



MISSISSIPPI
STATE DEPARTMENT OF
HEALTH

Division Of
Radiological Health

3150 Lawson Street
Post Office Box 1700
Jackson, Mississippi
39215-1700

601/354-6657
601/354-6167 FAX

May 5, 1997

U. S. Nuclear Regulatory Commission
Public Document Room
Washington, D. C. 20555

Gentlemen:

Enclosed is a copy of Mississippi's annual report to environment activities at the Grand Gulf Nuclear Station. These activities were conducted by the Division of Radiological Health, Mississippi State Department of Health, in accordance with Cooperative Agreement No. NRC-29-83-621.

Copies are being provided to the Office of Nuclear Reactor Regulation, the Division of Contracts and Property Management and the NRC's Regional Project Officer. If you have any questions regarding this report, please call Silas Anderson of my staff at (601) 354-6657.

Sincerely,

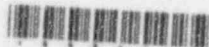
Robert W. Goff

Robert W. Goff
Division of Radiological Health

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Enclosure

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MISSISSIPPI STATE DEPARTMENT OF HEALTH

DIVISION OF RADIOLOGICAL HEALTH

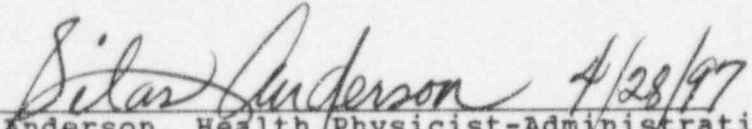
REPORT TO THE NUCLEAR REGULATORY COMMISSION
ENVIRONMENTAL MONITORING AT GRAND GULF NUCLEAR STATION

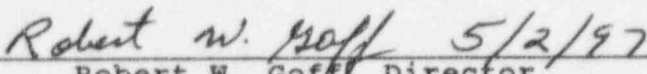
CALENDAR YEAR 1996

NRC CONTRACT NUMBER NRC-29-83-621

PREPARED BY:
Alexander H. Bell
Health Physicist

DATE PREPARED:
April 28, 1997

 4/28/97
Silas Anderson, Health Physicist-Administrative
Environmental Monitoring and Emergency Response Branch

 5/2/97
Robert W. Goff, Director
Division of Radiological Health

Abstract:

Under contract to the U.S. Nuclear Regulatory Commission (NRC), the Mississippi State Department of Health (MSDH), Division of Radiological Health (DRH) provides environmental radiological data to the NRC pertaining to the Grand Gulf Nuclear Station (GGNS), Claiborne County, Mississippi.

Detailed in this report are results for Calendar Year 1996 which represent the sixteenth year of this contract with the State of Mississippi.

MSDH and Licensee both detected Co-60 and Tritium in the discharge basin surface water, however, this sample point is not normally reported.

GRAND GULF NUCLEAR STATION
CLAIBORNE COUNTY, MISSISSIPPI
CY 1996

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Particulate Gross Beta

These results are for particulate air samples duplicated by the MSDH and the Licensee which were analyzed for Gross Beta. The Licensee's sampler is located at the IBEW Union Hall (UH) designated as AS-7 (indicator). The MSDH's comparable sampler is located at Arnold Acres (AA) 0.4 miles south of the GGNS. Specific lower limit of detection (LLD) requirements are listed on pages 28 (MSDH) and 29 (Licensee) for all categories.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
TC	12/26-01/02		0.018
AA	12/26-01/02	0.023	
UH	01/02-01/09		0.026
AA	01/03-01/09	0.037	
UH	01/09-01/16		0.015
AA	01/09-01/16	0.028	
UH	01/16-01/23		0.019
AA	01/16-01/23	0.028	
UH	01/23-01/30		0.016
AA	01/23-01/30	0.035	
UH	01/30-02/06		0.008A
AA	01/30-02/06	0.046	
UH	02/06-02/13		0.008
AA	02/06-02/13	0.043	
UH	02/13-02/20		0.010
AA	02/13-02/20	0.030	
UH	02/20-02/27		0.021
AA	02/20-02/27	0.046	
UH	02/27-03/05		0.016
AA	02/27-03/05	0.042	
UH	03/05-03/12		<0.007B
AA	03/05-03/12	0.059	
UH	03/12-03/19		0.011
AA	03/12-03/19	0.033	
UH	03/19-03/26		0.020
AA	03/19-03/26	0.023	

GRAND GULF NUCLEAR STATION
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Particulate Gross Beta (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	03/26-04/02		0.013
AA	03/26-04/02	0.039	
UH	04/02-04/09		0.020
AA	04/02-04/09	0.051	
UH	04/09-04/16		0.014
AA	04/09-04/16	0.027	
UH	04/16-04/23		0.012
AA	04/16-04/23	0.028	
UH	04/23-04/30		0.010
AA	04/23-04/30	0.023	
UH	04/30-05/07		0.015
AA	04/30-05/07	0.038	
UH	05/07-05/14		0.023
AA	05/07-05/14	0.042	
UH	05/14-05/21		0.027
AA	05/14-05/21	0.056	
UH	05/21-05/28		0.031
AA	05/21-05/28	0.038	
UH	05/28-06/04		0.045
AA	05/28-06/04	0.067	
UH	06/04-06/11		0.045
AA	06/04-06/11	0.059	
UH	06/11-06/18		0.018
AA	06/11-06/18	0.043	
UH	06/18-06/25		0.014
AA	06/18-06/25	0.016	
UH	06/25-07/02		0.023
AA	06/25-07/02	0.102	
UH	07/02-07/09		0.027
AA	07/02-07/09	0.062	
UH	07/09-07/16		0.025
AA	07/09-07/16	0.046	
UH	07/16-07/23		0.015
AA	07/16-07/23	0.070	
UH	07/23-07/30		0.014
AA	07/23-07/30	0.039	

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Particulate Gross Beta (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	07/30-08/06		0.017
AA	07/30-08/06	0.044	
UH	08/06-08/13		0.017C
AA	08/06-08/13	0.059	
UH	08/13-08/20		0.034
AA	08/13-08/20	0.073	
UH	08/20-08/27		0.034
AA	08/20-08/27	0.091	
UH	08/27-09/03		0.018
AA	08/27-09/03	0.077	
UH	09/03-09/10		0.026
AA	09/03-09/10	0.091	
UH	09/10-09/17		0.042
AA	09/10-09/17	0.037	
UH	09/17-09/24		0.030
AA	09/17-09/24	D	
UH	09/24-10/01		0.032
AA	09/24-10/01	D	
UH	10/01-10/08		0.040
AA	10/01-10/08	D	
UH	10/08-10/15		0.023
AA	10/08-10/15	D	
UH	10/15-10/22		0.033
AA	10/15-10/22	0.018	
UH	10/22-10/29		0.018
AA	10/22-10/29	0.014	
UH	10/29-11/05		0.027
AA	10/29-11/05	0.028	
UH	11/05-11/12		0.022
AA	11/05-11/12	0.015	
UH	11/12-11/19		0.028
AA	11/12-11/19	E	
UH	11/19-11/26		0.022
AA	11/19-11/26	E	
UH	11/26-12/03		0.035
AA	11/26-12/03	E	

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Particulate Gross Beta (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	12/03-12/10		0.030
AA	12/03-12/10	E	
UH	12/10-12/17		0.021
AA	12/10-12/17	E	
UH	12/17-12/23		0.023
AA	12/17-12/23	0.003	
UH	12/23-12/31		0.020
AA	12/23-12/31	0.007	

A Electrical Outage at 125.17 hours.
B Blown fuse at 68.95 hours.
C Mechanical failure at 151.43 hours.
D Blower failure.
E Motor failure.

GRAND GULF NUCLEAR STATION
CLAIBORNE COUNTY, MISSISSIPPI
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Radioiodine

These results are for charcoal canister air samples duplicated by the MSDH and the Licensee which were analyzed for radioiodine. The Licensee's sampler is located at the IBEW Union Hall (UH) designated as AS-7 (Indicator). The MSDH's comparable sampler is located at Arnold Acres (AA) 0.4 miles south of the GGNS.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	12/26-01/02		<0.025
AA	12/26-01/02	<0.07	
UH	01/02-01/09		<0.021
AA	01/02-01/09	<0.07	
UH	01/09-01/16		<0.016
AA	01/09-01/16	<0.07	
UH	01/16-01/23		<0.017
AA	01/16-01/23	<0.07	
UH	01/23-01/30		<0.014
AA	01/23-01/30	<0.07	
UH	01/30-02/06		<0.024A
AA	01/30-02/06	<0.07	
UH	02/06-02/13		<0.015
AA	02/06-02/13	<0.07	
UH	02/13-02/20		<0.012
AA	02/13-02/20	<0.07	
UH	02/20-02/27		<0.017
AA	02/20-02/27	<0.07	
UH	02/27-03/05		<0.021
AA	02/27-03/05	<0.07	
UH	03/05-03/12		<0.034B
AA	03/05-03/12	<0.07	
UH	03/12-03/19		<0.022
AA	03/12-03/19	<0.07	
UH	03/19-03/26		<0.018
AA	03/19-03/26	<0.07	

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Radioiodine (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	03/26-04/02		<0.022
AA	03/26-04/02	<0.07	
UH	04/02-04/09		<0.015
AA	04/02-04/09	<0.07	
UH	04/09-04/16		<0.017
AA	04/09-04/16	<0.07	
UH	04/16-04/23		<0.017
AA	04/16-04/23	<0.07	
UH	04/23-04/30		<0.022
AA	04/23-04/30	<0.07	
UH	04/30-05/07		<0.027
AA	04/30-05/07	<0.07	
UH	05/07-05/14		<0.016
AA	05/07-05/14	<0.07	
UH	05/14-05/21		<0.037
AA	05/14-05/21	<0.07	
UH	05/21-05/28		<0.037
AA	05/21-05/28	<0.07	
UH	05/28-06/04		<0.022
AA	05/28-06/04	<0.07	
UH	06/04-06/11		<0.023
AA	06/04-06/11	<0.07	
UH	06/11-06/18		<0.024
AA	06/11-06/18	<0.07	
UH	06/18-06/25		<0.025
AA	06/18-06/25	<0.07	
UH	06/25-07/02		<0.028
AA	06/25-07/02	<0.07	
UH	07/02-07/09		<0.027
AA	07/02-07/09	<0.07	
UH	07/09-07/16		<0.038
AA	07/09-07/16	<0.07	
UH	07/16-07/23		<0.027
AA	07/16-07/23	<0.07	
UH	07/23-07/30		<0.025
AA	07/23-07/30	<0.07	

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Radioiodine (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	07/30-08/06		<0.035
AA	07/30-08/06	<0.07	
UH	08/06-08/13		<0.031C
AA	08/06-08/13	<0.07	
UH	08/13-08/20		<0.026
AA	08/13-08/20	<0.07	
UH	08/20-08/27		<0.028
AA	08/20-08/27	<0.07	
UH	08/27-09/03		<0.035
AA	08/27-09/03	<0.07	
UH	09/03-09/10		<0.022
AA	09/03-09/10	<0.07	
UH	09/10-09/17		<0.017
AA	09/10-09/17	<0.07	
UH	09/17-09/24		<0.017
AA	09/17-09/24	D	
UH	09/24-10/01		<0.017
AA	09/24-10/01	D	
UH	10/01-10/08		<0.018
AA	10/01-10/08	D	
UH	10/08-10/15		<0.019
AA	10/08-10/15	D	
UH	10/15-10/22		<0.018
AA	10/15-10/22	<0.07	
UH	10/22-10/29		<0.017
AA	10/22-10/29	<0.07	
UH	10/29-11/05		<0.019
AA	10/29-11/05	<0.07	
UH	11/05-11/12		<0.016
AA	11/05-11/12	<0.07	
UH	11/12-11/19		<0.016
AA	11/12-11/19	E	
UH	11/19-11/26		<0.020
AA	11/19-11/26	E	
UH	11/26-12/03		<0.017
AA	11/26-12/03	E	

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Radioiodine (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	12/03-12/10		<0.015
AA	12/03-12/10	E	
UH	12/10-12/17		<0.015
AA	12/10-12/17	E	
UH	12/17-12/23		<0.022
AA	12/17-12/23	<0.07	
UH	12/23-12/31		<0.018
AA	12/23-12/31	<0.07	

- A Electrical outage at 125.17 hours.
- B Blown fuse at 68.95 hours.
- C Mechanical failure at 151.43 hours.
- D Blower failure.
- E Motor failure.

GRAND GULF NUCLEAR STATION
CLAIBORNE COUNTY, MISSISSIPPI
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Quarterly Composite (Gamma Isotopic)

These results are for particulate air samples, collected during a quarter, duplicated by the MSDH and the Licensee which were analyzed as a composite for gamma emitters. The Licensee's sampler is located at the IBEW Union Hall (UH) designated as AS-7 (Indicator). The MSDH's sampler is located at Arnold Acres (AA) 0.4 miles south of the GGNS.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
UH	12/27-03/26		<0.01
AA	12/27-03/26	<0.01	
UH	03/26-06/25		<0.01
AA	03/26-06/25	<0.01	
UH	06/25-09/24		<0.01
AA	06/25-09/24	<0.01	
UH	09/24-12/31		<0.01
AA	09/24-12/31	<0.01	

GRAND GULF NUCLEAR STATION
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Particulate Gross Beta Control

These results are for particulate air samples taken from control locations by the MSDH and the Licensee which were analyzed for Gross Beta. The Licensee's sampler is located in Vicksburg (VB) 18 miles north of the GGNS and designated as AS-3 (Control). The MSDH's sampler is located behind the Radiological Health Building (RH) in Jackson, 51 miles east northeast of the GGNS.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	12/26-01/02		0.018F
RH	12/26-01/02	0.018	
VB	01/02-01/09		0.022
RH	01/02-01/09	0.018	
VB	01/09-01/16		0.013
RH	01/09-01/16	0.026	
VB	01/16-01/23		0.019
RH	01/16-01/23	0.026	
VB	01/23-01/30		0.014
RH	01/23-01/30	0.009	
VB	01/30-02/06		0.018
RH	01/30-02/06	0.026	
VB	02/06-02/13		0.007
RH	02/06-02/13	0.017	
VB	02/13-02/20		0.014
RH	02/13-02/20	0.014	
VB	02/20-02/27		0.024
RH	02/20-02/27	0.029	
VB	02/27-03/05		0.022
RH	02/27-03/05	0.033	
VB	03/05-03/12		0.018
RH	03/05-03/12	0.036	
VB	03/12-03/19		0.010
RH	03/12-03/19	0.020	
VB	03/19-03/26		0.013
RH	03/19-03/26	0.024	

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Particulate Gross Beta Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	03/26-04/02		0.012
RH	03/26-04/02	0.027	
VB	04/02-04/09		0.019
RH	04/02-04/09	0.036	
VB	04/09-04/16		0.014
RH	04/09-04/16	0.022	
VB	04/16-04/23		0.008
RH	04/16-04/23	0.032	
VB	04/23-04/30		0.009
RH	04/23-04/30	0.020	
VB	04/30-05/07		0.015
RH	04/30-05/07	0.025	
VB	05/07-05/14		0.022
RH	05/07-05/14	0.032	
VB	05/14-05/21		0.026
RH	05/14-05/21	0.034	
VB	05/21-05/28		0.012
RH	05/21-05/28	0.022	
VB	05/28-06/04		0.027
RH	05/28-06/04	0.037	
VB	06/04-06/11		0.021
RH	06/04-06/11	0.041	
VB	06/11-06/18		0.010
RH	06/11-06/18	0.028	
VB	06/18-06/25		0.010
RH	06/18-06/25	0.025	
VB	06/25-07/02		0.021
RH	06/25-07/02	0.062	
VB	07/02-07/09		0.023
RH	07/02-07/09	0.039	
VB	07/09-07/16		0.024
RH	07/09-07/16	0.032	
VB	07/16-07/23		0.014
RH	07/16-07/23	0.027	
VB	07/23-07/30		0.014
RH	07/23-07/30	0.030	

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Particulate Gross Beta Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	07/30-08/06		0.016
RH	07/30-08/06	0.024	
VB	08/06-08/13		0.016
RH	08/06-08/13	0.006	
VB	08/13-08/20		0.025
RH	08/13-08/20	0.030	
VB	08/20-08/27		0.030
RH	08/20-08/27	0.052	
VB	08/27-09/03		0.018
RH	08/27-09/03	0.038	
VB	09/03-09/10		0.025
RH	09/03-09/10	0.044	
VB	09/10-09/17		0.035
RH	09/10-09/17	0.042	
VB	09/17-09/24		0.026
RH	09/17-09/24	0.064	
VB	09/24-10/01		0.028
RH	09/24-10/01	0.030	
VB	10/01-10/08		0.029
RH	10/01-10/08	0.039	
VB	10/08-10/15		0.020
RH	10/08-10/15	0.082	
VB	10/15-10/22		0.024
RH	10/15-10/22	0.038	
VB	10/22-10/29		0.016
RH	10/22-10/29	0.033	
VB	10/29-11/05		0.029G
RH	10/29-11/05	0.038	
VB	11/05-11/12		0.019
RH	11/05-11/12	0.032	
VB	11/12-11/19		0.024
RH	11/12-11/19	0.032	
VB	11/19-11/26		0.018
RH	11/19-11/26	0.022	
VB	11/26-12/03		0.030
RH	11/26-12/03	0.037	

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Particulate Gross Beta Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	12/03-12/10		0.024
RH	12/03-12/10	0.021	
VB	12/10-12/17		0.024
RH	12/10-12/17	E	
VB	12/17-12/23		0.023
RH	12/17-12/23	H	
VB	12/23-12/31		0.016
RH	12/23-12/30	0.020	

F Blown fuse at 139.58 hours.
G No flow at collection.
H Moter failure.

GRAND GULF NUCLEAR STATION
CLAIBORNE COUNTY, MISSISSIPPI
CY 1996

Radioiodine Control

These results are for charcoal canister air samples taken from control locations by the MSDH and the Licensee which were analyzed for radioiodine. The Licensee's sampler is located in Vicksburg (VB) 18 miles north of the GGNS and designated as AS-3 (Control). The MSDH's sampler is located behind the Radiological Health Building (RH) in Jackson, 51 miles east northeast of the GGNS.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	12/26-01/02		<0.025F
RH	12/26-01/02	<0.07	
VB	01/02-01/09		<0.021
RH	01/02-01/09	<0.07	
VB	01/09-01/16		<0.016
RH	01/09-01/16	<0.07	
VB	01/16-01/23		<0.017
RH	01/16-01/23	<0.07	
VB	01/23-01/30		<0.014
RH	01/23-01/30	<0.07	
VB	01/30-02/06		<0.024
RH	01/30-02/06	<0.07	
VB	02/06-02/13		<0.015
RH	02/06-02/13	<0.07	
VB	02/13-02/20		<0.012
RH	02/13-02/20	<0.07	
VB	02/20-02/27		<0.017
RH	02/20-02/27	<0.07	
VB	02/27-03/05		<0.021
RH	02/27-03/05	<0.07	
VB	03/05-03/12		<0.034
RH	03/05-03/12	<0.07	
VB	03/12-03/19		<0.022
RH	03/12-03/19	<0.07	
VB	03/19-03/26		<0.018
RH	03/19-03/26	<0.07	

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Radioiodine Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	03/26-04/02		<0.022
RH	03/26-04/02	<0.07	
VB	04/02-04/09		<0.015
RH	04/02-04/09	<0.07	
VB	04/09-04/16		<0.017
RH	04/09-04/16	<0.07	
VB	04/16-04/23		<0.017
RH	04/16-04/23	<0.07	
VB	04/23-04/30		<0.022
RH	04/23-04/30	<0.07	
VB	04/30-05/07		<0.024
RH	04/30-05/07	<0.07	
VB	05/07-05/14		<0.020
RH	05/07-05/14	<0.07	
VB	05/14-05/21		<0.026
RH	05/14-05/21	<0.07	
VB	05/21-05/28		<0.022
RH	05/21-05/28	<0.07	
VB	05/28-06/04		<0.016
RH	05/28-06/04	<0.07	
VB	06/04-06/11		<0.036
RH	06/04-06/11	<0.07	
VB	06/11-06/18		<0.033
RH	06/11-06/18	<0.07	
VB	06/18-06/25		<0.027
RH	06/18-06/25	<0.07	
VB	06/25-07/02		<0.018
RH	06/25-07/02	<0.07	
VB	07/02-07/09		<0.030
RH	07/02-07/09	<0.07	
VB	07/09-07/16		<0.024
RH	07/09-07/16	<0.07	
VB	07/16-07/23		<0.039
RH	07/16-07/23	<0.07	
VB	07/23-07/30		<0.026
RH	07/23-07/30	<0.07	

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Radioiodine Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	07/30-08/06		<0.032
RH	07/30-08/06	<0.07	
VB	08/06-08/13		<0.026
RH	08/06-08/13	<0.07	
VB	08/13-08/20		<0.025
RH	08/13-08/20	<0.07	
VB	08/20-08/27		<0.018
RH	08/20-08/27	<0.07	
VB	08/27-09/03		<0.039
RH	08/27-09/03	<0.07	
VB	09/03-09/10		<0.018
RH	09/03-09/10	<0.07	
VB	09/10-09/17		<0.015
RH	09/10-09/17	<0.07	
VB	09/17-09/24		<0.015
RH	09/17-09/24	<0.07	
VB	09/24-10/01		<0.017
RH	09/24-10/01	<0.07	
VB	10/01-10/08		<0.013
RH	10/01-10/08	<0.07	
VB	10/08-10/15		<0.015
RH	10/08-10/15	<0.07	
VB	10/15-10/22		<0.017
RH	10/15-10/22	<0.07	
VB	10/22-10/29		<0.020
RH	10/22-10/29	<0.07	
VB	10/29-11/05		<0.035G
RH	10/29-11/05	<0.07	
VB	11/05-11/12		<0.016
RH	11/05-11/12	<0.07	
VB	11/12-11/19		<0.016
RH	11/12-11/19	<0.07	
VB	11/19-11/26		<0.017
RH	11/19-11/26	<0.07	
VB	11/26-12/03		<0.016
RH	11/26-12/03	<0.07	

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Radioiodine Control (cont'd)

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	12/03-12/10		<0.016
RH	12/03-12/10	<0.07	
VB	12/10-12/17		<0.016
RH	12/10-12/17	H	
VB	12/17-12/23		<0.022
RH	12/17-12/23	H	
VB	12/23-12/31		<0.015
RH	12/23-12/31	<0.07	

F Blown fuse at 139.58 hours.
G No flow at collection.
H Moter failure.

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Quarterly Composite (Gamma Isotopic) Control

These results are for particulate air samples, collected during a quarter, taken from control locations by the MSDH and the Licensee which were analyzed as a composite for gross gamma emitters. The Licensee's sampler is located in Vicksburg (VB) 18 miles north of the GGNS and designated as AS-3 (Control). The MSDH's sampler is located behind the Radiological Health Building (RH) in Jackson, 51 miles east northeast of the GGNS.

Location	Date	MSDH (pCi/m ³)	Licensee (pCi/m ³)
VB	12/26-03/26		<0.0017
RH	12/26-03/26	<0.01	
VB	03/26-06/25		<0.001
RH	03/26-06/25	<0.01	
VB	06/25-09/24		<0.0018
RH	06/25-09/24	<0.01	
VB	09/24-12/31		<0.0016
RH	09/24-12/31	<0.01	

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Gamma Isotopic Analysis

These results are for river water samples split with the Licensee and analyzed by Gamma Isotopic analysis. The Mississippi River Water Upstream (MRU) sample location is 2 miles north northwest of the GGNS (Control). The Mississippi River Water Downstream (MRD) sample location is 2 miles west southwest of the GGNS (Indicator).

Location	Date	MSDH (pCi/l)	Licensee (pCi/l)
MRU	01/02/96	<LLD	<LLD
MRU I	01/02/96	<LLD	<LLD
MRU	02/06/96	<LLD	<LLD
MRU I	02/06/96	<LLD	<LLD
MRJ	03/05/95	<LLD	<LLD
MRU	04/02/96	<LLD	<LLD
MRU	05/01/96	<LLD	<LLD
MRU	06/04/96	<LLD	<LLD
MRU	07/02/96	<LLD	<LLD
MRU	08/06/96	<LLD	<LLD
MRU	09/03/96	<LLD	<LLD
MRU	10/01/96	<LLD	<LLD
MRU	11/05/96	<LLD	<LLD
MRU	12/03/96	<LLD	<LLD
MRD	01/02/96	<LLD	<LLD
MRD I	01/02/96	<LLD	<LLD
MRD	02/06/96	<LLD	<LLD
MRD I	02/06/96	<LLD	<LLD
MRD	03/05/96	<LLD	<LLD
MRD	04/02/96	<LLD	<LLD
MRD	05/01/96	<LLD	<LLD
MRD	06/04/96	<LLD	<LLD
MRD	07/02/96	<LLD	<LLD
MRD	08/06/96	<LLD	<LLD
MRD	09/06/96	<LLD	<LLD
MRD	10/01/96	<LLD	<LLD
MRD	11/05/96	<LLD	<LLD
MRD	12/03/96	<LLD	<LLD

I Duplicate sample for Licensee Quality Control program.

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Tritium

These results are for river water samples split by the MSDH and the Licensee and analyzed for tritium using liquid scintillation analysis. The Mississippi River Water Upstream (MRU) sample location is 2 miles north northwest of the GGNS (Control). The Mississippi River Water Downstream (MRD) sample location is 2 miles west southwest of the GGNS (Indicator). The Licensee's LLD is computed individually for each sample and indicated by "<nnn" below. Licensee's results are a quarterly composite of the preceding three months. The MSDH tritium analyses are performed monthly.

Location	Date	MSDH (pCi/l)	Licensee (pCi/l)
MRU	01/02/96	<330	COMP
MRU I	01/02/96		COMP
MRU	02/06/96	<330	COMP
MRU I	02/06/96		COMP
MRU	03/05/96	<330	<250
MRU	04/02/96	<330	COMP
MRU	05/01/96	<330	COMP
MRU	06/04/96	<330	<253
MRU	07/02/96	<330	114±106
MRU	08/06/96	<330	150±107
MRU	09/03/96	<330	167±106
MRU	10/01/96	<330	117±106
MRU	11/05/96	<330	
MRU	12/03/96	<330	
MRD	01/02/96	<330	COMP
MRD I	01/02/96		COMP
MRD	02/06/96	<330	COMP
MRD I	02/06/96		COMP
MRD	03/05/96	<330	<250
MRD	04/02/96	<330	COMP
MRD	05/01/96	<330	COMP
MRD	06/04/96	<330	<253
MRD	07/02/96	<330	160±106
MRD	08/06/96	<330	271±109
MRD	09/03/96	<330	252±108

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Tritium (cont'd)

Location	Date	MSDH (pCi/l)	Licensee (pCi/l)
MRD	10/01/96	<330	140±107
MRD	11/05/96	<330	
MRD	12/03/96	<330	

I Duplicate sample for Licensee Quality Control program.
COMP Composite sample, results below.

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Gamma Isotopic Analysis

These results are for river sediment samples collected in duplicate and analyzed by Gamma Isotopic methods. The MSDH designates their control as the Mississippi River Upstream (MRU) and their indicator as the Mississippi River Downstream (MRD). The Licensee's designation for control is the Mississippi River Upstream, (SEDCONT) and indicator is Hamilton Lake (SEDHAM). The controls are both located approximately 2 miles north northwest of GGNS. The indicators are located approximately 2 miles west southwest of the GGNS.

Location	Date	MSDH (pCi/kg)	Licensee (pCi/kg)
MRU	06/04/96	<LLD	
SEDCONT	06/04/96		<LLD
SEDCONT I	06/04/96		<LLD
MRD	06/04/96	<LLD	
SEDHAM	06/04/96		<LLD
SEDHAM I	06/04/96		<LLD

1 Duplicate sample for Licensee Quality Control program.

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Gamma Isotopic Analysis

These results are for duplicate Alcorn Dairy milk samples which the MSDH and the Licensee analyzed by Gamma Isotopic methods. Alcorn Dairy is located eleven miles southwest of the GGNS. Samples are labeled RH for Radiological Health and GG for Licensee.

Sample	Date	MSDH (pCi/l)	Licensee (pCi/l)
RH	05/14/96	<LLD	
GG	05/14/96		<LLD
GG I	05/14/96		<LLD

I Duplicate sample for Licensee Quality Control program.

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Radioiodine

These results are for duplicate Alcorn Dairy milk samples which the MSDH and the Licensee analyzed for radioiodine by Gamma Isotopic methods. Alcorn Dairy is located eleven miles southwest of the GGNS. Samples are labeled RH for Radiological Health and GG for Licensee.

Sample	Date	MSDH (pCi/l)	Licensee (pCi/l)
RH	05/14/96	<LLD	
GG	05/14/96		<0.9
GG I	05/14/96		<0.9

I Duplicate sample for Licensee Quality Control program.

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Gamma Isotopic Analysis

These results are for edible fish samples taken from the Mississippi River Upstream (MRU) approximately 2 miles north northwest of the GGNS and the Mississippi River Downstream (MRD) approximately 2 miles west southwest of the GGNS. Each sample was analyzed by Gamma Isotopic methods.

Location	Date	MSDH (pCi/kg)	Licensee (pCi/kg)
MRU	06/14/96	<LLD	<LLD
MRD	06/14/96	<LLD	<LLD

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Gamma Isotopic Analysis

These results are for vegetation samples taken from Sectors J, K, and R. These samples were analyzed by Gamma Isotopic methods.

Vegetable	Sector	Date	MSDH (pCi/kg)	Licensee (pCi/kg)
Collards	J	01/10/96	<LLD	<LLD
Cabbage	H	01/10/96	<LLD	<LLD
Collards	K	01/10/96	<LLD	<LLD
Collards	J	02/09/96	<LLD	<LLD
Collards	H	02/09/96	<LLD	<LLD
Collards	K	02/09/96	<LLD	<LLD
Henbit	J	03/12/96	<LLD	<LLD
Collards	H	03/12/96	<LLD	<LLD
Clover	K	03/12/96	<LLD	<LLD
Kale	J	04/10/96	<LLD	<LLD
Collards	H	04/10/96	<LLD	<LLD
Rape	K	04/10/96	<LLD	<LLD
Collards	J	05/14/96	<LLD	<LLD
Collards	H	05/14/96	<LLD	<LLD
Collards	K	05/14/96	<LLD	<LLD
Kale	J	06/06/96	<LLD	<LLD
Collards	H	06/06/96	<LLD	<LLD
Collards	K	06/10/96	<LLD	<LLD
Photesia	J	07/10/96	<LLD	<LLD
Squash	H	07/10/96	<LLD	<LLD
Amarcenthas	K	07/10/96	<LLD	<LLD
Collards	J	10/15/96	<LLD	<LLD
Rape	K	10/15/96	<LLD	<LLD

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MSDH Lower Limit of Detection (LLD)

The following are contractually specified detection capabilities for environmental sample analyses.

Analysis	Water (pCi/l)	Airborne Particulate or Gas (pCi/m ³)	Fish, Meat or Poultry (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)	Sediment (pCi/kg, dry)
gross beta	4 ^Q	1.0E-02				
³ H	2000 1000 ^Q					
⁵⁴ Mn	15	1.0E-02	130		60	100
⁵⁹ Fe	30	2.0E-02	260		80	200
⁵⁸ Co	15	1.0E-02	130		50	100
⁶⁰ Co	15	1.0E-02	130		50	100
⁶⁵ Zn	30	2.0E-02	260		60	200
⁹⁵ Zr	30	2.0E-02			80	200
⁹⁵ Nb	15	2.0E-02			80	200
¹³¹ I	1 ^Q	7.0E-02		1	60	200
¹³⁴ Cs	15	5.0E-02	130	15	60	150
¹³⁷ Cs	18	6.0E-02	150	18	80	180
¹⁴⁰ Ba	60	2.0E-02		60	60	200
¹⁴⁰ La	15	2.0E-02	15	60	200	

Q LLD for drinking water.

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Licensee Lower limit of Detection (LLD)

The following are maximum values of the Lower Limits of Detection for environmental sample analyses from the Offsite Dose Calculation Manual.

Analysis	Water (pCi/l)	Airborne Particulate or Gas (pCi/m ³)	Fish, Meat or Poultry (pCi/kg, wet)	Milk (pCi/l)	Food Products (pCi/kg, wet)	Sediment (pCi/kg, dry)
gross beta	4	1.0E-02				
³ H	3000 2000 ^Q					
⁵⁴ Mn	15		130			
⁵⁹ Fe	30		260			
⁵⁸ Co	15		130			
⁶⁰ Co	15		130			
⁶⁵ Zn	30		260			
⁹⁵ Zr	30					
⁹⁵ Nb	15					
¹³¹ I	1 ^Q	7.0E-02		1	60	
¹³⁴ Cs	15	5.0E-02	130	15	60	150
¹³⁷ Cs	18	6.0E-02	150	18	80	180
¹⁴⁰ Ba	60			60		
¹⁴⁰ La	15			15		

^Q LLD for drinking water.

EPA Cross-Check Results--1996

All values reported in pCi/l unless otherwise indicated.

		Reported	Known
January	Gross Alpha/Beta in Water		
	Alpha	9.9, 9.9, 10	12.1±8.7
	Beta	7.9, 7.9, 8.0	7.0±8.7
February	Iodine in Water		
	Iodine	66, 66, 67	67±12.1
	Strontium in Water		
	Strontium 89	70, 70, 71	73±8.7
	Strontium 90	5, 5, 5	5±8.7
March	Tritium in Water		
	Tritium	21736, 21918, 22101	22002±3816
April	Performance Evaluation Intercomparison Study		
	Alpha	77.8, 77.9, 78.0	74.8±32.4
	Radium 226	3.4, 3.4, 3.5	3.0±0.9
	Radium 228	4.8, 4.9, 5.0	5.0±2.3
	Uranium	65.6, 65.7, 65.8	58.4±10.1
	Beta	146.0, 146.0, 146.0	166.9±43.4
	Strontium 89	39.9, 40.0, 40.0	43±8.7
	Strontium 90	15.0, 15.0, 15.0	16±8.7
	Cobalt 60	29.1, 29.1, 29.2	31±8.7
	Cesium 134	41.0, 41.2, 41.2	46±8.7
	Cesium 137	49.5, 50.2, 50.5	50±8.7

EPA Cross-Check Results (cont'd)

	Reported	Known
June		
Radionuclides in Water		
Cobalt 60	96, 97, 97	99±8.7
Zinc 65	301, 302, 303	300±52
Cesium 134	71, 72, 72	79±8.7
Cesium 137	196, 196, 197	197±17.3
Barium 133	731, 732, 732	745±130
Uranium and Radium in Water		
Uranium	18.8, 18.8, 18.9	20.2±5.2
Radium 226	5.3, 5.4, 5.5	4.9±1.2
Radium 228	9.1, 9.2, 9.3	9.0±4.0
July		
Strontium in Water		
Strontium 89	26, 26, 26	25±8.7
Strontium 90	10, 10, 10	12±8.7
Gross Alpha/Beta in Water		
Alpha	25.8, 25.8, 25.9	24.4±10.6
Beta	44.6, 44.2, 44.2	44.8±8.7
August		
Tritium in Water		
Tritium	10805, 10845, 10896	10879±1088
September		
Uranium and Radium in Water		
Uranium	10.5, 10.5, 10.6	10.1±5.2
Radium 226	15.7, 15.8, 15.9	14.0±3.6
Radium 228	5.3, 5.3, 5.4	4.7±2.1

EPA Cross-Check Results (cont'd)

		Reported			Known
October	Iodine in Water				
	Iodine	26,	26,	27	27±6
Performance Evaluation					
Intercomparison Study					
	Alpha	78.8,	78.9,	79.0	59.1±14.8
	Radium 226	10.9,	10.9,	11.0	9.9±1.5
	Radium 228	6.5,	6.6,	6.7	5.1±1.3
	Uranium	42.0,	42.9,	43.0	40.9±4.1
	Beta	104.7,	104.8,	104.9	111.8±16.8
	Strontium 89	11,	11,	12	10±8.7
	Strontium 90	22,	22,	22	25±8.7
	Cobalt 60	14,	14,	14	15±8.7
	Cesium 134	19,	19,	20	20±8.7
	Cesium 137	28,	29,	29	30±8.7
Gross Alpha/Beta					
in Water					
	Alpha	8.7,	8.8,	8.8	10.3±8.7
	Beta	31.9,	32.0,	32.0	34.6±8.7
November					
	Radionuclides in Water				
	Cobalt 60	43,	44,	45	44±8.7
	Zinc 65	34,	34,	35	35±8.7
	Cesium 134	11,	11,	11	11±8.7
	Cesium 137	19,	20,	20	19±8.7
	Barium 133	64,	65,	65	64±13.
	Uranium and Radium in Water				
	Uranium	8.1,	8.2,	8.3	5.0±5.2
	Radium 226	20.2,	20.3,	20.4	20.1±5.2
	Radium 228	11.3,	11.5,	11.9	10.2±4.5

EPA cross check results were 100% within limits for 1996.