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

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station (GGNS) 2006 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, 2006 through December 31, 2006.

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,

CAB/MJL
attachment: 2006 Annual Radiological Environmental Operating Report
cc: (See Next Page)

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ENTERGY OPERATIONS, INC.
GRAND GULF NUCLEAR STATION

ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

January 1, 2006-December 31, 2006

4·26·07

Prepared By

4-26-07

Reviewed By

4-30-07

Approved By

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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, 2006 through December 31, 2006. 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 direct radiation, 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 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-7 UH	01/10/06	01/17/06	166.95	1.02	Power Outage
AS-1 PG	01/31/06	02/07/06	165.46	2.54	Power Outage
AS-7 UH	02/07/06	02/14/07	167.29	0.93	Power Outage
AS-7 UH	03/07/06	03/14/06	157.38	8.69	Power Outage
AS-7 UH	03/14/06	03/21/06	166.56	1.41	Power Outage
AS-7 UH	04/25/06	05/02/06	166.24	0.78	Power Outage
AS-7 UH	07/04/06	07/11/06	165.18	0.79	Power Outage
AS-7 UH	07/18/06	07/25/06	166.64	3.53	Power Outage
AS-3 61VA	07/18/06	07/25/06	150.14	20.29	Power Outage
AS-1 PG	07/25/06	08/01/06	165.83	1.52	Power Outage
AS-7 UH	08/22/06	08/29/06	166.14	2.01	Power Outage
AS-7 UH	10/03/06	10/10/06	162.91	0.81	Power Outage
AS-7 UH	11/14/06	11/21/06	158.67	2.23	Power Outage

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

AS-1 PG	99.95%
AS-3 61VA	99.77%
AS-7 UH	98.57%

- **TLDs**

TLD station M-49 (Outer Ring, Sector H, Radius 4.5 Miles) was displaced from its designated location by unknown causes during the 1st quarter of 2006. This data was excluded from reporting. Although the 1st quarter exposure at location M-49 is unknown, GGNS' review of results for similarly located TLDs indicated no abnormal readings.

TLD station M-17 (Inner Ring, Sector C, Radius 0.5 Miles) was noted as wet when collected for the 3rd quarter monitoring period. GGNS' review of results for similarly located TLDs indicated no abnormal readings. The 3rd quarter reading at location M-17 was consistent with previous and subsequent readings and the data was included in this report.

- **Missed Samples**

  One sample was missed due to a loss of a TLD. See page 9 of this report for additional information.

- **Unavailable Results**

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

Program Modifications

No program modifications occurred during the reporting period.

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. Data for the most recent land use census is included. 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^2 (500 ft^2) 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	**Radioiodine and Particulates** 1 sample close to the SITE BOUNDARY having the highest calculated annual average groundlevel D/Q.	**AS-7 UH (Sector H, Radius 0.5 Miles)** – 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 Cannister – I-131; 7 days Particulate Sampler – Gross beta radioactivity following filter change, composite (by location) for gamma isotopic; 92 days
	Radioiodine and Particulates 1 sample from the vicinity of a community having the highest calculated annual average groundlevel D/Q.	**AS-1 PG (Sector G, Radius 5.5 Miles)** – Southeast of GGNS at the Port Gibson City Barn.		
	Radioiodine and Particulates 1 sample from a control location 15 - 30 km (10 - 20 miles) distance.	**AS-3 61VA (Sector B, Radius 18 Miles) –** North-northeast of GGNS on Hwy 61, North of the Vicksburg Airport.		
Direct Radiation	**TLDs** An inner ring of stations in the general areas of the SITE BOUNDARY.	**M-16 (Sector A, Radius 0.9 Miles) –** Meteorological Tower. **M-17 (Sector C, Radius 0.5 Miles)** – South Side, Grand Gulf Road. **M-19 (Sector E, Radius 0.5 Miles)** – 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	**TLDs** An inner ring of stations in the general areas of the SITE BOUNDARY.	**M-21 (Sector J, Radius 0.4 Miles)** – Near Former Training Center Building on Bald Hill Road. **M-22 (Sector G, Radius 0.5 Miles)** – Former RR Entrance Crossing On Bald Hill Road. **M-23 (Sector Q, Radius 0.5 Miles)** – Gin Lake Road 50 Yards North of Heavy Haul Road on Power Pole. **M-25 (Sector N, Radius 1.6 Miles)** – Radial Well Number 1. **M-28 (Sector L, Radius 0.9 Miles)** – Former Glodjo Residence. **M-94 (Sector R, Radius 0.8 Miles)** – Sector R Near Meteorological Tower.	92 days	Gamma dose; 92 days
	TLDs An outer ring approximately 3 to 5 miles from the site.	**M-36 (Sector P, Radius 5.0 Miles)** – Curve on HW 608, Point Nearest GGNS at Power Pole. **M-40 (Sector M, Radius 2.3 Miles)** – Headly Drive, Near River Port Entrance.		

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

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	**TLDs** 8 stations in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control stations	**M-14 (Sector B, Radius 18.0 Miles)** – AS-3-61VA, Hwy 61, North of Vicksburg Airport. (Control) **M-33 (Sector P, Radius 12.5 Miles)** – Newellton, Louisiana Water Tower. (Special Interest) **M-38 (Sector M, Radius 9.5 Miles)** – Lake Bruin State Park, Entrance Road. (Special Interest) **M-39 (Sector M, Radius 13.0 Miles)** – St. Joseph, Louisiana, Auxiliary Water Tank. (Special Interest)	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
Waterborne	**Surface Water** 1 sample upstream.	**MRUP (Sector R, Radius 1.8 Miles)** - 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.	**MRDOWN (Sector N, Radius 1.6 Miles)** - 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.	**MRDOWN (Sector P, Radius 1.3 Miles)** – 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	**Groundwater** Samples from 2 sources.	**PGWELL (Sector G, Radius 5.0 Miles)** - Port Gibson Wells – Take from distribution system or one of the five wells. **CONSTWELL (Sector Q, Radius 0.4 Miles)** – GGNS Construction Water Well – Taken from distribution system or the well.	366 days	Gamma isotopic and tritium analyses; 366 days
	Sediment From Shoreline 1 sample from downstream area. 1 sample from upstream area.	**SEDHAM (Sector N, Radius 1.6 Miles)** – Downstream of the GGNS discharge point in the Mississippi River near Hamilton Lake outlet. **SEDCONT (Minimum of 100 yds)** – Upstream of the GGNS discharge point in the Mississippi River.	366 days	Gamma isotopic; 366 days
Ingestion	**Milk** 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. **ALCONT (Sector K, Radius 10.5 Miles)** - 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	**Fish** 1 sample in vicinity of GGNS discharge point.	**FISHDOWN** – Downstream of the GGNS discharge point into the Mississippi River	366 days	Gamma isotopic on edible portion; 366 days
	1 sample uninfluenced by GGNS discharge.	**FISHUP** – Upstream of the GGNS discharge point in the Mississippi River uninfluenced by plant operations.		
	Food Products 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.	**VEG-J (Sector J, Radius 0.4 Miles)** – South of GGNS near former Training Center on Bald Hill Road.	92 days when available	Gamma isotopic and I-131; 92 days
	1 sample of similar vegetation grown 15 – 30 km distant if milk sampling is not performed.	**VEG-CONT (Sector K, Radius 10.5 Miles)** – Alcorn State University south-southwest of GGNS when available, otherwise a location 15-30 km distant.		

FIGURE 1-1

Exposure Pathways

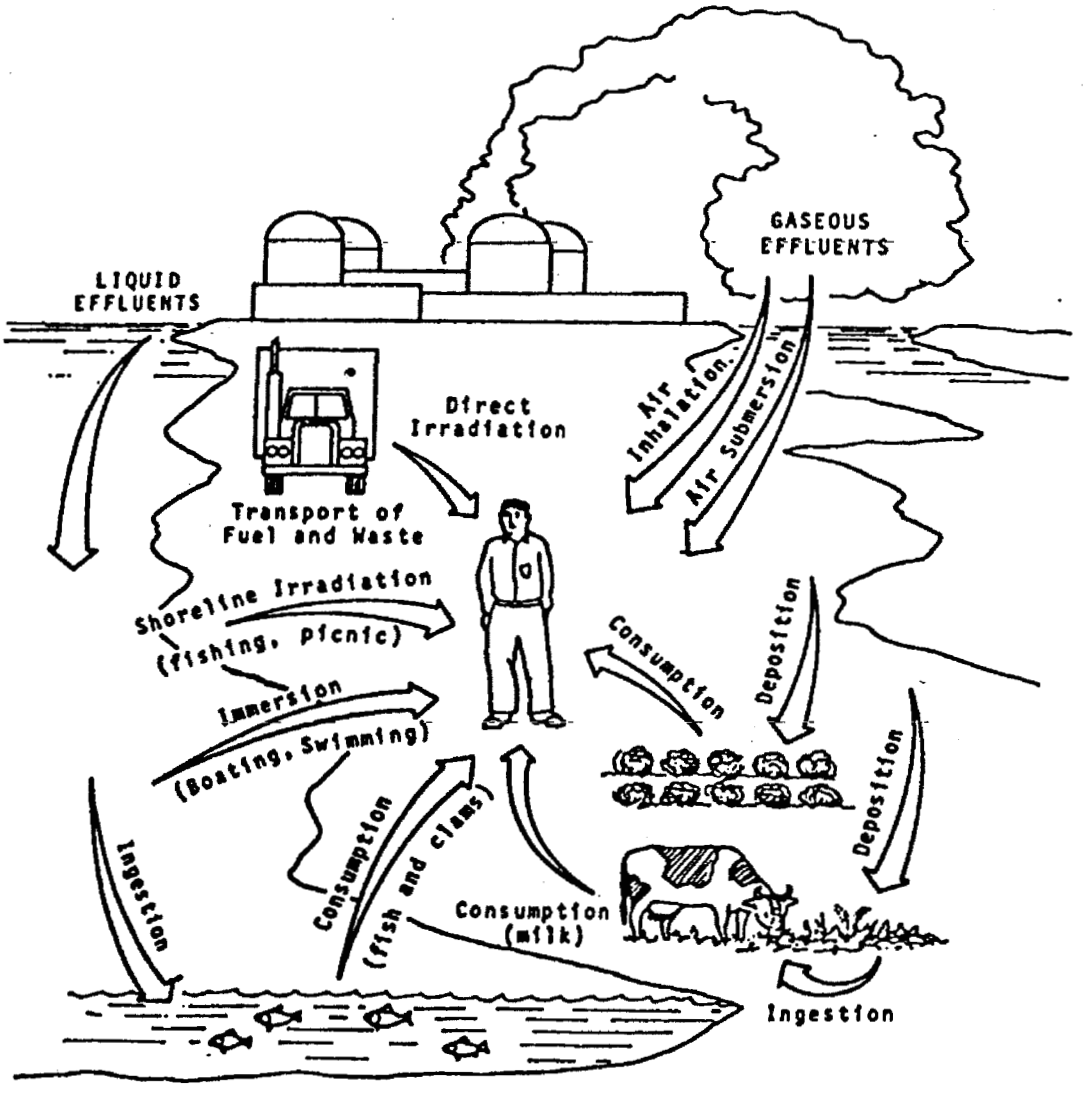


FIGURE 1-2

SAMPLE COLLECTION SITES – NEAR FIELD

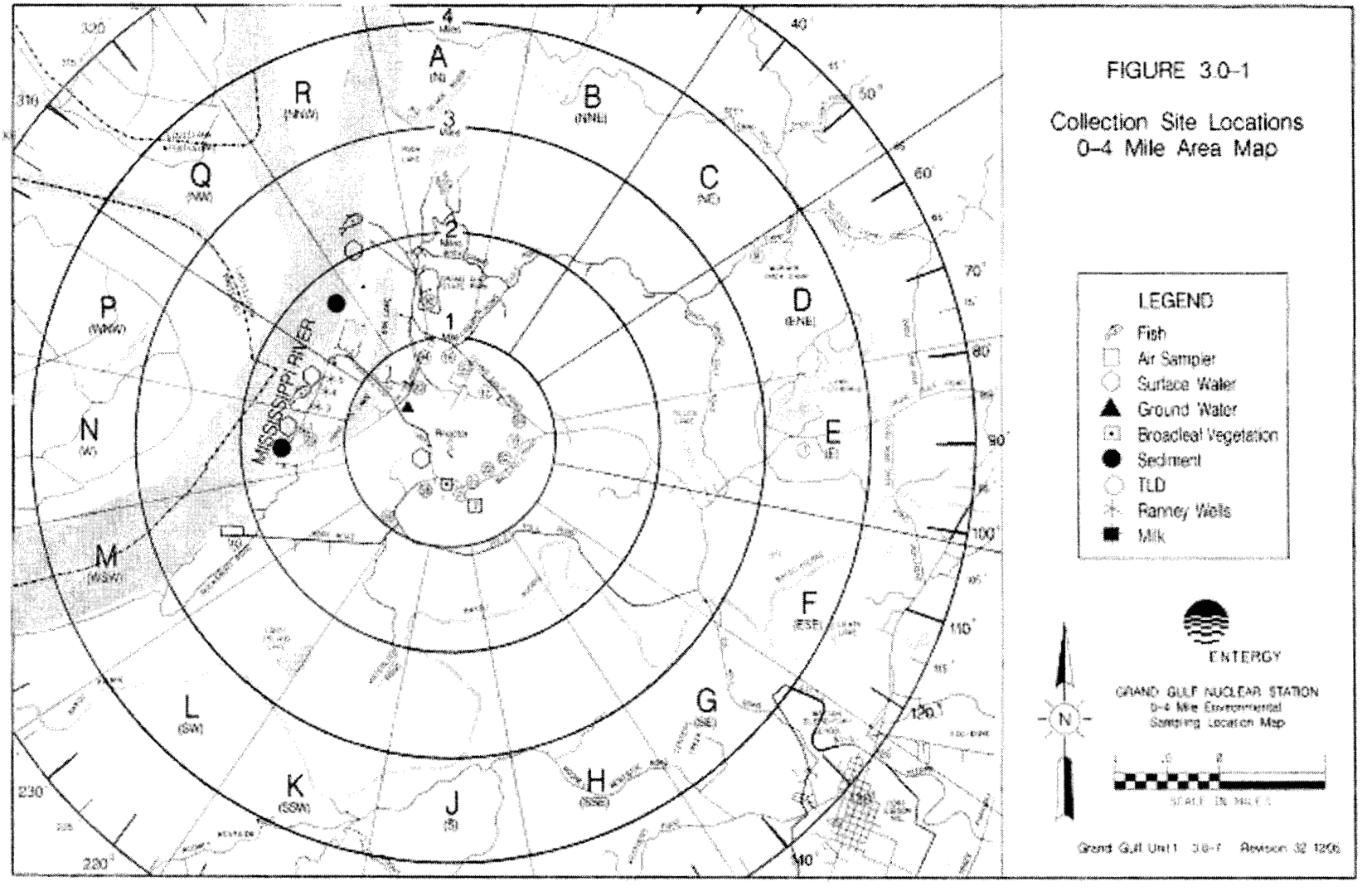
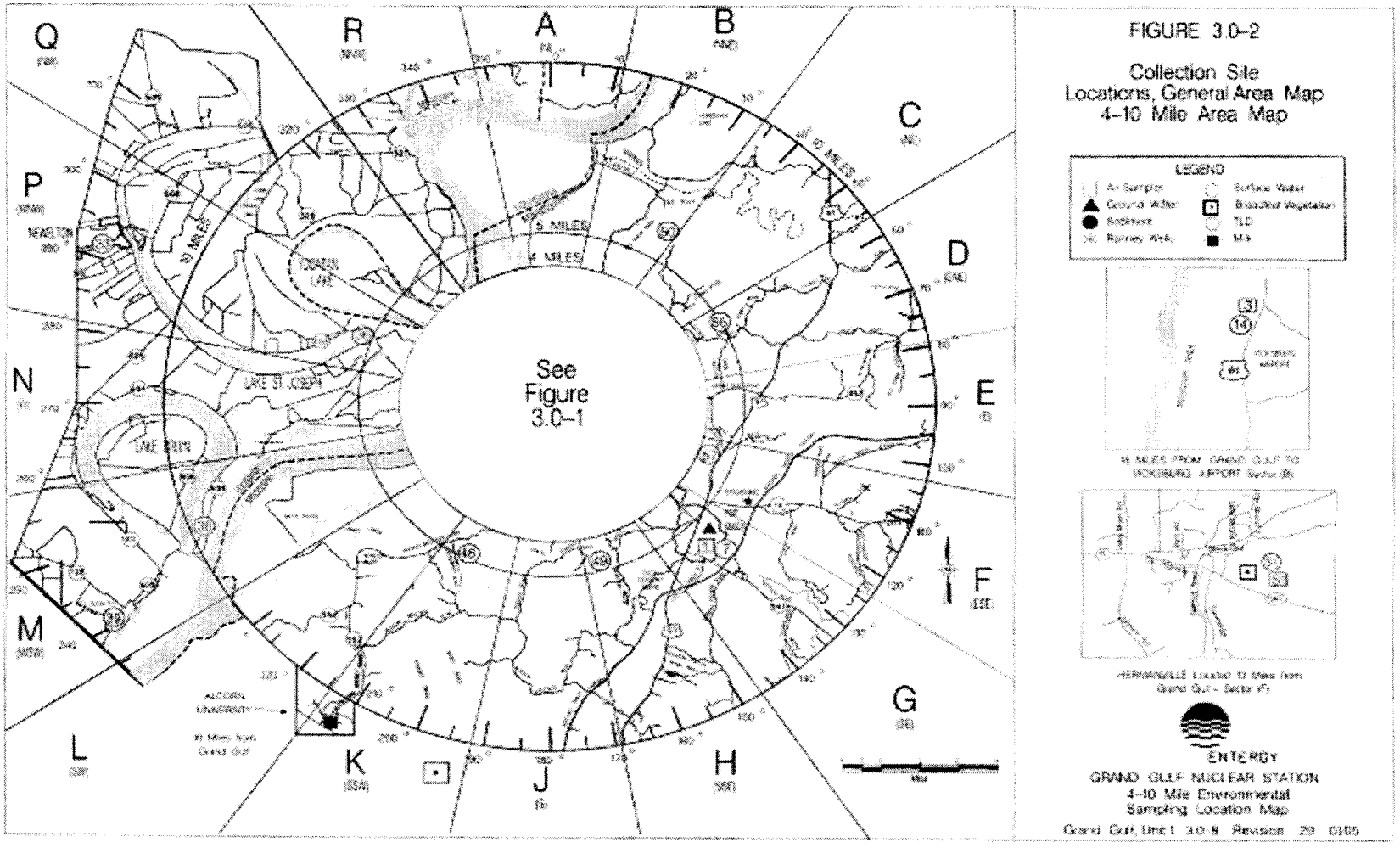


FIGURE 1-3

SAMPLE COLLECTION SITES – FAR 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.

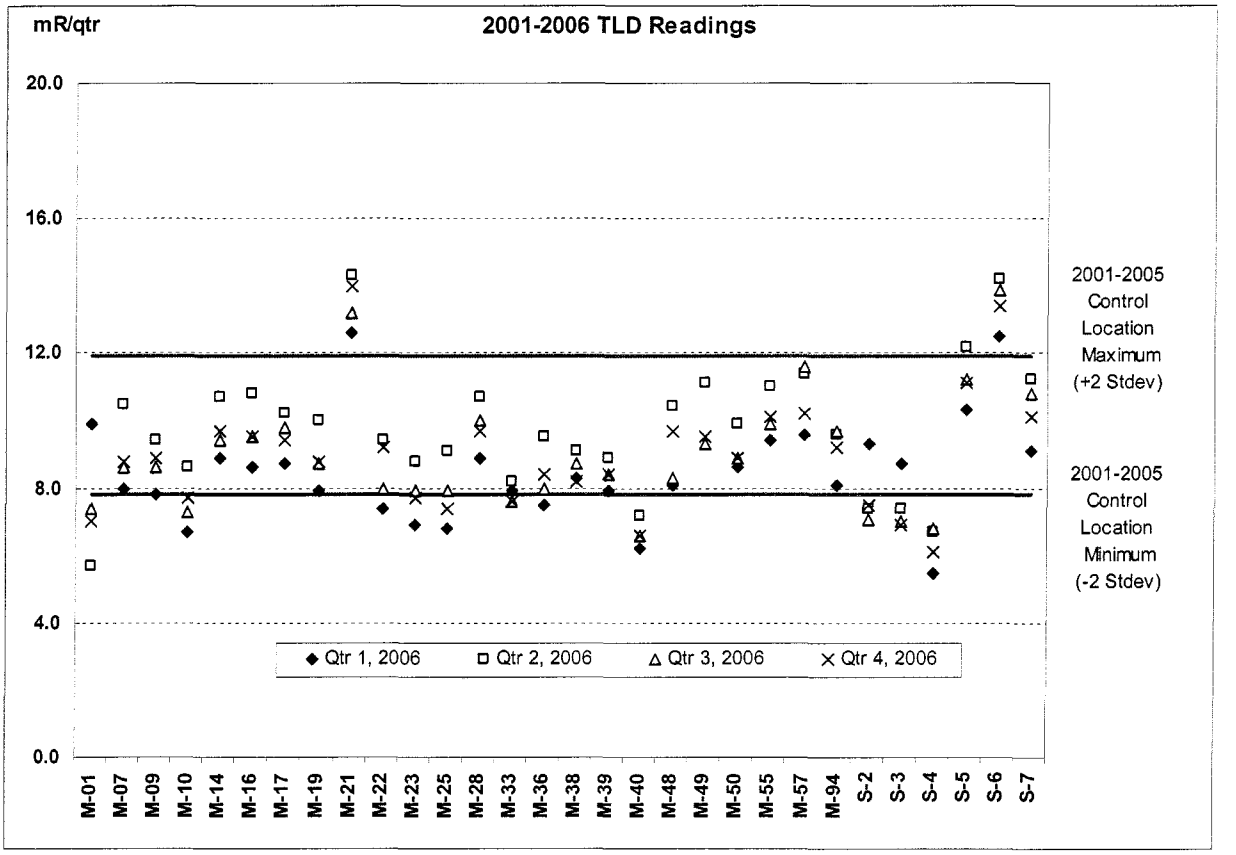
Six special TLD locations [S-2 through S-7] were included in this monitoring period. This additional monitoring serves to characterize the effect of hydrogen injection, described further in the following paragraph.

TLD	Location
S-2	Sector F, 0.5 mi
S-3	Sector B, 0.7 mi.
S-4	Sector D, 0.8 mi.
S-5	Sector H, 0.5 mi.
S-6	Sector K, 0.4 mi.
S-7	Sector C, 0.6 mi.

Hydrogen injection into the feedwater system provides protection against Intergranular Stress Corrosion of plant components.

With the exception of TLD locations M-21 (Sector J, 0.4 miles) and S-6 (Sector K, 0.4 miles), direct radiation levels continue to remain at or near background. The dose rate at these two locations is caused by increased Nitrogen-16 levels associated with hydrogen injection as discussed above. Dose rates for locations M-21 [3.8 millirem per quarter] and S-6 [3.8 millirem per quarter] above Control location M-14 (sector B, 18.0 miles) remain 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

Surface water samples were collected from three 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. Storm waters contribute to Outfall 007 and can include tritium as a result of washout and entrainment of routine, previously monitored gaseous effluents. As a result, tritium levels below the minimum detection level requirement are occasionally observed. Tritium was detected at an average concentration of 678 ± 260 pCi/L in the Outfall 007 (indicator) location.

In addition to the tritium samples required by the REMP, five special surface water samples for gamma were collected at the Outfall 007 location. Plant related gamma emitting radionuclides remained undetectable in these samples.

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

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 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) location. Cesium-137 was detected at an average concentration of 43.3 ± 14 pCi/kg in the downstream (indicator) location.

A review of REMP data collected at the downstream location from 1983 through 2005 indicates the Cesium-137 concentration has ranged from less than detectable to 300 pCi/Kg. Cesium-137 has previously been detected in the upstream (control) location. The presence of Cesium-137 is attributed to atmospheric weapons testing.

Based on review of results and historical data, 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 milking animals. 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 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.

One sample of vegetation was collected at an onsite location to supplement the REMP. GGNS did not detect any plant related gamma emitting radionuclides in this vegetation sample during the reporting period.

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

2.8 Land Use Census Results

The most recent Land Use Census was performed from 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 sections 5.1.3.b(2) and 5.2. 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 are more conservative than any of the changes. Other determinations from the previous Land Use Census results are:

- The child age group with the highest dose commitment is in Sector A (North) at 1.78 miles, GGNS ODCM calculations currently uses the maximum calculated dose from either Sector L (Southwest) at 0.89 miles or Sector C (Northeast) at 0.67 miles. Doses calculated at Sector A would be lower.

- One location recorded as occupied in the previous land use census is now unoccupied, sector E (East) at 0.83 miles.

- Because of downwind location and/or distance from the site, in no case will the occupancy of an existing unoccupied residence cause any ODCM critical receptor calculation results to be less conservative.

- No additional sampling locations are required as the onsite garden/vegetation sampling location (Sector J, 0.4 miles) is more conservative than changes identified in the land use census.

- Cattle are raised for human consumption (most notably Sector H, J, and K). GGNS uses the Grass/Cow/Meat pathway.

- The milk pathway does not need to be activated, no commercial dairy production is occurring within 5 miles. Resident in Sector F occasionally milks cows for consumption if the cow is producing too much milk for the calf. This is not commercial dairy production as referenced by ODCM Table 6.12.1-1; therefore, the milk pathway does not need to be activated.

- Sectors M, N, P, and Q are remote areas in which the primary use is hunting. Area was surveyed by vehicle and aerial photographs. Also, all areas in Louisiana within 5 miles belong to the "Winter Quarters" exclusive hunting club. From the previous census, personnel at entrance gate were interviewed and responded, "No permanent residence or gardens, the area is posted".

- Gardens, regardless of size, were included in the census data.

Table 2.1
Land Use Census Results

Parameter		Sector A *	Sector B	Sector C	Sector D
I. Nearest Occupied Residence	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
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (mile)	0.94	None	None	None
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (mile)	1.78	1.52	0.67	2.86
	b. Garden size (ft^2)	≈ 1200	≈ 4050	≈ 1250	≈ 500
	c. Degrees from true north	352.2	21.9	42.1	59.7
V. Census Comparison	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

Table 2.1
Land Use Census Results

Parameter		Sector E *	Sector F *	Sector G	Sector H
I. Nearest Occupied Residence	a. Distance (mile)	0.89	2.25	2.10	1.11
	b. Number of Occupants	3	2	3	6
	c. Degrees from true north	86.9	101.5	129.7	152.5
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (mile)	0.83	None	1.93	1.08
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (mile)	0.89	4.05	3.81	1.11
	b. Garden size (ft^2)	≈1000	≈50	≈1600	≈ 500
	c. Degrees from true north	86.9	114.3	129.1	152.5
V. Census Comparison	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

Table 2.1
Land Use Census Results

Parameter		Sector J	Sector K *	Sector L*	Sector M
I. Nearest Occupied Residence	a. Distance (mile) b. Number of Occupants c. Degrees from true north	3.16 2 174.3	2.23 1 196.9	0.89 2 219.7	None
II. Nearest UnoccupiedResidence (closer than occupied residence)	a. Distance (mile)	None	None	None	None
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (mile) b. Garden size (ft^2) c. Degrees from true north	3.16 ≈ 500 174.3	2.23 ≈ 2500 196.9	0.89 ≈ 300 219.7	None
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A Yes	Yes N/A Yes	Yes N/A Yes	N/A N/A N/A

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

Table 2.1
Land Use Census Results

Parameter		Sector N	Sector P	Sector Q	Sector R
I. Nearest Occupied Residence	a. Distance (mile) b. Number of Occupants c. Degrees from true north	None	None	None	1.11 2 346.1
II. Nearest UnoccupiedResidence (closer than occupied residence)	a. Distance (mile)	1.61	4.83	3.5	None
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (mile) b. Garden size (ft^2) c. Degrees from true north	None	None	None	1.46 ≈ 4000 342.9
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	Yes 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 ≈500 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 98% of results were within control limits for accuracy, and 100% 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 Summary

Name of Facility: Grand Gulf Nuclear Station Docket No: 50-416
Location of Facility: Claiborne County, Mississippi Reporting Period: January - December 2006

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Air Particulates (pCi/m^3)	GB 156	0.01	0.027 (104 / 104) [0.013 - 0.048]	AS-1 PG (Sector G, 5.5 mi)	0.027 (52 / 52) [0.015 - 0.048]	0.026 (52 / 52) [0.013 - 0.042]	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^3)	I-131 156	0.07	<LLD	N/A	N/A	<LLD	0
Inner Ring TLDs (mR/Qtr)	Gamma 36	(f)	9.4 (36 / 36) [6.8 – 14.3]	M-21 (Sector J, 0.4 mi.)	13.5 (4 / 4) [12.6 – 14.3]	N/A	0
Outer Ring TLDs (mR/Qtr)	Gamma 27	(f)	9.1 (27 / 27) [6.2 – 11.6]	M-57 (Sector F, 4.5 mi.)	10.7 (4 / 4) [9.6 – 11.6]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 28	(f)	8.6 (28 / 28) [6.7 – 11.3]	M-01 (Sector E, 3.5 mi.)	10.2 (4 / 4) [9.5 – 11.3]	N/A	0
Control TLDs (mR/Qtr)	Gamma 4	(f)	N/A	N/A	N/A	9.7 (4 / 4) [8.9 – 10.7]	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station Docket No: 50-416
Location of Facility: Claiborne County, Mississippi Reporting Period: January - December 2006

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Surface Water (pCi/l)	H-3 24	3000	678 (5 / 19) [354 - 1220]	Outfall 007 (Sector N, Radius 0.2 mi.)	678 (5 / 13) [354 - 1220]	<LLD	0
	GS 10						
	I-131	15	<LLD	N/A	N/A	<LLD	0
	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

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station Docket No: 50-416
Location of Facility: Claiborne County, Mississippi Reporting Period: January - December 2006

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Groundwater (pCi/1)	H-3 2	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	43.32 (2/2) [35.99- 50.64]	SEDHAM (Sector N, 1.6 mi.)	43.32 (2/2) [35.99- 50.64]	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station Docket No: 50-416
Location of Facility: Claiborne County, Mississippi Reporting Period: January - December 2006

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [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
TLDs (Special) (mR/Qtr)	Gamma 24	(f)	9.4 (24 / 24) [5.5 – 14.2]	S-6 (Sector K, 0.4 mi.)	13.5 (4 / 4) [12.5 – 14.2]	9.7 (4 / 4) [8.9 – 10.7]	0
Vegetation (Special) pCi/Kg	I-131 1	60	<LLD	N/A	N/A	<LLD	0
	GS 1						
	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 Summary

Name of Facility: Grand Gulf Nuclear Station Docket No: 50-416
Location of Facility: Claiborne County, Mississippi Reporting Period: January - December 2006

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Venison	GS 1						
(Special)	Mn-54	130	<LLD	N/A	N/A	N/A	0
(pCi/kg)	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
Surface Water	GS 5						
(Special)	I-131	15	<LLD	N/A	N/A	<LLD	0
(pCi/l)	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

[a] GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.

[b] LLD = Required lower limit of detection based on GGNS ODCM Table 6.12.1-3.

[c] Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis (F).

[d] Where applicable, locations are specified by name, distance from reactor site and meteorological sector.

[e] 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.

[f] LLD is not defined in GGNS ODCM Table 6.12.1-3.

Attachment 1

Radiological Monitoring Report

Summary of Monitoring Results

TABLE OF CONTENTS

Table 1.1
Sample Type: **Air Particulate Filter and Radioiodine Cartridge**
Analysis: Gross Beta and I-131
Units: pCi/m^3

AIR SAMPLE AS-1 PG - GGNS Nearest Community

LLD (pCi/m^3) AS-1			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20060008	12/27/2005	1/3/2006	< 0.020	0.035 +/- 0.003
20060026	1/3/2006	1/10/2006	< 0.018	0.028 +/- 0.002
20060058	1/10/2006	1/17/2006	< 0.016	0.024 +/- 0.002
20060085	1/17/2006	1/24/2006	< 0.015	0.028 +/- 0.003
20060121	1/24/2006	1/31/2006	< 0.015	0.024 +/- 0.002
20060156	1/31/2006	2/7/2006	< 0.018	0.019 +/- 0.002
20060198	2/7/2006	2/14/2006	< 0.022	0.022 +/- 0.002
20060218	2/14/2006	2/21/2006	< 0.018	0.021 +/- 0.002
20060244	2/21/2006	2/28/2006	< 0.018	0.025 +/- 0.002
20060269	2/28/2006	3/7/2006	< 0.018	0.033 +/- 0.003
20060294	3/7/2006	3/14/2006	< 0.014	0.026 +/- 0.003
20060316	3/14/2006	3/21/2006	< 0.020	0.024 +/- 0.002
20060348	3/21/2006	3/28/2006	< 0.017	0.017 +/- 0.002
20060387	3/28/2006	4/4/2006	< 0.016	0.023 +/- 0.002
20060436	4/4/2006	4/11/2006	< 0.012	0.029 +/- 0.003
20060462	4/11/2006	4/18/2006	< 0.019	0.026 +/- 0.002
20060494	4/18/2006	4/25/2006	< 0.019	0.026 +/- 0.003
20060527	4/25/2006	5/2/2006	< 0.019	0.026 +/- 0.002
20060549	5/2/2006	5/9/2006	< 0.017	0.022 +/- 0.002
20060564	5/9/2006	5/16/2006	< 0.015	0.020 +/- 0.002

LLD (pCi/m^3) AS-1 PG			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20060584	5/16/2006	5/23/2006	< 0.014	0.026 +/- 0.002
20060594	5/23/2006	5/30/2006	< 0.011	0.024 +/- 0.002
20060618	5/30/2006	6/6/2006	< 0.017	0.027 +/- 0.003
20060653	6/6/2006	6/13/2006	< 0.014	0.038 +/- 0.003
20060684	6/13/2006	6/20/2006	< 0.020	0.030 +/- 0.003
20060705	6/20/2006	6/27/2006	< 0.016	0.026 +/- 0.002
20060742	6/27/2006	7/4/2006	< 0.015	0.030 +/- 0.003
20060771	7/4/2006	7/11/2006	< 0.024	0.018 +/- 0.002
20060795	7/11/2006	7/18/2006	< 0.019	0.025 +/- 0.002
20060827	7/18/2006	7/25/2006	< 0.014	0.025 +/- 0.002
20060854	7/25/2006	8/1/2006	< 0.016	0.015 +/- 0.002
20060863	8/1/2006	8/7/2006	< 0.018	0.031 +/- 0.003
20060898	8/7/2006	8/14/2006	< 0.017	0.015 +/- 0.002
20060914	8/14/2006	8/22/2006	< 0.018	0.035 +/- 0.003
20060943	8/22/2006	8/29/2006	< 0.015	0.019 +/- 0.002
20060950	8/29/2006	9/5/2006	< 0.015	0.028 +/- 0.002
20060976	9/5/2006	9/12/2006	< 0.017	0.041 +/- 0.003
20061009	9/12/2006	9/19/2006	< 0.022	0.024 +/- 0.002
20061032	9/19/2006	9/26/2006	< 0.015	0.024 +/- 0.002
20061062	9/26/2006	10/3/2006	< 0.018	0.038 +/- 0.003
20061115	10/3/2006	10/10/2006	< 0.019	0.048 +/- 0.003
20061136	10/10/2006	10/17/2006	< 0.020	0.034 +/- 0.003

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LLD (pCi/m^3)	AS-1 PG		0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20061176	10/17/2006	10/24/2006	< 0.023	0.023 +/- 0.002
20061205	10/24/2006	10/31/2006	< 0.015	0.032 +/- 0.003
20061232	10/31/2006	11/7/2006	< 0.017	0.027 +/- 0.003
20061244	11/7/2006	11/14/2006	< 0.020	0.025 +/- 0.002
20061262	11/14/2006	11/21/2006	< 0.017	0.036 +/- 0.003
20061298	11/21/2006	11/28/2006	< 0.016	0.034 +/- 0.003
20061327	11/28/2006	12/4/2006	< 0.029	0.024 +/- 0.003
20061345	12/4/2006	12/12/2006	< 0.019	0.031 +/- 0.0011
20061378	12/12/2006	12/19/2006	< 0.021	0.029 +/- 0.0011
20061410	12/19/2006	12/27/2006	< 0.013	0.027 +/- 0.0010
Average:				0.027
Maximum				0.048
Minimum:				0.015

Table 1.1
Sample Type: **Air Particulate Filter and Radioiodine Cartridge**
Analysis: Gross Beta and I-131
Units: pCi/m^3

AIR SAMPLE AS-3 61VA - GGNS - Control

LLD (pCi/m^3)			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20060009	12/27/2005	1/3/2006	< 0.018	0.032 +/- 0.003
20060027	1/3/2006	1/10/2006	< 0.020	0.028 +/- 0.002
20060059	1/10/2006	1/17/2006	< 0.019	0.020 +/- 0.002
20060086	1/17/2006	1/24/2006	< 0.014	0.028 +/- 0.003
20060122	1/24/2006	1/31/2006	< 0.017	0.021 +/- 0.002
20060157	1/31/2006	2/7/2006	< 0.015	0.018 +/- 0.002
20060199	2/7/2006	2/14/2006	< 0.010	0.023 +/- 0.002
20060219	2/14/2006	2/21/2006	< 0.017	0.022 +/- 0.002
20060245	2/21/2006	2/28/2006	< 0.016	0.024 +/- 0.002
20060270	2/28/2006	3/7/2006	< 0.017	0.031 +/- 0.003
20060295	3/7/2006	3/14/2006	< 0.019	0.027 +/- 0.003
20060317	3/14/2006	3/21/2006	< 0.015	0.025 +/- 0.002
20060349	3/21/2006	3/28/2006	< 0.017	0.015 +/- 0.002
20060388	3/28/2006	4/4/2006	< 0.015	0.021 +/- 0.002
20060437	4/4/2006	4/11/2006	< 0.021	0.025 +/- 0.002
20060463	4/11/2006	4/18/2006	< 0.017	0.022 +/- 0.002
20060495	4/18/2006	4/25/2006	< 0.018	0.022 +/- 0.002
20060528	4/25/2006	5/2/2006	< 0.019	0.024 +/- 0.002
20060550	5/2/2006	5/9/2006	< 0.017	0.023 +/- 0.002
20060565	5/9/2006	5/16/2006	< 0.020	0.017 +/- 0.002

LLD (pCi/m^3) AS-3			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20060585	5/16/2006	5/23/2006	< 0.017	0.023 +/- 0.002
20060595	5/23/2006	5/30/2006	< 0.018	0.021 +/- 0.002
20060619	5/30/2006	6/6/2006	< 0.016	0.027 +/- 0.003
20060654	6/6/2006	6/13/2006	< 0.020	0.033 +/- 0.003
20060685	6/13/2006	6/20/2006	< 0.018	0.026 +/- 0.002
20060706	6/20/2006	6/27/2006	< 0.016	0.024 +/- 0.002
20060743	6/27/2006	7/4/2006	< 0.022	0.029 +/- 0.003
20060772	7/4/2006	7/11/2006	< 0.026	0.017 +/- 0.002
20060796	7/11/2006	7/18/2006	< 0.017	0.027 +/- 0.003
20060828	7/18/2006	7/25/2006	< 0.019	0.025 +/- 0.003
20060855	7/25/2006	8/1/2006	< 0.014	0.016 +/- 0.002
20060864	8/1/2006	8/7/2006	< 0.020	0.030 +/- 0.003
20060899	8/7/2006	8/14/2006	< 0.016	0.013 +/- 0.002
20060915	8/14/2006	8/22/2006	< 0.017	0.028 +/- 0.002
20060944	8/22/2006	8/29/2006	< 0.016	0.018 +/- 0.002
20060951	8/29/2006	9/5/2006	< 0.015	0.025 +/- 0.002
20060977	9/5/2006	9/12/2006	< 0.017	0.035 +/- 0.003
20061010	9/12/2006	9/19/2006	< 0.027	0.023 +/- 0.002
20061033	9/19/2006	9/26/2006	< 0.019	0.023 +/- 0.002
20061063	9/26/2006	10/3/2006	< 0.018	0.033 +/- 0.003
20061116	10/3/2006	10/10/2006	< 0.019	0.041 +/- 0.003
20061137	10/10/2006	10/17/2006	< 0.015	0.033 +/- 0.003

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LLD (pCi/m^3) AS-3			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20061177	10/17/2006	10/24/2006	< 0.020	0.023 +/- 0.002
20061206	10/24/2006	10/31/2006	< 0.014	0.033 +/- 0.003
20061233	10/31/2006	11/7/2006	< 0.015	0.026 +/ 0.003
20061245	11/7/2006	11/14/2006	< 0.018	0.027 +/- 0.002
20061263	11/14/2006	11/21/2006	< 0.017	0.042 +/- 0.003
20061299	11/21/2006	11/28/2006	< 0.016	0.029 +/- 0.003
20061328	11/28/2006	12/4/2006	< 0.026	0.024 +/- 0.003
20061346	12/4/2006	12/12/2006	< 0.019	0.031 +/- 0.0011
20061379	12/12/2006	12/19/2006	< 0.015	0.028 +/- 0.0011
20061411	12/19/2006	12/27/2006	< 0.018	0.029 +/- 0.0010
Average:				0.026
Maximum				0.042
Minimum:				0.013

Table 1.1
Sample Type: **Air Particulate Filter and Radioiodine Cartridge**
Analysis: Gross Beta and I-131
Units: pCi/m^3

AIR SAMPLE AS-7 - GGNS - Indicator

LLD (pCi/m^3) AS-7UH			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20060010	12/27/2005	1/3/2006	< 0.018	0.031 +/- 0.003
20060028	1/3/2006	1/10/2006	< 0.018	0.028 +/- 0.002
20060060	1/10/2006	1/17/2006	< 0.013	0.023 +/- 0.002
20060087	1/17/2006	1/24/2006	< 0.013	0.027 +/- 0.003
20060123	1/24/2006	1/31/2006	< 0.015	0.020 +/- 0.002
20060158	1/31/2006	2/7/2006	< 0.015	0.019 +/- 0.002
20060200	2/7/2006	2/14/2006	< 0.013	0.022 +/- 0.002
20060220	2/14/2006	2/21/2006	< 0.016	0.022 +/- 0.002
20060246	2/21/2006	2/28/2006	< 0.018	0.025 +/- 0.002
20060271	2/28/2006	3/7/2006	< 0.019	0.034 +/- 0.003
20060296	3/7/2006	3/14/2006	< 0.016	0.027 +/- 0.003
20060318	3/14/2006	3/21/2006	< 0.019	0.026 +/- 0.002
20060350	3/21/2006	3/28/2006	< 0.017	0.018 +/- 0.002
20060389	3/28/2006	4/4/2006	< 0.014	0.022 +/- 0.002
20060438	4/4/2006	4/11/2006	< 0.016	0.028 +/- 0.003
20060464	4/11/2006	4/18/2006	< 0.015	0.023 +/- 0.002
20060496	4/18/2006	4/25/2006	< 0.016	0.024 +/- 0.003
20060529	4/25/2006	5/2/2006	< 0.012	0.025 +/- 0.002

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LLD (pCi/m^3) AS-7UH			0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20060551	5/2/2006	5/9/2006	< 0.012	0.019 +/- 0.002
20060566	5/9/2006	5/16/2006	< 0.018	0.018 +/- 0.002
20060586	5/16/2006	5/23/2006	< 0.015	0.024 +/- 0.002
20060596	5/23/2006	5/29/2006	< 0.019	0.021 +/- 0.003
20060620	5/29/2006	6/6/2006	< 0.018	0.025 +/- 0.002
20060655	6/6/2006	6/13/2006	< 0.017	0.037 +/- 0.003
20060686	6/13/2006	6/20/2006	< 0.015	0.028 +/- 0.003
20060707	6/20/2006	6/27/2006	< 0.015	0.023 +/- 0.002
20060744	6/27/2006	7/4/2006	< 0.026	0.030 +/- 0.003
20060773	7/4/2006	7/11/2006	< 0.021	0.017 +/- 0.002
20060797	7/11/2006	7/18/2006	< 0.016	0.023 +/- 0.002
20060829	7/18/2006	7/25/2006	< 0.016	0.022 +/- 0.002
20060856	7/25/2006	8/1/2006	< 0.014	0.013 +/- 0.002
20060865	8/1/2006	8/7/2006	< 0.017	0.027 +/- 0.003
20060900	8/7/2006	8/14/2006	< 0.019	0.014 +/- 0.002
20060916	8/14/2006	8/22/2006	< 0.013	0.030 +/- 0.002
20060945	8/22/2006	8/29/2006	< 0.017	0.015 +/- 0.002
20060952	8/29/2006	9/5/2006	< 0.017	0.026 +/- 0.002
20060978	9/5/2006	9/12/2006	< 0.018	0.039 +/- 0.003
20061011	9/12/2006	9/19/2006	< 0.024	0.024 +/- 0.002
20061034	9/19/2006	9/26/2006	< 0.019	0.021 +/- 0.002
20061064	9/26/2006	10/3/2006	< 0.018	0.038 +/- 0.003
20061117	10/3/2006	10/10/2006	< 0.017	0.044 +/- 0.003
20061138	10/10/2006	10/17/2006	< 0.013	0.032 +/- 0.003

LLD (pCi/m^3)	AS-7UH		0.07	0.01
LAB ID	**START DATE**	**END DATE**	**I-131**	**GROSS BETA**
20061178	10/17/2006	10/24/2006	< 0.018	0.021 +/- 0.002
20061207	10/24/2006	10/31/2006	< 0.019	0.035 +/- 0.003
20061234	10/31/2006	11/7/2006	< 0.017	0.024 +/- 0.003
20061246	11/7/2006	11/14/2006	< 0.014	0.029 +/- 0.002
20061264	11/14/2006	11/21/2006	< 0.017	0.039 +/- 0.003
20061300	11/21/2006	11/28/2006	< 0.019	0.032 +/- 0.002
20061329	11/28/2006	12/4/2006	< 0.023	0.023 +/- 0.003
20061347	12/4/2006	12/12/2006	< 0.018	0.033 +/- 0.0011
20061380	12/12/2006	12/19/2006	< 0.022	0.028 +/- 0.0011
20061412	12/19/2006	12/27/2006	< 0.014	0.027 +/- 0.0010
Average:				0.026
Maximum				0.044
Minimum:				0.013

Table 1.2
Sample Type: **Air Particulate Filter**
Analysis: Gamma Isotopic
Units: pCi/m^3

AIR PARTICULATE FILTER QUARTERLY COMPOSITES (GAMMA) - GGNS

LLD (pCi/m^3)			0.05	0.06
LAB ID	**LOCATION**	**DATE**	**CS-134**	**CS-137**
20060450	AS-1 PG	2/10/2006	< 0.005	< 0.004
20060451	AS-3 61VA	2/10/2006	< 0.004	< 0.003
20060452	AS-7 UH	2/10/2006	< 0.003	< 0.003
20060730	AS-1 PG	5/12/2006	< 0.004	< 0.003
20060731	AS-3 61VA	5/12/2006	< 0.004	< 0.004
20060732	AS-7 UH	5/12/2006	< 0.004	< 0.003
20061091	AS-1 PG	8/11/2006	< 0.004	< 0.004
20061092	AS-3 61VA	8/11/2006	< 0.004	< 0.003
20061093	AS-7 UH	8/11/2006	< 0.005	< 0.003
20061418	AS-1 PG	11/11/2006	< 0.005	< 0.004
20061419	AS-3 61VA	11/11/2006	< 0.004	< 0.003
20061420	AS-7 UH	11/11/2006	< 0.003	< 0.004

Table 2.1
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Inner Ring - Within General Area of Site Boundary (ODCM Specifications)					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-16	8.6	10.8	9.5	9.5	9.6
M-17	8.7	10.2	9.8	9.4	9.5
M-19	7.9	10.0	8.7	8.8	8.8
M-21 *	12.6	14.3	13.2	14.0	13.5
M-22	7.4	9.4	8.0	9.2	8.5
M-23	6.9	8.8	7.9	7.7	7.8
M-25	6.8	9.1	7.9	7.4	7.8
M-28	8.9	10.7	10.0	9.7	9.8
M-94	8.1	9.6	9.7	9.2	9.1

Outer Ring – Approximately Three (3) to Five (5) Miles from the Site (ODCM Specifications)					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-36	7.5	9.5	8.0	8.4	8.4
M-40	6.2	7.2	6.6	6.6	6.7
M-48	8.1	10.4	8.3	9.7	9.1
M-49	**	11.1	9.3	9.5	9.9
M-50	8.6	9.9	8.9	8.9	9.1
M-55	9.4	11.0	9.9	10.1	10.1
M-57*	9.6	11.4	11.6	10.2	10.7

* **Location with highest annual mean.**
** **TLD Missing**

Table 2.2
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Special Interest Areas – Population Centers & Schools (ODCM Specifications)					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-01*	**9.5**	**11.3**	**10.0**	**10.2**	**10.2**
M-07	**8.0**	**10.5**	**8.6**	**8.8**	**9.0**
M-09	**7.8**	**9.4**	**8.6**	**8.9**	**8.7**
M-10	**6.7**	**8.6**	**7.3**	**7.7**	**7.6**
M-33	**7.9**	**8.2**	**7.6**	**7.6**	**7.8**
M-38	**8.3**	**9.1**	**8.7**	**8.2**	**8.6**
M-39	**7.9**	**8.9**	**8.4**	**8.4**	**8.4**

* **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	**8.9**	**10.7**	**9.4**	**9.7**	**9.7**

Table 2.4
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Supplemental Areas					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
S-2	**9.3**	**7.4**	**7.1**	**7.5**	**7.8**
S-3	**8.7**	**7.4**	**7.0**	**6.9**	**7.5**
S-4	**5.5**	**6.7**	**6.8**	**6.1**	**6.3**
S-5	**10.3**	**12.2**	**11.2**	**11.1**	**11.2**
S-6 *	**12.5**	**14.2**	**13.9**	**13.4**	**13.5**
S-7	**9.1**	**11.3**	**10.8**	**10.1**	**10.3**

*** Location with highest annual mean.**

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**	**C0-58**	**FE-59**	**CO-60**	**ZN-65**	**NB-95**	**ZR-95**	**1-131**	**CS-134**	**CS-137**	**BA-140**	**LA-140**
20060034	MR DOWN	1/10/2006	<10.50	< 10.54	< 15.87	< 8.19	< 18.82	< 8.42	< 21.93	< 13.03	< 12.84	< 7.51	< 47.97	< 14.26
20060035	MRUP	1/10/2006	< 9.62	< 8.30	< 22.10	< 5.23	< 15.03	< 10.64	< 15.67	< 10.57	< 8.68	< 7.32	< 30.85	< 10.27
20060432	MR DOWN	4/11/2006	< 5.38	< 9.38	< 18.49	< 9.35	< 16.99	< 9.74	< 19.59	< 14.39	< 9.91	< 9.03	< 38.67	< 10.56
20060434	MRUP	4/11/2006	< 11.52	< 13.38	< 24.72	< 13.09	< 22.44	< 10.65	< 19.22	< 12.00	< 11.42	< 13.40	< 28.69	< 14.99
20060767	MR DOWN	7/11/2006	< 8.25	< 9.80	< 23.31	< 7.66	< 21.37	< 10.80	< 12.94	< 11.11	< 10.66	< 9.20	< 31.30	< 14.29
20060779	MRUP	7/11/2006	< 8.88	< 9.51	< 9.18	< 9.47	< 21.91	< 10.73	< 13.74	< 13.97	< 9.69	< 7.02	< 36.71	< 13.09
20061124	MRDOWN	10/11/2006	< 5.89	< 4.96	< 12.88	< 7.52	< 29.79	< 9.65	< 15.32	< 10.28	< 10.19	< 7.46	< 36.29	< 12.96
20061125	MRUP	10/11/2006	< 8.41	< 9.81	< 16.04	< 6.29	< 19.53	< 9.35	< 9.46	< 10.10	< 8.00	< 7.55	< 36.46	< 14.86
20061126	MRDOWN*	10/11/2006	< 8.71	< 9.34	< 15.95	< 8.19	< 18.00	< 6.96	< 15.50	< 12.09	< 5.85	< 9.03	< 25.80	< 13.96
20061127	MRDOWN GG*	10/11/2006	< 11.59	< 11.00	< 24.13	< 9.63	< 15.52	< 10.79	< 13.12	< 11.36	< 11.11	< 11.33	< 47.34	< 14.76

"GG" – indicates duplicate sample.
* Annual Sample collected during liquid discharge

Table 3.2
Sample Type: **Surface Water**
Analysis: Tritium
Units: pCi/l

SURFACE WATER SAMPLES (TRITIUM) - GGNS

LLD (pCi/l)	SURFACE WATER H-3		3000
LAB ID	**LOCATION**	**DATE**	**TRITIUM**
20060034	MR DOWN	1/10/2006	< 576
20060035	MRUP	1/10/2006	< 572
20060036	MRDOWN GG	1/10/2006	< 569
20060037	MRUP GG	1/10/2006	< 574
20060038	OUTFALL 007	1/10/2006	< 580
20060165	OUTFALL 007	2/7/2006	1,220 +/- 273
20060273	OUTFALL 007	3/7/2006	< 566
20060402	OUTFALL 007	4/4/2006	845 +/- 262
20060433	MR DOWN	4/11/2006	< 584
20060435	MRUP	4/11/2006	< 581
20060553	OUTFALL 007	5/8/2006	< 588
20060617	OUTFALL 007	6/6/2006	< 577
20060741	OUTFALL 007	7/4/2006	< 581
20060768	MR DOWN	7/11/2006	< 589
20060770	MRUP	7/11/2006	< 589
20060862	OUTFALL 007	8/7/2006	598 +/- 259
20060954	OUTFALL 007	9/6/2006	373 +/- 254
20061105	OUTFALL 007	10/6/2006	354 +/- 250
20061124	MRDOWN	10/11/2006	< 567
20061125	MRUP	10/11/2006	< 565
20061126*	MRDOWN	10/11/2006	< 572
20061229	OUTFALL 007	11/3/2006	< 566
20061242	OUTFALL 007	11/14/2006	< 562
20061331	OUTFALL 007	12/4/2006	< 633

* 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	DATE	MN-54	C0-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	CS-134	CS-137	BA-140	LA-140
20061209	PGWELL	10/30/06	< 13.38	< 9.82	< 15.47	< 11.74	< 24.15	< 12.38	< 13.52	< 11.63	< 8.31	< 42.88	< 14.52
20061210	CONSTWELL	10/30/06	< 9.25	< 9.68	< 16.25	< 9.96	< 17.48	< 11.12	< 18.33	< 7.49	< 11.88	< 44.76	< 13.30
20061211	PGWELL GG	10/30/06	< 9.93	< 8.51	< 14.51	< 8.07	< 17.22	< 11.48	< 14.35	< 10.24	< 8.67	< 34.42	< 14.32
20061212	CONSTWELL GG	10/30/06	< 8.95	< 6.73	< 18.39	< 7.57	< 22.52	< 9.24	< 15.39	< 9.73	< 7.73	< 38.75	< 11.61

"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**
20061209	PGWELL	10/30/2006	< 562.12
20061210	CONSTWELL	10/30/2006	< 563.39

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**
20031209	PGWELL	10/30/2006	< 0.90
20061210	CONSTWELL	10/30/2006	< 0.88

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**	
20061128	SEDHAM	10/11/2006	< 23.94	50.64	+/- 12.76
20061129	SEDCONT	10/11/2006	< 17.53	< 18.92	
20061130	SEDHAM GG	10/11/2006	< 27.42	35.99	+/- 15.17
20061131	SEDCONT GG	10/11/2006	< 22.68	< 20.94	

"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 ID	**LOCATION**	**DATE**	**MN-54**	**C0-58**	**FE-59**	**CO-60**	**ZN-65**	**CS-134**	**CS-137**
20060814	FISHUP	7/20/2006	< 9.89	< 15.43	< 28.79	< 13.28	< 26.68	< 9.53	< 15.23
20060815	FISHDOWN	7/20/2006	< 11.38	< 11.42	< 37.68	< 15.82	< 27.24	< 11.93	< 11.90
20060816	FISHUP GG	7/20/2006	< 15.75	< 13.05	< 40.23	< 22.19	< 38.66	< 12.36	< 14.79
20060817	FISHDOWN GG	7/20/2006	< 14.87	< 14.03	< 35.64	< 16.44	< 42.55	< 9.84	< 14.68

"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**
20060051	VEG-CONT	1/10/2006	< 31.50	< 27.36	< 24.88
20060052	VEG-J	1/10/2006	< 59.48	< 35.38	< 40.17
20060054	VEG-J GG	1/10/2006	< 59.20	< 28.16	< 44.21
20060055	VEG-CONT GG	1/10/2006	< 26.31	< 26.55	< 26.54
20060531	VEG-CONT	4/21/2006	< 41.67	< 25.61	< 19.27
20060532	VEG-J	4/21/2006	< 50.48	< 29.51	< 27.74
20060810	VEG-CONT	7/19/2006	< 46.41	< 37.13	< 39.88
20060811	VEG-J	7/19/2006	< 58.29	< 22.42	< 44.55
20061213	VEG-CONT	10/30/2006	< 59.78	< 43.48	< 45.72
20061214	VEG-J	10/30/2006	< 55.32	< 27.59	< 35.53

"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 ID	LOCATION	DATE	MN-54	C0-58	FE-59	CO-60	ZN-65	CS-134	CS-137
20061230	VENISON	11/3/2006	< 23.49	< 30.83	< 72.85	< 23.32	< 56.11	< 20.34	< 19.41

SPECIAL VEGETATION SAMPLES (GAMMA) – GGNS

LLD (pCi/kg)			60	60	80
LAB ID	LOCATION	DATE	I-131	CS-134	CS-137
20060842	HAY	7/27/2006	< 14.92	< 10.40	< 11.99

SPECIAL 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	C0-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
20060038	OUTFALL 007	1/10/2006	< 7.81	< 9.18	< 11.99	< 5.07	< 21.44	< 10.11	< 19.42	< 14.64	< 11.05	< 12.87	< 40.92	< 14.90
20060398	OUTFALL 007	4/4/2006	< 7.75	< 10.80	< 17.86	< 10.60	< 18.72	< 10.34	< 10.76	< 11.21	< 11.53	< 10.70	< 36.54	< 14.62
20060737	OUTFALL 007	7/4/2006	< 8.12	< 8.58	< 22.39	< 13.22	< 23.32	< 8.24	< 19.39	< 12.14	< 5.18	< 9.74	< 39.86	< 9.20
20061106	OUTFALL 007	10/6/2006	< 8.09	< 7.55	< 17.00	< 8.16	< 21.65	< 8.46	< 17.03	< 11.07	< 8.94	< 9.52	< 45.30	< 12.64
20061243	OUTFALL 007	11/14/2006	< 9.14	< 10.23	< 13.49	< 4.95	< 21.60	< 8.62	< 15.99	< 8.97	< 9.68	< 12.49	< 30.93	< 10.54

Table 9.1
Sample Type: **Interlaboratory Comparison**
Analysis: Gross Beta, Tritium, Iodine-131 and Gamma Isotopic

Sample Type (units)	Sample #	Date	Analysis	Known value (a)	RBS Value	RBS N-DEV (b)	RBS N-RANGE(c)
Charcoal Cartridge (pCi/filter)	E5008-125	6/8/2006	**I-131**	66.4	73	1.15	0.297
Water	E5007-125	6/8/2006	**BETA**	169	125	**-3.01(d)**	0.093
(pCi/liter)	E5006-125	6/8/2006	**CR-51**	210	222	0.64	0.544
			MN-54	119	129.0	0.97	0.199
			CO-58	81.2	82.0	0.11	0.436
			FE-59	75.8	77.3	0.23	0.779
			CO-60	104	105	0.15	0.227
			ZN-65	150	157	0.56	0.394
			I-131	74.7	79.7	0.77	0.211
			CS-134	103	101	-0.22	0.153
			CS-137	95.1	104	1.12	0.248
			CE-141	149.00	157	0.62	0.159
	E5083-125	9/13/2006	**H-3**	11000	10926	-0.08	0.142
Air Filter	E5081-125	9/13/2006	**BETA**	88.4	99.2	1.41	0.058
(pCi/filter)	E5237-125	2/12/2007	**CR-51**	145	141	-0.33	0.277
			MN-54	171	185.3	0.97	0.104
			CO-58	77.9	79.6	0.26	0.369
			FE-59	50.2	54.6	1.01	0.745
			CO-60	491.0	493.9	0.07	0.030
			ZN-65	243	277.6	1.64	0.107
			CS-134	248.0	243.1	-0.23	0.094
			CS-137	423	443	0.54	0.028
			CE-141	145.0	125	-1.56	0.065
Sediment	E5082-125	9/13/2006	**CR-51**	0.423	0.421	-0.05	0.465
(pCi/gram)			**MN-54**	0.169	0.169	0.02	0.163
			CO-58	0.164	0.155	-0.61	0.600
			FE-59	0.066	0.062	-0.64	0.776
			CO-60	0.201	0.182	-1.11	0.196
			ZN-65	0.218	0.210	-0.42	0.578
			CS-134	0.128	0.126	-0.15	0.185
			CS-137	0.362	0.378	0.51	0.174
			CE-141	0.129	0.119	-0.90	0.275

Sample Type (units)	Sample #	Date	Analysis	Known Value(a)	RBS Value	RBS N-DEV (b)	RBS N-RANGE(c)
Milk (pCi/liter)	E5009-125	6/8/2006	**CR-51**	259	243	-0.70	0.395
			MN-54	146	150.0	0.32	0.135
			CO-58	100	101.0	0.12	0.118
			FE-59	93.6	104.0	1.28	0.463
			CO-60	104	128	2.63	0.189
			ZN-65	185	183.0	-0.12	0.170
			I-131	63.2	60.7	-0.46	0.187
			CS-134	127	122.7	-0.39	0.062
			CS-137	117	115	-0.20	0.067
			CE-141	184	184	0.02	0.150

NOTES:

(a) The known value as determined by cross check sample supplier.

(b) The normalized deviation from the "known" value is computed from the deviation and the standard error of the mean; ±2.00 is the warning limit and ±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 were outside control limits.

There was one result outside the control limits for accuracy in the 2006 Interlaboratory Comparison program studies. Sample E5007-125 gross beta in water was 0.006% outside the Lower Control Limit.

In October 2006, a new gross beta in water sample was prepared using the same source material. The results were within the acceptance criteria. The same sample was analyzed on a different alpha/beta counter. The results on the new instrument were within the control limits.

Review of trending information of gross beta in water results shows a fluctuation of high and low values. In 2000 there was another occurrence of gross beta in water below the control limit of 3.0. The supplier for the interlaboratory crosscheck samples was contacted to determine if a low bias was present in gross beta in water by other participants. A low bias response was not present.

The most probable cause of the low sample result was sample preparation error. The low result could also have been due to machine age or an intermittent issue, but other samples counted on the same machine were within the control level. The new sample that was counted lends the most logical conclusion that a preparation error could have occurred during mixing, transfer or evaporation of the sample media.

There is no impact accessed on previously reported data due to these results. Environmental samples are analyzed and reported with a ninety-five percent confidence level. A known standard is counted with each group of samples and must read within 10 percent of the decay corrected activity. 98% of interlaboratory crosscheck results were within control limits for accuracy and 100% were within control limits for precision.