S T A T E O F W I S C O N S I N

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LACBWR Environmental Radioactivity Survey

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State of Wisconsin

1980

LACBWR Environmental Radioactivity Survey

INTRODUCTION

This report is prepared under U. S. Nuclear Regulatory Commission Contract NRC 05-80-275 by the State of Wisconsin, Department of Health and Social Services, Section of Radiation Protection. This report covers the calendar year 1980. Results of environmental radioactivity monitoring are listed in tabular form. The data presented consists of duplicative sample analysis such as air and TLD data and split sample analysis conducted by the state radiation protection laboratory or subcontractor and the licensee. A brief description of sample collection techniques and analytical procedures conducted by the state laboratory are also given.

SAMPLING TECHNIQUES

Direct Radiation - Thermoluminescent Dosimeters (TLD's)

Continuous monitoring of direct radiation is performed quarterly using thermoluminescent dosimeters. The dosimeters are placed at five locations in the area of the LACBWR (Genoa) nuclear power plant.

Air Samples

Continuous air samples are collected weekly from two stations. Air particulate samples are collected on 47 mm. plastic filters. Air iodine samples are collected using charcoal absorbers mounted in tandem with the air particulate filters. The sampling rate is one cubic foot of air per minute.

Liquid Effluent

A split sample consisting of 3.5 liters of liquid effluent is collected quarterly at a point close to the discharge of the LACBWR effluent channel. This sample is a grab sample and is collected while the plant is discharging liquid to the channel.

Milk

A raw milk sample is collected monthly from the three local farms located in the Genoa, Wisconsin area.

Fish

Fish are collected periodically from locations in the Mississippi River near the LACBWR nuclear power plant.

Vegetation

Vegetation in the form of grass is collected from several locations in the LACBWR area.

ANALYTICAL PROCEDURES

The procedures given are abstracted to present only the basic steps.

Air Particulate Samples - Beta Gamma

Place the 47 mm. plastic filter on a 2 inch stainless steel planchet. Beta count in a Widebeta I external gas flow proportional counter. Calculate activity correcting for counter efficiency.

Air Particulate Samples - Gamma

Place all of the 47 mm. plastic filters for a month on the 4" x 4" NaI crystal detector. Determine the gamma sepctrum using 256 channels of an ND130A 512 channel gamma spectrometer set at 0.01 MeV per channel. Calculate activity correcting for counter efficiency.

Rain Water - Beta Gamma

Evaporate a 500 ml. aliquot on a weighed 2 inch stainless steel planchet. Beta count in a Widebeta I external gas flow proportional counter. Calculate activity correcting for counter efficiency.

Lake Water - Alpha, Beta Gamma (River Water)

Filter 500 ml. aliquot of sample. Evaporate filtrate in a 2 inch stainless steel planchet. Beta and alpha count in Widebeta I external gas flow proportional counter. Place filter paper in a 2 inch stainless steel planchet and dry at 103^{o}C. Beta and alpha count in Widebeta I external gas flow proportional counter. Calculate activity correcting for counter efficiency.

Lake Water - Cesium 137 (River Water)

Place 3.5 liter sample in Marinelli beaker on 4" x 4" NaI crystal detector. Count for 100 minutes on ND130A gamma spectrometer using 256 channels set at 0.01 MeV per channel. Calculate activity correcting for counter efficiency.

Vegetation - Alpha, Beta and Gamma Isotopic

Dry sample at 110°C, grind, weigh into stainless steel planchet. Beta and alpha count in a Widebeta I external gas flow proportional counter. Calculate activity correcting for self-absorption and counter efficiency.

Prepare a similar sample of 6 grams and place into a 4½ oz. graduated plastic container. Count for 100 minutes on a GeLi detector. Determine the gamma spectrum using 4096 channels of the 4096 channel gamma spectrometer set at 0.5 Kev per channel. Calculate the activity correcting for counter efficiency.

Milk - Cesium 137, Iodine 131 Gamma Scan

Procedure same as for Lake Water - Cesium 137.

Milk - Iodine 131 - Chemical Extraction

A stabile iodine carrier is added to a 2 liter sample of raw milk. The sample is passed through an anion exchange column and the iodine is removed from the resin by batch/extraction using NaOCl. After reduction to I_2 by hydroxylamine hydrochloride, the iodine is extracted into CCl_4, reduced with bisulfite, and back extracted into water. The iodine is precipitated as palladous iodide with the chemical yield determined gravimetrically and counted in a Widebeta I counter correcting for counter efficiency and decay.

Milk - Strontium 90

Strontium and yttrium carriers are added to milk which has been aged two to four weeks. A one liter sample is passed successively through cation and anion exchange columns. The yttrium is eluted from the anion resin with hydrochloric acid and precipitated as yttrium oxalate, filtered and weighed to determine yield and beta counted in a Widebeta I counter correcting for counter efficiency and decay.

Fish - Beta Gamma, Gamma Isotopic

Whole fish are put through a meat grinder and the ground fish well mixed. A representative fish sample of five grams is weighed into a stainless steel planchet. The sample is dried at 100°C and then ashed by slowly bringing the temperature to 550-600°C. Beta count in a Widebeta I external gas flow proportional counter. Calculate activity correcting for counter efficiency.

A 50 gram sample is ashed in a similar manner. Place the sample on a GeLi detector and count for 100 minutes. Determine the gamma spectrum using 4096 channels of the 4096 channel gamma spectrometer set at 0.5 Kev per channel. Calculate the activity correcting for counter efficiency.

Direct Radiation

Thermoluminescent dosimeters are supplied under a subcontract by the Eberline Corporation, Santa Fe, New Mexico. The dosimeters are read by Eberline and the data is reported to the State Radiation Protection Section.

CONCLUSIONS

Small increases in gross beta activity in air particulate samples were noted beginning in late October and continuing through December. The increases noted were two or three times above the normal levels and were also noticed on air particulate samples from monitoring areas around the state. The small increases can be attributable to radioactive fallout from an atmospheric nuclear weapons test conducted by the Chinese on October 16, 1980. No unusual activities were noticed in the air radioiodine analyses or the gamma analyses of the monthly composites.

Environmental samples collected such as milk, fish and surface water showed no unusual activity during the reporting period. The radioactivity levels from sample analysis were consistent with prior years' data.

Necessary Wisconsin data that is missing is due to problems associated with the laboratory that the State of Wisconsin contracted with for the analysis of the environmental samples. The contracting laboratory did not perform the required analyses due to difficulty in obtaining qualified personnel and has experienced difficulty with timely reporting of the required analyses causing this report to be late.

Missing data from 1979 has not been received from the contracting laboratory and much of the data is lost due to the aging of samples which contained isotopes of very short half lives, i.e., Iodine 131. Milk analysis for Iodine 131 during 1980 has not been reported to the required lower limit of detection since the chemical procedure was not performed on the samples.

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QUARTERLY RADIATION DOSE MEASUREMENTS IN THE VICINITY OF

LACBWR NUCLEAR POWER PLANT FROM TLD READINGS (mrem)

Location	1st Quarter 1/1/80 to 3/31/80		2nd Quarter 4/1/80 to 6/30/80		3rd Quarter 7/1/80 to 9/30/80		4th Quarter 10/1/80 to 12/31/80	
	Wisconsin	LACBWR	Wisconsin	LACBWR	Wisconsin	LACBWR	Wisconsin	LACBWR
2566-6								
South End of Dike	22.3 ± 6.7	18.8 ± 3.5	21.0 ± 2.8	24.6 ± 2.7	29.2 ± 6.5	13.0 ± 1.3	22.6 ± 3.8	18.9 ± 4.8
2566-7								
Power Pole 800 ft. from LACBWR	21.9 ± 5.1	19.1 ± 1.9	23.7 ± 5.3	20.3 ± 2.0	31.3 ± 3.6	15.2 ± 2.7	24.7 ± 3.0	15.7 ± 2.3
2566-8								
Lock & Dam No. 8	22.7 ± 4.6	16.5 ± 1.8	24.5 ± 9.2	20.2 ± 2.9	26.3 ± 2.9	12.3 ± 0.7	21.4 ± 3.0	13.7 ± 1.8
2566-9								
Trailer Park	24.4 ± 4.0	18.1 ± 3.5	25.5 ± 4.4	19.0 ± 2.4	30.9 ± 6.8	11.5 ± 0.8	No Sample	14.5 ± 2.2
2566-10								
Control State Office Building LaCrosse	20.7 ± 3.7	22.1 ± 2.6	20.9 ± 2.7	28.5 ± 3.3	29.2 ± 3.5	17.8 ± 1.3	23.5 ± 2.5	19.1 ± 1.9

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

January, February, March, 1980

AIR PARTICULATES - GROSS BETA, pCi/M^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
January				
1st wk.	0.022 ± 0.015	.049 ± .009	0.0225 ± .0025	.046 ± .009
2nd wk.		.030 ± .010	0.025 ± 0.002	.051 ± .012
3rd wk.	0.016 ± 0.002	.063 ± .010	0.017 ± 0.002	.052 ± .010
4th wk.	0.015 ± 0.002	.052 ± .009	0.012 ± 0.008	.053 ± .011
5th wk.	0.015 ± 0.003	.042 ± .009	0.016 ± 0.002	.065 ± .011
February				
1st wk.	0.009 ± 0.002	.036 ± .009	0.011 ± 0.002	.057 ± .012
2nd wk.	0.026 ± 0.006	.019 ± .008	0.023 ± 0.003	.041 ± .011
3rd wk.	0.032 ± 0.003	.028 ± .008	0.029 ± 0.003	.070 ± .011
4th wk.	0.019 ± 0.003	.048 ± .010	0.017 ± 0.002	.049 ± .010
March				
1st wk.	0.025 ± 0.003	.026 ± .008	0.014 ± 0.002	.045 ± .010
2nd wk.	0.021 ± 0.003	.036 ± .009	0.013 ± 0.002	.056 ± .013
3rd wk.	0.016 ± 0.003	.037 ± .008	0.014 ± 0.002	.065 ± .011
4th wk.	0.015 ± 0.003	.028 ± .008	0.012 ± 0.002	.048 ± .011

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

April, May, June, 1980

AIR PARTICULATES - GROSS BETA, pCi/M^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
April				
1st wk.	0.001 ± 0.002	.040 ± .009	0.001 ± 0.002	.036 ± .009
2nd wk.	0.012 ± 0.002	< .009	0.0001 ± 0.0010	< .009
3rd wk.	0.024 ± 0.003	.03 ± .009	0.0004 ± 0.0010	.037 ± .010
4th wk.	0.007 ± 0.002	.050 ± .010	0.002 ± 0.001	.040 ± .010
5th wk.	0.018 ± 0.003	.027 ± .009	0.001 ± 0.001	.027 ± .009
May				
1st wk.	0.008 ± 0.002	.025 ± .010	0.001 ± 0.001	.036 ± .011
2nd wk.	0.013 ± 0.002	.015 ± .009	0.0003 ± 0.001	.026 ± .001
3rd wk.	0.022 ± 0.003	.030 ± .009	0.002 ± 0.001	.025 ± .008
4th wk.	0.012 ± 0.002	.056 ± .011	0.001 ± 0.001	.057 ± .010
June				
1st wk.	0.015 ± 0.003	.037 ± .008	0.002 ± 0.001	.028 ± .008
2nd wk.	0.019 ± 0.003	.034 ± .009	0.001 ± 0.001	.026 ± .009
3rd wk.	0.098 ± 0.005	.031 ± .010	0.002 ± 0.001	.039 ± .010
4th wk.	0.004 ± 0.002	.043 ± .009	0.001 ± 0.001	.053 ± .010

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

July, August, September, 1980

AIR PARTICULATES - GROSS BETA, pCi/M^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
July				
1st wk.	0.014 ± 0.002	.047 ± .010	0.001 ± 0.001	.054 ± .011
2nd wk.	0.025 ± 0.003	.052 ± .010	0.002 ± 0.001	.059 ± .010
3rd wk.	0.033 ± 0.003	.051 ± .010	0.000 ± 0.002	.049 ± .009
th wk.	0.033 ± 0.003	.036 ± .009	0.002 ± 0.002	.042 ± .009
5th wk.		.042 ± .010		.027 ± .009
August				
1st wk.	0.080 ± 0.005	.056 ± .010	0.001 ± 0.003	.062 ± .010
2nd wk.	0.022 ± 0.003	.026 ± .009	0.001 ± 0.003	.042 ± .010
3rd wk.	0.026 ± 0.003	.034 ± .009	0.001 ± 0.003	.018 ± .006
4th wk.	0.048 ± 0.004	.024 ± .009	0.001 ± 0.003	.048 ± .009
September				
1st wk.	0.036 ± 0.003	.048 ± .010	0.001 ± 0.003	.035 ± .010
2nd wk.	0.055 ± 0.004	.030 ± .009	0.001 ± 0.003	.033 ± .009
3rd wk.	0.029 ± 0.003	.041 ± .009	0.002 ± 0.001	.039 ± .009
4th wk.	0.034 ± 0.004	.035 ± .009	0.001 ± 0.003	.023 ± .008
5th wk.	0.035 ± 0.004	.031 ± .010	0.001 ± 0.003	.040 ± .010

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

October, November, December, 1980

AIR PARTICULATES - GROSS BETA, pCi/M^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
October				
1st wk.	0.098 ± 0.006	.045 ± .009	0.002 ± 0.001	.069 ± .012
2nd wk.	0.030 ± 0.004	.039 ± .009		.044 ± .009
3rd wk.	0.025 ± 0.004	.041 ± .009		.061 ± .012
4th wk.	0.058 ± 0.005	.031 ± .007	0.002 ± 0.002	.039 ± .009
November				
1st wk.	0.005 ± 0.003	.044 ± 0.010	0.006 ± 0.001	.059 ± .011
2nd wk.	0.009 ± 0.003	.087 ± .012	0.006 ± 0.002	.113 ± .015
3rd wk.	0.010 ± 0.003	.078 ± .008	0.014 ± 0.003	.079 ± .010
4th wk.	0.044 ± 0.005	.100 ± .012	0.013 ± 0.003	.068 ± .012
December				
1st wk.	0.088 ± 0.006	.065 ± .008	0.007 ± 0.002	.096 ± .010
2nd wk.	0.054 ± 0.005	.120 ± .011	0.005 ± 0.001	.104 ± .011
3rd wk.	0.162 ± 0.008	.139 ± .014		.143 ± .023
4th wk.	0.099 ± 0.007	.104 ± .011		.132 ± .013
5th wk.	0.109 ± 0.007	.125 ± .012		.150 ± .015

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

January, February, March, 1980

AIR IODINE - I-131, pCi/m^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
January				
1st wk.	-0.02 ± 0.012	$3.625\ E^{-3}$	0.027 ± 0.033	$< 1.712\ E^{-3}$
2nd wk.		$8.022\ E^{-3}$	0.019 ± 0.007	$< 1.134\ E^{-2}$
3rd wk.	0.013 ± 0.011	$< 4.466\ E^{-3}$	- 0 -	$3.831\ E^{-3}$
4th wk.	-0.007 ± 0.008	$5.546\ E^{-3}$	-0.012 ± 0.008	$< 7.530\ E^{-3}$
5th wk.	- 0 -	$5.713\ E^{-3}$	0.029 ± 0.021	$3.498\ E^{-3}$
February				
1st wk.	-0.001 ± 0.032	$< 3.759\ E^{-3}$	0.006 ± 0.029	$< 4.598\ E^{-3}$
2nd wk.	0.001 ± 0.0032	$< 5.864\ E^{-3}$	0.012 ± 0.030	$3.034\ E^{-3}$
3rd wk.	No Sample	$< 1.821\ E^{-3}$	-0.001 ± 0.028	$< 4.778\ E^{-3}$
4th wk.	0.010 ± 0.029	$1.366\ E^{-3}$	0.003 ± 0.024	$6.245\ E^{-3}$
March				
1st wk.	0.008 ± 0.029	$1.488\ E^{-3}$	-0.003 ± 0.26	$4.732\ E^{-3}$
2nd wk.	- 0 -	$< 4.272\ E^{-3}$	0.003 ± 0.024	$< 1.784\ E^{-3}$
3rd wk.	0.016 ± 0.031	$5.159\ E^{-3}$	0.008 ± 0.027	$4.826\ E^{-3}$
4th wk.	- 0 -	$< 5.848\ E^{-3}$	-0.009 ± 0.017	$7\ E^{-3}$

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

April, May, June, 1980

AIR IODINE - I-131 pCi/m^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
April				
1st wk.	0.019 ± 0.020	$5.712\ E^{-3}$	0.036 ± 0.034	$4.463\ E^{-3}$
2nd wk.	0.004 ± 0.021	$6.614\ E^{-3}$	0.007 ± 0.027	$< 1.614\ E^{-2}$
3rd wk.	0.0004 ± 0.220	$< 6.153\ E^{-3}$	-0.002 ± 0.022	$< 6.359\ E^{-3}$
4th wk.	0.004 ± 0.020	$< 5.092\ E^{-3}$	-0.029 ± 0.019	$1.913\ E^{-3}$
5th wk.	-0.010 ± 0.021	$4.287\ E^{-3}$		$< 6.52\ E^{-3}$
May				
1st wk.	0.001 ± 0.021	$5.856\ E^{-3}$	-0.024 ± 0.03	$6.000\ E^{-3}$
2nd wk.	0.022 ± 0.021	$1.378\ E^{-2}$	0.01 ± 0.02	$< 6.323\ E^{-3}$
3rd wk.	0.006 ± 0.023	$< 8.257\ E^{-3}$	-0.004 ± 0.03	$2.893\ E^{-3}$
4th wk.	-0.002 ± 0.018	$< 4.161\ E^{-3}$	-0.011 ± 0.10	$< 4.004\ E^{-3}$
June				
1st wk.	0.0001 ± 0.020	$< 7.146\ E^{-3}$	0.013 ± 0.03	$< 7.491\ E^{-3}$
2nd wk.	0.008 ± 0.020	$< 8.269\ E^{-3}$	0.006 ± 0.02	$3.019\ E^{-3}$
3rd wk.	0.020 ± 0.021	$5.395\ E^{-3}$	0.011 ± 0.018	$< 6.24\ E^{-3}$
4th wk.	0.005 ± 0.019	$< 4.965\ E^{-3}$	0.017 ± 0.03	$< 4.329\ E^{-3}$

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

July, August, September, 1980

AIR IODINE - I-131 pCi/m^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
July				
1st wk.	-0.012 ± 0.017	$2.325\ E^{-3}$	-0.009 ± 0.03	$< 1.23\ E^{-2}$
2nd wk.	-0.012 ± 0.03	$< 8.538\ E^{-3}$	-0.005 ± 0.019	$< 9.92\ E^{-3}$
3rd wk.	-0.007 ± 0.019	$< 2.57\ E^{-3}$	0.03 ± 0.03	$< 2.246\ E^{-3}$
4th wk.	-0.004 ± 0.018	$6.059\ E^{-3}$	0.006 ± 0.02	$1.962\ E^{-3}$
5th wk.	-0.006 ± 0.02	$5.761\ E^{-3}$		$3.22\ E^{3}$
August				
1st wk.	-0.001 ± 0.02	$7.275\ E^{-3}$	-0.010 ± 0.02	$5.054\ E^{-3}$
2nd wk.	0.002 ± 0.019	$4.296\ E^{-3}$		$1.529\ E^{-3}$
3rd wk.	0.013 ± 0.019	$5.356\ E^{-3}$		$< 3.807\ E^{-3}$
4th wk.	0.012 ± 0.02	$6.553\ E^{-3}$		$< 7.007\ E^{-3}$
September				
1st wk.	0.02 ± 0.02	$4.442\ E^{-3}$		$4.044\ E^{-3}$
2nd wk.	-0.006 ± 0.02	$5.192\ E^{-3}$		$< 5.443\ E^{-3}$
3rd wk.	0.001 ± 0.02	$3.979\ E^{-3}$	-0.006 ± 0.012	$< 6.948\ E^{-3}$
4th wk.	-0.002 ± 0.02	$< 5.003\ E^{-3}$		$< 6.822\ E^{-3}$
5th wk.		$< 3.11\ E^{-3}$		$< 4.61\ E^{-3}$

LACBWR

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

October, November, December, 1980

AIR IODINE - I-131 pCi/m^3

Date	(0.9 mi. N) Lock & Dam No. 8		(16 mi. N) La Crosse	
	Wisconsin	LACBWR	Wisconsin	LACBWR
October				
1st wk.	0.006 ± 0.02	< 4.165 E^{-3}	0.006 ± 0.013	< 8.130 E^{-3}
2nd wk.	0.005 ± 0.03	< 3.904 E^{-3}		< 4.039 E^{-3}
3rd wk.	-0.011 ± 0.02	< 1.61 E^{-3}		< 2.055 E^{-3}
4th wk.	-0.001 ± 0.02	< 1.506 E^{-3}	-0.008 ± 0.02	< 1.656 E^{-3}
November				
1st wk.	No Sample	< 2.44 E^{-3}	0.002 ± 0.013	< 1.821 E^{-3}
2nd wk.	No Sample	< 2.462 E^{-3}	0.014 ± 0.014	< 3.426 E^{-3}
3rd wk.	No Sample	< 1.53 E^{-3}	0.016 ± 0.02	< 2.129 E^{-3}
4th wk.	0.018 ± 0.03	< 1.51 E^{-3}	0.014 ± 0.019	< 1.72 E^{-3}
December				
1st wk.	0.005 ± 0.02	< 1.096 E^{-3}	0.012 ± 0.019	< 1.616 E^{-3}
2nd wk.	0.006 ± 0.02	< 1.862 E^{-3}	0.001 ± 0.013	< 1.946 E^{-3}
3rd wk.	0.011 ± 0.02	< 1.983 E^{-3}		< 2.278 E^{-3}
4th wk.	0.003 ± 0.03	< 2.071 E^{-3}		< 2.201 E^{-3}
5th wk.	0.13 ± 0.21	< 2.255 E^{-3}		1.885 E^{-3}

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - Wisconsin Data

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
January 1980					
La Crosse	(-0.02) ± 0.012	0.001 ± 0.002	0.001 ± 0.003	0.04 ± 0.04	0.015 ± 0.012
Genoa	0.007 ± 0.017	0.002 ± 0.003	0.000	0.018 ± 0.05	0.002 ± 0.016
February 1980					
La Crosse	0.005 ± 0.018	(- .001) ± 0.003	(-0.001) ± 0.007	0.03 ± 0.09	0.006 ± 0.016
Genoa	(-0.002) ± 0.016	0.002 ± 0.003	(-0.001) ± 0.006	0.00 ± 0.03	0.004 ± 0.014
March 1980					
La Crosse	0.008 ± 0.017	0.001 ± 0.003	0.000	0.09 ± 0.10	0.017 ± 0.015
Genoa	0.018 ± 0.02	0.001 ± 0.003	0.000	0.08 ± 0.11	0.015 ± 0.018
April 1980					
La Crosse	0.005 ± 0.011	0.000	0.002 ± 0.003	0.02 ± 0.03	0.008 ± 0.010
Genoa	0.003 ± 0.013	0.000	0.001 ± 0.003	0.08 ± 0.04	0.023 ± 0.012

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - Wisconsin Data

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
May 1980					
La Crosse	0.007 ± 0.018	0.001 ± 0.004	0.001 ± 0.004	(-0.007) ± 0.05	(-0.009) ± 0.016
Genoa	0.012 ± 0.016	0.002 ± 0.003	(-0.002) ± 0.004	0.12 ± 0.04	0.036 ± 0.015
June 1980					
La Crosse	0.003 ± 0.009	(-0.005) ± 0.002	0.000	0.010 ± 0.02	0.006 ± 0.008
Genoa	0.009 ± 0.016	(-0.007) ± 0.003	0.002 ± 0.004	0.10 ± 0.04	0.038 ± 0.015
July 1980					
La Crosse	(-0.003) ± 0.02	0.002 ± 0.003	0.004 ± 0.019	0.2 ± 0.3	0.02 ± 0.02
Genoa	0.005 ± 0.013	0.002 ± 0.003	(-0.001) ± 0.003	0.06 ± 0.03	0.022 ± 0.012
August 1980					
La Crosse	0.014 ± 0.08	0.003 ± 0.015	0.007 ± 0.019	0.19 ± 0.23	0.02 ± 0.07
Genoa	(-0.001) ± 0.016	0.001 ± 0.003	(-0.001) ± 0.004	0.09 ± 0.04	0.022 ± 0.015

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - Wisconsin Data

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
September 1980					
La Crosse	0.009 ± 0.007	0.001 ± 0.001	0.000	0.020 ± 0.018	0.006 ± 0.006
Genoa	0.008 ± 0.016	0.001 ± 0.003	(-0.000)	0.08 ± 0.04	0.027 ± 0.015
October 1980					
La Crosse	0.006 ± 0.013	0.003 ± 0.003	0.003 ± 0.003	0.03 ± 0.03	0.010 ± 0.012
Genoa	0.014 ± 0.013	0.000	0.001 ± 0.003	0.07 ± 0.03	0.020 ± 0.012
November 1980					
La Crosse	(-0.002) ± 0.014	(-0.001) ± 0.003	0.000	0.04 ± 0.04	0.005 ± 0.012
Genoa	0.011 ± 0.016	0.001 ± 0.003	0.001 ± 0.004	0.07 ± 0.05	0.012 ± 0.015
December 1980					
La Crosse	0.005 ± 0.011	0.002 ± 0.002	0.000	0.03 ± 0.03	0.008 ± 0.010
Genoa	0.017 ± 0.017	0.001 ± 0.003	0.011 ± 0.004	0.14 ± 0.05	0.054 ± 0.016

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - LACBWR DATA

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
January 1980					
La Crosse	1.822×10^{-3}				
Genoa	1.215×10^{-3}		4.587×10^{-4}		
February 1980					
La Crosse		6.036×10^{-3}	7.339×10^{-4}		
Genoa	1.63×10^{-4}	8.384×10^{-4}	9.369×10^{-4}		
March 1980					
La Crosse	3.220×10^{-3}	1.096×10^{-3}			
Genoa	3.728×10^{-3}	1.701×10^{-3}			
April 1980					
La Crosse	1.665×10^{-3}				
Genoa	1.587×10^{-3}	1.680×10^{-3}			

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - LACBWR Data

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
May 1980					
La Crosse	6.219×10^{-4}	5.661×10^{-4}			
Genoa	1.719×10^{-4}	4.78×10^{-4}			
June 1980					
La Crosse		2.152×10^{-3}			
Genoa	7.832×10^{-4}	1.092×10^{-3}			
July 1980					
La Crosse		3.236×10^{-4}			
Genoa	1.272×10^{-3}	1.217×10^{-3}			
August 1980					
La Crosse	1.395×10^{-3}	1.055×10^{-3}	2.678×10^{-3}	2.689×10^{-3}	
Genoa	8.883×10^{-5}	3.252×10^{-4}			

AIR PARTICULATES

Monthly Composite Gamma Analysis (Measurements in Units of pCi/m^3)

LACBWR - LACBWR Data

Location	^{144}Ce	^{137}Cs	^{95}Zr - ^{95}Nb	^{7}Be	^{106}Ru
September 1980					
La Crosse		1.525×10^{-3}			
Genoa		1.544×10^{-4}			
October 1980					
La Crosse		1.271×10^{-4}			
Genoa		2.124×10^{-3}			
November 1980					
La Crosse	2.682×10^{-4}	1.364×10^{-2}	$3.53^{r} \times 10^{-3}$	6.988×10^{-3}	
Genoa	1.297×10^{-3}	1.293×10^{-3}	6.837×10^{-4}	2.494×10^{-3}	
December 1980					
La Crosse	1.912×10^{-3}	1.123×10^{-3}	1.504×10^{-2}	1.797×10^{-2}	
Genoa	5.006×10^{-4}	1.51×10^{-3}	6.121×10^{-3}	1.287×10^{-2}	

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample

2nd Quarter - collected 4-30-80

Analyzed for		Result - μ Ci/ml	
		Wisconsin	LACBWR
Gross Beta	Soluble	$(9.8 \pm 1.6) \times 10^{-9}$	
	Insoluble	$(5.7 \pm 1.3) \times 10^{-9}$	No Data
Tritium			< 1.94 E-7
Sr-89			No Data
Sr-90			No Data
Gamma Isotopic			
Co-58		$(5 \pm 4) \times 10^{-9}$	2.887 E-8
Co-60		$(3 \pm 4) \times 10^{-9}$	2.533 E-7
I-131		$(1.0 \pm 0.5) \times 10^{-8}$	< 2.0813 E-8
Cs-137		$(1.2 \pm 0.5) \times 10^{-8}$	1.134 E-7
Cs-134		$(4 \pm 4) \times 10^{-9}$	8.841 E-9

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample

4th Quarter - collected 10-1-80

Analyzed for		Results μ Ci/ml	
		Wisconsin	LACBWR
Gross Beta	Soluble	$(8.8 \pm 1.4) \times 10^{-9}$	
	Insoluble	$(1.6 \pm 2.6) \times 10^{-9}$	< 1.877 E-8
Tritium			8.1 E-6
Sr-89		Negative Number	$<(5.42 \pm 5.04)$ E-8
Sr-90		$(1.4 \pm 0.4) \times 10^{-9}$	$<(1.97 \pm 1.84)$ E-7
Gamma Isotopic			
Co-58		$(4 \pm 4) \times 10^{-9}$	1.695 E-7
Co-60		$(2 \pm 4) \times 10^{-9}$	1.612 E-7
I-131		$(4 \pm 5) \times 10^{-9}$	No Data
Cs-137		$(6 \pm 5) \times 10^{-9}$	1.224 E-7
Cs-134		$(4 \pm 4) \times 10^{-9}$	< 2.698 E-8

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample

4th Quarter - collected 12-30-80

Analyzed for		Results µCi/l	
		Wisconsin	LACBWR
Gross Beta	Insoluble	$(2.06 \pm 0.05) \times 10^{-7}$	
	Soluble	$(3.1 \pm 2) \times 10^{-8}$	2.731 E-7
Tritium			No Data
Sr-89		< 0	No Data
Sr-90		$(1.2 \pm 0.5) \times 10^{-9}$	No Data
Gamma Isotopic			
Co-58		$(4.2 \pm 4) \times 10^{-8}$	2.206 E-7
Co-60		$(1.91 \pm 4) \times 10^{-7}$	3.175 E-7
I-131		$< 1.01 \times 10^{-8}$	1.153 E-6
Cs-137		$(3.2 \pm 4) \times 10^{-8}$	3.479 E-8
Cs-134		$(-2.1) \times 10^{-8}$	1.348 E-8

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample - Wisconsin Data - 1980

Analyzed for: Result $\mu Ci/m\ell \times 10^{-9}$

	January		February		March	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Tritium						
Sr-89						
Sr-90						
Gamma Isotopic						
Co-58						
Co-60						
I-131						
Cs-137						
Cs-134						
Gross Beta	Soluble	Insoluble	Soluble	Insoluble	Soluble	Insoluble
La Crosse			3.9 ± 1.2	0.2 ± 0.7	7.0 ± 1.6	2.3 ± 1.9
Stoddard			5.0 ± 1.6	4.5 ± 1.4	10 ± 2	2.3 ± 1.3
Lock & Dam #8			5.9 ± 1.4	0.9 ± 0.8	5 ± 2	1.9 ± 1.3
Boat Launch			4.8 ± 1.3	-0.7 ± 0.6	4 ± 2	
Victory			5.5 ± 1.6	-0.2 ± 1.0	3.5 ± 2.1	3.6 ± 1.4

Upstream Composite: La Crosse, Stoddard, Lock & Dam #8

Downstream Composite: Boat Launch, Victory

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample - Wisconsin Data - 1980

Analyzed for: Result $\mu Ci/m\ell \times 10^{-9}$

	April		May		June	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Tritium						
Sr-89						
Sr-90						
Gamma Isotopic						
Co-58						
Co-60						
I-131						
Cs-137						
Cs-134						
Gross Beta	Soluble	Insoluble	Soluble	Insoluble	Soluble	Insoluble
La Crosse	5 ± 2		3 ± 2		12 ± 3	2.6 ± 1.9
Stoddard	4 ± 3	1.4 ± 1.8	3 ± 2	1.4 ± 1.8	4 ± 3	32 ± 3
Lock & Dam #8	5 ± 3		4.3 ± 1.5		3 ± 3	4 ± 2
Boat Launch	4 ± 3		5 ± 2		3 ± 3	14 ± 2
Victory	5 ± 3		3.8 ± 1.5		3 ± 3	

Upstream Composite: La Crosse, Stoddard, Lock & Dam #8

Downstream Composite: Boat Launch, Victory

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample - Wisconsin Data - 1980

Analyzed for: Result $\mu Ci/m\ell \times 10^{-9}$

	July		August		September	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Tritium						
Sr-89						
Sr-90						
Gamma Isotopic						
Co-58						
Co-60						
I-131						
Cs-137						
Cs-134						
Gross Beta	Soluble	Insoluble	Soluble	Insoluble	Soluble	Insoluble
La Crosse					3.6 ± 1.2	0.6 ± 2
Stoddard					2.4 ± 1.1	2 ± 3
Lock & Dam #8					2.9 ± 1.2	-1.8 ± 2
Boat Launch					2.8 ± 1.2	0.4 ± 2
Victory					2.9 ± 1.2	-0.4 ± 2

Upstream Composite: La Crosse, Stoddard, Lock & Dam #8

Downstream Composite: Boat Launch, Victory

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Effluent Sample - Wisconsin Data - 1980

Analyzed for: Result $\mu Ci/m\ell \times 10^{-9}$

	October		November		December	
	Upstream	Downstream	Upstream	Downstream	Upstream	Downstream
Tritium						
Sr-89						
Sr-90						
Gamma Isotopic						
Co-58						
Co-60						
I-131						
Cs-137						
Cs-134						
Gross Beta	Soluble	Insoluble	Soluble	Insoluble	Soluble	Insoluble
La Crosse	2.2 ± 1.0	0.6 ± 0.9	1.5 ± 1.1	-0.8 ± 2	2.9 ± 1.1	-1.4 ± 1.9
Stoddard	3.3 ± 1.1	0.8 ± 0.9	2.0 ± 1.2	-0.3 ± 2	9.1 ± 1.4	0.2 ± 2
Lock & Dam #8	1.4 ± 1.0	1.0 ± 0.9	2.0 ± 1.2	-1.3 ± 2	3.3 ± 1.1	0.7 ± 2
Boat Launch	3.9 ± 1.2	-1.2 ± 2	0.1 ± 1.0	6 ± 3	3.2 ± 1.1	-0.05 ± 2
Victory	2.8 ± 1.1	1.4 ± 1.1	0.7 ± 1.1	0.6 ± 2	3.1 ± 1.1	0.9 ± 2

Upstream Composite: La Crosse, Stoddard, Lock & Dam #8

Downstream Composite: Boat Launch, Victory

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR - 1980

LACBWR Data

MILK - pCi/liter

Date	Sample Identification	Sr 89	Sr 90	I-131	Cs 137	K 40
5/6/80	A. Malin - 1		3.48	< 1		
5/6/80	P. Malin - 1		4.38	< 1		
5/6/80	Pedretti - 1		5.26	< 1		
5/20/80	A. Malin - 2		3.51	< 1		
5/20/80	P. Malin - 2		3.50	< 1		
5/20/80	Pedretti - 2		6.24	< 1		
6/3/80	A. Malin - 3		3.26	< 1		
6/3/80	P. Malin - 3		3.77	< 1		
6/3/80	Pedretti - 3		6.12	< 1		
6/17/80	A. Malin - 4		3.86	< 1		
6/17/80	P. Malin - 4		3.70	< 1		
6/17/80	Pedretti - 4		3.20	< 1		
7/1/80	A. Malin - 5		2.46	< 1		
7/1/80	P. Malin - 5		2.94	< 1		
7/1/80	Pedretti - 5		2.80	< 1		
7/15/80	A. Malin - 6		3.00	< 1		
7/15/80	P. Malin - 6		3.16	< 1		
7/15/80	Pedretti - 6		2.16	< 1		
7/29/80	A. Malin - 7		2.17	< 1		
7/29/80	P. Malin - 7		2.80	< 1		
7/29/80	Pedretti - 7		2.86	< 1		
8/12/80	A. Malin - 8		1.43	< 1		
8/12/80	P. Malin - 8		1.71	< 1		
8/12/80	Pedretti - 8		1.34	< 1		
8/26/80	A. Malin - 9		3.65	< 1		
8/26/80	P. Malin - 9		3.50	< 1		
8/26/80	Pedretti - 9		4.03	< 1		

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR - 1980

LACBWR Data

MILK - pCi/liter

Date	Sample Identification	Sr 89	Sr 90	I 131	Cs 137	K 40
9/9/80	A. Malin - 10		1.41	< 1		
9/9/80	P. Malin - 10		3.32	< 1		
9/9/30	Pedretti - 10		3.35	< 1		
9/23/80	A. Malin - 11		2.07	< 1		
9/23/80	P. Malin - 11		2.95	< 1		
9/23/80	Pedretti - 11		2.97	< 1		
10/7/80	A. Malin - 12			< 1		
10/7/80	P. Malin - 12			< 1		
10/7/80	Pedretti - 12			< 1		
10/21/80	A. Malin - 13			< 1		
10/21/80	P. Malin - 13			< 1		
10/21/80	Pedretti - 13			< 1		
11/4/80	P. Malin - 14			< 1 (0.51 $\pm$ 0.17)		
11/4/80	Pedretti - 14			1.42 $\pm$ 0.16		
12/2/80	A. Malin - 15			< 1		
12/2/80	P. Malin - 15			< 1		
12/2/80	Pedretti - 15			< 1		

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR - 1980

Wisconsin Data

Milk - pCi/liter

Date	Sample Identification	Sr 89	Sr 90	I 131 *	Cs 137	K 40
1/15/80	Pedretti			4.8	-3.2	1470 ± 70
2/5/80	Malin			4.0	-2.1	1310 ± 70
3/18/80	Malin			2.9	-2.3	1220 ± 70
4/1/80	Pedretti		10.9	(-0.04)	-1.4	1380 ± 70
5/6/80	Malin			2.5	5.4	1360 ± 70
6/3/80	P. Malin			10.7	9.1	1200 ± 70
7/1/80	Pedretti			5.4	4.9	1380 ± 70
8/11/80	--			3.3	2.9	1250 ± 70
9/12/80	--			5.8	-5.1	1160 ± 70
10/7/80	P. Malin			2.6	1.1	1250 ± 70
11/18/80	A. Malin		10.9	3.1	-4.8	1320 ± 70
12/3/80	Pedretti			-12.6	-6.6	1240 ± 60

*From NaI gamma scan.

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Fish - μCi/gram (wet) LACBWR Data - 1980

Date	1-28-80	1-28-80	2-29-80	2-29-80	3-13-80	3-13-80
Isotope						
Co 58				2.357×10^{-8}	1.688×10^{-8}	5.457×10^{-8}
Co 60		2.03×10^{-7}	2.329×10^{-7}		1.39×10^{-7}	2.432×10^{-7}
I 131	8.204×10^{-9}	1.934×10^{-8}	1.744×10^{-8}			
Cs 134	1.348×10^{-8}					
Cs 137	1.811×10^{-8}	3.374×10^{-8}	4.465×10^{-8}	4.005×10^{-8}	9.987×10^{-8}	1.023×10^{-7}
Sr 89	3.687×10^{-5}		1.638×10^{-5}	2.334×10^{-5}		3.032×10^{-5}
Sr 90						
Gross Beta						
K 40		3.112×10^{-6}	2.943×10^{-6}		2.51×10^{-6}	

	4-30-80	4-30-80	5-1-80	5-1-80	7-8-80	7-8-80
Isotope						
Co 58		2.917×10^{-8}		5.84×10^{-8}	3.118×10^{-8}	
Co 60	2.372×10^{-7}	3.582×10^{-7}	1.522×10^{-7}	4.074×10^{-7}	2.685×10^{-7}	
I 131					2.667×10^{-8}	1.837×10^{-8}
Cs 134		1.771×10^{-8}			6.319×10^{-9}	
Cs 137	5.683×10^{-8}	6.548×10^{-8}	2.543×10^{-8}	9.38×10^{-8}	1.089×10^{-8}	3.333×10^{-8}
Sr 89						2.359×10^{-5}
Sr 90						
Gross Beta						
K 40						

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Fish - μCi/gram (wet)

LACBWR Data - 1980

Date	7-12-80	7-12-80	8-26-80	8-26-80	9-11-80	9-11-80
Isotope						
Co 58	9.552×10^{-9}	4.578×10^{-8}		7.016×10^{-8}	1.072×10^{-8}	5.657×10^{-8}
Co 60	1.951×10^{-7}	1.512×10^{-7}	2.343×10^{-7}	1.132×10^{-7}	1.03×10^{-7}	9.873×10^{-8}
I 131		2.510×10^{-8}			3.089×10^{-8}	
Cs 134		1.642×10^{-8}		2.39×10^{-8}		
Ce 137	8.314×10^{-8}	5.141×10^{-8}				1.25×10^{-7}
Sr 89			2.809×10^{-5}			3.511×10^{-5}
Sr 90						
Gross Beta						
K 40						

	10-1-80	10-1-80	11-1-80	11-1-80	12-1-80	12-1-80
Isotope						
Co 58	$< 7.956 \times 10^{-9}$	$< 7.885 \times 10^{-9}$	$< 5.025 \times 10^{-9}$	$< 5.025 \times 10^{-9}$	6.262×10^{-8}	
Co 60	2.798×10^{-8}	$< 1.881 \times 10^{-8}$	$< 1.926 \times 10^{-8}$	5.025×10^{-8}	1.405×10^{-7}	1.919×10^{-7}
I 131	7.088×10^{-9}	5.674×10^{-9}	$< 7.088 \times 10^{-9}$	$< 7.09 \times 10^{-9}$		
Cs 134	5.592×10^{-9}	$< 4.405 \times 10^{-9}$	$< 1.491 \times 10^{-8}$	$< 1.49 \times 10^{-8}$		1.305×10^{-8}
Ce 137	1.77×10^{-8}	$< 7.546 \times 10^{-9}$	$< 8.566 \times 10^{-9}$	$< 8.57 \times 10^{-9}$	6.899×10^{-8}	1.279×10^{-7}
Sr 89						
Sr 90						
Gross Beta						
K 40	1.925×10^{-7}	1.2×10^{-7}	$< 4.94 \times 10^{-7}$	4.93×10^{-6}	3.337×10^{-6}	2.859×10^{-6}

RESULTS OF THE ANALYSES OF OFF-SITE SAMPLES

LACBWR

Fish - μCi/gram (wet) Wisconsin Data - 1980

Date	1/28/80 Carp	1/28/80 Carp	4/30/80	4/30/80 Catfish	7/8/80 #12 ESP
Isotope					
Co-58	$(1.6 \pm 1.9) \times 10^{-8}$	$(8 \pm 18) \times 10^{-9}$	$(4 \pm 6) \times 10^{-8}$	$(2.4 \pm 1.6) \times 10^{-8}$	$(2 \pm 3) \times 10^{-8}$
Co-60	$(-4 \pm 15) \times 10^{-9}$	$(1.8 \pm 1.9) \times 10^{-8}$	$(4 \pm 2) \times 10^{-8}$	$(1.8 \pm 1.7) \times 10^{-8}$	$(1.1 \pm 3) \times 10^{-8}$
I-131					
Cs-134	$(2 \pm 14) \times 10^{-9}$	$(0.9 \pm 14) \times 10^{-9}$	$(1.4 \pm 1.1) \times 10^{-9}$	$(2 \pm 9) \times 10^{-9}$	$(1.1 \pm 2) \times 10^{-8}$
Cs-137	$(4 \pm 2) \times 10^{-8}$	$(5 \pm 2) \times 10^{-8}$	$(3 \pm 2) \times 10^{-8}$	$(1.8 \pm 1.8) \times 10^{-8}$	$(3 \pm 3) \times 10^{-8}$
K-40	$(2.8 \pm 0.6) \times 10^{-6}$	$(2.1 \pm 0.5) \times 10^{-6}$	$(2.5 \pm 0.5) \times 10^{-6}$	$(3.3 \pm 0.5) \times 10^{-6}$	$(3.1 \pm 0.8) \times 10^{-6}$
Gross Beta					

Date	7/8/80 #11 ESP	8/26/80 #16 Carp	10/31/80 Buffalo	10/31/80 Buffalo
Isotope				
Co-58	$(1.1 \pm 1.7) \times 10^{-8}$		$(7 \pm 49) \times 10^{-9}$	$(-4 \pm 50) \times 10^{-9}$
Co-60	$(2 \pm 2) \times 10^{-8}$	$(1.3 \pm 0.4) \times 10^{-7}$	$(3 \pm 2) \times 10^{-8}$	$(1.8 \pm 2) \times 10^{-8}$
I-131				
Cs-134	$(1.5 \pm 13) \times 10^{-9}$	$(2 \pm 15) \times 10^{-9}$	$(3 \pm 11) \times 10^{-9}$	$(7 \pm 12) \times 10^{-9}$
Cs-137	$(1.1 \pm 2) \times 10^{-8}$	$(4 \pm 3) \times 10^{-8}$	$(3 \pm 2) \times 10^{-8}$	$(5 \pm 2) \times 10^{-8}$
K-40	$(3.4 \pm 0.6) \times 10^{-6}$	$(2.4 \pm 0.6) \times 10^{-6}$	$(3.0 \pm 0.6) \times 10^{-6}$	$(2.4 \pm 0.6) \times 10^{-6}$
Gross Beta				

VEGETATION

Gamma Isotopic and Gross Beta Activity

(Activities in pCi/gm Wet Weight)

LACBWR DATA - 1980

Location	Date	Weight	Type	^{57}Co	^{60}Co	^{95}Zr - ^{95}Nb	^{131}I	^{144}Ce	^{141}Ce
Gianoli	8-8-80	170 gr.			.9063	.2393			
Malin	8-8-80	405 gr.			.04679	.04073		.03453	
Pedretti	8-8-80	280 gr.		.002925					
Gianoli	10-31-80	2,580 gr.					< .0013664		
Malin	10-31-80	2,200 gr.					< .001839		
Pedretti	10-31-80	2,000 gr.					< .001602		

(Activities in pCi/gm Dry Weight)

Wisconsin Data - 1980

Location	Date	Type	^{137}Cs	^{40}K	^{95}Zr	^{144}Ce	^{7}Be	Gross Beta Act.
Hwy. 35, 2 mi. south of LACBWR	6-5-80	Grass	1.0 ± 0.7	22 ± 12	0.3 ± 1.2	5 ± 4	10 ± 6	
Hwy. 35, 2 mi. north of LACBWR	6-5-80	Grass	0.4 ± 0.6	19 ± 12	0.4 ± 1.2	3 ± 4	6 ± 6	
Hwy. 35, 2 mi. south of LACBWR	10-1-80	Grass	-0.07 ± 0.6	11 ± 11	0.3 ± 1.1	-1.9 ± 3	5 ± 6	
Hwy. 35, 2 mi. north of LACBWR	10-1-80	Grass	0.05 ± 0.6	23 ± 12	-0.4 ± 1.8	-4 ± 4	0.2 ± 10	