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President and CEO

February 13, 2003

In reply, please refer to LAC-13790

DOCKET NO. 50-409

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U. S. Nuclear Regulatory Commission  
Washington, DC 20555

SUBJECT: Dairyland Power Cooperative  
La Crosse Boiling Water Reactor  
Possession-Only License No. DPR-45  
Annual Radioactive Effluent Report and  
Radiological Environmental Monitoring Report

REFERENCES: (1) NRC Letter, Keppler to Linder, dated August 12, 1983,  
Inspection Report 50-409/83-10 (DRMSP)  
(2) LACBWR Technical Specifications 6.4.2, 6.5.1.1.c & d

In accordance with 10 CFR 50.36a(a)(2), this letter serves to transmit to you the Radioactive Effluent Report and Radiological Environmental Monitoring Report for the La Crosse Boiling Water Reactor (LACBWR) for 2002.

If you have any questions, please contact us.

Sincerely,

DAIRYLAND POWER COOPERATIVE

William L. Berg, President & CEO

WLB:LLN:tmo

Enclosures

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IE48  
IE25

**RADIOACTIVE EFFLUENT REPORT  
AND  
RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT**

**FOR THE  
LA CROSSE BOILING WATER REACTOR (LACBWR)**

**(January 1 to December 31, 2002)**

**DAIRYLAND POWER COOPERATIVE  
3200 EAST AVENUE SOUTH  
LA CROSSE WI 54602-0817**

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**SECTION A**

**RADIOACTIVE EFFLUENT  
REPORT**

INTRODUCTION:

*The La Crosse Boiling Water Reactor (LACBWR), also known as Genoa Station No. 2, is located on the east bank of the Mississippi River near Genoa, Vernon County, Wisconsin. The plant was designed and constructed by the Allis-Chalmers Manufacturing Company. It was completed in 1967 and had a generation capacity of 50 MW (165 MW<sub>th</sub>). The reactor is owned by Dairyland Power Cooperative (DPC).*

*The reactor went critical in July 1967 and first contributed electricity to DPC's system in April 1968. After completing full power tests in August 1969, the plant operated between 60% and 100% full power, with the exception of plant shutdowns for maintenance and repair.*

*In April of 1987 plant operation was ceased. The reactor is presently defueled and in a SAFSTOR mode. In August of 1987 a possession-only license was received.*

*In accordance with LACBWR Technical Specifications 6.5.1.1.d and in compliance with 10 CFR 50.36a(a)(2), this document is the Radioactive Effluent Report for the period January 1 through December 31, 2002.*

# EFFLUENT AND WASTE DISPOSAL REPORT

(Supplemental Information)

FACILITY: La Crosse Boiling Water Reactor LICENSEE: Dairyland Power Cooperative

DOCKET NO. 50-409

## 1.0 REGULATORY LIMITS

### a. Gaseous Effluent Release Limits:

LACBWR's stack effluent release limitations for gaseous effluent releases of radioactive material limits the release rate of the sum of the individual radionuclides, so that the dose rates to members of the public beyond the Effluent Release Boundary do not exceed 500 mRem/year to the whole body, 3000 mRem/year to the skin from noble gases, and 1500 mRem/year to a critical organ from H-3 and particulates with half-lives greater than 8 days as per the requirements of the Offsite Dose Calculation Manual (ODCM).

Also, in accordance with 10 CFR 50, Appendix I, the ODCM limitations for gaseous effluent radioactive material limit the air dose to a member of the public from noble gases in areas beyond the Effluent Release Boundary to less than 5 mRad gamma and 10 mRad beta per calendar quarter, and less than 10 mRad gamma and 20 mRad beta per calendar year. The dose limits from H-3 and particulates with half-lives greater than 8 days are less than 7.5 mRem per calendar quarter, and less than 15 mRem per calendar year to any organ.

Cumulative dose contributions from gaseous effluent releases are determined in accordance with the LACBWR Offsite Dose Calculations Manual.



EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

b. Liquid Effluent Release Limits:

LACBWR's liquid effluent release limitations for liquid effluent releases are those concentrations specified in 10 CFR 20 Appendix B, Table 2, Column 2. For alpha emitting radionuclides, the concentration is limited to a total activity concentration of  $4.9E-9$   $\mu\text{Ci/ml}$ , based upon an actual alpha emitting radionuclide analysis performed on a representative water sample. The values reported in tables 2A and 2B, Liquid Effluents, are based on dilution with the combination of LACBWR and Genoa Station No. 3 condenser cooling water flow prior to discharge to the Mississippi River. No credit is taken for further dilution in the mixing zone of the Mississippi River.

Also, in accordance with 10 CFR 50, Appendix I, the dose commitment to a member of the public from radioactive materials released in liquid effluents to areas beyond the Effluent Release Boundary are limited to less than 1.5 mRem whole body and 5.0 mRem organ dose per calendar quarter, and less than 3.0 mRem whole body and 10 mRem organ dose per calendar year via the critical ingestion pathway.

Cumulative quarterly and annual dose contributions from liquid effluent releases are determined for the adult fish ingestion pathway in accordance with the LACBWR Offsite Dose Calculation Manual.

c. Solid Radioactive Waste

All solid radioactive wastes are handled in accordance with a Process Control Program as defined by LACBWR procedures in order to assure that all applicable transportation and burial site disposal requirements are met.

## EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

### 2.0 EFFLUENT RELEASE CONCENTRATION LIMIT

The Effluent Release Concentration used to calculate permissible release rates are obtained from 10 CFR 20, Appendix B, Table 2, Column 2.

### 3.0 AVERAGE ENERGY

The release rate limits for LACBWR are not based on average energy.

### 4.0 ANALYTICAL METHODS

#### a. Liquid Effluents

Liquid effluent measurements for gross radioactivity are performed by HPGe gamma isotopic analysis of a representative sample from each tank discharged. In addition, each batch discharged tank is analyzed for alpha and tritium activity concentration. A composite sample is created by collecting representative aliquots from each tank batch discharged during a calendar quarter. This composite is analyzed for Iron-55 and Strontium-90 by a contractor on a quarterly basis.

#### b. Airborne Particulates

Airborne particulate releases are determined by HPGe gamma isotopic analysis. This analysis is performed by analyzing a glass fiber filter paper taken from the stack monitor which continuously isokinetically samples and monitors the stack effluent. This filter is changed and analyzed on an approximate weekly basis and analyzed within 7 days after removal. This filter is also analyzed for alpha activity. A quarterly composite of these filters is sent to a contractor for Sr-90 analysis.

## EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

### c. Radioiodines

Since the plant shutdown in April 1987, the I-131/I-133 have decayed completely to stable elements. Amendment 66 to the LACBWR Technical Specifications, deleted the requirement for monitoring for iodine.

### d. Fission and Activation Gases

The concentration of radioactivity ( $\mu\text{Ci/cc}$ ) in gaseous releases from the stack is continuously monitored by two in line stack monitors. These gas concentrations ( $\mu\text{Ci/cc}$ ) are corrected for pressure loss in the sampling system and averaged by the monitors microprocessor. The results are used along with the stack flow rate to obtain the daily gaseous release from the plant. Since the plant shutdown in April 1987, gaseous releases have been immeasurable. All fission gases except Kr-85 have decayed to stable elements.

### e. Tritium

Tritium releases are determined by taking a grab sample of the stack atmosphere at the effluent of the stack monitor. Tritium, as tritiated water, is removed from the sample stream by condensation, using a cold trap. The condensed water vapor is then distilled and the distillate is analyzed for H-3 concentration ( $\mu\text{Ci/cc}$ ), by internal liquid scintillation spectrophotometry and the results are expressed in terms of tritium release rates. The tritium grab samples are obtained on at least a once/month basis unless the upper reactor cavity is flooded, at which time the sampling frequency is increased to at least once per 7 days.

## EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

### 5.0 BATCH RELEASES

#### a. Airborne

All airborne effluent releases at LACBWR are from a single Continuous-Elevated Release Point.

#### b. Liquid

All liquid effluent releases at LACBWR are batch releases. This is summarized as follows:

(1) Number of Batch Releases:	8
(2) Total Time Period for Batch Releases:	107.4 hours
(3) Maximum Time Period for a Batch Release:	18.4 hours
(4) Average Time Period for a Batch Release:	13.4 hours
(5) Minimum Time Period for a Batch Release:	10.8 hours
(6) Average Stream Flow Rate During Periods of Release of Effluent into a Flowing Stream:	35,680 ft <sup>3</sup> /sec

### 6.0 ABNORMAL RELEASES

There were no abnormal releases of radioactivity in plant effluents.

### 7.0 ESTIMATED TOTAL ANALYTICAL ERROR

The reported analytical results contain the following estimated errors:

Counting Error 95% Confidence Level

Sampling Volume Error  $\pm$  5%.

EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

TABLE 1A

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2002**

**GASEOUS EFFLUENTS – SUMMATION OF ALL RELEASES**

		UNIT	QTR	QTR	QTR	QTR	TOTAL
<b>A.</b>	<b>FISSION &amp; ACTIVATION GASES</b>						
1.	TOTAL RELEASE	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.	AVERAGE RELEASE RATE FOR PERIOD	μCi/Sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
<b>B.</b>	<b>IODINE I-131 - No longer analyzed for.</b>						
<b>C.</b>	<b>PARTICULATES</b>						
1.	PARTICULATES WITH HALF-LIVES > 8 DAYS	Ci	3.36E-6	3.99E-6	3.30E-6	2.16E-6	1.28E-5
2.	AVERAGE RELEASE RATE FOR PERIOD	μCi/Sec	4.32E-7	5.07E-7	4.15E-7	2.71E-7	
3.	GROSS ALPHA RADIOACTIVITY	Ci	2.45E-7	3.20E-8	0.00+00	8.60E-8	3.63E-7
<b>D.</b>	<b>TRITIUM</b>						
1.	TOTAL RELEASE	Ci	5.55E-3	5.39E-3	7.88E-3	1.16E-2	3.04E-2
2.	AVERAGE RELEASE RATE FOR PERIOD	μCi/Sec	7.14E-4	6.86E-4	9.91E-4	1.46E-3	
<b>E.</b>	<b>PERCENTAGE OF ODCM DOSE LIMITS FOR GASEOUS EFFLUENT RELEASES</b>						
			QTR	QTR	QTR	QTR	YEARLY
1.	NOBLE GAS RELEASE						
	GAMMA	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	BETA	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.	H-3 AND ALL RADIONUCLIDES IN PARTICULATE FORM WITH HALF-LIVES GREATER THAN 8 DAYS						
	GAMMA (Highest Organ)	%	1.21E-4	1.12E-4	1.32E-4	1.20E-4	2.42E-4

EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

TABLE 1B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2002

GASEOUS EFFLUENTS – ELEVATED RELEASE

		CONTINUOUS MODE					
		UNIT	QTR	QTR	QTR	QTR	TOTAL
NUCLIDES RELEASED							
1.	FISSION GASES						
	KRYPTON-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TOTAL FOR PERIOD	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.	IODINE I-131 - Analysis no longer required.						
3.	PARTICULATES						
	STRONTIUM-90	Ci	0.00E+00	0.00E+00	1.50E-8	0.00E+00	1.50E-8
	CESIUM-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CESIUM-137	Ci	1.21E-6	5.00E-7	1.20E-6	7.46E-7	3.66E-6
	COBALT-60	Ci	2.15E-6	3.49E-6	2.08E-6	1.41E-6	9.13E-6
		Ci					
		Ci					
		Ci					
		Ci					
		Ci					
		Ci					
	TOTALS	Ci	3.36E-6	3.99E-6	3.30E-6	2.16E-6	1.28E-5

EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

TABLE 2A

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2002**

**LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES**

		UNIT	QTR	QTR	QTR	QTR	TOTAL
<b>A</b>	<b>FISSION &amp; ACTIVATION PRODUCTS</b>						
1.	TOTAL RELEASE (NOT INCL. TRITIUM, GASES, ALPHA)	Ci	0.00+00	5.81E-3	6.26E-3	4.02E-3	1.61E-2
2.	AVERAGE DILUTED CONCENTRATION DURING PERIOD	µCi/ml	0.00+00	5.54E-9	4.85E-9	7.25E-9	
<b>B.</b>	<b>TRITIUM</b>						
1.	TOTAL RELEASE	Ci	0.00+00	1.19E-2	4.56E-2	2.58E-2	8.33E-2
2.	AVERAGE DILUTED CONCENTRATION DURING PERIOD	µCi/ml	0.00+00	1.13E-8	3.53E-8	4.66E-8	
<b>C.</b>	<b>DISSOLVED AND ENTRAINED GASES</b>						
1.	TOTAL RELEASE	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2.	AVERAGE DILUTED CONCENTRATION DURING PERIOD	µCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
<b>D.</b>	<b>GROSS ALPHA RADIOACTIVITY</b>						
1.	TOTAL RELEASE	Ci	0.00E+00	0.00+00	0.00E+00	0.00E+00	0.00+00
<b>E.</b>	<b>VOLUME OF WASTE RELEASED (PRIOR TO DILUTION)</b>						
		Liters	0.00+00	6.45E+4	6.48E+4	4.41E+4	1.73E+5
<b>F.</b>	<b>VOLUME OF DILUTION WATER USED DURING PERIOD</b>						
		Liters	0.00+00	1.05E+9	1.29E+9	5.54E+8	2.89E+9
<b>G.</b>	<b>PERCENTAGE OF ODCM LIMITS FOR LIQUID RELEASES</b>						
			QTR	QTR	QTR	QTR	YEARLY
	HIGHEST ORGAN	%	0.00+00	2.05	1.85	2.69	3.29
	WHOLE BODY	%	0.00+00	4.32	3.89	5.67	6.93

EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

TABLE 2B

EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT 2002

LIQUID EFFLUENTS

NUCLIDES RELEASED	UNIT	QTR	QTR	QTR	QTR
MANGANESE-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
IRON-55	Ci	0.00E+00	7.55E-6	2.61E-5	3.24E-6
COBALT-60	Ci	0.00E+00	1.17E-4	2.22E-4	1.31E-4
STRONTIUM-90	Ci	0.00E+00	1.01E-4	6.02E-5	4.59E-5
CESIUM-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CESIUM-137	Ci	0.00E+00	5.59E-3	5.96E-3	3.89E-3
TOTAL FOR PERIOD (ABOVE)	Ci	0.00E+00	5.81E-3	6.26E-3	4.07E-3
KRYPTON-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00



EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

TABLE 3

**EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT – 2002**  
**SOLID WASTE AND IRRADIATED FUEL SHIPMENTS**

**A. SOLID WASTE SHIPPED OFFSITE FOR DISPOSAL (Not Irradiated Fuel)**

1. TYPE OF WASTE	UNIT	6-MONTH PERIOD	6-MONTH PERIOD	TOTAL
a. SPENT RESINS, FILTER SLUDGES, EVAPORATOR BOTTOMS, ETC	m <sup>3</sup>	0	0	0
	Ci	0	0	0
b. DRY COMPRESSIBLE WASTE, CONTAMINATED EQUIPMENT, ETC	m <sup>3</sup>	130.93	58.8	189.73
	Ci	4.58E-2	2.62E-1	3.08E-1
c. IRRADIATED COMPONENTS, CONTROL RODS, ETC	m <sup>3</sup>	0	0	0
	Ci	0	0	0
d. OTHER (DESCRIBE)	m <sup>3</sup>	0	0	0
	Ci	0	0	0

2. ESTIMATE OF MAJOR NUCLIDE COMPOSITION (BY TYPE OF WASTE)	PERCENT	6-MONTH PERIOD	6-MONTH PERIOD
Co-60	44.30	2.03E-2	1.16E-1
Fe-55	24.86	1.14E-2	6.51E-2
Ni-63	27.96	1.28E-2	7.33E-2
Pu-241	2.17	9.94E-4	5.69E-3
Ni-59	0.21	9.62E-5	5.50E-4
Am-241	0.18	8.24E-5	4.72E-4

**3. SOLID WASTE DISPOSITION**

<u>NO. OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
8	Sole Use	American Ecology (Oak Ridge, TN)

**B. IRRADIATED FUEL SHIPMENTS (DISPOSITION)**

<u>NO OF SHIPMENTS</u>	<u>MODE OF TRANSPORTATION</u>	<u>DESTINATION</u>
NONE		

EFFLUENT AND WASTE DISPOSAL REPORT - (cont'd)

8.0 OFFSITE DOSE CALCULATIONS SUMMARY AND CONCLUSIONS:

a. Gaseous Effluent Releases

The maximum quarterly offsite gamma dose due to noble gases was 0.00 mRad. The cumulative 2002 annual offsite gamma dose due to noble gases was 0.00 mRad.

The maximum quarterly offsite beta dose due to noble gases was 0.00 mRad. The cumulative 2002 annual offsite beta dose due to noble gases was 0.00 mRad.

The maximum quarterly offsite dose to any organ from the release of H-3 and all radionuclides in particulate form with half-lives greater than 8 days was approximately  $9.88\text{E-}6$  mRem. The cumulative 2002 annual maximum organ dose from these radionuclides was also approximately  $3.62\text{E-}5$  mRem.

The highest historical annual average X/Q equal to  $1.82\text{E-}6\text{ sec/m}^3$  for the period 1985-1987 for the worst case offsite receptor location, in accordance with the ODCM, was used to calculate these offsite dose values.

b. Liquid Effluent Releases

The maximum quarterly organ dose from liquid releases was approximately  $1.35\text{E-}1$  mRem. The cumulative 2002 annual organ dose was approximately  $3.29\text{E-}1$  mRem. The maximum quarterly total body dose for liquid releases was approximately  $8.51\text{E-}2$  mRem, and the cumulative 2002 annual total body dose was approximately  $2.08\text{E-}1$  mRem.

c. Conclusion

All calculated offsite doses were below ODCM limits.

**SECTION B**

**ANNUAL  
RADIOLOGICAL  
ENVIRONMENTAL MONITORING  
REPORT**

## INTRODUCTION:

*The Radiological Environmental Monitoring (REM) Program is conducted to comply with the requirements of the ODCM and in accordance with 10 CFR 50 Appendix I. The REM Program provides measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides which could potentially lead to radiation doses to Members of the Public resulting from plant effluents. Environmental samples are taken within the surrounding areas of the plant and in selected control or background locations.*

*The monitoring program at the LACBWR facility includes monitoring of liquid and gaseous releases from the plant, as well as environmental samples of surface air, river water, river sediment, milk, fish, and penetrating radiation.*

*The REM program theory supplements the Radioactive Effluent analyses by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and modeling of the environmental exposure pathways using the methodology of the Offsite Dose Calculation Manual (ODCM).*

*An Interlaboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurements of radioactive material in environmental samples are performed.*

## **1.0 SAMPLE COLLECTION**

Environmental samples are collected from the area surrounding LACBWR at the frequencies outlined in the ODCM. A series of figures and tables are included in this report to better show LACBWR's environmental program.

FIGURE 1 This map includes the plant boundary, roads, other generation plants, and the relationship of the plant to the nearest local community.

FIGURE 2 This map shows the location of LACBWR's permanent environmental monitoring stations.

FIGURES 3&4 These maps show the location of LACBWR's TLDs.

TABLE 5 This table shows the sampling frequency of the various environmental samples and the analyses performed on these samples

TABLE 6 This table shows the permanent monitoring stations used in LACBWR's environmental program.

TABLE 7 This table shows the TLD locations.

TABLE 8 This table shows the number of various samples collected and analyzed during 2002.

## **2.0 RESULTS OF THE 2002 RADIO-ENVIRONMENTAL MONITORING SURVEYS**

During 2002, activity levels in the local environment were normal, indicating no significant plant attributed radioactivity.

### **2.1 PENETRATING RADIATION**

The environmental penetrating radiation dose is measured by thermoluminescent dosimeters consisting of four lithium fluoride (LiF) chips. These TLD's are changed on a quarterly basis and are sent to an outside contractor for reading. The TLD results for 2002 are shown on Table 9.

## 2.2 AIR PARTICULATE

Air samples are collected continuously from various sites (see Table 6) around LACBWR. An air sampler is also located 18 miles north of the plant in La Crosse, Wisconsin, to act as a control station.

Particulate air samples are collected at the rate of approximately 30-60 lpm with a Gelman Air Sampler. The air filter consists of a glass fiber filter with an associated pore size of approximately 0.45  $\mu\text{m}$ . The particulate filters are analyzed weekly for gross beta activity with an internal proportional counter, and the monthly particulate composites are gamma analyzed for individual isotopic concentration.

TABLE 10 This table shows the weekly gross beta gamma activity concentration from the air particulate filters.

TABLE 11 This table shows the composite air particulate isotopic analysis.

Comparison between the control station at La Crosse and the other stations near LACBWR indicate that there was no significant plant attributable airborne particulate activity.

## 2.3 RIVER WATER

River water is collected monthly. River water samples above, at, and below the plant site are collected and are gamma analyzed for isotopic concentration. The river water gamma isotopic analysis results are shown in Table 12. The results indicate that there is insignificant plant-attributable radionuclides in the river water.

## RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT – (cont'd)

### 2.4 SEDIMENT SAMPLES

Sediment samples were collected twice per year above, at, and below the plant outfall. These samples were gamma analyzed and these results appear on Table 13. They indicated that small amounts of plant attributed radionuclides have accumulated in river sediments near the outfall. The amount of radionuclide in this sediment has been declining since plant shutdown.

### 2.5 FISH

Fish samples were collected quarterly above and below the plant discharge. The results of gamma spectral analysis of edible portions of fish samples appear in Table 14. There has been no significant accumulation of plant attributed radionuclides in fish in the vicinity of LACBWR.

### 3.0 CONCLUSIONS

All environmental samples collected and analyzed during 2002 exhibited no significant contribution from LACBWR.

**4.0 INTERLABORATORY COMPARISON PROGRAM RESULTS**

During 2002, interlaboratory comparison samples were obtained from an outside contractor. The equipment used to analyze the environmental samples was tested against the contractors' results. The following is the result of this comparison.

ANALYSIS	LACBWR RESULTS	CONTRACTOR RESULTS	RATIO
GROSS BETA	170 pCi	158pCi	1.08
GROSS ALPHA	77 pCi	62 pCi	1.24
Ce-141	92 pCi/l	80 pCi/l	1.15
Cr-51	294 pCi/l	249 pCi/l	1.18
Cs-134	67 pCi/l	71 pCi/l	0.94
Cs-137	172 pCi/l	158 pCi/l	1.09
Co-58	108 pCi/l	100 pCi/l	1.08
Mn-54	116 pCi/l	102 pCi/l	1.14
Fe-59	61 pCi/l	52 pCi/l	1.17
Zn-65	146 pCi/l	129 pCi/l	1.13
Co-60	128 pCi/l	118 pCi/l	1.08
H-3	6590 pCi/l	5987 pCi/l	1.10



RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT - (cont'd)

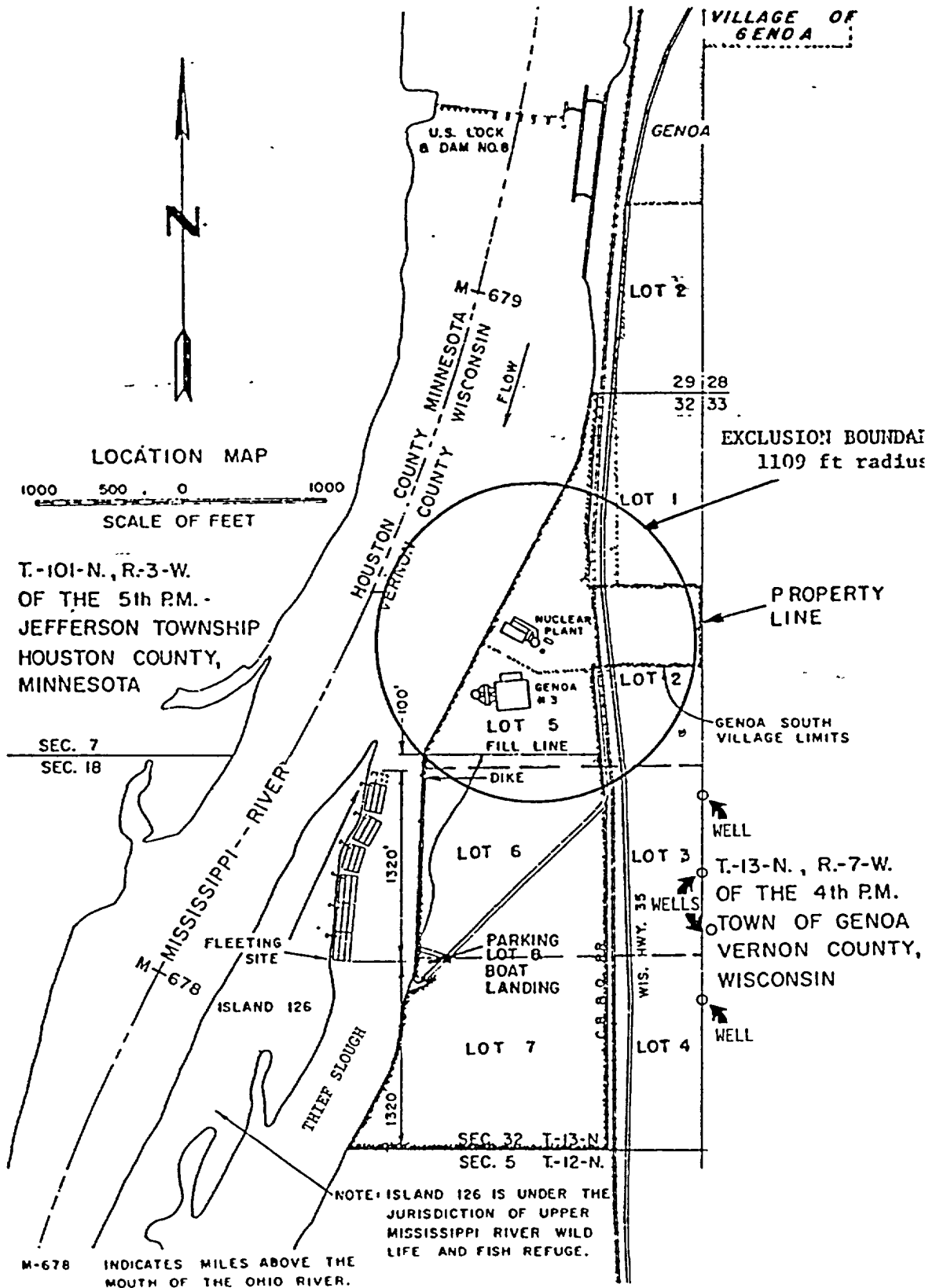
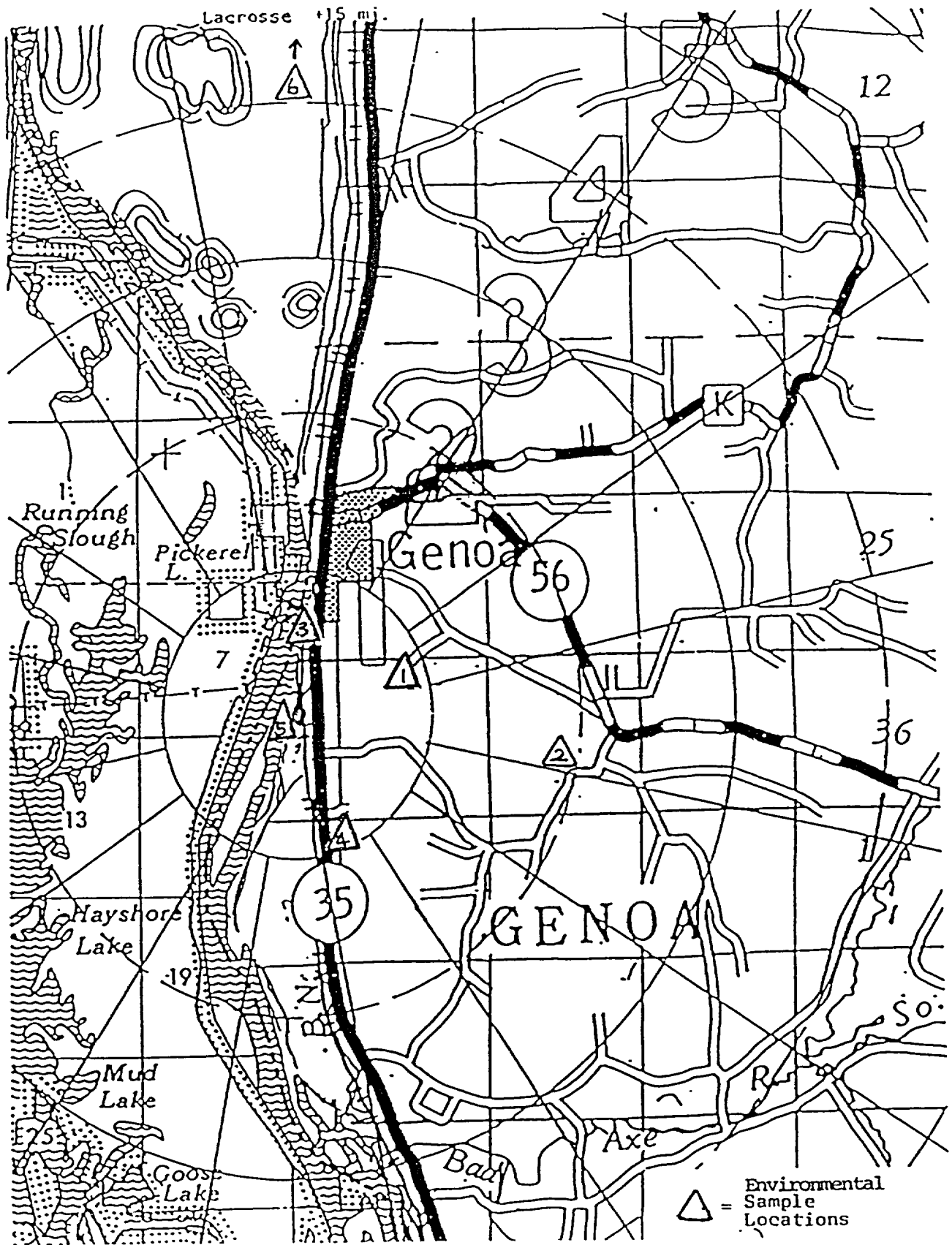


FIGURE 1 - LACBWR PROPERTY MAP



**FIGURE 2 - PERMANENT ENVIRONMENTAL MONITORING STATION LOCATIONS**

(Refer to Table 6)

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT - (cont'd)

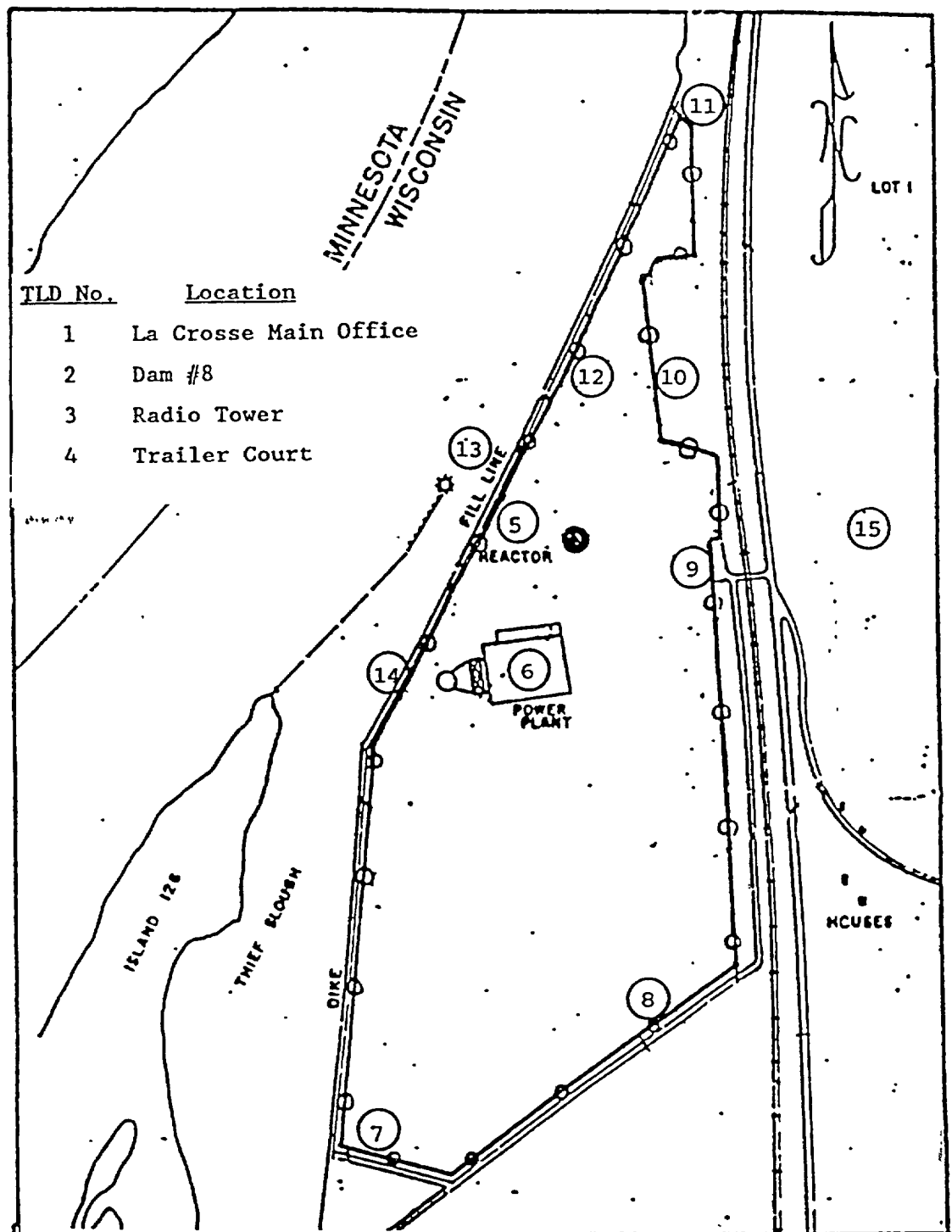


FIGURE 3 - LACBWR ENVIRONMENTAL DOSE ASSESSMENT LOCATIONS

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT - (cont'd)

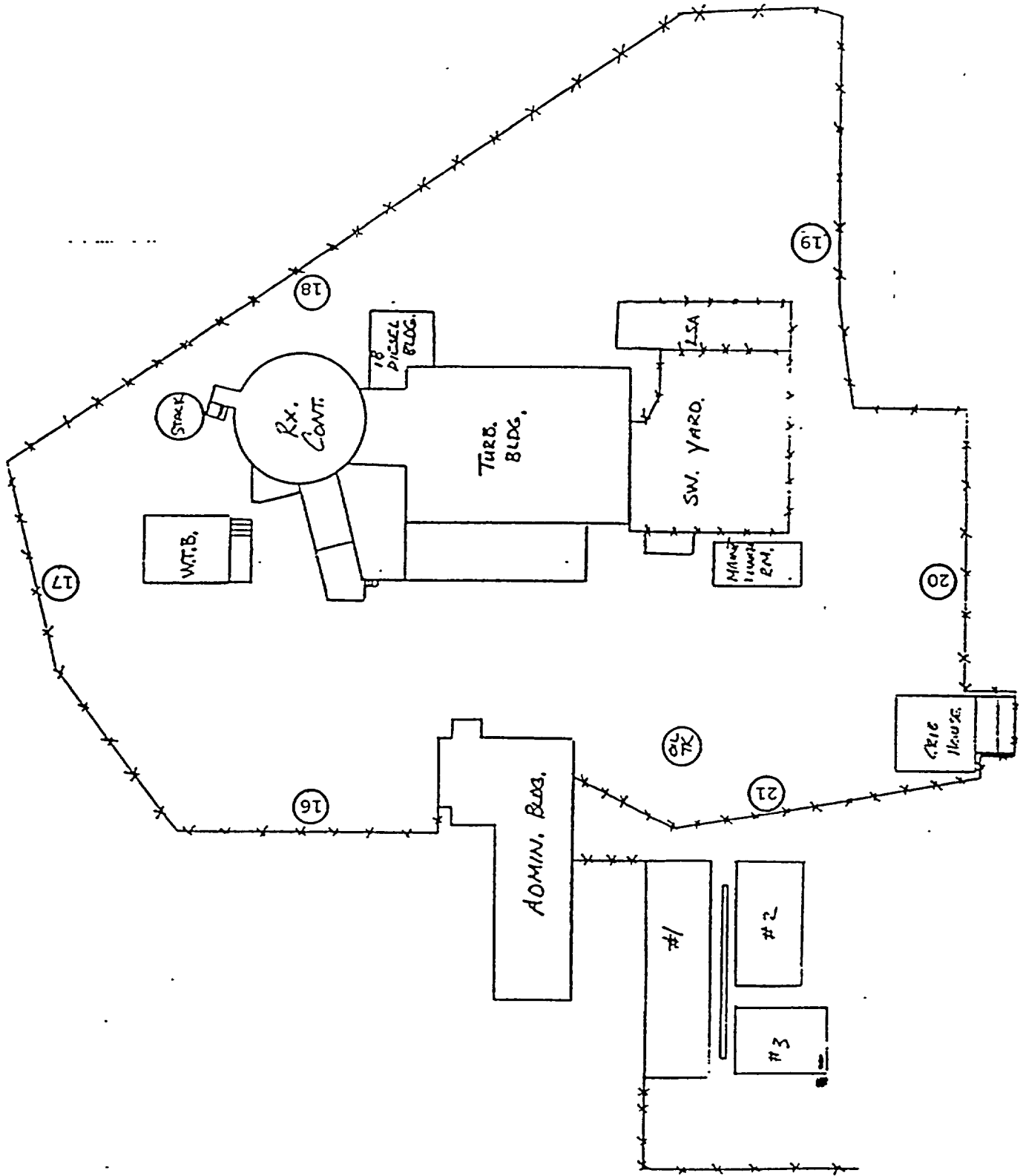


FIGURE 4 - LACBWR ENVIRONMENTAL DOSE ASSESSMENT LOCATIONS

TABLE 5

**SAMPLE FREQUENCY AND ANALYSIS OF RADIO-ENVIRONMENTAL SAMPLES**

<b><u>SAMPLE</u></b>	<b><u>FREQUENCY</u></b>	<b><u>ANALYSIS PERFORMED</u></b>
TLD (LiF) Dosimeters	Quarterly	Dose in mRem
Particulate Air Glass Fiber Filters	Weekly	Gross Beta and Gamma Spectroscopy of Composites Monthly (HPGe-MCA)
Milk	Obtain sample as directed if abnormal stack particulate release occurs.	Gamma Spectroscopy
Sediment	Twice per year	Gamma Spectroscopy
Fish	Quarterly	Gamma Spectroscopy
River	Monthly	Gamma isotopic analysis and tritium (Liquid Scintillation Analyzer)
Vegetation	Obtain sample as directed if abnormal stack particulate release occurs.	Gamma Spectroscopy

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT – (cont'd)

TABLE 6

PERMANENT ENVIRONMENTAL MONITORING STATION LOCATIONS

(Refer to Figure 2)

LOCATION NO.	LOCATION	AIR SAMPLE
1	Radio Tower	x
2	Dam No. 8	x
3	Trailer Court	x
4	Crib House	x
5	Main Office	x

**TABLE 7**  
**ENVIRONMENTAL TLD LOCATIONS**

LOCATION NO.	LOCATION
1	LA CROSSE MAIN OFFICE AIR SAMPLER BOX
2	DAM #8 AIR SAMPLER BOX
3	RADIO TOWER BUILDING AT AIR SAMPLER
4	TRAILER COURT AIR SAMPLER BOX
5	CRIBHOUSE AIR SAMPLER BOX
6	G-3 CONTROL ROOM
7	SW GATEPOST AT END OF G-3 DIKE
8	ON FENCE N. SIDE OF FISHERMAN'S ROAD
9	SITE ENTRANCE GUARD AREA
10	ON FENCE AT NE CORNER OF THE SWITCHYARD
11	ON N. SITE AREA FENCE GATE
12	G-1 CRIBHOUSE
13	ON MOORING WALKWAY WEST OF LACBWR #2 WAREHOUSE
14	G-3 COAL UNLOADING CRANE
15	POWER POLE ON BLUFF SIDE EAST OF PLANT
16	RESTRICTED AREA FENCE N. SIDE
17	RESTRICTED AREA FENCE E. SIDE
18	RESTRICTED AREA FENCE S. SIDE
19	RESTRICTED AREA FENCE SW CORNER
20	RESTRICTED AREA FENCE W. SIDE
21	RESTRICTED AREA FENCE NW CORNER

**TABLE 8**  
**RADIO-ENVIRONMENTAL SAMPLES COLLECTED**  
**JANUARY-DECEMBER 2002**

<u>TYPE OF SAMPLE</u>	<u>NUMBER OF SAMPLES</u>
Penetrating Radiation (TLD's)	84
Air Particulate	257
River Water	36
Sediment	6
Fish	8



**TABLE 9**  
**QUARTERLY THERMOLUMINESCENT DOSIMETER DOSE MEASUREMENTS**  
**IN THE LACBWR VICINITY 2002**

STATION NO.	1st QUARTER mrem	2nd QUARTER mrem	3rd QUARTER mrem	4th QUARTER mrem
1	15.1	13.0	15.3	14.6
2	18.6	18.5	18.0	15.3
3	20.1	16.5	15.6	15.8
4	18.7	19.6	20.8	18.8
5	21.0	21.9	21.2	18.7
6	17.5	15.8	15.8	15.2
7	19.6	19.9	22.2	19.3
8	18.1	20.0	19.7	17.9
9	20.4	19.6	20.4	19.6
10	16.0	16.0	25.1	16.4
11	22.2	19.6	20.2	19.4
12	20.4	22.9	21.6	20.1
13	18.6	18.4	18.4	18.0
14	14.8	13.4	12.8	13.8
15	24.4	23.2	25.0	24.8
16	32.9	31.8	32.7	30.7
17	40.1	44.1	41.5	38.4
18	40.1	38.1	40.7	41.9
19	29.2	25.5	32.7	26.3
20	26.5	23.9	22.3	23.2
21	32.7	31.0	34.5	28.8

*Station #1 (La Crosse Main Office) located approximately 16 miles north of LACBWR is considered the Control TLD.*

**TABLE 10**  
**WEEKLY GROSS BETA AIR PARTICULATES IN THE LACBWR VICINITY**  
 (Reporting Level = 10 times Control Value)

COLLECTION DATE	LACBWR PLANT pCi/m <sup>3</sup>	TRAILER COURT pCi/m <sup>3</sup>	DAM #8 pCi/m <sup>3</sup>	RADIO TOWER pCi/m <sup>3</sup>	LA CROSSE CONTROL
1/9/02	.035 ± .003	.039 ± .003	.039 ± .003	.027 ± .002	.038 ± .003
1/15/02	.017 ± .003	.019 ± .002	.018 ± .002	.013 ± .002	.020 ± .003
1/22/02	.026 ± .003	.027 ± .003	.029 ± .003	.026 ± .002	.032 ± .003
1/29/02	.026 ± .003	.028 ± .003	.039 ± .003	.027 ± .003	.033 ± .003
2/6/02	.035 ± .003	.035 ± .003	.040 ± .003	.031 ± .003	.041 ± .003
2/13/02	.029 ± .003	.022 ± .002	.019 ± .002	.020 ± .002	.030 ± .003
2/20/02	.014 ± .002	.015 ± .002	.018 ± .002	.012 ± .002	.020 ± .003
2/26/02	.016 ± .002	.015 ± .002	.017 ± .002	.016 ± .002	.018 ± .002
3/5/02	.021 ± .003	.022 ± .002	.025 ± .002	.013 ± .002	.019 ± .002
3/12/02	.028 ± .003	.026 ± .002	.024 ± .003	.021 ± .002	.010 ± .002
3/20/02	.024 ± .003	.021 ± .002	.025 ± .003	.017 ± .002	.023 ± .002
3/26/02	.027 ± .003	.031 ± .003	.034 ± .004	.025 ± .003	.035 ± .003
4/3/02	.019 ± .002	.018 ± .002	.021 ± .002	.016 ± .002	.021 ± .002
4/10/02	.021 ± .003	.022 ± .002	.019 ± .002	.019 ± .002	.025 ± .002
4/16/02	.013 ± .002	.018 ± .002	.028 ± .003	.022 ± .002	.024 ± .003
4/23/24/02	.021 ± .003	.019 ± .002	.019 ± .003	.015 ± .002	.019 ± .002
5/1/02	.018 ± .002	.020 ± .002	.018 ± .002	.015 ± .002	.018 ± .002
5/8/02	.018 ± .002	.021 ± .002	.023 ± .003	.020 ± .002	.016 ± .002
5/15/02	.019 ± .002	.015 ± .002	.021 ± .003	.018 ± .003	.016 ± .002

**TABLE 10**  
**WEEKLY GROSS BETA AIR PARTICULATES IN THE LACBWR VICINITY**  
 (Reporting Level = 10 times Control Value)

COLLECTION DATE	LACBWR PLANT pCi/m <sup>3</sup>	TRAILER COURT pCi/m <sup>3</sup>	DAM #8 pCi/m <sup>3</sup>	RADIO TOWER pCi/m <sup>3</sup>	LA CROSSE CONTROL
5/22/02	.015 ± .002	.016 ± .002	.018 ± .003	.018 ± .002	.015 ± .002
5/29/02	.018 ± .003	.016 ± .002	.018 ± .003	.015 ± .002	.017 ± .002
6/5/02	.018 ± .002	.017 ± .002	No Sample	.013 ± .002	.014 ± .002
6/12/02	.018 ± .002	.019 ± .002	.022 ± .003	.017 ± .002	.015 ± .003
6/19/02	.011 ± .002	.018 ± .002	.027 ± .005	.017 ± .002	.015 ± .002
6/26/02	.029 ± .003	.027 ± .003	.037 ± .005	.021 ± .002	.023 ± .002
7/3/02	.023 ± .003	.024 ± .002	.033 ± .004	.022 ± .002	.023 ± .002
7/10/02	.017 ± .002	.022 ± .002	.020 ± .003	.020 ± .003	.018 ± .002
7/17/02	.026 ± .003	.024 ± .002	.028 ± .003	.022 ± .002	.022 ± .002
7/24/02	.030 ± .003	.029 ± .003	.027 ± .003	.021 ± .002	.021 ± .002
7/31/02	.017 ± .002	.022 ± .002	.028 ± .005	.021 ± .002	.018 ± .002
8/7/02	.017 ± .002	.019 ± .002	.019 ± .003	.023 ± .003	.016 ± .002
8/14/02	.022 ± .002	.023 ± .002	.036 ± .004	No Sample	.020 ± .002
8/21/02	.014 ± .002	.016 ± .002	.016 ± .001	.014 ± .002	.014 ± .002
8/28/02	.022 ± .003	.023 ± .002	.023 ± .003	.021 ± .002	.020 ± .002
9/3/02	.021 ± .003	.027 ± .003	No Sample	.023 ± .002	.021 ± .002
9/11/02	.029 ± .003	.031 ± .003	.036 ± .003	.024 ± .002	.024 ± .002
9/18/02	.027 ± .003	.034 ± .003	.034 ± .003	.028 ± .002	.024 ± .003
9/25/02	.019 ± .003	.024 ± .002	.026 ± .003	.036 ± .003	.017 ± .002
10/2/02	.032 ± .003	.036 ± .003	.038 ± .003	.017 ± .002	.027 ± .002

**TABLE 10**  
**WEEKLY GROSS BETA AIR PARTICULATES IN THE LACBWR VICINITY**  
 (Reporting Level = 10 times Control Value)

COLLECTION DATE	LACBWR PLANT pCi/m <sup>3</sup>	TRAILER COURT pCi/m <sup>3</sup>	DAM #8 pCi/m <sup>3</sup>	RADIO TOWER pCi/m <sup>3</sup>	LA CROSSE CONTROL
10/09/02	.014 ± .002	.016 ± .002	.017 ± .002	.017 ± .002	.012 ± .002
10/16/02	.028 ± .003	.032 ± .003	.035 ± .003	.035 ± .003	.025 ± .002
10/23/02	.015 ± .002	.020 ± .002	.022 ± .002	.017 ± .002	.014 ± .002
10/30/02	.020 ± .003	.027 ± .002	.027 ± .002	.017 ± .002	.020 ± .002
11/6/02	.040 ± .003	.041 ± .004	.041 ± .003	.024 ± .002	.033 ± .003
11/13/02	.041 ± .004	.047 ± .003	.042 ± .003	.041 ± .003	.042 ± .003
11/20/02	.021 ± .003	.025 ± .002	.026 ± .002	.021 ± .002	.024 ± .003
11/26/02	.016 ± .003	.017 ± .002	.018 ± .002	.018 ± .002	.018 ± .003
12/4/02	.018 ± .002	.021 ± .002	.025 ± .002	.021 ± .002	.018 ± .002
12/11/02	.037 ± .003	.039 ± .003	.042 ± .003	.029 ± .002	.036 ± .003
12/19/02	.037 ± .003	.040 ± .003	.037 ± .003	.030 ± .002	.041 ± .003
12/26/02	.016 ± .002	.021 ± .002	.018 ± .002	.013 ± .002	.017 ± .002
12-31-02	.021 ± .003	.028 ± .003	.066 ± .004	.032 ± .003	.053 ± .004

**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>1-2-02</u>	<u>1-2-02</u>	<u>1-2-02</u>	<u>1-2-02</u>	<u>1-2-02</u>
END DATE	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.77E-3	<2.22E-3	<1.93E-3	<2.20E-3	<1.94E-3
Cs-137/20	<1.71E-3	<2.18E-3	<1.79E-3	<2.00E-3	<1.24E-3
Co - 60				1.87E-3±4.22E-4	

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>	<u>1-29-02</u>
END DATE	<u>3-05-02</u>	<u>3-05-02</u>	<u>3-05-02</u>	<u>3-05-02</u>	<u>3-05-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.39E-3	<1.82E-3	<1.38E-3	<1.52E-3	<1.48E-3
Cs-137/20	<9.85E-4±3.13E-4	<1.73E-3	<1.13E-3	<1.50E-3	<1.44E-3

\*RL = REPORTING LEVEL

**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>3-5-02</u>	<u>3-5-02</u>	<u>3-5-02</u>	<u>3-5-02</u>	<u>3-5-02</u>
END DATE	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.82E-3	<2.40E-3	<1.85E-3	<2.43E-3	<2.18E-3
Cs-137/20	<1.06E-3	1.50E-3±4.81E-4	<1.28E-3	<1.55E-3±4.99E-4	<2.14E-3
Co-60		1.50E-3 ±4.23E-4	1.89E-3±3.68E-4		1.59E-3±5.56E-4

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>	<u>4-3-02</u>
END DATE	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.86E-3	<2.59E-3	<1.89E-3	<2.63E-3	<1.94E-3
Cs-137/20	<1.85E-3	<2.56E-3	<1.00E-3	1.65E-3±5.39E-4	1.08E-3±4.03E-4
Co-60	1.58E-3±3.42E-4	2.54E-3±4.84E-4	1.94E-3±3.74E-4	1.98E-3±4.52E-4	

\*RL = REPORTING LEVEL

**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>	<u>5-1-02</u>
END DATE	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>
ISOTOPES/RL*					
Cs-134/10	<2.09E-3	<2.50E-3	<2.05E-3	<3.13E-3	<1.64E-3
Cs-137/20	<1.35E-3	<2.45E-3	<1.49E-3	1.80E-3±6.44E-4	1.07E-3±3.32E-4
Co-60	1.54E-3±3.50E-4	2.02E-3±4.56E-4	1.93E-3±3.92E-4	2.85E-3±6.14E-4	

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>	<u>5-29-02</u>
END DATE	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.45E-3	<2.04E-3	<1.62E-3	<4.29E-3	<1.98E-3
Cs-137/20	<1.51E-3	<1.23E-3	<9.71E-3	<4.23E-3	<7.48E-3
Co-60	1.55E-3±2.89E-4	1.67E-3±3.68E-4	1.26E-3 + 3.06E-4	3.98E-3±8.06E-4	

\*RL = REPORTING LEVEL

**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>	<u>7-3-02</u>
END DATE	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.91E-3	<2.40E-3	<2.05E-3	<3.60E-3	<1.68E-3
Cs-137/20	1.54E-3±4.31E-4	<1.48E-3	1.58E-3±4.58E-4	2.19E-3±7.56E-4	1.21E-3±3.52E-4
		1.73E-3±4.39E-4	1.60E-3±3.74E-4	3.02E-3±6.67E-4	1.28E-3±2.96E-4

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>	<u>7-31-02</u>
END DATE	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>
ISOTOPES/RL*					
Cs-134/10	<3.09E-3	<2.56E-3	<2.22E-3	<4.07E-3	<6.77E-3
Cs-137/20	1.51E-3±5.88E-4	1.40E-3±5.31E-4	<1.43E-3	<2.42E-3	<1.75E-3
Co-60	1.91E-3±5.20E-4		3.33E-3±7.52E-4		1.21E-3±3.10E-4

\*RL = REPORTING LEVEL



**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>	<u>8-28-02</u>
END DATE	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.80E-3	<2.01E-3	<1.80E-3	<2.12E-3	<1.37E-3
Cs-137/20	<1.09E-3	<1.40E-3	<1.07E-3	<1.13E-3	<9.47E-3
Co-60		1.57E-3±3.59E-4	1.26E-3±3.19E-4	1.51E-3±3.60E-4	

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>	<u>10-2-02</u>
END DATE	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.91E-3	<2.64E-3	<2.26E-3	<1.84E-3	<1.89E-3
Cs-137/20	1.57E-3 + 4.06E-4	<1.98E-3	<1.54E-3	<1.24E-3	<1.06E-3
Co-60	6.58E-3±6.10E-4	2.22E-3±4.75E-4			1.05E-3 ± 3.05E-4

\*RL = REPORTING LEVEL

**TABLE 11**  
**AIR PARTICULATE COMPOSITE RESULTS**  
 (Concentrations in pCi/m<sup>3</sup>)

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>	<u>10-30-02</u>
END DATE	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>
ISOTOPES/RL*					
Cs-134/10	<1.52E-3	<2.17E-3	<1.78E-3	<1.50E-3	<1.73E-3
Cs-137/20	<1.08E-3	<1.52E-3	<1.75E-3	<9.11E-4	<9.87E-4
Co-60				1.42E-3±2.71E- <sup>4</sup>	

\*RL = REPORTING LEVEL

LOCATION	RADIO TOWER	LACBWR	TRAILER COURT	DAM NO. 8	LA CROSSE
START DATE	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>	<u>12-04-02</u>
END DATE	<u>1-2-03</u>	<u>1-2-03</u>	<u>1-2-03</u>	<u>1-2-03</u>	<u>1-2-03</u>
ISOTOPES/RL*					
Cs-134/10	<1.80E-3	<2.75E-3	<2.63E-3	<1.86E-3	<2.55E-3
Cs-137/20	<9.57E-3	<1.81E-3	<1.36E-3	<1.54E-3	<1.80E-3
Co-60	1.21E-3 + 3.22E-4		1.57E-4 + 5.59E-4	1.65E-3 + 3.51E-4	1.51E-3±4.1E-4

\*RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**  
(Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 1-9-02 DAM 8	SAMPLE #2 1-9-02 OUTFALL	SAMPLE #3 1-9-02 VICTORY	SAMPLE #1 2-12-02 DAM 8	SAMPLE #2 2-12-02 OUTFALL	SAMPLE #3 2-12-02 VICTORY
ISOTOPES/RL *						
H-3	227 + 118	<126	171 + 118	524±125	590 + 126	527 + 125
Mn-54/1000	<4.40	<4.30	<4.39	<3.97	<4.19	<3.93
Co-60/300	<4.68	<4.47	<4.78	<4.18	<4.12	<4.22
Zn-65/300	<10.2	<9.97	<10.3	<9.68	<9.46	<9.14
Cs-134/30	<4.98	<4.78	<5.00	<4.44	<4.43	<4.38
Cs-137/50	<4.84	<4.99	<4.99	<4.02	<4.36	<3.72

\* RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**  
 (Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 3-12-02 DAM 8	SAMPLE #2 3-12-02 OUTFALL	SAMPLE #3 3-12-02 VICTORY	SAMPLE #1 4-4-02 DAM 8	SAMPLE #2 4-4-02 OUTFALL	SAMPLE #3 4-4-02 VICTORY
ISOTOPES/RL *						
H-3	262±130	286±130	426±132	304±117	443±119	456±120
Mn-54/1000	<3.94	<3.99	<4.12	<4.34	<4.35	<4.71
Co-60/300	<4.25	<4.06	<4.22	<4.89	<4.81	<4.80
Zn-65/300	<9.94	<9.39	<9.39	<9.75	<9.80	<10.4
Cs-134/30	<4.67	<4.66	<4.57	<5.01	<4.93	<5.08
Cs-137/50	<4.45	<4.52	<4.51	<4.95	<4.97	<4.86

\* RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**

(Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 5-15-02 DAM 8	SAMPLE #2 5-15-02 OUTFALL	SAMPLE #3 5-15-02 VICTORY	SAMPLE #1 6-12-02 DAM 8	SAMPLE #2 6-12-02 OUTFALL	SAMPLE #3 6-12-02 VICTORY
ISOTOPES/RL *						
H-3	140±120	176±121	607±126	333±123	486±125	372±123
Mn-54/1000	<4.51	<4.68	<4.70	<4.58	<4.53	<4.56
Co-60/300	<4.56	<4.81	<4.75	<4.74	<4.82	<4.90
Zn-65/300	<10.3	<10.4	<9.79	<9.91	<10.4	<9.96
Cs-134/30	<4.97	<5.15	<4.99	<5.23	<5.19	<5.17
Cs-137/50	<5.11	<5.00	<2.76	<3.13	<5.14	<5.19

\* RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**

(Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 7-09-02 DAM 8	SAMPLE #2 7-09-02 OUTFALL	SAMPLE #3 7-09-02 VICTORY	SAMPLE #1 8-13-02 DAM 8	SAMPLE #2 8-13-02 OUTFALL	SAMPLE #3 8-13-02 VICTORY
ISOTOPES/RL *						
H-3	258±127	394±129	360±128	<132	<132	<132
Mn-54/1000	<4.53	<4.43	<4.47	<4.43	<4.61	<4.64
Co-60/300	<4.80	<4.84	<4.84	<4.90	<4.68	<4.78
Zn-65/300	<9.77	<9.74	<9.66	<10.3	<9.99	<10.2
Cs-134/30	<5.13	<4.95	<4.83	<5.15	<5.16	<5.14
Cs-137/50	<5.10	<5.01	<3.20	<3.77	<5.15	<5.02

\* RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**  
 (Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 9-10-02 DAM 8	SAMPLE #2 9-10-02 OUTFALL	SAMPLE #3 9-10-02 VICTORY	SAMPLE #1 10-08-02 DAM 8	SAMPLE #2 10-08-02 OUTFALL	SAMPLE #3 10-08-02 VICTORY
ISOTOPES/RL *						
H-3	231±125	<131	174±127	<142	<142	<142
Mn-54/1000	<4.45	<4.38	<4.41	<4.44	<4.41	<4.45
Co-60/300	<4.86	<4.65	<4.69	<4.54	<4.77	<4.76
Zn-65/300	<10.0	<10.2	<9.81	<10.4	<9.84	<10.1
Cs-134/30	<5.12	<5.24	<5.20	<5.11	<5.07	<5.04
Cs-137/50	<2.57	<3.19	<4.98	<5.01	<5.11	<5.03

\* RL = REPORTING LEVEL

TABLE 12

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER WATER IN THE VICINITY OF LACBWR**

(Concentrations in pCi/Liter)

COLLECTION DATE: SAMPLE LOCATION:	SAMPLE #1 11-12-02 DAM 8	SAMPLE #2 11-12-02 OUTFALL	SAMPLE #3 11-12-02 VICTORY	SAMPLE #1 12-11-02 DAM 8	SAMPLE #2 12-11-02 OUTFALL	SAMPLE #3 12-11-02 VICTORY
ISOTOPES/RL *						
H-3	<138	213±130	249±131	289±136	238<134	194<134
Mn-54/1000	<4.38	<4.61	<4.41	<4.59	<4.51	<4.63
Co-60/300	<4.85	<4.53	<4.78	<4.85	<4.93	<4.91
Zn-65/300	<10.1	<9.99	<10.3	<10.2	<10.2	<10.2
Cs-134/30	<4.94	<5.10	<5.08	<5.08	<5.07	<5.17
Cs-137/50	<5.10	<5.19	<5.05	<2.72	<2.53	<3.57

\* RL = REPORTING LEVEL



**TABLE 13**

**RESULTS OF ANALYSIS OF MISSISSIPPI RIVER SEDIMENT IN THE VICINITY OF LACBWR**

(Concentration in pCi/Kg)

(Reporting Level = 10 times Upstream Value)

COLLECTION DATE SAMPLE LOCATION	SAMPLE # 1 <u>6-14-02</u> <u>UPSTREAM</u>	SAMPLE # 2 <u>6-13-02</u> <u>DOWNSTREAM</u>	SAMPLE # 3 <u>6-13-02</u> <u>OUTFALL</u>	SAMPLE # 1 <u>9-04-02</u> <u>OUTFALL</u>	SAMPLE # 2 <u>9-4-02</u> <u>DOWNSTREAM</u>	SAMPLE # 3 <u>9-4-02</u> <u>UPSTREAM</u>
ISOTOPES						
Cs-134	<5.95	<10.2	<5.82	<8.50	<10.9	<6.39
Cs-137	8.00±1.38	45.4±3.99	314±21.5	216±15.4	93.7±7.27	<5.82
Co-60			62.5±3.31	83.8±4.62		

TABLE 14

**FISH SAMPLE ACTIVITY IN THE VICINITY OF LACBWR**  
(Concentrations in pCi/Kg)

COLLECTION DATE: FISH SPECIES:	SAMPLE #1 <u>3-27-02</u> <u>CARP</u>	SAMPLE #2 <u>3-27-02</u> <u>BASS</u>	SAMPLE #1 <u>6-13-02</u> <u>CARP</u>	SAMPLE #2 <u>6-13-02</u> <u>WALLEYE</u>	SAMPLE #1 <u>9-04-02</u> <u>CARP</u>	SAMPLE #2 <u>9-04-02</u> <u>BASS</u>
ISOTOPES/RL*						
Mn-54/3E4	<4.85	<11.7	<6.07	<6.99	<5.22	<12.2
Co-60/1E4	<5.77	<12.0	<7.22	<8.13	<6.10	<13.5
Zn-65/2E4	<12.90	<28.1	<15.7	<17.3	<13.2	<30.3
Cs-134/1E3	<5.38	<11.9	<6.34	<7.02	<5.66	<12.8
Cs-137/2E3	<5.42	<8.66	<4.18	6.52±1.68	4.22±1.21	10.1±2.83

\*RL =REPORTING LEVEL

TABLE 14

**FISH SAMPLE ACTIVITY IN THE VICINITY OF LACBWR**  
 (Concentrations in pCi/Kg)

COLLECTION DATE: FISH SPECIES:	SAMPLE #1 <u>10-29-02</u> <u>CARP</u>	SAMPLE #2 <u>10-29-02</u> <u>WALLEYE</u>	SAMPLE #1	SAMPLE #2	SAMPLE #1	SAMPLE #2
ISOTOPES/RL*						
Mn-54/ 3E4	<10.4	<7.70				
Co-60/ 1E4	<11.2	<9.02				
Zn-65/ 2E4	<25.1	<19.8				
Cs-134/ 1E3	<11.2	<8.36				
Cs-137/ 2E3	9.07±2.59	<5.79				

\*RL =REPORTING LEVEL