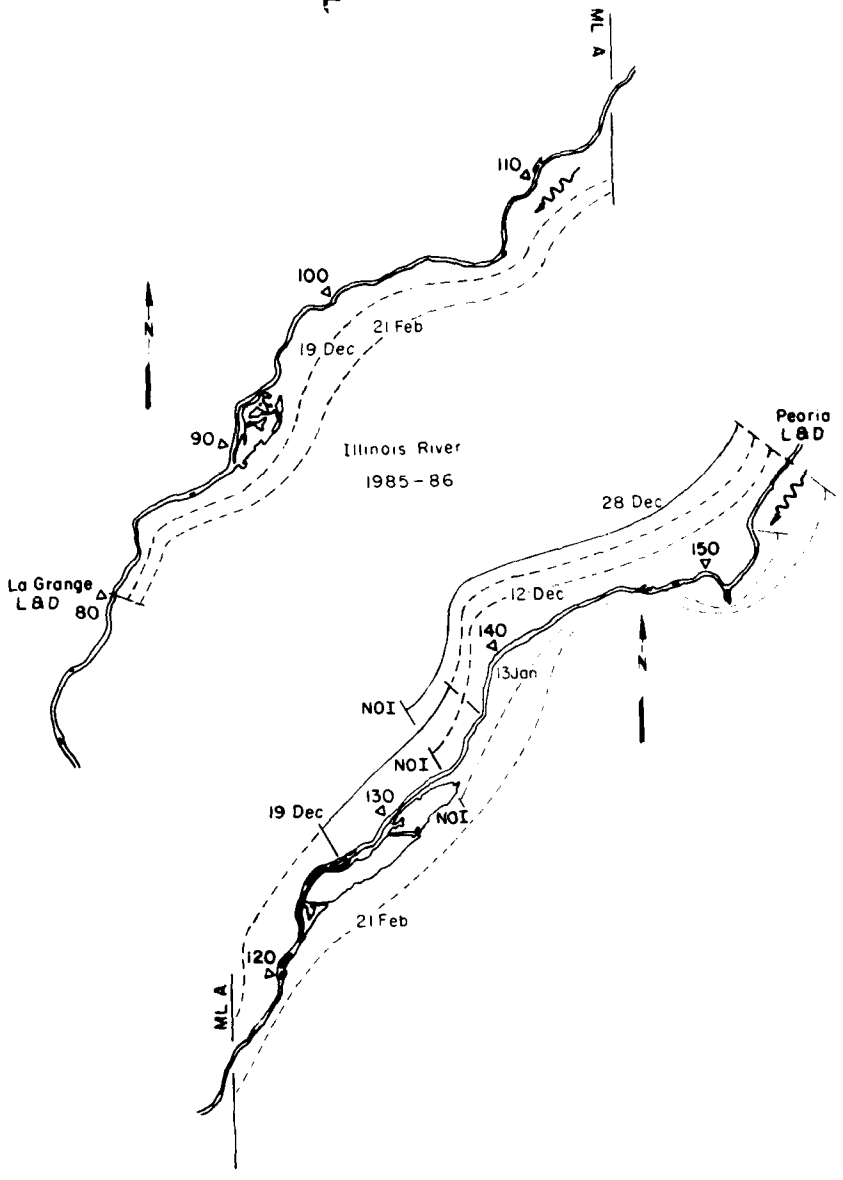
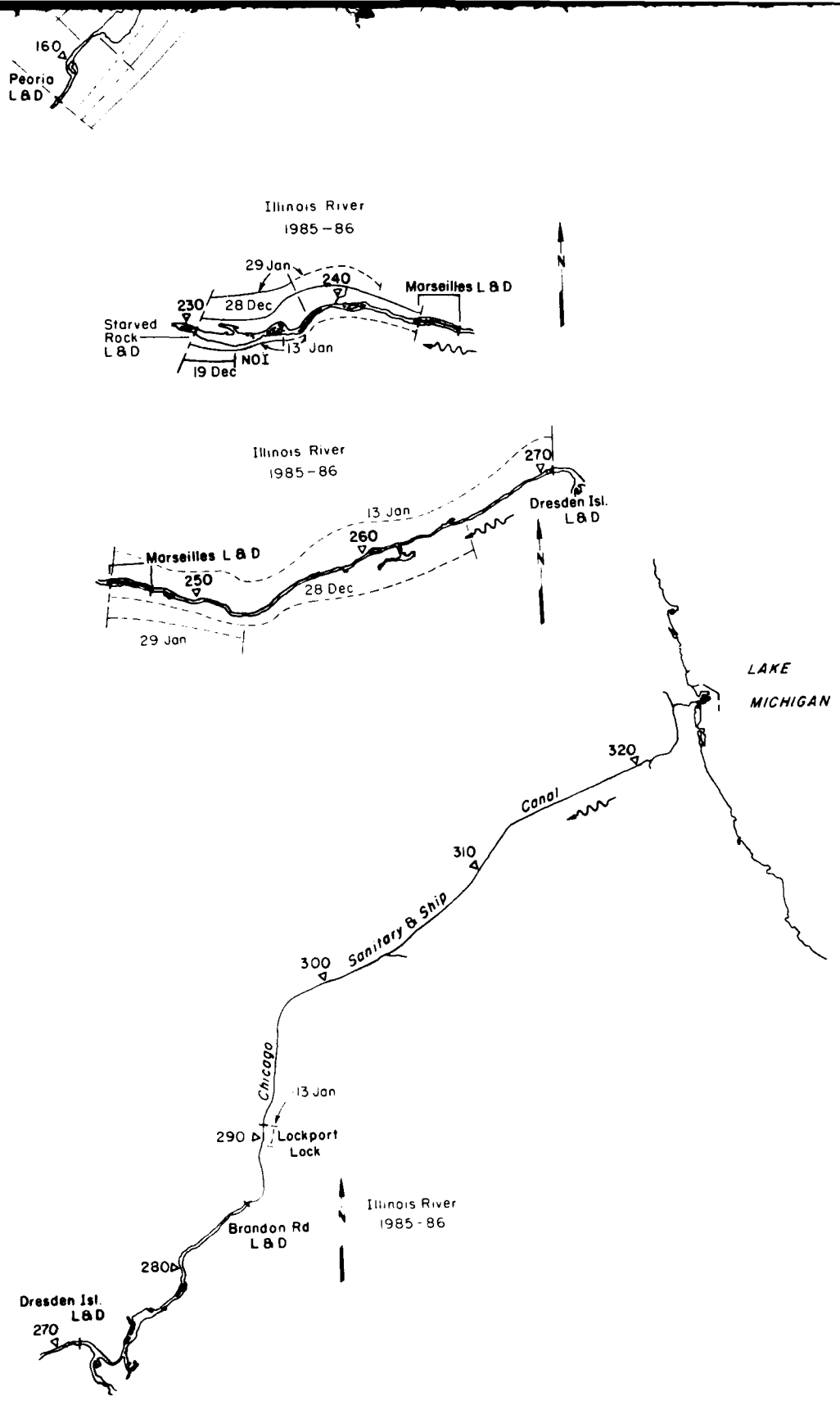


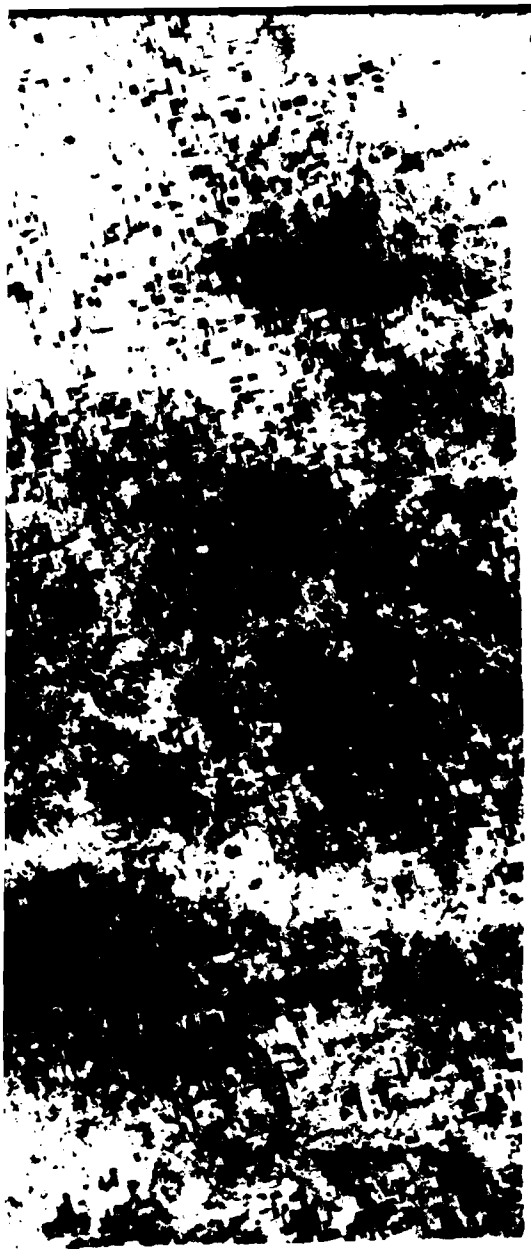
Figure C7. Ice observed on the Illinois River with Landsat-5 imagery (dashed line indicates gray ice, solid line white ice).


160
Peoria
L&D
Illinois River
1985-86
29 Jan
240
Marseilles L&D
230
28 Dec
Starved
Rock
L&D
13 Jan
NOI
19 Dec
N
Illinois River
1985-86
270
13 Jan
Dresden Isl.
L&D
260
Marseilles L&D
250
28 Dec
29 Jan
N
LAKE
MICHIGAN
320
Canal
310
Sanitary & Ship
300
Chicago
13 Jan
290
Lockport
Lock
Illinois River
1985-86
Brandon Rd
L&D
280
Dresden Isl.
L&D
270

N

a. Landsat-5 MSS band 2 images 50667-16024 and -16032, 2

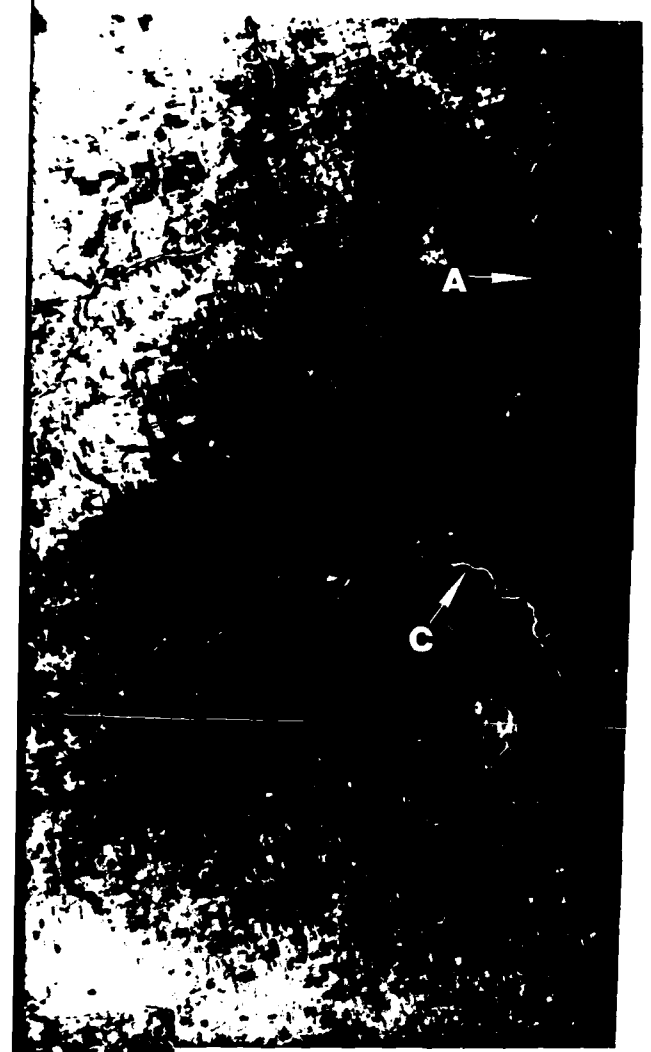
Figure C8. Ice distribution from Lockport Lock (A) to river mile 133 (
kee River (C).

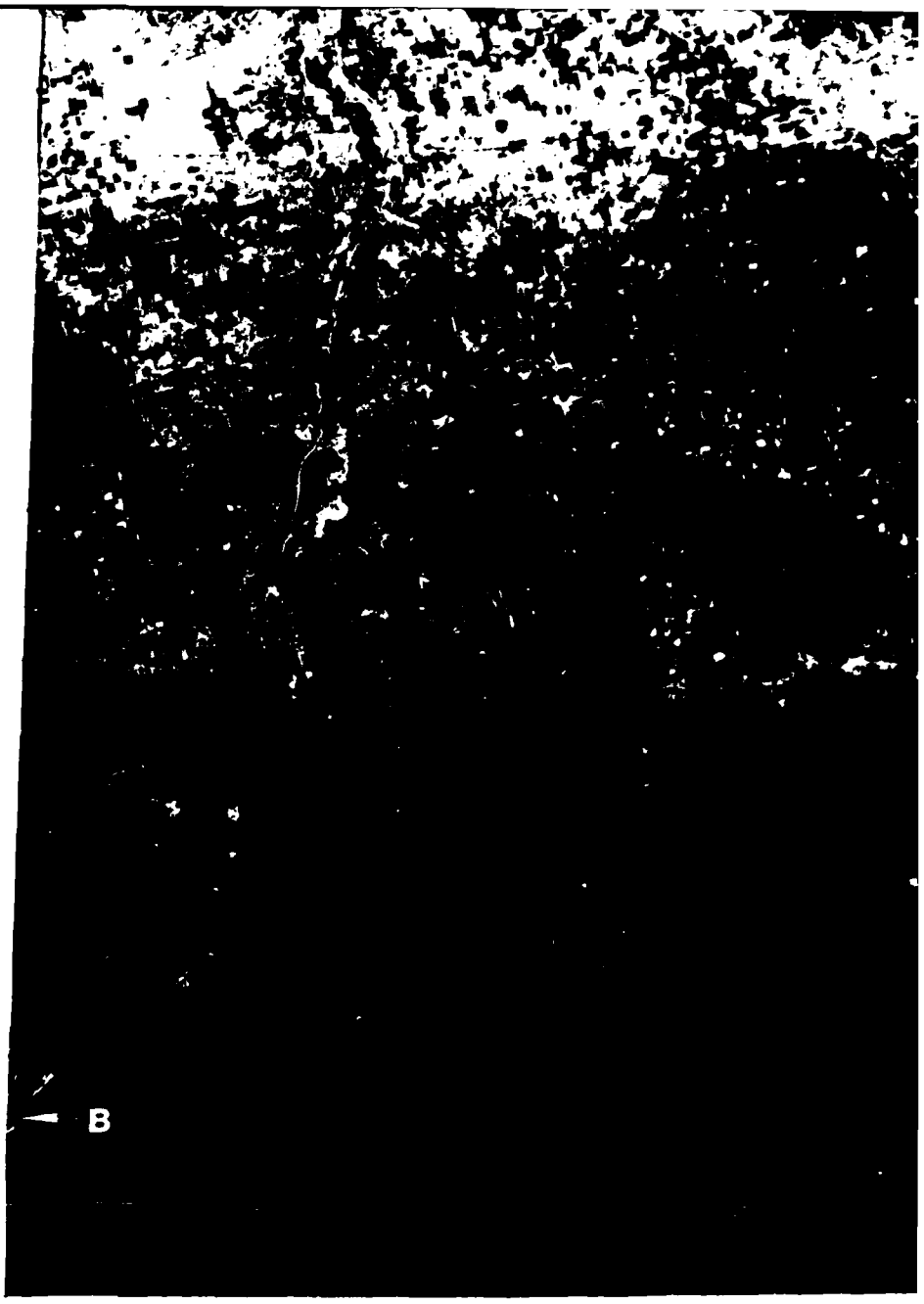


? images 50667-16024 and -16032, 28 December 1985.

ckport Lock (A) to river mile 133 (B), Illinois River and Kanka-

N


A
C



b. Landsat-5 TM band 3 images 50683-16023 and -16

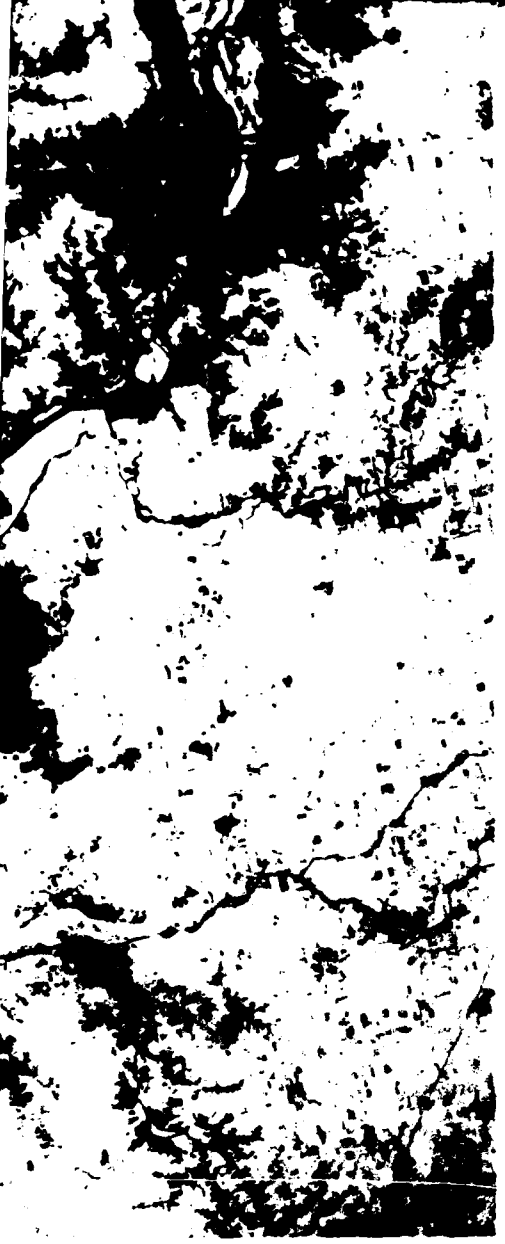
Figure C8 (cont'd).

583-16023 and -16025, 13 January 1986.

'8 (cont'd).

a. Landsat-5 MSS band 2 images 50658-16090 and -16093, 19

Figure C9. Ice distribution from Starved Rock Dam (A) to river mile



0658-16090 and -16093, 19 December 1985.

ock Dam (A) to river mile 84 (B), Illinois River.

b. Landsat-5 TM band 3 images 50722-16074 and -16081, 21 F

Figure C9 (cont'd).

722-16074 and -16081, 21 February 1986.

9 (cont'd).

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