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GNRO-2006/00017

April 26, 2006

U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station (GGNS) 2005 Annual Radiological  
Environmental Operating Report (AREOR)

Grand Gulf Nuclear Station  
Docket No. 50-416  
License No. NPF-29

Ladies & Gentlemen:

In accordance with the Grand Gulf Nuclear Station Unit 1 Technical Specification 5.6.2, attached is the Annual Radiological Environmental Operating Report for the period January 1, 2005 through December 31, 2005.

**This letter does not contain any commitments.** If you have questions or require additional information concerning these reports, please contact Mr. Richard Scarbrough (601) 437-6316, or this office at (601) 437-6685.

Yours truly,

A handwritten signature in black ink, appearing to be "CAB".

CAB/MJL  
attachment:  
cc:

2005 Annual Radiological Environmental Operating Report  
(See Next Page)

April 26, 2006  
GNRO-2006-00017  
Page 2 of 2

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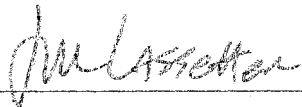
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**ENTERGY OPERATIONS, INC.  
GRAND GULF NUCLEAR STATION**

**ANNUAL  
RADIOLOGICAL ENVIRONMENTAL  
OPERATING REPORT**

**January 1, 2005-December 31, 2005**




4-21-06

Prepared By



4-21-06

Reviewed By



4-26-06

Approved By

## TABLE OF CONTENTS

<b>SUMMARY</b>	<b>6</b>
<b>1.0 INTRODUCTION</b>	<b>11</b>
1.1 Radiological Environmental Monitoring Program	11
1.2 Pathways Monitored	11
1.3 Land Use Census	12
<b>2.0 INTERPRETATION AND TRENDS OF RESULTS</b>	<b>23</b>
2.1 Air Particulate and Radioiodine Sample Results	23
2.2 Thermoluminescent Dosimetry (TLD) Sample Results	23
2.3 Water Sample Results	25
2.4 Sediment Sample Results	25
2.5 Milk Sample Results	26
2.6 Fish Sample Results	26
2.7 Food Product Sample Results	26
2.8 Land Use Census Results	27
2.9 Interlaboratory Comparison Results	33
<b>3.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b>	<b>34</b>
3.1 Program Results Summary	34

## **LIST OF TABLES**

<b>TABLE 1.1</b>	<b>RADIOLOGICAL ENVIRONMENTAL SAMPLING PROGRAM</b>	<b>13</b>
<b>TABLE 2.1</b>	<b>LAND USE CENSUS RESULTS</b>	<b>28</b>
<b>TABLE 3.1</b>	<b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b>	<b>35</b>

## **LIST OF FIGURES**

<b>FIGURE 1-1</b>	<b>EXPOSURE PATHWAYS</b>	<b>20</b>
<b>FIGURE 1-2</b>	<b>SAMPLE COLLECTION SITES – NEAR FIELD</b>	<b>21</b>
<b>FIGURE 1-3</b>	<b>SAMPLE COLLECTION SITES – FAR FIELD</b>	<b>22</b>
<b>FIGURE 2-1</b>	<b>TLD READINGS</b>	<b>24</b>

## **LIST OF ATTACHMENTS**

<b>ATTACHMENT 1</b>	<b>RADIOLOGICAL MONITORING REPORT SUMMARY OF MONITORING RESULTS</b>	<b>41</b>
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## **Summary**

The Annual Radiological Environmental Operating Report presents data obtained through analyses of environmental samples collected for Grand Gulf Nuclear Station's (GGNS) Radiological Environmental Monitoring Program (REMP) for the period January 1, 2005 through December 31, 2005. This report fulfills the requirements of GGNS Technical Specification 5.6.2.

To supplement the REMP, GGNS personnel collected duplicate surface water, ground water, vegetation, sediment and fish samples during the reporting period. Special samples collected during the reporting period included vegetation and venison. GGNS did not detect any plant-related radionuclides in these samples.

### **Radiological Environmental Monitoring Program**

GGNS established the REMP in 1978 prior to the station becoming operational (1985) to provide data on background radiation and radioactivity normally present in the area. GGNS has continued to monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring radiation directly. GGNS also samples milk if commercial milk production is occurring within five miles of the plant.

The REMP includes sampling indicator and control locations within an 18-mile radius of the plant. The REMP utilizes indicator locations near the site to show any increases or buildup of radioactivity that might occur due to station operation, and control locations farther away from the site to indicate the presence of only naturally occurring radioactivity. GGNS personnel compare indicator results with control and preoperational results to assess any impact GGNS operation might have had on the surrounding environment.

In the current year, GGNS personnel collected environmental samples for radiological analysis. They compared results of indicator locations with control locations and previous studies, and concluded that overall no significant relationship exists between GGNS operation and effect on the plant environs. Their review of current year data, in many cases, showed undetectable radiation levels in the environment and near background level in significant pathways associated with GGNS.



### **Harmful Effects or Irreversible Damage**

The REMP monitoring did not detect any harmful effects or evidence of irreversible damage in the current year. Therefore, no analysis or planned course of action to alleviate problems was necessary.

### **Reporting Levels**

GGNS' review indicates that no samples equaled or exceeded reporting levels for radioactivity concentration in environmental samples, as outlined in ODCM Specifications Table 6.12.1-2 when averaged over any calendar quarter, due to GGNS effluents. Therefore, results did not trigger any Radiological Monitoring Program Special Reports.

### **Radioactivity Not Attributable to GGNS**

In previous years, the GGNS REMP detected radioactivity attributable to other sources twice. These include the 25th Chinese nuclear test explosion in 1980, and the radioactivity plume release due to reactor core degradation at the Chernobyl Nuclear Power Plant in 1986.

### **Comparison to Federal and State Programs**

GGNS personnel compared REMP data to federal and state monitoring programs as results became available. Historically, the programs used for comparison have included the U.S. Nuclear Regulatory Commission (NRC) TLD Direct Radiation Monitoring Network and the Mississippi State Department of Health (MSDH), Division of Radiological Health.

The NRC TLD Network Program was discontinued in 1998. Historically these results have compared favorably to those from the GGNS REMP. GGNS TLD results remain similar to the historical average and continue to verify that plant operation is not affecting the ambient radiation levels in the environment.

The MSDH and the GGNS REMP entail similar radiological environmental monitoring program requirements. These programs include concurrent air sampling and splitting or sharing sample media such as water, sediment, fish and food products. Both programs have obtained similar results over previous years. The results of MSDH's monitoring program for the reporting period compared favorably with the GGNS REMP and did not indicate elevated levels of radiation or radioactivity build-up attributed to plant operations.

### **Sample Deviations**

#### **◆ Milk**

The REMP did not include milk sampling within five miles (8 km) of GGNS in the current year due to unavailability. ODCM Specifications require collection of milk samples if available commercially within 8 km (5 miles) of the plant. GGNS personnel collected vegetation samples to monitor the ingestion pathway, as specified in ODCM Specifications Table 6.12.1-1, because of milk unavailability.

#### **◆ Required Lower Limit of Detection (LLD) Values**

LLDs during this reporting period were within the acceptable limits required by the ODCM specifications.

## ◆ Air Samples

The following air sample locations had reduced run times due to weather-related outages or mechanical problems. As described in footnote (a) to ODCM Specification Table 6.12.1-1, deviations from the required sampling schedule are permitted due to malfunction of sampling equipment and other legitimate reasons.

Sample Location	Date In	Date Out	RunTime hours	Out-of-service hours	Comments
AS-1 PG	01/11/05	01/18/05	158.06	9.92	Power Outage
AS-7 UH	01/11/05	01/18/05	165.72	2.25	Power Outage
AS-7 UH	01/18/05	01/25/05	167.19	0.81	Power Outage
AS-7 UH	02/01/05	02/08/05	168.03	1.82	Power Outage
AS-7 UH	04/05/05	04/12/05	167.34	0.68	Power Outage
AS-1 PG	05/24/05	05/31/05	167.30	0.67	Power Outage
AS-7 UH	05/24/05	05/31/05	168.11	1.41	Power Outage
AS-7 UH	07/05/05	07/12/05	162.79	1.58	Power Outage
AS-1 PG	07/05/05	07/12/05	162.44	1.48	Power Outage
AS-3 61VA	08/23/05	08/30/05	154.60	12.22	Hurricane Katrina
AS-1 PG	08/23/05	08/30/05	149.54	18.69	Hurricane Katrina
AS-7 UH	08/23/05	08/30/05	148.01	20.92	Hurricane Katrina
AS-3 61VA	08/30/05	09/06/05	163.21	4.66	Hurricane Katrina
AS-1 PG	08/30/05	09/06/05	45.15	135.67	Hurricane Katrina
AS-7 UH	08/30/05	09/06/05	92.41	73.97	Hurricane Katrina
AS-1 PG	09/20/05	09/27/05	167.70	0.95	Hurricane Rita
AS-7 UH	11/22/05	11/29/05	163.67	1.51	Power Outage
AS-3 61VA	11/29/05	12/06/05	168.28	1.14	Planned Maintenance
AS-1 PG	11/29/05	12/06/05	167.64	0.86	Planned Maintenance
AS-7 UH	11/29/05	12/06/05	167.46	1.09	Planned Maintenance

Based on the sample collection period reductions, air samples were collected the following percentages of the available time:

AS-1 PG	98.1%
AS-3 61VA	99.8%
AS-7 UH	98.8%

♦ **Missed Samples**

There were no missed samples in the reporting period.

♦ **Unavailable Results**

GGNS received analytical results in adequate time for inclusion in this report. In addition, GGNS' review identified no missing results.

**Program Modifications**

In December 2005 one surface water sample location: Storm Drain System OUTFALL 007 [Sector N, Radius 0.2 Miles], was added to the REMP. The sampling requirement at this location became effective in January 2006.

**Attachments**

Attachment 1 contains results of TLD, air, water, sediment, fish, food products and special samples collected. TLDs were analyzed by Waterford-3 Dosimetry. All remaining samples were analyzed by River Bend Station's (RBS) Environmental Laboratory. Attachment 1 also contains RBS' results from participation in the interlaboratory comparison program.

## **1.0 Introduction**

### **1.1 Radiological Environmental Monitoring Program**

GGNS established the REMP to ensure that plant operating controls properly function to minimize any associated radiation endangerment to human health or the environment. The REMP is designed for:

- Analyzing important pathways for anticipated types and quantities of radionuclides released into the environment.
- Considering the possibility of a buildup of long-lived radionuclides in the environment and identifying physical and biological accumulations that may contribute to human exposures.
- Considering the potential radiation exposure to plant and animal life in the environment surrounding GGNS.
- Correlating levels of radiation and radioactivity in the environment with radioactive releases from station operation.

### **1.2 Pathways Monitored**

The airborne, direct radiation, waterborne and ingestion pathways, as seen in Figure 1-1, are monitored as required by GGNS ODCM Table 6.12.1-1. A description of the GGNS REMP utilized to monitor the exposure pathways is provided in Table 1.1 and shown in Figures 1-2 and 1-3. GGNS may supplement this program with additional sampling in order to provide a comprehensive and well-balanced program.

Section 2.0 of this report provides a discussion of sampling results with Section 3.0 providing a summary of results for the monitored exposure pathways.

### **1.3 Land Use Census**

GGNS personnel conduct a land use census biannually, as required by ODCM Specification 6.12.2. The purpose of this census is to identify changes in uses of land within five miles of GGNS that would require modifications to the REMP or the ODCM. The most important criteria during this census are to determine location in each sector of the nearest:

- 1) Residence
- 2) Animal milked for human consumption
- 3) Garden of greater than 50 m<sup>2</sup> (500 ft<sup>2</sup>) producing broadleaf vegetation.

When performed, GGNS personnel conduct the land use census by:

- Field surveys in each meteorological sector out to five miles in order to confirm:
  - Nearest permanent residence
  - Nearest unoccupied residence
  - Nearest garden and approximate size
  - Nearest milking animal.
- Identifying locations on maps, measuring distances to GGNS and recording results on surveillance data sheets.
- Comparing current land use census results to previous results.
- Contacting the Claiborne County Agent for verification of nearest dairy animals.

Table 1.1

Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Airborne	<b><u>Radioiodine and Particulates</u></b> 1 sample close to the SITE BOUNDARY having the highest calculated annual average groundlevel D/Q.	<b>AS-7 UH (Sector H, Radius 0.5 Miles)</b> – South-southeast of GGNS at the IBEW Union Hall.	Continuous sampler operation with sample collection per 7 days or as required by dust loading, whichever is more frequent	Radioiodine Canister – I-131; 7 days  Particulate Sampler – Gross beta radioactivity following filter change, composite (by location) for gamma isotopic; 92 days
	<b><u>Radioiodine and Particulates</u></b> 1 sample from the vicinity of a community having the highest calculated annual average groundlevel D/Q.	<b>AS-1 PG (Sector G, Radius 5.5 Miles)</b> – Southeast of GGNS at the Port Gibson City Barn.		
	<b><u>Radioiodine and Particulates</u></b> 1 sample from a control location 15 - 30 km (10 - 20 miles) distance.	<b>AS-3 61VA (Sector B, Radius 18 Miles)</b> – North-northeast of GGNS on Hwy 61, North of the Vicksburg Airport.		
Direct Radiation	<b><u>TLDs</u></b> An inner ring of stations in the general areas of the SITE BOUNDARY.	<b>M-16 (Sector A, Radius 0.9 Miles)</b> – Meteorological Tower.  <b>M-17 (Sector C, Radius 0.5 Miles)</b> – South Side, Grand Gulf Road.  <b>M-19 (Sector E, Radius 0.5 Miles)</b> – Eastern SITE BOUNDARY Property line, North-northeast of HWSA.	92 days	Gamma dose; 92 days

Table 1.1

Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<b><u>TLDs</u></b> An inner ring of stations in the general areas of the SITE BOUNDARY.	<b>M-21 (Sector J, Radius 0.4 Miles)</b> – Near Former Training Center Building on Bald Hill Road.  <b>M-22 (Sector G, Radius 0.5 Miles)</b> – Former RR Entrance Crossing On Bald Hill Road.  <b>M-23 (Sector Q, Radius 0.5 Miles)</b> – Gin Lake Road 50 Yards North of Heavy Haul Road on Power Pole.  <b>M-25 (Sector N, Radius 1.6 Miles)</b> – Radial Well Number 1.  <b>M-28 (Sector L, Radius 0.9 Miles)</b> – Former Glodjo Residence.  <b>M-94 (Sector R, Radius 0.8 Miles)</b> – Sector R Near Meteorological Tower.	92 days	Gamma dose; 92 days
	<b><u>TLDs</u></b> An outer ring approximately 3 to 5 miles from the site.	<b>M-36 (Sector P, Radius 5.0 Miles)</b> – Curve on HW 608, Point Nearest GGNS at Power Pole.  <b>M-40 (Sector M, Radius 2.3 Miles)</b> – Headly Drive, Near River Port Entrance.		



**Table 1.1**

**Radiological Environmental Sampling Program**

<b>Exposure Pathway</b>	<b>Requirement</b>	<b>Sample Point Description, Distance and Direction</b>	<b>Sampling and Collection Frequency</b>	<b>Type and Frequency Of Analyses</b>
Direct Radiation	<b><u>TLDs</u></b> An outer ring approximately 3 to 5 miles from the site.	<b>M-48 (Sector K, Radius 4.8 Miles)</b> – 0.4 Miles South on Mont Gomer Road on West Side.  <b>M-49 (Sector H, Radius 4.5 Miles)</b> – Fork in Bessie Weathers Road/Shafter Road.  <b>M-50 (Sector B, Radius 5.3 Miles)</b> – Panola Hunting Club Entrance.  <b>M-55 (Sector D, Radius 5.0 Miles)</b> – Near Ingelside Karnac Ferry Road/Ashland Road Intersection.  <b>M-57 (Sector F, Radius 4.5 Miles)</b> – Hwy 61, Behind the Welcome to Port Gibson Sign at Glensdale Subdivision.	92 days	Gamma dose; 92 days
	<b><u>TLDs</u></b> 8 stations in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control stations.	<b>M-01 (Sector E, Radius 3.5 Miles)</b> – Across the road from Lake Claiborne Entry Gate. (Special Interest)  <b>M-07 (Sector G, Radius 5.5 Miles)</b> – AS-1 PG, Port Gibson City Barn. (Special Interest)  <b>M-09 (Sector D, Radius 3.5 Miles)</b> – Warner Tully Y-Camp. (Special Interest)  <b>M-10 (Sector A, Radius 1.5 Miles)</b> – Grand Gulf Military Park. (Special Interest)		

**Table 1.1**

**Radiological Environmental Sampling Program**

<b>Exposure Pathway</b>	<b>Requirement</b>	<b>Sample Point Description, Distance and Direction</b>	<b>Sampling and Collection Frequency</b>	<b>Type and Frequency Of Analyses</b>
Direct Radiation	<p><b><u>TLDs</u></b>              8 stations in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control stations</p>	<p><b>M-14 (Sector B, Radius 18.0 Miles)</b> – AS-3-61VA, Hwy 61, North of Vicksburg Airport. (Control)</p> <p><b>M-33 (Sector P, Radius 12.5 Miles)</b> – Newellton, Louisiana Water Tower. (Special Interest)</p> <p><b>M-38 (Sector M, Radius 9.5 Miles)</b> – Lake Bruin State Park, Entrance Road. (Special Interest)</p> <p><b>M-39 (Sector M, Radius 13.0 Miles)</b> – St. Joseph, Louisiana, Auxiliary Water Tank. (Special Interest)</p>	92 days	Gamma dose; 92 days

**Table 1.1**

**Radiological Environmental Sampling Program**

<b>Exposure Pathway</b>	<b>Requirement</b>	<b>Sample Point Description, Distance and Direction</b>	<b>Sampling and Collection Frequency</b>	<b>Type and Frequency Of Analyses</b>
Waterborne	<b><u>Surface Water</u></b> 1 sample upstream.	<b>MRUP (Sector R, Radius 1.8 Miles)</b> - At least 4500 ft upstream of the GGNS discharge point into the Mississippi River to allow adequate mixing of the Mississippi and Big Black Rivers.	92 days	Gamma isotopic and tritium analyses; 92 days
	1 sample downstream.	<b>MRDOWN (Sector N, Radius 1.6 Miles)</b> - At least 5000 ft downstream of the GGNS discharge point into the Mississippi River near Radial Well No. 1.		
	1 sample downstream during a Liquid Radwaste Discharge.	<b>MRDOWN (Sector P, Radius 1.3 Miles)</b> – Downstream of the GGNS discharge point into the Mississippi River near Radial Well No. 5.	366 days	Gamma isotopic and tritium analyses; 366 days
	1 sample from Outfall 007	OUTFALL 007 (Sector N, Radius 0.2 Miles) – Storm Drain System	31 days	Tritium; 31 days

Table 1.1

Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Waterborne	<b>Groundwater</b> Samples from 2 sources.	<b>PGWELL (Sector G, Radius 5.0 Miles)</b> - Port Gibson Wells – Take from distribution system or one of the five wells.  <b>CONSTWELL (Sector Q, Radius 0.4 Miles)</b> – GGNS Construction Water Well – Taken from distribution system or the well.	366 days	Gamma isotopic and tritium analyses; 366 days
	<b>Sediment From Shoreline</b> 1 sample from downstream area.  1 sample from upstream area.	<b>SEDHAM (Sector N, Radius 1.6 Miles)</b> – Downstream of the GGNS discharge point in the Mississippi River near Hamilton Lake outlet.  <b>SEDCONT (Minimum of 100 yds)</b> – Upstream of the GGNS discharge point in the Mississippi River.	366 days	Gamma isotopic; 366 days
Ingestion	<b>Milk</b> 1 sample from milking animals within 8 km if milk is available commercially.  1 control sample (only if indicator exists) >8 km if milk is available.	Currently, no available milking animals within 8 km of GGNS.  <b>ALCONT (Sector K, Radius 10.5 Miles)</b> - Located South-southwest of GGNS at Alcorn State University.	92 days when required	Gamma isotopic and I-131; 92 days

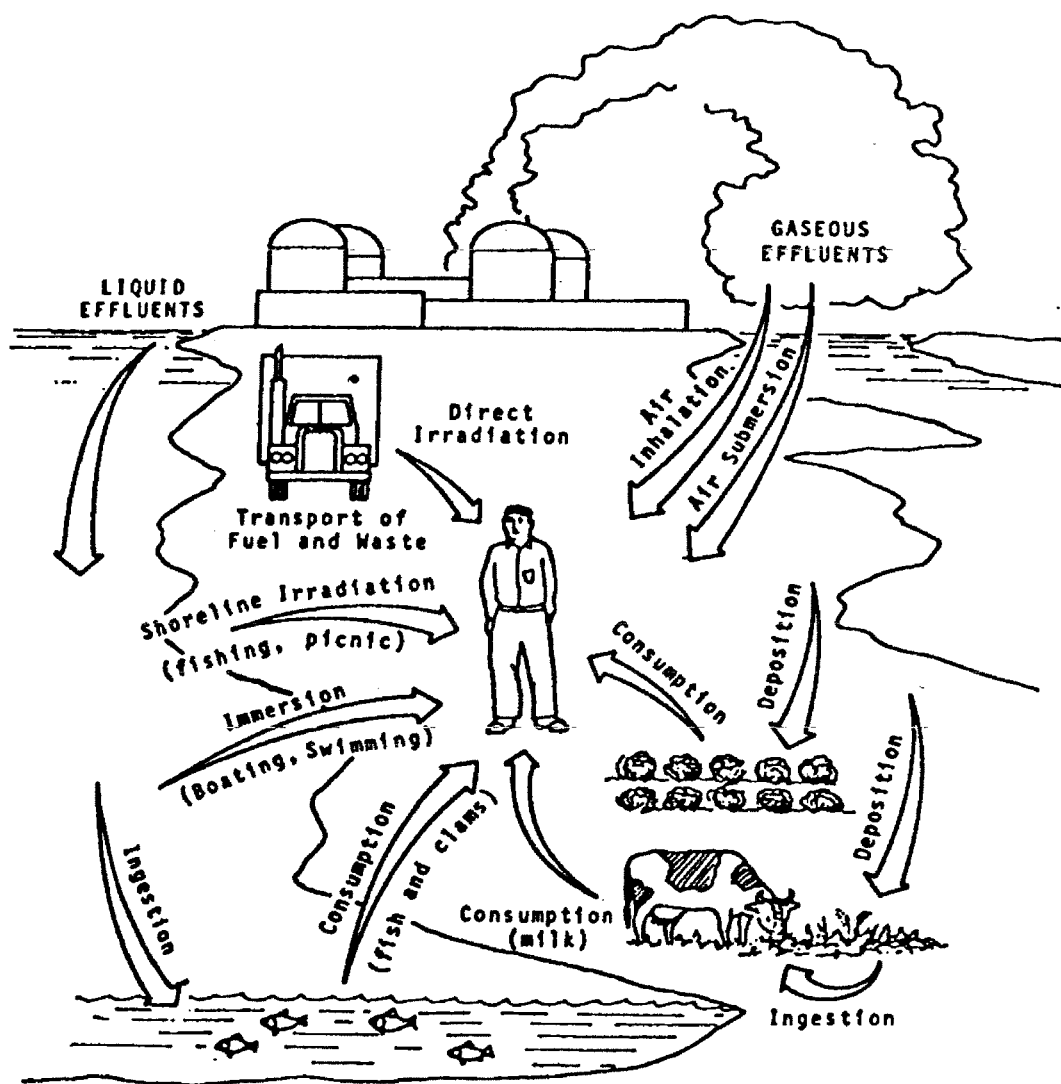
Table 1.1

Radiological Environmental Sampling Program

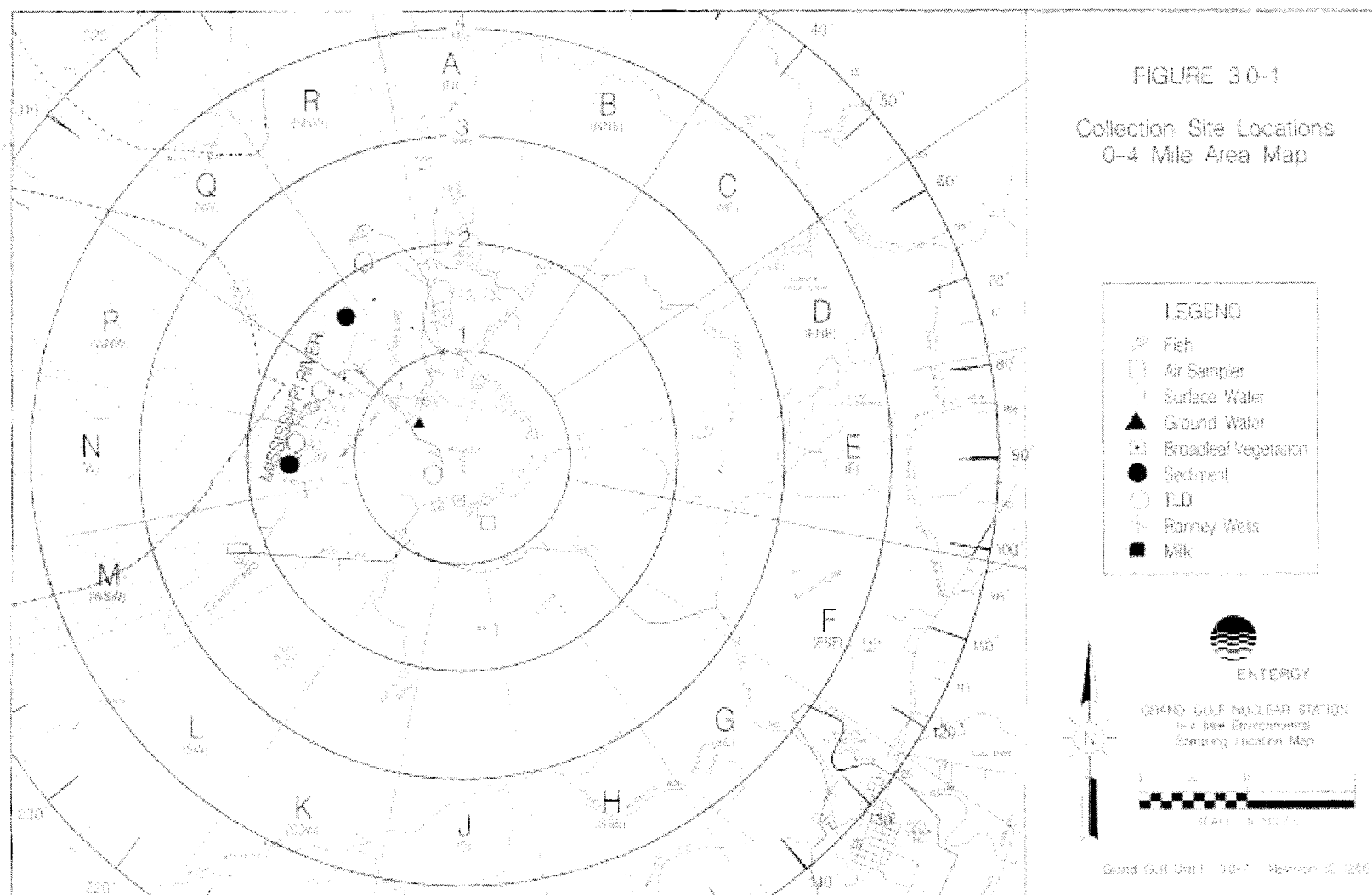
Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Ingestion	<p><b><u>Fish</u></b> 1 sample in vicinity of GGNS discharge point.</p> <p>1 sample uninfluenced by GGNS discharge.</p>	<p><b>FISHDOWN</b> – Downstream of the GGNS discharge point into the Mississippi River</p> <p><b>FISHUP</b> – Upstream of the GGNS discharge point in the Mississippi River uninfluenced by plant operations.</p>	366 days	Gamma isotopic on edible portion; 366 days
	<p><b><u>Food Products</u></b> 1 sample of broadleaf vegetation grown in one of two different offsite locations with highest anticipated annual average ground level D/Q if milk sampling is not performed.</p> <p>1 sample of similar vegetation grown 15 – 30 km distant if milk sampling is not performed.</p>	<p><b>VEG-J (Sector J, Radius 0.4 Miles)</b> – South of GGNS near former Training Center on Bald Hill Road.</p> <p><b>VEG-CONT (Sector K, Radius 10.5 Miles)</b> – Alcorn State University south-southwest of GGNS when available, otherwise a location 15-30 km distant.</p>	92 days when available	Gamma isotopic and I-131; 92 days

FIGURE 1-1

Exposure Pathways



**FIGURE 1-2**  
**SAMPLE COLLECTION SITES – NEAR FIELD**







## **2.0 Interpretation and Trends of Results**

### **2.1 Air Particulate and Radioiodine Sample Results**

GGNS did not detect any plant related gamma emitting radionuclides in the quarterly air particulate composites or Iodine-131 in the radioiodine cartridges during the reporting period, as has been the case in previous years. The REMP detected radioactivity in this pathway attributable to other sources twice. These include the 25th Chinese nuclear test explosion in 1980, and the radioactive plume release due to reactor core degradation at Chernobyl Nuclear Power Plant in 1986. Therefore, the airborne exposure pathway has been unaffected by the operation of GGNS and airborne concentrations continue to be at background levels.

Table 3.1, which includes gross beta concentrations, provides a comparison of the indicator and control means and ranges, further emphasizes that the airborne pathway continues to remain at background levels. In the absence of plant-related gamma radionuclides, gross beta activity is attributed to naturally occurring radionuclides. Consistent trends are present for control and indicator locations. This further supports the presence of naturally occurring activity.

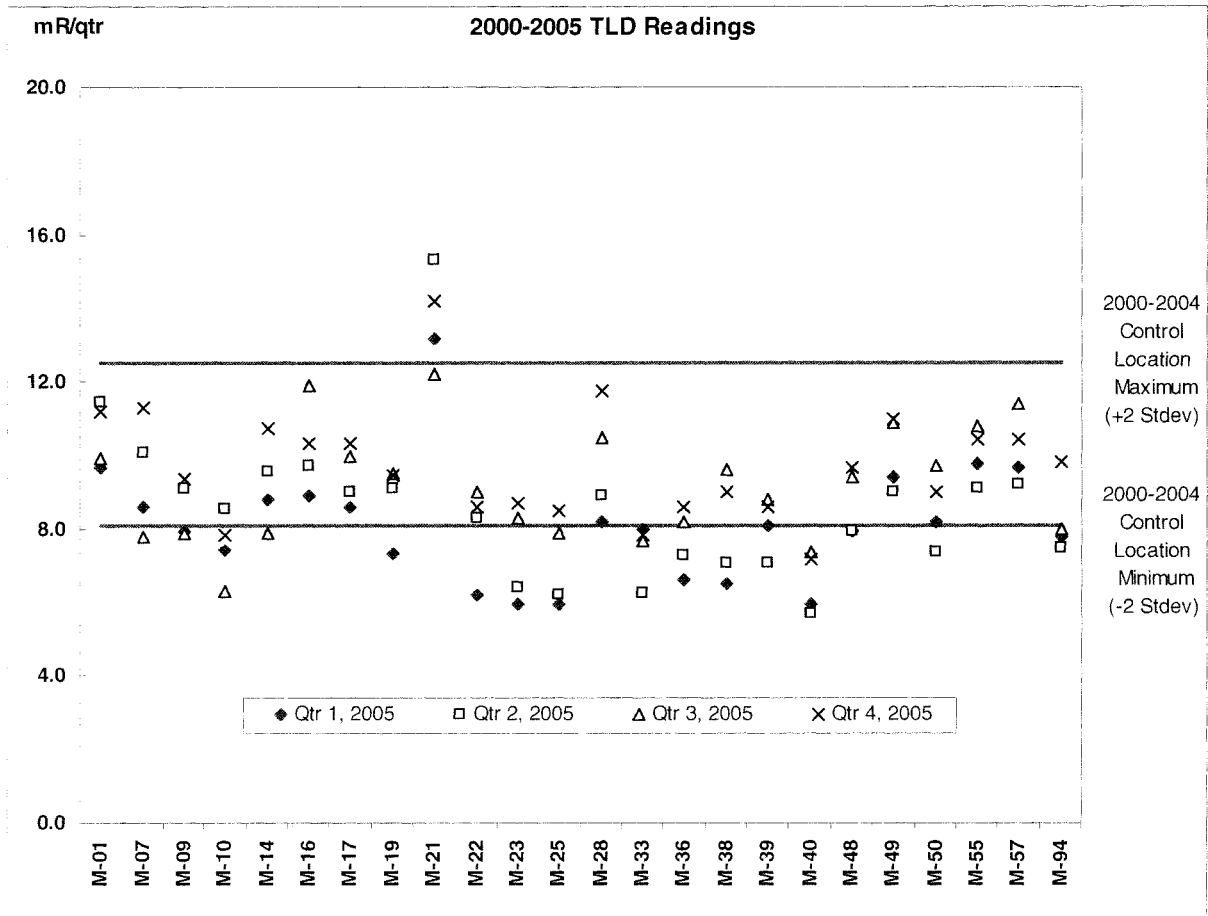
### **2.2 Thermoluminescent Dosimetry Sample Results**

GGNS calculates dose by subtracting shield readings from control and indicator location readings and reports measured dose as net exposure normalized to 92 days. GGNS relies on comparison of the indicator locations to the control location as a measure of plant impact. Gamma radiation dose in the reporting period is compared to control location readings for previous years as shown in Figure 2-1.

GGNS' comparison of the indicator results to the control and to previous indicator results, as seen in Figure 2-1 and Table 3.1, indicates that plant operations had no significant impact on ambient radiation levels during the reporting period.

With the exception of TLD location M-21 (Sector J, 0.4 miles), levels continue to remain at or near background. The dose rate at location M-21 is caused by increased Nitrogen-16 levels associated with hydrogen injection to the feed water system. Hydrogen injection provides protection against Intergranular Stress Corrosion of plant components. Location M-21 dose rate of 4.4 millirem per quarter greater than the Control location M-14 (sector B, 18.0 miles) remains well below the limitations of 10 CFR 20.1301(a)(1) and 10CFR 20.1302(b)(2)(ii).

Figure 2-1



### **2.3 Water Sample Results**

Analytical results for surface water and groundwater samples were similar to those reported in previous years.

**Surface water** samples were collected from two indicator and one control location and analyzed for gamma emitting radionuclides and tritium. Plant related gamma emitting radionuclides and tritium remained undetectable in the upstream and downstream Mississippi River locations, which is consistent with preoperational and previous operational years. In addition, gamma emitting radionuclides and tritium were undetectable in the downstream sample collected during a liquid radwaste discharge.

**Groundwater** samples were collected from two locations (indicator and control) and analyzed for gamma emitting radionuclides and tritium. GGNS did not detect any plant related gamma emitting radionuclides or tritium in groundwater samples during the reporting period.

Based on review of results and previous historical data, GGNS concluded that plant operations had no significant impact on this pathway during the reporting period.

### **2.4 Sediment Sample Results**

Sediment samples were collected from two ODCM Specification locations (indicator and control) and analyzed for gamma emitting radionuclides. In this reporting period, plant related gamma emitting radionuclides were below detectable concentrations in the upstream (control) and downstream (indicator) location.

2005 REMP data is consistent with the previous monitoring periods. Therefore, GGNS concluded that plant operations had no significant impact on this pathway during the reporting period.

## **2.5 Milk Sample Results**

GGNS personnel did not collect milk samples within five miles of the site in the reporting period due to the absence of commercial milk production. Since there are no dairies within five miles of GGNS, it is concluded GGNS' operation had no impact on this pathway.

## **2.6 Fish Sample Results**

Fish samples were collected from two locations (indicator and control) and analyzed for gamma emitting radionuclides. GGNS did not detect any plant related gamma emitting radionuclides in fish samples during the reporting period, as has been the case in preoperational and previous operational years. These results indicate that this pathway has not been affected by plant operations.

## **2.7 Food Product Sample Results**

Food product samples, primarily broad leaf vegetation, were collected from control and indicator locations when available and analyzed for gamma emitting radionuclides. GGNS did not detect any plant related gamma emitting radionuclides in vegetation samples during the reporting period. Nuclides detected previously at the control and indicator locations are attributed to the Chernobyl release and atmospheric weapons testing. These results indicate that this pathway has not been affected by plant operations.

Five special samples of vegetation were collected at an offsite location to supplement the REMP. GGNS did not detect any plant related gamma emitting radionuclides in vegetation samples during the reporting period.

One special sample of venison was collected on the GGNS property to supplement the REMP. GGNS did not detect any plant related gamma emitting radionuclides in the venison sample during the reporting period.

## **2.8 Land Use Census Results**

The latest Land Use Census was performed April 10-12, 2006. Methods utilized include: visual surveys, door to door surveys, telephone interviews, GPS, Aerial Photography, and consultation with the local county agent concerning dairy production in Claiborne County.

During the survey the following questions were asked:

- 1). Name of occupant
- 2). Address
- 3). Number of people residing at residence
- 4). Age group of occupants
- 5). Any farm animal raised for human consumption
- 6). Any dairy production
- 7). Maintain a garden

Changes from the previous Land Use Census were evaluated in accordance with GGNS Surveillance 06-EN-S000-0-0002. The differences were compared to the locations and assumptions used in calculations for compliance with the Offsite Dose Calculation Manual (ODCM), LCO 6.11.6. It was determined that the locations and assumptions currently used in ODCM, revision 32, are more conservative than any of the changes.

<p style="text-align: center;"><b>Table 2-1</b> <b>Land Use Census Results</b></p>					
<b>Parameter</b>		<b>Sector A *</b>	<b>Sector B</b>	<b>Sector C</b>	<b>Sector D</b>
<b>I. Nearest Occupied Residence</b>	a. Distance (mile)	0.98	0.83	0.67	2.57
	b. Number of Occupants	2	2	2	6
	c. Degrees from true north	354.0	15.1	42.1	60.5
<b>II. Nearest Unoccupied Residence (closer than occupied residence)</b>	a. Distance (mile)	0.94	None	None	None
<b>III. Nearest Milk Animal</b>	a. Distance	None	None	None	None
<b>IV. Nearest Broadleaf Garden</b>	a. Distance (mile)	1.78	1.52	0.67	2.86
	b. Garden size (ft <sup>2</sup> )	≈ 1200	≈ 4050	≈ 1250	≈ 500
	c. Degrees from true north	352.2	21.9	42.1	59.7
<b>V. Census Comparison</b>	a. Is nearest occupied residence in same location as last census?	Yes	Yes	Yes	Yes
	b. Is nearest milk animal in same location as last census?	N/A	N/A	N/A	N/A
	c. Is nearest broadleaf garden in same location as last census?	No	Yes	Yes	Yes

\* Change from last census, see attached table of Land Use Census Changes

<p style="text-align: center;"><b>Table 2-1</b> <b>Land Use Census Results</b></p>					
<b>Parameter</b>		<b>Sector E *</b>	<b>Sector F *</b>	<b>Sector G</b>	<b>Sector H</b>
<b>I. Nearest Occupied Residence</b>	a. Distance (mile)	0.89	2.25	2.10	1.11
	b. Number of Occupants	3	**	3	6
	c. Degrees from true north	86.9	101.5	129.7	152.5
<b>II. Nearest Unoccupied Residence (closer than occupied residence)</b>	a. Distance (mile)	0.83	None	1.93	1.08
<b>III. Nearest Milk Animal</b>	a. Distance	None	None	None	None
<b>IV. Nearest Broadleaf Garden</b>	a. Distance (mile)	0.89	4.05	3.81	1.11
	b. Garden size (ft <sup>2</sup> )	≈1000	≈50	≈1600	≈ 500
	c. Degrees from true north	86.9	114.3	129.1	152.5
<b>V. Census Comparison</b>	a. Is nearest occupied residence in same location as last census?	No	Yes	Yes	Yes
	b. Is nearest milk animal in same location as last census?	N/A	N/A	N/A	N/A
	c. Is nearest broadleaf garden in same location as last census?	Yes	No	Yes	Yes

\* Change from last census, see attached table of Land Use Census Changes

\*\* Could not be determined

<p style="text-align: center;"><b>Table 2-1</b> <b>Land Use Census Results</b></p>					
<b>Parameter</b>		<b>Sector J</b>	<b>Sector K *</b>	<b>Sector L*</b>	<b>Sector M</b>
<b>I. Nearest Occupied Residence</b>	a. Distance (mile)	3.16	2.23	0.89	None
	b. Number of Occupants	2	1	2	
	c. Degrees from true north	174.3	196.9	219.7	
<b>II. Nearest Unoccupied Residence (closer than occupied residence)</b>	a. Distance (mile)	None	None	None	None
<b>III. Nearest Milk Animal</b>	a. Distance	None	None	None	None
<b>IV. Nearest Broadleaf Garden</b>	a. Distance (mile)	3.16	2.23	0.89	None
	b. Garden size (ft <sup>2</sup> )	≈ 500	≈ 2500	≈ 300	
	c. Degrees from true north	174.3	196.9	219.7	
<b>V. Census Comparison</b>	a. Is nearest occupied residence in same location as last census?	Yes	Yes	Yes	N/A
	b. Is nearest milk animal in same location as last census?	N/A	N/A	N/A	N/A
	c. Is nearest broadleaf garden in same location as last census?	Yes	Yes	Yes	N/A

\* Change from last census, see attached table of Land Use Census Changes



**Table 2-1**  
**Land Use Census Results**

<b>Parameter</b>		<b>Sector N</b>	<b>Sector P</b>	<b>Sector Q</b>	<b>Sector R</b>
<b>I. Nearest Occupied Residence</b>	a. Distance (mile)	None	None	None	1.11
	b. Number of Occupants				2
	c. Degrees from true north				346.1
<b>II. Nearest Unoccupied Residence (closer than occupied residence)</b>	a. Distance (mile)	1.61	4.83	3.5	None
<b>III. Nearest Milk Animal</b>	a. Distance	None	None	None	None
<b>IV. Nearest Broadleaf Garden</b>	a. Distance (mile)	None	None	None	1.46
	b. Garden size (ft <sup>2</sup> )				≈ 4000
	c. Degrees from true north				342.9
<b>V. Census Comparison</b>	a. Is nearest occupied residence in same location as last census?	N/A	N/A	N/A	Yes
	b. Is nearest milk animal in same location as last census?	N/A	N/A	N/A	N/A
	c. Is nearest broadleaf garden in same location as last census?	N/A	N/A	N/A	Yes

\* Change from last census, see attached table of Land Use Census Changes

### Land Use Census Changes

SECTOR	PARAMETER	Reason for Change
A	Nearest Occupied Residence	Name Change
A	Nearest Garden	New nearest garden
E	Nearest Occupied Residence	Moved out from 0.83 miles to 0.89 miles
E	Unoccupied Residence	House unoccupied
E	Garden Size	More accurate size, now two $\approx 500 \text{ ft}^2$ gardens
F	Nearest Garden	New nearest garden
K	Garden Size	More accurate size
L	Garden Size	More accurate size

## **2.9 Interlaboratory Comparison Results**

River Bend Station (RBS) Environmental Laboratory analyzed interlaboratory comparison samples to fulfill the requirements of the ODCM Specifications 6.12.1. Attachment 1, Radiological Environmental Monitoring Report, contains these results in Table 9.1. GGNS' review of RBS' interlaboratory comparison indicated that 97.5% [40 of 41] of results were within control limits for accuracy, 100% [41 of 41] of results were within control limits for precision

### **3.0 Radiological Environmental Monitoring Program Summary**

#### **3.1 Program Results Summary**

Table 3.1 summarizes the REMP results. GGNS personnel did not use values reported as less than the lower limit of detection (<LLD) when determining ranges and means for indicator and control locations.

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: Grand Gulf Nuclear Station Docket No: 50-416Location of Facility: Claiborne County, MississippiReporting Period: January - December 2005

Sample Type ( Units )	Type & Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean ( F ) <sup>c</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>c</sup> [ Range ]	Number of Nonroutine Results <sup>e</sup>
				Location <sup>d</sup>	Mean ( F ) <sup>c</sup> [ Range ]		
Air Particulates ( pCi/m <sup>3</sup> )	GB 156	0.01	0.025 ( 104 / 104 ) [ 0.010 - 0.054 ]	AS-1 PG (Sector G, 5.5 mi )	0.026 ( 52 / 52 ) [ 0.010 - 0.054 ]	0.025 ( 52 / 52 ) [ 0.011 - 0.066 ]	0
	GS 12						
	Cs-134	0.05	<LLD	N/A	N/A	<LLD	0
	Cs-137	0.06	<LLD	N/A	N/A	<LLD	0
Airborne Iodine ( pCi/m <sup>3</sup> )	I-131 156	0.07	<LLD	N/A	N/A	<LLD	0
Inner Ring TLDs ( mR/Qtr )	Gamma 36	(f)	9.2 ( 36 / 36 ) [ 5.9 – 15.3 ]	M-21 ( Sector J, 0.4 mi. )	13.7 ( 4 / 4 ) [ 12.2 – 15.3 ]	N/A	0
Outer Ring TLDs ( mR/Qtr )	Gamma 28	(f)	8.8 ( 28 / 28 ) [ 5.7 – 11.4 ]	M-57 (Sector F, 4.5 mi.)	10.2 ( 4 / 4 ) [ 9.2 – 11.4 ]	N/A	0
Special Interest TLDs ( mR/Qtr )	Gamma 28	(f)	8.5 ( 28 / 28 ) [ 6.3 – 11.5 ]	M-01 ( Sector E, 3.5 mi. )	10.6 ( 4 / 4 ) [ 9.7 – 11.5 ]	N/A	0
Control TLDs ( mR/Qtr )	Gamma 4	(f)	N/A	N/A	N/A	9.3 ( 4 / 4 ) [ 7.9 – 10.8 ]	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: Grand Gulf Nuclear Station      Docket No: 50-416Location of Facility: Claiborne County, MississippiReporting Period: January - December 2005

Sample Type ( Units )	Type & Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Location Mean ( F ) <sup>c</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>c</sup> [ Range ]	Number of Nonroutine Results <sup>e</sup>
				Location <sup>d</sup>	Mean ( F ) <sup>c</sup> [ Range ]		
Surface Water ( pCi/l )	H-3      10	3000	<LLD	N/A	N/A	<LLD	0
	GS      12						
	I-131      15	15	<LLD	N/A	N/A	<LLD	0
	Mn-54      15	15	<LLD	N/A	N/A	<LLD	0
	Fe-59      30	30	<LLD	N/A	N/A	<LLD	0
	Co-58      15	15	<LLD	N/A	N/A	<LLD	0
	Co-60      15	15	<LLD	N/A	N/A	<LLD	0
	Zn-65      30	30	<LLD	N/A	N/A	<LLD	0
	Zr-95      30	30	<LLD	N/A	N/A	<LLD	0
	Nb-95      15	15	<LLD	N/A	N/A	<LLD	0
	Cs-134      15	15	<LLD	N/A	N/A	<LLD	0
	Cs-137      18	18	<LLD	N/A	N/A	<LLD	0
	Ba-140      60	60	<LLD	N/A	N/A	<LLD	0
	La-140      15	15	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: Grand Gulf Nuclear Station      Docket No: 50-416Location of Facility: Claiborne County, Mississippi      Reporting Period: January - December 2005

Sample Type ( Units )	Type & Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Locations Mean ( F ) <sup>c</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>c</sup> [ Range ]	Number of Nonroutine Results <sup>e</sup>
				Location <sup>d</sup>	Mean ( F ) <sup>c</sup> [ Range ]		
Groundwater ( pCi/l )	H-3      4	2000	<LLD	N/A	N/A	<LLD	0
	I-131    2	1	<LLD	N/A	N/A	<LLD	0
	GS      4						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0
Sediment ( pCi/kg )	GS      4						
	Cs-134	150	<LLD	N/A	N/A	<LLD	0
	Cs-137	180	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: Grand Gulf Nuclear Station Docket No: 50-416Location of Facility: Claiborne County, MississippiReporting Period: January - December 2005

Sample Type ( Units )	Type & Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Location Mean ( F ) <sup>c</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>c</sup> [ Range ]	Number of Nonroutine Results <sup>e</sup>
				Location <sup>d</sup>	Mean ( F ) <sup>c</sup> [ Range ]		
Fish ( pCi/kg )	GS 4						
	Mn-54	130	<LLD	N/A	N/A	<LLD	0
	Fe-59	260	<LLD	N/A	N/A	<LLD	0
	Co-58	130	<LLD	N/A	N/A	<LLD	0
	Co-60	130	<LLD	N/A	N/A	<LLD	0
	Zn-65	260	<LLD	N/A	N/A	<LLD	0
	Cs-134	130	<LLD	N/A	N/A	<LLD	0
	Cs-137	150	<LLD	N/A	N/A	<LLD	0
Food Products ( pCi/kg )	I-131 10	60	<LLD	N/A	N/A	<LLD	0
	GS 10						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0



TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: Grand Gulf Nuclear Station Docket No: 50-416Location of Facility: Claiborne County, MississippiReporting Period: January - December 2005

Sample Type ( Units )	Type & Number of Analyses <sup>a</sup>	LLD <sup>b</sup>	Indicator Location Mean ( F ) <sup>c</sup> [ Range ]	Location with Highest Annual Mean		Control Locations Mean ( F ) <sup>c</sup> [ Range ]	Number of Nonroutine Results <sup>e</sup>
				Location <sup>d</sup>	Mean ( F ) <sup>c</sup> [ Range ]		
Venison (Special) ( pCi/kg )	GS 1						
	Mn-54	130	<LLD	N/A	N/A	N/A	0
	Fe-59	260	<LLD	N/A	N/A	N/A	0
	Co-58	130	<LLD	N/A	N/A	N/A	0
	Co-60	130	<LLD	N/A	N/A	N/A	0
	Zn-65	260	<LLD	N/A	N/A	N/A	0
	Cs-134	130	<LLD	N/A	N/A	N/A	0
	Cs-137	150	<LLD	N/A	N/A	N/A	0
Food Products (Special) pCi/Kg	I-131 5	60	<LLD	N/A	N/A	<LLD	0
	GS 5						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0

<sup>a</sup> GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.<sup>b</sup> LLD = Required lower limit of detection based on GGNS ODCM Table 6.12.1-3.<sup>c</sup> Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis (F).<sup>d</sup> Where applicable, locations are specified by name, distance from reactor site and meteorological sector.<sup>e</sup> Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.<sup>f</sup> LLD is not defined in GGNS ODCM Table 6.12.1-3.

**Attachment 1**

**Radiological Monitoring Report**

**Summary of Monitoring Results**

## Attachment 1

TABLE 1.1	AIR PARTICULATE FILTER GROSS BETA AND CHARCOAL CARTRIDGE IODINE-131	42
TABLE 1.2	AIR PARTICULATE FILTER GAMMA	51
TABLE 2.1	THERMOLUMINESCENT DOSIMETERS	52
TABLE 2.2	THERMOLUMINESCENT DOSIMETERS	53
TABLE 2.3	THERMOLUMINESCENT DOSIMETERS	54
TABLE 3.1	SURFACE WATER GAMMA	55
TABLE 3.2	SURFACE WATER TRITIUM	56
TABLE 4.1	GROUNDWATER GAMMA	57
TABLE 4.2	GROUNDWATER TRITIUM	58
TABLE 4.3	GROUNDWATER IODINE-131	59
TABLE 5.1	SEDIMENT	60
TABLE 6.1	FISH	61
TABLE 7.1	FOOD PRODUCTS	62
TABLE 8.1	SPECIAL SAMPLES	63
TABLE 9.1	INTERLABORATORY COMPARISON	64

Table 1.1

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m<sup>3</sup>**AIR SAMPLE AS-1 PG - GGNS Nearest Community**

LLD (pCi/m <sup>3</sup> )	AS-1			0.07	0.01
LAB ID	START DATE	END DATE		I-131	GROSS BETA
20050001	12/28/2004	1/4/2005		< 0.016	0.019 +/- 0.002
20050019	1/4/2005	1/11/2005		< 0.015	0.013 +/- 0.002
20050062	1/11/2005	1/18/2005		< 0.016	0.034 +/- 0.003
20050070	1/18/2005	1/25/2005		< 0.018	0.028 +/- 0.002
20050096	1/25/2005	2/1/2005		< 0.016	0.021 +/- 0.002
20050103	2/1/2005	2/8/2005		< 0.020	0.017 +/- 0.002
20050133	2/8/2005	2/15/2005		< 0.017	0.024 +/- 0.002
20050166	2/15/2005	2/22/2005		< 0.016	0.027 +/- 0.002
20050188	2/22/2005	3/1/2005		< 0.012	0.029 +/- 0.002
20050214	3/1/2005	3/8/2005		< 0.017	0.025 +/- 0.002
20050240	3/8/2005	3/15/2005		< 0.016	0.014 +/- 0.002
20050284	3/15/2004	3/22/2005		< 0.019	0.021 +/- 0.002
20050310	3/22/2005	3/29/2005		< 0.012	0.014 +/- 0.002
20050334	3/29/2005	4/5/2005		< 0.017	0.017 +/- 0.002
20050372	4/5/2005	4/12/2005		< 0.017	0.016 +/- 0.002
20050400	4/12/2005	4/19/2005		< 0.019	0.021 +/- 0.002
20050414	4/19/2005	4/26/2005		< 0.013	0.018 +/- 0.002
20050434	4/26/2005	5/3/2005		< 0.018	0.022 +/- 0.002

LLD (pCi/m <sup>3</sup> )	AS-1			0.07	0.01
LAB ID	START DATE	END DATE		I-131	GROSS BETA
20050460	5/3/2005	5/10/2005		< 0.016	0.024 +/- 0.002
20050472	5/10/2005	5/17/2005		< 0.015	0.028 +/- 0.002
20050511	5/17/2005	5/24/2005		< 0.016	0.027 +/- 0.002
20050521	5/24/2005	5/31/2005		< 0.014	0.020 +/- 0.002
20050558	5/31/2005	6/7/2005		< 0.014	0.016 +/- 0.002
20050583	6/7/2005	6/14/2005		< 0.014	0.010 +/- 0.002
20050626	6/14/2005	6/21/2005		< 0.015	0.023 +/- 0.002
20050661	6/21/2005	6/28/2005		< 0.024	0.035 +/- 0.002
20050690	6/28/2005	7/5/2005		< 0.014	0.018 +/- 0.002
20050714	7/5/2005	7/12/2005		< 0.018	0.017 +/- 0.002
20050744	7/12/2005	7/19/2005		< 0.015	0.011 +/- 0.002
20050770	7/19/2005	7/26/2005		< 0.017	0.020 +/- 0.002
20050803	7/26/2005	8/2/2005		< 0.014	0.024 +/- 0.002
20050824	8/2/2005	8/9/2005		< 0.016	0.026 +/- 0.002
20050857	8/9/2005	8/16/2005		< 0.016	0.025 +/- 0.002
20050879	8/16/2005	8/23/2005		< 0.015	0.018 +/- 0.002
20050935	8/23/2005	8/30/2005		< 0.070	0.048 +/- 0.005
20050921	8/30/2005	9/6/2005		< 0.058	0.054 +/- 0.001
20050956	9/6/2005	9/13/2005		< 0.020	0.043 +/- 0.003
20050979	9/13/2005	9/20/2005		< 0.017	0.024 +/- 0.002

LLD (pCi/m <sup>3</sup> )	AS-1			0.07	0.01
LAB ID		START DATE	END DATE	I-131	GROSS BETA
20051006		9/20/2005	9/27/2005	< 0.017	0.028 +/- 0.003
20051067		9/27/2005	10/4/2005	< 0.019	0.026 +/- 0.002
20051118		10/4/2005	10/11/2005	< 0.018	0.019 +/- 0.002
20051158		10/11/2005	10/18/2005	< 0.018	0.049 +/- 0.003
20051194		10/18/2005	10/25/2005	< 0.018	0.041 +/- 0.003
20051219		10/25/2005	11/1/2005	< 0.016	0.028 +/- 0.002
20051261		11/1/2005	11/8/2005	< 0.018	0.029 +/- 0.003
20051267		11/8/2005	11/15/2005	< 0.016	0.028 +/- 0.002
20051294		11/15/2005	11/22/2005	< 0.029	0.033 +/- 0.003
20051298		11/22/2005	11/29/2005	< 0.018	0.031 +/- 0.003
20051343		11/29/2005	12/6/2005	< 0.018	0.037 +/- 0.003
20051347		12/6/2005	12/13/2005	< 0.015	0.043 +/- 0.003
20051385		12/13/2005	12/20/2005	< 0.028	0.031 +/- 0.003
20051409		12/20/2005	12/27/2005	< 0.014	0.038 +/- 0.003
<b>Average:</b>					0.026
<b>Maximum</b>					0.054
<b>Minimum:</b>					0.010

Table 1.1

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m<sup>3</sup>**AIR SAMPLE AS-3 61VA - GGNS - Control**

LLD (pCi/m <sup>3</sup> )			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20050002	12/28/2004	1/4/2005	< 0.016	0.019 +/- 0.002
20050020	1/4/2005	1/11/2005	< 0.016	0.013 +/- 0.002
20050063	1/11/2005	1/18/2005	< 0.015	0.032 +/- 0.002
20050071	1/18/2005	1/25/2005	< 0.015	0.029 +/- 0.002
20050097	1/25/2005	2/1/2005	< 0.014	0.021 +/- 0.002
20050104	2/1/2005	2/8/2005	< 0.017	0.018 +/- 0.002
20050134	2/8/2005	2/15/2005	< 0.017	0.026 +/- 0.002
20050167	2/15/2005	2/22/2005	< 0.016	0.025 +/- 0.002
20050189	2/22/2005	3/1/2005	< 0.016	0.031 +/- 0.002
20050215	3/1/2005	3/8/2005	< 0.020	0.024 +/- 0.002
20050241	3/8/2005	3/15/2005	< 0.015	0.016 +/- 0.002
20050285	3/15/2004	3/22/2005	< 0.016	0.017 +/- 0.002
20050311	3/22/2005	3/29/2005	< 0.017	0.017 +/- 0.002
20050335	3/29/2005	4/5/2005	< 0.016	0.016 +/- 0.002
20050373	4/5/2005	4/12/2005	< 0.017	0.013 +/- 0.002
20050401	4/12/2005	4/19/2005	< 0.018	0.020 +/- 0.002
20050415	4/19/2005	4/26/2005	< 0.015	0.020 +/- 0.002
20050435	4/26/2005	5/3/2005	< 0.017	0.023 +/- 0.002

LLD (pCi/m <sup>3</sup> )			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20050461	5/3/2005	5/10/2005	< 0.020	0.025 +/- 0.002
20050473	5/10/2005	5/17/2005	< 0.019	0.026 +/- 0.002
20050512	5/17/2005	5/24/2005	< 0.017	0.027 +/- 0.002
20050522	5/24/2005	5/31/2005	< 0.016	0.020 +/- 0.002
20050559	5/31/2005	6/7/2005	< 0.016	0.017 +/- 0.002
20050584	6/7/2005	6/14/2005	< 0.019	0.012 +/- 0.002
20050627	6/14/2005	6/21/2005	< 0.013	0.025 +/- 0.002
20050662	6/21/2005	6/28/2005	< 0.029	0.066 +/- 0.003
20050691	6/28/2005	7/5/2005	< 0.019	0.016 +/- 0.002
20050715	7/5/2005	7/12/2005	< 0.014	0.014 +/- 0.002
20050745	7/12/2005	7/19/2005	< 0.019	0.011 +/- 0.002
20050771	7/19/2005	7/26/2005	< 0.014	0.017 +/- 0.002
20050804	7/26/2005	8/2/2005	< 0.014	0.023 +/- 0.002
20050825	8/2/2005	8/9/2005	< 0.018	0.026 +/- 0.002
20050858	8/9/2005	8/16/2005	< 0.018	0.021 +/- 0.002
20050880	8/16/2005	8/23/2005	< 0.018	0.016 +/- 0.002
20050936	8/23/2005	8/30/2005	< 0.068	0.045 +/- 0.005
20050922	8/30/2005	9/6/2005	< 0.017	0.039 +/- 0.003
20050957	9/6/2005	9/13/2005	< 0.016	0.039 +/- 0.003
20050980	9/13/2005	9/20/2005	< 0.016	0.024 +/- 0.002



LLD (pCi/m <sup>3</sup> )			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20051007	9/20/2005	9/27/2005	< 0.018	0.026 +/- 0.002
20051068	9/27/2005	10/4/2005	< 0.019	0.022 +/- 0.002
20051119	10/4/2005	10/11/2005	< 0.017	0.015 +/- 0.002
20051159	10/11/2005	10/18/2005	< 0.023	0.043 +/- 0.003
20051195	10/18/2005	10/25/2005	< 0.019	0.038 +/- 0.003
20051220	10/25/2005	11/1/2005	< 0.017	0.022 +/- 0.002
20051262	11/1/2005	11/8/2005	< 0.021	0.026 +/- 0.002
20051268	11/8/2005	11/15/2005	< 0.017	0.025 +/- 0.002
20051295	11/15/2005	11/22/2005	< 0.035	0.031 +/- 0.003
20051299	11/22/2005	11/29/2005	< 0.017	0.030 +/- 0.003
20051344	11/29/2005	12/6/2005	< 0.021	0.032 +/-0.003
20051348	12/6/2005	12/13/2005	< 0.017	0.041 +/- 0.003
20051386	12/13/2005	12/20/2005	< 0.018	0.029 +/- 0.003
20051410	12/20/2005	12/27/2005	< 0.017	0.036 +/-0.003
Average:				0.025
Maximum				0.066
Minimum:				0.011

Table 1.1

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m<sup>3</sup>**AIR SAMPLE AS-7 - GGNS - Indicator**

LLD (pCi/m <sup>3</sup> )	AS-7UH			0.07	0.01
LAB ID	START DATE	END DATE		I-131	GROSS BETA
20050003	12/28/2004	1/4/2005		< 0.018	0.016 +/- 0.002
20050021	1/4/2005	1/11/2005		< 0.015	0.014 +/- 0.002
20050064	1/11/2005	1/18/2005		< 0.017	0.031 +/- 0.002
20050072	1/18/2005	1/25/2005		< 0.016	0.028 +/- 0.002
20050098	1/25/2005	2/1/2005		< 0.015	0.018 +/- 0.002
20050105	2/1/2005	2/8/2005		< 0.015	0.015 +/- 0.002
20050135	2/8/2005	2/15/2005		< 0.016	0.027 +/- 0.002
20050168	2/15/2005	2/22/2005		< 0.018	0.024 +/- 0.002
20050190	2/22/2005	3/1/2005		< 0.013	0.027 +/- 0.002
20050216	3/1/2005	3/8/2005		< 0.010	0.021 +/- 0.002
20050242	3/8/2005	3/15/2005		< 0.020	0.016 +/- 0.002
20050286	3/15/2004	3/22/2005		< 0.017	0.020 +/- 0.002
20050312	3/22/2005	3/29/2005		< 0.016	0.012 +/- 0.002
20050336	3/29/2005	4/5/2005		< 0.017	0.019 +/- 0.002
20050374	4/5/2005	4/12/2005		< 0.015	0.016 +/- 0.002
20050402	4/12/2005	4/19/2005		< 0.015	0.019 +/- 0.002
20050416	4/19/2005	4/26/2005		< 0.015	0.019 +/- 0.002
20050436	4/26/2005	5/3/2005		< 0.017	0.021 +/- 0.002

LLD (pCi/m <sup>3</sup> )			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20050462	5/3/2005	5/10/2005	< 0.018	0.025 +/- 0.002
20050474	5/10/2005	5/17/2005	< 0.017	0.025 +/- 0.002
20050513	5/17/2005	5/24/2005	< 0.017	0.024 +/- 0.002
20050523	5/24/2005	5/31/2005	< 0.016	0.018 +/- 0.002
20050560	5/31/2005	6/7/2005	< 0.018	0.013 +/- 0.002
20050585	6/7/2005	6/14/2005	< 0.015	0.012 +/- 0.002
20050628	6/14/2005	6/21/2005	< 0.015	0.022 +/- 0.002
20050663	6/21/2005	6/28/2005	< 0.021	0.035 +/- 0.002
20050692	6/28/2005	7/5/2005	< 0.015	0.020 +/- 0.002
20050716	7/5/2005	7/12/2005	< 0.016	0.016 +/- 0.002
20050746	7/12/2005	7/19/2005	< 0.019	0.011 +/- 0.002
20050772	7/19/2005	7/26/2005	< 0.017	0.017 +/- 0.002
20050805	7/26/2005	8/2/2005	< 0.014	0.021 +/- 0.002
20050826	8/2/2005	8/9/2005	< 0.014	0.027 +/- 0.002
20050859	8/9/2005	8/16/2005	< 0.015	0.024 +/- 0.002
20050881	8/16/2005	8/23/2005	< 0.013	0.017 +/- 0.002
20050937	8/23/2005	8/30/2005	< 0.064	0.044 +/- 0.005
20050923	8/30/2005	9/6/2005	< 0.023	0.042 +/- 0.004
20050958	9/6/2005	9/13/2005	< 0.020	0.039 +/- 0.003
20050981	9/13/2005	9/20/2005	< 0.020	0.023 +/- 0.002

LLD (pCi/m <sup>3</sup> )			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20051008	9/20/2005	9/27/2005	< 0.014	0.030 +/- 0.003
20051069	9/27/2005	10/4/2005	< 0.015	0.025 +/- 0.002
20051120	10/4/2005	10/11/2005	< 0.015	0.016 +/- 0.002
20051160	10/11/2005	10/18/2005	< 0.019	0.048 +/- 0.003
20051196	10/18/2005	10/25/2005	< 0.017	0.035 +/- 0.003
20051221	10/25/2005	11/1/2005	< 0.016	0.024 +/- 0.002
20051263	11/1/2005	11/8/2005	< 0.018	0.026 +/- 0.002
20051269	11/8/2005	11/15/2005	< 0.013	0.024 +/- 0.002
20051296	11/15/2005	11/22/2005	< 0.029	0.030 +/- 0.002
20051300	11/22/2005	11/29/2005	< 0.016	0.032 +/- 0.003
20051345	11/29/2005	12/6/2005	< 0.020	0.033 +/- 0.003
20051349	12/6/2005	12/13/2005	< 0.018	0.045 +/- 0.003
20051387	12/13/2005	12/20/2005	< 0.027	0.031 +/- 0.003
20051411	12/20/2005	12/27/2005	< 0.013	0.037 +/- 0.003
<b>Average:</b>				0.024
<b>Maximum</b>				0.048
<b>Minimum:</b>				0.011

Table 1.2

Sample Type: Air Particulate Filter

Analysis: Gamma Isotopic

Units: pCi/m<sup>3</sup>**AIR PARTICULATE FILTER QUARTERLY COMPOSITES (GAMMA) - GGNS**

LLD (pCi/m <sup>3</sup> )			0.05	0.06
LAB ID	LOCATION	DATE	CS-134	CS-137
20050344	AS-1 PG	2/11/2005	< 0.005	< 0.004
20050345	AS-3 61VA	2/11/2005	< 0.004	< 0.002
20050346	AS-7 UH	2/11/2005	< 0.004	< 0.003
20050694	AS-1 PG	5/13/2005	< 0.003	< 0.002
20050695	AS-3 61VA	5/13/2005	< 0.004	< 0.004
20050696	AS-7 UH	5/13/2005	< 0.004	< 0.003
20051131	AS-1 PG	8/12/2005	< 0.005	< 0.004
20051132	AS-3 61VA	8/12/2005	< 0.004	< 0.005
20051133	AS-7 UH	8/12/2005	< 0.004	< 0.005
20051434	AS-1 PG	11/11/2005	< 0.004	< 0.004
20051435	AS-3 61VA	11/11/2005	< 0.004	< 0.004
20051436	AS-7 UH	11/11/2005	< 0.004	< 0.003

Table 2.1

Sample Type: **Thermoluminescent Dosimeters**

Analysis: Gamma Dose

Units: mrem/Qtr

<b>Inner Ring - Within General Area of Site Boundary (ODCM Specifications)</b>					
<b>Station</b>	<b>1st Qtr</b>	<b>2nd Qtr</b>	<b>3rd Qtr</b>	<b>4th Qtr</b>	<b>Annual Mean</b>
M-16	8.9	9.7	11.9	10.3	10.2
M-17	8.6	9.0	10.0	10.3	9.5
M-19	7.3	9.1	9.5	9.5	8.9
M-21 *	13.2	15.3	12.2	14.2	13.7
M-22	6.2	8.3	9.0	8.6	8.0
M-23	5.9	6.4	8.3	8.7	7.3
M-25	5.9	6.2	7.9	8.5	7.1
M-28	8.2	8.9	10.5	11.7	9.8
M-94	7.8	7.5	8.0	9.8	8.3

<b>Outer Ring – Approximately Three (3) to Five (5) Miles from the Site (ODCM Specifications)</b>					
<b>Station</b>	<b>1st Qtr</b>	<b>2nd Qtr</b>	<b>3rd Qtr</b>	<b>4th Qtr</b>	<b>Annual Mean</b>
M-36	6.6	7.3	8.2	8.6	7.7
M-40	5.9	5.7	7.4	7.2	6.6
M-48	7.9	7.9	9.4	9.7	8.7
M-49	9.4	9.0	10.9	11.0	10.1
M-50	8.2	7.4	9.7	9.0	8.6
M-55	9.8	9.1	10.8	10.4	10.0
M-57*	9.7	9.2	11.4	10.4	10.2

\* Location with highest annual mean.

Table 2.2

Sample Type: **Thermoluminescent Dosimeters**

Analysis: Gamma Dose

Units: mrem/Qtr

<b>Special Interest Areas – Population Centers &amp; Schools (ODCM Specifications)</b>					
<b>Station</b>	<b>1st Qtr</b>	<b>2nd Qtr</b>	<b>3rd Qtr</b>	<b>4th Qtr</b>	<b>Annual Mean</b>
<b>M-01*</b>	<b>9.7</b>	<b>11.5</b>	<b>9.9</b>	<b>11.2</b>	<b>10.6</b>
M-07	8.6	10.1	7.8	11.3	9.4
M-09	7.9	9.1	7.9	9.4	8.6
M-10	7.4	8.6	6.3	7.8	7.5
M-33	8.0	6.3	7.7	7.8	7.5
M-38	6.5	7.1	9.6	9.0	8.1
M-39	8.1	7.1	8.8	8.6	8.1

\* Location with highest annual mean.

Table 2.3

Sample Type: **Thermoluminescent Dosimeters**

Analysis: Gamma Dose

Units: mrem/Qtr

Special Interest Areas – Control (ODCM Specifications)					
Station	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual Mean
M-14	8.8	9.6	7.9	10.8	9.3



Table 3.1  
Sample Type: **Surface Water**  
Analysis: Gamma Isotopic  
Units: pCi/l

**SURFACE WATER SAMPLES (GAMMA) - GGNS**

LLD (pCi/l)			15	15	30	15	30	15	30	15	15	18	60	15
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
20050023	MR DOWN	1/11/2005	< 10.75	< 8.98	< 13.34	< 10.31	< 19.53	< 11.43	< 17.45	< 12.06	< 9.79	< 11.69	< 28.12	< 11.35
20050025	MRUP	1/11/2005	< 9.95	< 13.60	< 17.90	< 5.82	< 26.62	< 11.51	< 19.71	< 9.85	< 13.04	< 13.81	< 42.11	< 14.74
20050027	MR DOWN GG	1/11/2005	< 9.98	< 8.08	< 23.30	< 8.86	< 23.10	< 11.35	< 10.08	< 12.81	< 11.52	< 11.13	< 34.25	< 3.65
20050028	MRUP GG	1/11/2005	< 12.56	< 12.44	< 22.09	< 12.36	< 28.77	< 12.78	< 15.63	< 12.44	< 12.53	< 12.82	< 46.85	< 12.87
20050330	MR DOWN	4/5/2005	< 9.50	< 10.61	< 13.84	< 9.58	< 19.52	< 8.56	< 12.44	< 9.69	< 8.85	< 9.07	< 28.94	< 10.38
20050332	MRUP	4/5/2005	< 9.95	< 5.10	< 12.79	< 10.36	< 21.88	< 11.43	< 14.36	< 8.78	< 8.90	< 8.46	< 28.98	< 10.82
20050718	MR DOWN	7/12/2005	< 7.32	< 10.70	< 14.26	< 9.52	< 20.13	< 9.03	< 13.93	< 7.36	< 9.82	< 7.82	< 26.60	< 10.13
20050720	MRUP	7/12/2005	< 11.66	< 9.07	< 19.92	< 9.09	< 17.20	< 11.44	< 15.95	< 10.82	< 10.35	< 15.31	< 22.85	< 12.95
20051122	MR DOWN	10/11/2005	< 11.02	< 13.80	< 19.41	< 5.02	< 27.57	< 14.30	< 17.04	< 12.71	< 6.39	< 9.51	< 37.52	< 7.53
20051124	MRUP	10/11/2005	< 8.57	< 10.40	< 20.46	< 7.36	< 19.35	< 8.73	< 15.15	< 13.29	< 11.15	< 9.49	< 34.29	< 6.81
20051166	MR DOWN*	10/19/2005	< 6.82	< 6.32	< 14.28	< 6.77	< 16.09	< 4.84	< 14.90	< 12.64	< 8.57	< 9.07	< 36.60	< 14.78
20051168	MR DOWN GG*	10/19/2005	< 10.16	< 7.22	< 20.89	< 8.45	< 10.43	< 5.80	< 15.12	< 9.86	< 8.39	< 5.50	< 34.29	< 12.96

\* Annual Sample collected during liquid discharge

“GG” – indicates duplicate sample.

Table 3.2

Sample Type: Surface Water

Analysis: Tritium

Units: pCi/l

**SURFACE WATER SAMPLES (TRITIUM) - GGNS**

LLD (pCi/l)			3000
LAB ID	LOCATION	DATE	TRITIUM
20050024	MR DOWN	1/11/2005	< 573
20050026	MRUP	1/11/2005	< 572
20050331	MR DOWN	4/5/2005	< 563
20050333	MRUP	4/5/2005	< 573
20050719	MR DOWN	7/12/2005	< 583
20050721	MRUP	7/12/2005	< 578
20051123	MR DOWN	10/11/2005	< 573
20051125	MRUP	10/11/2005	< 575
20051167*	MR DOWN	10/19/2005	< 587
20051169*	MR DOWN GG	10/19/2005	< 588

\* Annual Sample collected during liquid discharge

“GG” – indicates duplicate sample.

Table 4.1

Sample Type: **Groundwater**

Analysis: Gamma Isotopic

Units: pCi/l

**GROUND WATER SAMPLES (GAMMA) - GGNS**

LLD (pCi/l)			15	15	30	15	30	15	30	15	18	60	15
LAB ID	LOCATION	DAT	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	CS-134	CS-137	BA-140	LA-140
20051176	PGWELL	10/24/2005	< 10.18	< 14.07	< 13.31	< 9.60	< 22.28	< 12.84	< 19.42	< 10.99	< 12.09	< 43.14	< 7.51
20051179	CONSTWELL	10/24/2005	< 6.92	< 8.98	< 28.06	< 8.82	< 17.07	< 12.27	< 9.63	< 9.97	< 12.16	< 39.60	< 9.95
20051182	CONSTWELLGG	10/24/2005	< 10.96	< 10.03	< 21.18	< 13.60	< 11.93	< 11.02	< 17.30	< 13.52	< 10.82	< 44.24	< 10.51
20051183	PGWELL GG	10/24/2005	< 11.21	< 10.36	< 25.27	< 7.95	< 15.07	< 10.66	< 15.82	< 14.48	< 11.02	< 40.89	< 14.72

“GG” – indicates duplicate sample.

Table 4.2

Sample Type: **Groundwater**

Analysis: Tritium

Units: pCi/l

## **GROUND WATER SAMPLES ( TRITIUM) - GGNS**

LLD (pCi/l)			2000
LAB ID	LOCATION	DATE	TRITIUM
20051178	PGWELL	10/24/2005	< 588.47
20051181	CONSTWELL	10/24/2005	< 590.39
20051184	PGWELL	10/24/2005	< 580.33
20051185	CONSTWELL GG	10/24/2005	< 604.33

Table 4.3

Sample Type: Groundwater

Analysis: Iodine

Units: pCi/l

### **GROUND WATER SAMPLES (Iodine-131) - GGNS**

LLD(pCi/l)			1.0
LAB ID	LOCATION	DATE	I-131
20051177	PGWELL	10/24/2005	< 0.88
20051180	CONSTWELL	10/24/2005	< 0.85

Table 5.1

Sample Type: **Sediment**

Analysis: Gamma Isotopic

Units: pCi/kg

# **SEDIMENT SAMPLES (GAMMA) - GGNS**

LLD (pCi/kg)			150	180
LAB ID	LOCATION	DATE	CS-134	CS-137
20051170	SEDHAM	10/19/2005	< 29.64	< 28.12
20051171	SEDCONT	10/19/2005	< 26.42	< 26.00
20051172	SEDCONT GG	10/19/2005	< 22.44	< 22.53
20051173	SEDHAM GG	10/19/2005	< 29.37	< 29.00

“GG” – indicates duplicate sample.

Table 6.1

Sample Type: **Fish**

Analysis: Gamma Isotopic

Units: pCi/kg

**FISH SAMPLES (GAMMA) - GGNS**

LLD (pCi/kg)			130	130	260	130	260	130	150
LAB	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	CS-134	CS-137
2005075	FISHUP	7/15/2005	< 12.87	< 18.12	< 53.35	< 22.81	< 52.61	< 19.55	< 22.13
2005075	FISHUP GG	7/15/2005	< 15.77	< 18.19	< 31.42	< 19.73	< 37.14	< 16.50	< 19.13
2005075	FISHDOWN	7/15/2005	< 13.38	< 20.32	< 51.46	< 26.76	< 40.43	< 24.28	< 19.39
2005075	FISHDOWN GG	7/15/2005	< 11.14	< 17.98	< 41.32	< 14.90	< 47.63	< 13.81	< 13.14

“GG” – indicates duplicate sample.

Table 7.1

Sample Type: **Food Products**

Analysis: Iodine-131 and Gamma Isotopic

Units: pCi/kg

**VEGETATION SAMPLES (GAMMA) - GGNS**

LLD (pCi/kg)			60	60	80
LAB ID	LOCATION	DATE	I-131	CS-134	CS-137
20050037	VEG-CONT	1/12/2005	< 43.75	< 51.28	< 52.48
20050038	VEG-J	1/12/2005	< 48.07	< 50.91	< 62.99
20050039	VEG-CONT GG	1/12/2005	< 34.90	< 48.12	< 40.75
20050040	VEG-J GG	1/12/2005	< 49.21	< 56.64	< 34.19
20050358	VEG-CONT	4/5/2005	< 59.67	< 57.01	< 31.81
20050359	VEG-J	4/5/2005	< 58.89	< 47.80	< 43.23
20050748	VEG-CONT	7/19/2005	< 55.06	< 22.95	< 48.18
20050749	VEG-J	7/19/2005	< 40.98	< 49.94	< 61.63
20051186	VEG-CONT	10/21/2005	< 57.97	< 53.72	< 36.30
20051187	VEG-J	10/21/2005	< 59.09	< 34.71	< 31.11

"GG" – indicates duplicate sample.



Table 8.1

Sample Type: **Special Samples**

Analysis: Gamma Isotopic

Units: pCi/kg

**SPECIAL VENISON SAMPLES (GAMMA) - GGNS**

LLD (pCi/kg)			130	130	260	130	260	130	150
LAB	SAMPLE ID	DATE	MN-54	C0-58	FE-59	CO-60	ZN-65	CS-134	CS-137
20051248	VENISON	11/7/2005	< 17.62	< 14.32	< 33.43	< 18.27	< 45.80	< 17.10	< 16.52

**SPECIAL VEGETATION SAMPLES (GAMMA) – GGNS**

LLD (pCi/kg)			60	60	80
LAB ID	LOCATION	DATE	I-131	CS-134	CS-137
20050041	VEG-SPECIAL	1/12/2005	< 32.61	< 41.56	< 40.82
20050042	VEG-SPECIAL GG	1/12/2005	< 34.65	< 26.25	< 38.46
20050360	VEG-SPECIAL	4/5/2005	< 48.87	< 42.20	< 47.98
20050750	VEG-SPECIAL	7/19/2005	< 24.35	< 20.25	< 29.78
20051188	VEG-SPECIAL	10/21/2005	< 56.98	< 30.13	< 40.99

“GG” – indicates duplicate sample.

Table 9.1

Sample Type: **Interlaboratory Comparison**

Analysis: Gross Beta, Tritium, Iodine-131 and Gamma Isotopic

Sample Type (units)	Sample Number	Date	Analysis	Known value(a)	Measured Value	N- DEV(b)	N- RANGE(c)
<b>Charcoal Cartridge (pCi/filter)</b>	E4570-125	6/9/2005	<b>I-131</b>	91.7	96.3	0.88	0.386
<b>Water (pCi/liter)</b>	E4569-125	6/9/2005	<b>BETA</b>	214	232	1.48	0.055
	E4568-125	6/9/2005	<b>CR-51</b>	330	347	0.89	0.251
			<b>MN-54</b>	136	140	0.55	0.217
			<b>CO-58</b>	69.7	81.3	2.89	0.678
			<b>FE-59</b>	158	165.7	0.84	0.262
			<b>CO-60</b>	169	191	2.25	0.384
			<b>ZN-65</b>	93.8	100	1.08	0.378
			<b>I-131</b>	104	95.7	-1.39	0.170
			<b>CS-134</b>	206	213	0.56	0.086
			<b>CS-137</b>	101	107	1.09	0.117
			<b>CE-141</b>	214	232	1.48	0.055
	E4719-125	9/15/2005	<b>H-3</b>	4190	4337	0.61	0.152
<b>Air Filter (pCi/filter)</b>	E4717-125	9/15/2005	<b>BETA</b>	95.8	94.2	-0.29	0.253
	E4720-125	9/15/2005	<b>CR-51</b>	237	209	-2.05	0.548
			<b>MN-54</b>	64.5	65.3	0.21	0.449
			<b>CO-58</b>	44.4	43.1	-0.51	0.931
			<b>FE-59</b>	42.7	44.7	0.81	0.332
			<b>CO-60</b>	117	112	-0.79	0.454
			<b>ZN-65</b>	86.6	89.6	0.60	0.498
			<b>CS-134</b>	85.7	80.2	-1.12	0.193
			<b>CS-137</b>	137	135	-0.29	0.302
			<b>CE-141</b>	164	153	-1.16	0.576
<b>Sediment (pCi/gram)</b>	E4718-125	9/15/2005	<b>CR-51</b>	0.455	0.467	0.47	0.091
			<b>MN-54</b>	0.124	0.155	4.28(d)	0.191
			<b>CO-58</b>	0.085	0.093	1.63	0.347
			<b>FE-59</b>	0.082	0.090	1.76	1.008
			<b>CO-60</b>	0.225	0.246	1.59	0.158
			<b>ZN-65</b>	0.166	0.187	2.19	0.676
			<b>CS-134</b>	0.164	0.183	1.97	0.396
			<b>CS-137</b>	0.364	0.418	2.55	0.097
			<b>CE-141</b>	0.314	0.355	2.24	0.150

Sample Type (units)	Analytics #	Date	Analysis	Known Value <sup>a</sup>	Measured Value	N-DEV	N-RANGE
Milk (pCi/liter)	E4571-125	6/9/2005	CR-51	303	254	-2.82	1.111
			MN-54	125	126.0	0.18	0.614
			FE-59	63.9	74.7	2.92	0.647
			CO-60	145	132.0	-1.51	0.407
			ZN-65	155.0	158.0	0.37	0.495
			I-131	86.9	83.3	-0.71	0.068
			CS-134	95.0	89.0	-1.09	0.373
			CS-137	189	184	-0.49	0.281
			CE-141	92.4	95.7	0.61	0.447

**NOTES:**

- (a) The known value.
- (b) The normalized deviation from the "known" value is computed from the deviation and the standard error of the mean;  $\pm 2.00$  is warning limit and  $\pm 3.00$  is the control limit. This is a measure of accuracy of the analytical methods.
- (c) The normalized range is computed from the mean range, the control limit, and the standard error of the range;  $+2.000$  is the warning limit and  $+3.000$  is the control limit. This is a measure of precision of the analytical methods.
- (d) The results reported were out of the control limits.

**Exceptions:**

One result was outside the control limits for accuracy in the 2005 Interlaboratory Comparison program participation studies. The result was in the analysis of the nuclide Mn-54 in sediment/soil sample number E4718-125. The normalized-deviation for the analysis was +4.28 with control limits of  $\pm 3.00$ . Re-analysis of the 2005 soil sample produced results very similar to the original averaged result. This high bias result is considered conservative and is considered as having no impact on past results of the program. Mn-54 results were within control limits in other program samples for the year 2005. Coincidence summation in the efficiency curve near 834 keV can result in a lower efficiency and higher calculated activity in that region.