

PALISADES NUCLEAR PLANT
HEALTH PHYSICS PROCEDURE

TITLE: PALISADES RADIOLOGICAL ENVIRONMENTAL PROGRAM
SAMPLE COLLECTION AND SHIPMENT

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ATTACHMENTS

- Attachment 1, "Environmental Sample Collection Schedule"
- Attachment 2, "Sample Locations"
- Attachment 3, "Sample Identification"
- Attachment 4, "Sample Packaging and Shipment"
- Attachment 5, "Palisades Sample Collection Forms and Records"

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USER ALERT

INFORMATION USE PROCEDURE

The activities covered by this procedure may be performed from memory.

1.0 PURPOSE

To provide methodology for collection of environmental samples in support of the Radiological Environmental Monitoring Program (REMP).

2.0 REFERENCES

2.1 SOURCE DOCUMENTS

2.1.1 Reg Guide 4.15(7)

2.1.2 10CFR50, Appendix I

2.1.3 Palisades Administrative Procedure 7.08, "Nuclear Plants Radiological Environmental Monitoring Program"

2.1.4 REMP Sample Shipping Manual, Teledyne Isotopes Midwest Laboratory

2.1.5 Palisades Health Physics Procedure 10.1, "Radiological Environmental Monitoring Program Surveillance"

2.2 REFERENCE DOCUMENTS

2.2.1 Palisades ODCM, Appendix A, Sections III.J, IV.C, and Tables E-1 and E-2

2.2.2 Palisades Administrative Procedure 10.46, "Plant Records"

3.0 PREREQUISITES

As indicated in procedure.

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4.0 PRECAUTIONS AND LIMITATIONS

- 4.1 This procedure shall be applicable to Palisades/C&RSD HP, Environmental Department, and any contractual personnel assigned to collect or evaluate REMP samples.
- 4.2 Any revisions to this procedure shall be reviewed against Palisades ODCM Specifications to verify compliance to all requirements.
- 4.3 Deviations from the required sampling schedule shall be documented in the Annual Radiological Environmental Operating Report.
- 4.4 Every effort shall be made to complete corrective action on malfunctioning sampling equipment prior to the end of the next sampling period.
- 4.5 If it is not possible to obtain the required samples, suitable alternative media and locations shall be substituted within 30 days.
- 4.6 Samples shall be collected, prepared, and shipped for analysis in a timely manner to preserve integrity. Other specific handling precautions for sample media are indicated in Section 5.0 as required.
- 4.7 Obtain best available replacement sample for any missing sample. Notify Palisades C&RSD Radiological Environmental contact with description and location of the replacement sample. Some samples are not replaceable (TLDs, air samples, etc), however, water, milk, crop samples, etc, should be.
- 4.8 Document any missing samples or malfunctioning equipment on sample data collection sheets.

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5.0 **PROCEDURE**

USER ALERT

INFORMATION USE PROCEDURE

The activities covered by this procedure may be performed from memory.

5.1 **CONTROL AND OVERSIGHT OF SAMPLING FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

5.1.1 Sampling techniques described by this procedure must be strictly adhered with.

- a. This includes use of forceps for air sample media change out to ensure the collected media is not disturbed.
- b. Recorded data should be verified including verification of transcribed data to avoid errors.
- c. All deviations from performance requirements, unavailable samples, or other sampling anomalies must be reported to the C&RSD Radiological Environmental Contact.

5.1.2 Failure of sample collectors to comply with sampling and reporting requirements may result in remedial training, disciplinary action, or reassignment of sampling duties.

5.1.3 The C&RSD radiological environmental contact shall conduct periodic (annual) audits of sampling activities.

- a. These audits shall include observation of collection techniques, verification of procedural compliance and review of equipment condition.
- b. Audits should specifically address air sample collection and should include observation of all individuals involved in sample changeout.
- c. Audit of collection of other sample media may be performed at the discretion of the C&RSD environmental contact.

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- d. Results of the audits and any follow up action should be documented in the REMP file.

Collect samples using the following methodology in accordance with schedule and location data described in Attachments 1 and 2.

5.2 REMP AIR SAMPLE COLLECTION

5.2.1 Precautions

- a. New filters and cartridges should be transported and handled such that potential contamination of them is minimized (ie, placed in clean plastic bags, etc).
- b. If an air sampling unit is discovered not operating, attempt to find the cause and repair. If this cannot be done, replace applicable component and document on air sample collection data sheet.
- c. Airflow meters shall be calibrated annually by General Meter. All in service calibrated meters will have affixed a valid calibration sticker/card stating date of calibration and calibration due date.
- d. Airflow meters shall be changed out prior to the expiration of calibration dates. Replacement air meters are available from Plant C&RSD Environmental contact.
- e. Air station leakage shall be < 0.1 CFM. If the replacement of air station components is required due to air leakage, document on air sample collection data sheet.

5.2.2 Prerequisites

- a. Glass fiber (particulate) air filters
- b. Charcoal cartridges for iodine sampling (prelabeled for each air sampler)
- c. Glassine or plastic envelopes (prelabeled for each air sampler)
- d. REMP Air Sample Data Sheet (containing installation data)
- e. Replacement air sample meters (as required)

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- f. Forceps
- g. Stop Watch
- h. Step Ladder

NOTE: The Control Stations 10-GR, 11-KZ, and 12-DG are changed out weekly by three independent collectors, and mailed in separately. The prelabeling of cartridges and envelopes, detailed below, is not required for these stations as sample mix-up is not possible. In addition, for these control stations, the Palisades Sample Collection Form and Records (Page 1 of Attachment 5) is completed by the Technician changing out the nine local stations by transferring the recorded data provided by the independent collectors.

5.2.3 Perform the following weekly at each sample location:

- a. Open the protective cover on the air sample station and verify the sampling location number written on the inside of the door is the same as the prelabeled sample change-out package.
- b. Verify that the meter serial number and calibration due date are correctly documented on Palisades Plant Environmental Monitor Operability Check and Sample Collection data form (Page 1 of Attachment 5.)
- c. Determine and record the "As Found Flow" rate (seconds for one cubic foot of volume).
- d. Determine and record the "As Found Leak" rate by placing hand over filter housing inlet to form a seal. While holding hand over the inlet, determine if air leakage is evident by checking the air flow meter needle for movement (leakage). If air leakage is less than 0.1 CFM, record as <0.1. If air leakage is greater than or equal to 0.1 CFM, record the amount (in a fraction of CFM). If leakage is >0.1 CFM determine the cause and repair as soon as possible.
- e. Unplug or turn off the air pump and record the "REMOVED MONTH/DAY/YEAR," "REMOVED TIME," and "GAS METER READING REMOVED."
- f. Remove the prelabeled charcoal cartridge and place in zip lock bag.

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- g. Using tweezers, carefully remove particulate filter from the sampler head and place in the pre-labeled glassine envelope or plastic envelope.
- h. Clean out any residue or moisture buildup in sampler head before replacement filter is installed. Check the condition of the sampler head o-rings. Replace cracked o-rings as necessary to prevent air leakage.
- i. Install new particulate filter and charcoal cartridge and ensure that both are properly centered in sampler head to prevent air leakage. Ensure the fiber side of the particulate filter is facing out (smooth side facing inward).
- j. Restart air pump. Place hand over the filter housing inlet to form a seal, determine if air leakage is evident by checking air flow meter needle movement. If air leakage is less than 0.1 CFM, record as <0.1 CFM. If air leakage is greater than 0.1 CFM, determine the cause of the leakage (filter not centered in holder properly or cracked o-ring) and correct problem as soon as possible, restoring to less than 0.1 CFM leakage.
- k. Determine and record "As Left" flow rate. If greater than 90 seconds are required for one cubic foot of volume, the sample pump is degrading. Replace pump as soon as possible to avoid failure to reach minimum sample volume. (5000 ft³).
- l. If an airflow meter must be replaced, record this in the "Comments" column. Record replacement meter data in the reading on the upcoming week's sample collection data sheet.
- m. Close the protective cover on the air sample station.
- n. Calculate and record "SAMPLE VOL (FT3)," ALSO ensure all pertinent data is recorded.
- o. Proceed to the next station. Date and sign the current weeks data sheet upon completion of the entry of all current data.

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- p. Transcribe the "REMOVED MONTH/DAY/YR" and "GAS METER READING REMOVED" taken in Step 5.2.3e to the "INSTALLED" reading columns on the sample collection sheet to be used for the upcoming week's air sample collection. Also transcribe the meter serial number and calibration due date to the upcoming week's sample collection sheet.

**5.3 REMP LAKE (DRINKING) WATER SAMPLE COLLECTION-SOUTH HAVEN,
MICHIGAN**

5.3.1 Prerequisites

- a. Four clean one-gallon plastic containers labeled with sample type, location, amount, and date (or collection period)
- b. REMP Miscellaneous Data Sheet (Attachment 3)

5.3.2 Perform the following sample collection monthly:

- a. Leave four containers with the Plant Superintendent at the South Haven Municipal Water Treatment Plant. New water sample containers should be left at the South Haven Water Treatment Plant upon pickup of end-of-month composite samples.
- b. Instruct the Plant Superintendent to add approximately 300 ml per day of raw water to container labeled "RAW" and approximately 300 ml per day of treated water to container labeled "TREATED," or "TAP."
- c. Return at end of month to collect containers. Obtain verbal verification that Step 5.3.2b was carried out. Note any deviations in "Remarks" column of data sheet.
- d. Label containers with sample type, amount, location, and collection period.
- e. Package and ship samples per Attachment 4.
- f. Record location, sample types (raw and treated), and amount on sample identification data sheet (Attachment 3). Sign and date data sheet.

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5.4 REMP WELL WATER SAMPLE COLLECTION

5.4.1 Prerequisites

- a. Clean, one-gallon plastic containers
- b. REMP Miscellaneous Data Sheet (Attachment 3)

5.4.2 Perform the following sample collection monthly:

NOTE: During the winter months, the State and Township Park wells may be out of service. When this occurs, note the unavailability of the water samples and document on sample data sheet.

- a. Turn on water supply (or begin pumping water) and allow water to run for approximately one minute to purge the lines.
- b. Fill two clean, one-gallon plastic containers with well water from each sample location.
- c. Label containers with sample type, amount, location, and collection date.
- d. Package and ship samples per Attachment 4.
- e. Record on data sheet (Attachment 3) location, type, date, amount, and under "Remarks" any pertinent information. Sign form in space provided.

5.5 REMP MILK SAMPLE COLLECTION

5.5.1 Precautions

- a. Milk samples shall be sent to the laboratory as soon as possible because of the short half-life of I-131. Any undue delay may cause ODCM, Appendix A, Table E-3 analytical LLD requirements to be violated.
- b. Obtain best available replacement sample for any missing milk sample(s). Identify new sample location(s) and notify Palisades C&RSD Radiological Environmental contact as soon as possible.

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- c. If milk samples are unavailable, then samples of three different kinds of broad leaf vegetation grown nearest to Palisades in each of two different offsite locations of the highest predicted average ground level D/Q (SE or SSE sectors near site), and one sample of each kind of similar broad leaf vegetation grown 15-30 km distant from Palisades in the least prevalent wind direction (SSW or S sectors) may be used as replacement samples. The new sample locations shall be identified and the REMP procedures revised within 30 days to reflect sampling changes. Collect approximately one kilogram (2.2 lb) of each sample type.

5.5.2 Prerequisites

- a. Two clean, plastic one-gallon containers for each sample location
- b. Sodium bisulfite preservative (approximately 40 gm per gallon of milk required)
- c. Miscellaneous sample data form (Attachment 3)

5.5.3 Perform the following monthly at each specified sample collection location:

- a. Obtain two one-gallon grab samples of raw milk as specified in Attachments 1 and 2.
- b. If problems are encountered in obtaining a sufficient quantity of milk sample, notify the Palisades C&RSD Radiological Environmental contact.
- c. Add approximately 40 gm of sodium bisulfite to each one-gallon container of milk and thoroughly mix. The sodium bisulfite can either be in prepared packets or "scooped" with a volumetric measure from its container.
- d. Label containers with sample type, amount, location, date, and time.
- e. Package and ship samples as per Attachment 4.
- f. Record on Sample Data Form (Attachment 3), the location, type, date, and amount of samples. Under "Remarks," note any other pertinent information. Sign form in space provided.

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5.6 REMP AQUATIC BIOTA COLLECTION

5.6.1 Precautions

- a. Collection to be coordinated between Radiological Services Department RMC Section and the Environmental Department. At least one individual in the collection party is required to have MDNR Cultural and Scientific Fish Collectors Permit.
- b. If logistical problems prevent use of a boat to set gill nets from the lake side of Palisades, then the nets can be set offshore from the site boundary (by wading). Notify Security prior to using offshore wading method for beach access.

5.6.2 Prerequisites

- a. Boat with required safety equipment, or waders
- b. Gill nets (of varying size mesh) and weights and floats
- c. Plastic one-liter wide-mouth bottles
- d. REMP Miscellaneous Data Sheet (Attachment 3)
- e. 10% formaldehyde solution
- f. Fillet knives
- g. Black permanent felt markers for sample identification on containers
- h. Notify district MDNR Fisheries biologist prior to sample collection

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- 5.6.3 Collect samples twice during the season of greatest abundance (typically May through October) as follows:
- a. Gill nets are placed at the locations specified in Attachment 1 to collect at least two species of commercially and/or recreationally important fish in the vicinity of the Plant discharge area and the same species in an area not influenced by the Plant discharge (Ludington Pump Storage Plant). One liter of flesh should be collected for each species caught for analysis accuracy. Fish samples from the same area may be combined, if necessary, to make a one-liter composite sample.
 - b. Filamentous algae samples are not required, but may be collected from driftwood or shoreline protection structures at vicinity of discharge if available.
 - c. Periphyton samples are not required, but may be collected if available. Scrape periphyton from rocks into a pail. When sufficient sample is collected, excess water is gently poured off. The partially solidified periphyton is then transferred to a liter sample bottle.
 - d. Crayfish (invertebrates) samples are not typically available at Palisades but shall be collected if available. Collect crayfish by hand picking or spearing.
 - e. Label all containers with sample type, amount, location, and date.
 - f. Package and ship samples per Attachment 4.
 - g. Record on data sheet (Attachment 3) location, type, date, amount, and under "Remarks" indicate any pertinent information. Sign form in space provided.

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5.7 REMP SEDIMENT SAMPLE COLLECTION

5.7.1 Prerequisites

- a. One-liter, wide-mouth plastic sample bottles
- b. Miscellaneous Data Sheet (Attachment 3)

5.7.2 Collect sediment samples semiannually at collection locations specified in Attachment 1 (includes control sample at the Ludington Pump Storage Plant). Palisades C&RSD and/or Environmental Department personnel shall collect these sediment samples.

- a. Label containers with sample type, amount, location, and date.
- b. Package and ship samples per Attachment 4.
- c. Record on Sample Data Sheet (Attachment 3) location, type, date, and amount of sample. Note any other pertinent information in the "Remarks" section. Sign form in space provided.

5.8 REMP FOOD PRODUCT SAMPLE COLLECTION

- a. Sample containers
- b. Miscellaneous Data Sheet (Attachment 3)

5.8.1 Collect food samples monthly during the harvest season, as per ODCM, Appendix A, Table E-1. Blueberries and apples must be collected. Other crop samples can be collected on availability.

- a. Sample selection of the following crops if available:

Strawberries	Turnips
Grapes	Cauliflower
Peaches	Cabbage - outer leaves only
Pears	Broccoli
	Collard greens

- b. Collect approximately one kilogram (2.2 lb) of each sample type. Samples are not to be washed, shaken, or cleaned. Samples should not be collected from a single source, but at random from the entire orchard or field.

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- c. Label all containers with sample type, amount, location, and date.
- d. Package and ship samples per Attachment 4.
- e. Record on data sheet (Attachment 3) location, type, date, amount, and under "Remarks" note any unusual conditions. Sign form in space provided.

5.9 REMP TLD SAMPLE COLLECTION

5.9.1 Prerequisites

- a. TLDs
- b. TLD Data Sheet (Attachment 5)

5.9.2 Monthly TLDs are to be changed each month; quarterly TLDs during January, April, July, and October; and annual TLDs during January.

5.9.3 Monthly, quarterly, and annually at each sample location perform the following:

- a. Upon receipt of TLDs from the laboratory contractor, all TLDs shall be inventoried and immediately placed in the lead cave (at offsite sample collector's residence). Note date of receipt and inventory on TLD data sheet.
- b. Field TLDs shall only be removed from the lead cave for delivery to their proper locations. All control TLDs remain in the lead cave throughout the entire exposure period.
- c. Remove and replace TLDs at each sample location.
- d. For any missing TLDs, perform the following:
 - 1. Search immediate area.
 - 2. If lost TLD is found, collect it and perform standard change out procedure.
 - 3. If lost TLD is not found, post the new TLD in proper location.

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4. Record in "Remarks" column of data sheet any of the above circumstances.
- e. Store collected field TLDs in lead cave along with control TLDs until ready for mailing to laboratory contractor. Mark "Do not x-ray" on TLD package.
- f. Transportation control TLDs are to be stored in a special lead shield provided by laboratory contractor after the field TLDs are posted.

Ensure that designated transportation control TLDs are included with the correct TLD package being mailed to laboratory contractor. Also ensure that laboratory contractor's TLD data sheet is completed and enclosed with shipment.
- g. Record TLD collection date and the date that the TLDs are returned to the vendor. Initial/sign the data sheet (Attachment 5). Record the installation date for the new TLDs on the appropriate data sheet.
- h. Package and ship samples per Attachment 4.

5.10 MISCELLANEOUS SAMPLES

5.10.1 Ludington - Control Station

NOTE: Aquatic Biota and Sediment samples are also collected at Ludington Pump Storage Plant per Sections 5.6 and 5.7 of this procedure.

- a. Ludington Lake In & Well Water composites are collected daily and shipped to Palisades on a monthly basis.
- b. Palisades RETS/REMP personnel record appropriate data on the Sample Identification Form (Attachment 3), and deliver samples to the local Teledyne sample collector for shipment to Teledyne Midwest Laboratory.

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5.10.2 **Palisades Daily Samples**

- a. Palisades Lake In, Lake Out, Site Well Water, Service Water, and Turbine Sump effluent samples are collected on a daily basis per Palisades per Health Physics Procedure HP 6.52, "Palisades (Onsite) Radiological Environmental Program Sample Collection."
- b. Palisades RETS/REMP personnel record appropriate data on the Sample Identification Form (Attachment 3), label all samples, and deliver samples to the local Teledyne sample collector for shipment to Teledyne Midwest Laboratory.

6.0 **ACCEPTANCE CRITERIA**

Proper completion of procedure.

7.0 **ATTACHMENTS AND RECORDS**

7.1 **ATTACHMENTS**

- 7.1.1 Attachment 1, "Environmental Sample Collection Schedule"
- 7.1.2 Attachment 2, "Sample Locations"
- 7.1.3 Attachment 3, "Sample Identification"
- 7.1.4 Attachment 4, "Sample Packaging and Shipment"
- 7.1.5 Attachment 5, "Palisades Sample Collection Forms and Records"

7.2 **RECORDS**

- 7.2.1 Distribution of Sample Collection Data Sheet as per Attachment 4.
- 7.2.2 All Radiological Environmental Monitoring Program Records shall be considered complete when the Annual Radiological Environmental Operating Report is submitted to the NRC. Records shall be retained in accordance with Palisades Administrative Procedure 10.46, "Plant Records."

ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Palisades Nuclear Plant

<u>Exposure Pathway and/or Sample</u>	<u>Number of Samples and Locations*</u>	<u>Sample Type</u>	<u>Collection Frequency</u>
Airborne: Particulates	1 - Onsite 8 - Within a 10 km Radius 3 - 25 to 89 km Distant	Continuous at approximately 1 cfm (may be less due to dust loading)	Weekly
Iodines	Same as Particulates	Same as particulates	Weekly
Waterborne: Lake Water	1 - Intake 1 - Discharge 1 - Intake (Ludington Control)	Daily composite to obtain a two-gallon sample	Monthly
Drinking Water	1 - S Haven Municipal System - Raw 1 - S Haven Municipal System - Treated		
Well Water	6 - Plant Site Locations 1 - State Park 1 - Township park 1 - Ludington Control	Two-gallon grab sample	Monthly
Sediment	1 - Within 152.4 m of discharge (500 ft) 1 - 0.8 km North of discharge 1 - 0.8 km South of discharge 1 - 8.9 km North 1 - Ludington control (2 recommended)	One-liter grab sample	Semiannually
Ingestion: Milk	3 - From 5 to 13 km 1 - Control from 15 to 30 km	Two-gallon grab sample	Monthly

NOTE: If milk samples are unavailable, see Step 5.5.1c.

*If samples are unavailable at the specified location, an attempt should be made to sample at an alternate location (Refer to Step 4.5).

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ENVIRONMENTAL SAMPLE COLLECTION SCHEDULE

Palisades Nuclear Plant

<u>Exposure Pathway and/or Sample</u>	<u>Number of Samples and Locations*</u>	<u>Sample Type</u>	<u>Collection Frequency</u>
Food Products	1 - Each of two principal fruit crops (blueberries and apples).	Two-pound grab sample	At time of harvest
Fish and Invertebrates	2 - Location in vicinity of Plant discharge 2 - Ludington control	One-liter fish flesh from each available species, two species required. Attempt to obtain the same species from the control location.	Twice in season
Direct: TLD	1 - Onsite 16 - Site boundary 9 - Within 12 km radius 3 - Control stations 1 - Control in lead cave (Contractor's House)	Continuous	Monthly Quarterly and Annually

*If samples are unavailable at the specified location, an attempt should be made to sample at an alternate location (Refer to Step 4.5).

SAMPLE LOCATIONS
Palisades Nuclear Plant

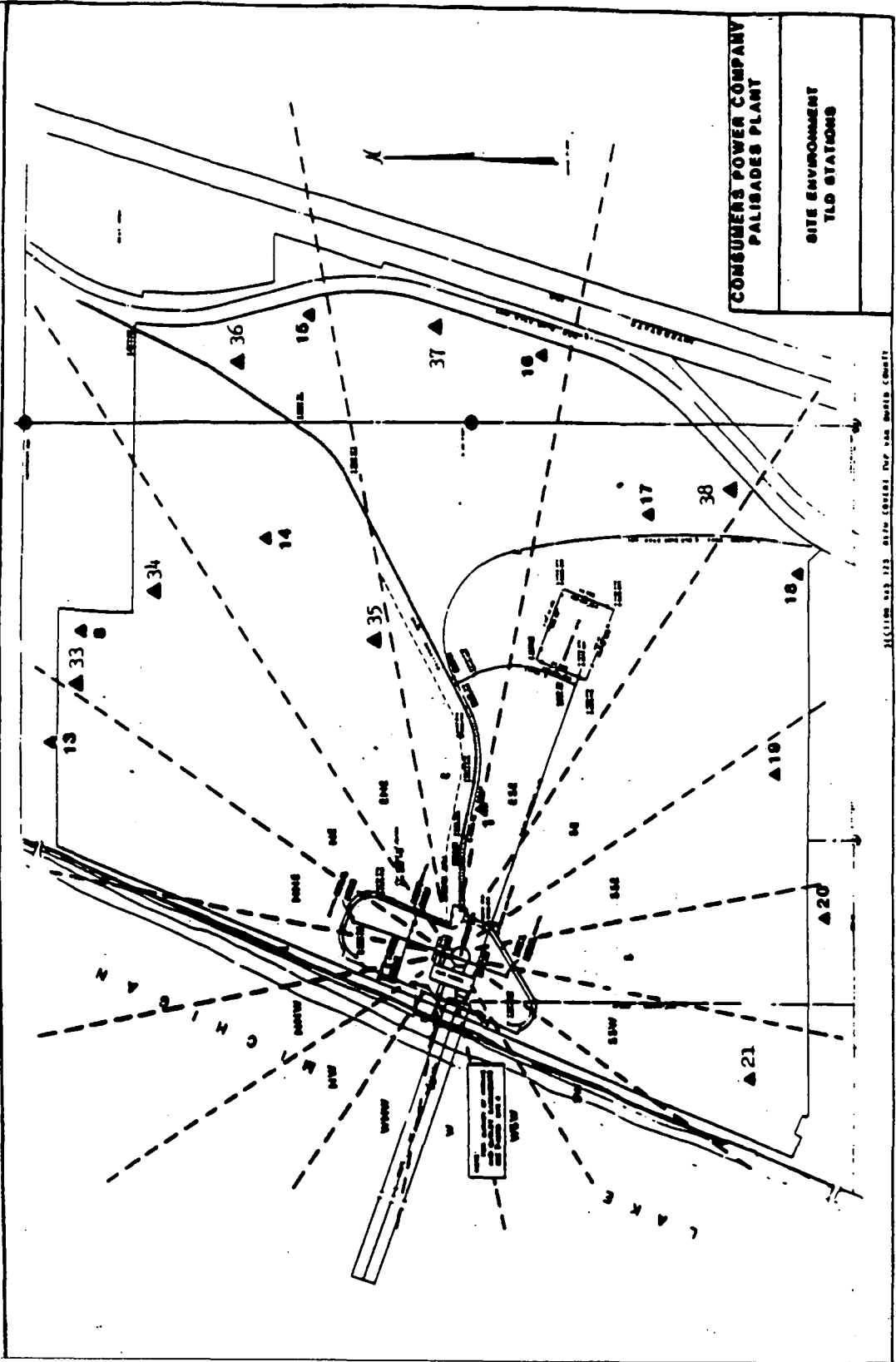
Station	Code	Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Crops	Sediment	TLD	Fish
*1	ST	Palisades Nuclear Plant	Mounted onsite, 500 ft east of main gate. 25 ft south of access road next to well.	X	X	X	X		X	X	X
2	TH	RR 3 Coloma, MI 5 miles south	Along 48th Ave, 500 ft east of 80th St, 25 ft off north side of road.	X	X			X		X	
3	HS	76182 48th Ave. Covert, MI 5 miles south	Along 48th Ave, 1/4 mile west of 76th St. In barnyard 50 yds off north side of road.	X	X					X	
4	JS	36197 M-140 Hwy Covert, MI 3-1/2 miles SE	Along 36th Ave, 1/2 mile east of M-140 15 ft off south side of road.	X	X			X		X	
5	PR	72723 CR 378 Covert, MI 3-1/2 miles ESE	Along CR 378, 3/4 mile east of M-140, 30 ft off north side of road.	X	X			X		X	
6	RB	RR 3 South Haven, MI 4-1/2 miles NE	Along 12th Ave, 1/4 mile west of M-43, 30 ft off south side of road.	X	X			X		X	
7	SD	Sherman Dairy South Haven, MI 6 miles NNE	Along Phoenix Rd, directly behind Sherman Dairy. 1/4 mile east of I-196 and Phoenix Rd on north side.	X	X						
7a	SN35	Emergency Siren 35 4-3/4 miles NNE	On Monroe Blvd.							X	
8	SP	State Park 1 mile N	Onsite along the dump road, north of Plant. One mile from main gate. Near State Park boundary, on side of road as road turns west.	X	X		X			X	

*Plant Site Well #2 or #3

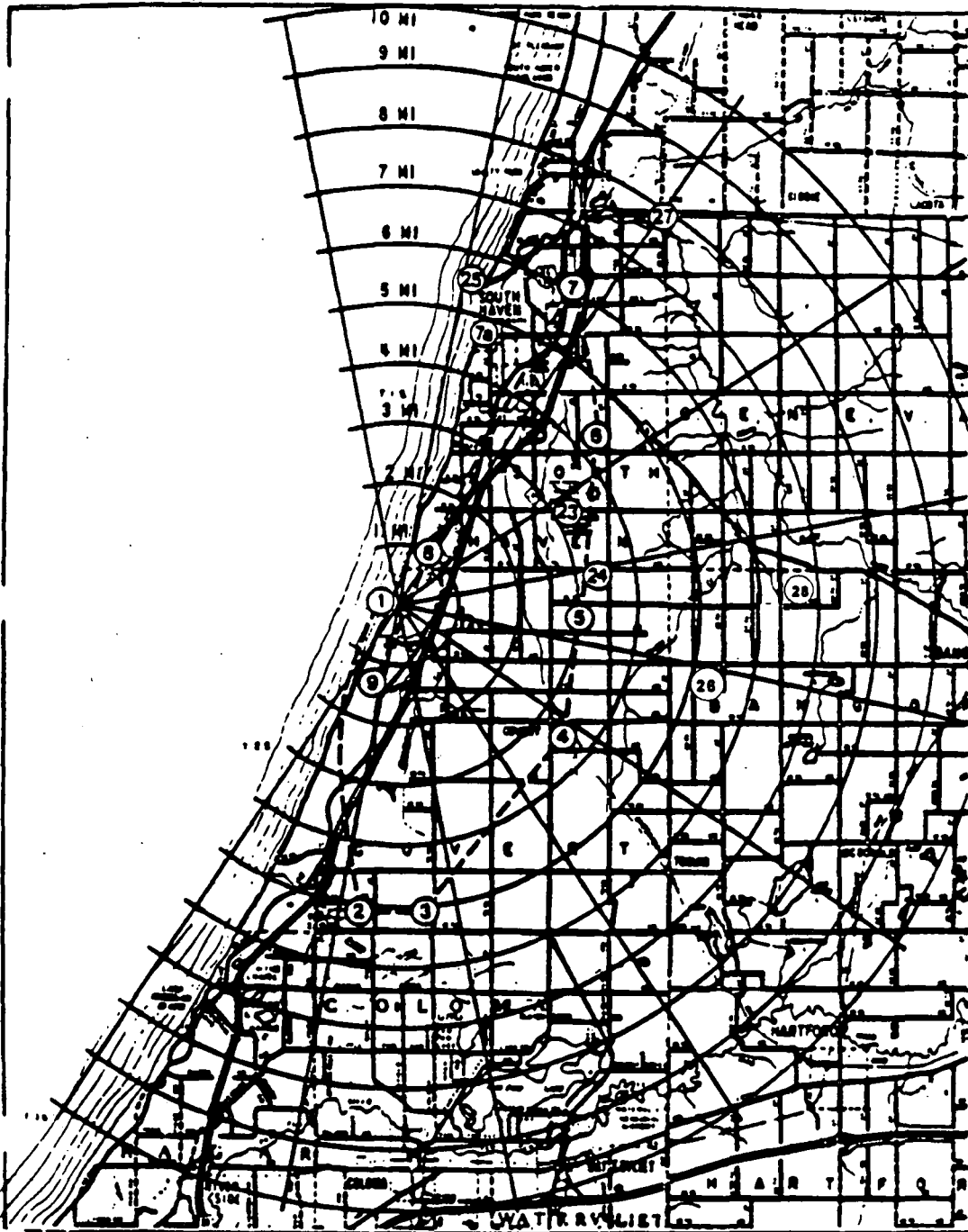
SAMPLE LOCATIONS
Palisades Nuclear Plant

Station	Code	Location	Air Particulates	Air Iodine	Lake Water	Well Water	Milk	Crops	Sediment	TLD	Fish
34	ST	Perimeter of Palisades. Along dump road to area where fence divides old Blue Star Hwy, 25 yards east of road, near Station 14								X	
35	ST	Perimeter of Palisades Located on the main post directly across the storeroom, near Training Building								X	
36	ST	Perimeter of Palisades North along Blue Star Hwy, 0.15 miles from access road, near old RR spur, 50 Ft off West side of road								X	
37	ST	Perimeter of Palisades North along Blue Star Hwy, 0.6 miles from access road, 50 Ft off West side of road								X	
38	ST	Perimeter of Palisades North along Blue Star Hwy, 0.9 miles from access road, 50 Ft off West side of road								X	
39	ST	Plant Site Wells #7 or #9 (Warehouse)				X					
40	ST	Plant Site Wells #11, 12, 13 (Outage Building)				X					
41	ST	Plant Site Monitoring Well #14				X					
42	ST	Plant Site Monitoring Well #15				X					
43	ST	Plant Site Monitoring Well #16				X					

SAMPLE LOCATIONS Palisades Nuclear Plant



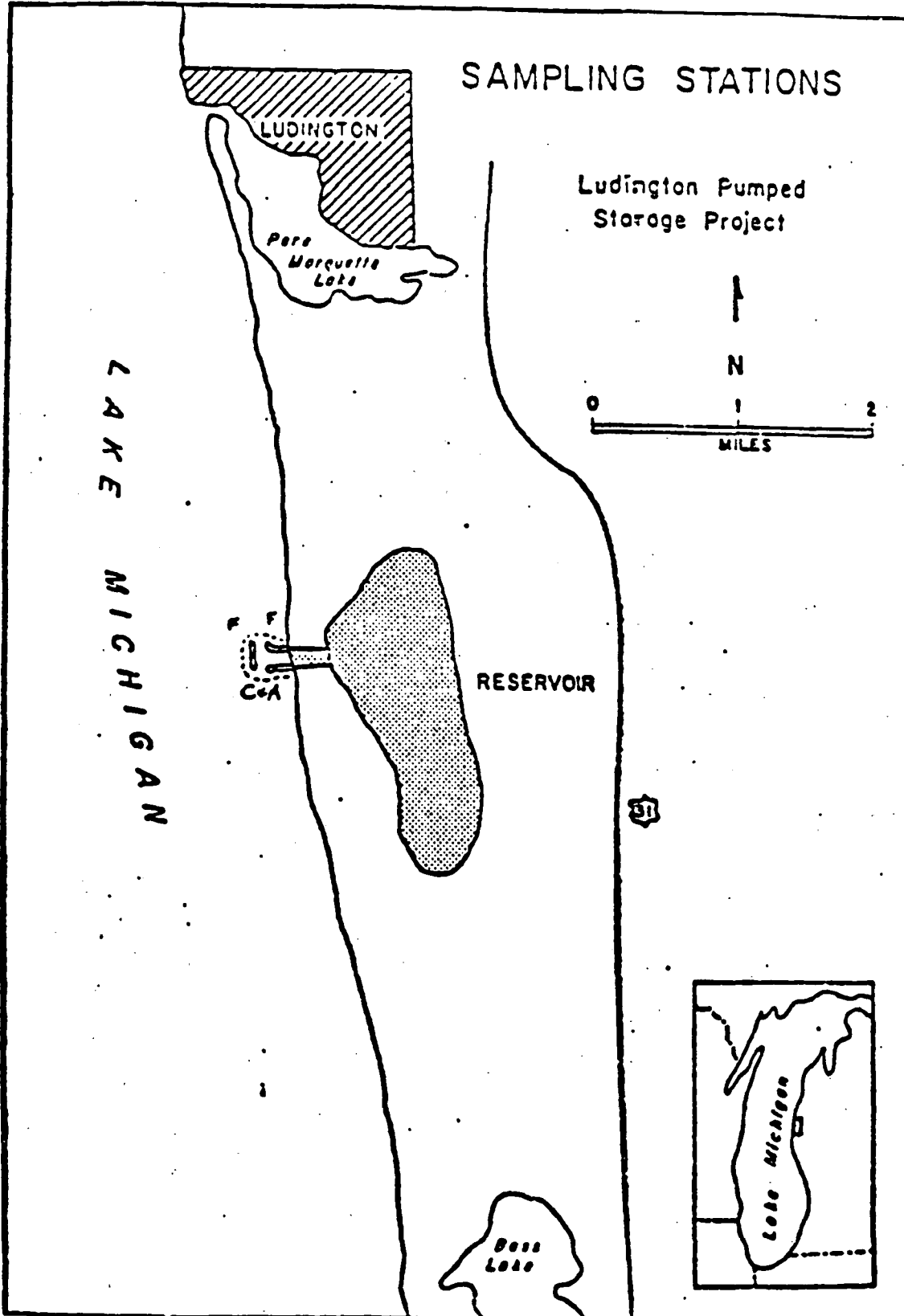
SAMPLE LOCATIONS
Palisades Nuclear Plant



NOT SHOWN (Control Locations)

- 10 Grand Rapids (55 mi NNE)
- 11 Kalamazoo (35 mi SSE)
- 12 Dowagiac (30 mi SSE)
- 22 Control TLD placed in lead cave at Location 4
- 29 William Shine (WS - 10 mi E)

SAMPLE LOCATIONS
Palisades Nuclear Plant



SAMPLE LOCATIONS
Palisades Nuclear Plant

<u>REMP SAMPLING</u>	<u>NUMBER</u>	<u>WELL STATUS</u>	<u>LOCATION</u>
NO	#1	Abandon	NA
YES	#2	In Service	North side of Support Building. Supports Plant site.
YES (Note 1)	#3	Active	Across from East-Radwaste (South Side) backup for well #2.
NO	#4	Abandon	NA
NO	#5	Abandon	NA
NO	#6	Active	Located ~ 145 ft west of Blue Star Hwy. Used for training trailers, well capped when not in service and well is outside of Westerly Groundwater Flow to Plant and interim storage facility.
YES	#7	In Service	Just to the west & between outage building and interim storage facility: Water is nonpotable and used in warehouse restrooms (later to be used for fire system only).
NO	#8	Abandon	NA
YES (Note 2)	#9	Active	Located at junction of access and warehouse road, domestic water supply for warehouse when it is put in service.
NO	#10	Abandon	NA
YES (Note 3)	#11 #12 #13	In Service In Service In Service	North of access road and east of construction road, supplies domestic water for outage building, all in one tie-in.
YES	#14	Active	East of Interim Storage Facility, used for REMP monitoring well.
YES	#15	Active	Southwest of Interim Storage Facility, used for REMP monitoring well.
YES	#16	Active	Northwest of Interim Storage Facility, used for REMP monitoring well.

- NOTES:**
1. When well #2 is out of service, well #3 is put in service with same sample point as well #2, only one sample required in combination of wells #2 and #3.
 2. Sample point will be same as well #7 (in warehouse restroom) when well is put in service.
 3. Wells #11, #12, and #13 all have a common line which supplies domestic water to outage building, only one sample required in conjunction with all 3 wells.

SAMPLE LOCATIONS
Palisades Nuclear Plant

WEST

#16

#15

12'6"

7'6"

5'5"

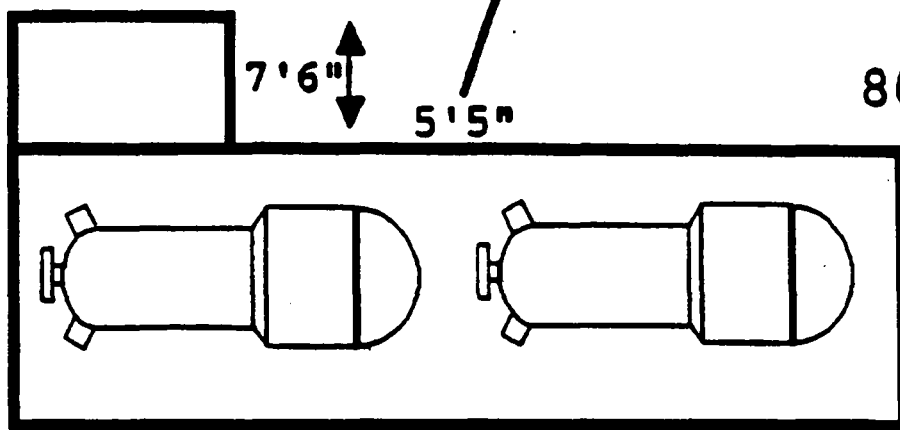
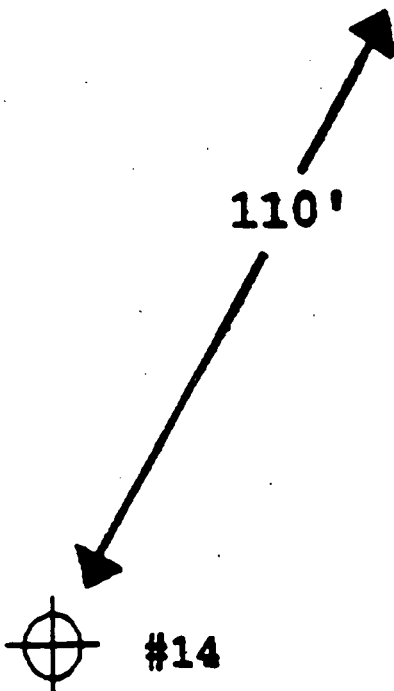
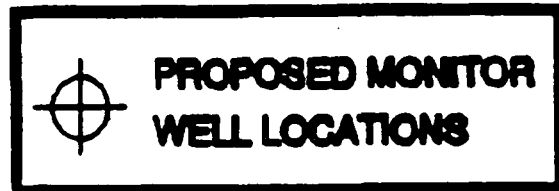
80'

29'

129'4"

110'

#14



SAMPLE PACKAGING AND SHIPMENT

1. Label samples clearly per Attachment 3.
2. Seal all liquid, biota, fish, and sediment sample containers with tape to prevent leakage.
3. Ship liquid samples separately from air particulate and air iodine samples and TLDs.
4. Use sufficient packing material (ie, crumpled newspaper) to avoid possible sample container damage during shipment.
5. Package air filters in glassine or plastic envelopes.
6. For TLD shipments, make sure that Laboratory contractor's own TLD data sheet is enclosed with package.
7. Ship milk samples as soon as possible. Be sure to add a sufficient amount of sodium bisulfite (40 grams) as preservative to each sample.
8. Ship food products as soon as possible after collection.
9. Ship fish and biota samples with a 10% formaldehyde solution added (preservative). Only 10 milliliters is required per sample. Samples should be shipped as soon as possible after processing.
10. Distribute copies of the Sample Collection Data Sheet(s) to the:

Analytical Laboratory
Radiological Services Department Environmental Contact (Palisades)
Sample Collector
11. Send samples to the following address:

Teledyne Brown Engineering Services Midwest Laboratory
Att: Laboratory Manager
700 Landwehr Road
Northbrook, IL 60062
12. Ship all samples to the Laboratory contractor with minimal delay after collection so as to avoid elevated analytical levels of detection.

PALISADES SAMPLE COLLECTION FORMS AND RECORDS

**PALISADES PLANT
 ENVIRONMENTAL MONITOR OPERABILITY CHECK
 AND SAMPLE COLLECTION**

	INSTALLED (MO/DA/YR)	REMOVED (MO/DA/YR)	REMOVED TIME	GAS METER READING		METER SERIAL NO	FLOW TEST				REPLACEMENT METER		SAMPLE VOL (Ft 3)	COMMENTS
				INSTALLED (Ft 3)	REMOVED (Ft 3)		AS FOUND		AS LEFT		SERIAL NUMBER	CALIB ACCURACY ACCEPTABLE		
							FLOW (SEC/Ft3)	LEAK (CFM)	FLOW (SEC/Ft3)	LEAK (CFM)				
1ST														
2TH														
3HS														
4JS														
5PR														
6RB														
7SD														
8SP														
9TP														
10GR														
11KZ														
12DG														

TEST PERFORMED BY: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

ENCLOSURE D

**CONSUMERS ENERGY COMPANY
PALISADES PLANT
DOCKET 50-255**

PALISADES NUCLEAR PLANT

1997 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

1997 PALISADES FINAL MONTHLY PROGRESS REPORT