

# CITY OF HALLANDALE BEACH-WATER SUPPLY STRATEGY

## (WHITE PAPER)

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### **Background**

Over the past fifteen years, the City of Hallandale Beach has been investigating its options pertaining to its future water supply. Realizing that saltwater intrusion continues to move toward the City's current well field, various strategies have been investigated. This white paper will provide a background explaining the recent history of the City's water supply strategies, an analysis of the options at hand, and a recommendation for moving forward.

It should be underscored that the City of Hallandale Beach produces excellent drinking water for this community. In fact, in 2010 the City won the region's "Best Tasting Water Award." This document seeks to outline a strategy(ies) to address the issue of potential saltwater intrusion into the City's current well fields.

### **South Florida Water Management District (SFWMD)**

In Florida the allotment of water supply to all water utilities is a function of the various water management districts; South Florida is governed by the South Florida Water Management District (SFWMD). Typically the means of managing the water supply has been through the issuance of Water Use Permits (WUPs), also called "Consumptive Use Permits" (CUPs). The last official WUP for the City of Hallandale Beach issued by the SFWMD expired seven years ago. Though the City has not had a permit for several years, due to the District's decision to assure that there is agreement between the participating parties, the City continues to follow SFWMD guidelines and is considered to be in compliance. However, the District is now looking to the City to make a decision concerning its future water supply strategy in order to grant a Water Use Permit.

### **Current Situation**

For over 15 years, the City of Hallandale Beach has been drawing its water supply from two sources:

- City-owned well field in Northwest Quadrant – approximately 3 MGD (million gallons per day)
- Broward County well field in Brian Piccolo Park – approximately 3 MGD

The average amount of water use per day for the City is less than 6 MGD.

Currently the City's allotment of water supply by the SFWMD for current and future demand is 9.7 MGD:

City well field	3.5 MGD
Broward County well field	<u>6.2 MGD</u>
TOTAL	9.7 MGD

### Well Field Relocation Strategy

Beginning in 2008, the City launched upon a plan to move its well field west as a strategy to meet the challenge of saltwater intrusion. Essentially this strategy was based upon the expectation that the City's existing well field will eventually succumb to saltwater intrusion. This strategy also entailed the release of the City's allotment from Broward County.

<u>Existing Allotment</u>		<u>Proposed Allotment</u>	
City well field	3.5 MGD	City well field	0 MGD
Broward County well field	<u>6.2 MGD</u>	Broward County well field	0 MGD
TOTAL	9.7 MGD	Western well field	<u>9.7+ MGD</u>
			9.7+ MGD

For several years the City pursued this strategy, first with the proposed location at Mary Saunders Park in the City of West Park, and later with the proposed location at the Hillcrest Golf and Country Club in the City of Hollywood. In accordance with this strategy, the City revised its Water Use Permit application with the SFWMD to reflect the west well field strategy.

### Well Field Revitalization Strategy

In 2012 Public Works Director Hector Castro formulated a strategy that entailed revitalization of the City's well field, rather than its abandonment. Realizing that the City would be constructing a massive injection well infrastructure on NE 14<sup>th</sup> Avenue as a major feature of the Hazard Mitigation Grant Program (HMGP), Mr. Castro envisioned the possibility that this project could result in the formation of a salinity barrier in the Biscayne Aquifer. In other words, this project could result in countering the effects of saltwater intrusion. While the *Well Field Relocation* strategy was based upon a resolve to accept the eventual loss of the City's well field to saltwater intrusion, the *Well Field Revitalization* strategy considers the possibility that the City's well field may not only be salvaged but may actually become *more* secure from the threat of saltwater intrusion.

Should the City pursue this strategy, the existing allotment of water supply with the SFWMD would remain the same as it currently is.

City well field	3.5 MGD
Broward County well field	<u>6.2 MGD</u>
TOTAL	9.7 MGD

On September 5, 2012, the City Commission authorized MWH, one of the City's consultants, to begin a preliminary investigation into the feasibility of the development of a salinity barrier through the stormwater injection wells. As a component of the investigation, the City and MWH met with key representatives from the South Florida Water Management District, the Florida Department of Environmental Protection, the Broward County Natural Resources Planning and Management Division, and the US Geologic Survey. All these agencies were willing to pursue the possibility of implementation, and all except one of these agencies expressed enthusiastic support for the plan. The MWH report, while not conclusive, confirmed the feasibility of pursuing the salinity barrier (Revitalization) strategy.

In addition to injection of stormwater, the proposed plan also considers the possibility of injection of reuse water. If permitted, this would have the dual benefit of enhancing the proposed salinity

barrier, especially during dry months, and establishing a very cost-effective utilization of reuse water. The latter benefit is particularly pertinent in light of the Ocean Outfall legislation that requires eventual reuse utilization of 60% of the water that previously was pumped into the ocean through ocean outfalls.

### **SFWMD Directive**

Because the District must consider all Water Use Permits (WUPs) from a regional perspective, its allocation of water resources to Broward County is dependent upon whether or not the City will relocate its well field. In the attached letter dated April 17, 2013, SFWMD gave the City until October 31, 2013 “to allow for the City Commission to provide directive on which of two options the City will pursue for their future water supply needs.”

Should the City choose to pursue the Well Field Relocation strategy, the capital cost would be approximately \$8.5 million. This amount is currently budgeted under Capital Improvement Project #103301, Well Field Relocation.

Following are additional strategies that staff has identified to meet the future water supply needs in the event that the salinity barrier is not successful:

1. **Purchase of Water from North Miami Beach:** The City currently has an inter-connect with the water system of North Miami Beach. The City utilizes this water on an as-needed basis. One option the City has for future water supply in the event that its wells succumb to saltwater intrusion would be to purchase the water needed from the City of North Miami Beach. Because this strategy would be significantly more expensive than other options, it would be seen only as a temporary solution.
2. **Membrane Filtration:** The strategy that the City began implementing approximately 13 years ago entails the building of a membrane water treatment plant which eventually could be expanded to include additional nanofiltration (NF) and/or reverse osmosis (RO) capability. Nanofiltration is the City’s current membrane filtration system and RO is a finer membrane (filter) technology that is able to strain out the saline elements within saltwater. In the event that the City’s well field succumbs to saltwater intrusion, the City could continue to treat its own water utilizing RO technology or purchase all of its water from Broward County and treat it all through NF. In 2008 the new membrane treatment plant was completed, and an area has been built which can be utilized for installation of up to three additional NF or RO skids.

## **Fiscal Analysis**

A cost comparison performed by Hazen and Sawyer of the various strategies is attached and summarized below in 20-year present worth value:

<u>Option A (Well Field Relocation)</u>	<u>Option B: (Well Field Revitalization)</u>
\$36,360,000	\$27,220,000 Well Field Revitalization (salinity barrier is successful)
	\$34,660,000 Well Field Revitalization (salinity barrier is unsuccessful)
	\$37,300,000 Membrane Filtration
	\$43,710,000 Purchase of Water from North Miami Beach

## **Recommendation**

City Staff recommends Option B: Well Field Revitalization.

Following are some of the reasons staff considers this to be the better option for the City.

### **1. Delay and minimization of capital costs**

If the City were to decide to move forward with the Well Field Relocation strategy, this would mean that the City would begin expending capital funds as soon as it is able to do so. This would mean a commitment to expend approximately \$8.5 million. Even if the City's wells continue to be free from saltwater intrusion, the City would move forward with expending this capital cost. On the other hand, if the City opts for staying within its borders, it will not be required to expend capital funds until it is necessary to do so. When it does expend capital, it can do so in the time and to the extent that circumstances dictate.

### **2. Possible benefit resulting from success of salinity barrier**

The injection of stormwater into the Biscayne Aquifer may itself succeed in the formation of a salinity barrier. The system is designed to inject 100,000 gallons per minute into the aquifer. That would be a rate of 144 MGD. Stormwater by itself may form a salinity barrier with or without permitted reuse. The completion of the stormwater project is scheduled for December 2013, so the positive effects of the salinity barrier could become apparent as early as 2014. It would be very unfortunate if, after the City begins to build its western well field, the chlorides begin to go down in existing well fields.

### **3. Demonstration of commitment to permitting agencies**

The City has spoken with USGS, DEP, SFWMD and Broward County about its tentative plans to pursue a salinity barrier to protect its well field. Three of these agencies have given their support to the effort and the fourth has stated its willingness to consider it. Were the City to commit \$8.5 million to move its well field west, there would be no well field to protect. Saltwater intrusion would no longer be an issue for the City, considering the City would have essentially accepted its inevitability. If, on the other hand, the City chooses not to move its well field, it is demonstrating to all the agencies that saltwater intrusion is an issue and the City is committed to combat it.

**4. Refusal to set a bad precedent for utilities**

The City of West Park is seeking a level of compensation far beyond historical values. Were the City to accept such a high value, not only would it be expensive to the City, but it would also set a precedent that may make it expensive for utilities in the future to gain water access. Because Florida's laws clearly give the State ownership of water resources, there should not be a premium on water usage as if it is owned by any jurisdiction.

**5. Potential financial benefit to the City with the eventual utilization of its reuse**

The very fact of *any* potential of success for eventual injection of reuse water makes it worth the risk of pursuing. It may save millions of dollars for the City. Furthermore, given the passage of the recent ocean outfall legislation, the City may be able to provide a viable means of making good use of reuse for other entities besides the Southern Wastewater Treatment Plant Large Users.

**6. Prolonged utilization of the City's excellent water**

The City's current well field provides excellent water. The required treatment is minimal and thus inexpensive. Were the City to move its well field westward, it would not be able to continue to use this exceptional water, regardless of how long the well field remains uncontaminated by saltwater intrusion.

Regardless of which option the Commission chooses, it should be emphasized that the City of Hallandale Beach water always has been and will continue to be safe. Furthermore, even if the City's wells were to succumb to saltwater intrusion today, the City will not be in any danger of compromising its water quality. It could purchase additional water from North Miami Beach and/or Broward County and continue to supply customers with excellent water.