

Shell Creek and Prairie Creek Watersheds Management Plan

4th Bi-Annual Performance Monitoring Summary September 2010– September 2012



Shell, Prairie, and Joshua Creeks Watershed Management Plan Stakeholders Group

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Shell Creek and Prairie Creek Watersheds Management Plan

Fourth Bi-Annual Performance Monitoring Summary *September 2010 – September 2012*

Prepared by:

**Shell, Prairie, and Joshua Creeks
Watershed Management Plan Stakeholders Group**

Acknowledgements

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This document was compiled by the Data Collection and Natural Systems Restoration Bureaus at the Southwest Florida Water Management District. For information or additional copies of this document, please contact (352) 796-7211, extension 4258.

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Shell Creek and Prairie Creek Watersheds Management Plan Performance Monitoring Summary

Purpose of Document

The purpose of this document is to provide the fourth bi-annual summary of performance monitoring results which are directly related to management actions specified in the Shell Creek and Prairie Creek Watersheds Management Plan (SPCWMP) Reasonable Assurance document (SWFWMD, 2004). The SPCWMP Reasonable Assurance document was developed by the Shell, Prairie, and Joshua Creeks (SPJC) Watershed Stakeholders Group to address verified Total Maximum Daily Load (TMDL) impairment in surface waters due to elevated concentrations of chloride, total dissolved solids (TDS), and specific conductance.

The SPCWMP Reasonable Assurance document is comprehensive in scope and not only provides reasonable assurance that management actions will address water quality conditions due to elevated chloride, TDS, and specific conductance in the TMDL impaired Shell and Prairie Creek watersheds, but in the adjacent Joshua Creek watershed as well (Figure 1). The SPCWMP Reasonable Assurance document was submitted to the Florida Department of Environmental Protection (FDEP) in December 2004, received approval from the FDEP Secretary in June 2005, and was adopted by an order signed by the FDEP Secretary in February, 2012.

The reporting time period for this fourth bi-annual Performance Monitoring Summary document is September 2010 through September 2012. The goal of the SPJC Stakeholders Group is to achieve the water quality goals set forth in the SPCWMP Reasonable Assurance document by 2014. Performance Monitoring Summaries will be generated on a bi-annual basis over the duration of this time period to show reasonable assurance toward improving water quality and consistently meeting Class I surface-water quality criteria under Florida Administrative Code (F.A.C.) 62-302.530 in the SPJC TMDL impaired sub-basins.

Description of Water Quality Goals

The specific goal of the Stakeholders Group is to improve surface-water quality within the Shell and Prairie Creek watersheds, with specific emphasis placed on identified TMDL impaired sub-basins, to consistently meet Class I surface-water quality criteria. Currently, water quality is impaired due to elevated levels of chloride, TDS, and specific conductance derived from the use of mineralized groundwater to irrigate agricultural lands for crop production. The goal of the SPCWMP Reasonable Assurance document (and the specific management actions outlined within the document) is to reduce levels of specific conductance, chloride, and TDS below the maximum Class I criterion of 1275 uS/cm, 250 mg/L, and 1000 mg/L, respectively, at all times throughout the SPJC watersheds. In addition, the goal of the plan is to reduce TDS below the Class I standard of 500 mg/L as a monthly average. Specific conductance must be below 775 uS/cm, based upon historical data analysis in the SPJC watersheds, to ensure compliance with Class I standards for chloride and TDS. A specific conductance value of 775 uS/cm equates to a chloride concentration of approximately 150 mg/L and a TDS concentration of 500 mg/L. The time frame to achieve these water quality goals is ten years, or by 2014.

This fourth bi-annual Performance Monitoring Summary addresses the water segments found in the following table, each of which are Class I water bodies that have been listed as verified impaired based on FDEP's evaluations using methodologies from the Impaired Surface Waters Rule (IWR) (Chapter 62-303, F.A.C.) (Figure 2):

Water Segments in the SPJC Listed as TMDL Verified Impaired

Water Segment	FDEP WBID	Water Body Type	Basin/Watershed	Impaired Area	Parameters of Concern
Prairie Creek	1962	Stream	Peace River/ Prairie Creek	29 mi.	Sp. Conductance, TDS
Shell Creek	2041	Stream	Peace River/ Shell Creek	10.5 mi.	Sp. Conductance, Chloride, TDS
Myrtle Slough	2040	Stream	Peace River/ Shell Creek	6 mi.	Sp. Conductance, Chloride, TDS

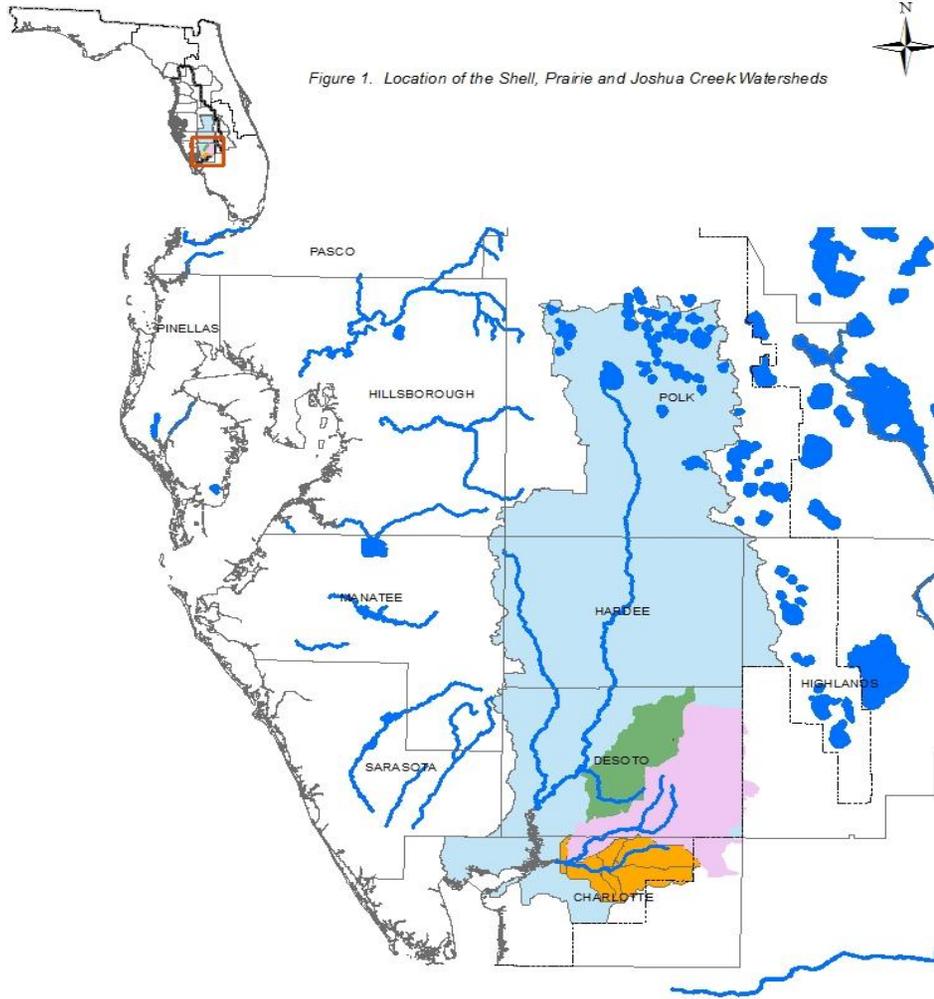


Figure 1. Location of the Shell, Prairie and Joshua Creek Watersheds

Legend

- District Counties
- Shell Watershed
- 1:250,000 Streams
- Peace River Basin
- WATER
- Joshua Creek Watershed
- Prairie Creek Watershed

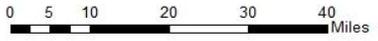
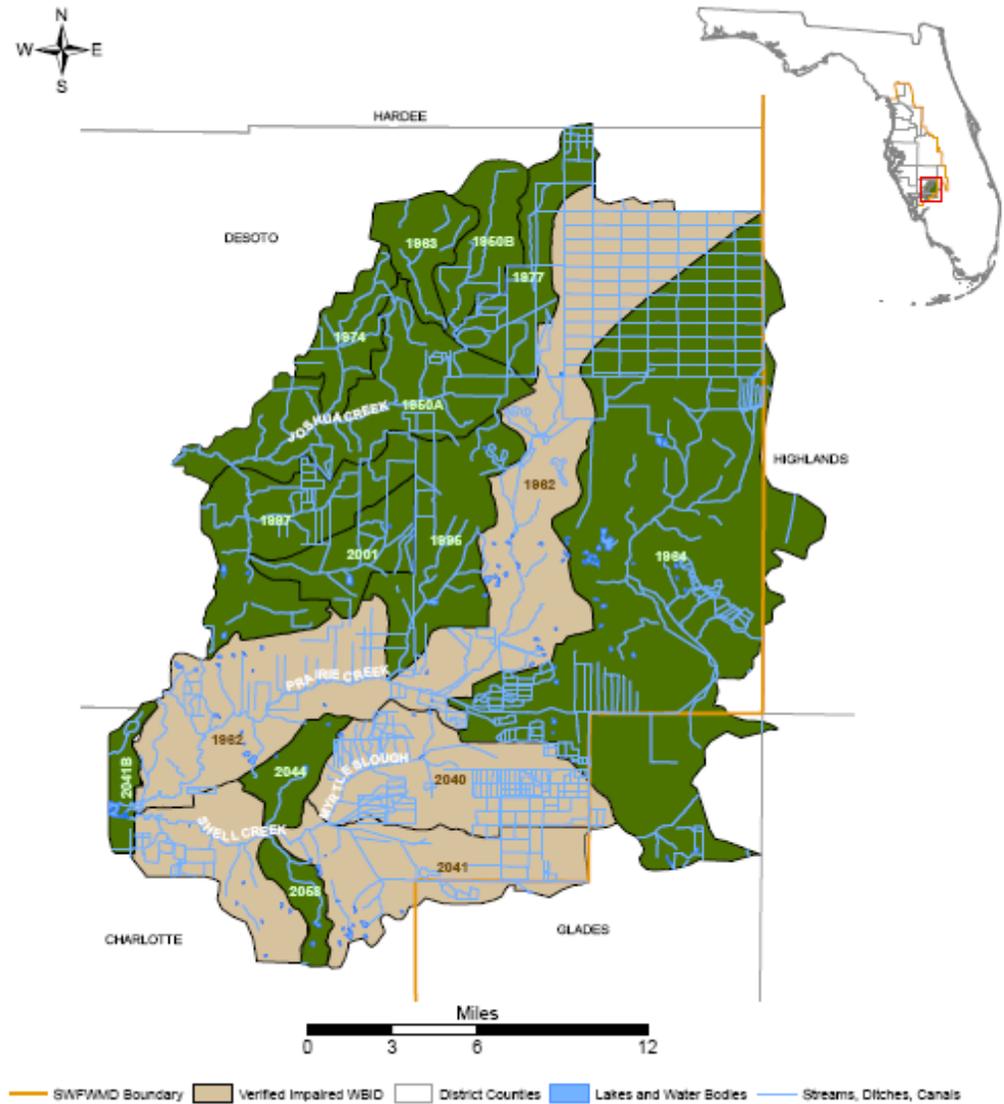


Figure 2. Location of WBIDs within the Shell, Prairie, and Joshua Creek Watersheds



The performance monitoring results presented in this document will be prioritized by the verified impaired water body IDs (WBIDs) as listed above. However, the stakeholders group considers the entire area of the Shell, Prairie, and Joshua Creeks potentially impaired, therefore performance monitoring results will also be presented for the 13 water bodies listed below with proposed management actions specified in the SPCWMP Reasonable Assurance document also being applied within the following WBIDs:

Water Segments in the SPJC not Listed as TMDL Verified Impaired

Water Segment	FDEP WBID	Water Body Type	Basin / Watershed
Shell Creek Reservoir	2041B	Reservoir / Lake	Peace River / Shell Creek
Cypress Slough	2044	Stream	Peace River / Shell Creek
Unnamed Ditch	2058	Stream	Peace River / Shell Creek
Cow Slough	1964	Stream	Peace River / Prairie Creek
Myrtle Slough	1995	Stream	Peace River / Prairie Creek
Joshua Cr. ab Peace Rv.	1950A	Stream	Peace River / Joshua Creek
Joshua Cr. ab Honey Creek	1950B	Stream	Peace River / Joshua Creek
Lake Slough	1963	Stream	Peace River / Joshua Creek
Unnamed Branch	1974	Stream	Peace River / Joshua Creek
Honey Run	1977	Stream	Peace River / Joshua Creek
Hawthorne Creek	1997	Stream	Peace River / Joshua Creek
Hog Bay Slough	2001	Stream	Peace River / Joshua Creek
*Gannet Slough	2020	Stream	Peace River

*Addressed in this report but only partially contained within District boundaries

Expenditures in the SPJC Watersheds for Top Priority Resource Management Actions

The following table provides cost expenditures that have supported top priority resource management actions within the SPJC Watersheds during the October 2010 to September 2012 time frame, and also includes total combined funding for these efforts since inception of the SPCWMP Reasonable Assurance document. Water quality monitoring and associated laboratory expenditures for performance monitoring activities are also included. The \$43,441,225 expended to date for resource management actions have been supported by District, State, Federal, and Facilitating Agricultural Resource Management Systems (FARMS) participant cost-share funding. Listed below are actions that have been defined as having the highest effectiveness to address water quality impairment within the SPJC watersheds. Funding that has supported regional resource management actions (SWUCA Recovery, etc.) are difficult to determine and are not provided at this time. A table providing progress-to-date for each of the 11 Resource Management Actions can be found in the following “Resource Management Actions and Progress to Date” section.

Cost Expenditures in the SPJC Watersheds for Top Priority Resource Management Actions; October 2010 to September 2012 (FY2011 and FY2012) (prior funding also provided)

Resource Management Action	Total Expenditure
Shell, Prairie, and Joshua Creek (SPJC) Well Back-Plugging Program	\$49,661*
Facilitating Agricultural Resource Management Systems (FARMS) Program FY2011-FY2012	\$13,259,898*
Environmental Quality Incentives Program (EQIP)	\$2,481,517**
Quality of Water Improvement Program (QWIP)	\$10,000
Water Quality Monitoring & Laboratory Analysis	\$117,484
Total Expenditures FY2011-FY2012	\$15,918,560
Top Priority Resource Management Action Expenditures 2004 – 2010	\$27,522,665
Total Expenditures 2004 – 2012	\$43,441,225

*These are District expenditures and do not include cooperator costs.

**These represent expenditures of federal dollars by the USDA

The improvements in mineralized constituents seen throughout the SPJC surface waters can be directly related to resource management actions that have been initiated within the SPJC watershed since inception of the SPCWMP Reasonable Assurance Plan.

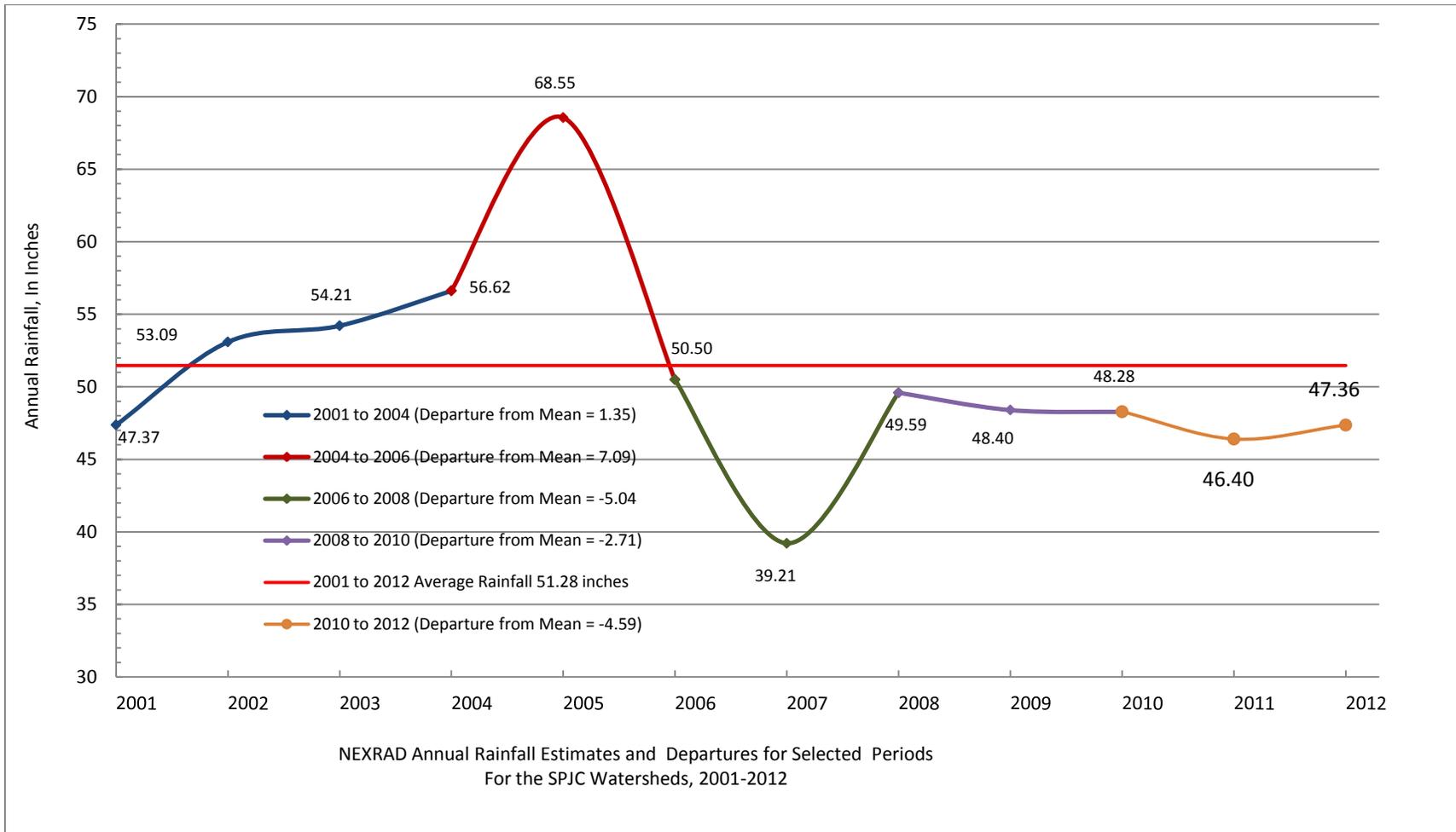
Precipitation and Stream Discharge within the SPJC Watersheds

Prevailing climatic conditions have a direct influence on water quality in receiving surface waters within agricultural areas of the SPJC watersheds. Mineralized groundwater, which commonly occurs throughout the SPJC, can affect both shallow groundwater (water table) and direct runoff, especially when used to irrigate during dry conditions. The intensity of dry conditions can increase mineralized concentrations due to two principal factors; 1) additional mineralized irrigation water is applied to crops to compensate for rainfall shortages, and 2) reduced rainfall limits the natural dilution and flushing effects on direct runoff to the underlying shallow groundwater aquifer, which ultimately then drains to surface-water systems. During dry or drought periods, the source of most, if not all, streamflow is derived from shallow groundwater aquifer discharge. This effect on surface waters can be further compounded by a corresponding decrease in stream discharge associated with lower rainfall. Conversely, during wet conditions, the increase in rainfall can dilute and decrease the concentration of mineralized groundwater runoff water that ultimately drains to surface-water bodies.

Rainfall calculations for the SPJC watersheds were determined using National Weather Service NexRAD RADAR imagery. Daily totals were estimated based on cumulative rainfall amounts measured within a cell of an overlying network grid. NexRAD rainfall estimates, based on the SPJC network grid, are considered highly accurate when compared to individual point rainfall gages located strategically within a watershed. The NexRAD average annual rainfall for the SPJC performance monitoring ten-year period (2001 to 2010) was 51.58 inches, which correlates well with the 95-year period (1915 to 2010) average of 51.86 inches for DeSoto County. The average annual total for the three monitoring periods represents a range of prevailing climatic conditions: normal, wet, and dry.

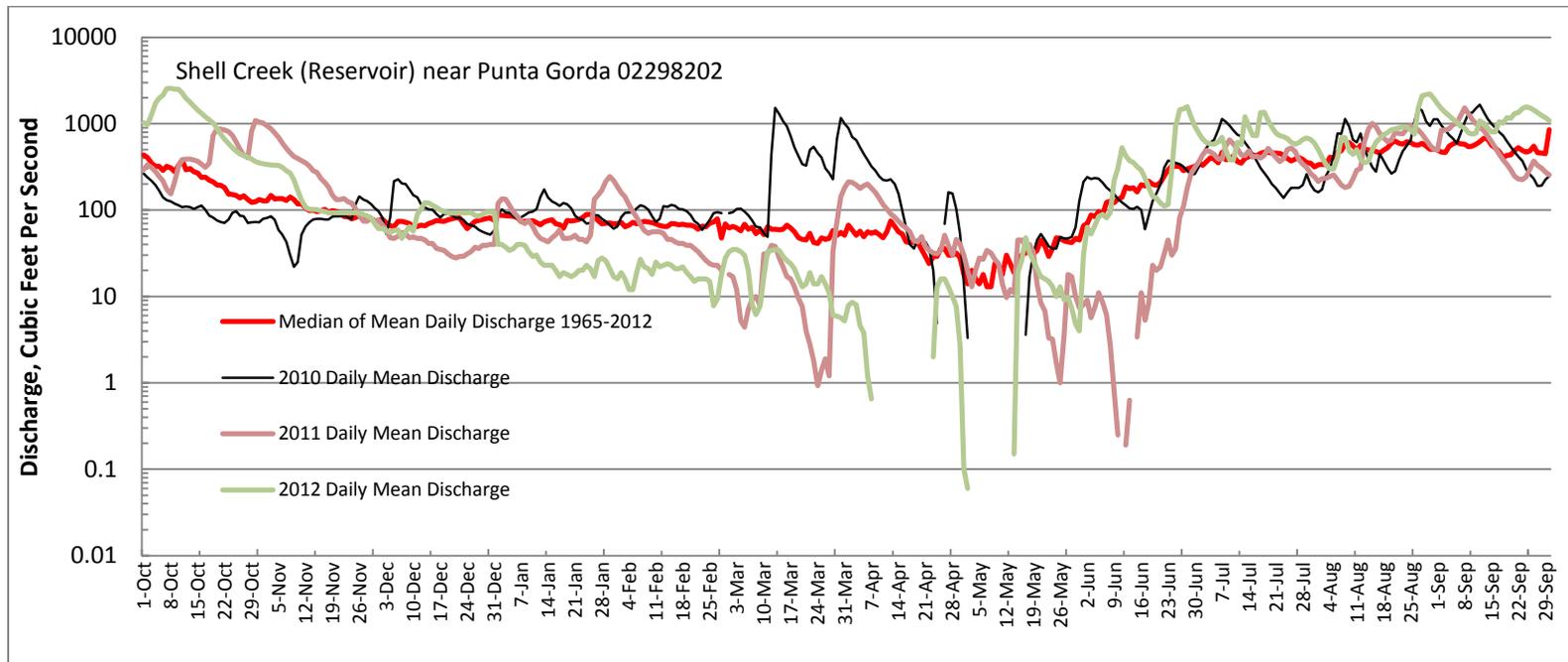
Figure 3 compares total annual rainfall throughout the SPJC performance monitoring period (2001 to 2012), and can be used to evaluate how climatic conditions may have affected resource management actions and subsequent water-quality data results during these time periods. The initial baseline performance monitoring results were based on data collected during a 'flat' climatic period from 2001 to 2004, with an average of 52.8 inches of rainfall. This period started with a regional drought in 2001 that ended the following year. The 2004 to 2006 monitoring period was heavily influenced by both the effects of three back-to-back hurricanes that occurred in the latter part of 2004 and a very wet year in 2005 where above average rainfall amounts of 58.6 inches were experienced. The third time period, 2006 to 2008, has been classified as a period of persistent drought with an annual average rainfall of 46.4 inches. The year 2007 was particularly dry with only 39.2 inches of measured precipitation. This deficit of approximately 15 inches from the ten-year average (2001-2010) prompted an increase in irrigation usage of ambient mineralized groundwater and subsequent runoff of groundwater to surface water systems within the SPJC watersheds. The 2008 to 2010 study period, had a cumulative rainfall deficit for the consecutive three-year period of 8.47 inches, which averaged annually 2.82 inches below the eleven-year average (2001-2012) of 51.58 inches. The current study period 2010-2012, was influenced by a cumulative rainfall deficit of 4.19 inches.

Figure 3. NexRAD Annual Rainfall Estimates for the SPJC Watersheds, 2001-2012



Hydrograph comparisons of long-term (1965-2012) median of daily mean discharge (heavy red line) for the Shell Creek Reservoir are shown in Figure 4. The Shell Creek Reservoir station monitors combined drainage from both the Prairie and Shell Creek watersheds. Previous bi-annual report data are included to describe changes in discharge quantities over time, while Figure 4 only shows the mean daily discharge for the current reporting period for simplicity. The increased discharge for the 2005 water year correlates with above average annual rainfall. The 2005 discharges during the normally dry spring and the wet summer months noticeably exceeded both the long-term means and the discharge for each of the subsequent years, 2006 to 2008. Almost all discharge that occurred during the 2006 to 2008 water years (October 1 through September 30) was generally well below the long-term mean, and extended periods of low to no flow conditions were also experienced. The discharges for 2008-2010, were generally below average. The discharges for the first-half of 2009 were the lowest for the period of study with a long, intermittent period of no-flow (over the Shell Creek Reservoir dam) during March through May. The discharges for the current study period 2010-2012 continued to be below average during the dry season with extended times at or near zero flow, and discharges varied above or near the median daily discharge rates during the wet season.

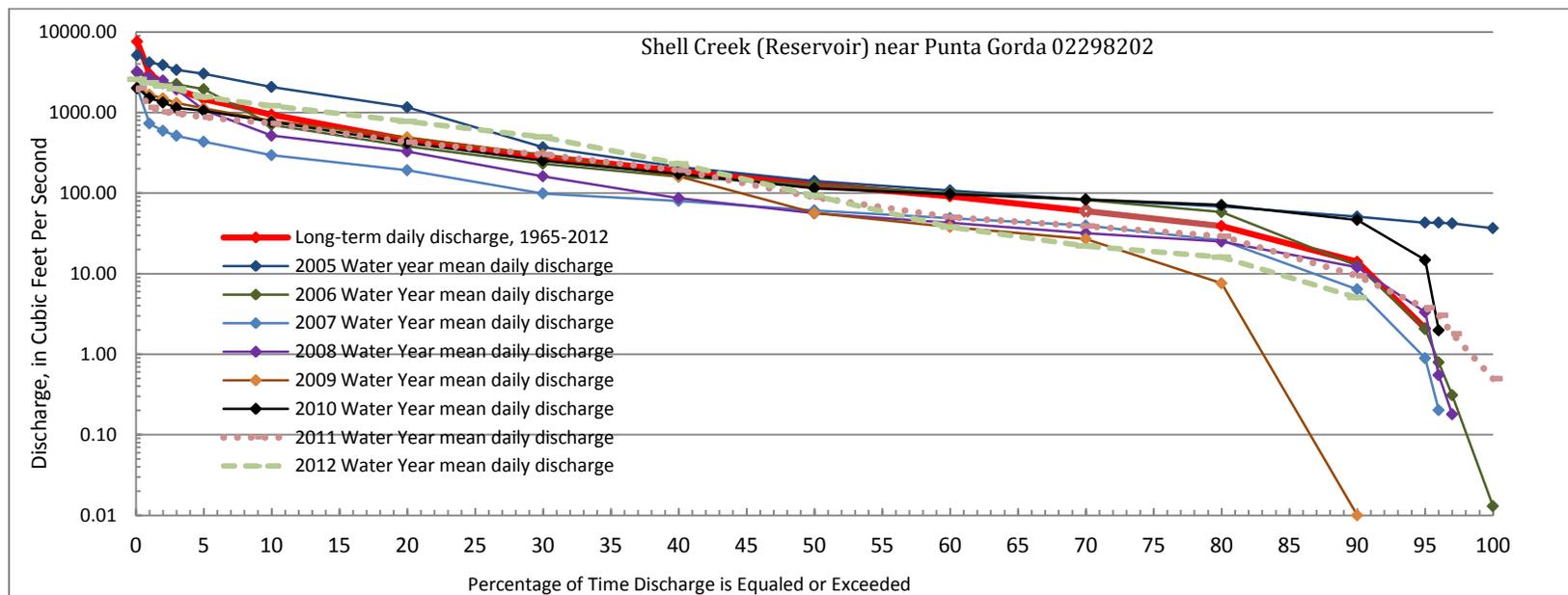
Figure 4. Long-term (1965-2012) median of daily discharge and daily mean discharge (2010 - 2012) for the Shell Creek Reservoir (USGS site 02298202



Discharge-duration curves are cumulative frequency curves that graphically characterize stream flow conditions. The flat shape of the curves indicate stable conditions, whereas, areas of marked decreasing slope for the lower discharges can indicate the percentage of time that no flow or limited groundwater (base flow) contribution occurred.

- The 2005 water year had discharges well above average, with record high flows and elevated low flows, and no periods of zero flows.
- Discharges for 2006-2008 were generally well below the long-term discharge for the complete range of flows.
- Discharges for 2009, correspond very closely to the long-term average (1965-2010) for medium-to-high flows, but show a significant decline when compared to other years during periods of low-flow.
- Discharges for 2010 have a similar medium-to-high flow characteristic compared to the long-term trend, while the lower flow discharges were typically higher than the long-term trend.
- Discharge curves, for 2011 closely followed the baseline conditions for medium-to-high flows and fell below the baseline for low flows discharge rates.
- Discharge rates for 2012 were above the baseline for high flows and remained below the long-term baseline for low to medium discharge rates.

Figure 5. Discharge Duration Curves of 2005 - 2010 Annual Daily Discharge Compared to 47-year Long-Term Daily Discharge for the Shell Creek Reservoir (USGS site 02298202)



Median Percent Reduction Goals and Progress to Date

Concentration based load reductions that need to occur in the SPJC impaired water segments by year 2014 have been identified by the FDEP using IWR data sources from January 2001 through February 2004. The following table includes the reduction goals initially established by FDEP, progress achieved during the first bi-annual reporting period (March 2004 to July 2006), and progress achieved for subsequent and current (2010-2012) reporting periods. These percentages are calculated by determining the reductions required to meet water quality goals of 250 mg/L for chloride, 1000 mg/L for TDS (at all times) and 500 mg/L for TDS (as a monthly average) based upon data collected at long-term data collection stations and calculated as; 1) percent each discrete value is above the established water quality criteria for each parameter, and 2) percentage shown is the median of all individual percent values that exceed criteria levels. Also provided on this table is the number of values (for each site and parameter) that exceeded water quality criteria, since in some instances what appears to be a high percentage is due to only one value exceeding the water quality criteria. In addition, multiple values for TDS during a one-month time period are not consistently available to calculate monthly averages, individual values have been used in some instances to determine exceedances above the 500 mg/L criteria.

Considerable progress has been achieved for reducing TDS concentrations below the Class I criteria of 500 mg/L since the inception of this Reasonable Assurance Plan (2004). The prior three reporting periods (2004-2010), had continued reduction in TDS concentrations of 500mg/L. The current reporting period had a substantial number of exceedances for the Class I criteria throughout the sub basin likely as a result of continued drier than normal conditions. WBID 1962, Prairie Creek at Washington Loop Road and near Ft. Ogden had 12 values and 10 values that exceeded Class I criteria, respectively. WBID 2041, Shell creek at Washington Loop rd and Shell Creek at SR 31 also had exceedance values above the Class I criteria with 21 values and 12 values, respectively. WBID 2040, Myrtle Slough @ SR31 had 12 values exceeding Class I criteria.

This is the fourth performance reporting summary with no values exceeding the Class I criteria of 1000 mg/L in the Prairie Creek watershed (WBID 1962). However, Shell Creek at Washington Loop Road (WBID 2041) had 14 values or 4.1% exceedance of the Class I 1000 mg/L criteria, which has not occurred since the 2004-2006 reporting period. Finally, WBID 2040 was similar to previous years with 1 value exceeding the 1000 mg/L criteria. Efforts to address the mineralized water quality impacts in these watersheds are explained in the following section.

Management Actions Implemented to Target Poor Water Quality the Shell Creek and Myrtle Slough Watersheds

Increasing trends of TDS and chloride concentrations in both Shell Creek and Myrtle Slough (WBIDs 2041 and 2040, respectively) have been correlated to increasing agricultural activities in the headwaters of these creek systems, along with persistent drought conditions. District surface and ground water quality monitoring have been conducted to locate irrigation wells that are contributing elevated mineralization to these surface water systems via seepage and direct runoff. Outreach to the agricultural community in these watersheds has occurred using the FARMS Program as an incentive to improve irrigation practices, raise awareness through monitoring of irrigation water, implementation of precision irrigation projects, assisting with the back-plugging of highly mineralized groundwater wells, and increasing the use of alternative water supply sources such as tail-water recovery ponds. These incentives have been very effective in other areas of the SPJC watersheds at reducing mineralized groundwater inputs to receiving surface waters. Ongoing monitoring efforts through a water quality sampling reconnaissance network by District staff identified 65 Water Use Permits (WUPs) based on 2010 sampling results that may be contributing mineralized groundwater to these surface water systems. As a result, 15 WUPs have participated in water quality analysis, and were investigated for irrigation water quality and/or quantity improvements through the FARMS Program. Additional WUPs are in the process of being identified for similar follow up based on 2011 water quality sampling results. The remainder of this document specifically describes management actions and monitoring efforts that have been accomplished thus far toward addressing water quality impairment in the SPJC watershed and providing reasonable assurance toward achieving these goals.

Median Percent Class I Water Quality Exceedances and Progress to Date

	TDS; 500 mg/L as monthly avg. ^{a,c}					TDS; 1000 mg/L at all times ^c					Chloride; 250 mg/L at all times ^b				
	Initial RA Plan Percent & No. Values Exceeding Criteria	3/2004 to 7/2006 Percent & No. Values Exceeding Criteria	8/2006 to 8/2008 Percent & No. Values Exceeding Criteria	9/2008 to 9/2010 Percent & No. Values Exceeding Criteria	9/2010 to 9/2012 Percent & No. Values Exceeding Criteria	Initial RA Plan Percent & No. Values Exceeding Criteria	3/2004 to 7/2006 Percent & No. Values Exceeding Criteria	8/2006 to 8/2008 Percent & No. Values Exceeding Criteria	9/2008 to 9/2010 Percent & No. Values Exceeding Criteria	9/2010 to 9/2012 Percent & No. Values Exceeding Criteria	Initial RA Plan Percent & No. Values Exceeding Criteria	3/2004 to 7/2006 Percent & No. Values Exceeding Criteria	8/2006 to 8/2008 Percent & No. Values Exceeding Criteria	9/2008 to 9/2010 Percent & No. Values Exceeding Criteria	9/2010 to 9/2012 Percent & No. Values Exceeding Criteria
WBID 1962															
Prairie Creek at Washington Loop Rd.	25.6% 20 Values	8.5% 7 Values	11.7% 11 Values	9.8% 10 Values	50% 12 Values	10.2% 7 Values	No Values Exceed	No Values Exceed	No Values Exceed	No Values Exceed	Not Impaired	Not Impaired	Not Impaired	Not Impaired	Not Impaired
Prairie Creek near Ft. Ogden (SR 31)	32.6% 16 Values	7.9% 5 Values	16.7% 8 Values	2.4% 5 Values	42% 10 Values	29.3% 13 Values	No Values Exceed	No Values Exceed	No Values Exceed	No Values Exceed	Not Impaired	Not Impaired	Not Impaired	Not Impaired	Not Impaired
WBID 2041															
Shell Creek at Washington Loop Rd.	28.8% 25 Values	15.9% 15 Values	25.9% 17 Values	23.9% 13 Values	87% 21 Values	5.4% 8 Values	11.6% 1 Values	No Values Exceed	No Values Exceed	4.1% 14 Values	19.7% 52 Values	12% 2 Values	11.6% 2 Values	6.93% 4 Values	6.1% 13 Values
Shell Creek at SR 31	24.8% 25 Values	12.4% 10 Values	25.6% 15 Values	38.4% 21 Values	75% 12 Values	10.4% 19 Values	29.8% 2 Values	*24.2% 2 Values	8.7% 2 Values	No Values Exceed	29.3% 39 Values	26.4% 2 Values	13.8% 9 Values	14.5% 9 Values	50% 8 Values
WBID 2040															
Myrtle Slough at SR 31	43.4% 33 Values	33.1% 13 Values	36.7% 20 Values	37.1% 23 Values	85% 17 Values	16.5% 48 Values	1.5% 1 Value	No Values Exceed	14.6% 1 Value	1.7% 1 Value	34.6% 63 Values	16.1% 4 Values	10.71% 7 Values	10.69% 6 Values	27.1% 19 Values

a Median of individual percent exceedances above the Class I criteria of 500 mg/L

b Median of individual percent exceedances above the Class I criteria of 250 mg/L

c Some earlier FDEP and City of Punta Gorda TDS data not lab analyzed; values calculated from field specific conductance readings
Data sources include; FDEP STORET; IWR_run43, city of Punta Gorda, FDEP Ft. Myers, and SWFWMD

Resource Management Actions and Progress to Date

The following table provides the number and/or progress of Resource Management Actions that have been initiated in the SPJC Watersheds during the October 2004 to September 2012 time frame. These Management Actions have been defined in the SPJCWMP Reasonable Assurance document, and are expected to measurably improve chloride, specific conductance, and TDS concentrations within each of the SPJC Watersheds. The Resource Management Actions are listed in order of their effectiveness to address water quality impairment, with detailed progress of Management Actions for each specific SPJC WBID summarized in the following tabulated sections of this document.

Resource Management Action	Current and Prior Progress		Result
Shell, Prairie, and Joshua Creek (SPJC) Well Back-Plugging Program	Number Wells Back-Plugged		Improves water quality at source of mineralized water. Highly effective with documented program success. Provides economic incentive to growers to improve crop production.
	Prior to October 2010	October 2010- September 2012	
	48	4	
SWFWMD Resource Regulation Well Construction and Water-Use Permitting (WUP)	Permitted and Constructed Irrigation Wells (2006-2012)	Water-Use Permits (2006-2012)	Highly effective complement to incentive programs such as FARMS and Well Back-Plugging. Regulates compliance on permit renewals and new WUP applications.
	693	247	
	Overall Number FARMS/EQIP Projects		
Facilitating Agricultural Resource Management Systems (FARMS) Program	Overall Number FARMS Projects prior to October 2010	Overall Number FARMS Projects 2010-2012	Very effective dual role of improving water quality and reducing water use. High grower participation due to improved water supply for crops and economic incentive.
	50	34	
	Overall Number EQIP Projects**		
Environmental Quality Incentives Program (EQIP)	74		Focuses on key agricultural management activities to improve environmental conditions.
*Peace River Valley/Manasota Citrus Best Management Practices	Not Quantitative See Regional Section		Highly effective as applied to nutrient management issues.
*Regional Water Supply Plan and SWUCA Recovery Strategy	Not Quantitative See Regional Section		Significant over long-term (20 years) due to anticipated reduction in overall water use (with correspondent reduction in poor water quality use). Significant funding committed over long-term.
Quality of Water Improvement Program (QWIP)	Overall Number Wells Plugged/Abandoned 2004-2012		Very effective as wells are available for complete abandonment.
	3		
*Land Acquisition	Total Acres Acquired Historically through Sept. 2012		Has the potential for a much greater percent effectiveness. Time frame for land acquisition is undetermined.
	43,810		
*Mobile Irrigation Laboratory	Overall Sites Visited 2004-2012	Overall Acres Served 2004-2012	Effective due to its ability to improve water management. Can result in decreased water use (with correspondent reduction in poor water quality use).
	103	8303	
*Education and Outreach	Overall Media Coverage Items 2004-2012	Overall Outreach Events Attended 2004-2012	Effective in promoting awareness of issue and advertising incentive programs available. Important element to maintain funding levels.
	50	167	
*IFAS Research Efforts	Overall Number Projects Funded 2004-2012		Effective in continual assessment of water quality problems to focus management actions for greatest effectiveness.
	32		

*Regional Resource Management Action Items **DeSoto and Charlotte Counties

Water Quality Monitoring Networks and Data Sources

The District, FDEP, United States Geological Survey (USGS), and City of Punta Gorda currently have surface and/or ground-water quality monitoring networks in place from which data results are being used to demonstrate progress toward water quality improvements within the SPJC watersheds. Results from these monitoring networks are used extensively in this Performance Monitoring Summary. The following information describes the purpose for initiating these networks and also explains how data from these networks are utilized for SPJCWMP Reasonable Assurance performance monitoring.

In-Stream Specific Conductance Logging Network (District and USGS)

Purpose

The purpose of the Specific Conductance Logging Network is: 1) to determine surface water systems (streams, canals) that may be showing ground water signature characteristics so that management actions can be developed, and 2) to track the success of tailwater recovery projects and other management actions at site-specific locations to meet performance-monitoring objectives.

Network Description

During dry season events (November through May) the District currently has YSI® 600XLM data sondes deployed in fifteen stream and canal systems throughout the SPJC watersheds. Eight of these locations are equipped with telemetry equipment so data are transferred instantaneously via satellite to a web site interface for viewing and retrieval. An additional three stations have data sondes deployed year-round which are maintained by the USGS under contract with the District. All data sondes are programmed to record temperature and specific conductance measurements on either hourly or 15-minute intervals.

Reporting of Results

The Specific Conductance Logging Network results will be displayed as graphical plots and are presented in the following tabulated sections. These data plots reflect weekly median values for specific conductance, which have been calculated from independent values collected on 15 minute or hourly intervals. These data plots also show weekly median specific conductance values in relation to the 775 uS/cm reference line goal. A table located at the end of each tabulated section provides the overall specific conductance monitoring logging results for each respective WBID/water segment.

Specific Conductance Reconnaissance Network (District)

Purpose

The purpose of the Specific Conductance Reconnaissance Network is to track changes or declines in water quality of stream and canal systems throughout the SPJC watersheds and in other areas adjacent to these watersheds. This network assists with identifying surface waters that are showing ground water signature characteristics and also provide information on surface waters that are entering the SPJC watersheds from outside study area boundaries.

Network Description

Field parameters (temperature, specific conductance, pH, total station depth, and salinity) are currently collected at approximately 150 surface water stations District-wide. Thirty-one of these stations are located throughout the SPJC watersheds. Additional stations may be added to this network as more sites are identified. Each station is visited twice per year, during dry and rainy season periods. Station locations have been selected based on ease of accessibility (bridge/culvert crossings, etc.) for efficiency purposes.

Reporting of Results

Table comparing specific conductance for dry season events, along with percent change increases and/or decreases for each monitoring location, will be shown for each respective WBID.

Pre- and Post Back-Plugging Well Monitoring Network (District)

Purpose

A total of 52 wells were back-plugged in the SPJC watersheds by the end of the current reporting period October 2010 to September 2012. Generally, agricultural Water Use Permit (WUP) wells that exceed 600 feet or more in depth and produce highly mineralized groundwater with a specific conductance measuring greater than 1000 uS/cm may be candidates for the Well Back-Plug Program. Typically, these wells have a source of high ion concentration groundwater coming from the bottom well interval that can degrade better quality groundwater produced from upper well intervals. Locating and plugging off a poor quality groundwater source in the well without a severe reduction in pumping capacity is the goal of every successful back-plug operation (SWFWMD, 2007).

Water quality data collected from agricultural (WUP) wells allows project managers to determine which wells in the SPJC watersheds exhibit poor water quality (e.g. elevated levels of specific conductivity (>1000 uS/cm), chloride, and TDS). These wells, if proven to have poor water quality, are then scheduled for back-plugging based on owner consent if reviews of other well characteristics indicate that an improvement might be achieved. Water quality data and well productivity data are collected following back-plug activities to determine if the well back-plugs have resulted in an improvement in water quality and/or a change in well yield. A sub-set of back-plugged wells is currently monitored on an ongoing, quarterly basis to ensure the back-plugs have remained functional and no measurable differences in water quality are observed.

Network Descriptions

Wells in the SPJC watersheds that are potential candidates for back-plugging are scheduled for sampling on an "as needed" basis which is dependent on what areas have been selected for further investigation. Approximately 108 wells were sampled as part of the back-plug network during 2002-2003 to characterize water quality and assess potential back-plug candidates, with an additional 121 wells sampled as part of this effort in 2004-2006; then approximately 180 wells were sampled during the 2006-2008 period, 110 wells were sampled during the 2008-2010 period and 110 wells were sampled in the current report period. To date, 52 wells have been back-plugged in the SPJC watersheds. The original Post Back-Plug Monitoring Network consisted of 16 wells sampled on a quarterly frequency. Due to land sales and resultant land use changes, seven of the wells in the original network are no longer sampled bringing the current number of post back-plugged wells that are monitored on a quarterly frequency to nine.

Reporting of Results

Results from each quarterly event for wells in the Post Back-Plug Network will be displayed as graphical plots. These results assist with determining if the well back-plugs have remained functional and no measurable differences in water quality are observed.

Surface-Water Quality and Biological Monitoring Networks (District, FDEP, and City of Punta Gorda)

Purpose

Surface-water quality samples are collected by the District, FDEP, and City of Punta Gorda to track concentration levels of impaired parameters within identified TMDL impaired waters throughout the SPJC watersheds. Results from these monitoring efforts also assist project managers in determining the success of management actions and identify surface waters that show poor water quality characteristics.

The City of Punta Gorda is currently permitted to withdraw 8.1 million gallons per day (mgd) (annual average) for public supply from the Shell Creek Reservoir. In 1991, under conditions of the original Water Use Permit, the District required the City to implement a Hydrobiological Monitoring Program (HBMP) to ensure the long-term protection of Shell Creek and lower Peace River estuarine systems. The overall objectives of this monitoring program are to determine whether biological communities are adversely impacted by either existing or projected permitted freshwater withdrawals from the reservoir. The City has performed these monitoring efforts and has reported results to the District on an annual basis since 1991.

Network Descriptions

The District collects samples from five surface water stations on a quarterly frequency and the FDEP-Fort Myers office currently collects samples at six surface water sites (rivers and streams) throughout the SPJC watersheds. The FDEP sites are currently sampled on a monthly basis. All data collected for the District and FDEP surface water projects are uploaded to the Florida STORET database for use in TMDL/IWR water quality assessments. All data collected by FDEP and District staff for Habitat Assessment (HA) and Stream Condition Index (SCI) monitoring efforts (DEP-SOP-001/01 FS 7000) are uploaded to the FDEP SBIO database for use in TMDL assessments.

Field parameters collected for the above District water quality networks include temperature, specific conductance, pH, dissolved oxygen, salinity, and total station depth. Chemical parameters include chloride, sulfate, TDS, silica, iron, strontium, sodium, magnesium, calcium, potassium, and alkalinity. The field and chemical parameter list for the FDEP sites is similar to the District's list with the exception of nutrients and bacteria data that are collected at select sites.

The District also performs sample collection for other long-term surface-water quality monitoring networks. Two of these networks: Peace River and Comprehensive Watershed Management, have stations located District-wide. Four sites in these networks are located within the SPJC watersheds and samples are collected on a monthly frequency. Parameters include temperature, specific conductance, pH, dissolved oxygen, total station depth, nutrients, major ions, and chlorophyll. Data from these networks will also be utilized for SPJC performance monitoring reviews and reporting, and are also uploaded to the Florida STORET database for use in TMDL/IWR water quality assessments.

The City of Punta Gorda performs water quality monitoring at 19 surface water stations located throughout the Shell and Prairie Creek systems, as well as the reservoir. Three of these stations (freshwater-upstream of Hendrickson Dam) are located within the SPJC study area boundaries. Prior to 2005, data collection and laboratory analysis was performed by Earth Balance, North Port, Florida under contract with the City. Since 2005, Test America; Analytical Testing Corporation, Orlando, Florida has performed monitoring and laboratory analysis for this

effort. During the 1999-2001 drought period the City also monitored surface-water quality at additional sites throughout the Shell and Prairie Creek Watersheds.

Field parameters collected at the three freshwater HBMP monitoring sites include temperature, specific conductance, pH, dissolved oxygen, salinity, Secchi depth, total station depth, and sample collection depth. Chemical parameters include color, turbidity, total suspended solids, nitrate+nitrite, ammonia, Total Kjeldahl Nitrogen, orthophosphate, total phosphate, chlorophyll a, silica, alkalinity, chloride, and total organic carbon.

Results from monitoring the biology of rivers and streams provide a comprehensive depiction of the overall health of a flowing surface-water system. HA and SCI monitoring can assist in determining if anthropogenic factors, such as run-off from surrounding land-use practices and/or disruption of riparian zone buffer areas, are impairing macroinvertebrate habitat and populations. Although there is not a defined network at this time for biological monitoring, District and FDEP staff have performed SCI monitoring in the Joshua, Shell, and Prairie Creek watersheds.

Reporting of Results

Data from the District, FDEP, and City of Punta Gorda's monitoring networks have been used collectively to produce graphical plots depicting water quality trends in TMDL impaired waters throughout the SPJC. Data collected by the City for their HBMP have been essential in providing water quality information for historical review and trend analysis, as well as data collected by the City since 1975 which was initiated to monitor potential degradation of Shell and Prairie Creeks. The entire period of record for both of these data sets has been utilized for SPJC performance monitoring reviews and reporting.

Habitat Assessment and Stream Condition Index (FDEP and District)

Purpose

Habitat Assessment (HA) and Stream Condition Index monitoring (SCI) provide a comprehensive depiction of the overall health of a flowing surface-water system. HAs provide a measure of anthropogenic disturbances to biological communities by scoring stations according to their habitat/in-stream characteristics and morphological and riparian features; habitat availability, habitat diversity, water velocity, habitat smothering, artificial channelization, bank stability, and riparian zone vegetation width and quality. The SCI adds a biometric component to the HA score to further assess the biological community response to potential disturbances using such matrices as total number of taxa present in a sample, total number of sensitive taxa present in a sample, etc.

Network Description

All HAs and SCIs performed by the District are completed in accordance with FDEP SOPs FT 3100 and FS 7420, respectively. HAs and SCIs are performed on qualified sites, selected from the WQMP surface water networks, with an emphasis on waterbodies or reaches of waterbodies not actively monitored by other agencies, in an effort to increase the coverage of sites monitored within a watershed. HA and SCI data are stored by FDEP in their Statewide Biological Database (SBIO) and are utilized along with water chemistry results in support of TMDL assignment. FDEP also conducts HA and SCI assessments within the SPJC watersheds.

Reporting of Results

The results of HAs and SCIs performed by FDEP or the District will be provided for each respective WBID.

Coastal Ground-Water Quality Monitoring Network (District)
Water-Use Permitting Ground-Water Quality Monitoring Network (District)

Purpose

The Coastal Ground-Water Quality Monitoring Network (CGWQMN) was developed to determine the quality of groundwater in coastal regions of the District. Primary use of the data is to track any apparent landward movement of salt-water intrusion resulting from major agricultural, industrial, and municipal groundwater withdrawals. The network is also designed to monitor up-coning of sulfate rich waters in coastal areas and limited inland areas.

The Water Use Permitting Ground-Water Quality Monitoring Network (WUPNET), located in the Southern Water Use Caution Area (SWUCA), was developed to upgrade the quality of data obtained from permitted irrigation and public supply wells. Well permit conditions require that permit holders provide water quality information about their wells to the District. Historically, data received for some of the permitted wells were not reliable. This network provides a continuous, reliable data collection effort to assist with water resource management decisions. Data from these two networks can also be utilized for SPJC performance monitoring reviews and reporting.

Network Descriptions

Approximately 360 wells (District-wide) in the CGWQMN are sampled once each year during the months of December, January, February, and March. Of these 360 wells, 16 are located within the SPJC watersheds. A sub-network consisting of approximately 70 wells (which were chosen from the original list of 360 wells) is sampled additionally in May and September. Fourteen of these sub-network wells are located within the SPJC watersheds.

Wells sampled for the WUPNET were chosen using statistical techniques to determine well density and sampling frequency. From these statistical results a sentinel or “fixed” well network has been established for water quality monitoring of the WUPNET. Monitoring of the sentinel portion of the WUPNET is done concurrently with the CGWQMN. Approximately 150 wells (District-wide) in the sentinel WUPNET are sampled three times each year during the months of January, May, and September. Of these 149 wells, 17 lie within SPJC watershed boundaries.

Field parameters collected for the above District well networks include temperature, specific conductance, pH, depth-to-water, and purge volume. Chemical parameters for the CGWQMN include chloride, sulfate, TDS, silica, iron, strontium, sodium, magnesium, calcium, potassium, and alkalinity. Parameters collected for the WUPNET are the same as the CGWQMN with the exception of TDS. Fluoride is also on the parameter list for the WUPNET project.

Reporting of Results

A narrative summarizing the District's most recent (2011) conclusions on the status of salt water intrusion in Charlotte, DeSoto, and Highlands counties will be presented in the Regional Water Quality Monitoring Networks section of this report.

Quality Assurance/Quality Control Elements that Demonstrate Monitoring will Comply with Chapter 62-160, F.A.C.

The analyzing laboratory (District Laboratory, Brooksville, Florida) for District monitoring networks listed in the previous section has a State-approved Quality Assurance Plan on file (#870100-G; Rev. 15; 12/05/08), which complies with FDEP's Quality Assurance (QA) rule, Chapter 62-160 F.A.C., including FDEP approved Standard Operating Procedures (SOPs). The District laboratory is NELAC certified (Lab ID #E44149). The District's Water Quality Monitoring Program (WQMP) is responsible for collecting the ground and surface-water quality field parameters and samples for the various networks described in the previous section. The WQMP also has an internal SOP manual that is updated on an annual basis.

Water quality monitoring and laboratory analysis that is performed by the FDEP Ft. Myers office falls under FDEP's Quality Assurance Plan and SOP guidelines. Water quality monitoring and laboratory analysis performed for the City of Punta Gorda's HBMP is conducted by Test America; Analytical Testing Corporation, Orlando, Florida. This laboratory is NELAC certified (Lab ID #E87839).

Procedures for Reporting Results

Performance monitoring results for water bodies in each of the SPJC WBIDs is contained in the following tabulated sections of this Performance Monitoring Summary. Particular management actions which are considered regional rather than specifically related to a boundary-defined WBID area are addressed in a separate tabulated section.

The reporting time period for this Performance Monitoring Summary document is September 2010 through September 2012. Performance monitoring results contained in the previous summary reports are also included. The goal of the SPJC Stakeholders Group is to achieve the water quality goals set forth in the SPCWMP Reasonable Assurance document by 2014. Performance Monitoring Summaries will be generated on a bi-annual basis over the duration of this time period to show reasonable assurance toward improving water quality and consistently meeting Class I surface-water quality standards in the SPJC TMDL impaired sub-basins.

Water Segments in the SPJC Watersheds Recognized as Requiring Water Quality Monitoring Efforts

The following table represents waterbodies in the SJPC watersheds that are currently lacking water quality monitoring data collection efforts. Although Resource Management Actions are occurring in these WBIDs, the SPJC Stakeholders Group realizes the importance of collecting water quality data throughout all of the SPJC WBIDs not only to track the success of Resource Management Actions, but also to determine areas that require additional focus. None of the waterbodies shown below are currently listed by FDEP as verified impaired under TMDL Rule.

Field reconnaissance was conducted to determine monitoring accessibility within the following WBIDs. At this time all potential monitoring locations were on private property, and access permission has not been secured at this time.

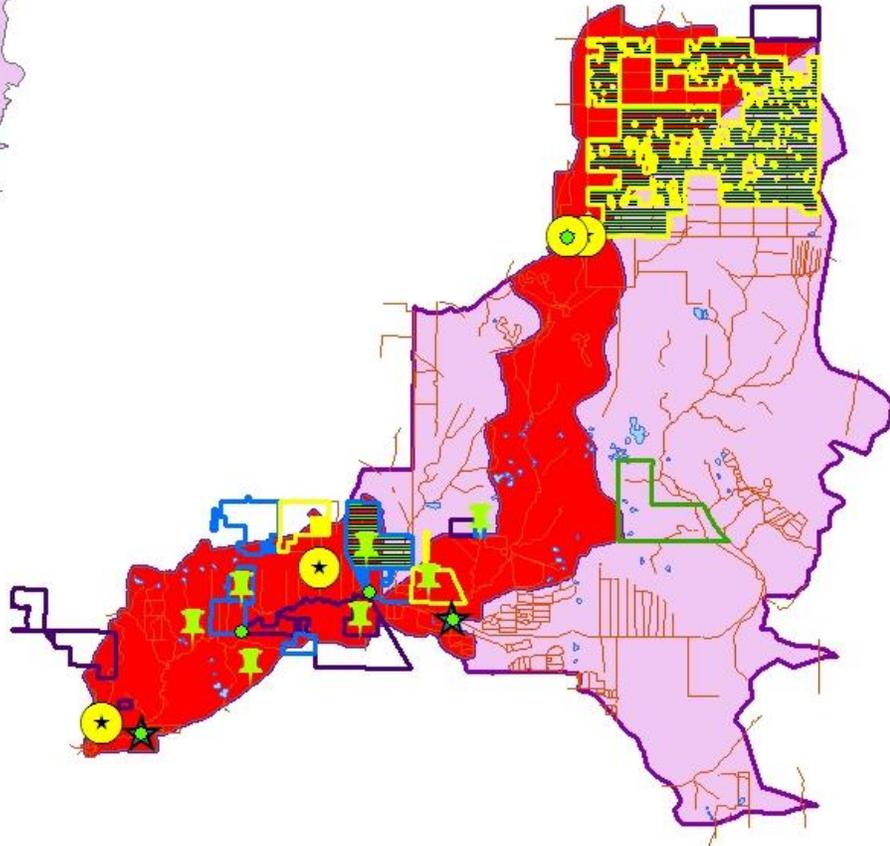
Water Segments in the SPJC Requiring Water Quality Data Collection Efforts

Water Segment	FDEP WBID	Water Body Type	Basin / Watershed
Joshua Cr. ab Honey Run	1950B	Stream	Peace River / Joshua Creek
Lake Slough	1963	Stream	Peace River / Joshua Creek
Honey Run	1977	Stream	Peace River / Joshua Creek

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS

WBID 1962
 Water Segement - Prairie Creek
 Prairie Creek Watershed; Water Use - Class I
 Verified Impaired Pollutants of Concern - sp. conductance, TDS



Legend

- Data Sonde Locations
- Reconnaissance Network Locations
- Surface Water Sample Locations
- Backplug Locations
- WBID 1962
- FARMS Projects - Under Construction
- FARMS - Potential Projects
- FARMS Projects - Operational
- FARMS - Dormant Contacts
- FARMS Projects - Board Approval Pending
- Lakes
- Streams and Canals
- Prairie Creek Watershed



WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of this program, a total of 19 irrigation wells have been back-plugged in WBID 1962. No wells were back-plugged in WBID 1962 during the current reporting period. The following table represents water quality improvements for chloride and TDS concentrations at each well directly following back-plugging activities:

Post Well Back-Plugging Water Quality Results in WBID 1962

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20009732	2	27%	37%
20009127	6	N/A	N/A
20009127	7	N/A	N/A
20009129 (20012818)	1	76%	91%
20009782	1	31%	49%
20009782	2	-1%	-4%
20009782	3	45%	73%
20009782	4	N/A	N/A
20009782	4	1%	13%
20009782	5	-1%	1%
20009782	6	11%	21%
20009782	7	-5%	2%
20009782	9	N/A	N/A
20009782	9	N/A	N/A
20003069	2	44%	59%
20003069	6	68%	83%
20003069	7	64%	80%
20006765	18	71%	84%
20006765	19	55%	70%

 Denotes repeat back-plug

District Resource Regulation – Water Use Permitting

In WBID 1962, seventy-two Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the seventy-two applications, two were new permits, forty-six were renewals, four were modifications, fifteen were letter modifications, and five were owner transfers.

WUP Renewals and Modifications in WBID 1962

	Oct. 2004 – July 2006	Oct. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	1	1	0
WUP Renewals	4	12	12	18
WUP Modifications	0	2	2	0
WUP Letter Modifications	3	4	0	8
WUP Owner Transfer	0	0	0	5

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Twenty-two FARMS projects were Board approved between October 2004 and September 2012 in WBID 1962, four of which have since been cancelled. An additional eight FARMS projects were discussed or were in the contract initiation phase during this time. The following table summarizes the Board approved projects, as well as ground water offsets that have occurred over the performance monitoring period. Details for each of the projects listed below can be found in Appendix IV.

FARMS Projects in WBID 1962; October 2004 to September 2012

Project Number / Type	Project Operational/ (Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset as through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a WUP #20006765 Phase I – H516 (citrus)	August 2006	222,500	267,600	1,175,689
^a WUP #20006765 Phase 2 – H516 (citrus)	March 2009	76,980	206,600	711,581
^a WUP #20006765 Phase 3 – H584 (citrus)	June 2010	348,400	327,000	877,065
WUP #20008348– H514 (citrus)	April 2006	71,000	96,400	415,194
WUP #20009127– H526 (citrus)	May 2006	15,600	21,654	491,565
WUP #20002386– H555 (Section 29 East) (citrus, sod)	April 2009	225,100	86,636	171,710
WUP # 200002386– H606 (Section 10SW) (citrus)	March 2011	432,000	355,276	564,655
WUP #200002386– H606 (Phase 1A) (citrus)	May 2011	386,450	336,886	1,044,846
WUP #200002386– H606 (Phases 2 and 3) (citrus)	December 2012	610,008	Not Available	Not Available
WUP #200002386 – H606 (Phase 2 and 3 Amendment) (citrus)	December 2013	83,960	Not Available	Not Available
WUP #20003275– H507 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
WUP #20000153– H547 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20010065 (citrus)	N/D	N/D	N/D	N/D
WUP #20003069– H657 (citrus)	July 2012	185,000	73,000	73,000
*WUP #20009782– H648 (citrus)	January 2013	72,300	Not Available	Not Available
WUP #200004641– H594 (citrus)	September 2012	32,000	Not Available	Not Available

WBID 1962

Water Segment - Prairie Creek

Prairie Creek Watershed; Water Use - Class I

Verified Impaired Pollutants of Concern – sp. conductance, TDS

WUP #200002665– H682 (citrus)	September 2013	65,000	Under Construction	Under Construction
WUP #200008287– H546 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
^a WUP #20012818 – H556 (blueberries)	January 2009	98,820	201,274	708,968
WUP #20002386 – H608 (citrus)	October 2011	81,840	80,205	97,475
*WUP #20013370 (citrus)	N/D	N/D	N/D	N/D
WUP #20011982 – H610 (sod)	March 2012	107,280	2,206,540	6,382,050
*WUP #20006765 – H693 (citrus)	January 2014	87,100	N/D	N/D
*WUP #20009127 (citrus)	N/D	N/D	N/D	N/D
^a WUP #20004589 – H617 (sod)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20004905 (dairy)	N/D	N/D	N/D	N/D
*WUP #20007783 (citrus)	N/D	N/D	N/D	N/D
*WUP #20009226 (citrus)	N/D	N/D	N/D	N/D

*Potential project or project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aAlso received EQIP funding

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

Quality of Water Improvement Program (QWIP)

No wells have been plugged/abandoned in WBID 1962 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Specific Conductance Logging Network (District and USGS)

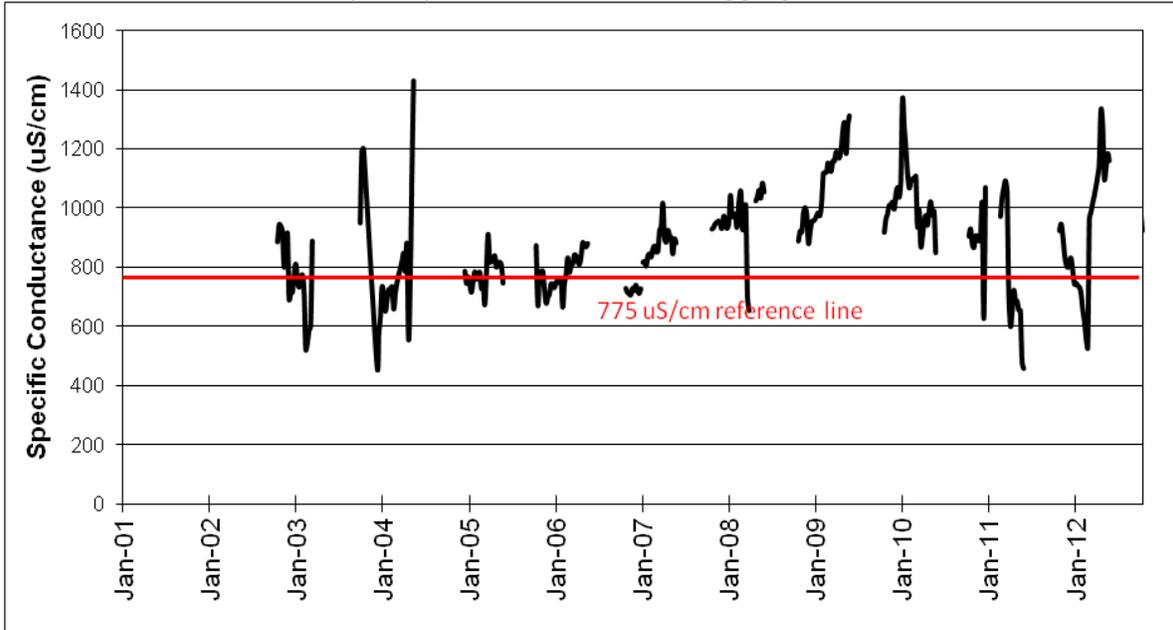
There are currently six YSI® 600XLM data sondes deployed in creek and canal systems throughout WBID 1962.

The **Mossy Gully** data sonde is deployed in an agricultural canal that is located in the northern region of the Prairie Creek Watershed. The site was upgraded to include data collection via satellite telemetry in October 2009. This canal provides flows to Prairie Creek, and land use in the immediate surrounding area of this monitoring location is predominantly agriculture (citrus). The following data plot shows median weekly values of continuous/hourly logging for specific conductance during dry season periods (November – May) for October 2002 through May 2012. Low water level conditions and smothering of the data probe by sediment and vegetation has resulted in some missing values for this monitoring location. These erroneous values have been removed from the data set.

The following graph shows evidence of increasing trends in specific conductance over the data period of record at this monitoring station, particularly during the 2007-2009 dry seasons. Downward trends occur during the 2010 and 2011 dry season, while the 2012 reporting period shows an increasing trend.

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Mossy Gully In-Situ Data Sonde Logging Results

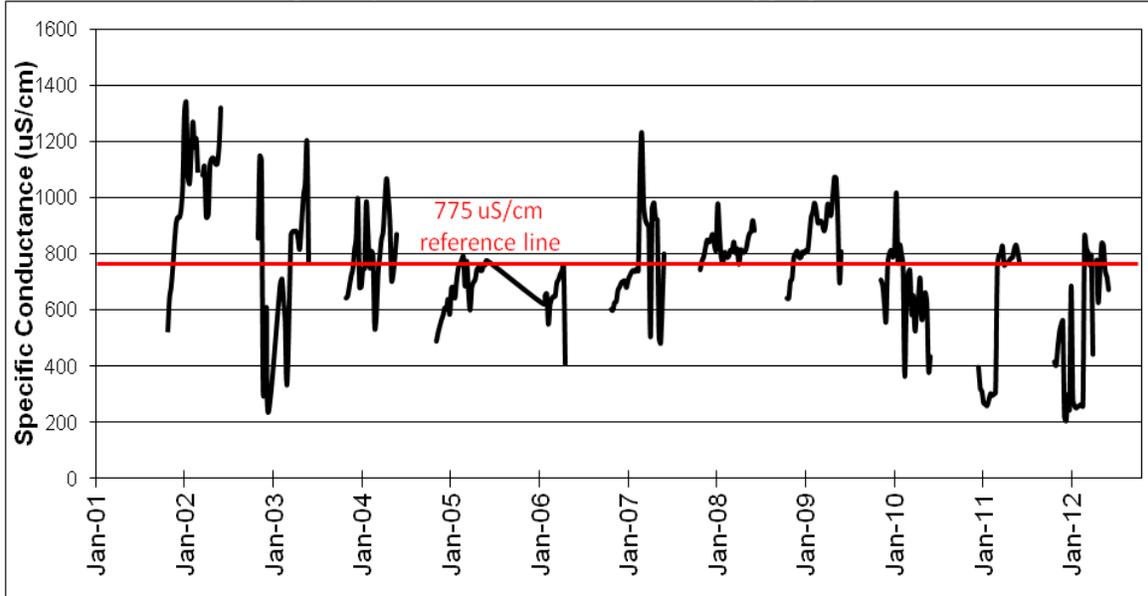


The **Montgomery Canal** data sonde is located in a canal in the central region of the Prairie Creek Watershed, and the site was upgraded to include data collection via satellite telemetry in October 2008. This canal provides flows to Prairie Creek, and land use contributing to this canal has historically been agriculture (sod farming). The following data plot shows median weekly values of continuous/hourly logging for specific conductance during dry season periods (November – May) for October 2002 through May 2012.

During the fall of 2004 a large portion of the sod farming operation upstream of this monitoring site was discontinued therefore, noticeable decreases in specific conductance occurred during the 2005-2006 time period. Well back-plugging activities have occurred in the immediate surrounding area of this data sonde location which has also contributed to water quality improvements in this portion of the Prairie Creek Watershed. Slight increases in specific conductance occurred during the 2007-2008 dry season months as agricultural operations became more active in the area during this time period, and drought conditions resulted in increased irrigation with groundwater. Significant decreases in specific conductivity were recorded during the 2009-2010 dry season. During a majority of the 2010-2012 reporting period decreases in specific conductance were observed. Although the specific conductance values during the dry season of the current reporting period saw increasing values, the maximum values were still below the historic maximum values, indicating overall progress in this area of Prairie Creek Watershed.

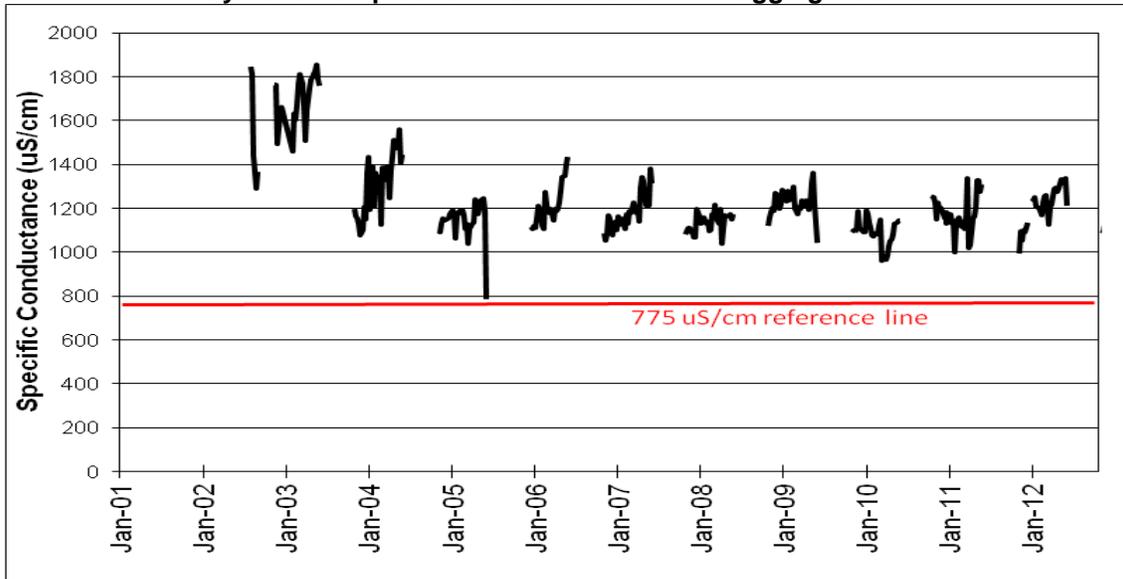
WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Montgomery Canal In-Situ Data Sonde Logging Results



The **Symons Pump Canal** data sonde is deployed in an irrigation canal located in the central region of the Prairie Creek Watershed. The canal provides flows to Prairie Creek, and the monitoring location is directly adjacent to citrus farming activities. The immediate surrounding area also includes rangeland. The following data plot shows median weekly values of continuous/hourly logging for specific conductance during dry season periods (November–May) for November 2002 through May 2012. Specific conductance values for the current reporting period showed an increasing trend in both the number of exceedances and the duration of time above the 775 uS/cm.

Symons Pump Canal In-Situ Data Sonde Logging Results



WBID 1962

Water Segment - Prairie Creek

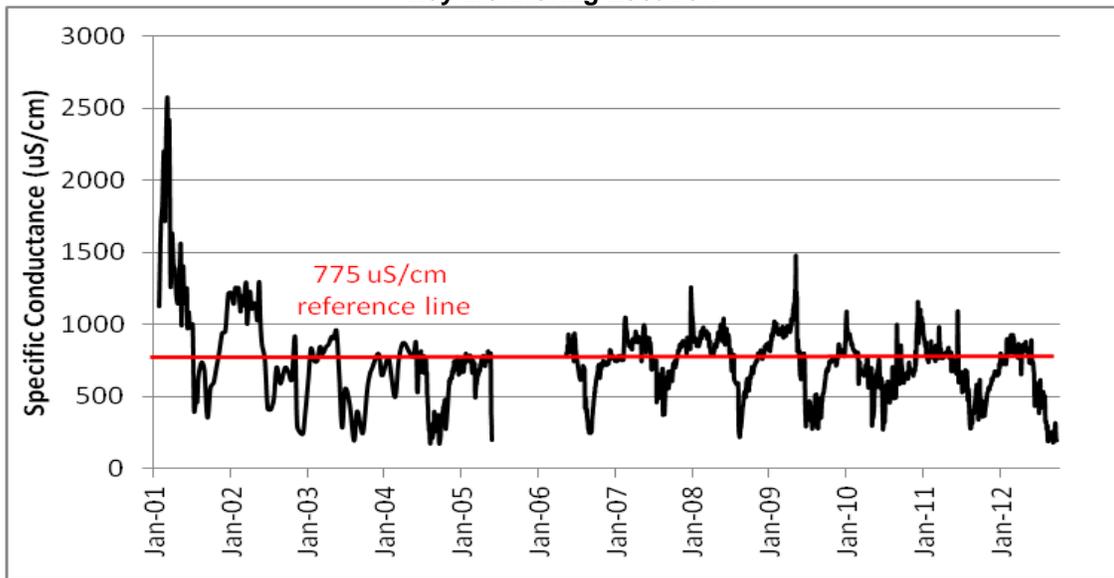
Prairie Creek Watershed; Water Use - Class I

Verified Impaired Pollutants of Concern – sp. conductance, TDS

The **Prairie Creek near Fort Ogden** data sonde is deployed in the main channel of Prairie Creek in the central region of the Prairie Creek Watershed, and is located approximately 100 yards downstream of the Symon Pump Canal's confluence with Prairie Creek. The immediate surrounding land use includes agriculture (citrus) and rangeland. This location is one of the key surface water monitoring stations in WBID 1962, with data results used by FDEP for TMDL assessments. For this reason data sonde deployment occurs year-round at this site under contract with the USGS. The following data plot shows weekly median results for continuous/hourly logging of specific conductance values throughout each year for November 2001 through August 2012.

Decreases in specific conductance have occurred at this monitoring location during dry season time periods since November 2001. Increasing specific conductance values for the 2006-2008 time periods are a result of severe drought conditions, particularly during dry season months however, no weekly median values have exceeded the 1,275 uS/cm Class III criteria for specific conductance since late 2001. Specific conductance values for the current reporting period show some improvement although exceedances continue to persist during the dry season time frames.

**Prairie Creek near Ft. Ogden In-Situ Data Sonde Logging Results
Key Monitoring Location**



WBID 1962

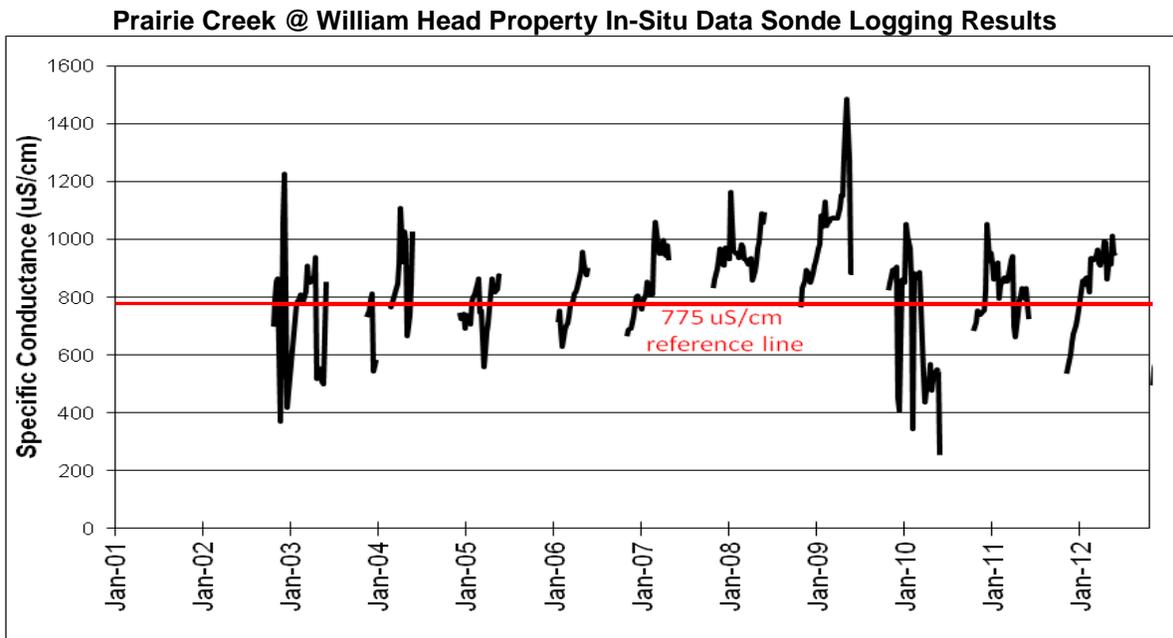
Water Segment - Prairie Creek

Prairie Creek Watershed; Water Use - Class I

Verified Impaired Pollutants of Concern – sp. conductance, TDS

The **Prairie Creek @ William Head** property data sonde is located in the main channel of Prairie Creek in the south/central region of the Prairie Creek watershed, and the site was upgraded to include data collection via satellite telemetry in October 2009. Land use in the immediate surrounding area is rangeland and agriculture (citrus). The following data plot shows weekly median results for continuous/hourly logging of specific conductance values for dry season periods (November – May) for October 2002 through May 2012. Sediment smothering of the data sonde during periods of high flow conditions has occurred at this location therefore, these erroneous values have been removed from the data set.

Increasing trends in specific conductance values for the 2006-2008 and the beginning of 2008-2010 time periods are a result of below average rainfall amounts during dry season months. Trends for the current reporting period reflect previous seasonal variability with overall declines since 2009.



WBID 1962

Water Segment - Prairie Creek

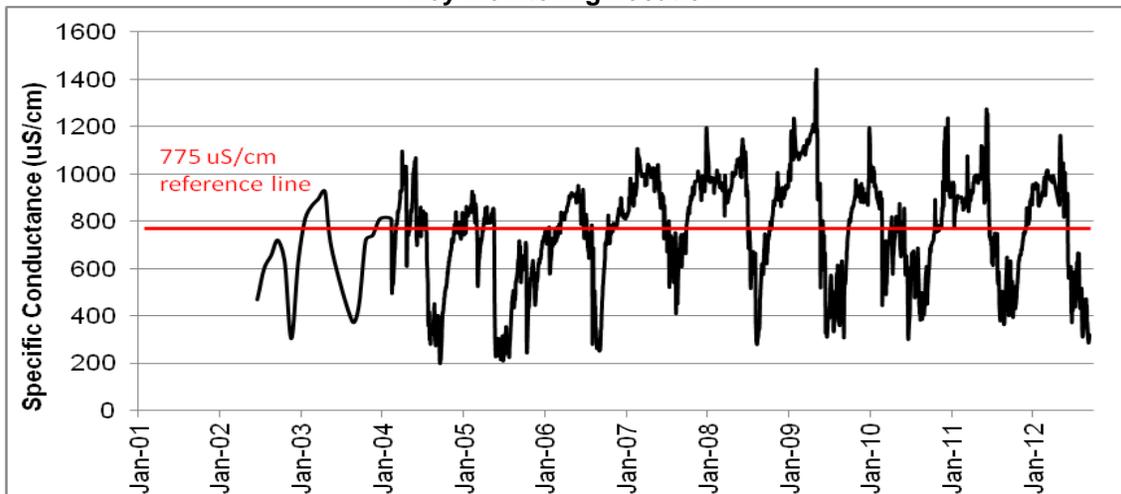
Prairie Creek Watershed; Water Use - Class I

Verified Impaired Pollutants of Concern – sp. conductance, TDS

The **Prairie Creek @ Washington Loop Road** data sonde is located on the main stem of Prairie Creek in the southern region of the Prairie Creek watershed, just upstream of the Shell Creek Reservoir. Land use in the immediate surrounding area is predominantly agriculture, with some rangeland and urban/built-up. This location is one of the key surface water monitoring stations in WBID 1962, with data results used by FDEP for TMDL assessments. For this reason, data sonde deployment occurs year-round at this site under contract with the USGS. The following data plot shows weekly median results for continuous/hourly logging of specific conductance values throughout each year for July 2002 through August 2012.

Decreases in weekly median specific conductance values occurred during the dry season periods of 2003 through 2005. Below average rainfall amounts during the 2006-2008 dry and wet season months are reflected by increasing trends in specific conductance values during this time period. Specific conductance values during the 2008-2010 and 2010-2012 appear to be showing a declining trend, as shown in the percentage of time below the 775 uS/cm reference line compare to previous reporting periods.

**Prairie Creek @ Washington Loop Rd. In-Situ Data Sonde Logging Results
Key Monitoring Location**



The following table summarizes period of data record logging results for specific conductance at the six established data sonde monitoring locations in WBID 1962. Individual values, and the percentage of these values exceeding the FDEP surface-water quality Class I and Class III criterion of 1275 uS/cm are provided. This table also includes the number of weekly median values and percentages of these weekly values above the 775 uS/cm goal criteria.

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Specific Conductance Logging Results in WBID 1962 over Entire Period of Data Record
Sites are listed as they are located from north to south throughout WBID 1962

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
*Mossy Gully	52,876	2,031	3.8%	286	197	68.9%
*Montgomery Canal	53,220	936	1.8%	312	146	46.8%
*Symons Pump Canal	50,995	13,283	26%	299	298	99.7%
**Prairie Cr. nr Ft. Ogden	246,366	212	0.09%	475	195	41%
Prairie Cr. @ William Head	46,825	131	0.28%	274	194	70.8%
**Prairie Cr. @ Washington Loop	294,163	801	0.3%	459	238	51.9 %

*Monitoring site located in agricultural canal – not on main channel of Prairie Creek.

** Key monitoring location

Specific Conductance Reconnaissance Network (District)

Within WBID 1962 there are currently four stations monitored for the Specific Conductance Reconnaissance Network. Individual values for the Mossy Gully @ SR 70 station have been excluded from this section since they were discussed earlier in the In-Stream Specific Conductance Logging Network section. Of the thirty-five individual specific conductance values collected within WBID 1962 during the period of record, seven values exceeded the 775 uS/cm goal criteria and two values exceeded the FDEP surface-water quality Class III criterion of 1275 uS/cm.

The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1962 during the 2004-2006, 2006-2008, 2008-2010 and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted in the following table as dry.

Overall, dry season percent changes for the 2010-2012 reporting period were either decreasing or not calculated due to dry stations in 2008.

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Specific Conductance Reconnaissance Results in WBID 1962; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 vs. Dry Season 2005	Percent change Dry Season 2005 vs. Dry Season 2006
Unnamed Cr. SR 70- #3A	701	*	677	537	685	↓3.42%**	↑1.18%**
Unnamed Cr. @ Washington Loop Rd. - #29	414	270	1009	738	873	↑143.72%**	↓13.48%**
Unnamed Ditch @ Farms Rd. - #12	*	454	521	331	*	*	*

* Station dry

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 1962; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 vs. Dry Season 2007	Percent change Dry Season 2007 vs. Dry Season 2008
Unnamed Cr. SR 70- #3A	572	766	599	885	651	↑11.82%	↑15.54%
Unnamed Cr. @ Washington Loop Rd. - #29	151	*	1401	*	636	*	*
Unnamed Ditch @ Farms Rd. - #12	700	*	435	*	423	*	*

* Station dry

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Specific Conductance Reconnaissance Results in WBID 1962; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Unnamed Cr. SR 70- #3A	904	690	675	573	↑2.1%	↓25.3%
Unnamed Cr. @ Washington Loop Rd. - #29	1798	210	827	405	*	↓54.0%
Unnamed Ditch @ Farms Rd. - #12	551	334	544	634	*	↓1.3%

* Station dry

Specific Conductance Reconnaissance Results in WBID 1962; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2010 vs. Dry Season 2012
Unnamed Cr. SR 70- #3A	808	576	847	565	↓16.5%	↓20.3%
Unnamed Cr. @ Washington Loop Rd. - #29	1037	703	*	404	↓20.2%	*
Unnamed Ditch @ Farms Rd. - #12	*	588	*	443	*	*

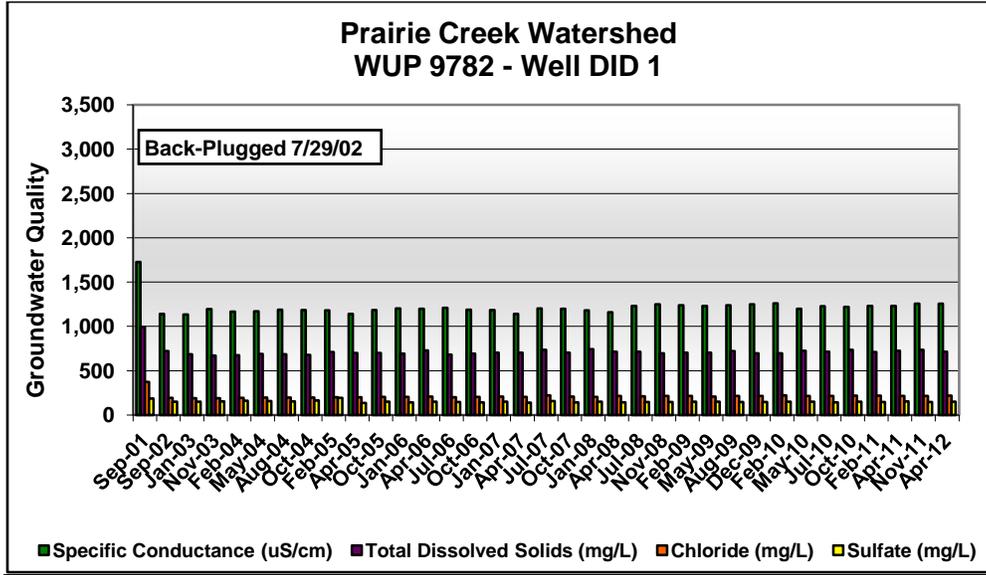
* Station dry

Pre- and Post Back-Plug Well Monitoring Network (District)

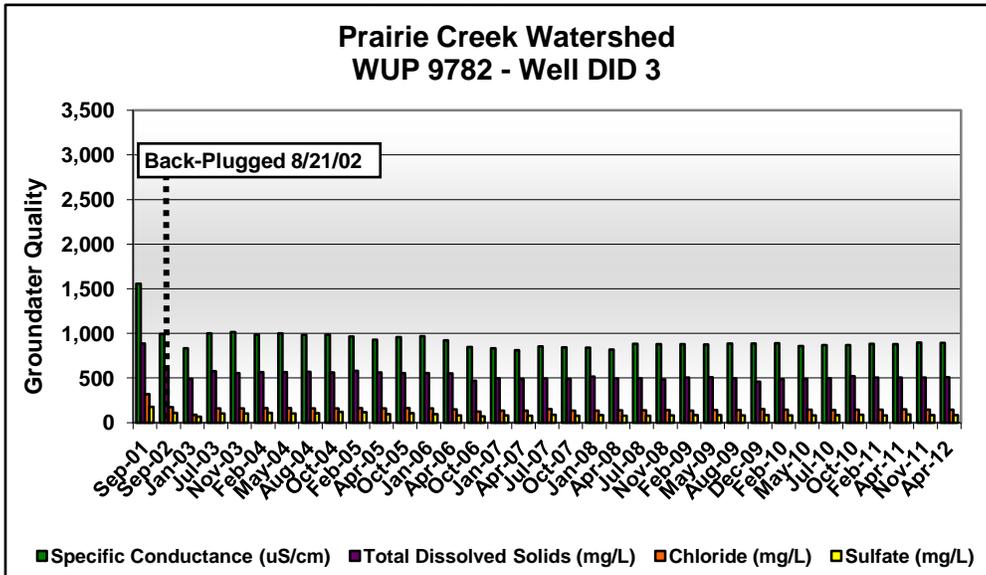
There are six wells in WBID 1962 that have been back-plugged. These wells are sampled on a quarterly frequency to monitor long-term improvements of water quality and to also ensure that the back-plugs have remained functional. The following graphs represent mineralized constituent values pre- and post well back-plugging activities.

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

WUP 20003069 - DID No. 1

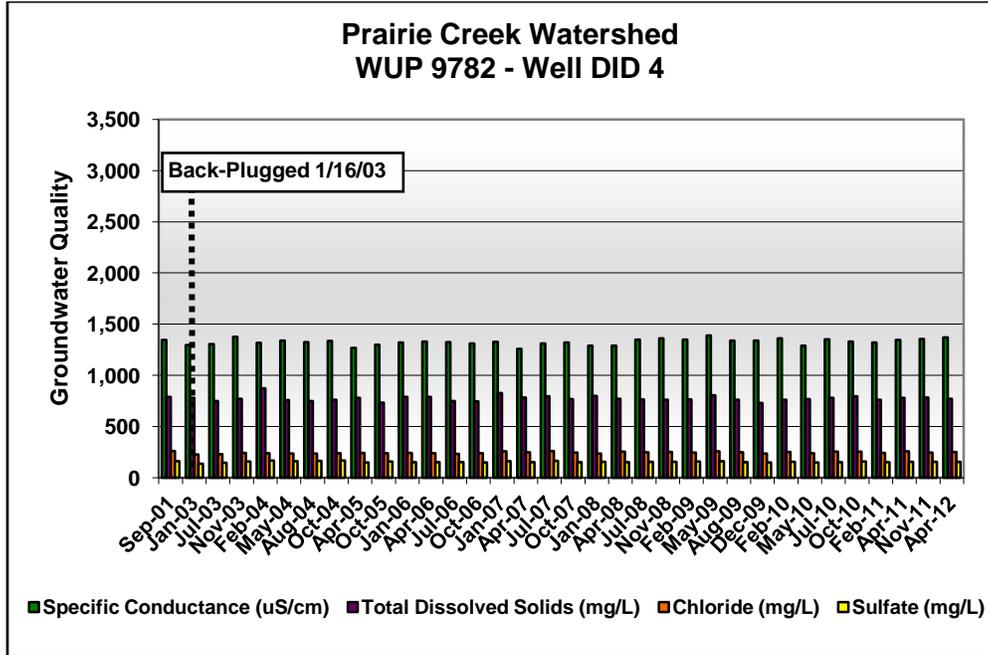


WUP 20009782 - DID No. 3

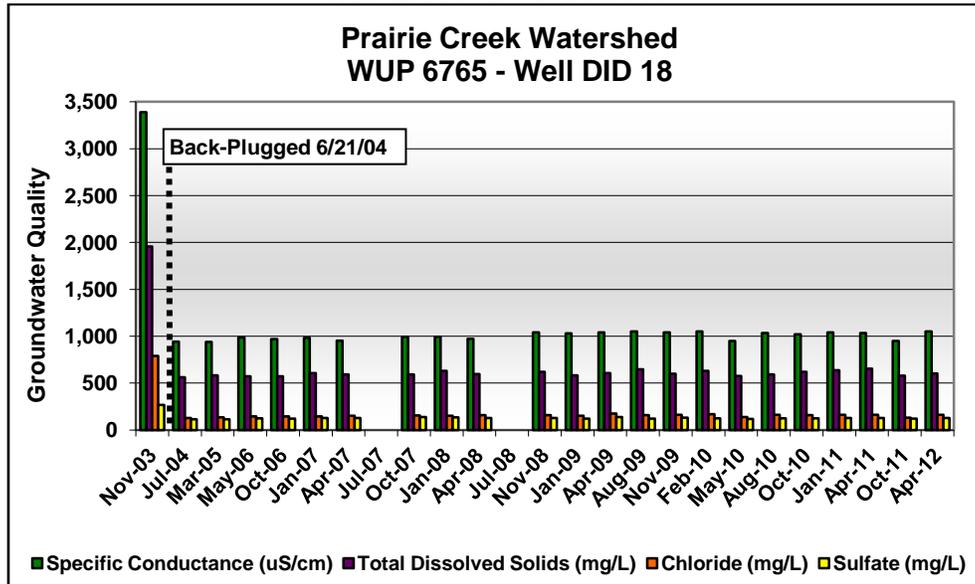


WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

WUP 20009782 - DID No. 4

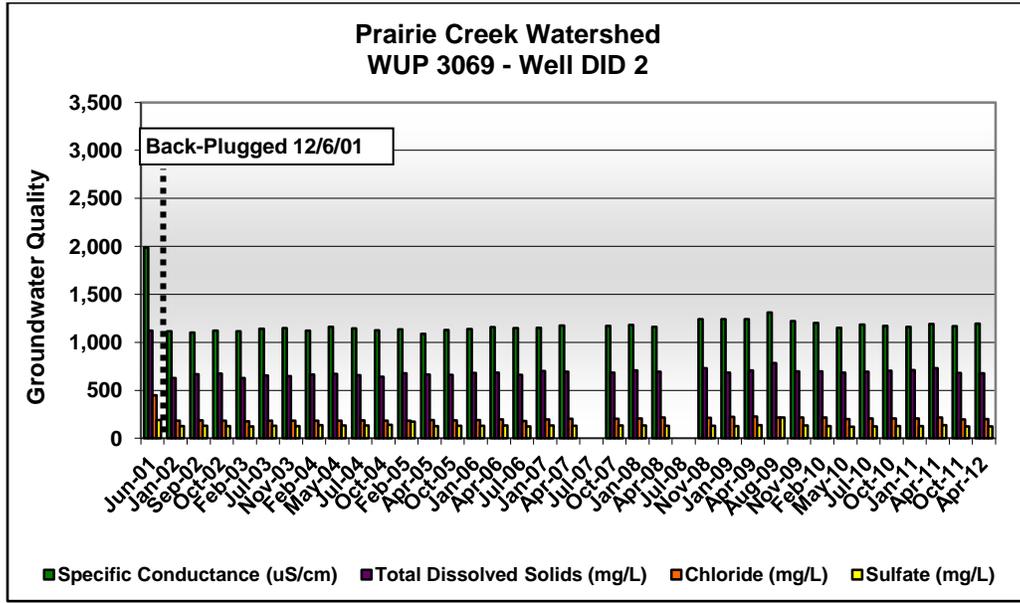


WUP 20006765 - DID No. 18

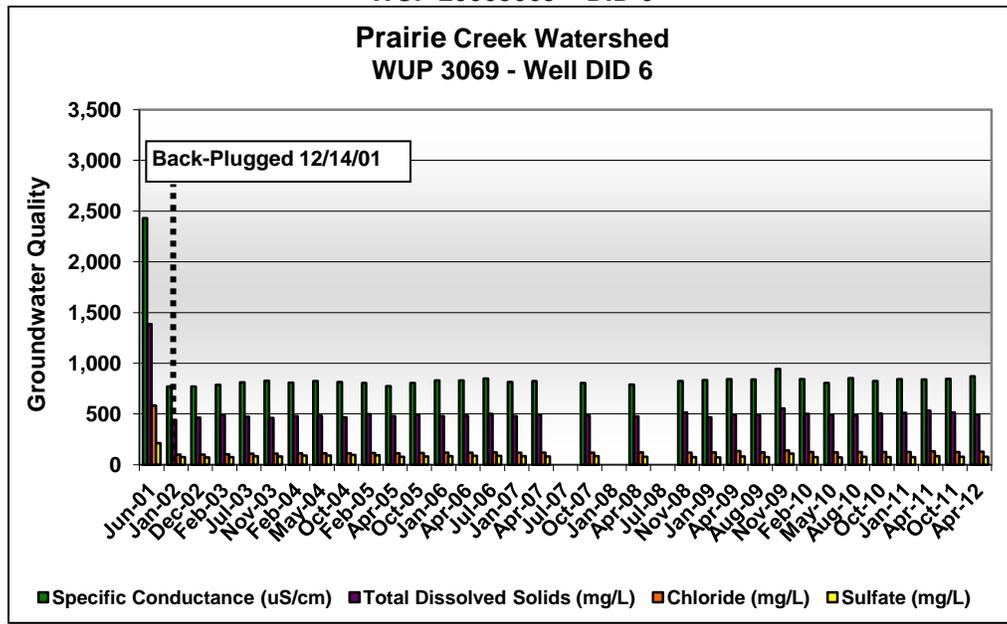


WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

WUP 20003069 – DID 2



WUP 20003069 – DID 6



WBID 1962

Water Segment - Prairie Creek

Prairie Creek Watershed; Water Use - Class I

Verified Impaired Pollutants of Concern – sp. conductance, TDS

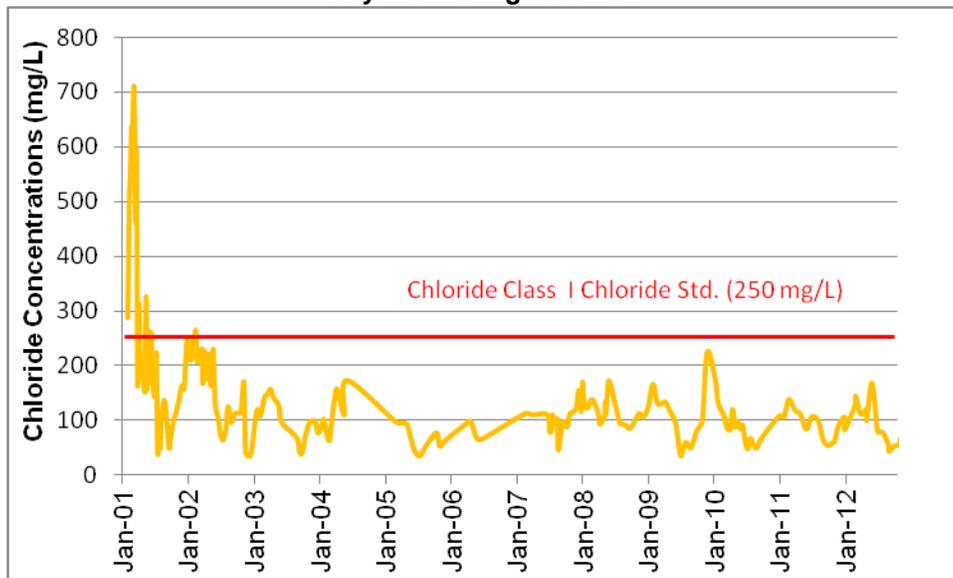
Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

The following graphs represent period of record water quality results through September 2012 for chloride and TDS concentrations at two key water quality monitoring stations in WBID 1962. Graphical representations for three additional surface water stations monitored in this WBID can be found in Appendix I. A table summarizing individual values above the Class I surface-water quality criteria for each of these five monitoring stations can be found at the end of this section.

These data plots were generated using historical and recently collected data from the City of Punta Gorda, as well as any data collected by the City since 1991 under the City's WUP requirements. Data were also used from FDEP's IWR database. Averaged monthly values for TDS are not consistently available from the above data sources (e.g. only one value available per month), therefore individual values were used to determine the number and percentage of TDS values over the 500 mg/L monthly average criterion. Numerous values for TDS in the above data sets were reported as calculated rather than derived from laboratory analyses.

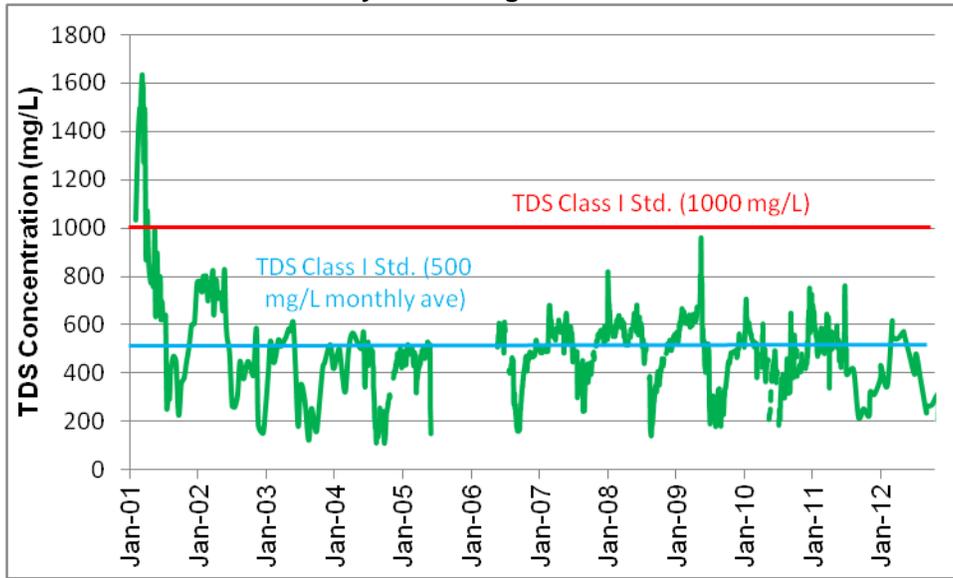
For comparative purposes, these data plots also contain reference lines depicting FDEP Class I criteria for chloride (250 mg/L) and TDS (500 mg/L as a monthly average, 1000 mg/L as maximum). Notable improvements in both chloride and TDS concentrations have occurred at these monitoring locations since 2001.

**Prairie Creek near Ft. Ogden Water Quality Results for Chloride
Key Monitoring Location**

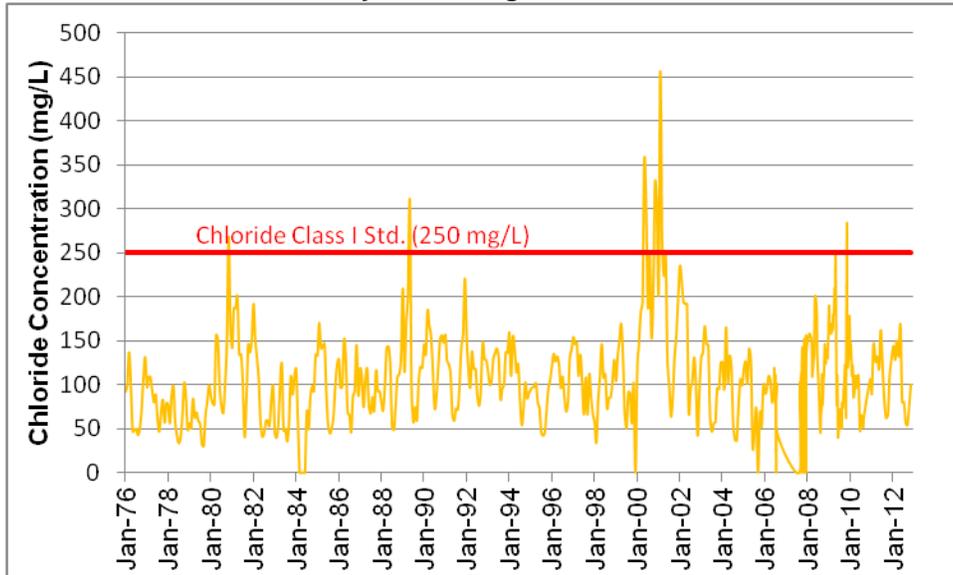


WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

**Prairie Creek near Ft. Ogden Water Quality Results for TDS
Key Monitoring Location**

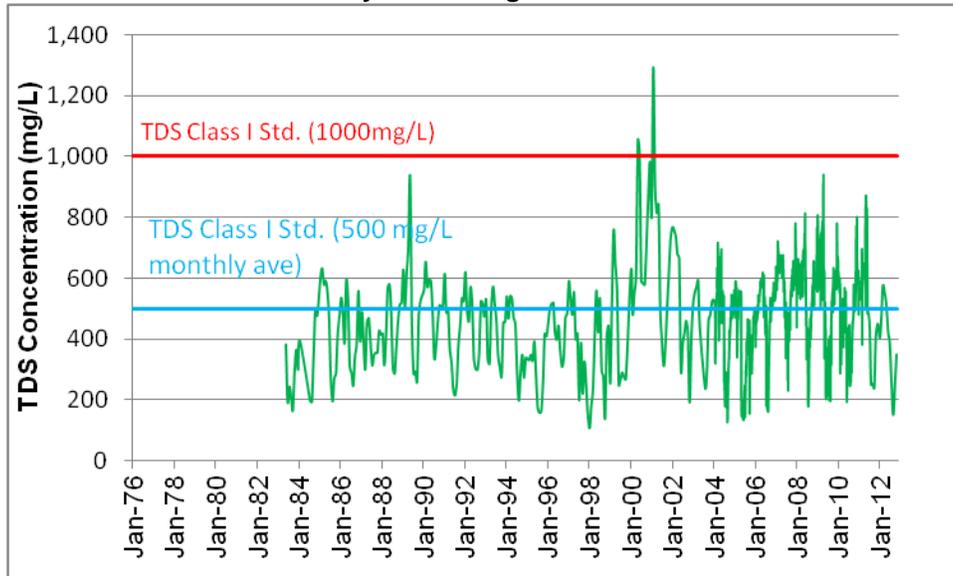


**Prairie Creek @ Washington Loop Rd. Water Quality Results for Chloride
Key Monitoring Location**



WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

**Prairie Creek @ Washington Loop Rd. Water Quality Results for TDS
Key Monitoring Location**



The following table summarizes water quality results for chloride and TDS at the five established monitoring locations in WBID 1962. Individual values, and the percentage of these values exceeding the FDEP surface-water quality Class I criterion of 250 mg/L for chloride, 500 mg/L (as monthly average), and 1000 mg/L (as maximum) for TDS are provided.

Chloride and TDS Water Quality Results in WBID 1962 over Entire Period of Data Record
Sites are listed as they are located from north to south throughout WBID 1962

Water Segment	***Number Individual Reported CI Values	***Number Individual CI Values >250 mg/L	***Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
*Mossy Gulley	96	0	N/A	87	77	88.5%	0	N/A
*Montgomery Canal	54	0	N/A	57	11	19.3%	0	N/A
*Symons Pump Canal	55	6	10.9%	33	32	97%	2	6.1%
**Prairie Cr. nr Ft. Ogden	196	16	8.2%	2146	988	46.0%	13	.6%
**Prairie Cr. @ Washington Loop Rd.	495	9	1.8%	2899	1573	54.3 %	3	0.1%

*Monitoring site located in agricultural canal – not on main channel of Prairie Creek (Class III).

**Key monitoring location (Class I)

***This parameter not listed by FDEP as TMDL verified impaired in WBID 1962

WBID 1962
Water Segment - Prairie Creek
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern – sp. conductance, TDS

Habitat Assessment and Stream Condition Index Monitoring (District)

No sites were evaluated for HAs and SCIs during the October 2004 to July 2006 time period. During the August 2006 to August 2008 reporting period, three sites in WBID 1962 were evaluated for biological health indicators. No sites were evaluated for HAs and SCIs during the 2008 to 2010 or 2010 to 2012 reporting periods. The results of the 2006 to 2008 assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-Stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Prairie Creek at Herbert Road	01/30/2008	51	69	120 Optimal	19 Category 3 ("impaired")
Prairie Creek near Ft. Ogden	05/28/2008	45	54	99 Suboptimal	39 Category 2 ("healthy")
Prairie Creek @ William Head Property	06/16/2008	38	57	95 Suboptimal	23 Category 3 ("impaired")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. Stations scored as Category 3 ("impaired") are characterized as having a notable loss of diversity with very tolerant taxa representing a large proportion of the individuals collected.

A definitive link between declines in the number and quality of macroinvertebrates and surface waters with elevated specific conductance values from anthropogenic activities has not been determined. However, it is likely that the impairment of the Prairie Creek at Herbert Road and Prairie Creek at William Head Property sites for the SCI can be directly linked to secondary factors of anthropogenic activities such as runoff which can lead to sedimentation and turbidity. Sedimentation and the resulting high turbidity of surface waters occurs as runoff flows over disturbed agricultural soils, picking up sediments and other small debris which can physically scour the bodies of the macroinvertebrates and smother available habitat and food sources.

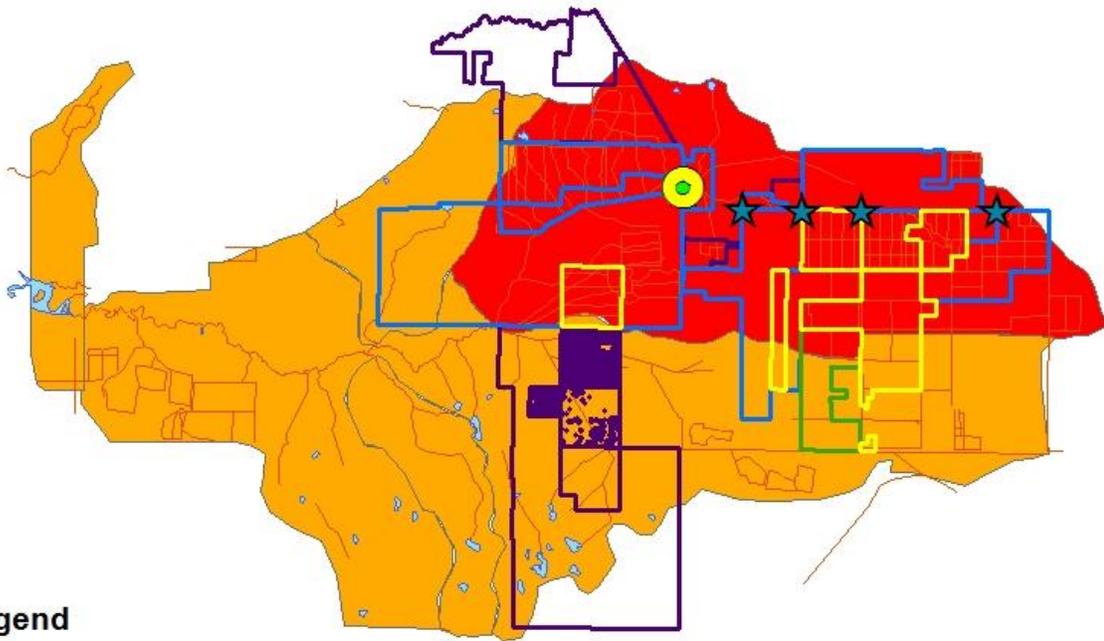
WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

WBID 2040

**Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride**

WBID 2040
 Water Segment - Myrtle Slough
 Shell Creek Watershed; Water Use - Class I
 Verified Impaired Pollutants of Concern - sp. conductance, TDS, chloride



Legend

- Data Sonde Locations
- ★ Reconnaissance Network Locations
- ★ Surface Water Sample Locations
- WBID 2040
- FARMs Projects - Under Construction
- FARMs - Potential Projects
- FARMs Projects - Operational
- FARMs - Dormant Contacts
- Lakes
- Streams and Canals
- Shell Creek Watershed



WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 2040.

District Resource Regulation – Water Use Permitting

In WBID 2040, Twenty six Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the twenty six applications, four were new permits, twelve were renewals, eight were modifications or letter modifications, and two were owner transfers.

WUP Renewals and Modifications in WBID 2040

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	4	0	0
WUP Renewal	1	2	2	7
WUP Modifications	1	1	1	1
WUP Letter Modifications	0	0	1	3
WUP Owner Transfer	0	0	0	2

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Seventeen FARMS projects were Board approved in WBID 2040 between October 2004 and September 2012, two of which have since been cancelled. An additional five potential FARMS projects were under consideration during this time period. The following table summarizes the projects, as well as actual and projected ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

Approved and Potential FARMS Projects in WBID 2040; October 2004-September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset as of September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a WUP #20009687 – H512 (row crop) Phase I	April 2006	662,700	632,159	3,658,739
WUP #20009687 – H512 (row crop) Phase II	October 2009	245,700	401,995	1,130,045
WUP #20009398 - H501 (citrus) Phase I	October 2003	120,700	Reported with Phase III	Reported with Phase III
WUP #20009398 – H501 (citrus) Phase II	August 2005	60,300	Reported with Phase III	Reported with Phase III
WUP #20009398 - H501 (citrus) Phase III	October, 2011	1,000,000	796,654	3,031,226
^a WUP #20010726 – H513 (row crop)	January 2006	106,260	27,100	256,243
WUP #20003530 - H504 (citrus)	December 2003	142,600	171,050	1,548,667
WUP #20001759 – H534 (sod)	August 2008	197,000	216,600	603,667
WUP #20009052 – H539 (citrus)	December, 2007	1,457,400	708,593	3,387,194
WUP #20003275 – H507 (citrus)	Cancelled	Cancelled	N/D	N/D
^a WUP #20009417 -H585 (citrus)	November 2012	80,000	N/D	N/D
WUP #200013096 – H573 (citrus)	June 2010	23,790	0	0
WUP #20002689 – H593 (citrus)	(December 2012)	195,000	N/D	N/D
WUP #20002689 – H593 Amendment (citrus)	(December 2012)	173,685	N/D	N/D
WUP #20002689 – H588 (citrus)	(December 2012)	145,990	N/D	N/D
*WUP #20002588 (sod & row crop)	N/D	N/D	N/D	N/D
*WUP #20002593 – H649 (citrus)	(February 2013)	130,000	N/D	N/D
^a WUP #20003070 – H639 (citrus)	Cancelled	150,000	Cancelled	Cancelled
*WUP #20010959 (cattle)	N/D	N/D	N/D	N/D
*WUP #20006569 (sod)	N/D	N/D	N/D	N/D
*WUP #20007783 (citrus)	N/D	N/D	N/D	N/D
*WUP #20012541 – H550 (sod)	N/D	N/D	N/D	N/D

*Potential project or project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aAlso received EQIP funding

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

Quality of Water Improvement Program (QWIP)

From October 2003 to September 2010, one well has been plugged/abandoned through the QWIP Program in WBID 2040. The well was associated with WUP No. 20009687.05, District Identification number (DID) 3, and had a casing diameter of six inches, a casing depth of 318 feet, and a total depth of 468 feet below land surface. The specific conductance at the time the well had geophysical logging performed on January 11, 2005 was 670 uS/cm. The well was plugged on April 14, 2005.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date no wells in WBID 2040 are monitored as part of the Back-Plug Well Monitoring Network.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There is currently one YSI® 600XLM data sonde deployed in WBID 2040 at station ***Myrtle Slough @ SR 31*** which is located in the northeastern region of the Shell Creek Watershed and provides flows to Shell Creek. This monitoring station was outfitted with satellite telemetry in October 2008. The majority of land use surrounding this monitoring location is agriculture. This location is one of the key surface water monitoring stations in WBID 2040, with data results used by FDEP for TMDL assessments. In contrast to other key monitoring locations in the SPJC, data sonde deployment does not occur year-round at this site due to the potential for flooding and access issues during the wet season.

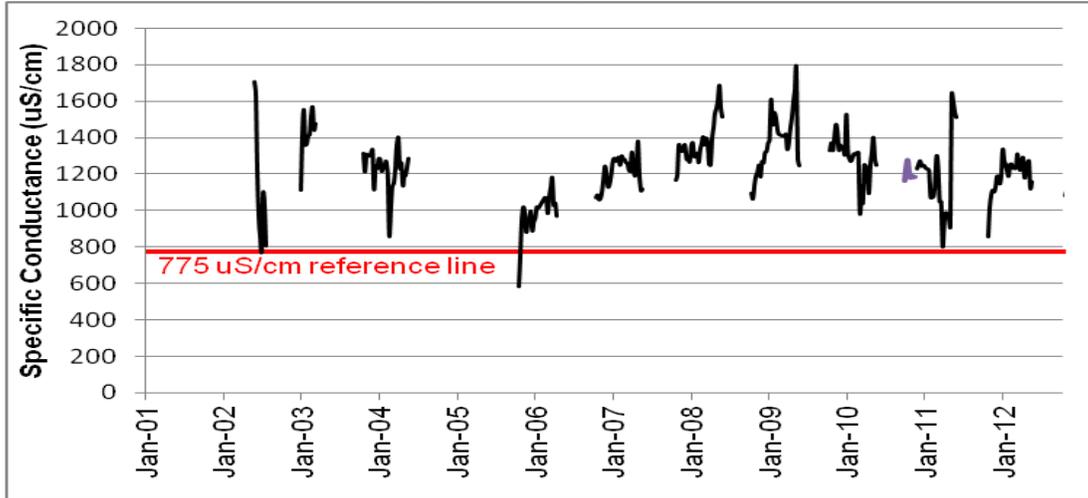
The following data plot shows weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency during dry season periods (November – May) from January 2003 through September 2012. Smothering of the data probe by decaying vegetation caused periodic losses of data at this site during periods of low flow conditions. These erroneous values have been removed from the data set.

Specific conductance at this monitoring location decreased from 2002 to early 2005 time period, trends increased through the 2006-2008 period and shows an overall decreasing trend since 2008.

WBID 2040

Water Segment – Myrtle Slough
 Shell Creek Watershed; Water Use - Class I
 Verified Impaired Pollutants of Concern:
 Sp. Conductance, TDS, Chloride

**Myrtle Slough @ SR 31 In-Situ Data Sonde Logging Results
 Key Monitoring Location**



The following table summarizes logging results at the established data sonde monitoring location in WBID 2040. Individual values, and the percentage of values, exceeding the FDEP surface-water quality Class I criterion of 1275 uS/cm are provided. This table also includes the number of weekly median values above the 775 uS/cm goal criteria.

Specific Conductance Logging Results in WBID 2040 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
**Myrtle Slough @ SR 31	53,178	19,414	37%	297	294	99%

** Key Monitoring Location (Class I)

Specific Conductance Reconnaissance Network (District)

Within WBID 2040 there is one station currently being monitored for the Specific Conductance Reconnaissance Network. Individual values for **Myrtle Slough @ SR 31** will not be explained here since the specific conductance results were discussed earlier in the In-Stream Specific Conductance Logging Network section.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date no wells in WBID 2040 are monitored as part of the Back-Plug Well Monitoring Network.

WBID 2040

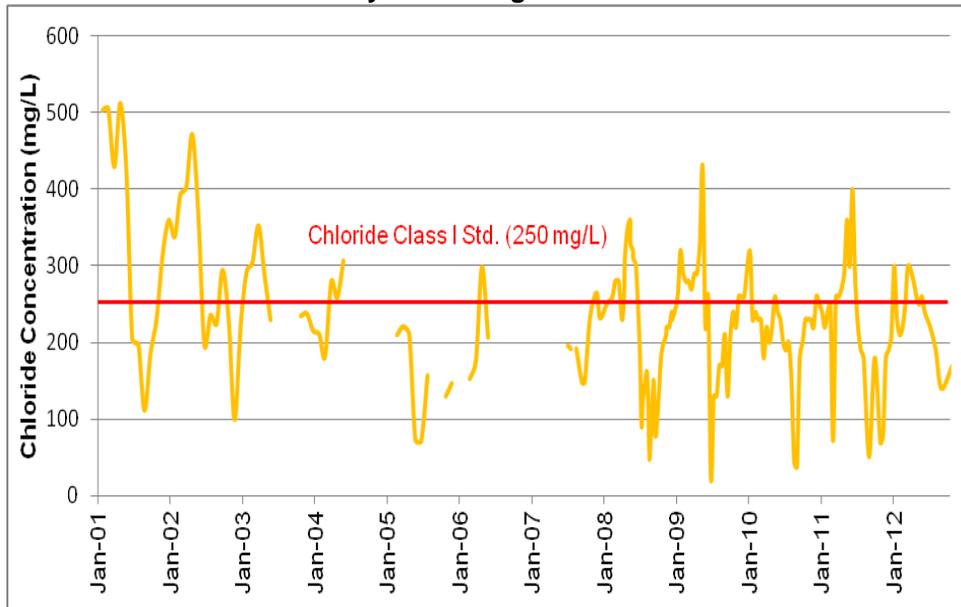
Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

One water quality sample collection site has been established in WBID 2040 at **Myrtle Slough @ SR 31**, which is a key monitoring location. The following graphs represent available water quality results through September 2010 for chloride and TDS concentrations. These data plots were generated using data that were collected by the FDEP-Fort Myers office. The City began collecting water quality samples at this location as a result of deteriorating water quality in the Shell Creek Reservoir during the 2001 drought. This site is not included under the City's WUP monitoring requirements; therefore the period of data record is shorter than some of the monitoring locations in the SPJC. Numerous values for TDS in both of these data sets were reported as calculated rather than derived from laboratory analyses. For comparative purposes, these data plots also contain reference lines depicting FDEP Class I criteria for chloride (250 mg/L) and TDS (500 mg/L as a monthly average, 1000 mg/L as maximum).

Decreasing trends in both chloride and TDS have occurred during the period of data record at the Myrtle Slough monitoring location. Drought impacts are evident by slight increases in both constituents during dry season months, with wet season rainfall events reducing both TDS and chloride concentrations during July and August of 2010 and 2012.

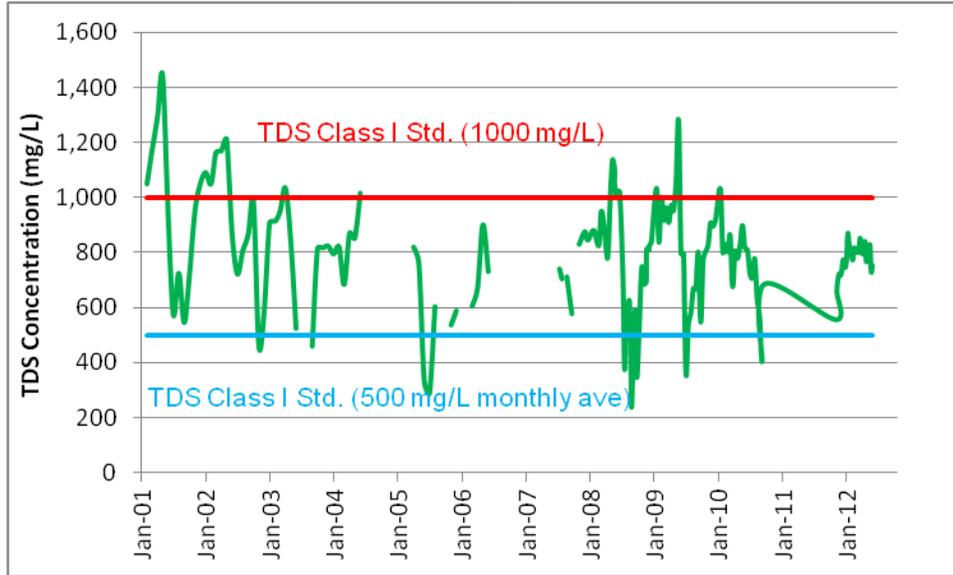
**Myrtle Slough @ SR 31 Water Quality Results for Chloride
Key Monitoring Location**



WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

**Myrtle Slough @ SR 31 Water Quality Results for TDS
Key Monitoring Location**



Chloride and TDS Water Quality Results in WBID 2040 over Entire Period of Data Record

Water Segment	Number Individual Reported CI Values	Number Individual CI Values >250 mg/L	Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
**Myrtle Slough @ SR 31	182	65	35.7%	167	157	94%	21	12.6%

**Key Monitoring Location (Class I)

Habitat Assessment and Stream Condition Index Monitoring (FDEP)

In the summer of 2003 and winter of 2004, biological (macroinvertebrate) samples for SCI analysis were collected at Myrtle Slough @ SR 31. The initial 2004 SCI evaluation of this site was "Excellent."

After the samples were collected and evaluated, a new method of calculating the SCI was developed by FDEP to more accurately reflect the biological condition of streams and effects of development around them. The SCI 2004 methodology ranks streams as Good, Fair, Poor, or Very Poor. Myrtle Slough @ SR 31 was categorized under this new method as "Fair", which indicates a significant change from completely natural conditions, but not a serious degradation of the biological community. Because the SCI_2004 method had not been adopted at the time the samples were collected, the SCI_2004 evaluation is not official, but does provide an additional analysis of the biological condition of the stream system.

WBID 2040

*Water Segment – Myrtle Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride*

Both the old and new SCI evaluations do not indicate that water quality is having a detrimental effect on the biological communities at the Myrtle Slough @ SR 31 site.

During the August 2006 to August 2008 reporting period, no sites in WBID 2040 were evaluated for HAs or SCIs. During the September 2008-September 2010 reporting period, one site in WBID 2040 was evaluated for biological health indicators. No sites were evaluated during the 2010 to 2012 reporting period for HAs or SCIs.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-Stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Myrtle Sough @ SR 31	08/11/2009	40	28	68 Marginal	18 Category 3 ("impaired")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 3 ("impaired") are characterized as having a notable loss of diversity with very tolerant taxa representing a large proportion of the individuals collected.

A definitive link between declines in the number and quality of macroinvertebrates and surface waters with elevated specific conductance values from anthropogenic activities has not been determined. However, it is likely that the impairment of the Myrtle Slough @ SR 31 site for the SCI can be directly linked to secondary factors of anthropogenic activities such as runoff which can lead to sedimentation and turbidity. Sedimentation and the resulting high turbidity of surface waters occurs as runoff flows over disturbed agricultural soils, picking up sediments and other small debris which can physically scour the bodies of the macroinvertebrates and smother available habitat and food sources.

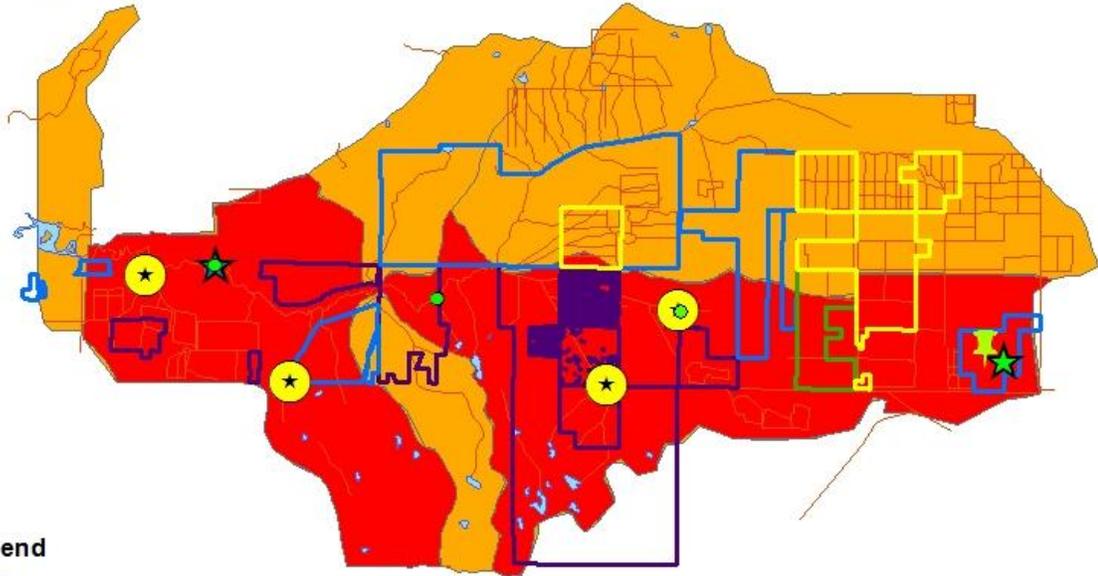
WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

WBID 2041

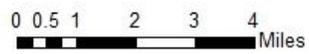
**Water Segment – Shell Creek
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, TDS, Chloride**

WBID 2041
 Water Segment - Shell Creek
 Shell Creek Watershed; Water Use - Class I
 Verified Impaired Pollutants of Concern - sp. conductance, TDS, chloride



Legend

- Backplug locations
- Data Sonde Locations
- Reconnaissance Network Locations
- Surface Water Sample Locations
- Groundwater Sample Location
- WBID 2041
- FARMS Projects - Under Construction
- FARMS - Potential Projects
- FARMS Projects - Operational
- FARMS - Dormant Contacts
- Lakes
- Streams and Canals
- Shell Creek Watershed



WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of the Program, two irrigation wells have been back-plugged in WBID 2041. The following table represents water quality improvements for TDS and chloride concentrations at each well directly following back-plug activities. No additional wells were back-plugged in WBID 2041 for the current report period.

Post Well Back-Plugging Water Quality Results in WBID 2041

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20009648*	1	51%	76%
20009648	2	N/A	N/A

Denotes repeated back-plug
*Only this DID continues to be monitored.

District Resource Regulation – Water Use Permitting

In WBID 2041, twenty-six Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the twenty-six applications six were new permits, fifteen were renewals, and four received letter modifications, and one was a owner transfer (see table below).

WUP Renewals and Modifications in WBID 2041

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	1	4	0	1
WUP Renewals	0	1	5	9
WUP Modifications	0	0	0	0
WUP Letter Modifications	1	1	1	1
WUP Owner Transfer	0	0	0	1

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Sixteen FARMS projects were Board approved between October 2004 and September 2012 in WBID 2041, three of which have since been cancelled. An additional six FARMS projects were under consideration during this time period. The following table summarizes the projects, as well as actual and projected ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

Approved and Potential FARMS Projects in WBID 2041; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset as of September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20009687 - H512 (row crop) Phase I	April 2006	662,700	632,159	3,658,739
WUP #20009687 – H512 (row crop) Phase II	October 2009	245,700	401,995	1,130,045
^a WUP #20009476 – H500 (surface water) (citrus)	August 2003	136,000	178,700	706,259
WUP #20009476 - H548 (citrus) (electronics)	June 2008	27,170	92,500	545,322
WUP #20009476 – H575 (citrus) (Phase II)	Cancelled	Cancelled	Cancelled	Cancelled
WUP #20001759 – H534 (sod)	August 2008	197,000	216,600	603,667
^a WUP #20009648 – H508 (row crop)	May 2006	132,500	239,918	1,310,000
*WUP #20002589	N/D	N/D	N/D	N/D
*WUP #20002689 – H593 (citrus)	(December 2012)	195,000	N/D	N/D
*WUP #20002689 – H593 Amendment (citrus)	(December 2012)	173,685	N/D	N/D
*WUP #20002689 –H588 (citrus)	(December 2012)	145,990	145,990	N/D
^a WUP #20009417 – H585 (citrus)	November 2012	80,000	N/D	N/D
WUP #20009727 – H581 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
WUP #200013096 – H573 (citrus)	June 2010	23,790	0	0
No WUP Assigned – H563 (citrus)	September 2009	55,200	33,551	624,097
*WUP #20002588 (row crop)	N/D	N/D	N/D	N/D
*WUP #200010959 (citrus)	N/D	N/D	N/D	N/D
No WUP Assigned – H629 (citrus)	May 2011	22,500	100,900	108,700
*WUP #20009926 (citrus)	N/D	N/D	N/D	N/D
*WUP #20010874 (citrus)	N/D	N/D	N/D	N/D
*WUP #20009476 – H575 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #2001287(row crops)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aFunding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset

WBID 2041

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride

Quality of Water Improvement Program (QWIP)

No wells have been plugged/abandoned in WBID 2041 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

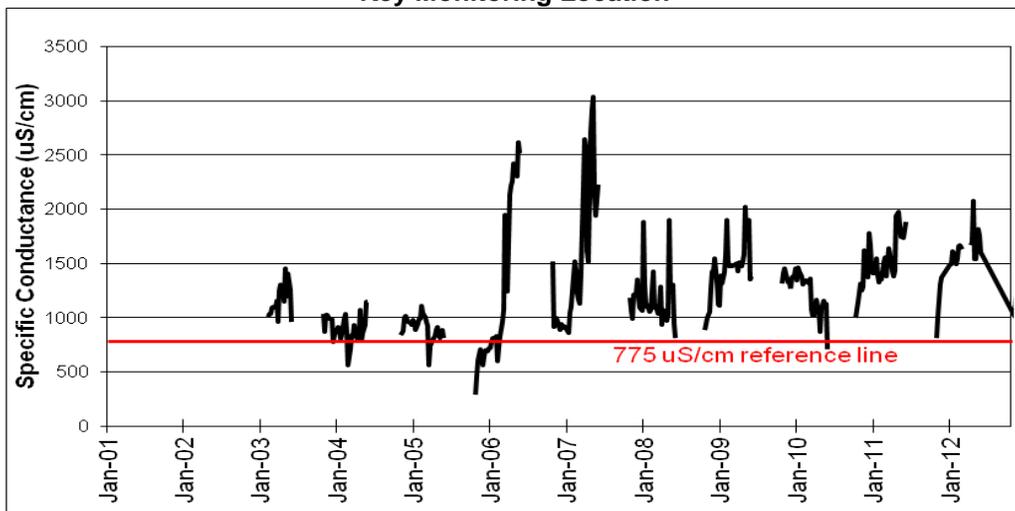
In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are currently three YSI® 600XLM data sondes deployed in WBID 2041. The following data plots reflect weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency.

The **Shell Creek @ SR 31** data sonde is located in the main channel of Shell Creek in the eastern region of WBID 2041, and was upgraded to include satellite telemetry in October 2008. This monitoring location is near the headwaters of Shell Creek, and is a key surface water monitoring station with data results used by FDEP for TMDL assessments. In contrast to other key monitoring locations in the SPJC, data sonde deployment does not occur year-round at this site due to flooding issues during the wet season. Land uses contributing to this canal include agriculture (citrus), rangeland, wetlands, and upland forested areas. The following data plot shows continuous/hourly logging of specific conductance values for dry season periods (November – May) for February 2003 through September 2012. Low water level conditions and smothering of the data probe by sediment and vegetation have resulted in some missing values for this monitoring location. These erroneous values have been removed from the data set.

Specific conductance values increased during the dry season months of 2005-2007 which in part can be attributed to below average rainfall during this time period. Dry season values decreased significantly in late 2007 to early 2008 and remained in the 1,000 to 1,500 uS/cm range. Values during the current (2010-2012) reporting period have increased slightly and remain in the 1,500 uS/cm to 2,000 uS/cm range.

**Shell Creek @ SR 31 In-Situ Data Sonde Logging Results
Key Monitoring Location**

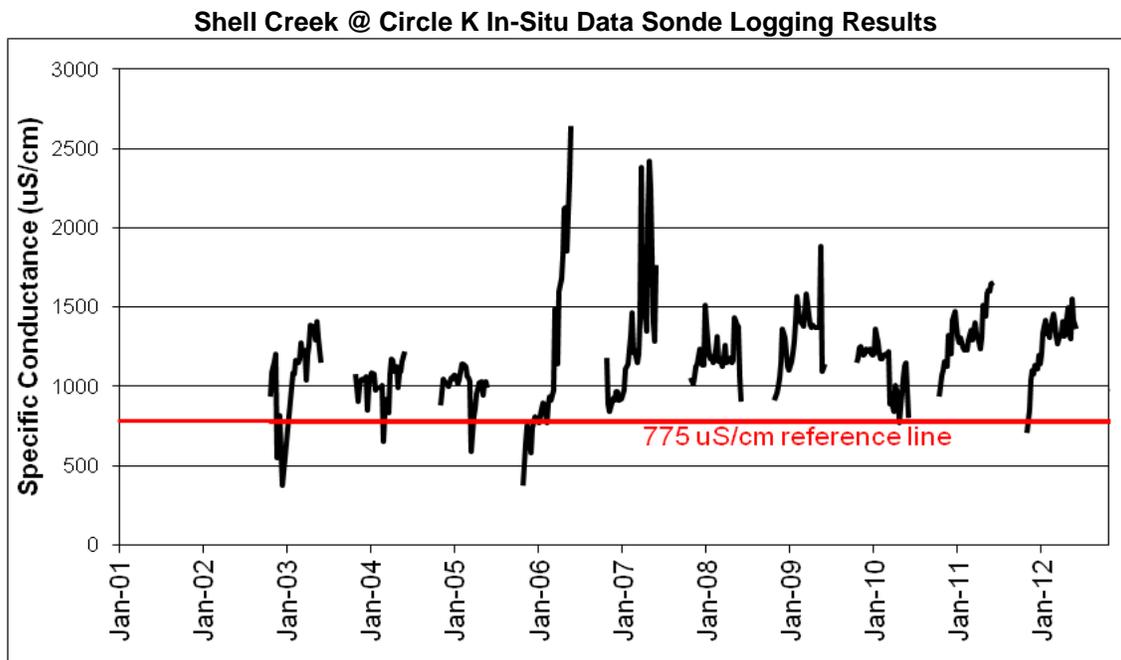


WBID 2041

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride

The **Shell Creek @ Circle K** data sonde is located in the main channel of Shell Creek in the central region of WBID 2041. Satellite telemetry was added to this monitoring location in October 2009. Land use contributing to this canal is predominantly agriculture (citrus). The following data plot shows continuous/hourly logging of specific conductance values for dry season periods (November – May) for October 2002 through May 2012.

Specific conductance values increased during the dry season months of 2005-2009 due to below average rainfall during this time period but show improvement during the 2010 dry period. The current reporting period is similar to the 2008-2009 time period with seasonal fluctuations related to rainfall.



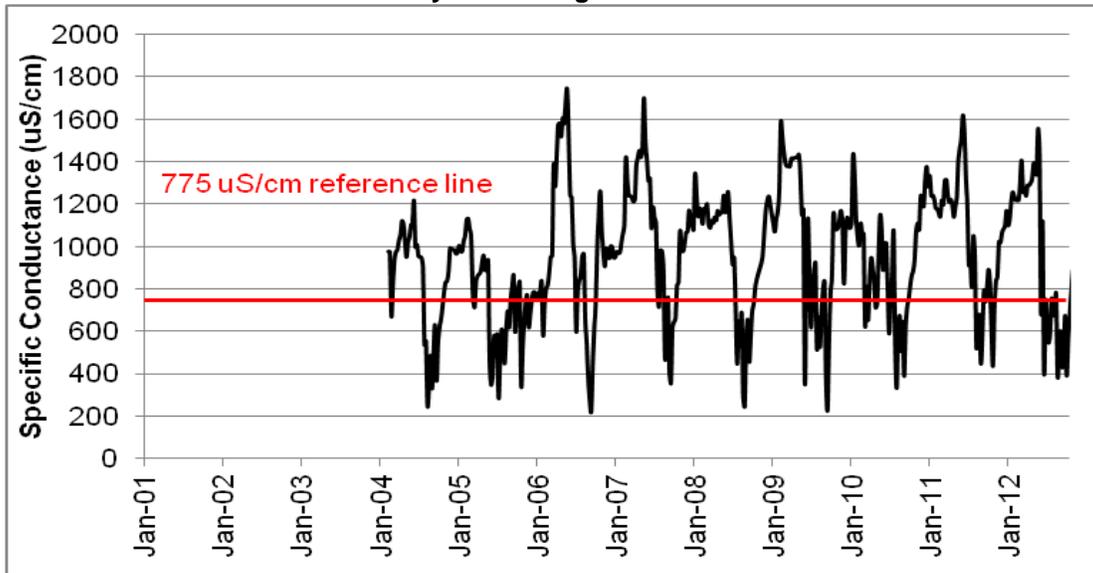
WBID 2041

*Water Segment – Shell Creek Reservoir
 Shell Creek Watershed: Water Use - Class I
 Verified Impaired Pollutants of Concern:
 Sp. Conductance, Chloride*

The **Shell Creek @ Washington Loop Road** data sonde is located on the main channel of Shell Creek in the southern region of the Shell Creek watershed, just upstream of the Shell Creek Reservoir. Land use in the immediate surrounding area is urban/built up and agriculture. This location is one of the key surface water monitoring stations in WBID 2041, with data results used by FDEP for TMDL assessments. For this reason, data sonde deployment occurs year-round at this site under contract with the USGS. The following data plot shows continuous/hourly logging of specific conductance for weekly median values throughout each year for July 2002 through September 2012.

Below average rainfall amounts during the spring and summer months of 2006, and the impacts on smaller tributaries and canals that provide flow to this location, have resulted in increased trends in weekly median specific conductance values for the 2002-2007 time period. Trends for the current reporting period are similar to previous reporting periods with increasing weekly median values.

**Shell Creek @ Washington Loop Rd. In-Situ Data Sonde Logging Results
 Key Monitoring Location**



**Specific Conductance Logging Results in WBID 2041 over Entire Period of Data Record
 Sites are listed as they are located from east to west throughout WBID 2041**

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
**Shell Creek @ SR 31	51,880	19,399	37.4%	291	273	93.8%
Shell Creek @ Circle K	50,222	14,101	27.2%	312	296	94.9%
**Shell Creek @ Washington Loop	310,331	43,818	14.1%	463	338	73%

**Key Monitoring Location (Class I)

WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

Specific Conductance Reconnaissance Network (District)

Within WBID 2041 there are currently four stations monitored for the Specific Conductance Reconnaissance Network. Individual values for the Shell Creek @ SR 31 station are not presented here since they were discussed previously in the In-Stream Specific Conductance Logging Network section. Of the thirty-one individual specific conductance values collected within WBID 2041 during the period of record, eight values exceeded the 775 uS/cm goal criteria and five values exceeded the FDEP surface-water quality Class I criterion of 1275 uS/cm.

The following table summarizes the percent change increases and/or decreases between dry season events for each monitoring station within WBID 2041 during the 2004-2006, 2006-2008, 2008-2010, and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted as dry in the table. Overall, dry season percent changes for the 2010-2012 reporting period were either decreasing or not calculated due to dry stations in 2008.

Specific Conductance Reconnaissance Results in WBID 2041; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Unnamed Cr. @ Washington Lp Rd – #28	1708	467	1559	959	1415	↓8.72%**	↓9.24%**
Unnamed Cr. @ CR 74 - #26	392	63	299	*	*	↓23.72%**	*
Unnamed Cr. @ CR 74 - #25	*	164	331	84	*	*	*

* Station dry

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 2041; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Unnamed Cr. @ Washington Lp Rd – #28	500	1252	673	*	155	↓11.52%	*
Unnamed Cr. @ CR 74 - #26	38	*	33	*	33	*	*
Unnamed Cr. @ CR 74 - #25	130	*	166	*	163	*	*

* Station dry

WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

Specific Conductance Reconnaissance Results in WBID 2041; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Unnamed Cr. @ Washington Lp Rd – #28	1637	586	1269	1337	*	↓22.5%
Unnamed Cr. @ CR 74 - #26	216	39	175	*	*	↓19.0%
Unnamed Cr. @ CR 74 - #25	*	77	153	403	*	*

* Station dry

Specific Conductance Reconnaissance Results in WBID 2041; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2011 vs. Dry Season 2012
Unnamed Cr. @ Washington Lp Rd – #28	*	1610	1681	1358	*	*
Unnamed Cr. @ CR 74 - #26	*	73	*	72	*	*
Unnamed Cr. @ CR 74 - #25	*	96	*	128	*	*

* Station dry

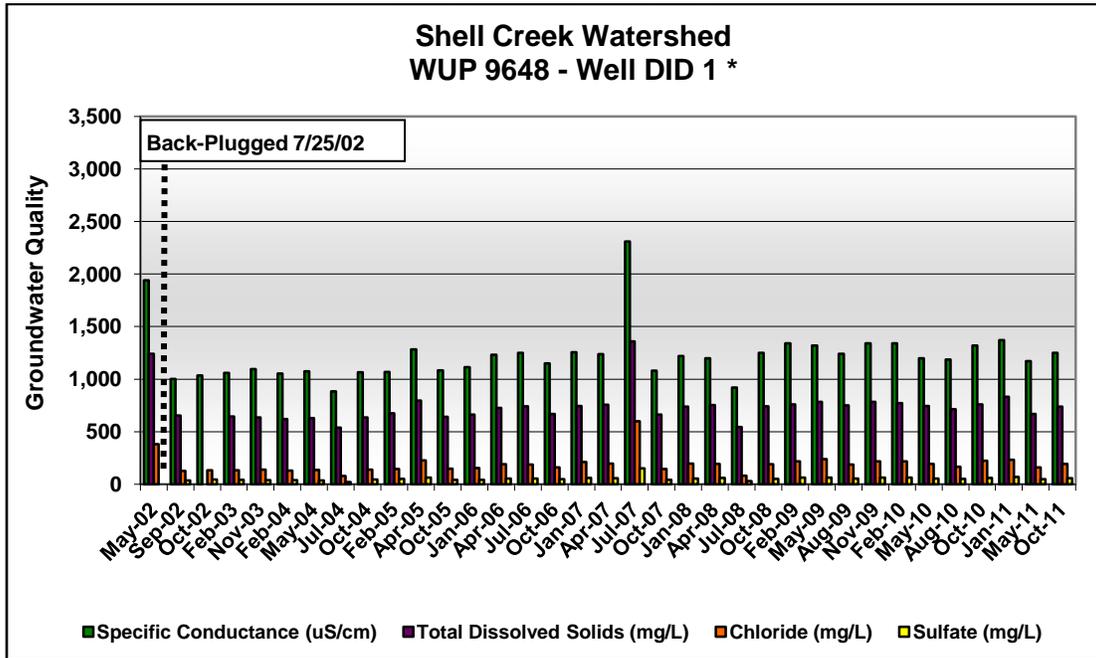
Pre- and Post Back-Plug Well Monitoring Network (District)

There is one back-plugged well in WBID 2041 that is sampled on a quarterly frequency to monitor long-term improvements in water quality, and to also ensure that the back-plugs have remained functional. Monitoring results in July 2007 indicated an increase in mineralized parameters, therefore a repeat back-plug of this well was performed on August 27, 2007. The following graph represents water quality results throughout the period of data record for this well showing both pre- and post back-plug values for specific conductance, sulfate, chloride, and TDS. Following the second back-plug, this well has retained the integrity of the post back-plug concentrations.

WBID 2041

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride

WUP 20009648 - DID No. 1



*2012 sampling was not completed during this reporting period due to access issues

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

The following graphs represent available water quality results through September 2011 for chloride and TDS concentrations at key Class I monitoring stations; Shell Creek @ Washington Loop Rd. and Shell Creek @ SR 31 in WBID 2041. The data plots for station Shell Creek @ Washington Loop Rd. were generated using historical data from the City of Punta Gorda, as well as data collected by the City since 1991 under the City's WUP requirements. Data were also used for the 2002 through 2010 time frame from monitoring efforts conducted by the FDEP-Fort Myers office.

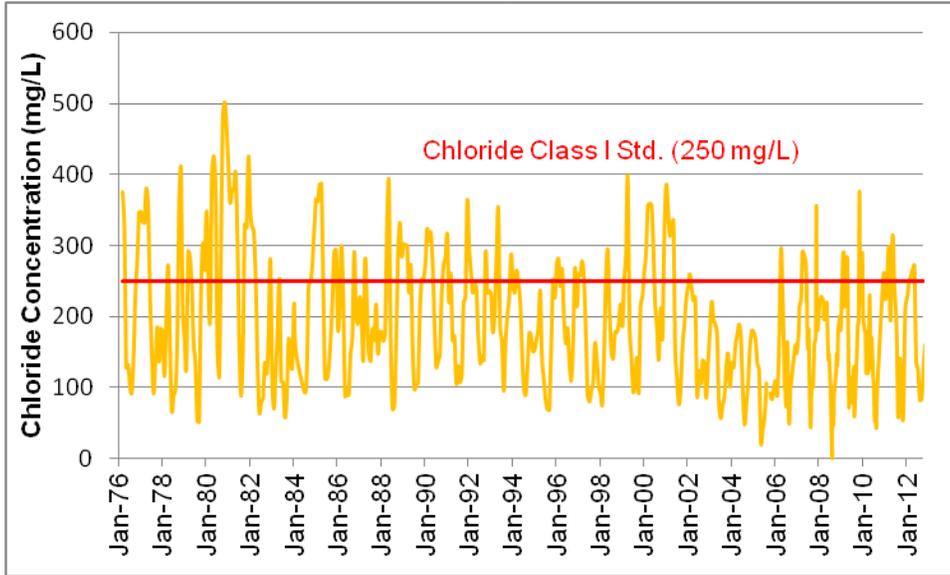
Numerous values for TDS in both of these data sets were reported as calculated rather than derived from laboratory analyses. For comparative purposes these data plots also contain reference lines depicting FDEP Class I criteria for chloride (250 mg/L) and TDS (500 mg/L as a monthly average, 1000 mg/L as maximum).

The City also began collecting water quality samples at the Shell Creek @ SR 31 location as a result of deteriorating water quality in the Shell Creek Reservoir during the 2001 drought. This site is not included under the City's WUP monitoring requirements; therefore the period of data record is shorter than some of the monitoring locations in the SPJC. Overall decreasing trends for both chloride and TDS have occurred at both monitoring stations in WBID 2041, with increasing trends evident during 2006-2009 as a result of drought impacts. The current reporting period shows an overall decrease in the duration of exceedances for both chloride and TDS, even during continued dry conditions.

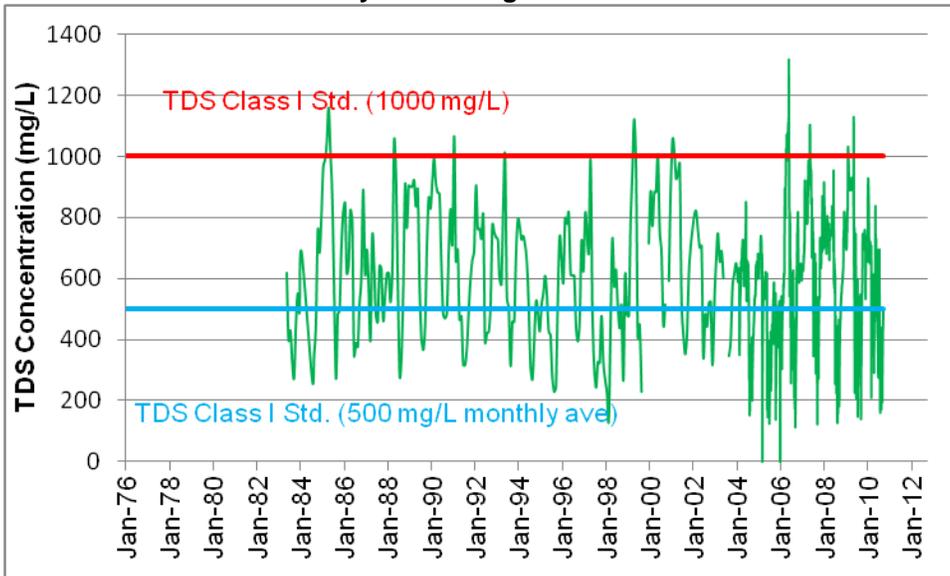
WBID 2041

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride

**Shell Cr. @ Washington Loop Rd. Water Quality Results for Chloride
Key Monitoring Location**



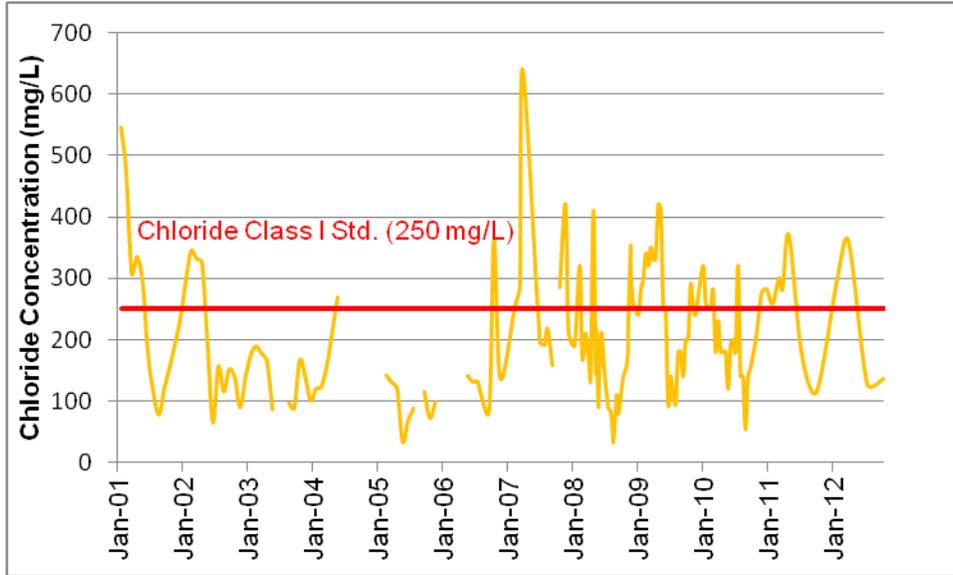
**Shell Cr. @ Washington Loop Rd. Water Quality Results for TDS
Key Monitoring Location**



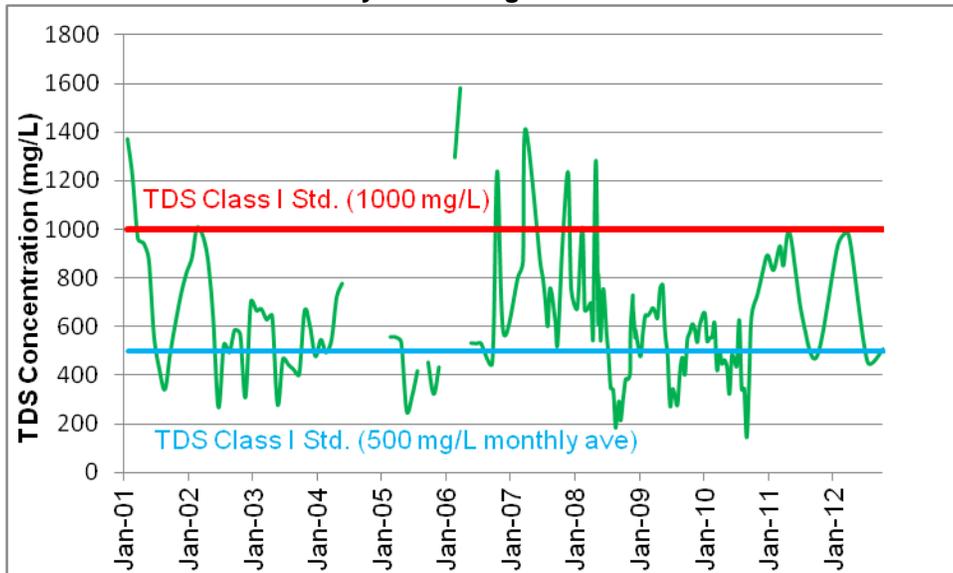
WBID 2041

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride

**Shell Cr. @ SR 31 Water Quality Results for Chloride
Key Monitoring Location**



**Shell Cr. @ SR 31 Water Quality Results for TDS
Key Monitoring Location**



WBID 2041

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern:
Sp. Conductance, Chloride*

Chloride and TDS Water Quality Results in WBID 2041 over Entire Period of Data Record

Water Segment	Number Individual Reported CI Values	Number Individual CI Values >250 mg/L	Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
**Shell Cr. @ Washington Loop Rd.	497	124	25.0%	2953	2184	74%	90	3.0%
**Shell Cr. @ SR 31	144	39	27.1%	148	113	76.4%	18	12.2%

**Key Monitoring Location (Class I)

Habitat Assessment and Stream Condition Index Monitoring (FDEP)

In the summer of 2003 and winter of 2004, biological (macroinvertebrate) samples for SCI analysis were collected at Shell Creek @ Circle K. The initial 2004 SCI evaluation of this site was "Excellent."

After the samples were collected and evaluated, a new method of calculating the SCI was developed by FDEP to more accurately reflect the biological condition of streams and effects of development around them. The SCI 2004 methodology ranks streams as Good, Fair, Poor, or Very Poor. The Shell Creek @ Circle K site was categorized under this new method as "Fair", which indicates a significant change from completely natural conditions, but not a serious degradation of the biological community. Because the SCI_2004 method had not been adopted at the time the samples were collected, the SCI_2004 evaluation is not official, but does provide an additional analysis of the biological condition of the stream system. Both the old and new SCI evaluations do not indicate that water quality is having a detrimental effect on the biological communities at the Shell Creek @ Circle K site.

During the August 2006 to August 2008 reporting period, no sites in WBID 2041 were evaluated for biological health indicators. Two sites were evaluated for HAs and SCIs during the September 2008 to September 2010 time period. No site were evaluated Has or SCIs during the 2010 to 2012 reporting period. The results of the assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-Stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Shell Cr. @ SR 31	06/15/2010	51	63	114 Suboptimal	36 Category 2 ("healthy")
Shell Creek @ Circle K	06/16/2010	55	68	123 Optimal	49 Category 2 ("healthy")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. The 2010 biological health assessments indicate that water quality is not having a detrimental effect on the biological communities of the Shell Creek @ SR 31 and Shell Creek @ Circle K sites.

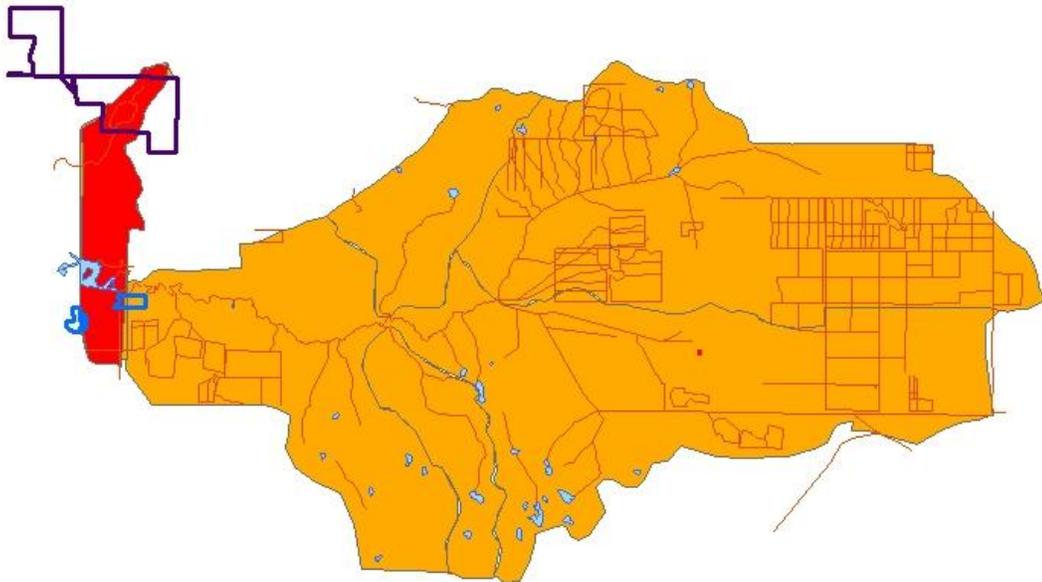
WBID 2041B

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – none*

WBID 2041B

**Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None**

WBID 2041B
Water Segment - Shell Creek Reservoir
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern - None



Legend

-  WBID 2041B
-  FARMs - Potential Projects
-  FARMs Projects - Operational
-  FARMs - Dormant Contacts
-  Lakes
-  Streams and Canals
-  Shell Creek Watershed



WBID 2041B

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – none

Proposed Management Actions- Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date, no irrigation wells have been back-plugged in WBID 2041B.

District Resource Regulation – Water Use Permitting

In WBID 2041B, four Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). One application was a renewal, two were new WUP's and one was a letter modification.

WUP Renewals and Modifications in WBID 2041B

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Oct. 2012
New WUPs	0	0	0	1
WUP Renewals	0	1	1	0
WUP Modifications	0	0	0	0
WUP Letter Modifications	0	0	0	1
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Two FARMS projects have been Board approved in WBID 2041B between October 2004 and September 2012. An additional two FARMS projects were considered for potential projects during this time period. The following table summarizes this project. Details for this project can be found in Appendix IV.

Approved and Potential FARMS Projects in WBID 2041B; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a No WUP Assigned – H563 (citrus)	September 2009	55,200	33,551	624,097
No WUP Assigned – H629 (citrus)	May 2011	22,500	100,900	124,100
*WUP #20004589 – H617 (sod)	Cancelled	Cancelled	Cancelled	Cancelled
WUP #20020285	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aFunding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset

WBID 2041B

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – none*

Quality of Water Improvement Program (QWIP)

No wells have been plugged/abandoned in WBID 2041B since October 2004.

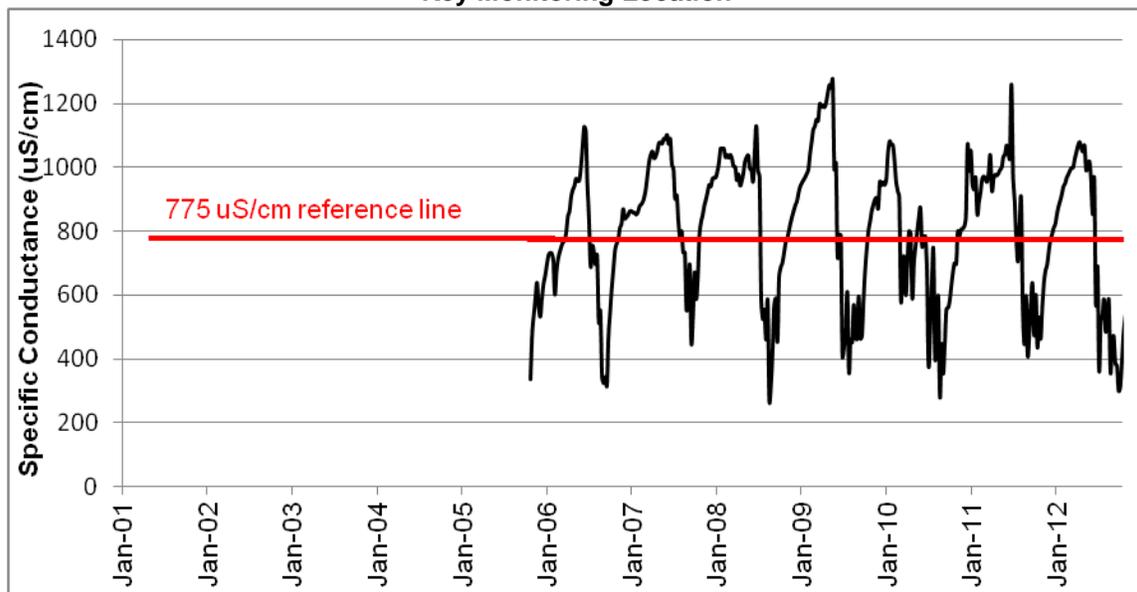
SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There is currently one YSI® 600XLM data sonde deployed in WBID 2041B at the **Shell Creek Reservoir**. This Reservoir is the City of Punta Gorda's in-stream, potable water supply source and is located in the southwestern region of the Shell Creek Watershed. This location is also one of the key surface water monitoring stations with data sonde deployment occurring year-round under contract with the USGS. This WBID is not listed as having TMDL verified water quality impairments for TDS, chloride, or specific conductance. Land uses immediately surrounding the Reservoir include agriculture, urban/built-up, and upland forests.

The following data plots reflect weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency from December 2003 through September 2012. Specific conductance values increased during the dry season months of 2005-2009 due to below average rainfall during these time periods, while the current reporting period showed similar trends during the dry season.

**Shell Creek Reservoir In-Situ Data Sonde Logging Results
Key Monitoring Location**



Specific Conductance Logging Results in WBID 2041B over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
**Shell Cr. Reservoir	241,626	433	0.1%	404	235	58%

**Key Monitoring Location

WBID 2041B

Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – none

Specific Conductance Reconnaissance Network (District)

Within WBID 2041B there are no stations currently being monitored for the Specific Conductance Reconnaissance Network.

Pre- and Post Back-Plug Well Monitoring Network (District)

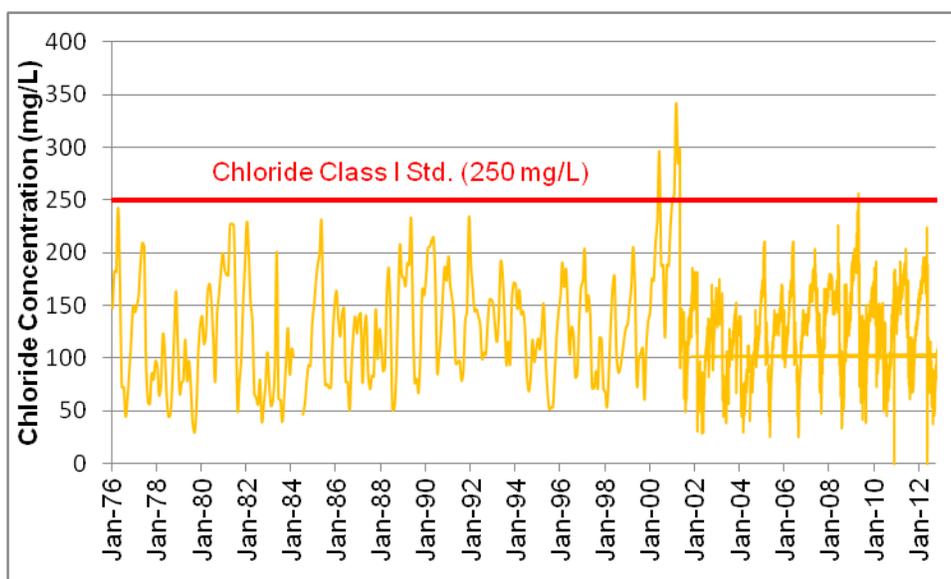
To date no wells in WBID 2041B are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

The following graphs represent water quality results through September 2011 for chloride and TDS concentrations at the Shell Creek Reservoir (WBID 2041B). These data plots were generated using historical data from the City of Punta Gorda, as well as data collected by the City since 1991 under the City's WUP requirements. Numerous values for TDS in the comprehensive data set were reported as calculated rather than derived from laboratory analyses. Data were also used for the 2002 through 2006 time frame from monitoring efforts conducted by the FDEP-Fort Myers office. For comparative purpose, these data plots also contain reference lines depicting FDEP Class I criteria for chloride (250 mg/L) and TDS (500 mg/L as a monthly average, 1000 mg/L as maximum).

Chloride and TDS concentrations remain relatively consistent throughout the period of data record at the Shell Creek Reservoir, with drought impacts evident during 2000-2001 when chloride and TDS were at their highest levels. Even though rainfall totals during 2006-2012 were less than 2000-2001 totals, management actions within the Shell Creek watershed have assisted with keeping values below the drinking water standard for chloride (with the exception of one value), and below the TDS drinking water standard of 1000 mg/L.

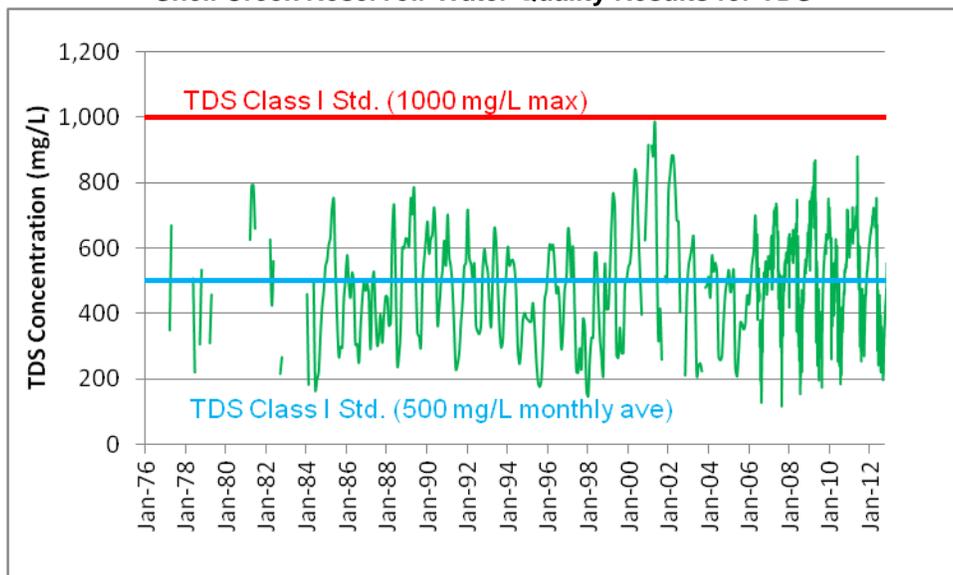
Shell Creek Reservoir Water Quality Results for Chloride



WBID 2041B

*Water Segment – Shell Creek Reservoir
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – none*

Shell Creek Reservoir Water Quality Results for TDS



Chloride and TDS Water Quality Results in WBID 2041B over Entire Period of Data Record

Water Segment	Number Individual Reported CI Values	Number Individual CI Values >250 mg/L	Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
**Shell Cr. Reservoir	4503	10	0.22%	2700	1571	58%	0	0.0

**Key Monitoring Location (Class I)

Habitat Assessment and Stream Condition Index Monitoring (FDEP)

There have been no sites in WBID 2041B evaluated for HAs or SCIs during the October 2004 to September 2012 time period.

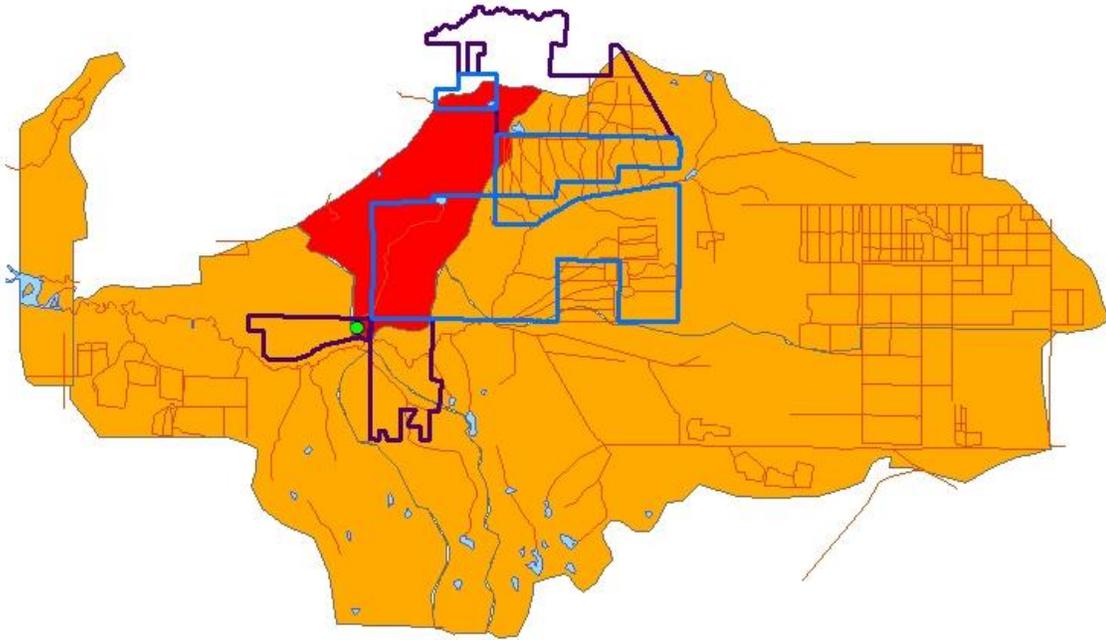
WBID 2044

*Water Segment – Cypress Slough
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None*

WBID 2044

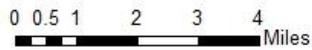
**Water Segment – Cypress Slough
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None**

WBID 2044
Water Segment - Cypress Slough
Shell Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern - None



Legend

-  Data Sonde Locations
-  WBID 2044
-  FARMS Projects - Operational
-  FARMS - Dormant Contacts
-  Lakes
-  Streams and Canals
-  Shell Creek Watershed



WBID 2044

*Water Segment – Cypress Slough
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None*

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date, no irrigation wells have been back-plugged in WBID 2044.

District Resource Regulation – Water Use Permitting

Four WUP applications were submitted to the District in WBID 2044 during the reporting period of October 2004 to September 2012. Two of these applications were renewals, one was a letter modification and one was an ownership transfer.

WUP Renewals and Modifications in WBID 2044

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	0	0	2	0
WUP Modifications	0	0	0	0
WUP Letter Modifications	0	0	0	1
WUP Owner Transfer	0	0	0	1

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Seven FARMS projects were Board approved in WBID 2044 between October 2004 and September 2012, two of which have since been cancelled. One additional project was under consideration during this time period. The following table summarizes the projects, including actual and projected ground water offsets that have occurred during the monitoring period. Details for each of the below listed projects can be found in Appendix IV.

Approved and Potential FARMS Projects in WBID 2044; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20009398 - H501 (citrus) Phase I	October 2003	120,700	Reported with Phase III	Reported with Phase III
WUP #20009398 – H501 (citrus) Phase II	August 2005	60,300	Reported with Phase III	Reported with Phase III
WUP #20009398 – H501 (citrus) Phase III	October, 2011	1,000,000	796,654	3,031,226
WUP #20001759 – H534 (sod)	August 2008	197,000	216,600	603,667
*WUP #20003275 – H507 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20009727 – H581 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
WUP #20011982 – H610 (sod)	March 2012	107,280	209,600	326,155
*WUP #20009926 (citrus)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

WBID 2044

Water Segment – Cypress Slough
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 2044 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

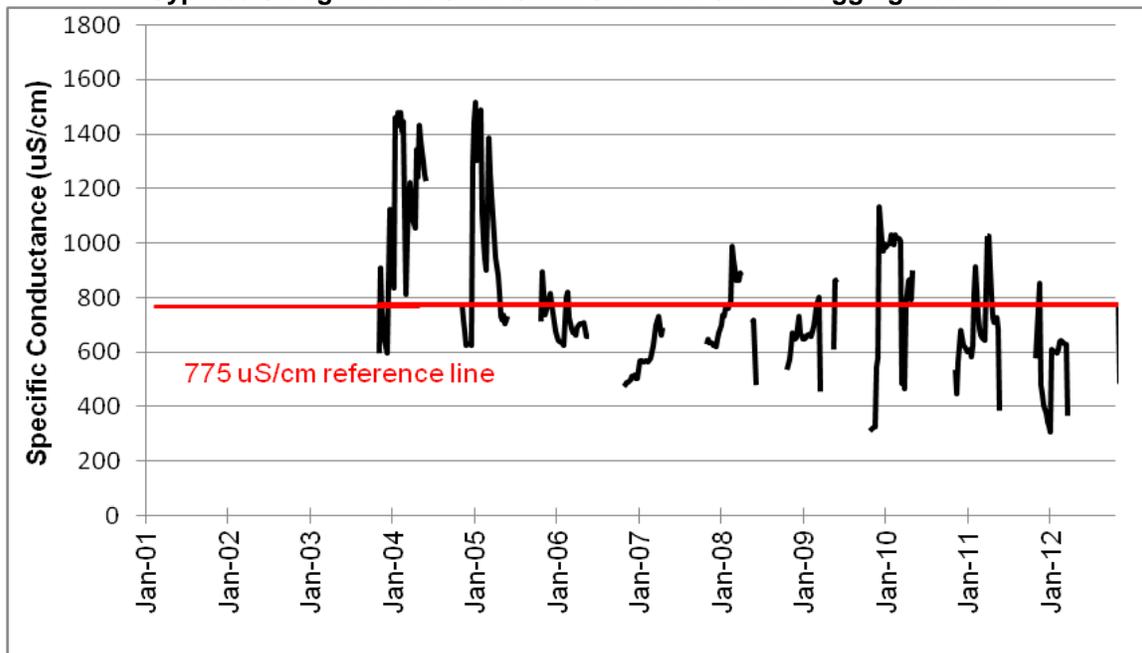
In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There is currently one YSI® 600XLM data sonde deployed at station **Cypress Slough above Shell Creek**, and this monitoring station was upgraded with satellite telemetry in October 2009. This slough is located in the central region of the Shell Creek Watershed and provides flows to Shell Creek. The majority of land use surrounding this monitoring location is agriculture.

The following data plot shows weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency during dry season periods (November – May) from November 2003 through September 2012. Infrequent smothering of the data probe by sediment has caused some loss of data at this site during periods of low flow conditions. These erroneous values have been removed from the data set.

Notable decreases in weekly median specific conductance values have occurred during the dry season months of 2005-2012 when compared to the 2003-2005 time period, with only 9 percent of the values exceeding the Class III criteria for specific conductance (1275 uS/cm) since 2004-2005.

Cypress Slough above Shell Cr. In-Situ Data Sonde Logging Results



WBID 2044

*Water Segment – Cypress Slough
Shell Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None*

Specific Conductance Logging Results in WBID 2044 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Cypress Slough above Shell Cr.	42,589	3,817	9%	240	81	33.8%

Specific Conductance Reconnaissance Network (District)

Within WBID 2044 there are no stations currently being monitored for the Specific Conductance Reconnaissance Network.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 2044 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 2044 at this time.

Habitat Assessment and Stream Condition Index Monitoring

There have been no sites assessed for HAs or SCIs in WBID 2044 throughout the October 2004 to September 2012 reporting periods.

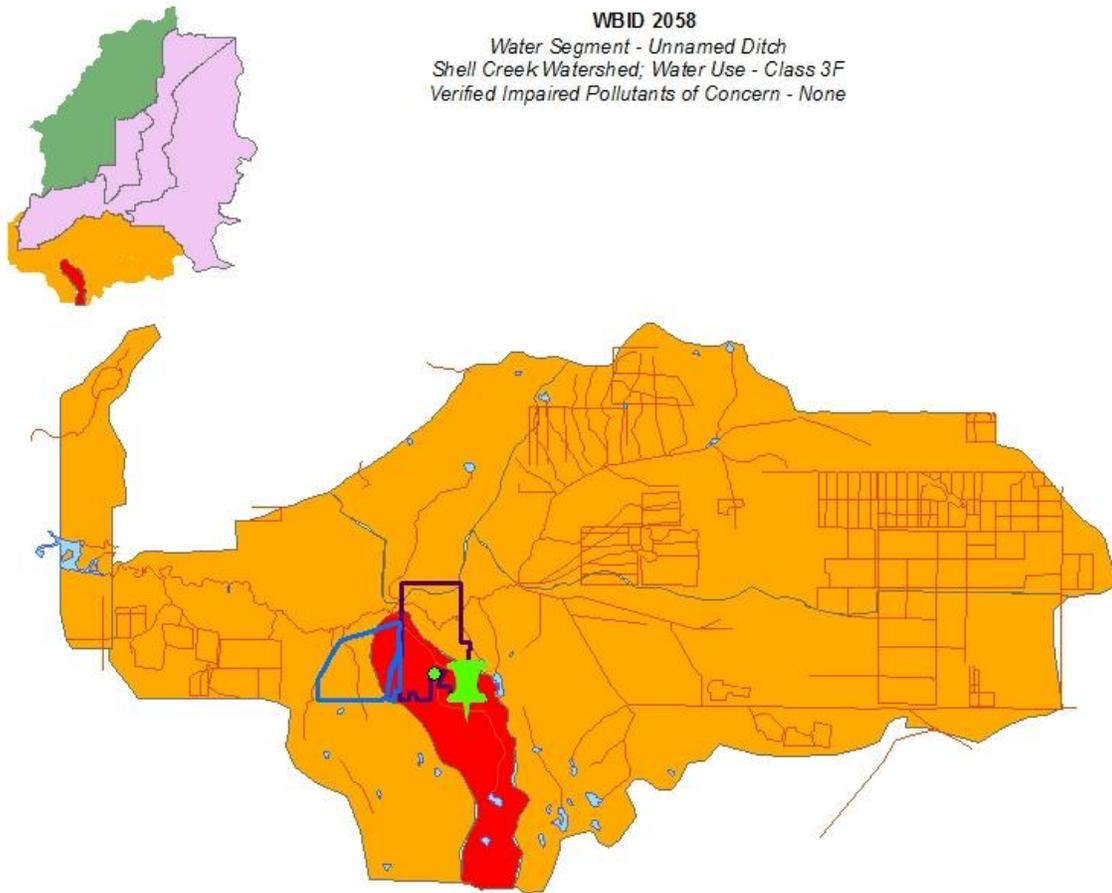
WBID 2058

*Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

WBID 2058

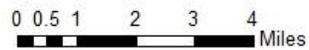
**Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**

WBID 2058
Water Segment - Unnamed Ditch
Shell Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  Backplug locations
-  Data Sonde Location
-  WBID 2058
-  FARMs Projects - Operational
-  FARMs - Dormant Contacts
-  Lakes
-  Streams and Canals
-  Shell Creek Watershed



WBID 2058

*Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Two wells were back-plugged in WBID 2058 during the current report. The following table represents water quality improvements for TDS and chloride concentrations at the well directly following back-plug activities.

Pre- and Post Well Back-Plugging Results in WBID 1964

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20009926	1	1%	-1%
20009926	5	40%	38%

District Resource Regulation – Water Use Permitting

Four Water Use Permit (WUP) applications were submitted to the District for this WBID over the entire reporting period of performance monitoring (October 2004 to September 2012). All four applications were for WUP renewals.

WUP Renewals and Modifications in WBID 2058

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	0	1	1	2
WUP Modifications	0	0	0	0
WUP Letter Modifications	0	0	0	0
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Three FARMS projects were Board approved in WBID 2058 between October 2004 and September 2012, one of which has since been cancelled. An additional potential project was also considered during this time period. The following table summarizes the projects, as well as actual and projected ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

Approved and Potential FARMS Projects in WBID 2058; October 2004 through September 2010

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a WUP #20009476 – H500 (surface water) (citrus)	August 2003	136,000	178,700	702,259
WUP #20009476 – H548 (citrus) (electronics)	June 2008	27,170	92,500	1,176,019
WUP #20009476 – H575 (citrus)(Phase II)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20009926	N/D	N/D	N/D	N/D

^aPotential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

³Funding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

WBID 2058

*Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 2058 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

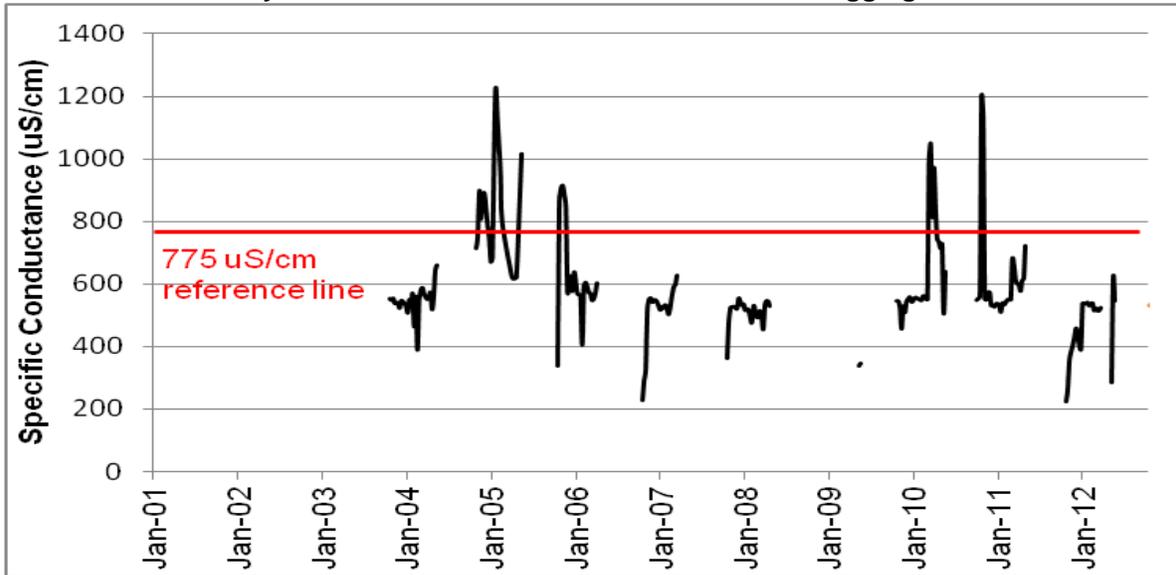
In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There is currently one YSI® 600XLM data sonde deployed in WBID 2058 at station **Tributary from Cecil Webb Lake**. This site is located in the central region of the Shell Creek Watershed, and flows from this small tributary enter Shell Creek. The major contributing land uses surrounding this water body are rangelands and upland forests, and the majority of flow contributing to this tributary originates from a small lake.

The following data plot shows weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency during dry season periods (November – May) from November 2003 through September 2012. The tributary went dry at the beginning of April 2006; therefore, no data are available for the months of April and May 2006.

Increases in weekly median values for specific conductance during the November 2004 through May 2005 time frame occurred because the lake that is the headwaters of this tributary was being augmented by a Floridan aquifer well with elevated concentrations of mineralized ground water. Regulatory actions undertaken in the summer of 2005 have resulted in decreasing conductance concentration values through January 2012. Dry season values in 2010 and 2011 exceeded the 775mg/L threshold for the first time in four years, but decreased during 2012.

Tributary from Cecil Webb Lake In-Situ Data Sonde Logging Results



WBID 2058

*Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

Specific Conductance Logging Results in WBID 2058 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Tributary from Cecil Webb Lake	40,372	118	0.3%	225	25	11.1%

Specific Conductance Reconnaissance Network (District)

Within WBID 2058 there is one station currently being monitored for the Specific Conductance Reconnaissance Network. Of the ten individual specific conductance values collected within WBID 2058 during the period of record, no values exceeded either the 775 uS/cm goal criteria or the FDEP surface-water quality Class I criterion of 1275 uS/cm. The following tables summarize the percent change increases and/or decreases between dry season events for this monitoring station within WBID 2058 during the 2004 to 2006, 2006 to 2008, 2008 to 2010, and 2010 to 2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted in the following table as dry.

Overall, dry season percent changes for the 2008-2010 reporting period were either decreasing or not calculated due to dry stations in 2008.

Specific Conductance Reconnaissance Results in WBID 2058; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Trib. From Cecil Webb	*	420	691	568	*	*	*

* Station dry

Specific Conductance Reconnaissance Results in WBID 2058; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Trib. From Cecil Webb	213	*	171	*	233	*	*

* Station dry

Specific Conductance Reconnaissance Results in WBID 2058; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Trib. From Cecil Webb	563	233	507	264	*	↓9.9%

* Station dry

WBID 2058

*Water Segment – Unnamed Ditch
Shell Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

Specific Conductance Reconnaissance Results in WBID 2058; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2011 vs. Dry Season 2012
Trib. From Cecil Webb	*	315	393	237	*	*

* Station dry

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 2058 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 2058 at this time.

Habitat Assessment and Stream Condition Index Monitoring

During the October 2004 to August 2008 reporting periods, no sites in WBID 2058 were evaluated for biological health indicators. One site was evaluated for HAs and SCIs during the September 2008 to September 2012 time period. No sites were evaluated for HAs or SCIs during the 2010 to 2012 reporting period. The results of this assessment are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-Stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Trib. From Cecil Webb	06/16/2010	46	64	110 Suboptimal	62 Category 2 ("healthy")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. This assessment indicates that water quality is not having a detrimental effect on biological communities at the Tributary from Cecil Webb station.

WBID 1964

Water Segment – Cow Slough

Prairie Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

WBID 1964

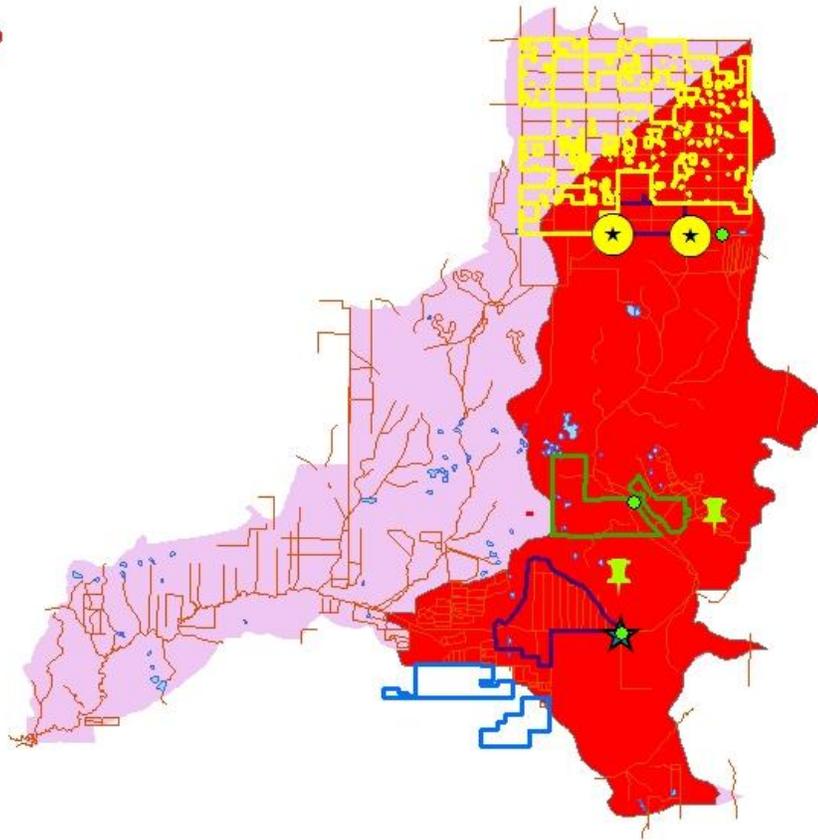
Water Segment – Cow Slough

Prairie Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

WBID 1964

*Water Segement - Cow Slough
Prairie Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None*



Legend

-  Data Sonde Locations
-  Reconnaissance Network Locations
-  Surface Water Sample Location
-  Backplug Locations
-  WBID 1964
-  FARMs Projects - Under Construction
-  FARMs - Potential Projects
-  FARMs Projects - Operational
-  FARMs - Dormant Contacts
-  FARMs Projects - Board Approval Pending
-  Lakes
-  Streams and Canals
-  Prairie Creek Watershed



WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of this Program, a total of three irrigation wells have been back-plugged in WBID 1964. The following table represents water quality improvements for chloride and TDS concentrations at each well directly following back-plugging activities. No additional wells have been back-plugged since October 2004.

Pre- and Post Well Back-Plugging Results in WBID 1964

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20006275	5	N/A	N/A
20006872	66	67%	76%
20006872	76	85%	89%

District Resource Regulation – Water Use Permitting

In WBID 1964, thirty-one Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the thirty-one applications, one was a new permit, twenty-four were renewals, four were letter modifications, and two were owner transfers.

WUP Renewals and Modifications in WBID 1964

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	1	0	0
WUP Renewals	1	7	8	8
WUP Modifications	0	0	0	0
WUP Letter Modifications	1	1	0	2
WUP Owner Transfer	0	0	0	2

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Nine FARMS projects were Board approved in WBID 1964 and five projects were under consideration between October 2004 and September 2012. The following table summarizes the projects, as well as actual and projected ground water offsets. Details for each of the below listed projects can be found in Appendix IV.

WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Potential FARMS Projects in WBID 1964; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20003530 – H504 (citrus)	June 2004	142,600	171,050	1,548,667
*WUP #20006872 – H656 (citrus)	August 2012	160,000	N/D	N/D
WUP # 200002386– H606 (Section 10SW) (citrus)	March 2011	432,000	355,276	564,655
WUP #200002386– H606 (Phase 1A) (citrus)	May 2011	386,450	336,886	1,044,846
WUP #200002386– H606 (Phases 2 and 3) (citrus)	December 2012	610,008	Not Available	Not Available
WUP #200002386 – H606 (Phase 2 and 3 Amendment) (citrus)	December 2013	83,960	Not Available	Not Available
WUP #20002386– H555 (Section 29 East) (citrus, sod)	April 2009	225,100	86,636	171,710
WUP #20002386 – H608 (citrus)	October 2011	81,840	80,205	97,475
WUP #2009052 – H539 (citrus)	March 2009	1,457,400	708,593	3,837,194
*WUP #20010791 (citrus)	N/D	N/D	N/D	N/D
*WUP #20011549 (citrus)	N/D	N/D	N/D	N/D
*WUP #20004606 (sod)	N/D	N/D	N/D	N/D
*WUP #20006274 (citrus)	N/D	N/D	N/D	N/D
*WUP #20013370 (Biofuels)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

N/D = Not determined/project under consideration

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1964 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are currently three YSI® 600XLM data sondes deployed in WBID 1964, which is located in the eastern region of the Prairie Creek Watershed. The following data plots reflect weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency.

WBID 1964

Water Segment – Cow Slough

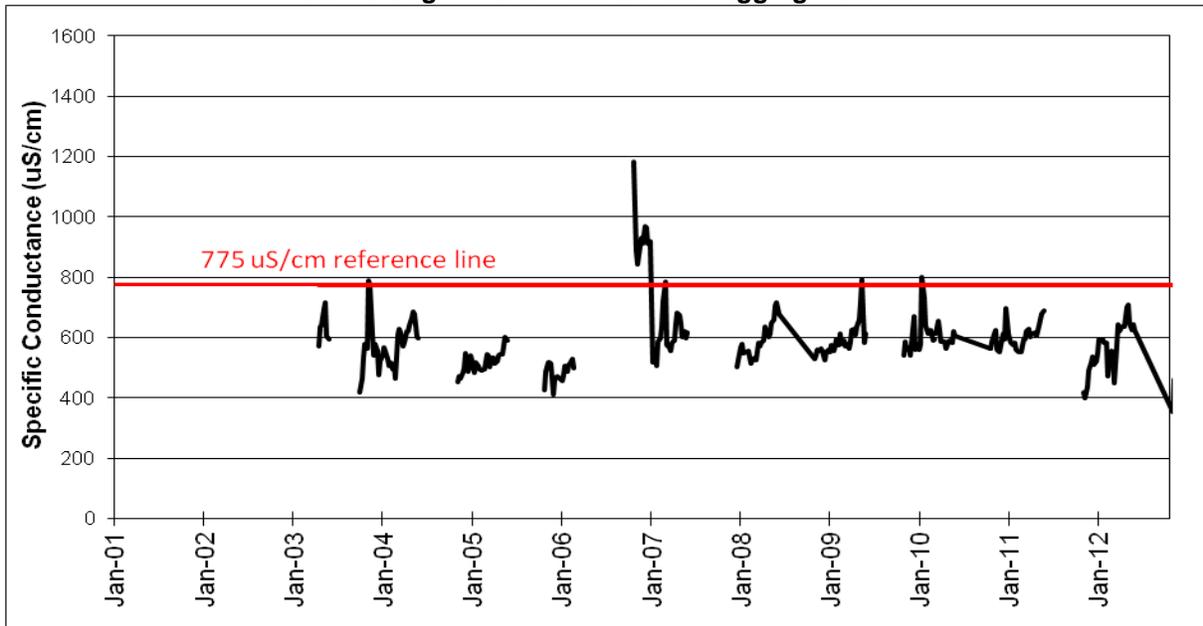
Prairie Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern – None

The **Cow Slough** data sonde is located in an agricultural canal in the northern area of WBID 1964 on SR 70. Flows from this canal do not contribute directly to Prairie Creek, but travel south through a large wetland area before entering Montgomery Canal (which then becomes Prairie Creek). Land use in the immediate surrounding areas of this canal is predominantly agriculture (citrus). The following data plot shows weekly median values from continuous/hourly logging of specific conductance values for dry season periods (November – May) for April 2003 through September 2012.

The majority of specific conductance values over the period of data record, have been below the 775 uS/cm goal. Values above the 775 uS/cm goal occurred during the October 2006 to December 2008 and the October 2008 to December 2010 time periods., The current reporting period had no values above the 775 uS/cm target. Additionally, no values have exceeded the 1275 uS/cm Class III surface water criteria for specific conductance at this monitoring location.

Cow Slough In-Situ Data Sonde Logging Results

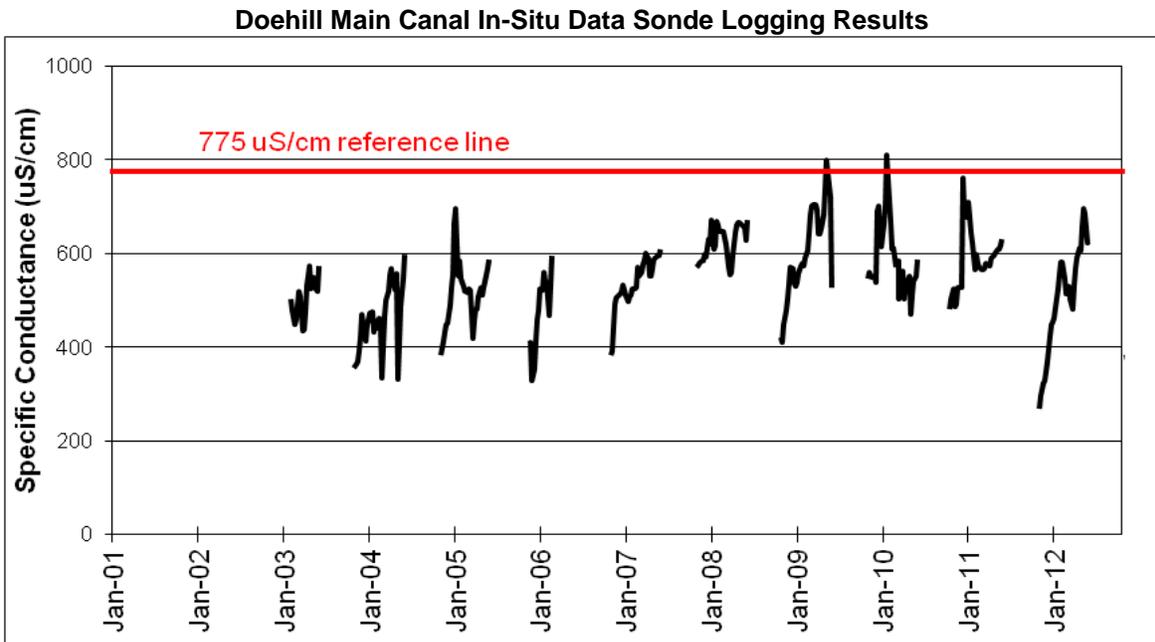


WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

The **Doehill Main Canal** data sonde is located in an agricultural canal in the central region of WBID 1964. Flows from this canal contribute directly to Prairie Creek via Montgomery Canal. Land uses in the immediate surrounding region of this canal include wetlands, rangelands, and small areas of agriculture.

The following data plot shows median weekly values derived from continuous/hourly logging of specific conductance for dry season periods (November – May) for January 2003 through May 2012. The data sonde malfunctioned during March – May 2006 therefore, no data exist for these months. The majority of the weekly median specific conductance values have been below the 775 uS/cm goal over the data period of record.

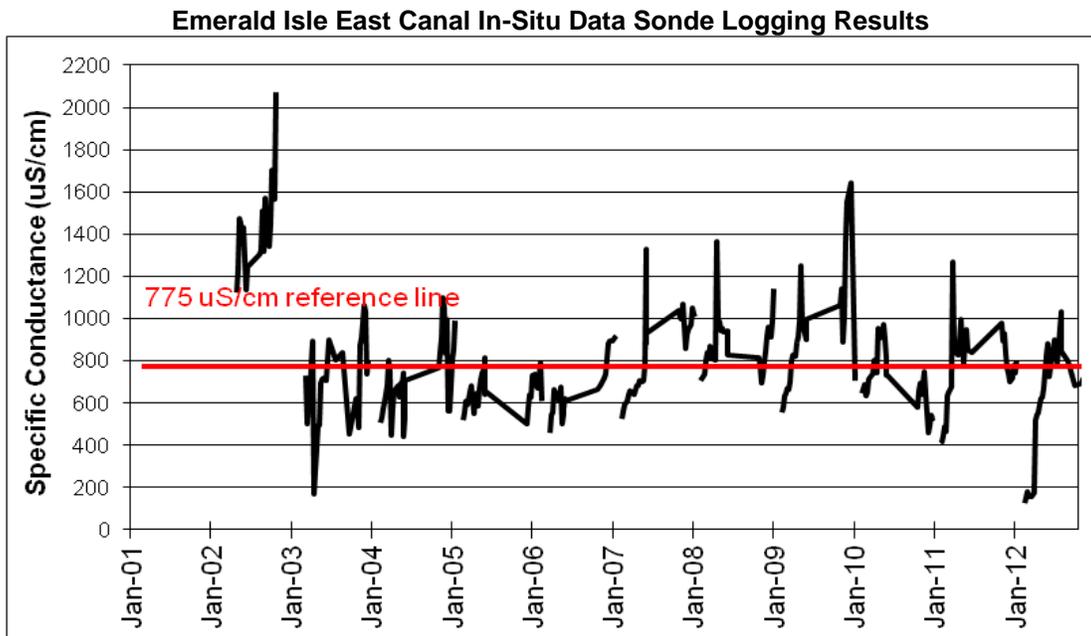


WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

The ***Emerald Isle East Canal*** data sonde is located in an agricultural canal in the south-central region of WBID 1964, and flows from this canal contribute directly to Prairie Creek. Land use in the immediate area of this canal is predominantly agriculture (sod farming) with some wetlands and rangelands. The following data plot shows weekly median values for continuous/hourly logging of specific conductance values for dry season periods (November – May) for January 2002 through May 2012.

In the fall of 2004 a large portion of the sod farming operation located upstream of this monitoring site was discontinued. Therefore, noticeable decreases in specific conductance occurred since this time period. Drought impacts are evident by increases in values over the 2007-2011 dry season months. During the current reporting period specific conductance values appear to be improving.



WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Specific Conductance Logging Results in WBID 1964 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Cow Slough	49,052	0	0%	271	14	5.2%
*Doehill Main Canal	48,460	96	0.2%	285	2	0.7%
*Emerald Isle East Canal	59,936	4,028	6.7%	325	149	45.8%

*Monitoring site located in agricultural canal – not on main channel of Prairie Creek.

Specific Conductance Reconnaissance Network (District)

Within WBID 1964 there are currently two stations monitored for the Specific Conductance Reconnaissance Network. Of the nineteen individual specific conductance values collected within WBID 1964 during the period of record, one value exceeded the 775 uS/cm goal criteria and no values exceeded the FDEP surface-water quality Class I criterion of 1275 uS/cm.

The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1964 during the 2004-2006, 2006- 2008, 2008-2010, and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event have been recorded as dry.

Dry season percent changes for the 2010-2012 reporting period showed a decreasing trend with the exception of one of the WBID 1964 stations.

Specific Conductance Reconnaissance Results in WBID 1964; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Unnamed Cr. @ SR 70 - #2	479	290	641	367	707	↑33.82%**	↑10.30%**
Unnamed Cr. @ SR 70 - #33	*	114	*	*	*	*	*

* Station dry

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 1964; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Unnamed Cr. @ SR 70 - #2	540	586	662	653	600	↓17.11%	↑11.43%
Unnamed Cr. @ SR 70 - #33	*	*	*	*	126	*	*

* Station dry

WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Specific Conductance Reconnaissance Results in WBID 1964; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Unnamed Cr. @ SR 70 - #2	780	549	619	*	↑19.4%	↓20.6%
Unnamed Cr. @ SR 70 - #33	368	575	140	389	*	↓62.0%

* Station dry

Specific Conductance Reconnaissance Results in WBID 1964; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2011 vs. Dry Season 2012
Unnamed Cr. @ SR 70 - #2	*	531	664	530	*	↑1.9%
Unnamed Cr. @ SR 70 - #33	*	576	847	565	*	↓1.9%

* Station dry

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1964 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

The following table represents water quality results through July 2006 for chloride and TDS concentrations at two monitoring stations in WBID 1964. Since these monitoring sites are not considered key index stations, graphical results are not presented in the main body of the report but can be found in Appendix I. The following information was generated using data from the District's SPJC quarterly monitoring network.

**Chloride and TDS Water Quality Results in WBID 1964 over Entire Period of Data Record
Sites are listed as they are located from north to south throughout WBID 1964**

Water Segment	Number Individual Reported Cl Values	Number Individual Cl Values >250 mg/L	Percentage Individual Cl Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
*Cow Slough	75	0	N/A	76	1	1.3%	0	0%
*Emerald Isle East Canal	49	2	4.1%	49	11	22.4%	0	0%

*Monitoring site located in agricultural canal – not on main channel of Prairie Creek

WBID 1964

*Water Segment – Cow Slough
Prairie Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Habitat Assessment and Stream Condition Index Monitoring

During the October 2004 to August 2008 reporting periods, no sites in WBID 1964 were evaluated for biological health indicators. Two sites were evaluated for HAs and SCIs during the September 2008 to September 2012 time period. No sites were evaluated for HAs and SCIs during the 2010 to 2012 reporting period. The results of the assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-Stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Emerald Isle East Canal	06/17/2010	26	22	48 Marginal	27 Category 3 ("impaired")
Doehill Main Canal	06/17/2010	15	50	65 Marginal	31 Category 3 ("impaired")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 3 ("impaired") are characterized as having a notable loss of diversity with very tolerant taxa representing a large proportion of the individuals collected.

A definitive link between declines in the number and quality of macroinvertebrates and surface waters with elevated specific conductance values from anthropogenic activities has not been determined. However, it is likely that the impairment of the Emerald Isle East Canal and Doehill Main Canal sites for the SCI can be directly linked to secondary factors of anthropogenic activities such as runoff which can lead to sedimentation and turbidity. Sedimentation and the

resulting high turbidity of surface waters occurs as runoff flows over disturbed agricultural soils, picking up sediments and other small debris which can physically scour the bodies of the macroinvertebrates and smother available habitat and food sources.

WBID 1995

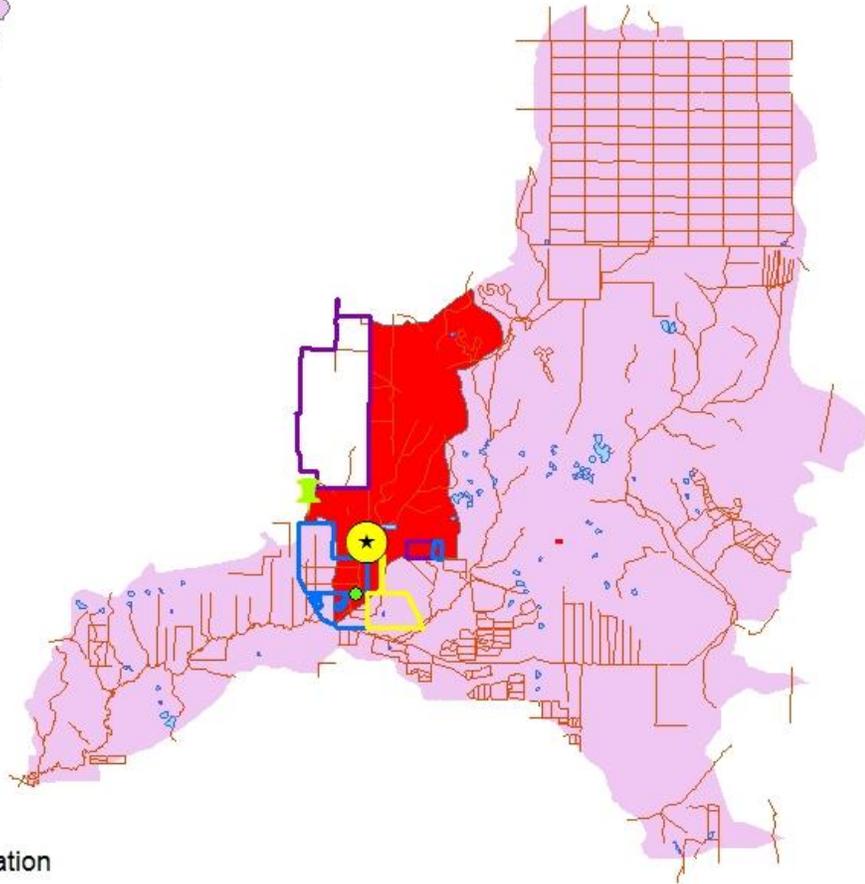
*Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use – Class I
Verified Impaired Pollutants of Concern – None*

WBID 1995

**Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern: None**

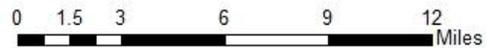
WBID 1995

*Water Segement - Myrtle Slough
Prairie Creek Watershed; Water Use - Class I
Verified Impaired Pollutants of Concern - None*



Legend

-  Data Sonde Location
-  Reconnaissance Network Locations
-  Backplug Location
-  WBID 1995
-  FARMS Projects - Under Construction
-  FARMS Projects - Operational
-  FARMS - Dormant Contacts
-  FARMS Projects - Board Approval Pending
-  Lakes
-  Streams and Canals
-  Prairie Creek Watershed



WBID 1995
Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of the Well Back-Plugging Program, one irrigation well has been back-plugged in WBID 1995. The following table represents water quality improvements for chloride and TDS concentrations at this well directly following back-plugging activities. No additional wells have been back-plugged since October 2004.

Pre- and Post Well Back-Plugging Results in WBID 1995

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20010971	1	57%	86%

District Resource Regulation – Water Use Permitting

In WBID 1995, twenty-one Water Use Permit (WUP) applications were submitted to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the twenty-one applications, four were new permits, ten were renewals, six were letter modifications and one was an ownership transfer.

WUP Renewals and Modifications in WBID 1995

	Oct. 2004 – July 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	2	2	0	0
WUP Renewals	2	3	3	2
WUP Modifications	0	0	0	0
WUP Letter Modifications	1	1	0	4
WUP Owner Transfer	0	0	0	1

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Eleven FARMS projects were Board approved in WBID 1995 between October 2004 and September 2012, two of which have since been cancelled. The following table summarizes the projects, as well as projected and actual ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

WBID 1995
Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – None

FARMS Projects in WBID 1995; October 2004 – September 2012

Project Number / Type	Project Operational/ (Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a WUP #20006765 – H516 Phase I (citrus)	August 2006	222,500	267,600	1,175,689
WUP #20006765 – H516 Phase 2 (citrus)	March 2009	76,980	206,600	711,581
^a WUP #20006765 – H584 Phase 3 (citrus)	June, 2010	348,400	327,000	877,065
*WUP #20006765 – H693 Phase 4 (citrus)	(January 2014)	87,100	Under Construction	Under Construction
^a WUP #200012818 – H556 (blueberries)	January 2009	109,800	201,274	708,968
WUP #20002418, 20012818, 20009716 - H560 (blueberries, electronics)	February 2010	25,000	27,268	632,369
*WUP #20008287 - H546 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20003069 – H657 (citrus)	July, 2012	185,000	73,000	148,313
*WUP 200009782 – H648 (citrus)	January, 2013	72,300	Under Construction	Under Construction
*WUP 20007462 – H567	July, 2012	186,900	Under Construction	Under Construction
*WUP 20005060 – H502	Cancelled	Cancelled	Cancelled	Cancelled

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aFunding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

Quality of Water Improvement Program (QWIP)

From October 1, 2003 to date, one well has been plugged/abandoned through the QWIP Program in WBID 1995. The well was associated with WUP No. 20003069, DID number 4. It had a casing diameter of 12 inches, a casing depth of approximately 80 feet, and a total depth of 606 feet below land surface. The specific conductance at the time the well had geophysical logging performed on February 24, 2003 was 863 uS/cm. The well was plugged on January 29, 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

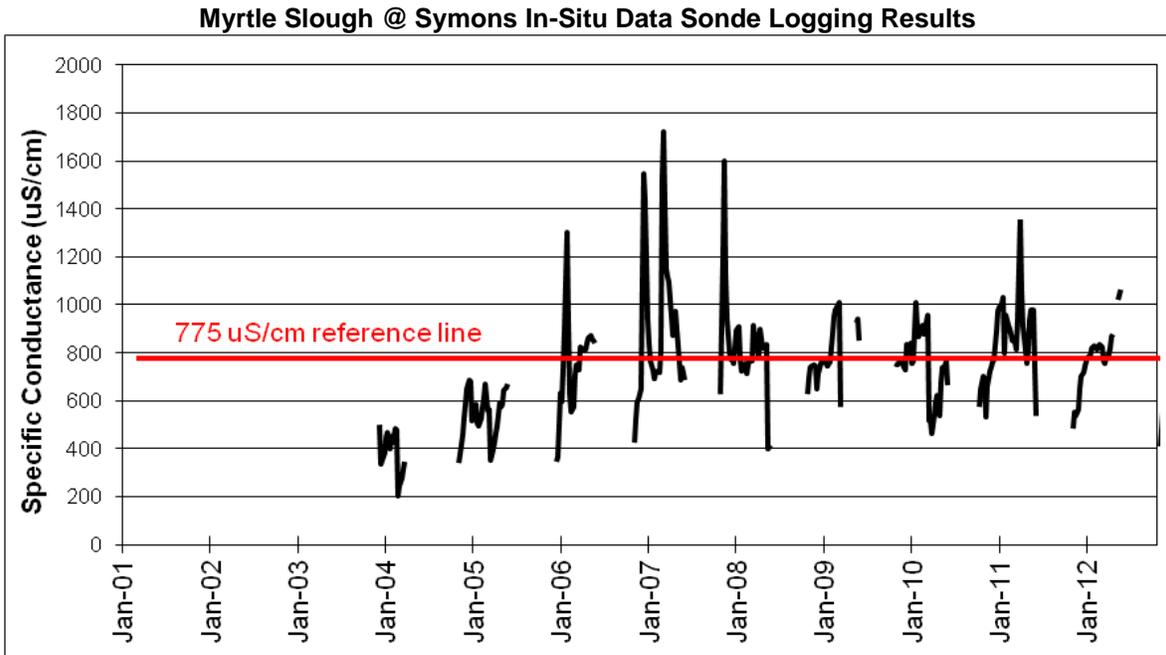
There is currently one YSI® 600XLM data sonde deployed in WBID 1995 in **Myrtle Slough**. This data sonde site is located in the southern region of WBID 1995 in the Prairie Creek watershed and was upgraded with satellite telemetry in October 2009. Land uses immediately surrounding this monitoring location are predominantly agriculture (citrus). The following data plot shows continuous/hourly logging of specific conductance values for dry season periods

WBID 1995

*Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – None*

(November – May) for December 2003 through September 2012. The data sonde was smothered by sediment during March – May 2004 therefore, no data exist for this time period.

The following data plot reflects weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency. Specific conductance values show an increasing trend throughout the first half of the period of data record. Values in the current reporting period indicate a large number of values above the 775 $\mu\text{S}/\text{cm}$ during 2011 and 2012. A table located at the end of this section provides the overall data sonde specific conductance monitoring results for WBID 1995.



Specific Conductance Logging Results in WBID 1995 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 $\mu\text{S}/\text{cm}$	Percentage of Individual Values >1275 $\mu\text{S}/\text{cm}$	Number Weekly Median Values	Number Weekly Median Values >775 $\mu\text{S}/\text{cm}$	Percentage Weekly Median Values >775 $\mu\text{S}/\text{cm}$
Myrtle Slough @ Symons	42,310	1,163	2.7%	247	102	41.3%

Specific Conductance Reconnaissance Network (District)

Within WBID 1995 there is currently one station monitored for the Specific Conductance Reconnaissance Network. Of the eleven individual specific conductance values collected within WBID 1995 during the period of record, one value exceeded the 775 $\mu\text{S}/\text{cm}$ goal criteria and no values exceeded the FDEP surface-water quality Class I criterion of 1275 $\mu\text{S}/\text{cm}$. The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1995 during the 2004-2006, 2006-2008, 2008-2010, and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted below as dry.

WBID 1995

*Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – None*

Overall, dry season percent changes for the 2010-2012 reporting period were either decreasing or not calculated due to dry stations in 2008.

Specific Conductance Reconnaissance Results in WBID 1995; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Myrtle Slough @ Pine Island Rd. - #30	652	208	572	312	*	↓12.27%**	*

* Station dry.

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 1995; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Myrtle Slough @ Pine Island Rd. - #30	280	*	256	*	466	*	*

* Station dry.

Specific Conductance Reconnaissance Results in WBID 1995; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Myrtle Slough @ Pine Island Rd. - #30	979	462	646	338	*	↓34.0%

*Station dry.

Specific Conductance Reconnaissance Results in WBID 1995; 2010 - 2012

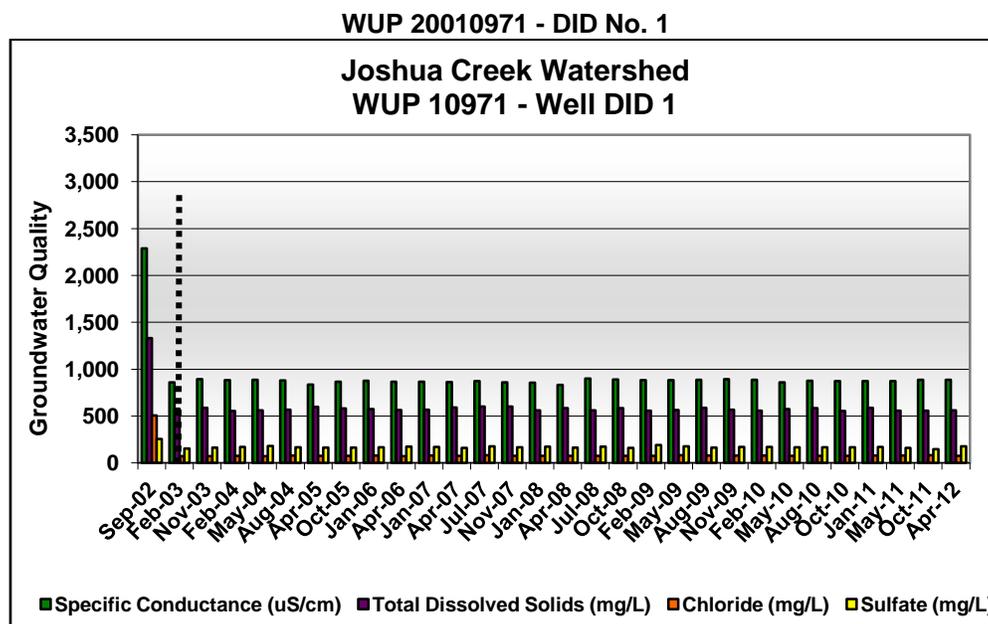
Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2011 vs. Dry Season 2012
Myrtle Slough @ Pine Island Rd. - #30	*	328	*	263	*	*

*Station dry.

WBID 1995
Water Segment – Myrtle Slough
Prairie Creek Watershed: Water Use - Class I
Verified Impaired Pollutants of Concern – None

Pre- and Post Back-Plug Well Monitoring Network (District)

There is one back-plugged well in WBID 1995 that is sampled on a quarterly frequency to monitor long-term improvements on water quality and to also ensure that the back-plug has remained functional. The following graph represents water quality results throughout the period of data record for this quarterly monitored well showing both pre- and post back-plug values for specific conductance, sulfate, chloride, and TDS. To date, this well has retained the integrity of the post back-plug concentrations for these parameters.



Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1995 at this time.

Habitat Assessment and Stream Condition Index Monitoring (FDEP)

In the summer of 2003 and winter of 2004, biological (macroinvertebrate) samples for SCI analysis were collected at Myrtle Slough above Nichols Road. The initial 2004 SCI evaluation of this site was "Excellent."

After the samples were collected and evaluated, a new method of calculating the SCI was developed by FDEP to more accurately reflect the biological condition of streams and effects of development around them. The SCI 2004 methodology ranks streams as Good, Fair, Poor, or Very Poor. The Myrtle Slough @ Nichols Road site was categorized under this new method as "Fair", which indicates a significant change from completely natural conditions, but not a serious degradation of the biological community. Because the SCI_2004 method had not been adopted at the time the samples were collected, the SCI_2004 evaluation is not official, but does provide an additional analysis of the biological condition of the stream system. Both the old and new SCI evaluations do not indicate that water quality is having a detrimental effect on the biological communities at the Myrtle Slough @ Nichols Road site.

No HA or SCI evaluations were conducted in WBID 1995 during the August 2006 to September 2012 time period.

WBID 1950A

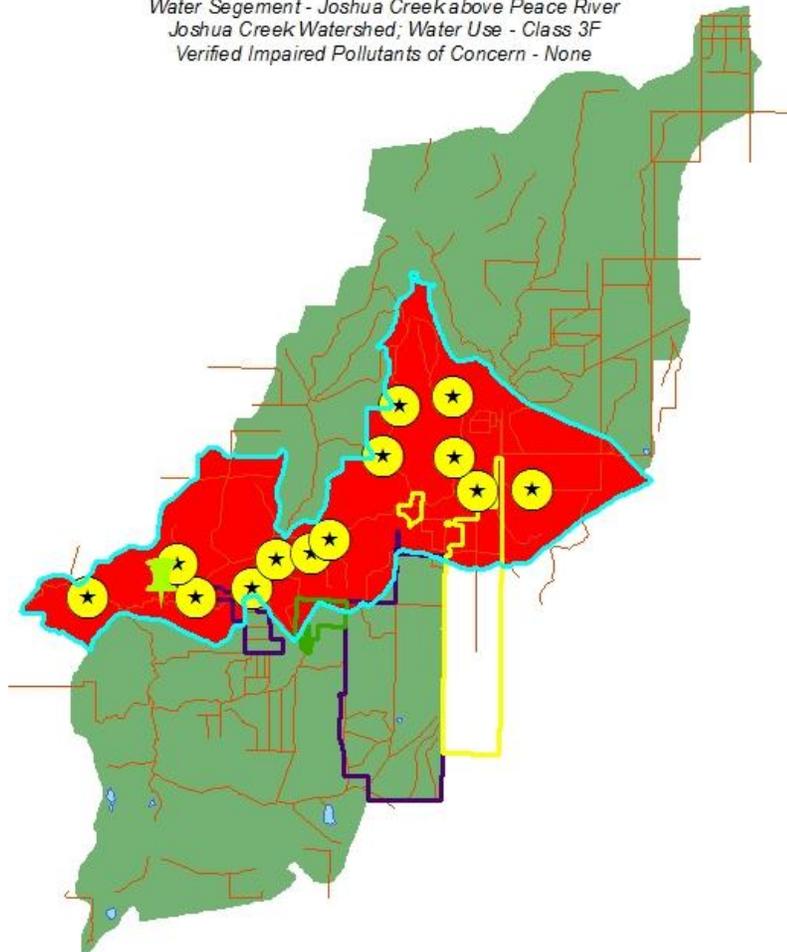
**Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**

WBID 1950A

**Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**



WBID 1950A
Water Segement - Joshua Creek above Peace River
Joshua Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  Reconnaissance Network Locations
-  Backplug Locations
-  WBID 1950A
-  FARMS Projects - Under Construction
-  FARMS - Potential Projects
-  FARMS - Dormant Contacts
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1950A

Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of the Well Back-Plugging Program, two irrigation wells have been back-plugged in WBID 1950A. The following table represents water quality improvements for chloride and TDS concentrations at these wells directly following back-plug activities. No additional wells were back-plugged in the current report period.

Pre- and Post Well Back-Plugging Results in WBID 1950A

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20002240	3	71%	83%
20002240	4	70%	94%

District Resource Regulation – Water Use Permitting

Thirty-seven Water Use Permit (WUP) applications were submitted for WBID 1950A to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the thirty-seven applications twenty-four were renewals, two were new permits, three were modifications, two were an owner transfer, and six were letter modifications.

WUP Renewals and Modifications in WBID 1950A

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	1	1	0
WUP Renewals	0	4	11	9
WUP Modifications	1	1	1	0
WUP Letter Modifications	1	1	1	3
WUP Owner Transfer	0	0	1	1

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

Two FARMS projects have been Board approved to date within this WBID, one of which has been subsequently cancelled. Three additional projects were under consideration between October 2004 and September 2012. The following table summarizes the projects, as well as ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

WBID 1950A

Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

FARMS Projects in WBID 1950A; October 2004 – September 2012

Project Number / Type	Project Operational/ (Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
*WUP #20007331 – H660 (citrus)	N/D	N/D	N/D	N/D
*WUP #20007854 (citrus)	N/D	N/D	N/D	N/D
*WUP #20009567 (citrus)	N/D	N/D	N/D	N/D
*WUP 20007462 – H567	July, 2012	186,900	Under Construction	Under Construction
*WUP 20005060 – H502	Cancelled	Cancelled	Cancelled	Cancelled

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1950A since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

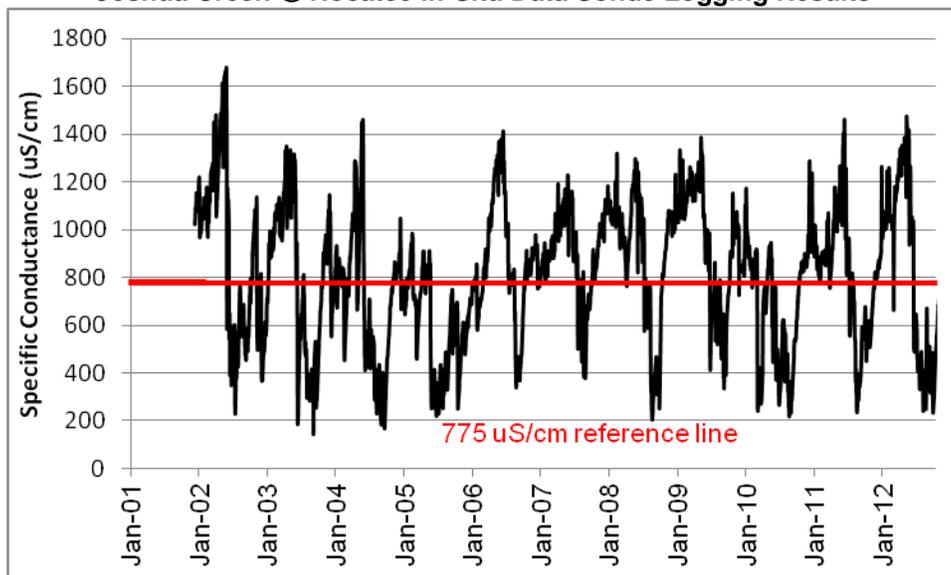
There is currently one YSI® 600XLM data sonde deployed in WBID 1950A at Joshua Creek @ Nocatee, with maintenance and operation performed by the USGS. This monitoring location is in the western region of WBID 1950A in the Joshua Creek Watershed. Land use immediately surrounding this site includes agriculture, wetlands, and some urban/built-up. Although the Joshua Creek Watershed does not currently have any waterbodies listed as TMDL impaired, monitoring is occurring because evidence of impairment has been observed. Due to the potential for future TMDL impairment, this monitoring location is being regarded as a key station, with data sonde deployment occurring year-round.

The following data plot reflects weekly median values for specific conductance, which were calculated from independent values collected on an hourly frequency from January 2002 through September 2012. Specific conductance values remain consistent with previous periods. A table located at the end of this section provides the overall data sonde specific conductance monitoring results for WBID 1950A.

WBID 1950A

*Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Joshua Creek @ Nocatee In-Situ Data Sonde Logging Results



Specific Conductance Logging Results in WBID 1950A over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Joshua Creek @ Nocatee	381,110	19,155	5%	574	336	58.5%

Specific Conductance Reconnaissance Network (District)

Within WBID 1950A there are currently 13 stations monitored for the Specific Conductance Reconnaissance Network. Individual values for the Joshua Creek @ Nocatee station have been excluded from this section since they were discussed earlier in this plan in the In-Stream Specific Conductance Logging Network section. Of the 118 individual specific conductance values collected within WBID 1950A during the period of record, 27 values exceeded the 775 uS/cm goal criteria and 4 values exceeded the FDEP surface-water quality Class I criterion of 1275 uS/cm. The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1950A during the 2004-2006, 2006-2008, 2008-2010, and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted as dry.

Dry season percent changes for the 2010-2012 reporting period show mixed results overall or were not calculated due to dry stations for six stations during the reporting period.

WBID 1950A

*Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Specific Conductance Reconnaissance Results in WBID 1950A; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Unnamed Ditch @ CR 760 - #5	551	64	506	517	424	↓8.17%**	↓16.21%**
Joshua Cr. @ SR 70 – #6	516	116	511	339	572	↓0.97%**	↑11.94%**
Unnamed Cr. @ CR 760 - #6	1093	330	974	619	1430	↓10.89%**	↑46.82%**
Unnamed Cr. @ Airport Ave. - #34	590	638	631	553	*	↑6.95%**	*
Unnamed Cr. @ SR 31 - #7.	*	314	*	*	*	*	*
Unnamed Cr. @ SE Kings St. -	442	229	468	183	*	↑5.88%**	*
Unnamed Cr. @ CR 760 - #5	1183	180	618	620	*	↓47.76%**	*
Upper Joshua Cr. - # 32	52	44	162	70	*	↑211.54%**	*
Unnamed Cr. @ CR 760 - #4	*	63	294	197	*	*	*
Unnamed Cr. @ Roan St. - #2	564	124	626	*	*	↑10.99%**	*
Unnamed Cr. @ Roan St. - #3	721	78	441	309	*	↓38.83%**	*
Tributary to Joshua Cr. @ SR 70	*	104	333	218	*	*	*

* Station dry.

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

WBID 1950A

Water Segment – Joshua Creek ab. Peace River

Joshua Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern – None

Specific Conductance Reconnaissance Results in WBID 1950A; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Unnamed Ditch @ CR 760 - #5	301	675	401	708	671	↑59.20%	↑4.89%
Joshua Cr. @ SR 70 – #6	198	656	447	791	398	↑14.69%	↑20.58%
Unnamed Cr. @ CR 760 - #6	722	1662	972	2019	991	↑16.22%	↑21.48%
Unnamed Cr. @ Airport Ave. - #34	*	*	*	840	914	*	*
Unnamed Cr. @ SR 31 - #7.	*	*	*	*	*	*	*
Unnamed Cr. @ SE Kings St. -	260	*	*	*	*	*	*
Unnamed Cr. @ CR 760 - #5	507	*	682	*	715	*	*
Upper Joshua Cr. - # 32	*	*	*	*	*	*	*
Unnamed Cr. @ CR 760 - #4	262	*	*	*	326	*	*
Unnamed Cr. @ Roan St. - #2	322	*	419	*	431	*	*
Unnamed Cr. @ Roan St. - #3	114	*	*	942	306	*	*
Tributary to Joshua Cr. @ SR 70	210	*	274	*	337	*	*

* Station dry.

WBID 1950A

*Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Specific Conductance Reconnaissance Results in WBID 1950A; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent change Dry Season 2009 vs. Dry Season 2010
Unnamed Ditch @ CR 760 - #5	792	240	612	105	↑11.9	↓22.7%
Joshua Cr. @ SR 70 – #6	766	389	565	254	↓3.2%	↓26.2%
Unnamed Cr. @ CR 760 - #6	1594	971	1051	1095	↓21.1%	↓34.1%
Unnamed Cr. @ Airport Ave. - #34	1009	1069	1044	628	↑20.1%	↑3.5%
Unnamed Cr. @ SR 31 - #7.	*	*	*	*	*	*
Unnamed Cr. @ SE Kings St. -	1234	373	726	464	*	↓41.2%
Unnamed Cr. @ CR 760 - #5	955	604	768	639	*	↓19.6%
Upper Joshua Cr. - # 32	161	91	148	*	*	↓8.1%
Unnamed Cr. @ CR 760 - #4	470	287	*	403	*	*
Unnamed Cr. @ Roan St. - #2	994	518	*	505	*	*
Unnamed Cr. @ Roan St. - #3	879	416	822	462	↓6.7%	↓6.5%
Tributary to Joshua Cr. @ SR 70	880	429	830	427	*	↓5.7%

* Station dry.

WBID 1950A

Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Specific Conductance Reconnaissance Results in WBID 1950A; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent change Dry Season 2011 vs. Dry Season 2012
Unnamed Ditch @ CR 760 - #5	944	176	1468	147	↑19.2%	↑55.5%
Joshua Cr. @ SR 70 – #6	670	292	768	271	↓12.5%	↑14.6%
Unnamed Cr. @ CR 760 - #6	1647	1264	1753	1129	↑3.3%	↑6.4%
Unnamed Cr. @ Airport Ave. - #34	1021	1033	1135	1154	↑1.2%	↑11.2%
Unnamed Cr. @ SR 31 - #7.	*	1126	2863	685	*	*
Unnamed Cr. @ SE Kings St. -	*	476	753	338	*	*
Unnamed Cr. @ CR 760 - #5	603	631	591	484	↓21.5%	↓2%
Upper Joshua Cr. - # 32	938	201	*	91	↑534%	*
Unnamed Cr. @ CR 760 - #4	*	480	*	178	*	*
Unnamed Cr. @ Roan St. - #2	*	581	*	483	*	*
Unnamed Cr. @ Roan St. - #3	423	605	*	402	*	*
Tributary to Joshua Cr. @ SR 70	322	526	547	441	↓61.8%	↑37%

* Station dry.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1950A are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

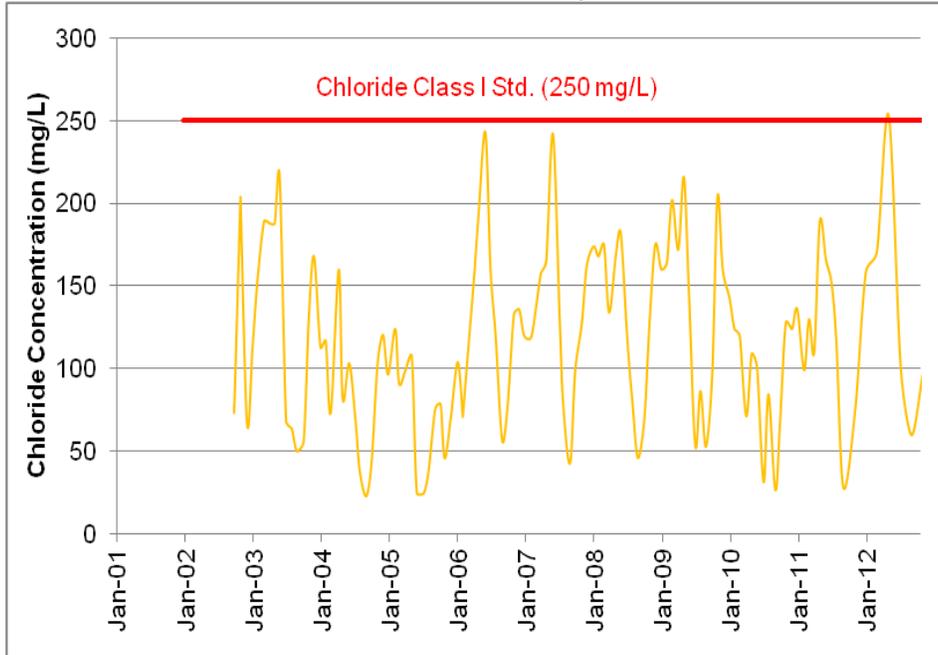
The following graphs represents water quality results through July 2012 for chloride and TDS concentrations at station Joshua Creek @ Nocatee (WBID 1950A). These data plots were generated using data from the District's monthly CWM Network. Although this creek is a Class III system, for comparative purposes, these data plots also contain reference lines depicting FDEP Class I criteria for chloride (250 mg/L) and TDS (500 mg/L as a monthly average, 1000 mg/L as maximum).

Significant decreasing trends in both chloride and TDS concentrations have occurred since the drought impacts of 2000-2001. Overall, chloride values have been below the Class I criteria for chloride since 2003, with only two values exceeding the criteria in 2012. Values continue to remain below the TDS (1000 mg/L) criteria for the current reporting period.

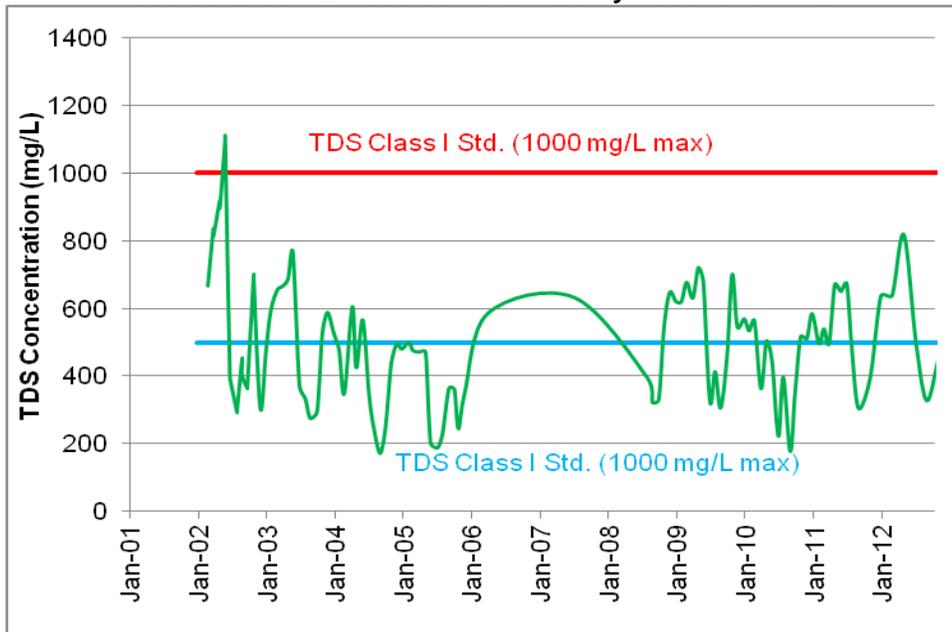
WBID 1950A

Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Joshua Creek @ Nocatee Water Quality Results for Chloride



Joshua Creek @ Nocatee Water Quality Results for TDS



WBID 1950A

*Water Segment – Joshua Creek ab. Peace River
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Chloride and TDS Water Quality Results in WBID 1950A over Entire Period of Data Record

Water Segment	Number Individual Reported CI Values	Number Individual CI Values >250 mg/L	Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
Joshua Cr. @ Nocatee	120	1	0.8%	102	46	45.1%	2	2%

Habitat Assessment and Stream Condition Index Monitoring (FDEP)

No sites in WBID 1950A were evaluated for biological health indicators during the October 2004 to July 2006 reporting period. During the August 2006 to August 2008 reporting period, two sites in WBID 1950A were evaluated for HAs and SCIs. During the September 2008 to September 2010 reporting period, one site was evaluated for HAs and SCIs. No sites were evaluated during the 2010 to 2012 reporting period. The results of the assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Joshua Creek @ Nocatee	05/21/2007	38	42	80 Suboptimal	30 Category 3 ("impaired")
Joshua Creek at Airport Road	01/30/2008	67	70	137 Optimal	47 Category 2 ("healthy")
Unnamed Cr. @ CR 760 - #6	08/12/2009	60	70	130 Optimal	12 Category 3 ("impaired")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. Stations scored as Category 3 ("impaired") are characterized as having a notable loss of diversity with very tolerant taxa representing a large proportion of the individuals collected.

A definitive link between declines in the number and quality of macroinvertebrates and surface waters with elevated specific conductance values from anthropogenic activities has not been determined. However, it is likely that the impairment of the Joshua Creek at Nocatee and Unnamed Creek @ CR 760 sites for the SCI can be directly linked to secondary factors of anthropogenic activities such as runoff which can lead to sedimentation and turbidity. Sedimentation and the resulting high turbidity of surface waters occurs as runoff flows over disturbed agricultural soils, picking up sediments and other small debris which can physically scour the bodies of the macroinvertebrates and smother available habitat and food sources.

WBID 1950B

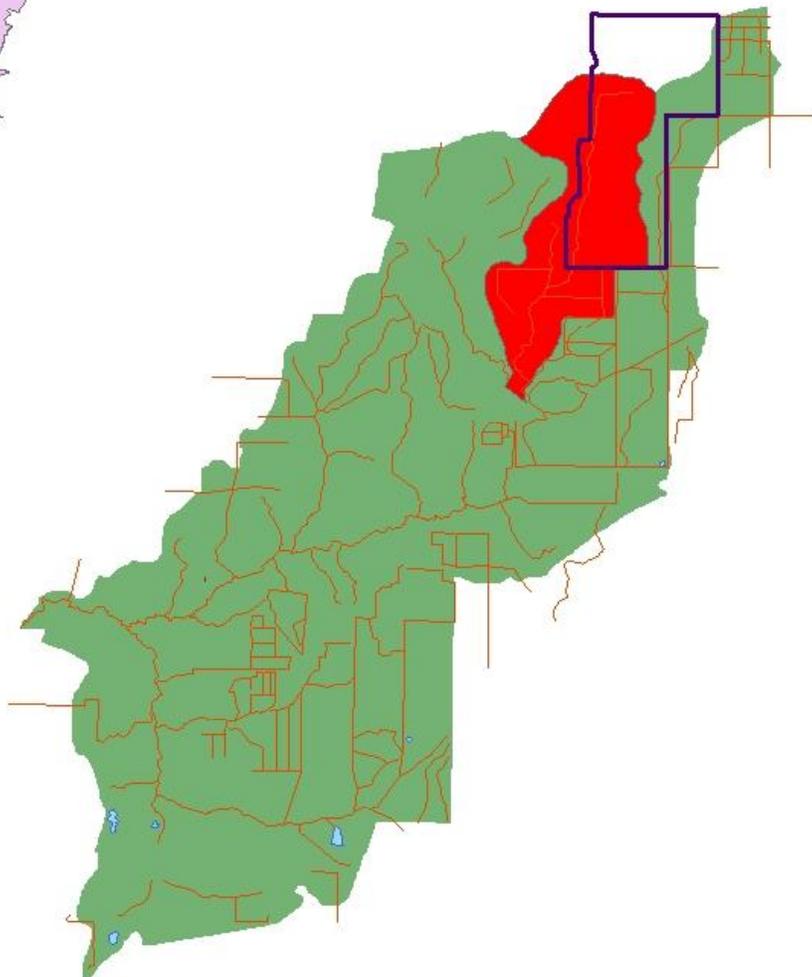
*Water Segment – Joshua Creek ab. Honey Creek
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

WBID 1950B

**Water Segment – Joshua Creek ab. Honey Creek
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**



WBID 1950B
Water Segement - Joshua Creek above Honey Creek
Joshua Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  WBID 1950B
-  FARMS - Dormant Contacts
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1950B

Water Segment – Joshua Creek ab. Honey Creek
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 1950B.

District Resource Regulation – Water Use Permitting

Seven Water Use Permit (WUP) applications were submitted to the District for WBID 1963 over the entire reporting period of performance monitoring (October 2004 to September 2012). One of the applications was for a new WUP, three were renewals, one was a modification, and two were letter modifications.

WUP Renewals and Modifications in WBID 1963

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	1	0
WUP Renewals	0	0	2	1
WUP Modifications	1	0	0	0
WUP Letter Modifications	0	0	1	1
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

To date, there are no Board approved FARMS/EQIP projects in WBID 1963

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1950B since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are no instantaneous data collection activities occurring in WBID 1950B at this time.

Specific Conductance Reconnaissance Network (District)

Within WBID 1950B there are no stations currently being monitored for the Specific Conductance Reconnaissance Network.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date no wells in WBID 1950B are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1950B at this time.

Habitat Assessment and Stream Condition Index Monitoring

No sites in WBID 1950B have been evaluated for HA or SCIs during the October 2004 to September 2012 time period.

WBID 1963

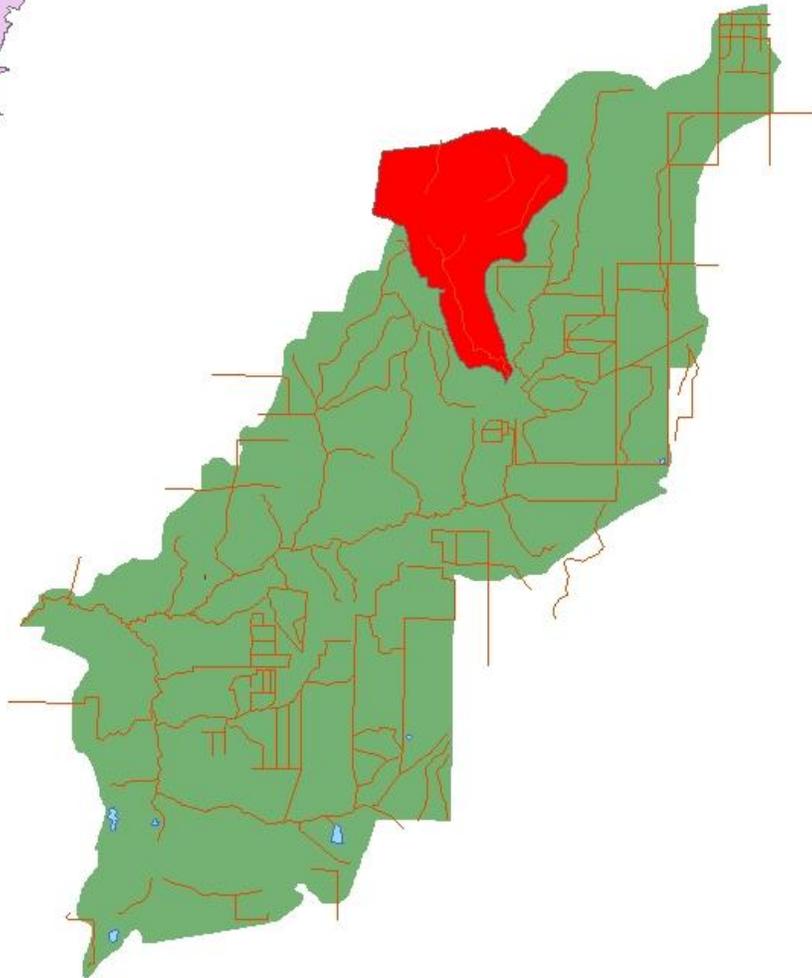
*Water Segment – Lake Slough
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

WBID 1963

**Water Segment – Lake Slough
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**

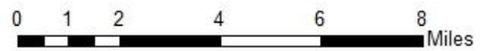


WBID 1963
Water Segement - Lake Slough
Joshua Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  WBID 1963
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1963
Water Segment – Lake Slough
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 1950B.

District Resource Regulation – Water Use Permitting

Seven Water Use Permit (WUP) applications were submitted to the District for WBID 1963 over the entire reporting period of performance monitoring (October 2004 to September 2012). One of the applications was for a new WUP, three were renewals, one was a modification, and two were letter modifications.

WUP Renewals and Modifications in WBID 1963

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	1	0
WUP Renewals	0	0	2	1
WUP Modifications	1	0	0	0
WUP Letter Modifications	0	0	1	1
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

To date, there are no Board approved FARMS/EQIP projects in WBID 1963.

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 1963.

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1963 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are no instantaneous data collection activities occurring in WBID 1963 at this time.

Specific Conductance Reconnaissance Network (District)

There are currently no water quality sites being monitored for the Specific Conductance Reconnaissance Network in WBID 1963.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1963 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1963 at this time.

WBID 1963

*Water Segment – Lake Slough
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Habitat Assessment and Stream Condition Index Monitoring

No sites in WBID 1963 have been evaluated for HAs or SCIs during the October 2004 to September 2012 time period.

WBID 1974

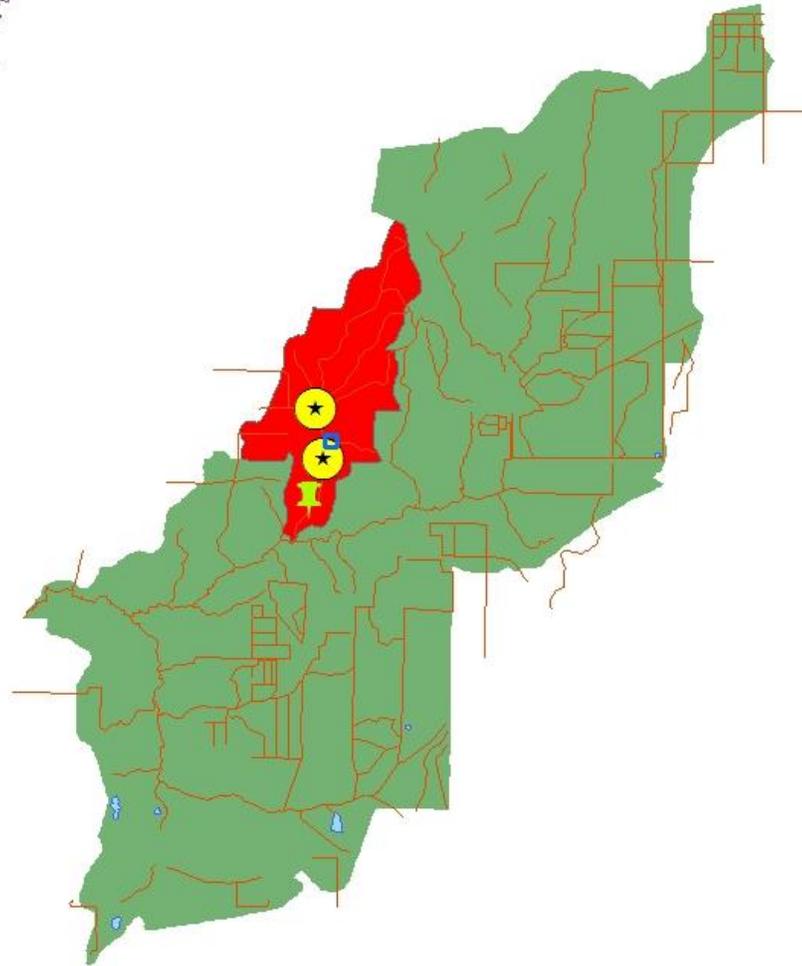
*Water Segment – Unnamed Branch
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None*

WBID 1974

**Water Segment – Unnamed Branch
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern: None**

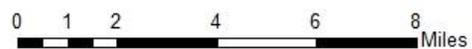


WBID 1974
Water Segement - Unnamed Branch
Joshua Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  FARMS Projects - Operational
-  Reconnaissance Network Locations
-  Backplug Location
-  WBID 1974
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1974

Water Segment – Unnamed Branch
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

No wells were back plugged during this reporting period.

District Resource Regulation – Water Use Permitting

Nine Water Use Permit (WUP) applications were submitted to the District for WBID 1974 over the entire reporting period of performance monitoring (October 2004 to September 2012). Six were for renewals, one was for a modification, and two were letter modifications.

WUP Renewals and Modifications in WBID 1974

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	0	1	2	3
WUP Modifications	0	0	1	0
WUP Letter Modifications	0	0	1	1
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) and/or Environmental Quality Incentives (EQIP) Projects

One FARMS/EQIP project was Board approved during the October 2004 – September 2012 time period in WBID 1974. The following table summarizes this project, as well as ground water offsets that have occurred over the performance monitoring period. Details for the project listed below can be found in Appendix IV.

FARMS Projects in WBID 1974; October 2004 September 2012

Project Number/Type	Project Operational/ (Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
^a WUP #20001391 – H570 (blueberries)	December 2009	48,600	33,588	95,881

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

^aFunding also provided by EQIP

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 1974.

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1974 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are no instantaneous data collection activities occurring in WBID 1974 at this time.

Specific Conductance Reconnaissance Network (District)

WBID 1974

*Water Segment – Unnamed Branch
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Within WBID 1974 there are currently two stations monitored for the Specific Conductance Reconnaissance Network. Of the 28 individual specific conductance values collected within WBID 1974 during the period of record, one value exceeded the 775 uS/cm goal criteria and no values exceeded the FDEP surface-water quality Class I criterion of 1275 uS/cm. The following table summarizes the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1974. Individual values for each dry season event are also provided.

Dry season percent changes for the 2008-2010 reporting period were mixed for one station and decreasing for one station in WBID 1974.

Specific Conductance Reconnaissance Results in WBID 1974; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent Change Dry Season 2004 vs. Dry Season 2005	Percent Change Dry Season 2005 vs. Dry Season 2006
Maple Branch @ Roan St. - #	673	129	720	641	634	↑6.98%**	↓11.94%**
Maple Branch @ SR 70 - # 7	492	121	518	350	500	↑5.28%**	↓3.47%**

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 1974; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent Change Dry Season 2006 vs. Dry Season 2007	Percent Change Dry Season 2007 vs. Dry Season 2008
Maple Branch @ Roan St. - #	349	704	507	868	456	↑11.04%	↑23.30%
Maple Branch @ SR 70 - # 7	384	662	455	610	419	↑32.40%	↓7.85%

Specific Conductance Reconnaissance Results in WBID 1974; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent Change Dry Season 2008 vs. Dry Season 2009	Percent Change Dry Season 2009 vs. Dry Season 2010
Maple Branch @ Roan St. - # 8	661	395	647	427	↓23.8%	↓2.1%
Maple Branch @ SR 70 - # 7	696	389	526	438	↑14.1%	↓24.4%

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1974 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1974 at this time.

WBID 1974

*Water Segment – Unnamed Branch
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None*

Habitat Assessment and Stream Condition Index Monitoring

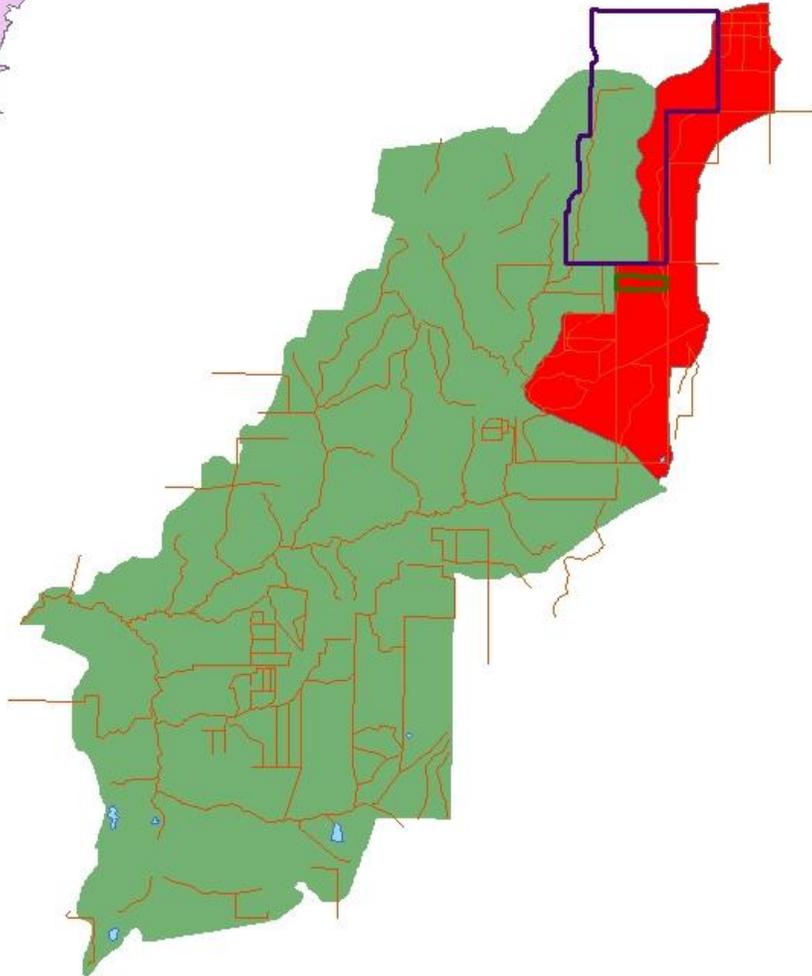
No sites in WBID 1974 were evaluated for HAs or SCIs during the October 2004 to September 2012 reporting period.

WBID 1977
Water Segment – Honey Run
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

WBID 1977
Water Segment – Honey Run
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None



WBID 1977
Water Segement - Honey Run
Joshua Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  WBID 1977
-  FARMs - Potential Projects
-  FARMs - Dormant Contacts
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1977
Water Segment – Honey Run
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date, no irrigation wells have been back-plugged in WBID 1977.

District Resource Regulation – Water Use Permitting

Eight Water Use Permit (WUP) applications were submitted for WBID 1977 to the District over the entire reporting period of performance monitoring (October 2004 to September 2012), one was for a new permit, two were for a renewal, three were for letter modifications, and one was for a modification.

WUP Renewals and Modifications in WBID 1977

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	1	0
WUP Renewals	0	1	0	1
WUP Modifications	0	1	0	0
WUP Letter Modifications	0	0	2	1
WUP Owner Transfer	0	0	0	1

Facilitating Agricultural Resource Management Systems (FARMS) Projects

To date, there are no Board approved FARMS projects in WBID 1977; however, two projects were under consideration between October 2004 and September 2012.

FARMS Projects in WBID 1977; October 2004 – September 2012

Project Number / Type	Project Operational/ (Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
*WUP #20007957 (citrus)	N/D	N/D	N/D	N/D
*WUP #20012562 (citrus)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date no irrigation wells have been back-plugged in WBID 1977.

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1977 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are no instantaneous data collection activities occurring in WBID 1977 at this time.

Specific Conductance Reconnaissance Network (District)

WBID 1977

Water Segment – Honey Run

Joshua Creek Watershed

Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

There are currently no water quality sites being monitored for the Specific Conductance Reconnaissance Network in WBID 1977.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1977 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1977 at this time.

Habitat Assessment and Stream Condition Index Monitoring

During all four reporting periods for this Performance Monitoring document, no sites in WBID 1977 have been evaluated for the HAs or SCIs.

WBID 1997

Water Segment – Hawthorne Creek

Joshua Creek Watershed

Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

WBID 1997

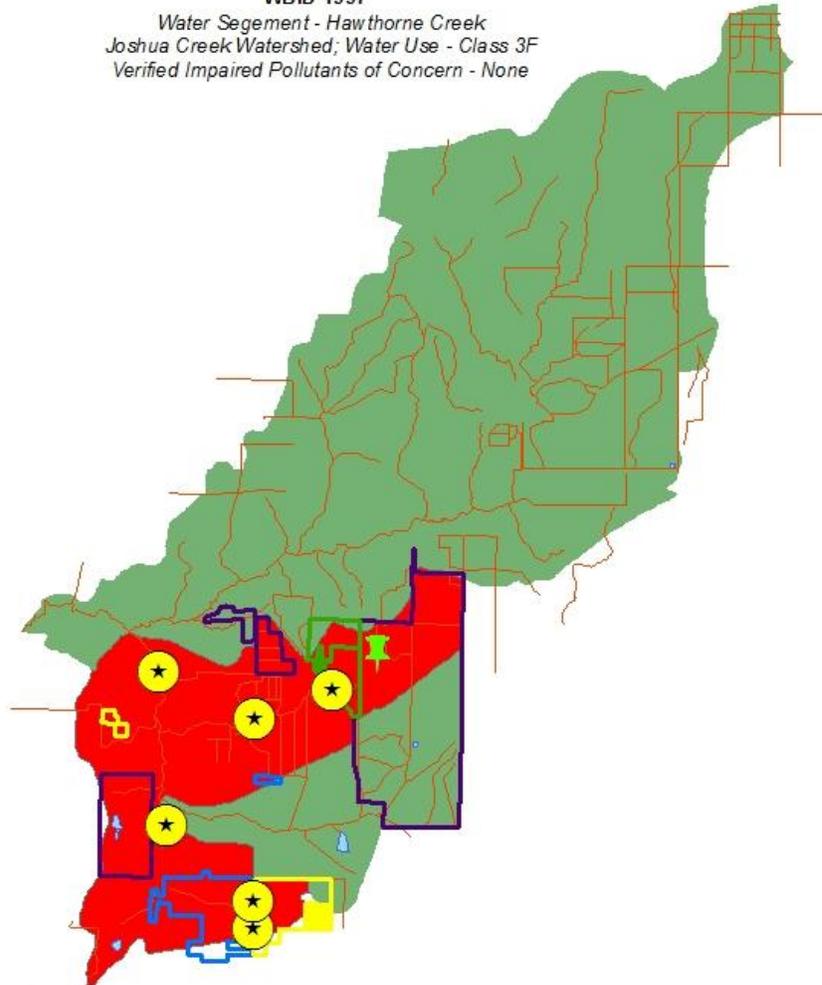
Water Segment – Hawthorne Creek

Joshua Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

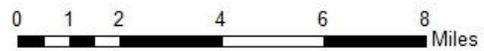


WBID 1997
 Water Segement - Hawthorne Creek
 Joshua Creek Watershed; Water Use - Class 3F
 Verified Impaired Pollutants of Concern - None



Legend

-  Reconnaissance Network Locations
-  Backplug Locations
-  WBID 1997
-  FARMS Projects - Under Construction
-  FARMS - Potential Projects
-  FARMS Projects - Operational
-  FARMS - Dormant Contacts
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 1997
Water Segment – Hawthorne Creek
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of this Program, a total of nine irrigation wells have been back-plugged in WBID 1997. The following table represents water quality improvements for chloride and TDS concentrations at these wells directly following back-plugging activities. No additional wells have been back-plugged since October 2004.

Pre- and Post Well Back-Plugging Results in WBID 1997

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20005060	2	33%	65%
20005060	3	N/A	N/A
20005060	4	11%	28%
20005060	5	37%	87%
20005060	7	49%	88%
20005060	9	58%	93%
20005060	10	64%	94%
20005060	12	47%	90%
20005060	13	68%	95%

District Resource Regulation – Water Use Permitting

Fifty-three Water Use Permit (WUP) applications were submitted for WBID 1997 to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the fifty-three applications, thirty-eight were renewals, seven were owner transfers, seven were letter modifications and one was a modification.

WUP Renewals and Modifications in WBID 1997

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	2	9	10	17
WUP Modifications	0	1	0	0
WUP Letter Modifications	1	1	0	5
WUP Owner Transfer	0	0	2	5

Facilitating Agricultural Resource Management Systems (FARMS) Projects

Six FARMS projects were Board approved in WBID 1997 between October 2004 and September 2012, one of which was subsequently cancelled. Five additional projects were under consideration during this time period. The following table summarizes the projects, as well as projected and actual ground water offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

WBID 1997
*Water Segment – Hawthorne Creek
 Joshua Creek Watershed
 Water Use – Class 3F
 Verified Impaired Pollutants of Concern: None*

Potential FARMS Projects in WBID 1997; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20002418, 20012818, 20009716 – H560 (blueberries, electronics)	February 2010	25,000	27,268	346,989
^a WUP #20002418 – H522 (blueberries)	March 2008	50,130	65,287	89,636
^a WUP 200013225 – H557 (sod)	January 2010	128,320	30,195	162,933
WUP #20004641 – H594 (citrus)	September 2012	32,000	Under Construction	Under Construction
*WUP #20002665 – H682 (citrus)	(September 2013)	65,000	Under Construction	Under Construction
*WUP #20005060 – H502 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20007331 – H660 (citrus)	N/D	N/D	N/D	N/D
*WUP #20008660 – H545 (citrus)	N/D	N/D	N/D	N/D
*WUP #20008480 (citrus)	N/D	N/D	N/D	N/D
*WUP #20007854 (citrus)	N/D	N/D	N/D	N/D
*WUP #20009567 (citrus)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2010

N/D = Not determined/project under consideration

^aFunding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

Quality of Water Improvement Program (QWIP)

There have been no wells plugged/abandoned in WBID 1997 since October 2004.

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

There are no instantaneous data collection activities occurring in WBID 1997 at this time.

Specific Conductance Reconnaissance Network (District)

Within WBID 1997 there are currently six stations monitored for the Specific Conductance Reconnaissance Network. Of the 67 individual specific conductance values collected within WBID 1997 during the period of record, 47 values exceeded the 775 uS/cm goal criteria and 18 values exceeded the FDEP surface-water quality Class I criterion of 1275 uS/cm. The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 1997 during the 2004-2006, 2006-2008, 2008-2010 and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event are denoted as dry in the following table.

WBID 1997
Water Segment – Hawthorne Creek
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

Dry season percent changes for the 2010-2012 reporting had percent changes that were either decreasing or not calculated for the reporting period due to dry stations in 2008.

Specific Conductance Reconnaissance Results in WBID 1997; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 vs. Dry Season 2005	Percent Change Dry Season 2005 vs. Dry Season 2006
Upper Hawthorne Cr. @ Piggyback Rd. - #14	1457	423	943	748	1422	↓35.28%**	↑50.80%**
Unnamed Cr. @ SR 31 Near 760A - #31	1347	512	1226	690	1461	↓8.89%**	↑19.17%**
Unnamed Cr. @ CR 763 - #8	1303	630	1165	869	1447	↓10.59%**	↑24.21%**
Unnamed Cr. @ CR 763 - #10	*	*	809	*	*	*	*
Unnamed Ditch @ CR 763 - #11	833	*	713	494	*	↓14.41%**	*
Hawthorne Cr. @ 760A	1108	315	1009	855	1435	↓8.94%**	↑42.22%**

* Station dry

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

WBID 1997
Water Segment – Hawthorne Creek
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

Specific Conductance Reconnaissance Results in WBID 1997; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 vs. Dry Season 2007	Percent Change Dry Season 2007 vs. Dry Season 2008
Upper Hawthorne Cr. @ Piggyback	673	1345	1020	1614	710	↓5.41%	↑20.00%
Unnamed Cr. @ SR 31 Near 760A - #31	468	*	908	2420	1517	*	*
Unnamed Cr. @ CR 763 - #8	573	1544	926	2401	960	↑6.70%	↑55.51%
Unnamed Cr. @ CR 763 - #10	*	*	*	*	789	*	*
Unnamed Ditch @ CR 763 - #11	669	*	*	*	*	*	*
Hawthorne Cr. @ 760A	595	1227	999	1511	981	↓14.49%	↑23.15%

* Station dry.

Specific Conductance Reconnaissance Results in WBID 1997; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 vs. Dry Season 2009	Percent Change Dry Season 2009 vs. Dry Season 2010
Upper Hawthorne Cr. @ Piggyback Rd. - #14	1001	574	838	891	↓38.0%	↓16.3%
Unnamed Cr. @ SR 31 Near 760A - #31	1545	737	1780	795	↓36.2%	↑15.2%
Unnamed Cr. @ CR 763 - #8	1506	844	1241	831	↓37.3%	↓17.6%
Unnamed Cr. @ CR 763 - #10	1004	733	828	*	*	↓17.5%
Unnamed Ditch @ CR 763 - #11	1101	710	858	*	*	↓22.1%
Hawthorne Cr. @ 760A	1347	752	876	754	↓10.9%	↓35.0%

* Station dry.

WBID 1997
Water Segment – Hawthorne Creek
Joshua Creek Watershed
Water Use – Class 3F
Verified Impaired Pollutants of Concern: None

Specific Conductance Reconnaissance Results in WBID 1997; 2010 - 2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 vs. Dry Season 2011	Percent Change Dry Season 2011 vs. Dry Season 2012
Upper Hawthorne Cr. @ Piggyback	1001	574	838	891	↓38.0%	↓16.3%
Unnamed Cr. @ SR 31 Near 760A - #31	1545	737	1780	795	↓36.2%	↑15.2%
Unnamed Cr. @ CR 763 - #8	1506	844	1241	831	↓37.3%	↓17.6%
Unnamed Cr. @ CR 763 - #10	1004	733	828	*	*	↓17.5%
Unnamed Ditch @ CR 763 - #11	1101	710	858	*	*	↓22.1%
Hawthorne Cr. @ 760A	1347	752	876	754	↓10.9%	↓35.0%

* Station dry.

Pre- and Post Back-Plug Well Monitoring Network (District)

To date, no wells in WBID 1997 are monitored as part of the Back-Plug Well Monitoring Network.

Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

There are no water quality sample collection activities occurring in WBID 1997 at this time.

Habitat Assessment and Stream Condition Index Monitoring

No sites in WBID 1997 were evaluated for HAs or SCIs during the October 2004 to July 2006 time period. During the August 2006 to August 2008 reporting period, one site in WBID 1997 was evaluated for biological health indicators. No sites were evaluated for HAs and SCIs during the September 2008 to September 2012 time period. The results of the assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Hawthorne Creek at Reynolds	01/30/2008	41	51	92 Suboptimal	59 Category 2 ("healthy")

According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. This biological health assessment indicates that water quality is not having a detrimental effect on the biological communities of the Hawthorne Creek @ Reynolds site.

WBID 2001

Water Segment – Hog Bay

Joshua Creek Watershed: Water Use – Class 3F

Verified Impaired Pollutants of Concern: None

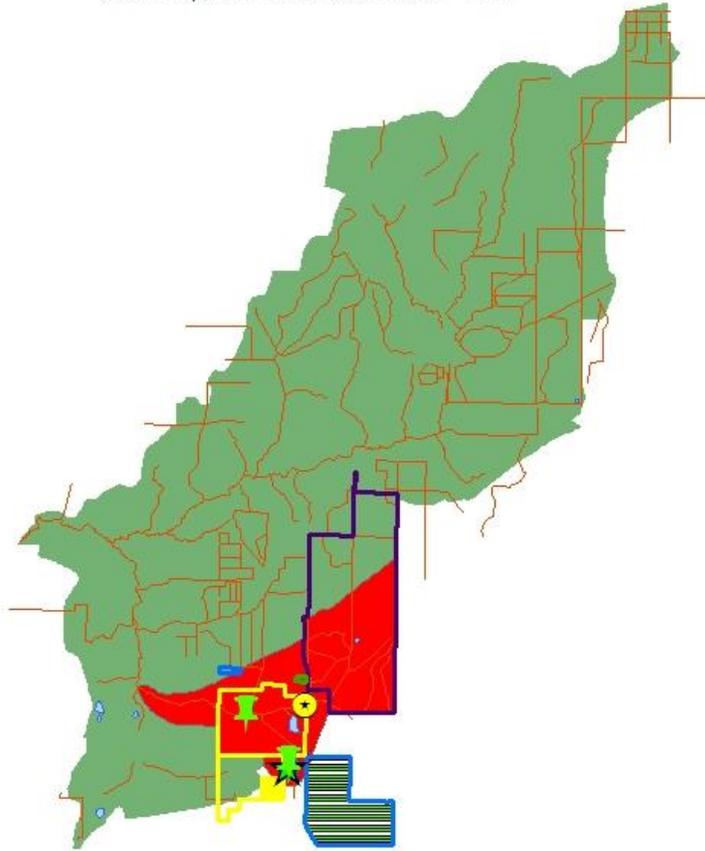
WBID 2001

Water Segment – Hog Bay

Joshua Creek Watershed: Water Use – Class 3F

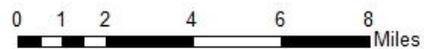
Verified Impaired Pollutants of Concern: None

WBID 2001
 Water Segement - Hog Bay
 Joshua Creek Watershed; Water Use - Class 3F
 Verified Impaired Pollutants of Concern - None



Legend

-  Reconnaissance Network Location
-  Groundwater Sample Location
-  Backplug Locations
-  WBID 2001
-  FARMs Projects - Under Construction
-  FARMs - Potential Projects
-  FARMs Projects - Operational
-  FARMs - Dormant Contacts
-  FARMs Projects - Board Approval Pending
-  Streams and Canals
-  Lakes
-  Joshua Creek Watershed



WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

Since the inception of the Program, a total of 12 irrigation wells have been back-plugged in WBID 2001. The following table represents water quality improvements for TDS and chloride concentrations at these wells directly following back-plug activities. One well was back-plugged in the current report period.

Pre- and Post Well Back-Plugging Results in WBID 2001

Permit Information		Percent Improvement	
WUP No.	DID No.	TDS (mg/L)	Chloride (mg/L)
20009716*	2	22%	54%
20006669	2	33%	45%
20006669	4	-18%	-46%
20006669	5	34%	62%
20006669	8	94%	99%
20006669	9	N/A	0%
20006669	10	77%	90%
20006669	11	94%	99%
20006669	12	N/A	N/A
20006669	12	95%	99%
20006669	13	83%	91%
20006669	15	48%	84%

 Denotes repeated back-plug
 *Only this DID continues to be monitored.

District Resource Regulation – Water Use Permitting

Sixteen Water Use Permit (WUP) applications were submitted to the District in WBID 2001 over the entire reporting period of performance monitoring (October 2004 to September 2012). Of the sixteen applications, seven were renewals, three were owner transfers, and six were letter modifications.

WUP Renewals and Modifications in WBID 2001

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	2	0	3	2
WUP Modifications	0	0	0	0
WUP Letter Modifications	1	0	0	5
WUP Owner Transfer	0	0	2	1

WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Facilitating Agricultural Resource Management Systems (FARMS) Projects

Twelve FARMS projects were Board approved in WBID 2001 between October 2004 and September 2012, one of which has subsequently been cancelled. Three additional projects were under consideration during this time period. The following table summarizes the projects, as well as projected and actual groundwater offsets that have occurred over the performance monitoring period. Details for each of the below listed projects can be found in Appendix IV.

Potential FARMS/EQIP Projects in WBID 2001; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20006669 – H505 Phase I (citrus)	April 2006	170,900	58,150	413,300
^a WUP #20006669 – H569 Phase II + Culverts (citrus)	March 2010	107,700	198,011	795,469
WUP #20006669 – H604 Phase II Pump 2 (citrus)	November 2010	70,000	148,023	294,962
WUP #20006669 – H673 Phase III (citrus)	(January 2013)	173,000	Under Construction	Under Construction
WUP #20006669 – H695 Phase IV (citrus)	(March 2014)	100,000	Board Approval Pending	Board Approval Pending
WUP #20009716 – H530 (blueberries)	February 2007	71,200	120,097	402,433
WUP #20002418, 20012818, 20009716 – H560 (blueberries, electronics)	February 2010	25,000	27,268	632,369
^a WUP #20002418 – H522 (blueberries)	March 2008	50,130	65,287	309,871
^a WUP #20006765 – H516 – Phase I (citrus)	August 2006	222,500	267,600	1,175,689
^a WUP #20006765 – H516 – Phase II (citrus)	March 2009	76,980	206,600	711,581
^a WUP #20006765 – H584 - Phase III (citrus)	June 2010	348,400	327,000	877,065
WUP #20006765 – H693 -Phase IV (citrus)	(January 2014)	87,100	Board Approval Pending	Board Approval Pending
*WUP #20002665 – H682 (citrus)	(September 2013)	65,000	Under Construction	Under Construction
WUP #20005060 – H502 (citrus)	Cancelled	Cancelled	Cancelled	Cancelled
*WUP #20020103 (strawberries)	N/D	N/D	N/D	N/D

*Potential project under consideration between October 2004 and September 2012

N/D = Not determined/project under consideration

^aFunding also provided by EQIP

**The actual ground water offset fluctuates with weather conditions and seasons. The actual is calculated by dividing the number of days the project has been operational into the total gallons offset.

WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Quality of Water Improvement Program (QWIP)

From October 1, 2003 to date, one well has been plugged/abandoned through the QWIP Program in WBID 2001. The well was associated with WUP No. 20011200.03, DID number 2. It had a casing diameter of ten inches, a casing depth of 96 feet, and a total depth of 929 feet below land surface. The specific conductance at the time the well had geophysical logging performed on February 10, 2005 was 1,089 uS/cm. The well was plugged on January 20, 2006.

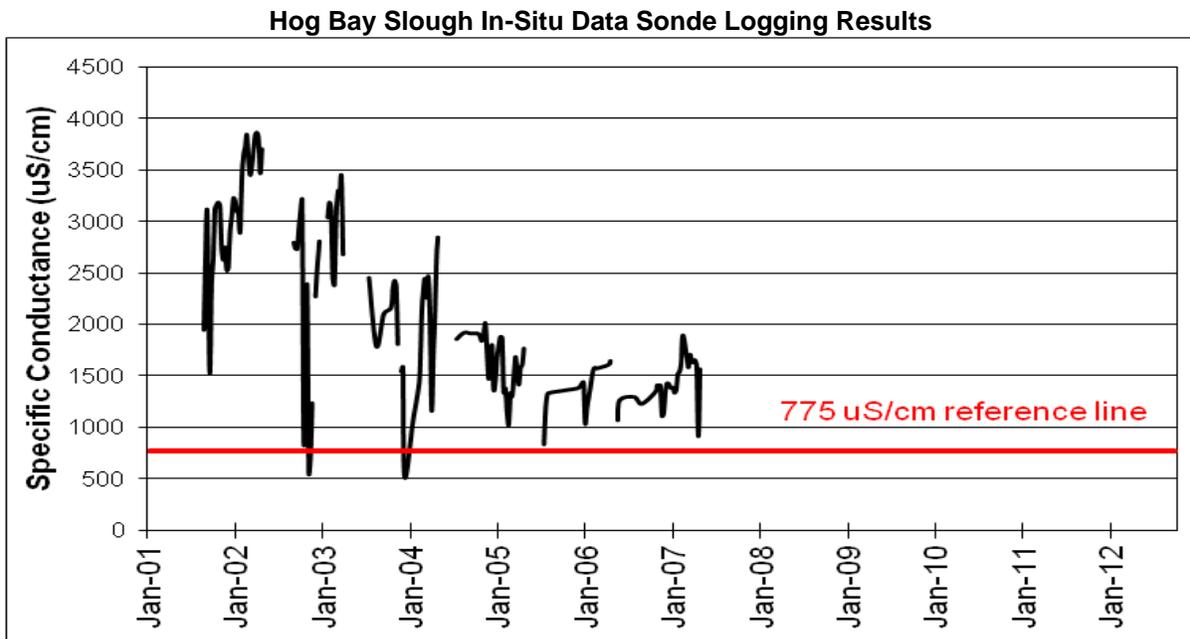
SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

From May 2001 to May 2007, there was one YSI® 600XLM data sonde deployed in WBID 2001 at station Hog Bay Slough in the Joshua Creek watershed. This monitoring location is no longer active because the property owner has denied access. This site is located in the western portion of WBID 2001, and flows from this canal enter Joshua Creek. The major contributing land use to this canal is agriculture (citrus), and this monitoring station is located directly within a citrus grove. Battery malfunctions occurred during May 2003, December – February 2003, and October – November 2005; therefore, no data exists for these time periods.

The following data plot shows weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency during dry season periods (November – May) from October 2001 through May 2007. A table located at the end of this section provides the overall data sonde specific conductance monitoring results for WBID 2001.

Back-plugging activities that occurred on this property in 2001 at eight well site locations have resulted in noticeable decreases in specific conductance in this canal system throughout the period of data record (see Case Study No. 2 in the SPCWMP Reasonable Assurance document).



Specific Conductance Logging Results in WBID 2001 over Entire Period of Data Record

WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Hog Bay Slough	29,868	24,302	81.4%	163	160	98.2%

Specific Conductance Reconnaissance Network (District)

Within WBID 2001 there are currently two stations monitored for the Specific Conductance Reconnaissance Network. Individual values for the Hog Bay Slough – Prairie River Grove station have been excluded from this section since they were discussed earlier in this plan in the In-Stream Specific Conductance Logging Network section. Of the 14 individual specific conductance values collected within WBID 2001 during the period of record, no values exceeded either the 775 uS/cm goal criteria or the FDEP surface-water quality Class I criterion of 1275 uS/cm. The following tables summarize the percent change increases and/or decreases between dry season events for each monitoring station within WBID 2001 during the 2004-2006, 2006-2008, 2008-2010, and 2010-2012 reporting periods. Individual values for each dry season event are also provided. Stations that were not flowing during a sample event have been recorded as dry in the table.

Overall, dry season percent changes for the 2010-2012 reporting period had decreased.

Specific Conductance Reconnaissance Results in WBID 2001; 2004 - 2006

Station	Dry Season 2004 Value uS/cm	Wet Season 2004 Value uS/cm	Dry Season 2005 Value uS/cm	Wet Season 2005 Value uS/cm	Dry Season 2006 Value uS/cm	Percent change Dry Season 2004 versus Dry Season 2005	Percent change Dry Season 2005 versus Dry Season 2006
Hog Bay @ SR 31 - #9	605	205	403	318	622	↓33.39%**	↑54.34%**

**Values modified since 2004 – 2006 Performance Monitoring Report due to calculation error.

Specific Conductance Reconnaissance Results in WBID 2001; 2006 - 2008

Station	Wet Season 2006 Value uS/cm	Dry Season 2007 Value uS/cm	Wet Season 2007 Value uS/cm	Dry Season 2008 Value uS/cm	Wet Season 2008 Value uS/cm	Percent change Dry Season 2006 versus Dry Season 2007	Percent change Dry Season 2007 versus Dry Season 2008
Hog Bay @ SR 31 - #9	197	284	348	464	611	↓54.34%	↑63.38%

Specific Conductance Reconnaissance Results in WBID 2001; 2008 - 2010

Station	Dry Season 2009 Value uS/cm	Wet Season 2009 Value uS/cm	Dry Season 2010 Value uS/cm	Wet Season 2010 Value uS/cm	Percent change Dry Season 2008 versus Dry Season 2009	Percent change Dry Season 2009 versus Dry Season 2010
Hog Bay @ SR 31 - #9	772	565	612	431	↑66.4%	↓20.7%

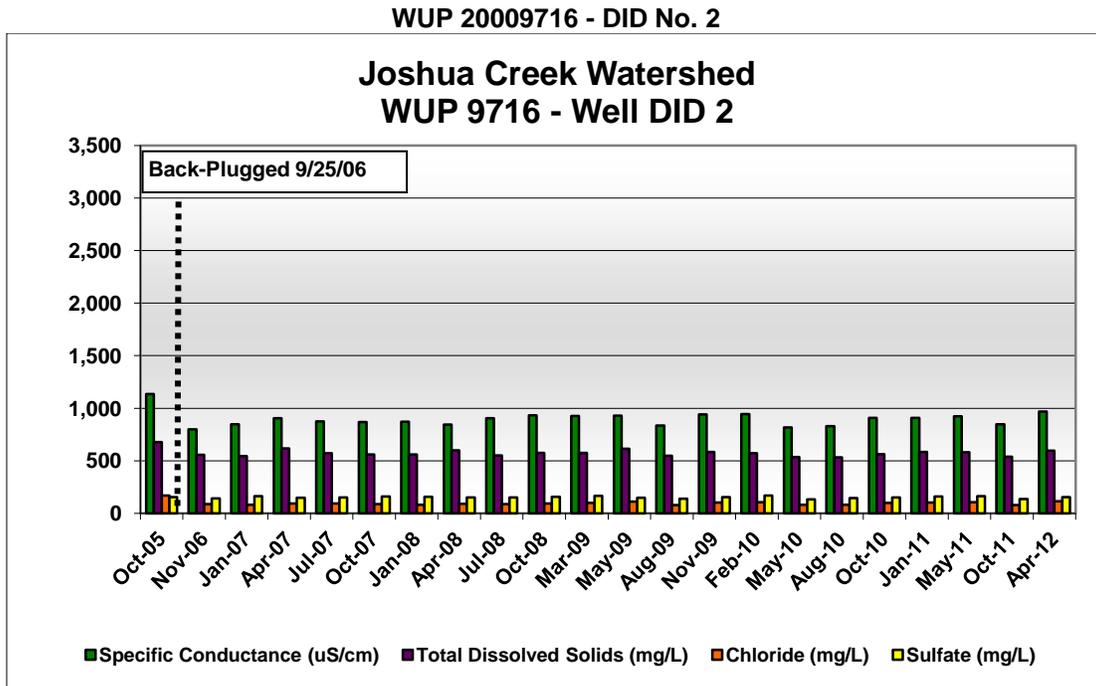
WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Specific Conductance Reconnaissance Results in WBID 2001; 2010-2012

Station	Dry Season 2011 Value uS/cm	Wet Season 2011 Value uS/cm	Dry Season 2012 Value uS/cm	Wet Season 2012 Value uS/cm	Percent change Dry Season 2010 versus Dry Season 2011	Percent change Dry Season 2011 versus Dry Season 2012
Hog Bay @ SR 31 - #9	486	577	314	246	↓20.6%	↓35.4%

Pre- and Post Back-Plug Well Monitoring Network (District)

There is one back-plugged well in WBID 2001 that is sampled on a quarterly frequency to monitor long-term improvements in water quality and to also ensure that the back-plug has remained functional. The following graph represents water quality results throughout the period of data record for this quarterly monitored well showing both pre- and post back-plug values for specific conductance, sulfate, chloride, and TDS. To date, this well has retained the integrity of the post back-plug concentrations for these parameters.



Surface-Water Quality Monitoring Networks (District, FDEP, and City of Punta Gorda)

The following table represents water quality results through July 2006 for chloride and TDS concentrations at one monitoring station (Hog Bay Slough) in WBID 2001. Since this monitoring site is not considered a key index station, graphical results are not presented here but can be found in Appendix I. The following information was generated using data from the District's SPJC quarterly monitoring network. Monitoring began at this location in June 2003 and ended in September 2007 due to access denial by the property owner.

WBID 2001
Water Segment – Hog Bay
Joshua Creek Watershed: Water Use – Class 3F
Verified Impaired Pollutants of Concern – None

Chloride and TDS Water Quality Results in WBID 2001 over Entire Period of Data Record

Water Segment	Number Individual Reported CI Values	Number Individual CI Values >250 mg/L	Percentage Individual CI Values >250 mg/L	Number Individual Reported TDS Values	Number Individual TDS Values >500 mg/L	Percentage Individual TDS Values >500 mg/L	Number Individual TDS Values >1000 mg/L	Percentage Individual TDS Values >1000 mg/L
Hog Bay Slough	58	35	60.3%	59	59	100%	56	95%

*Monitoring site located in agricultural canal – not on main channel of Joshua Creek.

Habitat Assessment and Stream Condition Index Monitoring (District)

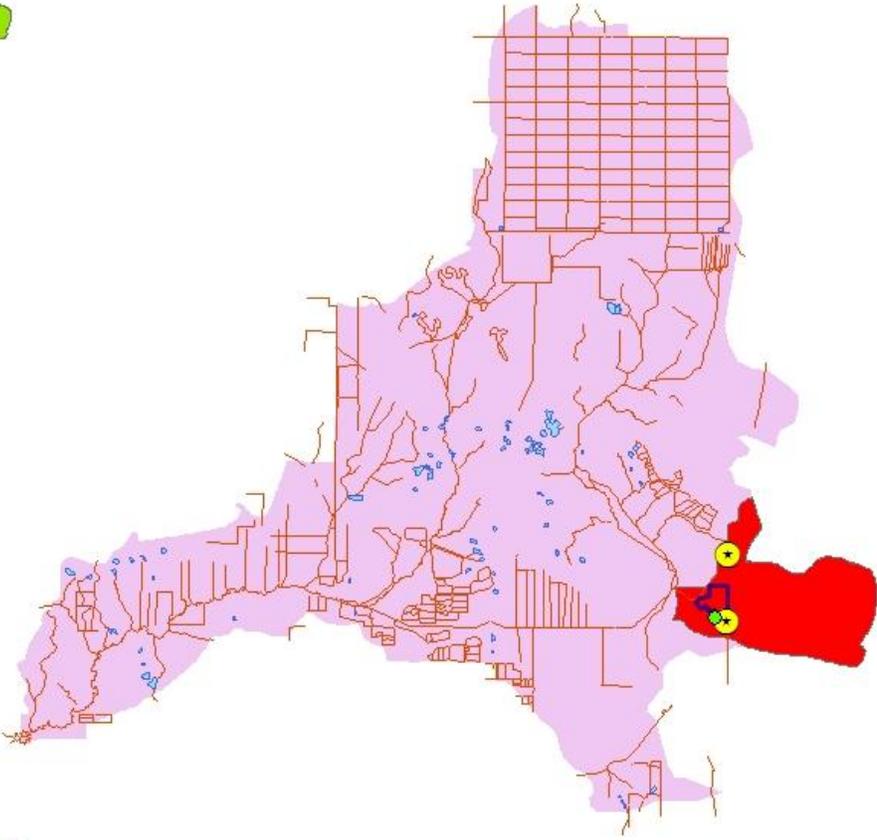
No sites in WBID 2001 were evaluated for HAs or SCIs during the October 2004 to July 2006, September 2008 to September 2010, and 2010 to 2012 reporting periods. During the August 2006 to August 2008 reporting period, two sites in WBID 2001 were evaluated for HAs and SCIs. The results of the assessments are presented below.

Habitat Assessment and Stream Condition Index Results

Station	Assessment Date	In-stream Characteristics Score	Morphological and Riparian Features Score	Overall Habitat Assessment Score	Overall SCI Score
Hog Bay Slough	05/23/2007	40	67	107 Suboptimal	46 Category 2 ("healthy")
Hog Bay at CR 763	01/30/2008	42	36	78 Marginal	53 Category 2 ("healthy")

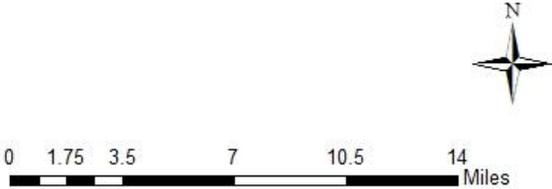
According to FDEP SOP 002/01 LT 7000, stations scored as Category 2 ("healthy") are characterized as having a diverse assemblage of species, with a small increase in dominance by a single taxon; very tolerant taxa represent a small percentage of individuals. These assessments indicate that water quality is not having a detrimental effect on the biological communities at the Hog Bay Slough and Hog Bay at CR 763 sites.

WBID 2020
Water Segement - Gannett Slough
Prairie Creek Watershed; Water Use - Class 3F
Verified Impaired Pollutants of Concern - None



Legend

-  Data Sonde Location
-  Reconnaissance Network Sites
-  WBID 2020
-  FARMS - Dormant Contacts
-  Lakes
-  Streams and Canals
-  Prairie Creek Watershed



WBID 2020

*Water Segment – Gannett Slough
Prairie Creek Watershed
Borders DeSoto/Highlands Counties/SFWMD
Water Use - Class 3F
TMDL verified impaired pollutants of concern: None*

WBID 2020

**Water Segment – Gannett Slough
Prairie Creek Watershed
Borders DeSoto/Highlands Counties/SFWMD
Water Use - Class 3F
TMDL verified impaired pollutants of concern: None**

WBID 2020
Water Segment – Gannett Slough
Prairie Creek Watershed
Borders DeSoto/Highlands Counties/SFWMD
Water Use - Class 3F
TMDL verified impaired pollutants of concern: None

Proposed Management Actions – Progress to Date

Shell, Prairie, and Joshua Creek Well Back-Plugging Program

To date, no irrigation wells have been back-plugged in WBID 2020.

District Resource Regulation – Water Use Permitting

One Water Use Permit (WUP) applications were submitted for WBID 2020 to the District over the entire reporting period of performance monitoring (October 2004 to September 2012). The application was for a renewal.

WUP Renewals and Modifications in WBID 2020

	Oct. 2004 – Jul. 2006	Aug. 2006 – Aug. 2008	Sept. 2008 – Sept. 2010	Oct. 2010 – Sept. 2012
New WUPs	0	0	0	0
WUP Renewals	0	1	0	0
WUP Modifications	0	0	0	0
WUP Letter Modifications	0	0	0	0
WUP Owner Transfer	0	0	0	0

Facilitating Agricultural Resource Management Systems (FARMS) Projects

One potential FARMS project was under consideration within this WBID between October 2004 and September 2012.

Potential FARMS/EQIP Projects in WBID 2020; October 2004 through September 2012

Project Number / Type	Project Operational/(Expected Operational) Date	Projected Ground Water Offset (gpd)	**Actual Ground Water Offset through September 2012 (gpd)	Max. Ground Water Offset Achieved in One Month through September 2012 (gpd)
WUP #20011665 (citrus)	N/D	N/D	N/D	N/D

N/D = Not determined/project under consideration

SPJC Water Quality Monitoring Results – Progress to Date

In-Stream Data Sonde - Conductance Logging Network (District and USGS)

The ***Gannet Slough*** data sonde is deployed in a small tributary/slough in the southeastern region of the Prairie Creek watershed. This monitoring site is located in the South Florida Water Management District and surrounding land uses include agriculture (citrus) and rangeland. Gannet Slough flows to the west, with flows eventually entering Montgomery Canal/Prairie Creek. Although WBID 2020 is not contained within the study/monitoring area boundary for SPJC management actions and monitoring initiatives, the District established this data collection site to determine the water quality of this tributary/slough and its potential impacts to the receiving surface waters in the Prairie Creek Watershed.

WBID 2020

Water Segment – Gannett Slough

Prairie Creek Watershed

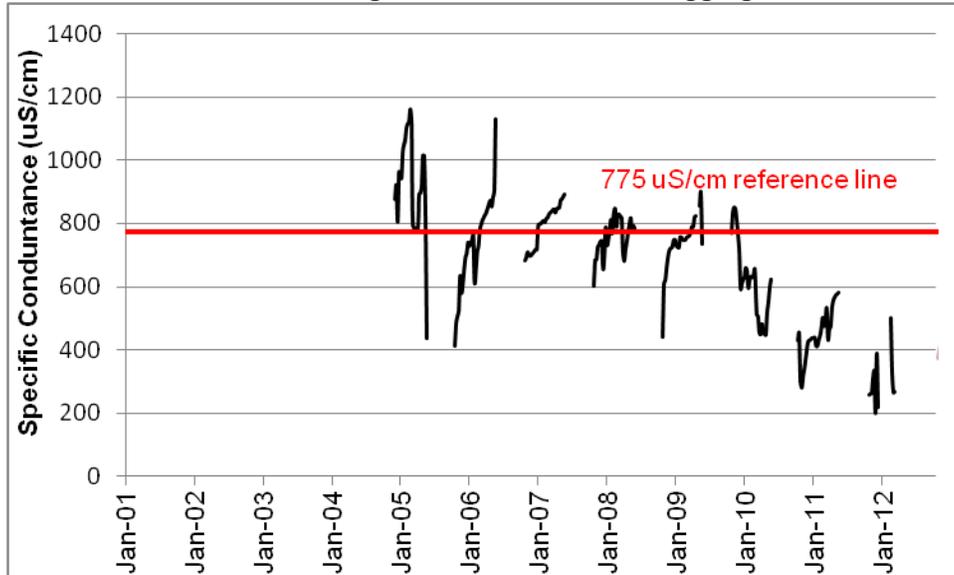
Borders DeSoto/Highlands Counties/SFWMD

Water Use - Class 3F

TMDL verified impaired pollutants of concern: None

The following data plot shows weekly median values for specific conductance, which have been calculated from independent values collected on an hourly frequency during dry season periods (November – May) from December 2004 through September 2012. Dry season specific conductance values have decreased over the period of record.

Gannett Slough In-Situ Data Sonde Logging Results



Specific Conductance Logging Results in WBID 2020 over Entire Period of Data Record

Water Segment	Number Individual Logged Values	Number Individual Values >1275 uS/cm	Percentage of Individual Values >1275 uS/cm	Number Weekly Median Values	Number Weekly Median Values >775 uS/cm	Percentage Weekly Median Values >775 uS/cm
Gannett Slough	41,455	4	0%	234	79	33.8%

Regional Management Actions in the SPJC Watersheds District Resource Regulation

The legislative basis for Water Use Permitting and Well Construction are codified in Chapter 373, Parts II and III, F.S. District rules Chapter 40D-2 (Consumptive Use of Water), and Chapter 40D-3 (Well Construction), were adopted by the District to implement these two Regulatory Programs. Under these programs an applicant must meet the three-prong test of Chapter 373 and the Conditions for Issuance in order for a permit to be issued for well construction or water use. If the application meets the Conditions for Issuance and the permit is issued with the appropriate standard and special conditions, the District is provided with the reasonable assurance that the well construction and water use will meet the District's regulatory program responsibilities and the Class I water quality standards.

Well Construction Permitting

Since implementation of the SPCWMP Reasonable Assurance document, staff has re-evaluated the number of irrigation wells related to WUPs that are proposed to be constructed in the three watersheds. Through current reporting period, approximately 156 wells were proposed to be constructed through approved WUPs within the SPJC watersheds. Of this total, 46 wells have proposed total depths that exceed the depth criteria*. These wells could potentially intersect highly mineralized zones within the Upper Floridan aquifer system and exceed water quality limits, therefore a maximum total depth will be imposed for these proposed WUP-related wells through well construction stipulations. Below is a breakdown of the proposed wells in all three watersheds.

**Approximate Number of Proposed Irrigation Wells - Potential Contributions to Impairment
(August 2006 – September 2012)**

Watershed	No. of Proposed WUP-Related Irrigation Wells (Aug. 2006 – Aug. 2008)	No. of Proposed WUP-Related Irrigation Wells (Aug. 2006 – Sept. 2010)	No. of Proposed WUP-Related Irrigation Wells (through 2012)**	Depth Criteria*	Total No. Proposed WUP-Related Wells Exceeding Criteria through 2012**
Joshua	36	37	35	1400	12
Prairie	74	65	75	1200	28
Shell	12	40	46	450	6
TOTALS	122	142	156	N/A	46

*Total depth criteria used in the well construction queries were taken from average depths of post back-plugged irrigation wells per watershed and ROMP well site vertical water quality profile data.

**Wells listed as proposed by watershed as of February 2013.

Well construction permits (WCP) associated with WUPs issued by the District will contain the following limitations and requirements for wells constructed in the Shell, Prairie, and Joshua Creek watersheds: 1) maximum total depth limits, 2) required water quality sampling with depth, and 3) a maximum specific conductance limit of 1000 uS/cm. Historically, two WCP Stipulations have been used to ensure that these criteria were followed: 1) Stipulation No. 31 – Special Well Construction and 2) Stipulation No. 41 – Special Well Construction – Water Quality Sampling. In 2007, these WCP Stipulations were combined into Stipulation No. 56 - Special Well Construction and water quality sampling for the Shell, Prairie, and Joshua Creek Watersheds. Copies of these three stipulations are attached in Appendix II.

The aquifer information generated from the well back-plugging program is available to regulatory staff. Staff will utilize the information when making decisions regarding well construction in order to avoid continued use of highly mineralized water as a permanent irrigation source.

Nearly 700 groundwater wells have been permitted and constructed in the SPJC since August, 2006. Staff is working on continued coordination to ensure all permits in these watersheds receive both stipulations.

**Approximate Number of Permitted and Constructed Wells in the
SPJC Watersheds (August 1, 2006 through September 30, 2012)**

Watershed	No. of Permitted and Constructed Wells	Depth Criteria*	Wells Exceeding Criteria
Joshua	405	1400	5 – 1 new, 3 repairs, 1 plugging
Prairie	166	1200	5 – 2 new and 3 repairs
Shell	122	450	8– 2 new, 2 repairs, and 4 pluggings
TOTALS	693	N/A	18 – 5 new, 8 repairs, and 5 pluggings

Well Construction

Geographic Information Systems (GIS) analyses of the District's well construction database indicate that there are approximately 1121 existing permitted and constructed groundwater irrigation wells within the SPJC watersheds. Of these existing wells, approximately 386 exceed the depth criteria.

**Approximate Number of Existing Permitted and Constructed Irrigation Wells Potentially
Contributing to Impairment in the
SPJC Watersheds (Through 2012)**

Watershed	No. of Existing Permitted and Constructed Irrigation Wells	Depth Criteria*	Wells Exceeding Criteria
Joshua	386	1400	89
Prairie	428	1200	154
Shell	307	450	143
TOTALS	1121	N/A	386

*Total depth criteria used in the well construction queries were taken from average depths of post back-plugged irrigation wells per watershed and Regional Observation Monitor Well Program (ROMP) well site vertical water quality profile data.

Additional GIS well construction depth analyses indicate that there are 528 permitted and constructed irrigation wells located in the three impaired WBIDs of Shell Creek and Prairie Creek. Of these wells, approximately 218 exceed depth criteria chosen for verified impaired WBIDs 1962, 2040 and 2041. Due to their location, these wells may directly contribute to impacts in area surface waters due to runoff from mineralized ground water. Testing of these irrigation wells is considered a priority effort in support of the FARMS Program and property owners will be given all possible assistance to expedite this task. A summary of existing irrigation well queries within the impaired WBIDs is given below.

Potential Number of Permitted and Constructed Irrigation Wells Directly Contributing to Impairment in the SPJC Watersheds

Watershed	WBID No.	No. of Permitted and Constructed Irrigation Wells	Depth Criteria*	Wells Exceeding Criteria
Shell	2040	144	450 ft.	92 (17 WUPs)
Shell	2041	117	450 ft.	38 (10 WUPs)
Prairie	1962	267	1200 ft.	88 (27 WUPs)
TOTALS	N/A	528	N/A	218 (53 WUPs – one WUP is in more than one WBID)

*Total depth criteria used in the well construction queries were taken from average depths of post back-plugged irrigation wells per watershed and ROMP well site vertical water quality profile data.

Within the impaired WBIDs, these "deeper" wells are associated with 27 WUPs in the Prairie Creek watershed and 27 WUPs in the Shell Creek watershed and may be directly contributing to mineralized concentrations within these three impaired surface water WBIDs. These properties are considered a priority within the SPCWMP Reasonable Assurance document and will be given all possible assistance under the FARMS Program. Twenty-two of these priority permits located in the three Shell and Prairie Creek priority watersheds have Board approved FARMS projects.

Water Use Permitting

The District regulates the use of groundwater and surface water for irrigation, as well as other uses through Chapter 40D-2, Consumptive Use of Water. As part of the evaluation process, the District requires all Water Use Permit (WUP) applicants to evaluate the economic, technical, and environmental feasibility of developing an alternative supply, such as surface water. Funding for development of these alternative supplies can be provided through the FARMS program. Farm operators have an additional incentive to participate in the FARMS Program to address water quality issues in the SPJC watersheds. A June 30, 2010 amendment to the District's water use permitting rules in Chapter 40D-2, F.A.C. address permits with a 20 year duration. The amendment language allows for 20 year permits to be issued in accordance with the following criteria outlined in 40D-2.321, "Duration of Permits." This Rule was amended again, with Rule development beginning in July, 2012 and the Rule became effective on January 1, 2013. The most recent Rule amendment allows more permits to be eligible for the 20 year duration and the language for each amendment is presented below.

June 2010:

- (1) When requested by an applicant, a water use permit shall have a duration of 20 years if:
 - (a) The applicant provides reasonable assurance that the proposed withdrawals and use meets the conditions for issuance in Rule 40D-2.301, F.A.C., and the criteria in Part B, Basis of Review, of the Water Use Permit Information Manual, incorporated by reference in Rule 40D-2.091, F.A.C., and*
 - (b) There is a demonstrated demand of at least 20 years, and*
 - (c) One or more of the conditions in paragraph (2) (a)-(f) will be met, and*
 - (d) Where mitigation measures are proposed by the applicant, paragraph (2) (g) is met.**
- (2) Conditions for a water use permit with a duration of 20 years:
 - (a) The permit is for the development of an Alternative Water Supply. A longer duration shall be granted where the permittee demonstrates a longer duration is required by the bonding authority for the retirement of bonds issued for the construction of the project and the applicant provides reasonable assurance that the proposed use meets the conditions for issuance in Rule 40D-2.301, F.A.C., and the criteria in Part B, Basis of Review, of the Water Use Permit Information Manual, and that there is a demonstrated demand for the requested duration.*
 - (b) The applicant demonstrates that at least 75 percent of their total annual average water needs will be met using an Alternative Water Supply or Supplies by the tenth year of the permit.*
 - (c) The applicant demonstrates that it has achieved and will maintain a compliance per capita rate of less than 110 gallons per day per person, or will achieve such per capita by the tenth year of the permit. For regional water supply authorities, the per capita rate requirements shall refer to the weighted average compliance per capita rate of the member governments.*
 - (d) The applicant demonstrates for its system-wide use of reclaimed water including imports and exports that it will beneficially reuse at least 75 percent of its treated domestic waste water, and at least 75 percent of that quantity will offset existing and planned water supplies by the tenth year of the permit. The term offset means the amount of traditional, potable quality water supplies that will be replaced by reclaimed water, expressed as an annual average in MGD.*
 - (e) The applicant demonstrates that the project meets the Conditions of Eligibility of the Facilitating Agricultural Resource Management System (FARMS) program as specified in Rule 40D-26.101, F.A.C. and has an approved Facilitating Agricultural Resource**

Management System (FARMS) application and, by the tenth year of the permit, demonstrates that it will develop an Alternative Water Supply or Supplies that offset a minimum of 50 percent of the applicant's current fresh or brackish water supply.

(f) The permit to be issued is a Small General.

(g) Any pre-existing adverse impacts resulting from the permittee's existing permit that are being addressed through a mitigation plan that includes a minimum flow and level recovery strategy must be eliminated by the tenth year of the permit.

January 2013:

(1) When requested by an applicant, a water use permit shall have a duration of 20 years provided the applicant provides sufficient data to demonstrate reasonable assurance that the proposed use meets the conditions for issuance in Rule 40D-2.301, F.A.C., and the criteria in Part B, Basis of Review, of the Water Use Permit Information Manual, incorporated by reference in Rule 40D-2.091, F.A.C. for the requested duration.

(2) If there are pre-existing adverse impacts resulting from the permittee's existing permit that are being addressed through a mitigation plan that includes a minimum flow and recovery strategy that must be eliminated by the tenth year of the permit, the water use permit shall have a duration of 10 years provided that the applicant provides sufficient data to demonstrate reasonable assurance that the proposed use meets the conditions for issuance in Rule 40D-2.301, F.A.C., and the criteria in Part B, Basis of Review, of the Water Use Permit Information Manual, incorporated by reference in Rule 40D-2.091, F.A.C. for the permit's duration. Subsection (3) shall not apply to a permit required to have a 10 year duration pursuant to subsection 40D-2.321(2), F.A.C.

(3) Permits that do not qualify for a 20 year permit duration pursuant to subsection 40D-2.321(1), F.A.C., shall be issued for a shorter duration that reflects the period for which the applicant has provided sufficient data to demonstrate such reasonable assurances that the proposed use meets the conditions for issuance in Rule 40D-2.301, F.A.C., and the criteria in Part B, Basis of Review, of the Water Use Permit Information Manual, incorporated by reference in Rule 40D-2.091, F.A.C.

(4) The District is authorized to issue permits for a period up to 50 years in accordance with Section 373.236(3), F.S.

(5) If the permitted water use activity ceases for more than 2 years the permit shall be subject to revocation unless documentation is provided indicating that use will recommence within the next year.

(6) Permits that are modified prior to renewal will maintain the original expiration date unless the applicant requests the modification be deemed by the District to be substantial as described in the Basis of Review Section 1.12, and treated as a renewal with modification. If the District determines that the criteria of Basis of Review Section 1.12 are met, the application shall be processed as a renewal application with modification. Notwithstanding Basis of Review Section 1.12(2)a.(5), a request for modification solely of the permit expiration date of a water use permit issued from January 1, 2003 to December 31, 2012, shall be approved by letter, provided the permit is in compliance with the criteria in Rule 40D-2.301, F.A.C. and all conditions of the permit, and the permit does not exceed the applicable permit duration provided in subsection 40D-2.321(1), F.A.C. or is a permit required to have a ten year duration pursuant to subsection 40D-2.321(2), F.A.C.

(7) Wholesale Public Supply Permits shall be issued with an expiration date that coincides with the expiration date of the supplier's permit that provides the majority of the supply to the Wholesale Public Supply Permittee.

(8) Subject to the limitations on groundwater allocations explained in the provisions under the heading “REQUIREMENTS FOR APPLICANTS FOR GROUNDWATER WITHDRAWALS WITHIN THE CENTRAL FLORIDA COORDINATION AREA” set forth in Section 3.6 of the Basis of Review (“the Provisions”), within the CFCA, the maximum permit duration for a Public Supply Utility or Similar Applicant proposing to withdraw groundwater shall be limited to December 31, 2013, unless the applicant will satisfy the requirements of B.2.a. or b., of the Provisions. If the applicant satisfies the requirements of B.2.a., or b., the permit duration shall be up to 20 years.

Since the implementation of the SPCWMP Reasonable Assurance document, staff have refined the boundaries of the watersheds and corrected the number of water use permits located in or bordering the watersheds. Based on that evaluation, there are currently 297 WUPs issued by the District in the Shell, Prairie and Joshua Creek watersheds for agriculture, mining/dewatering, public supply and industrial/commercial uses. During the October 2004 – July 2006 reporting period approximately 106.4 million gallons per day (mgd) was permitted for these four use types, approximately 117.6 mgd was permitted over the August 2006 – August 2008 reporting period, approximately 143 mgd was permitted for the September 2008 – September 2010 reporting period, and approximately 142 mgd for the September 2010- September 2012 period. During the current reporting period, approximately 87 percent of the total water use permits was issued for agricultural use with less than one percent for industrial/commercial, 1.5 percent issued for mining/dewatering, and 11 percent for public supply. The table below provides a complete breakdown of the WUPs in the Shell, Prairie and Joshua Creek watersheds over all four reporting time periods.

Water Use Permit Summary in the SPJC Watersheds (October 2004 – July 2006)

Predominant Use	Shell Creek (avg. gpd)	Prairie Creek (avg. gpd)	Joshua Creek (avg. gpd)	Total (avg. gpd)	Percent Use in Watershed
Agriculture	19,422,400	47,254,560	33,576,000	100,252,960	94.2%
Public Supply	5,370,100	347,600	155,000	5,872,700	5.5%
Mining/ Dewatering	95,000	121,000	0	216,000	0.2%
Industrial/ Commercial	0	0	76,100	76,100	0.1%
Total Permitted Quantities (gpd)	24,887,500	47,723,160	33,807,100	106,417,760	100.0%

Water Use Permit Summary in the SPJC Watersheds (August 2006 – August 2008)

Predominant Use	Shell Creek (avg. gpd)	Prairie Creek (avg. gpd)	Joshua Creek (avg. gpd)	Total (avg. gpd)	Percent Use in Watershed
Agriculture	17,631,300	47,624,600	33,870,700	99,126,600	84.4%
Public Supply	15,300,100	821,600	155,000	16,276,700	13.9%
Mining/ Dewatering	1,806,500	211,500	0	2,018,000	1.7%
Industrial/ Commercial	0	0	0	0	0%
Total Permitted Quantities (gpd)	34,737,900	48,657,700	34,025,800	117,421,300	100.0%

Water Use Permit Summary in the SPJC Watersheds (Sept 2008 – Sept 2010)

Predominant Use	Shell Creek (avg. gpd)	Prairie Creek (avg. gpd)	Joshua Creek (avg. gpd)	Total (avg. gpd)	Percent Use in Watershed
Agriculture	27,797,500	56,937,600	41,406,800	126,141,900	88.2%
Public Supply	15,300,100	821,600	155,000	16,276,700	11.4%
Mining/ Dewatering	319,700	204,300	0	524,000	0.4%
Industrial/ Commercial	0	0	76,100	76,100	<0.1%
Total Permitted Quantities (gpd)	43,417,300	57,963,500	41,637,900	143,018,700	100.0%

Water Use Permit Summary in the SPJC Watersheds (Sept 2010- Sept 2012)

Predominant Use	Shell Creek (avg. gpd)	Prairie Creek (avg. gpd)	Joshua Creek (avg. gpd)	Total (avg. gpd)	Percent Use in Watershed
Agriculture	25,716,200	57,213,300	41,391,780	124,321,280	87.1%
Public Supply	15,300,100	821,600	0	16,121,700	11.3%
Mining/ Dewatering	2,048,000	147,100	0	2,195,100	1.5%
Industrial/ Commercial	0	0	76,100	76,100	<0.1%
Total Permitted Quantities (gpd)	43,064,300	58,182,000	41,474,580	142,788,880	100.00%

Of the 11.3 percent for public supply, 99 percent is surface water from the Shell Creek Reservoir for the City of Punta Gorda. The remaining percentage is groundwater that is treated through a lime softening process or other similar process to meet drinking water standards prior to consumption.

The quantities of water for mining/dewatering are based upon that volume of water that is transported off-site as moisture contained within the product mined, generally sand or shell. The shallow water table aquifer water contained within the sand or shell does not contribute to the declining water quality in these two basins and is not considered an integral contributor to the water quality issues in these basins.

The permits that have been renewed in the past several years will contain all of the necessary special conditions designed to meet the water quality issues associated with this management plan. Appendix II provides an example of the special conditions attached to WUPs to address water quality impairment in the SPJC watersheds prior to 2007 and the revised/simplified special conditions in use after 2007.

Within the WUP renewal process, each applicant must address the issue of groundwater quality, the potential effects on the surface water bodies within each WBID in which it is located and address the composite water quality potentially leaving each site. An integral part of that analysis includes water quality sampling of ground water from existing wells and potentially modifying the construction of the existing well if the water quality does not meet the standard of 1000 uS/cm. In addition, if a new well is proposed under the water use permit the District will stipulate the construction standard in order to meet all of the requirements of the SPCWMP Reasonable Assurance document (see Appendix III).

Resource Regulation activities have already shown the ability to account for a significant improvement in surface water quality. As District staff performs water quality monitoring in tributaries that flow into Shell, Prairie and Joshua Creeks, they are able to identify potential water quality "hot spots". The location of these "hot spots" provides Regulation staff with additional information that can be taken into account during the WUP evaluation process. Regulation staff then urges permittees toward the FARMS and Back-Plugging Programs for cost-share assistance to address and remediate water quality issues at those sites. This staff coordination within the District will allow for continued water quality improvements within these watersheds.

Mini-FARMS Program

In 2005, the District and FDACS agreed to co-fund the Mini-FARMS Program, which assists smaller growers (generally defined as having irrigated acreage of less than 100 acres) in establishing Best Management Practices (BMPs) for water resource improvements within the District. The cost-share reimbursement rate was capped at 85 percent of verified costs for eligible items, up to a maximum amount of \$8,000 per project. Program cooperators sign a "Notice of Intent" (NOI) form that is submitted to FDACS staff to provide documentation that serves as proof of the applicant's intent to implement BMPs in accordance with F.S. 403.067(7) (c) 2.

Beginning in 2010 the Mini-FARMS cost-share rate was changed to 75 percent of verified costs for eligible items, up to \$5,000 per project with eligibility and reimbursements administered jointly by FDACS and the District.

To qualify for Mini-FARMS BMP cost-share the following criteria must be met:

- Production units under consideration for cost share are limited to 100 irrigated acres or less per parcel. All pressurized irrigation systems are encouraged to receive an expedited Mobile Irrigation Lab evaluation if water conservation BMPs are contemplated.
- Actively engaged in agriculture the past two years.
- All sites considered for possible cost share assistance must be free of active regulatory enforcement action that may influence the scope of the project.
- A grower must be enrolled to implement BMPs. Qualifying BMPs must be first time, new installations; the Mini-FARMS Program will not reimburse for like-kind replacements. Replacement of existing items may be eligible if improvements to the system can be demonstrated to have environmental benefits.

Of the total mini-FARMS projects implemented by all funding sources so far, three are located within the SPJC watershed.

Best Management Practices

Agricultural BMP Implementation through the Notice of Intent (NOI) Process and Florida Watershed Restoration Act

The FDACS coordinates with the FDEP and other stakeholders to identify and adopt science-based BMPs to minimize water quality and quantity impacts from agricultural operations. BMPs must be economically viable and focus on real problems using workable solutions. As a part of BMP implementation, growers participate in an environmental assessment of their farming operations. This process helps to identify the applicable BMPs to address water quality and quantity concerns. Farmers and ranchers submit the identified BMPs, those in place and planned, to FDACS along with an NOI to implement the BMPs. The District's Governing Board approved funding for this program at a level of \$50,000 covering the previous three Fiscal Years beginning in FY2010 through 2012 for a combined total of \$150,000. Additional funding support from the District is anticipated in future years.

Section 403.067(7) (c)(3), Florida Statutes, provides a *Presumption of Compliance* with water quality standards to growers who enroll in and implement/maintain FDACS BMPs that FDEP has verified as effective in addressing pollutant loads addressed by the practices. Participation in BMPs also precludes FDEP from recovering costs or damages associated with contamination of surface or ground waters from the targeted pollutants. Additionally, growers enrolled in the BMP Program can become eligible for cost-share funding to implement specific practices. FDACS has the lead role in coordinating the development and implementation of BMPs. The adopted manuals, rules, and other documents can be found at:

<http://www.floridaagwaterpolicy.com/BestManagementPractices.html>

Water Quality BMPs for Citrus Groves

In February 2005, the FDACS adopted a manual detailing BMPs for Citrus Groves in the Peace River and Manasota Basins. The complete historic manual can be found at:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_PeaceRiverCitrus2004.pdf

The FDACS adopted a consolidated, statewide citrus manual in 2012, which integrates flatwoods and ridge citrus BMPs into a single document:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_FloridaCitrus2012.pdf

Ridge Citrus operations will be required to re-enroll under the manual within a specified time period. While already-enrolled active flatwoods operations will be “grandfathered” under the new manual, grove owners who are re-establishing fallow groves will be encouraged and expected to re-enroll under the new manual. BMPs in the Citrus BMP Program involve water management systems, including tailwater recovery, surface water use, and soil moisture monitoring. These are activities the FARMS Program typically funds.

Overall, 43,344 citrus acres in the SPJC have been enrolled in the BMP program as of September, 2012.

Best Management Practices for Vegetable and Agronomic Crops

In 2006, the FDACS adopted a manual detailing the water quality/quantity BMPs for Florida Vegetable and Agronomic Crops. The manual is applicable to vegetable and agronomic crop farmers statewide. The manual addresses vegetables, potatoes, corn, soybeans, peanuts, peppers, sugarcane, and cotton. For the purposes of this manual, vegetables also include tomatoes, cucumbers, strawberries, melons, and various types of squashes. The FDACS plans to revise the manual in the near future to provide a clearer structure, update the BMPs as applicable, and include hay and caladiums.

The BMPs contained in the existing manual should decrease leaching of nutrients and agricultural chemicals into groundwater and reduce the off-site movement of pesticides, nutrients, sediments, and overall water volume to surface water sources. The major categories of BMPs are listed below. The manual can be found at: http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_VeggieAgroCrops2005.pdf

- Pesticide Management
- Conservation Practices And Buffers
- Erosion Control And Sediment Management
- Nutrient And Irrigation Management
- Water Resources Management
- Seasonal Or Temporary Farming

The BMPs assist in the implementation of the vegetable and agronomic BMP Program involve water management systems, including tailwater recovery systems, surface water use, and soil moisture monitoring. These are activities that FARMS typically funds.

Overall, 55 vegetable acres in the SPJC have been enrolled in the BMP program as of September, 2012.

Best Management Practices for Cow/Calf Operations

In 2009, the FDACS adopted a statewide BMP manual for beef cow/calf operations in Florida. These practices are designed to protect water resources and help maintain compliance with state water quality standards. The manual discusses Total Maximum Daily Loads (TMDLs) and why it is important to the rancher to implement BMPs. Assistance in conducting a site assessment and enrolling in BMPs can be obtained from FDACS and its contractors. Agricultural Extension agents may be able to provide technical assistance with BMP implementation.

Overall, 155,559 cow/calf operation acres in the SPJC have been enrolled in the BMP program as of September, 2012.

Best Management Practices for Florida Container Nursery

In 2007, FDACS adopted a statewide manual detailing the water quality/quantity BMPs for Florida Container Nurseries. The complete container nursery manual can be found by accessing the following link:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_FloridaContainerNurseries2007.pdf

The major categories of BMPs are listed below:

- Nursery layout
- Container substrate and planting practices
- Fertilization management
- Container substrate nutrient monitoring
- Irrigation water quality
- Irrigation application
- Irrigation uniformity
- Erosion control and runoff water management
- Pesticide management
- Waste management

Overall, 10 nursery acres in the SPJC have been enrolled in the BMP program as of September, 2012.

The complete container nursery manual can be found by accessing the following link:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_FloridaContainerNurseries2007.pdf

Water Quality BMPs for Sod Production

In 2008, FDACS adopted a statewide BMP manual for Florida Sod. The complete manual can be found by accessing the following link:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_FloridaSod2008.pdf

The major categories of BMPs are listed below:

- Nutrient management
- Irrigation scheduling
- Irrigation system maintenance and evaluation
- Sediment and erosion control measures
- Integrated pest management
- Wellhead protection
- Wetlands and springs protection
- Ditch construction and maintenance
- Conservation buffers
- Stormwater management
- Access roads
- Mowing management
- Seasonal farming operations

Overall, 1,228 sod acres in the SPJC have been enrolled in the BMP program as of September, 2012.

Water Quality BMPs for Specialty Fruit and Nut Crops

In 2012, FDACS adopted a statewide BMP manual for Specialty Fruit and Nut Crops, most significantly for the SPJC including blueberry production. The complete manual can be found by accessing the following link:

http://www.floridaagwaterpolicy.com/PDF/Bmps/Bmp_FloridaSpecialtyFruitNut2011.pdf

The major categories of BMPs are listed below:

- Nutrient management
- Irrigation management
- Sediment and erosion control
- Stormwater management
- Water resources protection
- Integrated pest management

Overall, 175 specialty fruit and nut acres in the SPJC have been enrolled in the BMP program as of September, 2012.

Water Quality BMPs for Florida Equine Operations

In 2012, FDACS adopted a statewide BMP manual for Florida Equine Operations. The complete manual can be found by accessing the following link:

<http://www.flrules.org/Gateway/reference.asp?No=Ref-00772>

The major categories of BMPs are listed below:

- Nutrient management
- Manure Management
- Sediment and Erosion Control
- Pasture Management
- Stormwater Management
- Water Resources Protection
- Equine Watering Requirements and Sources
- Pesticide/Pharmaceutical Use
- Animal Mortality Management

FDACS staff is currently encouraging equine operations to enroll in this recently developed BMP Program

Federal Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial assistance to farmers and ranchers who face threats to soil, water, air, plant and related natural resources on their land. Through EQIP, the NRCS provides assistance to agricultural producers in a manner that will promote agricultural production and environmental quality as compatible goals, optimize environmental benefits, and help farmers and ranchers meet federal, state, tribal, and local environmental requirements.

EQIP was reauthorized in the Farm Security and Rural Investment Act of 2008 (Farm Bill). The 2008 Farm Bill provides the funds, facilities, and authorities of the Commodity Credit Corporation (CCC) to NRCS for carrying out EQIP and working with landowners to implement conservation practices on their property.

National priorities will be used to guide which producers will be selected to receive EQIP funding. The national priorities are:

- Reductions of nonpoint source pollution, such as nutrients, sediment, pesticides, or excess salinity in impaired watersheds consistent with total maximum daily loads (TMDLs) where available; the reduction of surface and groundwater contamination; and the reduction of contamination from agricultural point sources, such as concentrated animal feeding operations;
- Conservation of ground and surface water resources;
- Reduction of emissions, such as particulate matter, nitrogen oxides, volatile organic compounds, and ozone precursors and depleters that contribute to air quality impairment violations of National Ambient Air Quality Standards;
- Reduction in soil erosion and sedimentation from unacceptable levels on agricultural land; and,
- Promotion of at-risk species habitation conservation.

The NRCS State Conservationist, with advice from the State Technical Committee, decides how funds will be apportioned into various resource concerns, what practices will be offered, what cost-share rates will be, and the ranking process used to prioritize contracts.

EQIP Eligibility

Persons engaged in livestock or agricultural productions are eligible for the program. Eligible land includes cropland, rangeland, pasture, private non-industrial forestland, and other farm or ranch land. Land that has been irrigated two of the last five years is eligible for EQIP assistance to improve irrigation efficiency. NRCS works with the participant to develop the Resource Management System (RMS) Plan of Operations. This RMS Plan becomes the basis for which practices are eligible for cost-share assistance and become part of the cost-share agreement between NRCS and the participant. NRCS provides cost-share payments to landowners under these agreements that can be up to ten years in duration.

The total amount of cost-share and incentive payments paid to an individual or entity is limited to an aggregate of \$300,000, directly or indirectly, for all contracts entered into during fiscal years 2009 through 2014.

EQIP Action Item Timeline

- EQIP has a continuous signup period.
- Annually, NRCS establishes a cutoff date for applications to be evaluated and ranked for current year funding.
- All applications received after the cutoff date will be held for evaluation for funding the following fiscal year.
- Stakeholder and local working group meetings are conducted to develop local resource concerns.

History of Funding in Charlotte County

Since 2004, there have been 37 farms funded under EQIP totaling 40,967 acres. The total cost-share funding obligated for the 37 farms was \$5,099,707.

History of EQIP Funding in Charlotte County; 2004 - 2012

Year	Acres	Cost-Share Funding Obligated
2004	831	\$345,100
2005	7,184	\$226,228
2006	2,355	\$791,885
2007	1,323	\$677,498
2008	12,238	\$559,425
2009	6,058	\$148,034
2010	1,640	\$845,331
2011	7,207	\$1,083,885
2012	2,131	\$422,321
Total	40,967	\$5,099,707

History of Funding in DeSoto County

Since 2004, there have been 37 farms funded under EQIP totaling 32,899 acres. The total cost-share funding obligated for the 37 farms was \$5,213,671.

History of EQIP Funding in DeSoto County; 2004 - 2012

Year	Acres	Cost-Share Funding Obligated
2004-2005	5,880	\$1,394,649
2006	0	\$0
2007	2,674	\$932,463
2008	4,326	\$1,377,116
2009	1,944	\$426,541
2010	4,631	\$107,591
2011	541	\$188,935
2012	12,903	\$786,376
Total	32,899	\$5,213,671

The following link provides additional information and a list of conservation practices:
<http://www.nrcs.usda.gov/PROGRAMS/EQIP/>

Regional Water Supply Plan and Southern Water Use Caution Area Recovery Strategy

In July 2011, the District Governing Board approved the “Regional Water Supply Plan” (RWSP) (SWFWMD, 2010). The RWSP is an updated assessment of projected water demands and potential sources of water to meet these demands in the Planning Region (which includes the SPJC watersheds) of the District for the period 2010 to 2030. The purpose of the plan, as an update to the 2006 RWSP, is to provide the framework for future water management decision in areas of the District where the hydrologic system is stressed due to ground-water withdrawals. The RWSP identifies potential options and associated costs for developing alternative sources. The RWSP is a critical component in the SPCWMP Reasonable Assurance document because it identifies and promotes the use of alternative sources, including surface water or improved irrigation management systems to provide conservation. The increased use of these alternative sources will decrease the reliance of the agricultural community on poor ground-water quality wells within the area covered under the SPCWMP Reasonable Assurance document.

The 2010 version of the RWSP specifically includes some of the key management actions that are also a part of the SPCWMP Reasonable Assurance document. Page seventeen of the RWSP (Executive Summary Volume) indicates that one of the guiding principles developed since the 2001 RWSP includes expanding agricultural conservation programs such as FARMS. In the Southern Region Volume, Pages 4, 80, 81, and 82 of the RWSP highlight the accomplishments and need for the use of FARMS Program, the Irrigation Well Back-Plugging Program, and the QWIP for water conservation. The emphasis these key SPCWMP Reasonable Assurance document management actions have within the context of the RWSP indicates the strong commitment to these efforts by the District and its cooperators in the Shell and Prairie Creek areas. Water resource planning in the RWSP is expected to continue to support efforts to reduce ground water use within the SPJC area, which will improve water quality in surface waters impacted by mineralized ground water withdrawals.

The Southern Water Use Caution Area (SWUCA) Recovery Strategy (SWFWMD, 2006) was completed in March 2006. As in the draft version of this report, the critical goal of this strategy is to reduce ground water withdrawals within the SWUCA (including the area of the SPCWMP Reasonable Assurance document) to improve lake levels in the Lake Wales Ridge area, increase river flows in the Upper Peace River, slow salt water intrusion in the Upper Floridan aquifer along coastal regions, and ensure there are sufficient water supplies for all existing and projected reasonable-beneficial users. As with the RWSP, the SWUCA Recovery Strategy specifically references agricultural conservation efforts and alternative supplies to accomplish these goals.

A specific example of these goals includes the new SWUCA resource regulation rules. These rules can require increased agricultural efficiencies as well as conditions on Water Use Permits that directly address the installation of alternative supply irrigation sources. These efforts reduce the reliance on ground water by the agricultural community which also limits the use of mineralized water that can potentially impact surface water.

Both the RWSP and the SWUCA Recovery Strategy focus extensively on reducing Upper Floridan aquifer ground water withdrawals. The focus on reducing Upper Floridan water use, as applied within the area of the SPCWMP Reasonable Assurance document, results in a reduction in the use of Upper Floridan aquifer zones that are potentially mineralized due to elevated concentrations of chloride, TDS, and specific conductance. A reduction in ground water use lowers the potential for poor water quality to enter area surface water bodies. This strongly links the RWSP and SWUCA Recovery Strategy with the Class I water quality

impairment issues described within this plan. As the recommendations and strategies in these documents continue to be implemented, including such efforts as FARMS projects, land acquisition activities, well plugging and back-plugging, and new water use rules, continued progress in improving water quality conditions is expected. The natural alignment on water resource issues that these two critical guidance documents provide to the relatively localized issue of the SPCWMP Reasonable Assurance document ensure considerable progress will be achieved.

Land Acquisition Programs

The Florida Forever Trust Fund was established by the Florida Legislature in 1999 and provides funding to several state agencies and the five Water Management Districts for land acquisition and acquiring less-than-fee (LTF) interests in land. To date, approximately 43,810 acres have been protected in the Prairie, Joshua and Shell Creek Watersheds through either fee acquisition or acquisition of LTF interests. Proposed land acquisition projects by the District in these watersheds total approximately 51,000 acres through fee acquisition or acquisition of LTF interests. The following table summarizes the acreage totals associated with these land acquisition projects.

Acquisition of the Long Island Marsh property easement was signed and is under additional review for wetland restoration through the USDA Wetlands Reserve Program. It has been proposed that 7,016-acre (fee) parcel be acquired. Terms under this agreement would potentially allow for the construction of surface water retention and storage areas. These projects would provide supplies of good water quality for augmentation of the Montgomery Canal/Prairie Creek system during dry season periods. Considerable ground-water use savings and surface-water quality improvement will be realized if these proposed property acquisitions are made through fee interests.

Summary of Acreage Totals Associated with District Land Acquisition Projects in the SPJC Watersheds

Project	Watershed/County	Acquired		Proposed		Total
		Fee	Less-than Fee	Fee	Less-than Fee	
Bright Hour Watershed	Prairie and Joshua/DeSoto		32,903		20,262	53,165
Prairie Creek Preserve	Prairie/Charlotte	1,644				1,644
Hathaway Park	Shell/Charlotte	14				14
Shell Creek Preserve	Shell/Charlotte	367				367
Biscayne Trust Conservation Easement	Shell/Charlotte		177			177
Babcock Ranch Preserve	Shell/Charlotte	2,126				2,126
Fred C. Babcock-Cecil M. Webb WMA	Shell/Charlotte	6,579				6,579
Lower Peace River	Joshua/DeSoto			399		399
Hall Ranch	Shell/Charlotte			6,571		6,571
Prairie/Shell Creek	Prairie and Shell/DeSoto and Charlotte			4,070	12,636	16,706
Long Island Marsh	Prairie/Charlotte, Desoto			7,016		7,016
Total		10,730	33,080	18,056	32,898	94,764

The Peace River/Manasota Regional Water Supply Authority recently completed the Regional Source Feasibility Study. Within the document, the Shell Creek System, located in north and east Charlotte County and southeast DeSoto County, is identified as a potential future water supply source out past 2020. The feasibility study investigated creating new storage and enhancing the available yield of Shell Creek. Part of this project could be done in conjunction with the City of Punta Gorda, who utilizes Shell Creek as their raw water source. The District could acquire lands in these regions of the Shell and Prairie Creek watersheds if this portion of the Study moves forward.

On November 7, 2006 Charlotte County citizens approved a referendum authorizing the county to issue up to \$77 million in bonds to purchase environmentally sensitive lands under the Conservation Charlotte initiative. These lands are to be held in preservation for public use. The bonds are paid for by a .20 mil ad valorem tax and will be levied annually until 2027. The Charlotte County Natural Resources Division is responsible for the management of these lands, and under this program anyone can nominate land for acquisition. Sites are reviewed using science-based criteria by biologists from the Natural Resources Division, with final purchases approved by the Board of Charlotte County Commissioners. Approximately 2,000 acres have been acquired since the inception of this program that fall within the impaired SPJC watersheds. The following table summarizes these purchased lands.

**Summary of Acreage Totals Associated with Charlotte County’s “Conservation Charlotte”
Land Acquisition Projects in the SPJC Watersheds**

Project	Watershed/County	Acres Acquired
Shell Creek Preserve	Shell Cr. / Charlotte	370
Prairie Creek Preserve	Prairie Cr. / DeSoto	1,600

Education and Outreach Activities

Education and outreach activities are an integrated collaborative approach at state, regional, and local levels. These cooperative efforts in the SPJC have involved the FDEP, FDACS, District, City of Punta Gorda, Charlotte Harbor National Estuary Program, Peace River Valley Citrus Growers Association, University of Florida/Institute of Food and Agricultural Science, USDA–NRCS, and Florida Farm Bureau. Activities have and continue to focus on State Legislative Delegations, Regional Policy Boards, and grower associations. Also, articles and press releases concerning this issue and associated recovery strategies are an on-going activity. Additionally, display booths and presentations are provided at relevant conferences and commodity trade organizations.

A considerable education and outreach effort is tied to the FARMS and Well Back-Plugging Programs. Each of these programs entails numerous site visits with potential program applicants which allows for an opportunity to educate individual growers on the water quality issues within the SPJC watersheds. Growers who have participated in these cost-share programs have realized significantly improved quality of water available for irrigation use. This, in turn, has resulted in improved tree quality and fruit yield. This education and outreach effort, coupled with the ability to demonstrate both environmental and economic impact improvements, provides the greatest opportunity to involve additional growers within the region in management actions.

See Appendix V for a partial list of media coverage, and outreach and education activities that have occurred throughout the timeline of this document.

Regional Water Quality Monitoring Networks

Coastal Ground-Water Quality Monitoring Network (District) and Water-Use Permitting Ground-Water Quality Monitoring Network (District)

Water quality data collected by the District's Water Quality Monitoring Program were used in Volume VI of the Coastal Ground-Water Quality Monitoring Network / Water-Use Permit Network Report (SWFWMD, 2011) in order to assess changes in the water quality of wells in the Coastal Ground-Water Quality Monitoring Network (CGWQMN) and the Water-Use Permit Ground-Water Quality Monitoring Network (WUPNET) over a period of fourteen years from 1993 to 2007. Monitor wells throughout the District were included in the analysis for this report. In order to assess the increases and decreases in chloride concentrations for the SPJC area, only information for Charlotte, Desoto, and Highlands counties from this report will be discussed.

According to the Coastal Ground-Water Quality Monitoring Network / Water-Use Permit Network Report, wells located in the Southern Water Use Caution Area (SWUCA), which incorporates the SPJC area, are particularly at risk of contamination by salt-water intrusion and sulfate enriched mineralized waters. This is most likely due to ground water withdrawals that reduce coastal discharge. The trending of both chloride and sulfate, along with chloride/sulfate ratios, were examined within the report. The Wilcoxon Rank-Sum test, a statistical trend analysis method, was used to evaluate the data. The data were separated into six different temporal groups and compared according to the bounds of the test. For the SPJC area, the percentage of wells with significant increases and decreases in chloride for Charlotte, Desoto, and Highlands counties is presented below.

From the seven-year temporal group chloride trend analysis comparisons performed, Charlotte and Desoto were two of the counties established to have monitor well(s) in the intermediate aquifer with significantly increasing chloride trends. It is important to note that other intermediate aquifer and Tampa/Suwannee monitor wells in these two counties also showed a significant decrease in chloride concentrations. A significant increase in chloride concentrations was reported for six wells (approximately 33 percent) in Charlotte County and one well (approximately 17 percent) in Desoto County. A significant decrease in chlorides was reported for three wells (approximately 17 percent) in Charlotte County and one well (approximately 17 percent) in Desoto County. This can possibly be explained by localized land uses, which may be contributing to the upwelling of transition zone waters. In Desoto County, the Tampa/Suwannee monitor well(s) were found not to have a significant increase in chloride concentrations, while five Ocala/ Avon Park monitor wells (approximately 83 percent) were found to have a significant increase in chloride concentrations. Conversely, in Charlotte County the Ocala/Avon Park monitor well(s) did not display any significant increases in chlorides, but one Tampa/Suwannee monitor well (25 percent) was reported to have a significant increase in chloride concentrations. Highlands County was only represented in the Ocala/Avon Park monitor well analysis and determined to have one well (50 percent) with a significant increase in chloride concentration. The following tables summarize the fourteen-year chloride trend results for Charlotte, DeSoto, and Highlands counties:

Fourteen Year Chloride Trend Analysis Results for Monitor Wells in Charlotte County

Well / Aquifer Type	No. Wells Analyzed	No. Wells w/Significant Trend	Percentage Wells w/Significant Trend
Intermediate	18	6↑, 3↓	33%↑, 17%↓
Tampa/Suwannee	4	1↑, 1↓	25%↑, 25%↓
Ocala/Avon Park	1	0↑, 0↓	0%↑, 0%↓

Fourteen Year Chloride Trend Analysis Results for Monitor Wells in DeSoto County

Well / Aquifer Type	No. Wells Analyzed	No. Wells w/Significant Trend	Percentage Wells w/Significant Trend
Intermediate	6	1↑, 1↓	17%↑, 17%↓
Tampa/Suwannee	4	0↑, 1↓	0%↑, 25%↓
Ocala/Avon Park	6	5↑, 0↓	83%↑, 0%↓

Fourteen Year Chloride Trend Analysis Results for Monitor Wells in Highlands County

Well / Aquifer Type	No. Wells Analyzed	No. Wells w/Significant Trend	Percentage Wells w/Significant Trend
Intermediate	0	0↑, 0↓	0%↑, 0%↓
Tampa/Suwannee	0	0↑, 0↓	0%↑, 0%↓
Ocala/Avon Park	2	1↑, 0↓	50%↑, 0%↓

Efforts to continue ground-water quality monitoring for salt water intrusion and/or up-welling of mineralized water through the CGWQMN and WUPNET are scheduled to be a continuous long term data collection effort. Automation of these trend data is currently scheduled to be released by the end of 2013.

Mobile Irrigation Laboratory

The following information was taken from the Fiscal Year Activity Reports, which are submitted to the District by the USDA, Natural Resources Conservation Service, Wauchula, Florida. Acreage evaluations for irrigation management and crop types are not broken down by geographical region because this information remains confidential to encourage greater participation by agriculture entities. Therefore, information specific to the SPJC Watersheds is not available.

Project Description

The Mobile Irrigation Laboratory (MIL) is a joint project of the District and the United States Department of Agriculture Natural Resources Conservation Service (NRCS). The purpose of the MIL project is to help farmers and growers in Southwest Florida conserve water through efficient irrigation. The Lab operator helps irrigators test the performance of irrigation systems, plan system improvements and establish irrigation schedules. In addition, the lab operator helps growers install tensiometers, water table observation wells and other water saving devices.

Accomplishments in 2010 - 2012

In Fiscal Year 2010 through 2012 (October 1, 2010 to September 30, 2012), the MIL assisted 12 growers or irrigation system operators. Twelve irrigation systems were tested serving a total of about 1,948 acres. If recommended improvements are made, the Potential Water Saving will be 557 million gallons per year (based on Farms Irrigation Rating Method estimates). One new microirrigation system was installed covering 31 acres. Follow up services were provided for eleven sites to review water management plans, plan system improvements, and install or

service water management equipment. From FY 2010 to FY 2012 MIL services (i.e. evaluations and irrigation management) were provided for irrigation systems serving over 2465 acres.

Accomplishments in 2008 - 2010

In Fiscal Year 2008 through 2010 (October 1, 2008 to September 30, 2010), the MIL assisted 10 growers or irrigation system operators. Eight irrigation systems were tested serving a total of about 355 acres. If recommended improvements are made, the Potential Water Saving will be 90 million gallons per year (based on Farms Irrigation Rating Method estimates). Five new microirrigation systems were installed covering 155 acres. Follow up services were provided for six sites to review water management plans, plan system improvements, and install or service water management equipment. From FY 2008 to FY 2010 MIL services (i.e. evaluations and irrigation management) were provided for irrigation systems serving over 3000 acres.

Accomplishments in 2007 - 2008

In Fiscal Year 2007 (October 1, 2006 to September 30, 2007), the MIL assisted 52 growers or irrigation system operators. Seven irrigation systems were tested serving a total of about 620 acres. If recommended improvements are made, an estimated 13 percent average increase in efficiency will result in these systems. Follow up services were provided for 45 sites to review water management plans, plan system improvements, and install or service water management equipment. In 2007 MIL services (i.e. evaluations and irrigation management) were provided for irrigation systems serving over 3000 acres. Since the beginning of the project in 1986, assistance has been provided for 1040 irrigation systems serving approximately 46,000 acres.

Much of the water management assistance in 2007 involved helping NRCS field offices with EQIP practices. The Wauchula field office and other field offices were assisted with checking needs, planning, designing or checking 30 irrigation systems for EQIP. An additional 15 cooperators throughout the area were assisted with irrigation system designs, evaluations or water management.

During Fiscal Year 2008 the MIL was without a designated operator due to a vacated position while the staff position was advertised and filled. A new operator was brought on board in late 2008 therefore only one project was conducted. This project was a single site irrigation efficiency evaluation.

Accomplishments in 2005 - 2006

In Fiscal Year 2006 (October 1, 2005 to September 30, 2006), the MIL assisted 31 growers or irrigation system operators. Thirteen irrigation systems were tested, serving a total of about 630 acres. If recommended improvements are made, an estimated 9 percent average increase in efficiency will result in these systems. Follow-up services were provided for 22 sites to review water management plans, plan system improvements, and install or service water management equipment. In 2005-2006, MIL services (i.e., evaluations and irrigation management) were provided for irrigation systems serving over 3000 acres.

IFAS Research Completed Prior to October 2010

Sod Irrigation on Farm Demonstration Project

Cooperator: University of Florida

Status: Completed

With the increase of urban growth the demand for sod production will also increase. Irrigation system choice and management of these systems for sod production includes seepage

irrigation by ditch conveyance; the use of subsurface tile; fully enclosed subirrigation and overhead irrigation through fixed systems; and center pivot and moveable big guns. No one system seems to be the system of choice or the system that provides for efficient water use and optimum sod production. This demonstration project monitored several typical sod irrigation systems in an established commercial setting to determine the effectiveness and efficiency of water use. A network of data collection sites for water table levels; weather data; pumping records; and production data were used to determine the effectiveness of different irrigation systems and their management. The use of GIS mapping allowed cross-site evaluation for such measurements as soil moisture, water table levels, and production quality. Data from the project was used to make recommendations for system and irrigation management improvements that aid in water conservation.

SWUCA Soil Water Balance and Citrus Evapotranspiration

Cooperator: University of Florida

Status: Completed

Research has shown that citrus trees have different water requirements through the growing season. The frequency of irrigation and the amount of water applied with each irrigation are dependent on local climatic conditions, soil water holding capacity, plant size and density. By knowing when and how much water to apply a grower will get optimum utilization of the water resource and conserve water. Most of the citrus water use research is based on overhead irrigation. Since the current standard is micro-irrigation, which applies water to a limited wetted area, the industry needs updated information to improve their irrigation efficiency.

Crops Coefficients & Water Use for Watermelons

Cooperator: University of Florida

Status: Completed

To improve the crops' water use efficiency and to help conserve water, it's important for the grower and the District to know exactly how much water the crops require. Currently, the District and the growers use water use values developed outside of Florida. Although these values seem to be reasonable, local information could help to reduce water use. The intent of this project was to develop crop coefficients to determine how much water is needed for watermelon production and to improve irrigation management. These values helped reduce water use, and were used to update the District's AGMOD program and for other conservation efforts.

Water Requirements for Transplant Establishment of Plastic Mulched Vegetable Crops Grown on Flatwoods

Cooperator: University of Florida

Status: Completed

Much variation occurs for the use of water for field preparation and crop establishment of transplanted vegetables grown on flatwoods soils. Whether or not a grower uses microirrigation, some form of subirrigation (i.e., seepage) is required to get the field into condition to form beds and establish new transplants. This study helped determine the amount of time and hence, the amount of water needed to ensure both survivability and water conservation. The results from this project helped producers make decisions as to the minimum period of time needed to establish a crop with respect to the irrigation systems used and local conditions. This resulted in providing growers with a water management tool to further conserve water resources. In addition the District used this information in AGMOD, its irrigation water use projection tool.

Reducing Winter and Fall Citrus Irrigation

Cooperator: University of Florida

Status: Completed

Recent one-year studies in Japan and Israel have indicated that water restriction to trees results in substantial water savings and, at the same time, benefits fruit quality. The intent of this project was to study when and how much water can be withheld from a mature citrus tree during the fall and winter months without impacting the fruit. After this objective is obtained, information from the project was distributed to the growers to help them reduce water use in an area of water use concerns.

Impact of Organic Amendments on Soil Water Retention and Water Conservation

Cooperator: University of Florida

Status: Completed

While the yield and biological effects of organic amendments have been investigated, the water conservation benefits of organic amendments have not been quantified for Florida. Research done in other parts of the U.S. has indicated that while the organic amendments can increase the field capacity of soil with higher than 15% clay, the net increase in the plant available water was not substantial. However, for sandy soils the preliminary research done elsewhere (Minnesota) indicates that there was a net increase in the water holding capacity. In light of the potential for amendments to increase the water holding capacity of soils and grower (citrus and vegetable) interest in using the amendments, efforts were needed to quantify the water conservation benefits of organic amendments in Southwest Florida. Preliminary research done by the PI at a vegetable grower site in Southwest Florida indicated that the fields treated with compost (yard waste) resulted in 3% increase in soil moisture compared to the no-compost site. There are other similar organic amendments available which may offer similar benefits. The objectives of this study were to quantify the effects of two organic amendments (yard waste + bio-solids and another commercially available product) on the water holding capacity and total water use in Southwest Florida. The organic amendments were implemented on a vegetable or citrus farm in Southwest Florida. Soil moisture monitoring instruments and flow measurement devices were installed to monitor continuous flow and soil moisture data for three years. Effect of organic amendments in increasing the wetted volume (drip/micro sprinkler) was also quantified.

Tailwater Recovery

Cooperator: University of Florida

Status: Completed

This project will build on previous research to examine best management practices for commercial vegetable farms in south Florida to reduce the potential re-introduction of pathogens via tailwater. The project's objective was to examine management practices and to formulate recommendations to reduce the potential impact of reintroducing economically important pathogens to the field. Management practices to reduce the likelihood of reintroducing pathogens were tested for commercial nurseries in Oklahoma and other sites. The project was intended to determine if it was possible that some of these strategies were applicable to vegetable crops including dilution of irrigation water with unused water to lower pathogen populations; sand filtration, UV light, chlorination, or ozonation. Also investigated were water sources managed by taking water for irrigation from deeper parts of the pond to promote the dilution, settling and die-off of the pathogen or pumping from the middle depth to avoid pathogens that settle on the bottom of the pond or motile spores, which aggregate on the surface of the water.

Reduction of Water Use for Citrus Cold Protection

Cooperator: University of Florida

Status: Completed

This is a multi-agency agricultural water conservation project which is intended to assist citrus producers in reducing water use for cold protection. The project is an expansion and enhancement of a previously successful Peace River and Alafia Basin Board project (B137). That project was taken statewide by FDACS, SFWMD and SJRWMD. Florida citrus growers use low volume irrigation to conserve water and to provide a more effective method of freeze protection. One characteristic of low volume irrigation used for citrus freeze protection is that the decision to use irrigation must be made prior to the water in the lateral irrigation lines reaching freezing temperatures of 32 degrees F. This project assisted in the development of site-specific methodology to accurately determine minimum temperatures the next morning based on sunset temperatures recorded the previous evening. This allowed for multiple temperature observations on cold nights from the growing area providing necessary replication of the Brunt equation. In addition, this project helped disseminate this information in newsletters and other sources, including FAWN to help the growers conserve water.

Evaluation and Demonstration of Soil Moisture Based on Demand Irrigation Controllers for Vegetable Production

Cooperator: University of Florida

Status: Completed

Water use information from this project will be used by growers to save water and reduce pollutant loading. Although soil moisture based control has been investigated in the past, the systems tested required either too much maintenance (e.g. tensiometers) or were too expensive to be practical for farmers. The technology being tested in this project consisted of commercially available controllers that have been marketed for irrigation control but have not been tested under Florida conditions for vegetable crops. Results from this project will help expedite the grower's acceptance of this water conserving technology. The project's statistical design will be a randomized complete block design with four replicates. Based on field trial results, a demonstration trial was conducted in a vegetable field within the District

Effects of Micro-Sprinkler Irrigation Coverage on Citrus Irrigation Management and Water Use

Cooperator: University of Florida

Status: Completed

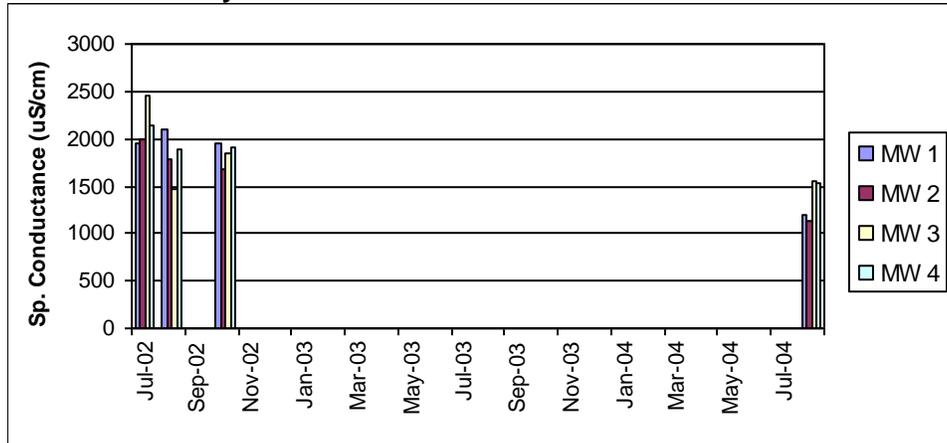
More than 300,000 acres of citrus are permitted within the Peace River Basin with most under micro-irrigation. Micro-irrigation efficiently supplies water to a tree's primary root mass and can significantly decrease water use. The project will assist improvements to irrigation system design and management that will help growers conserve water. The amount of water saved will depend on the implementation of management practices and area of crop production, which may periodically change with conditions of market and weather.

Back-Plugging of Deep Irrigation Wells and the Effects on Salinity in Surficial Aquifer Wells; Symons Grove, DeSoto County, Florida

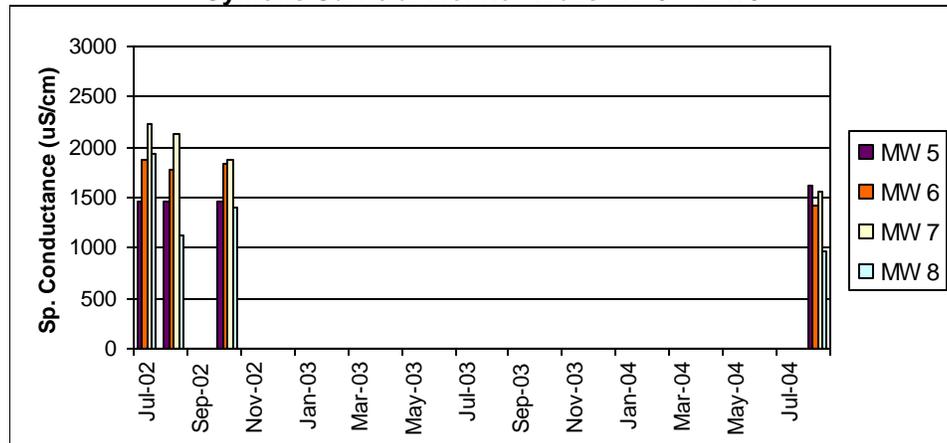
A District project study was initiated to determine whether successful back-plugging of deep irrigation wells would induce a subsequent decrease of salinity in shallow groundwater beneath a large, irrigated citrus grove in the Prairie Creek watershed (WBID 1962). In 2001, District staff back-plugged borehole intervals for three deep irrigation wells penetrating the Upper Floridan aquifer. Following these procedures, results of test pumping for these wells indicated a combined average of nearly 60 percent reduction in specific conductance from pre-existing conditions.

In 2002, 14 shallow monitor wells ranging in depth from about 12 to 20 feet were installed across the 450 acre property and configured for sampling at the water table. Two years later, 2004 monitoring results indicated shallow groundwater specific conductance had decreased overall on average nearly 25 percent from initial conditions. The following graphs show lower specific conductance values observed in the surficial aquifer wells in 2004 when compared to the 2002 time period. These lower values are believed to be the direct result of significantly improved quality in irrigation waters presently used at the grove.

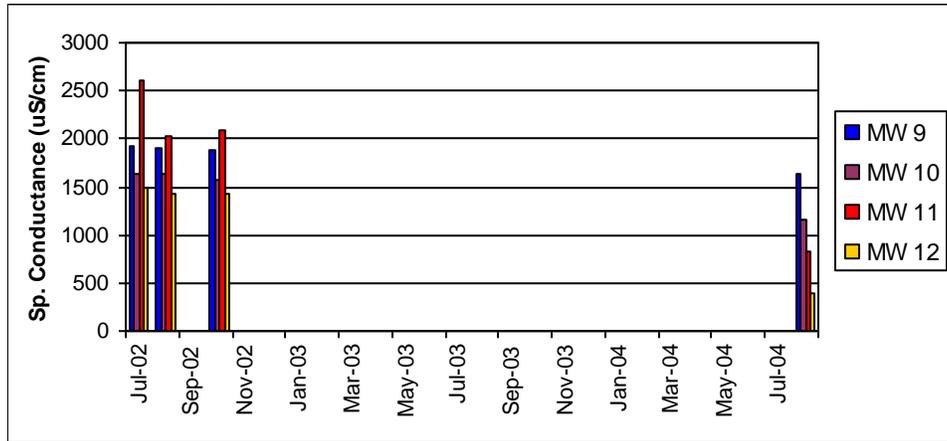
Symons Surficial Monitor Wells MW1 – MW4



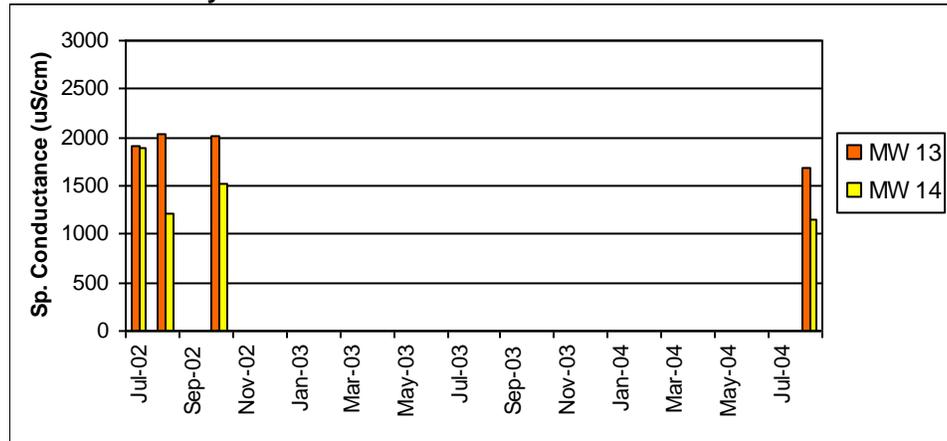
Symons Surficial Monitor Wells MW5 – MW8



Symons Surficial Monitor Wells MW9 – MW12



Symons Surficial Monitor Wells MW13 – MW14



Research Activities Completed between October 2010 and September 2012

Evaluation and Development of an Evapotranspiration Reference Model for Irrigation of Wood Ornamentals

Cooperator: University of Florida

Status: Completed

The key to irrigation conservation is knowing when and how much to irrigate. To improve nursery growers' irrigation water use, they must be more precise in the amount and frequency of irrigation they apply. Growers need to irrigate based on plant requirements and maximizing the use of rain events. This project will develop a mathematic nursery irrigation model based on reference evapotranspiration (ET_{ref}) to help them conserve water. The model will improve irrigation management by helping to determine the amount and frequency of irrigation, thus, helping to reduce ground water use in an area of water use concern.

Crop Coefficients and Water Use for Peppers in Southwest Florida

Cooperator: University of Florida

Status: Completed

Peppers are one of the major row crops grown in the District and in some regions, second only to tomatoes. The actual amount of water these crops use is based on soils, growing season and climatic conditions. To improve the crops' water use efficiency and to help conserve water, it is important for the grower and the District to know exactly how much water the crops require. This lysimeter study will determine how much water pepper plants in Southwest Florida need, determine crop coefficients, and an irrigation schedule to help growers.

Reducing Water Consumption in Polyethylene-Mulched Tomato and Pepper Fields After Methyl Bromide Phase-Out

Cooperator: University of Florida

Status: Completed

Tomato and pepper producers use methyl bromide (MBr) to fumigate their beds before production. About 50 to 95% of the MBr that is injected in to the soil can eventually enter the atmosphere and damage the earth's ozone layer. EPA's Clean Air Act (Amendments of 1990) requires that MBr and other similar chemicals be phased out. The loss of MBr has a major impact on the production practices of tomato and pepper producers in our District and can cause an increase their water use. This project will provide the water use information needed to address this change in technology.

Accounting for Interception of Sprinkler Irrigation Water by Container Grown Plants

Cooperator: University of Florida

Status: Completed

The plant canopy plays a critical role in the interception of sprinkler irrigation water. Depending on the size and architecture of the canopy, as well as the container spacing, interception of irrigation water can be greater than or less than the amount of irrigation water that would fall into the container. Typically, interception is considered a water loss and not accounted for when supplying irrigation water. This project will quantify the amount of water that is intercepted by the plant and funneled to the plant's container. By accounting for this intercepted water, the overall amount for irrigation management can be reduced. The industry is supportive of this project and will provide funds to reduce the overall project results.

Update of Net Irrigation Requirements for Turfgrass

Cooperator: University of Florida

Status: Completed

This project will accurately determine the net irrigation requirements for turfgrass, using defensible methodologies that render the information useful for broad planning and information purposes, as well as site-specific water use permitting. The previous net turfgrass irrigation requirements, published in IFAS's Bulletin 200 "Water Requirements of Florida Turfgrasses" in 1984 has been determined to no longer be valid due to the outdated methodology. This project will update the information using the more current and widely accepted methods to determine plant water requirements and measure evapotranspiration (ET) of turfgrasses.

Evaluation of Minimal Required Number of Soil Moisture Sensors

Cooperator: University of Florida

Status: Completed

Recently, the District and FDACS have funded multi-year projects to investigate the potential use of soil moisture based irrigation. The use of soil moisture sensors has shown strong potential for saving irrigation water. This project will determine how many sensors are needed

for each location. The information from the project will be used by the District's FARMS program and many also be used for permitting water use.

Ongoing Research Activities October 2010 through September 2012

Efficient Irrigation Practices for Florida Blueberries.

Cooperator: University of Florida

Status: Project in Progress

Blueberry production is a high valued cash crop. The estimated 2003 value of blueberry production in Florida was about \$18.6 million dollars. As the value of other crops decrease, more growers have been converting their fields to blueberries. A 1998 report estimated a 400% increase in blueberry acres by the year 2008. This four-budget year research project has quantified how much water a typical blueberry plant needs and will develop irrigation guidelines to help conserve water, reduce potential runoff and water quality impacts. A final report is due in 2013.

Automated Citrus Irrigation Management to Reduce Water Consumption

Cooperator: University of Florida

Status: Project in Progress

Agriculture is the largest permitted water use in the District and citrus production is the largest of those permitted uses. Over 366 MGD are permitted for citrus irrigation and most of that water use is in the SWUCA. This project will help citrus growers reduce their water use by developing tools to automate and improve irrigation scheduling. These tools can be used by the District's FARMS program to further expand their conservation efforts. Where applicable, this project will build on past projects and use new technology to help reduce water and fertilizer use.

Evaluation of Different On-Farm Blueberry Systems to Improve Irrigation Efficiency

Cooperator: University of Florida

Status: Project in Progress

This project will compare different irrigation management techniques under real production conditions to determine the most efficient way to irrigate blueberry plants. Due to current market conditions and plant diseases, many Central Florida agricultural producers have converted their production acres to blueberries, which is a high valued cash crop. Some of the newer blueberry growers have relatively little experience with blueberry irrigation and some of the existing producers might not be familiar with better ways to manage different irrigation systems. Researchers will create a demonstration plot in a grower's field. This plot will consist of different soils and irrigation methods to determine which is best for specific growing conditions. The projects results will be presented to the growers during a field day for them to learn and visualize the project's results.

Citrus Irrigation Management to Increase Young Tree Growth & Productivity on Flatwoods Ridge Soils

Cooperator: University of Florida

Status: Project in Progress

Because of citrus greening, canker and labor issues, the citrus industry has encouraged the University of Florida to develop alternative methods for economical production of citrus. One of the more promising methods includes high density planting of smaller, more compact trees, which was originally developed in Spain and later commercialized in South Africa, Australia and California. The project will center on new forms of technology that significantly changes plant density, irrigation and nutrient management, particularly with regard to benefits of reduced water use and nutrient loading. Florida citrus production remains one of the State's primary water

uses, and as many growers have recently begun to expand or replant operations in response to promising new practices to overcome diseases recently threatening the industry, it is important to develop further ways to conserve the resources necessary to meet ongoing production demands.

Determination of Maximum Acceptable Irrigation Deficit in Turf Grasses

Cooperator: University of Florida

Status: Project in Progress

The project will determine the level of deficit irrigation of three common turfgrasses (St. Augustine, Bahia and Zoysia) that will result in adequate turfgrass quality. Turfgrass response to varying levels and duration of soil water deficit will be studied. Deeper root development is associated with improved drought response. Therefore, fertility, mowing and irrigation management practices will also be studied to determine the effect on turfgrass root development. The first phase of the project will include performing container studies of the three types of turfgrass to determine the evapotranspiration (ET) rates and response of turfgrass quality and root characteristics to soil water deficit. Also during the first phase, field plots will be constructed at the UF/IFAS Turfgrass Research Unit in Citra. The second phase of the project will include monitoring of the field plots. Irrigation of the field plots will be controlled by soil moisture sensors and based on observations from the container studies. The effect of mowing height and frequency on root growth will also be studied in containers during the second phase, as will additional irrigation management practices and deficit nitrogen fertilization. The field project will continue into the third phase in order to assess repeatability of trends observed. Also in the third phase, new field plots will be established to test turfgrass response to mowing management practices that were observed during the second phase container study. The root depth, shoot growth, visual appearance and water use will be monitored during and after turfgrass establishment. The project will conclude after the third phase, and a final report will integrate all aspects of the project. Recommendations for deficit irrigation of the three turfgrasses will be presented.

Water Use of Two Bio Fuel Crops

Cooperator: University of Florida

Status: Project in Progress

High fuel prices and a strong national interest in greater energy independence and conservation have made biofuels important for the foreseeable future. In addition, the state of Florida is promoting biofuel production to assist the state's agricultural community. The southern half of Florida, with a subtropical climate, has good potential for biofuel crop production. Large-scale production of biofuel crops is likely to affect the water and related land resources in the nation, including Florida. The effects on water supply and water quality are especially important for southwest Florida due to already stressed surface and ground water resources. The water use of two potential energy crops, switchgrass, *Panicum virgatum*, and sweet sorghum, *Sorghum bicolor*, will be quantified. The results of this research will be necessary in evaluating the water supply needs of the biofuel crops and in developing improved strategies for sustainable agricultural production. This information will be used by the District to allocate water and could also be used by the FARMS program to determine project cost benefits.

IFAS BMP Implementation

Cooperator: University of Florida

Status: Project in Progress

The primary goal of this project is to assist IFAS in promoting BMPs, which include typical FARMS Program projects. District participation in this project will promote the establishment of additional FARMS Projects, which will provide water resource benefits. The Scope of Work for

the BMP Agreement includes: Assisting growers with conducting site assessments, selecting applicable BMPs, and filing Notices of Intent to Implement (NOIs); Following up with growers to determine whether they need help understanding or implementing BMPs, and providing technical assistance directly or by coordinating with the appropriate OAWP staff or IFAS Extension agents; Informing growers of available BMP-related programs offered by FDACS, the water management districts, and other entities; Providing field demonstrations, workshops, and other educational opportunities for growers and their employees concerning FDACS-adopted BMPs; Identifying areas of further educational needs.

Reduction of Water Use for Citrus Cold Protection

Cooperator: University of Florida

Status: Project in Progress

This is an ongoing agricultural water conservation project to assist citrus producers in reducing the amount of water used for cold protection. Citrus growers use their low volume sprinkler systems to conserve water during regular irrigation and also for cold protection under certain night-time freezing conditions. One characteristic of low volume sprinkler irrigation used for citrus cold protection is that the decision to use the irrigation system in this manner must be made prior temperatures dropping to the plant's critical freezing temperature and for citrus trees this temperature will change as winter progresses and the groves become more or less cold hardy. This project provides growers with an indication of their grove's potential cold hardiness-critical temperature range over the winter as reported to the FAWN weather system website, so growers can optimize their cold protection irrigation requirements.

New Research Activities: October 2010 – September 2012

Evaluation of Nutrient Leaching From Mixed Landscapes

Cooperator: University of Florida

Status: Project in Progress

This project will partner with the District's existing project, Investigation and Development of Methods to Determine Urban Landscape Irrigation for Planning and Permitting in Central Florida, to determine the impacts of irrigation scheduling on nutrient leaching. Information from this project will develop models based on irrigation, rainfall input, ET and plant size to determine nitrogen and phosphorus leaching.

Irrigation Requirements for Diverse Soilless and Open Field Production

Cooperator: University of Florida

Status: Project in Progress

Most of Florida's strawberry production occurs under the annual hill system, in which raised planting beds are fumigated for soil borne pest control, irrigated with drip lines, and covered with polyethylene mulch. Open-field production of strawberries uses elevated water volumes for plant establishment, crop maintenance and freeze protection. Currently, alternative production systems are being tested and implemented by growers and rural home owners to produce strawberry and vegetable crops. One of these systems consists of soilless medium with vertical or horizontal containers. This project will quantify the benefits of this type of production and provide information to the growers to help reduce their water use.

Automatic Sprinkler Irrigation in Container Nurseries Using a Web-Based Program

Cooperator: University of Florida

Status: Project in Progress

Irrigation scheduling based upon objective information has the potential to improve plant water use efficiency in the container nursery. A preliminary trial at the University of Florida resulted in

a 30% reduction in container nursery water use when using the web-based Container Crop Resource Optimization Program (CCROP) to manage irrigation versus a constant irrigation rate. CCROP utilizes a combination of cultural practices and daily weather information at the container nursery. The funding for the second year of this project will continue to develop a software-hardware interface to automatically operate irrigation control valves (as opposed to relying on the grower to manually operate valves) using the CCROP for producing ornamental crops in a commercial nursery. The addition to the Scope of Work beginning in the third year of the study will improve the ability of the grower to use the automated system, and therefore further increase efficiency and decrease water use, by integrating the CCROP irrigation scheduling program with a web based tool linked to FAWN weather data. The spreadsheet version of the irrigation scheduling system used in the initial Scope of Work will be translated into an interactive web version and testing of the web based system will be conducted in a commercial nursery.

Turfgrass Establishment

Cooperator: University of Florida

Status: Project in Progress

The project will determine the total water needs and watering interval for establishment of four common residential turfgrasses (Floritam St. Augustine, Captiva St. Augustine, Argentine Bahia, and Empire Zoysia). New turfgrass plots will be established at the Gulf Coast Research and Education Center in Balm (Hillsborough County) at least three times throughout the year for each of two years to represent a range of seasons and varying weather conditions.

Florida Automated Weather Network Data Dissemination and Education

Cooperator: University of Florida

Status: Project in Progress

The Florida Automated Weather Network (FAWN) project started in 1997 and the District's involvement with the project started in 2003. This project collects and distributes real-time weather and climatic data, specifically geared to agricultural users, to increase irrigation efficiencies and reduce water use. Funding for the project is provided annually and primarily supports network maintenance and enhancements. In FY2010 and FY2011 FAWN introduced a cold weather tool kit, designed to assist agricultural users in reducing their frost/freeze water use. FAWN also conducts educational workshops and commodity based weather schools to promote the proper use of the information available on the FAWN website.

Citrus Irrigation Soil Moisture Sensors

Cooperator: University of Florida

Status: Project in Progress

This water conservation project will evaluate the use of soil moisture sensors and a soil water balance model to more effectively irrigate a large citrus grove using automated irrigation equipment. The soil moisture and irrigation control systems will be provided by the co-operator and will be partially funded by the FARMS program. The Orange-Co, Inc. Joshua Grove will be the demonstration site for irrigation scheduling with both soil moisture sensors and the Citrus Water Management System (CWMS). The grove is currently equipped with six soil moisture sensor arrays that are recorded on a daily basis. Irrigation is being scheduled for approximately 17,000 acres of grove using these few sensors. Grove management is not satisfied with these few sensor sites and will expand the number of soil moisture sensors to 36 AquaSpy sensor arrays over the next 3 years. Irrigation schedules will be automated using Motorola radio linked control equipment including diesel engine starts. Irrigation in selected grove blocks will be scheduled using the soil moisture sensors or the CWMS for a three-year period. The project will demonstrate the use of soil moisture models, soil moisture sensors, and automated irrigation

systems with engine starts, demonstrate the Citrus Water Management System on a large citrus operation, expedite the acceptance of the CWMS soil water balance model, compare soil water estimates at several depths by CWMS to soil moisture sensor data, compare water use with intensively managed systems with irrigation water use of surrounding groves, and provide educational programs to cooperators, citrus growers, SWFWMD personnel, and mobile irrigation lab field agents.

Evaluation of Bed Geometry for Water Conservation on Drip Irrigated Tomatoes in Southwest Florida

Cooperator: University of Florida

Status: Project in Progress

This is a three (3) year research project to evaluate the most effective and efficient bed geometry for drip irrigated tomatoes. The goal of the research is to determine the bed configuration for a drip irrigated tomato crop's root zone that results in greatest water conservation while having the added benefit of reducing both fertilizer leaching and storm generated runoff. Winter vegetable production is one of the largest water use groups in Florida and should be one of the target areas for water conservation. Historically, tomatoes in southwest Florida are produced with raised crop beds covered with plastic mulch. These beds typically measure three feet wide at the top with a height of eight inches. The geometry of these beds was designed more for purposes other than for water use efficiency. Bed geometry should be evaluated in order to develop dimensions that increase both irrigation efficiency and nutrient uptake, while maintaining or increasing crop yields. Additionally, a narrower bed might allow producers to use one drip tape instead of two to maintain optimum soil moisture within the bed. Differently configured beds may also help growers increase their yield (more plants per acre) and water and nutrient use efficiency while reducing the nutrient transport to groundwater and surface water. The goal of the proposed project is to evaluate different mulched, raised-bed geometries for water use and crop yield.

Appendices and References

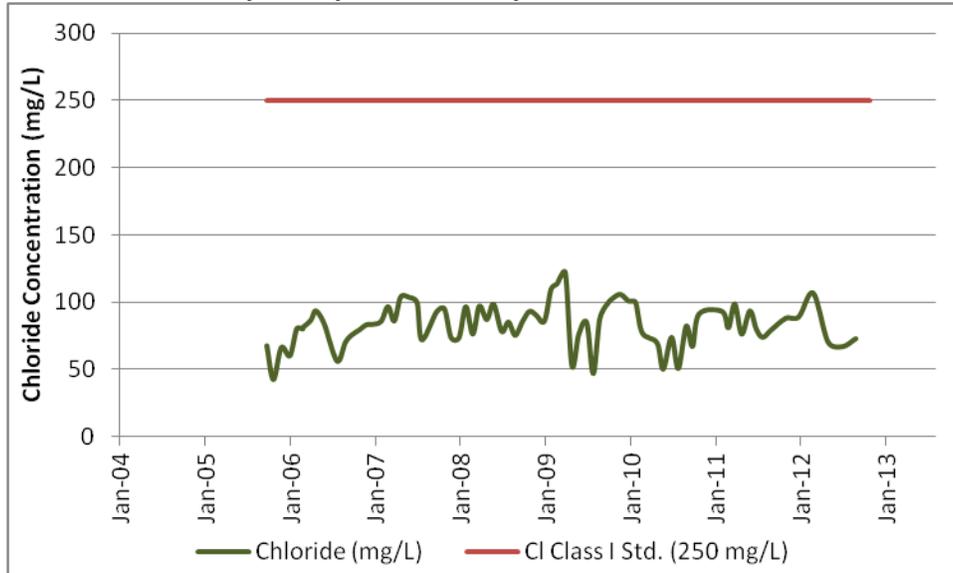
Appendix I

Water Quality Results from In-Stream Data Collection for Specific Conductance at "Non-Key" Monitoring Locations

WBID 1962

Water Segment - Prairie Creek
Prairie Creek Watershed

Mossy Gulley Water Quality Results for Chloride



Mossy Gulley Water Quality Results for TDS

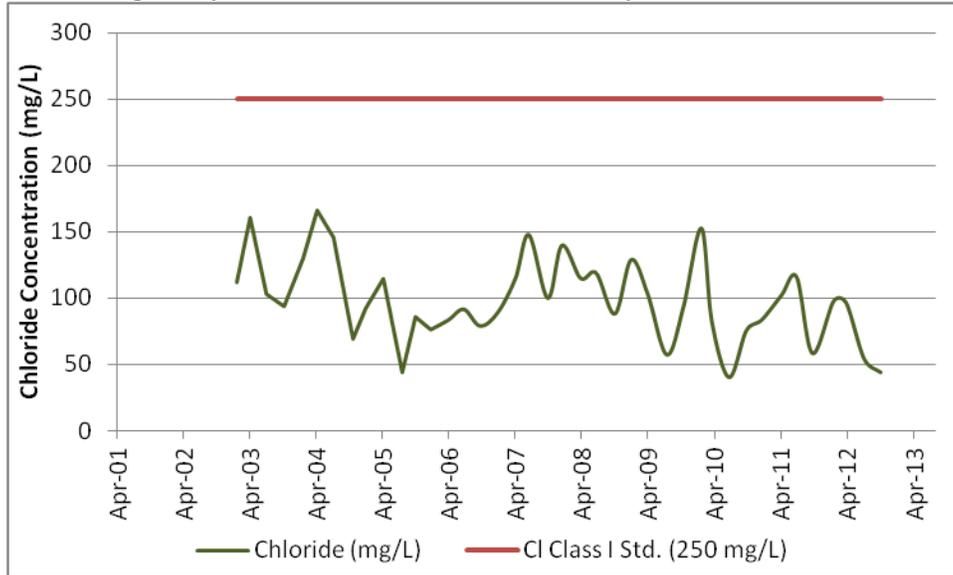


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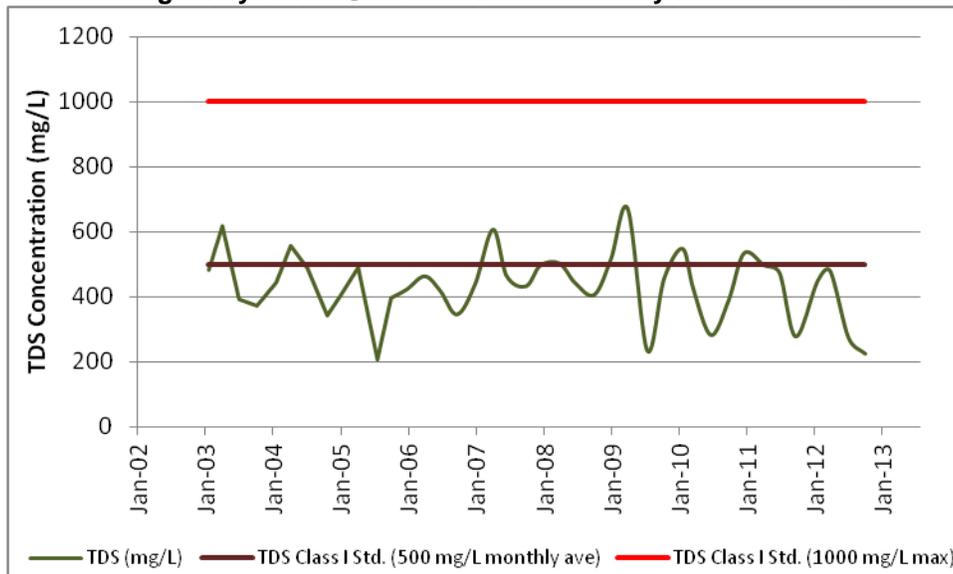
WBID 1962

Water Segment - Prairie Creek
Prairie Creek Watershed

Montgomery Canal @ ROMP 12 Water Quality Results for Chloride



Montgomery Canal @ ROMP 12 Water Quality Results for TDS

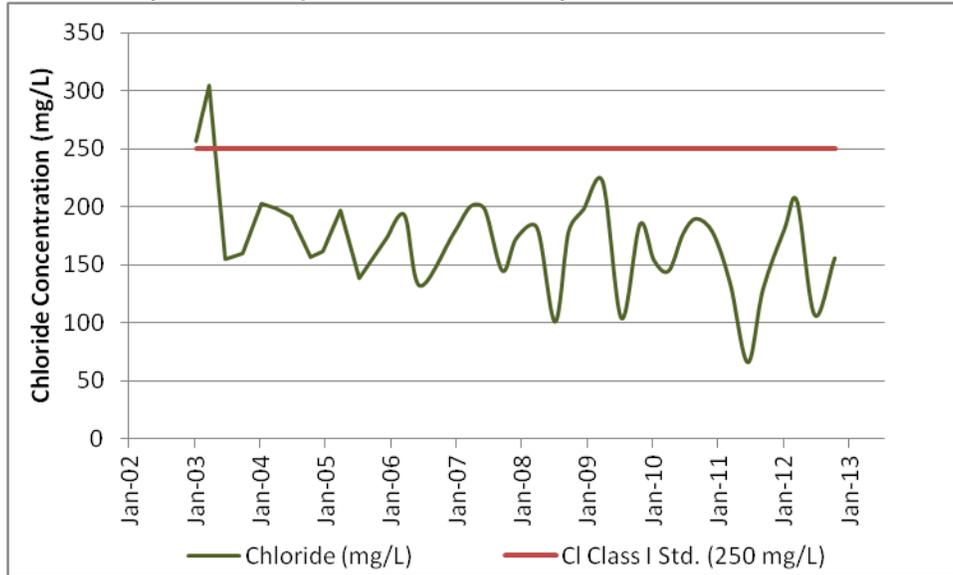


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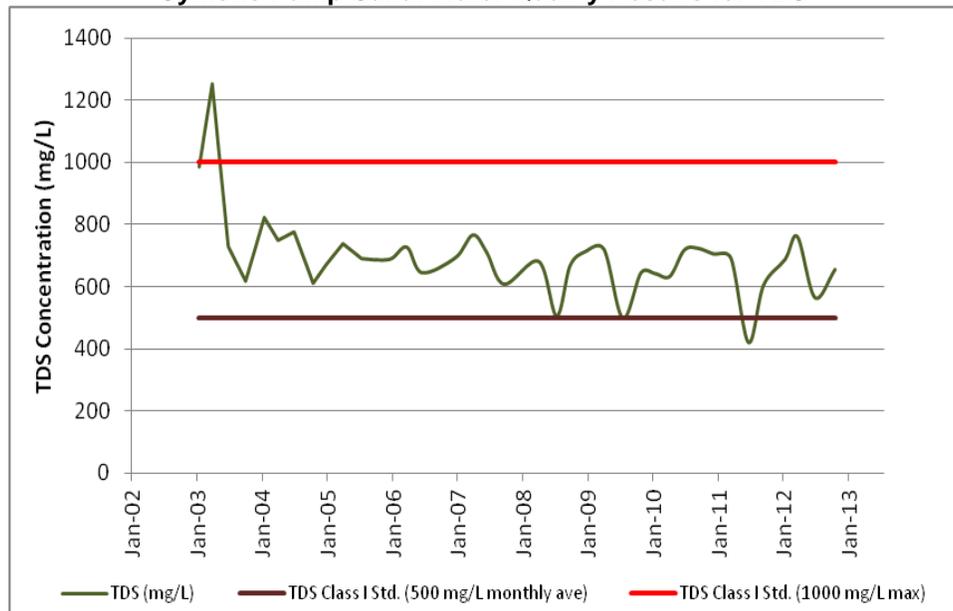
WBID 1962

Water Segment - Prairie Creek
Prairie Creek Watershed

Symons Pump Canal Water Quality Results for Chloride



Symons Pump Canal Water Quality Results for TDS

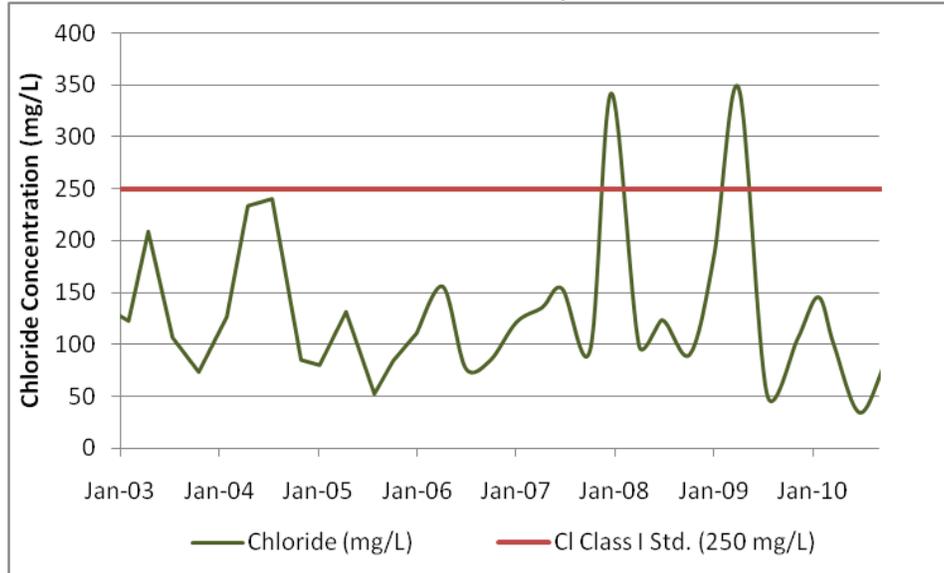


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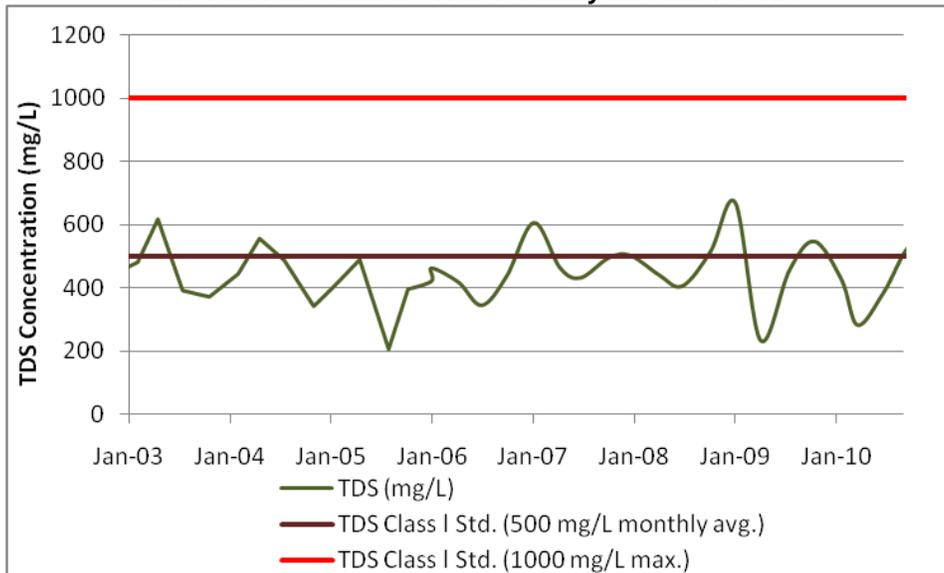
WBID 1964

Water Segment – Cow Slough
Prairie Creek Watershed

Emerald Isle Canal #5 Water Quality Results for Chloride



Emerald Isle Canal #5 Water Quality Results for TDS

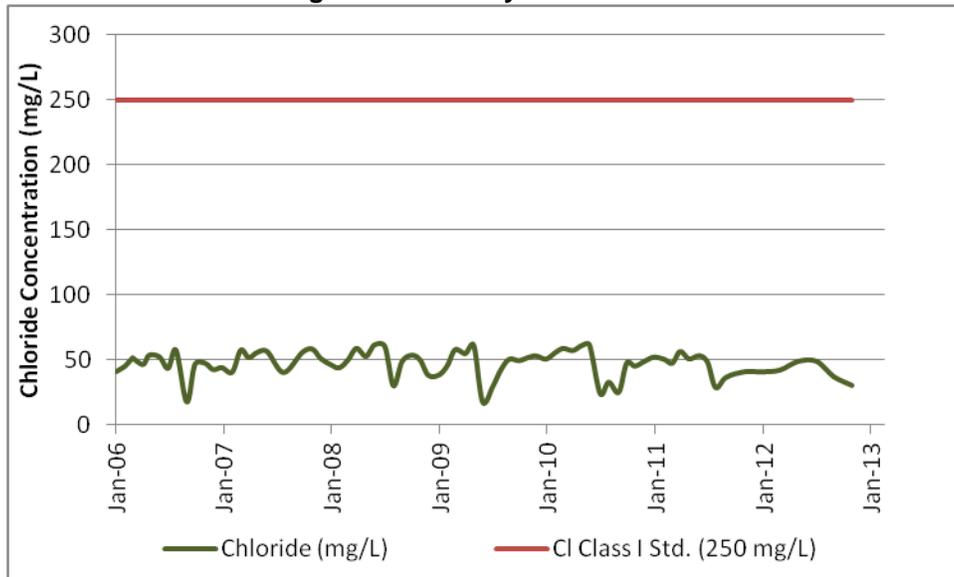


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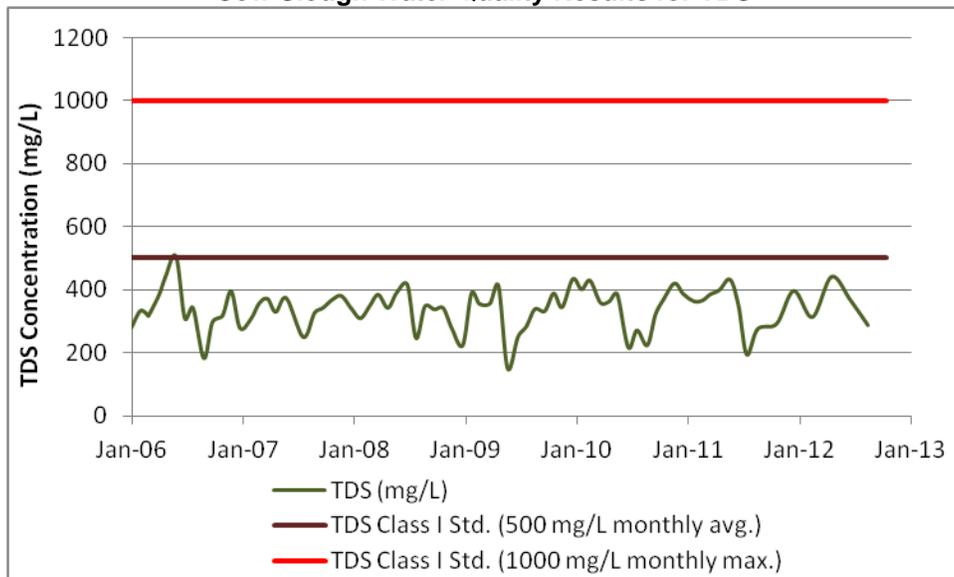
WBID 1964

Water Segment – Cow Slough
Prairie Creek Watershed

Cow Slough Water Quality Results for Chloride



Cow Slough Water Quality Results for TDS

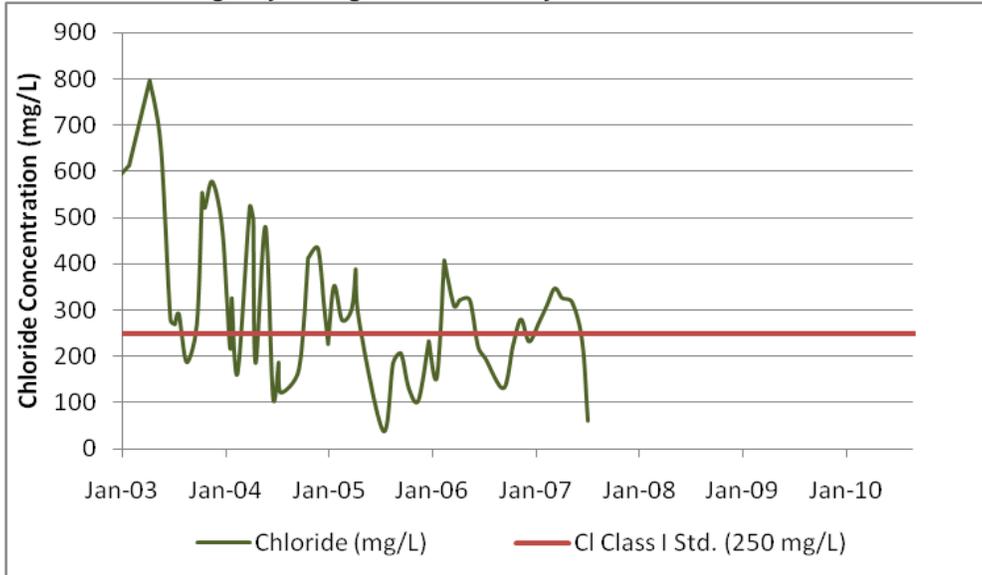


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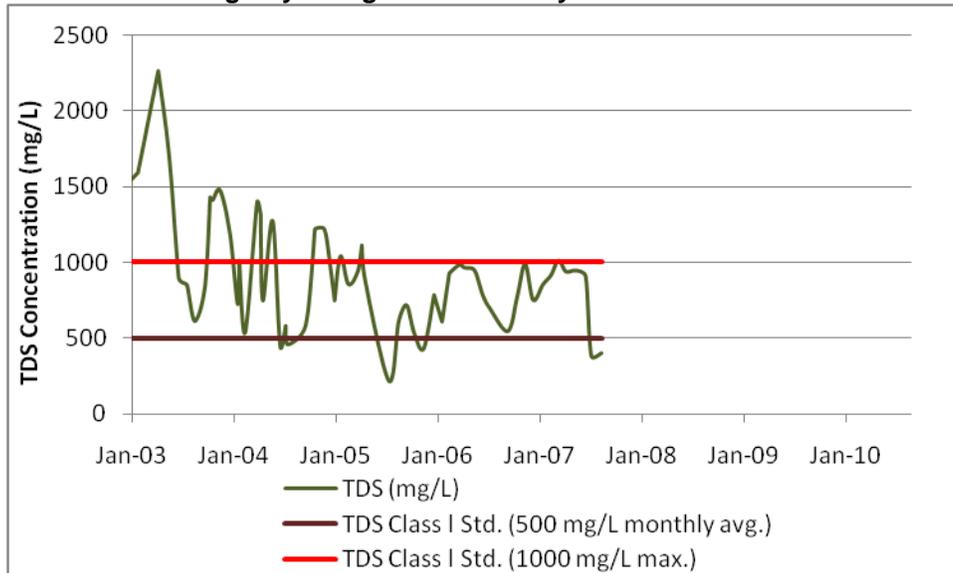
WBID 2001

Water Segment – Hog Bay
Joshua Creek Watershed

Hog Bay Slough Water Quality Results for Chloride



Hog Bay Slough Water Quality Results for TDS



Appendix II

Special Conditions Applied to Water Use Permits Located in the SPJC Watersheds

In use prior to 2007:

Shell and Prairie Creek Watershed - Special Condition

The District has determined that direct and indirect run-off of irrigation water into Shell Creek and Prairie Creek have contributed to water quality degradation in a Class I waterway that serves as a public supply source for an existing legal water user, the City of Punta Gorda. Degradation of the City's reservoir has occurred to such an extent that the concentration of several constituents has exceeded secondary drinking water standards in the past. To avoid further degradation of the reservoir and to improve water quality, such that it is consistent with Class I water quality standards, the Permittee shall continue to improve the management of irrigation water by reducing or eliminating off-site discharge of lower quality irrigation water. At the time of issuance of this permit the District is addressing off-site discharge and attempting to resolve the aforementioned adverse impacts through cooperative and collaborative measures with Permittees, changes in irrigation management practices, and other methods. If the effectiveness of these measures is determined to be insufficient to resolve these adverse impacts and irrigation management practices on this site appear to contribute to these continued impacts, the District may seek to modify this permit in accordance with applicable law.

Joshua Creek Watershed - Special Condition

This specific permit is issued with the understanding that the Permittee shall implement Best Management Practices (BMPs), which will result in elimination of off-site discharge of lower quality irrigation water to the greatest extent practicable. This is required to avoid contribution by this permitted site to the water quality degradation and potential impairment of surface waters within the Joshua Creek watershed.

In use starting in 2007:

Specific Well Construction – Water Quality Problem Area

The Permittee shall construct the proposed wells according to the surface diameter and casing depth specifications below. The casing shall be continuous from land surface to the minimum depth stated and is specified to prevent the unauthorized interchange of water between different water bearing zones. The total depth listed below is an estimate, based on best available information, of the depth at which high producing zones are encountered and which poor water quality should not be encountered. However, since this well is located in an area where water quality can be poor, it is the Permittee's responsibility to have the water in the well sampled during well construction before reaching the maximum total depth stated below. Such sampling is necessary to ensure that the well does not encounter water of a quality that cannot be utilized by the Permittee, and to ensure that withdrawals from the well will not cause salt-water intrusion. All depths given are in feet below land surface. For Well Construction requirements see Exhibit B, Well Construction Instructions, attached to and made part to this permit.

District ID No. (Specify DID No.), Permittee ID No. (specify PID No.) having a surface diameter

of (insert outer diameter) inches, with a minimum casing depth of (Insert min. casing depth) feet, drilled to a maximum total depth of (insert max. total depth) feet.

Best Management Practices (SPJC)

This specific permit is issued with the understanding that the Permittee shall implement Best Management Practices (BMPs), which will result in elimination of off-site discharge of lower quality irrigation water to the greatest extent practicable. This is required to avoid contribution by this permitted site to the water quality degradation within the Shell Creek and Prairie Creek watersheds, and to assist in improvement in water quality of the City of Punta Gorda's Shell Creek Reservoir.

Joshua Creek Best Management Practices

This specific permit is issued with the understanding that the Permittee shall implement Best Management Practices (BMPs), which will result in elimination of off-site discharge of lower quality irrigation water to the greatest extent practicable. This is required to avoid contribution by this permitted site to the water quality degradation and potential impairment of surface waters within the Joshua Creek watershed.

Water Quality Sampling at Total Depth in SPJC

Upon initiation of the construction of the well(s) listed below, the Permittee shall notify the Data Collection Bureau (813) 985-7481 or 800-836-0797, extension 2102. Upon reaching the estimated total depth(s) listed below for the wells listed below, a water-quality sample shall be collected by District Staff for laboratory analysis. The sample shall be collected during reverse air drilling, or other appropriate method with prior approval by the Water Use Permit Bureau Chief, which will allow representative samples to be collected. The sample shall be analyzed by the District's certified laboratory for specific conductivity, chloride, sulfate and total dissolved solids. Reports of the analyses will be submitted to the Permittee upon completion.

District ID No. xxx / Permittee ID No. XXX, at estimated total depth of [x,xxx] feet

Appendix III

Special Well Construction Stipulations - For Wells Located in the Shell, Prairie and Joshua Creek Watersheds

In use previously:

Stipulation No. 31 – Special Well Construction

The Permittee shall construct the proposed well according to the surface diameter and casing depth specifications below. The casing depth specified is to prevent the unauthorized interchange of water between different water bearing zones. The total depth listed below is an estimate, based on best available information, and of the depth at which high producing zones are encountered and which poor water quality should not be encountered. However, since this well is located in an area where water quality can be poor, it is the Permittee's responsibility to have the water in the well sampled during well construction, before reaching the estimated maximum total depth. Such sampling is necessary to ensure that the well does not encounter water of a quality that cannot be utilized by the Permittee, and to ensure that withdrawals from the well will not cause salt-water intrusion.

District ID No.	Permittee ID No.	Permittee Diameter	Surface Diameter	Minimum Casing Depth	Maximum Total Depth
	XX	XX	X inches	XX feet	XX feet

- a. Regardless of the maximum depth specified above, drilling shall cease when the specific conductance of the ground water reaches 1,000 uS/cm.
- b. The casing shall be continuous from land surface to the minimum depth stated above.
- c. All well casing (including liners and/or pipe) must be sealed to the depth specified above.
- d. The proposed well(s) shall be constructed of materials that are resistant to degradation of the casing/grout due to interaction with the water of lesser quality. A minimum grout thickness of two (2) inches is required on wells four (4) inches or more in diameter.
- e. A minimum of twenty (20) feet overlap and two (2) centralizers is required for Public Supply wells, and all wells six (6) inches or more in diameter.
- f. The finished well casing depth shall not vary from these specifications by greater than ten percent unless advance approval is granted by the Regulation Department Director, Resource Regulation, or the Supervisor of the Well Construction Permitting Section in Brooksville.
- g. The finished well total depth shall not exceed the suggested maximum total depth by greater than ten percent unless advance approval is granted by the Regulation Department Director, Resource Regulation, or the Supervisor of the Well Construction Permitting Section in Brooksville.
- h. Advance approval from the Regulation Department Director, Resource Regulation, is necessary should the Permittee propose to change the well location or casing diameter.

The Permittee shall submit a copy of the well completion report to the District Permit Data Section, Records and Data Department within 30 days of well completion.

In use previously:

Stipulation No. 41 – Special Well Construction – Water Quality Sampling

- a. During drilling of District ID No(s). __, Permittee ID No(s). __ water-quality samples shall be collected at intervals of 50 feet or less, from XX feet to a maximum depth of five feet above the bottom of the well. Regardless of the specified sample collection interval, a sample shall be collected from the depth, which corresponds, to five feet above the bottom of the well. Samples shall be collected during reverse air drilling, or other appropriate method with prior approval by the Regulation Department Director, Resource Regulation, which will allow representative samples for each depth to be collected.

Samples shall be analyzed in the field for specific conductance. Reports of the analyses shall be submitted to the District's Permit Data Section, Records and Data Department.

- b. Following completion of District ID No(s). __, Permittee ID No(s). __, a water-quality sample shall be collected for laboratory analysis. The sample shall be collected during reverse air drilling, or other appropriate method with prior approval by the Regulation Department Director, Resource Regulation, which will allow representative samples to be collected. The sample shall be analyzed by a certified laboratory for chloride, sulfate, and total dissolved solids. The Permittee's sampling procedure shall follow the handling and chain of custody procedures designated by the certified laboratory that will undertake the analysis. Reports of the analyses shall be submitted to the Permit Data Section, Records and Data Department (using District forms) within thirty days of sampling, and shall include the signature of an authorized representative and the certification number of the Department of Health and Rehabilitative Services (DHRS) certified laboratory under Environmental Laboratory Certification General Category "1" which undertook the analysis.

Analyses shall be performed according to procedures outlined in the current edition of Standard Methods for the Examination of Water and Wastewater (American Public Health Association, 1995), or by Methods for Chemical Analyses of Water and Wastes (EPA, 1983).

In use currently:

STIPULATION #56: Special Well Construction and Water Quality Sampling For The Shell, Prairie and Joshua Creek Watersheds

The Permittee shall construct the proposed well(s) according to the surface diameter and casing depth specifications below. The casing depth specified is to prevent the unauthorized interchange of water between different water bearing zones. The total depth listed below is an estimate, based on best available information. However, since this well is located in an area where water quality can be poor, it is the well driller's responsibility to measure specific conductivity of the well water during construction, in ?? ft intervals once casing is set. The open hole interval of the well can only be advanced if the specific conductivity does not exceed 1000 microSiemens/centimeter and sampling of specific conductivity occurs in ?? foot intervals. Such sampling is necessary to ensure that the well does not encounter water of a quality that cannot be utilized by the Permittee, and to ensure that withdrawals from the well will not cause impacts to area surface waters or induce salt water intrusion. Specific conductivity readings must be recorded and submitted to the District. District staff are available to assist and verify readings during well construction and to receive water quality results. Please contact the Data Collection Bureau at (813) 985-7481 ext. 2102, 48 hours prior to initiation of well construction and specify

at that time if assistance is needed in collecting specific conductivity measurements.

District ID No. **XX having** surface diameter of **XX inches**, with minimum casing depth of **XX feet**, drilled to estimated total depth of **XX feet**.

1. Regardless of the maximum depth specified above, it is the well driller's responsibility to cease drilling when the specific conductivity of the ground water reaches 1,000 microSiemens/centimeter.
2. The casing shall be continuous from land surface to the minimum depth stated above.
3. All well casing (including liners and/or pipe) must be sealed to the depth specified above.
4. The proposed well(s) shall be constructed of materials that are resistant to degradation of the casing/grout due to interaction with the water of lesser quality. A minimum grout thickness of two (2) inches is required on wells four (4) inches or more in diameter.
5. A minimum of twenty (20) feet overlap and two (2) centralizers is required for Public Supply wells, and all wells six (6) inches or more in diameter.
6. The finished well casing depth shall not vary from these specifications by greater than ten (10) percent unless advance approval is granted by the Water Use Permit Bureau Chief, or the Well Construction Section Manager.
7. The finished well total depth shall not exceed the maximum total depth unless advance approval is granted by either the Water Use Permit Bureau Chief, or the Well Construction Section Manager, and the specific conductivity is less than 1,000 microSiemens/centimeter.
8. Advance approval from the Water Use Permit Bureau Chief is necessary should the Permittee propose to change the well location or casing diameter.

The Permittee shall submit a copy of the well completion reports to the District's Water Use Permit.

Appendix IV

Detailed Descriptions of FARMS Board Approved Projects List by FARMS Project Number (Does not include cancelled or potential projects) October 2004 – September 2012

WUP No. 20009476 - Surface Water – H500 (FARMS and EQIP funded; WBIDs 2041 and 2058):

The purpose of the project is to capture and reuse surface water and irrigation tailwater for citrus irrigation. The project facilitates the withdrawal and use of surface water and irrigation tailwater from drainage areas within the property boundaries. This project has been operational since August 2003. Over the life of the project surface water use has averaged more than 178,700 gpd, which is 131 percent of the projected offset.

WUP No. 20009398 – Phase I – H501 (FARMS funded; WBIDs 2040 and 2044):

The purpose of the project is to increase the use of surface water and irrigation tailwater through the construction of a surface water pump station, filtration, and piping for citrus irrigation. The project also consists of the installation and use of radio controlled pump station controllers to allow for the precise startup and shutdown of all irrigation sources based on data remotely collected by the project's soil moisture probes and weather station. This project has been operational since October 2003. Surface water use as a result of Phases 1, 2 and 3 of this project has averaged 796,654 gpd. This is 80 percent of projected total offsets.

WUP No. 20009398 – Phase II – H501 (FARMS funded; WBIDs 2040 and 2044):

The purpose of Phase 2 of this FARMS project is to further increase groundwater savings and irrigation conservation by adding components that complement the Phase I project infrastructure. The additions include filter element replacement for the six surface water pump stations; pump station auto starts and solenoids to improve the remote start-up and shut-down of all pump stations; five additional soil moisture stations to increase precise irrigation management on additional farm acreage; an interconnecting sub-main pipeline to accommodate increased distribution of irrigation resources, an upgrade to the existing computer system to operate the software necessary to micromanage all irrigation resources, new rain bucket switches to shut off irrigation pumps during rain events, riser boards for existing surface water control structures, and a conductance meter to accurately monitor onsite water quality. This project has been operational since August 2005. Surface water use as a result of Phases 1, 2 and 3 of this project has averaged 796,654 gpd. This is 80 percent of projected total offsets.

WUP No. 20009398 – Phase III – H501 (FARMS funded; WBIDs 2040 and 2044):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the construction and operation of a 68-acre surface water irrigation reservoir, the retrofitting of two surface water irrigation pump stations, and efficiently controlling the irrigation events through the operation of automated pumps controlled by soil moisture probes and rain monitoring devices. This project has been operational since October 2011. Surface water use as a result of Phases 1, 2 and 3 of this project has averaged 796,654 gpd. This is 80 percent of projected total offsets.

WUP No. 20003530 – H504 (FARMS funded; WBIDs 1964 and 2040):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the construction and operation of a 40-acre surface water irrigation reservoir. FARMS components include a surface water irrigation pump station, filtration, and the piping necessary to connect the proposed surface water reservoir system to the existing irrigation system. In addition, the project expands the use of surface water resources through the installation of a second surface water pump station on an existing shell pit, approximately four-acres in size. This second pump station also involved the installation of a pipeline to connect to the irrigation system and is anticipated to reduce groundwater irrigation for approximately 195 acres. Surface water supplies for the shell pit are additionally increased through manual manipulation of existing onsite water control structures. This project is operational and the actual offset is averaging 171,050 gpd, which is 120 percent of the projected offset.

WUP No. 20006669 Phase I – H505 (FARMS funded; WBID 2001):

The primary goal of this project is to reduce groundwater withdrawals on a citrus grove through the use of surface water from an existing storm water collection reservoir. Project components include a surface water pump station, filtration, piping and the infrastructure necessary to operate and connect the existing reservoir into the irrigation system. This project has been operational since April 2006 and has an average ground water offset of 58,150 gpd, which is 34 percent of the projected offset.

WUP No. 20009648 – H508 (FARMS and EQIP funded; WBID 2041):

The purpose of the project is to reduce Upper Floridan groundwater withdrawals through the use of a 15-acre tailwater recovery and surface water collection reservoir to irrigate a large variety of organically grown vegetables on a 585-acre farm. FARMS project components include surface water pump stations, filtration, piping for irrigation and water control structures to assist in on-site surface water management. This project has been operational since May 2006. Actual ground water offset has averaged 239,918 gpd, which is 181 percent of the projected offset.

WUP No. 20009687 – Phase I – H512 (FARMS and EQIP funded; WBIDs 2040 and 2041):

The purpose of the first phase of the project was to reduce groundwater withdrawals through the use of surface water from a shell pit on the northern portion of the property. Phase I of the FARMS project funded two surface water withdrawal pump stations, filtration, and mainline pipe to connect the northern surface water reservoir to the existing drip irrigation system, and central irrigation control system with soil moisture sensors. Phase I of this project has been operational since April, 2006. Average surface water use is 632,159 gpd, which is about 95 percent of the projected offset; however, it is 100 percent of the irrigation applied to the site.

WUP No. 20009687 – Phase II – H512 (FARMS funded; WBIDs 2040 and 2041):

The purpose of the second phase of the project is to reduce groundwater withdrawals through the use of surface water from an additional shell pit on the southern portion of the property. The second phase of the FARMS project includes additional surface water pumps, filtration and piping to connect the southern reservoir to the existing irrigation system and also to connect the southern irrigation system to the northern irrigation system. Phase II became operational in August 2009. Surface water use has averaged 401,995 gpd, which is 163 percent of the projected offset; however, it is 100 percent of the irrigation applied to the site.

WUP No. 20010726 – H513 (FARMS and EQIP funded; WBID 2040):

The purpose of the project is to reduce groundwater withdrawals through the use of two tailwater recovery and surface water collection reservoirs. FARMS project components include two surface water pump stations, filtration and the infrastructure necessary to operate and connect the reservoirs to a new, more efficient drip irrigation system. This project has been operational since January, 2006. Surface water use has averaged 27,100 gpd, which is 26 percent of the projected offset; however no groundwater has been used on the site since the system became operational. The low water use is due to averaging the water use over long periods of time that the fields lie fallow in order to avoid common diseases associated with melon production.

WUP No. 20008348 – H514 (FARMS funded; WBID 1962):

The purpose of the project is to reduce groundwater withdrawals through the use of an existing shell pit as a tailwater recovery and surface water collection reservoir. FARMS project components include a surface water pump station, filtration, piping and infrastructure necessary to operate and connect the existing reservoir into the irrigation system. Other project components include the construction of a swale to provide additional tailwater recovery on the farm. This project has been operational since April, 2006. Surface water use has averaged 96,400 gpd since that time, which is 136 percent of the projected groundwater offset.

WUP No. 20006765 – Phase I – H516 (FARMS and EQIP funded; WBIDs 1962, 1995 and 2001):

The purpose of the project is to reduce groundwater withdrawals through the construction and operation of a tailwater interception and surface water reservoir system. The project included the excavation of a linear interception trench and feeder ditches, a 20,000 gallon per minute (gpm) surface water collection pump station, two 2,500 gpm irrigation pump stations, including filtration, and piping necessary to connect the tailwater interception and surface water reservoir system to the existing irrigation system. Project has been operational since August, 2006 and has offset an average of 267,600 gpd, or 120 percent of projected offset.

WUP No. 20006765 – Phase II – H516 (FARMS and EQIP funded; WBIDs 1962, 1995 and 2001):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the use of an existing 25-acre pond as an irrigation source. FARMS project components consist of two surface water irrigation pump stations, filtration, and the piping necessary to connect the surface water reservoir system to the existing irrigation system. This project has been operational since March, 2009 and has offset an average of 206,600 gpd, or 268 percent of the projected offset.

WUP No. 20002418 – H522 (FARMS funded; WBIDs 1997 and 2001):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the construction and operation of a surface water irrigation reservoir. FARMS components include a surface water irrigation pump station, filtration, and the piping necessary to connect the surface water reservoir system to the existing irrigation system. The project also addresses water quality concerns by reducing the amount of mineralized ground water entering Joshua Creek. This project has been operational since May, 2008. Surface water use averaged 65,287 gpd since that time, which is 130 percent of the projected offset.

WUP No. 20009127 – H526 (FARMS funded; WBID 1962):

The purpose of the project is to reduce groundwater withdrawals through the installation and operation of three remote soil moisture-monitoring stations. Soil moisture data, collected in the three locations, at three different vertical depths, allows the grower to shorten irrigation events by applying irrigation to the root zone only. Once the necessary moisture content is reached, the

onsite manager can determine when to stop irrigating. This type of precision irrigation management allows for reduced water use, reduced fertilizer leaching, and reduced fuel consumption. This project has been operational since May 2006. The actual offset is averaging 45,796 gpd, which is 294 percent of the projected offset.

WUP No. 20009716 – H530 (FARMS and EQIP funded; WBID 2001):

The purpose of the project is to reduce mineralized groundwater withdrawals through the use of surface water from an existing storm water collection reservoir. FARMS project components include two surface water irrigation pumps, filtration, piping and infrastructure necessary to operate and connect the existing reservoir into the irrigation system. The project also increases irrigation efficiency through the use of an innovative, real-time irrigation control system. The system employs automated pump controls, soil moisture and weather monitoring devices to reduce overall irrigation and extend surface water resources. This project has been operational since September 2006. Surface water use has averaged 120,097 gpd since that time, which is 169 percent of the projected offset.

WUP No. 20001759 – H534 (FARMS funded; WBIDs 2040, 2041 and 2044):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the use of an existing 12-acre surface water reservoir to irrigate 140 acres of sod. FARMS project components include one pump station, filtration, piping, and infrastructure necessary to connect the reservoir to the sod production area. Construction was complete on this project in August 2008. Surface water use has averaged 216,600 gpd since that time which is 110 percent of the projected offset; however, it should be noted that sod production has been reduced during this time period due to economic conditions.

WUP No. 20009052 - H539 (FARMS funded; WBIDs 1964 and 2040):

The purpose of the project is to reduce Upper Floridan groundwater withdrawals through the use of an existing surface water reservoir and existing grove ditches to irrigate 1,335 acres of a 1,665-acre citrus grove. FARMS project components include two surface water pump stations, filtration, piping, a weather station, culverts with risers, and infrastructure necessary to connect the surface water reservoirs into the existing irrigation system. This project has been operational since January, 2008. Surface water use has averaged 708,593 gpd, which is approximately 49 percent of the projected offset; however, it should be noted that irrigated acreage has been reduced due to citrus canker and 100 percent of water use is from surface water.

WUP No. 20009476 - Electronics – H548 (FARMS funded; WBIDs 2041 and 2058):

The purpose of this project is to reduce groundwater pumping using a system of solar powered environmental sensors and radio telemetry uplinked to the Internet to optimize irrigation scheduling and prevent over-watering. This project became operational in June, 2008. Water use reduction as a result of the project is estimated at 92,500 gpd, which is 340 percent of the projected offset.

WUP No. 20002386 – H555 (FARMS funded; WBIDs 1962 and 1964):

The purpose of the project is to reduce ground-water withdrawals from the Upper Floridan aquifer. The reduction in ground-water usage is achieved through the construction and operation of a linear surface-water irrigation reservoir, one surface-water irrigation pump station, filtration, and the mainline piping necessary to connect the reservoir to a more efficient microjet irrigation system. This project became operational in April 2009 and has averaged a groundwater offset of 86,636 gpd, which is 38% of the projected offset.

WUP No. 20012818 – H556 (FARMS and EQIP funded; WBIDs 1962 and 1995):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the creation of a two-acre reservoir within an existing storm water and tailwater retention area. The project also includes the construction of a surface water irrigation pump station, filtration, and the piping necessary to connect the proposed surface water reservoir system to the existing irrigation system. This project began operation in December, 2008. Surface water use has averaged 201,274 gpd since operation began, which is 204 percent of the projected offset.

WUP No. 200013225 – H557 (FARMS and EQIP funded; WBID 1997):

The primary goal of this project is to replace the permitted Upper Floridan aquifer withdrawal through the use of two surface water reservoirs and the construction of two surface water irrigation pump stations, filtration, and the piping necessary to connect the proposed surface water reservoirs to the existing irrigation system. This project became partially operational in January 2010. Surface water use has averaged 30,195 gpd since that time, which is 24 percent of the projected offset; however, it should be noted that the sod production on this farm has been less than expected due to economic conditions and changes in lessee.

WUP 20002418, 20012818, 20009716 – H560 (FARMS funded; WBIDs 1995, 1997 and 2001):

The purpose of the project is to further reduce Upper Floridan aquifer withdrawals and overall water use on three existing blueberry farms through an integrated irrigation system that includes two weather stations, soil moisture sensors, and automated pump controls for the three Upper Floridan wells to reduce the number and duration of irrigation events. The project involves Farm 4 in the Hog Bay Slough watershed of Joshua Creek, Farm 5 in the Hawthorne Creek watershed of Joshua Creek, and Farm 6 in the Myrtle Slough Watershed of Prairie Creek. All three farms are within five miles of one another. This project became operational in February 2010. Actual offset has averaged 27,268 gpd, which is 109 percent of the projected offset.

No WUP Associated with this Project – H563 (FARMS funded; WBIDs 2041 and 2041B):

The purpose of the project is to improve the quality of water that leaves the 40-acre citrus grove and flows into the Shell Creek reservoir by constructing a surface water pump station, with associated filters and mainline piping, to withdraw water directly from Shell Creek. This project became operational in September 2009. Actual offset has averaged 33,551 gpd, which is 61 percent of the projected offset.

WUP No. 20007462 – H567 (FARMS funded; WBIDs 1995 and 1995a):

The purpose of this project is to convert an existing 5.0-acre stormwater management pond to collect tailwater and surface water from the property and surrounding watershed to offset mineralized Upper Floridan aquifer groundwater used for irrigation over approximately 692 acres of citrus. This project became operational in July, 2012.

WUP No. 20006669 – Phase II + Culverts – H569 (FARMS and EQIP funded; WBID 2001):

The purpose of the project is to reduce the withdrawal of mineralized groundwater through the construction and operation of a five acre surface water irrigation reservoir. The reduction in groundwater use will benefit the Joshua Creek Watershed by reducing the quantity of marginal quality groundwater entering the creek. FARMS project components consist of one surface water irrigation pump station, filtration, and the piping necessary to connect the proposed surface water reservoir system to the existing irrigation system. This project has been operational since March, 2010 and has an average groundwater offset of 198,011 gpd, which is 156 percent of the projected offset.

WUP No. 20001391 – H570 (FARMS and EQIP funding; WBID 1974):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the creation of a one-acre reservoir. The project includes the construction of a surface water irrigation pump station, filtration, and the piping necessary to connect the proposed surface water reservoir system to the existing irrigation system. This project became operational in December 2009 and surface water use has averaged 33,588 gpd, which is 69 percent of the projected offset.

WUP No. 200013096 – H573 (FARMS funded; WBIDs 2040 and 2041):

The primary goal of the project is to increase the efficiency of irrigation events by installing hydraulic valves that will be controlled by a timer at each irrigation zone, a cut-off switch for the single power unit, and a rain sensor to shut down the system during rainfall events. The project became operational in March 2010.

WUP No. 20006765 – Phase III – H584 (FARMS and EQIP funded; WBIDs 1962, 1995 and 2001):

The purpose of the project is to reduce Upper Floridan aquifer withdrawals through the use of an existing 36-acre reservoir as an irrigation source. FARMS project components consist of a surface water irrigation pump station, filtration, pump controls and the piping necessary to connect the surface water reservoir system to the existing irrigation system. This project has been operational since June, 2010 and has offset an average of 327,000 gpd, or 94 percent of the projected offset.

WUP No. 20009417 – H585 (FARMS and EQIP funded; WBIDs 2040 and 2041):

The purpose of the project is to reduce Upper Floridan aquifer groundwater withdrawals through the use of surface water supplies. An existing farm reservoir will be used to accumulate storm runoff and tailwater, which will augment grove irrigation. The proposed project components are a surface water pump station and mainline pipe to the existing grove irrigation system. The project became operational in November 2012.

WUP No. 20002689 – H588 (FARMS funded; WBIDs 2040 and 2041):

The primary goal of this project is to increase the efficiency of irrigation events to the groves owned and maintained by Bermont Properties by installing hydraulic valves that will be controlled by a timer at each irrigation zone and rain sensors to shut down each zone during rainfall events. FARMS project components will consist of several dozen hydraulically controlled irrigation valves, five irrigation control stations with rain sensors, and the piping necessary to connect the new valves to the existing irrigation system. This project is expected to become operational in December 2012.

WUP No. 20002689 – H593 and H593 Amendment (FARMS funded; WBIDs 2040 and 2041):

FARMS staff have discussed the potential to cost-share a project to reduce Upper Floridan aquifer withdrawals with surface water. Project components would include the excavation of a reservoir, a surface water pump station, filtration, and pipeline to connect to the existing irrigation system. The contract amendment was to increase the pump capacity and power unit size of the originally intended pump station at the 5.0-acre reservoir, add pipeline to connect the 5.0-acre surface water reservoir to an existing 3.6-acre grove ditch made a part of this project through the contract amendment, and to add a pump

station at the 3.6-acre grove ditch that will irrigate an additional 190 acres of citrus grove. The project is expected to become operational in 2013.

WUP No. 20004641 – H594 (FARMS funded; WBIDs 1962 and 1997):

This project will integrate soil moisture sensors, hydraulic valve controls, and automated pump controls to conserve groundwater. The project area consists of approximately 312 acres of citrus. The primary goal of the project is to reduce Upper Floridan and Intermediate aquifer withdrawals by efficiently controlling irrigation events through the automated operation of pumps and hydraulic valves controlled by soil moisture sensors. The project became operational in September 2012.

WUP No. 20006669 Phase 2, Pump 2 – H604 (FARMS funded; WBID 2001):

The primary goal of the project is to reduce the withdrawal of groundwater through the addition of a second pump to the existing southern tailwater reservoir. The reduction in groundwater use will benefit the Joshua Creek Watershed by reducing the quantity of marginal quality groundwater entering the creek. FARMS project components consist of one surface water irrigation pump station, filtration, and the piping necessary to connect the additional pump system to the existing irrigation system. This project became operational in November 2010. Actual offset is 148,023 gpd, which is 211 percent of the projected offset.

WUP No. 20002386 – H606 – Section 10 SW, Phase 1a, Phases 2 and 3 and Phase 2 and 3 Amendment (FARMS funded; WBIDs 1962 and 1964):

The primary goal of the multiple phase of this project is to reduce groundwater withdrawals from the Upper Floridan aquifer through the construction and operation of multiple linear surface water irrigation reservoirs, each with a surface water irrigation pump station and the filtration and the piping necessary to connect the pump stations to the respective existing irrigation systems. The linear reservoirs will be formed by placing adjustable risers within existing drainage culverts and withdrawing water that will be stored within linear, large grove ditches behind the risers. This first portion of this project became operational in June, 2011 and additional phases are under construction. Actual groundwater offset through September 2012 was 692,162 gpd, which is 85 percent of the projected offset for the initial two phases.

WUP No. 20002386 – H608 (FARMS funded; WBIDs 1962 and 1964):

The primary goal of this project is to reduce groundwater withdrawals from the Upper Floridan aquifer by utilizing an existing grove ditch as a linear surface water irrigation reservoir. Surface water from the ditch reservoir will be withdrawn and used to irrigate 110 acres of citrus. The project became operational in October, 2011. Actual groundwater offset is 80,205, which is 98 percent of the projected offset.

WUP No. 20011982 – H610 (FARMS funded; WBIDs 1962 and 2044):

The primary goal of this project is to collect and reuse irrigation water from 2.6 miles of surface ditches on the property and surrounding watershed. The surface water will be used to irrigate 307 acres of sod with seepage irrigation. The project became operational in March 2012. Actual groundwater offset is 163,378 gpd, which is 152 percent of the projected offset.

No Assigned WUP – H629 (FARMS funded; WBIDs 2041 and 2041b):

The primary goal of this project is to reduce mineralized groundwater withdrawals from the Upper Floridan aquifer by utilizing an existing surface water reservoir recently modified for use in irrigating the grove. FARMS project components consist of an electrically operated surface water irrigation pump station, water filtration equipment, controls and mainline pipe necessary to

connect the surface water pump to the existing irrigation system. The project became operational in May 2011. The actual groundwater offset has averaged 100,900 gpd, which is 448% of the projected offset and 100% of the water use in the grove is from surface water.

WUP No. 20009782 – H648 (FARMS funded; WBIDs 1962 and 1995):

The primary goal of the project is to reduce the use of groundwater for irrigation and cold protection by construction of a 5-acre reservoir and operation of surface water control structures and a pump station to be connected to the existing grove irrigation system. Surface water will be used for irrigation and cold protection to the greatest extent practicable for approximately 500 acres of grove area surrounding the reservoir site. FARMS project components consist of reservoir control structures, a stationary surface water pump station with filtration, and mainline pipe to connect the surface water pump station to the existing irrigation system.

WUP No. 20002593 – H649 (FARMS funded; WBID 2040):

The primary goal of this project is to reduce mineralized groundwater withdrawals from the Upper Floridan aquifer by utilizing an existing surface water reservoir recently modified for use in irrigating a citrus grove. The project became operational in May, 2011. Actual groundwater offset is 100,900 gpd, which is 448 percent of the projected offset. It should be noted that 100 percent of the water used to irrigate the grove is now from surface water.

WUP No. 20006872 – H656 (FARMS and EQIP funded; WBID 1964):

This primary goal of this project is to construct and operate a 5.15-acre reservoir to collect tailwater and surface water from the property and surrounding watershed to offset mineralized Upper Floridan aquifer groundwater quantities used for irrigation over approximately 500 citrus acres. FARMS project components consist of a stationary surface water pump station, filtration system, and mainline pipe to connect the surface water pump station to the existing irrigation system. This project became operational in August 2012.

WUP No. 20003069 – H657 (FARMS funded; WBIDs 1962 and 1995):

This project will involve construction and operation of a 5-acre reservoir to collect tailwater and surface water from the property and surrounding watershed to offset Upper Floridan aquifer groundwater quantities for irrigation and cold protection. FARMS project components consist of two surface water pump stations, filtration systems, and mainline pipe to connect the surface water pump stations to the existing irrigation system.

WUP No. 20006669 – H673 (FARMS funded; WBID 2001):

The primary goal of this project is the construction and operation of a 5-acre reservoir to collect tailwater and surface water from the property and surrounding watershed to offset Upper Floridan aquifer groundwater used for supplemental irrigation of citrus. The project is expected to become operational in 2013.

WUP No. 20002665 – H682 (FARMS funded; WBIDs 1962, 1997 and 2001):

The primary goal of this project is operation of an existing 70-acre reservoir to collect tailwater and surface water from the property and surrounding watershed to offset Upper Floridan aquifer groundwater used to irrigate 230 acres of citrus. The project is expected to become operational in 2013.

WUP No. 20006765 – H693 (FARMS funded; WBIDs 1962, 1995 and 2001):

This grove previously completed three FARMS projects that each facilitated an existing tailwater reservoir to offset the use of Upper Floridan aquifer groundwater with surface water to irrigate

the grove. The Phase 4 project will facilitate the remaining fourth tailwater reservoir to supply surface water for supplemental irrigation of a 333-acre portion of the citrus grove and further reduce use of groundwater. The project is expected to become operational in 2013.

Appendix V
Media Coverage (October 2004 – September 2012)

Title	Outlet	Date
<i>Southwest Florida WMD Report</i>	FloridAgriculture	07/2006
<i>District approves project that could reduce groundwater pumping up to 197,000 gallons per day</i>	SWFWMD Press Release	09/2006
<i>Mini-FARMS Cost Share Funding</i>	PRVCGA Citrus Grower Vol 13, No. 10	10/2006
<i>SWFWMD Well Back-Plugging Program</i>	PRVCGA Citrus Grower Vol 13, No. 12	12/2006
<i>FARMS Program</i>	InTheField Magazine	12/2006
<i>FARMS Program Expanding</i>	PRVCGA Citrus Grower Vol 14, No. 2	12/2007
<i>Ag Reservoirs Confused With Dirt Mining</i>	PRVCGA Citrus Grower Vol 14, No. 3	03/2007
<i>Disturbing the Peace</i>	Charlotte Sun, Supplement	04/2007
<i>Changing to Surface Irrigation?</i>	PRVCGA Citrus Grower Vol 14, No. 7	07/2007
<i>SWFWMD Well Back-Plugging Program</i>	PRVCGA Citrus Grower Vol 14, No. 7	07/2007
<i>Fertilizer laws needed to limit runoff into water</i>	Charlotte Sun	11/2007
<i>Growers Worry About Water Supplies</i>	Charlotte Sun	11/2007
<i>Project's final phase will continue to reduce groundwater pumping in Charlotte County</i>	Charlotte Sun	02/2008
<i>Irrigation program will benefit from county cooperation</i>	Charlotte Sun, editorial	03/2008
<i>To Restore Peace, Water Is Needed</i>	Tampa Tribune	05/2008
<i>FARMS Program: A Progressive Approach to Water Management</i>	Florida Citrus Mutual, Triangle	08/2008
<i>"State Eyeing Charlotte's Water Quality"</i>	Sun-Herald.com	03/2005
<i>"BMP Kick-Off"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	06/2005
<i>"Peace Rv. Basin Board Sets Proposed Millage Rate"</i>	Sun-Herald.com	06/2005
<i>"Tree Health and Salinity"</i>	Triangle (Florida Citrus Manual)	06/2005
<i>"FARMS Cost-Share Program"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	07/2005
<i>"SWFWMD's Activities Increase Production"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	08/2005
<i>"Citrus Best Management Practices"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	09/2005
<i>"Acronyms you Should get to Know"</i>	Florida Agriculture	10/2005
<i>"Shell Creek & Prairie Creek Watersheds Management Plan Stakeholders Signing Ceremony"</i>	Harbor Happenings (Charlotte Harbor NEP)	Issue 2; 2005
<i>"International Interest in FARMS Program"</i>	Water Matters; District Newsletter	09/2005
<i>"BMPs – Easy as 1,2,3"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	10/2005
<i>"District Releases \$1 million for FARMS Program"</i>	e-Resource	01/2006
<i>"\$1 Million in Grants to Help Farmers, Environment"</i>	Sun-Herald	02/2006
<i>"FARMS"</i>	(WWSB) ABC - Sarasota	02/2006
<i>"SWFWMD Programs Available to Assist Producers"</i>	Florida Lawn Newsletter	05/2006
<i>"SWUCA Plan will Restore Water Resources, Meet Water Needs"</i>	Water Matters; District Newsletter	05/2006
<i>"Cost-share Funding for BMP Participants"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	07/2006
<i>"Mini-Farms"</i>	e-Resource	05/2006

<i>"FARMS Activity Summary"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	01/2009
<i>"BMP Tour Teaches Others About Ag Conservation"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	12/2009
<i>"Backplugging Helps Local Growers"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	04/2010
<i>"West Central Florida Water Restoration Action Plan – Report to the Legislature"</i>	Southwest Florida Water Management District	03/2010
<i>"FARMS Project Boosts Economy, Improves Water Quality and Reduces Water Use"</i>	Watermatters	08/2009
<i>"Cost-sharing funding through the FARMS Program helps growers in southwest Florida improve water quality and reduce water use"</i>	Florida Grower	09/2009
<i>"Water Need to Knows"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	12/2010
<i>"Water District Offers Farmers a Carrot"</i>	Citrus County Chronicle	2/2011
<i>"Water Management District Undergoes Changes"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	6/2011
<i>"Water Quality Issues Monitored"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	10/2011
<i>"United Front on Water Quality Regulation"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	3/2012
<i>"Southern Water Soil Experts"</i>	In the Field Magazine	4/2012
<i>"Reasonable Assurance Plan Adopted"</i>	Peace Rv. Valley Citrus Growers Assoc. Newsletter	4/2012
<i>"Agencies Update Agricultural Interests on Water Issues at Regional Meeting"</i>	In the Field Magazine	6/2012
<i>"District Remains Committed to Agricultural Programs"</i>	Water World	6/2012
<i>"Public-Private Partnerships in Water Resource Management – Case Studies at the Southwest Florida Water Management District"</i>	The Florida Watershed Journal	9/2012

Outreach and Education (October 2004 – September 2012)

Event	Date
2006 Citrus Expo	August, 2006
SWFWMD Ag Advisory Committee	August, 2006
DeSoto Co. Planning Commission – Ag reservoirs	October, 2006
Florida Blueberry Growers Fall Short Course	October, 2006
2006 Ag Expo	November, 2006
Legislators FARMS Tour	November, 2006
SPJC Stakeholders Meeting	November, 2006
Legislators FARMS Tour	December, 2006
Charlotte Co. ANRAC Meeting	December, 2006
USDA-CREES National Water Conference	January, 2007
PRVCGA Annual Meeting	February, 2007
SWFWMD Ag Advisory Committee	February, 2007
Florida Blueberry Growers Spring Meeting	March, 2007
DeSoto Co. Planning Commission – Ag reservoirs	March, 2007
SPJC Stakeholders Meeting	April, 2007
Florida Chapter, ASABE Annual Conference	May, 2007
Legislators FARMS Tour	May, 2007
SWFWMD Ag Advisory Committee	May, 2007

Charlotte Co. ANRAC Meeting	May, 2007
2007 Florida Industry Annual Conference	June, 2007
2007 Soil & Water Conservation Society Conference	July, 2007
SWFWMD Well Drillers Advisory Committee	July, 2007
2007 Florida Local Environmental Resource Agencies Conference	August, 2007
SWFWMD Ag Advisory Committee	August, 2007
2007 Citrus Expo	August, 2007
Florida Blueberry Growers Fall Short Course	October, 2007
SWFWMD Governing Board Meeting - FARMS Status Report	October, 2007
2007 Ag Expo	November, 2007
SPJC Stakeholders Meeting	November, 2007
FARMS Interagency Meeting	December, 2007
PRVCGA Annual Meeting	January, 2008
SPJC Stakeholders Meeting	March, 2008
FARMS Interagency Meeting	March, 2008
IFAS Workshop – Water & Nutrients in the Root Zone	May, 2008
Florida Chapter, ASABE Annual Conference	June, 2008
2008 Florida Industry Annual Conference	June, 2007
FARMS Interagency Meeting	July, 2008
FARMS Interagency Meeting	October, 2008
FDACS Fall Interagency Meeting	November, 2008
2008 Ag Expo	November, 2008
2008 Florida Blueberry Growers Fall Meeting	November, 2008
SPJC Stakeholders Meeting	December, 2008
Legislative Delegation Meeting (Manatee)	Dec. 2004
Legislative Delegation Meeting (Sarasota)	Dec. 2004
Peace River/Manasota Water Supply Authority Meeting	Dec. 2004
Shell and Prairie Creek RA Plan Signing Ceremony	Dec. 3, 2004
Legislative Delegation Meeting (Charlotte)	Jan. 2005
American Clean Water Foundation	Jan. 2005
EPA SPJC RA Plan Briefing – Atlanta, Ga.	Jan. 31, 2005
<i>CHEC Field Trip to FARMS Projects</i>	<i>Feb. 2005</i>

Manatee Chamber of Commerce Environmental and Legislative Committee	Feb. 2005
Manasota League of Cities	Feb. 2005
FARMS Interagency Team Meeting	Feb. 18, 2005
SPJC Stakeholder Meeting	Mar. 3, 2005
Florida Farm Bureau Legislative Reception	Mar. 29, 2005
District Governing Board	Mar. 29, 2005
IFAS – Balm Research Center Opening	April 1, 2005
CHEC Meeting	April 27, 2005
SWF RPC	May 1, 2005
Agricultural Advisory Committee Meeting	May 3, 2005
IFAS Peace River Citrus BMP Kickoff	May 18, 2005
Vegetable BMP Meeting	June 6, 2005
SPJC RA Plan Presented at Fl. Lake Management Society Conference	June 7, 2005
Peace River Basin Board - DEP/EPA Approval Status of SPJC RA Plan	June 10, 2005
Sarasota County Agriculture Council meeting	June 14, 2005
Florida Representatives Field Visit – TRB Groves	June 30, 2005
Flatford Agriculture Meeting - FDACS	July 7, 2005
Australians Visit FARM Project Properties	Jul. 25, 2005
Agricultural Advisory Committee Meeting	Aug. 9, 2005
FARMS Interagency Meeting	Aug. 29, 2005

Citrus Expo	Aug. 24, 2005
Peace River/Manasota Regional Water Supply Authority Meeting	Oct. 27, 2005
Agricultural Advisory Committee Meeting	Nov. 9, 2005
SPJC Stakeholder Meeting	Nov. 10, 2005
FARMS Interagency Meeting	Nov. 28, 2005
SPJC RA Plan Presented at Fl. Stormwater Association Conference	Dec. 7, 2005
IFAS Citrus BMP Workshop, Arcadia	Jan. 18, 2005
FDACS Annual Meeting, Tallahassee	Feb 7, 2006
Agricultural Advisory Committee Meeting	Feb. 12, 2006
Tampa Bay Wholesale Growers Spring Conference	Feb. 25, 2006
FARMS Interagency Meeting	Feb. 27, 2006
Spring Blueberry Tour	Mar. 7, 2006
Senate Agriculture Meeting	Mar. 8, 2006
FDACS Luncheon – Upper Myakka	Apr. 1, 2006
SPJC Stakeholder Meeting	May 4, 2006
Agricultural Advisory Committee Meeting	May 17, 2006
WMDs Coordination Meeting	May 18, 2006
Vegetable and Agronomic Crop BMP Manual Regional Sign-up	Jun. 14, 2006
Cattleman's Annual Conference	Jun. 20, 2006
FARMS Interagency Meeting	October 14, 2008
SWFWMD Food Safety Public Meeting	October 8, 2008
Ag Expo – GCREC Balm	October 2009
SWFWMD Agricultural Advisory Committee	February 2009
Charlotte Harbor National Estuary Program Reservoirs Seminar	April 2009
IFAS GCREC – Balm Precision Agriculture Seminar	July 2009
Florida Citrus Expo	August 2009
Florida Tomato Institute	September 2009
SWFWMD Agricultural Advisory Committee	November 2009
FAWN Weather School	January 2010
Florida State Fair Breakfast	February 2010
SWFWMD Agricultural Advisory Committee	February 2010
SWFWMD Agricultural Advisory Committee	May 2010
Peace River Valley Citrus Growers Association Annual Meeting	February 2009
PRVCGA and Charlotte Harbor Environmental Center BMP Tour	November 2009
Peace River Valley Citrus Growers Association Annual Meeting	February 2010
Florida Citrus Expo	August 2010
Agritunity Conference	January 2010
Agritunity Conference	January 2009
FSGA Agritech	August 2009
Florida Blueberry Growers Association Meeting	October 2009
FARMS Interagency Meeting	October 2009
Spring Expo	February 2010
FSGA Agritech	August 2010
Good Agricultural Practices Workshop	February 2010
Hardee County Economic Development Council meeting	June 2010
DeSoto County Planning Commission meeting	February 2008
SPJC Stakeholders meeting	February 2010
SPJC Stakeholders meeting	March 2008
SPJC Stakeholders meeting	June 2009
SPJC Stakeholders meeting	December 2008
Association of Florida Conservation Districts Annual Meeting	July 2010
State of Our Water Conference	November 2008
American Association of Agricultural and Biological Engineers – Florida Section Annual Meeting	June 2009

American Association of Agricultural and Biological Engineers – Florida Section Annual Meeting	June 2010
DeSoto County Farm Bureau	August 2009
Florida Blueberry Growers Association meeting	November 2008
Peace River Basin Board Tour	November 2008
SWFWMD Agricultural Advisory Committee meeting	November 2008
FARMS Interagency Meeting	January 2009
Spring Expo	February 2009
Florida Blueberry Growers Association meeting	March 2009
IFAS Nursery Growers Workshop	April 2009
Prairie River Ranch FARMS Project Tour	May 2009
Farming into the Future Seminar	July 2009
FLM Prairie River Ranch Peace Basin Board Tour	October 2009
Florida Blueberry Growers Association meeting	October 2009
University of Florida Water Institute Symposium	February 2010
Agritech Outreach	August 2010
Florida Citrus Expo	August 2010
FARMS Program Update – SWFWMD Governing Board	October 2010
SWFWMD Agricultural Advisory Committee	November 2010
Florida Ag Expo	November 2010
SPJC Stakeholders Meeting	December 2010
Spring Expo	February 2011
PRVCGA Annual Meeting	March 2011
Florida Blueberry Growers Association Annual Meeting	March 2011
UF-IFAS Vegetable Field Day	May 2011
Charlotte County Soil and Water Conservation District meeting	May 2011
SWFWMD Agricultural Advisory Committee	May 2011
Charlotte County ANRAC	July 2011
Charlotte County ANRAC	August 2011
Specialty Fruit and Nut BMP Manual Kick-Off	October 2011
Florida Blueberry Growers Association	November 2011
Florida Ag Expo	November 2011
Spring Expo	February 2012
Wedgeworth Leadership Class VIII	February 2012
Florida Berry Expo	February 2012
PRVCGA Annual Meeting	February 2012
Florida Blueberry Growers Association	March 2012
All Florida Ag Expo	April 2012
Charlotte Harbor Estuary Program FARMS Tour	April 2012
Southwest Florida Agricultural water Update	May 2012
FAWN Advisory Committee meeting	June 2012
SWFWMD Agricultural Advisory Committee	June 2012
Peace Creek BMAP meeting	June 2012
Florida Citrus Expo	August 2012
SWFWMD Agricultural Advisory Committee	September 2012

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