

Annual
**WATER
QUALITY
REPORT**

Reporting Year 2012



*Presented By
Florida Keys
Aqueduct Authority*

PWS ID#: 4134357, 5444047

There When You Need Us

We are once again proud to present our annual water quality report covering all testing performed between January 1 and December 31, 2012. As in years past, we are committed to delivering the best-quality drinking water possible. To that end, we remain vigilant in meeting the challenges of source water protection, distribution and transmission system protection, and water conservation.

Through proactive efforts, the Florida Keys Aqueduct Authority (FKAA) is continually monitoring, assessing, and working to eliminate potential hazards to our water source, including inappropriate aquifer utilization, unsuitable land uses, and the potential for saltwater intrusion. Progressive planning, such as construction of our new reverse osmosis plant, the strategic installation of additional monitoring wells, and the implementation of alternative water supplies and advanced conservation strategies, will continually be used to protect our resource. Additionally, we persist in our efforts to manage the impacts to our transmission and distribution lines from ongoing outside utility construction and harsh environmental conditions. Throughout these challenges, we maintain our high standards in an effort to continue delivering the best-quality drinking water possible. There may be other hurdles in the future, but please know that we will always stand by you and the exceptional drinking water we work diligently to provide. We encourage you to share your thoughts with us on the information contained in this report. Should you ever have any questions or concerns, we are always available to assist you.

For more information about this report, or for any questions relating to your drinking water, please call Julie Cheon, Water Quality and Environmental Manager, at (305) 295-2150.



Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants may be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. The U.S. EPA/CDC (Centers for Disease Control and Prevention) guidelines on appropriate means to lessen the risk of infection by *Cryptosporidium* and other microbial contaminants are available from the Safe Drinking Water Hotline at (800) 426-4791 or <http://water.epa.gov/drink/hotline>.

Where Does My Water Come From?

J. Robert Dean Water Treatment Facility (PWS ID#: FL4134357)

The freshwater Biscayne Aquifer is the primary water supply for the Florida Keys Aqueduct Authority. Our wellfield is located within an environmentally protected pine rockland forest west of Florida City on the mainland. The location of the wellfield near Everglades National Park, along with restrictions enforced by state and local regulatory agencies, contributes to the unusually high-quality raw water. The FKAA wells contain some of the highest quality groundwater in the state, meeting all regulatory standards prior to treatment.

Included in the regulations mentioned above are restrictions which limit the amount of water that can be extracted from the Biscayne Aquifer. In order to abide by the regulations, the FKAA utilizes the Floridan Aquifer, a brackish groundwater source located approximately 800 to 1,000 feet below the surface, to supplement the Biscayne Aquifer supply. The Floridan Aquifer is the source employed by the FKAA's low pressure reverse osmosis (LPRO) water treatment plant located at our Florida City Wellfield. The LPRO facility was completed in the fall of 2009 and can contribute up to an additional six million gallons a day to our water supply.

Kermit H. Lewin Reverse Osmosis & Marathon Reverse Osmosis Facilities (PWS ID#: FL5444047)

During an emergency situation, the FKAA may utilize the emergency Reverse Osmosis Water Treatment Plants (WTPs), located in Stock Island (Kermit Lewin Reverse Osmosis Facility) and Marathon, to supplement the water supply and increase emergency storage capacity. The RO WTPs withdraw from seawater wells to produce potable water from saltwater.

How Is My Water Treated and Purified?

J. Robert Dean Water Treatment Facility (PWS ID#: FL4134357)

The water treatment plant is an integrated source facility staffed by state-licensed personnel. Groundwater extracted from the Biscayne Aquifer is the primary source water for this facility. A secondary groundwater source, the Floridan Aquifer, is utilized to a much lesser extent. The Biscayne groundwater is classified as very hard, due to the high concentration of calcium in the water. A process called lime softening is used to reduce calcium hardness. Lime softening is achieved by the addition of excess calcium under high pH conditions. This allows the water to become supersaturated with calcium, thereby causing the calcium to sink to the bottom of the lime softening treatment unit, leaving less hard (softened) water for use by FKAAs. The FKAAs product water is considered moderately hard.

The softened water is then piped to dual media filters, which are made up of layers of anthracite and fine sand, for additional removal of particles (calcium) and further purification. Chlorine and ammonia are injected into the water to form chloramines, which provide long-lasting disinfectant protection without the objectionable taste and odor of regular chlorine. Fluoride, which is recommended for drinking water by the American Dental Association to prevent cavities and strengthen bones, is also added.

In order to comply with Biscayne Aquifer withdrawal limitations, a Floridan wellfield and low pressure reverse osmosis (LPRO) water treatment plant were constructed. Operational since the summer of 2009, the LPRO water treatment plant treats the brackish water of the Floridan Aquifer. The Floridan raw water contains approximately 4,000 to 5,000 parts per million of salt. This concentration is significantly lower than the 35,000 ppm typically found in seawater. This LPRO system utilizes very fine membrane elements mounted on LPRO system skids. The water is pressurized to approximately 250 pounds per square inch (psi), rejecting the salt while allowing the passage of the pure finished water. The LPRO water is disinfected in the same manner as the Biscayne lime-softened water. Finished water from the LPRO WTP is blended with water treated from the Biscayne Aquifer.



The FKAAs treated water is pumped 130 miles from Florida City to Key West, supplying water to the entire Florida Keys. The water provided to customers in the Florida Keys is continuously monitored and tested to ensure the water quality is consistent, safe, and meets all federal and state drinking water standards. The FKAAs operates two state-certified laboratories, located in Florida City and Stock Island, to perform many daily water quality analyses.

Kermit H. Lewin Reverse Osmosis & Marathon Reverse Osmosis Water Treatment Facilities (PWS ID#: FL5444047)

Through a process called Reverse Osmosis (RO), the Kermit H. Lewin and Marathon RO water treatment facilities desalinate saltwater, producing potable water. The saltwater from seawater wells first enters the cartridge filter, to remove particulate matter. From the filters, the water is pressurized up to 900 psi. These pressures are significantly higher than those required at the Florida City LPRO due to the significantly higher salt content of the seawater. The high pressure forces some of the water in through the RO membranes and is commonly referred to as permeate; the remainder of water is rejected as brine and disposed in an underground injection well. The permeate flows into a degasifier and clear well, where hydrogen sulfide and carbon dioxide are removed. Next, sodium hydroxide is added to raise the pH and a corrosion inhibitor may be added to provide corrosion control. In the final treatment stage, the permeate is disinfected with chloramines and the finished product is transferred to the storage tank for distribution.

Community Participation

You are invited to participate in regularly scheduled board meetings and voice your concerns about your drinking water. Call the executive office at (305) 296-2454, or visit our Web site at www.fkaa.com for more information on these meetings.



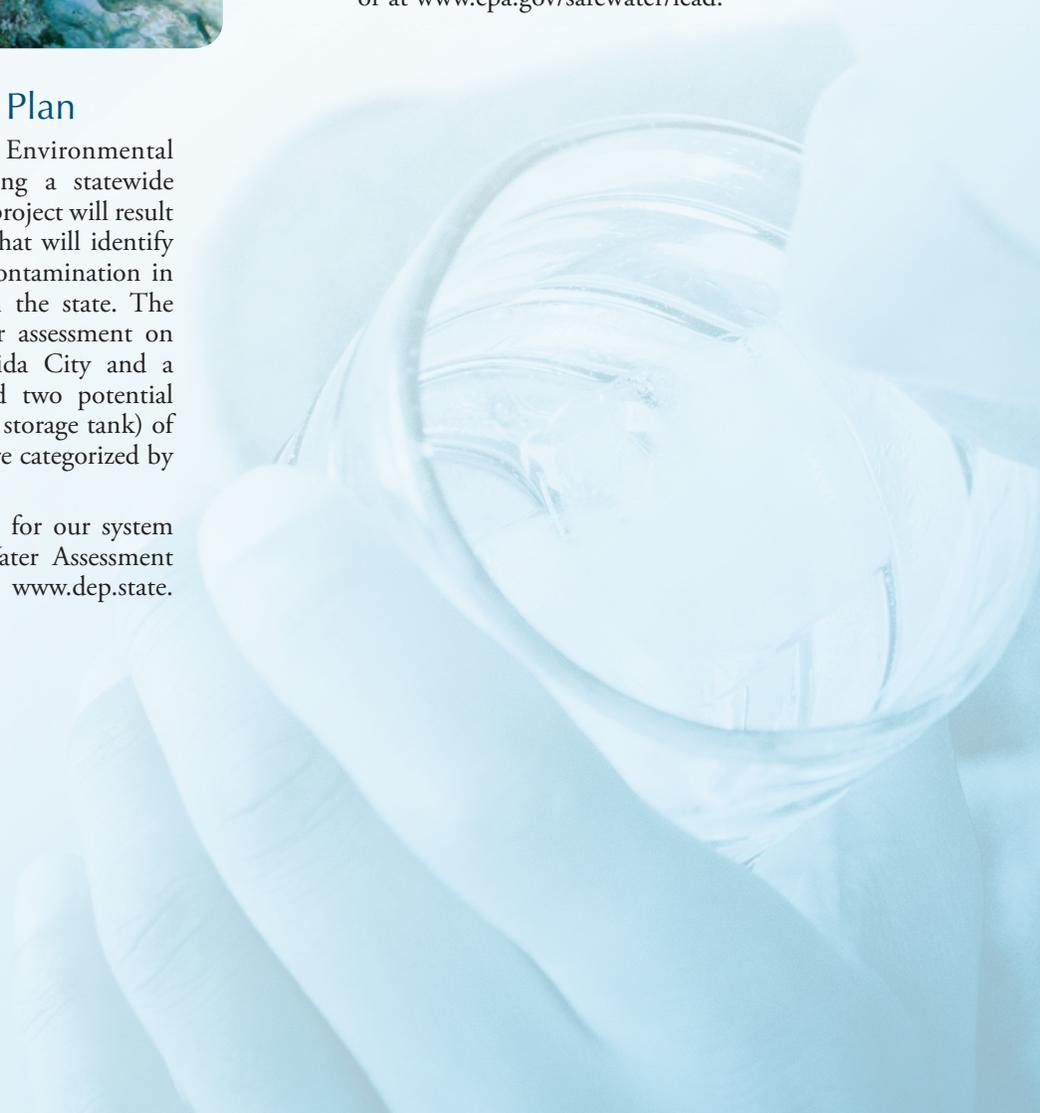
Source Water Assessment Plan

The Florida Department of Environmental Protection (FDEP) is conducting a statewide source water assessment project. This project will result in Source Water Assessment reports that will identify and assess any potential sources of contamination in the vicinity of each water supply in the state. The FDEP has performed a source water assessment on our shallow aquifer system in Florida City and a search of the data sources indicated two potential sources (injection well and petroleum storage tank) of contamination near our wells. Both are categorized by the FDEP as being of low concern.

The Source Water Assessment report for our system is available at the FDEP Source Water Assessment and Protection Program Web site at www.dep.state.fl.us/swapp.

Lead in Home Plumbing

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. We are responsible for providing high-quality drinking water but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at www.epa.gov/safewater/lead.



Power Monitoring – Saving Energy, Water, and Money

Pumping water for 130 miles at pressures up to 250 psi is an energy intensive endeavor which requires the FCAA to employ several booster pumping stations along the pipeline in addition to the large pumps located at the water treatment plant. In our constant effort to reduce costs and increase efficiencies, the FCAA seized upon the opportunity to customize and install a Pressure Monitoring System. The system uses monitoring equipment at the water treatment plant and all five booster pump stations. It tracks the real-time power costs, even taking in the varying rates charged by each electric utility along the way, along with the kilowatt usage of each pump in relation to water demand. By analyzing this real-time data, the utility can minimize costs by:

- Allowing the Pipeline Control Operators to determine the most cost effective time to run pumps and fill tanks, depending on electric utility supplier rates and peak rates.
- Allowing operators to determine individual pump efficiencies, both overall and at varying pressures, allowing operation of the pumps most appropriate for the demand.
- Identifying pumps with decreasing efficiencies, allowing for timely repair and preventing failures.

The FCAA has seen a cost savings of over \$270,000 per using this system.

The system also helps to conserve water.

All of the electricity utilized by the FCAA, regardless of the supplier, originates at the Turkey Point Nuclear Facility. According to the Virginia Water Resource Research Center, nuclear power requires between 31,000 and 74,900 liters of water for each kilowatt hour. As an example, an average house in Florida uses 1,200 kilowatt hours per month. Anytime we reduce the energy consumption, we are also saving a tremendous amount of water.

Finally, the system has created an environment of conservation consciousness at the FCAA, motivating employees to seek and employ additional energy- and cost-saving measures throughout the utility.

Implementation of this one software program has resulted in a triple success, saving energy, water, and money, even beyond its original intention.



Substances That Could Be in Water

The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs, and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity.

Contaminants that may be present in source water include:

Microbial Contaminants, such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic Contaminants, such as salts and metals, which can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and Herbicides, which may come from a variety of sources, such as agriculture, urban stormwater runoff, and residential uses.

Organic Chemical Contaminants, including synthetic and volatile organic chemicals, which are

by-products of industrial processes and petroleum production and can also come from gas stations, urban stormwater runoff, and septic systems.

Radioactive Contaminants, which can be naturally occurring or be the result of oil and gas production and mining activities.

In order to ensure that tap water is safe to drink, the U.S. EPA prescribes regulations, which limit the amount of certain contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for contaminants in bottled water, which must provide the same protection for public health.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at (800) 426-4791.

Sampling Results

During the past year, we have taken hundreds of water samples in order to determine the presence of any radioactive, biological, inorganic, volatile organic, or synthetic organic contaminants. The table below shows only those contaminants that were detected in the water. The state allows us to monitor for certain substances less than once per year because the concentrations of these substances do not change frequently. In these cases, the most recent sample data are included, along with the year in which the sample was taken.

PRIMARY REGULATED CONTAMINANTS

Microbiological Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	HIGHEST MONTHLY NUMBER	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Total Coliform Bacteria (# positive samples)	No	1/1/2012–12/31/2012	1	0	Presence of coliform bacteria in 1 sample collected during a month	Naturally present in the environment

Inorganic Contaminants

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Barium (ppm)	No	02/2012	0.01	NA	2	2	Discharge of drilling wastes; discharge from metal refineries; erosion of natural deposits
Fluoride (ppm)	No	1/1/2012–12/31/2012	0.84	0.65–1.06	4	4.0	Erosion of natural deposits; discharge from fertilizer and aluminum factories; water additive that promotes strong teeth when at optimum levels between 0.7 and 1.3 ppm
Nitrate [as Nitrogen] (ppm)	No	2/2012	2.6	NA	10	10	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Sodium (ppm)	No	2/2012	17	NA	NA	160	Saltwater intrusion; leaching from soil

Stage 1 Disinfectants and Disinfection By-Products

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	LEVEL DETECTED	RANGE OF RESULTS	MCLG OR [MRDLG]	MCL OR [MRDL]	LIKELY SOURCE OF CONTAMINATION
Chloramines (ppm)	No	1/1/2012–12/31/2012	3.68	NA	[4]	[4.0]	Water additive used to control microbes
Haloacetic Acids (five) [HAA5] (ppb)	No	8/2012	18.2	NA	NA	60	By-product of drinking water disinfection
TTHM [Total trihalomethanes] (ppb)	No	8/2012	27.6	NA	NA	80	By-product of drinking water disinfection

CONTAMINANT AND UNIT OF MEASUREMENT	MCL VIOLATION (YES/NO)	DATE OF SAMPLING (MO./YR.)	LEVEL DETECTED	RANGE OF RESULTS	MCLG	MCL	LIKELY SOURCE OF CONTAMINATION
Haloacetic Acids (five) [HAA5]–Stage 2 (ppb)	No	12/2012	NA	16.3–19.47	NA	60	By-product of drinking water disinfection
TTHM [Total trihalomethanes]–Stage 2 DDBP (ppb)	No	12/2012	NA	22.1–24.4	NA	80	By-product of drinking water disinfection

Lead and Copper (Tap water samples were collected from sites throughout the community)

CONTAMINANT AND UNIT OF MEASUREMENT	AL EXCEEDANCE (YES/NO)	DATE OF SAMPLING (MO./YR.)	90TH PERCENTILE RESULT	NO. OF SAMPLING SITES EXCEEDING THE AL	MCLG	AL (ACTION LEVEL)	LIKELY SOURCE OF CONTAMINATION
Copper [tap water] (ppm)	No	8/2012	0.036	0	1.3	1.3	Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives
Lead [tap water] (ppb)	No	8/2012	5.9	0	0	15	Corrosion of household plumbing systems; erosion of natural deposits

Definitions

AL (Action Level): The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.

IDSE (Initial Distribution System Evaluation): An important part of the Stage 2 Disinfection By-products Rule (DBPR). The IDSE is a one-time study conducted by water systems to identify distribution system locations with high concentrations of trihalomethanes (THMs) and haloacetic acids (HAAs). Water systems will use results from the IDSE, in conjunction with their Stage 1 DBPR compliance monitoring data, to select compliance monitoring locations for the Stage 2 DBPR.

MCL (Maximum Contaminant Level): The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.

MCLG (Maximum Contaminant Level Goal): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

MRDL (Maximum Residual Disinfectant Level): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

MRDLG (Maximum Residual Disinfectant Level Goal): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

NA: Not applicable.

ppb (parts per billion): One part substance per billion parts water (or micrograms per liter).

ppm (parts per million): One part substance per million parts water (or milligrams per liter).