



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 22 1989

Ms. Barbara D. Hays, Chair
Pennsylvania Chapter, Sierra Club
1421 Wightman Street
Pittsburgh, Pennsylvania 15217

Dear Ms. Hays:

I have been asked to respond to your letter of May 23, 1989, to NRC Chairman Lando Zech concerning offsite radiation monitoring and the emergency warning system in the vicinity of the Three Mile Island Nuclear Station Unit 2 (TMI-2).

At a meeting on April 13, 1989, of the TMI-2 Advisory Panel on the Decontamination of Three Mile Island Unit 2, Mr. M. Roche, the Director of TMI-2 for General Public Utilities Nuclear Corporation (GPUN), discussed continued operation of the real-time monitoring system around TMI-2. Mr. Roche stated that it was GPUN's intention to maintain and upgrade the system through the end of defueling, fuel shipping, processed water evaporation, and the early stages of monitored storage. Although there is no accurate schedule for the beginning of storage, it is the NRC staff's opinion that the existing real-time monitoring system would remain operational for at least the next several years. After that time, GPUN will be considering replacement of the present system with an improved, state-of-the-art monitoring system at a number of locations.

GPUN currently has an offsite monitoring program required by the TMI-2 license that, in addition to the real-time monitors at 16 locations, collects quarterly thermoluminescent dosimeter (TLD) measurements from 104 locations up to 21 miles from the plant. GPUN also has various aquatic, atmospheric, and terrestrial sampling programs that take samples at various locations and frequencies. At the present time the NRC staff is unaware of any changes being considered by GPUN to any of these programs.

An offsite monitoring program is required by both the TMI-1 and TMI-2 licenses. Over the past several years, GPUN has changed the offsite radiation monitoring programs at both facilities so that in the near future a single site program can be instituted. At the present time although GPUN has separate programs, one for Unit 1 and one for Unit 2, they are essentially the same.

GPUN has proposed to place TMI-2 into long-term storage for an indefinite period. To accomplish this objective, GPUN needs an amendment to its license. On August 16, 1988, GPUN proposed changing the TMI-2 license to allow for the post-defueling monitored storage of the facility. Part of that proposal includes removing the requirement for the continuation of the TMI-2 offsite radiation monitoring program from the TMI-2 license as the requirements for continuing the offsite radiation monitoring for both units will be included

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in the TMI site program. The NRC staff is currently reviewing GPUN's proposal for long-term storage of the facility and will, as a part of the staff review, examine the offsite radiation monitoring program. The staff expects to complete its evaluation of GPUN's proposal in early 1990.

Your letter of May 23, 1989, addresses a second concern, that of the adequacy of the emergency notification system, and in specific warning sirens in use at all of Pennsylvania's nuclear facilities. You cite a recent incident in which a warning siren malfunctioned near an operating nuclear power station in Pennsylvania.

Malfunctioning of warning sirens occasionally occurs. Whenever there is a malfunction, representatives from the utility and county authorities investigate the source of the malfunction and take corrective actions to minimize a recurrence. The counties are responsible for the operation of the siren systems and conduct periodic tests. The warning sirens are just a part of the alert and notification systems in place at all nuclear sites and are also used by the county authorities to alert the public about non-nuclear events such as tornadoes or chemical spills. Other portions of this system include radio and TV broadcasts, route alerting, and the use of tone radios. Utilities in the Commonwealth of Pennsylvania operating nuclear power facilities are required to maintain an adequate emergency notification system around their nuclear plants. The adequacy of this program is evaluated during the licensing of the facilities and periodically during site emergency preparedness exercises. During these exercises, these systems are tested and any malfunctions corrected.

You also requested a status report on monitoring in the TMI area. GPUN, the NRC, the U.S. Environmental Protection Agency, and the Commonwealth of Pennsylvania conduct radiation monitoring in the vicinity of TMI. Enclosure 1 provides a description of GPUN's program. Enclosure 2, NUREG-0837, Vol. 8, No. 4, presents the results of the NRC Direct Radiation Monitoring Network for the fourth quarter of 1988. This report covers the vicinity of 75 sites throughout the United States, including the TMI site. Enclosure 3 provides summary information of the Commonwealth of Pennsylvania program and the results of its dosimetry program in the environs of the TMI site for 1987. Enclosure 4 provides information on the EPA-funded monitoring program at the Milton S. Hershey Medical Center. The NRC staff is unaware of any proposals for modifying the monitoring programs other than GPUN's plan to consolidate the monitoring for the TMI site.

The TMI-2 Advisory Panel for the Decontamination of TMI-2 has, with representatives from the various organizations conducting the monitoring, reviewed the offsite radiation monitoring programs and has made recommendations that were adopted by the participants. The Advisory Panel has recently indicated that a review of the offsite radiation monitoring program should be conducted before long-term storage of the facility and will place this issue on the agenda of a future meeting. The TMI-2 Advisory Panel will likely take an active role in advising the participants to assure a comprehensive and balanced program.

Ms. Barbara D. Hays

- 3 -

The NRC staff is aware of the concern expressed by local citizens in the Advisory Panel Meeting of April 13, 1989, on the issue of offsite radiation monitoring at TMI-2. The staff will work closely with the TMI-2 Advisory Panel and give the matter careful consideration during the staff's review of the licensee's proposal to place the facility in long-term storage. I hope that this letter responds to your concerns.

Sincerely,

Original signed by
Thomas E. Murley

Thomas E. Murley, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission

Enclosures: 1-4 as stated

[LETTER TO MS. HAYS]

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At an ^{a meeting on} April 13, 1989 meeting of the TMI-2 Advisory Panel on the Decontamination of Three Mile Island Unit 2, Mr. M. Roche, the Director of TMI-2 for General Public Utilities Nuclear Corporation (GPUN), discussed continued operation of the real-time monitoring system around TMI-2. Mr. Roche stated that it was GPUN's intention to maintain and upgrade the system through the end of defueling, fuel shipping, processed water evaporation, and the early stages of monitored storage. Although there is no accurate schedule for the beginning of storage, it is the NRC staff's opinion that the existing real-time monitoring system would remain operational for at least the next couple of years. After that time, GPUN will be considering replacement of the present system with an improved state-of-the art monitoring system at a number of locations.

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in the TMI site program. The NRC staff is currently reviewing GPUN's proposal for long-term storage of the facility and will, as a part of the staff review, examine the offsite radiation monitoring program. The staff expects to complete its evaluation of GPUN's proposal in early 1990.

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Sincerely,

Thomas E. Murley, Director
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Enclosure 1

TMI-2

RADIOLOGICAL

ENVIRONMENTAL

MONITORING

PROGRAM

TMI-2 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

- Plant Monitors
- Dosimeter (TLD) Station
- Sample Collection
- Real-time Monitors

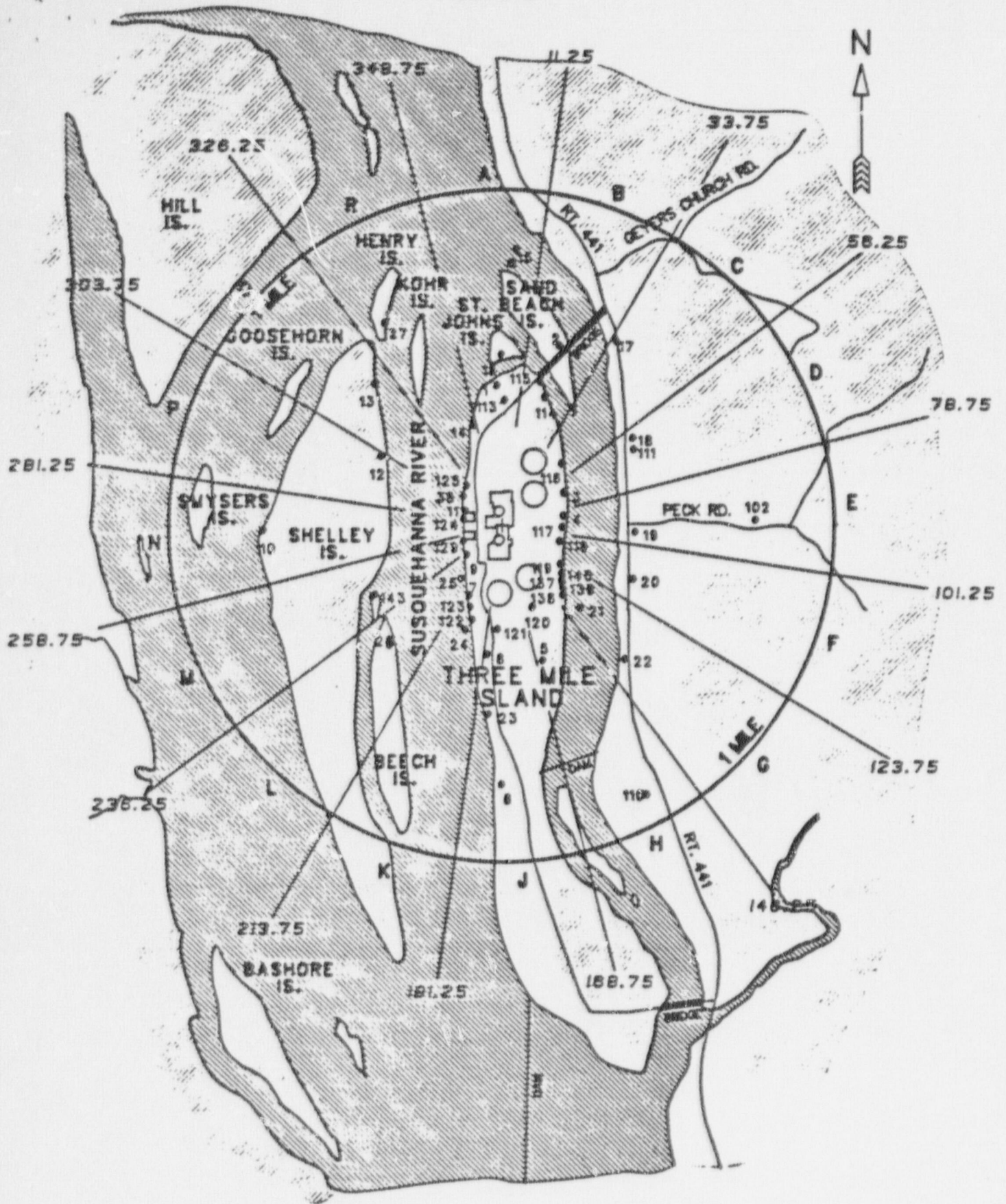
PLANT MONITORS

- Measure in-plant radiation levels
- Measure liquid and gaseous releases from the plant
- Early notification to plant operators of changing radiological conditions

DOSIMETER (TLD) STATIONS

- Measure environmental radiation at 104 locations up to 21 miles from TMI
- Read TLD's quarterly, or more frequently, if necessary

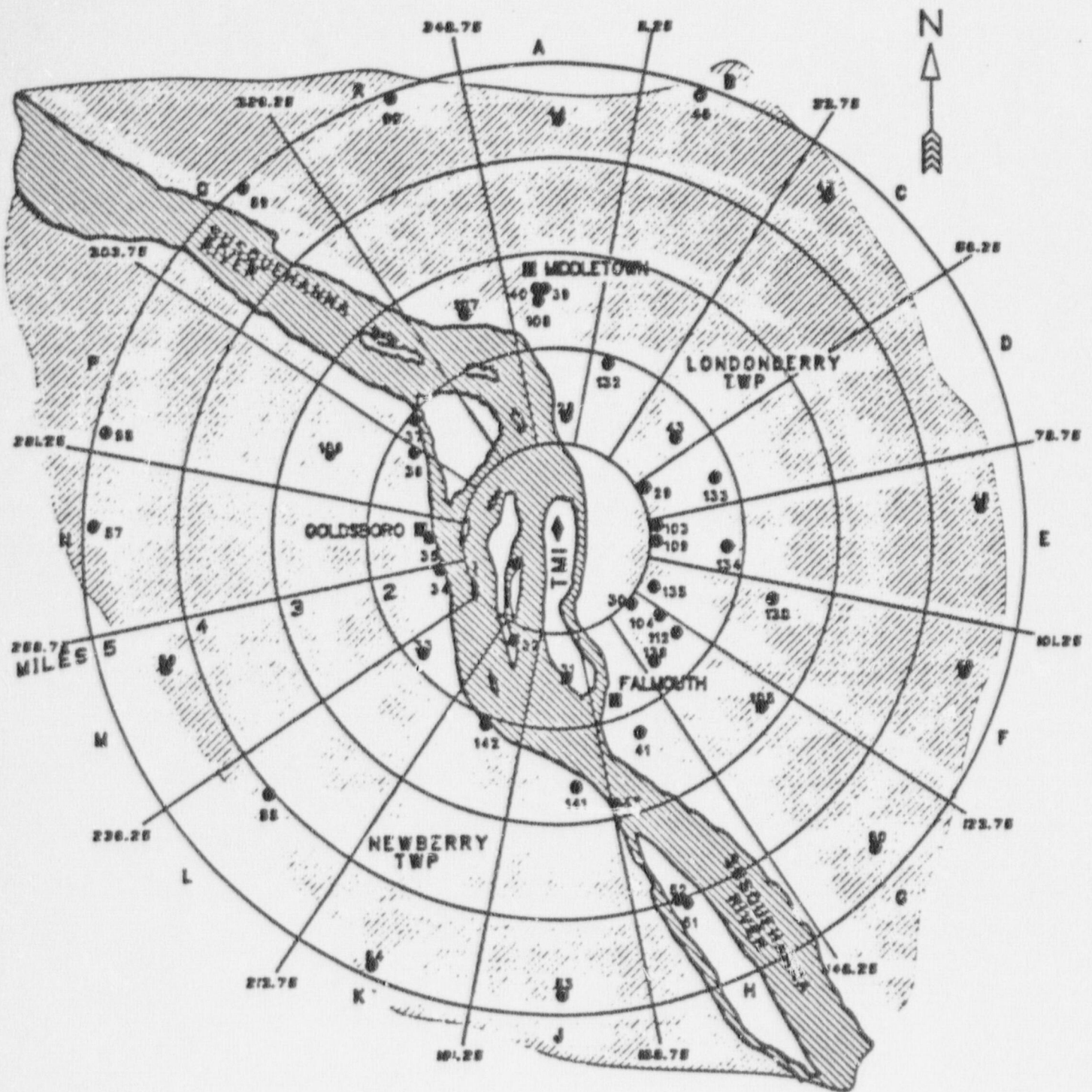
FIGURE 2



THREE MILE ISLAND NUCLEAR STATION

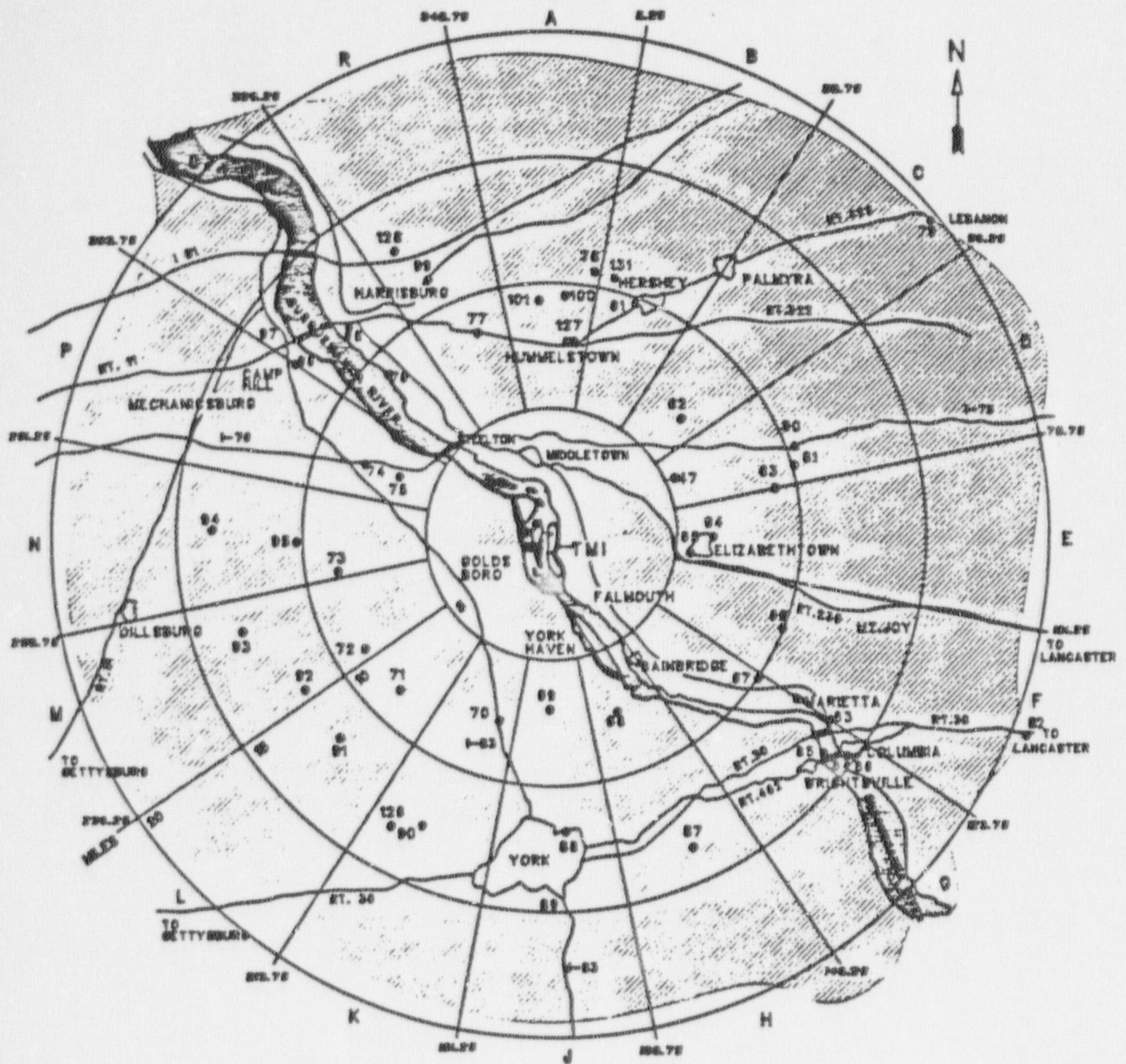
Locations of Radiological Environmental Monitoring Program (REMP)
Stations Approximately 1 Mile from the Site.

FIGURE 3



THREE MILE ISLAND NUCLEAR STATION
Locations of Radiological Environmental Monitoring Program (REMP)
Stations Within 5 Miles of the Site

FIGURE 4



THREE MILE ISLAND NUCLEAR STATION
Locations of Radiological Environmental Monitoring Program (REMP)
Stations Greater Than 5 Miles from the Site.

SAMPLE COLLECTION

- Three types of samples:

Aquatic - water, fish, river sediment

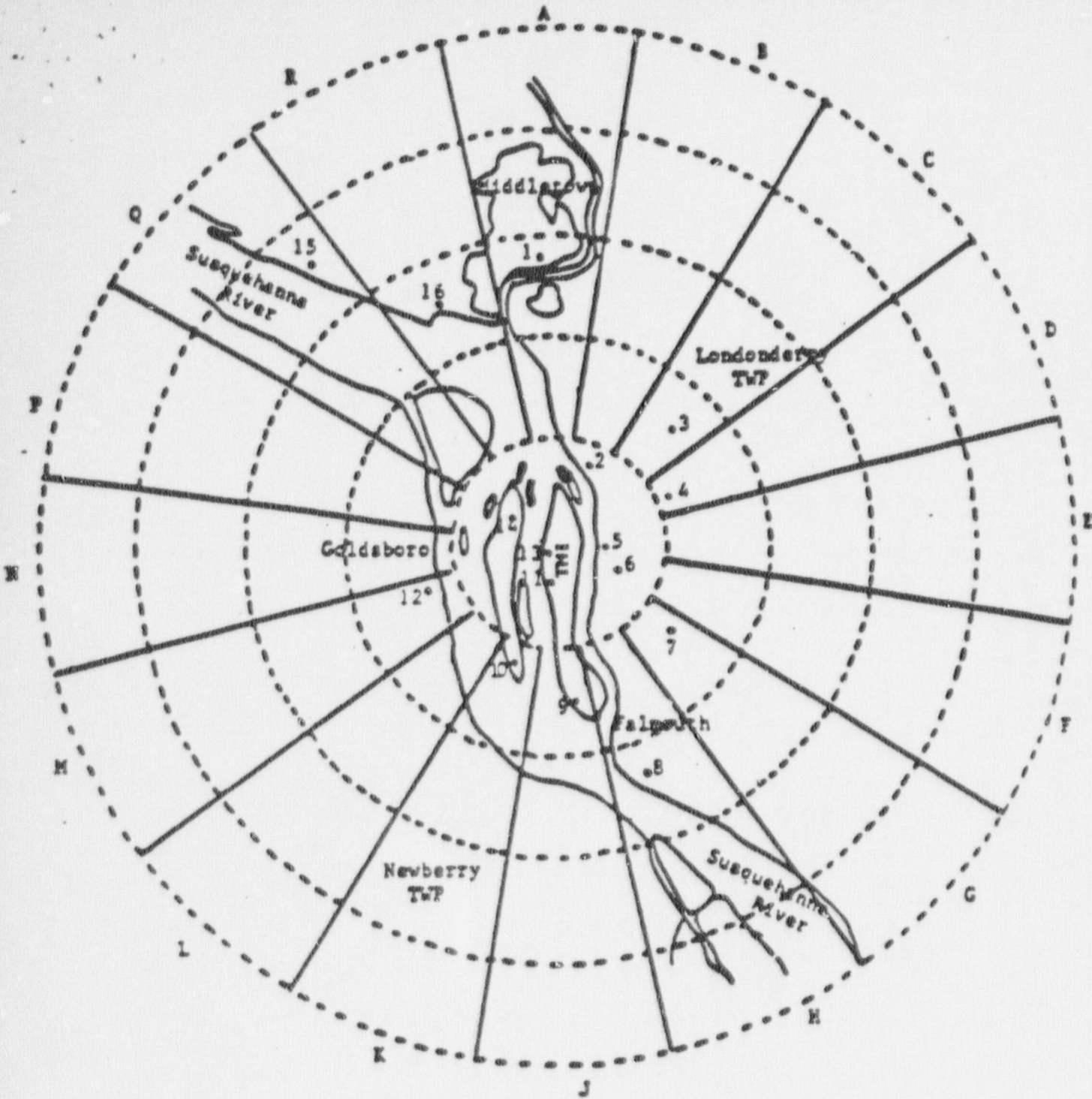
Atmospheric - air particules, precipitation

Terrestrial - milk, soil, meat, vegetables

- In 1987, 1400 samples were taken
- 3,600 analyses performed on the 1900 samples

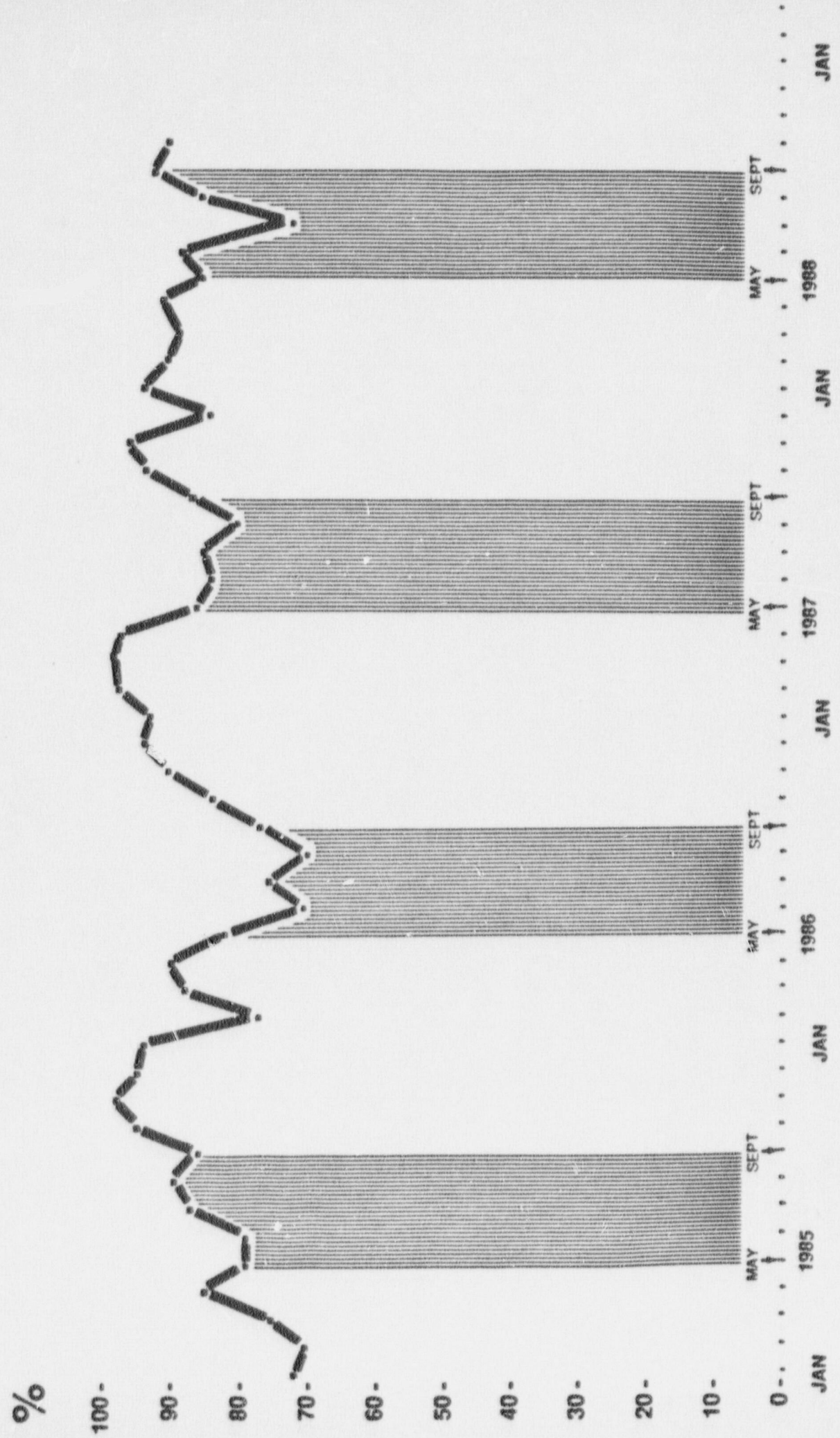
REAL-TIME MONITORS

- Measure environmental radiation at 16 locations up to 3 miles from TMI
- Readings recorded electronically at GPU Nuclear, and Dauphin and Lancaster county courthouses

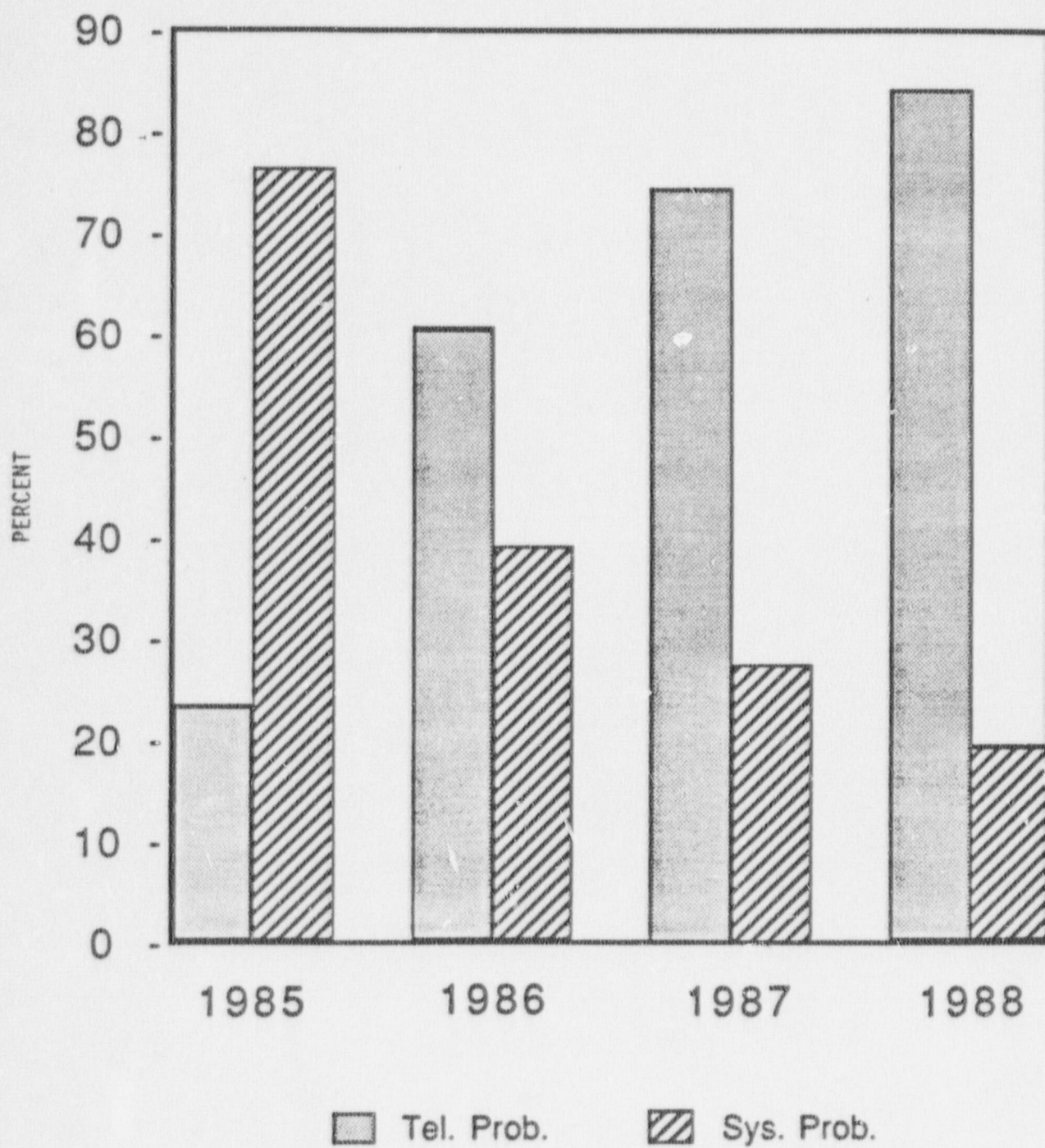


- | | |
|---|--------------------------------------|
| 1. Mill Street, Middletown | 9. South End TMI |
| 2. North Gate, Rt. 441 | 10. South end Shelley Island |
| 3. Middletown Junction, Geyers Church Rd. | 11. Mechanical Draft Towers, TMI |
| 4. Alvine Farm, Gingrich Rd. | 12. Goldsboro Air Station, Goldsboro |
| 5. Observation Center, Rt. 441 | 13. Between Intake Structures, TMI |
| 6. 500 KV Substation, Rt. 441 | 14. North End Shelley Island |
| 7. Becker Farm, Becker Rd. | 15. Harrisburg Int'l Airport |
| 8. Collins Substation, Falmouth | 16. Crawford Station, Middletown |

Real-Time Monitors' Percentage of Data Recovery



REUTER - STOKES ANOMALIES



REUTER STOKES EVALUATION

- GPU Nuclear is committed to maintaining the current system through the completion of TMI-2 defueling and fuel shipping.
- GPU Nuclear is aware of the concerns about the future of the system and taking those concerns fully into consideration as the system is evaluated.
- The evaluation includes possible modification of the system.
- The evaluation of the entire environmental monitoring program is expected to be completed and presented to the panel this summer.

(X)
Enclosure 3

**ANNUAL REPORT OF ENVIRONMENTAL RADIATION IN PENNSYLVANIA
1987**

Commonwealth of Pennsylvania
Department of Environmental Resources
Bureau of Radiation Protection
Division of Environmental Radiation

August 1988

Prepared By

Margaret A. Reilly
Chief
Division of Environmental Radiation

and

Barbara S. Conrad
Radiation Health Physicist
Division of Environmental Radiation

(X)

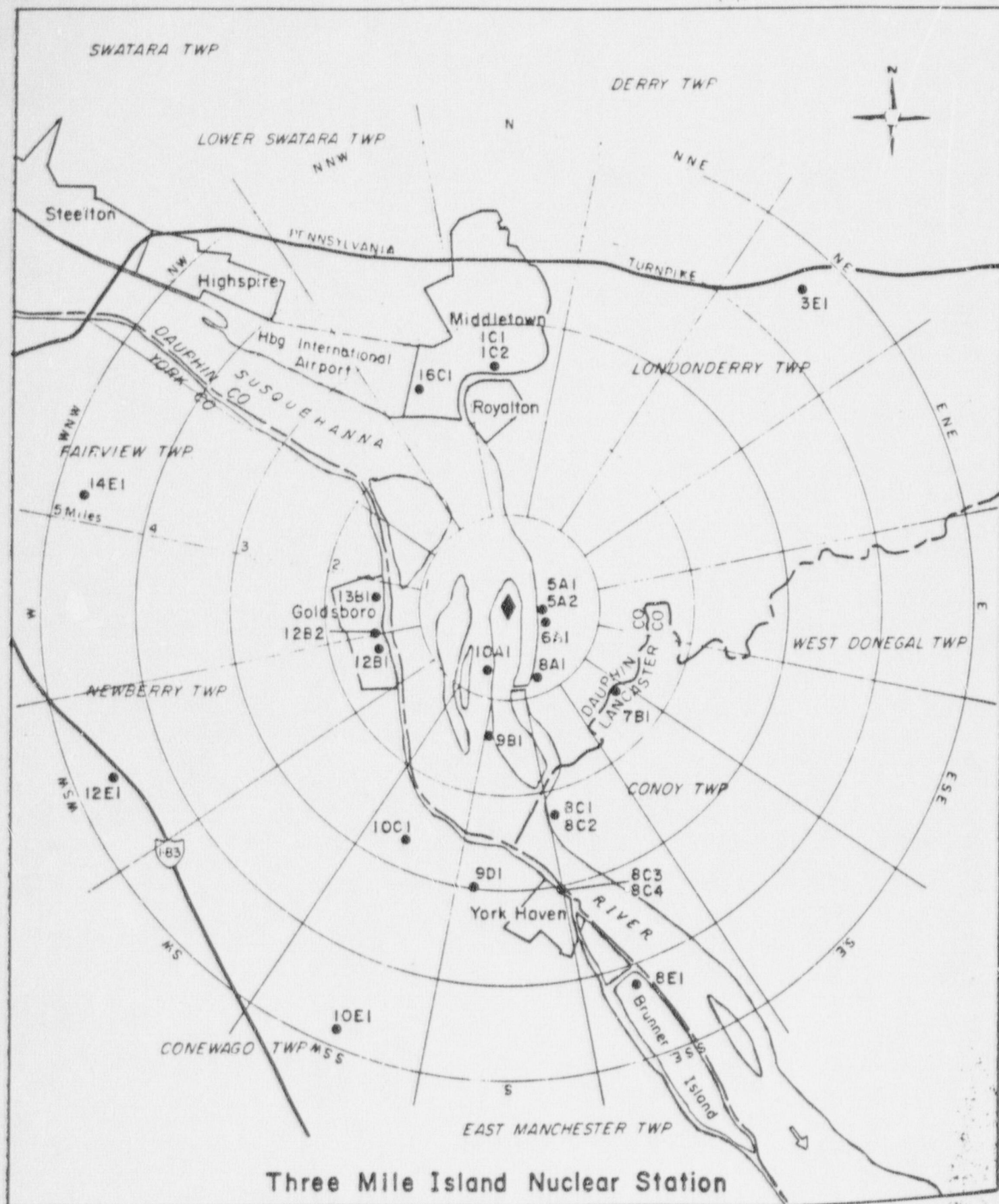
THREE MILE ISLAND NUCLEAR STATION

Three Mile Island Nuclear Station Units 1 and 2 are pressurized water reactors rated at 871 and 959 megawatts electrical (Mwe) respectively. The facility is located on an island in the Susquehanna River, Londonderry Township, Dauphin County, Pennsylvania. Clean-up operations at TMI Unit 2 continued throughout 1987.

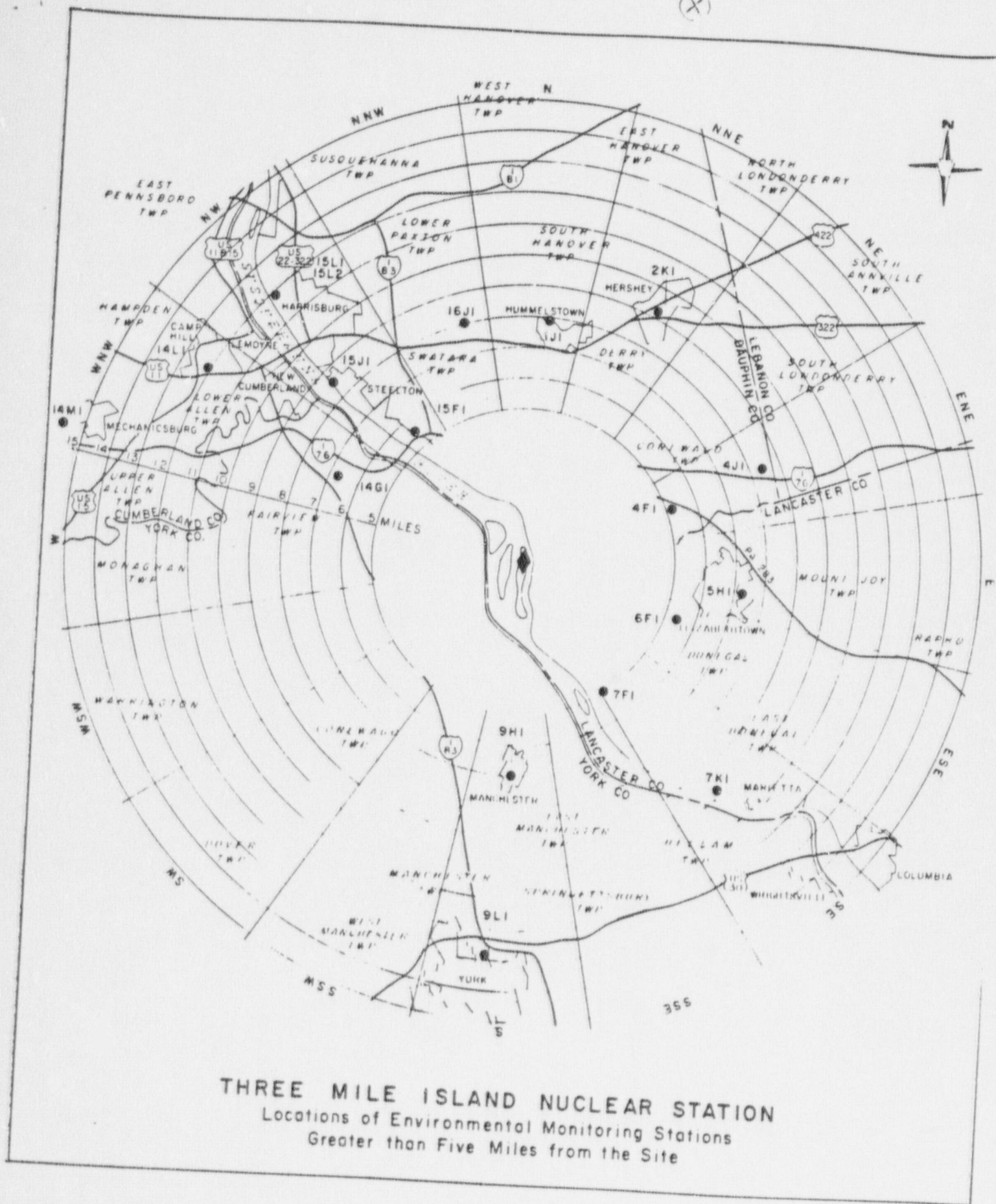
The facility is operated by General Public Utilities Nuclear Corporation.

Locations of Environmental Monitoring Stations Within 5 Miles of the Site

(X)



Three Mile Island Nuclear Station



(X)

THREE MILE ISLAND THERMOLUMINESCENCE DOSIMETRY

The BRP thermoluminescence dosimetry (TLD) program in the environs of Three Mile Island Nuclear Station includes 30 dosimeter stations exchanged quarterly. The locations range in distance from 0.5 to 16.4 miles from the site.

Contractor dosimeters are co-located with BRP TLDs at four locations to provide a check on BRP data.

All dosimeters are changed by BRP staff.

The annual average dose for the 30 BRP TLD locations was 61.5 ± 0.5 millirad in 1987, compared to 68.0 ± 0.4 in 1986. The annual average for the four BRP TLDs co-located with contractor TLDs was 47.1 ± 1.1 millirad. The corresponding contractor value was 54.5 ± 1.1 millirad.

These data are generally consistent with Oakley's* calculated value of the annual exposure from natural background in the Harrisburg area of 88 millirad.

*Donald T. Oakley, Natural Radiation Exposure in the United States (ORP/SID) 72-1, U.S. Environmental Protection Agency, Office of Radiation Programs (Washington, D.C.: Government Printing Office, 1972), p. 56.

THREE MILE ISLAND NUCLEAR STATION
THERMOLUMINESCENCE DOSIMETRY (TL) DATA
(Mr/std. mo.)

Station Number	Location	1/08/87 to 4/09/87	4/09/87 to 7/09/87	7/09/87 to 10/09/87	10/09/87 to 1/07/88	Annual Dose
1C1	Mill Street Substation	3.7 +/- 0.4	3.9 +/- 0.1	3.7 +/- 0.2	3.7 +/- 0.2	45.0 +/- 1.5
1J1	Hummelstown	6.5 +/- 0.2	missing	missing	5.4 +/- 0.2	71.4 +/- 1.7
2K1	Hershey	4.5 +/- 0.3	4.9 +/- 0.2	4.6 +/- 0.3	4.7 +/- 0.2	56.1 +/- 1.5
3E1	Kennedy Lane	4.7 +/- 0.2	4.9 +/- 0.4	5.0 +/- 0.6	5.0 +/- 0.3	58.8 +/- 2.4
4F1	Beagle Road	5.0 +/- 0.2	5.8 +/- 0.2	5.6 +/- 0.3	5.4 +/- 0.1	65.4 +/- 1.3
4J1	Bellaire	6.0 +/- 0.6	6.8 +/- 0.5	6.6 +/- 0.4	6.4 +/- 0.2	77.4 +/- 2.7
5A1	Visitors Center	4.5 +/- 0.4	4.5 +/- 0.2	4.4 +/- 0.7	4.5 +/- 0.3	53.7 +/- 3.0
5H1	Elizabethtown	5.7 +/- 0.2	5.9 +/- 0.4	5.9 +/- 0.5	5.3 +/- 0.2	68.4 +/- 2.1
6A1	500 Kev Substation	4.5 +/- 0.1	4.9 +/- 0.5	4.6 +/- 0.1	4.6 +/- 0.3	55.8 +/- 2.3
6F1	Elizabethtown Sewage Plant	5.6 +/- 0.3	6.0 +/- 0.5	6.0 +/- 0.3	5.6 +/- 0.3	69.6 +/- 2.2
7F1	Bainbridge	5.0 +/- 0.4	5.2 +/- 0.4	5.4 +/- 0.3	4.8 +/- 0.4	61.2 +/- 2.3
7K1	Marietta	6.8 +/- 0.6	7.2 +/- 0.2	7.3 +/- 0.2	6.9 +/- 0.4	84.6 +/- 2.3
8C1	Falmouth	3.5 +/- 0.3	3.6 +/- 0.1	3.5 +/- 0.2	3.5 +/- 0.2	42.3 +/- 1.3
8C3	York Haven	3.9 +/- 0.1	4.1 +/- 0.2	3.9 +/- 0.2	3.9 +/- 0.3	47.4 +/- 1.3
8E1	Brunner Island	4.6 +/- 0.6	4.9 +/- 0.2	4.8 +/- 0.5	4.5 +/- 0.4	56.4 +/- 2.7
9D1	Cly Substation	3.6 +/- 0.2	3.8 +/- 0.1	3.7 +/- 0.2	3.7 +/- 0.3	44.4 +/- 1.3
9H1	Manchester	5.1 +/- 0.1	5.4 +/- 0.2	5.4 +/- 0.1	5.4 +/- 0.1	63.9 +/- 0.8
9L1	York	8.8 +/- 0.3	8.9 +/- 0.1	9.6 +/- 3.5	8.6 +/- 0.1	107.7 +/- 10.5
10C1	Pleasant Grove	4.1 +/- 0.6	4.4 +/- 0.4	4.3 +/- 0.5	4.3 +/- 0.5	51.3 +/- 3.0
10E1	Strinestown	5.0 +/- 0.4	5.4 +/- 0.1	5.0 +/- 0.3	5.3 +/- 0.8	62.1 +/- 3.1
12B1	Goldsboro	3.8 +/- 0.2	4.1 +/- 0.8	3.8 +/- 0.2	4.1 +/- 0.6	47.4 +/- 3.1
12E1	Newberrytown	4.4 +/- 0.4	4.8 +/- 0.2	4.5 +/- 0.0	4.1 +/- 0.1	53.4 +/- 1.4
13B1	Goldsboro Marina	4.5 +/- 0.3	5.0 +/- 0.0	4.8 +/- 0.2	4.8 +/- 0.1	57.3 +/- 1.1
14E1	Redland Acres	5.8 +/- 0.2	6.2 +/- 0.1	6.2 +/- 0.2	5.8 +/- 0.7	72.0 +/- 2.3
14L1	Camp Hill	4.5 +/- 0.2	4.8 +/- 0.1	4.6 +/- 0.3	4.5 +/- 0.2	55.2 +/- 1.3
14M1	Mechanicsburg	5.2 +/- 0.2	5.6 +/- 0.3	5.1 +/- 0.2	5.1 +/- 0.2	63.0 +/- 1.4
15F1	Highspire	5.0 +/- 0.3	5.4 +/- 0.1	5.2 +/- 0.4	5.2 +/- 0.6	62.4 +/- 2.4
15L1	Harrisburg	3.9 +/- 0.2	3.9 +/- 0.2	3.6 +/- 0.1	3.8 +/- 0.3	45.6 +/- 1.3
16C1	Crawford Station	5.4 +/- 0.4	5.8 +/- 0.3	5.7 +/- 0.3	5.5 +/- 0.3	67.2 +/- 2.0
16J1	Rutherford Fire Co.	6.1 +/- 0.1	6.7 +/- 0.2	6.5 +/- 0.5	6.6 +/- 0.1	77.7 +/- 1.7

THREE MILE ISLAND NUCLEAR STATION
QUARTERLY TLD INTERCOMPARISON
(Mr/std. mo.)

Station Number	Location	Collection Period	BRP Results	Teledyne Results
1C1	Mill Street Substation	1/08/87 - 4/09/87	3.7 +/- 0.4	4.3 +/- 0.2
		4/09/87 - 7/09/87	3.9 +/- 0.1	4.2 +/- 0.1
		7/09/87 - 10/09/87	3.7 +/- 0.2	4.6 +/- 0.3
		10/09/87 - 1/07/88	3.7 +/- 0.2	4.2 +/- 0.2
5A1	Visitors Center	1/08/87 - 4/09/87	4.5 +/- 0.4	5.3 +/- 0.8
		4/09/87 - 7/09/87	4.5 +/- 0.2	4.9 +/- 0.3
		7/09/87 - 10/09/87	4.4 +/- 0.7	5.2 +/- 0.6
		10/09/87 - 1/07/88	4.5 +/- 0.3	5.0 +/- 0.4
8C1	Falmouth	1/08/87 - 4/09/87	3.5 +/- 0.3	4.2 +/- 0.2
		4/09/87 - 7/09/87	3.6 +/- 0.1	4.1 +/- 0.2
		7/09/87 - 10/09/87	3.5 +/- 0.2	4.5 +/- 0.6
		10/09/87 - 1/07/88	3.5 +/- 0.2	4.1 +/- 0.2
10A1	Goldsboro	1/08/87 - 4/09/87	3.8 +/- 0.2	4.3 +/- 0.1
		4/09/87 - 7/09/87	4.1 +/- 0.8	4.5 +/- 0.2
		7/09/87 - 10/09/87	3.8 +/- 0.2	4.9 +/- 0.3
		10/09/87 - 1/07/88	4.1 +/- 0.6	4.4 +/- 0.2

(X)

(X)

THREE MILE ISLAND AIR SAMPLING

Air sampling in the environs of Three Mile Island continued at 4 stations in 1987. A control sampler is located at Harrisburg. The samplers continuously collect air particulates and radioiodines. The particulate filters were analyzed individually for gross activity, and composited quarterly for gamma spectrum analysis. Activated charcoal canisters impregnated with TEDA, a chelating agent, were analyzed individually by gamma spectroscopy for Iodine-131. The filters and canisters were changed by BRP on a weekly basis.

The airborne gross activity in the environs of Three Mile Island was observed to be relatively flat throughout the year. No airborne Iodine-131 was detected. Air monitoring data from Three Mile Island are similar to analogous data from other nuclear power stations in Pennsylvania and the control station at Harrisburg.

THREE MILE ISLAND AIR SAMPLING DATA
MILL STREET SUBSTATION (1C2)

Iodine-131
(x 0.01 pCi/m3)

Particulates
(x 0.01 pCi/m3)

Collection Period	Alpha	Beta	I-131
12/30/86-1/07/87	0.2 +/- 0.1	1.5 +/- 0.1	<0.5
1/07/87-1/15/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
1/15/87-1/21/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.5
1/21/87-1/29/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
1/29/87-2/05/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
2/05/87-2/12/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
2/12/87-2/19/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.3
2/19/87-2/26/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
2/26/87-3/05/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.4
3/05/87-3/12/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4
3/12/87-3/19/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5
3/19/87-3/26/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.5
3/26/87-4/02/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.7
4/02/87-4/09/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
4/09/87-4/16/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5
4/16/87-4/23/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
4/23/87-4/30/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5
4/30/87-5/07/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
5/07/87-5/14/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4
5/14/87-5/21/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.4
5/21/87-5/28/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.4
5/28/87-6/04/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
6/04/87-6/11/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
6/11/87-6/18/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.5
6/18/87-6/25/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.5
6/25/87-7/02/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4

(X)

THREE MILE ISLAND AIR SAMPLING DATA
MILL STREET SUBSTATION (1C2)

Collection Period	Particulates (x 0.01 pCi/m3)		Iodine-131 (x 0.01 pCi/m3)	
	Alpha	Beta	Alpha	Beta
7/02/87- 7/09/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5	<0.5
7/09/87- 7/16/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5	<0.5
7/16/87- 7/23/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.8	<0.5
7/23/87- 7/30/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.5	<0.4
7/30/87- 8/06/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5	<0.5
8/06/87- 8/13/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	<0.5
8/13/87- 8/20/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5	<0.5
8/20/87- 8/27/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5	<0.5
8/27/87- 9/03/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	<0.5
9/03/87- 9/10/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5	<0.5
9/10/87- 9/17/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.6	<0.4
9/17/87- 9/23/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.5	<0.5
9/23/87- 10/01/87	0.2 +/- 0.1	1.9 +/- 0.1	<0.4	<0.5
10/01/87- 10/07/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5	<0.5
10/07/87- 10/15/87	<0.1	0.9 +/- 0.1	<0.5	<0.5
10/15/87- 10/22/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5	<0.5
10/22/87- 10/29/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4	<0.6
10/29/87- 11/05/87	0.2 +/- 0.1	2.0 +/- 0.1	<0.4	<0.4
11/05/87- 11/12/87	0.2 +/- 0.1	1.2 +/- 0.1	<0.4	<0.4
11/12/87- 11/19/87	0.1 +/- 0.1	2.2 +/- 0.1	<0.4	<0.5
11/19/87- 11/25/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5	<0.4
11/25/87- 12/03/87	<0.1	0.9 +/- 0.1	<0.5	<0.4
12/03/87- 12/10/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	<0.4
12/10/87- 12/17/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	<0.4
12/17/87- 12/24/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.5	<0.5
12/24/87- 12/31/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4	<0.4

THREE MILE ISLAND AIR SAMPLING DATA
VISITORS CENTER (5A2)

Iodine-131
(x 0.01 pCi/m3)

Particulates
(x 0.01 pCi/m3)

Collection Period	Particulates (x 0.01 pCi/m3)		I-131
	Alpha	Beta	
12/30/86-1/07/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
1/07/87-1/15/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
1/15/87-1/21/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5
1/21/87-1/29/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
1/29/87-2/05/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
2/05/87-2/12/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4
2/12/87-2/19/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
2/19/87-2/26/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.3
2/26/87-3/05/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.4
3/05/87-3/12/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4
3/12/87-3/19/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
3/19/87-3/26/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
3/26/87-4/02/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4
4/02/87-4/09/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
4/09/87-4/16/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
4/16/87-4/23/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
4/23/87-4/30/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.3
4/30/87-5/07/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
5/07/87-5/14/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
5/14/87-5/21/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.5
5/21/87-5/28/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.3
5/28/87-6/04/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
6/04/87-6/11/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
6/11/87-6/18/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
6/18/87-6/25/87	0.1 +/- 0.1	0.6 +/- 0.1	<0.4
6/25/87-7/02/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4

(X)

THREE MILE ISLAND AIR SAMPLING DATA
VISITORS CENTER (5A2)

Collection Period	Particulates (x 0.01 pCi/m3)		Iodine-131 (x 0.01 pCi/m3)	
	Alpha	Beta	I-131	
7/02/87- 7/09/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4	
7/09/87- 7/16/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.3	
7/16/87- 7/23/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.6	
7/23/87- 7/30/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4	
7/30/87- 8/06/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
8/06/87- 8/13/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
8/13/87- 8/20/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.3	
8/20/87- 8/27/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5	
8/27/87- 9/03/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5	
9/03/87- 9/10/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
9/10/87- 9/17/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.6	
9/17/87- 9/23/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5	
9/23/87-10/01/87	0.2 +/- 0.1	2.0 +/- 0.1	<0.3	
10/01/87-10/07/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	
10/07/87-10/15/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4	
10/15/87-10/22/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4	
10/22/87-10/29/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4	
10/29/87-11/05/87	0.1 +/- 0.1	1.9 +/- 0.1	<0.5	
11/05/87-11/12/87	0.2 +/- 0.1	1.2 +/- 0.1	<0.4	
11/12/87-11/19/87	0.1 +/- 0.1	2.0 +/- 0.1	<0.5	
11/19/87-11/25/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4	
11/25/87-12/03/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.4	
12/03/87-12/10/87	<0.1	1.1 +/- 0.1	<0.4	
12/10/87-12/17/87	0.1 +/- 0.1	3.7 +/- 0.2	<0.9	
12/17/87-12/24/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
12/24/87-12/31/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4	

(X)

THREE MILE ISLAND AIR SAMPLING DATA
COLLINS SUBSTATION (8C2)

Iodine-131
(x 0.01 pCi/m3)

Particulates
(x 0.01 pCi/m3)

Collection Period	Particulates (x 0.01 pCi/m3)		I-131
	Alpha	Beta	
12/30/86-1/07/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
1/07/87-1/15/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.6
1/15/87-1/21/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.6
1/21/87-1/29/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5
1/29/87-2/05/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.5
2/05/87-2/12/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.5
2/12/87-2/19/87	0.2 +/- 0.1	1.4 +/- 0.1	<0.5
2/19/87-2/26/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5
2/26/87-3/05/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.5
3/05/87-3/12/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
3/12/87-3/19/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5
3/19/87-3/26/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.3
3/26/87-4/02/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
4/02/87-4/09/87	<0.1	0.9 +/- 0.1	<0.5
4/09/87-4/16/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
4/16/87-4/23/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
4/23/87-4/30/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.3
4/30/87-5/07/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4
5/07/87-5/14/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5
5/14/87-5/21/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
5/21/87-5/28/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.6
5/28/87-6/04/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.6
6/04/87-6/11/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.6
6/11/87-6/18/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
6/18/87-6/25/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.7
6/25/87-7/02/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5

THREE MILE ISLAND AIR SAMPLING DATA
COLLINS SUBSTATION (8C2)

Iodine-131
(x 0.01 pCi/m3)

Particulates
(x 0.01 pCi/m3)

Collection Period	Particulates (x 0.01 pCi/m3)		I-131
	Alpha	Beta	
7/02/87- 7/09/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5
7/09/87- 7/16/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.7
7/16/87- 7/23/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.6
7/23/87- 7/30/87	0.2 +/- 0.1	1.7 +/- 0.1	<0.8
7/30/87- 8/06/87	0.2 +/- 0.1	1.6 +/- 0.1	<0.5
8/06/87- 8/13/87	0.3 +/- 0.1	1.7 +/- 0.1	<0.6
8/13/87- 8/20/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5
8/20/87- 8/27/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.5
8/27/87- 9/03/87	0.2 +/- 0.1	1.7 +/- 0.1	<0.7
9/03/87- 9/10/87	0.1 +/- 0.1	1.8 +/- 0.2	<1.2
9/10/87- 9/17/87	0.2 +/- 0.1	3.3 +/- 0.2	<1.4
9/17/87- 9/23/87	0.1 +/- 0.1	1.2 +/- 0.2	<1.2
9/23/87-10/01/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4
10/01/87-10/07/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
10/07/87-10/15/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
10/15/87-10/22/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.5
10/22/87-10/29/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
10/29/87-11/05/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5
11/05/87-11/12/87	0.2 +/- 0.1	1.3 +/- 0.1	<0.5
11/12/87-11/19/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4
11/19/87-11/25/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
11/25/87-12/03/87	0.2 +/- 0.1	1.0 +/- 0.1	<0.4
12/03/87-12/10/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5
12/10/87-12/17/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
12/17/87-12/24/87	0.2 +/- 0.1	1.0 +/- 0.1	<0.4
12/24/87-12/31/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4

THREE MILE ISLAND AIR SAMPLING DATA
GOLDSBORO (12B2)

Iodine-131
(x 0.01 pCi/m3)

Particulates
(x 0.01 pCi/m3)

Collection Period	Alpha	Beta	I-131
12/30/86-1/07/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
1/07/87-1/15/87	0.1 +/- 0.1	0.6 +/- 0.1	<0.4
1/15/87-1/21/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.6
1/21/87-1/29/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
1/29/87-2/05/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.6
2/05/87-2/12/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.5
2/12/87-2/19/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
2/19/87-2/26/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
2/26/87-3/05/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.5
3/05/87-3/12/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5
3/12/87-3/19/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
3/19/87-3/26/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4
3/26/87-4/02/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.3
4/02/87-4/09/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.3
4/09/87-4/16/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
4/16/87-4/23/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.4
4/23/87-4/30/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
4/30/87-5/07/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.3
5/07/87-5/14/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4
5/14/87-5/21/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.4
5/21/87-5/28/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4
5/28/87-6/04/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
6/04/87-6/11/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
6/11/87-6/18/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
6/18/87-6/25/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.5
6/25/87-7/02/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4

(X)

THREE MILE ISLAND AIR SAMPLING DATA
GOLDSBGRO (12B2)

Collection Period	Particulates (x 0.01 pCi/m3)		Iodine-131 (x 0.01 pCi/m3)	
	Alpha	Beta	I-131	
7/02/87- 7/09/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4	
7/09/87- 7/16/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5	
7/16/87- 7/23/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
7/23/87- 7/30/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.6	
7/30/87- 8/06/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5	
8/06/87- 8/13/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	
8/13/87- 8/20/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.5	
8/20/87- 8/27/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5	
8/27/87- 9/03/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.4	
9/03/87- 9/10/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.6	
9/10/87- 9/17/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.5	
9/17/87- 9/23/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
5/23/87-10/01/87	0.2 +/- 0.1	2.0 +/- 0.1	<0.5	
10/01/87-10/07/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5	
10/07/87-10/15/87	<0.1	1.1 +/- 0.1	<0.5	
10/15/87-10/22/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5	
10/22/87-10/29/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5	
10/29/87-11/05/87	0.1 +/- 0.1	1.9 +/- 0.1	<0.6	
11/05/87-11/12/87	0.3 +/- 0.1	1.2 +/- 0.1	<0.5	
11/12/87-11/19/87	0.1 +/- 0.1	2.1 +/- 0.1	<0.5	
11/19/87-11/25/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4	
11/25/87-12/03/87	<0.1	0.7 +/- 0.1	<0.5	
12/03/87-12/03/87*	0.1 +/- 0.3	2.3 +/- 0.7	<6.0	
12/10/87-12/17/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.4	
12/17/87-12/24/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
12/24/87-12/31/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.4	

* Very low air volume due to sampler malfunction.

CONTROL AIR SAMPLING DATA
HARRISBURG - EVANGELICAL PRESS BUILDING (15L2)

Collection Period	Particulates (x 0.01 pCi/m3)		Iodine-131 (x 0.01 pCi/m3)	
	Alpha	Beta	I-131	
12/29/86-i/05/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
1/05/87-1/12/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.6	
1/12/87-1/20/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.3	
1/20/87-1/26/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5	
1/26/87-2/02/87	0.1 +/- 0.1	1.8 +/- 0.1	<0.5	
2/02/87-2/09/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.3	
2/09/87-2/17/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.3	
2/17/87-2/23/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
2/23/87-3/02/87	0.1 +/- 0.1	0.8 +/- 0.1	<0.4	
3/02/87-3/09/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4	
3/09/87-3/16/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
3/16/87-3/23/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
3/23/87-3/30/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
3/30/87-4/06/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4	
4/06/87-4/13/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4	
4/13/87-4/20/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5	
4/20/87-4/27/87	0.1 +/- 0.1	0.7 +/- 0.1	<0.4	
4/27/87-5/04/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
5/04/87-5/11/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4	
5/11/87-5/18/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
5/18/87-5/26/87	0.1 +/- 0.1	0.9 +/- 0.1	<0.3	
5/26/87-6/01/87	0.1 +/- 0.1	1.7 +/- 0.1	<0.3	
6/01/87-6/08/87	0.1 +/- 0.1	1.5 +/- 0.1	<0.4	
6/08/87-6/15/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5	
6/15/87-6/22/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4	
6/22/87-6/29/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.5	

HARRISBURG - EVANGELICAL PRESS BUILDING (15L2)

CONTROL AIR SAMPLING DATA

Collection Period	Particulates (x 0.01 pCi/m3)		I-131 (x 0.01 pCi/m3)
	Alpha	Beta	
6/29/87- 7/06/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.7
7/06/87- 7/13/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.5
7/13/87- 7/20/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5
7/20/87- 7/27/87	0.1 +/- 0.1	2.4 +/- 0.1	<0.5
7/27/87- 8/03/87	0.1 +/- 0.1	1.6 +/- 0.1	<0.4
8/03/87- 8/10/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
8/10/87- 8/17/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.6
8/17/87- 8/24/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.6
8/24/87- 8/31/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.5
8/31/87- 9/08/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.3
9/08/87- 9/14/87	0.1 +/- 0.1	2.0 +/- 0.1	<0.7
9/14/87- 9/21/87	0.1 +/- 0.1	1.8 +/- 0.1	<0.4
9/21/87- 9/28/87	0.2 +/- 0.1	1.6 +/- 0.1	<0.4
9/28/87-10/05/87	0.2 +/- 0.1	1.7 +/- 0.1	<0.5
10/05/87-10/12/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
10/13/87-10/19/87*	0.1 +/- 0.1	2.2 +/- 0.1	<0.5
10/19/87-10/26/87	0.1 +/- 0.1	1.9 +/- 0.1	<0.4
10/26/87-11/02/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.5
11/02/87-11/09/87	0.2 +/- 0.1	1.9 +/- 0.1	<0.5
11/09/87-11/16/87	0.1 +/- 0.1	1.0 +/- 0.1	<0.4
11/16/87-11/23/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
11/23/87-11/30/87	0.1 +/- 0.1	1.3 +/- 0.1	<0.4
11/30/87-12/07/87	0.1 +/- 0.1	1.1 +/- 0.1	<0.4
12/07/87-12/14/87	0.1 +/- 0.1	1.4 +/- 0.1	<0.5
12/14/87-12/21/87	0.1 +/- 0.1	1.2 +/- 0.1	<0.4
12/21/87-12/28/87	0.1 +/- 0.1	1.9 +/- 0.1	<0.5

* No electrical power to sampler 10/12/87-10/13/87

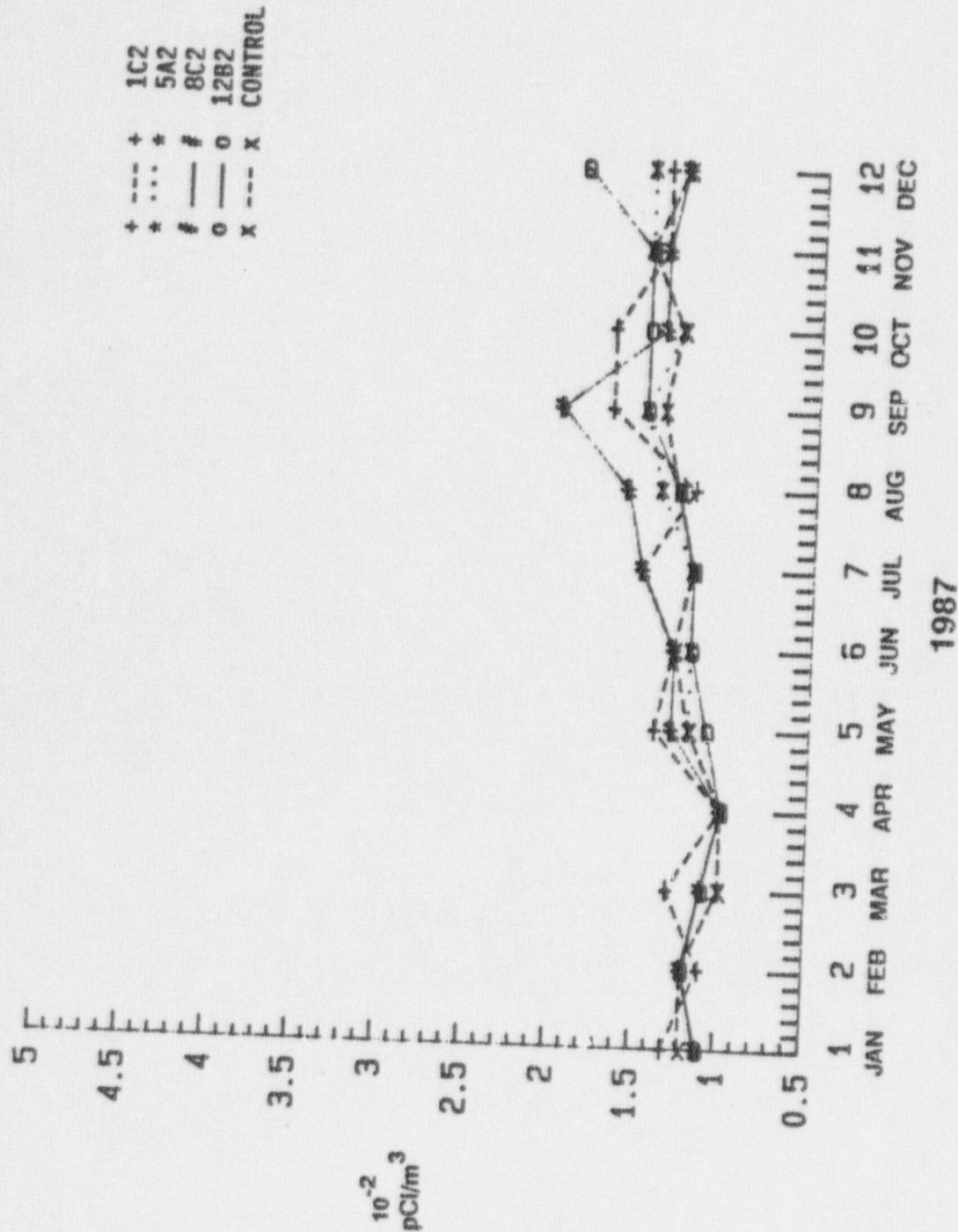
THREE MILE ISLAND AIR PARTICULATE COMPOSITES (fCi/m3)+

Station Number	Location	Collection Period	Cs-134	Cs-137
1C2	Mill St. Substation	12/30/86 - 3/26/87	<0.09	<0.08
		3/26/87 - 6/25/87	<0.09	<0.07
		6/25/87 - 10/01/87	<0.09	<0.07
		10/01/87 - 12/31/87	<0.10	<0.10
5A2	Visitors Center	12/30/86 - 3/26/87	<0.09	<0.09
		3/26/87 - 6/25/87	<0.09	<0.08
		6/25/87 - 10/01/87	<0.08	<0.07
		10/01/87 - 12/31/87	<0.10	<0.10
8C2	Collins Substation	12/30/86 - 3/26/87	<0.08	<0.07
		3/26/87 - 6/25/87	<0.08	<0.07
		6/25/87 - 10/01/87	<0.10	<0.09
		10/01/87 - 12/31/87	<0.10	<0.10
12B2	Goldsboro	12/30/86 - 3/26/87	<0.08	<0.08
		3/26/87 - 6/25/87	<0.08	<0.07
		6/25/87 - 10/01/87	<0.08	<0.06
		10/01/87 - 12/31/87	<0.20	<0.10
15L2	Harrisburg	12/29/86 - 3/30/87	<0.09	<0.07
		3/30/87 - 6/29/87	<0.08	<0.06
		6/29/87 - 9/28/87	<0.10	<0.08
		9/28/87 - 12/28/87	<0.10	<0.10

+ fCi = femto curie = 1/1000 pico curie

THREE MILE ISLAND NUCLEAR STATION

AVERAGE GROSS BETA CONCENTRATIONS IN AIRBORNE PARTICULATES



THREE MILE ISLAND WATER SAMPLING

Three Mile Island Nuclear Station uses the Susquehanna River for station water and for discharge of liquid effluents. During 1987, only effluents from Unit 1 were allowed to be discharged. Liquid radwaste generated by the Unit 2 accident was retained on-site.

During the reporting period, the routine surface water sampling program continued at one upstream and one downstream location. Both the upstream location at Steelton Water Treatment Plant and the downstream location at York Haven Hydroelectric Plant are continuously composited and collected monthly.

These routine samples are analyzed for gross beta activity, for tritium and for gamma emitters.

All data compare favorably with the U.S. EPA National Interim Primary Drinking Water Regulations. Those criteria are 15 picocuries per liter gross alpha, 50 picocuries per liter gross beta and 20,000 picocuries per liter tritium.

Supplementary water samples continued to be collected in 1987 as part of the TMI Long Term Surveillance program. Composites of discharges from the liquid radwaste system (001), mixed with other station water, were sampled daily. The storm water basin onsite (005) was sampled periodically. Water from the TMI intake (006) was sampled daily for a weekly composite. Raw water from the City of Lancaster water intake downstream on the Susquehanna was sampled daily for a weekly composite.

These supplementary samples were gamma scanned by the U.S. EPA laboratory at Middletown. Gross alpha and beta, and tritium analyses were done by the DER Radiation Measurements Laboratory.

Tritium was detected routinely in discharge water samples (001) and periodically in the storm water basin (005). A trace of tritium was detected once at the downstream Lancaster intake. Gross alpha and beta results are elevated in some Lancaster water samples due to a high content of suspended solids.

THREE MILE ISLAND SURFACE WATER DATA
YORK HAVEN (8C4)
(pCi/l)

Collection Period Ending	Beta	Tritium	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-140
1/29/87	<3	<270	<4	<8	<4	<4	<9	<7/<4	<4	<5	<4	<14
2/26/87	4 +/- 1	<270	<4	<7	<4	<5	<9	<7/<4	<4	<4	<4	<13
4/02/87	<2	<270	<4	<9	<4	<5	<10	<8/<4	<4	<5	<5	<14
4/29/87	<3	<270	<4	<8	<4	<4	<9	<7/<4	<4	<5	<4	<13
5/27/87	4 +/- 2	<280	<2	<3	<2	<2	<3	<3/<2	<2	<2	<2	<6
7/01/87	4 +/- 1	<280	<2	<4	<2	<2	<4	<4/<2	<2	<2	<2	<6
7/29/87	9 +/- 2	<280	<5	<9	<5	<5	<11	<8/<5	<5	<6	<5	<16
8/26/87	7 +/- 2	<270	<2	<3	<2	<2	<3	<3/<2	<2	<2	<2	<6
9/30/87	<3	<260	<1	<3	<1	<2	<3	<2/<1	<2	<2	<2	<4
10/28/87	3 +/- 1	<300	<4	<8	<4	<4	<9	<7/<5	<5	<5	<4	<16
11/24/87	2 +/- 1	<290	<2	<3	<2	<2	<4	<3/<2	<2	<2	<2	<4
12/30/87	<3	<250	<2	<4	<2	<2	<3	<3/<2	<2	<2	<2	<7

THREE MILE ISLAND SURFACE WATER DATA
STEELTON (15J1)
(pCi/l)

Collection Period Ending	Beta	Tritium	Mn-54	Fe-59	Co-58	Co-60	Zn-65	Zr-Nb-95	I-131	Cs-134	Cs-137	Ba-140
1/29/87	<3	<270	<2	<4	<2	<2	<4	<3/<2	<2	<2	<2	<7
2/26/87	2 +/- 1	<270	<2	<4	<2	<2	<4	<3/<2	<2	<2	<2	<6
4/02/87	<2	<280	<2	<4	<2	<2	<4	<3/<2	<2	<2	<2	<6
4/29/87	2 +/- 1	<270	<2	<4	<2	<2	<4	<3/<2	<2	<2	<2	<7
5/27/87	3 +/- 1	<280	<2	<3	<2	<2	<4	<2/<2	<2	<2	<2	<5
7/01/87	3 +/- 1	<280	<2	<4	<3	<3	<5	<4/<3	<2	<2	<3	<8
7/29/87	3 +/- 1	<280	<2	<4	<2	<2	<4	<3/<2	<2	<2	<2	<6
8/26/87	4 +/- 1	<270	<2	<3	<2	<2	<3	<3/<2	<2	<2	<2	<6
9/30/87	4 +/- 2	<260	<2	<3	<2	<2	<3	<3/<2	<2	<2	<2	<6 ^(X)
10/28/87	<3	<300	<2	<3	<2	<2	<3	<3/<2	<2	<2	<2	<5
11/24/87	2 +/- 1	<290	<2	<3	<2	<2	<4	<3/<2	<2	<2	<2	<6
12/30/87	<2	<250	<2	<4	<2	<2	<4	<4/<2	<2	<2	<2	<6

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Tritium
1/01/87	<3	<3	<280
1/02/87	<3	<3	<280
1/03/87	<3	3 +/- 2	<280
1/04/87	<3	<4	<280
1/05/87	<3	<4	<270
1/06/87	<2	5 +/- 2	1930 +/- 180
1/07/87	<2	<3	1330 +/- 170
1/08/87	<2	<3	2300 +/- 180
1/09/87	<2	<3	<280
1/10/87	<2	<3	1620 +/- 180
1/11/87	<2	<3	2050 +/- 180
1/12/87	<3	<3	1980 +/- 180
1/13/87	<3	<3	1580 +/- 170
1/14/87	<3	<3	1670 +/- 180
1/15/87	<3	4 +/- 2	<280
1/16/87	<3	<4	<280
1/17/87	<3	4 +/- 2	<270
1/18/87	4 +/- 2	6 +/- 2	<280
1/19/87	<3	<3	<270
1/20/87	<3	<3	<270
1/21/87	<3	4 +/- 2	<270
1/22/87	<3	<3	<270
1/23/87	<3	<3	<280
1/24/87	<2	4 +/- 2	<280
1/25/87	<2	<3	<280
1/26/87	<2	<3	<280
1/27/87	<2	<3	<280
1/28/87	<2	3 +/- 2	<280
1/29/87	<2	<3	<280
1/30/87	<3	<3	1080 +/- 170
1/31/87	<3	<3	<270
2/01/87	<3	<3	<270
2/02/87	<3	<3	340 +/- 160
2/03/87	<3	<3	1010 +/- 170
2/04/87	<3	5 +/- 2	880 +/- 170
2/05/87	<2	3 +/- 1	390 +/- 160
2/06/87	<2	<3	1300 +/- 170
2/07/87	<2	2 +/- 1	1990 +/- 180
2/08/87	<2	<3	1140 +/- 170
2/09/87	<2	<3	<270
2/10/87	<2	<3	1030 +/- 170
2/11/87	<2	3 +/- 1	<270
2/12/87	<2	5 +/- 1	<270
2/13/87	<2	4 +/- 1	<270
2/14/87	<2	4 +/- 1	<270
2/15/87	<2	4 +/- 1	<270

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Tritium
2/16/87	<2	3 +/- 1	<270
2/17/87	<2	4 +/- 1	<270
2/18/87	<2	3 +/- 1	<270
2/19/87	<2	5 +/- 1	<270
2/20/87	<2	2 +/- 1	<280
2/21/87	<2	3 +/- 1	<280
2/22/87	<2	3 +/- 1	<280
2/23/87	<2	5 +/- 1	<270
2/24/87	<2	3 +/- 2	<270
2/25/87	<2	4 +/- 1	<270
2/26/87	<2	4 +/- 1	<270
2/27/87	<2	6 +/- 1	<270
2/28/87	<2	4 +/- 1	<270
3/01/87	<2	5 +/- 1	<270
3/02/87	<2	5 +/- 1	850 +/- 170
3/03/87	<2	3 +/- 1	1070 +/- 170
3/04/87	<2	3 +/- 1	1150 +/- 170
3/05/87	<2	3 +/- 1	740 +/- 170
3/06/87	<2	<3	640 +/- 170
3/07/87	<2	<3	1070 +/- 170
3/08/87	<2	2 +/- 1	660 +/- 170
3/09/87	<2	2 +/- 1	620 +/- 170
3/10/87	<2	4 +/- 1	<280
3/11/87	<2	3 +/- 1	<270
3/12/87	<2	4 +/- 1	<270
3/13/87	<2	3 +/- 1	<270
3/14/87	<2	4 +/- 1	<270
3/15/87	<2	3 +/- 1	<270
3/16/87	<2	3 +/- 1	<270
3/17/87	<2	<3	<270
3/18/87	<2	3 +/- 1	<270
3/19/87	<2	<3	<270
3/20/87	<2	<3	<270
3/21/87	<2	<3	<270
3/22/87	<2	<3	<270
3/23/87	<2	<3	<270
3/24/87	<2	3 +/- 2	510 +/- 160
3/25/87	<2	5 +/- 2	1010 +/- 170
3/26/87	<2	5 +/- 2	430 +/- 160
3/27/87	<2	5 +/- 2	1250 +/- 170
3/28/87	<2	5 +/- 2	470 +/- 160
3/29/87	<2	<2	1970 +/- 180
3/30/87	<2	3 +/- 1	9460 +/- 240
3/31/87	<2	3 +/- 1	7300 +/- 220
4/01/87	<2	4 +/- 1	5440 +/- 210
4/02/87	<2	2 +/- 1	<280

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Iritium
4/03/87	<2	4 +/- 1	<270
4/04/87	<2	3 +/- 1	<280
4/05/87	<2	3 +/- 1	<280
4/06/87	<2	3 +/- 1	<280
4/07/87	<2	4 +/- 1	900 +/- 170
4/08/87	<2	5 +/- 1	<270
4/09/87	<2	4 +/- 1	<270
4/10/87	<2	5 +/- 2	<280
4/11/87	<2	3 +/- 2	<280
4/12/87	1 +/- 1	3 +/- 2	<270
4/13/87	<2	2 +/- 1	<270
4/14/87	<2	4 +/- 1	<270
4/15/87	1 +/- 1	3 +/- 1	<280
4/16/87	1 +/- 1	3 +/- 1	<280
4/17/87	<2	4 +/- 1	1280 +/- 170
4/18/87	<2	2 +/- 1	<270
4/19/87	1 +/- 1	4 +/- 1	2630 +/- 190
4/20/87	<2	4 +/- 1	<270
4/21/87	<2	3 +/- 2	<280
4/22/87	<2	<3	1940 +/- 180
4/23/87	<2	<3	<280
4/24/87	<2	3 +/- 2	<280
4/25/87	<2	<3	3150 +/- 200
4/26/87	<2	4 +/- 2	2480 +/- 190
4/27/87	<2	3 +/- 2	2350 +/- 190
4/28/87	<1	4 +/- 2	960 +/- 180
4/29/87	2 +/- 1	4 +/- 2	<270
4/30/87	3 +/- 1	7 +/- 2	<270
5/01/87	1 +/- 1	5 +/- 1	<270
5/02/87	<2	3 +/- 1	<270
5/03/87	<2	5 +/- 1	<270
5/04/87	<2	3 +/- 1	<270
5/05/87	<2	<3	<270
5/06/87	<2	3 +/- 1	<280
5/07/87	<2	<3	<280
5/08/87	<3	5 +/- 2	<280
5/09/87	<2	<3	<280
5/10/87	<3	<3	<280
5/11/87	<3	3 +/- 1	<280
5/12/87	<3	3 +/- 1	<280
5/13/87	<3	5 +/- 2	8120 +/- 240
5/14/87	<3	4 +/- 2	5130 +/- 210
5/15/87	<3	5 +/- 2	2250 +/- 180
5/16/87	<3	4 +/- 2	<280
5/17/87	<4	5 +/- 2	<280
5/18/87	<3	4 +/- 2	<280
			33600 +/- 390

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

Collection Date	Alpha	Beta	Tritium
5/19/87	<3	3 +/- 2	22330 +/- 330
5/20/87	<3	4 +/- 2	1180 +/- 170
5/21/87	<3	4 +/- 2	<270
5/22/87	<2	4 +/- 2	<280
5/23/87	<2	6 +/- 2	<280
5/24/87	<3	4 +/- 2	<280
5/25/87	<2	6 +/- 2	520 +/- 170
5/26/87	<2	4 +/- 2	1270 +/- 180
5/27/87	<2	7 +/- 2	<270
5/28/87	<3	4 +/- 2	<280
5/29/87	<3	7 +/- 2	510 +/- 170
5/30/87	<3	5 +/- 2	<280
5/31/87	<3	6 +/- 2	8950 +/- 240
6/01/87	<4	5 +/- 2	1000 +/- 170
6/02/87	<3	5 +/- 2	9150 +/- 250
6/03/87	<3	6 +/- 2	4690 +/- 210
6/04/87	<3	4 +/- 2	14890 +/- 290
6/05/87	<4	7 +/- 2	26340 +/- 350
6/06/87	<3	5 +/- 2	<270
6/07/87	<3	5 +/- 2	<280
6/08/87	<3	8 +/- 2	1220 +/- 170
6/09/87	<4	6 +/- 3	380 +/- 160
6/10/87	<4	8 +/- 2	<290
6/11/87	<4	6 +/- 2	<290
6/12/87	<3	7 +/- 2	<290
6/13/87	<3	4 +/- 2	<290
6/14/87	<3	3 +/- 2	<290
6/15/87	<3	3 +/- 2	<270
6/16/87	<2	6 +/- 2	810 +/- 170
6/17/87	<2	8 +/- 2	17860 +/- 300
6/18/87	3 +/- 2	13 +/- 3	<270
6/19/87	<3	10 +/- 2	<280
6/20/87	<3	4 +/- 2	9270 +/- 240
6/21/87	<3	5 +/- 2	7960 +/- 230
6/22/87	<3	4 +/- 2	<280
6/23/87	<3	4 +/- 2	9170 +/- 240
6/23/87	<3	8 +/- 2	<280
6/24/87	<3	4 +/- 2	<280
6/25/87	<3	9 +/- 2	<280
6/26/87	<2	7 +/- 2	<280
6/27/87	<2	8 +/- 2	<280
6/28/87	<3	7 +/- 2	3660 +/- 190
6/29/87	<2	8 +/- 2	<280
6/30/87	<3	5 +/- 2	16180 +/- 290

(X)
TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

Collection Date	Alpha	Beta	Tritium
7/01/87	<3	5 +/- 2	5580 +/- 210
7/02/87	<2	6 +/- 2	840 +/- 160
7/03/87	<2	3 +/- 1	20170 +/- 310
7/04/87	<2	5 +/- 1	<280
7/05/87	<2	4 +/- 1	<280
7/06/87	<2	5 +/- 1	<280
7/07/87	<2	4 +/- 1	16350 +/- 290
7/08/87	<3	7 +/- 2	<270
7/09/87	<3	7 +/- 2	<270
7/10/87	<3	6 +/- 2	<270
7/11/87	<3	5 +/- 2	<270
7/12/87	<2	6 +/- 2	<270
7/13/87	<2	5 +/- 2	<290
7/14/87	<2	6 +/- 2	<290
7/15/87	<2	3 +/- 2	<280
7/16/87	<2	5 +/- 2	7180 +/- 230
7/17/87	<3	6 +/- 2	4700 +/- 210
7/18/87	<3	5 +/- 2	4120 +/- 210
7/19/87	<3	6 +/- 3	<280
7/20/87	<3	6 +/- 3	<280
7/21/87	<3	9 +/- 2	<290
7/22/87	<3	<4	<290
7/23/87	<3	6 +/- 3	<260
7/24/87	<3	5 +/- 3	<270
7/25/87	<3	4 +/- 3	<270
7/26/87	<3	6 +/- 3	<270
7/27/87	<3	8 +/- 2	<270
7/28/87	<3	10 +/- 2	<270
7/29/87	<3	6 +/- 2	<270
7/30/87	<3	8 +/- 2	<270
7/31/87	3 +/- 2	7 +/- 2	<270
8/01/87	2 +/- 2	9 +/- 2	1120 +/- 180
8/02/87	<3	11 +/- 2	370 +/- 170
8/03/87	<3	10 +/- 2	2820 +/- 200
8/06/87	<6	19 +/- 5	<300
8/07/87	<3	7 +/- 2	<270
8/08/87	3 +/- 2	9 +/- 2	<310
8/09/87	3 +/- 2	8 +/- 3	<310
8/10/87	<3	5 +/- 2	<280
8/11/87	<4	<5	<280
8/12/87	<4	6 +/- 3	<280
8/13/87	<4	9 +/- 3	<280
8/14/87	<3	5 +/- 3	<280
8/15/87	<3	7 +/- 3	<280
8/16/87	<4	5 +/- 2	<280
8/17/87	<3	9 +/- 3	<280

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Tritium
8/18/87	<3	7 +/- 3	<280
8/19/87	<3	5 +/- 3	<310
8/20/87	<3	7 +/- 3	<270
8/21/87	<3	9 +/- 3	<280
8/23/87	<3	9 +/- 3	<280
8/24/87	<3	6 +/- 3	4430 +/- 210
8/25/87	<3	8 +/- 3	<270
8/26/87	<3	6 +/- 3	13970 +/- 280
8/27/87	<4	<7	<270
8/28/87	<3	6 +/- 3	420 +/- 170
8/29/87	<3	5 +/- 3	<280
8/30/87	<3	7 +/- 3	<280
8/31/87	<3	<6	<280
9/01/87	<5	<5	<310
9/02/87	<5	6 +/- 3	<270
9/03/87	<5	6 +/- 3	<270
9/04/87	<5	8 +/- 3	<280
9/05/87	<4	<5	700 +/- 190
9/06/87	<3	5 +/- 3	7960 +/- 250
9/07/87	<3	6 +/- 2	34280 +/- 410
9/08/87	<4	7 +/- 3	54720 +/- 500
9/09/87	<4	7 +/- 3	9360 +/- 270
9/10/87	<3	7 +/- 2	<320
9/11/87	<3	7 +/- 2	<270
9/12/87	<3	5 +/- 2	<270
9/13/87	<3	6 +/- 2	<270
9/14/87	<2	5 +/- 1	<270
9/15/87	<2	8 +/- 2	940 +/- 200
9/16/87	<2	7 +/- 1	4090 +/- 230
9/17/87	<2	5 +/- 1	<280
9/18/87	2 +/- 1	4 +/- 1	<280
9/19/87	<2	6 +/- 1	<280
9/20/87	<2	7 +/- 1	<280
9/21/87	<2	4 +/- 1	4950 +/- 220
9/22/87	<2	6 +/- 2	3120 +/- 220
9/23/87	<2	6 +/- 1	670 +/- 190
9/24/87	<2	4 +/- 1	2040 +/- 200
9/25/87	<2	3 +/- 1	1060 +/- 190
9/26/87	<2	4 +/- 1	2820 +/- 210
9/27/87	<2	5 +/- 2	2920 +/- 210
9/28/87	<2	5 +/- 2	8050 +/- 260
9/29/87	<2	4 +/- 2	<260
9/30/87	<2	4 +/- 2	8430 +/- 260
10/01/87	<2	4 +/- 2	<260
10/02/87	<2	4 +/- 2	23400 +/- 360
10/03/87	<2	5 +/- 2	41480 +/- 460

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Tritium
10/04/87	<2	5 +/- 2	64240 +/- 530
10/05/87	2 +/- 2	9 +/- 2	52910 +/- 480
10/06/87	<4	<4	<290
10/07/87	<4	6 +/- 2	440 +/- 160
10/08/87	<3	6 +/- 2	410 +/- 170
10/09/87	<3	4 +/- 2	440 +/- 170
10/10/87	<3	7 +/- 2	<300
10/11/87	<3	6 +/- 2	<300
10/12/87	<3	6 +/- 2	<280
10/13/87	<4	6 +/- 3	<290
10/14/87	<4	<5	4170 +/- 210
10/15/87	<4	<5	4200 +/- 210
10/16/87	<4	<5	12170 +/- 280
10/17/87	<3	5 +/- 3	4890 +/- 220
10/18/87	<4	<5	3000 +/- 200
10/19/87	<4	5 +/- 3	<310
10/20/87	<4	8 +/- 2	<320
10/21/87	<4	6 +/- 2	580 +/- 180
10/22/87	<4	7 +/- 2	550 +/- 180
10/23/87	<4	6 +/- 2	290 +/- 180
10/24/87	<4	6 +/- 2	<300
10/25/87	<4	10 +/- 2	<300
10/26/87	<4	4 +/- 2	<300
10/27/87	<3	6 +/- 2	640 +/- 180
10/28/87	<3	4 +/- 2	<300
10/29/87	<3	7 +/- 3	<300
10/30/87	<3	6 +/- 2	470 +/- 170
10/31/87	<3	6 +/- 2	3950 +/- 210
11/01/87	<3	6 +/- 2	<300
11/02/87	<2	3 +/- 2	6200 +/- 230
11/03/87	<3	8 +/- 2	9910 +/- 250
11/04/87	<3	7 +/- 2	7350 +/- 230
11/05/87	<3	6 +/- 2	<290
11/06/87	<3	7 +/- 2	350 +/- 170
11/07/87	<3	5 +/- 2	360 +/- 170
11/08/87	<4	5 +/- 2	280 +/- 170
11/09/87	<4	4 +/- 2	400 +/- 170
11/10/87	<4	5 +/- 2	<290
11/11/87	<4	4 +/- 2	<290
11/12/87	<4	5 +/- 2	<290
11/13/87	<3	<4	310 +/- 170
11/14/87	<2	6 +/- 2	370 +/- 170
11/15/87	<4	4 +/- 2	300 +/- 170
11/16/87	<3	5 +/- 2	5640 +/- 220
11/17/87	2 +/- 1	6 +/- 2	6730 +/- 230
11/18/87	<2	4 +/- 2	4250 +/- 210

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 001

(X)

Collection Date	Alpha	Beta	Tritium
11/19/87	<2	<3	<280
11/20/87	<2	4 +/- 2	290 +/- 170
11/21/87	<4	12 +/- 3	<290
11/22/87	1 +/- 1	6 +/- 2	<290
11/23/87	2 +/- 1	7 +/- 2	<290
11/24/87	<3	4 +/- 2	4160 +/- 220
11/25/87	<2	2 +/- 1	44280 +/- 440
11/26/87	<2	5 +/- 1	41120 +/- 430
11/27/87	<2	4 +/- 1	90850 +/- 610
11/28/87	<2	3 +/- 1	22800 +/- 340
11/29/87	<2	4 +/- 1	9090 +/- 250
11/30/87	<2	4 +/- 1	11790 +/- 240
12/01/87	<2	5 +/- 1	3070 +/- 180
12/02/87	<2	3 +/- 1	560 +/- 150
12/03/87	<2	3 +/- 1	<280
12/04/87	<2	4 +/- 1	<300
12/05/87	<2	<3	<290
12/06/87	<2	<3	<280
12/07/87	<2	3 +/- 1	<280
12/08/87	2 +/- 1	4 +/- 1	<280
12/09/87	<2	4 +/- 1	<280
12/10/87	<2	4 +/- 1	<280
12/11/87	1 +/- 1	3 +/- 1	<280
12/12/87	<2	4 +/- 1	430 +/- 150
12/13/87	<2	4 +/- 1	2730 +/- 170
12/14/87	<2	4 +/- 1	5010 +/- 190
12/15/87	<2	3 +/- 1	11940 +/- 240
12/16/87	<2	4 +/- 1	2800 +/- 170
12/17/87	<2	4 +/- 1	<290
12/18/87	<2	3 +/- 1	<280
12/19/87	<2	4 +/- 1	450 +/- 150
12/20/87	<2	4 +/- 1	570 +/- 150
12/21/87	<2	5 +/- 1	<280
12/22/87	<2	7 +/- 2	540 +/- 150
12/23/87	<2	<3	630 +/- 150
12/24/87	<2	4 +/- 2	<250
12/25/87	<2	2 +/- 1	<250
12/26/87	<2	<3	<250
12/27/87	<2	3 +/- 1	4820 +/- 190
12/28/87	<2	3 +/- 1	8390 +/- 220
12/29/87	<2	4 +/- 1	1150 +/- 160
12/30/87	<2	2 +/- 1	7540 +/- 210
12/31/87	<2	<3	7270 +/- 210
		2 +/- 1	<260

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 005

(X)

Collection Date	Alpha	Beta	Tritium
1/06/87	<9	<10	<270
1/09/87	<5	<6	380 +/- 160
1/13/87	<5	<9	<280
1/16/87	<7	<9	360 +/- 160
1/20/87	<4	8 +/- 3	<280
3/03/87	3 +/- 2	7 +/- 2	<280
3/06/87	2 +/- 1	6 +/- 1	<270
3/10/87	2 +/- 1	3 +/- 2	<270
3/13/87	<2	3 +/- 1	<280
3/17/87	<2	4 +/- 2	<270
3/20/87	1 +/- 1	3 +/- 2	<270
3/24/87	<2	<3	<270
3/27/87	<2	3 +/- 2	<270
3/31/87	<2	5 +/- 2	<280
4/03/87	3 +/- 1	7 +/- 2	590 +/- 170
4/07/87	2 +/- 1	4 +/- 1	<280
4/10/87	<2	4 +/- 1	<270
4/14/87	2 +/- 1	8 +/- 2	350 +/- 160
4/17/87	<2	6 +/- 1	<280
4/21/87	1 +/- 1	4 +/- 1	<280
4/24/87	<2	3 +/- 2	<280
4/28/87	<2	4 +/- 2	<280
5/01/87	2 +/- 1	4 +/- 2	<270
5/05/87	3 +/- 1	8 +/- 2	<270
5/08/87	2 +/- 1	<3	<280
5/12/87	<2	2 +/- 1	<280
5/15/87	<3	5 +/- 2	<280
5/19/87	<3	3 +/- 1	<280
5/22/87	<2	3 +/- 1	<270
5/26/87	<2	3 +/- 1	<270
5/29/87	<2	3 +/- 1	<270
6/02/87	<2	3 +/- 1	<280
6/05/87	<2	<3	<270
6/09/87	<2	3 +/- 2	<270
6/12/87	<3	4 +/- 1	<290
6/16/87	<2	<3	<290
6/19/87	<2	<3	<270
6/23/87	4 +/- 2	16 +/- 2	<280
6/26/87	<2	3 +/- 1	<280
6/30/87	<2	4 +/- 1	<280
7/02/87	<2	3 +/- 1	<280
7/07/87	<2	3 +/- 1	<280
7/10/87	<2	6 +/- 1	<270
7/11/87	<2	4 +/- 2	<270
7/17/87	<2	4 +/- 2	<290
7/21/87	<3	5 +/- 2	<280

9/8/92

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 005

(X)

Collection Date	Alpha	Beta	Tritium
7/24/87	<2	4 +/- 2	<270
7/28/87	<2	<3	<270
7/31/87	2 +/- 1	5 +/- 1	<270
8/04/87	2 +/- 1	5 +/- 1	<280
8/06/87	<3	6 +/- 2	<300
8/11/87	<2	5 +/- 1	<310
8/14/87	<2	6 +/- 2	<290
8/18/87	<2	3 +/- 1	<280
8/21/87	<2	6 +/- 2	<280
8/25/87	<2	6 +/- 1	<280
8/28/87	<2	5 +/- 2	<270
9/01/87	<2	4 +/- 2	<280
9/04/87	<3	4 +/- 2	<270
9/08/87	2 +/- 1	3 +/- 1	<280
9/11/87	3 +/- 1	5 +/- 1	<280
9/15/87	2 +/- 1	6 +/- 1	<270
9/18/87	4 +/- 2	12 +/- 2	<280
9/22/87	<2	5 +/- 1	<280
9/25/87	<2	3 +/- 1	<260
9/29/87	<2	3 +/- 1	<260
10/02/87	<2	3 +/- 1	<260
10/06/87	<3	3 +/- 1	590 +/- 180
10/09/87	<3	3 +/- 2	<290
10/13/87	<2	4 +/- 1	410 +/- 170
10/16/87	<2	<3	400 +/- 180
10/20/87	<2	<3	420 +/- 180
10/23/87	<2	4 +/- 1	<320
10/27/87	<2	3 +/- 1	<300
10/30/87	<2	3 +/- 1	<300
11/03/87	<2	<3	<300
11/06/87	<2	<3	<300
11/10/87	<2	<3	<290
11/13/87	<3	3 +/- 2	300 +/- 170
11/17/87	<3	<4	<280
11/20/87	<3	6 +/- 2	<280
11/24/87	3 +/- 2	<5	<290
11/27/87	<4	<5	<300
12/01/87	<3	4 +/- 2	<300
12/04/87	1 +/- 1	5 +/- 2	<300
12/08/87	2 +/- 1	4 +/- 1	<280
12/11/87	2 +/- 1	4 +/- 1	<280
12/15/87	2 +/- 1	4 +/- 1	<280
12/18/87	2 +/- 1	7 +/- 2	<280
12/22/87	<2	5 +/- 1	<250
12/24/87	<2	4 +/- 1	<250
12/29/87	3 +/- 1	4 +/- 1	<250

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 006


Collection Date	Alpha	Beta	Tritium
1/03/87	<2	<3	<280
1/10/87	<3	<3	<270
1/17/87	<2	<3	<280
1/24/87	<3	<3	<270
1/24/87	<3	4 +/- 2	<280
1/31/87	<2	2 +/- 1	<270
2/07/87	<2	4 +/- 1	<270
2/14/87	<2	<2	<280
2/21/87	<2	4 +/- 1	<270
2/28/87	<2	<3	<270
3/07/87	<2	<3	<270
3/14/87	<2	3 +/- 1	<270
3/21/87	<2	<3	<280
3/26/87	<2	<2	<280
3/27/87	2 +/- 1	4 +/- 2	<280
3/28/87	<2	<2	<280
3/29/87	<2	<2	<280
3/31/87	<2	2 +/- 1	<280
4/04/87	<2	<3	<270
4/11/87	<2	3 +/- 1	<280
4/18/87	<1	<3	<270
4/25/87	<2	<2	<270
5/02/87	<2	<3	<280
5/09/87	<2	2 +/- 1	<270
5/16/87	<2	<3	<270
5/23/87	<2	3 +/- 2	<280
5/23/87	<2	4 +/- 2	<270
5/30/87	<2	<3	<270
6/06/87	<3	3 +/- 1	<290
6/13/87	<2	2 +/- 1	<270
6/19/87	<2	3 +/- 2	<280
6/20/87	<2	3 +/- 1	<280
6/22/87	<3	3 +/- 2	<280
6/26/87	<2	3 +/- 1	<280
6/27/87	<2	4 +/- 1	<280
6/28/87	<2	3 +/- 1	<280
7/04/87	<2	5 +/- 2	<270

TMI SUPPLEMENTARY WATER DATA
STATION DISCHARGE 006

(X)

Collection Date	Alpha	Beta	Tritium
7/11/87	<1	<2	<280
7/18/87	<2	5 +/- 2	<270
7/25/87	1 +/- 1	4 +/- 1	<280
8/01/87	<2	5 +/- 2	<270
8/07/87	<3	7 +/- 2	<280
8/08/87	<3	4 +/- 2	<270
8/08/87	<3	7 +/- 2	<280
8/09/87	<3	4 +/- 2	<280
8/10/87	<3	4 +/- 2	<280
8/11/87	<3	5 +/- 2	<280
8/12/87	<3	5 +/- 2	<280
8/13/87	<2	4 +/- 2	<280
8/14/87	<3	<3	<280
8/17/87	<9	14 +/- 6	<280
8/17/87	<3	10 +/- 3	<280
8/22/87	3 +/- 2	6 +/- 2	<280
8/29/87	<3	3 +/- 2	<280
9/05/87	<2	6 +/- 2	<270
9/12/87	<3	4 +/- 1	<260
9/19/87	<2	3 +/- 1	<260
9/26/87	<2	3 +/- 1	<290
10/03/87	<2	3 +/- 1	<280
10/10/87	<2	4 +/- 1	<290
10/17/87	<3	3 +/- 1	<300
10/24/87	<2	<3	<300
10/31/87	<2	4 +/- 2	<290
11/05/87	<2	3 +/- 1	<280
11/06/87	<2	2 +/- 1	<280
11/07/87	<2	3 +/- 1	<280
11/07/87	<2	2 +/- 1	<290
11/14/87	<2	3 +/- 1	<300
11/21/87	<2	<3	<300
11/28/87	<2	<3	<280
12/05/87	<2	<2	<280
12/12/87	<2	<2	<280
12/19/87	<2	<3	<250
12/26/87	1 +/- 1	2 +/- 1	<250

CITY OF LANCASTER FILTRATION PLANT

Collection Date	Alpha	Beta	 Tritium
1/03/87	<2	<3	<270
1/10/87	20 +/- 12	49 +/- 13	<280
1/17/87	<2	3 +/- 2	<280
1/24/87	<2	<3	<280
1/31/87	<3	4 +/- 2	<270
2/07/87	<2	4 +/- 2	<270
2/14/87	<2	2 +/- 1	<270
2/21/87	<2	3 +/- 1	<270
2/28/87	<2	<3	<270
3/07/87	<2	6 +/- 2	<280
3/14/87	<2	4 +/- 2	<270
3/21/87	<2	3 +/- 1	<270
3/28/87	<2	3 +/- 1	<280
4/04/87	2 +/- 1	4 +/- 2	<280
4/11/87	5 +/- 2	10 +/- 3	<280
4/18/87	2 +/- 1	4 +/- 2	<280
4/25/87	<1	<3	<270
5/02/87	<2	<3	<280
5/09/87	<3	<3	<280
5/16/87	<3	2 +/- 1	<270
5/23/87	<2	3 +/- 2	<280
6/04/87	<2	4 +/- 2	<270
6/06/87	<2	<3	<270
6/13/87	<2	3 +/- 1	<270
6/20/87	<2	3 +/- 1	<280
7/01/87	<2	3 +/- 1	<280
7/04/87	<2	4 +/- 1	<270
7/05/87	<2	3 +/- 2	<280
7/18/87	<2	<3	<270
7/25/87	<2	3 +/- 1	<280
8/05/87	<3	3 +/- 2	<300
8/08/87	<2	4 +/- 2	<280
8/15/87	<2	4 +/- 2	<280
8/22/87	<3	<3	<270
8/29/87	<4	<3	<270
9/05/87	<2	5 +/- 2	<270
9/12/87	<2	5 +/- 1	<280
9/19/87	<2	3 +/- 1	<260
9/26/87	<2	<3	<260
10/03/87	<3	3 +/- 2	<290
10/10/87	<2	<3	430 +/- 180
10/17/87	<2	5 +/- 1	<320
10/24/87	<2	3 +/- 2	<300
10/31/87	<2	<3	<300
11/14/87	<2	4 +/- 1	<290
11/16/87	<3	2 +/- 1	<290
11/21/87	<2	<3	<300
11/28/87	5 +/- 2	5 +/- 2	<300
12/05/87	<2	<3	<280
12/12/87	<2	3 +/- 1	<280
12/19/87	<2	<3	<250
12/26/87	<2	<3	<250

(X)

THREE MILE ISLAND MILK SAMPLING

Milk sampling near Three Mile Island Nuclear Station continued monthly at two farms in 1987. The grab samples of raw milk were analyzed by gamma spectroscopy.

Cesium-137 was detected periodically at both stations throughout the year. This radioisotope is a major constituent in fallout from weapons testing and the accident at Chernobyl in April, 1986. Similar data were observed in routine milk samples at all nuclear power stations in Pennsylvania.

Natural Potassium-40 concentrations are equivalent to a potassium content of 1.4 to 1.8 grams per liter.

THREE MILE ISLAND MILK SAMPLING DATA
(pCi/l)

Station Number	Collection Date	I-131	Cs-134	Cs-137	Ba-140	K-40
7B1	1/15/87	<2	<3	5 +/- 2	<7	1390 +/- 70
	2/12/87	<2	<3	5 +/- 2	<8	1420 +/- 70
	3/12/87	<3	<3	<3	<8	1390 +/- 70
	4/09/87	<2	<3	6 +/- 3	<8	1350 +/- 70
	5/21/87	<2	<3	4 +/- 2	<7	1320 +/- 60
	6/04/87	<3	<3	<3	<9	1340 +/- 70
	7/16/87	<2	<2	<2	<7	1410 +/- 60
	8/13/87	<2	<2	<2	<6	1480 +/- 50
	9/10/87	<2	<3	<2	<6	1320 +/- 50
	10/15/87	<2	<3	<2	<7	1370 +/- 60
	11/12/87	<2	<3	<3	<7	1340 +/- 50
	12/10/87	<2	<3	<2	<7	1360 +/- 50
14G1	1/15/87	<2	<3	2 +/- 2	<6	1360 +/- 60
	2/12/87	<3	<3	5 +/- 3	<9	1330 +/- 80
	3/12/87	<3	<3	<3	<8	1280 +/- 70
	4/09/87	<3	<3	4 +/- 2	<9	1480 +/- 70
	5/21/87	<3	<3	<3	<8	1310 +/- 70
	6/04/87	<2	<3	<3	<6	1380 +/- 60
	7/16/87	<2	<2	<2	<7	1530 +/- 60
	8/13/87	<2	<3	<3	<8	1380 +/- 60
	9/10/87	<2	<3	2 +/- 1	<6	1210 +/- 50
	10/15/87	<2	<2	<2	<7	1390 +/- 50
	11/24/87	<2	<3	<3	<5	1470 +/- 60
	12/10/87	<2	<3	<3	<7	1350 +/- 60

THREE MILE ISLAND FISH, PRODUCE AND SEDIMENT

During the reporting period, fish and sediment from the Susquehanna River and locally grown produce were collected by the utility and split with BRP.

The fish sample was a composite of white crappie, smallmouth bass and rock bass. The produce sample, raw cabbage, was collected from a truck garden 0.8 mile south-southeast of the station. The sediment sample was collected downstream of the discharge point. Analysis was by gamma spectroscopy.

The Cesium-137 detected in the sediment and fish samples could be attributed to either fallout or station discharges. No reactor-related radioisotopes were detected in the produce sample.

THREE MILE ISLAND FISH, PRODUCE & SEDIMENT DATA
(pCi/kg)

Isotope	Fish* 4/22/87 to 6/11/87	Produce* 7/20/87	Sediment** 6/04/87
I-131	<323	<10	-
Mn-54	<8	<6	<23
Fe-59	<32	<15	<86
Co-58	<10	<6	<30
Co-60	<8	<6	<25
Zn-65	<19	<13	<50
Zr-Nb-95	<19/<17	<9/<6	<62/<63
Cs-134	<8	<7	<24
Cs-137	8 +/- 6	<6	362 +/- 26
Ba-140	<267	<29	-

* Wet weight

** Dry weight

Enclosure 4

NARRATIVE STATEMENT

Purpose

The purpose of this proposal is to provide a mechanism by which the U. S. Environmental Protection Agency can transfer to the Commonwealth of Pennsylvania and the Milton S. Hershey Medical Center its environmental surveillance and dissemination of information to the public for the remainder of the decontamination of the Three Mile Island Unit II.

Participants

U. S. Environmental Protection Agency (EPA)
Office of Radiation Programs (ORP)
Eastern Environmental Radiation Facility (EERF)

U. S. Department of Energy (DOE)

Commonwealth of Pennsylvania
Department of Environmental Resources (DER)
Bureau of Radiation Protection (BRP)

The Pennsylvania State University (PSU)
The Milton S. Hershey Medical Center (HMC)
Department of Radiology
Division of Health Physics

Background

EPA has conducted an environmental monitoring program in the vicinity of TMI since March 31, 1979. On April 13, 1979, EPA was given responsibility by the White House for coordinating the Federal monitoring effort at TMI.

EPA is committed to maintain a monitoring program at TMI until such time as the fuel and debris have been removed from the Unit 2 reactor, sealed in shipping containers, and removed from the Island. When the commitment was originally made in various meetings circa 1980 by ORD officials, the program was estimated to last 3-4 years, and when reaffirmed by Mr. W. Ruckelshaus in 1984, the end of fuel shipment was estimated to be late 1987 or early 1988. Current "official" estimates are for late 1988, however further delay is probable. This agreement is designed to provide the necessary resources to meet EPA's commitment to have a monitoring program until the fuel is shipped without the expense of an onsite Agency staff and an office. This will be accomplished by adding the required analytic and sample collection capability to the existing infrastructure of HMC.

Program to be Conducted

A. Ambient gamma radiation monitoring

1. Doserate monitoring - Reuter Stokes RSS1011 "Sentri" System.

The 13 "Sentri" units will be kept operating as free-standing, independent units with stripchart readout. The units will be checked weekly by HMC personnel and charts replaced monthly. Charts will be visually examined if requested by PA-DER and will be kept until final closeout of the monitoring project. "Sentri" operation will continue until fuel debris shipment is completed.

When fuel debris shipment is completed, the "Sentri" units will be dismantled and returned to EERF (ORP), if requested.

2. Cumulative ambient gamma radiation dose - Thermoluminescent dosimeters (TLDs).

The present program will be continued until the fuel debris is shipped. EPA (ORP-LV) will continue to furnish TLDs quarterly, readout the TLUs, and furnish data on floppy disc and hard copy (EERF, HMC, PA-DER), and TLD holders. HMC will changeout TLDs at 34 locations, complete data forms, and return TLDs and their transportation controls from the previous quarter to ORP-LV. HMC will replace TLD holders when necessary.

B. Air Monitoring

1. Constant volume samplers - particulates and radioiodine.

Particulate and radioiodine monitoring will be continued with weekly sample changeout until the later of (1) completion of shipment of fuel debris or (2) completion of disposal of "accident water" and then terminated. HMC will maintain samplers, changeout filters and charcoal cartridges and analyze them, in weekly composites, by gamma spectroscopy. Samplers and sampler shelters will be retained by PA-DER or HMC upon mutual agreement.

2. High volume air sampling.

The samplers at the TMI Observation Center and at Goldsboro will be operated as part of the ERAMS, by HMC and EERF, until the later of (1) completion of fuel debris shipment or (2) completion of "accident water" disposal. HMC will change filters twice weekly, conduct the required "Field Estimate" and mail the filters to EERF where lab analyses, including quarterly analysis for U and Pu isotopes, will be done.

3. Tritium (HTO) in air.

Six samplers will be operated at Middletown, TMI Observation Center, Goldsboro, Red Hill and Wernersville and York Haven until the later of (1) completion of fuel debris shipment or (2) completion of disposition of "accident water". Sample collection and analytical equipment will be retained by HMC or PA-DER as determined by the Director, Bureau of Radiation Protection, PA-DER.

C. Water Monitoring

1. General

Unless otherwise indicated, water monitoring will continue until the later of (1) completion of fuel debris shipment or (2) completion of the disposition of "accident water."

The analysis of water samples will include: (1) high resolution gamma spectroscopy; (2) gross alpha radioactivity determination; (3) gross beta radioactivity determination; (4) HTO (tritiated water) determination; and (5) strontium-90 determination on quarterly composites from each location. Analyses will be done at HMC except for the strontium-90 which will be done at EERF.

2. TMI 001 Industrial Outfall

a. Flow-through gross gamma radioactivity monitor.

The operation of this monitor will be continued with local strip chart readout by HMC personnel. The system will be flushed out monthly to prevent background buildup from silt accumulation.

b. Continuous sampler

Collection of daily samples will be continued, using the automated system which collects four consecutive 24-hour samples. The samples will be picked up twice weekly, returned to the HMC lab and analyzed as a weekly composite. If the gamma spectroscopic analysis of the weekly composite is positive for reactor origin radionuclides, the daily samples making up that composite will be gamma counted to determine the date of and more properly quantify the release.

3. TMI water treatment plant intake

This unit is similar to the TMI Outfall continuous sampler and will be operated on the same schedule.

4. TMI East Dike Runoff Pond (Storm Water Basin).

Collection and analysis of a weekly grab sample will be continued except that no samples will be collected when the pond is frozen.

5. Lancaster water supply

HMC will continue the analysis of weekly composite samples (250 ml/8hr.) that are collected and delivered to the HMC lab by City of Lancaster employees.

D. Periodic Report

HMC will provide a single monthly report of data collected. This report will replace both the monthly "Environmental Newsletter" and the weekly interim data report sent to the NRC, PA-DER and the Mayor of Lancaster. The distribution of this new monthly report will include the 250 individuals on the current mailing list, NRC, PA-DER and the Mayor of Lancaster. Also 40 copies of the report will be mailed to the Capitol Press Room in Harrisburg, Pennsylvania.

Resources Provided

EPA will provide to HMC the following equipment that is currently located at the TMI Field Station (this equipment will be retained by HMC at completion of this agreement):

Printer and Computer Terminal
IBM PC/XT Computer
Tritium in Air Samplers (6)
Wall Assembly - Lab Furniture in prep lab
Topaz power systems
Mettler 400g top-loading balance
Mettler PK16 electronic balance
45 gallon flammable storage cabinet
Labconco fiberglass fume hood
Frigidaire refrigerator
Kenmore freezer
Fisher lab oven
Model 820 KSR TI terminal
Canberra nimbin

Gamma Products lead shield
N. D. Model 620 MCA
TI 743KSR Thermal printer
Tracor Model 1710 MCA
Tracor Preamp
Elgar 300 B A/C line conditioner
Keithley multimeter
Keithley digital electrometer
Tektronix oscilloscope
IBM Selectric typewriter
Kodak Carousel projector
Kodak Ectograph Audioviewer
projector
IBM PC/XT system



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555
EDO Principal Correspondence Control

ACTION

FROM:

DUE: 06/12/89

EDO CONTROL: 0004519
DOC DT: 05/23/89
FINAL REPLY:

BARBARA HAYS, CHAIR
PENNSYLVANIA CHAPTER
SIERRA CLUB

TO:

CHAIRMAN ZECH

FOR SIGNATURE OF:

** GRN **

CRC NO: 89-0512

MURLEY

DESC:

ROUTING:

REQUEST STATUS REPORT ON CURRENT AND PROPOSED
MONITORING IN TMI AREA

RUSSELL, RI

DATE: 05/30/89

ASSIGNED TO:

CONTACT:

NRR

MURLEY

SPECIAL INSTRUCTIONS OR REMARKS:

NRR RECEIVED: MAY 30, 1989
ACTION: DRPR:VARGA

NRR ROUTING: MURLEY/SNIEZEK
MIRAGLIA
PARTLOW
CRUTCHFIELD
GILLESPIE
MOSSBURG

ACTION

DUE TO NRR DIRECTOR'S OFFICE

BY June 7, 1989

OFFICE OF THE SECRETARY
CORRESPONDENCE CONTROL TICKET

PAPER NUMBER: CRC-89-0512 LOGGING DATE: May 26 89

ACTION OFFICE: EDO

AUTHOR: B. Hays

AFFILIATION: PA (PENNSYLVANIA)

LETTER DATE: May 23 89 FILE CODE: ID&R-5 TMI

SUBJECT: Reg status rpt on current and proposed emergency
monitoring devices in the TMI area by GPU, the NRC
and other government agencies

ACTION: Appropriate

DISTRIBUTION: RF, Docket

SPECIAL HANDLING: None

NOTES:

DATE DUE:

SIGNATURE: DATE SIGNED:

AFFILIATION:

Rec'd Off. EDO

Date 5-30-89

Time 7:30