ATTACHMENT B

Three Mile Island Nuclear Station

Proposed
Aquatic Monitoring Programs

Commencing January 1, 1983

TABLE OF CONTENT

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1.0 INTRODUCTION

The aquatic monitoring program described herein recognizes the existing. substantial data base developed by previous aquatic monitoring programs for the TMINS since 1974. It is not the intent of this program to duplicate the extensive monitoring studies that were necessary during the assessment stage for the operation of TMINS. Rather, this program is designed to efficiently supplement the existing scientific data base to:

1) Ensure compliance with all monitoring requirements of regulatory agencies and permits.

2) Confirm the continued absence of adverse environmental impacts from TMINS until the completion of the discharge of the processed water, if that option is chosen as the means of disposal.

3) Utilize information gained from studies performed up to the present to focus future monitoring on areas most susceptable to impact from activities at TMINS.

4) Ensure moderate continuity of the scientific data base on the aquatic resources of the Susquehanna River in the vicinity of TMINS.

5) Supplement the existing TMINS surveillance of the Asiatic Clam in the Susquehanna River Basin.

6) Reduce contractor dependence.

7) Reduce costs

2.0 PROGRAM DESCRIPTION

The major components of the program are described in the following subsections. Each subsection identifies sample frequency, the number of stations to be sampled, the number of samples per station, and a brief justification for the proposed sampling regime. Much of this information also is summarized in Table 1.

2.1 Water Quality Analysis (ETS 3.1.1.a(4), p. 3-9 and 10)

2.1.1 Sample Frequency - Monthly, April through October

2.1.2 Number of Stations - 3 (1 control, 2 indicator)

2.1.3 Samples/Station - 1

2.1.4 Procedure

With the exceptions noted below, the Water Quality Analysis Program will be performed in accordance with ECP 1449, Revision 2.

2.1.5 Bases

Water quality will be measured at the same frequency and stations as sampled in the Benthic Macroinvertebrates Program (Figure 1). Parameters to be measured include temperature, pH, dissolved oxygen, and total dissolved solids.

2.2 Benthic Macroinvertebrates (ETS 3.1.2.a(1)(a), p. 3-12 and 13)

2.2.1 Sample Freguency - Monthly, April through October

2.2.2 Number of Stations - 3 (1 control, 2 indicator)

2.2.3 Samples/Stations - 4 replicate, Ponar Grabs

2.2.4 Procedure

With the exceptions noted below, the Benthic Macroinvertebrate Program will be performed in accordance with ECP 1450, Revision 2.

2.2.5 Bases

From the review of Benthic Macroinvertebrate data collected by Ichthyological Associates, Inc. (IA) since 1974, 3 stations (1 control, 2 indicator) in the vicinity of the TMINS Main Discharge (DSN 001) have been selected. These stations, illustrated on Figure 1, were selected based upon their position (relative to DSN 001) and their degree of similarity. Results of a study releasing flourescent dye from DSN 001 during low, medium, and high river flows (Figures 2, 3, and 4) confirms the appropriateness of the positioning of the two indicator stations. The zone of influence from the TMINS Main Discharge to the York Haven Dam ranged from approximately 15 to 190 meters from the west bank of TMI during river flows from 64,000 cfs down to 4,100 cfs. Higher river flows would compress the zone closer to the bank. Additionally, Stations 1A2 (control), 11A1, and 9B1 have Percent Similarity Values greater than 80%. Hence, changes in the composition of the benthos between stations should be readily discernable.

2.2.5 Bases con't

Sample frequency was selected to monitor the benthos during the "biologically active" period of the year. Historical data indicate peak densities of benthos from May through August. Typically, macroinvertebrates exhibit growth at 10°C leading to reproduction about 1 month later. In the vicinity of TMINS, the Susquehanna River warms to about 10°C in early April. Therefore, to ensure monitoring during this active time, the sampling period was selected as April through October. Additionally, a monthly sampling frequency was believed sufficient to monitor potential changes in the benthos.

Ancilliary functions of this monitoring will be to supplement the existing Asiatic Clam Surveillance as well as to obtain river sediment samples for analysis in the Radiological Environmental Monitoring Program (REMP).

2.3 Far-Field Ichthyoplankton (IP) (ETS 3.1.2.a(1)(b), p. 3-14 and 15)

2.3.1 Sample Frequency - Weekly, April through August

2.3.2 Number of Stations - 4

2.3.3 Samples/Station - 2 (Replicate surface tows)

2.3.4 Procedure

With the exceptions noted below, a Far-Field Ichthyoplankton Program will be performed in accordance with ECP 1451, Revision 2.

2.3.5 Bases

IA has conducted a far-field sampling program for ichthyoplankton since 1976. During 1976 and 1977, only night samples were collected. Both day and night samples were collected from 1978 through 1981. Through the review of these data, several important planning and monitoring tools have been identified:

(1) Night densities comprise over 80% of the total densities sampled in York Haven Pond.

(2) Night densities can successfully predict day densities in York Haven Pond.

(3) The stations along TMI are the most similar in species composition among all stations sampled for IP.

(4) Upstream stations can successfully predict densities at the discharge station

(5) Historical data can successfully predict densities at the discharge station.

Another important planning tool is the discharge plume mapping (dye study) conducted by Surtron Corporation. Surtron has mapped lateral (cross channel) and longitudinal (downstream) mixing characteristics of the TMINS main discharge at various river flows. They found the maximum extent of lateral mixing occurred during the low flow study and was confined to 190 m off the west bank of TMI. The information derived from the IA and Surtron reports have been combined and a monitoring plan developed that will sample existing ichthyoplankton stations that either fall within the discharge plume of TMINS or can predict densities of those discharge stations (Figure 5).

TMINS will continue weekly, night sampling of the selected stations throughout the summer spawning and growing season. Data collected in this study will provide a continuance of the data base for these stations.

2.4 Fish (Electrofishing) (ETS 3.1.2.a(1)(c), p. 3-16 and 17)

2.4.1 Sample Frequency - Monthly, April through November
Semimonthly, August and September

2.4.2 Number of Stations - 6 zones

2.4.3 Samples/Station - 1

2.4.4 Procedure

With the exceptions noted below, a Fish Monitoring Program (Electrofishing) will be performed in accordance with ECP 1452, Revision 2.

2.4.5 Bases

Fish Monitoring Programs have been conducted by IA in the vicinity of TMINS since 1974. Various studies and types of sampling gear employed to collect and monitor fish have included electrofishing, seine, trapnetting, and studies on fish movement, population estimates, and food habits. As a result of these studies, a substantial data base exists on the fishery resources of the Susquehanna River in the vicinity of TMINS. This knowledge has identified zones common to specific species as well as changes in the fishery unrelated to the operation of TMINS. Consequently, TMINS

believes there is technical justification for reducing the p... ...ssessment/inventory regime to a monitoring regime based on the Electrofishing Program.

Food habit study requirements were dropped after the 1978 sampling season. Population Estimates and Movement studies have been conducted since 1974. Based on this historical data, movements of fishes appear random for most species. Habitat preferences, temperature preferences, and spawning migration appear to be the main factors influencing movements of fishes in York Haven Pond. At no time were movements of fishes related to the discharge of TMINS. The summer and fall population estimate program also identifies seasonal shifts which are again presumably due to temperature preferences. Therefore, based on these findings, food habits, population estimates, and movement studies are considered complete and will not be continued.

To further reduce the sampling efforts, redundant sampling programs will not be continued. Adult fish populations are currently sampled by trapnet and electrofishing. Juvenile fish are sampled by seine and to a lesser degree, trapnet and electrofishing. It is believed that one, well coordinated program is sufficient, based on the vast amounts of historical data available for comparison. Of all the programs currently performed, electrofishing provides the best assessment of the adult fish populations in the reservoir. Review of previous surveys indicates that electrofishing samples the greatest diversity of fishes and correlates the best with other programs. Three of the chosen electrofishing zones correspond to ichthyoplankton stations. Therefore, TMINS will be able to monitor the adult to spawned larvae to juvenile (to some extent) and adult fish. Additionally, the selection of other stations (zones) representative of different habitats within the reservoir will reduce sampling efforts and still provide thorough coverage. The zones selected are illustrated on Figure 6.

Ancilliary functions of this program will be to obtain fish samples for radiological analysis in the REMP and provide fishery data as required for the relicensing of the York Haven Generating Station and programs for the restoration of anadromus fish in the Susquehanna River.

2.5 Creel Survey (ETS 3.1.2.a(1)(c), p. 3-16 and 17)

2.5.1 Sample Frequency - One weekday and one weekend day per month, April through October

2.5.2 Number of Stations - 4 (Figure 3)

2.5.3 Samples/Station - 3 (0900-1300, 1301-1700, 1701-2100 Hours)

2.5.4 Procedures

With the exception noted below, the Creel Survey Program will be performed in accordance with ECP 1476, Revision 3.

2.5.5 Bases

Survey data collected by LA since 1974 adequately demonstrate angling pressure and success within York Haven Reservoir. NUREG 0596 and NUREG 0754 document behavior responses of fisherman as a result of the TMI-2 accident. Additional creel surveys, at the present scope, are not needed for assessment purposes.

TMINS proposes a creel survey program based on the fact that historical data indicate that fishing pressure near TMINS peaks sharply in May and declines substantially in October. Monthly surveys from April through October will sample a representative cross section of anglers during these peak months.

2.6 Impingement

2.6.1 Sample Frequency - Weekly, in August and September

2.6.2 Number of Stations - 2

2.6.3 Samples/Station - 24 hour composite sample

2.6.4 Procedure

With exceptions noted below, the Impingement Program will be performed in accordance with ECP 1453, Revision 2.

2.6.5 Bases

Data collected by LA since 1974, indicate minimal impacts on the fish population from the operation of the traveling screens at TMINS. Impingement estimates less than 100 lbs. occurred in all years of study. However, impingement does provide a useful tool to monitor the migration of anadromus fish from spawning grounds north of TMI to the Atlantic Ocean. Should the reintroduction efforts for anadromus fish succeed, TMINS will need to address mortality impacts associated with the traveling screens of the intake structures. Weekly impingement surveys during periods of out-migration (August and September) will demonstrate these impacts, as well as provide data on the success of the reintroduction program.

Table 1

Proposed Aquatic Monitoring Program For
The Susquehanna River In The Vicinity Of TMINS

Program	Sampling Frequency	Stations	Samples/Station
Benthic Macroinvertebrates	Monthly, April-October	3	4
Water Quality	Monthly, April-October	3	1
Ichthyoplankton	Weekly, April-August	4	2
Electrofishing	Monthly, April-November Semimonthly, August and September	6 zones	1
Creel Survey	Monthly, April-October	4	3
Impingement	Weekly, August and September	2	24 hr. comp.

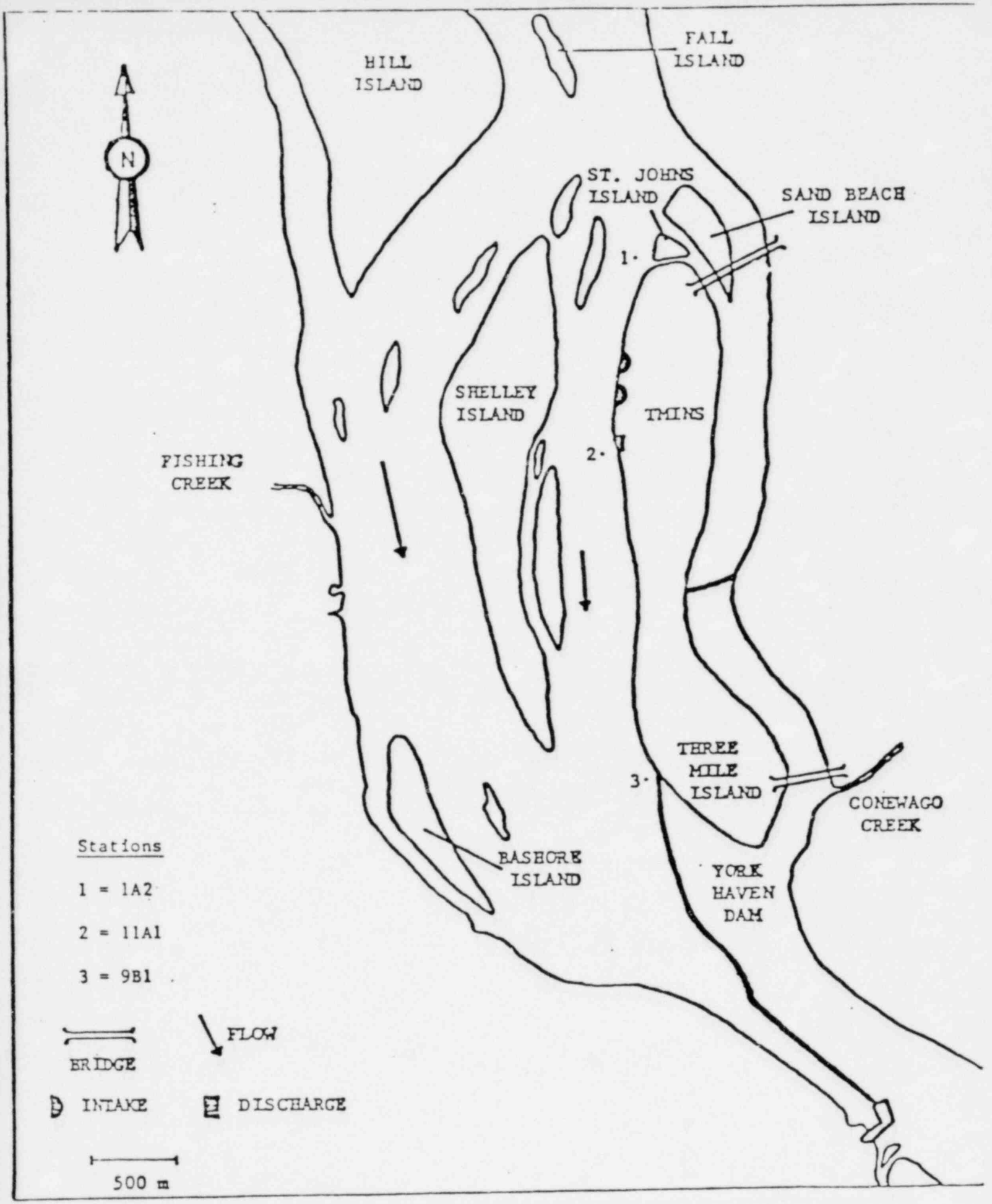

Figure 1. Proposed Aquatic Monitoring Program for the Susquehanna River In the Vicinity of TMINS.

Location of Macroinvertebrate Sampling Stations.

Figure 2. Plan View of Area Impacted by Dye Cloud

Low Flow: 4,100 cfs

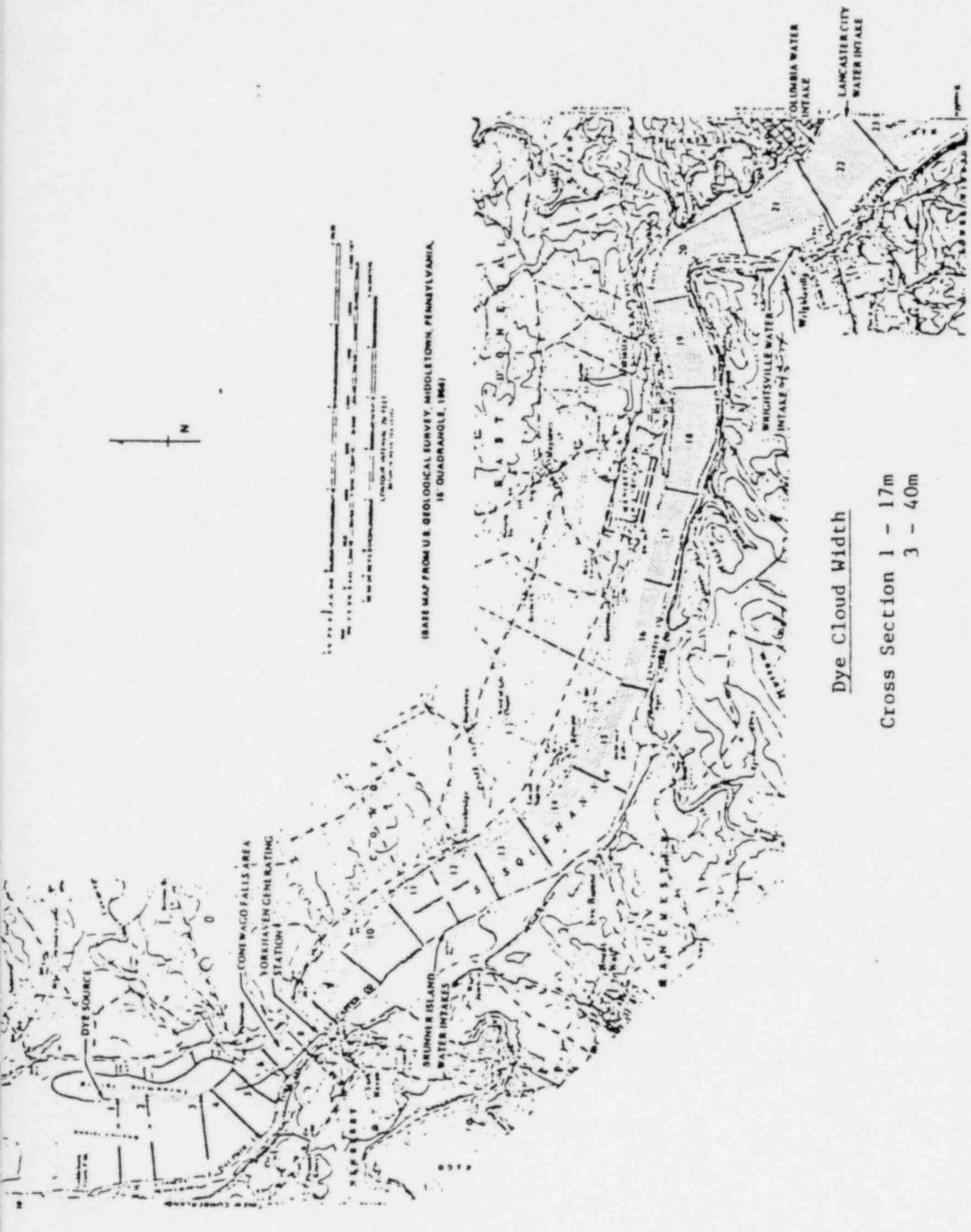

Figure 3. Plan View of Area Impacted by Dye Cloud

Medium Flow: 24,000 cfs

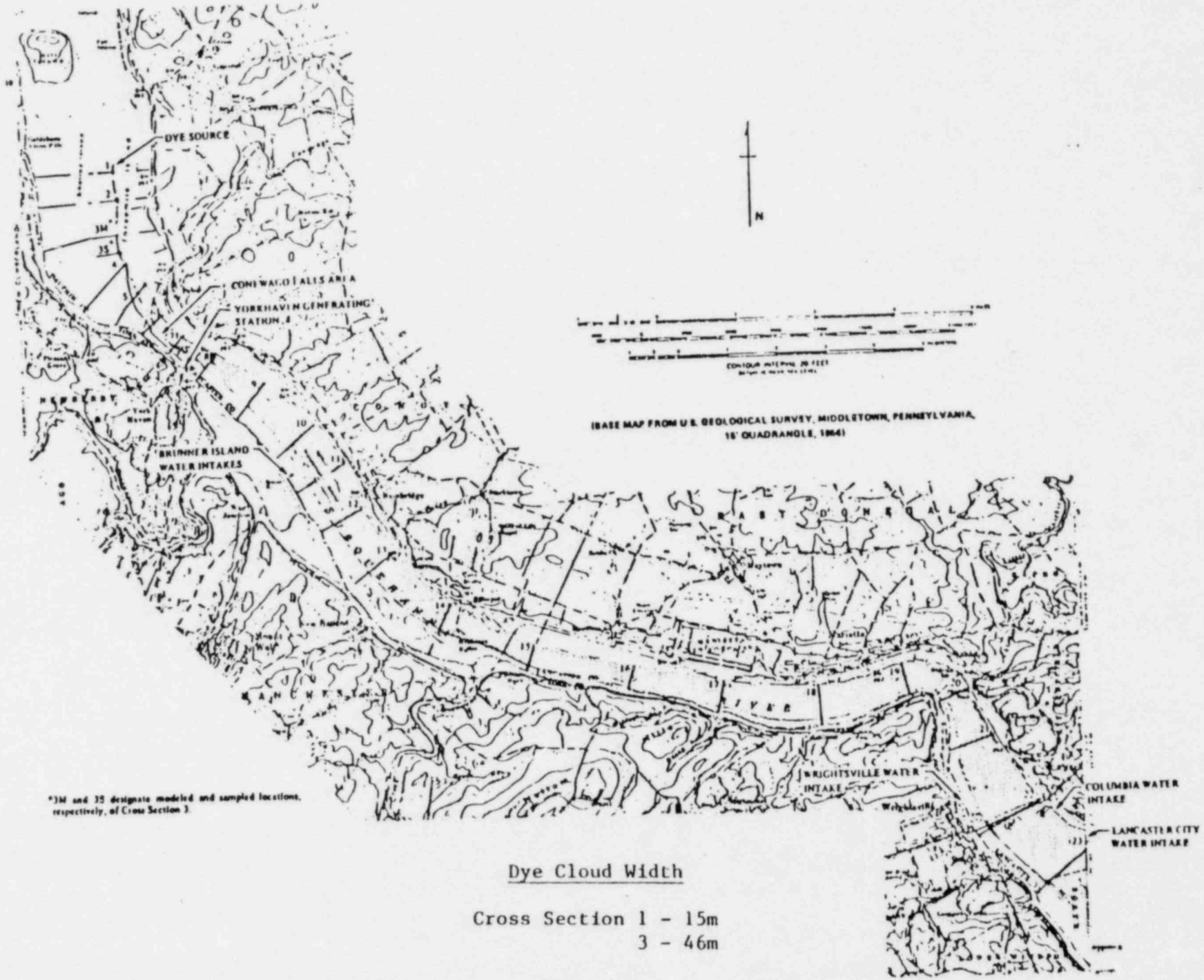

Figure 4. Plan View of Area Impacted by Dye Cloud

High Flow: 64,000 cfs

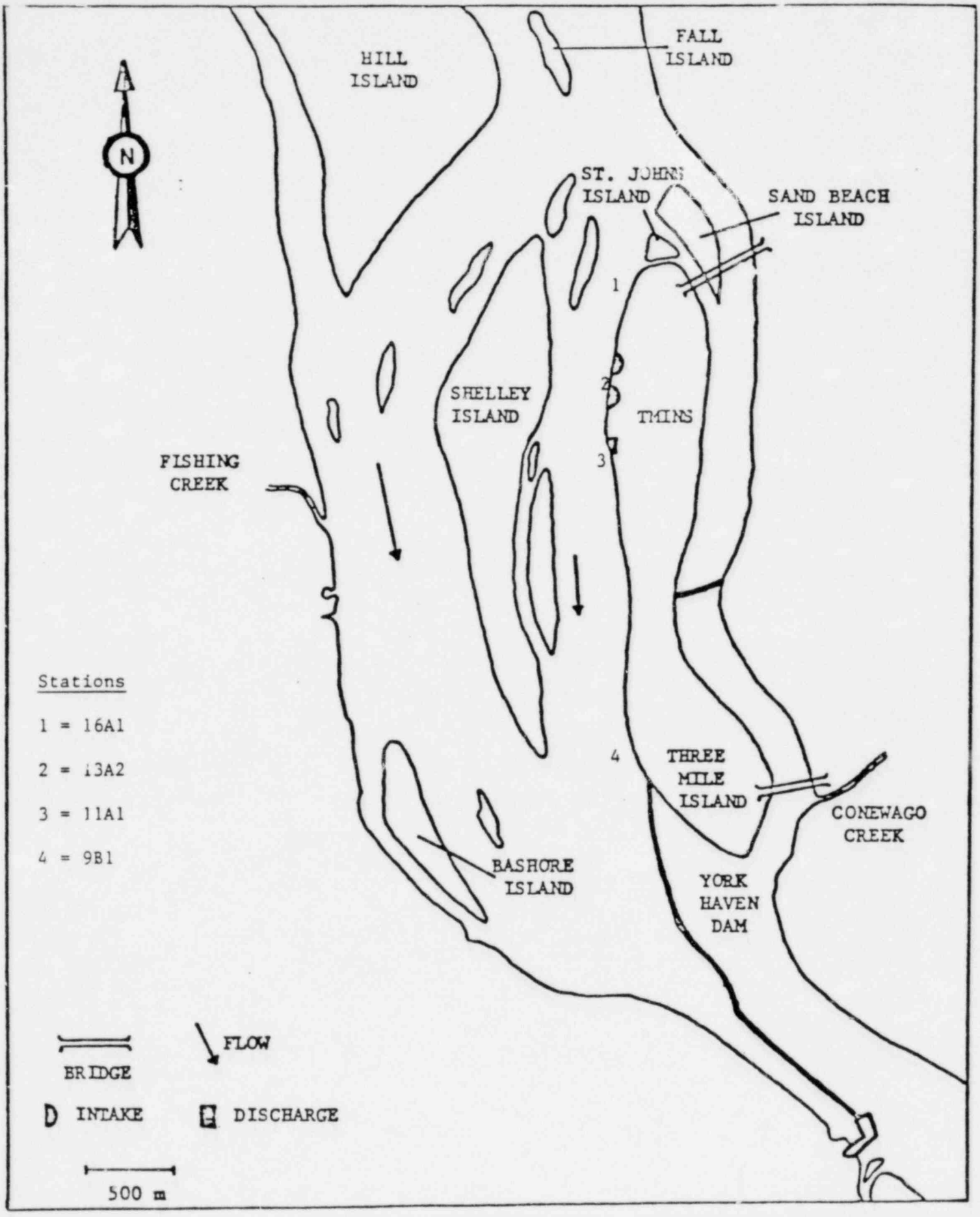

Figure 5. Proposed Aquatic Monitoring Program for the Susquehanna River In The Vicinity Of TMINS.

Location of Ichthyoplankton Push Net Stations

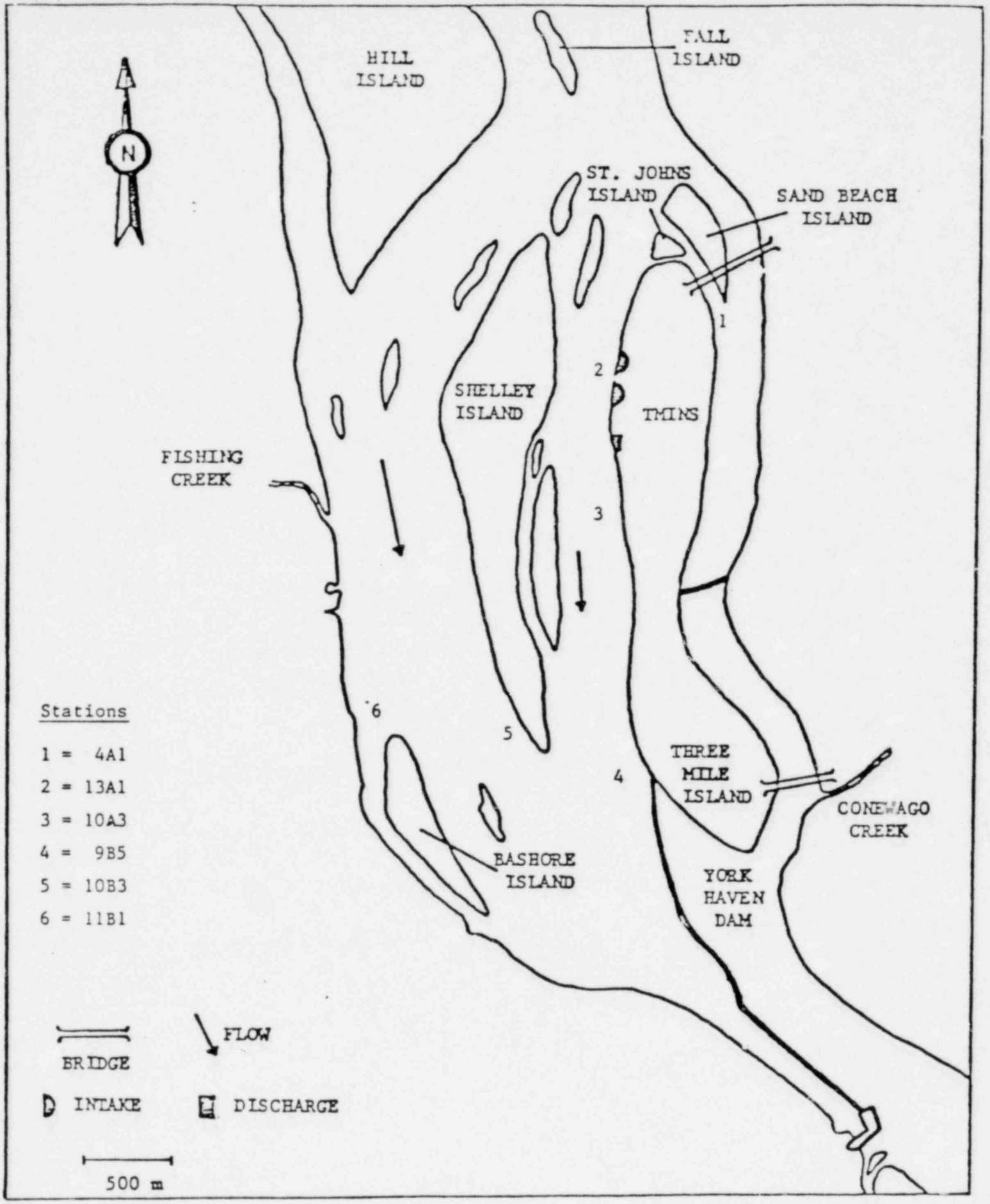

Figure 6. Proposed Aquatic Monitoring Program for the Susquehanna River In The Vicinity Of TMINS.

Location of Electrofishing Zones

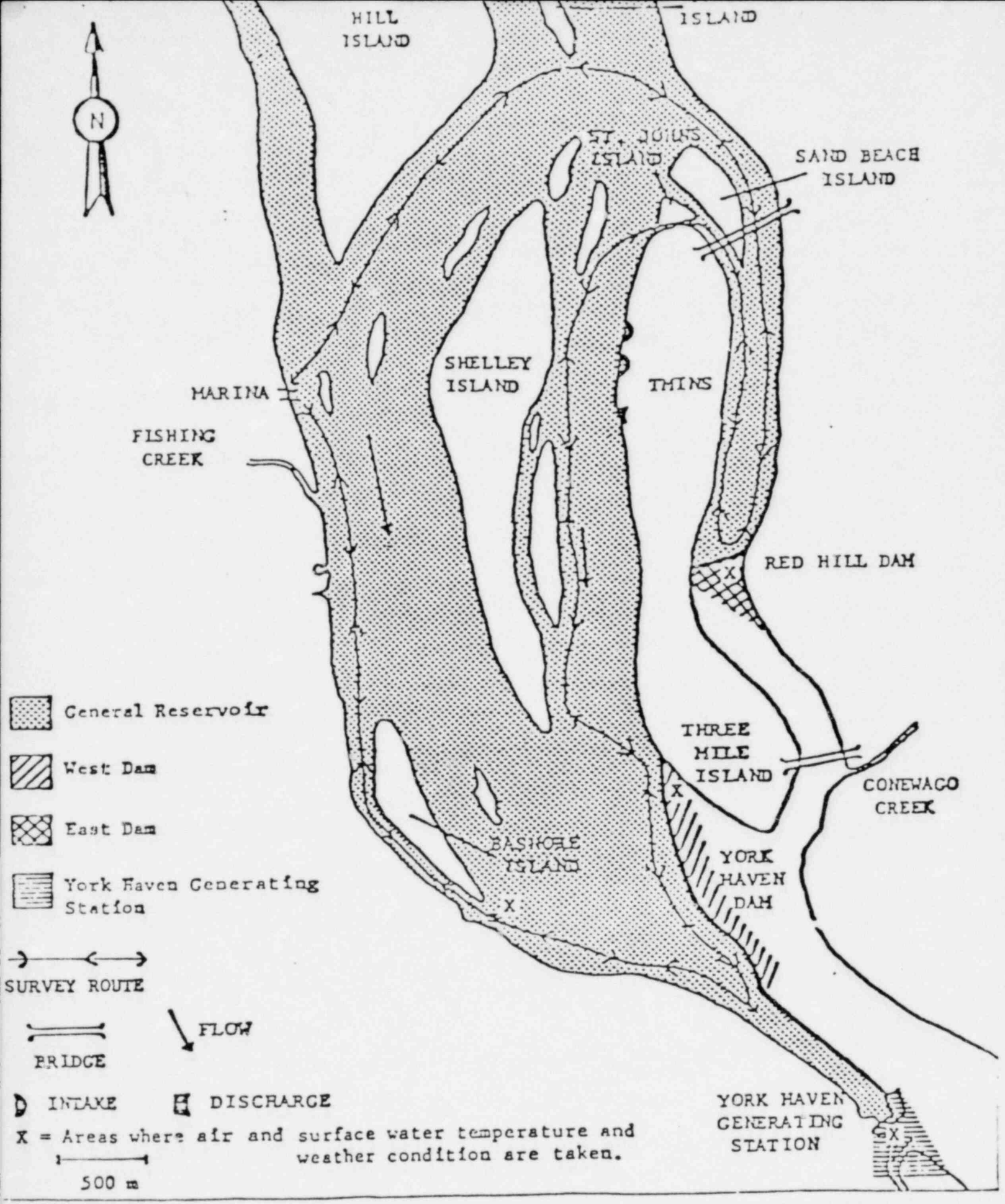

Figure 7. Proposed Aquatic Monitoring Program for the Susquehanna River In the Vicinity of TMINS.

Location of Creel Survey Areas