

An Overview of SRS Environmental Monitoring Air Surveillance Program

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Purpose

- To fulfill a 2016 Facilities Disposition and Site Remediation Committee Work Plan Commitment
- To Provide an Overview of the SRS Air Surveillance Program



Overview

- SRS Air Surveillance Program Overview
- Air surveillance results for radionuclides are within the historical five-year trend and below 1% of the (EPA) dose standard of 10 mrem/yr.
- Tritium-in-Rainwater: Concentrations from all locations are below the EPA drinking water standard of 20,000 pCi/L

SRS is Bigger Than a Breadbox... But How Big is It?



The Savannah River Site (SRS) covers 310 square miles or 198,344 acres. It encompasses parts of Aiken, Barnwell and Allendale counties. Of its 198,344 acres, about 90 percent is pine forest and teeming swampland. The property is a National Environmental Research Park and is home to several endangered species.

Why SRS Monitors



To ensure protection of the public and the environment

Evolution of Site Monitoring

- Environmental baseline studies during the 1950s included:
 - Scientists from the Universities of Georgia and South Carolina
 - *Collected baseline data on plant and animal communities.*
 - Team from the Academy of Natural Sciences in Philadelphia under the leadership of Dr. Ruth Patrick.
 - *Performed a biological study of the Savannah River.*
 - Du Pont's Site Survey team of Health Physics personnel.
 - *Completed a landmark study of local natural radioactivity.*
- **Environmental monitoring program established in 1953**



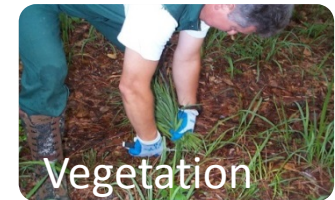
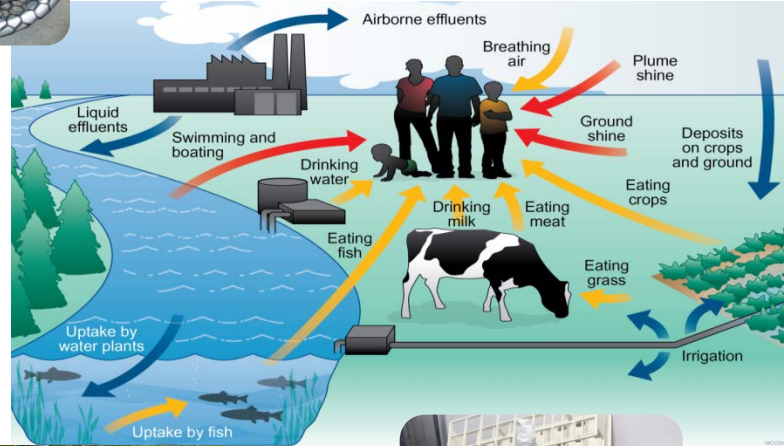
Dr. Ruth Patrick, pioneer in studying the health of freshwater streams and rivers, and member of the Academy of Natural Sciences

Environmental Monitoring

- SRS has performed environmental sampling and monitoring for over 60 years
 - Earliest baseline sampling initiated in early 1950s
 - Assess impact to the public and environment from site operations
 - Monitor facility discharges
 - Extensive on- and off-site, extending to Savannah
 - Sample media: air, water, groundwater, soil, food products (including fish) and vegetation
 - *Chemical*
 - *Radiological*



Exposure Pathways & Sampling by Media



Effluent Monitoring vs. Environmental Surveillance

- **Effluent Monitoring**
 - The collection of samples or data from the permitted point at which a facility discharges liquid or gaseous releases to the environment
- **Environmental Surveillance**
 - The collection of samples of air, water, soil, foodstuffs, biota and other media, or of data from the ambient environment (beyond the point of discharge)



Radiological Airborne Surveillance

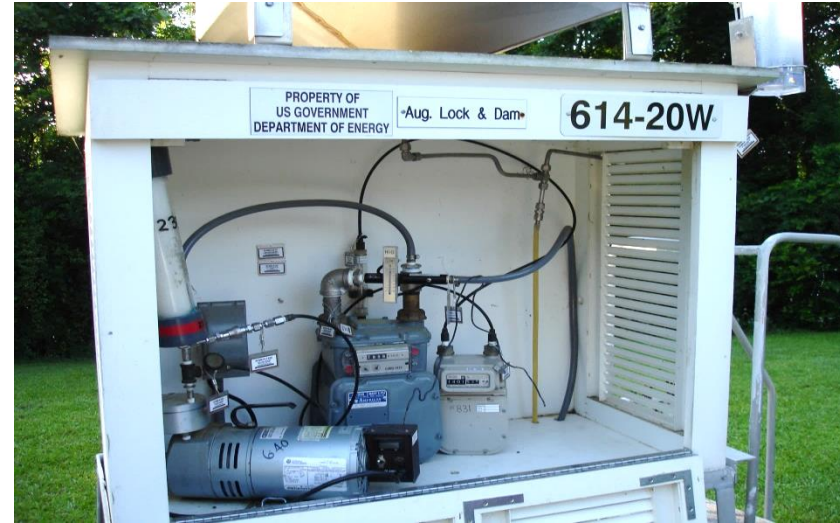
- Radionuclides present in and around the SRS environment are from a number of sources, including natural background, fallout from historical atmospheric testing of nuclear weapons, offsite nuclear power plant operations, offsite non-routine releases such as Fukushima disaster in 2011*, and SRS operations.
- SRS conducts atmospheric surveillance to determine whether airborne radionuclides from SRS releases have reached the environment in measurable quantities.

*<http://www.srs.gov/general/pubs/ERsum/er11/index.html>



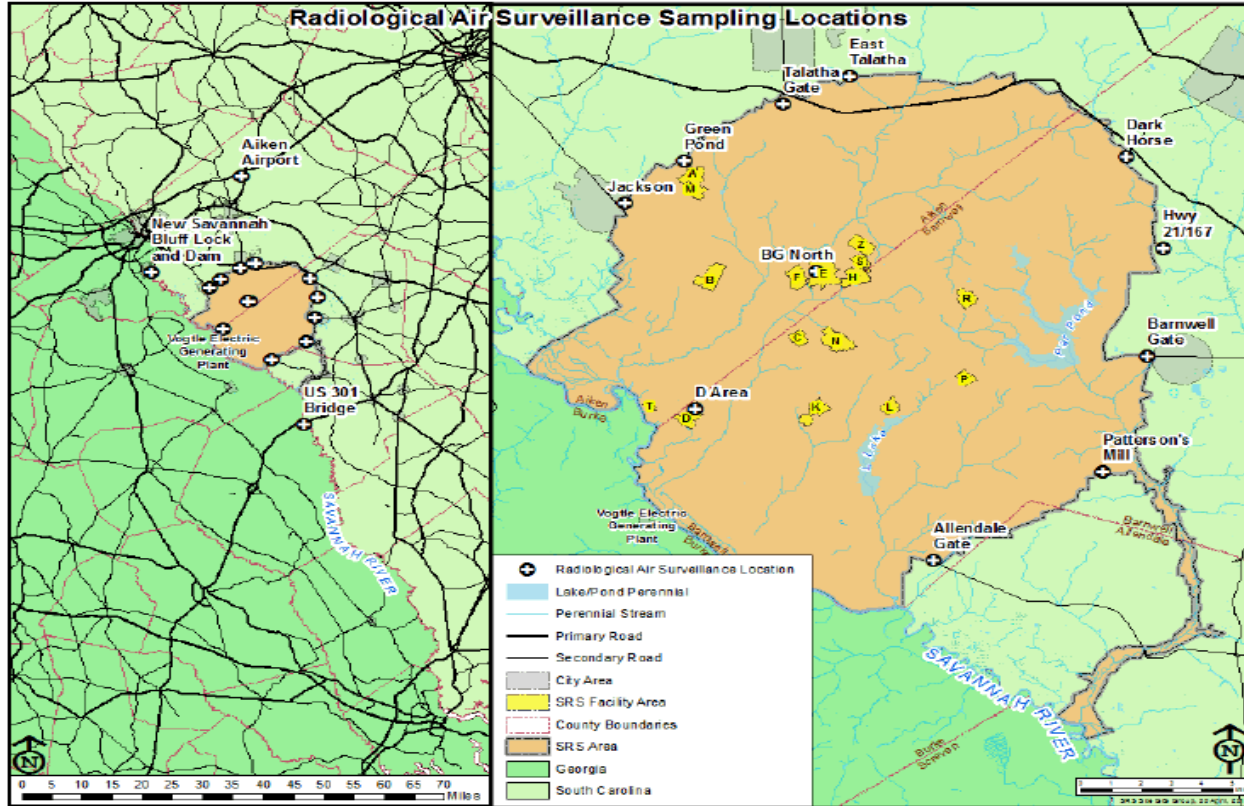
Air Surveillance Continued

- The atmosphere contains radionuclides in various forms (gaseous, particulate matter, water vapor). Rainwater can redeposit particulate matter from the air onto the ground and the radionuclides can eventually be absorbed into vegetation or soil. The atmospheric surveillance program monitors both air and rainwater.
- SRS maintains a network of 14 atmospheric surveillance sampling stations in and around SRS to monitor the concentration of tritium and radioactive particulate matter in the air and rainwater.



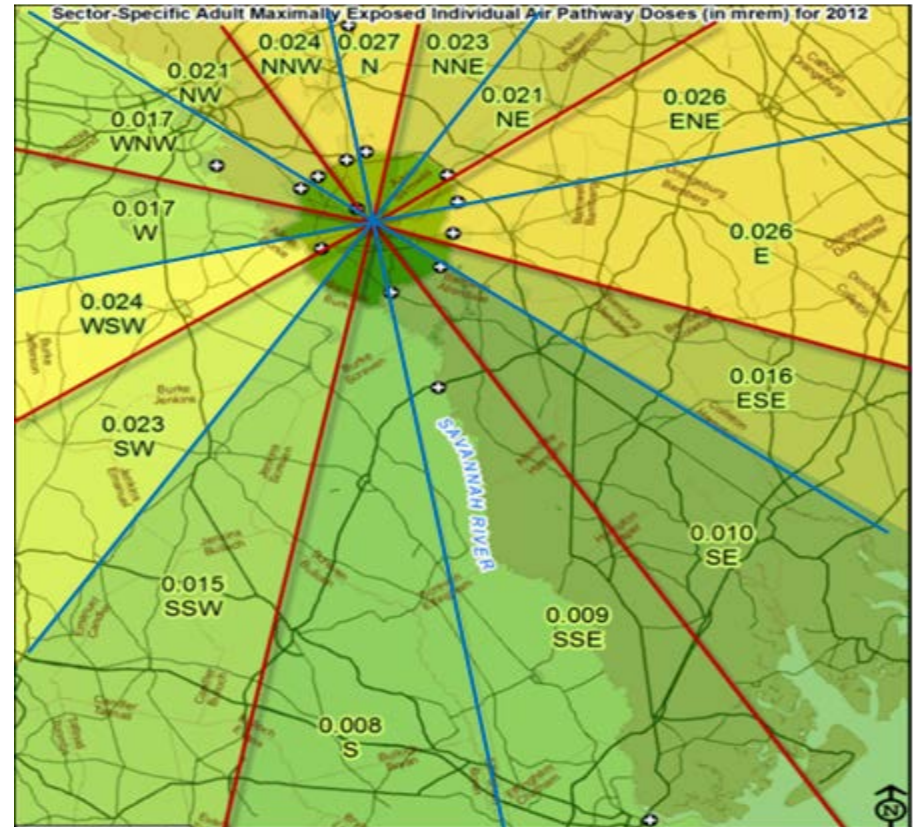
Air Surveillance Locations

(11) "Outer Perimeter" & (3) "25 Mile" Locations

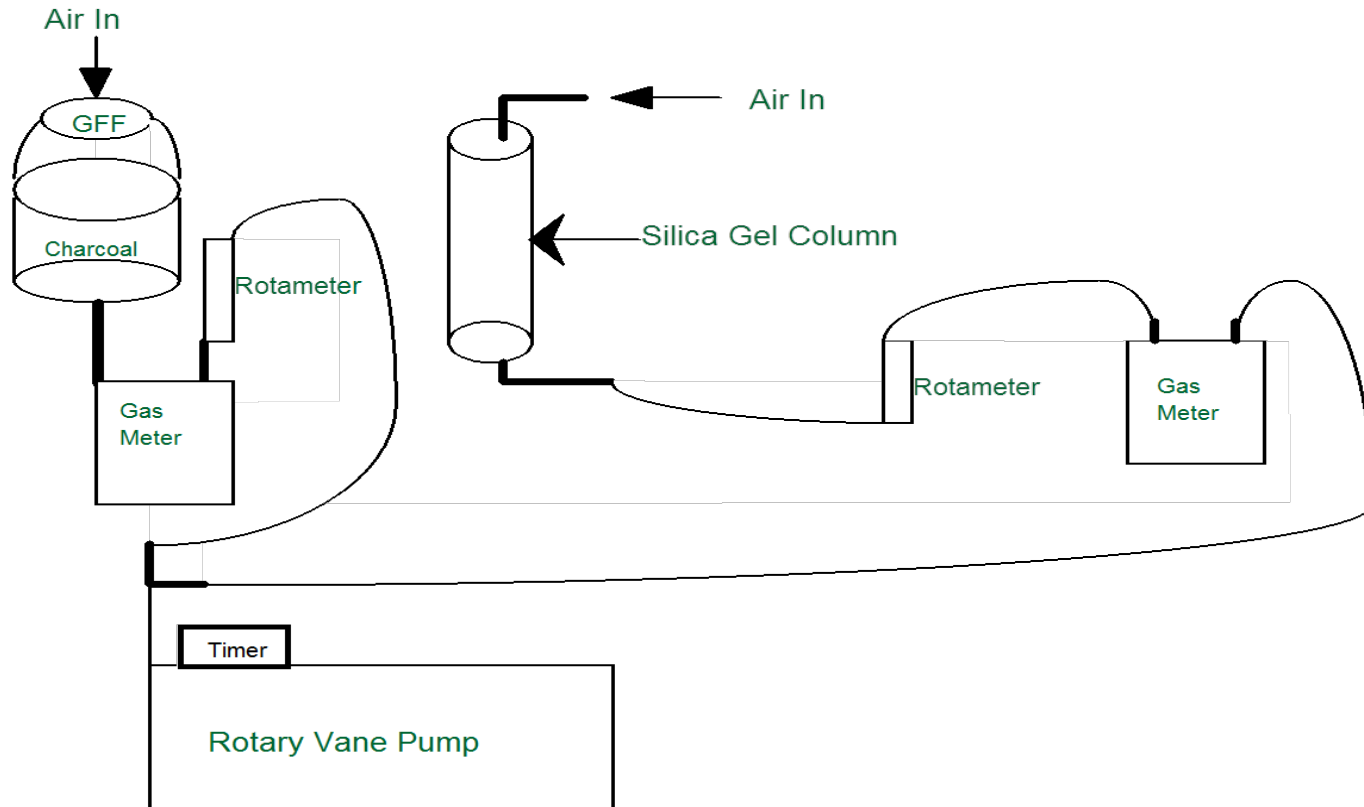


Location Geometry

- Stations are placed in the center of site; in a ring around site perimeter; at a regional reference location assumed to be un-impacted by site operations at 25 miles, and in population centers at 25 miles.
- Placement on the site boundary was designed to ensure that at least one monitoring station is located in every 45-degree sector



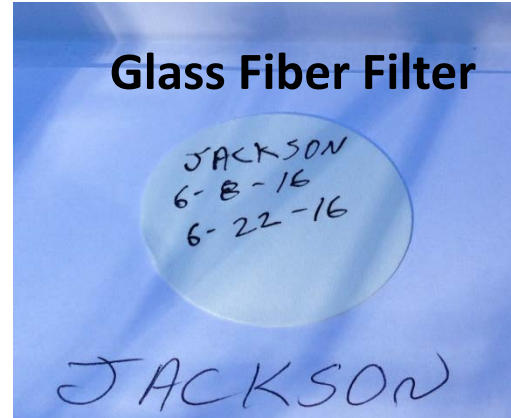
Air Station Schematic



Filtration System (Bi-Weekly Sampling)



Filter Holder Housing



Glass Fiber Filter



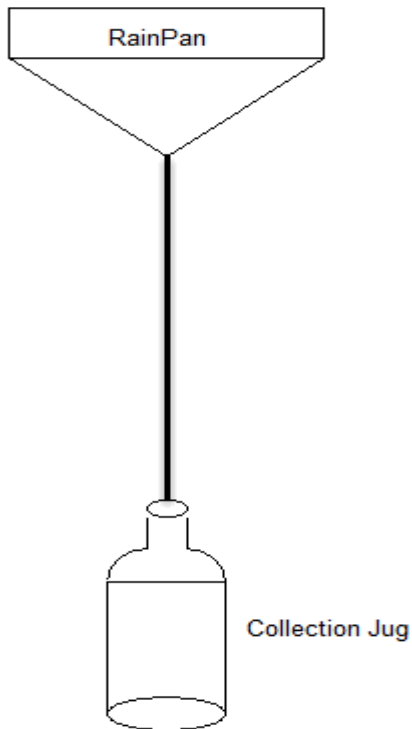
Charcoal Canister



Silica Gel Column

- **Glass Fiber Filter-** Airborne Particulate Matter (Gamma-emitting radionuclides, gross alpha/beta emitting radionuclides)
- **Charcoal Canister-** Gaseous states of Radioiodine (Iodine-129, Iodine-131, gamma-emitting radionuclides)
- **Silica Gel-** Tritiated Water Vapor

Schematic of Rainwater Collection



Monthly Sampling-

- Rainwater- Tritium in Rainwater

Conclusion

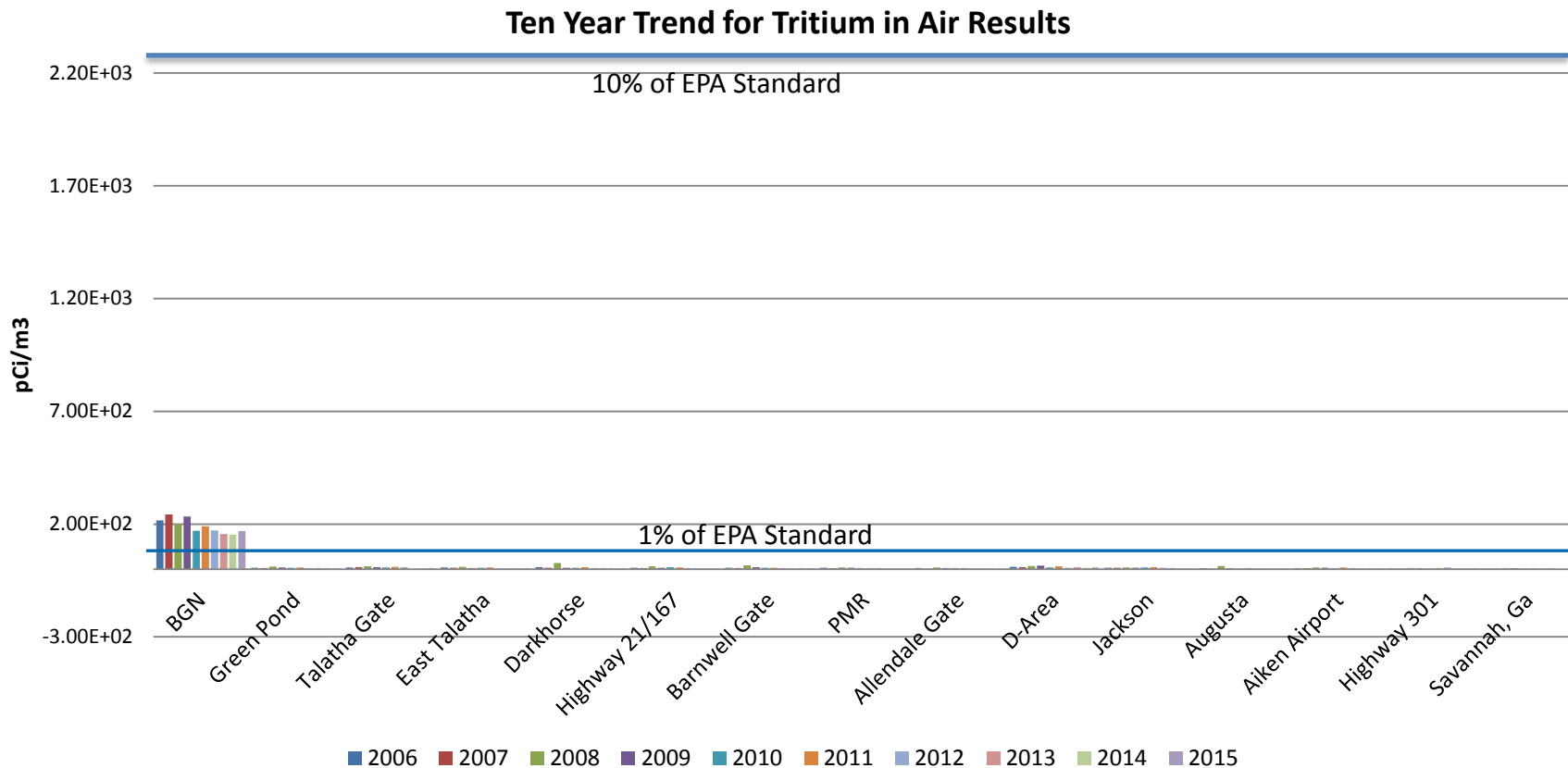
- SRS performs environmental monitoring to meet state and federal regulations and DOE orders to ensure protection of the public and the environment
- SRS conducts atmospheric surveillance (beyond the point of discharge) to determine whether airborne radionuclides from SRS releases have reached the environment in measurable quantities.
- SRS maintains a network of 14 atmospheric surveillance sampling stations in and around SRS to monitor the concentration of tritium and radioactive particulate matter in the air and rainwater.
- Air surveillance results for radionuclides are within the historical five-year trend and below 1% of the (EPA) dose standard of 10 mrem/yr
- Tritium-in-Rainwater: Concentrations from all locations are below the EPA drinking water standard of 20,000 pCi/L
- For more information please see Annual Site Environmental Report <http://www.srs.gov/general/pubs/ERsum/er14/index.html>.
 - 2015 ASER will be available 10/1/16.

Backup Slides

- Backup Slides

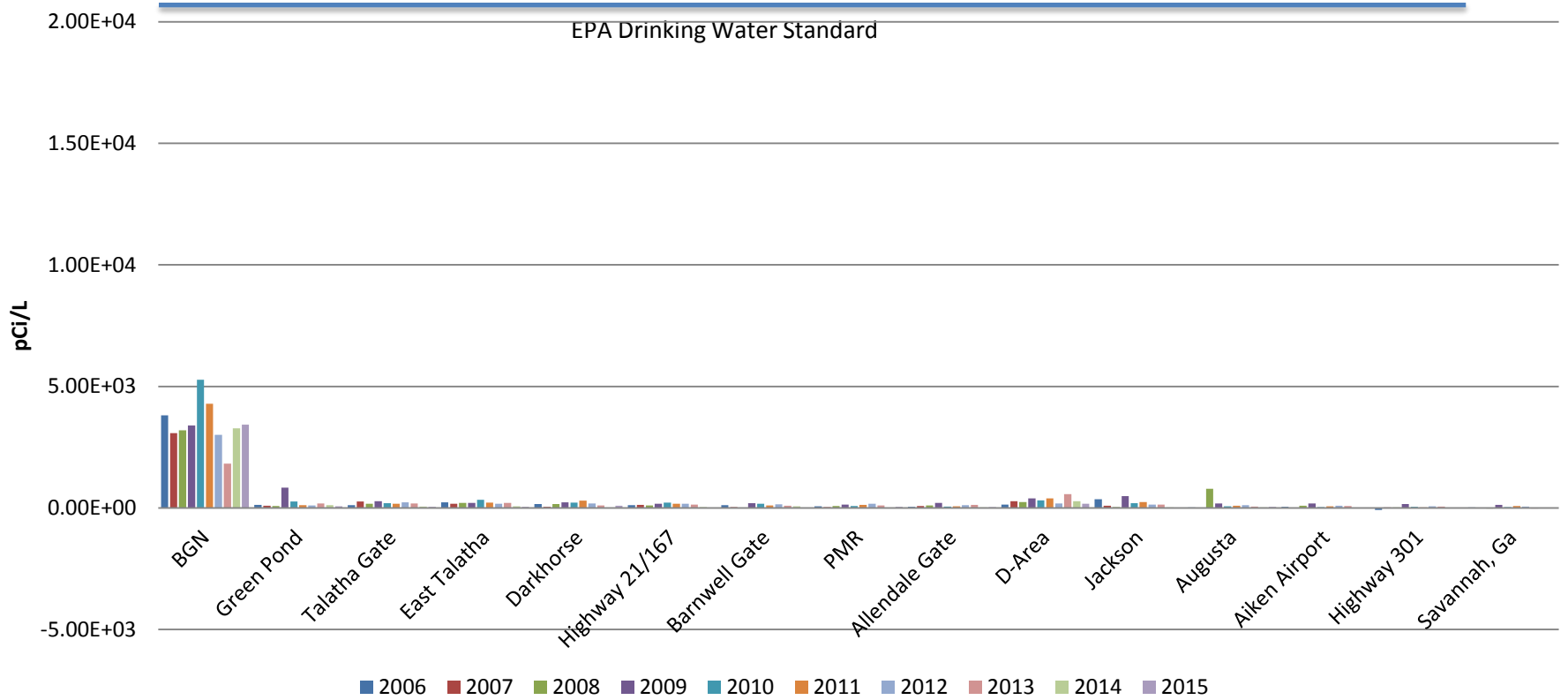


Tritium-in Air Results Compared to Standards



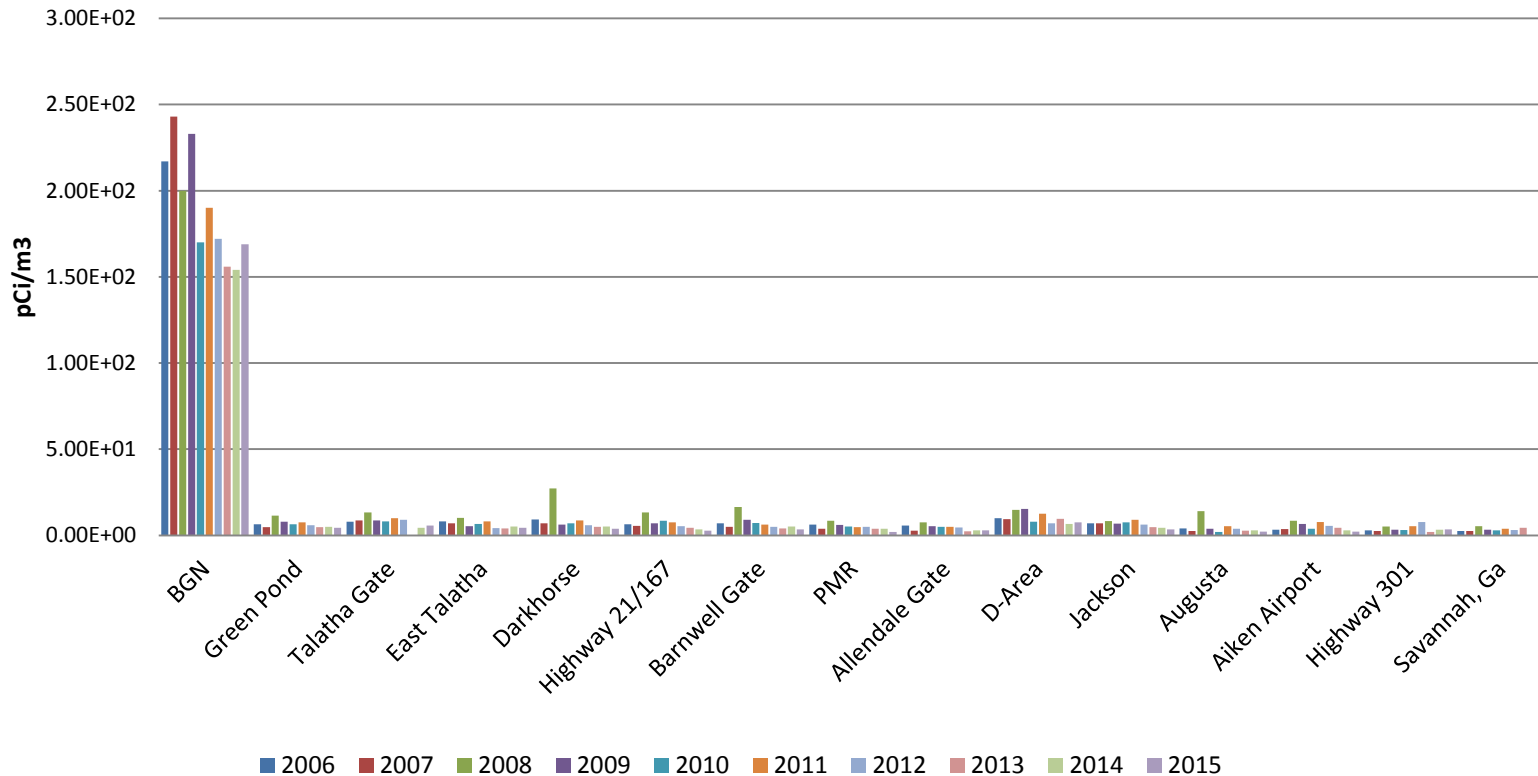
Tritium in Rainwater Compared to Standard

Ten Year Trend for Tritium in Rainwater Results



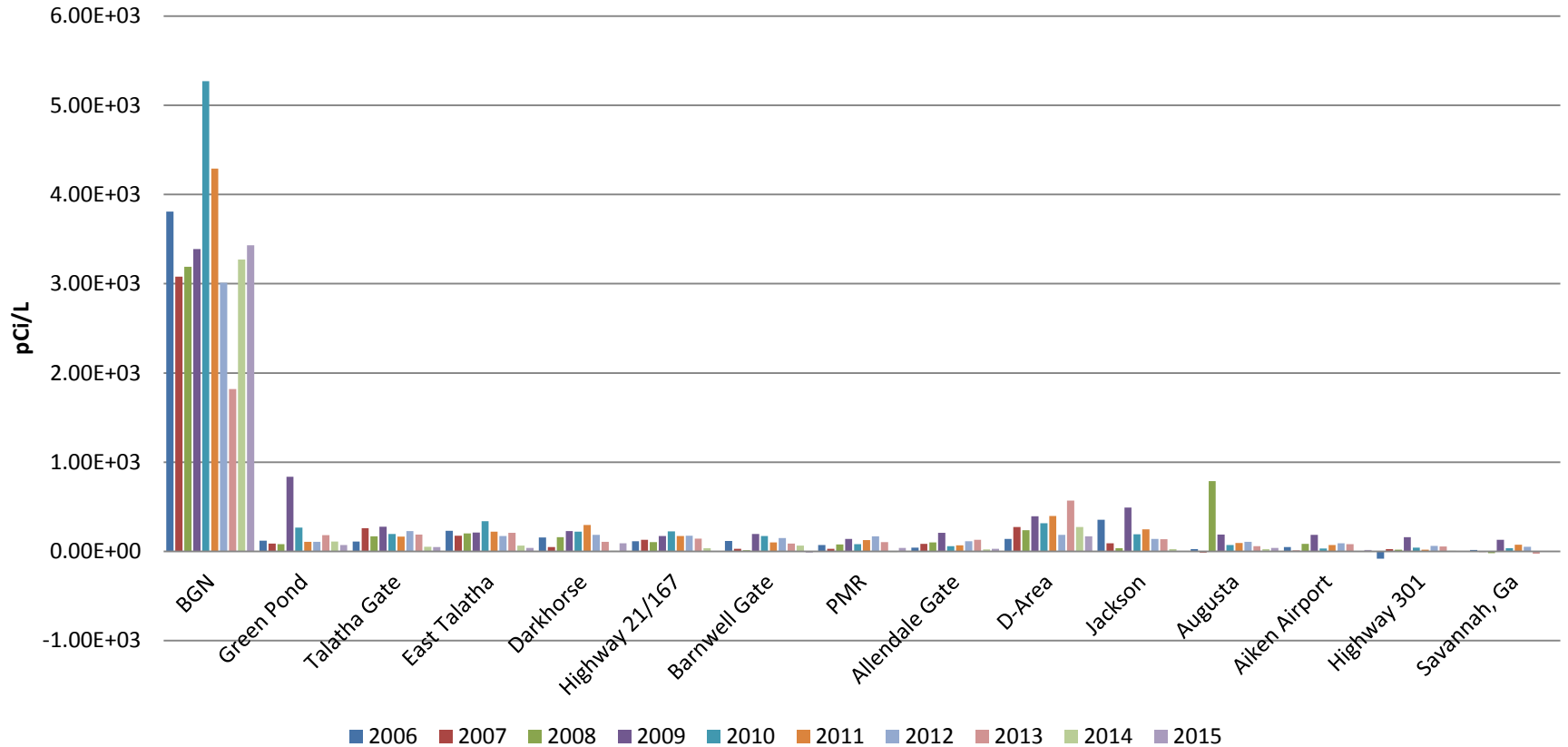
Tritium in Air Surveillance Results

Ten Year Trend for Tritium-in-Air Results, pCi/m³



Tritium in Rainwater Results

Ten Year Trend for Tritium in Rainwater



SRS WindRose

