

DETROIT EDISON - FERMI 2
AUTOMATED RECORD MANAGEMENT
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Ref: ca6076

A045

PROTECTIVE ACTION RECOMMENDATIONS

Revision Summary

- 1) Made editorial changes throughout the text including Enclosures A and B. No revision bars have been used to mark these changes.
- 2) Added step 7.2 to direct use of "Evaluation Considerations for PAR Effectiveness" block in Enclosure A.
- 3) Modified wording in Enclosure A to reflect the addition of step 7.2.

Implementation Plan

- 1) This procedure goes into effect upon issuance.

Attachments - None

CM

Enclosures

A	02/08/01	PAR Flowchart
B	02/08/01	Downwind Affected Sector to Area Conversion Table
C	01/27/98	Protective Action Areas
D	01/27/98	EF 2 10-Mile EPZ Evacuation Time Estimates Summary
E	01/27/98	EF 2 10-Mile EPZ Population Analysis
F	11/13/00	Schools Within the 10-Mile EPZ
G	11/13/00	Special Facilities Within the 10-Mile EPZ
H	11/13/00	Recreation Areas, Motels, and Miscellaneous Facilities Within the 10-Mile EPZ
I	01/27/98	Representative Shielding Factors From a Gamma Cloud Source
J	01/27/98	Inhalation Shielding Factors for a Wood House, Snug Doors, Closed Windows (Thyroid)

Information and Procedures				
DSN EP-545	Revision 15	DCR # 01-0316	DTC TPEPT	File # 1703.10
IP Code I	Date Approved 3-1-01	Released By D. Adams/s/	Date Issued 3-1-01	Recipient 935

CONTROLLED

1.0 PURPOSE

To provide guidelines for formulating and recommending appropriate protective actions for the general public in the event of a General Emergency.

2.0 USE REFERENCES

2.1 EP-290, Emergency Notifications

3.0 ENTRY CONDITIONS

3.1 A Site Area Emergency or General Emergency is declared.

4.0 GENERAL INFORMATION

4.1 Protective actions (evacuation and/or sheltering) are required for the affected areas of the general public at the General Emergency declaration, and are recommended to local and/or state authorities as appropriate.

4.2 Protective Action Recommendation (PAR) formulation involves an assessment of risk to the general public. Appropriate recommendations are determined using Enclosure A, PAR Flowchart, which considers risk assessment based on two primary indicators.

4.2.1 Dose Projections

1. Dose projections are classified as "Actual" or "Potential".
 - a. **Actual** doses are based on radioactivity actually being released from the plant. They are calculated using either effluent radiation monitor readings (normal), grab sample results, or actual field measurements.
 - b. **Potential** doses are based on radioactivity in primary containment available for release. They are calculated using Containment High Range Radiation Monitors (CHRRMs) or containment atmosphere grab sample results.

2. PAR decision making may be based on an estimate of radiation exposure an individual might receive over an eight hour period in comparison to a Protective Action Guideline (PAG).

- a. A PAG is that level of exposure that an individual might receive that warrants a specific protective action to be implemented.
- b. PAG values are expressed in units of dose and represent the risk of health effects to the exposed population.
- c. PAG values are as follows:

	Lower Level	Upper Level
• TEDE	1R	5R
• Adult Thyroid	5R	25R

- d. A projected dose greater than the lower PAG values but less than the upper PAG values is used to initiate PAR decision-making and **normally** requires an evacuation.
 - e. A projected dose greater than the upper PAG value represents the greatest risk to the public and normally requires an evacuation under all circumstances. This trigger point is **not** considered by facility personnel.
3. The risk associated with a projected dose that exceeds a PAG value is generally higher than the risk associated from an evacuation.
4. When projected doses exceed the PAG values at a distance greater than 10 miles, manual dose calculations may be used to determine the exact affected areas and distances.
5. Enclosure A reflects analysis of dose projections in comparison to the PAGs at 5 miles. This is because the minimum PAR due to dose projections extends to the downwind affected areas out to 5 miles.

4.2.2 Plant Status

1. PAR decision-making also includes an assessment of plant conditions, specifically core damage estimates.
2. The plant conditions, described on the "Plant Status" side of Enclosure A, represent the greatest risk to the general public and indicate a "severe accident" is in progress or projected (>20% gap release).
3. The risk due to the potential radiation exposure from a severe accident is reduced by the implementation of protective actions.
4. PAR decision-making based on plant status represents the desired proactive approach to the protection of the public. It focuses the decision-maker on the likelihood of radiation exposure thereby offering the greatest reduction of risk.
5. Careful evaluation of plant conditions is needed to properly determine if a severe accident is in progress or projected. This evaluation may include, but is not limited to:
 - a. Status of injection capabilities
 - b. Reactor water level
 - c. CHRRMs
 - d. Core damage estimates such as EP-547, "Rapid Estimate of Core/Fuel Damage Based on Containment High Range Radiation Monitor," or dose assessment program
6. Severe accidents (>20% gap release) reflect an amount of radioactivity that may present an unacceptable risk to the general health of the public. These accidents would require evacuation of those close to the plant and sheltering of further out areas should later evacuations be needed.
7. Analysis of potential primary containment failure during a severe accident may prove to be extremely difficult or impossible to predict due to plant conditions are outside of plant design. Therefore, status of primary containment is not considered for the initial PAR development.

8. Core melt sequences represent the greatest risk to the health of the general public. Activity produced from these sequences, if released, can produce severe early health effects and necessitates immediate protection of the public.

4.2.3 PARs must be continually evaluated for effectiveness as conditions change or more information becomes available.

1. If substantial core damage is projected or detected ($\geq 20\%$) after a PAR based on dose projections has been made, full consideration must be given to the plant status PAR determination in order to assure PAR effectiveness.
2. If dose projections become available after a PAR based on plant status has been made, full merit must be given to the impact of dose calculations and the corresponding PAR in order to assure PAR effectiveness.
3. When differing PARs are formulated between using dose projections and plant status, the more stringent PAR is normally communicated.
4. Meteorological data and the Offsite Radiological Emergency Team (RET) survey also provide useful information for PAR development. Each provides information on exact plume position.
5. Current offsite hazards may also exist that might impact protective actions. The presence of physical or environmental hazards (e.g., tornadoes, ice storms, road hazards, etc.) should be communicated to offsite authorities.
6. The current status of emergency response efforts can provide insight to future PARs. Successful (or failed) efforts can provide decision makers with data to help determine likelihood of further core damage.

- 4.3 Other considerations may be involved when evaluating the effectiveness of a PAR and are normally used by **state** decision-makers.

NOTE: Enclosures F, G, and H represent information maintained and used by offsite authorities. Data contained in these enclosures may not reflect current status (i.e., student population, school name, etc.). The applicable offsite authority may be contacted for the most current information.

- 4.3.1 Certain members of the general public may be at a greater risk from an evacuation or evacuation efforts may take much longer. These members are identified in the following:

1. Enclosure F, Schools Within the 10-Mile EPZ
2. Enclosure G, Special Facilities Within the 10-Mile EPZ
3. Enclosure H, Recreation Areas, Motels, and Miscellaneous Facilities Within the 10-Mile EPZ

- 4.3.2 Evacuations are most effective if completed before plume arrival.

1. Enclosures D and E identify evacuation time estimates and total population which may be useful to evaluate evacuation effectiveness.

- 4.3.3 Dose received before PAR implementation is normally not used for evaluations.

- 4.3.4 In cases where evacuations are not prudent, sheltering may be appropriate.

1. Enclosure I, Representative Shielding Factors From a Gamma Cloud Source, and Enclosure J, Inhalation Shielding Factors for a Wood House, Snug Doors, Closed Windows (Thyroid), may be used to evaluate sheltering effectiveness by multiplying projected Total Effective Dose Equivalent (TEDE) and adult thyroid dose respectively by the Enclosure's shielding factors.

- 4.4 Protective actions for the early phase of a General Emergency are prescribed for the 10-Mile Emergency Planning Zone (EPZ) surrounding the site.

- 4.4.1 For planning purposes, the EPZ is divided into concentric rings of 2, 5, and 10 miles.

- 4.4.2 The EPZ is also divided into sixteen 22.5° sectors.
- 4.4.3 The EPZ is further divided into five Protective Action Areas (PAAs) as shown in Enclosure C.
- 4.4.4 When making PARs, the minimum area considered is the PAAs located in the 2-mile radius, and the projected plume's centerline sector, and two adjacent sectors out to five miles.
 - 1. When developing PARs for "Loss of Physical Control of the Plant" (HG1), the minimum area considered is the PAA located in the 2-mile radius (Area 1).
 - 2. If the projected dose exceeds a PAG value >10 miles away, adhoc protective actions would be developed in conjunction with offsite authorities.
- 4.4.5 More stringent recommendations may be necessary as more information is known, such as better understood accident sequence, presence of significant particulate fission products or radioiodine, or the presence of an unmonitored or unfiltered release path.
- 4.4.6 Once a PAR has been determined **and** communicated, less stringent recommendations are normally not considered or used.
- 4.5 Responsibility for PARs
 - 4.5.1 Detroit Edison decision-makers only **recommend** protective actions. State decision-makers make the final decision on what protective action to implement.
 - 4.5.2 If the Technical Support Center (TSC) and Emergency Operations Facility (EOF) are **not** functional:
 - 1. The Shift Technical Advisor evaluates available information and advises the Emergency Director in matters related to protective actions.
 - 2. The Emergency Director is responsible for making final recommendation to local and/or state authorities as appropriate.

4.5.3 If the TSC is functional and the EOF is **not** functional:

1. The Radiation Protection Advisor and/or Technical Engineer, as appropriate, evaluate available information and advise the Emergency Director in matters related to protective actions.
2. The Emergency Director is responsible for making a final recommendation to local and/or state authorities as appropriate.

4.5.4 If the EOF is functional:

1. The Radiation Protection Coordinator evaluates available information and advises the Emergency Officer in matters related to protective actions. The Nuclear Operations Advisor should assist as appropriate.
2. The Emergency Officer is responsible for making a final recommendation to local and/or state authorities as appropriate.

4.5.5 PARs are made to the State Emergency Operations Center (SEOC) if the SEOC is functional.

1. Recommendations will be discussed with the State Emergency Director before issuance, when time permits.
2. The State Emergency Director will consider recommendations and issue a Protective Action Order, when appropriate, acting with the delegated authority of the Governor.

4.5.6 PARs are made directly to Wayne and Monroe Counties when the SEOC is **not** functional.

1. Recommendations will be discussed with county officials before issuance, when time permits.
2. When deemed appropriate, recommendations will be passed on to the public by county officials.

5.0 IMMEDIATE ACTIONS

5.1 When a Site Area Emergency is declared:

NOTE: Do **not** make any PAR until a General Emergency has been declared.

- 5.1.1 Initiate formulation of PARs using Enclosure A and/or Section 6.0 when possible before declaration of a General Emergency.

5.2 When a General Emergency is declared:

NOTE: A PAR shall be made to appropriate offsite authorities concurrent with the initial notification of General Emergency declaration using a Michigan Notification Form.

5.2.1 If no PAR has been formulated:

1. **Then** immediately recommend the following **default** protective action to appropriate offsite authorities:
 - a. Evacuate Area 1
 - b. Evacuate to 5 miles - downwind affected area(s)
2. GO TO Section 6.0.

5.2.2 If a PAR has been formulated using Enclosure A and/or Section 6.0:

1. **Then** immediately recommend that protective action recommendation to appropriate offsite authorities.

5.2.3 GO TO Section 7.0.

6.0 PROCEDURE

6.1 PAR formulation

6.1.1 Determine appropriate PAR based on available indications using Enclosures A and B.

1. If available, review dose projections of TEDE and Adult Thyroid dose for the expected duration of the release (Use 8-hour projections unless duration is expected to be less).
2. Determine plant status relative to potential for core damage.
3. Follow PAR Flowchart (Enclosure A) to determine most appropriate PAR based on dose projections and/or plant status.
4. Review other considerations listed on Enclosure A to formulate final PAR.

NOTE: When time permits, all relevant conditions and additional considerations exercised should be discussed with appropriate offsite officials before making a PAR.

6.1.2 Make PAR to appropriate offsite officials in accordance with EP-290, "Emergency Notifications."

7.0 FOLLOW-UP ACTIONS

- 7.1 Continue to evaluate dose projections and plant status to ensure effectiveness of current protective actions implemented in accordance with Section 6.0.
- 7.2 Review "Evaluation Considerations for PAR Effectiveness" in Enclosure A to ensure effectiveness of current protective actions.
- 7.3 Keep offsite authorities informed of most current dose projections and plant status.

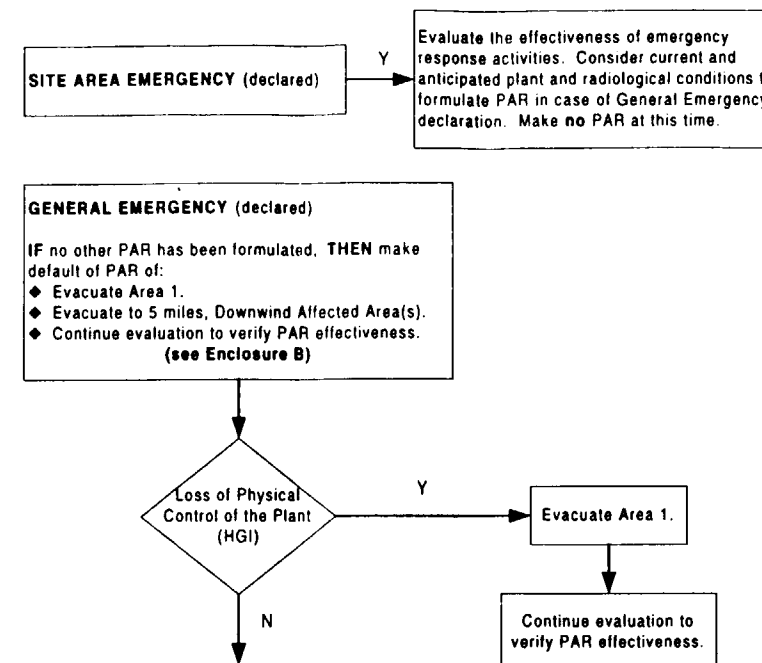
8.0 RECORDS

- 8.1 There are no required records generated through this procedure.

END OF TEXT

PAR FLOWCHART

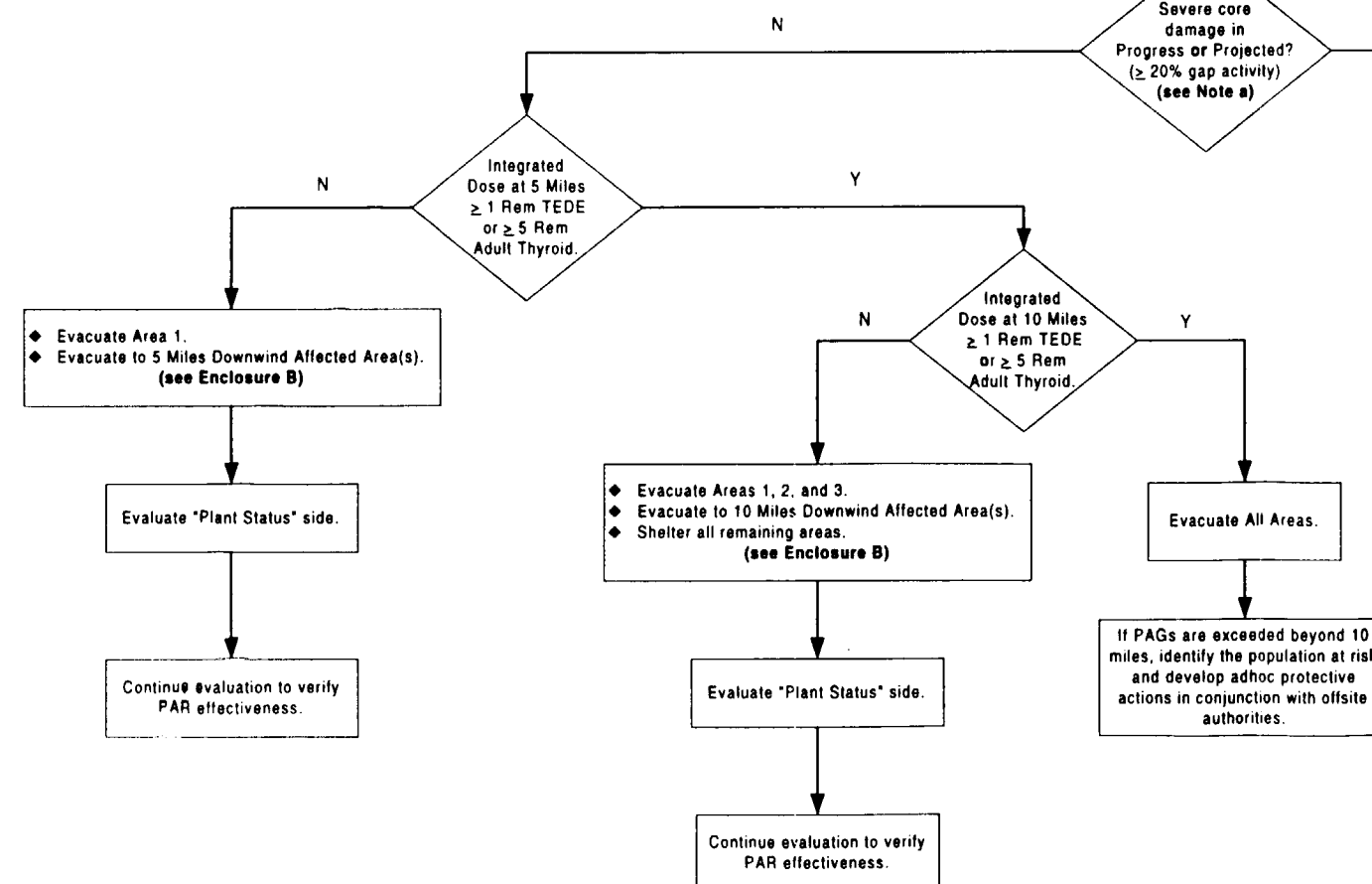
Evaluation Considerations for PAR Effectiveness	
1.	Are wind shifts expected to affect areas where protective actions are not in place?
2.	Is a lake breeze in effect? Is precipitation present?
3.	Is offsite RET survey data available?
4.	Are core cooling capabilities being maintained?
5.	Are core damage estimates available?
6.	Is there a release in progress? Is the release monitored? Is it filtered?
7.	Has containment failed or likely to fail? Is a flammable/explosive condition ($H_2 \geq 6\%$ and $O_2 \geq 5\%$) present?
8.	Are there significant physical or environmental hazards offsite that would impede an evacuation?
9.	Are current emergency response efforts successful?
10.	Are plant conditions present that may lead to a severe accident?



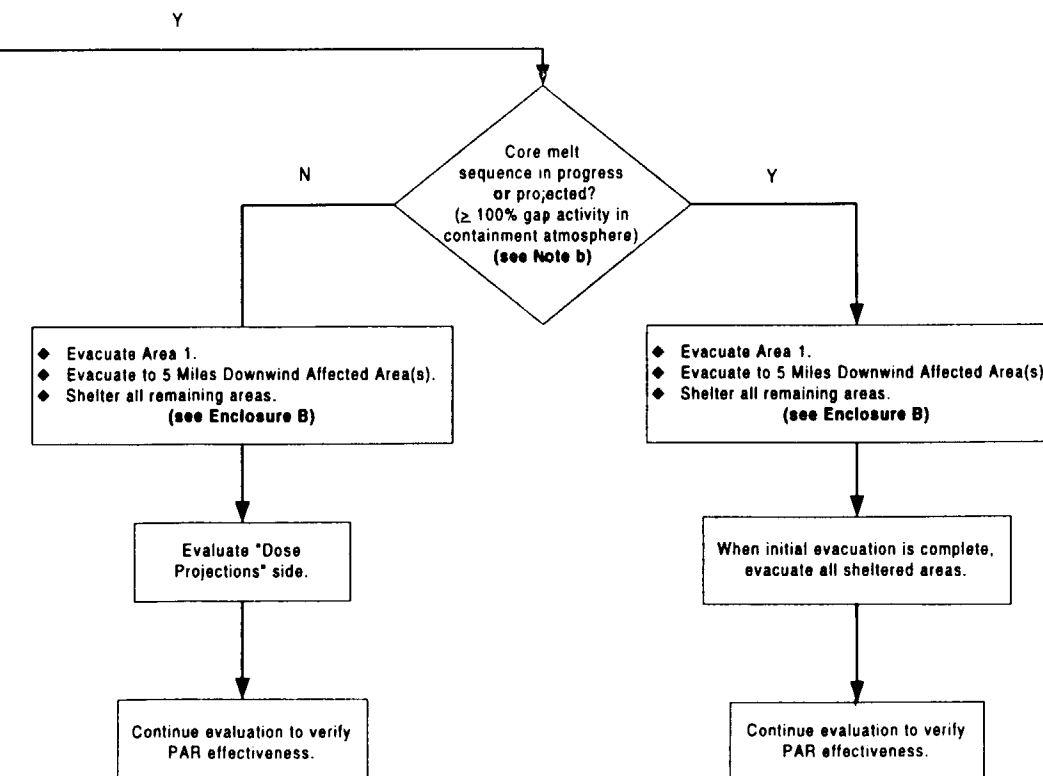
Notes:

- May be indicated as actual or imminent loss of core cooling capability (i.e., failure of ECCS to perform, other sequences likely to lead to fuel failure, or by performing core damage estimates using Dose Assessment program or EP-546 and/or EP-547).
- May be determined using CHRRMs and Dose Assessment program or EP-546 and/or EP-547. Other methods may also be acceptable.

Dose Projections



Plant Status



DOWNWIND AFFECTED SECTOR TO AREA CONVERSION TABLE

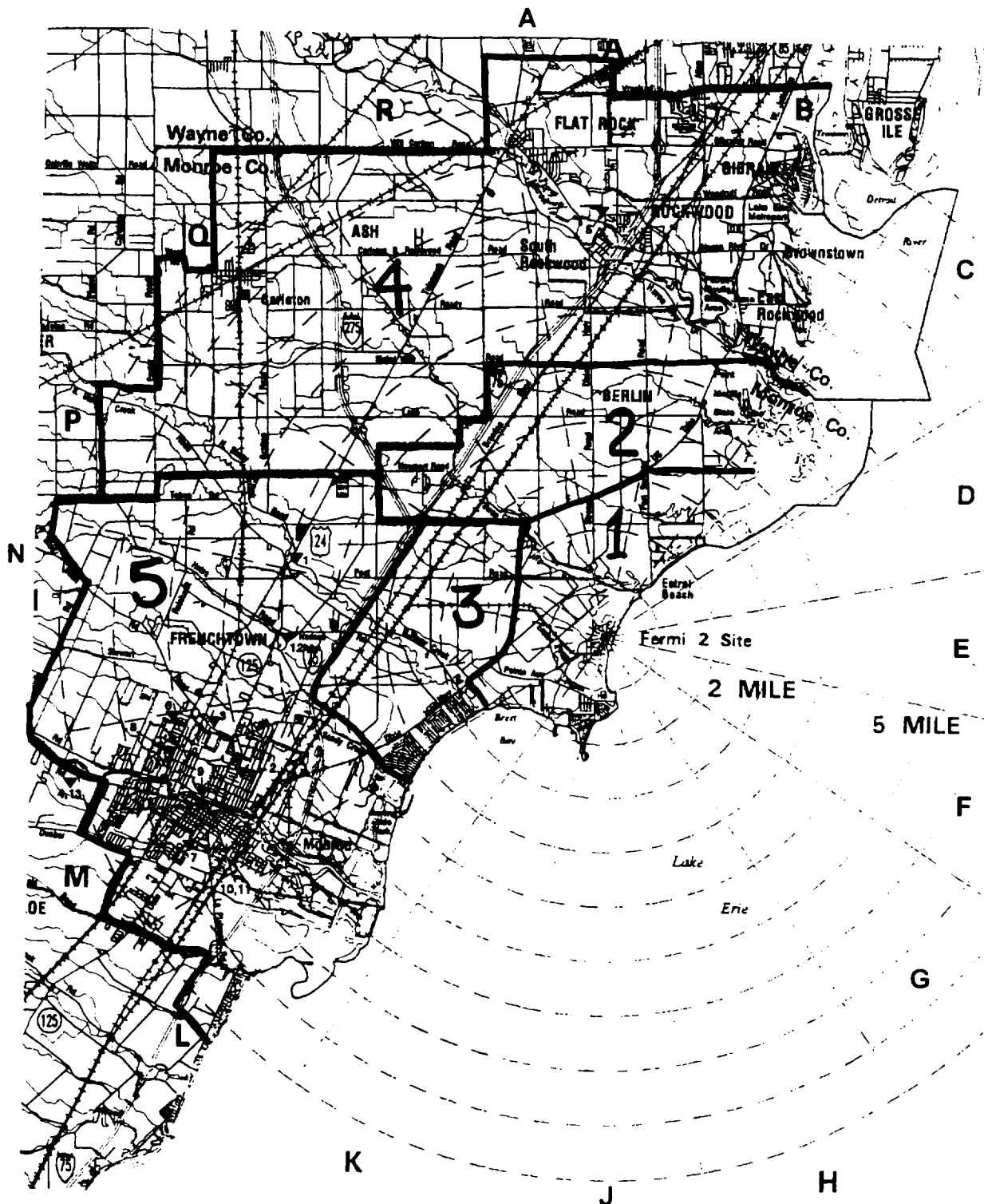
NOTE: The Centerline Sector can be identified on:

- the ERIS “Straight Line” plume plot display
- dose reports indicated as “Affected Sector”

When evacuating to 5 miles “Downwind Affected Area(s)”	The “Downwind Affected Area(s)” are:
If Downwind Centerline Sector is E, F, G, H, or J	Area 1
If Downwind Centerline Sector is A, B, C, or D	Areas 1 and 2
If Downwind Centerline Sector is K, L, or M	Areas 1 and 3
If Downwind Centerline Sector is N, P, Q, or R	Areas 1, 2, and 3

When evacuating to 10 miles “Downwind Affected Area(s)”	The “Downwind Affected Area(s)” are:
If Downwind Centerline Sector is R, A, B, C, or D	Areas 1, 2, 3, and 4
If Downwind Centerline Sector is E, F, G, H, or J	Areas 1, 2, and 3
If Downwind Centerline Sector is K, L, or M	Areas 1, 2, 3, and 5
If Downwind Centerline Sector is N, P, or Q	Areas 1, 2, 3, 4, and 5

PROTECTIVE ACTION AREAS



EF2 10-MILE EPZ EVACUATION TIME ESTIMATES SUMMARY*

Area	Description	Summer Day Normal	Summer Day Adverse^b	Summer Night Normal	Summer Night Adverse^b	Winter Day Normal	Winter Day Adverse^b	Winter Night Normal	Winter Night Adverse^b
1	All Sectors to 2 miles	2:55	3:25	1:55	2:05	2:55	3:30	1:55	2:15
1 & 2	All Sectors to 2 miles Northwest sectors to 5 miles	2:55	3:25	1:55	2:05	2:55	3:30	1:55	2:15
1 & 3	All Sectors to 2 miles Southwest sectors to 5 miles	2:55	3:25	1:55	2:05	2:55	3:30	1:55	2:15
1, 2, & 3	All sectors to 5 miles	2:55	3:25	1:55	2:05	2:55	3:30	1:55	2:15
1, 2, 3, & 4	All Sectors to 5 miles Northwest sectors to 10 miles	3:10	3:35	2:20	2:35	3:10	3:45	2:20	2:50
^{a.} 1, 2, 3, & 5	All Sectors to 5 miles Southwest sectors to 10 miles	3:10	3:35	2:20	2:35	3:10	3:45	2:20	2:50
^{a.} 1, 2, 3, 4, & 5	All sectors to 10 miles	3:15	3:45	2:25	2:40	3:15	3:55	2:25	2:55

* These are comparative times based on data drawn from the Evacuation Time Estimates Analyses for the Enrico Fermi Atomic Power Plant Unit No. 2 Plume Exposure Pathway Emergency Planning Zone, Rev. 2, May, 1994, prepared by JB/A, Inc. **Times are given in hours : minutes.**

a. When evaluating an evacuation PAR for distances greater than 5 miles, and including Area 5, consideration should be given to the special needs of Mercy Memorial Hospital and Mercy Memorial Nursing Center. These facilities are located approximately 7 miles from the site and require approximately 6 hours - 20 minutes to complete an evaluation.

b. "Adverse" weather conditions are those which may impair visibility and/or traction, such as light snow, ice, rain, or fog.

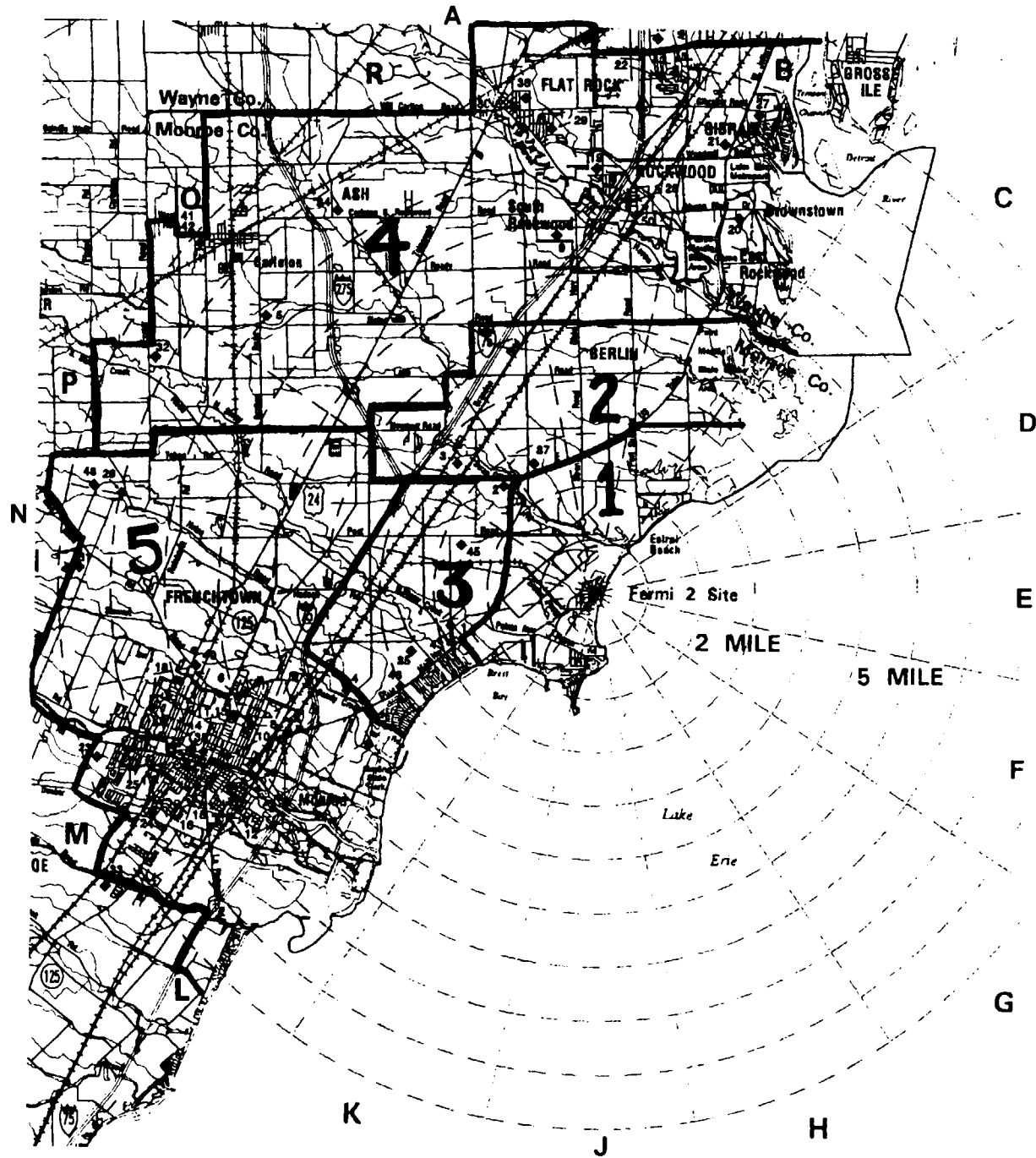
EF2 10-MILE EPZ POPULATION ANALYSIS*

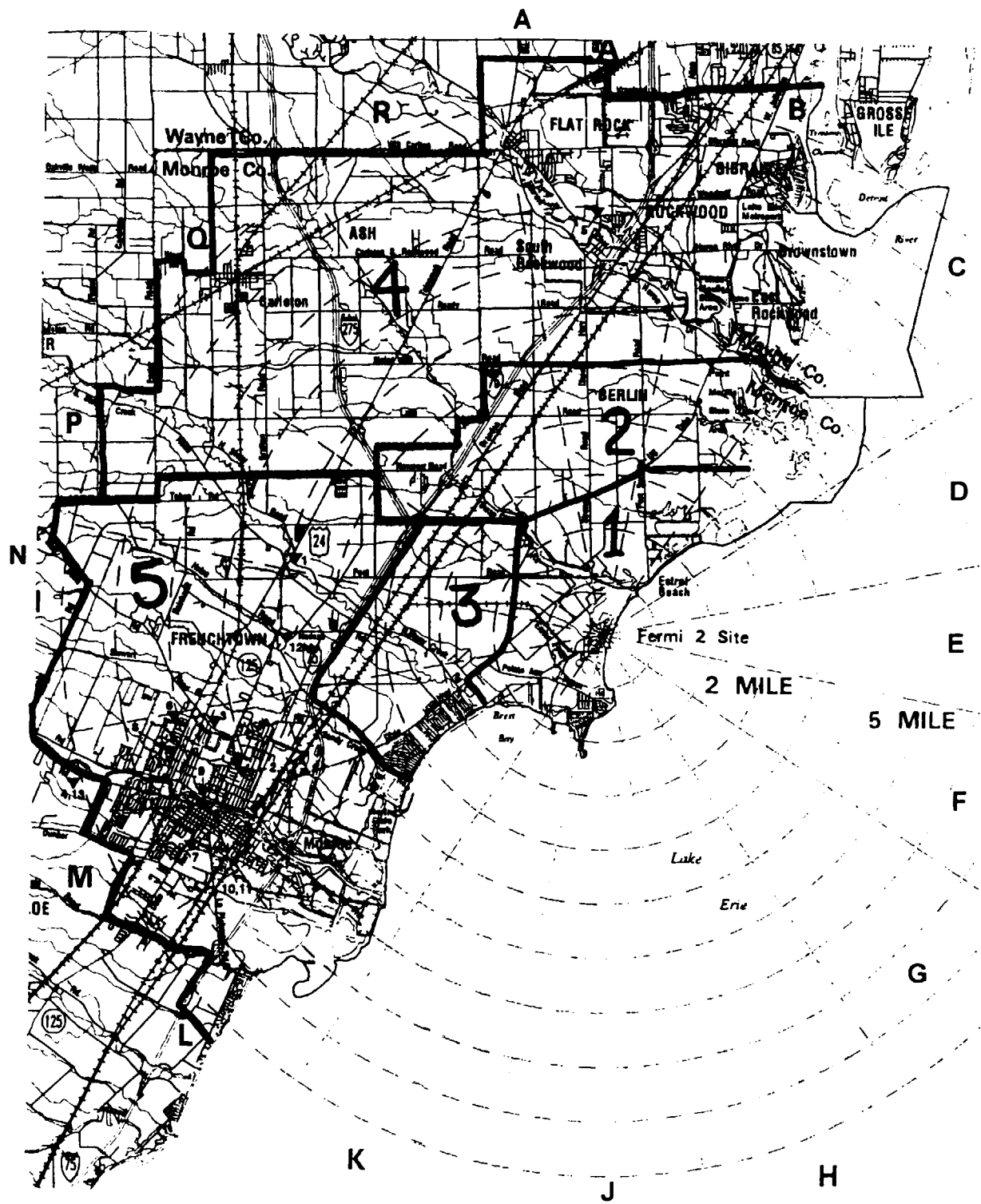
Area	Description	Summer Day	Summer Night	Winter Day	Winter Night
1	All Sectors to 2 miles	4419	3598	4398	3598
1 & 2	All Sectors to 2 miles Northwest sectors to 5 miles	7053	5571	7656	5571
1 & 3	All Sectors to 2 miles Southwest sectors to 5 miles	15466	10413	13097	9633
1, 2, & 3	All sectors to 5 miles	18102	12388	16354	11608
1, 2, 3, & 4	All sectors to 5 miles Northwest sectors to 10 miles	53888	45029	57547	44174
1, 2, 3, & 5	All sectors to 5 miles Southwest sectors to 10 miles	65861	55516	71296	53334
1, 2, 3, 4, & 5	All sectors to 10 miles	109937	96038	121367	93581

* EPZ population data extracted from the Evacuation Time Estimates Analyses for the Enrico Fermi Atomic Power Plant Unit No. 2 Plume Exposure Pathway Emergency Planning Zone, Rev. 2, May, 1994, prepared by JB/A, Inc. Additional population data provided by local planning agencies using U.S. Census data.

SCHOOLS WITHIN THE 10-MILE EPZ

								Facility Population		
Facility No.	Township	Name of School	Compass Direction	Distance (miles)	Period(s) of Operation	Transportation Resources	Mobilization Time	Student	Staff	Total
Monroe County										
1	Frenchtown	Jefferson High	WSW	2.8	Winter Day	District buses	60-90 minutes	758	58	816
1	Frenchtown	Jefferson Jr. High	WSW	2.8	Winter Day	District buses	60-90 minutes	634	44	678
2	Berlin	St. Charles	NW	2.7	Winter Day	District buses	60-90 minutes	185	10	1195
3	Berlin	Neidermeier Elementary	NW	3.6	Winter Day	District buses	60-90 minutes	244	11	255
4	Frenchtown	Hurd Road Elementary	WSW	5	Winter Day	District buses	60-90 minutes	432	24	456
5	Ash	Airport Senior High	NW	8	Winter Day	District buses	15 minutes	731	38	769
5	Ash	Wagar Jr. High	NW	8	Winter Day	District buses	15 minutes	606	33	639
5	Ash	Sterling Elementary	NW	8	Winter Day	District buses	60-90 minutes	325	19	344
6	Monroe	Zion Lutheran Elementary	WSW	6.9	Winter Day	District buses	60-90 minutes	98	5	103
7	Monroe	Cantrick Jr. High	WSW	6.8	Winter Day	District buses	60-90 minutes	568	32	600
8	Monroe	Hollywood Elementary	WSW	6.8	Winter Day	District buses	60-90 minutes	275	23	298
9	S. Rockwood	Ritter Elementary	N	6.8	Winter Day	District buses	60-90 minutes	385	15	400
10	Monroe	Christiency Elementary	WSW	7.5	Winter Day	District buses	60-90 minutes	342	22	364
11	Monroe	St. Mary's Elementary	WSW	7.8	Winter Day	District buses	60-90 minutes	280	14	294
12	Monroe	Lincoln Elementary	WSW	7.7	Winter Day	District buses	60-90 minutes	428	33	461
13	Monroe	St. Mary's Catholic Central High	WSW	7.8	Winter Day	District buses	60-90 minutes	411	29	440
14	Monroe	Riverside Elementary	WSW	8.3	Winter Day	District buses	60-90 minutes	289	18	307
15	Monroe	Trinity Lutheran School	WSW	7.9	Winter Day	District buses	60-90 minutes	299	11	310
16	Monroe	Monroe Jr. High	WSW	8.1	Winter Day	District buses	60-90 minutes	1126	63	1189
16	Monroe	St. John's Catholic School	WSW	8.1	Winter Day	District buses	60-90 minutes	210	13	223
17	Monroe	St. Michael's Elementary	WSW	8.2	Winter Day	District buses	60-90 minutes	168	12	180
18	Monroe	Manor Elementary	WSW	8.5	Winter Day	District buses	60-90 minutes	434	23	457
23	Monroe	Monroe Sr. High	WSW	9.8	Winter Day	District buses	60-90 minutes	1573	100	1673
24	Monroe	S. Monroe Townsite Elementary	WSW	9.2	Winter Day	District buses	60-90 minutes	238	16	254
25	Monroe	Waterloo Elementary	WSW	9.1	Winter Day	District buses	60-90 minutes	378	22	400
26	Frenchtown	Holy Ghost Lutheran Elementary	WNW	9	Winter Day	District buses	60-90 minutes	95	5	100
31	Raisinville	Raisinville Elementary	W	9.7	Winter Day	District buses	60-90 minutes	456	29	485
32	Ash	St. Patrick's Elementary	WNW	9.3	Winter Day	District buses	60-90 minutes	196	13	209
33	Monroe Twns	Custer Elementary	WSW	10.5	Winter Day	District buses	60-90 minutes	1221	50	1271
34	Ash	Eyler Elementary	NW	8.6	Winter Day	District buses	60-90 minutes	372	16	388
35	Frenchtown	Sodt Elementary	WSW	3.6	Winter Day	District buses	60-90 minutes	309	17	326
37	Berlin	North Elementary	NW	2.7	Winter Day	District buses	60-90 minutes	415	23	438
-	Monroe Twns	Monroe County Community College	W	11	Year Round	Outside EPZ	na	na	na	na
38	Monroe	Meadow Montessori	WSW	8	Winter Day	Private vehicles or buses	60 minutes	160	20	180
39	Monroe	Monroe Cooperative Pre-School	WSW	7.5	Winter Day	Private vehicles or buses	60 minutes	20	3	23
40	Frenchtown	Pathway Child Care	WSW	7.5	Winter Day	Private vehicles or buses	60 minutes	20	3	23
41	Carleton	Headstart Program	NW	9.5	School Year	Private vehicles or buses	30 minutes	34	5	39
41	Monroe	Headstart Program - Lincoln School	WSW	7.7	School Year	Private vehicles or buses	30 minutes	68	6	74
41	Monroe	Headstart Program - Greenwood	WSW	6.5	School Year	Private vehicles or buses	30 minutes	34	4	38
41	Monroe	Headstart Program - River Raisin	WSW	9.5	School Year	Private vehicles or buses	30 minutes	34	4	38
42	Ash	Carleton Country Day	NW	9.8	Winter Day	Private vehicles or buses	60 minutes	16	2	18
43	Frenchtown	Faith Lutheran Church Childcare	WSW	3	Winter Day	Private vehicles or buses	60 minutes	20	3	23
44	Frenchtown	Kiddie Korner Christian Day Care & Preschool Center	WSW	8.5	Winter Day	Private vehicles or buses	60 minutes	20	3	23
47	Monroe	Small World Christian Child Care Center	WSW	8	Winter Day	Private vehicles or buses	60 minutes	20	3	23
48	Raisinville	Special Little People Child Care	WNW	9.5	Winter Day	Private vehicles or buses	60 minutes	20	3	23
Wayne County										
19	Rockwood	Chapman Elementary	N	7.9	Winter Day	6 buses	60-120 minutes	377	23	400
20	Brownstown	Barrow Elementary	NNE	7.5	Winter Day	4 buses	60-120 minutes	265	16	281
21	Gibraltar	Carlson High	NNE	8.7	Winter Day	14 buses	60-120 minutes	1024	61	1085
21	Gibraltar	Shumate Jr. High	NNE	8.7	Winter Day	10 buses	60-120 minutes	652	39	691
22	Brownstown	Hunter Elementary	N	9.7	Winter Day	9 buses	60-120 minutes	619	37	656
27	Gibraltar	Parsons Elementary	NNE	9.5	Winter Day	6 buses	60-120 minutes	404	24	428
28	Rockwood	St. Mary's	N	7.4	Winter Day	5 buses	60-120 minutes	290	17	307
28	Rockwood	Pooh Corner's Day Care	N	7.4	Winter Day	(see above)	60-120 minutes	20	2	22
29	Flat Rock	Simpson Jr. High	N	8.5	Winter Day	5 buses	60-120 minutes	370	22	392
29	Flat Rock	Barnes Elementary	N	8.5	Winter Day	4 buses	60-120 minutes	300	18	318
30	Flat Rock	Flat Rock Sr. High	N	9.2	Winter Day	7 buses	60-120 minutes	520	31	551
36	Flat Rock	Evergreen (Bobcean) Elementary	N	9.2	Winter Day	7 buses	60-120 minutes	500	30	530
-	Brownstown	Weiss Elementary	N	9.8	-CLOSED-	na	na	na	na	na
49	Brownstown	1 st Step Children's Center - Outsize EPZ	N	>10	Winter Day	2 buses	60-120 minutes	120	7	127
50	Rockwood	Allison's Wonderland Day Care	N	7	Winter Day	1 bus	60-120 minutes	60	4	64



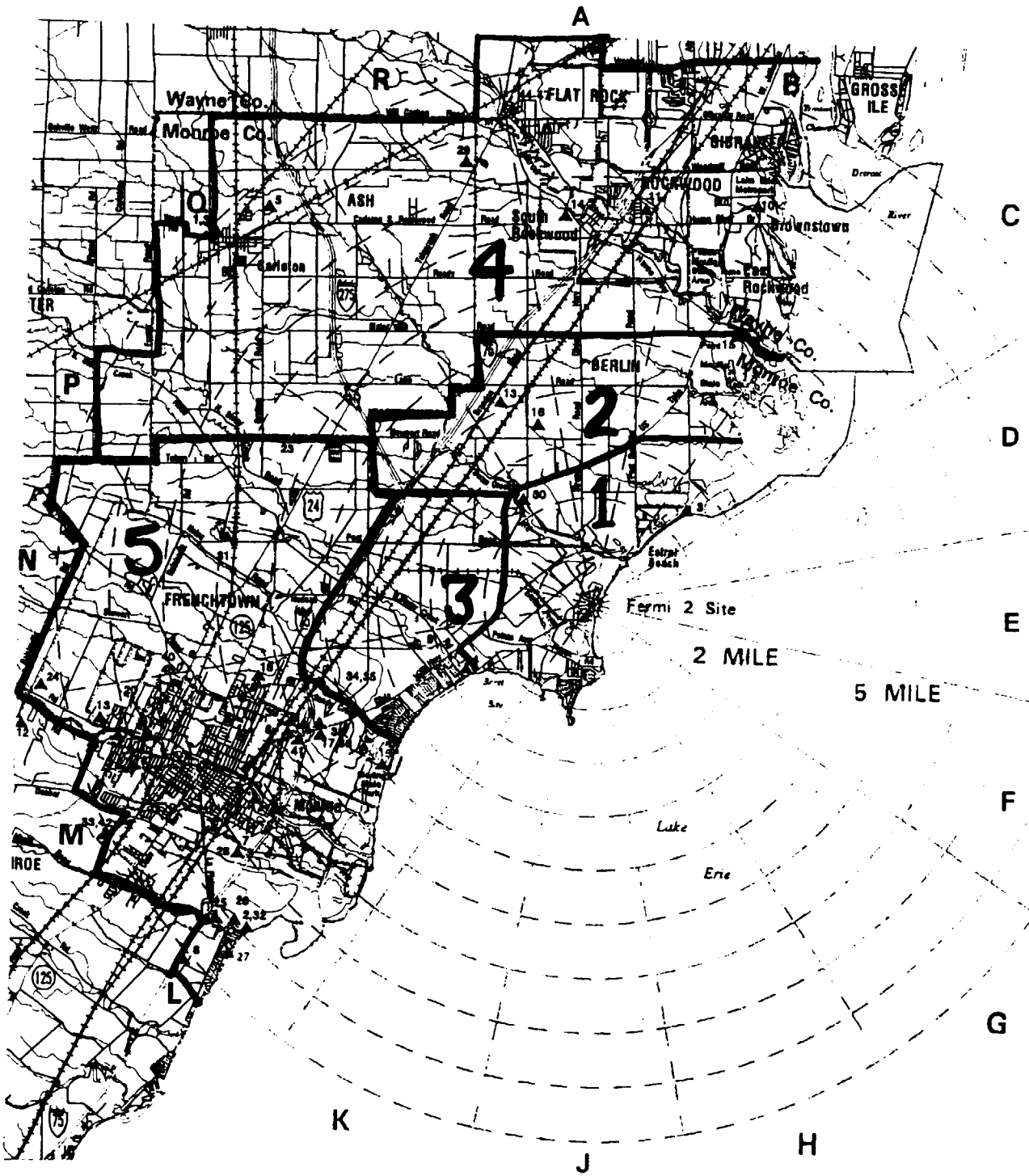


SPECIAL FACILITIES WITHIN THE 10-MILE EPZ

Facility No.	Township	Facility Name	Compass Direction	Distance (miles)	Period(s) of Operation	Mobilization Time	Transportation Resources	Resident	Facility Population	
									Staff/Visitors	
								Day	Night	
Monroe County										
1	Frenchtown	Frenchtown Nursing Care Center	WNW	5.8	Year round	60 minutes	Available Buses	229	60	40
2	Monroe	Mercy Memorial Hospital	WSW	7.1	Year round	6 Hours	Available Resources	185	400	200
3	Monroe	Mercy Memorial Nursing Center	WSW	7.2	Year round	6 Hours	Available Resources	70	50	30
4	Ash	Fairview Apartments	WSW	10	Year round	60 minutes	Available Buses	36	9	1
6	Monroe	Beach Nursing Home	WSW	8	Year round	60 minutes	Available Buses	189	35	20
7	Monroe	The Lutheran Home	SW	8	Year round	60 minutes	Available Buses	122	70	30
8	Monroe	Greenbrook Manor, Inc.	WSW	8.2	Year round	60 minutes	Available Buses	103	12	4
9	Monroe	IHM Motherhouse	WSW	7	Year round	60 minutes	Available Buses	285	100	40
10	Monroe	Monroe County Jail	WSW	7.9	Year round	60+ minutes	Available Buses	124	45	30
11	Monroe	Monroe Corrections Center	WSW	7.9	Year round	60 minutes	Available Buses	22	3	3
12	Frenchtown	Boysville of Michigan	W	5.8	Year round	60 minutes	Available Buses	52	35	15
13	Monroe	Monroe County Youth Center	WSW	10	Year round	60 minutes	Available Buses	45	15	10
Wayne County										
5	Rockwood	Rockwood Children's Home	N	7.5	Year round	60 minutes	Available Buses	19	4	2

RECREATION AREAS, MOTELS, AND MISCELLANEOUS FACILITIES WITHIN THE 10-MILE EPZ

Facility No.	Township	Facility Name	Compass Direction	Distance (miles)	Period(s) of Operation	Mobilization Time	Transient Population			Employee	
							Day	Night	Peak	Day	Night
Monroe County											
1	Ash	Ash-Carleton Park	NW	9.8	Summer	5-45 minutes	100	100	1000	10	5
2	Monroe Twp.	Bolles Harbor	SW	9	Summer	5-45 minutes	30	0	na	2	0
4	Frenchtown	Brest Bay Marina	SW	2.5	Summer	5-45 minutes	40	0	na	2	0
6	Frenchtown	Heck Park	WSW	6.1	Summer	5-45 minutes	20	0	na	1	0
7	Monroe	Hellenberg Park	WSW	7.1	Summer	5-45 minutes	40	0	na	1	0
8	Monroe Twp.	I-75 Rest Area	SW	10	Year Round	5-45 minutes	30	0	na	0	0
9	Frenchtown	Kiwanis Park	WSW	3.5	Summer	5-45 minutes	20	0	na	0	0
12	Monroe Twp.	Monroe County Fairgrounds	WSW	11	Outside EPZ	na	na	na	na	na	na
13	Monroe	Munson Park	WSW	9.5	Summer	5-45 minutes	20	0	na	0	0
15	Berlin	Point Mouille State Game Area	NE	5	Summer	5-45 minutes	350	0	2000	10	0
					Winter	5-45 minutes	200	0	2000	5	0
19	Frenchtown	Sterling State Park	SW	5	Summer	5-45 minutes	5000	850	8500	20	0
					Winter	5-45 minutes	425	70	70	10	0
20	Frenchtown	Veterans Park	WSW	8.6	Summer	5-45 minutes	20	0	0	0	0
22	Frenchtown	Waterloo Park	WSW	9.1	Summer	5-45 minutes	30	0	0	0	0
5	Carleton	Carleton Glen Golf Course	NW	9.5	Summer	5-45 minutes	100	50	na	20	10
16	Berlin	Lilac Brothers Golf Course	NNW	3.5	Summer	5-45 minutes	80	0	na	10	0
17	Monroe	River Raisin Golf Club	WSW	5.5	Summer	5-45 minutes	200	0	na	15	0
18	Monroe	Monroe Golf & Country Club	WSW	6.5	Summer	5-45 minutes	100	0	na	10	0
3	Berlin	Island Marina	NE	2.5	Summer	5-45 minutes	40	0	na	2	0
26	Monroe	Trout's Yacht Basin	SW	9	Summer	5-45 minutes	40	0	na	2	0
14	S. Rockwood	Wesburn Golf Club	N	7.2	Summer	5-45 minutes	80	0	na	10	0
27	Monroe	Harbor Marine	SW	9.5	Summer	5-45 minutes	40	0	na	2	0
28	Monroe	Riverfront Marina	SW	8	Summer	5-45 minutes	40	0	na	2	0
23	Frenchtown	Nike Park	WNW	6.4	Summer	5-45 minutes	20	0	na	0	0
24	Monroe Twp.	Navarre-Anderson Trading Post	W	10	Year Round	5-45 minutes	15	0	na	1	0
29	Ash	Flat Rock Speedway	NNW	8.5	Summer	5-45 minutes	na	na	na	0	0
30	Berlin	Swan Yacht Basin	NNW	2.4	Summer	5-45 minutes	20	0	na	1	0
31	Frenchtown	Camp Lord Willing	W	7	Summer	5-45 minutes	200	200	0	3	0
33	Monroe Twp.	Sunny South Villa	WSW	10	Summer	5-45 minutes	200	200	0	3	0
35	Frenchtown	Hometown Inn	WSW	5.5	Year Round	5-45 minutes	30	30	na	2	1
36	Frenchtown	Cross Country Inn	WSW	5.8	Year Round	5-45 minutes	80	80	na	6	2
37	Carleton	Glee Motel	NW	9	Year Round	5-45 minutes	20	20	na	1	1
38	Monroe	Days Inn	WSW	6	Year Round	5-45 minutes	120	120	na	12	3
39	Frenchtown	Holiday Inn of Monroe	WSW	5.9	Year Round	5-45 minutes	200	200	na	16	4
40	Monroe	Hollywood Motel	WSW	8.5	Year Round	5-45 minutes	40	40	na	2	1
41	Monroe	Knights Inn	WSW	6	Year Round	5-45 minutes	40	40	na	2	1
42	Monroe	Monroe Motel	WSW	10	Year Round	5-45 minutes	40	40	na	2	1
43	Monroe	Sunset Motel	WSW	8	Year Round	5-45 minutes	20	20	na	2	1
Wayne County											
10	Brownstown	Lake Erie Metropark	NNE	8	Summer	5-45 minutes	2000	0	6000	20	0
					Winter	5-45 minutes	20	0	0	5	0
11	Rockwood	Mercure Park	N	7.5	Summer	5-45 minutes	20	0	na	0	0
44	Flat Rock	Smith Flat Rock Hotel	N	9	Year Round	5-45 minutes	30	30	na	3	1
45	Flat Rock	Hillcrest Motor Inn	N	9	Year Round	5-45 minutes	30	30	na	3	1
46	Flat Rock	Maple Grove Motel	N	9	Year Round	5-45 minutes	30	30	na	3	1
47	Flat Rock	Seaway Motel	N	9	Year Round	5-45 minutes	30	30	na	3	1



REPRESENTATIVE SHIELDING FACTORS FROM GAMMA CLOUD SOURCE^(a)

Structure or Location	Representative Shielding Factor (b)	Representative Range
Outside	1.0	--
Vehicles	1.0	--
Wood frame house ^(c) (no basement)	0.9	0.9
Basement of wood house	0.6	0.1 to 0.7 ^(d)
Masonry house (no basement)	0.6	0.4 to 0.7 ^(d)
Basement of masonry house	0.4	0.1 to 0.5 ^(d)
Large office or industrial building	0.2	0.1 to 0.3 ^(d,e)

(a) Taken from SAND 77-1725 (Unlimited Release).

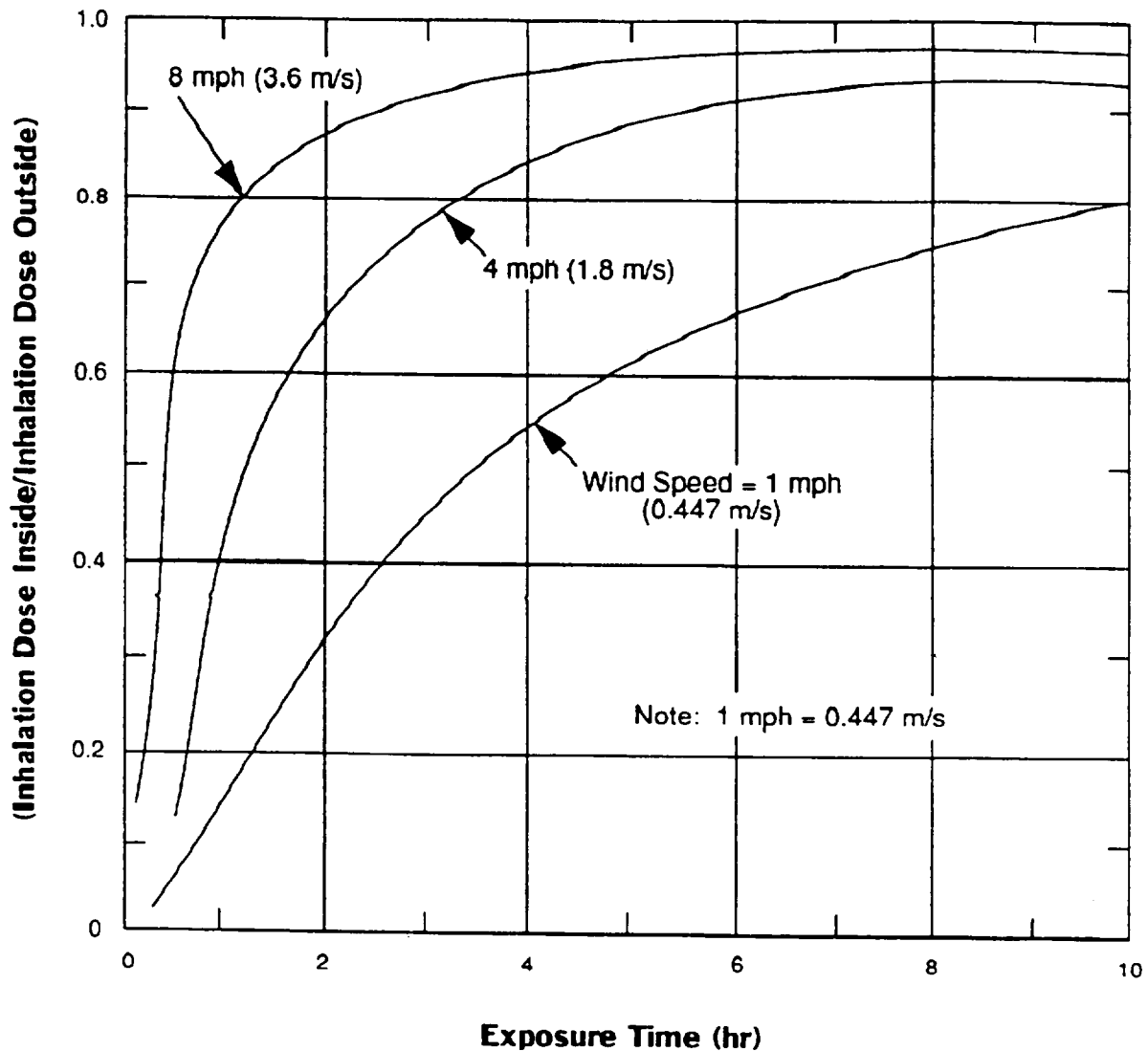
(b) The ratio of the dose received inside the structure to the dose that would be received outside the structure.

(c) A wood-frame house with brick or stone veneer is approximately equivalent to a masonry house for shielding purposes.

(d) This range is mainly due to different wall materials and different geometries.

(e) The shielding factor depends on where the personnel are located within the building (e.g., the basement or an inside room).

**INHALATION SHIELDING FACTORS FOR A WOOD HOUSE,
SNUG DOORS, CLOSED WINDOWS (THYROID)**



The above curve assumes the house remains closed up for the duration. Actually, the dose inside the house can be further reduced by opening the doors and windows after the cloud has passed and purging the house with fresh air.

"Reactor Safety Study," Appendix VI, Wash-1400, October 1975

END