Nuclear Operating Company
South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

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U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498, STN 50-499
2013 Annual Environmental and Annual
Radiological Environmental Operating Reports

Pursuant to South Texas Project Unit 1 Operating License NPF-76 and Unit 2 Operating License NPF-80 Appendix B, Environmental Protection Plan (Non-radiological), and Technical Specification 6.9.1.3, the STP Nuclear Operating Company provides the attached 2013 Annual Environmental and Annual Radiological Environmental Operating Reports.

There are no commitments included in this report.

If there are any questions, please contact either Marilyn Kistler at (361) 972-8385 or me at (361) 972-8679.

Roger A. Aguilera
Manager,
Health Physics

MK

Attachment: 2013 Annual Environmental and Annual Radiological Environmental Operating Reports

STI: 33854805

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NRR

cc:
(paper copy)

Regional Administrator, Region IV
U. S. Nuclear Regulatory Commission
1600 East Lamar Boulevard
Arlington, TX 76011-4511

Balwant K. Singal
Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North (MS 8 B1)
11555 Rockville Pike
Rockville, MD 20852

NRC Resident Inspector
U. S. Nuclear Regulatory Commission
P. O. Box 289, Mail Code: MN116
Wadsworth, TX 77483

Jim Collins
City of Austin
Electric Utility Department
721 Barton Springs Road
Austin, TX 78704

Matagorda County Judge
Nate McDonald
1700 7th Street Rm 301
Bay City, Texas 77414

Commissioner Pct. 1
Daniel Pustka
2604 Nichols Road
Bay City, Texas 77414

Commissioner Pct. 3
James Gibson
1200 Perryman Ave.
Palacios, Texas 77465

Commissioner Pct. 2
Kent Pollard
Box 571
Matagorda, Texas 77457

Commissioner Pct. 4
David J. Woodson
Box 679
Blessing, Texas 77419

(electronic copy)

A. H. Gutterman, Esquire
Morgan, Lewis & Bockius LLP

Balwant K. Singal
U. S. Nuclear Regulatory Commission

John Ragan
Chris O'Hara
Jim von Suskil
NRG South Texas LP

Kevin Pollo
Cris Eugster
L. D. Blaylock
City Public Service

Peter Nemeth
Crain Caton & James, P.C.

C. Mele
City of Austin

Richard A. Ratliff
Texas Department of State Health Services

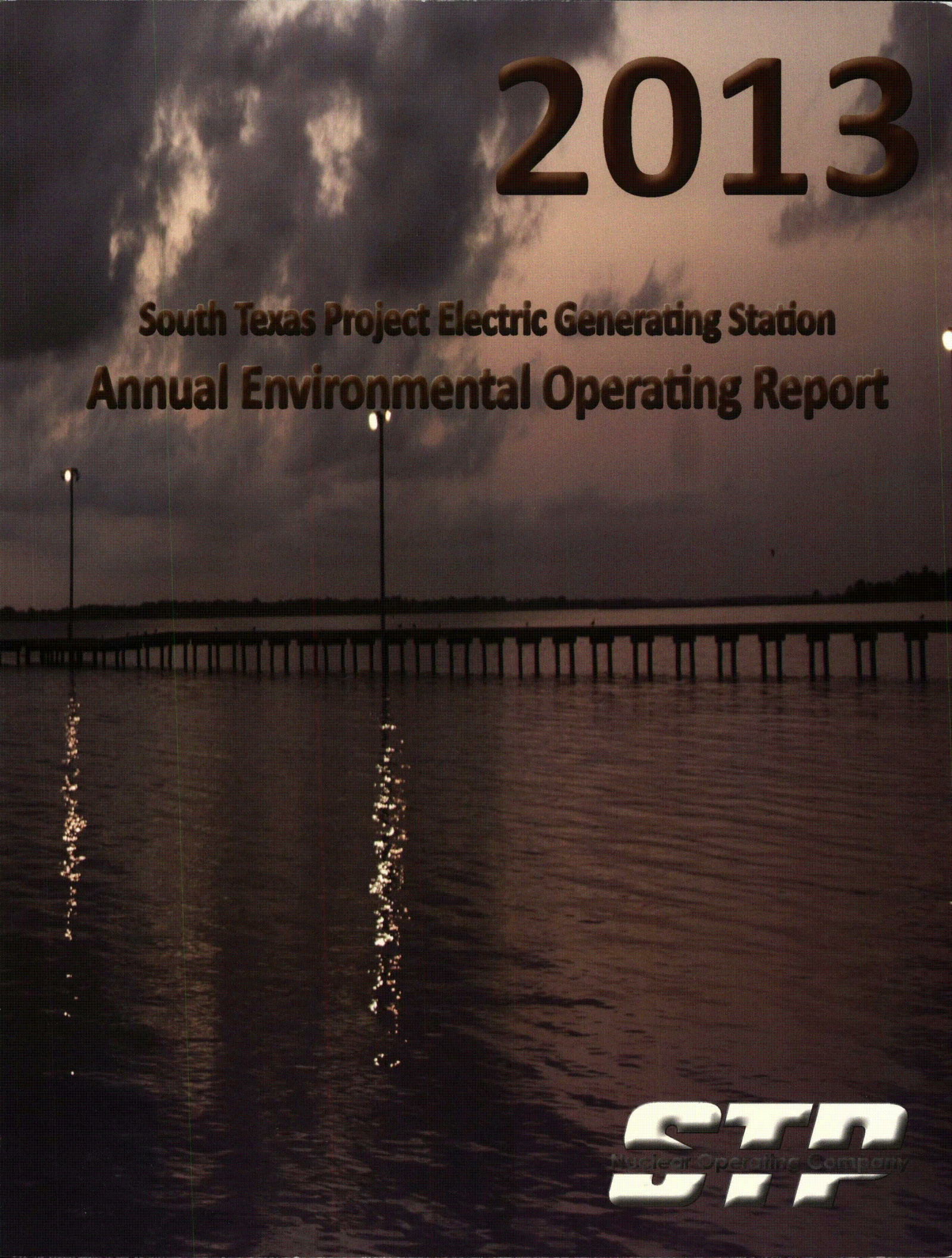
Robert Free
Texas Department of State Health Services

Attachment

South Texas Project

Units 1 and 2

2013 Annual Environmental and Annual Radiological Environmental Operating Reports


2013
South Texas Project Electric Generating Station
Annual Environmental Operating Report
STP
Nuclear Operating Company

The 2013 Annual Environmental Operating Report for the South Texas Project Electric Generating Station combines in one report the requirements for the Annual Environmental Operating Report (Nonradiological) found in Appendix B to Facility Operating License Nos. NPF-76 and NPF-80 and the requirements for the Annual Radiological Environmental Operating Report found in Part A of the station's Offsite Dose Calculation Manual.

Graphics and artwork performed by Barbara Carnley

Photography performed by: Susan Branson, Thomas Dennis, Mary Dykes, Frank Jacobus, Jodie Jankauskas, Haley Kruse, Kristy Moss, Bud Nosbisch, Gary Parkey, Aubrey Passafuma, Bill Sansing, Robyn Savage, Edna Simpsom-Kocurek, Sue Stacy, Elaine Steele, Tammy Stevens and STP Corporate Communications

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Maps provided by Janice Hopes and Vicki Maden

STP Nuclear Operating Company

Completed
in accordance with
Technical Specifications
for
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License Nos.
NPF-76 and NPF-80
April 2014

Authored by: Laura Stoicescu

Laura Stoicescu
Staff Health Physicist
Health Physics Division

and

Peggy Lofton Travis, J.D.
Environmental Supervisor
Regulatory Affairs

Technical Review: Kim Reynolds

Kim Reynolds
Staff Effluent Chemist
Chemistry Division

Approved by:

Roger A. Aguilera
Manager
Health Physics Division

2013

Annual Environmental

Operating Report

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION

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Photo By: Sue Stacy

Executive Summary

Photo By: Jodie Jankauskas

Chapter 1

Executive Summary

The South Texas Project continues to operate with no adverse effect on the population or the environment. The exposure for people living in the area remains at less than one millirem per year. Environmental programs at the site monitor known and predictable relationships between the operation of the South Texas Project and the surrounding area. These monitoring programs verify that the operation of the South Texas Project has no impact offsite and is well within state and federal regulations and guidelines. These programs are verified by the State of Texas through collection and analysis of samples and placement of the State's monitoring dosimeters and other onsite and offsite inspections.

This report describes the environmental monitoring programs, radiological and nonradiological, conducted at the South Texas Project during 2013. Included in this report are the Environmental Protection Plan Status, the results of the Radiological Environmental Monitoring Program, and the Land Use Census.

Nonradiological environmental monitoring is performed each year as part of the station's overall Environmental Protection Plan which is intended to provide for protection of nonradiological environmental values during station operations. Nonradiological monitoring encompasses, as a minimum, water quality, air quality, waste generation and minimization, and local aquatic and terrestrial ecological conditions. In 2013, nonradiological monitoring by the station confirmed that the South Texas Project's efforts to respect and protect local environmental conditions were successful. The South Texas Project continued to be rated by the Texas Commission on Environmental Quality as a high performer in the area of environmental compliance, continued to provide high-quality habitat areas for a variety of flora and fauna, and continued to have no indications of negative nonradiological impacts to local environmental conditions.

The environment within a 15-mile radius of the South Texas Project is routinely monitored for radiation and radioactivity. Sampling locations are selected using weather, land use, and water use information. Two types of sampling locations are used. The first type, control stations, are located in areas that are beyond the measurable influence of the South Texas Project or any other nuclear facility. The sample results from these stations are used to explain radiation from sources other than the South Texas Project. Indicator stations are the second type of stations. The samples from these stations measure any radiation contributed to the environment that could be caused by the South Texas Project. Indicator stations are located in areas close to the South Texas Project where any plant releases would be detected.

Prior to initial operation of the South Texas Project, samples were collected and analyzed to determine the amount of radioactivity present in the area. These results are used as a "preoperational baseline." Results from the indicator stations are compared to both current control sample results and the preoperational baseline values to determine if changes in radioactivity levels are attributable to station operations or other causes such as previous nuclear weapons testing programs and natural variations.

Radioactivity levels in the South Texas Project's environment frequently fall below the minimum detection capabilities of state-of-the-art scientific instruments. Samples with radiation levels that cannot be detected are below the Lower Limits of Detection. The United States Nuclear Regulatory Commission requires that equipment used for radiological monitoring must be able to detect specified minimum limits for certain types of samples. This ensures that radiation measurements are sufficiently sensitive to detect small changes in the environment. The United States Nuclear Regulatory

Commission also has a required reporting level. Licensed nuclear facilities must prepare a special report and increase their sampling if any measured radiation level is equal to or greater than this reporting level. No sample from the South Texas Project has ever reached or exceeded this reporting level.

Measurements made are divided into four categories, or pathways, based upon how the results may affect the public. Airborne, waterborne, ingestion, and direct radiation are the four pathways that are sampled. Each pathway is described below.

★ The airborne pathway is sampled in areas around the South Texas Project by measuring radioactivity of iodine and particulate air filters. The 2013 airborne results were similar to preoperational levels detecting only naturally occurring radioactive material unrelated to the operation of the South Texas Project.

★ The waterborne pathway includes samples taken from surface water, ground water, and drinking water. Also included in this pathway are sediment samples taken from the Main Cooling Reservoir and the Colorado River. Tritium was the only man-made nuclide consistently detected in water samples and was measured in the shallow aquifer, the Main Cooling Reservoir, ditches, and sloughs consistent with the South Texas Project Main Cooling Reservoir operating design. The levels of tritium found were near or lower than the concentration of the Main Cooling Reservoir. Additional onsite wells have been sampled to map tritium migration. The average tritium level in the Main Cooling Reservoir remained stable throughout 2013. Tritium levels remain well below United States Nuclear Regulatory Commission reporting limits and within United States Environmental Protection Agency drinking water standards. Previously detected plant-related nuclides, Cobalt-60 and Cesium-137, were also detected in the reservoir sediment this year at the designated sample locations. Several samples had detectable Cesium-137 which is present in the environment and was detected at preoperational concentrations. Onsite sediment samples continue to occasionally indicate traces of plant-related nuclides such as Cobalt-60. Offsite sediment samples continue to show no radioactivity from the South Texas Project. In summary, the station produces no detectable waterborne effects offsite.

★ The ingestion pathway includes broadleaf vegetation, agricultural products, and food products. Naturally occurring nuclides were detected at average environmental levels in the samples. The data indicated there were no man-made nuclides detected in these types of samples.

★ The direct exposure pathway measures environmental radiation doses using thermoluminescent dosimeters. These results are consistent with the readings from previous years and continue to show no effect from plant operations.

The South Texas Project continues to operate with no negative effect on the population or the environment. The dose for people living in the area is maintained at less than one millirem per year. Environmental programs at the site monitor known and predictable relationships between the operation of the South Texas Project and the surrounding area. These monitoring programs verify that the operation of the South Texas Project has no impact offsite and is well within state and federal regulations and guidelines. These programs are verified by United States Nuclear Regulatory Commission inspections, STP Nuclear Operating Company sponsored quality assurance audits, and the State of Texas through collection and analysis of samples and State radiation monitoring dosimeters.

Photo By: Jodie Jankauskas

Site and Area Description

Photo by: Sue Stacy

Chapter 2

Site and Area Description

The South Texas Project is located on 12,220 acres in Matagorda County, Texas, approximately 15 miles southwest of Bay City along the west bank of the Colorado River. The South Texas Project Electric Generating Station is owned by NRG South Texas LP, City of Austin, Texas, and City Public Service Board of San Antonio as tenants in common. Houston Lighting & Power Company was the original project manager of the South Texas Project and was responsible for the engineering, design, licensing, construction, startup, and initial commercial operation of the two-unit facility. In 1997, the STP Nuclear Operating Company assumed operational control of the South Texas Project and responsibility for implementation of associated environmental programs.

The South Texas Project has two Westinghouse pressurized water reactors. The rated core thermal power of each unit is 3,853 megawatts-thermal (MWt). Each unit was originally designed for a net electrical power output of 1,250 megawatts-electric (MWe). Unit 1 received a low-power testing license on August 21, 1987, achieved initial criticality on March 8, 1988, and was declared commercially operational on August 25, 1988. Unit 2 received a low-power testing license on December 16, 1988, achieved initial criticality on March 12, 1989, and was declared commercially operational on June 19, 1989. The combined units currently produce enough electricity to serve more than two million homes and businesses throughout Texas. With nearly 1,200 baseline employees, the STP Nuclear Operating Company is the largest employer and source of revenue for Matagorda County.

The South Texas Project initiated activities in 2008 to pursue renewal of the operating licenses for Units 1 and 2 from the United States Nuclear Regulatory Commission. The license renewal application was submitted to the United States Nuclear Regulatory Commission in October of 2010 to request authorization to operate the South Texas Project, Units 1 and 2, for an additional 20 years beyond the period specified in the current licenses. The Nuclear Regulatory Commission

Photo By: Robyn Savage

issued the final Supplemental Environmental Impact Statement for the license renewal in November of 2013. The final Supplemental Environmental Impact Statement was prepared in compliance with the National Environmental Policy Act. The process for preparation of the final supplemental impact statement included consultation with other applicable regulating agencies, review of information provided by the South Texas Project, the Nuclear Regulatory Commission's own independent environmental review and consideration of public comments received during the process.

In September of 2007, a Combined Construction and Operating License Application (COLA) was filed with the United States Nuclear Regulatory Commission to build and operate two additional units, Units 3 and 4, at the South Texas Project. Efforts continue to secure licensing for the two new units. Nuclear energy continues to provide long-term cost stability and promote energy independence. It is our nation's largest source of carbon-free energy. As we work collectively to secure our state's long-term energy future, nuclear energy will continue to play an important role as a safe and reliable supply of clean baseload electricity.

How the South Texas Project Works

Fossil-fueled and nuclear-powered steam generating plants operate on the same principle. Fuel is used to produce heat to convert water into high-pressure steam. The steam is directed through a turbine to turn a generator. In a fossil fuel plant, either coal, lignite, oil or natural gas is burned in a boiler to produce the heat. In a nuclear plant, the reactor replaces the boiler and the "fissioning" or splitting of uranium atoms inside the reactor produces the heat.

The fuel for a nuclear reactor is uranium. It is formed into cylindrical ceramic pellets, each about the size of the end of your little finger. One pellet has the energy potential of about a ton of coal. Millions of these pellets are stacked in fuel rods that are arranged into assemblies that make up the core of the reactor. The use of uranium allows us to conserve natural gas, oil and coal and to avoid the associated production of greenhouse gases.

The fission process and generation of usable heat begins in a nuclear reactor when control rods in the core are withdrawn. In pressurized water reactors, like those at the South Texas Project, the fuel rods heat water circulating in sealed, stainless steel piping that passes through large heat exchangers called steam generators. The water in the reactor is under pressure to prevent boiling. This is why the South Texas Project's Units 1 and 2 reactors are called "pressurized water reactors."

This hot, pressurized water heats a separate supply of water in the steam generators to produce steam that is directed through the blades of a turbine generator to produce electricity. The steam is then fed to a condenser where a separate supply of cooling water from the reservoir turns it back into water that is then pumped back to the steam generator for reuse. A diagram of the plant water systems is shown in Figure 2-1.

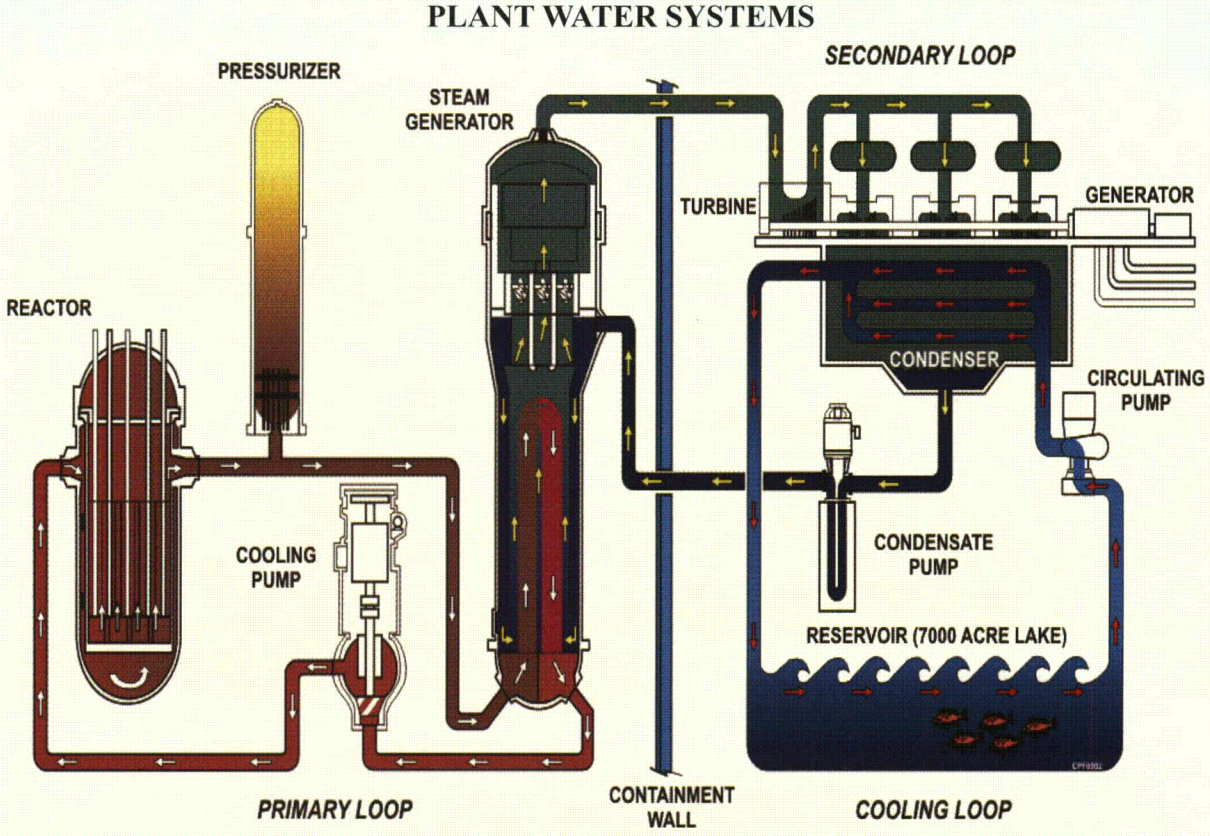


Figure 2-1

In addition to its safety systems, the South Texas Project has many built-in physical barriers that would prevent the release of radioactive materials in the unlikely event of an accident. The most visible ones are the 200-foot-tall, domed containment buildings with steel-reinforced concrete walls four feet thick. Inside each of these massive structures, two more concrete walls provide another 11 feet of shielding. The reactor vessel itself has steel walls six inches thick, and the fuel pellets inside it are sheathed in hardened metal tubes.

Nuclear energy has one of the lowest impacts on the environment. It is the most eco-efficient energy source because it produces the most electricity in relation to its minimal environmental impact. In 2012, the most recent year for which data is available, nuclear generation in the United States prevented 569.74 million metric tons of carbon dioxide, one million short tons of sulfur dioxide, and 0.47 million short tons of nitrogen oxide from entering the Earth's atmosphere.[1] In 2012, nuclear power plants generated approximately 64 percent of all clean-air electricity in the United States.[2] Additional information on nuclear energy and the environment can be found on the website maintained by the Nuclear Energy Institute at http://www.nei.org.

[1] Nuclear Energy Institute. Emissions Avoided by the U.S. Nuclear Industry. http://www.nei.org/Knowledge-Center/Nuclear-Statistics/Environment-Emissions-Prevented/Emissions-Avoided-by-the-US-Nuclear-Industry. May 2013.

[2] Nuclear Energy Institute. Environment: Emissions Prevented. http://www.nei.org/Knowledge-Center/Nuclear-Statistics/Environment-Emissions-Prevented. Viewed on March 4, 2014.

Photo courtesy of: STP Corporate Communications

The Plant Site

Sixty-five of the entire 12,220 acres at the South Texas Project are occupied by the two current power plants. Plant facilities include a 7,000-acre main cooling reservoir and a 47-acre essential cooling pond. Many smaller bodies of water onsite include wetlands, Kelly Lake, drainage ditches, sloughs, and depressions. Much of the land east of the cooling reservoir is leased for cattle grazing. Approximately 1,700 acres remain in a more natural state as a lowland habitat. A 110-acre wetland habitat area was established in 1996 on previously unused land located northeast of the power plants. The area surrounding the South Texas Project is characterized by coastal plain with farmland and pasture predominating. Local relief of the area is characterized by flat land, approximately 23 feet above sea level.

The Area

Matagorda County's economy is based primarily on ranching, farming, oil and natural gas production and refinement, petrochemical production, electricity generation, and commercial fishing and fisheries. The area within 10 miles of the site is generally rural and characterized as farmland, which is primarily pastureland used for livestock ranching. Although the surrounding area is heavily cultivated, significant amounts of woodlands, thicket, brush, fields, marsh, and open water exist to support wildlife. The area lies in the southern region of the central flyway and is host to an abundance of migratory birds. The local estuary environments provide the necessary habitat for a variety of fish types to complete their life cycles. The area also affords opportunity for recreational hunting and fishing.

The South Texas Project is home to many species of animals. Inhabitants include American alligators, ospreys, and several hundred deer. In winter, literally hundreds of thousands of waterfowl, principally migratory geese as well as white pelicans and the common tern, have found that the plant's 7,000-acre cooling reservoir provides a good resting place during their migrations.

The climate of the region is subtropical maritime, with continental influence. It is characterized by short, mild winters and long, hot and humid summers. Although drought conditions continued in Texas throughout 2013, rainfall normally ranges from about two inches per month in February peaking to about four to five inches per month in May, June, September and October. The prevailing wind direction is from the south-southeast, shifting to north-northeast for short intervals during the winter months.

Photo courtesy of: Jodie Jankauskas

Nonradiological Environmental Introduction and Summary

Photo By: Susan Branson

Chapter 3

Nonradiological Environmental Introduction and Summary

Nonradiological environmental conditions and performance at the South Texas Project during 2013 remained satisfactory and demonstrated that the South Texas Project continued to operate in an environmentally responsible manner during the year. The South Texas Project achieved and maintained high standards of environmental performance and compliance throughout 2013.

The South Texas Project is committed to the production of electricity in a safe, reliable, and economical manner using nuclear energy. The station's programs, policies, and business plan objectives also incorporate a commitment to environmental protection and management. The station's commitment to sound environmental management is illustrated by the following successes in 2013.

- ★ Continued classification as a high performer[3] by the Texas Commission on Environmental Quality based on the station's environmental compliance record in all areas considered, including water quality, waste management, and air quality compliance;

Photo By: Jodie Jankauskas

[3]Per Compliance History Report for CN601658669, RN102395654, Rating Year 2013; as prepared by the Texas Commission on Environmental Quality on March 20, 2014.

- ★ No regulatory non-compliances identified by outside regulatory agency inspections or audits; and,

- ★ A thirteen percent increase in the percentage of industrial, nonradioactive waste that was recycled or processed for reuse.

Everyone has a responsibility to protect the environment. Commitment to environmental safety is an integral component of the South Texas Project operating policy and core values. This responsibility reaches further than mere compliance with laws and regulations to encompass the integration of sound environmental practices into our daily operational and business decisions. The people at the South Texas Project understand the need to balance economic, operational and environmental issues for the benefit of the station and the public. We recognize our responsibility to hold ourselves to the highest principles of environmental stewardship for station activities.

Photo By: Jodie Jankauskas

Photo By: Haley Kruse

Nonradiological Environmental Operating Report

Photo By: Thomas Dennis

Chapter 4

ENVIRONMENTAL CONDITIONS

This section of the report describes the South Texas Project's nonradiological environmental program performance and environmental conditions from January 1 through December 31, 2013. The STP Nuclear Operating Company closely monitors environmental conditions and performance at the South Texas Project. NRG Energy, Inc. provides support and technical assistance to the South Texas Project. The Texas Commission on Environmental Quality conducted two onsite air quality permit compliance inspections and one offsite air quality compliance file review in 2013. No findings or violations were identified.

The Texas Commission on Environmental Quality rated the South Texas Project as a high performer in 2013 based on the station's environmental compliance record. Facilities, such as the South Texas Project, are classified by the state as a high performer, satisfactory performer, or unsatisfactory performer based on that facility's compliance history. The state's classification of the South Texas Project as a high performer was based on the station's environmental performance over the last five year period. In addition, the STP Nuclear Operating Company continued to participate in the Texas Commission on Environmental Quality CLEAN TEXAS program as a bronze-level member in 2013. This was the last year that the CLEAN TEXAS program was conducted by the state and it has since been discontinued.

The South Texas Project, along with other local industries and organizations, co-sponsored and participated in the annual Matagorda County Household Hazardous Waste Collection Day in the fall of 2013, and station employees also participated in other community area environmental projects such as the county's Matagorda County Beach Cleanup. During the period of this report, the station continued to promote many "green" initiatives, including a "Turn Off Lights" campaign for energy conservation, encouraging carpooling among employees, and the recycling of plastics and aluminum for site employees. The station also continued to support various bird counts and surveys in 2013 sponsored by federal and state agencies and volunteer organizations such as the annual National Audubon Society Christmas Bird Count, the Great Texas Birding Classic, and the United States Fish and Wildlife Service Colonial Waterbird Survey.

Photo By: Frank Jacobus

AQUATIC AND ECOLOGICAL MONITORING

The location of the South Texas Project falls within the Texas Land Resource Area designation as coastal prairie and can be divided into two broad ecological areas based on topography, soils, and vegetation. The bottomland lowland habitat is a swampy, marshy area that provides an important habitat for birds and other wildlife and occupies approximately 1,700 acres of the site near the Colorado River. A spoil impoundment constructed in 1972 by the United States Army Corps of Engineers is included in this area. In addition, a 110-acre wetland habitat area that attracts a variety of bird groups and other wildlife was established in 1996 on previously unused land located northeast of the power plants. In 2012, the Matagorda County chapter of Ducks Unlimited awarded the station the John Runnels Good Steward Award for maintenance of the wetland habitat area. The remaining area of the site offers diverse habitats for mammals and several types of birds. The South Texas Project regularly monitors the site's environs for changing conditions. Ecological conditions onsite in 2013 remained generally unchanged and satisfactory.

The South Texas Project is located on the state-sponsored Great Texas Coastal Birding Trail that spans the entire Texas Gulf Coast from Brownsville to the Louisiana border. Matagorda County, which includes the South Texas Project, consistently ranks at or near the top of the National Audubon Society's annual Christmas Bird Count for the number of species identified. Several bird species listed on the state and federal threatened or endangered species lists have been observed visiting the wetland habitat and elsewhere onsite. These include the bald eagle, peregrine falcon, wood stork, white-faced ibis, brown pelican and white-tailed hawk. Additional migratory and resident bird species such as a variety of ducks, geese, turkey and pelicans (both brown and white) have been observed during informal surveys of the site's diverse natural and man-made habitats. Intensive bird nesting continues throughout the lowland habitat, particularly in a heron rookery around the perimeter of Kelly Lake. U. S. Fish and Wildlife Service biologists estimate that approximately one-third of Texas' breeding adult Gull-billed Tern population, considered to be in decline, nest on the internal dikes of the Main Cooling Reservoir at the South Texas Project. The South Texas Project continues to provide vital habitat for more than an estimated 125 different species of wintering and resident birds.

Photo By: Robyn Savage

The South Texas Project continues to monitor important wildlife species to detect population changes. Informal observations by station and NRG Energy, Inc. personnel continue to indicate that the site provides high-quality habitat in which a wide range of animals live. The site continues to attract extensive wildlife populations, offering a refuge for resident species as well as seasonal migrants. The lowland habitat located between the Colorado River and the east bank of the Main Cooling Reservoir offers a significant source of water year-round. These natural resource areas, in concert with numerous additional wetland and grassland areas, offer the key ingredients necessary to sustain the extensive wildlife population at the South Texas Project.

WATER QUALITY MANAGEMENT

Water is an essential component in electricity production, and all electric utilities must comply with extensive federal, state and local water regulations. These regulations govern virtually every aspect of business operations at the South Texas Project. Water usage, wastewater treatment onsite and certain maintenance and repair activities are regulated under the Safe Drinking Water Act, the Federal Clean Water Act, and the Texas Water Quality Act. Collectively, these acts provide for the safeguarding of public drinking water supplies and maintaining the integrity of state and federal waters. Regulating agencies that administer these requirements include the United States Army Corps of Engineers, the United States Environmental Protection Agency, the Texas Commission on Environmental Quality, the Texas General Land Office and the Lower Colorado River Authority.

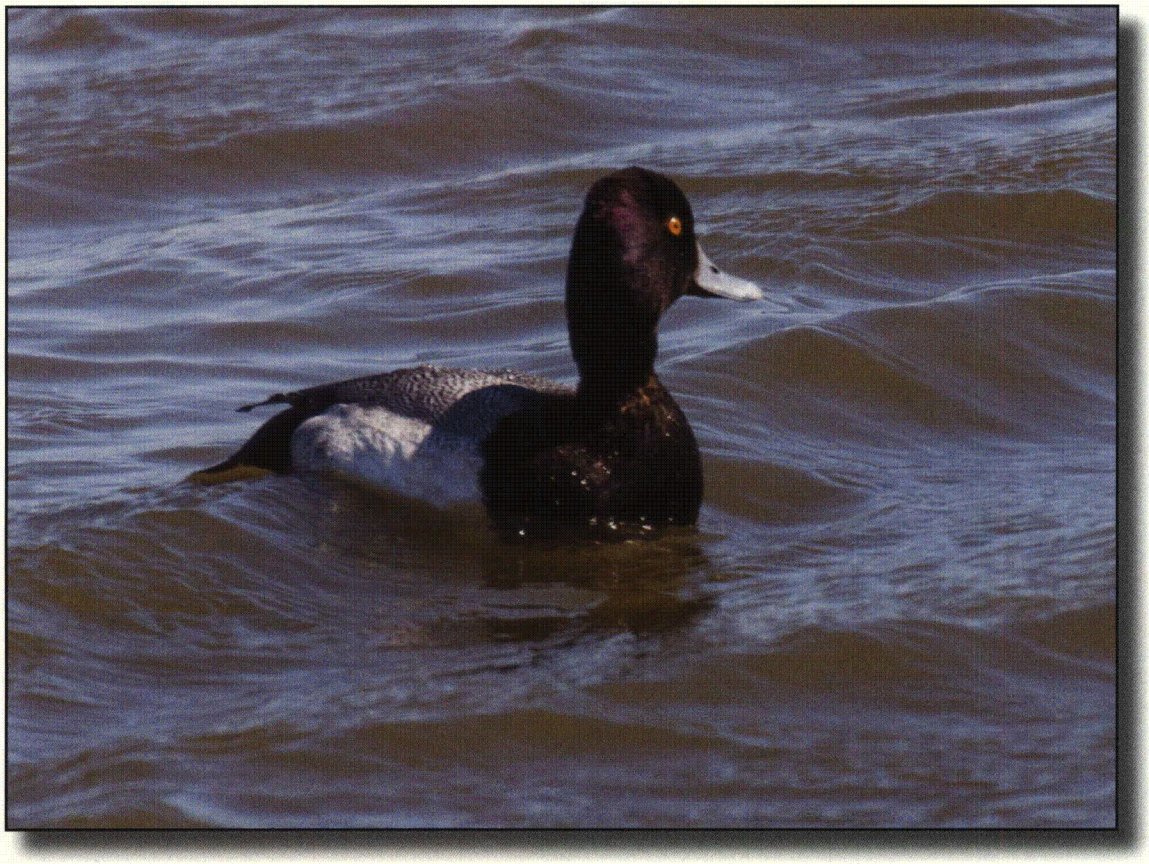


Photo By: Gary Parkey

The South Texas Project uses both surface water and groundwater for station purposes. Groundwater is pumped from deep aquifer wells to provide onsite drinking water for station personnel, to replenish the Essential Cooling Pond, and for other industrial purposes onsite. Consistent with the station's environmental principles encouraging efficient water usage and conservation, groundwater usage is carefully managed to conserve this important resource. Water from the Main Cooling Reservoir and the Essential Cooling Pond is used as cooling water for plant activities. Water from the Colorado River replenishes the Main Cooling Reservoir via intermittent pumping periods. Surface water diverted to the Main Cooling Reservoir from the Colorado River accounted for almost 97.5 percent of the water used at the South Texas Project in 2013. Information regarding water use in Texas can be found on the website maintained by the Texas Water Development Board at http://www.twdb.state.tx.us/.

Most of the water used by the South Texas Project is needed to condense steam and provide cooling for plant generating systems. The majority of this water is drawn from and returned to the station's Main Cooling Reservoir.

Photo By: Bill Sansing

The Main Cooling Reservoir is a 7,000-acre, above grade, off-channel reservoir capable of impounding 202,600 acre-feet of water at its maximum level. Water is diverted intermittently from the adjacent Colorado River to replenish the Main Cooling Reservoir. In addition, the Essential Cooling Pond, a 47-acre, below grade, off-channel reservoir that supplies water to cool crucial plant components, is capable of impounding 388 acre-feet of water. Various water rights permits, contractual agreements, and compliance documents authorize the South Texas Project to maintain these reservoirs, impound water diverted from the Colorado River, and to circulate, divert, and use water from the reservoirs for industrial purposes to operate the plant. These permits also limit the rate of diversion from the Colorado River. Although prolonged and widespread drought conditions during the year limited the amount of water available for diversion from the river, the South Texas Project diverted 44,018 acre-feet in 2013 from the Colorado River for Main Cooling Reservoir fill operations, mainly in the latter part of the year, while preserving adequate freshwater flow conditions for downstream bay and estuarine ecosystems. Approximately 2.5 percent, or 1,114 acre-feet, of the water used by the station was withdrawn from onsite groundwater sources in 2013.

Existing federal and state water quality standards are implemented and enforced through the Texas Pollutant Discharge Elimination System (TPDES) permit program to restore and maintain the state's waters. Under this permit program, the South Texas Project monitors, records, and

reports the types and quantities of pollutants from wastewater discharges to ensure that we meet or exceed the stringent levels set in the permit. A monthly monitoring report is submitted to the Texas Commission on Environmental Quality for wastewater discharges. Reports identifying ground and surface water use are submitted annually to the Texas Water Development Board. Reports of diversion and consumptive use are submitted to the Texas Commission on Environmental Quality. An annual groundwater use report is also submitted to the Coastal Plains Groundwater Conservation District.

Wastewater generated at the South Texas Project is processed and discharged to the onsite Main Cooling Reservoir to be re-used by the station as cooling water for plant systems. No water was discharged from the reservoir in 2013. Station conditions neither required site aquatic monitoring studies be conducted in 2013, nor were any additional studies required by the United States Environmental Protection Agency or the State of Texas either by way of station discharge permits or otherwise. Wastewater discharges met state and federal water quality standards during the year, while conserving and maximizing efficient water usage at the station.

In addition to the wastewater discharge permit program, the Federal Clean Water Act, as amended, requires permits for storm water discharges associated with industrial activity. The South Texas Project Storm Water Pollution Prevention Plan ensures that potential pollution sources at the site are evaluated and that appropriate measures are selected and implemented to prevent or control the discharge of pollutants in storm water runoff. This plan is a working document that is revised whenever there is a change in design, construction, operation, or maintenance that has a significant effect on the potential for the discharge of pollutants from the station.

Following a severe drought in 1996, the Texas Legislature recognized the need to address a wide range of state water resource management issues. In 1997, the Texas Senate drafted legislation known as Senate Bill 1 to address these issues and to develop a comprehensive state water policy. Towards this end, this legislation required that the Texas Water Development Board create a statewide water plan that emphasizes regional planning. Sixteen planning regions were created, each tasked to prepare a regional plan for the orderly development, management, and conservation of water resources. The South Texas Project was chosen to represent the electric generating utility interest for the water-planning region, Region K, encompassing the lower Colorado River Basin. A state water plan is prepared by the Texas Water Development Board based on the regional water plans that are developed every

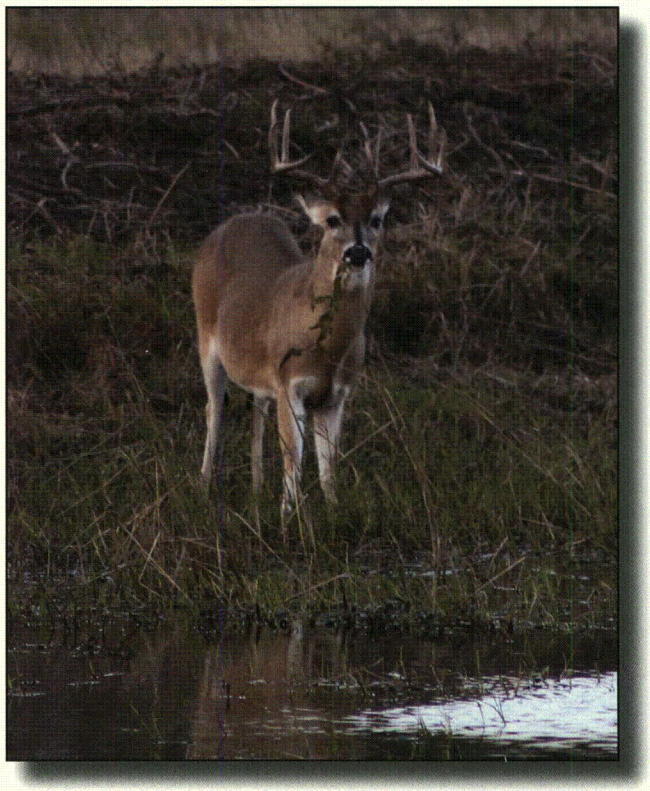


Photo By: Bud Nosbisch

five years by the regional water planning groups. The fourth cycle of regional and state water planning commenced in 2011 and will extend through 2016. For the fourth cycle of regional planning, the 2010 U.S. Census data will be used as the basis for revision of the regional water plans including the associated population and water demand projections, water supply analyses, and water management strategies for a water planning horizon out to the year 2070. The South Texas Project continues to actively participate in the Lower Colorado Regional Water Planning Group to identify strategies to meet future water supply demand projections for the region and update the existing plan accordingly. Additional information regarding regional water planning in Texas can be found on the website maintained by the Texas Water Development Board at http://www.twdb.state.tx.us/.

Photo By: Edna Simpson-Kocurek

Senate Bill 1 also required groundwater conservation districts to develop groundwater management plans with estimates on the availability of groundwater in the district, details of how the district would manage groundwater, and management goals for the district. The water planning and management provisions were further clarified in 2001 with the enactment of Senate Bill 2. Accordingly, the Coastal Plains Groundwater Conservation District, encompassing Matagorda County, was confirmed by local election in late 2001. The purpose of the District is to "...manage and protect the groundwater resources of the District." The South Texas Project groundwater wells are registered with the Coastal Plains Groundwater Conservation District. Station personnel continue to monitor onsite groundwater usage according to the requirements of the District's rules. Additional information regarding the Coastal Plains Groundwater Conservation District can be found on their website at http://www.coastalplainsgcd.com/.

In 2007, in further recognition of the importance of water conservation to meet future demands in the state, Senate Bill 3, enacted by the Texas Legislature, created a stakeholder-driven process for the development of environmental flows. Environmental flows are the amount of water necessary for a river, estuary, or other freshwater system to maintain its health and productivity. The law established a process to develop environmental flow regime recommendations for each major river basin in Texas. The process tasked a team of stakeholders for each area of the state, working with a science team, to develop a set of recommendations to submit to the Texas Commission on Environmental Quality. The South Texas Project participated as a member of the stakeholder committee that included the Colorado River and Matagorda Bay. In August of 2011, the stakeholder committee recommendations for the Colorado River Basin were submitted to the Texas Commission on Environmental Quality. The commission, after considering these recommendations along with public input, adopted formal environmental flow standards that must be maintained. The environmental flow standards set flow levels at various points in rivers and streams to protect water in the rivers and estuaries along the coast. As a follow up to the initial flow recommendations, the stakeholder committee submitted a Draft Work Plan to the Texas Commission on Environmental Quality in June of 2012. The Draft Work Plan addresses additional efforts needed for research and data development to support a planned review of the environmental flow standards in 2021. In 2013, the stakeholder committee evaluated

and recommended additional environmental studies for the Matagorda Bay and Estuaries and subsequently submitted this recommendation to the Texas Water Development Board for approval and funding. The existing South Texas Project surface water diversion right is not impacted by this legislation. Additional information regarding environmental flows can be found at http://www.tceq.texas.gov/permitting/water_supply/water_rights/eflows/.

In January 2010, the Texas Commission on Environmental Quality approved a revised Lower Colorado River Authority Water Management Plan. The Water Management Plan determines how water is allocated from the Highland Lakes (specifically, Lakes Travis and Buchanan) to meet the needs of water users, including the South Texas Project, during water supply shortages. As part of the of January 2010 approval of the revised Water Management Plan, the Texas Commission on Environmental Quality directed the Lower Colorado River Authority to file an application to revise the Water Management Plan no later than July of 2013. To assist with this update, the Lower Colorado River Authority assembled an advisory committee to represent the diverse interests that rely on the Highlands Lakes water supply. The advisory committee included representatives from cities, industry, lake area business and residents, the environment and agriculture. The advisory committee started in July 2010 and completed its recommendations in late 2011. The South Texas Project represented industrial firm water customers on the advisory committee. Recommendations by the advisory committee to be incorporated into a revised Water Management Plan include, among other things, use of two trigger points during the year (January 1 and June 1) to determine how much stored water from the lakes would be available for agriculture instead of one trigger point on January 1. The Lower Colorado River Authority Board of Directors approved the revised plan February of 2012. It was then sent to the Texas Commission on Environmental Quality for final approval. The plan remains under technical review by the Texas Commission on Environmental Quality. Additional information on the Water Management Plan can be found at http://www.lcra.org.

In 1999, the South Texas Project developed, submitted and implemented an initial station Water Conservation Plan in accordance with state water use regulations. The purpose of the station's Water Conservation Plan is to identify and establish principles, practices, and standards to effectively conserve and efficiently use available water supplies and provide historical and projected average industrial water demand. Annual implementation reports are submitted to the Texas Water Development Board. The South Texas Project personnel understand that the water resources of the state are a critical natural resource requiring careful management and conservation to preserve water quality and availability. Accordingly, the station continues to explore and support efforts focusing on the efficient use of water resources and reduction of water waste.

Photo By: Aubrey Passafuma

AIR QUALITY MANAGEMENT

Air emission sources at the South Texas Project fall under the scope of air pollution regulations promulgated under the Texas Clean Air Act and the Federal Clean Air Act and the numerous associated amendments. The purpose of these regulations is to protect air resources from pollution by controlling or abating air pollution and emissions. The South Texas Project uses small amounts of fossil fuel for backup and emergency equipment. Regulated emission sources at the South Texas Project include a fossil-fuel boiler, diesel-powered emergency generators and fire pumps, fire-fighting training, and other minor maintenance equipment and activities. The station submits a report of air emissions annually to the Texas Commission on Environmental Quality. In 2013, one excess opacity event occurred for less than 16 minutes at the station and was reported to the Texas Commission on Environmental Quality. This event was associated with visible emissions resulting from a transformer fire that occurred in January of 2013. No visible emissions were released offsite.

The South Texas Project has one fossil fuel-fired auxiliary steam boiler available to furnish steam for plant use when steam is not available from the nuclear steam supply system. In addition to the auxiliary steam boiler, a number of fossil-fueled diesel generators are located onsite. These diesels are designed to provide emergency power to various plant systems or buildings in the event of a loss of power. This equipment is not normally needed for daily operations and the station does not use it to produce electricity for distribution. Routine maintenance runs are conducted to ensure availability if needed and for equipment maintenance.

Photo By: Gary Parkey

In 1990, amendments to the Federal Clean Air Act mandated a permitting program to clearly define applicable air quality requirements for affected facilities such as the South Texas Project. This program is commonly known as the Title V Federal Operating Permit Program and is administered by the state. The station's Federal Operating Permit grants authority to operate identified emission sources at the station in accordance with applicable permit and regulatory requirements. The Federal Operating Permit for the station was revised in 2013 to incorporate new regulations associated with reciprocating internal combustion engines and other minor changes. Two deviations associated with gaps in a continuous electronic strip chart record of auxiliary boiler flue gas content that occurred when the electronic recorder failed to transfer data were reported to the Texas Commission on Environmental Quality. No emission limits were exceeded. The Texas Commission on Environmental Quality conducted two onsite inspections and one offsite file review in 2013 for compliance with applicable requirements for air quality as identified in the station's Federal Operating Permit. No findings or violations were identified.

Unlike conventional electrical generating stations, nuclear power plants do not burn fossil fuel for production of electricity. Therefore, the South Texas Project produces virtually no greenhouse gases or other air pollutants that are the typical by-products of industrial production processes. The use of emissions-free nuclear power is a significant contributor to the preservation of our community's clean air resources.

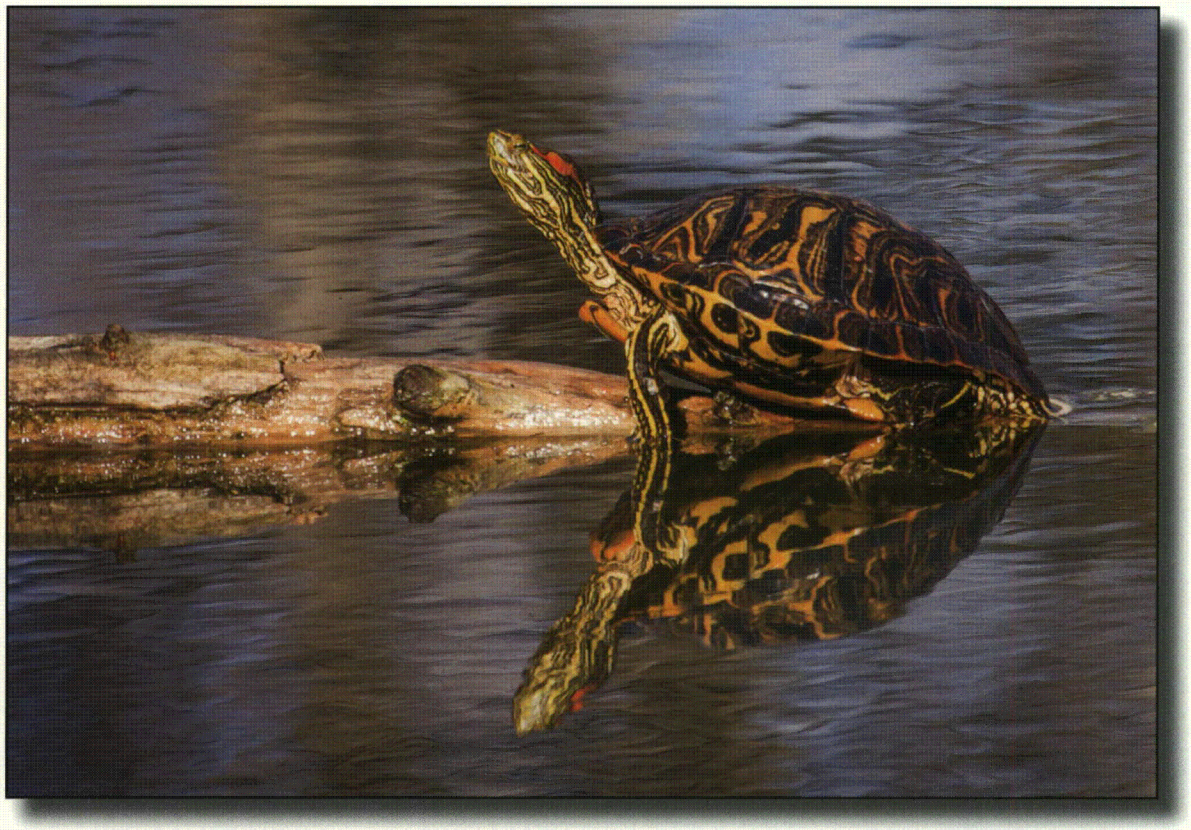


Photo By: Gary Parkey

NONRADIOACTIVE WASTE MANAGEMENT

Solid waste management procedures for hazardous and non-hazardous wastes generated at the South Texas Project ensure that wastes are properly dispositioned in accordance with applicable federal, state, and local environmental and health regulations. By regulatory definition, solid waste includes solid, semi-solid, liquid, and gaseous waste material. The Texas Commission on Environmental Quality, which administers the Texas Solid Waste Disposal Act and also the federal Resource Conservation and Recovery Act program, is the primary agency regulating nonradioactive wastes generated at the South Texas Project. The Texas Commission on Environmental Quality regulates the collection, handling, storage, and disposal of solid wastes, including hazardous wastes. The transportation of waste materials is regulated by the United States Department of Transportation.

The South Texas Project is classified as a small quantity generator of industrial solid wastes. Texas Commission on Environmental Quality regulations require that industrial solid wastes generated at the South Texas Project be identified to the Commission. These are listed in the Texas Commission on Environmental Quality Notice of Registration for the South Texas Project. The registration is revised whenever there is a change in waste management practices at the site. Hazardous waste and Class I non-hazardous waste handling and disposal activities are summarized and documented in a waste summary report for the South Texas Project that is submitted annually to the Texas Commission on Environmental Quality.

Hazardous waste accumulation at the South Texas Project in 2013 was limited to a maximum holding period of 180 days. The Resource Conservation and Recovery Act and Texas Solid Waste Disposal Act also requires the use of proper storage and shipping containers, labels, manifests, reports, personnel training, a spill control plan, and an accident contingency plan. Plant personnel routinely inspect areas throughout the site to ensure wastes are not stored or accumulated inappropriately.

Photo By: Mary Dykes

Station policies and regulations encourage the recycling, recovery, or reuse of waste when possible to reduce the amount of waste generated or disposed of in landfills. Approximately 87 percent, an increase of 13 percent over the past year, of the industrial nonradioactive waste generated in 2013 at the South Texas Project was recycled or processed for reuse. (Reference Figure 4-1) Used oil, diesel fuels,

electro-hydraulic fluid and used oil filters are sent to a recycling vendor for reprocessing. Empty polyethylene drums are returned, when possible, to the original manufacturer for reuse. Non-hazardous blast grit and construction debris were also shipped for recycle in 2013. Site recycling programs for cardboard, paper, aluminum and plastic result in the collection of several tons of material each year. In 2013, the station collected more than 23 tons of cardboard, more than 7 tons of paper, slightly less than 1 ton of aluminum and more than 6 tons of plastic for recycling. In addition, approximately 48 tons of scrap metal were removed from the station for recycle in 2013. Recycling efforts in 2013 also included almost 1 ton of printer cartridges returned for recycling. The station continues to explore new areas where recycling may be expanded or initiated.

Nonradioactive solid waste that cannot be shipped for recycling is shipped for disposal. Municipal-type trash is transported to an offsite landfill. Hazardous waste accounts for only a small portion of the waste generated at the South Texas Project; however, minimization and reduction of hazardous waste generation where feasible remains an important goal at the station. Changes in the amount of hazardous waste shipped each year generally reflect differences in operation and maintenance activities that result in the generation of hazardous waste. The increase in the amount of hazardous waste shipped in 2013 is attributable to increased solvent use associated with electrical generator cleaning activities conducted during the year. Successful waste minimization and source reduction efforts by employees have allowed the South Texas Project to remain classified as a small-quantity generator since 2004. (Reference Figures 4-2 and 4-3)

Photo By: Gary Parkey

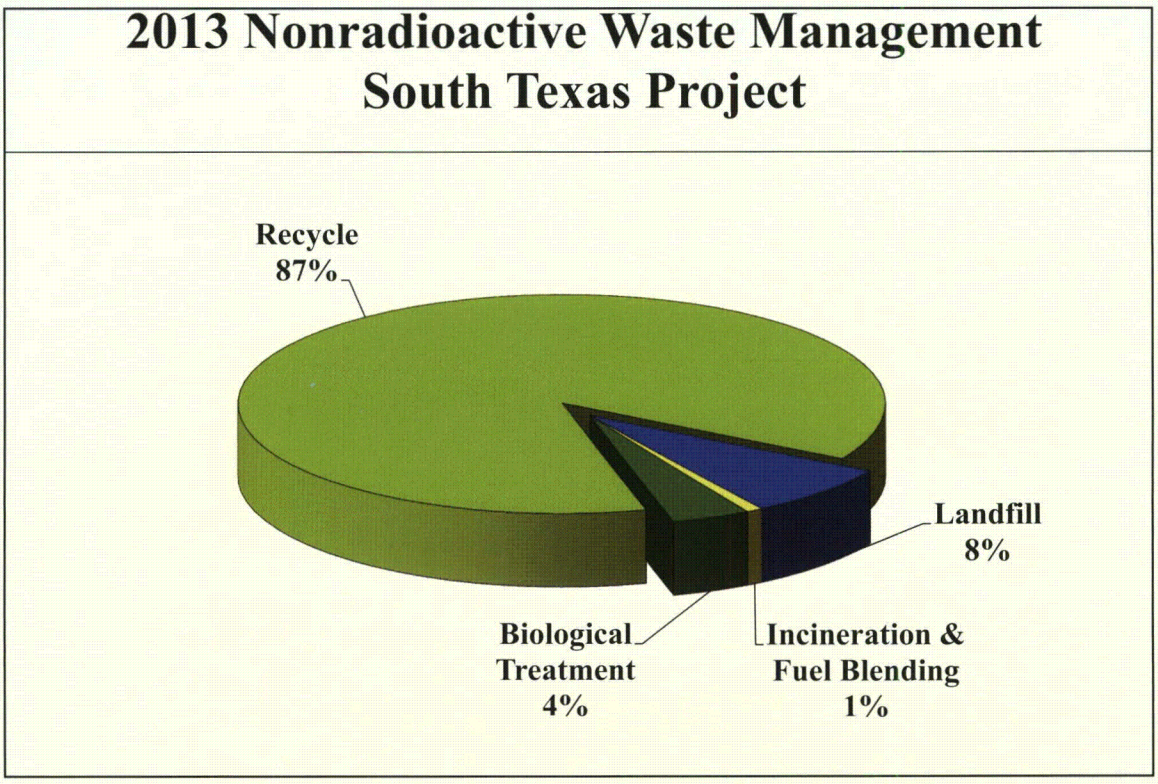


Figure 4-1

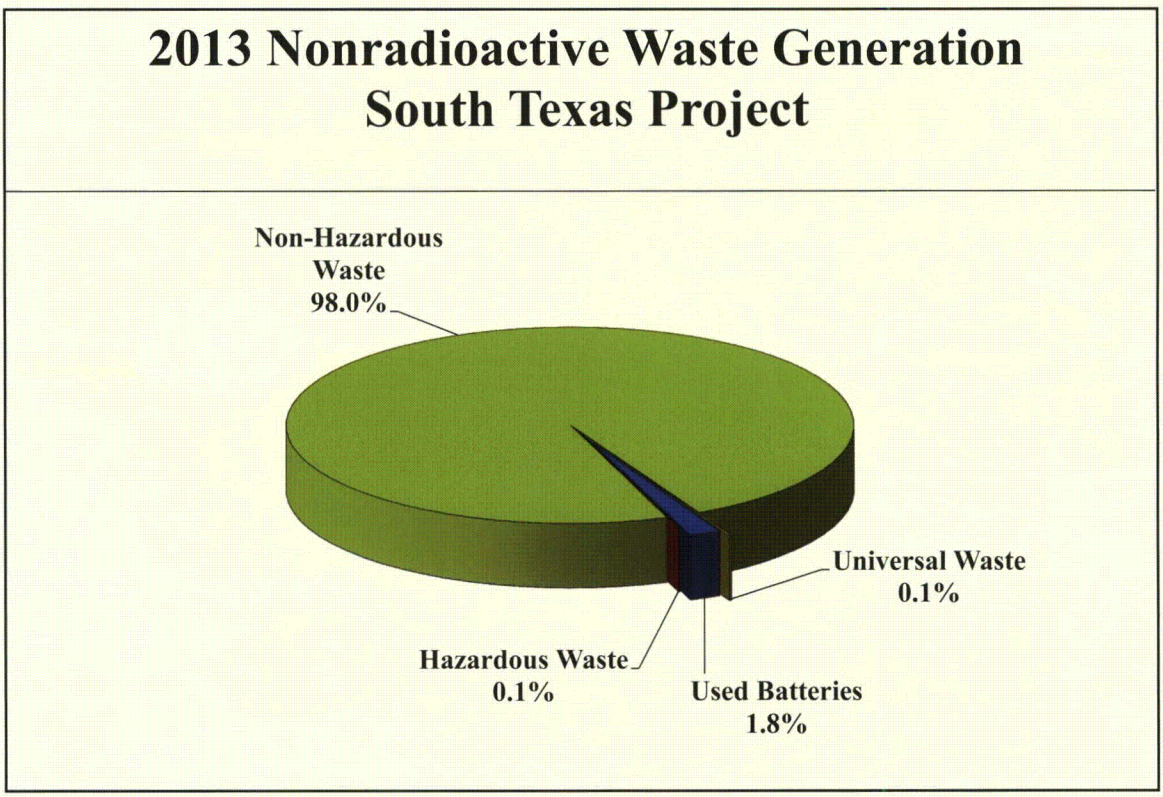


Figure 4-2

Figure 4-3

CHEMICAL CONTROL AND MANAGEMENT

The station's Integrated Spill Contingency Plan for the South Texas Project Electric Generating Station, updated and recertified in 2009, consolidates multiple federal and state requirements into one plan. The plan is implemented through standard site operating procedures and guidelines. The South Texas Project uses standard operating procedures, policies, and programs to minimize the generation of waste materials, control chemical use, and prevent spills. The South Texas Project also evaluates chemicals and products proposed for use at the station. Site procedures that implement the station's Integrated Spill Contingency Plan and the station's Chemical Control Program, which replaced the station's former expendable material program in 2013, address the evaluation, storage, use, labeling, spill control, and disposal requirements of chemicals. These guidelines also assist in reducing waste generation, ensuring proper packaging for disposal and mitigating the consequences of inadvertent spillage.

The South Texas Project emphasizes awareness training for spill prevention and maintains station readiness to respond should a spill occur. Spill response team members receive annual refresher training in hazardous material incident response. No reportable, significant, or consequential spills occurred in 2013.

ENVIRONMENTAL PROTECTION PLAN STATUS

The South Texas Project's Environmental Protection Plan was issued in March of 1989 to protect nonradiological environmental values during operation of the South Texas Project. This report reviews Environmental Protection Plan non-compliances, if any, identified by the plant in 2013 and the associated corrective actions taken to prevent their recurrence. Potential nonconformities are promptly addressed, as identified, to maintain operations in an environmentally acceptable manner. The station uses its Corrective Action Program to document these conditions and track corrective actions to completion. Internal assessments, reviews and inspections are also used to document compliance.

This report also reviews non-routine reports submitted by plant personnel and any activities that involved a potentially significant unreviewed environmental question. A proposed change, test or experiment is considered to present an unreviewed environmental question if it concerns:

1) A matter that may result in a significant increase in any adverse environmental impact previously evaluated in the Final Environmental Statement related to the Operation of South Texas Project, Units 1 and 2 (Docket Nos. 50-498 and 50-499), environmental impact appraisals, or in any decisions of the Atomic Safety and Licensing Board; or,

2) A significant change in effluents or power level; or,

3) A matter not previously reviewed and evaluated in the documents specified in (1) above, that may have a significant adverse environmental impact.

No unreviewed environmental questions were identified in 2013.

Events that require reports to federal, state or local agencies, other than the United States Nuclear Regulatory Commission, are reported in accordance with the applicable reporting requirements. The United States Nuclear Regulatory Commission is provided with a copy of any such report at the time it is submitted to the cognizant agency. If a non-routine event occurs and a report is not required by another agency, then a 30-day report to the United States Nuclear Regulatory Commission is required by the Environmental Protection Plan. No such 30-day or other non-routine report was required in 2013.

Photo By: Gary Parkey

Photo By: Mary Dykes

Radiological Environmental Introduction and Summary

Photo By: Elaine Steele

Chapter 5

Radiological Environmental Introduction and Summary

The Radiological Environmental Monitoring Program is designed to evaluate the radiological impact of the South Texas Project on the environment by collecting and analyzing samples for low levels of radioactivity. Measurements of samples from the different pathways indicate that there is no adverse effect offsite from the operation of the South Texas Project.

Only naturally occurring radioactive material were identified in the environmental samples in 2013. Measurements of direct radiation onsite and offsite indicate no dose limits were exceeded. Samples of fish and meat collected and analyzed show no plant-related nuclides were present. Water samples from the onsite drinking water supply from the deep aquifer and from offsite sampling stations on the Colorado River show only natural background radioactivity.

Tritium is a radioactive isotope of hydrogen that is produced in the reactor and cannot be removed from effluents released to the Main Cooling Reservoir because it is a part of the water molecule. Due to the design of the Main Cooling Reservoir, the presence of tritium in various sloughs and ditches onsite and the shallow aquifer was expected. Tritium has been detected in these types of samples and the concentrations remain below the United States Environmental Protection Agency drinking water limits.

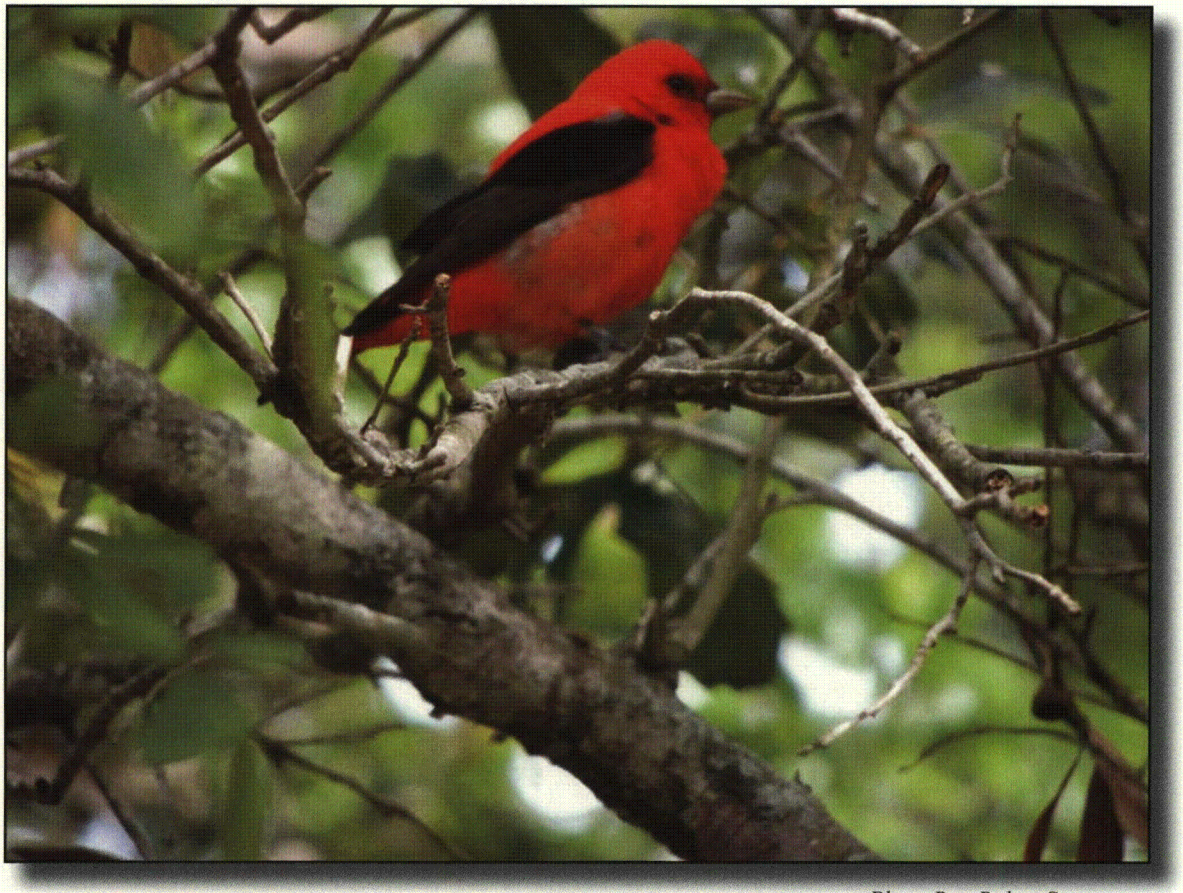


Photo By: Robyn Savage

In 2005, several nuclear plants discovered tritium in groundwater on site at levels exceeding the United States Environmental Protection Agency drinking water limits, mainly near underground process or effluent pipes. To determine if this were the case at the South Texas Project, test wells near underground process and effluent pipes were sampled and analyzed for tritium. Although some results were positive, all results were below the United States Environmental Protection Agency drinking water limits.

A sampling program was developed to monitor the tritium in the immediate area around the nuclear plants for long term trending. Wells are sampled semi-annually, annually, and once every five years, depending on location and the amount of tritium present. The tritium concentration remained below the United States Environmental Protection Agency drinking water limits in 2013 and within the design basis of the South Texas Project.

Analyses of the data collected from the implementation of the Radiological Environmental Monitoring Program indicates that the operation of the South Texas Project has no adverse offsite radiological impact.

Photo By: Aubrey Passafuma

Photo By: Bud Nosbisch

Radiological Environmental Operating Report

Photo By: Elaine Steele

Chapter 6

PROGRAM DESCRIPTION

The South Texas Project initiated a comprehensive preoperational Radiological Environmental Monitoring Program in July 1985. That program terminated on March 7, 1988, when the operational program was implemented. The data from the preoperational monitoring program forms the baseline against which operational changes are measured.

Analyses of the environmental pathways require that samples be taken from water, air, and land environments. These samples are obtained to evaluate potential radiation exposure to people. Sample types are based on established pathways and experience gained at other nuclear facilities. Sample locations were determined after considering site meteorology, site hydrology, local demography, and land use. Sampling locations are further evaluated and modified according to field and analysis experience. Table 1 at the end of this section lists the required sampling locations and frequency of collection. Additional discretionary samples were also collected.

Sampling locations consist of indicator and control stations. Indicator stations are locations on or off the site that may be influenced by plant discharges during plant operation. Control stations are located beyond the measurable influence of the South Texas Project. Although most samples analyzed are accompanied by a control sample, it should be noted that this practice is not always possible or meaningful with all sample types. Fluctuations in the concentration of radionuclides and direct radiation exposure at indicator stations are evaluated in relation to historical data and against the control stations. Indicator stations are compared with characteristics identified during the preoperational program to monitor for radiological effects from plant operation.

Two sample identification methods are used in the program. Figures 6-1 and 6-2 are maps that identify permanent sample stations. Descriptions of sample stations shown on Figure 6-1 and 6-2 are found in Table 2. Table 2 also includes supplemental sampling locations and media types that may be used for additional information. Figure 6-3 illustrates zones that may be used instead of permanent, numbered sample stations.

Photo By: Elaine Steele

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
DESIGNATED SAMPLE LOCATION MAP

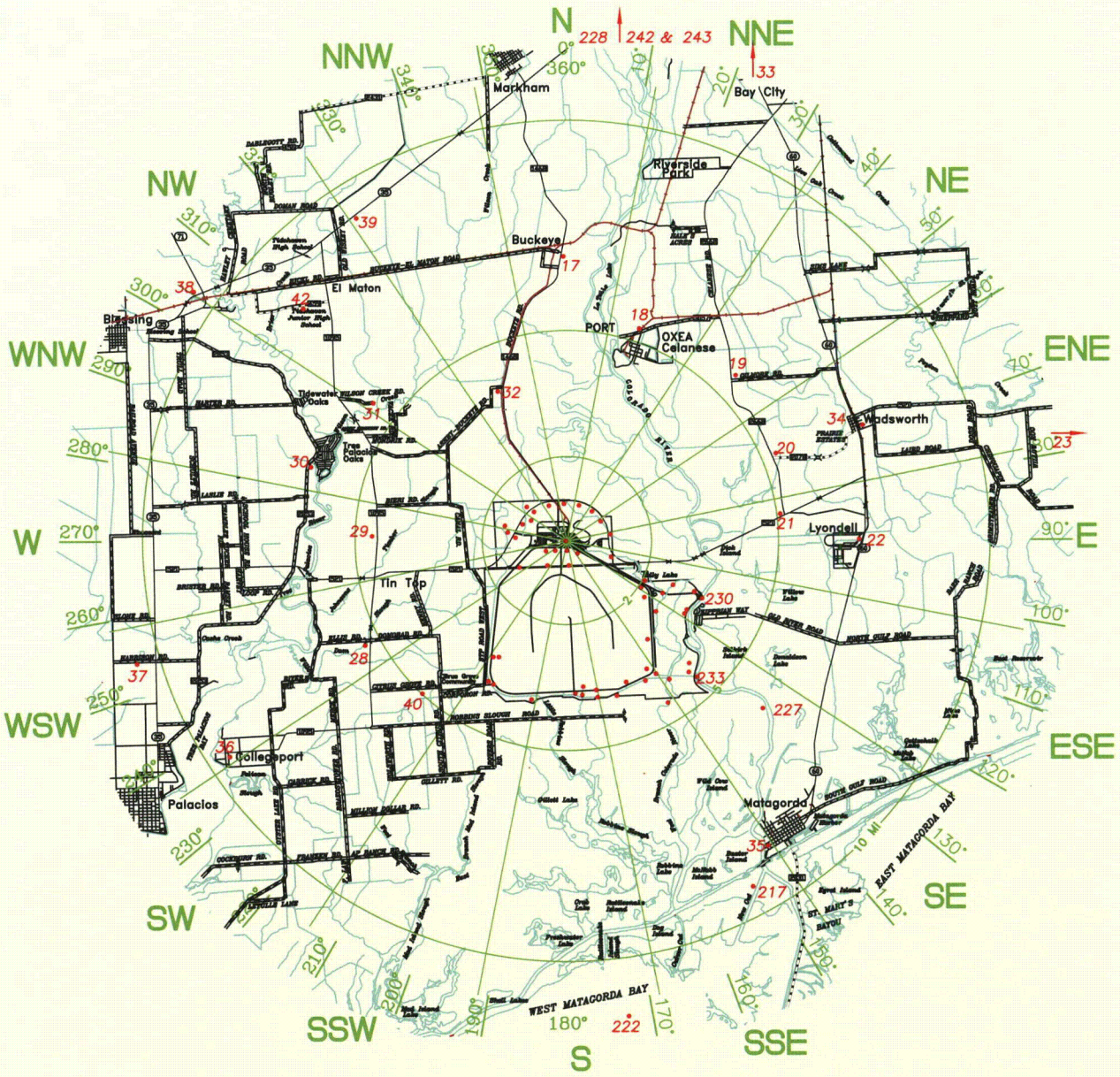


Figure 6-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM
ONSITE SAMPLE LOCATION MAP

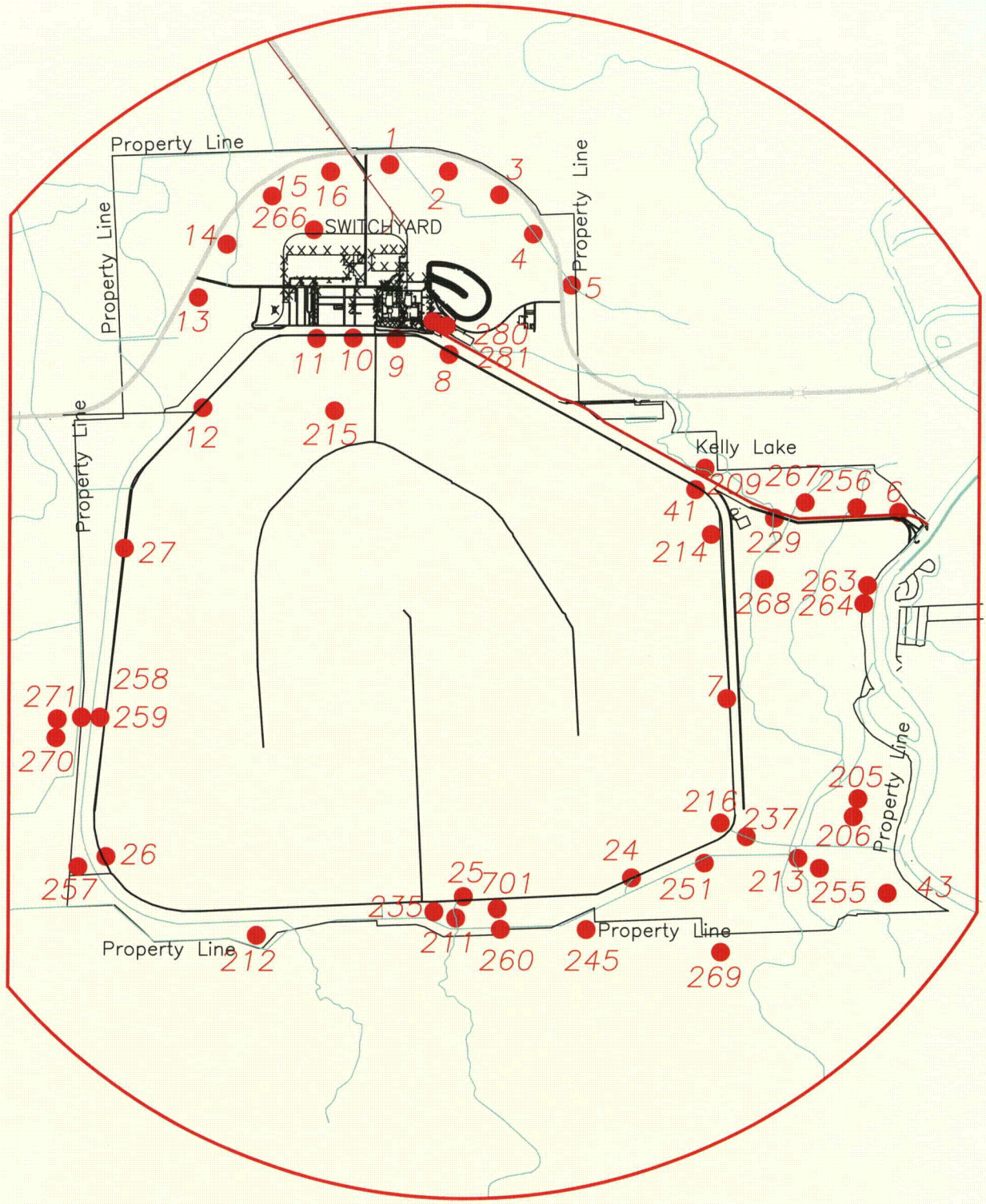
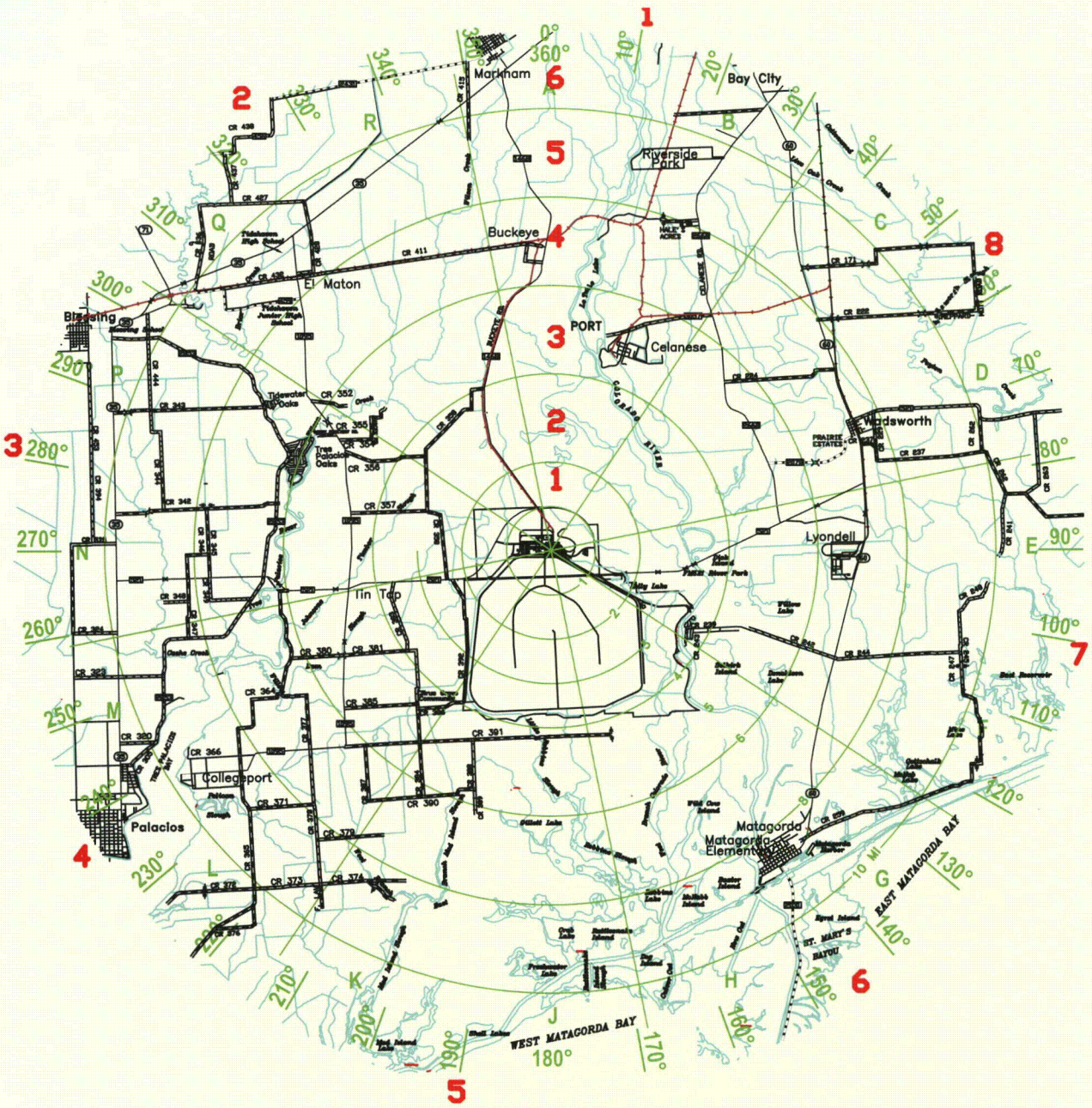


Figure 6-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ZONE LOCATION MAP



The zone station is determined in the following manner:

* The first character of the station number "Z" to identify it as a zone station.
* The second character is the direction coordinate number 1-8.
* The third character is the distance from the site number 1-6.

Figure 6-3

ANALYSIS OF RESULTS AND TRENDS

Environmental samples from areas surrounding the South Texas Project continue to indicate no radiological effects from plant operation. Analytical values from offsite indicator sample stations continue to trend with the control stations. Measurements from onsite indicator samples continued to fluctuate within normal historical ranges.

Average quarterly air particulate sample beta activity from three onsite indicator stations and a single control station have been compared historically from 2001 through 2013 (see Figure 6-4). The average of the onsite indicators trends closely with the offsite control values. The comparison illustrates that plant operations are not having an impact on air particulate activity even at the Sensitive Indicator Stations (#1, #15, and #16). These stations are located near the site boundary downwind from the plant, based on the prevailing wind direction. The beta activity measured in the air particulate samples is from naturally occurring radioactive material such as Beryllium-7 from atmosphere production. Gamma analyses are performed on quarterly composites of the air particulate samples to determine if any activity is from the South Texas Project. The gamma analyses revealed no radioactivity from the South Texas Project.

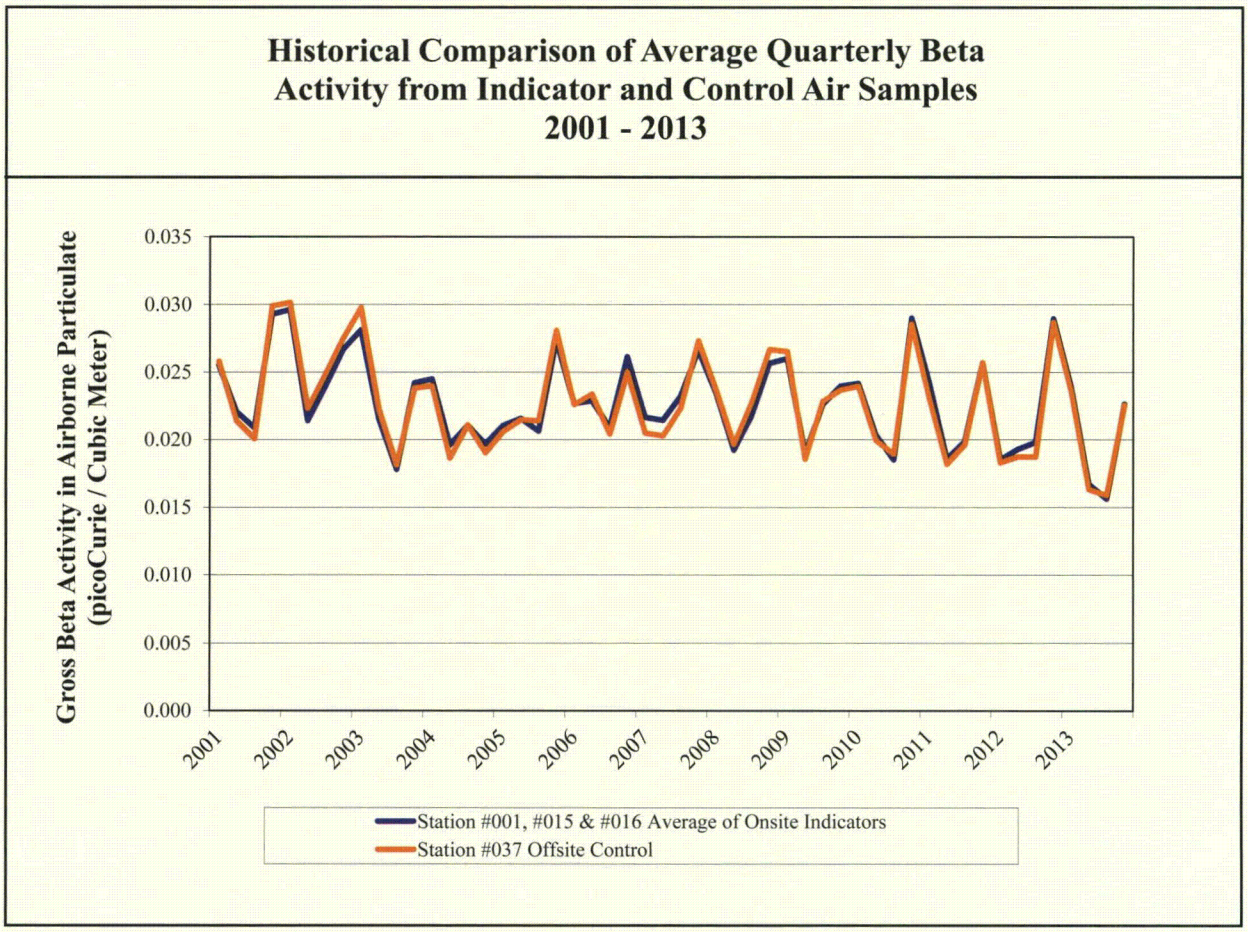


Figure 6-4

Direct gamma radiation is monitored in the environment by thermoluminescent dosimeters located at 40 sites. The natural direct gamma radiation varies according to location because of differences in the natural radioactive materials in the soil, soil moisture content, and other factors. Figure 6-5 compares the amount of direct gamma radiation measured at the plant since the fourth quarter of 2001 for three different types of stations. The Control Stations, Stations #23 and #37, are greater than 10 miles from the site in the minimal wind direction. The prevailing wind direction was into the NW sector. The Sensitive Indicator Stations are one mile NW, NNW, and N from the power plants on FM 521 at Stations # 15, # 16 and #1 respectively. The Indicator Stations are the remainder of the required stations. The values plotted are the averages for all of the stations according to type. The average of the Control Stations is higher than the other stations because station #23 is in an area that has a slightly higher natural background radiation. The trends of Figure 6-5 clearly show that the power plants are not adding to the direct radiation in the offsite environment.

Photo By: Robyn Savage

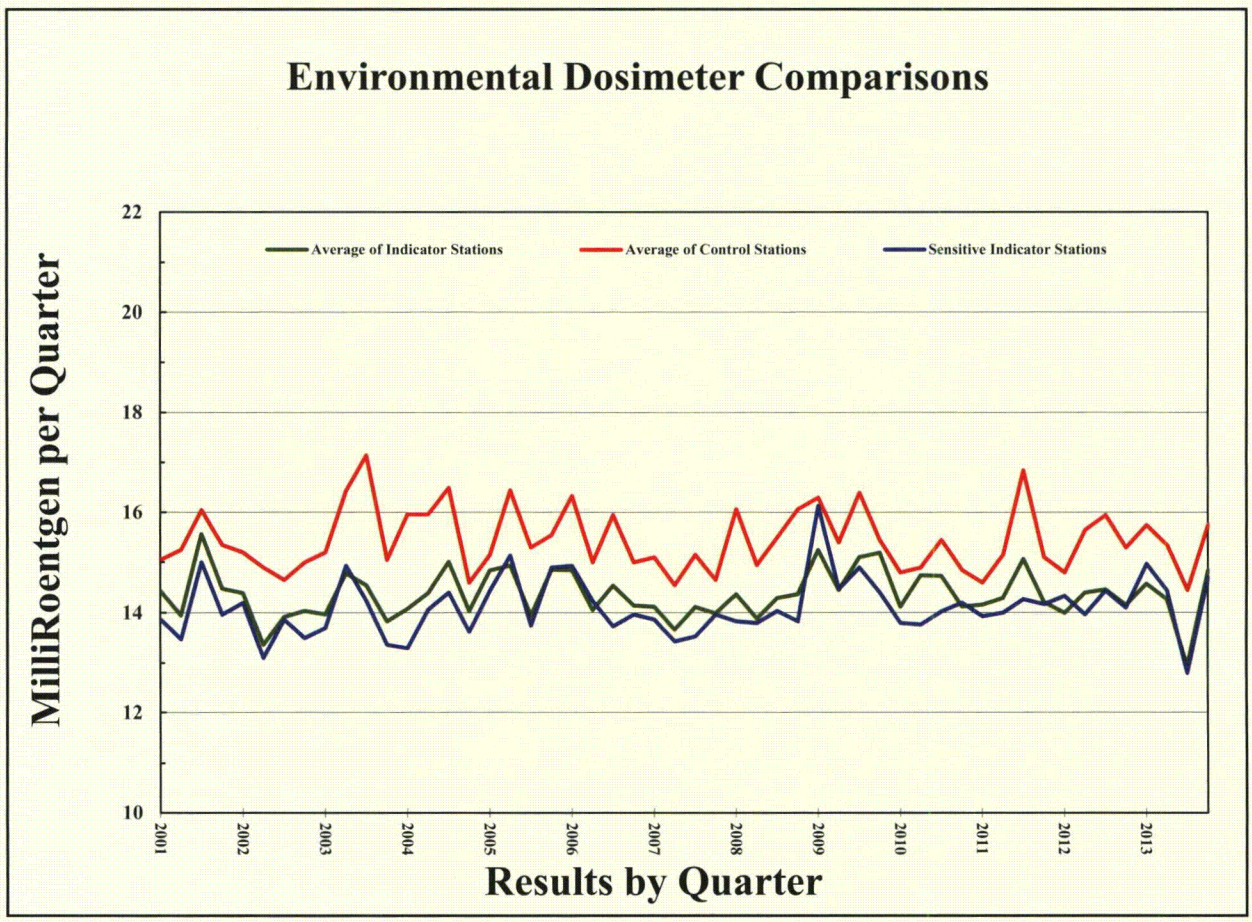


Figure 6-5

Bottom sediment samples are taken from the Main Cooling Reservoir each year. Although no Cobalt-60 was detected from 2007 through 2010, the concentration of Cobalt-60 is not uniformly distributed in the reservoir sediment and there still is a depository of Cobalt-60. Figure 6-6 shows the positive results from the plant-produced radioactive material Cobalt-60. The Cobalt-60 inventory in the reservoir has decreased since 1992 because of radioactive decay and equipment installed to reduce radioactive effluents. Although the total activity of Cobalt-60 has decreased over time, an inventory of Cobalt-60 is still in the reservoir as seen occasionally at Stations # 215 and # 216. In 2013, Cobalt-60 was identified in three of four samples taken, but all results were less than the reporting levels. Figure 6-7 demonstrates the calculated decline in the total amount of Cobalt-60 in the reservoir.

Cesium-137 was measured in five of six bottom sediment samples from Stations #215 and #216 in the Main Cooling Reservoir. The highest measurement was 159 pCi/kg at Station #216. The highest measurement at Station #215 was 45 pCi/kg. Cesium-137 is often found in environmental media including soil and sediment from residual radioactive material from nuclear weapons testing fallout. Soil and sediment samples taken in 1986 and 1987 prior to operation of STP contained Cesium-137 from weapons testing fallout. The preoperational average Cesium-137 concentration was 118 pCi/kg when it was detected in soil and sediment samples but the highest sample measured was 383 pCi/kg. Cesium-137 activities measured at Station #216 in 2013 were slightly greater than previously detected, but remained considerably less than reportable levels. In addition, the measured values at Station # 215 and #216 are consistent with preoperational concentrations reduced by 25 years of radioactive decay.

Tritium has been monitored in the shallow aquifer since 1997 on the south side of the Main Cooling Reservoir. Models used when licensing the site predicted tritium in the shallow aquifer. These models were validated with additional studies for the proposed Units 3 and 4. A site conceptual model, developed in 2008 and updated in 2009, validated the original predictions of the site hydrology study.

Tritium is a radioactive isotope of hydrogen and is produced during plant operation. Tritium produced in the reactors is a part of the water molecule. Wastewater is treated to remove impurities before release, but tritium cannot be removed because it is chemically part of the water molecule. Some of the tritium is released into the atmosphere, and the remainder is released into the Main Cooling Reservoir. The tritium escapes from the Main Cooling Reservoir by evaporation, movement into the shallow aquifer, and by percolation from the relief wells which are a part of the reservoir embankment's stabilization system. Figure 6-8 shows the amount of tritium released to the Main Cooling Reservoir each year and the amount present during the last quarter of each year.

The concentration of tritium in the Main Cooling Reservoir was relatively stable in 2013. The amount of tritium measured in the Main Cooling Reservoir was consistent with the amount released. The amount of rainfall and river makeup normally influences the concentration of tritium in the Main Cooling Reservoir and the shallow aquifer surrounding it. The effect of continued reduced rainfall in the area due to drought conditions throughout 2013 resulted in

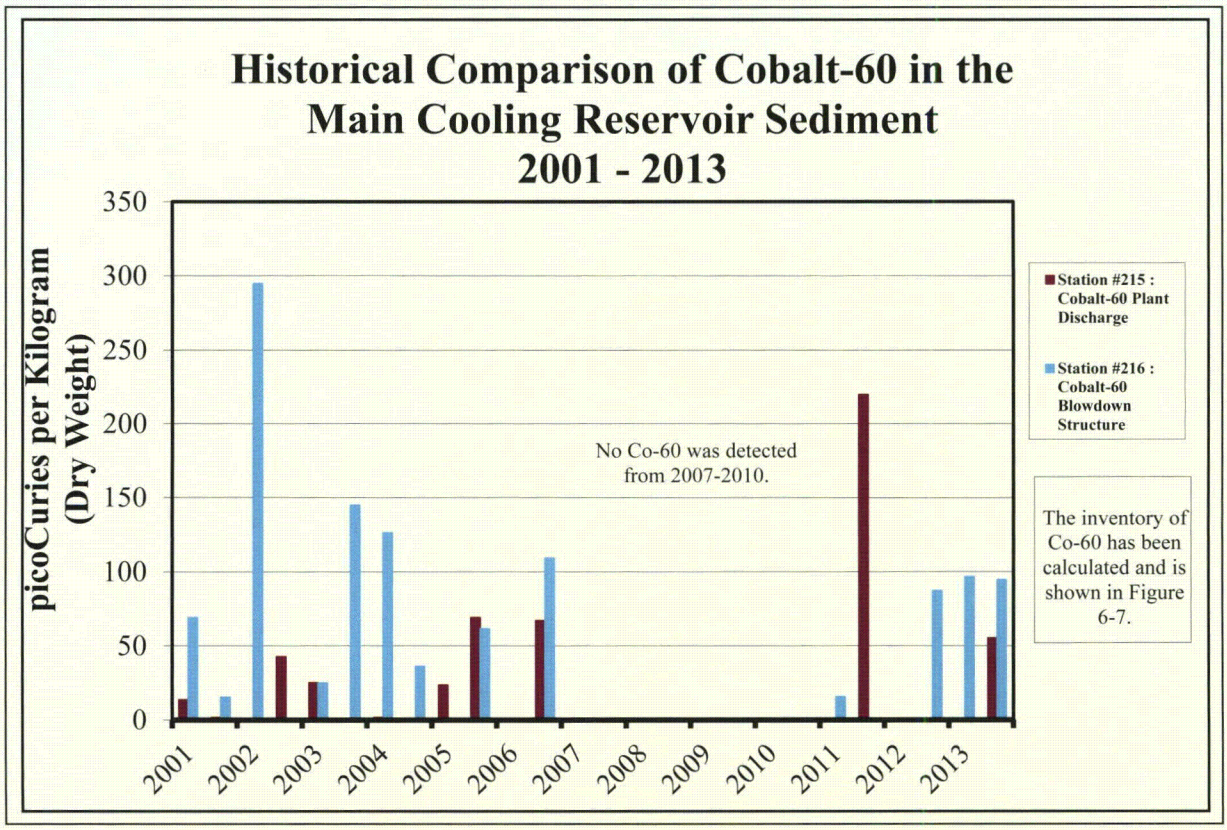


Figure 6-6

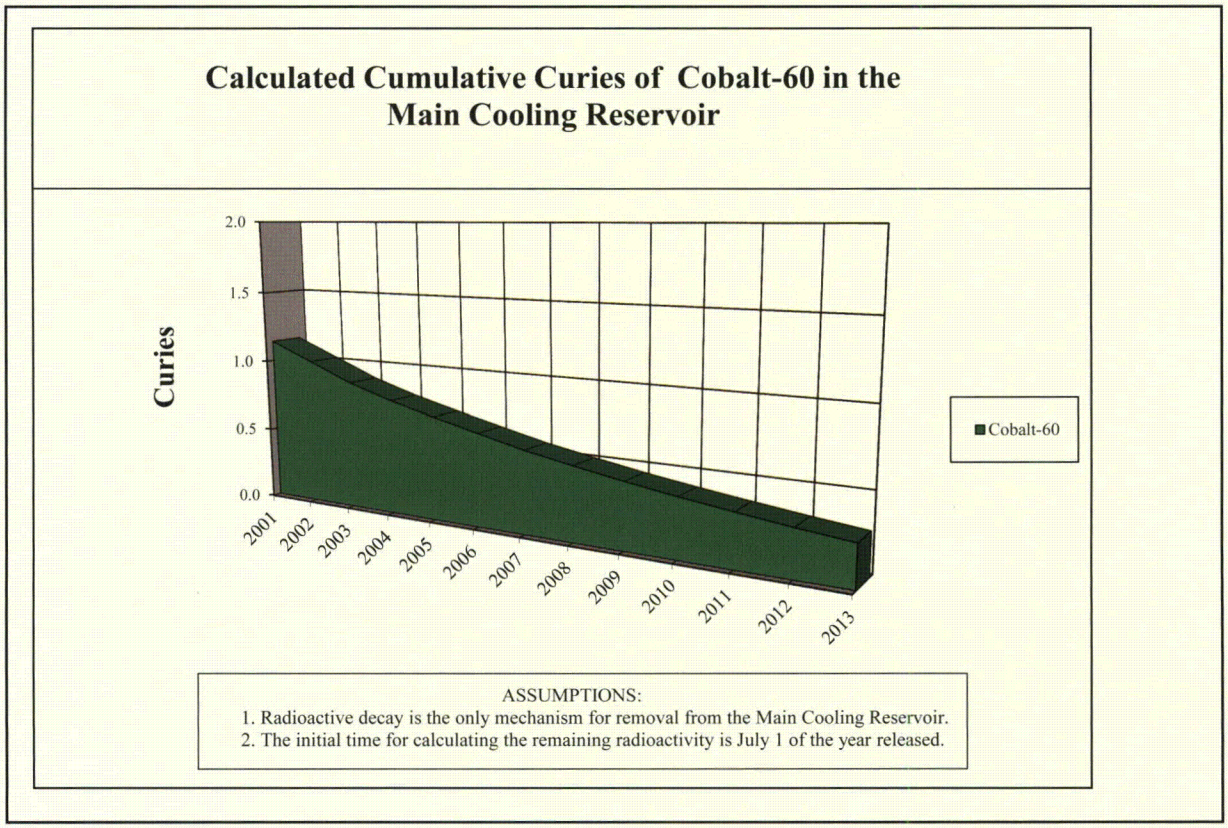


Figure 6-7

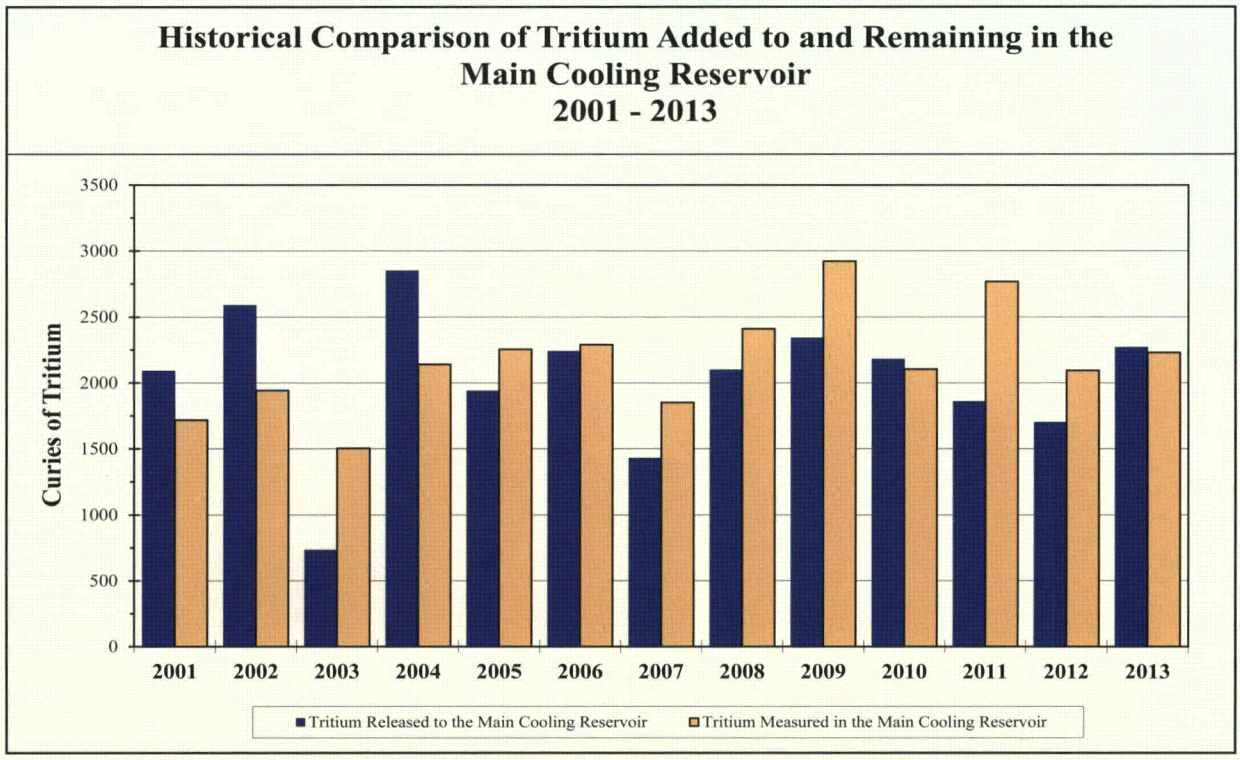


Figure 6-8

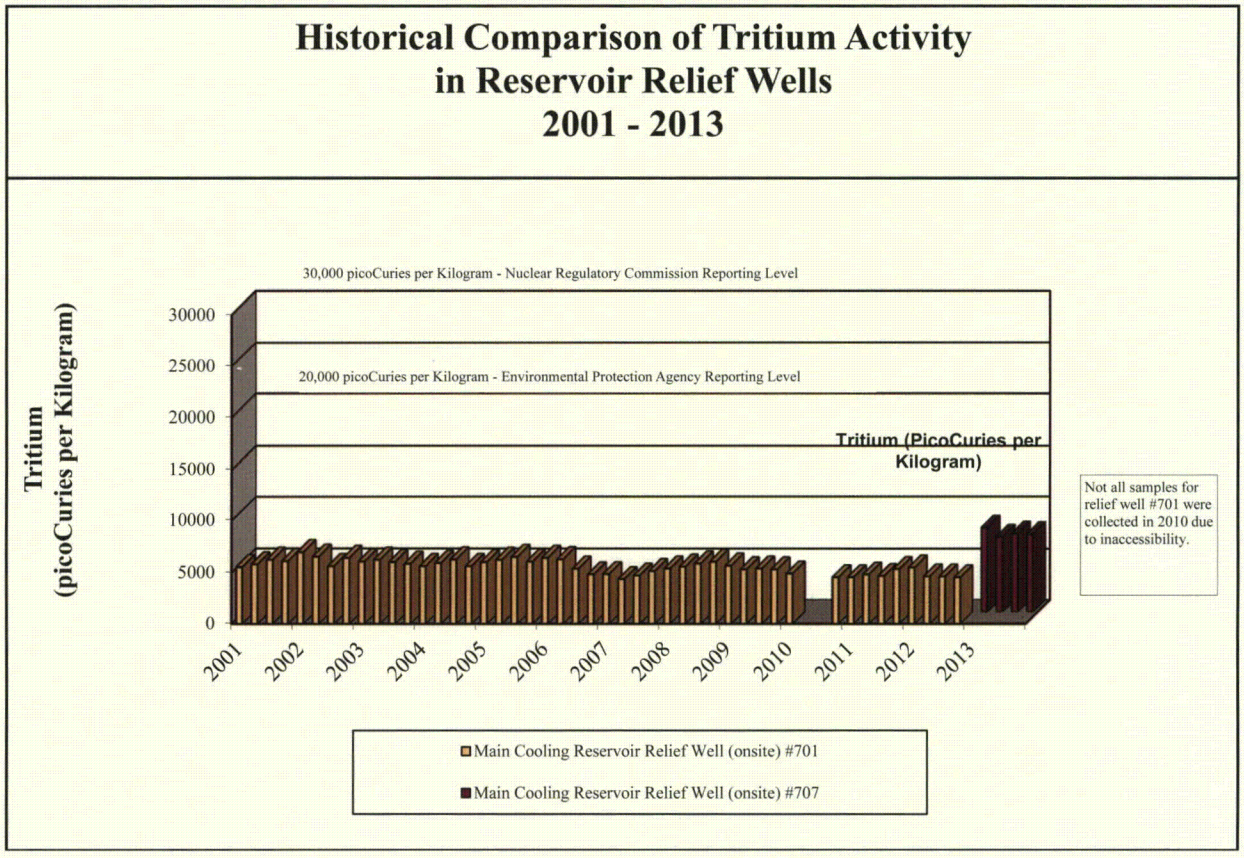


Figure 6-9

higher concentrations of tritium in surface waters across the site. Tritium enters the sloughs and ditches of the site as runoff from the relief wells that surround the reservoir. In 2013, tritium levels remained low in the relief wells as shown in Figure 6-9. Quarterly sampling of the Main Cooling Reservoir relief well # 701 has been discontinued due to the inability to collect a sample at that location. The bottom of the discharge pipe, at relief well # 701, is below the water level in the drainage ditch in which the well discharges into resulting in the mixture of water prior to sampling. A new Main Cooling Reservoir relief well # 707 was used as a representative substitute for sampling the relief well water from the Main Cooling Reservoir. Station # 707 is just west of the discontinued relief well on the south side of the Main Cooling Reservoir. The first sample from this relief well had indicated approximately 8,200 pCi/L, which is less than the required reporting levels.

The tritium concentrations in eight surface water sample points from 2001 through 2013 are shown in Figure 6-10. The specific sample point locations can be found in Table 2. Tritium levels in the onsite sloughs and ditches vary with the concentration in the reservoir and the amount of rainfall received. The average tritium concentration in the relief well, sloughs, and ditches are less than the reservoir because the water is diluted as it migrates through the reservoir relief well system. In 2013, four required and twenty-one non-required surface water samples tested positive for tritium. All test results were below the United States Environmental Protection Agency drinking water limit of 20,000 pCi/kg. Rainwater was collected and analyzed during 2013 to determine if the tritium from the reservoir precipitated in the local area. Tritium was not measured in any of the rainwater samples.

Surface water sampling station # 227 was moved a tenth of a mile upstream on the Colorado River to accommodate a new land owner site. This station is still located down river from the plant and the new location has had no adverse impact on the sample results.

Tritium was identified in the shallow (i.e. ten to thirty feet deep) aquifer test wells at Station #235 approximately seventy-five yards south of the reservoir embankment base during 1999. Starting in 2000, samples were collected from the shallow aquifer well at Station #251 south of the Main Cooling Reservoir. The tritium results from these two shallow aquifer wells are shown in Figure 6-11. In 2013, the concentration of tritium at Station #235 was consistent with values over the past three years. Shallow aquifer tritium concentrations have remained near the concentrations found in the relief wells. Wells at Stations #258 and #259 on the west side of the site boundary have been sampled since 2006. Wells at Stations #270 and #271 were installed during the last quarter of 2008. The sample results are shown in Figure 6-12. Tritium levels were stable in 2013 with a maximum value of 7,490 pCi/kg and remained below the United States Environmental Protection Agency drinking water limit (20,000 pCi/kg).

The well at Station #271, located adjacent to site property on a county road easement directly west of the Main Cooling Reservoir, indicated its highest concentration in 2013 at 880 pCi/kg. This is the fourth year that a positive measurement has been detected at this shallow monitoring well location, and, is most likely related to prolonged drought conditions that affect the ability of the shallow aquifer to recharge. Tritium has not been found in the deep aquifer that is the typical source of drinking water for the local communities and homes. These measurements follow the hydrological model described in original license basis and the updated site conceptual model discussed earlier in this report.

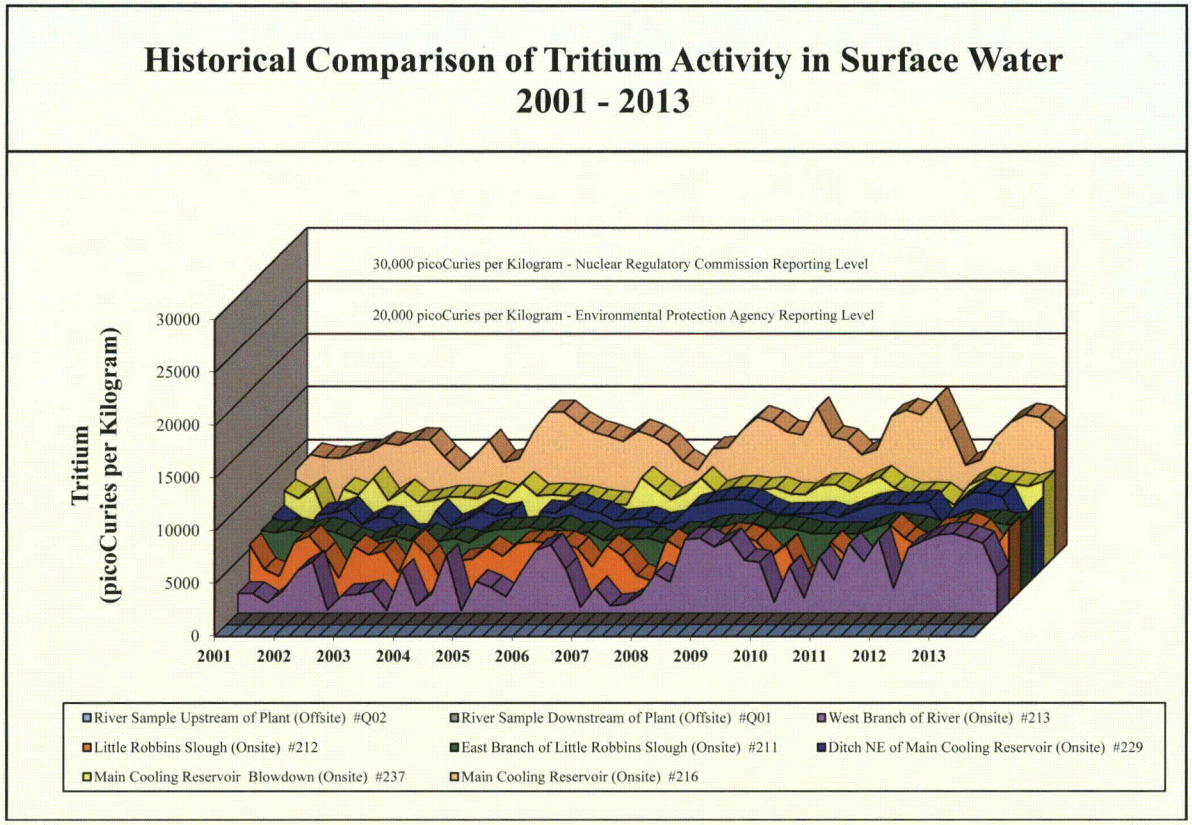


Figure 6-10

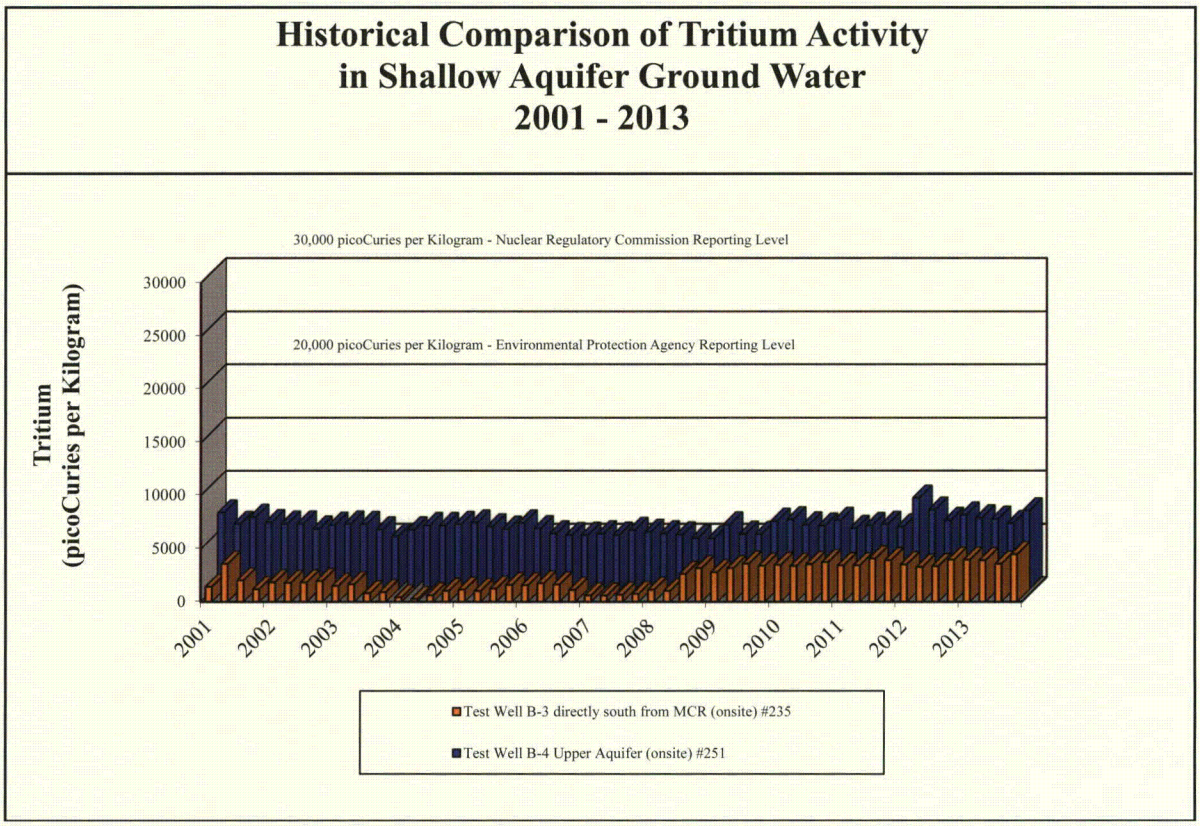


Figure 6-11

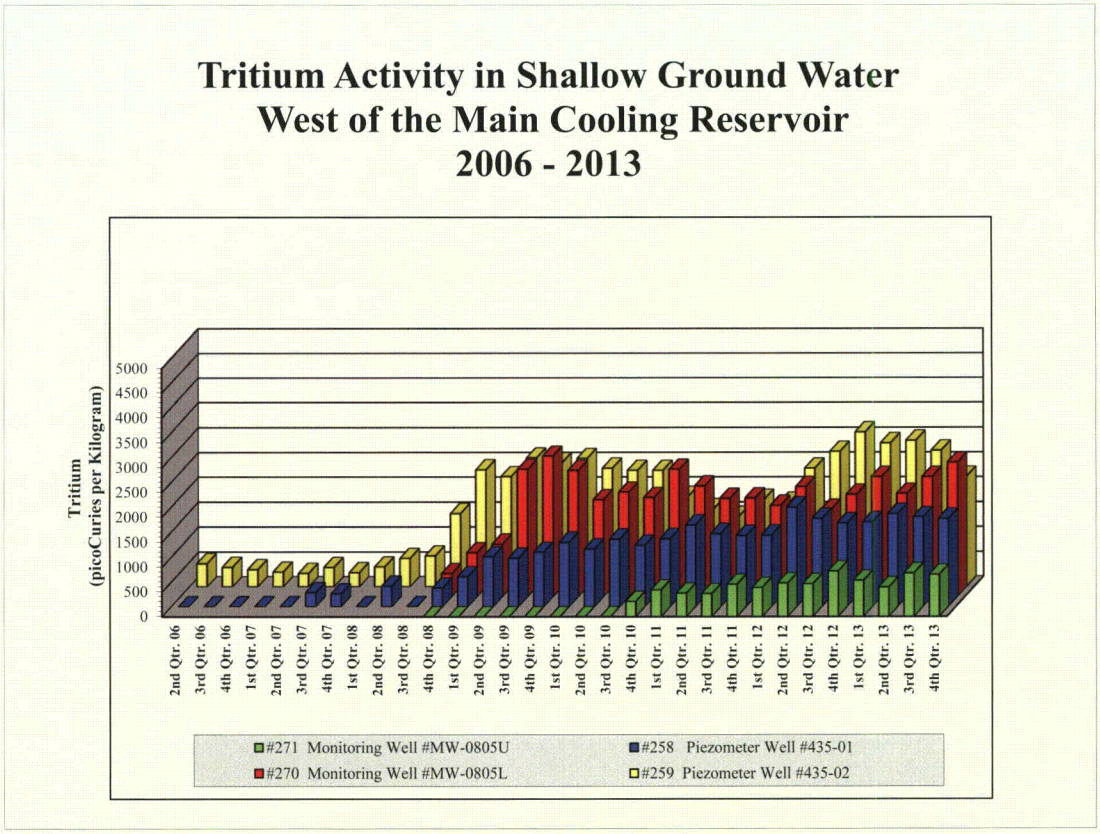


Figure 6-12

A windmill-powered ground water well, sample station # 267, indicated tritium activity slightly above detection limits at 293 pCi/kg in 2013. This onsite ground water sample station is the most distant location from the Main Cooling Reservoir that tritium has been detected.

The drinking water onsite is pumped from deep aquifer wells and is tested monthly and composited quarterly to verify tritium is not present. The South Texas Project uses no water from the reservoir, shallow aquifers or other surface water for drinking. If the water with the highest tritium concentration that leaves the site (Little Robbins Slough) was used for drinking, the maximum dose to an individual would be about one millirem in a year. This dose is insignificant compared to the approximately 620 millirem the public receives a year from natural radioactivity in the environment and the radiation received from medical procedures.[4]

Other samples are collected and analyzed in addition to those required by our licensing documents or internal procedures. These samples are collected to give additional assurance that the public and the environment are protected from any adverse effects from the plant. These samples include pasture grass, sediment samples, rain water, shallow aquifer well water, water from various ditches and sloughs onsite, and air samples near communities or other areas of interest. The results of these analyses indicate that plant related radioactive material released to the environment during plant operation has no health impact.

[4] NCRP (2006). National Council on Radiation Protection and Measurements, Ionizing Radiation Exposure of the Population of the United States, (Bethesda, Maryland), NCRP Report No. 160.

NEI GROUNDWATER PROTECTION INITIATIVE

Nuclear industry experience involving tritium prompted the station to sample groundwater in the shallow aquifer near the nuclear units in 2005. Some samples indicated the presence of tritium, but all were at concentrations below the Environmental Protection Agency drinking water limit of 20,000 pCi/kg.

In 2007, the Nuclear Energy Institute (NEI) established a standard for monitoring and reporting radioactive isotopes in groundwater entitled *NEI Groundwater Protection Initiative*, NEI 07-07. The station implemented the recommendations of this industry standard and has broadened the groundwater monitoring program to include additional samples collected near the nuclear units. Some of the positive results of this broadened monitoring program likely reflect tritium associated with the Main Cooling Reservoir.

Sample Station	2013 Measurements (pCi/liter)	Historical High (pCi/liter)
801	387	1152
807	911	15300
808	560	2858
809	less than 300	424
835	less than 300	less than 300
838	less than 300	less than 300
803	less than 300	less than 300
842	less than 300	less than 300
843	less than 300	less than 300
844	less than 300	less than 300

Figure 6-13

Wells near the nuclear units are sampled semiannually, annually, or once every five years depending on the concentration of tritium anticipated and the location of the wells. Figure 6-13 contains the 2013 results along with the historical highs measured prior to 2013 for each station since sampling began in 2006. Their locations are shown in Figure 6-14.

Two wells sampled quarterly (Stations #807 and #808) are adjacent to where a pipe was broken and repaired several years ago. The tritium concentration at these two wells continued to decrease

Photo By: Tammy Stevens

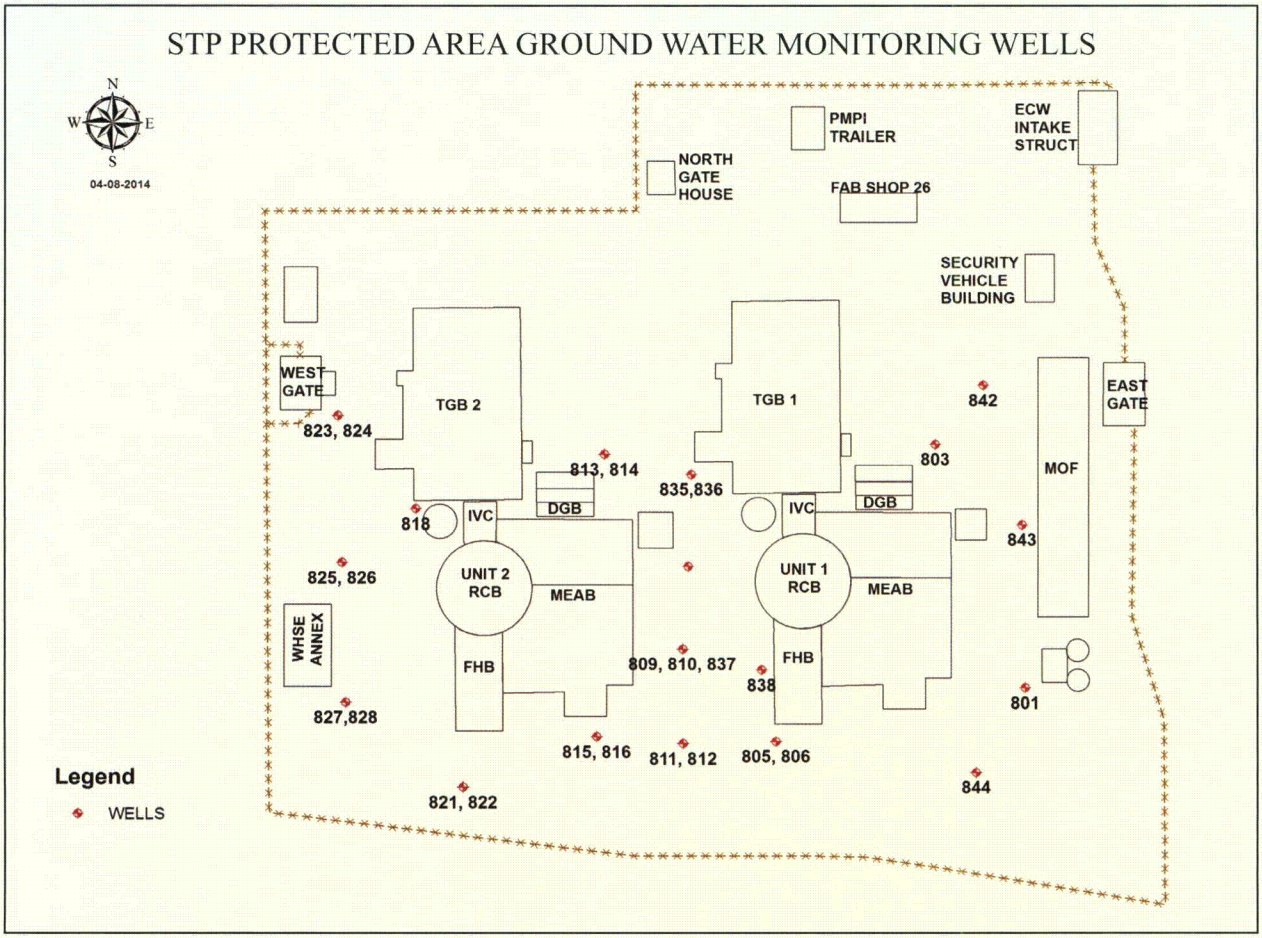


Figure 6-14

in 2013, as it has for the last five years. Station # 809 tritium concentrations decreased below detection levels and the source of that previous tritium is also likely to be related to the previously referenced pipe break and subsequent repair. All the other wells sampled in 2013 that had detectable tritium are influenced by groundwater originating in the Main Cooling Reservoir. Their concentrations remain in the range of groundwater tritium concentrations associated with the Main Cooling Reservoir. All of the 2013 measurements of tritium in groundwater are only a small fraction of the United States Environmental Protection Agency drinking water limit (20,000 pCi/liter).

During 2012, per self-assessment actions, steam traps for the auxiliary steam system that could potentially contain trace amounts of tritium were modified to re-direct the condensed steam or liquid water to the Main Cooling Reservoir. No groundwater remediation was required. Information regarding the steam traps and subsequent response was documented in the station's Corrective Action Program. This evaluation identified no new effluent release pathways and no impact to the drinking water or the health and safety of the public. In 2013, the Electric Power Research Institute performed an assessment of the station's groundwater protection initiative as required by industry standards. The assessment confirmed the station's overall compliance with program requirements. Recommendations are documented in the station's Corrective Action Program.

LAND USE CENSUS

The Annual Land Use Census is performed to determine if any changes have occurred in the location of residents and the use of the land within five miles of the South Texas Project generating units. The information is used to determine whether any changes are needed in the Radiological Environmental Monitoring Program. The census is performed by contacting area residents and local government agencies that provide the information. In addition, a survey is performed to verify the nearest residents within five miles of the South Texas Project generating units in each of 16 sectors. The results of the survey indicated no changes for 2013. The eleven sectors that have residents within five miles and the distance to the nearest residence in each sector are listed below.

Sector	Distance (miles)	Location
ENE	4.5	CR 232 (Ryman Rd.)
ESE	3.5	Selkirk Dr.
SE	3.5	Selkirk Dr.
SW	4.5	CR 386 (Corporon Rd.)
SSW	4.5	CR 391 (Robbins Slough Rd.)
WSW	2.5	CR 358
W	4.5	FM 1095
WNW	4.5	CR 356 (Ashby-Buckeye Road)
NW	4.5	CR 354 (Mondrik Road)
NNW	3	Runnells Ranch – FM 1468
N	3	Runnells Ranch – FM 1468

The following items of interest were noted during the census:

★ No commercial dairy operates within Matagorda County.

★ A dairy goat exists approximately 4.95 miles from the STP plant. A dose evaluation was performed and it determined that sampling of dairy milk was not required. No other source of milk has been identified within the five mile zone.

★ Two commercial fish farms continue to operate. One is two miles west of the plant near FM 521 and the second is approximately four to five miles southwest of the plant located in the area north of Robbins Slough Road and east of South Citrus Grove Road. The water supply for the ponds is not affected by the operations of the South Texas Project.

★ Colorado River water from below the Bay City Dam has not been used to irrigate crops

★ There were no identified commercial vegetable farms located within the five mile zone.

★ Broadleaf vegetation sampling is performed at the site boundary in the three most leeward sectors and at a control location in lieu of a garden census. The broadleaf vegetation samples collected also satisfy the collection requirement when milk samples are not available.

QUALITY ASSURANCE

Quality assurance encompasses planned and systematic actions to ensure that an item or facility will perform satisfactorily. Reviews, surveillances, and audits have determined that the programs, procedures and personnel are adequate and perform satisfactorily.

Quality audits and independent technical reviews help to determine areas that need attention. These areas are addressed in accordance with the station's Corrective Action Program.

The measurement capabilities of the Radiological Laboratory are demonstrated by participating in an interlaboratory measurement assurance program as well as performing duplicate and split sample analyses. A total of approximately 10% of the analyses performed are quality control samples consisting of interlaboratory measurement assurance program samples, duplicate samples, and split samples.

The interlaboratory measurement assurance program provides samples that are similar in matrix and size to those measured by the Radiological Environmental Monitoring Program. This program assures that equipment calibrations and sample preparation methods accurately measure radioactive material in samples. Figure 6-15 summarizes the results of the interlaboratory comparison programs.

Duplicate sampling of the environment allows the STP Nuclear Operating Company to estimate the repeatability of the sample collection, preparation, and analysis process. Splitting samples allows estimation of the precision and bias trends of the method of analysis without the added variables introduced by sampling. Generally, two samples split from the same original sample material should agree better than two separate samples collected in the same area and time period. The 2013 frequencies for Duplicates and Splits are shown in Figure 6-16.

PROGRAM DEVIATIONS

In addition to measurement accuracy, radiochemical measurements must meet sensitivity requirements at the Lower Level of Detection for environmental samples. Deviations from the sampling program or sensitivity requirements must be acknowledged and explained in this report. During 2013 the following samples were not collected or were unacceptable for analysis:

- Six out of thirty-six required broadleaf vegetation samples were not collected from January through February due to seasonal unavailability.
- Thirteen out of two hundred sixty-five air samples were not continuously collected for the full time interval because of power or equipment failures.
- Three surface water Lower Level of Detection requirements were missed when a computer software error resulted in required count times not being met.
- One out of one hundred sixty direct radiation measurements was missed because of vandalism.

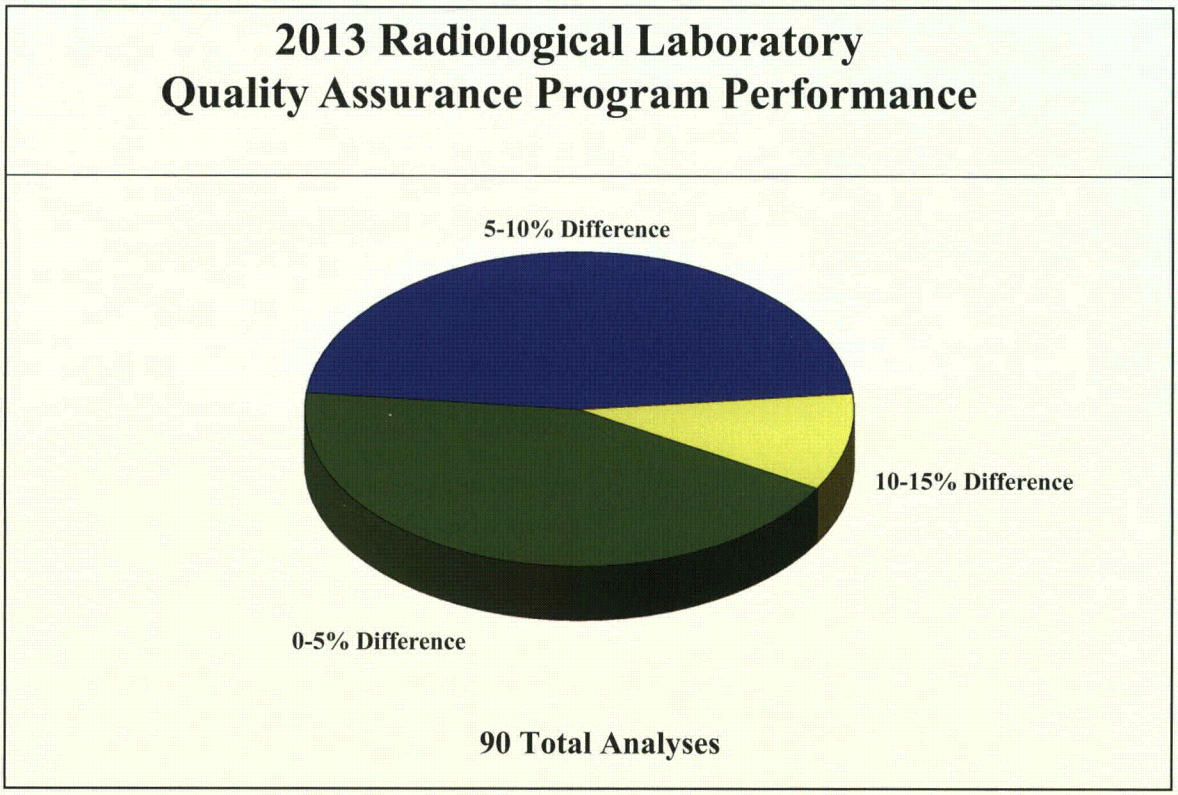


Figure 6-15

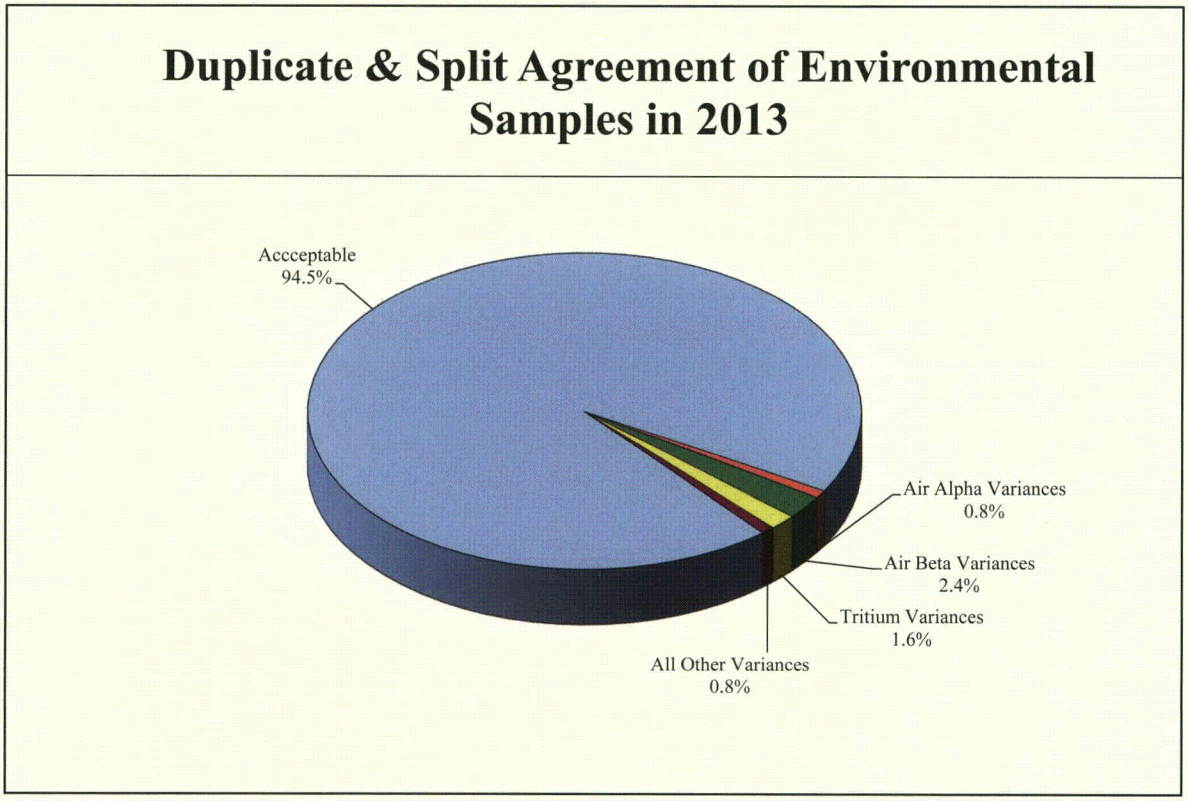


Figure 6-16

TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE: **DIRECT RADIATION** — 40 TOTAL SAMPLING STATIONS

Sample Media, Number, Approximate Location and Distance of Sample Stations from Containment.	Routine Sampling Mode	Sampling and Collection Frequency	Analysis Type	Minimum Analysis Frequency
Exposure Media: TLD 16- Located in all 16 meteorological sectors, 0.2* to 4 miles. 16- Located in all 16 meteorological sectors, 2 to 7 miles. 6- Located in special interest areas (e.g. school, population centers), within 14 miles. 2- Control stations located in areas of minimal wind direction (WSW,ENE), 10-16 miles.	Continuously	Quarterly	Gamma dose	Quarterly

* The inner ring of stations in the southern sectors are located within 1 mile because of the main cooling reservoir

EXPOSURE: **AIRBORNE** — 5 TOTAL SAMPLING STATIONS

Sample Media, Number, Approximate Location, and Distance of Sample Stations from Containment.	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
Charcoal and Particulate Filters 3- Located at the exclusion zone, N, NNW, NW Sectors, 1 mile. 1- Located in Bay City, 14 miles. 1- Control Station, located in a minimal wind direction (WSW), 10 miles.	Continuous sampler operations	Weekly or more frequently if required by dust loading	Radiojodine Canister: I-131 Particulate Sampler: Gross Beta Activity Gamma-Isotopic of composite (by location)	Weekly Following filter change Quarterly

TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (Continued)

EXPOSURE: **WATERBORNE** 13 TOTAL SAMPLING STATIONS

Sample Media, Number And Approximate Location of Sample Stations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
Surface				
1- Located in MCR at the MCR blowdown structure.	Composite sample over a 1 month period (grab if not available)	Monthly	Gamma-Isotopic	Monthly
1- Located above the site on the Colorado River not influenced by plant discharge (control).			Tritium	Quarterly Composite
1- Located downstream from blow down entrance into the Colorado River.				
Ground				
5- Located in wells used to monitor tritium migration in the shallow aquifer.	Grab	Quarterly	Gamma-Isotopic & Tritium	Quarterly

EXPOSURE: **WATERBORNE** (CONTINUED)

Sample Media, Number And Approximate Location of Sample Stations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
Drinking Water				
1- Located on site. *	Grab	Monthly	Gross Beta & Gamma-Isotopic	Monthly
1- Located at a control station.			Tritium	Quarterly Composites
Sediment	Grab	Semiannually	Gamma-Isotopic	Semiannually
1- Located above the site on the Colorado River, not influenced by plant discharge.				
1- Located downstream from blowdown entrance into the Colorado River.				
1- Located in MCR.				

* No municipal water systems are affected by STP. This sample taken from deep aquifer supplying drinking water to employees while at work.

TABLE 1
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (Continued)

EXPOSURE: **INGESTION** 7 TOTAL SAMPLING STATIONS

Sample Media, Number And Approximate Location of Sample Stations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
Milk				
*	Grab	Semi-monthly when animals are on pasture; monthly at other times.	Gamma-Isotopic And Low Level I-131	Semi-monthly when animals are on pasture; monthly at other times.
Broadleaf Vegetation**				
2- Located at the exclusion zone, N, NW, or NNW sectors.	Grab	Monthly during growing season (When available)	Gamma-Isotopic	As collected
1- Located in a minimal wind direction.				

* Limited source of sample in vicinity of the South Texas Project. (Attempts will be made to obtain samples when available.)

** Three different kinds of broadleaf vegetation are to be collected over the growing season, not each collection period.

EXPOSURE: **INGESTION** (continued)

Sample Media, Number And Approximate Location of Sample Stations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
Fish and Invertebrates (edible portions)				
1- Representing commercially or recreational important species in vicinity of STP that maybe influenced by plant operation.	Grab	Sample semi-annually	Gamma-Isotopic on edible portions	As collected
1- Same or analogous species in area not influenced by STP.				
1- Same or analogous species in the MCR.				
Agricultural Products	Grab	At time of harvest	Gamma-Isotopic Analysis in edible portion	As collected
*				
Domestic Meat				
1- Represents domestic stock fed on crops grown exclusively within 10 miles of the plant.	Grab	Annually	Gamma-Isotopic	As collected

* No sample stations have been identified in the vicinity of the site. Presently no agricultural land is irrigated by water into which liquid plant wastes will be discharged. Agricultural products will be considered if these conditions change.

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

AI	AIRBORNE RADIOIODINE	L6	COLLARD GREENS
AP	AIRBORNE PARTICULATE	L7	MUSTARD GREENS
B1	RESIDENT DABBLER DUCK	M1	BEEF MEAT
B2	RESIDENT DIVER DUCK	M2	POULTRY MEAT
B3	MIGRATORY DABBLER DUCK	M3	WILD SWINE
B4	MIGRATORY DIVER DUCK	M4	DOMESTIC SWINE
B5	GOOSE	M5	EGGS
B6	DOVE	M6	GAME DEER
B7	QUAIL	M7	ALLIGATOR
B8	PIGEON	M8	RABBIT
CC	CRUSTACEAN CRAB	OY	OYSTER
CS	CRUSTACEAN SHRIMP	SO	SOIL
DR	DIRECT RADIATION	S1	SEDIMENT - SHORELINE
F1	FISH - PISCIVOROUS	S2	SEDIMENT - BOTTOM
F2	FISH - CRUSTACEAN & INSECT FEEDERS	VB	ANY COMBINATION OF BROADLEAF SAMPLES (L1 thru L7)
F3	FISH - PLANKTIVORES & DETRITUS FEEDERS	VP	PASTURE GRASS
L1	BANANA LEAVES	WD	DRINKING WATER
L2	CANA LEAVES	WG	GROUND WATER
L4	TURNIP GREENS	WR	RAIN WATER
L5	CABBAGE	WS	SURFACE WATER
		WW	RELIEF WELL WATER

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

MEDIA CODE	STATION CODE	VECTOR (Approximate)	LOCATION DESCRIPTION
DR AI AP VB VP SO	001	1 mile N	FM 521
DR	002	1 mile NNE	FM 521
DR	003	1 mile NE	FM 521
DR	004	1 mile ENE	FM 521
DR	005	1 mile E	FM 521
DR AI AP SO	006	3.5 miles ESE	Site near Reservoir Makeup Pumping Facility
DR	007	3.5 miles SE	MCR Dike
DR	008	0.25 mile SSE	MCR Dike
DR	009	0.25 mile S	MCR Dike
DR	010	0.25 mile SSW	MCR Dike
DR	011	0.5 mile SW	MCR Dike
DR	012	1.5 mile WSW	MCR Dike
DR	013	1.5 mile W	FM 521
DR	014	1.5 mile WNW	FM 521
DR AI AP VB SO VP	015	1 mile NW	FM 521
DR AI AP VB SO VP	016	1 mile NNW	FM 521
DR	017	6.5 miles N	Buckeye - FM 1468
DR AI AP SO	018	5.5 miles NNE	OXEA Corp. - FM 3057
DR	019	5.5 miles NE	FM 2668

MCR-STP Main Cooling Reservoir
STP- South Texas Project
Media codes typed in bold satisfy collection requirement described in Table 1.
* Control Station

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

MEDIA CODE	STATION CODE	VECTOR (Approximate)	LOCATION DESCRIPTION
DR	020	5 miles ENE	FM 2668 & FM 2078
DR	021	5 miles E	FM 521 & FM 2668
DR	022	7 miles E	Lyondell Chemical Plant
DR	023 *	16 miles ENE	Intersection of FM 521 and FM 2540
DR	024	4 miles SSE	MCR Dike
DR	025	4 miles S	MCR Dike
DR	026	4 miles SSW	MCR Dike
DR	027	2.5 miles SW	MCR Dike
DR	028	5 miles WSW	FM 1095 & Ellis Road
DR SO	029	4.5 miles W	FM 1095
DR	030	6 miles WNW	Tres Palacios Oaks, FM 2853
DR	031	5.5 miles NW	Wilson Creek Road
DR	032	3.5 miles NNW	FM 1468
DR AI AP SO	033	14 miles NNE	Microwave Tower at end of Kilowatt Road in Bay City
DR	034	7.5 miles ENE	Wadsworth Water Supply Pump Station
DR AI AP SO	035	8.5 miles SSE	Matagorda
DR	036	9 miles WSW	College Port
DR AI AP VB VP SO	037*	10 miles WSW	Palacios AEP Substation
DR	038	10.5 miles NW	AEP Substation on TX 71 near Blessing

MCR-STP Main Cooling Reservoir
STP- South Texas Project
Media codes typed in bold satisfy collection requirement described in Table 1.
* Control Station

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

MEDIA CODE	STATION CODE	VECTOR (Approximate)	LOCATION DESCRIPTION
DR AI AP SO	039	9 miles NW	TX 35 under High Voltage Power lines near Tidehaven High School
DR	040	4.5 miles SW	Citrus Grove
DR	041	2.0 miles ESE	MCR Dike
DR	042	8.5 miles NW	FM 459 at Tidehaven Intermediate School
DR	043	4.5 miles SE	Site boundary at blowdown outlet
WG	205	4.0 miles SE	Piezometer Well #446A, 40' deep
WG	206	4.0 miles SE	Piezometer Well #446, 78' deep
WS	209	2 miles ESE	Kelly Lake
WD	210	On Site	Approved drinking water supply from STP
WS S1	211	3.5 miles S	Site, E. Branch Little Robbins Slough
WS S1	212	4 miles S	Little Robbins Slough
WS S1	213	4 miles SE	West Branch Colorado River
F (1,2, or 3) CC	214	2.5 miles SE	MCR at Makeup Water Discharge
S2	215	0.5 mile SW	MCR at Circulating Water Discharge
WS S2	216	3.5 miles SSE	MCR at blowdown structure
WS S(1 or 2) F(1,2 OR 3)	217	7-9 miles SSE	Region 1 (mouth of the Colorado River to marker 1)
F (1, 2, or 3) CC CS OY	222	>10 miles	West Matagorda Bay
WS S(1 or 2)	227	5-6 miles SE	West bank of Colorado River downstream of STP across from channel marker #22
WD	228*	14 miles NNE	Le Tulle Park public water supply
WS S1	229	2.3 miles ESE	Drainage ditch north of the reservoir that empties into Colorado River upstream of the reservoir makeup pumping facility
S(1 or 2)	230	3.5 miles ESE	Colorado River at point where drainage ditch (#229) empties into it

MCR-STP Main Cooling Reservoir
STP- South Texas Project
Media codes typed in bold satisfy collection requirement described in Table 1.
* Control Station

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

MEDIA CODE	STATION CODE	VECTOR (Approximate)	LOCATION DESCRIPTION
S(1 or 2) WS	233	4.5 miles SE	Colorado River where MCR blowdown discharge channel empties into it.
WG	235	3.8 miles S	Well B-3 directly south from MCR
B8	236	N/A	STP Protected Area
WS	237	3.7 miles SSE	Blowdown discharge channel from MCR
S(1 or 2) WS	242*	>10 miles N	Colorado River where it intersects Highway 35
WS	243*	>10 miles N	Colorado River upstream of Bay City Dam at the Lower Colorado River Authority pumping station
WG	245	4.5 miles SSE	Water well approximately 60' deep located on private property about 0.5 miles south of MCR
WS	247	<1 mile E	Essential Cooling Pond
F(1,2, or 3)	249*	N/A	Control sample purchased from a local retailer
SO	250	0.75 miles NW	Sewage sludge land farming area
WG	251	4.0 miles SSE	Test Well B-4, upper aquifer
WG	255	4.2 miles SE	Piezometer Well # 415 110' deep
WG	256	2.8 miles ESE	Piezometer Well # 417 100' deep
WG	257	3.9 miles SSW	Piezometer Well # 421-02, 80' deep 1.1 miles down STP Road from Well # 258 approximately 20' inside east fence (site boundary)
WG	258	2.9 miles SW	Piezometer Well # 435-01, 1.5 miles down STP Road from HWY 521 along east fence (site boundary)
WG	259	2.9 miles SW	Piezometer Well # 435-02, 1.5 miles down STP Road from HWY 521 20' east of fence (site boundary)
WG	260	3.7 miles S	Piezometer Well # 437, 74' deep
WG	263	3.2 miles ESE	Piezometer Well # 447, 104' deep

MCR-STP Main Cooling Reservoir
STP- South Texas Project
Media codes typed in bold satisfy collection requirement described in Table 1.
* Control Station

TABLE 2
SAMPLE MEDIA AND LOCATION DESCRIPTIONS

MEDIA CODE	STATION CODE	VECTOR (Approximate)	LOCATION DESCRIPTION
WG	264	3.2 miles ESE	Piezometer Well # 447A , 46' deep
WG	266	0.68 miles NW	Piezometer Well # 602A, 40' deep
WG	267	2.7 miles ESE	Windmill north of Heavy Haul Road
WG	268	3.0 miles SE	Windmill west of MCR
WG	269	4.2 miles SSE	Windmill south of STP owner contolled area on private land
WG	270	2.9 miles SW	Monitoring Well # MW-0805L, depth 49'
WG	271	2.9 miles SW	Monitoring Well # MW-0805U, depth 33'
S1	280	0.2 miles ESE	Beginning of Heavy Haul road ditch. West of the Nuclear Support Center and South of the Drainage Discharge Pipe Outlet
WS	281	0.2 miles ESE	Drainage pipe manifold. Located just North of the beginning of the Heavy Haul road ditch.
F(1, 2, or 3) CC S2	301-356	S	STP Main Cooling Reservoir
WW	701	4 miles S	MCR Relief Well # 440
WW	707	4 miles S	MCR Relief Well # W-455
WS	Q01	N/A	Quarterly composite of station #227 and/or alternate #233
WS	Q02	N/A	Quarterly composite of station #243 and/or alternate #242

MCR-STP Main Cooling Reservoir
STP- South Texas Project
Media codes typed in bold satisfy collection requirement described in Table 1.
* Control Station

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

A summary of all required samples is given in Table 3. The table has been formatted to resemble a United States Nuclear Regulatory Commission industry standard. Modifications have been made for the sole purpose of reading ease. Only positive values are given in this table.

Media type is printed at the top left of each table, and the units of measurement are printed at the top right. The first column lists the type of radioactivity or specific radionuclide for which each sample was analyzed. The second column gives the total number of analyses performed and the total number of non-routine analyses for each indicated nuclide. A non-routine measurement is a sample whose measured activity is greater than the reporting levels for Radioactivity Concentrations in Environmental Samples. The "LOWER LIMIT OF DETECTION" column lists the normal measurement sensitivities achieved. The sensitivities were better than required by the Nuclear Regulatory Commission.

A set of statistical parameters is listed for each radionuclide in the remaining columns. The parameters contain information from the indicator locations, the location having the highest annual mean, and information from the control stations. Some sample types do not have control stations. When this is the case, "no samples" is listed in the control location column. For each of these groups of data, the following is calculated:

- The mean positive values.
- The number of positive measurements / the total number of analyses.
- The lowest and highest values for the analysis.

The data placed in the table are from the samples listed in Table 1. Additional thermoluminescent dosimeters were utilized each quarter for quality control purposes. The minimum samples required by Table 1 were supplemented in 2013 by twelve direct radiation measurements, twenty-one surface water samples for gamma analysis, sixteen additional ground water samples, four rain water samples, and three sediment samples. Fish and crustacean samples vary in number according to availability but also exceeded the minimum number required by Table 1.

A non-required sediment sample was taken at Stations #280 at the beginning of the Plant Area Drainage Ditch southwest of the Nuclear Support Center on station property. The first sample collected indicated 35 pCi/kg of Cobalt-60. A second sample was analyzed and no detectable radionuclides were found above background. The first result was a statistical variation which was confirmed by resampling.

The minimum required Radiological Environmental Monitoring Program is presented in Table 1. The table is organized by exposure pathway. Specific requirements such as location, sampling method, collection frequency, and analyses are given for each pathway.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Direct Radiation — Units: MilliRoentgen/Standard Quarter

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Gamma	173/ 0	---	1.4E+01 (165/ 165) (1.0E+01 - 1.9E+01)	1.5 miles W (#013)	1.8E+01 (5 / 5) (1.5E+01 - 1.9E+01)	1.5E+01 (8 / 8) (1.4E+01 - 1.8E+01)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Airborne Particulate & Radioiodine — Units: PicoCuries per Cubic Meter

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Gross Beta	265/ 0	1.4E-03	2.0E-02 (210 / 212) (7.1E-03 - 5.6E-02)	14 miles NNE (#033)	2.1E-02 (53 / 53) (9.4E-03 - 5.6E-02)	2.0E-02 (53 / 53) (7.9E-03 - 5.5E-02)
Iodine-131	264/ 0	1.4E-02	--- (0 / 212)	---	---	--- (0 / 52)
Cesium-134	20/ 0	4.8E-04	--- (0 / 16)	---	---	--- (0 / 4)
Cesium-137	20/ 0	4.6E-04	--- (0 / 16)	---	---	--- (0 / 4)
Manganese-54	20/ 0	5.1E-04	--- (0 / 16)	---	---	--- (0 / 4)
Iron-59	20/ 0	2.5E-03	--- (0 / 16)	---	---	--- (0 / 4)
Cobalt-58	20/ 0	7.6E-04	--- (0 / 16)	---	---	--- (0 / 4)
Cobalt-60	20/ 0	5.6E-04	--- (0 / 16)	---	---	--- (0 / 4)
Zinc-65	20/ 0	1.5E-03	--- (0 / 16)	---	---	--- (0 / 4)
Zirconium-95	20/ 0	1.4E-03	--- (0 / 16)	---	---	--- (0 / 4)
Niobium-95	20/ 0	8.3E-04	--- (0 / 16)	---	---	--- (0 / 4)
Lanthanum-140 Barium-140	20/ 0	9.9E-03	--- (0 / 16)	---	---	--- (0 / 4)

† Number of positive measurements / total measurements at specified locations.

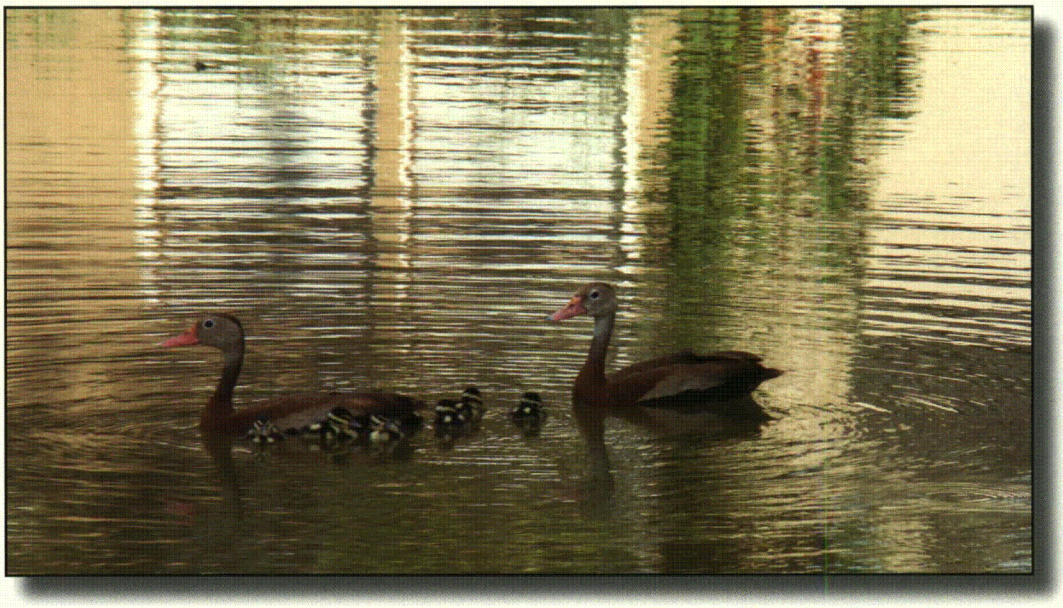


Photo By: Tammy Stevens

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Surface Water — Units: PicoCuries per Kilogram

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Hydrogen-3	13/ 0	2.8E+02	1.3E+04 (4 / 8) (1.2E+04 - 1.3E+04)	3 miles SSE (#216)	1.3E+04 (4 / 4) (1.2E+04 - 1.3E+04)	--- (0 / 5)
Iodine-131	42/ 0	7.3E+00	--- (0 / 28)	---	---	--- (0 / 14)
Cesium-134	42/ 0	2.0E+00	--- (0 / 28)	---	---	--- (0 / 14)
Cesium-137	42/ 0	2.1E+00	--- (0 / 28)	---	---	--- (0 / 14)
Manganese-54	42/ 0	2.0E+00	--- (0 / 28)	---	---	--- (0 / 14)
Iron-59	42/ 0	5.4E+00	--- (0 / 28)	---	---	--- (0 / 14)
Cobalt-58	42/ 0	2.2E+00	--- (0 / 28)	---	---	--- (0 / 14)
Cobalt-60	42/ 0	2.2E+00	--- (0 / 28)	---	---	--- (0 / 14)
Zinc-65	42/ 0	4.8E+00	--- (0 / 28)	---	---	--- (0 / 14)
Zirconium-95	42/ 0	3.9E+00	--- (0 / 28)	---	---	--- (0 / 14)
Niobium-95	42/ 0	2.3E+00	--- (0 / 28)	---	---	--- (0 / 14)
Lanthanum-140 Barium-140	42/ 0	6.2E+00	--- (0 / 28)	---	---	--- (0 / 14)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Ground Water *(On site test well)* — Units: PicoCuries per Kilogram

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Hydrogen-3	23/ 0	2.8E+02	4.4E+03 (15 / 23) (2.2E+03 - 7.5E+03)	4.0 miles SSE (#251)	6.9E+03 (5 / 5) (6.2E+03 - 7.5E+03)	no samples
Iodine-131	23/ 0	5.6E+00	--- (0 / 23)	---	---	no samples
Cesium-134	23/ 0	2.6E+00	--- (0 / 23)	---	---	no samples
Cesium-137	23/ 0	2.7E+00	--- (0 / 23)	---	---	no samples
Manganese-54	23/ 0	2.4E+00	--- (0 / 23)	---	---	no samples
Iron-59	23/ 0	5.8E+00	--- (0 / 23)	---	---	no samples
Cobalt-58	23/ 0	2.6E+00	--- (0 / 23)	---	---	no samples
Cobalt-60	23/ 0	2.8E+00	--- (0 / 23)	---	---	no samples
Zinc-65	23/ 0	6.9E+00	--- (0 / 23)	---	---	no samples
Zirconium-95	23/ 0	4.5E+00	--- (0 / 23)	---	---	no samples
Niobium-95	23/ 0	2.8E+00	--- (0 / 23)	---	---	no samples
Lanthanum-140 Barium-140	23/ 0	5.3E+00	--- (0 / 23)	---	---	no samples

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Drinking Water — Units: PicoCuries per Kilogram

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Gross Beta	26/ 0	4.3E-02	+2.2E+00 (13 / 14) (+1.5E+00 - +3.0E+00)	14 miles NNE (#228)	+5.2E+00 (12 / 12) (+2.6E+00 - +6.2E+00)	+5.2E+00 (12 / 12) (+2.6E+00 - +6.2E+00)
Hydrogen-3	8/ 0	2.8E+02	--- (0 / 4)	---	---	--- (0 / 4)
Iodine-131	26/ 0	5.0E+00	--- (0 / 14)	---	---	--- (0 / 12)
Cesium-134	26/ 0	2.5E+00	--- (0 / 14)	---	---	--- (0 / 12)
Cesium-137	26/ 0	2.6E+00	--- (0 / 14)	---	---	--- (0 / 12)
Manganese-54	26/ 0	2.4E+00	--- (0 / 14)	---	---	--- (0 / 12)
Iron-59	26/ 0	5.6E+00	--- (0 / 14)	---	---	--- (0 / 12)
Cobalt-58	26/ 0	2.5E+00	--- (0 / 14)	---	---	--- (0 / 12)
Cobalt-60	26/ 0	2.7E+00	--- (0 / 14)	---	---	--- (0 / 12)
Zinc-65	26/ 0	6.9E+00	--- (0 / 14)	---	---	--- (0 / 12)
Zirconium-95	26/ 0	4.3E+00	--- (0 / 14)	---	---	--- (0 / 12)
Niobium-95	26/ 0	2.7E+00	--- (0 / 14)	---	---	--- (0 / 12)
Lanthanum-140 Barium-140	26/ 0	4.9E+00	--- (0 / 14)	---	---	--- (0 / 12)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Rain Water — Units: PicoCuries per Kilogram

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Hydrogen-3	4/ 0	2.8E+02	--- (0 / 4)	---	---	no samples
Iodine-131	4/ 0	7.6E+00	--- (0 / 4)	---	---	no samples
Cesium-134	4/ 0	2.4E+00	--- (0 / 4)	---	---	no samples
Cesium-137	4/ 0	2.5E+00	--- (0 / 4)	---	---	no samples
Manganese-54	4/ 0	2.4E+00	--- (0 / 4)	---	---	no samples
Iron-59	4/ 0	6.1E+00	--- (0 / 4)	---	---	no samples
Cobalt-58	4/ 0	2.5E+00	--- (0 / 4)	---	---	no samples
Cobalt-60	4/ 0	2.8E+00	--- (0 / 4)	---	---	no samples
Zinc-65	4/ 0	5.8E+00	--- (0 / 4)	---	---	no samples
Zirconium-95	4/ 0	4.5E+00	--- (0 / 4)	---	---	no samples
Niobium-95	4/ 0	2.5E+00	--- (0 / 4)	---	---	no samples
Lanthanum-140 Barium-140	4/ 0	6.5E+00	--- (0 / 4)	---	---	no samples

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Sediment-Shoreline — Units: PicoCuries per Kilogram dry weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	4/ 0	2.8E+01	--- (0/ 2)	---	---	--- (0/ 2)
Cesium-137	4/ 0	2.4E+01	2.1E+01 (1/ 2) (2.1E+01 - 2.1E+01)	6 miles SE (#227)	2.1E+01 (1/ 2) (2.1E+01 - 2.1E+01)	--- (0/ 2)
Manganese-54	4/ 0	2.5E+01	--- (0/ 2)	---	---	--- (0/ 2)
Iron-59	4/ 0	1.1E+02	--- (0/ 2)	---	---	--- (0/ 2)
Cobalt-58	4/ 0	3.1E+01	--- (0/ 2)	---	---	--- (0/ 2)
Cobalt-60	4/ 0	2.6E+01	--- (0/ 2)	---	---	--- (0/ 2)
Zinc-65	4/ 0	9.1E+01	--- (0/ 2)	---	---	--- (0/ 2)
Zirconium-95	4/ 0	6.4E+01	--- (0/ 2)	---	---	--- (0/ 2)
Niobium-95	4/ 0	4.0E+01	--- (0/ 2)	---	---	--- (0/ 2)
Lanthanum-140 Barium-140	4/ 0	3.0E+02	--- (0/ 2)	---	---	--- (0/ 2)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Sediment-Bottom — Units: PicoCuries per Kilogram dry weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	LOCATION WITH HIGHEST ANNUAL MEAN MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	6/ 0	3.8E+01	--- (0/ 6)	---	---	no samples
Cesium-137	6/ 0	2.5E+01	1.0E+02 (5/ 6) (4.0E+01 - 1.6E+02)	3 miles SSE (#216)	1.2E+02 (4/ 4) (4.6E+01 - 1.6E+02)	no samples
Manganese-54	6/ 0	3.3E+01	--- (0/ 6)	---	---	no samples
Iron-59	6/ 0	1.4E+02	--- (0/ 6)	---	---	no samples
Cobalt-58	6/ 0	4.2E+01	--- (0/ 6)	---	---	no samples
Cobalt-60	6/ 0	3.4E+01	8.5E+01 (4/ 6) (5.5E+01 - 1.1E+02)	3 miles SSE (#216)	9.5E+01 (3/ 4) (8.2E+01 - 1.1E+02)	no samples
Zinc-65	6/ 0	1.1E+02	--- (0/ 6)	---	---	no samples
Zirconium-95	6/ 0	8.6E+01	--- (0/ 6)	---	---	no samples
Niobium-95	6/ 0	5.4E+01	--- (0/ 6)	---	---	no samples
Lanthanum-140 Barium-140	6/ 0	4.9E+02	--- (0/ 6)	---	---	no samples

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Banana Leaves — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Iodine-131	15/ 0	2.0E+01	--- (0/ 10)	---	---	--- (0/ 5)
Cesium-134	15/ 0	1.1E+01	--- (0/ 10)	---	---	--- (0/ 5)
Cesium-137	15/ 0	1.2E+01	--- (0/ 10)	---	---	--- (0/ 5)
Manganese-54	15/ 0	1.1E+01	--- (0/ 10)	---	---	--- (0/ 5)
Iron-59	15/ 0	3.1E+01	--- (0/ 10)	---	---	--- (0/ 5)
Cobalt-58	15/ 0	1.2E+01	--- (0/ 10)	---	---	--- (0/ 5)
Cobalt-60	15/ 0	1.4E+01	--- (0/ 10)	---	---	--- (0/ 5)
Zinc-65	15/ 0	3.6E+01	--- (0/ 10)	---	---	--- (0/ 5)
Zirconium-95	15/ 0	2.0E+01	--- (0/ 10)	---	---	--- (0/ 5)
Niobium-95	15/ 0	1.2E+01	--- (0/ 10)	---	---	--- (0/ 5)
Lanthanum-140 Barium-140	15/ 0	1.7E+01	--- (0/ 10)	---	---	--- (0/ 5)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Cana Leaves — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Iodine-131	9/ 0	2.2E+01	--- (0/ 6)	---	---	--- (0/ 3)
Cesium-134	9/ 0	1.1E+01	--- (0/ 6)	---	---	--- (0/ 3)
Cesium-137	9/ 0	1.1E+01	--- (0/ 6)	---	---	--- (0/ 3)
Manganese-54	9/ 0	1.1E+01	--- (0/ 6)	---	---	--- (0/ 3)
Iron-59	9/ 0	3.0E+01	--- (0/ 6)	---	---	--- (0/ 3)
Cobalt-58	9/ 0	1.1E+01	--- (0/ 6)	---	---	--- (0/ 3)
Cobalt-60	9/ 0	1.3E+01	--- (0/ 6)	---	---	--- (0/ 3)
Zinc-65	9/ 0	3.3E+01	--- (0/ 6)	---	---	--- (0/ 3)
Zirconium-95	9/ 0	1.9E+01	--- (0/ 6)	---	---	--- (0/ 3)
Niobium-95	9/ 0	1.2E+01	--- (0/ 6)	---	---	--- (0/ 3)
Lanthanum-140 Barium-140	9/ 0	1.8E+01	--- (0/ 6)	---	---	--- (0/ 3)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Collard Greens — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Iodine-131	6/ 0	1.4E+01	--- (0/ 4)	---	---	--- (0/ 2)
Cesium-134	6/ 0	1.2E+01	--- (0/ 4)	---	---	--- (0/ 2)
Cesium-137	6/ 0	1.2E+01	--- (0/ 4)	---	---	--- (0/ 2)
Manganese-54	6/ 0	1.2E+01	--- (0/ 4)	---	---	--- (0/ 2)
Iron-59	6/ 0	2.9E+01	--- (0/ 4)	---	---	--- (0/ 2)
Cobalt-58	6/ 0	1.1E+01	--- (0/ 4)	---	---	--- (0/ 2)
Cobalt-60	6/ 0	1.5E+01	--- (0/ 4)	---	---	--- (0/ 2)
Zinc-65	6/ 0	3.5E+01	--- (0/ 4)	---	---	--- (0/ 2)
Zirconium-95	6/ 0	2.0E+01	--- (0/ 4)	---	---	--- (0/ 2)
Niobium-95	6/ 0	1.2E+01	--- (0/ 4)	---	---	--- (0/ 2)
Lanthanum-140 Barium-140	6/ 0	1.7E+01	--- (0/ 4)	---	---	--- (0/ 2)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Fish - Piscivorous — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	8/ 0	2.9E+01	--- (0/ 6)	---	---	--- (0/ 2)
Cesium-137	8/ 0	2.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Manganese-54	8/ 0	2.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Iron-59	8/ 0	1.2E+02	--- (0/ 6)	---	---	--- (0/ 2)
Cobalt-58	8/ 0	3.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Cobalt-60	8/ 0	3.2E+01	--- (0/ 6)	---	---	--- (0/ 2)
Zinc-65	8/ 0	7.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Zirconium-95	8/ 0	7.2E+01	--- (0/ 6)	---	---	--- (0/ 2)
Niobium-95	8/ 0	4.0E+01	--- (0/ 6)	---	---	--- (0/ 2)
Lanthanum-140 Barium-140	8/ 0	5.3E+02	--- (0/ 6)	---	---	--- (0/ 2)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Fish - Crustacean & Insect Feeders — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	8/ 0	2.9E+01	--- (0/ 6)	---	---	--- (0/ 2)
Cesium-137	8/ 0	2.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Manganese-54	8/ 0	2.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Iron-59	8/ 0	1.2E+02	--- (0/ 6)	---	---	--- (0/ 2)
Cobalt-58	8/ 0	3.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Cobalt-60	8/ 0	3.2E+01	--- (0/ 6)	---	---	--- (0/ 2)
Zinc-65	8/ 0	7.8E+01	--- (0/ 6)	---	---	--- (0/ 2)
Zirconium-95	8/ 0	7.2E+01	--- (0/ 6)	---	---	--- (0/ 2)
Niobium-95	8/ 0	4.0E+01	--- (0/ 6)	---	---	--- (0/ 2)
Lanthanum-140 Barium-140	8/ 0	5.3E+02	--- (0/ 6)	---	---	--- (0/ 2)

† Number of positive measurements / total measurements at specified locations.

Photo By: Aubrey Passafuma

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Crustacean Shrimp — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	4/ 0	3.1E+01	--- (0/ 2)	---	---	--- (0/ 2)
Cesium-137	4/ 0	3.0E+01	--- (0/ 2)	---	---	--- (0/ 2)
Manganese-54	4/ 0	3.1E+01	--- (0/ 2)	---	---	--- (0/ 2)
Iron-59	4/ 0	1.1E+02	--- (0/ 2)	---	---	--- (0/ 2)
Cobalt-58	4/ 0	3.9E+01	--- (0/ 2)	---	---	--- (0/ 2)
Cobalt-60	4/ 0	3.6E+01	--- (0/ 2)	---	---	--- (0/ 2)
Zinc-65	4/ 0	8.0E+01	--- (0/ 2)	---	---	--- (0/ 2)
Zirconium-95	4/ 0	7.2E+01	--- (0/ 2)	---	---	--- (0/ 2)
Niobium-95	4/ 0	4.2E+01	--- (0/ 2)	---	---	--- (0/ 2)
Lanthanum-140 Barium-140	4/ 0	3.2E+02	--- (0/ 2)	---	---	--- (0/ 2)

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Beef Meat — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	2/ 0	2.5E+01	--- (0/ 2)	---	---	no samples
Cesium-137	2/ 0	2.4E+01	--- (0/ 2)	---	---	no samples
Manganese-54	2/ 0	2.6E+01	--- (0/ 2)	---	---	no samples
Iron-59	2/ 0	1.4E+02	--- (0/ 2)	---	---	no samples
Cobalt-58	2/ 0	4.1E+01	--- (0/ 2)	---	---	no samples
Cobalt-60	2/ 0	2.7E+01	--- (0/ 2)	---	---	no samples
Zinc-65	2/ 0	7.1E+01	--- (0/ 2)	---	---	no samples
Zirconium-95	2/ 0	7.6E+01	--- (0/ 2)	---	---	no samples
Niobium-95	2/ 0	4.4E+01	--- (0/ 2)	---	---	no samples
Lanthanum-140 Barium-140	2/ 0	1.0E+03	--- (0/ 2)	---	---	no samples

† Number of positive measurements / total measurements at specified locations.

TABLE 3

2013 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANALYSIS SUMMARY

Medium: Wild Swine — Units: PicoCuries per Kilogram wet weight

ANALYSIS TYPE	TOTAL ANALYSES /NONROUTINE MEASUREMENTS	LOWER LIMIT OF DETECTION	INDICATOR LOCATIONS MEAN † RANGE	LOCATION WITH HIGHEST ANNUAL MEAN LOCATION INFORMATION	MEAN † RANGE	CONTROL LOCATIONS MEAN † RANGE
Cesium-134	2/ 0	3.1E+01	--- (0/ 2)	---	---	no samples
Cesium-137	2/ 0	3.1E+01	--- (0/ 2)	---	---	no samples
Manganese-54	2/ 0	2.9E+01	--- (0/ 2)	---	---	no samples
Iron-59	2/ 0	1.2E+02	--- (0/ 2)	---	---	no samples
Cobalt-58	2/ 0	4.3E+01	--- (0/ 2)	---	---	no samples
Cobalt-60	2/ 0	3.5E+01	--- (0/ 2)	---	---	no samples
Zinc-65	2/ 0	7.9E+01	--- (0/ 2)	---	---	no samples
Zirconium-95	2/ 0	7.7E+01	--- (0/ 2)	---	---	no samples
Niobium-95	2/ 0	4.4E+01	--- (0/ 2)	---	---	no samples
Lanthanum-140 Barium-140	2/ 0	3.7E+02	--- (0/ 2)	---	---	no samples

† Number of positive measurements / total measurements at specified locations.

Photo By: Kristy Moss

Photo By: Jodie Jankauskas

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