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Ladies and Gentlemen:

Enclosed is the River Bend Station (RBS) Annual Radiological Environmental Operating Report for the period January 1, 2003, through December 31, 2003. This report is submitted in accordance with the RBS Technical Specifications, Section 5.6.2.

Should you have any questions regarding the enclosed information, please contact Mr. Bill Fountain of my staff at (225) 381-4625.

Sincerely,

A handwritten signature in black ink, appearing to read "David N. Lorfing".

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DNL/WJF
enclosure

JE25

Radiological Environmental Operating Report for 2003
RBG-46264
Page 2 of 2

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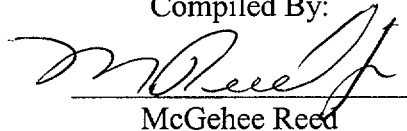
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RIVER BEND STATION

**ANNUAL RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT FOR 2003**

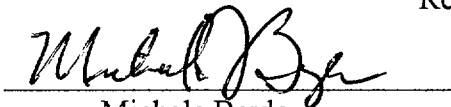
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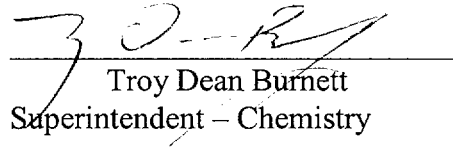
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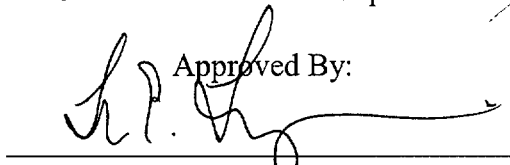
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Summary

The Annual Radiological Environmental Operating Report presents data obtained through analyses of environmental samples collected for the River Bend Station (RBS) Radiological Environmental Monitoring Program (REMP) for the period January 1, 2003 through December 31, 2003. This report fulfills a requirement specified in RBS Technical Requirements Manual (TRM) 5.6.2 as required by Technical Specification 5.6.2 of Appendix A to RBS License Number NPF-47. During 2003, REMP results remained at background levels, as has been the case in previous years.

All required lower limit of detection (LLD) capabilities were achieved in all sample analyses during 2003. No measurable levels of radiation above baseline levels were detected in the vicinity of River Bend Station. The 2003 Radiological Environmental Monitoring Program thus substantiated the adequacy of source control and effluent monitoring at River Bend Station with no observed impact of plant operations on the environment.

Radiological Environmental Monitoring Program

RBS established the REMP prior to the station's becoming operational (1985) to provide data on background radiation and radioactivity normally present in the area. RBS has continued to monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring direct radiation. RBS also samples milk if milk-producing animals used for human consumption are present within five miles (8 km) of the plant.

The REMP includes sampling indicator and control locations within an approximately 20-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. RBS personnel compare indicator results with control and preoperational results to assess any impact RBS operation might have had on the surrounding environment.

In 2003, environmental samples were collected for radiological analysis. The results of indicator locations were compared with control locations and previous studies. It was concluded that overall, no significant relationship exists between RBS operation and effect on the area around the plant. The review of 2003 data, in many cases, showed radioactivity levels in the environment were undetectable in many locations and near background levels in significant pathways.

Harmful Effects or Irreversible Damage

The REMP monitoring did not detect any harmful effects or evidence of irreversible damage in 2003. Therefore, no analysis or planned course of action to alleviate problems was necessary.

Reporting Levels

RBS's review indicates that no samples equaled or exceeded reporting levels for radioactivity concentration in environmental samples, as outlined in RBS Technical Requirements Manual Table 3.12.1-2, when averaged over any calendar quarter. Therefore, 2003 results did not trigger any Radiological Monitoring Program Special Reports.

Radioactivity Not Attributable to RBS

The RBS REMP detected gamma nuclide Cs-137 in a down stream river sediment sample during 2003. This nuclide was quantified at a level below the LLD requirement. Since the detection of Cs-137 is not uncommon in soils and sediments, attributing this radioactivity to RBS is very doubtful. Additional discussion is offered in Sediment Sample Results. Following the radioactive plume release due to reactor core degradation at the Chernobyl Nuclear Power Plant in 1986, RBS REMP detected I-131 in water, vegetation, and air samples. I-131 was also detected during 1998 in the wastewater treatment plant effluent. This was attributed to the medical treatment of a RBS employee.

Comparison to Federal and State Programs

RBS 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 Environmental Radiological Laboratory – Department of Environmental Quality Laboratory Services Division (ERL-DEQLSD).

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

The (ERL-DEQLSD) and the RBS REMP entail similar radiological environmental monitoring program requirements. These programs include collocated air samples and splitting or sharing sample media such as water, fish and food products. Both programs have obtained similar results over previous years.

Sample Deviations

◆ Milk

The REMP did not include milk sampling within five miles (8 km) of RBS in 2003 due to unavailability of milk-producing animals used for human consumption. RBS's Technical Requirements Manual requires collection of milk samples if available commercially

within 8 km (5 miles) of the plant. RBS personnel collected vegetation samples to monitor the ingestion pathway, as specified in RBS Technical Requirements Manual Table 3.12.1-1, because of milk unavailability.

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

All LLDs during this reporting period were more conservative than the acceptable limits required by the RBS Technical Requirement Manual (TRM).

◆ **Air Samples**

Listed below are sample/sampling deviations that occurred during 2003. These deviations did not result in a missed sample and no LLD values were exceeded. As described in footnote (a) to RBS Technical Requirements Manual Table 3.12.1-1, deviations are permitted from the required sampling schedule due to malfunction of equipment or other legitimate reasons.

Station	Sampling Period	Problem Description	Comment
AP1	3/3/03 – 3/17/03	Power Outage	Loss of 0.4 hours or < 1% sample volume due to planned work in area.
AN1	3/31/03 – 4/14/03	Power Outage	Loss of 194.6 hours or 58% of sample volume due to electrical breaker trip from inclement weather. Required LLD achieved
AGC	7/21/03 – 8/4/03	Power Outage	Loss of 0.7 hours or < 1% sample volume due to local power outage.
AP1 & AN1	11/10/03 – 11/24/03	Power Outage	Loss of 6.7 hours or 2% sample volume due scheduled substation outage.

◆ **Missed Samples**

No missed samples occurred during the 2003 sampling period. An up-gradient ground water sample was not collected per plant schedule on 12/17/03, due to an inoperative well pump. The sample was collected on 1/15/04 after pump replacement. The actual collection date was within the surveillance late date.

◆ **Unavailable Results**

There were no unavailable results during the year 2003.

Program Modifications

RBS made no modifications to the REMP during the year 2003.

Attachments

Attachment 1 contains results of air, TLD, water, sediment, fish, food products and special samples collected in 2003. TLDs were analyzed by Waterford-3 Dosimetry. All remaining samples were analyzed by RBS Environmental Laboratory. Attachment 1 also contains RBS' participation in the interlaboratory comparison program during the year 2003.

1.0 Introduction

1.1 Radiological Environmental Monitoring Program

RBS 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 RBS.
- 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 the RBS Technical Requirements Manual 3.12.1. A description of the RBS REMP sample locations utilized to monitor exposure pathways are described in Table 1.1 and shown in Figures 1-2 and 1-3. RBS may occasionally 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 2003 sampling results with Section 3.0 providing a summary of results for the monitored exposure pathways.

1.3 Land Use Census

RBS personnel conduct a land use census biannually, as required by RBS Technical Requirements Manual 3.12.2. The land use census was performed in 2002. The purpose of this census is to identify changes in uses of land within five miles of RBS that would require modifications to the REMP or the Technical Requirements Manual. The most important criteria during this census is to determine location in each sector of the nearest:

- 1) Residence
- 2) Animal milked for human consumption
- 3) Garden of greater than 50 m² (500 ft²) producing broadleaf vegetation *

The method used by RBS personnel for conducting this land use census is as follows:

- RBS personnel conduct door-to-door field surveys and/or aerial surveys in each meteorological sector out to five miles in order to locate the nearest resident and milk animal.
- Consultation with local agricultural authorities is used in instances when personal contact cannot be made.
- As a result of these surveys, the following information is obtained in each meteorological sector:
 - 1) Nearest permanent residence
 - 2) Nearest milking animal
- RBS personnel identify locations on the map, measure distances to RBS and record results.
- Locations, if any, are identified which yield a calculated dose or dose commitments greater than those currently calculated in the Technical Requirements Manual.
- RBS personnel compare results to previous census.

- * RBS personnel do not perform a garden census since Technical Requirements Manual 3.12.2 allows the routine sampling of broadleaf vegetation in the highest D/Q sector near the site boundary in lieu of the garden census.

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	<u>Radioiodine and Particulates</u> 2 samples from close to the 2 SITE BOUNDARY locations, in different sectors, of the highest calculated annual average groundlevel D/Q.	AN1 (0.9 km W) - RBS site Hwy 965; 0.4 km south of Activity Center. AP1 (0.9 km WNW) – Behind River Bend Station Activity Center.	Continuous sampler operation with sample collection every two weeks, or more frequently if required by dust loading.	Radioiodine Cannisters – I-131 analysis every two weeks. Air Particulate – Gross beta radioactivity analysis following filter change.
	<u>Radioiodine and Particulates</u> 1 sample from the vicinity of a community having the highest calculated annual average groundlevel D/Q.	AQS2 (5.8 km NW) - St. Francis Substation on US Hwy. (Bus.) 61 in St. Francisville.		
	<u>Radioiodine and Particulates</u> 1 sample from a control location, as for example 15 - 30 km distance and in the least prevalent wind direction.	AGC (17.0 km SE) – Entergy Service Center compound in Zachary. (Control)		
Direct Radiation	<u>TLDs</u> One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.	TA1 (1.7 km N) - River Bend Training Center. TB1 (0.5 km NNE) - Utility pole near River Bend Station cooling tower yard area. TC1 (1.7 km NE) - Stub pole at Jct. US Hwy. 61 and Old Highway 61.	Quarterly	mR exposure quarterly.

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	<p>TLDs</p> <p>One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.</p>	<p>TD1 (1.6 km ENE) – Stub pole along WF7, 150m S of Jct. WF7 and US Hwy. 61.</p> <p>TE1 (1.3 km E) – Stub pole along WF7, 1 km S of Jct. WF7 and US Hwy. 61.</p> <p>TF1 (1.3 km ESE) – Stub pole along WF7, 1.6 km S of Jct. WF7 and US Hwy. 61.</p> <p>TG1 (1.6 km SE) – Stub pole along WF7, 2 km S of Jct. WF7 and US Hwy. 61.</p> <p>TH1 (1.7 km SSE) – Stub pole at power line crossing of WF7 (near Grants Bayou).</p> <p>TJ1 (1.5 km S) – Stub pole near River Bend Station Gate #23 on Powell Station Road (LA Hwy. 965).</p> <p>TK1 (0.9 km SSW) – Utility pole on Powell Station Road (LA Hwy. 965), 20 m S of River Bend Station River Access Road.</p> <p>TL1 (1.0 km SW) – First utility pole on Powell Station Road (LA Hwy. 965) S of former Illinois Central Gulf RR crossing.</p>	Quarterly	mR exposure quarterly.

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	<u>TLDs</u> One ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY.	TM1 (0.9 km WSW) - Third utility pole on Powell Station Road (LA Hwy. 965) N of former Illinois Central Gulf RR crossing. TN1 (0.9 km W) – Utility pole along Powell Station Road (LA Hwy. 965), near garden and AN1 air sampler location. TP1 (0.9 km WNW) - Behind River Bend Station Activity Center at AP1 air sampler location. TQ1 (0.6 km NW) – Access from MA-1 on RBS North Access Road. TR1 (0.8 km NNW) – River Bend Station North Access Road across from Main Plant entrance.	Quarterly	mR exposure quarterly.
	<u>TLDs</u> The balance of the stations (8) to be placed in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control locations.	TAC (15.8 km N) – Utility pole at Jct. of US Hwy. 61 and LA Hwy. 421, 7.9 km north of Bains. (Control) TCS (12.3 km NE) – Utility pole at gate to East Louisiana State Hospital in Jackson. (Special) TEC (16.0 km E) – Stub pole at jct. of Hwy. 955 and Midway Road, 4.8 km North of Jct. of Hwys 955 and 964. (Control)		

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	<p><u>TLDs</u> The balance of the stations (8) to be placed in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control locations.</p>	<p>TGS (17.0 km SE) – Entergy Service Center compound in Zachary. (Special)</p> <p>TNS (6.0 km W) – Utility pole with electrical meter at west bank ferry landing (LA Hwy. 10). (Special)</p> <p>TQS1 (4.0 km NW) – Utility pole front of Pentecostal church (opposite West Feliciana Parish Hospital) near Jct. US Hwy. 61 and Commerce Street. (Special)</p> <p>TQS2 (5.8 km NW) – St. Francis Substation on business US Hwy. 61 in St. Francisville. (Special)</p> <p>TRS (9.2 km NNW) - Stub pole at Jct. of US Hwy. 61 and WF2 near Bains (West Feliciana High School). (Special)</p>	Quarterly	mR exposure quarterly.
Waterborne	<p><u>Surface Water</u> 1 sample upstream and 1 sample downstream.</p>	<p>SWU (5.0 km W) - Mississippi River about 4 km upstream from the plant liquid discharge outfall, near LA Hwy. 10 ferry crossing.</p> <p>SWD (7.75 km S) - Mississippi River about 4 km downstream from plant liquid discharge outfall, near paper mill.</p>	Grab samples quarterly	Gamma isotopic analysis quarterly, tritium analysis quarterly.

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 1 or 2 sources only if likely to be affected.	WU (~470 m NNE) - Upland Terrace Aquifer well upgradient from plant. WD (~470 m SW) – Upland Terrace Aquifer well downgradient from plant.	Semiannually	Gamma isotopic and tritium analysis semiannually.
	Sediment From Shoreline 1 sample from downstream area with existing or potential recreational value.	SEDD (7.75 km S) – Mississippi River about 4 km downstream from plant liquid discharge outfall, near paper mill.	Annually	Gamma isotopic analysis annually.
Ingestion	Milk If commercially available, 1 sample from milking animals within 8 km distant where doses are calculated to be greater than 1 mrem per year. 1 sample from milking animals at a control location 15 – 30 km distant when an indicator location exists.	Currently, no available milking animals within 8 km of RBS.	Quarterly when animals are on pasture.	Gamma isotopic and I-131 analysis quarterly when animals are on pasture.
	Fish and Invertebrates 1 sample of a commercially and/or recreationally important species in vicinity of plant discharge area. 1 sample of similar species in area not influenced by plant discharge.	FD (7.75 km S) - One sample of a commercially and/or recreationally important species from downstream area influenced by plant discharge. FU (4.0 km WSW) - One sample of a commercially and/or recreationally important species from upstream area not influenced by plant discharge.	Annually	Gamma isotopic analysis on edible portions annually

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><u>Food Products</u> 1 sample of one type of broadleaf vegetation grown near the SITE BOUNDARY location of highest predicted annual average groundlevel D/Q if milk sampling is not performed.</p> <p>1 sample of similar broadleaf vegetation grown 15 – 30 km distant, if milk sampling is not performed.</p>	<p>GN1 (0.9 km W) – Sampling will be performed in accordance with Table 3.12.1-1 Section 4.a of the Technical Requirements Manual.</p> <p>GQC (32.0 km NW) - One sample of similar vegetables from LA State Penitentiary at Angola. (Control)</p>	Quarterly during the growing season.	Gamma isotopic and I-131 analysis quarterly.

FIGURE 1-1
EXPOSURE PATHWAYS

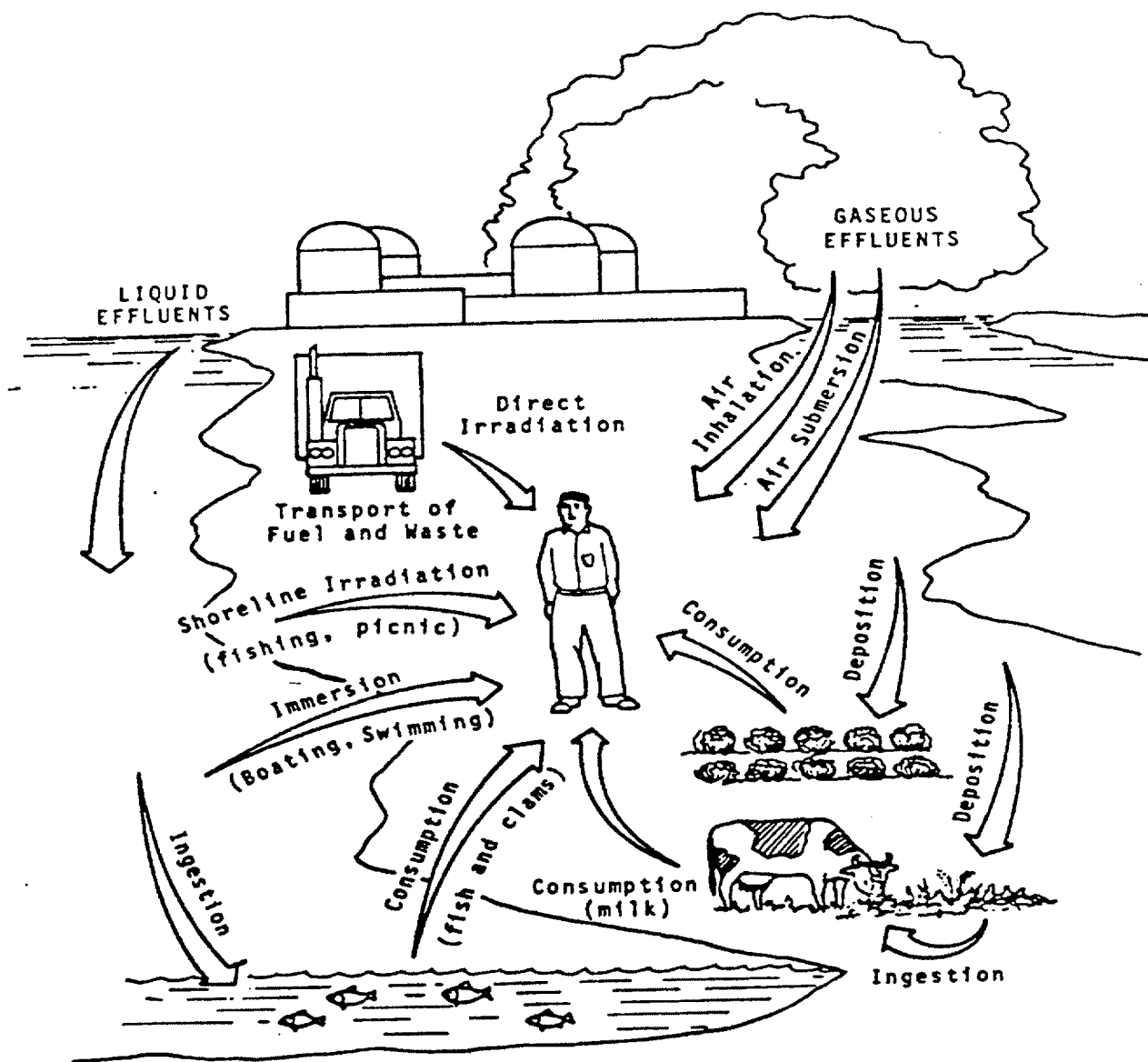


FIGURE 1-2
SAMPLE COLLECTION SITES – NEAR FIELD

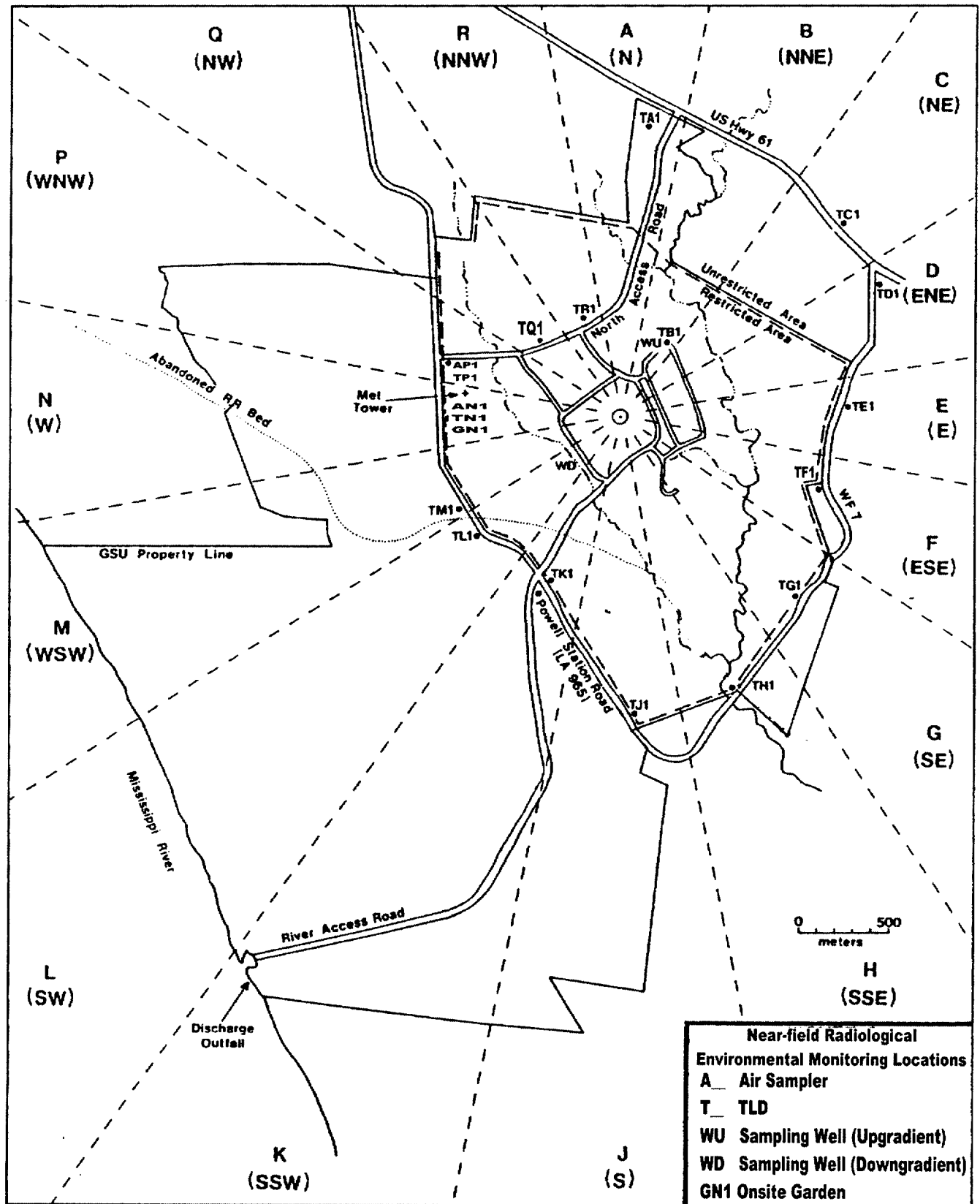
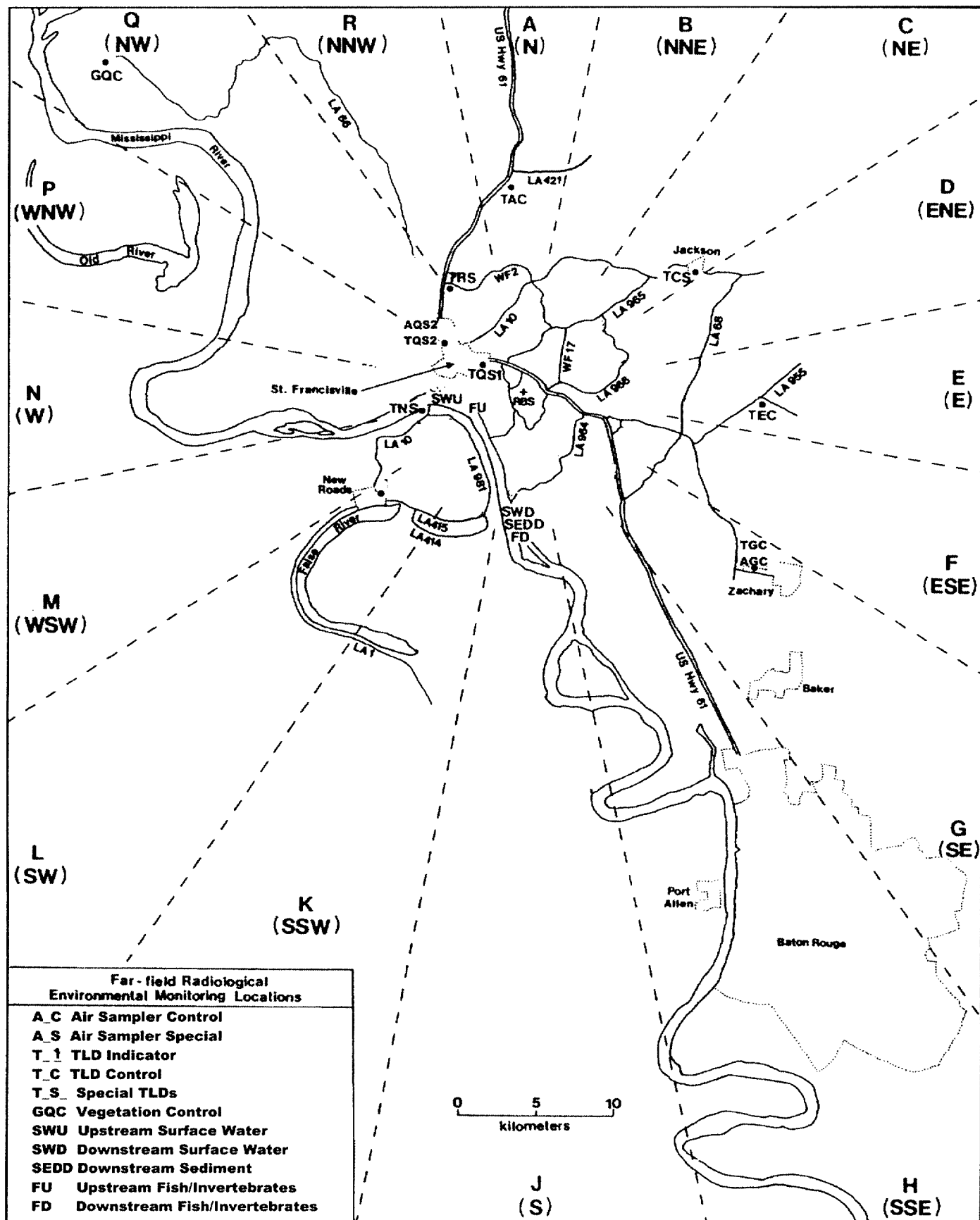


FIGURE 1-3
SAMPLE COLLECTION SITES-FAR FIELD



2.0 Interpretation and Trends of Results

2.1 Air Particulate and Radioiodine Sample Results

Iodine-131 was not detected in the radioiodine cartridges during 2003, as has been the case in previous years. Indicator gross beta air particulate results for 2003 were similar to preoperational and operational levels as seen below. Results are reported as annual average pCi/m³.

<u>Monitoring Period</u>	<u>Result</u>
Preoperational	0.030
2003	0.021
2002	0.020
2001	0.021
2000	0.020

Table 3.1 provides a comparison of the indicator and control location mean values, which further emphasizes that the airborne pathway continues to remain at background levels. Figure 2-2 also shows a comparison of indicator results versus control location data from 1986 to 2002. Six indicator results for 2003 were above the upper three sigma limit for control data. These results, from all indicator locations, range from 0.033 to 0.037 pCi/m³, with the upper 3-sigma control limit of 0.032. All six results were from the time period 9/2/03 to 10/13/03, typically the driest period of the year. Increased gross beta results are often experienced due to increased dust particulates in the air.

2.2 Thermoluminescent Dosimetry Sample Results

Gamma radiation dose in the reporting period compares to previous years and remains below preoperational levels. Figure 2-1 compares quarterly indicator results for 2003 with control location data from 1986 to 2002. All indicator results are below the upper control three-sigma limit.

RBS normalizes measured doses to 90 days and relies on comparison of the indicator locations to the control as a measure of plant impact. RBS's comparison of the inner ring and special interest area TLD results to the controls, as seen in Table 3.1, indicates that the ambient radiation levels are unaffected by plant operations. Therefore, levels continue to remain at or near background.

2.3 Water Sample Results

Analytical results for 2003 surface water and groundwater samples were similar to those reported in previous years.

Surface water samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides and tritium. Gamma radionuclides were below detectable limits at the indicator and control locations. Tritium was also below detectable limits at all locations. Listed below is a comparison of 2003 results from the indicator location as compared to the preoperational and operational years. Results are reported as annual average pCi/l.

<u>Radionuclide</u>	<u>2003</u>	<u>1996 – 2002</u>	<u>Preoperational</u>
Gammas	<LLD	<LLD	<LLD
Tritium	<LLD	258*	<LLD

* Average tritium value quantified less than LLD of 3000.

Groundwater samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides and tritium. Gamma radionuclides and Tritium were below detectable limits at the indicator and control locations. Listed below is a comparison of 2003 results from the indicator location as compared to the preoperational and operational years. Results are reported as annual average pCi/l.

<u>Radionuclide</u>	<u>2003</u>	<u>1996 – 2002</u>	<u>Preoperational</u>
Gammas	<LLD	<LLD	<LLD
Tritium	<LLD	290*	<LLD

* Tritium value quantified less than the LLD of 3000.

Based on these comparisons, the operation of RBS had no impact on this pathway during 2003, and levels of radionuclides monitored for this pathway continue to remain similar to those obtained in operational and preoperational years.

RBS personnel also collected special effluent wastewater samples from the wastewater treatment plant during 2003 to supplement the REMP. RBS did not detect any gamma radionuclides in these samples, which were analyzed to RBS TRM LLD requirements for water.

2.4 Sediment Sample Results

Sediment sample was collected from the indicator location in 2003 and analyzed for gamma radionuclides. Gamma radionuclide Cs-134 was below detectable limits, which is consistent with the preoperational and operational monitoring periods. Gamma nuclide Cs-137 was quantified in the down stream river shoreline sediment at 60.8 pCi/kg. This quantified result is less than the Cs-137 LLD of 180 pCi/kg. No reportable level of radioactivity concentrations is defined for environmental sediment samples in the RBS TRM. Additional sampling of river shoreline sediment was

performed with no Cs-137 activity detected. Therefore, based on these measurements, RBS operations had no significant radiological impact upon the environment or public by this pathway.

RBS personnel also collected special sediment samples from East Creek and West Creek during 2003 to supplement the REMP. RBS did not detect any gamma radionuclides in these samples, which were analyzed to RBS TRM LLD requirements for sediment.

2.5 Milk Sample Results

Milk samples were not collected during 2003 due to the unavailability of indicator locations within 5 miles (8 km) of RBS. Since there are no dairies within five miles of the RBS site, it is concluded RBS's operation had no impact on this pathway in 2003.

2.6 Fish and Invertebrate Sample Results

Fish samples were collected from two locations (indicator and control) and analyzed for gamma radionuclides. In 2003, gamma radionuclides were below detectable limits, which is consistent with the preoperational and operational monitoring periods. Therefore, based on these measurements, RBS operations had no significant radiological impact upon the environment or public by this pathway.

2.7 Food Product Sample Results

Food product samples were collected when available from two locations (indicator and control) in 2003 and analyzed for Iodine-131 and gamma radionuclides. The 2003 levels remained undetectable, which is consistent with previous operational years. Therefore, since levels continue to remain at background, it can be concluded that plant operations is not impacting this pathway.

2.8 Land Use Census Results

The last land use census was conducted during the 2002 growing season in accordance with RBS Technical Requirements Manual 3.12.2. Although there were some minor changes between the 2000 and 2002 census as seen in Table 2-1, the land use census did not identify any location(s) that yields a calculated dose or dose commitment greater than the values currently being calculated in requirement TSR 3.11.2.3.1. In addition, no dairy animals were found within 8 km of RBS during the 2002 census.

RBS personnel did not perform a garden census since Technical Requirements Manual 3.12.2 allows the routine sampling of broadleaf vegetation in the highest D/Q sector near the site boundary in lieu of the garden census.

2.9 Interlaboratory Comparison Results

RBS' Environmental Laboratory analyzed interlaboratory comparison samples to fulfill the requirements of Technical Requirements Manual 3.12.3. Attachment 1, 2003 Radiological Environmental Monitoring Report, contains these results. RBS's review of interlaboratory comparison results indicated that 98% of the sample results for accuracy were within the acceptable control limits of the three normalized deviations. For those sample results outside the acceptable control limits, RBS's review indicated no impact on previously reported data. Attachment 1 also provides additional discussion regarding sample results outside the acceptable control limits.

Table 2-1
Land Use Census Results
2002

Item	Sector	Direction	Nearest Residence	Range (km)	Nearest Milk Animal	Range (km)
1	A	N	5498 Hwy. 61 ¹	1.8	-	-
2	B	NNE	5435 Hwy. 61	1.6	-	-
3	C	NE	4549 Old Hwy. 61	1.4	-	-
4	D	ENE	12657 Powell Station Road	1.4	-	-
5	E	E	4737 Hwy. 61	2.2	-	-
6	F	ESE	12233 Star Hill Trace ²	2.8	-	-
7	G	SE	3213 Hwy. 964 ³	3.9	-	-
8	H	SSE	11813 Powell Station Road	1.7	-	-
9	J	S	11649 Powell Station Road	1.8	-	-
10	K	SSW	145 Waterloo Drive (Hwy. 981)	7.4	-	-
11	L	SW	2200 Lizzie Lane (Hwy. 415)	7.9	-	-
12	M	WSW	⁴ -	-	-	-
13	N	W	11101 Ferdinand Street	6.1	-	-
14	P	WNW	10426 Old Field Road	3.4	-	-
15	Q	NW	9666 Hwy. 965	1.3	-	-
16	R	NNW	Ricks Traylor Park, Hwy. 965	1.7	-	-

¹ New resident at the same range in sector A.

² New resident at a range of 2.8 km., compared to 2.9 km. in 2000 census, in sector F.

³ New resident at a range of 3.9 km., compared to 6.6 km. in 2000 census, in sector G.

⁴ No resident in sector M within 8 km. distance.

FIGURE 2-1
TLD Indicator Results (2003) Versus Control Data (1986-2002)

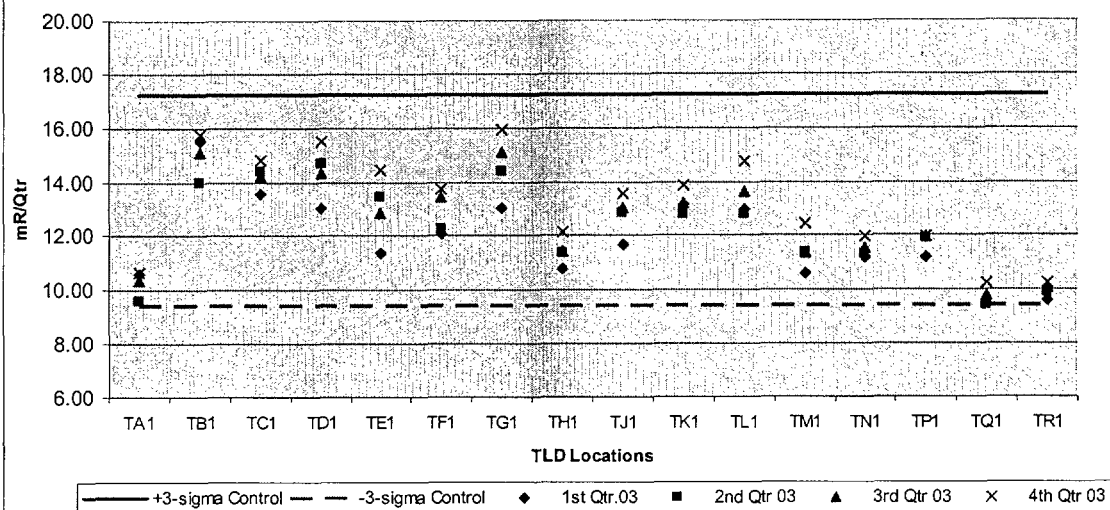
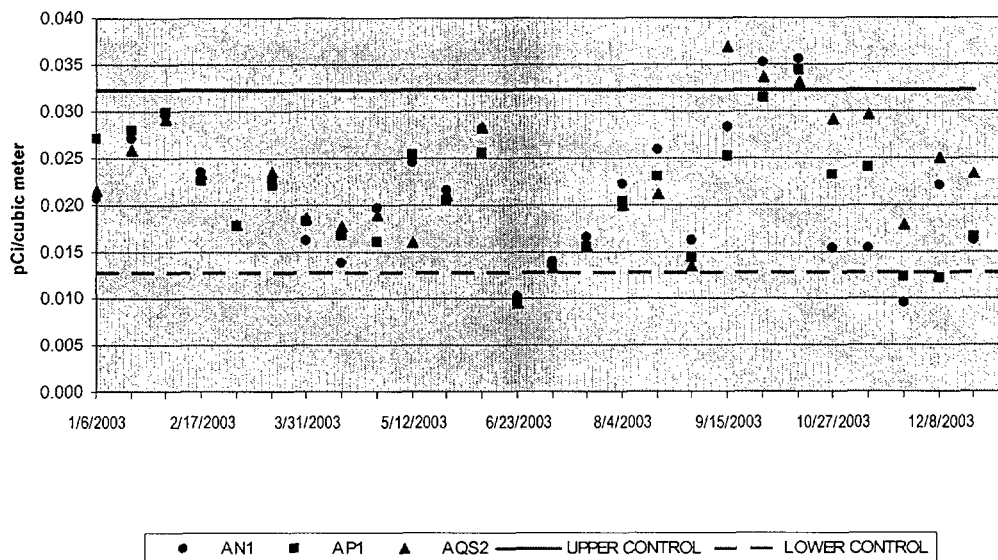


FIGURE 2-2
Gross Beta Indicator Results (2003) Versus Control Data (1986-2002)



3.0 Radiological Environmental Monitoring Program Summary

3.1 2003 Program Results Summary

Table 3.1 summarizes the 2003 REMP results. RBS 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: River Bend StationDocket No: 50-458Location of Facility: West Feliciana Parish, LouisianaReporting Period: January - December 2003

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)	Gross Beta 104	0.01	0.021 (78 / 78) [0.009 - 0.037]	AQS2 (5.8 km NW)	0.022 (26 / 26) [0.009 - 0.037]	0.023 (26 / 26) [0.009 - 0.039]	0
Airborne Iodine (pCi/m ³)	I-131 104	0.07	<LLD	N/A	N/A	<LLD	0
Indicators TLDs (mR/Qtr)	Gamma 64	(f)	12.50 (64 / 64) [9.42 – 15.92]	TB1 (0.5 km NNE)	15.07 (4 / 4) [13.96 – 15.72]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 24	(f)	13.18 (24 / 24) [10.69 – 14.97]	TGS (17.0 km SE)	15.20 (4 / 4) [14.95 – 15.50]	N/A	0
Control TLDs (mR/Qtr)	Gamma 8	(f)	N/A	N/A	N/A	14.53 (8 / 8) [12.76 – 14.83]	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: River Bend StationDocket No: 50-458Location of Facility: West Feliciana Parish, LouisianaReporting Period: January - December 2003

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 10	3000	<LLD	N/A	N/A	<LLD	0
	Gamma 10					<LLD	
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<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
	I-131	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: River Bend Station
 Location of Facility: West Feliciana Parish, Louisiana

Docket No: 50-458
 Reporting Period: January - December 2003

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/l)	H-3 4	3000	<LLD	N/A	N/A	<LLD	0
	Gamma 4					<LLD	
	Mn-54 15	15	<LLD	N/A	N/A	<LLD	0
	Co-58 15	15	<LLD	N/A	N/A	<LLD	0
	Fe-59 30	30	<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
	I-131 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
Shoreline Sediment (pCi/kg)	Gamma 1						
	Cs-134 150	150	<LLD	N/A	N/A	<LLD ^g	0
	Cs-137 180	180	60.8 ± 17.9	N/A	60.8 ± 17.9	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program SummaryName of Facility: River Bend StationDocket No: 50-458Location of Facility: West Feliciana Parish, LouisianaReporting Period: January - December 2003

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)	Gamma 3						
	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 8	60	<LLD	N/A	N/A	<LLD	0
	Gamma 8						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0
Special Sediment (East & West Creek) (pCi/kg)	Gamma 8						
	Cs-134	150	<LLD	N/A	N/A	N/A	0
	Cs-137	180	<LLD	N/A	N/A	N/A	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: River Bend Station
 Location of Facility: West Feliciana Parish, Louisiana

Docket No: 50-458
 Reporting Period: January - December 2003

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]		
Special Water (Wastewater Plant Effluent) (pCi/l)	Gamma 12						
	Mn-54	15	<LLD	N/A	N/A	N/A	0
	Fe-59	30	<LLD	N/A	N/A	N/A	0
	Co-58	15	<LLD	N/A	N/A	N/A	0
	Co-60	15	<LLD	N/A	N/A	N/A	0
	Zn-65	30	<LLD	N/A	N/A	N/A	0
	Zr-95	30	<LLD	N/A	N/A	N/A	0
	Nb-95	15	<LLD	N/A	N/A	N/A	0
	I-131	15	<LLD	N/A	N/A	N/A	0
	Cs-134	15	<LLD	N/A	N/A	N/A	0
	Cs-137	18	<LLD	N/A	N/A	N/A	0
	Ba-140	60	<LLD	N/A	N/A	N/A	0
	La-140	15	<LLD	N/A	N/A	N/A	0

^a I-131 = Iodine-131; H-3 = Tritium

^b LLD = Required lower limit of detection based on RBS Technical Requirements Manual Table 3.12.1-3.

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

^d Locations are specified (1) by name and (2) direction and distance relative to reactor site.

^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 RBS Technical Requirements Manual Table 3.12.1-3.

^g Control location for sediment is upstream surface water sample.

Attachment 1
2003 Radiological Monitoring Report
Summary of Monitoring Results

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Table 1.1

Sample Type: Air Particulate and Charcoal Cartridge – Indicator Location AN1

Analysis: Gross Beta and Iodine

Units: pCi/m³

LLD (pCi/m ³)			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20030002	12/23/2002	1/6/2003	< 0.008	0.021 +/-0.001
20030031	1/6/2003	1/20/2003	< 0.007	0.027 +/-0.001
20030060	1/20/2003	2/3/2003	< 0.007	0.030 +/-0.001
20030098	2/3/2003	2/17/2003	< 0.006	0.024 +/-0.001
20030140	2/17/2003	3/3/2003	< 0.006	0.018 +/-0.001
20030173	3/3/2003	3/17/2003	< 0.008	0.023 +/-0.001
20030235	3/17/2003	3/31/2003	< 0.007	0.016 +/-0.001
20030300	3/31/2003	4/14/2003	< 0.018	0.014 +/-0.002
20030338	4/14/2003	4/28/2003	< 0.006	0.020 +/-0.001
20030361	4/28/2003	5/12/2003	< 0.008	0.025 +/-0.001
20030395	5/12/2003	5/27/2003	< 0.007	0.021 +/-0.001
20030435	5/27/2003	6/9/2003	< 0.008	0.028 +/-0.002
20030519	6/9/2003	6/23/2003	< 0.008	0.010 +/-0.001
20030559	6/23/2003	7/7/2003	< 0.008	0.014 +/-0.001
20030623	7/7/2003	7/21/2003	< 0.010	0.017 +/-0.001
20030674	7/21/2003	8/4/2003	< 0.008	0.022 +/-0.001
20030712	8/4/2003	8/18/2003	< 0.009	0.026 +/-0.001
20030745	8/18/2003	9/2/2003	< 0.008	0.016 +/-0.001
20030811	9/2/2003	9/15/2003	< 0.011	0.028 +/-0.001
20030842	9/15/2003	9/29/2003	< 0.007	0.035 +/-0.001
20030881	9/29/2003	10/13/2003	< 0.008	0.036 +/-0.001
20030926	10/13/2003	10/27/2003	< 0.008	0.015 +/-0.001
20030980	10/27/2003	11/10/2003	< 0.007	0.015 +/-0.001
20031032	11/10/2003	11/24/2003	< 0.008	0.009 +/-0.001
20031082	11/24/2003	12/8/2003	< 0.007	0.022 +/-0.001
20031135	12/8/2003	12/22/2003	< 0.008	0.016 +/-0.001
Average:				0.021
Maximum:				0.036
Minimum:				0.009

Table 1.2

Sample Type: Air Particulate and Charcoal Cartridge – Indicator Location AP1

Analysis: Gross Beta and Iodine

Units: pCi/m³

LLD (pCi/m ³)			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20030001	12/23/2002	1/6/2003	< 0.007	0.027 +/-0.001
20030030	1/6/2003	1/20/2003	< 0.007	0.028 +/-0.001
20030059	1/20/2003	2/3/2003	< 0.007	0.030 +/-0.001
20030097	2/3/2003	2/17/2003	< 0.008	0.023 +/-0.001
20030139	2/17/2003	3/3/2003	< 0.006	0.018 +/-0.001
20030172	3/3/2003	3/17/2003	< 0.008	0.022 +/-0.001
20030234	3/17/2003	3/31/2003	< 0.008	0.018 +/-0.001
20030299	3/31/2003	4/14/2003	< 0.007	0.017 +/-0.001
20030337	4/14/2003	4/28/2003	< 0.007	0.016 +/-0.001
20030360	4/28/2003	5/12/2003	< 0.006	0.025 +/-0.001
20030394	5/12/2003	5/27/2003	< 0.007	0.021 +/-0.001
20030434	5/27/2003	6/9/2003	< 0.008	0.026 +/-0.001
20030518	6/9/2003	6/23/2003	< 0.006	0.010 +/-0.001
20030558	6/23/2003	7/7/2003	< 0.006	0.014 +/-0.001
20030622	7/7/2003	7/21/2003	< 0.007	0.016 +/-0.001
20030673	7/21/2003	8/4/2003	< 0.006	0.020 +/-0.001
20030711	8/4/2003	8/18/2003	< 0.008	0.023 +/-0.001
20030744	8/18/2003	9/2/2003	< 0.007	0.014 +/-0.001
20030810	9/2/2003	9/15/2003	< 0.007	0.025 +/-0.001
20030841	9/15/2003	9/29/2003	< 0.007	0.031 +/-0.001
20030880	9/29/2003	10/13/2003	< 0.007	0.034 +/-0.001
20030925	10/13/2003	10/27/2003	< 0.008	0.023 +/-0.001
20030979	10/27/2003	11/10/2003	< 0.006	0.024 +/-0.001
20031031	11/10/2003	11/24/2003	< 0.006	0.012 +/-0.001
20031081	11/24/2003	12/8/2003	< 0.006	0.012 +/-0.001
20031134	12/8/2003	12/22/2003	< 0.006	0.016 +/-0.001
Average:				0.021
Maximum:				0.034
Minimum:				0.010

Table 1.3

Sample Type: Air Particulate and Charcoal Cartridge – Indicator Location AQS2

Analysis: Gross Beta and Iodine

Units: pCi/m³

LLD (pCi/m ³)			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20030003	12/23/2002	1/6/2003	< 0.009	0.022 +/-0.001
20030032	1/6/2003	1/20/2003	< 0.008	0.026 +/-0.001
20030061	1/20/2003	2/3/2003	< 0.007	0.029 +/-0.001
20030099	2/3/2003	2/17/2003	< 0.008	0.023 +/-0.001
20030141	2/17/2003	3/3/2003	< 0.007	0.018 +/-0.001
20030174	3/3/2003	3/17/2003	< 0.009	0.024 +/-0.001
20030236	3/17/2003	3/31/2003	< 0.008	0.019 +/-0.001
20030301	3/31/2003	4/14/2003	< 0.008	0.018 +/-0.001
20030339	4/14/2003	4/28/2003	< 0.008	0.019 +/-0.001
20030362	4/28/2003	5/12/2003	< 0.008	0.016 +/-0.001
20030396	5/12/2003	5/27/2003	< 0.009	0.021 +/-0.001
20030436	5/27/2003	6/9/2003	< 0.008	0.028 +/-0.002
20030520	6/9/2003	6/23/2003	< 0.008	0.009 +/-0.001
20030560	6/23/2003	7/7/2003	< 0.008	0.013 +/-0.001
20030624	7/7/2003	7/21/2003	< 0.008	0.016 +/-0.001
20030675	7/21/2003	8/4/2003	< 0.006	0.020 +/-0.001
20030713	8/4/2003	8/18/2003	< 0.007	0.021 +/-0.001
20030746	8/18/2003	9/2/2003	< 0.008	0.013 +/-0.001
20030812	9/2/2003	9/15/2003	< 0.008	0.037 +/-0.002
20030843	9/15/2003	9/29/2003	< 0.007	0.034 +/-0.001
20030882	9/29/2003	10/13/2003	< 0.007	0.033 +/-0.001
20030927	10/13/2003	10/27/2003	< 0.007	0.029 +/-0.001
20030981	10/27/2003	11/10/2003	< 0.008	0.030 +/-0.001
20031033	11/10/2003	11/24/2003	< 0.008	0.018 +/-0.001
20031083	11/24/2003	12/8/2003	< 0.008	0.025 +/-0.001
20031136	12/8/2003	12/22/2003	< 0.007	0.023 +/-0.001
Average:				0.022
Maximum:				0.037
Minimum:				0.009

Table 1.4

Sample Type: Air Particulate and Charcoal Cartridge – Control Location AGC

Analysis: Gross Beta and Iodine

Units: pCi/m³

LLD (pCi/m ³)			0.07	0.01
LAB ID	START DATE	END DATE	I-131	GROSS BETA
20030004	12/23/2002	1/6/2003	< 0.006	0.023 +/-0.001
20030033	1/6/2003	1/20/2003	< 0.006	0.030 +/-0.001
20030062	1/20/2003	2/3/2003	< 0.007	0.030 +/-0.001
20030100	2/3/2003	2/17/2003	< 0.006	0.025 +/-0.001
20030142	2/17/2003	3/3/2003	< 0.008	0.019 +/-0.001
20030175	3/3/2003	3/17/2003	< 0.007	0.019 +/-0.001
20030237	3/17/2003	3/31/2003	< 0.006	0.015 +/-0.001
20030302	3/31/2003	4/14/2003	< 0.007	0.015 +/-0.001
20030340	4/14/2003	4/28/2003	< 0.006	0.020 +/-0.001
20030363	4/28/2003	5/12/2003	< 0.006	0.021 +/-0.001
20030397	5/12/2003	5/27/2003	< 0.005	0.018 +/-0.001
20030437	5/27/2003	6/9/2003	< 0.007	0.021 +/-0.001
20030521	6/9/2003	6/23/2003	< 0.006	0.009 +/-0.001
20030561	6/23/2003	7/7/2003	< 0.006	0.012 +/-0.001
20030625	7/7/2003	7/21/2003	< 0.005	0.016 +/-0.001
20030676	7/21/2003	8/4/2003	< 0.005	0.018 +/-0.001
20030714	8/4/2003	8/18/2003	< 0.007	0.021 +/-0.001
20030747	8/18/2003	9/2/2003	< 0.006	0.014 +/-0.001
20030813	9/2/2003	9/15/2003	< 0.007	0.039 +/-0.001
20030844	9/15/2003	9/29/2003	< 0.007	0.036 +/-0.001
20030883	9/29/2003	10/13/2003	< 0.007	0.035 +/-0.001
20030928	10/13/2003	10/27/2003	< 0.007	0.034 +/-0.001
20030982	10/27/2003	11/10/2003	< 0.006	0.033 +/-0.001
20031034	11/10/2003	11/24/2003	< 0.007	0.019 +/-0.001
20031084	11/24/2003	12/8/2003	< 0.006	0.023 +/-0.001
20031137	12/8/2003	12/22/2003	< 0.005	0.023 +/-0.001
Average:				0.023
Maximum:				0.039
Minimum:				0.009

Table 2.1
Sample Type: **Thermoluminescent Dosimeters**
Analysis: mR Exposure
Units: mrem/Qtr

Normalized Gamma-Ray Exposure Summary (mR)
Quarterly Environmental Thermoluminescence Dosimeter Results for Year 2003

<u>INDICATORS</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TA1	10.61	9.61	10.36	10.68	10.32
TB1	15.50	13.96	15.11	15.72	15.07
TC1	13.54	14.36	14.22	14.83	14.24
TD1	13.05	14.66	14.32	15.52	14.39
TE1	11.39	13.47	12.84	14.44	13.03
TF1	12.07	12.28	13.43	13.74	12.88
TG1	13.05	14.36	15.11	15.92	14.61
TH1	10.80	11.39	11.45	12.16	11.45
TJ1	11.68	12.88	13.04	13.55	12.78
TK1	13.15	12.78	13.23	13.84	13.25
TL1	12.95	12.78	13.63	14.73	13.52
TM1	10.61	11.39	11.35	12.46	11.45
TN1	11.19	11.29	11.55	11.96	11.50
TP1	11.19	11.89	11.95	11.96	11.75
TQ1	9.63	9.42	9.77	10.28	9.77
TR1	9.63	9.91	10.07	10.28	9.97
MAX	15.50	14.66	15.11	15.92	15.07
AVG	11.88	12.28	12.59	13.26	12.50
MIN	9.63	9.42	9.77	10.28	9.77
SPECIAL INTEREST					
<u>INTEREST</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TCS	11.68	11.69	11.85	12.56	11.94
TNS	11.64	11.59	11.95	12.95	12.03
TQS1	12.82	13.67	13.73	14.63	13.71
TQS2	11.93	11.69	11.85	12.75	12.06
TRS	13.71	14.06	14.32	14.34	14.11
TGS	15.50	14.95	15.01	15.33	15.20
MAX	15.50	14.95	15.01	15.33	15.20
AVG	12.88	12.94	13.12	13.76	13.18
MIN	11.64	11.59	11.85	12.56	11.94
CONTROLS					
<u>CONTROLS</u>	<u>1ST QTR</u>	<u>2ND QTR</u>	<u>3RD QTR</u>	<u>4TH QTR</u>	<u>MEAN</u>
TAC	15.00	14.06	15.71	15.82	15.15
TEC	12.76	13.37	14.72	14.83	13.92
MAX	15.00	14.06	15.71	15.82	15.15
AVG	13.88	13.72	15.21	15.33	14.53
MIN	12.76	13.37	14.72	14.83	13.92
	<u>INDICATOR</u>	<u>CONTROL</u>	<u>SPECIAL</u>		
MAX	15.92	15.82	15.50		
AVG	12.50	14.53	13.18		
MIN	9.42	12.76	11.59		

Table 3.1

Sample Type: **Surface Water**

Analysis: Gamma Isotopic and Tritium

Units: pCi/l

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
20030006	SWU	1/7/2003	< 6.18	< 3.52	< 10.40	< 5.76	< 11.80	< 4.27	< 8.86	< 6.22	< 4.71	< 5.03	< 16.60	< 3.18
20030007	SWD	1/7/2003	< 4.78	< 3.73	< 7.60	< 3.62	< 9.46	< 4.01	< 7.56	< 4.47	< 3.82	< 3.44	< 16.10	< 3.25
20030265	SWU	4/8/2003	< 4.73	< 5.28	< 10.02	< 5.22	< 7.45	< 4.56	< 8.89	< 4.28	< 6.87	< 3.63	< 21.09	< 7.38
20030266	SWD	4/8/2003	< 3.86	< 2.99	< 8.77	< 3.38	< 9.66	< 4.57	< 7.94	< 4.96	< 3.95	< 4.54	< 14.94	< 5.62
20030562	SWU	7/7/2003	< 3.08	< 6.38	< 11.16	< 6.14	< 13.91	< 4.20	< 9.99	< 5.94	< 4.77	< 4.49	< 12.71	< 4.37
20030563	SWD	7/7/2003	< 6.53	< 3.68	< 10.68	< 7.59	< 8.20	< 4.22	< 8.64	< 6.59	< 5.83	< 5.85	< 22.31	< 4.59
20030564	SWU DUP	7/7/2003	< 4.34	< 3.85	< 8.26	< 5.37	< 10.17	< 3.30	< 9.01	< 5.01	< 5.49	< 5.23	< 14.62	< 7.68
20030570	SWD DUP	7/7/2003	< 7.61	< 4.41	< 9.98	< 6.37	< 7.19	< 4.22	< 6.41	< 5.48	< 4.61	< 4.71	< 17.56	< 7.02
20030853	SWU	10/7/2003	< 3.67	< 4.25	< 7.46	< 4.24	< 9.50	< 4.46	< 6.02	< 2.90	< 4.08	< 4.72	< 10.41	< 4.80
20030855	SWD	10/7/2003	< 4.75	< 5.96	< 10.22	< 5.21	< 10.97	< 5.23	< 5.71	< 6.42	< 5.57	< 5.99	< 16.69	< 11.75

LLD (pCi/l)			3000	
LAB ID	LOCATION	DATE	TRITIUM	
20030006	SWU	1/7/2003	< 572.00	
20030007	SWD	1/7/2003	< 567.00	
20030265	SWU	4/8/2003	< 586.01	
20030266	SWD	4/8/2003	< 583.70	
20030562	SWU	7/7/2003	< 574.08	
20030563	SWD	7/7/2003	< 576.17	
20030564	SWU DUP	7/7/2003	< 572.57	
20030570	SWD DUP	7/7/2003	< 574.00	
20030854	SWU	10/7/2003	< 591.00	
20030856	SWD	10/7/2003	< 590.00	

Table 4.1

Sample Type: **Groundwater**

Analysis: Gamma Isotopic and Tritium

Units: pCi/l

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
20030496	WU	6/18/2003	< 4.62	< 4.86	< 10.60	< 3.95	< 8.57	< 7.11	< 6.94	< 4.73	< 5.32	< 6.98	< 20.56	< 6.49
20030497	WD	6/18/2003	< 4.58	< 4.21	< 8.92	< 3.95	< 9.57	< 6.15	< 4.95	< 4.22	< 4.12	< 3.38	< 21.74	< 6.38
20031129	WD	12/17/2003	< 3.66	< 5.54	< 11.25	< 4.33	< 10.61	< 6.46	< 8.53	< 5.40	< 4.21	< 4.46	< 21.09	< 6.38
20031262	WU	1/15/2004	< 5.45	< 4.71	< 10.84	< 6.90	< 11.61	< 7.73	< 9.33	< 5.87	< 6.41	< 7.34	< 18.88	< 6.88

LLD (pCi/l)			3000	
LAB ID	LOCATION	DATE	TRITIUM	
20030496	WU	6/18/2003	< 580.00	
20030497	WD	6/18/2003	< 582.00	
20031129	WD	12/17/2003	< 582.82	
20031263	WU	1/15/2004	< 568.63	

Table 5.1

Sample Type: **Shoreline Sediment**

Analysis: Gamma Isotopic

Units: pCi/kg, dry

LLD (pCi/kg)		150	180
LAB ID	DATE	CS-134	CS-137
20031102	12/8/2003	< 33.47	60.82 +/- 17.85

Table 6.1

Sample Type: **Food Products**

Analysis: Gamma Isotopic

Units: pCi/kg, wet

LLD (pCi/kg, wet)			60	60	80
LAB ID	LOCATION	DATE	I-131	CS-134	CS-137
20030041	GN1	1/22/2003	< 25.70	< 16.75	< 44.60
20030106	GQC	2/18/2003	< 18.30	< 37.30	< 35.80
20030317	GN1	4/22/2003	< 48.40	< 58.70	< 55.70
20030388	GQC	5/21/2003	< 47.10	< 45.20	< 39.50
20030626	GN1	7/21/2003	< 47.86	< 50.93	< 62.11
20030716	GQC	8/20/2003	< 30.63	< 39.48	< 26.72
20030910	GN1	9/21/2003	< 39.72	< 36.74	< 37.58
20031004	GQC	11/18/2003	< 22.72	< 28.55	< 25.73

Table 7.1

Sample Type: **Fish**

Analysis: Gamma Isotopic

Units: pCi/kg, wet

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
20031085	FU	12/8/2003	< 75.13	< 119.19	< 248.88	< 102.2	< 217.53	< 96.92	< 91.03
20031086	FD	12/8/2003	< 79.95	< 77.32	< 164.07	< 126.1	< 243.72	< 95.38	< 121.27
20031087	FD	12/8/2003	< 60.44	< 59.18	< 111.06	< 80.36	< 153.84	< 90.19	< 98.97

Table 8.1

Sample Type: **Sediments (Special)**

Analysis: Gamma Isotopic

Units: pCi/kg, dry

LLD (pCi/kg, dry)			150	180
LAB ID	DATE	LOCATION	CS-134	CS-137
20030160	3/12/2003	WEST CREEK	< 15.80	< 16.40
20030161	3/12/2003	EAST CREEK	< 10.40	< 9.62
20030664	6/26/2003	EAST CREEK	< 14.31	< 13.97
20030665	6/26/2003	WEST CREEK	< 23.04	< 28.51
20030749	9/2/2003	WEST CREEK	< 11.68	< 16.47
20030750	9/2/2003	EAST CREEK	< 12.59	< 13.75
20031242	12/31/2003	WEST CREEK	< 17.16	< 14.51
20031243	12/31/2003	EAST CREEK	< 12.38	< 13.63

Table 9.1

Sample Type: **Wastewater Treatment Plant Effluent (Special)**

Analysis: Gamma Isotopic

Units: pCi/l

LLD (pCi/l)		15	15	30	15	30	15	30	15	15	18	60	15
LAB ID	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
20030058	1/29/2003	< 6.91	< 4.99	< 8.77	< 5.56	< 7.62	< 5.38	< 8.49	< 4.68	< 5.59	< 6.53	< 20.80	< 5.36
20030121	2/26/2003	< 4.15	< 3.09	< 9.67	< 3.53	< 10.10	< 4.22	< 6.09	< 4.33	< 3.84	< 4.02	< 12.30	< 4.64
20030233	3/27/2003	< 4.51	< 4.05	< 8.79	< 3.36	< 7.62	< 3.91	< 8.78	< 4.07	< 4.10	< 3.78	< 13.84	< 3.46
20030341	4/30/2003	< 4.51	< 3.57	< 6.75	< 3.88	< 9.48	< 3.46	< 6.51	< 3.91	< 5.01	< 5.26	< 12.48	< 3.52
20030408	5/28/2003	< 5.08	< 3.00	< 4.09	< 3.64	< 10.20	< 31.50	< 5.43	< 4.15	< 3.18	< 4.02	< 11.32	< 5.49
20030546	6/30/2003	< 3.84	< 4.29	< 6.25	< 3.80	< 8.28	< 4.66	< 7.27	< 4.06	< 4.86	< 3.57	< 9.88	< 5.34
20030547	6/30/2003	< 6.00	< 4.27	< 10.98	< 4.98	< 11.68	< 4.52	< 5.53	< 4.96	< 5.45	< 3.93	< 16.09	< 3.74
20030666	7/31/2003	< 4.75	< 6.62	< 6.82	< 3.28	< 7.19	< 4.44	< 6.36	< 5.71	< 4.86	< 4.54	< 15.28	< 6.71
20030733	8/27/2003	< 3.75	< 3.84	< 7.28	< 3.87	< 10.25	< 4.25	< 6.82	< 4.44	< 4.15	< 4.98	< 16.89	< 5.13
20030825	9/23/2003	< 5.84	< 3.56	< 13.14	< 6.84	< 9.86	< 5.33	< 6.39	< 4.68	< 7.03	< 5.47	< 12.19	< 7.50
20030933	10/30/2003	< 3.99	< 3.56	< 7.31	< 4.75	< 7.01	< 4.05	< 6.81	< 3.88	< 3.59	< 2.32	< 11.47	< 4.72
20031048	11/26/2003	< 7.10	< 5.53	< 8.54	< 5.70	< 5.87	< 6.49	< 10.20	< 4.97	< 5.29	< 5.92	< 15.90	< 4.06
20031241	12/31/2003	< 1.36	< 3.88	< 7.40	< 3.90	< 7.01	< 3.61	< 8.20	< 4.35	< 4.76	< 4.99	< 14.68	< 5.45

Table 10.1

Sample Type: **Interlaboratory Comparison**

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

Sample Type (units)	Study	Date	Analysis	"Known" Value ^a	RBS Value	RBS N- DEV ^b	RBS N-RANGE ^c
Charcoal Cartridge (pCi/cartridge)	E3757-125	6/12/03	I-131	62.0 ± 10.7	62.3	0.09	0.095
Water (pCi/liter)	E3756-125	6/12/03	BETA	268 ± 69.6	224	-1.90	0.029
	E3755-125	6/12/03	CR-51	213 ± 36.9	210	-0.24	0.638
			MN-54	166 ± 28.8	177	1.17	0.107
			CO-58	83 ± 14.4	86	0.63	0.142
			FE-59	88 ± 15.2	96.3	1.64	0.201
			CO-60	118 ± 20.4	127	1.27	0.250
			ZN-65	162 ± 28.1	178	1.75	0.547
			I-131	81 ± 14	95.3	3.06 ^d	0.438
			CS-134	92 ± 15.9	90.7	-0.25	0.257
			CS-137	206 ± 35.7	218	1.01	0.057
			CE-141	253 ± 43.8	260	0.50	0.117
	E4034-125	12/11/03	H-3	2290 ± 397	2154	-1.03	0.500
Air Filter (pCi/filter)	E4032-125	12/11/03	BETA	28 ± 4.85	30.3	1.40	0.401
	E4035-125	12/11/03	CR-51	272 ± 47.1	260	-0.79	1.060
			MN-54	168 ± 29.1	173	0.52	0.180
			CO-58	107 ± 18.5	109	0.27	0.220
			FE-59	99 ± 17.2	107	1.34	0.180
			CO-60	150 ± 26	149	-0.08	0.320
			ZN-65	191 ± 33.1	200	0.82	0.220
			CS-134	132 ± 22.9	126	-0.74	0.080
			CS-137	126 ± 21.8	124	-0.32	0.141
			CE-141	196 ± 34	196	0.03	0.271
Sediment (pCi/gram)	E4033-125	12/11/03	CR-51	0.208 ± 0.036	0.201	-0.611	0.341
			MN-54	0.128 ± 0.022	0.126	-0.226	0.231
			CO-58	0.082 ± 0.014	0.075	-1.549	0.360
			FE-59	0.076 ± 0.013	0.074	-0.380	0.855
			CO-60	0.115 ± 0.020	0.111	-0.602	0.719
			ZN-65	0.146 ± 0.025	0.149	0.395	0.769
			CS-134	0.100 ± 0.017	0.099	-0.173	0.473
			CS-137	0.202 ± 0.035	0.203	0.057	0.205
			CE-141	0.149 ± 0.026	0.146	-0.387	0.674

Table 10.1

Sample Type: **Interlaboratory Comparison**Analysis: **Gamma Isotopic**

Sample Type (units)	Study	Date	Analysis	"Known" Value ^a	RBS Value	RBS N-DEV ^b	RBS N-RANGE ^c
Milk (pCi/liter)	E3758-125	6/12/03	CR-51	239 ± 41.4	230	-0.68	0.618
			MN-54	186 ± 32.2	192	0.59	0.095
			CO-58	93 ± 16.1	92.3	-0.12	0.191
			FE-59	99 ± 17.2	107	1.34	0.537
			CO-60	132 ± 22.9	141	1.22	0.134
			ZN-65	181 ± 31.4	189	0.80	0.261
			I-131	103 ± 17.8	97.7	-0.90	0.057
			CS-134	103 ± 17.8	101	-0.39	0.229
			CS-137	230 ± 39.8	234	0.33	0.077
			CE-141	283 ± 49	280	-0.20	0.146

NOTES:

- (a) The "known" values are listed with a range reflecting control (3 sigma) limits.
- (b) The normalized deviation from the "known" value is computed from the deviation and the standard error of the mean ± 2.000 is the warning limit and ± 3.000 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:

There was one result outside the control limits for accuracy in the 2003 cross check program participation studies. This result was in a gamma isotopic analysis of a water sample.

The result outside the control limits for accuracy was in the analysis of the nuclide I-131 in sample study E3755-125 of 6/12/2003. RBS normalized-deviation for the analysis was $+3.06$ with control limits of ± 3.00 . This slightly high bias result is considered conservative and is considered as having no impact on past results of the program. I-131 results were all within control limits in other cross check samples for the year; with normalized-deviation of 0.09 in charcoal cartridge analysis, and -0.90 in a milk sample analysis.