Florida Department of Environmental Protection
Class V, Group 7, Aquifer Storage and Recovery (ASR)Well System
Operation Permit Application

Peace River Facility
Aquifer Storage Recovery System

Prepared for:

Peace River Manasota Regional Water Supply Authority

Prepared by:

JACOBS

4350 West Cypress Street
Suite 600
Tampa, Florida 33607-4155

In Association with:

ASR US, LLC

CH2M Project No.

February 2018

Contents

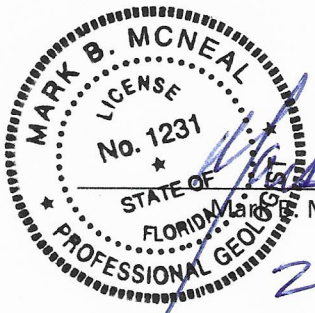
Acronyms and Abbreviations

AOR	Area of Review
ASR	Aquifer Storage Recovery
BG	billion gallons
bls	Below land surface
CFU/100 mL	Colony forming units per 100 mL
FDEP	Florida Department of Environmental Protection
FGS	Florida Geological Survey
ft^2/d	feet squared per day
gpm	gallons per minute
LOAU	Letter of Authorization to Use
LPZ	lower producing zone of the Hawthorn aquifer system (a.k.a. lower Arcadia aquifer, Tampa Zone, PZ3)
µg/L	micrograms per Liter
MCL	Maximum Contaminant Level
MDL	Method Detection Limit
MG	million gallons
mg/L	milligrams per Liter
MGD	million gallons per day
pCi/L	picocuries per liter
PRF	Peace River Regional Water Supply Facility
PRMRWSA	Peace River/Manasota Regional Water Supply Authority
psi	Pounds/square inch
SR	State Road
SWFWMD	Southwest Florida Water Management District
TDS	total dissolved solids
TON	Threshold Odor Number
TSS	total suspended solids
UFA	Upper Floridan aquifer
UIC	Underground Injection Control
UPZ	upper producing zone of the IAS
WCP	Well Construction Permit
WF1	Wellfield No. 1
WF2	Wellfield No. 2
WQCE	Water Quality Criteria Exemption
WUP	Water Use Permit

Signature Page

Professional Geologist

The geological evaluation and interpretations contained in the "Florida Department of Environmental Protection Class V, Group 7, Well Operation Permit Application Peace River Facility Aquifer Storage and Recovery System" for Peace River Manasota Regional Water Supply Authority were prepared by, or reviewed by, a Licensed Professional Geologist in the State of Florida.



Mark B. McNeal, P.G.

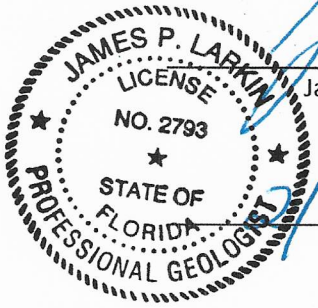
2/14/18

Date

License No. 01231

Professional Geologist

The geological evaluation and interpretations contained in the "Florida Department of Environmental Protection Class V, Group 7, Well Operation Permit Application Peace River Facility Aquifer Storage and Recovery System" for Peace River Manasota Regional Water Supply Authority were prepared by, or reviewed by, a Licensed Professional Geologist in the State of Florida.



James P. Larkin, P.G.

2/14/18

Date

License No. 2793

SECTION 1

FDEP Application to Construct/ Operate/ Abandon Class I, III, or V Injection Well Systems

Florida Department of Environmental Protection

Twin Towers Office Bldg., 2600 Blair Stone Road, Tallahassee, Florida 32399-2400

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/ Operate/Abandon Class I, III, or V Injection Well Systems
Effective Date: _____.
DEP Application No,: _____.
WACS#_____(Filled in by DEP)

APPLICATION TO CONSTRUCT/OPERATE/ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

Part I. Directions

A. All applicable items must be completed in full in order to avoid delay in processing this application. Where attached sheets or other technical documentation are utilized in lieu of the blank space provided, indicate appropriate cross-reference in the space and provide copies to the Department in accordance with C. below. Where certain items do not appear applicable to the project, indicate N/A in the appropriate spaces.

B. All information is to be typed or printed in ink.

C. Two (2) copies of this application and two (2) copies of supporting information such as plans, reports, drawings and other documents shall be submitted to the appropriate Department office if submitted as a paper document, or one (1) copy of the application and one (1) copy of the plans, reports, drawings and other documents if the submittal is in an electronic format. An engineering report is also required to be submitted to support this application pursuant to the applicable sections of Rule 62-528, F.A.C. The attached list* shall be used to determine completeness of supporting data submitted or previously received. A check for the application fee in accordance with Rule 62-4.050, F.A.C., made payable to the Department shall accompany the application.

D. For projects involving construction, this application is to be accompanied by two (2) sets or one (1) set, in accordance with C. above, of engineering drawings, specifications and design data as prepared by a Professional Engineer registered in Florida, where required by Chapter 471, Florida Statutes.

E. Attach 8 1/2" x 11" site location map indicating township, range and section and latitude/longitude for the project.

PART II. General Information

A. Applicant Name Mike Coates, P.G. Title Deputy Director

Address 9415 Town Center Parkway

City Lakewood Ranch State FL Zip 34202

Telephone Number (941)316-1776 Email MCoates@regionalwater.org

B. Project Status: ☐ New ☑ Existing

☐ Modification (specify) _____

*"Engineering and Hydrogeologic Data Required for Support of Application to Construct, Operate and Abandon Class I, III, or V Injection Wells"

C. Well Type: ☐ Exploratory Well ☑ Test/Injection Well

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/ Operate/Abandon Class I, III, or V Injection Well Systems
Effective Date: .
DEP Application No,: .
WACS# (Filled in by DEP)

D. Type of Permit Application

- ☐ Class I Test/Injection Well Construction and Testing Permit
- ☐ Class I Well Operation Permit
- ☐ Class I Well Operation Repermitting
- ☐ Class I Well Plugging and Abandonment Permit
- ☐ Class III Well Construction/Operation/Plugging and Abandonment Permit
- ☐ Class V Exploratory Well Construction and testing Permit
- ☐ Class V Well Construction Permit
- ☑ Class V Well Operation Permit
- ☐ Class V Well Plugging and Abandonment Permit
- ☐ Monitor Well Only

E. Facility Identification:

Name Peace River Facility

Facility Location: Street 8998 SW County Road 769

City Arcadia County DeSoto

SIC Code(s) 4941 Public Water Supply

F. Proposed facility located on Indian Lands: Yes ☐ No ☑

G. Well Identification:

Well No. * of 21 Wells **Multiple wells may be noted*
(total #)

Purpose (Proposed Use) Aquifer Storage Recovery - Public Supply

Well Location: Latitude: see ° Table ' 3-1 " Longitude: ° ' "
(attach separate sheet(s), if necessary, for multiple wells)

Subpart B. General Project Description:

H. General Project Description: Describe the nature, extent and schedule of the injection well project. Refer to existing and/or future pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance with the requirements of Chapter 403, F.S., and all rules of the Department. Attach additional sheet(s) if necessary or cross-reference the engineering report.

See Supporting Document

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/ Operate/Abandon Class I, III, or V Injection Well Systems
Effective Date:
DEP Application No.:
WACS# (Filled in by DEP)

PART III. Statement by Applicant and Engineer

A. Applicant

I, the owner/authorized representative* of PRMRWSA certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. I understand that this certification also applies to all subsequent reports submitted pursuant to this permit. Where construction is involved, I agree to retain the design engineer, or other professional engineer registered in Florida, to provide inspection of construction in accordance with Rule 62-528.455(1)(c), F.A.C.

Signed

02-16-2018
Date

Mike Coates, P.G. Deputy Director
Name and Title (Please Type)

(941)316-1776
Telephone Number

*Attach a Letter of Authorization.

B. Professional Engineer Registered in Florida

This is to certify that the engineering features of this injection well have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that the well, when properly maintained and operated, will discharge the effluent in compliance with all applicable statutes of the State of Florida and the rules of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for proper maintenance and operation of the well or ensure they have been furnished.

RYAN A. MESSER LICENSE No. 79332 STATE OF FLORIDA PROFESSIONAL ENGINEER

Signed

Ryan Messer
Name (Please Type)

Jacobs
Company Name (Please Type)

(Please Affix Seal)

4350 W. Cypress Street, Suite 600, Tampa, Florida 33607
Mailing Address(Please Type)

Florida Registration No. FL 79332 Date 2/16/18 Phone No. (813) 281-7770

Email of P.E.: Ryan.Messer@ch2m.com

DEP Form No: 62-528.900(1)
Form Title: Application to Construct/ Operate/Abandon Class I, III, or V Injection Well Systems
Effective Date: .
DEP Application No,: .
WACS# (Filled in by DEP)

ENGINEERING AND HYDROLOGIC DATA REQUIRED FOR SUPPORT OF APPLICATION TO CONSTRUCT, OPERATE, AND ABANDON CLASS I, III, OR V INJECTION WELL SYSTEMS

The following information shall be provided for each type of permit application.

A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT

1. A map showing the location of the proposed injection wells of well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.

2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.

3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.

4. Maps and cross sections detailing the hydrology and geologic structures of the local area.

5. Generalized maps and cross sections illustrating the regional geologic setting.

6. Proposed operating data.

   (a) Average and maximum daily rate and volume of the fluid to be injected;

   (b) Average and maximum injection pressure; and,

   (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids.

7. Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.

8. Proposed stimulation program.

9. Proposed injection procedure.

10. Engineering drawings of the surface and subsurface construction details of the system.

11. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.

12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.

13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.

14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program.

15. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.

B. CLASS I INJECTION WELL OPERATION PERMIT

1. A report shall be submitted with each application for a Class I Well operating permit, which shall include, but not be limited to, the following information:

   (a) Results of the information obtained under the construction permit described in A. CLASS I TEST/INJECTION WELL CONSTRUCTION AND TESTING PERMIT, including:

      (1) All available logging and testing program data and construction data on the well or well field;

      (2) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C;

      (3) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;

      (4) The actual injection procedure;

      (5) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone; and,

      (6) The status of corrective action on defective wells in the area of review.

   (b) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;

   (c) Certification of completion submitted by the engineer of record;

   (d) If requested by the Department, operation manual including emergency procedures;

   (e) Proposed monitoring program and data to be submitted;

(f) Proof that the existence of the well has been recorded on the surveyor's plan at the county courthouse; and,

(g) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

C. CLASS I WELL OPERATION REPERMITTING

1. An updated map showing the location of the injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of pubic record and pertinent information known to the applicant is required to be included on this map.

2. A tabulation of data on all wells within the area of review which penetrate into the injection zone, confining zone, or monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.

3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the injection.

4. Maps and cross sections detailing the hydrology and geologic structures of the local area.

5. Generalized maps and cross sections illustrating the regional geologic setting.

6. Contingency plans to cope with all shut-ins or well failures, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.

7. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.

8. A certification that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.

9. A report shall be submitted with each application for repermitting of Class I Well operation which shall include the following information:

   (a) All available logging and testing program data and construction data on the well or well field;

(b) A satisfactory demonstration of mechanical integrity for all wells pursuant to Rule 62-528.300(6), F.A.C.;

(c) The actual operating data, including injection pressures versus pumping rates where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;

(d) The actual injection procedure;

(e) The compatibility of injected waste with fluids in the injection zone and minerals in both the injection zone and the confining zone;

(f) The status of corrective actin on defective wells in the area of review;

(g) Record drawings, based upon inspections by the engineer or persons under his direct supervision, with all deviations noted;

(h) Certification of completion submitted by the engineer of record;

(i) An updated operation manual including emergency procedures;

(j) Proposed revisions to the monitoring program or data to be submitted; and,

(k) Proposed plugging and abandonment plan pursuant to Rule 62-528.435(2), F.A.C.

D. CLASS I WELL PLUGGING AND ABANDONMENT PERMIT

1. The reasons for abandonment.

2. A proposed plan for plugging and abandonment describing the preferred and alternate methods, and justification for use.

   (a) The type and number of plugs to be used;

   (b) The placement of each plug including the elevation of the top and bottom;

   (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,

   (d) The method for placement of the plugs.

3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

E. CLASS III WELLS CONSTRUCTION/OPERATION/PLUGGING AND ABANDONMENT PERMIT

Construction Phase

1. A map showing the location of the proposed injection wells or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water system, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.

2. A tabulation of data on all wells within the area of review which penetrate into the proposed injection zone, confining zone, or proposed monitoring zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Department may require.

3. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.

4. Maps and cross sections detailing the hydrology and geologic structures of the local area.

5. Generalized maps and cross sections illustrating the regional geologic setting.

6. Proposed operating data:

   (a) Average and maximum daily rate and volume of the fluid to be injected;

   (b) Average and maximum injection pressure; and,

   (c) Source and an analysis of the chemical, physical, radiological and biological characteristics of injection fluids, including any additives.

7. Proposed formation testing program to obtain an analysis of the chemical, physical and radiological characteristics of and other information on the injection zone.

8. Proposed stimulation program.

9. Proposed injection procedure.

10. Engineering drawings of the surface and subsurface construction details of the system.

11. Contingency plans to cope with all shut-ins or well failures or catastrophic collapse, so as to protect the quality of the waters of the State as defined in Rule 62-3 and 62-520, F.A.C., including alternate or emergency discharge provisions.

12. Plans (including maps) and proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.

13. For wells within the area of review which penetrate the injection zone but are not properly completed or plugged, the corrective action proposed to be taken under Rule 62-528.300(5), F.A.C.

14. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, and a drilling, testing and coring program.

15. A certificate that the applicant has ensured, through a performance bond or other appropriate means, the resources necessary to close, plug or abandon the well as required by Rule 62-528.435(9), F.A.C.

16. Expected changes in pressure, native fluid displacement, direction of movement of injection fluid.

17. A proposed monitoring plan, which includes a plan for detecting migration of fluids into underground sources of drinking water, a plan to detect water quality violation in the monitoring wells, and the proposed monitoring data to be submitted.

Operation Phase

1. The following information shall be provided to the Department prior to granting approval for the operation of the well or well field:

   (a) All available logging and testing program data and construction data on the well or well field;

   (b) A satisfactory demonstration of mechanical integrity for all new wells pursuant to Rule 62-528.300(6), F.A.C.;

   (c) The actual operating data, including injection pressure versus pumping rate where feasible, or the anticipated maximum pressure and flow rate at which the permittee will operate, if approved by the Department;

   (d) The results of the formation testing program;

   (e) The actual injection procedure; and,

   (f) The status of corrective action on defective wells in the area of review.

Plugging and abandonment Phase

1. The justification for abandonment.

2. A proposed plan for plugging and abandonment describing the preferred and alternate methods.

   (a) The type and number of plugs to be used;

   (b) The placement of each plug including the elevation of the top and bottom;

   (c) The type and grade and quantity of cement or any other approved plugging material to be used; and,

   (d) The method for placement of the plugs.

3. The procedure to be used to meet the requirements of Rule 62-528.435, F.A.C.

F. EXPLORATORY WELL CONSTRUCTION AND TESTING PERMIT

1. Conceptual plan of the injection project. Include number of injection wells, proposed injection zone, nature and volume of injection fluid, and proposed monitoring program.

2. Preliminary Area of Review Study. Include the proposed radius of the area of review with justification for that radius. Provide a map showing the location of the proposed injection well or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.

3. Proposed other uses of the exploratory well.

4. Drilling and testing plan for the exploratory well. The drilling plan must specify the proposed drilling program, sampling, coring, and testing procedures.

5. Abandonment Plan.

G. CLASS V WELL CONSTRUCTION PERMIT

(This form should be used for Class V Wells instead of Form 62-528.900(3), F.A.C., when there is a need for a Technical Advisory Committee and an engineering report.)

1. Type and number of proposed Class V Wells:

_____ Wells Receiving Domestic Waste

_____ Desalination Process Concentrate Wells (Reverse Osmosis, etc.)

_____ Aquifer Storage and Recovery Wells

_____ Aquifer Remediation Wells

_____ Salt-water Intrusion Barrier Wells

_____ Cooling Water Return Flow Wells Open-looped System

_____ Subsidence Control Wells

_____ Aquifer Recharge Wells

_____ Experimental Technology Wells

_____ Wells used to inject spent brine after halogen recovery

_____ Radioactive Waste Disposal Wells*

_____ Borehole Slurry Mining Wells

_____ Other non-hazardous Industrial or Commercial Disposal Wells

(explain) _____

_____ Other (explain) _____

*Provided the concentrations of the waste do not exceed drinking water standards contained in Chapter 62-550, F.A.C.

2. Project Description:

(a) Description and use of proposed injection system;

(b) Nature and volume of injected fluid (the Department may require an analysis including bacteriological analysis) in accordance with Rule 62-528.635(2)(b), F.A.C.; and,

(c) Proposed pretreatment.

3. Water well contractor's name, title, state license number, address, phone number and signature.

4. Well Design and Construction Details. (For multi-casing configurations or unusual construction provisions, an elevation drawing of the proposed well should be attached.)

   (a) Proposed total depth;

   (b) Proposed depth and type of casing(s);

   (c) Diameter of well;

   (d) Cement type, depth, thickness; and,

   (e) Injection pumps (if applicable): _____ gpm @ _____ psi

   Controls: _____

5. Water Supply Wells - When required by Rule 62-528.635(1), F.A.C., attach a map section showing the locations of all water supply wells within a one-half (1/2) mile radius of the proposed well. The well depths and casing depths should be included. When required by Rule 62-528.635(2), F.A.C., results of bacteriological examinations of water from all water supply wells within one-half (1/2) mile and drilled to approximate depth of proposed well should be attached.

6. Area of review (When required by Rule 62-528.300(4), F.A.C.)

   Include the proposed radius of the area of review with justification for that radius. Provide a map showing the location of the proposed injection well or well field area for which a permit is sought and the applicable area of review. Within the area of review, the map must show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, surface bodies of water, springs, public water systems, mines (surface and subsurface), quarries, water wells and other pertinent surface features including residences and roads. The map should also show faults, if known or suspected. Only information of public record and pertinent information known to the applicant is required to be included on this map.

H. CLASS V WELL OPERATION PERMIT

(Final report of the construction that includes the following information may be submitted with the application to operate.)

1. Permit Number of Class V Construction Permit: 0136595-014-UO5Q

2. Owner's Name: Peace River Manasota Regional Water Supply Authority

3. Type of Wells: Aquifer Storage and Recovery

4. Construction and Testing Summary: see supporting documentation

(a) Actual Dimensions:

Diameter (inches)	Well Depth (feet)	Casing Depth (feet)

(b) Result of Initial Testing

5. Proposed Operating Data: see supporting documentation

(a) Injection Rate (GPM);

(b) Description of injected waste; and,

(c) Injection pressure and pump controls.

6. Proposed Monitoring Plan (if any): see supporting documentation

(a) Number of monitoring wells;

(b) Depth(s);

(c) Parameters;

(d) Frequency of sampling; and,

(e) Instrumentation (if applicable) Flow _____

Pressure _____

I. CLASS V WELLS PLUGGING AND ABANDONMENT PERMIT

1. Permit number of Class V construction or operating permit.

2. Type of well.

3. Proposed plugging procedures, plans and specifications.

4. Reasons for abandonment.

J. MONITOR WELL PERMIT

This section should be used only when application is made for a monitor well only. If a monitor well is to be constructed under a Class I, III, or V injection well permit, it is not necessary to fill in this section.

1. A site map showing the location of the proposed monitor wells for which a permit is sought. The map must be to scale and show the number or name, and location of all producing wells, injection wells, abandoned wells, dry holes, water wells and other pertinent surface features including structures and roads.

2. Maps and cross sections indicating the general vertical and lateral limits within the area of review of all underground sources of drinking water, their position relative to the injection formation and the direction of water movement, where known, in each underground source of drinking water which may be affected by the proposed injection.

3. Maps and cross sections detailing the hydrology and geologic structures of the local area.

4. Generalized maps and cross sections illustrating the regional geologic setting.

5. Proposed formation testing program to obtain an anlysis of the chemical, physical and radiological characteristics of and other information on the monitor zone(s).

6. Proposed monitoring procedure.

7. Engineering drawings of the surface and subsurface construction details of the monitoring system.

8. Proposed monitoring data to be reported for meeting the monitoring requirements in Rule 62-528.425, F.A.C.

9. Construction procedures including a cementing and casing program, logging procedures, deviation checks, proposed methods for isolating drilling fluids from surficial aquifers, proposed blowout protection (if necessary), and a drilling, testing and coring program

10. Monitor Well Information:

☐ On-site ☐ Multizone ☐ Single-zone

☐ Regional ☐ Other (specify) _____

Proposed Monitoring Interval(s) _____

Distance and Direction From Associated Injection Well

_____

Part II. General Information
Subpart B. General Project Description

SECTION 2

Project Description

2.1 Purpose

The purpose of this application is to submit a timely renewal of the Florida Department of Environmental Protection Agency (FDEP) underground injection control (UIC) program Class V operation permit for the Peace River Manasota Regional Water Supply Authority's (Authority) Aquifer Storage and Recovery (ASR) system (PA File Number 0136595-014-UO/5Q) which expires April 23, 2018. In addition to the continued use of potable water from the Peace River Facility (PRF) as the ASR source water for their ASR system, the Authority is evaluating partially treated surface water (PTSW) as a new source water for the ASR system. PTSW is, for purposes of this application, surface water withdrawn from the Peace River, stored in the Authority's surface reservoir system, and run through a filtration system. At the time of this application, the decision to implement PTSW has not been fully vetted since PTSW pilot testing has just recently concluded in January 2018. The Authority requests consideration of a permit condition that allows the Department to approve PTSW as a source water over the duration of the permit without requiring a major modification of the permit. A decision by the Authority to implement PTSW ASR is anticipated in summer 2018. As part of this permit application, water quality for the reservoir and PTSW is provided for review by the Department and to be made available to interested parties at the time of public notice.

2.2 Background

The Authority was created to meet the growing water supply requirements for Charlotte, DeSoto, Manatee, and Sarasota Counties. The Peace River Facility (PRF) is located in southwest DeSoto County, Florida and is owned and operated by the Authority. The Authority is an independent, nonprofit, wholesale distributor of potable water serving Charlotte, DeSoto, and Sarasota Counties, and the City of North Port, and has the ability to provide service to Manatee County. The PRF is a conventional alum coagulation surface water treatment facility. Influent raw water supply demands are met from Peace River withdrawals. The ASR system and the two surface reservoirs at the PRF are key components of the surface water treatment, storage, and transmission system. The river's flow is highly seasonal, and permit restrictions are in place to protect downstream ecology typically preventing river withdrawals for 2 to 3 months a year, though the PRF has experienced drought periods that prevented river withdrawals for 200 consecutive days. Therefore, seasonal system storage is a critical component of the PRF. The Authority has successfully developed a reliable and drought tolerant water supply through the combined use of ASR and surface reservoirs.

Hydrogeologic formations currently utilized for ASR operations at the PRF include 20 ASR wells completed into the Suwannee Limestone and a single ASR well completed into the Tampa member of the Arcadia Formation of the Hawthorn Group. Two primary ASR wellfields have been constructed to date at the PRF. The older wells, referred to as Wellfield No. 1 (WF1), consist of eight Suwannee Zone ASR wells and a single Tampa Zone ASR well. A test ASR well completed into the Avon Park High Permeability Zone is also located within WF1, but has not been used extensively to date and has been converted into a non-compliance monitoring well that is sampled annually. These wells are located in the immediate vicinity of the PRF. Wellfield No. 2 (WF2) was constructed in 2002 and consists of 12 Suwannee Zone ASR wells located immediately south of the Authority's 520 MG Reservoir No. 1 and approximately 1 mile southwest of the PRF. **Figure 2-1** presents the project location map.

The Authority was granted a Water Quality Criteria Exemption (WQCE) for arsenic in the Suwannee Limestone of the Floridan aquifer to allow localized exceedances of arsenic resulting from geochemical changes associated with ASR operations, as long as the exceedances are within the property under the control of the Authority. This has allowed an operation permit to be issued for this ASR facility. The PRF ASR system has remained in compliance with the conditions of the WCQE and FDEP operation permit 0136595-014-UO5Q (**Appendix A**). The Authority is receptive to alternative regulatory mechanisms available to the Department such as a zone of discharge (ZOD), which would allow compliance of primary and secondary drinking water standards at selected compliance wells at, or in the direction of, the boundaries of the property under the control of the Authority. A ZOD would allow

the localized exceedances of arsenic to continue on the property of the Authority as currently permitted with the WQCE. If PTSW is implemented, a ZOD would also be critical for compliance of total coliform and secondary drinking water standards such as color and aluminum.

Figure 2-2 shows a combined aerial view of all ASR wells and monitoring wells associated with the Authority's ASR program. All property owned or controlled (through easements) by the Authority at/near the PRF is shown in **Figure 2-3**.

2.3 ASR Wellfield 1

ASR WF1 has been in operation since the mid-1980s when ASR was implemented at the PRF to meet seasonal storage needs for its drinking water customers. ASR wells T-1, S-1, and S-2 were the initial wells constructed. A second phase of ASR wells were constructed that included S-6, S-7, and S-8. The Authority's acquisition of the facility and the successful operation of these wells resulted in the third and final expansion of WF1 when wells S-3R, S-5R, and S-9R came online in 1995. The success of WF1 also justified the future expansion of the ASR system into WF2. **Figure 2-4** is a site map of WF1 ASR wells and associated monitor wells. Water recharged in the WF1 ASR wells is drinking water produced at the PRF. All water recovered from the ASR wells in WF1 is returned to the surface reservoirs for blending and re-treatment.

Figure 2-5 is a cross-section of the nine ASR wells in WF1 and the hydrogeologic units underlying the Facility. The units presented on the figure are based on the geology and hydrogeology encountered during construction of PRF ASR wells and monitor wells. The completion details of WF1 monitor wells are provided in **Table 2-1** and details of the WF1 ASR wells are included in **Table 2-2**.

WF1 has been regulated under an operation permit since August 2008. Prior to that, it was operated under an FDEP Letter of Authorization to Use (LOAU). The operation permit and LOAU both offered greater flexibility in the operation of the wellfield compared to the construction permit that WF2 operated under prior to April 2013. This allowed the Authority to use WF1 to supply water during short intermittent periods of high demand or to store water during short-term water supply surplus periods without being overly restricted by the operational limits of a cycle test plan. This is evident in the cumulative storage trend of WF1 shown in **Figure 2-6**. A total of approximately 1.33 billion gallons (BG) is currently stored in WF-1. During the period of the current 5-year operation permit approximately 1.55 BG was recharged at WF1 and approximately 985 MG was recovered.

The two primary water quality issues associated with the operation of the Authority's potable water ASR wellfields are increasing salinity throughout recovery and the potential for localized arsenic mobilization near the ASR wells. Recovery efficiency can be managed operationally by limiting recovery volumes and rates and maintaining adequate storage volumes in the ASR wells. Through issuance of the WQCE, arsenic concentrations above the regulatory standard of 10 micrograms per liter (µg/L) are allowed within the property controlled by the Authority. An extensive monitoring network is in place and frequent water quality sampling is required by the FDEP operation permit to monitor water quality changes in the aquifer resulting from ASR operations.

Although arsenic concentrations from some of the ASR wells occasionally exceed the 10 µg/L standard, the monitoring well arsenic concentrations over the period of record have been 10 µg/L or less, with the exception of M-22 which is located in the middle of the wellfield approximately 100 feet from multiple ASR wells. During the current permit cycle, arsenic concentrations remained below 10 µg/L in all of the WF1 monitoring wells. A more comprehensive analysis of the ASR data and monitor well data is provided in the annual ASR summary reports submitted to the FDEP. The latest report was submitted August 29, 2017, titled *2016 Annual Report Peace River Facility ASR System, August 2017*.

TABLE 2-1
WF1 Monitor Well Construction Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Approximate Distance To nearest ASR well (feet)	Hydrogeologic Interval
E	6	140	200	>50 feet (S-2)	UPZ
T-2	4	393	490	1,900 (S-1)	LPZ
M-2	6	596	900	1,900 (S-1)	Suwannee Zone
I-7	6	220	261	360 (S-6)	LPZ
T-7	6	349	400	360 (S-6)	LPZ
M-7	6	580	605	360 (S-6)	Suwannee Zone
M-20	6	584	688	450 (SR-5)	Suwannee Zone
M-21	6	575	672	190 (S-7)	Suwannee Zone
M-22	6	565	572	100 (S-2)	Suwannee Zone
AP-1	20/12	1,300	1,479	440 (S-1)	APHPZ

LPZ= lower producing zone of the Hawthorn aquifer system (a.k.a. lower Arcadia aquifer, or Tampa Zone)
UPZ= upper producing zone of the Hawthorn aquifer system
APHPZ= Avon Park high permeability zone
Suwannee Zone = refers to the Upper Floridian aquifer permeable unit within the Suwannee Limestone formation

TABLE 2-2
WF1 ASR Wells Construction Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Hydrogeologic Interval
T-1	12	380	482	LPZ
S-1	8	570	920	Suwannee Zone
S-2	12	570	900	Suwannee Zone
S-6	12	580	910	Suwannee Zone
S-7	12	575	915	Suwannee Zone
S-8	12	510	623	Suwannee Zone
S-3R	16	580	769	Suwannee Zone
S-5R	16	650	955	Suwannee Zone
S-9R	16	580	800	Suwannee Zone

[a] Table Notes
LPZ = lower producing zone of the Hawthorn aquifer system (a.k.a. lower Arcadia aquifer, or Tampa Zone)
Suwannee Zone = refers to the Upper Floridan aquifer permeable unit within the Suwannee Limestone formation

2.4 ASR Wellfield 2

The 12 ASR wells in WF2 were completed in 2002 into the Suwannee zone of the Upper Floridan aquifer (UFA). The final casing depths of the ASR wells range from 568 feet to 621 feet below land surface (bls), and the total well depths range from 883 feet to 905 feet bls. The wells were installed in a grid pattern with approximately 300 feet spacing between each ASR well. WF2 has been in operation since 2002, storing potable water from the PRF and recovering the stored water to the surface reservoirs for blending and re-treatment. **Figure 2-7** shows an aerial view of WF2 ASR wells and associated monitoring wells. **Figure 2-8** illustrates the well completion details for the 12 ASR wells in WF2. **Table 2-3** provides a summary of the monitor well construction details and **Table 2-4** shows the details of the ASR production wells in WF2.

A total of approximately 4.67 BG is currently stored in WF2. During the period of the current 5-year operation permit, approximately 5.77 BG was recharged at WF2 and approximately 1.36 BG was recovered. **Figure 2-9** shows the cumulative storage volume trend for WF2.

In March of 2005, with 50 percent funding from the Southwest Florida Water Management District (SWFWMD), the Authority expanded their ASR monitoring program by constructing 13 additional monitoring wells. One Tampa Zone monitoring well (T-11), and twelve Suwannee Zone monitoring wells (M-13 through M-22) were constructed to enhance the ASR groundwater monitoring program. Three of the Suwannee Zone monitoring wells were constructed near WF1, and the remaining ten monitoring wells were completed in the vicinity of WF2. The extensive monitor network provided the data to confirm the limited extent of arsenic mobilization resulting from ASR operations, the basis for FDEP's authorization of a WQCE for arsenic at the PRF ASR system.

Multiple monitoring wells surround WF2 to monitor water quality of the aquifer and movement of recharged water from the ASR system. Arsenic concentrations from the monitor wells have remained below 10 μg/L during the current permitting period except for M-14 and M-15, observed during the recent PTSW cycle testing. M-14 has shown an almost immediate influence of ASR water during recharge, and therefore this well has had relatively consistent arsenic responses with elevated concentrations typically observed during storage and recovery events. Storage at WF2 has increased significantly since 2013. As a result of increased storage, and potentially the recent PTSW testing, several monitor wells (in addition to M-14) have shown elevated arsenic concentrations including M-11, M-12, M-15, and M-16. Though arsenic detections have been more frequent at these wells, most samples have remained below 10 μg/L, with M-12, M-14, and M-15 briefly exceeding 10 μg/L. Only one sample at M-12 was above 10 μg/L recorded at 18.9 μg/L during PTSW cycle testing. The highest concentration above 10 μg/L at M-14 was a single sample of 12.5 μg/L recorded in June of 2017. Of these monitoring wells, only M-15 is listed as a "compliance" well per the conditions of the WQCE. A discussion on the compliance well water quality is provided in the Section 2.6 below.

WF2 ASR operational data and monitoring well data are evaluated annually, and summarized in an annual report submitted to the FDEP. The latest report was submitted August 29, 2017, titled *2016 Annual Report Peace River Facility ASR System, August 2017*. A copy of that annual report is provided as **Appendix B** in this application for reference. Additional data were collected during the PTSW ASR pilot test, which will be compiled into a report that will be available within a few months of this permit application submittal.

2.5 Compliance Monitoring Well Water Quality

As part of this permit application water quality graphs for the monitor wells listed in the conditions of the WQCE as "compliance" wells (E, I-7, I-8, I-10, T-2, T-7, T-8, T-11, M-2, M-15, M-18, M-19, and M-21) were updated through December 2017. The graphs are provided in **Appendix C** and include TDS, sulfate, and arsenic concentrations from the compliance monitor wells. Arsenic concentrations have remained below 10 μg/L at all of the compliance wells with the exception of M-15, which only increased to above 10 μg/L in December 2017, potentially in response to the PTSW pilot testing that was ongoing at the time. The highest value was recorded on December 4, 2017 at a concentration of 14 μg/L. The remaining three samples collected in December ranged between 11 μg/L and 13 μg/L. Storage volumes at WF2 have increased significantly since 2013, and as more recharge water reached M-15 (as demonstrated by the decreasing TDS trend), arsenic detections began to

increase. It is anticipated that concentrations will begin to decrease at this well as the geochemical environment begins to stabilize. Sampling at M-15 has increased to twice weekly until concentrations are consistently below 10 μg/L. The submittal of this application serves as notification of the exceedance at M-15 to the Department pursuant to condition 6. (c) 1. of the WQCE. Since this well is not near the boundary of the property under the control of the Authority and concentrations are relatively low at approximately 12 μg/L, no action is proposed at this time other than continued increased monitoring frequency.

TABLE 2-3
WF2 Monitoring Well Construction Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Approximate Distance To nearest ASR well (feet)	Hydrogeologic Interval
T11	6	350	400	340 (S-20)	LPZ
M11	6	570	677	340 (S-20)	Suwannee Zone
M12	6	585	705	400 (S-15)	Suwannee Zone
M13	6	550	670	660 (S-20)	Suwannee Zone
M14	6	575	676	170 (S-20, S-19)	Suwannee Zone
M15	6	570	678	560 (S-14)	Suwannee Zone
M16	6	560	673	400 (S-15)	Suwannee Zone
M17	6	565	670	95 (S-16)	Suwannee Zone
M18	6	575	700	250 (S-10)	Suwannee Zone
M19	6	580	680	525 (S-17)	Suwannee Zone
I-10	6	260	320	6,400	LPZ
M-6	6	579	640	7,900	Suwannee Zone
I-8	6	155	190	860 (S-20)	UPZ
T-8	12	354	401	860 (S-20)	LPZ
M-8	10	570	860	900 (S-20)	Suwannee Zone

LPZ= lower producing zone of the Hawthorn aquifer system
UPZ= upper producing zone of the Hawthorn aquifer system
Suwannee Zone = refers to the Upper Floridian aquifer permeable unit within the Suwannee Limestone formation

TABLE 2-4
WF2 ASR Wells Construction Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Hydrogeologic Interval
S-4	12	570	905	Suwannee Zone
S-10	16	620	906	Suwannee Zone
S-11	16	585	816	Suwannee Zone
S-12	16	600	900	Suwannee Zone
S-13	16	621	898	Suwannee Zone
S-14	16	568	900	Suwannee Zone
S-15	16	583	833	Suwannee Zone
S-16	16	583	902	Suwannee Zone
S-17	16	579	786	Suwannee Zone
S-18	16	592	900	Suwannee Zone

TABLE 2-4
WF2 ASR Wells Construction Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Hydrogeologic Interval
S-19	16	585	900	Suwannee Zone
S-20	16	566	898	Suwannee Zone

Suwannee Zone = refers to the Upper Floridan aquifer permeable unit within the Suwannee Limestone formation

2.6 Partially Treated Surface Water ASR

The Authority continuously explores options to increase their water supply for drought tolerance. The addition of PTSW as a source water option would provide for additional storage with a decrease in overall potable water delivery cost from ASR. The use of PTSW versus potable water at WF2 would provide cost, environmental, and permitting benefits. Rather than the current practice of treating the water to potable standards twice before it enters the distribution system, the Authority would only need to fully treat the water once.

A desktop study was prepared to evaluate PTSW ASR (*Partially Treated Surface Water ASR Desktop Study*, CH2M and ASRus, March 2016). Based on the recommendation in that study, the Authority submitted a request for a modification of the ASR permit to allow limited testing of PTSW ASR to evaluate water quality and operational considerations. The permit major modification (136595-016-017-UO/M5) was issued by the FDEP December 14, 2016 and will expire on April 23, 2018. **Appendix A** provides the FDEP permit modification to allow PTSW ASR pilot testing.

Pilot test using PTSW at ASR Well S-4 and S-20 began in February 2017 and concluded in January 2018. Evaluation of the data is currently underway from which a report will be completed and provided to the Department. Upon completion of this report and deliberation by the Authority, the Authority may request addition of PTSW as a new source water for the ASR system.

2.7 Local Geology and Hydrogeology

Well site stratigraphy was defined from lithologic descriptions of formation samples collected during construction of the new monitor wells associated with the ASR Wellfield Enhanced Groundwater Monitoring Program (CH2M HILL, August 2005). The geologic units penetrated by the ASR wells include Recent to Eocene aged sediments. Geologic units encountered are described below in descending order from land surface.

2.7.1 Geology

Undifferentiated Surficial Deposits

The uppermost geologic unit at the site is undifferentiated surficial deposits, primarily clastics, from Pliocene to Recent age. The unit is comprised primarily of fine to medium grained unconsolidated quartz sand with occasional inter-bedded silt and clay. At the project location, the unit extends to a depth of 40 to 60 feet bls.

Peace River Formation

The Peace River Formation consists predominately of olive gray, clayey quartz sand and phosphatic sand, with occasional intermittent lenses of limestone. The interval unconformably underlies the undifferentiated surficial deposits and is considered part of the Hawthorn Group sediments (Scott, 1988). The age of sediments range from Pliocene to Miocene and the formation extends generally from 40 feet to 120 feet bls at the project location.

Arcadia Formation

The Arcadia Formation, also part of the Hawthorn Group, is middle-Miocene in age and extends from approximately 120 feet to 580 feet bls at the site. The formation can be separated into three units; an upper undifferentiated unit, the Tampa Member, and the Nocatee Member. The undifferentiated unit consists of varying amounts of sandy and clayey limestone and yellowish-gray and olive-gray clay. The vertical extent of the unit varies at each well location but is generally from 120 feet to 250 feet bls. The Tampa Member of the Arcadia

Formation is composed predominantly of fossiliferous limestone with some inter-bedded quartz and phosphatic sand. The limestone is fine grained, yellowish gray to light gray, and generally has moderate permeability. The thickness of the unit varies from well to well but typically extends from approximately 250 feet to 400 feet bls. The third member of the Arcadia Formation is the Nocatee Member which consists primarily of clay, sandy clay and phosphatic clays. The unit exists from approximately 400 feet to 580 feet bls at the well site and is generally of low permeability.

Suwannee Limestone

The Suwannee Limestone is Oligocene in age and consists of chalky to granular limestone distinguished from the overlying carbonates by the absence of phosphate. The formation is the primary storage zone for the ASR wellfields and extends from approximately 580 feet bls to approximately 860 feet bls at the two ASR wellfields.

2.7.2 Hydrogeology

surficial aquifer

The surficial aquifer is an unconfined permeable unit extending to approximately 40 feet bls. It is composed of the undifferentiated surficial deposits of the Holocene to Pliocene sediments. Clayey sand of the Peace River Formation underlies the surficial deposits and provides confinement to the underlying Hawthorn aquifer system (previously designated as the Intermediate aquifer system).

Hawthorn aquifer system

The Hawthorn aquifer system (previously referred to as the Intermediate Aquifer System) includes strata from the Hawthorn Group. The Hawthorn aquifer system is situated below the surficial aquifer and above the primary aquifer in this area, the UFA. Confinement exists between the Hawthorn aquifer system and the overlying surficial aquifer and the underlying UFA. The Hawthorn aquifer system regionally consists of the Peace River aquifer, upper Arcadia aquifer, and the lower Arcadia aquifer. The presence and thickness of each of these aquifers at the project site varied significantly from well to well as indicated from data collected during monitoring well construction in 2005, and data and testing completed previously during the construction of the ASR wellfields. The primary water-producing unit of the Hawthorn aquifer system is the lower Arcadia aquifer, described previously as the “Tampa Zone”, “PZ-3”, or “LPZ”. ASR well T-1 was completed into this zone.

Upper Floridan aquifer (UFA)

The UFA begins at the top of the Suwannee Limestone at an average depth of about 580 feet bls in this area. The depth of the drilling investigation for the ASR wells and monitor wells at the two wellfields did not fully penetrate the UFA, however the aquifer is known to be approximately 1,300 feet thick at this location. The primary storage zone for the ASR wellfields exists within the permeable Suwannee Limestone. This permeable unit displays moderate production primarily from secondary porosity with occasional minor fractures systems. Some localized confinement was noted by the small, variable lenses of clay encountered within the formation.

The UFA, which is the most productive and widely used aquifer in the study area, consists of the Suwannee Limestone, the Ocala Limestone, and the Avon Park Formation. Thickness of the UFA generally ranges from 1,200 feet in northeastern Hardee County to 1,400 feet in DeSoto County. The UFA consists of limestone and dolomite containing solution-enlarged fractures that commonly yield abundant supplies of water to wells. The most productive part of the aquifer generally occurs in a fractured dolomite section within the Avon Park Formation. The aerial distribution of transmissivity of the UFA, as determined from aquifer tests and specific capacity tests and results of flow model calibration show great variability.

Transmissivities determined from aquifer tests of the UFA range from 5,000 feet squared per day (ft^2/d) to more than 1,600,000 ft^2/d. The large range in transmissivities is characteristic of fractured-rock aquifers and could be due to variations in the number and size of fractures intercepted by the test well or variations in the extent of the aquifer penetrated by the well. Storage coefficients for the UFA were estimated to range from $4.1x10^{-1}$ to $3.0x10^{-4}$ (Torres, et al, 2001).

An upper permeable unit includes most of the Suwannee Limestone and sometimes the overlying lower Arcadia aquifer (Tampa Member). The permeability of this unit is principally intergranular with little contribution from

secondary porosity (Basso, 2001). The Suwannee Limestone at the PRF however is separated from the lower Arcadia aquifer by the low permeability, semi-confining Nocatee Member of the Arcadia Formation. The Suwannee Limestone exists from approximately 500 feet to 950 feet bls at the PRF. All of the ASR wells, with the exception of T-1 and the Avon Park ASR test well, are constructed into the Suwannee Limestone. T-1 is constructed into the lower Arcadia aquifer. There are no significant permeable zones within the Ocala Limestone in the project area. This unit comprises a semi-confining unit over most of the area of interest. However, water levels in wells completed above and below this unit show little difference in value.

The next permeable zone underlying the Ocala low permeability zone occurs in the Avon Park Formation and is referred to as the Avon Park high permeability zone. Fracturing and secondary porosity are the principal source of this permeability. The Avon Park test ASR well is completed into this highly transmissive zone.

2.8 Water Supply Wells in the Area of Review

A well inventory utilizing information in the public record was conducted within a 2-mile radius from the approximate center of each wellfield. Information on existing wells within the 2-mile radius Area of Review (AOR) was acquired from the Southwest Florida Water Management District (SWFWMD), Florida Geological Survey (FGS), and Florida Department of Health (FDOH), well database records.

2.8.1 Area of Review

The 2-mile radius was selected as a conservative distance from the center of the wellfields where operations at the ASR site are not expected to affect other potential competing users within the ASR storage zone outside of this radius. An aerial map showing the project location and 2-mile AOR is shown on **Figure 2-10**. Also shown is the estimated current lateral extent of ASR storage and a five year and ten year projection. The estimation of these projected volumes are based on a cylindrical volume calculation which is provided in **Appendix D**. The calculation assumes an ASR storage zone of 200 feet (smaller than the average open hole interval of the ASR wells), and an effective porosity of 0.1 for the limestone matrix. These conservative parameters where used to partially account for the preferential flow paths from secondary porosity features that may be present, however the method serves to only provide a gross estimation of potential ASR storage extent. The five year and ten year projections assume recharge at each ASR well for 100 days per year at 1 MGD per well and no recovery (10.5 BG total storage and 21 BG total storage respectively). This is an unrealistically high storage volume but serves to provide an extreme condition for the purposes of establishing a conservative AOR. Using these ASR storage volumes the five year and ten year the lateral extent of the projected storage are within the 2-mile AOR. The calculation of the five and ten year storage projection is provided in **Appendix D**.

2.8.2 Well Inventory

Well construction permits (WCPs) on file with the SWFWMD and within the AOR are shown on **Figure 2-11**. A table of all WCPs are provided in **Appendix E-1**. A well construction permit must be obtained for each new well constructed within the SWFWMD, regardless of well diameter, well depth, or type of use. A total of 265 WCPs have been issued within the 2-mile AOR.

SWFWMD Water Use Permits (WUPs) not issued to the Authority within the AOR are also shown on **Figure 2-12**. SWFWMD issues WUPs to those users with wells that exceed 6 inches in diameter or that use more than 100,000 gallons per day. A total of 24 WUPs are currently issued within the AOR that are not owned by the Authority. Of these water use permits, most had a listed use type as either irrigation or livestock. One WUP had a use of unknown capped and another, public supply capped. Capped is assumed to mean the well is not in use as the permitted water use allocation for both of these WUPs was listed as zero. **Appendix E-2** provides a table of the WUPs within the AOR, not including the Authority permits.

FGS and FDOH databases were queried as part of this well inventory review. Two FGS wells were found in the AOR, FGS-1 was a duplicate of WCP-2 which is discussed in the next section. The other well was a shallow boring to 80 feet. Due to the duplication of FGS-1 and the shallow construction of FGS-2 these wells are not shown on a figure. A table of the FGS wells is provided in **Appendix E-3**. The FDOH database had a total of six wells in the

AOR with a listing of non-community public water supply or limited use public water supply, they are discussed in the following section.

2.8.3 Water Supply Wells of Interest

Wells designated as domestic or public supply wells from all databases queried are shown on **Figure 2-13.** These are considered to be wells affording the most consideration when evaluating potential impacts from ASR operations since the water is in some cases used for public consumption. A total of 196 wells were listed as domestic or public supply with in the AOR, with a high concentration of wells located over one mile to the south and southeast of the PRF. A table of the wells are provided in **Appendix E-2** (SWFWMD WUPs), **Appendix E-4** (FDOH), **Appendix E-5** (SWFWMD WCPs). Most of the domestic and public supply wells have completions depths into the Hawthorn aquifer system and therefore would not be impacted by ASR operations which primarily occur in the UFA, the exception being T-1 at WF1.

Figure 2-14 and **Figure 2-15** show all wells that are greater than 500 feet in depth from the SWFWMD WCP and WUP databases, respectively. Wells that exceed 500 feet in depth likely penetrate the Tampa Member permeable unit of the Hawthorn aquifer system, which is considered to be a conservative estimate of wells that may be potentially impacted by ASR operations. A total of eleven WCPs and fourteen WUPs have completion depths of 500 feet or greater. One domestic well and one public supply well (WCP-2 and WUP-20) have a listed depth greater than 500 feet bls. WCP-2 is on the R.V. Griffin Reserve and is not associated with a residential property. It is believed to be an old well installed at a hunting camp that is no longer in use. WUP-20 is owned by River Oaks RV Inc., this well is listed as capped and it was confirmed by the Authority that this permittee is now supplied potable water from DeSoto County. A table of the SWFWMD WCPs and WUPs, organized by well depth, are provided in **Appendix E-1** and **Appendix E-2**, respectively.

Evaluation of the well inventory within the AOR indicated that there are no active domestic or public supply wells that penetrate the Tampa Member of the Hawthorn aquifer system and therefore ASR operations do not pose a potential threat to public health. The remaining wells that are 500 feet or greater in depth in the AOR are mostly irrigation wells. The potential for water quality impacts to these users are minor and would be related to upconing of higher salinity water resulting from depressed water levels that may be associated with recovery of water from the ASR system. The Authority's ASR operating protocol strives to maintain an overall positive storage balance in the aquifer. This excess recharge water stored in the aquifer has a lower salinity concentration than the native groundwater, and the positive water balance increases water levels in the aquifer, therefore providing a net regional benefit to other groundwater users of the UFA.

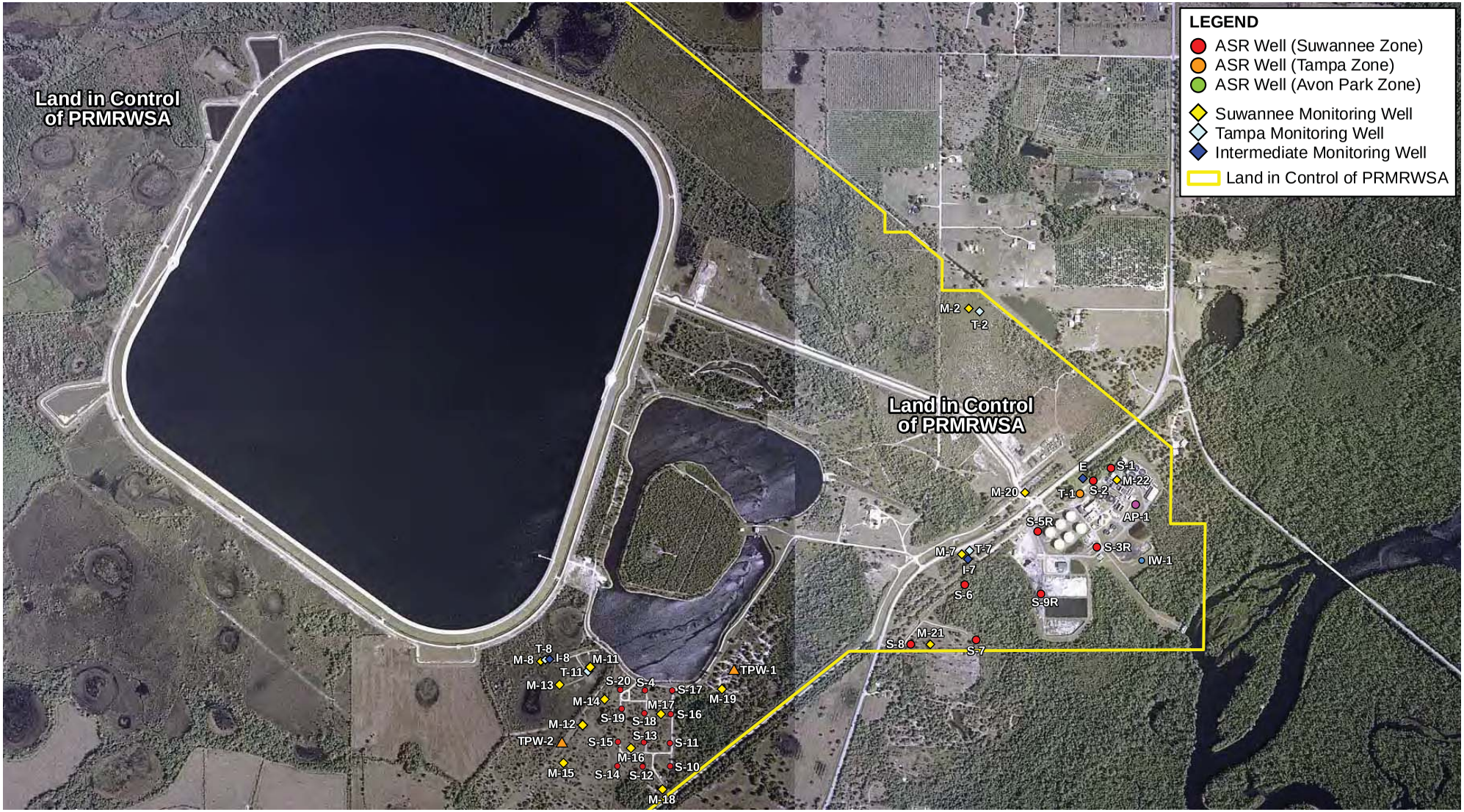
North

Scale in Miles
0 1/2 1

FIGURE 2-1
Project Location Map

WBG062512214751TPA F2-1 Project Location Map.ai

CH2MHILL



PEACE RIVER REGIONAL WATER SUPPLY AUTHORITY MANASOTA

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

0 1000 1500 2000

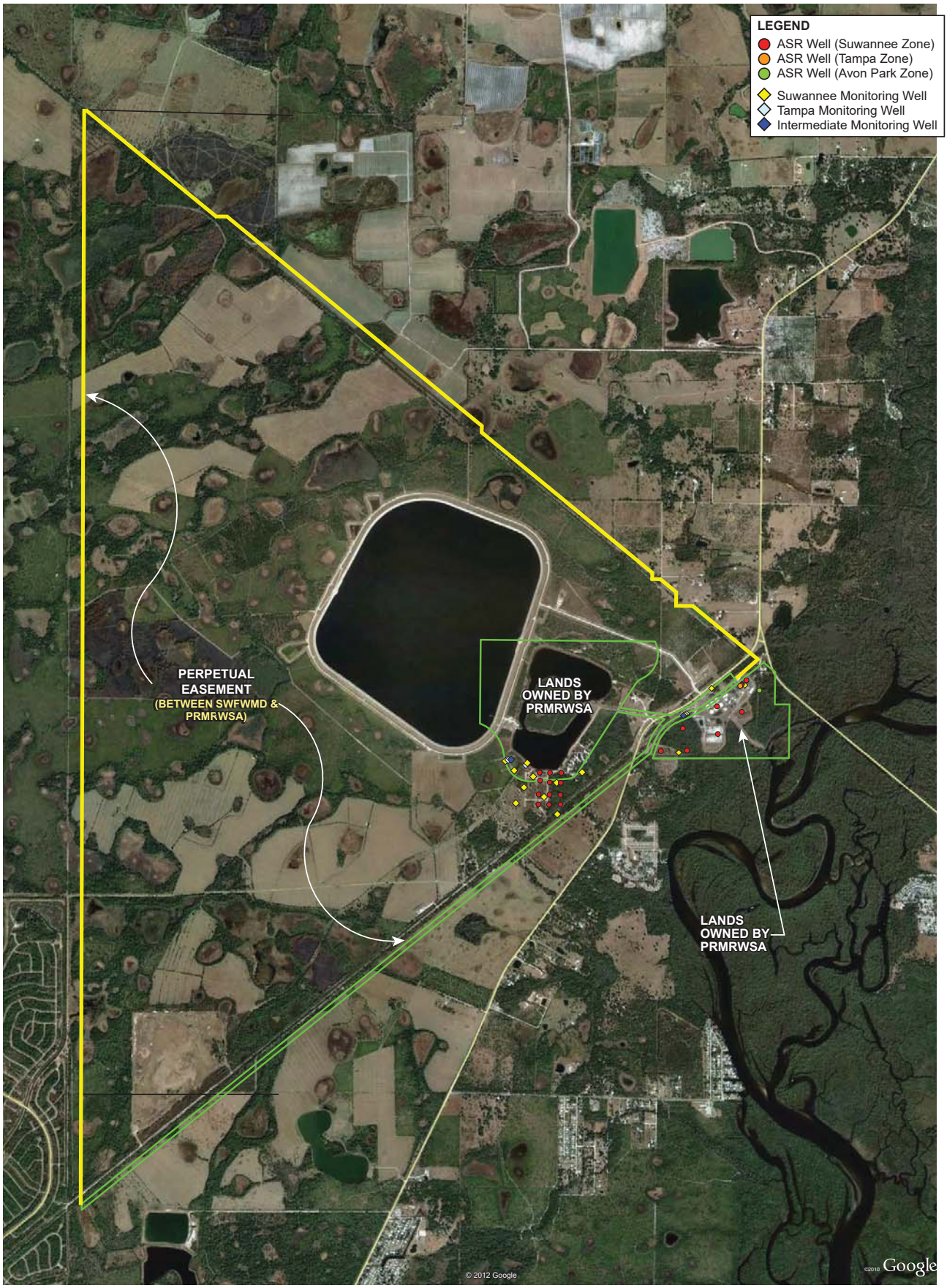
Scale in Feet

North

FIGURE 2-2
Site Map of ASR System (WF1 and WF2)

ASRJS LLC

CH2MHILL



PEACE RIVER REGIONAL WATER SUPPLY AUTHORITY MANASOTA

0 1000 1500 2000
Scale in Feet

North

Image: © Google Earth Pro
Data: CH2M HILL

Imagery Date: 1/19/2012

FIGURE 2-3
Property Boundaries and Easement Boundaries at the PRF and R.V. Griffin Reserve

ASR US, LLC
ch2m now JACOBS

WBG033110202324TPA F2-7 Property and Easement Boundaries.ai

Peace River Regional Water Supply Authority Manasota

Scale in Feet

0 200 400

North

Image: © Google Earth Pro
Data: CH2M HILL

Imagery Date: 1/19/2012

FIGURE 2-4
Wellfield 1 Site Plan

ASRJS LLC

CH2MHILL

WBG062512214751TPA F2-2 WF1 Site Plan-rev3.ai

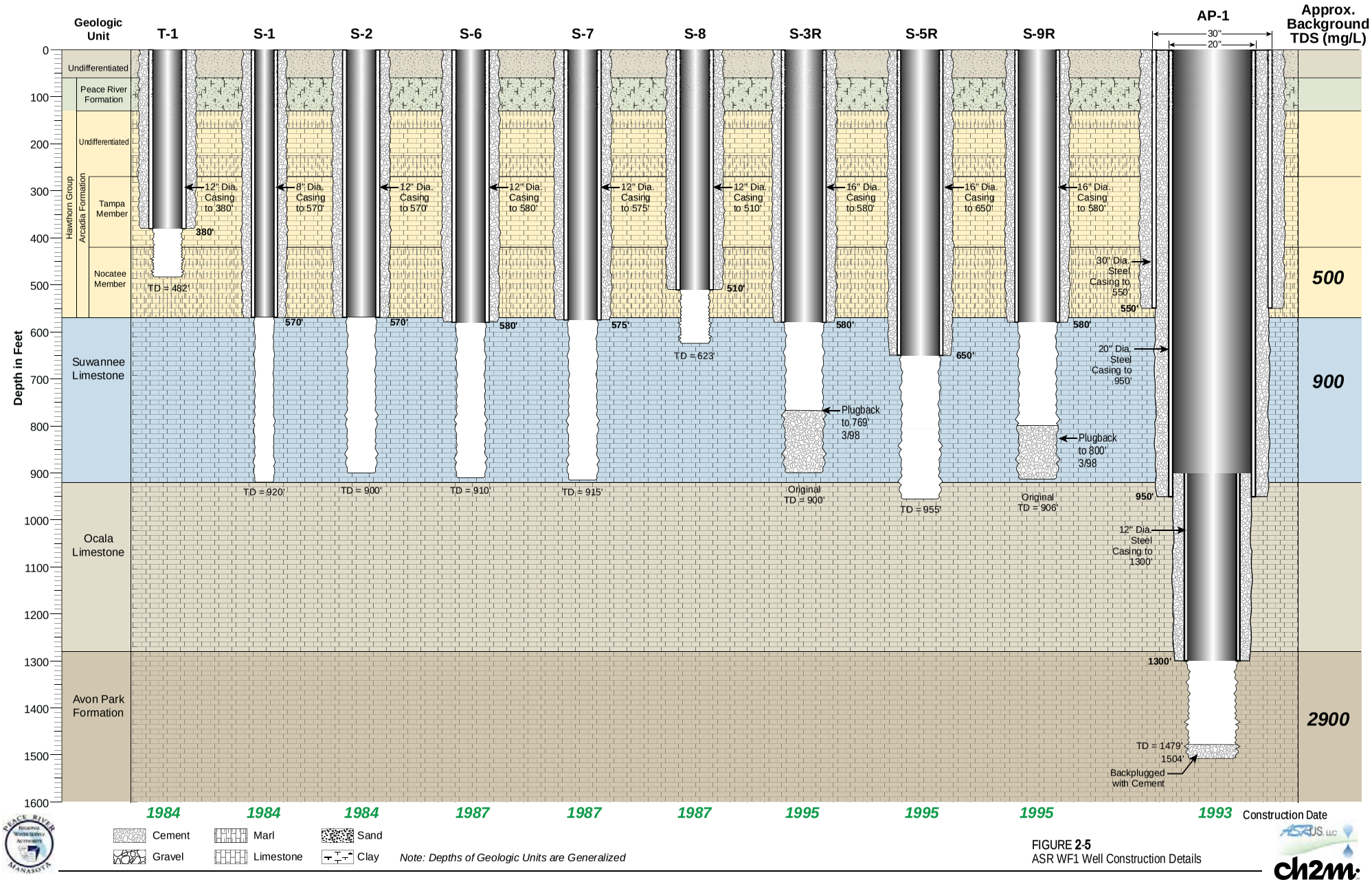


FIGURE 2-5
ASR WF1 Well Construction Details

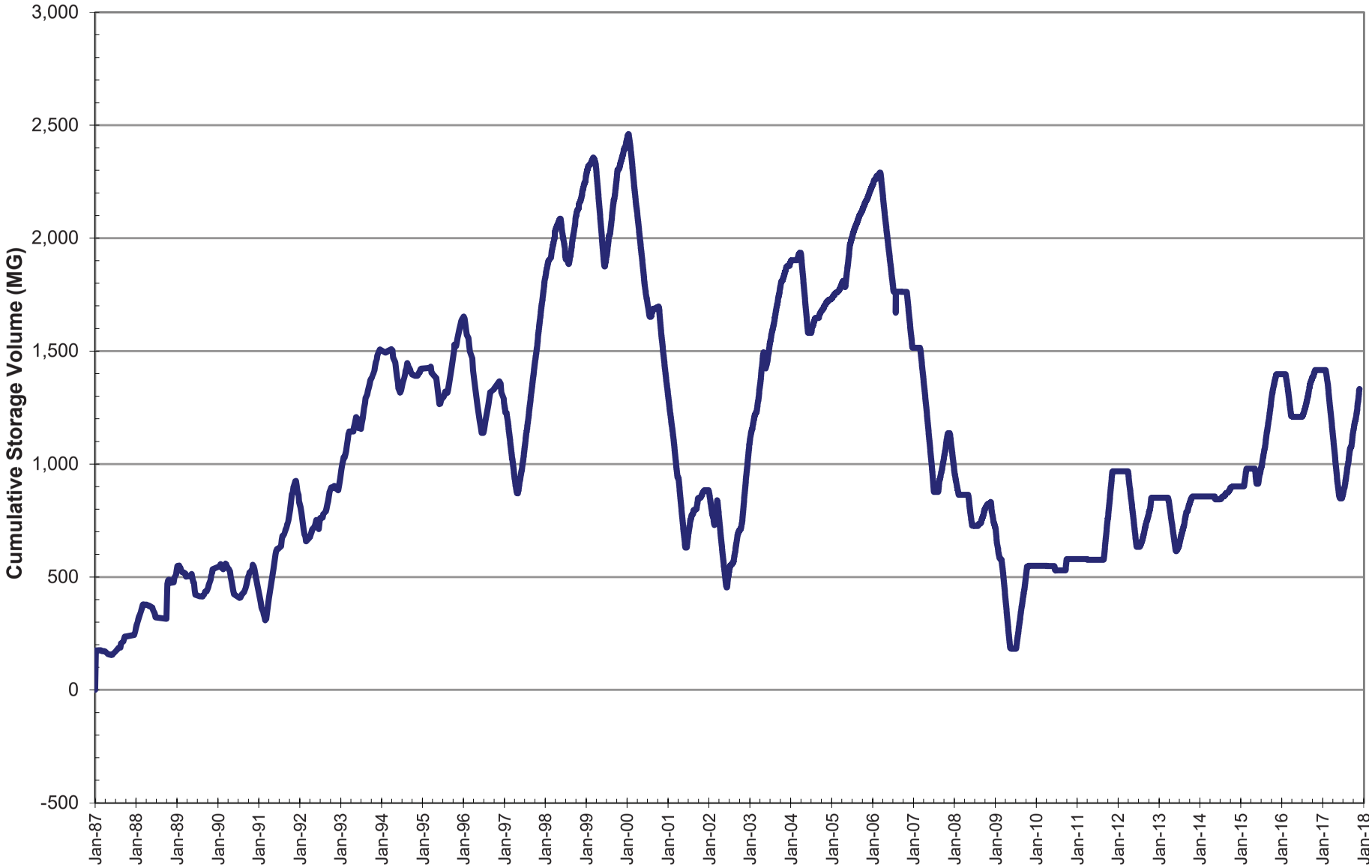


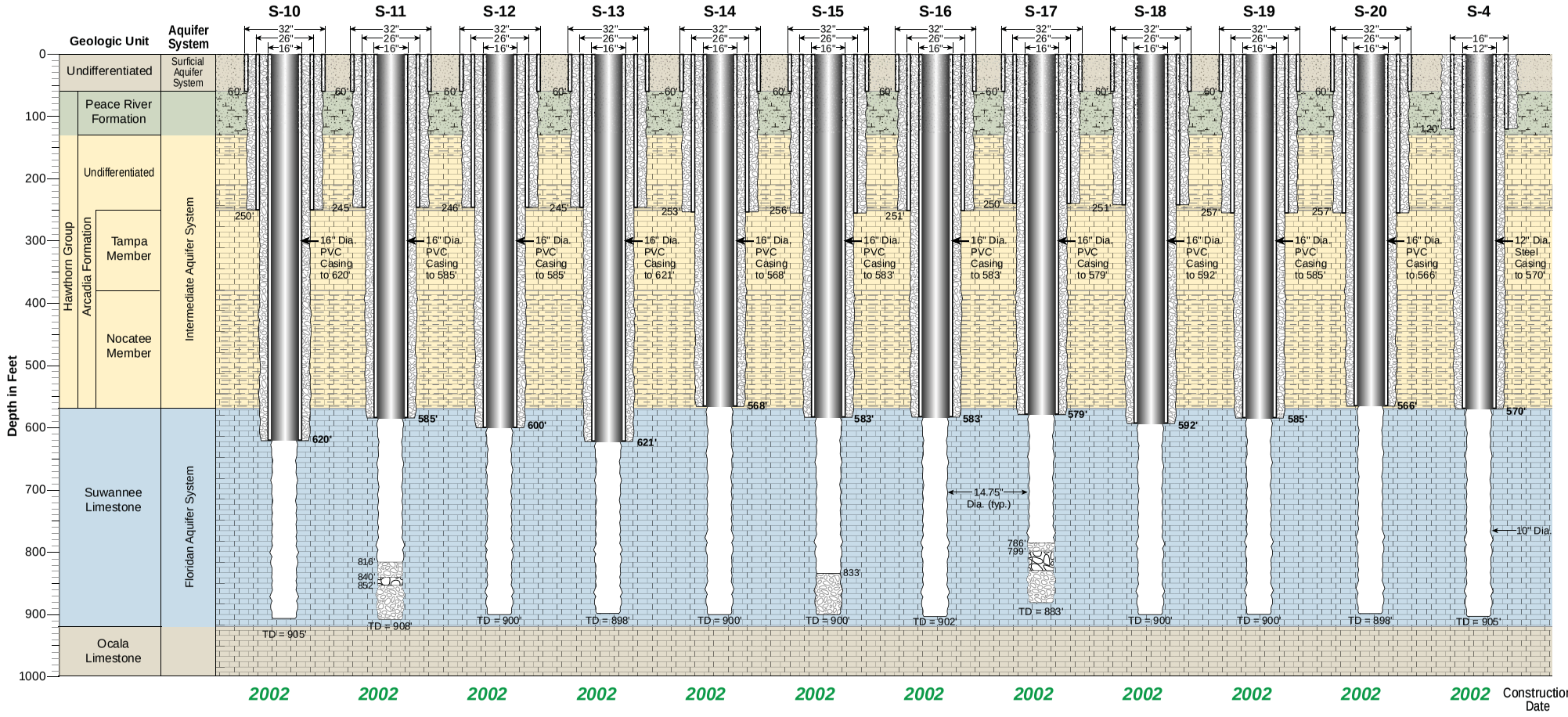
Figure 2-6
WF1 Cumulative Storage Volume

Scale in Feet
0 200 400

North

FIGURE 2-7
Wellfield 2 Site Plan

WBG062512214751TPA F2-4 WF2 Site Plan-rev1.ai



Cement
Gravel
Marl
Limestone
Sand
Clay

Note: Depths of Geologic Units are Generalized

FIGURE 2-**8**
ASR WF2 Well Construction Details

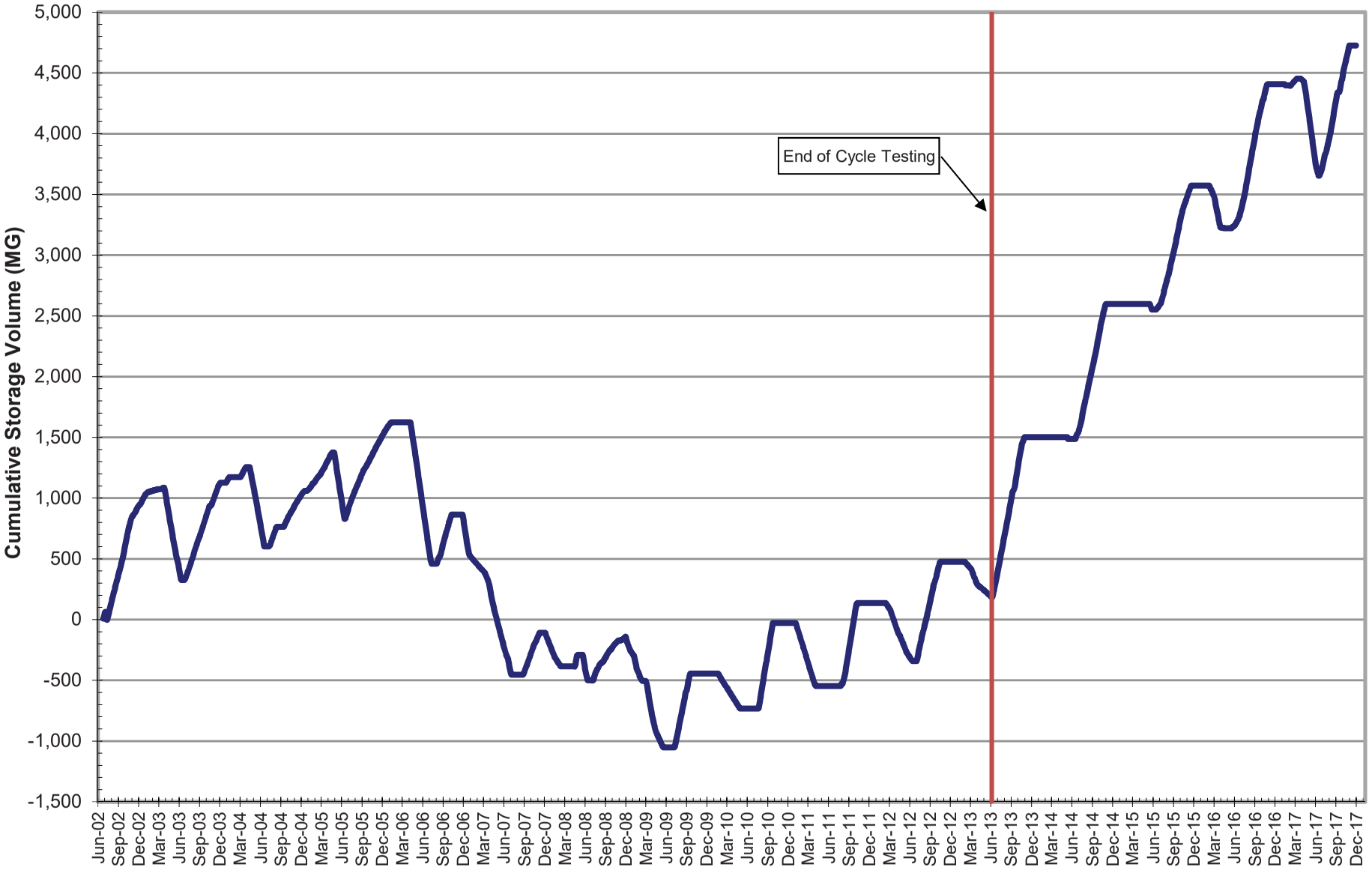
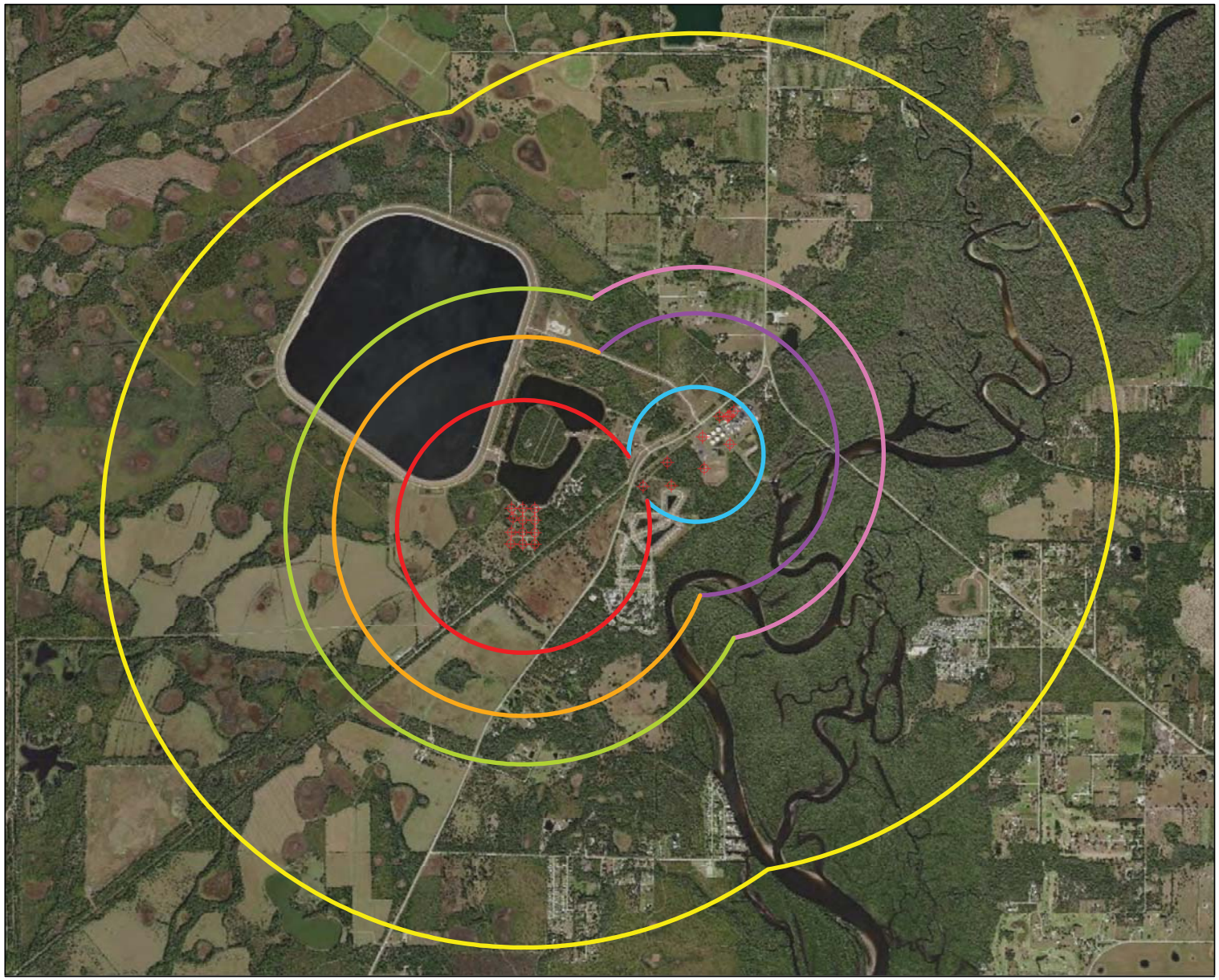
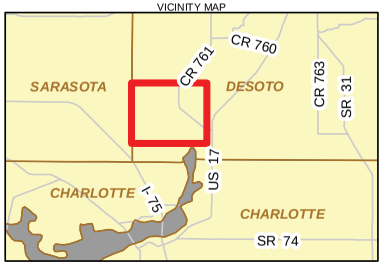


Figure 2-9
WF2 Historical Cumulative Storage Summary



VICINITY MAP



Legend

- PRMRWSA ASR Wells
- Area of Review

Estimated Extent of Current ASR Storage

- WF1: 0.32 Miles (1.3 BG)
- WF2: 0.60 Miles (4.7 BG)

Estimated Extent of Future ASR Storage (5 Years)

- WF1: 0.67 Miles (5.8 BG)
- WF2: 0.90 Miles (10.7 BG)

Estimated Extent of Future ASR Storage (10 Years)

- WF1: 0.89 Miles (10.3 BG)
- WF2: 1.13 Miles (16.7 BG)

Notes:

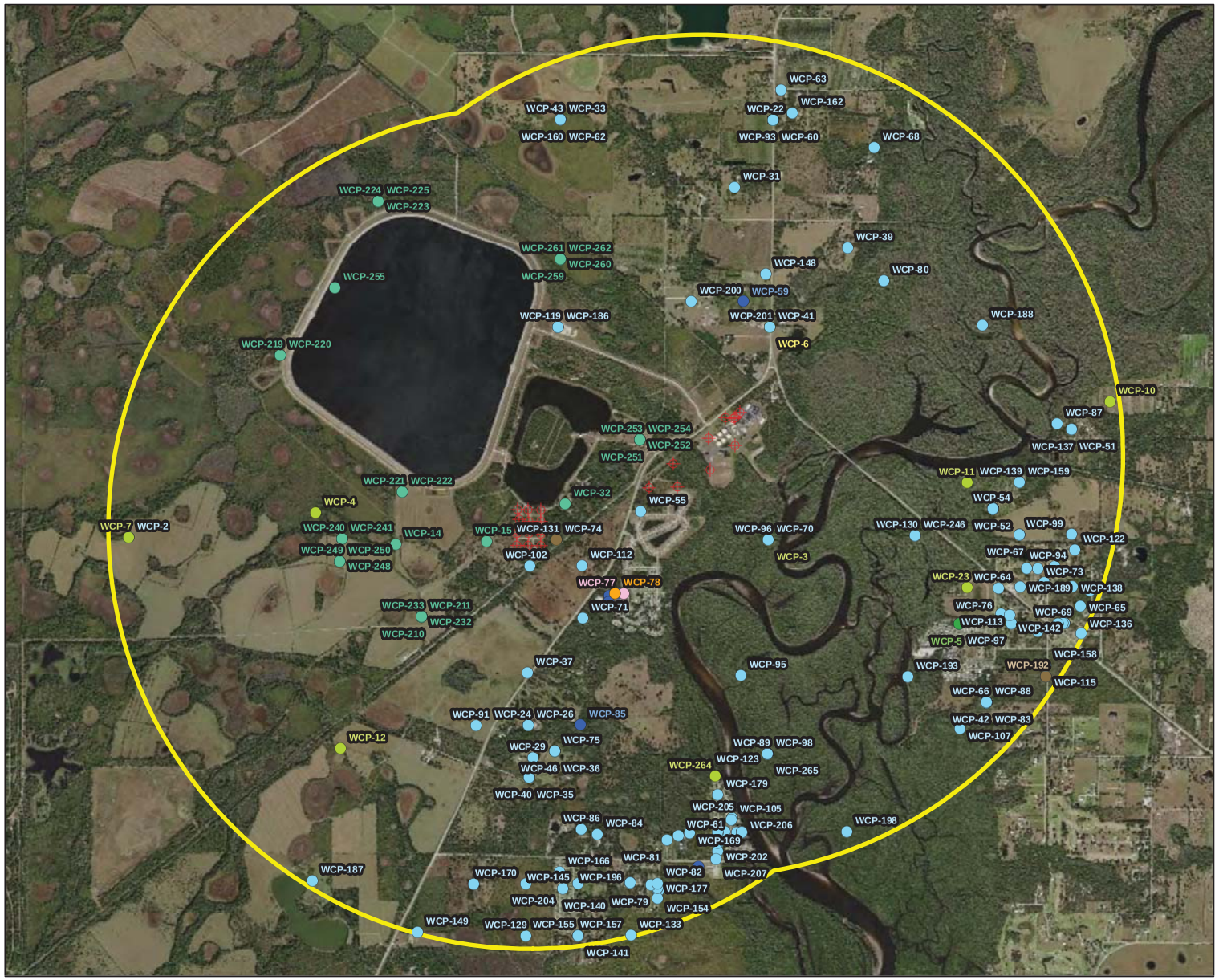
1. A cylindrical volume calculation was used to provide a gross estimation of the average distance the ASR stored water may extend laterally from the ASR wellfields. Using this simple method assumes the following:
   - The recharge zone is homogenous and isotropic.
   - No leakance occurs between the overlying and underlying geologic units.
   - No density differences exist between the injected water and the native groundwater.
   - The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
   - The effective porosity of the recharge zone (Limestone) is 0.1
   - The conservative thickness of 200 feet is used for the recharge zone (cylinder height)
2. The 5-year and 10-year projections are based on recharge of 1 mgd per well for 100 days per year and no recovery.
3. State Counties, Roads, SWFWMD 2018; Aerial Imagery, ESRI 2018.

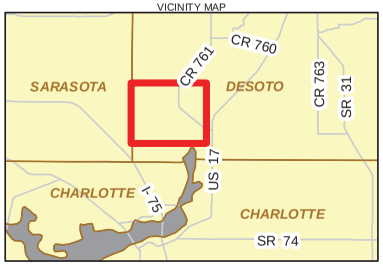
Miles
0 0.25 0.5 0.75 1

N

FIGURE 2-10
AOR and Estimated Extent of ASR Storage
Permit Application, Peace River Manasota Regional Water Supply Authority Peace River Facility

ch2m:





Legend

- PRMRWSA ASR Wells
- Area of Review

Well Construction Permits

- DOMESTIC
- HVAC RETURN (CLASS V)
- HVAC SUPPLY
- IRRIGATION
- LIVESTOCK
- MINING
- MONITOR
- PUBLIC SUPPLY
- PUBLIC SUPPLY - LIMITED USE/DOH
- SEALING WATER
- UNKNOWN

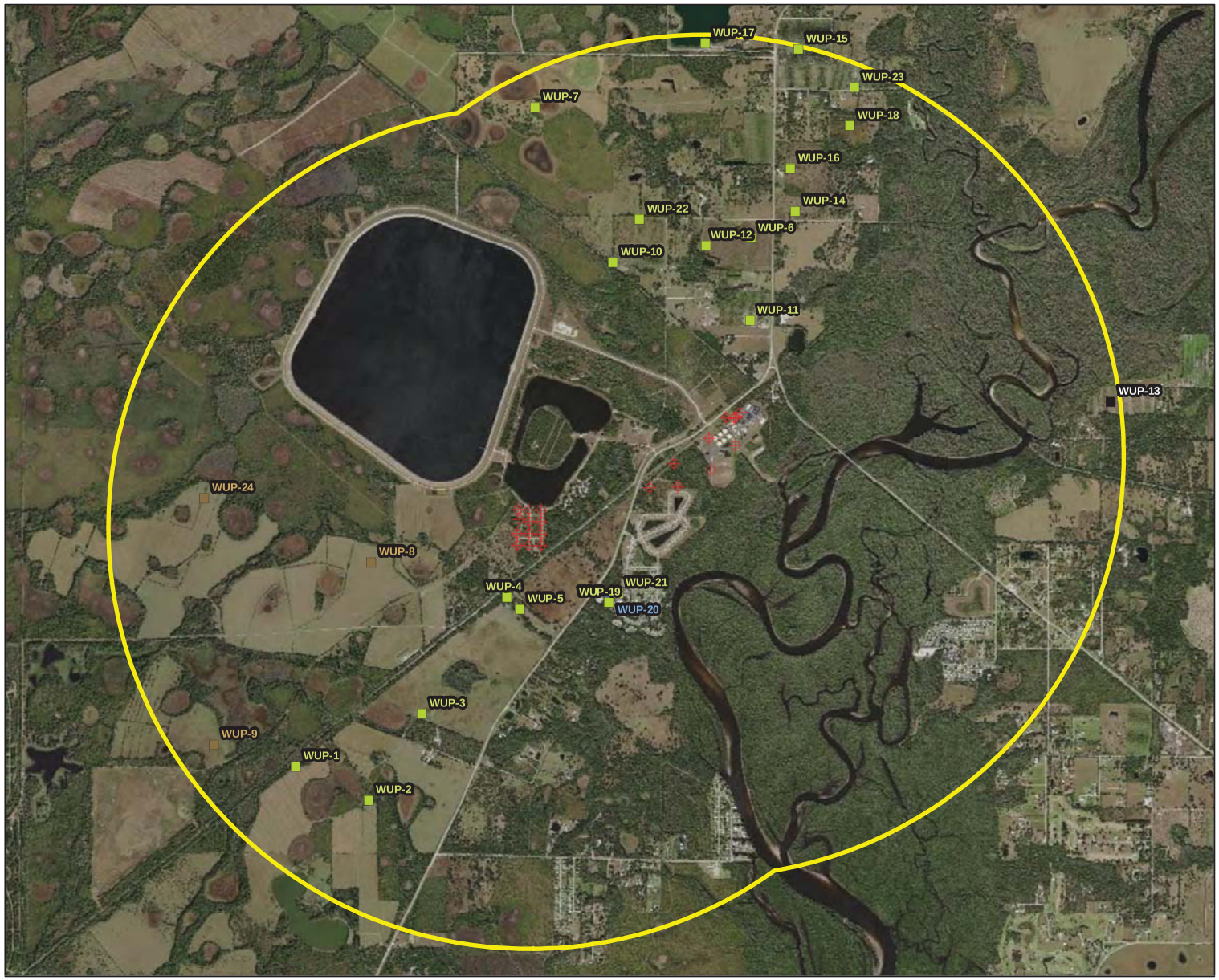
Notes:
1. Peace River-Manasota Regional Water Supply Authority explicitly owned wells, with the exception of ASR Wells, are not included in figure or associated tables.
2. WCPs, State Counties, Roads, SWFWMD 2018; Aerial Imagery, ESRI 2018.

0 0.25 0.5 0.75 1 Miles

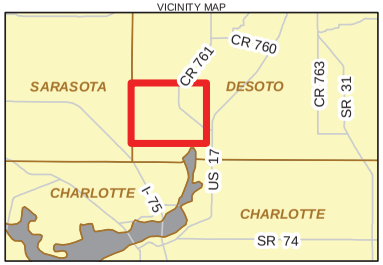
N

FIGURE 2-11
2-Mile AOR Well Inventory - All SWFWMD WCPs
Permit Application
Peace River Manasota Regional Water Supply Authority

ch2m



VICINITY MAP



Legend

- PRMRWSA ASR Wells
- Area of Review

Water Use Permits

- IRRIGATION
- LIVESTOCK
- PUBLIC SUPPLY (CAPPED)
- UNKNOWN (CAPPED)

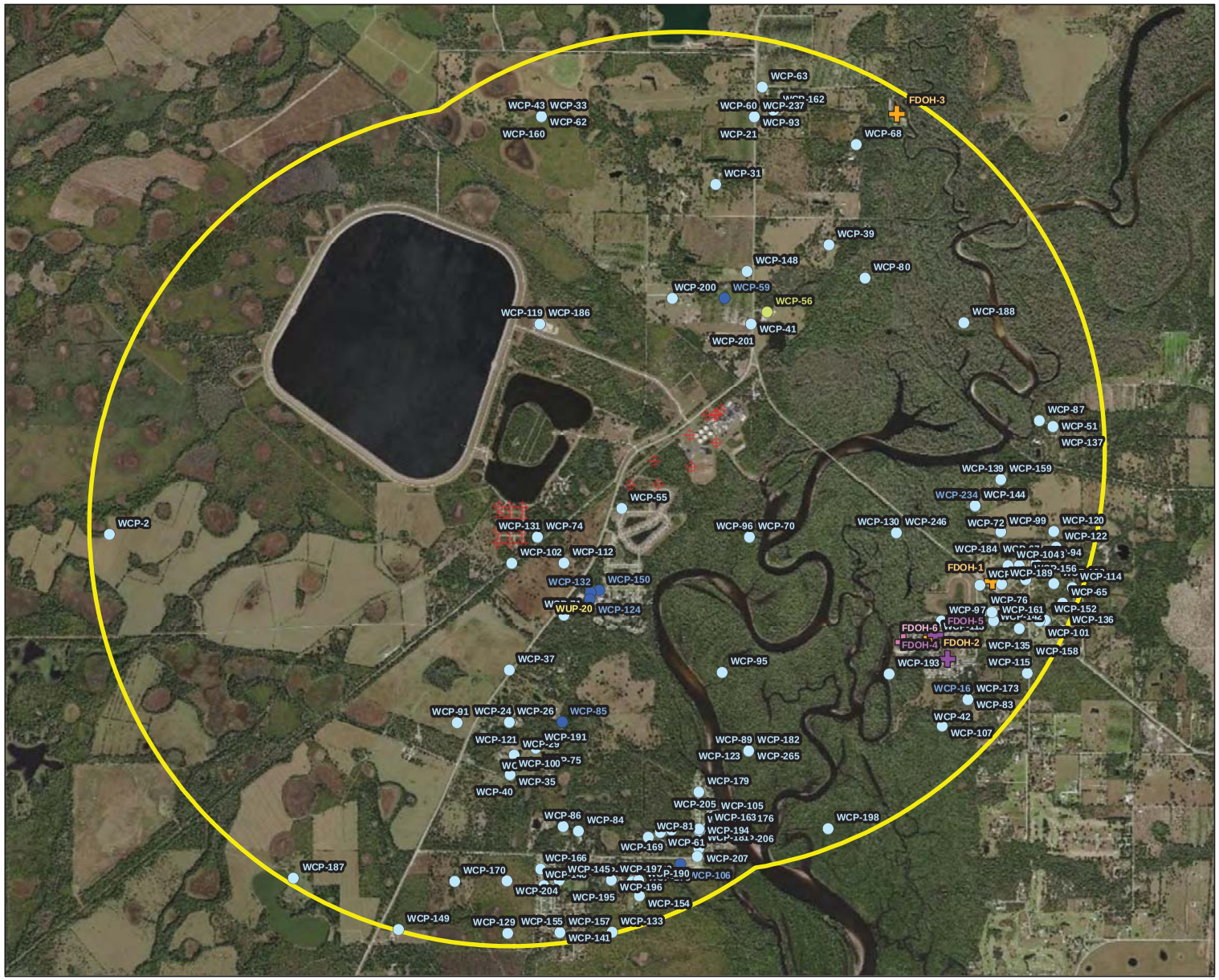
Notes:
1. Peace River-Manasota Regional Water Supply Authority explicitly owned wells, with the exception of ASR Wells, are not included in figure or associated tables.
2. WUPs, State Counties, Roads, SWFWMD 2018; Aerial Imagery, ESRI 2018.

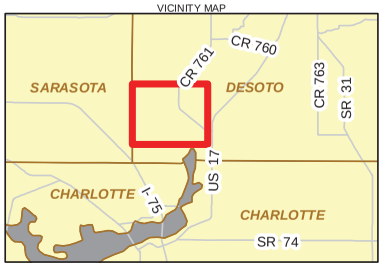
0 0.25 0.5 0.75 1 Miles

N

FIGURE 2-12
2-Mile AOR Well Inventory - All SWFWMD WUPs
Permit Application
Peace River Manasota Regional Water Supply Authority

ch2m





Legend

- PRMRWSA ASR Wells
- Area of Review

Well Construction Permits

- DOMESTIC
- PUBLIC SUPPLY
- PUBLIC SUPPLY - LIMITED USE/DOH

Water Upse Permits

- PUBLIC SUPPLY (CAPPED)

FDOH Wells

- Limited Use PWS
- Non-Community PWS
- Non-Transient Non-Community PWS

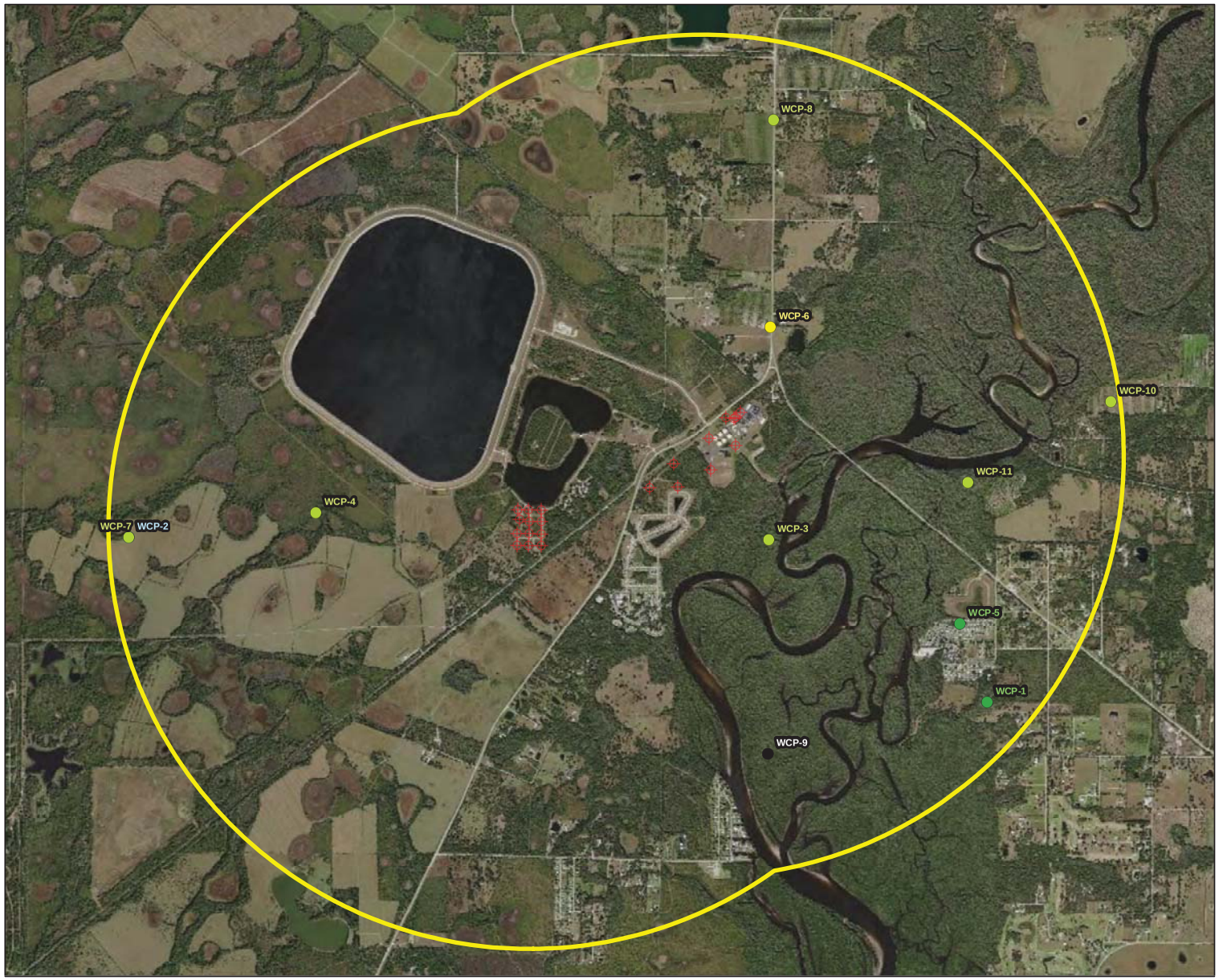
Notes:
1. Peace River-Manasota Regional Water Supply Authority explicitly owned wells, with the exception of ASR Wells, are not included in figure or associated tables.
2. WCPs, WUPs, State Counties, Roads, SWFWMD 2018; FDOH Wells, FDOH 2018; Aerial Imagery, ESRI 2018.

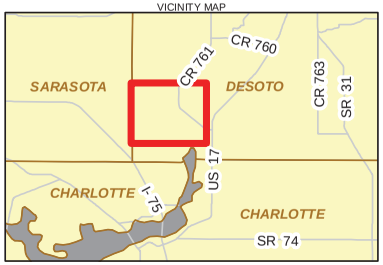
Miles
0 0.25 0.5 0.75 1

N

FIGURE 2-13
2-Mile AOR Well Inventory
Domestic and Public Supply (WCPs, WUPs, FDOH)
Permit Application
Peace River Manasota Regional Water Supply Authority Peace River Facility

ch2m





Legend

- PRMRWSA ASR Wells
- Area of Review

Well Construction Permits

≥ 500 feet bls

- DOMESTIC
- IRRIGATION
- MINING
- SEALING WATER
- UNKNOWN

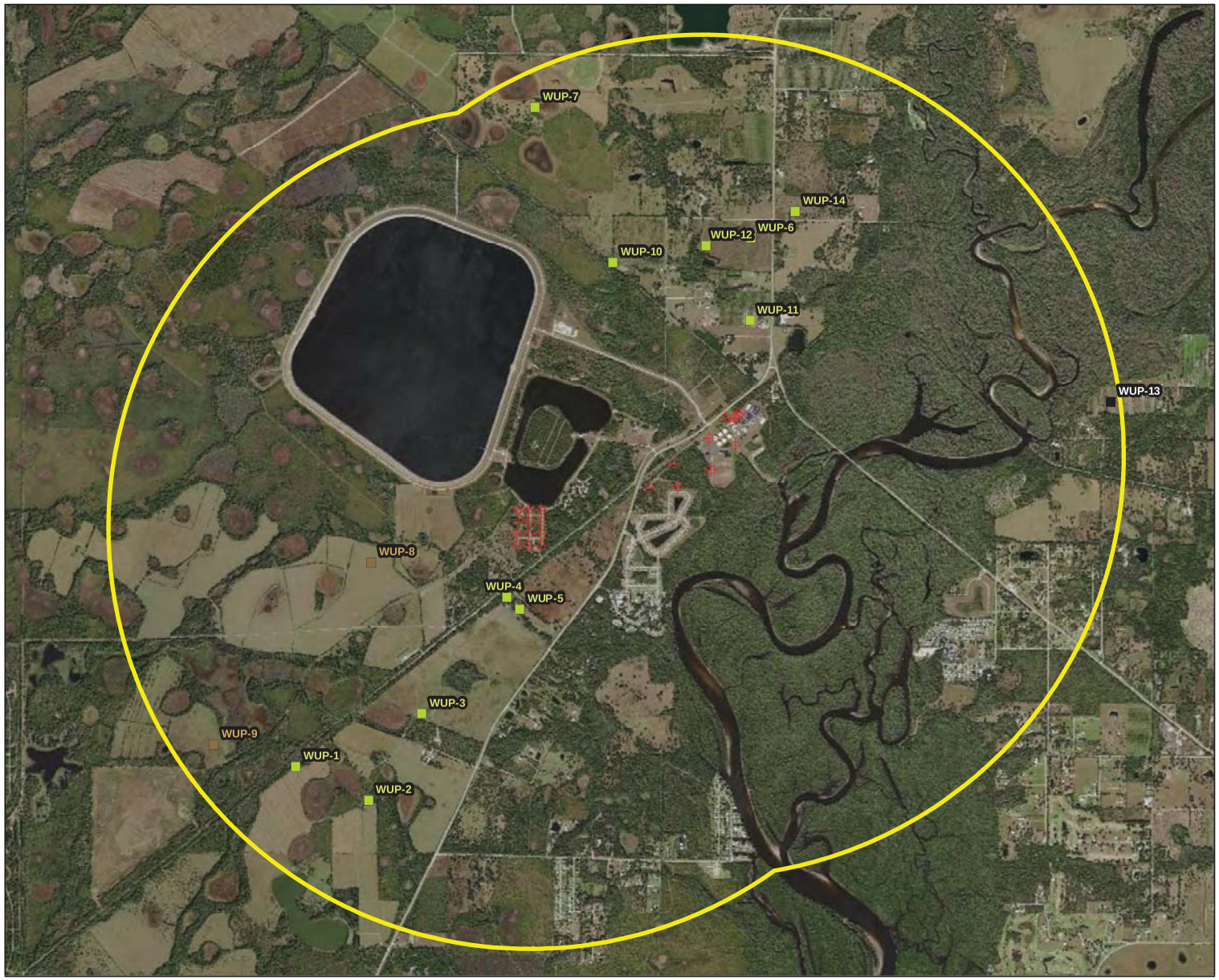
Notes:
1. Peace River-Manasota Regional Water Supply Authority explicitly owned wells, with the exception of ASR Wells, are not included in figure or associated tables.
2. WCPs, State Counties, Roads, SWFWMD 2018; Aerial Imagery, ESRI 2018.

0 0.25 0.5 0.75 1 Miles

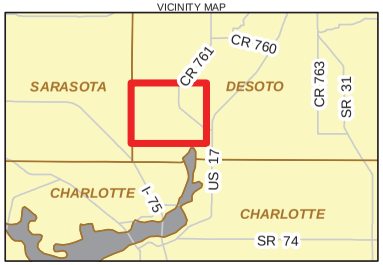
N

FIGURE 2-14
2-Mile AOR Well Inventory - SWFWMD WCPs ≥ 500 feet bls
Permit Application
Peace River Manasota Regional Water Supply Authority

ch2m



VICINITY MAP



Legend

- PRMRWSA ASR Wells
- Area of Review

Water Use Permits

≥ 500 feet bls

- IRRIGATION
- LIVESTOCK
- UNKNOWN (CAPPED)

Notes:
1. Peace River-Manasota Regional Water Supply Authority explicitly owned wells, with the exception of ASR Wells, are not included in figure or associated tables.
2. WUPs, State Counties, Roads, SWFWMD 2018; Aerial Imagery, ESRI 2018.

0 0.25 0.5 0.75 1 Miles

N

FIGURE 2-15
2-Mile AOR Well Inventory - SWFWMD WUPs ≥ 500 feet bls
Permit Application
Peace River Manasota Regional Water Supply Authority

ch2m

SECTION 3

Responses to Part H Class V Well Operation Permit

Re: Permit Application Pages 12/13 of 14

H. Class V Well Operation Permit

1. Permit Number of Class V Construction Permits:
Renewal of Operation Permit 0136595-014-UO5Q

2. Owners Name:
Peace River Manasota Regional Water Supply Authority (Authority)

3. Type of Wells:
WF1 consists of 9 ASR wells and 9 monitor wells.
WF2 consists of 12 ASR wells and 15 monitor wells.
A detailed description of WF1 and WF2 is contained within Section 2 of this application.

4. Construction and Testing Summary:

(a) Actual Dimensions: See **Table 3-1** for casing dimensions, depth, and coordinates for each ASR well.

(b) Result of Initial Testing: See *Section 2 Project Description* for a discussion on well construction and testing and water quality update. In addition, a comprehensive annual data analysis report is prepared each year and submitted to the Department. The 2016 ASR Annual Report for the Peace River Facility ASR System was submitted in August 2017. It is included as **Appendix B** of this application. The 2017 ASR Annual Report is anticipated to be submitted by mid-year 2018.

5. Proposed Operating Data:

(a) Injection Rate (GPM);

Each ASR well is designed to recharge and recover at rates up to 1.25 Million Gallons per Day (MGD), typical flow rates will be 0.5 to 1 MGD (350 to 700 GPM).

(b) Description of injected waste; and,

The proposed source water for WF1 and WF2 is potable drinking water from the Peace River Facility, as has been permitted in the past.

As mentioned previously, the Authority is evaluating PTSW as a potential new source water for its ASR system. Water quality data for the reservoir system and PTSW is presented in **Appendix F**. The PTSW from the pilot testing conducted between February 2017 and December 2017 is water pumped from Reservoir No. 1 that has passed through a filtration system prior to being recharged into the test wells, S-4 and S-20.

The following water quality data are provided in **Appendix F**:

- Routine reservoir sampling from May 2012 to May 2016 – **Appendix F-1**
- Primary and Secondary drinking water analysis from Reservoir No. 1 on June 26, 2016 – **Appendix F-2**
- PTSW Cycle Test Recharge Water Quality – **Appendix F-3**

A comprehensive data evaluation will be presented in a forthcoming PTSW ASR Pilot Test report.

(c) Injection pressure and pump controls.

Injection pressures are monitored continuously and typically range from 0 – 70 pounds per square inch (psi). Well pumps can be operated locally at the well or remotely via SCADA from the Peace River Facility. Flow rates are controlled by valves at each ASR wellhead.

6. Proposed Monitoring Plan (if any):

(a) Number of monitoring wells; *Section 2 Project Description*.

(b) Depth(s); See *Section 2 Project Description*.

(c) Parameters; *No changes to the current operation permit monitoring program is proposed with this permit application. If PTSW ASR is requested by the Authority, a revised sampling program will be submitted for review.*

(d) Frequency of sampling; and, *No changes to the current operation permit monitoring program is proposed with this permit application. If PTSW ASR is requested by the Authority, a revised sampling program will be submitted for review.*

(e) Instrumentation (if applicable) Flow: monitor well – NA

Pressure: monitor well - pressure gauge

TABLE 3-1

ASR Well Construction and Location Details

Well	Casing Diameter (inches)	Casing Depth (feet bls)	Total Depth (feet bls)	Latitude	Longitude
T-1	12	380	482	27 5' 29.04"	82 0' 9.78"
S-1	8	570	920	27 5' 27.96"	82 0' 17.28"
S-2	12	570	900	27 5' 29.46"	82 0' 9.24"
S-6	12	580	910	27 5' 17.52"	82 0' 26.34"
S-7	12	575	915	27 5' 11.76"	82 0' 25.2"
S-8	12	510	623	27 5' 22.2"	82 0' 33.3"
S-3R	16	580	769	27 5' 22.2"	82 0' 9.3"
S-5R	16	650	808	27 5' 24.06"	82 0' 16.56"
S-9R	16	580	906	27 5' 16.14"	82 0' 16.26"
S-4	12	570	905	27 05' 06.1042"	82 01' 06.4977"
S-10	16	620	906	27 04' 57.1407"	82 01' 03.3015"
S-11	16	585	900	27 05' 00.1137"	82 01' 03.2584"
S-12	16	600	900	27 04' 57.1524"	82 01' 06.6125"
S-13	16	621	898	27 05' 00.1531"	82 01' 06.5644"
S-14	16	568	900	27 04' 57.2286"	82 01' 09.9465"
S-15	16	583	900	27 05' 00.2032"	82 01' 09.8760"
S-16	16	583	902	27 05' 03.0748"	82 01' 03.2110"
S-17	16	579	883	27 05' 06.0299"	82 01' 03.1812"
S-18	16	592	900	27 05' 03.1111"	82 01' 06.5295"
S-19	16	585	900	27 05' 05.7252"	82 01' 03.2877"
S-20	16	566	898	27 05' 03.2466"	82 01' 02.7664"

SECTION 4

Bibliography and References Cited

ASRus, LLC &CH2M HILL, October 2006. *ASR Wellfield No. 1 Data Evaluation for the Peace River Regional Water Supply Facility.*

Barr, G.L., 1996. Hydrogeology of the Surficial and Intermediate Aquifer Systems in Sarasota and Adjacent Counties, Florida. U.S. Geological Survey WRI Report 96-4063. 81 pp.

Basso, R., 2001. Hydrostratigraphic Zones with the Eastern Tampa Bay Water Use Caution Area. Southwest Florida Water Management District. 34 pp and Appendices.

Boyle Engineering, 1998. *Peace River Option – Peace River Facility/ASR Wellfield Expansion. Basis of Design Report ASR Wellfield Expansion.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

Boyle Engineering, 1998. *Peace River Option – Peace River Facility/ASR Wellfield Expansion. Basis of Design Report Peace River Facility Expansion*. Prepared for the Peace River/ Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M and ASRus, February 2018. *Peace River Facility Partially Treated Surface Water ASR Pilot Test – Cycle Test Report*. *CH2M and ASRus, February 2018.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.CH2M HILL and ASRus, August 2017. *Peace River Facility ASR System 2016 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, August 2016. *Florida Department of Environmental Protection Class V, Group 7, Operation Permit Aquifer Storage Recovery – Request for Major Modification to Permit Peace River Regional Water Supply Facility Aquifer Peace River Facility.* Prepared for the Florida Department of Environmental Protection on behalf of the Peace River Manasota Regional Water Supply Authority.

CH2M HILL and ASRus, August 2016. *Peace River Facility ASR System 2015 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, March 2016. *Partially Treated Surface Water Desktop Study.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, August 2015. *Peace River Facility ASR System 2014 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, August 2014. *Peace River Facility ASR System 2013 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, March 24, 2014. *Aquifer Storage and Recovery Well Condition Assessment.* Technical Memorandum prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, December 2, 2013. *Aquifer Storage and Recovery System Yield Study Update 2013.* Technical Memorandum prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, May 2013. *Peace River Facility ASR System 2012 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, January 2013. *Preliminary Investigation of Brackish Groundwater Development Opportunities at the Peace River Facility - Well Completion Report for the Peace River Exploratory Well.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, July 2012. *Florida Department of Environmental Protection Class V, Group 7, Injection Well Operation Permit Application - Peace River Regional Water Supply Facility Aquifer Storage Recovery System.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, May 2012. *Peace River Facility ASR System 2011 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, May 2011. *Peace River Facility ASR System 2010 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, April 2011. *Class V Exploratory Well Construction Permit Application – Exploratory Well for Brine Concentrate Disposal at the Peace River Facility.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, May 2010. *Peace River Facility ASR System 2009 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, January 2010. *Florida Department of Environmental Protection Class V, Group 7, Injection Well Construction Permit Renewal Application Potable Water Aquifer Storage Recovery at the Peace River Facility Wellfield No. 2.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, October 2009. *Florida Department of Environmental Protection Class V, Group 7, Injection Well Construction Permit Application Drinking Water Aquifer Storage Recovery at the Avon Park Test Well.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, May 2009. *Peace River Facility ASR System 2008 Annual Report.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, July 2008. *Data Analysis for the Peace River Facility ASR System Including Wellfield 2 Cycle Test 6.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Bradenton, Florida.

CH2M HILL and ASRus, January 2007. *Data Analysis for ASR Wellfield No. 2 Cycle Test 5 at the Peace River Facility*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL and ASRus, January 2007. *ASR Wellfield No. 1 Data Evaluation for the ASR Peace River Regional Water Supply Facility*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, October 2006. Data Analysis for ASR Wellfield 2 Cycle Test 5 at the Peace River Facility. Prepared for the Peace River/Manasota Regional Water Supply Authority.

CH2M HILL, November 2005. Data Analysis for ASR Wellfield 2 Cycle Test 4 at the Peace River Facility. Prepared for the Peace River/Manasota Regional Water Supply Authority.

CH2M HILL, July 2005. *Well Completion Report for the ASR Wellfield Enhanced Groundwater Monitoring Program*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, May 2003. *Peace River Regional Water Supply Facility. Data Analysis for the East ASR Wellfield 1987 to 2002*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, January 1998. *Peace River Regional Water Supply Facility. Analysis of Aquifer Storage Recovery System Operational Data – 1987 to 1997.* Prepared for the Peace River/ Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, November 1995. *Results of Operational Testing of ASR Wells S-3R, S-5R, and S-9R*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, May 1995. *Report on the Construction of ASR Wells S-3R, S-5R, and S-9R and the Rehabilitation of Existing ASR Wells at the Peace River Regional Water Supply Facility.* Prepared for the Peace River/Manasota Regional Water Supply Authority.

CH2M HILL, 1995. *Water Use Permit Renewal –Response to the Request for Additional Information*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, October 1994. *Water Use Permit Renewal – Permit No. 2010429.01. Volume 1 (Application and Attachments 1 and 2) and Volume 2 (Attachments 2 through 7).* Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, 1993. *Peace River Regional Water Supply Facility Expansion Plan*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, September 1993. *Interim Report on the Well Construction and Testing of the Peace river Regional Water Supply Facility Avon Park Test Well.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, May 1993. *Class V Injection Well Construction Permit Application: Aquifer Storage Recovery Wells Nos. S-3R, S-5R, and S-9R at the Peace River Regional Water Supply Facility.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, January 18, 1993. *Letter Response to Request for Additional Information Water Use Permit Application No. 2010420.01.* Letter submitted to the Southwest Florida Water Management District on behalf of the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, December 4, 1992. *Water Use Permit Modification for the Peace River Regional Water Supply Facility (WUP Permit No. 2010420.00).* Letter report submitted to the Southwest Florida Water Management District on behalf of the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

CH2M HILL, July 14, 1988. T*echnical Memorandum No. 2 – Supplemental Finite-Difference Modeling 1994 Facilities Expansion Peace River Regional Water Treatment Facility.* Prepared for General Development Utilities, Inc., Miami, Florida.

CH2M HILL, June 30, 1988. *Technical Memorandum No. 1 – Aquifer Withdrawal Test Conducted on Well S-2 Peace River Regional Water Treatment Facility*. Prepared for General Development Utilities, Inc., Miami, Florida.

CH2M HILL, November 1987. *Water Supply Master Plan for the Port Charlotte Service Area*. Prepared for General Development Utilities, Inc., Miami, Florida.

CH2M HILL, October 1987. *Needs and Sources Report for the Port Charlotte Service Area*. Prepared for General Development Utilities, Inc., Port Charlotte, Florida.

CH2M HILL, June 1987. *Final Report Aquifer Storage Recovery Cycles Seven and Eight Peace River Water Treatment Plant.* Prepared for General Development Utilities, Inc., Miami, Florida.

CH2M HILL, June 1987. *Final Report Aquifer Storage Recovery Cycles Seven and Eight Peace River Water Treatment Plant*. Prepared for General Development Utilities, Inc., Port Charlotte, Florida.

CH2M HILL, April 1985. *Peace River Aquifer Storage Recovery*. Prepared for General Development Utilities, Inc., Miami, Florida.

CH2M HILL, April 1985. *Program Documentation Peace River Water Supply Simulation*. Prepared for General Development Utilities, Inc., Miami, Florida.

Florida Environmental, 1997. *Peace River Facility ASR Wellfield Expansion, Ecological and Wetland Monitoring Program*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

Gerhardt M. Witt & Associates, January 31, 1997. *The City of Venice, Florida Groundwater Modeling Report Intracoastal Wellfield and Eastern Wellfield*. Prepared for the City of Venice, Florida.

Gilboy, A.E., 1985. Hydrogeology of the Southwest Florida Water Management District: Brooksville. Southwest Florida Water Management District Report. 18 p.

Johnston, R.H., and Bush, P.W., 1988**.** Summary of the Hydrology of the Floridian Aquifer System in Florida and in parts of Georgia, South Carolina, and Alabama. U.S. Geological Survey Professional Paper 1403-A, 24 p. 4 pl.

Miller, J.A. 1986. Hydrogeologic Framework of the Floridan Aquifer System in Florida, and in Parts of Georgia, Alabama, and South Carolina. U.S. Geological Survey Professional Paper 1403-B, 91 p. 33 pl.

Nodarse & Associates, 1999. *Subsurface Soil Exploration – Peace River Water Treatment Facility, ASR Wellfield Expansion*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

PR/MRWSA, July 10, 1997. *ASR Wells S-4 and S-5 Capacity and Water quality Test Program Final Report – WUP No. 2010420.02.* Prepared for the Southwest Florida Water Management District, Venice, Florida.

PR/MRWSA, October 1991. *Peace River Regional Water Supply Facility Monitor Well "E" Report*. Prepared by the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

PR/MRWSA, April 1988. *GDU's Peace River Regional Water Treatment Facility CUP Renewal*. Prepared by the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

Ryder, P.D., 1985. Hydrology of the Floridan Aquifer System in West-Central Florida. U.S. Geological Survey Professional Paper 1403-F. 63 pp.

Scott, T. M., 1988. The Lithostratigraphy of the Hawthorn Group (Miocene) of Florida. Florida Geological Survey Bulletin No. 59.

Torres, A.E., L.A. Sacks, D.K. Yobbi, L.A. Knochenmus, and B.G. Katz, 2001. Hydrogeologic Framework and Geochemistry of the Intermediate Aquifer System in Parts of Charlotte, DeSoto and Sarasota Counties, Florida. USGS Water Resources Investigations Report 01-4015.

ViroGroup and Boyle Engineering, February 1998. *Peace River Option – Peace River Facility/ASR Wellfield Expansion. Technical Memorandum No. 11 – Phase II ASR Wellfield Expansion.* Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

ViroGroup and Boyle Engineering, October 1998. *Peace River Option – Peace River Facility/ASR Wellfield Expansion. Letter Modification for Relocation of Approved Wells*. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

ViroGroup and Boyle Engineering, September 1998. Peace River Option – Peace River Facility/ASR Wellfield Expansion. Florida Department of Environmental Protection Class V, ASR Well Construction Permit Application. Prepared for the Peace River/Manasota Regional Water Supply Authority, Sarasota, Florida.

White, W.A. 1970. The Geomorphology of the Florida Peninsula. Florida Bureau of Geology Bulletin 51. 164 pp.

Wilson, W.E., and Gerhart, J.M., 1982. Simulated Effects of Groundwater Development on Potentiometric Surface of the Floridan Aquifer, west-central Florida: U.S. Geological Survey Professional Paper 1217. 83 p.

Appendix A

FDEP Operation Permit and PTSW Permit Modification

Florida Department of
Environmental Protection
Southwest District Office
13051 North Telecom Parkway
Temple Terrace, Florida 33637-0926

Rick Scott
Governor

Herschel T. Vinyard Jr.
Secretary

Underground Injection Control
Class V, Group 7
Aquifer Storage and Recovery (ASR) Well System
Operation Permit

Permittee:

Patrick Lehman, P.E.
Executive Director
Peace River/Manasota Regional
Water Supply Authority
9415 Town Center Parkway
Lakewood Ranch, FL 34202
plehman@regionalwater.org

Permit/Certification

PA File Number:	0136595-014-UO/5Q
Facility ID Number:	614-2734
WACS ID:	40593
Date of Issuance:	April 24, 2013
Date of Expiration:	April 23, 2018
Permit Processor:	Rommy Lahera-Aument, P.G.

Facility

Peace River Regional Water Supply Facility
8998 SW County Road 769
Arcadia, FL 34269

Location

County:	DeSoto
Latitude:	27˚05'27.85" N
Longitude:	83˚00' 3.87" W

Project: Class V, Group 7 ASR Wells in Well Field 1: T-1, S-1, S-2, S-6, S-7, S-8, S-3R, S-5R, S-9R
Class V, Group 7 ASR Wells in Well Field 2: S-4, S-10 through S-20

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.), Chapters 62-4, 62-520, 62-528, and 62-550. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows.

The permittee is reminded of the necessity to comply with the pertinent regulations of any other regulatory agency, as well as any county, municipal, and federal regulations applicable to the project. These regulations may include, but are not limited to, those of the Federal Emergency Management Agency in implementing flood control measures. This permit should not be construed to imply compliance with the rules and regulations of other regulatory agencies.

TO OPERATE: 21 ASR and 24 monitor wells in Well Fields 1 & 2, at a typical flow rate of 0.5 to 1 million gallons per day (MGD) for each ASR well for the storage and recovery of potable water.

IN ACCORDANCE WITH: The Application to Operate DEP Form No. 62-528.900(1) received August 20, 2012 and technical specifications, drawings, plan of study and addenda submitted to this agency.

LOCATION: The Peace River Regional Water Supply Facility is located at 8998 SW County Road 769, Arcadia, DeSoto County, Florida. Well Field 1 is located on the facility or east side of County Road 769, and Well Field 2 is on the reservoir or west side.

The ASR and monitoring wells at this facility are designated as follows:

ASR Wells:

Well Name	*WACS Effluent Test-site ID*	*Total Well Depth*	*Diameter (inches)*	*Interval Type*	*Interval (feet bls)*
T-1		482	12	LPZ	380-482
S-1		920	8	Suwannee Zone	570-920
S-2		900	12	Suwannee Zone	570-900
S-6		910	12	Suwannee Zone	580-910
S-7		915	12	Suwannee Zone	575-915
S-8		623	12	Suwannee Zone	510-623
S-3R		769	16	Suwannee Zone	580-769
S-5R		955	16	Suwannee Zone	650-955
S-9R		800	16	Suwannee Zone	580-800
S-4		905	12	Suwannee zone	570-905
S-10		906	16	Suwannee Zone	620-906
S-11		816	16	Suwannee Zone	585-816
S-12		900	16	Suwannee Zone	600-900
S-13		898	16	Suwannee Zone	621-898
S-14		900	16	Suwannee Zone	586-900
S-15		833	16	Suwannee Zone	583-833
S-16		902	16	Suwannee Zone	583-902
S-17		786	16	Suwannee Zone	579-786
S-18		900	16	Suwannee Zone	592-900
S-19		900	16	Suwannee Zone	585-900
S-20		898	16	Suwannee Zone	566-898

LPZ = lower producing zone of the Intermediate Aquifer system (a.k.a. Tampa Zone)
Suwannee Zone = refers to the Upper Floridan aquifer permeable unit within the Suwannee Limestone Formation

Monitoring Wells:

Well Name	*WACS Monitoring Well Testsite ID*	*Diameter (inches)*	*Interval Type*	*Depth Cased (ft bls)-Total (ft bls)*
E		6	UPZ	140-200
T-2		4	LPZ	393-490
M-2		6	Suwannee Zone	596-900
I-7		6	LPZ	220-261
T-7		6	LPZ	349-400

M-7		6	Suwannee Zone	580-605
M-20		6	Suwannee Zone	584-688
M-21		6	Suwannee Zone	575-672
M-22		6	Suwannee Zone	565-572
T-11		6	LPZ	350-400
M-11		6	Suwannee Zone	570-677
M-12		6	Suwannee zone	585-705
M-13		6	Suwannee Zone	550-670
M-14		6	Suwannee Zone	575-676
M-15		6	Suwannee Zone	570-678
M-16		6	Suwannee Zone	560-673
M-17		6	Suwannee Zone	565-670
M-18		6	Suwannee Zone	575-700
M-19		6	Suwannee Zone	580-680
I-10		6	LPZ	260-320
M-6		6	Suwannee Zone	579-640
I-8		6	UPZ	155-190
T-8		12	LPZ	354-401
M-8		10	Suwannee Zone	570-860

UPZ = upper producing zone of the Intermediate Aquifer System
LPZ = lower producing zone of the Intermediate Aquifer system (a.k.a. Tampa Zone)
Suwannee Zone = refers to the Upper Floridan aquifer permeable unit within the Suwannee Limestone Formation

SUBJECT TO: Specific Conditions I - IV and General Conditions 1- 24.

Specific Conditions

I. OPERATING REQUIREMENTS

A. General

1. Injection of fluids other than those permitted into the ASR well will constitute a violation of this permit and shall constitute cause for permit revocation and possible enforcement action for water quality violation. Only water from the Peace River Regional Water Supply Facility, a surface water drinking water facility, may be injected.

2. No underground injection is allowed that causes or allows movement of fluid into a USDW if such fluid movement may cause a violation of any Primary Drinking Water Standard or may otherwise affect the health of persons unless such activities are specifically authorized by permit or through the Water Quality Criteria Exemption issued for this facility. [62-528.440(2)(c)]

3. All equipment of this facility shall be operated and maintained so as to function consistently as designed in removing pollutants. [62-528.307(3)(b) and 62-528.400(1)

4. In the event a well must be plugged or abandoned, the permittee shall obtain a permit from the Department as required by Chapter 62-528, Florida Administrative Code. When no longer used for their intended purpose, these wells shall be properly plugged and abandoned. Within 180 days of well abandonment, the permittee shall submit to the Department the proposed plugging method, pursuant to Rule 62-528.460, F.A.C. [62-528.460(1) and 62-528.435(6)]

5. In accordance with rules 62-4.090 and 62-528.640(3), F.A.C., the permittee shall submit an application for permit renewal at least 60 days prior to expiration of this permit. [62-528.307(3)(a)]

6. Hurricane Preparedness: Preparations to be made by permittee upon issuance of a "Hurricane Watch" by the National Weather Service include, but are not limited to:
    a. Secure all onsite salt and other stockpiled additive materials to prevent surface and/or ground water contamination.
    b. Properly secure equipment to prevent damage to well(s) and onsite treatment process equipment.

    [62-528.307(3)(b)]

7. This ASR facility shall be operated in conformance with the criteria contained in Water Quality Criteria Exemption OGC File 12-1502.

B. Surface Equipment

1. The integrity of the monitoring zone sampling systems shall be maintained at all times. Sampling lines shall be clearly and unambiguously identified by monitoring zone at the point at which samples are drawn. All reasonable and prudent precautions shall be taken to ensure that samples are properly identified by monitoring zone and that samples obtained are representative of those zones. Sampling lines and equipment shall be kept free of contamination with independent discharges and no interconnections with any other lines. [62-528.307(1)(f) and 62-528.307(3)(b)]

2. The surface equipment for each ASR well shall maintain compliance with Chapter 62-528.450(2)(j), F.A.C. for water hammer control, screening, access for logging and testing, and reliability and flexibility in the event of damage to the well and surface piping. A regular program of exercising the valves integral to the well head shall be instituted. A record shall be maintained at the facility that documents the exercising of the valves. [62-528.307(1)(f) and 62-528.307(3)(b)]

3. The surface equipment and piping for the ASR and monitoring wells shall be kept free of corrosion, to the extent practical, at all times. [62-528.307(1)(f) and 62-528.307(3)(b)]

4. The ASR well pads shall be maintained and retained in service for the life of the ASR wells. The ASR and monitoring well pads are not, unless specific approval is obtained from the Department, to be used for storage of any material or equipment at any time. [62-528.307(1)(f) and 62-528.307(3)(b)]

II. QUALITY ASSURANCE/QUALITY CONTROL

1. The permittee shall ensure that the operation of this ASR well system shall be as described in the application and supporting documents. Any proposed modifications to the permit shall be submitted in writing to the Underground Injection Control Program for review and clearance prior to implementation. Changes of negligible impact to the environment and staff time will be reviewed by the program manager, cleared when appropriate and incorporated into this permit. Changes or modifications other than those described above will require submission of a completed application and appropriate processing fee as per Rule 62-4.050, F.A.C. [62-528.100, 62-4.050]

2. Proper operation and maintenance include effective performance and appropriate quality assurance procedures; adequate operator staffing and training; and adequate laboratory and process controls. [62-528.307(3)(b)]

3. All water quality samples required by this permit shall be collected in accordance with the appropriate Department Standard Operation Procedures (SOP), pursuant to Chapter 62-160, Quality Assurance, Part II, Field Procedures, F.A.C. A certified laboratory shall conduct the analytical work, as provided by Chapter 62-160, Quality Assurance, Part III, Laboratory Certification and Procedures, F.A.C. Department approved test methods shall be utilized, unless otherwise stated in this permit. All calibration procedures for field testing and laboratory equipment shall follow manufacturer's instrumentation manuals and satisfy the requirements of the Department SOPs. A listing of the SOPs pertaining to field and laboratory activities is available at the FDEP website at: **http://www.dep.state.fl.us/water/sas/sop/sops.htm**. [62-4.246, 62-160]

4. All indicating, recording and totalizing devices associated with the ASR well system shall be maintained in good operating condition and calibrated annually at a minimum. United States Environmental Protection Agency (USEPA) laboratory guidelines as expressed in Standard Methods for the Examination of Water and Wastewater. The pressure gauges, flow meter, and chart records shall be calibrated using standard engineering methods. [62-528.307(1)(f) and 62-528.307(3)(b)]

5. All reports submitted to satisfy the requirements of this permit shall be signed by a person authorized under Rule 62-528.340(1), F.A.C., or a duly authorized representative of that person under Rule 62-528.340(2), F.A.C. All reports required by this permit which are submitted to the Department shall contain the following certification as required by Rule 62-528.340(4), F.A.C.:

> I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

[62-528.340(1), (2), and (4)]

6. Analyses shall be conducted on unfiltered samples, unless filtered samples have been previously approved as being more representative of ground water conditions. [62-520.310(5)]

III. TESTING AND REPORTING REQUIREMENTS

A. General

1. The permittee shall submit monthly to the Department the results of all ASR well and monitoring well data required by this permit no later than the last day of the month immediately following the month of record. The report shall include:

    a. A cover page summarizing the current status of all monthly activities, including the certification and signature required in condition II.5.;
    b. Operational and water quality data in a tabular format. Standardized forms for the project may be provided by the Department if deemed necessary;
    c. Laboratory pages and supporting documentation;
    d. The following identifying information (to be provided by the Department) must be included on each data sheet:

        - Facility Name
        - Well Name
        - UIC Permit Number
        - WACS Facility ID
        - WACS Test site ID
        - WACS Test site Name

    The Monthly Operating Report (MOR) shall be submitted *via* direct internet electronic mail (e-mail) to UIC Staff at the South District (david.rhodes@dep.state.fl.us) and Tallahassee Offices (joe.haberfeld@dep.state.fl.us) in Adobe™ (.pdf) format. A compact disc may be sent instead of the e-mail format to the South District (2285 Victoria Avenue, Suite 364, Fort Myers, FL 33902-2549) and the Department of Environmental Protection, UIC Program (Mail Station 3530, 2600 Blair Stone Road, Tallahassee, FL 32399-2400). [62-528.307(3)(d)]

2. An Annual Summary Report shall be submitted to the Department South District and Tallahassee Underground Injection Control Program by September 1 of each year. A single report combining all ASR systems is acceptable. The report shall address and summarize the preceding year of operations (January 1 through December 31) and shall include at a minimum:

    a. All ASR well system monitoring data from the preceding year in both graphic and tabular formats;
    b. A summary of system specific injectivity efficiency;
    c. Proposed changes (if any) to the monitoring program.

    [62-528.307(1)(m)1.]

B. Monitoring

1. The ASR system shall be monitored in accordance with Rules 62-528.425(l)(g) and 62-528.430(2), F.A.C. The following ASR well performance data and monitor zone data shall be recorded and reported in the MOR as indicated below during each recharge, storage and recovery phase. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. [62-528.307(3)(d) and 528.430(2)]

PARAMETER	UNIT	RECORDING FREQUENCY	FREQUENCY OF ANALYSES			
			ASR wells	**M-2,M-15, M -18,M-19, M-21,T-2,T-7,T-11**	M-7, M-8, M-14, M-16, M-22 M-17, M-20	E,I-7,I-8, I-10, T-8,M-6, M-11, M-12,M-13
Flow Rate, max.	gpm	continuous	[a]			
Flow Rate, min.	gpm	continuous	[a]			
Flow Rate, avg.	gpm	continuous	[a]			
Total Volume Recharged	mg	Daily/Monthly				
Total Volume Recovered		Daily/Monthly				
Net Storage	MG	Monthly				
ASR Well Pressure, max.	psi	continuous	[a]			
ASR Well Pressure, min.	psi	continuous	[a]			
ASR Well Pressure, avg.	psi	continuous	[a]			
Water Level, max.[g]	feet (NGVD) / PSI	continuous		[a]	[a]	[a]
Water Level, min.[g]	feet (NGVD) / PSI	continuous		[a]	[a]	[a]
Water Level, avg.[g]	feet (NGVD) / PSI	continuous		[a]	[a]	[a]
pH [b]	std. units	Grab	W[c]	W	M	Q
Specific Conductivity [b]	µmhos/cm	Grab	W[c]	W	M	Q
Temperature [b]	°C	Grab	W[c]	W	M	Q
Dissolved Oxygen [b]	mg/L	Grab	W[c]	W	M	Q
Turbidity [b]	NTU	Grab	W[c]	W	M	Q
Oxidation – Reduction Potential [b]	mV	Grab	W[c]	W	M	Q
Total Dissolved Solids	mg/L	Grab	W[c]	W	M	Q
Chloride	mg/L	Grab	W[c]	W	M	Q
Sulfate	mg/L	Grab	W[c]	W	M	Q
Arsenic	µg/L	Grab	W[c]	W	M	Q
Gross Alpha	pCi/L	Grab	Q	Q	Q	
Total Uranium	µg/L	Grab	Q[e]	Q[e]	Q[e]	
Total Trihalomethanes	mg/L	Grab	A[d]	A	A	
Primary and Secondary stds.		Grab	A[f]			

W – Weekly; M - Monthly; Q - Quarterly; A – Annually.
No Sampling of ASR wells during storage.
[a] - Operational data reporting for flows, pressures and water levels: daily max, min and average from continuous reporting; monthly max, min and average (calculated from daily averages).
[b] – Field samples
[c] – Weekly during recovery from currently operating wells, monthly from common distribution during recharge
[d] – During recovery only
[e] – Analyzed only if Gross Alpha exceeds 15 pci/L
[f] – July (finished water)
[g] – Water Level readings from monitor wells M-11 through M-22 will be manual readings recorded monthly
Bolded wells are compliance wells.

2. During extended storage periods (greater than 30 days) the monitoring well water quality parameters listed above may be sampled and analyzed monthly. [62-528.615(2)]

3. A record shall be included in each MOR that documents the monthly exercising of valves. For each valve, this record shall include the valve identification number (tag), type of valve, date and time when exercised, and the initials of operator(s) performing the work. The record shall be maintained at the facility and shall be available for review by FDEP personnel at all times. [62-528.430(2)(b)2.b.]

4. Pertaining to the evacuation (purging) of monitoring wells, which is required prior to the collection of samples for the MOR, the facility may elect to follow either one of the following two purging protocols:

   a. <u>The protocol stated below</u>:

      A minimum of three well volumes of fluid shall be evacuated from the monitoring systems prior to sampling for the chemical parameters listed above. Sufficient purging shall have occurred when either of the following has occurred:

      1) pH, specific conductance <u>and</u> temperature when sampled, upon purging the third or subsequent well volume, each vary less than 5% from that sampled upon purging the previous well volume; or
      2) Upon purging the fifth well volume.

   b. <u>The following protocol taken from DEP-SOP-001/01(Field Procedures)</u>:

      1) Purge until the water level has stabilized (well recovery rate equals the purge rate), then purge a minimum of one well volume, and then collect the first set of stabilization parameters, namely pH, specific conductance and temperature;
      2) Thereafter, collect stabilization parameters ≥ every ¼ well volume;
      3) Purging shall be complete when either of the following have occurred:

a) 3 consecutive readings of the parameters listed below are within the following ranges[1]:
   - pH ± 0.2 Standard Units
   - Specific Conductance ± 5.0% of reading
   - Temperature ± 0.2°C

b) Upon purging the fifth well volume.

[62-160.210(1) and 62-528.430(2)]

IV. ABNORMAL EVENTS

1. In the event the permittee is temporarily unable to comply with any of the conditions of a permit due to breakdown of equipment, power outages or destruction by hazard of fire, wind, or by other cause, the permittee of the facility shall notify the Southwest District Office. [62-528.415(4)(a)]

2. Notification shall be made in person, by telephone, or by electronic mail (e-mail) within 24 hours of breakdown or malfunction to the Southwest District Office. [62-528.307(1)(x)]

3. A written report of any noncompliance referenced in Specific Condition (1) above shall be submitted to the Southwest District and the Tallahassee offices within five days after its occurrence. The report shall describe the nature and cause of the breakdown or malfunction, the steps being taken or planned to be taken to correct the problem and prevent its reoccurrence, emergency procedures in use pending correction of the problem, and the time when the facility will again be operating in accordance with permit conditions. [62-528.415(4)(b)]

General Conditions

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit are "permit conditions" and are binding and enforceable pursuant to section 403.141, F.S. [62-528.307(1)(a)]

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action. [62-528.307(1)(b)]

3. As provided in subsection 403.087(7), F.S., the issuance of this permit does not convey any vested rights or exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit. [62-528.307(1)(c)]

[1] Provided dissolved oxygen in the groundwater of the zone being monitored is ≤ 20% of saturation for the measured temperature and turbidity is ≤ 20 NTUs. This assumption holds true for groundwater in most zones of the Floridan aquifer.

4. This permit conveys no title to land, water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title. [62-528.307(1)(d)]

5. This permit does not relieve the permittee from liability for harm to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties there from; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department. [62-528.307(1)(e)]

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, or are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules. [62-528.307(1)(f)]

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

    a. Have access to and copy any records that must be kept under conditions of this permit;
    b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and
    c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.
    d. Reasonable time will depend on the nature of the concern being investigated.

    [62-528.307(1)(g)]

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

    a. A description of and cause of noncompliance; and
    b. The period of noncompliance, including dates and times; or, if not corrected the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent the recurrence of the noncompliance. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

    [62-528.307(1)(h)]

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except

where such use is proscribed by sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules. [62-528.307(1)(i)]

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules. [62-528.307(1)(j)]

11. This permit is transferable only upon Department approval in accordance with rules 62-4.120 and 62-528.350, F.A.C. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department. [62-528.307(1)(k)]

12. This permit or a copy thereof shall be kept at the work site of the permitted activity. [62-528.307(1)(l)]

13. The permittee shall comply with the following:

    a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records shall be extended automatically unless the Department determines that the records are no longer required.
    b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
    c. Records of monitoring information shall include:
        i. the date, exact place, and time of sampling or measurements;
        ii. the person responsible for performing the sampling or measurements;
        iii. the dates analyses were performed;
        iv. the person responsible for performing the analyses;
        v. the analytical techniques or methods used; and
        vi. the results of such analyses.
    d. The permittee shall furnish to the Department, within the time requested in writing, any information which the Department requests to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit.
    e. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

    [62-528.307(1)(m)]

14. All applications, reports, or information required by the Department shall be certified as being true, accurate, and complete. [62-528.307(1)(n)]

15. Reports of compliance or noncompliance with, or any progress reports on, requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each scheduled date. [62-528.307(1)(o)]

16. Any permit noncompliance constitutes a violation of the Safe Drinking Water Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. [62-528.307(1)(p)]

17. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. [62-528.307(1)(q)]

18. The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit. [62-528.307(1)(r)]

19. This permit may be modified, revoked and reissued, or terminated for cause, as provided in 40 C.F.R. sections 144.39(a), 144.40(a), and 144.41 (1998). The filing of a request by the permittee for a permit modification, revocation or reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition. [62-528.307(1)(s)]

20. The permittee shall retain all records of all monitoring information concerning the nature and composition of injected fluid until five years after completion of any plugging and abandonment procedures specified under rule 62-528.435, F.A.C. The permittee shall deliver the records to the Department office that issued the permit at the conclusion of the retention period unless the permittee elects to continue retention of the records. [62-528.307(1)(t)]

21. All reports and other submittals required to comply with this permit shall be signed by a person authorized under rules 62-528.340(1) or (2), F.A.C. All reports shall contain the certification required in rule 62-528.340(4), F.A.C. [62-528.307(1)(u)]

22. The permittee shall notify the Department as soon as possible of any planned physical alterations or additions to the permitted facility. In addition, prior approval is required for activities described in rule 62-528.410(1)(h). [62-528.307(1)(v)]

23. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or injection activity which may result in noncompliance with permit requirements. [62-528.307(1)(w)]

24. The permittee shall report any noncompliance which may endanger health or the environment including:

    a. Any monitoring or other information which indicates that any contaminant may cause an endangerment to an underground source of drinking water; or
    b. Any noncompliance with a permit condition or malfunction of the injection system which may cause unauthorized fluid migration into or between underground sources of drinking water.

c. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [62-528.307(1)(x)]

Issued this 24th day of April, 2013

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Mary E. Yeargan

Mary E. Yeargan, P.G.
District Director
Southwest District Office

Rec VIA E-MAIL
12-14-2016

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

SENT VIA ELECTRONIC MAIL

In the Matter of an Application for Permit by: 14 December 2016

Mr. Patrick J. Lehman, P.E., Executive Director
Peace River Regional Water Supply Authority
9415 Town Center Parkway
Lakewood Ranch, FL 34202
PLehman@RegionalWater.org

Desoto County UIC
FDEP File No: 136595-016-017-UO/M5
WACS ID Number: 40593
Class V ASR Injection Well System
Operation Permit

NOTICE OF PERMIT

Enclosed is Permit Number 136595-016-017-UO/M5 to modify a non-hazardous Class V injection well operation permit to allow cycle tests of aquifer storage and recovery (ASR) wells S-4 and S-20 at wellfield No. 2. ASR wells S-4 and S-20 will receive partially treated surface water. Recharge of the remaining nineteen ASR wells with potable water from the Peace River Water Treatment Plant (WTP), 8998 SW County Road 769, Arcadia, DeSoto County will continue at Wellfields No. 1 & 2. ASR wells S-4 and S-20 will be recharged with 2 to 4 million gallons per day each.

Any party to this Order (permit) has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rules 9.110 and 9.190, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, agency_clerk@dep.state.fl.us; and by filing a copy of the Notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Notice is filed with the Clerk of the Department.

Executed in Leon County, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Joseph Haberfeld

Joseph Haberfeld, P.G.
Environmental Administrator
Aquifer Protection Program
Division of Water Resource Management

PERMITTEE: Mr. Patrick Lehman, Executive Director
Peace River Water Treatment Plant
Class V, ASR Injection Well System

WACS ID No.: 40593
Permit ID No.: 136595-016-017-UO/M5
Date: December 14, 2016

CERTIFICATE OF SERVICE

The undersigned designated clerk hereby certifies that this **NOTICE OF PERMIT** and all copies were mailed before the close of business on Wednesday, December 14, 2016, to the listed persons.

FILING AND ACKNOWLEDGMENT

FILED, on this date, pursuant to Section.120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged

Mary Genung

Clerk

December 14,2016

Date

Copies Furnished To:

Joseph Haberfeld, FDEP/TLH	*joe.haberfeld@dep.state.fl.us*
Neil Campbell, FDEP/TLH	*neil.i.campbell@dep.state.fl.us*
James Dodson, FDEP/TLH	*james.dodson@dep.state.fl.us*
Danielle Henry, FDEP, SWD	*danielle.d.henry@dep.state.fl.us*
Mike Coates, PRMRWSA	*mcoates@regionalwater.org*
Ryan Messer, ED/CH2M	*ryan.messer@ch2m.com*
Mark McNeal, ASRus	*mmcneal@asrus.net*
Hope Cates, FDEP/TLH	*hope.cates@dep.state.fl.us*
Cathy McCarty, FDEP/TLH	*cathleen.mccarty@dep.state.fl.us*
Mary Genung, FDEP/TLH	*mary.genung@dep.state.fl.us*
Nancy Marsh, USEPA/ATL	*marsh.nancy@epa.gov*

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Underground Injection Control
Class V, Group 7, Aquifer Storage and Recovery (ASR) Well System
Operation Permit Major Modification

December 14, 2016

Permittee:
Peace River Regional Water Supply Authority

Responsible Official:
Mr. Patrick J. Lehman, P.E., Executive Director
9415 Town Center Parkway
Lakewood Ranch, FL 34202
PLehman@RegionalWater.org

Facility:
Peace River Water Treatment Plant
8998 Southwest County Road 769
Arcadia, Florida 34269

Permit/Certification:

Permit Number:	136595-016-017-UO/M5
WACS ID:	40593
Date of Issuance:	December 14, 2016
Date of Expiration:	April 23, 2018
Permit Processor:	Neil I. Campbell

Section/Township/Range S16 / T39S / R23E

Location:

County:	Desoto
Latitude:	27° 05' 06" N
Longitude:	82° 01' 08" W

RE: Major Modification to FDEP Permit 136595-016-017-UO/M5 under 136595-016-017-UO/M5 to allow cycle tests of aquifer storage and recovery (ASR) wells S-4 and S-20 at wellfield No. 2.

This permit is issued under the provisions of Chapter 403, Florida Statutes (F.S.), and the rules adopted thereunder. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows.

To modify a non-hazardous Class V injection well operation permit to allow cycle tests of aquifer storage and recovery (ASR) wells S-4 and S-20 at wellfield No. 2. ASR wells S-4 and S-20 will receive partially treated surface water. Recharge of the remaining nineteen ASR wells with potable water from the Peace River Water Treatment Plant (WTP), 8998 SW County Road 769, Arcadia, DeSoto County will continue at Wellfields No. 1 & 2. ASR wells S-4 and S-20 will be recharged with 2 to 4 million gallons per day each.

IN ACCORDANCE WITH: The Application to Modify the current Operating Permit DEP Form No. 62-528.900(1) received, August 16, 2016, response to the Department's request for

additional information, received September 8, 2016, and supporting information submitted to this agency.

LOCATION: Peace River Water Treatment Plant, 8998 Southwest County Road 769, Arcadia, Florida 34269, in the county of Desoto.

Based on the information provided to the Department, per the request of the Peace River Regional Water Supply Authority, the Department hereby approves the above major modification to FDEP Permit Number 136595-014-UO/5Q under FDEP Permit Modification Number 136595-016-017-UO/M5. Testing of partially treated surface water (PTSW) as a source water for storage in two of ASR Wellfield No. 2 (WF2) wells, S-20 and S-4, may begin upon receipt of this modification. The permit's operational specific conditions I. through III. are changed as specified below:

Page 3 – Adds the Avon Park Monitor well, AP-1, 12-inch casing set to 1300 feet below land surface (bls), open hole to 1479 feet bls.

Conditions I. Operating Requirements:

A.1 Injection of fluids other than those permitted into the ASR well will constitute a violation of this permit and shall constitute cause for permit revocation and possible enforcement action for water quality violation. Only water from the Peace River Regional Water Supply Facility, a surface water drinking water facility, may be injected, **except that partially treated surface water from Reservoir No. 1 may be injected into ASR wells S-4 and S-20.**

A.7 This ASR facility shall be operated in conformance with the criteria contained in Water Quality Criteria Exemption OGC File 12-1502. **This permit modification removes ASR wells S-4 and S-20 from the Exemption in order to cycle test those wells with partially treated surface water. All other provisions of the Exemption remain unchanged.**

A.8 **NEW: Zone of Discharge**

a. A zone of discharge under Rule 62-520.465(2)(b), F.A.C, is established for this injection project for the parameters of total coliform bacteria, aluminum, and color. The zone of discharge extends to the permittee's property boundary. *[62-520.465(2)(b)]*

b. Compliance with the zone of discharge shall be demonstrated at monitor well M-18; total coliform bacteria, aluminum, and color must be met at this compliance well. If the concentration for any standard in the natural background quality is greater than that which is listed in Rule 62-520.420(1), F.A.C., or in the case of pH is also less than the minimum, the representative natural background quality shall be the prevailing standard. *[62-520.420, 62-520.600]*

c. Should ground water monitoring during operation indicate drinking water parameters are not met at compliance well M-18, the permittee shall, upon the Department's request, submit a report addressing the results of the collected ground

water monitoring data. The report shall be submitted to the Department no later than 90 days after the request and shall include a discussion of the changes in water quality for parameters exceeding maximum contaminant levels. The report shall also address the adequacy of the zone of discharge and the steps to be taken to come into compliance. *[62-520.700, 62-528.610(1)]*

Conditions III. Testing and Reporting Requirements

A.3 **NEW:** Cycle testing of ASR-4 and ASR-20 shall be in accordance with the schedule specified below:

Cycle	Recharge Rate (MGD)	Storage Duration (Days)	Recovery Rate (MGD)	Volume in Storage (MG)
1	2-4	15	1.5-2.5	50
2	2-4	15	1.5-2.5	100
3	2-4	15	1.5-2.5	150

Additional or fewer cycles, or changes in the cycle testing details above, may be authorized in writing by the Department.

[62-528.450(3)(a)]

B.5 **NEW:** Table 3 of the permittee's September 8, 2016 response to a Request for Additional Information is incorporated into this permit modification. It contains monitoring and sampling requirements specific to the cycle testing, and is reproduced as an attachment at the end of this modification. *[62-528.307(3)(d) and 528.430(2)]*

B.6 **NEW:** Monitoring well AP-1 shall be sampled semiannually for static pressure or water level, chloride, total dissolved solids, and field pH, specific conductance, and temperature (°C). *[62-528.307(2)(d) and 528.430(2)]*

This document must be attached to your permit and becomes a part of that permit. All conditions of Permit no. 0136595-014-UO/5Q not specifically modified or deleted in this document remain in effect.

Table 3. Proposed Monitoring Plan
Peace River WF2 PTSW ASR Pilot Testing

Parameter	Units	Recording Frequency	Frequency of Analysis			
			Recharge (reservoir)	*Recovery (S-4, S-20)*	*M-11, M-14, M-16, M-17, M-18, T-11*	*M-8, M-13, T-8*
Flow Rate, max.	gpm	daily	D/M	D/M		
Flow Rate, min.	gpm	daily	D/M	D/M		
Flow Rate, avg.	gpm	daily	D/M	D/M		
Total Volume Recharged	Mg	daily	D/M			
Total Volume Recovered	Mg	daily		D/M		
Injection Pressure, max.	Psi	continuous	D/M			
Injection Pressure, min.	Psi	continuous	D/M			
Injection Pressure, avg.	Psi	continuous	D/M			
Water Level, max.	feet (NGVD)	continuous		D/M	D/M	D/M
Water Level, avg.	feet (NGVD)	continuous		D/M	D/M	D/M
Water Level, min.	feet (NGVD)	continuous		D/M	D/M	D/M
pH +	std. Units		W[a]	W[b]	W	M
Specific Conductivity +	µmhos/cm		W[a]	W[b]	W	M
Temperature +	°C		W[a]	W[b]	W	M
Dissolved Oxygen +	mg/L		W[a]	W[b]	W	M
Turbidity +	NTU		W[a]	W[b]	W	M
Oxidation-Reduction Potential +	mV		W[a]	W[b]	W	M
Total Dissolved Solids	mg/L		W[a]	W[b]	W	M
Chloride	mg/L		W[a]	W[b]	W	M
Sulfate	mg/L		W[a]	W[b]	W	M
Arsenic	µg/L		W[a]	W[b]	W	M
Total Suspended Solids	mg/L		W[a]	W[b]	W	M
Nitrate (as N)	mg/L		W[a]	W[b]	W	M
TKN	mg/L		W[a]	W[b]	W	M
Ammonia	mg/L		W[a]	W[b]	W	M
TOC	mg/L		W[a]	W[b]	W	M
Color	Units		W[a]	W[b]	W	M
Aluminum	µg/L		W[a]	W[b]	W	M
Total Coliform	CFU/100 mL		W[a]	W[b]	W	M
Escherichia coli	CFU/100 mL		W[a]	W[b]	W	M
Primary and Secondary stds.	mg/L		B		-	-

Notes:

No sampling of ASR wells during storage
W - weekly; D/M - daily and monthly;
a - during recharge only
b - during recovery only
+ - field samples
B - Background sample prior to cycle 1 recharge

Appendix B

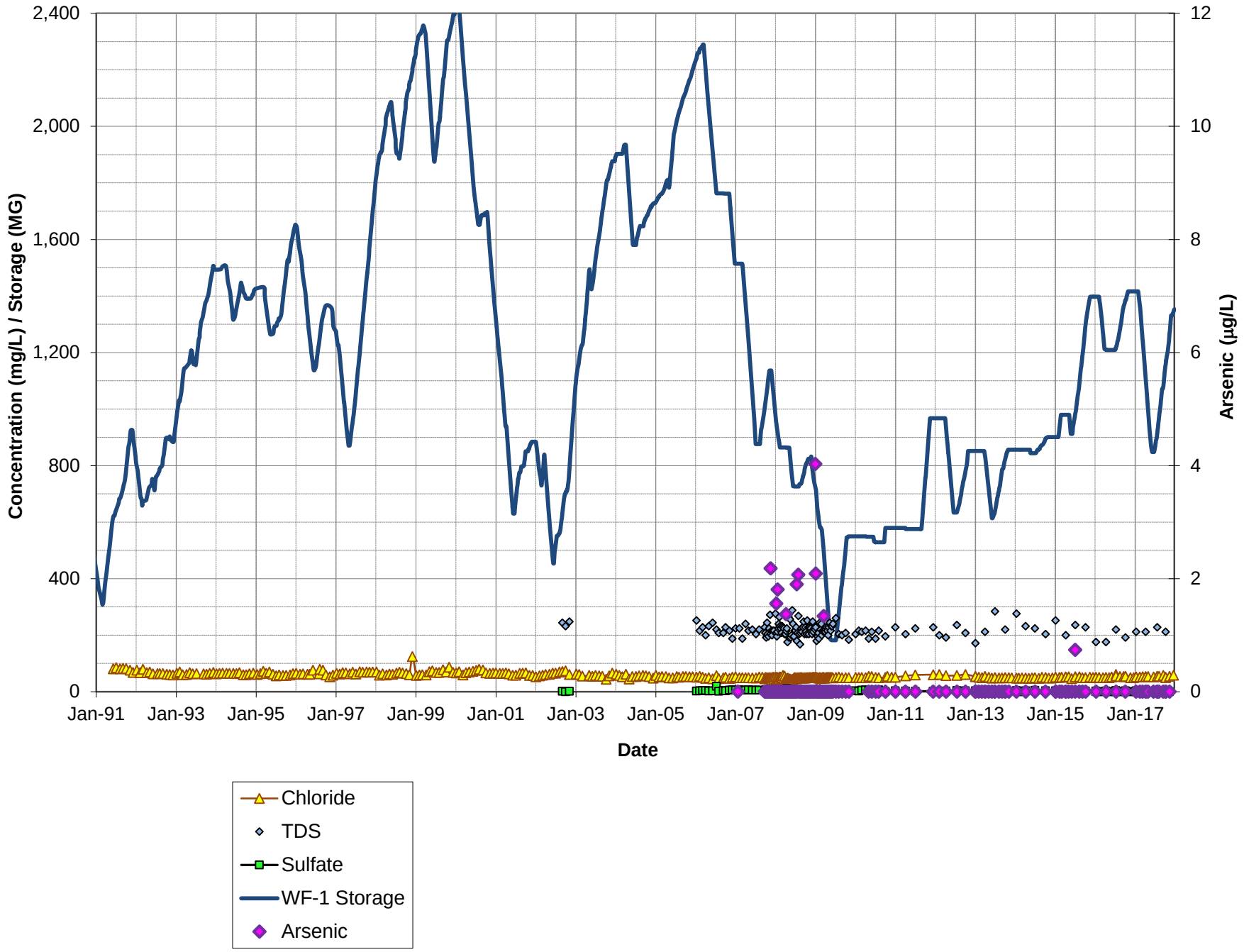
The 2016 ASR Annual Report Peace River Facility ASR System

(CH2M HILL and ASRus, August 2017)

(Under Separate Cover)

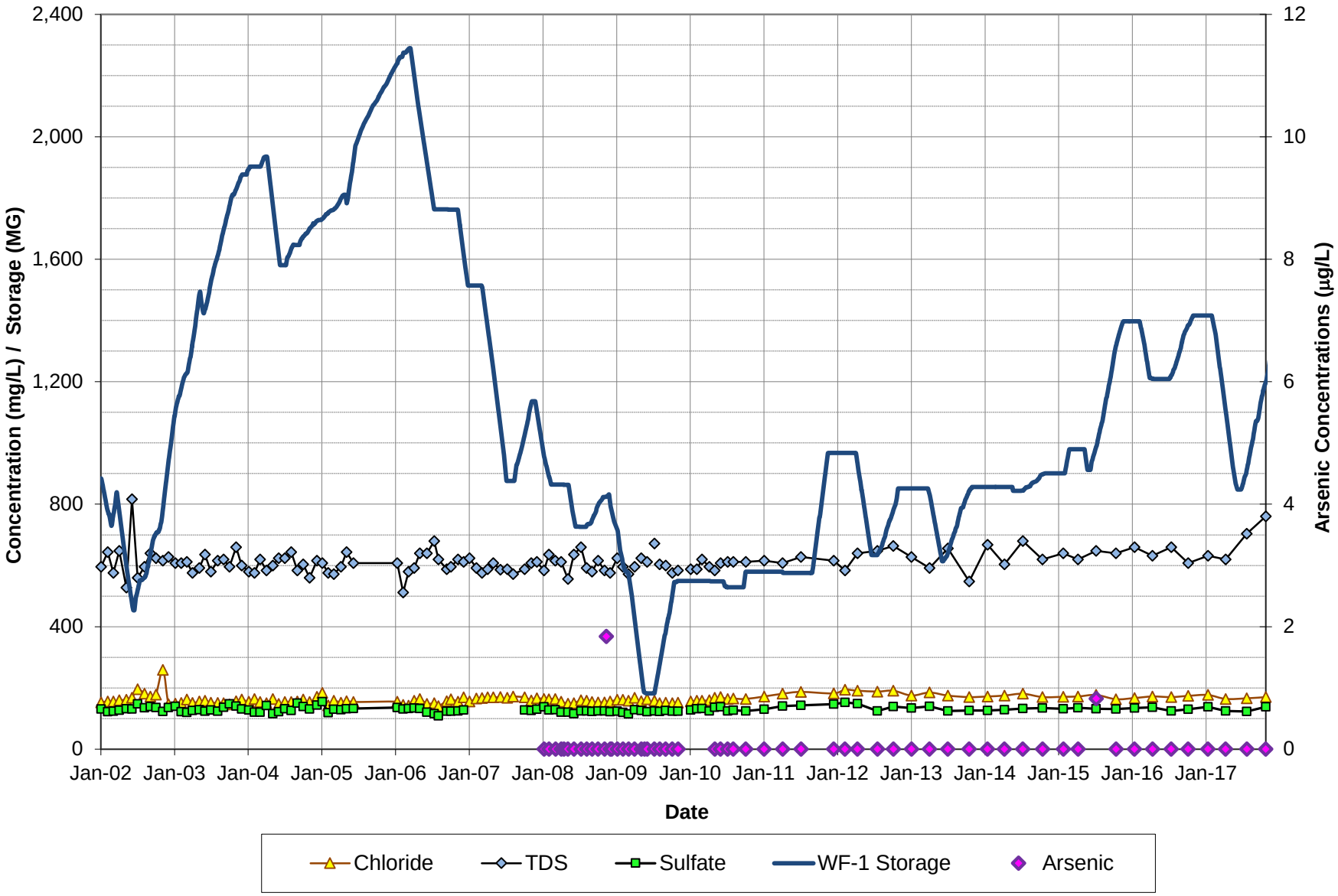
Appendix C

Compliance Monitor Well Water Quality Graphs Updated Through 2017

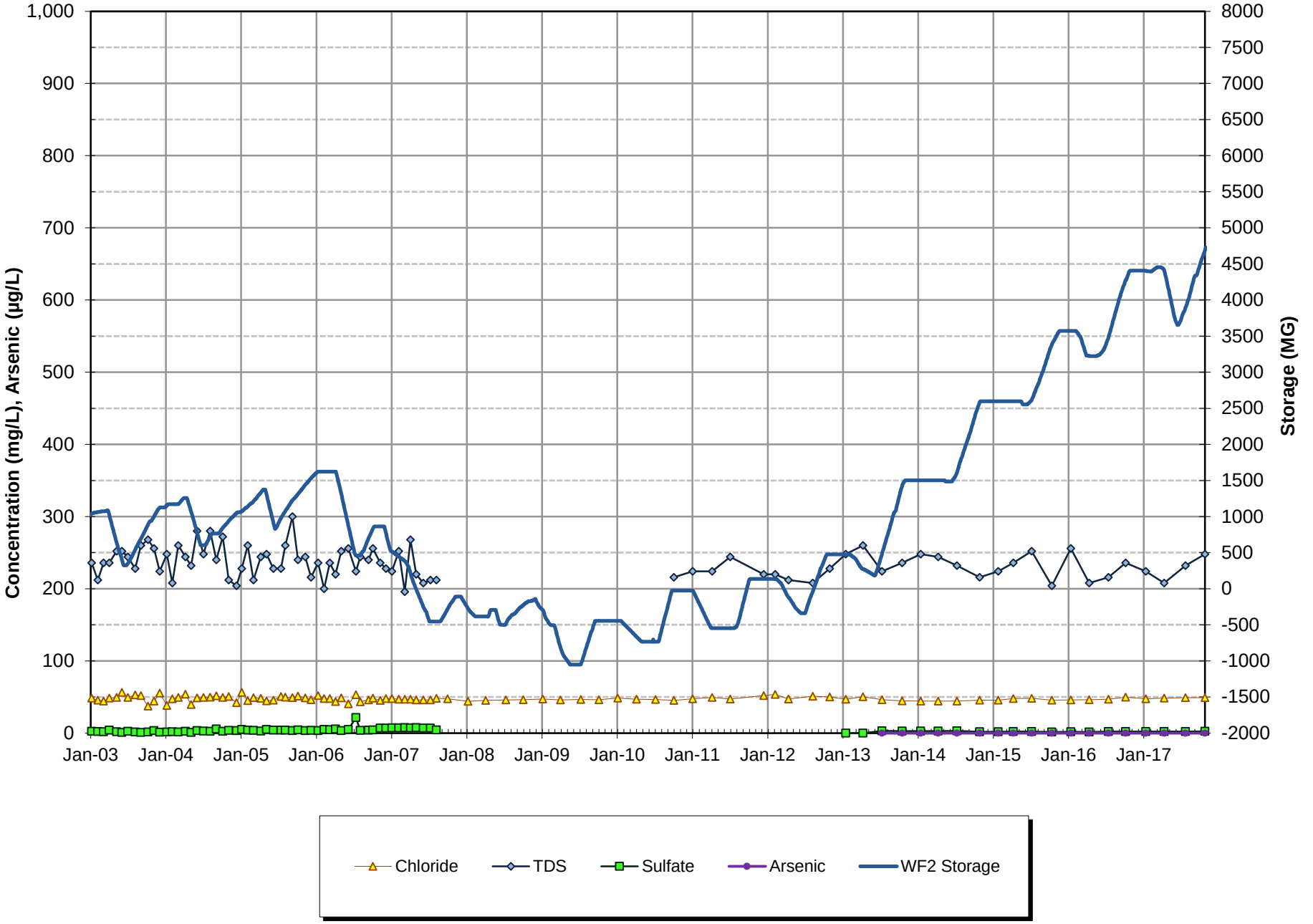


Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well "E" Water Quality

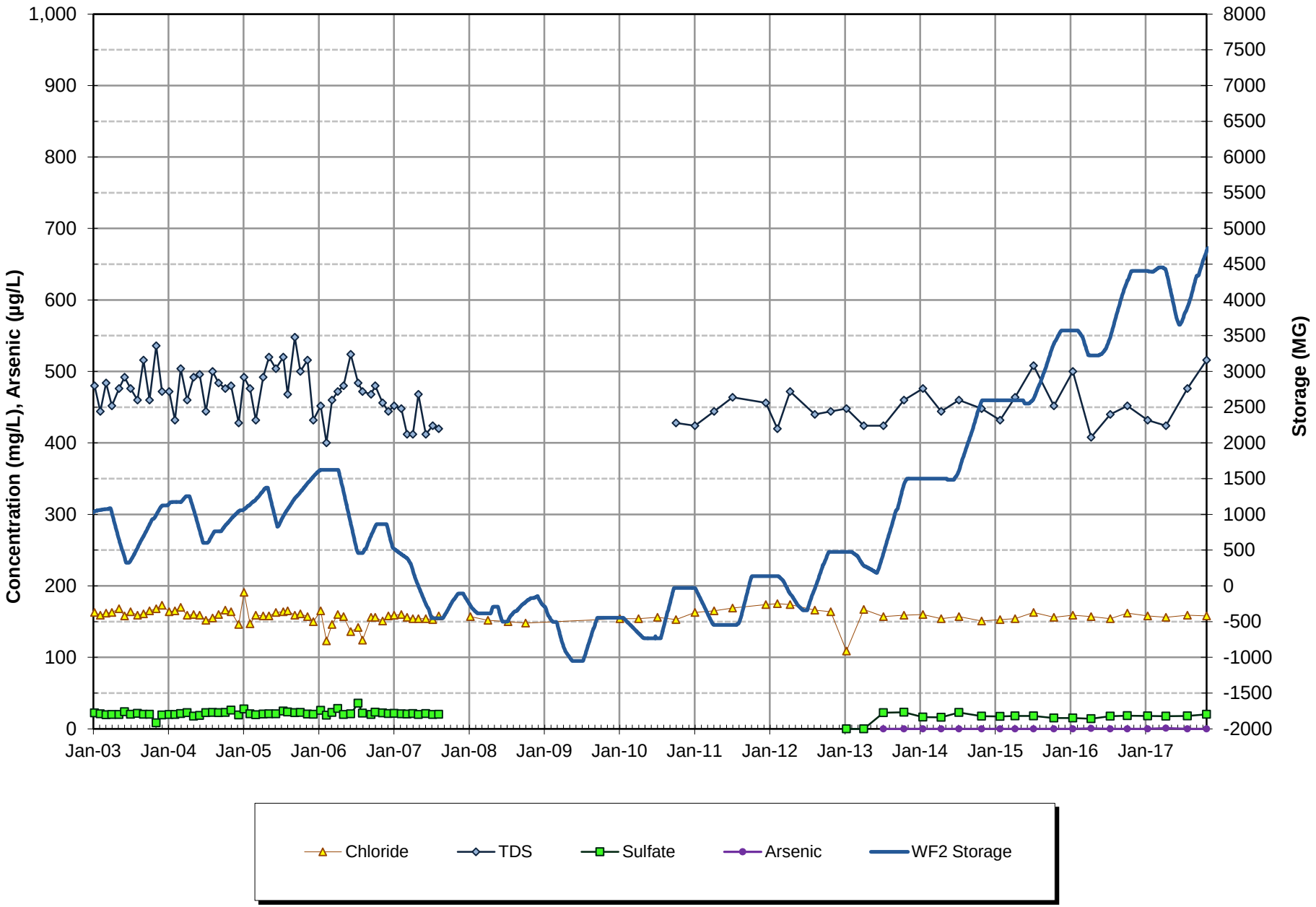


Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero



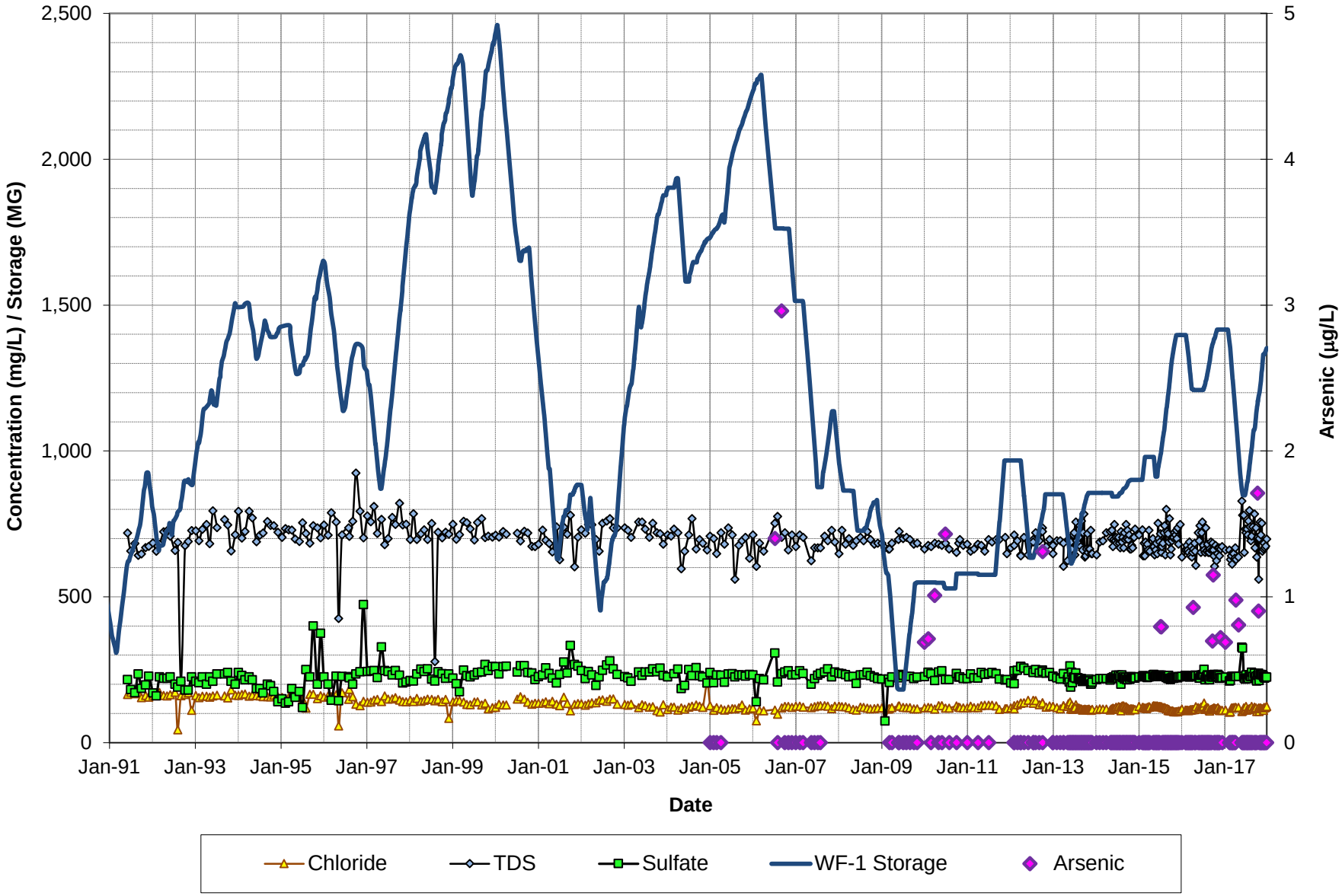
Monitoring Well I-8 Water Quality

Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero



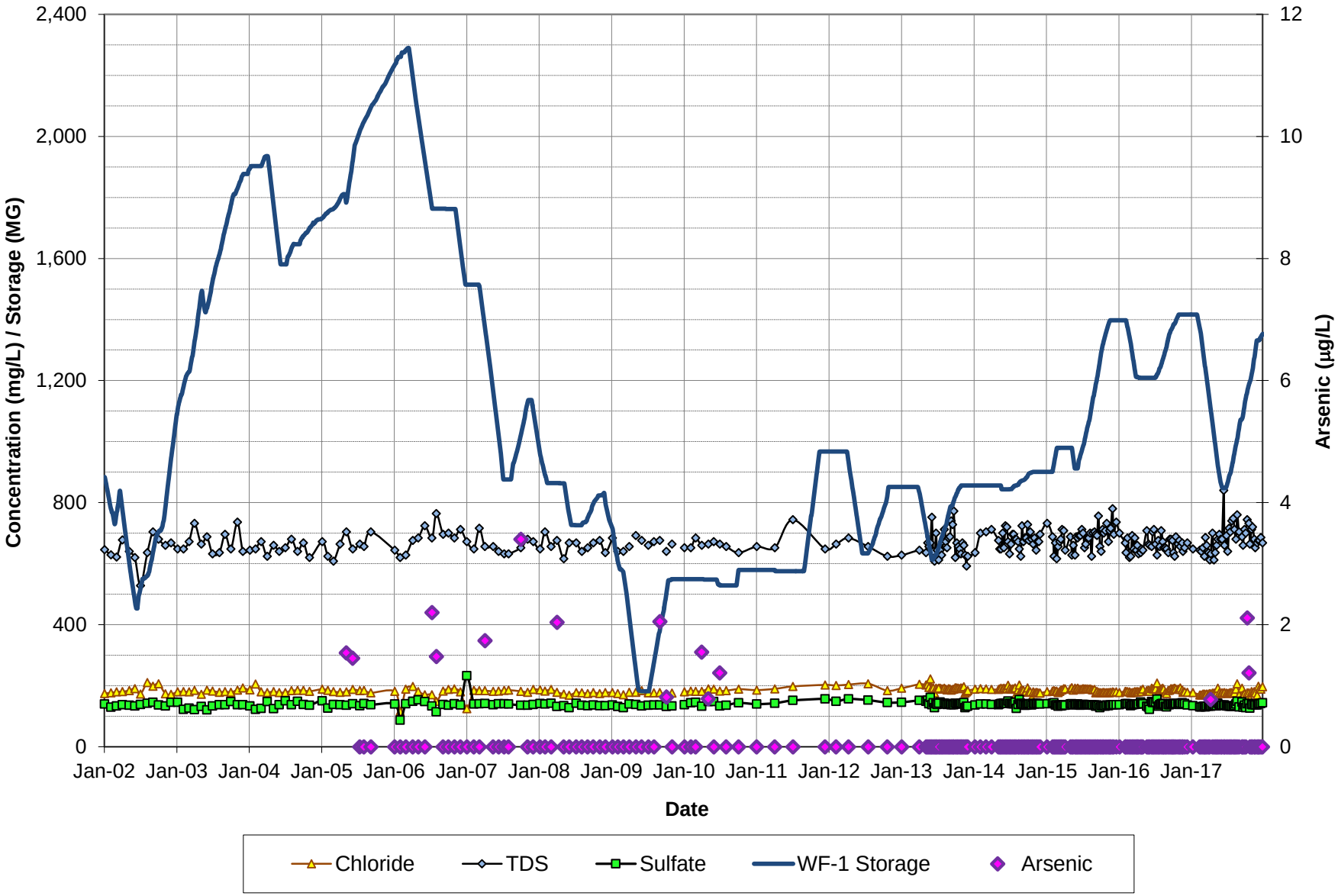
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well I-10 Water Quality



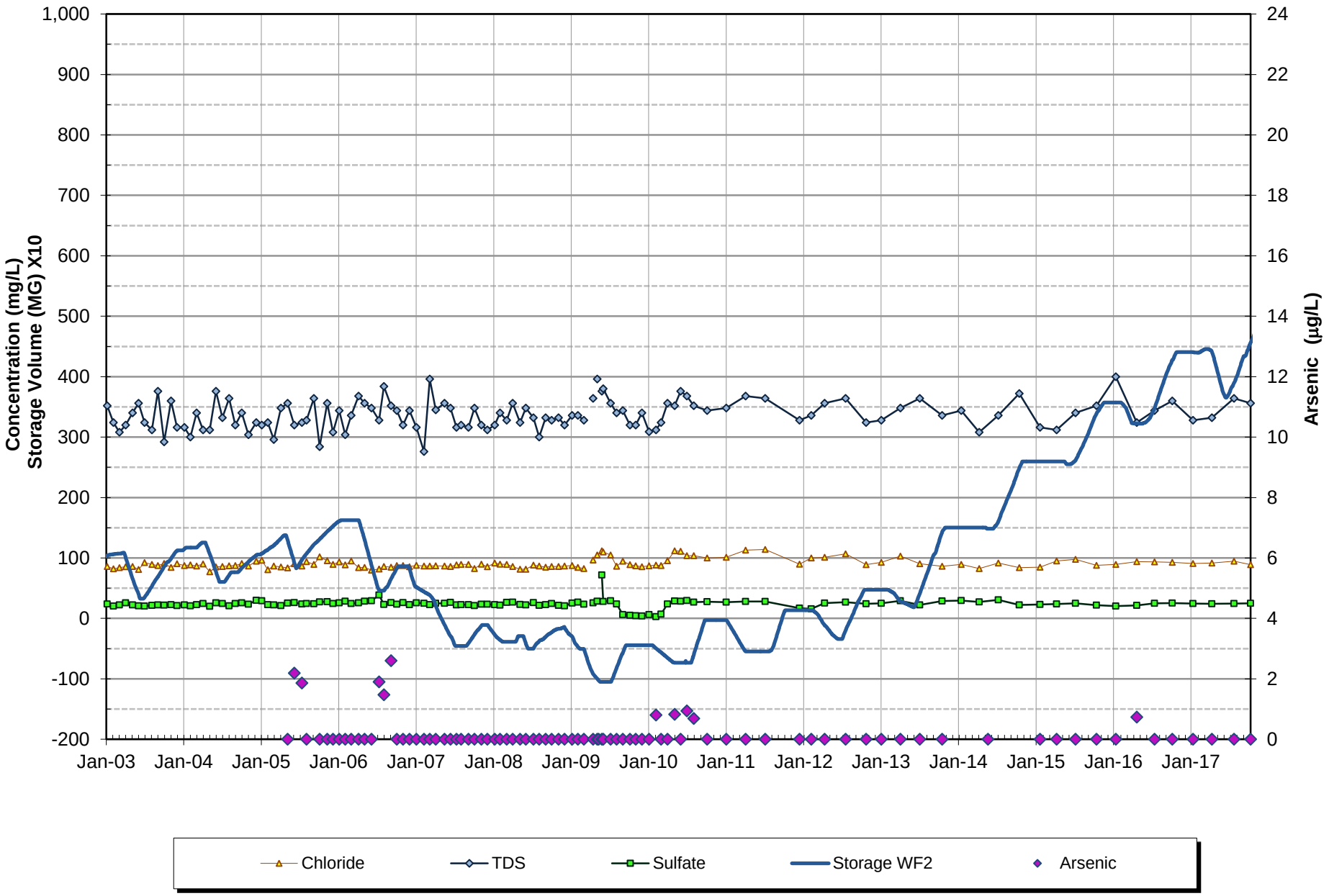
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well T-2 Water Quality



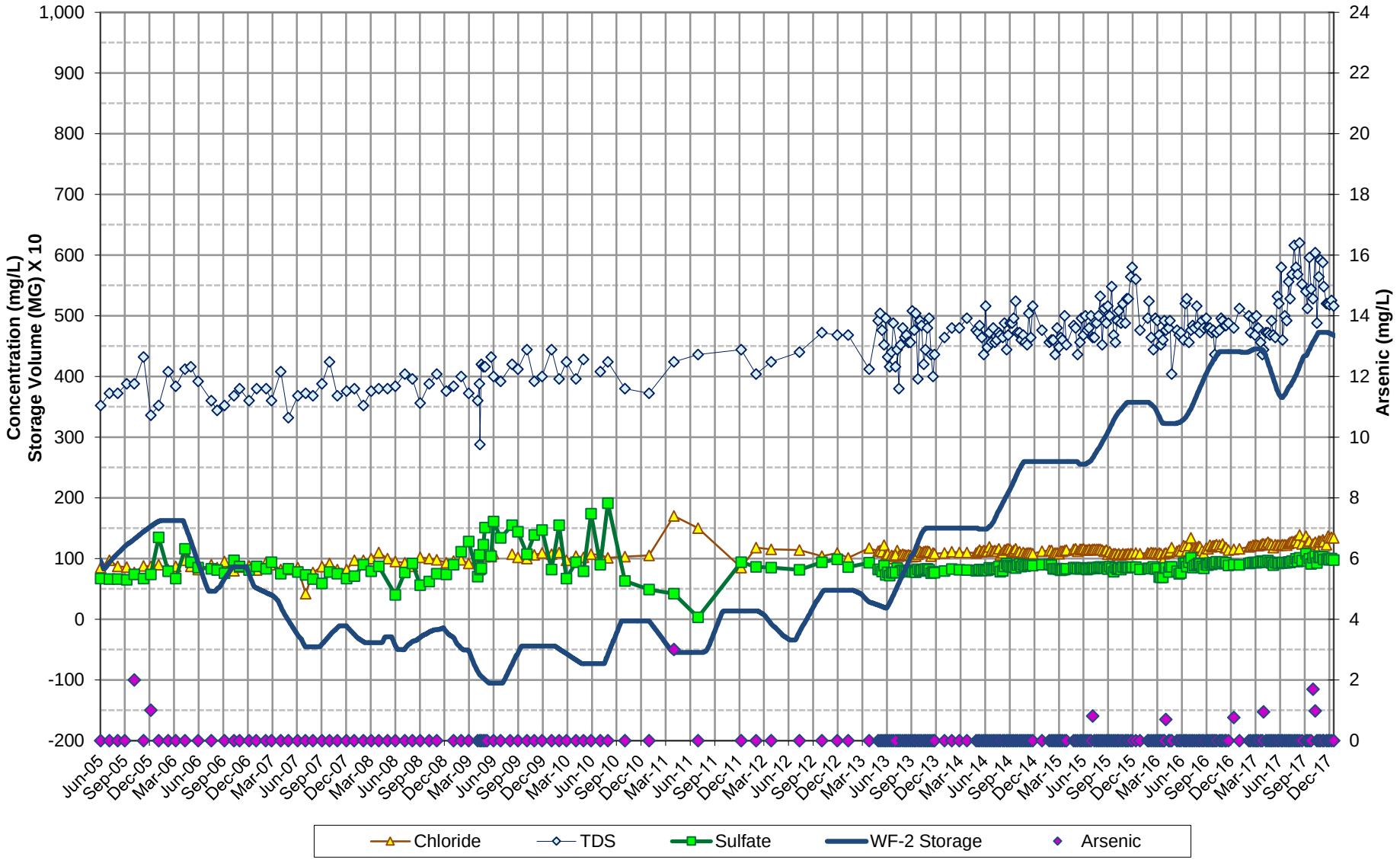
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well T-7 Water Quality



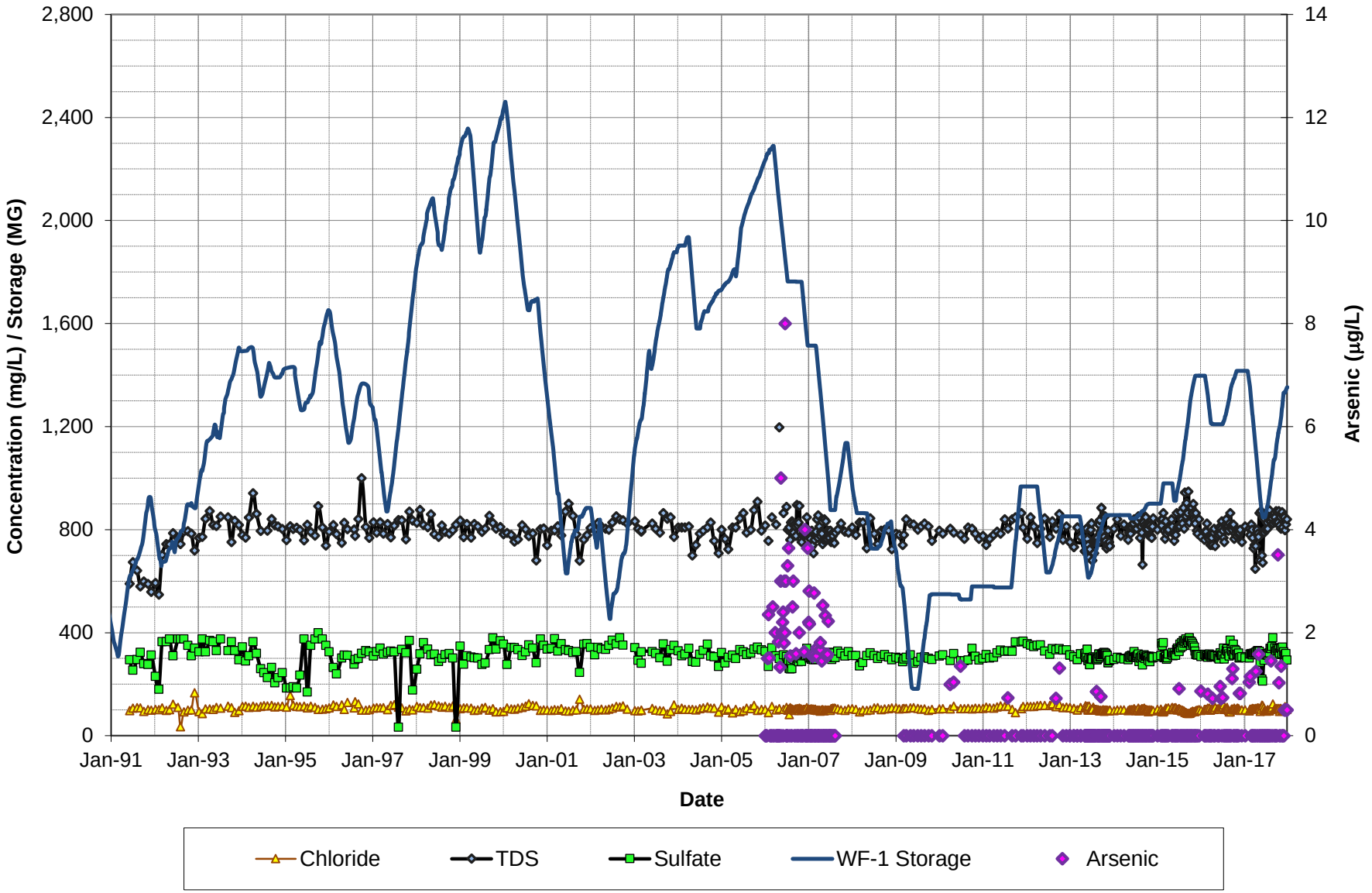
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well T-8 Water Quality



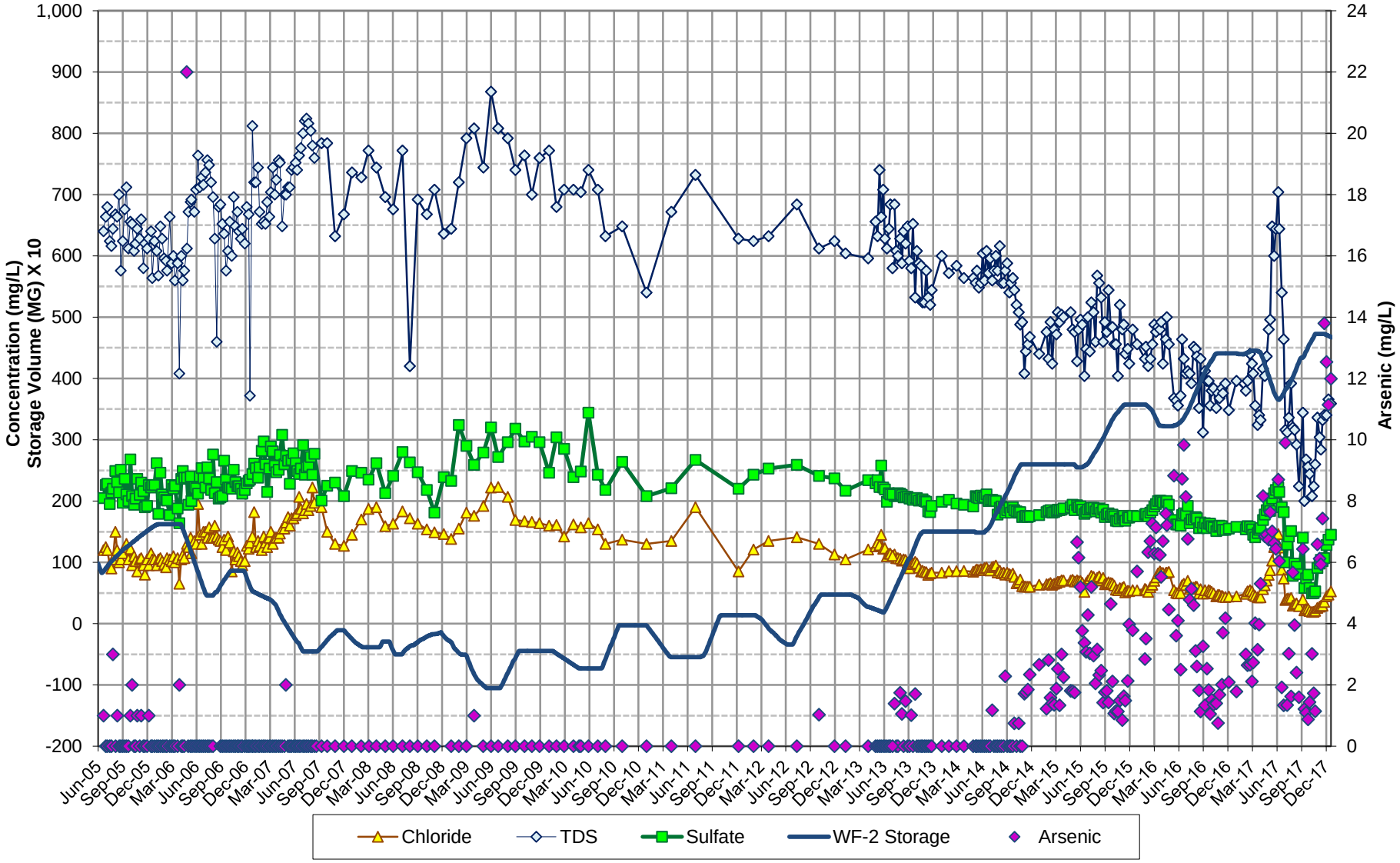
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well T-11 Water Quality



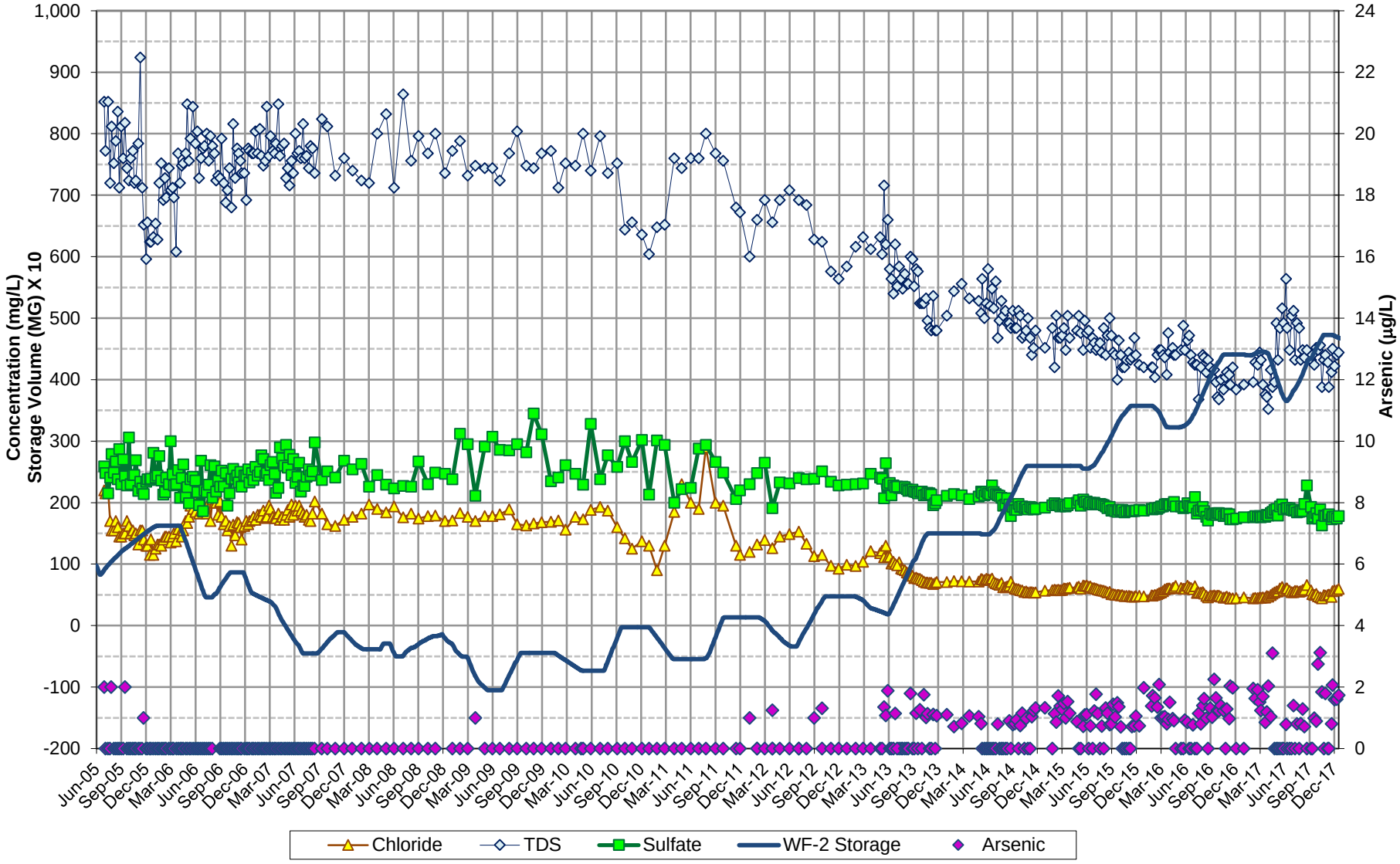
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well M-2 Water Quality



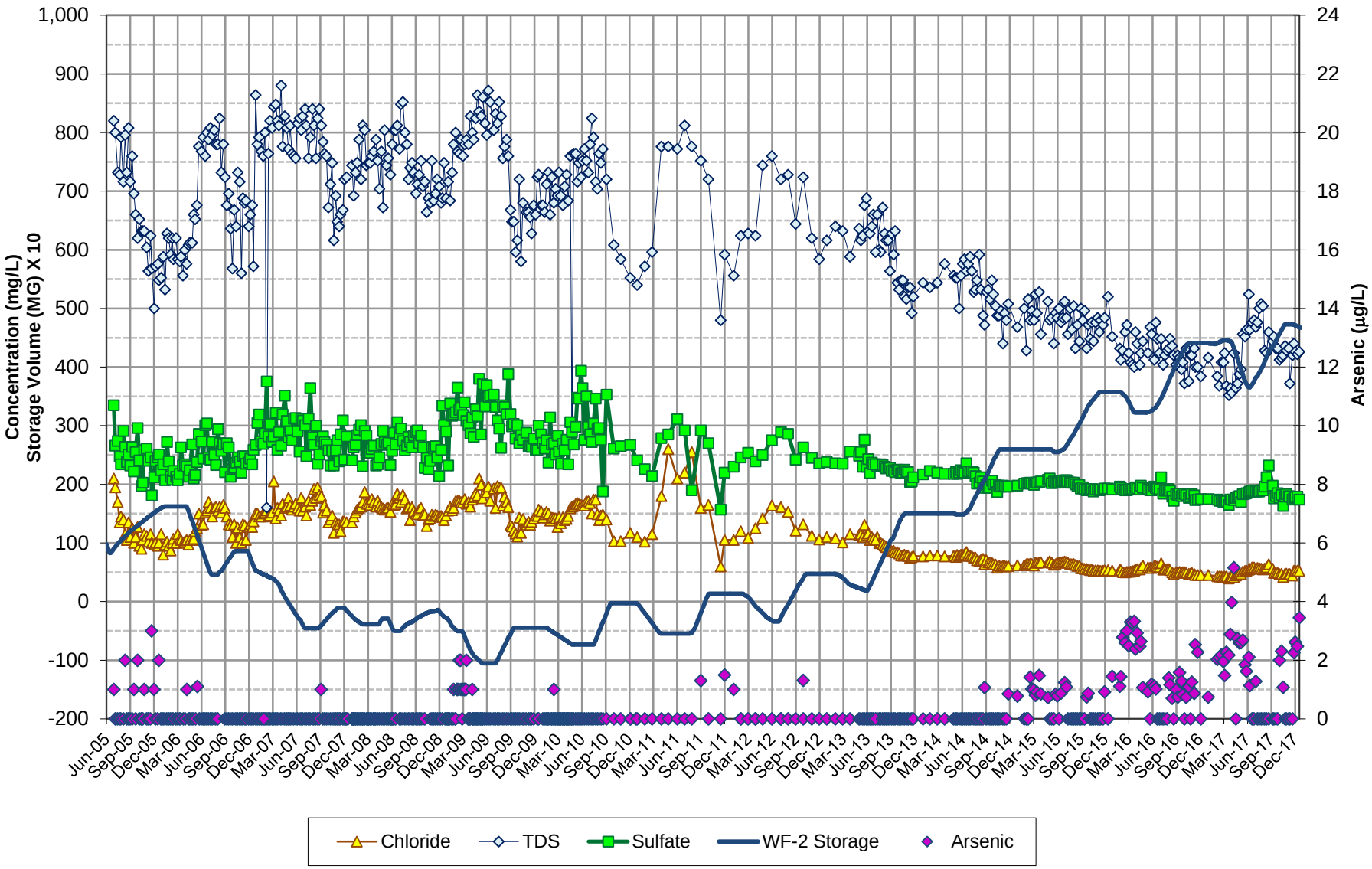
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well M-15 Water Quality



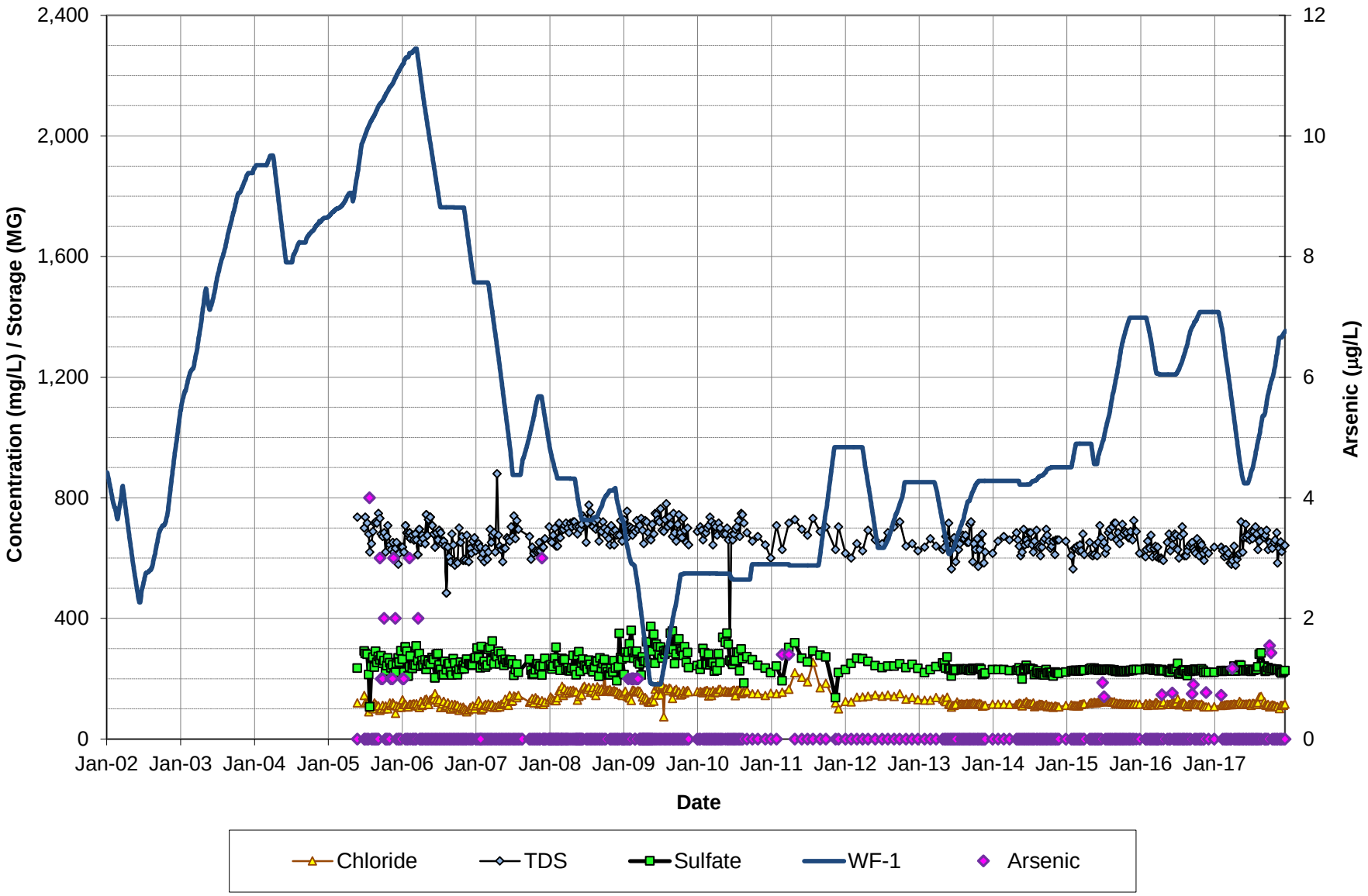
Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well M-18 Water Quality



Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well M-19 Water Quality



Note: For the purpose of this graphic any readings below the laboratory method detection limit were assigned zero

Monitoring Well M-21 Water Quality

Appendix D

Lateral Extent of ASR Storage Volume Projections

Appendix D-1 WF1 Current Storage Volume Calculation

1) Current Volume recharged

Storage Volume	1,332,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of

storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	1,332,000,000
ft^3	178,062,501

Using the formula from step two, the following radii (ft) are found:

1683	feet
0.32	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).

Appendix D-2 WF1 5 Year Projected Storage Volume Calculation

1) Projected Volume to be recharged (maximum)

Max Anticipated Storage Volume	5,832,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	5,832,000,000
ft^3	779,625,003

Using the formula from step two, the following radii (ft) are found:

3523	feet
0.67	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).
-Projected 5-year and 10-year storage volumes are based on 1 MGD of recharge at each well for 100 days per year with no recovery

Appendix D-3 WF1 10 Year Projected Storage Volume Calculation

1) Projected Volume to be recharged (maximum)

Max Anticipated Storage Volume	10,332,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	10,332,000,000
ft^3	1,381,187,505

Using the formula from step two, the following radii (ft) are found:

4689	feet
0.89	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).
-Projected 5-year and 10-year storage volumes are based on 1 MGD of recharge at each well for 100 days per year with no recovery

Appendix D-4 WF2 Current Storage Volume Calculation

1) Current Volume recharged

Storage Volume	4,725,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of

storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	4,725,000,000
ft^3	631,640,627

Using the formula from step two, the following radii (ft) are found:

3171	feet
0.60	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).

Appendix D-5 WF2 5 Year Projected Storage Volume Calculation

1) Projected Volume to be recharged (maximum)

Max Anticipated Storage Volume	10,725,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	10,725,000,000
ft^3	1,433,723,963

Using the formula from step two, the following radii (ft) are found:

4777	feet
0.90	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).
-Projected 5-year and 10-year storage volumes are based on 1 MGD of recharge at each well for 100 days per year with no recovery

Appendix D-6 WF2 10 Year Projected Storage Volume Calculation

1) Projected Volume to be recharged (maximum)

Max Anticipated Storage Volume	16,725,000,000	gallons

2) Equation for volume of cylinder:

r=(V/π nh)^0.5

where:

r=Radius of AOR (ft)

V= Volume (ft^3) from step 1

h= assumed thickness of

storage zone intervals (ft) accepting fluids, h= 200 ft

n= effective porosity, n= 0.1

3) Calculation of projected radius of groundwater flow:

Gal	16,725,000,000
ft^3	2,235,807,299

Using the formula from step two, the following radii (ft) are found:

5965	feet
1.13	miles

Assumptions and qualifiers when using this method to estimate lateral distances of injected flow:

The recharge zone is homogenous and isotropic.
No leakance occurs between the overlying and underlying geologic units.
No density differences exist between the injected water and the native groundwater.
The direction, magnitude, and temporal variations of the groundwater gradient are not accounted for.
The cylindrical volume calculation is used only to provide a gross estimation of the average distance the injected water may extend laterally from the ASR wellfield.

Notes:

-It is assumed that only portions of the open hole will accept flow, therefore a conservative thickness of 200 feet was used in the calculation of the storage interval (h).
-Projected 5-year and 10-year storage volumes are based on 1 MGD of recharge at each well for 100 days per year with no recovery

Appendix E

Well Inventory Data

APPENDIX E-1

SWFWMD Well Construction Permits Within 2-Mile AOR (Figure 2-11, 2-13, and 2-14)

INVENTORY FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-1	319228	319228 - 1	SEALING WATER	12	250	1100	Lettuce Lk	NO ADDRESS	27 04 18.28	81 58 59.63
WCP-2	305595	305595 - 1	DOMESTIC	8	63	834	Doughtry, David D	RT 1 BOX 267	27 04 59.23	82 02 57.67
WCP-3	307513	307513 - 1	IRRIGATION	8	97	796	No Name - Do Not Modify	NO ADDRESS	27 04 58.63	82 00 00.13
WCP-4	350117	CALVIN C BOGGESS	IRRIGATION	10	84	792	Calvin C Boggess	P O BOX 551	27 05 05.32	82 02 05.71
WCP-5	319226	319226 - 1	SEALING WATER	14	58	735	Lettuce Lk	NO ADDRESS	27 04 37.73	81 59 07.07
WCP-6	320713	320713 - 1	MINING	6	63	707	L R Morgan	NO ADDRESS	27 05 51.52	81 59 59.75
WCP-7	340600	340600 - 1	IRRIGATION	10	63	700	C Boggess	NO ADDRESS	27 04 59.23	82 02 57.67
WCP-8	490007	490007 - 1	IRRIGATION	4	111	560	Harvey W Mc Leod	JERNIGAN ST.	27 06 42.94	81 59 58.92
WCP-9	306136	306136 - 1	UNKNOWN	10	126	515	Game & Fresh Water Fish Commission	620 SOUTH MERIDIAN STREET	27 04 05.53	82 00 00.33
WCP-10	355496	355496 - 1	IRRIGATION	6	88	515	George P. Hayden, Jr.	P.O. BOX 167	27 05 32.92	81 58 25.26
WCP-11	535922	535922 - 1	IRRIGATION	5	84	500	Bernice Mclennon	PO BOX 73	27 05 12.82	81 59 05.03
WCP-12	329884	329884 - 1	IRRIGATION	10	68	470	C Boggess	NO ADDRESS	27 04 06.76	82 01 58.84
WCP-13	376960	376960 - 1	IRRIGATION	6	126	450	W.F. Boggess	P.O. BOX 24	27 04 18.28	81 58 59.63
WCP-14	769621	Proposed WCP Well	MONITOR	12	238	445	Southwest Florida Wmd	.9225 CO RD 769 SW	27 04 57.51	82 01 43.46
WCP-15	769232	Proposed WCP Well	MONITOR	12	235	426	Southwest Florida Wmd	9225 CO RD 769 SW	27 04 58.23	82 01 18.27
WCP-16	497685	497685 - 1	PUBLIC SUPPLY	4	70	400	Kavanaugh, Clinch	P O BOX 35193	27 04 18.28	81 58 59.63
WCP-17	650808	650808 - 1	IRRIGATION	4	90	400	James B Hobbs	9924 KINGS HIGHWAY	27 04 58.65	82 00 59.03
WCP-18	622433	622433 - 1	DOMESTIC	4	75	380	French Connection C/O Wayne Kiem	JERNICAN RD	27 06 42.94	81 59 58.92
WCP-19	473864	473864 - 1	PUBLIC SUPPLY	2	100	360	Elizabeth Wilcoxen	RT 3 BOX 629	27 05 06.37	81 58 57.71
WCP-20	616625	616625 - 1	LIVESTOCK	3	110	360	J. William Gaddy	10174 CR769 KINGS HWY	27 04 06.16	82 00 59.41
WCP-21	316890	316890 - 1	DOMESTIC	4	66	360	L Hones	NO ADDRESS	27 06 42.94	81 59 58.92
WCP-22	339625	339625 - 1	DOMESTIC	4	105	358	Christ,D R	NO ADDRESS	27 06 42.94	81 59 58.92
WCP-23	450242	450242 - 1	IRRIGATION	4	110	340	Steele, Darrell & Marie	RTE. 3, BOX 596	27 04 46.82	81 59 04.80
WCP-24	618025	618025 - 1	DOMESTIC	4	95	340	Futuristic Construction Inc	10230 SW CO RD769	27 04 12.61	82 01 06.73
WCP-25	626672	626672 - 1	DOMESTIC	4	110	340	Mike Marquis	7356 START CENTER RD	27 06 42.94	81 59 58.92
WCP-26	634757	634757 - 1	DOMESTIC	4	110	340	Keith Gant	10326 SW CR 769	27 04 12.61	82 01 06.73
WCP-27	677674	677674 - 1	DOMESTIC	4	96	340	Kevin Brozanski	9393 START CENTER SW	27 06 42.94	81 59 58.92
WCP-28	446370	446370 - 1	DOMESTIC	2	82	330	Mcleod, Harvey W	21508 EDGEWATER DRIVE	27 06 42.94	81 59 58.92
WCP-29	757874	Proposed WCP Well	DOMESTIC	4	106	330	Donovan Jamie & Jennifer	10580 CO RD 769 SW	27 04 04.49	82 01 05.47
WCP-30	338876	338876 - 1	PUBLIC SUPPLY	4	120	330	Steele,D S	NO ADDRESS	27 04 18.28	81 58 59.63
WCP-31	812385	Proposed WCP Well	DOMESTIC	4	104	330	MILLER GREGORY L & GINGER D	9750 JERNIGAN ST SW	27 06 26.20	82 00 09.57
WCP-32	768588	Proposed WCP Well	MONITOR	12	232	323	Southwest Florida Wmd	9225 CO RD 769 SW	27 05 07.60	82 00 56.50
WCP-33	590249	590249 - 1	DOMESTIC	4	83	320	Donald Gant	10058 S W GANT RD	27 06 43.02	82 00 57.82
WCP-34	593745	593745 - 1	DOMESTIC	4	110	320	Bobby Carlton	10442 SW COUNTY RD 769	27 03 59.61	82 01 06.61
WCP-35	597670	597670 - 1	DOMESTIC	4	110	320	Thomas & Teri Provencal	OFF PEACE RIVER ST	27 03 59.61	82 01 06.61
WCP-36	616624	616624 - 1	DOMESTIC	4	105	320	J. William Gaddy	10174 CR769 KINGS HWY	27 04 06.16	82 00 59.41
WCP-37	618464	618464 - 1	DOMESTIC	4	100	320	Jimmy Allen Hall	10096 SW COUNTY RD	27 04 25.61	82 01 06.85
WCP-38	694783	694783 - 1	DOMESTIC	4	97	318	Edward Diaz	OFF START CENTER RD	27 06 42.94	81 59 58.92
WCP-39	448104	448104 - 1	DOMESTIC	2	77	315	Aurin A Collins	PO BOX 341	27 06 11.17	81 59 38.14
WCP-40	603967	603967 - 1	DOMESTIC	4	94	310	Louis Sorrentino	10023 SW HWY 769	27 03 59.61	82 01 06.61
WCP-41	602856	602856 - 1	DOMESTIC	4	135	304	Holiday Builders	675 TAMIAMI TR	27 05 51.52	81 59 59.75
WCP-42	381957	381957 - 1	DOMESTIC	2	70	300	Walker, William Donald	RT 3, BOX 581 SOUTH ON 761	27 04 18.28	81 58 59.63
WCP-43	582325	582325 - 1	DOMESTIC	4	75	300	Phillip Hue	8827 RED HAWK ROAD	27 06 43.02	82 00 57.82
WCP-44	584078	584078 - 1	IRRIGATION	5	80	300	Tom Barnwell	OFF KINGS HWY	27 06 42.94	81 59 58.92
WCP-45	581018	581018 - 1	DOMESTIC	4	80	300	Cara Vandiver	JERIGAN ROAD	27 06 42.94	81 59 58.92
WCP-46	597839	597839 - 1	DOMESTIC	4	110	300	John Merrill	10508 PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-47	620461	620461 - 1	IRRIGATION	4	86	300	David Mizell	7107 SWCR769	27 06 42.94	81 59 58.92
WCP-48	645371	645371 - 1	DOMESTIC	4	117	300	Crew Or Barbara Blackmon	7432 SW HWY 769	27 06 42.94	81 59 58.92
WCP-49	661923	661923 - 1	DOMESTIC	3	110	300	Ken Herndon	7500 SW CO RD 769	27 06 42.94	81 59 58.92
WCP-50	711324	711324 - 1	DOMESTIC	4	90	300	Dirk Hinga	7558 Sw 769	27 06 42.94	81 59 58.92
WCP-51	723997	723997 - 1	DOMESTIC	4	100	300	Jerry Taylor	OFF RIVER ST/FT OGDEN	27 05 26.02	81 58 36.09
WCP-52	729609	729609 - 1	DOMESTIC	4	90	300	David Gutierrez	COW PASTURE - ACREAGE	27 05 06.37	81 58 57.71
WCP-53	739750	739750 - 1	IRRIGATION	4	98	300	Granny'S Produce LLC	9700 JERNIGAN STREEET	27 06 42.94	81 59 58.92
WCP-54	738858	738858 - 1	DOMESTIC	4	85	300	David & Debra Manolakos	10018 JUDY AVE, ARCADIA	27 05 06.37	81 58 57.71
WCP-55	820172	Proposed WCP Well	DOMESTIC	4	108	300	DAUGHTREY DAVID & ANN	9394 SW CO RD 769	27 05 05.69	82 00 35.55

APPENDIX E-1

SWFWMD Well Construction Permits Within 2-Mile AOR (Figure 2-11, 2-13, and 2-14)

INVENTORY FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
			PUBLIC SUPPLY - LIMITED							
WCP-56	849665	Proposed WCP Well	USE/DOH	4	114	300	NEGLEY MARK A	8476 CO RD 769 SW	27 05 54.50	81 59 55.30
WCP-57	691827	691827 - 1	LIVESTOCK	4	106	298	Southwest Fla Water Mgt District	8910 KINGS HIGHWAY ARCADIA	27 04 58.65	82 00 59.03
WCP-58	591476	591476 - 1	DOMESTIC	4	145	292	Mark Collins	10268 SW CR 769 KINGS HWY	27 03 59.61	82 01 06.61
WCP-59	520919	520919 - 1	PUBLIC SUPPLY	4	85	290	Florida Southern College	8788 CR 761	27 05 57.96	82 00 07.07
WCP-60	728687	728687 - 1	DOMESTIC	4	110	290	Steven D Gant	9900 Jernigan St. Arcadia	27 06 42.94	81 59 58.92
WCP-61	767730	Proposed WCP Well	DOMESTIC	4	101	287	Provencal Thomas & Teri L	9940 PEACE RIVER ST SW	27 03 45.20	82 00 25.00
WCP-62	405233	405233 - 1	DOMESTIC	4	110	280	Steele, Darrell & Marie	RTE. 3, BOX 596	27 06 43.02	82 00 57.82
WCP-63	598101	598101 - 1	DOMESTIC	4	110	280	Carolyn Dewitt	7339 SW START CENTOR ST	27 06 50.37	81 59 56.65
WCP-64	826228	Proposed WCP Well	DOMESTIC	4	80	280	HUTCHISON FREDERICK JAY	9982 SW LETTUCE LAKE AVE	27 04 46.62	81 58 56.27
WCP-65	851158	Proposed WCP Well	DOMESTIC	4	96	280	NEADS DANIEL E & SUSAN	8086 NANCY DR SW	27 04 42.17	81 58 33.43
WCP-66	333235	333235 - 1	DOMESTIC	6	120	279	Condon E A	NO ADDRESS	27 04 18.28	81 58 59.63
WCP-67	695559	695559 - 1	DOMESTIC	3	100	278	Donald Wheeler	9899 SW LEUSKI ST ARCADIA	27 04 59.92	81 58 50.39
WCP-68	801188	Proposed WCP Well	DOMESTIC	4	98	278	Anthony & Aida Brignoni	7713 VINEYARD TER SW	27 06 36.09	81 59 30.67
WCP-69	786771	Proposed WCP Well	DOMESTIC	4	95	268	Al Baker	10111 LEVSKY AVE SW	27 04 37.94	81 58 38.37
WCP-70	308160	308160 - 1	DOMESTIC	4	84	267	E Turner	NO ADDRESS	27 04 58.63	82 00 00.13
WCP-71	611172	611172 - 1	DOMESTIC	4	125	262	Ray Fiedler	9878 CO RD 769(KINGS HWY)PARC 32	27 04 39.20	82 00 51.59
WCP-72	468677	468677 - 1	DOMESTIC	4	100	260	Burchfield, Lawrence J.	P.O. BOX 94	27 05 06.37	81 58 57.71
WCP-73	559876	559876 - 1	DOMESTIC	4	60	260	Delmar Carter	8278 SW EASY ST.	27 04 51.49	81 58 45.37
WCP-74	614701	614701 - 1	DOMESTIC	4	74	260	James B Hobbs	9924 KINGS HIGHWAY-PARCEL 31	27 04 58.65	82 00 59.03
WCP-75	692467	692467 - 1	DOMESTIC	4	90	260	Bill Pesti	10028 PEACE RIVER ST ARCADIA`	27 04 06.16	82 00 59.41
WCP-76	778060	Proposed WCP Well	DOMESTIC	4	90	260	Robert E Aiken	8471 NANCY DR SW	27 04 40.23	81 58 55.59
WCP-77	843483	Proposed WCP Well	HVAC SUPPLY	4	92	260	River Oaks RV, Inc	9770 CO RD 769 SW	27 04 45.30	82 00 40.18
WCP-78	843484	Proposed WCP Well	HVAC RETURN (CLASS V)	4	94	260	River Oaks RV, Inc	9770 CO RD 769 SW	27 04 45.36	82 00 42.56
WCP-79	776586	Proposed WCP Well	DOMESTIC	4	90	258	Mcgonigle Thomas S	10042 VICTORY DR SW	27 03 32.98	82 00 32.76
WCP-80	782757	Proposed WCP Well	DOMESTIC	3	77	258	Keith Davis	Pastureland	27 06 02.95	81 59 28.18
WCP-81	786269	Proposed WCP Well	DOMESTIC	4	98	258	Provencal Thomas & Teri L	9990 PEACE RIVER ST SW	27 03 44.08	82 00 28.29
WCP-82	785389	Proposed WCP Well	DOMESTIC	4	91	258	Fluty Mary L	11107 BRANSON AVE SW	27 03 33.32	82 00 30.97
WCP-83	474738	474738 - 1	DOMESTIC	2	71	255	Roland A. Wolfe	STATE RD. 761 RT.3 BOX 909-Z	27 04 18.28	81 58 59.63
WCP-84	856379	Proposed WCP Well	DOMESTIC	4	82	255	HAUG GREGG	10306 PEACE RIVER ST SW	27 03 45.53	82 00 47.67
WCP-85	560259	560259 - 1	PUBLIC SUPPLY	4	65	250	Grace Presbyterian Church of Charlotte County, Inc.	10548 SW CR 769	27 04 12.71	82 00 52.21
WCP-86	586969	586969 - 1	DOMESTIC	4	60	250	Raymond Decosta	10384 S W CR769	27 03 46.72	82 00 51.98
WCP-87	844469	Proposed WCP Well	DOMESTIC	4	90	250	Robert & Gail Strickland	8234 SW River St	27 05 27.48	81 58 39.90
WCP-88	356559	356559 - 1	DOMESTIC	2	80	250	Crawford, Richard	HWY 671 LETTUCE LAKE	27 04 18.28	81 58 59.63
WCP-89	493616	493616 - 1	DOMESTIC	2	90	240	William P Anderson	BOX 763 RT 3 PALM CT	27 04 05.53	82 00 00.33
WCP-90	584074	584074 - 1	IRRIGATION	2	95	240	Rudy Rhodes	HWY 769	27 06 42.94	81 59 58.92
WCP-91	611760	611760 - 1	DOMESTIC	4	95	240	Rick Guina	10124 SW CR 769	27 04 12.50	82 01 21.25
WCP-92	681211	681211 - 1	IRRIGATION	4	80	240	Mark & Pat Schlundt	1875 CITRON ST.	27 04 18.28	81 58 59.63
WCP-93	717679	717679 - 1	DOMESTIC	4	180	240	George Stratford	9345 Start Center Arcadia	27 06 42.94	81 59 58.92
WCP-94	703392	703392 - 1	DOMESTIC	3	100	238	Max Keller	8230 S W EASY ST	27 04 52.00	81 58 40.68
WCP-95	532509	532509 - 1	DOMESTIC	2	176	236	John Ress	736 RIVERVIEW CIR	27 04 24.98	82 00 07.77
WCP-96	376291	376291 - 1	DOMESTIC	2	83	230	Floyd E Hester	PO BOX 95	27 04 58.63	82 00 00.13
WCP-97	405890	405890 - 1	DOMESTIC	2	63	230	Johnston, Reginald A	RT 3 BOX 583-K	27 04 37.73	81 59 07.07
WCP-98	570858	570858 - 1	DOMESTIC	4	125	230	James Flanigan	PEACE RIVER ST.	27 04 05.53	82 00 00.33
WCP-99	694991	694991 - 1	DOMESTIC	5	70	230	Michael Andrew Mardis	8200 BARBARA DR SW ARCADIA	27 04 59.92	81 58 50.39
WCP-100	719713	719713 - 1	DOMESTIC	4	87	230	James Broderick	10490 Co Rd 769 SW Arcadia	27 03 59.61	82 01 06.61
WCP-101	850227	Proposed WCP Well	DOMESTIC	4	87	230	BRAUCH ROGER F & MARY JO	10200 CO RD 761 SW	27 04 37.73	81 58 39.88
WCP-102	592075	592075 - 1	DOMESTIC	4	86	224	Wade Cartel	9990 S W CR 769	27 04 52.10	82 01 06.23
WCP-103	734261	734261 - 1	DOMESTIC	4	85	220	Dave Niklas	LABRADOR LANE ARCADIA	27 06 42.94	81 59 58.92
WCP-104	733648	733648 - 1	DOMESTIC	5	80	220	Darrell Mitchell	8307 SW EASY STREET	27 04 51.52	81 58 48.38
WCP-105	858805	Proposed WCP Well	DOMESTIC	4	60	220	Joseph Herring	9689 ANCHOR DR SW	27 03 49.10	82 00 10.41
WCP-106	767143	Proposed WCP Well	PUBLIC SUPPLY	4	100	217	Desoto Co Bocc	.9695 SW Peace River	27 03 37.40	82 00 19.40
WCP-107	709005	709005 - 1	DOMESTIC	4	78	210	Ron Carter	9900 Drop Tine Drive SW	27 04 11.73	81 59 06.84
WCP-108	430758	430758 - 1	DOMESTIC	2	50	207	Norman, Lyle	RT 3	27 04 05.53	82 00 00.33
WCP-109	457443	457443 - 1	DOMESTIC	4	110	205	Gregory, James F.	RT. 3 BOX 600	27 05 06.37	81 58 57.71
WCP-110	696597	696597 - 1	DOMESTIC	4	90	205	Jarrett Black	8057 NANCY LANE SW ARCADIA	27 05 06.37	81 58 57.71

APPENDIX E-1

SWFWMD Well Construction Permits Within 2-Mile AOR (Figure 2-11, 2-13, and 2-14)

INVENTORY FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-111	530005	530005 - 1	DOMESTIC	2	90	200	Carl Denison	10268 S.W. JUDY AVE	27 04 37.94	81 58 38.02
WCP-112	544407	544407 - 1	DOMESTIC	4	120	200	Scott Langfang	9182 SE JEANS ROAD	27 04 52.20	82 00 51.71
WCP-113	555699	555699 - 1	DOMESTIC	2	80	200	William Stacy Hall	LOT 8 SW NANCY LANE	27 04 37.83	81 58 52.54
WCP-114	588969	588969 - 1	DOMESTIC	4	100	200	Mary Ferron	10056 LETTUCE LAKE RD	27 04 46.02	81 58 30.80
WCP-115	589962	589962 - 1	DOMESTIC	4	72	200	Roger Lowe	10735 S W KISSIMEE	27 04 24.76	81 58 43.11
WCP-116	607043	607043 - 1	DOMESTIC	4	80	200	Lloyd G Bentley	10087 S W VICTORY DR	27 03 32.25	82 00 31.01
WCP-117	618024	618024 - 1	DOMESTIC	3	110	200	Alex Grantham	4831 SW BARBARA DR	27 05 06.37	81 58 57.71
WCP-118	613070	613070 - 1	DOMESTIC	4	70	200	Mr Callagher	10187 SW CIRCLE DR	27 04 18.28	81 58 59.63
WCP-119	657181	657181 - 1	DOMESTIC	3	109	200	James Gill	9894 SW BARNHILL DR	27 05 51.52	82 00 58.43
WCP-120	687660	687660 - 1	DOMESTIC	4	84	200	Dale & Wendy Wadsworth	19022 SW JUDY ST	27 05 00.02	81 58 35.87
WCP-121	704230	704230 - 1	DOMESTIC	4	50	200	Andy Franklin	KING HIGHWAY	27 04 12.61	82 01 06.73
WCP-122	779820	Proposed WCP Well	DOMESTIC	4	70	200	Lukach Edward W & Mary Lou	8114 BARBARA DR SW	27 04 56.05	81 58 35.11
WCP-123	628983	628983 - 1	DOMESTIC	4	65	197	George Blake	9980 SW PEACE RIVER RD	27 04 05.53	82 00 00.33
WCP-124	506108	506108 - 1	PUBLIC SUPPLY	6	90	195	River Oaks Rv Inc	9770 CR 769	27 04 43.10	82 00 44.50
WCP-125	684308	684308 - 1	DOMESTIC	4	80	195	Ray And Stacey Kanwischer	10034 RIVERVIEW CIR BLK A	27 03 45.73	82 00 14.28
WCP-126	748391	748391 - 1	DOMESTIC	4	73	195	David & Wendy Homan	8011 SUNNYOAKS DR, ARCADIA	27 04 18.28	81 58 59.63
WCP-127	560578	560578 - 1	DOMESTIC	2	96	190	James W Gregory	9966 SW LEVESKY DRIVE	27 05 06.37	81 58 57.71
WCP-128	566509	566509 - 1	DOMESTIC	2	86	190	Steele, Darrell & Marie	9827 S.W. KISSIMMEE RD.	27 05 06.37	81 58 57.71
WCP-129	408379	408379 - 1	DOMESTIC	2	79	189	Smith, Teddy & Gail	RT 3 BOX 671	27 03 20.23	82 01 07.30
WCP-130	412108	412108 - 1	DOMESTIC	2	63	189	Cummins, Jack	PO BOX 214	27 04 59.72	81 59 19.44
WCP-131	381537	381537 - 1	DOMESTIC	2	92	182	Glerum, Donald J.	123 SE PECKHAM ST	27 04 58.65	82 00 59.03
WCP-132	475166	475166 - 1	PUBLIC SUPPLY	6	90	180	River Oaks Rv Inc	9770 CR 769	27 04 44.80	82 00 44.30
WCP-133	526710	526710 - 1	DOMESTIC	2	62	180	Barbara Eckman	R. R. 3 BOX 680	27 03 20.44	82 00 38.27
WCP-134	554981	554981 - 1	DOMESTIC	2	68	180	Home Builders Construction Inc.	RT 7 BOX 73E	27 04 37.83	81 58 52.54
WCP-135	640147	640147 - 1	DOMESTIC	4	78	180	Helmut Ehrhard	8327 SW GULF ST	27 04 35.92	81 58 45.40
WCP-136	671252	671252 - 1	DOMESTIC	3	98	180	Russell W Muse Jr	10248 SW JUDY AVENUE	27 04 35.36	81 58 33.18
WCP-137	739325	739325 - 1	DOMESTIC	4	81	180	Corry Walters	8176 MERRY DRIVE, ARCADIA	27 05 26.02	81 58 36.09
WCP-138	743594	743594 - 1	DOMESTIC	3	98	180	Brad Hatch	8087 S W BARBARA LANE	27 04 47.02	81 58 35.76
WCP-139	743389	743389 - 1	DOMESTIC	4	70	180	Greg Hatcher	9967 LEVSKY, ARCADIA	27 05 12.92	81 58 50.50
WCP-140	758572	Proposed WCP Well	DOMESTIC	4	100	180	Mccormack Thomas	11148 WELCH AVE SW	27 03 32.00	82 00 57.10
WCP-141	587049	587049 - 1	DOMESTIC	4	95	175	Roy Tarman	11255 SW CRENSHAW	27 03 20.33	82 00 52.79
WCP-142	850739	Proposed WCP Well	DOMESTIC	4	68	175	REED BRYAN H	8431 NANCY DR SW	27 04 39.95	81 58 53.03
WCP-143	577979	577979 - 1	DOMESTIC	4	85	170	Rick Taggart	10433 JERNIGAN RD.	27 06 42.94	81 59 58.92
WCP-144	384013	384013 - 1	DOMESTIC	2	65	168	Bryant, O.	HWY 761 SW	27 05 06.37	81 58 57.71
WCP-145	672446	672446 - 1	DOMESTIC	3	103	168	Harley E Simmons	11269 SW CRENSHAW AVE	27 03 33.33	82 00 52.90
WCP-146	357908	357908 - 1	DOMESTIC	2	70	168	Crawford, Mrs E.	RT 3,-LETTUCE LAKE RD	27 04 18.28	81 58 59.63
WCP-147	496200	496200 - 1	DOMESTIC	2	79	165	Centers, Millard	RT 3 PO 583N	27 04 18.28	81 58 59.63
WCP-148	754404	Proposed WCP Well	DOMESTIC	4	82	165	Ken Mobley	8269 CO RD 769 SW	27 06 04.61	82 00 00.91
WCP-149	411692	411692 - 1	DOMESTIC	2	73	160	Hawkes, Bonnie	LOT 10 OLIVE LOOP ROAD	27 03 21.13	82 01 37.41
WCP-150	475165	475165 - 1	PUBLIC SUPPLY	6	60	160	River Oaks Rv Inc	9770 CR 769	27 04 45.40	82 00 41.80
WCP-151	496696	496696 - 1	DOMESTIC	2	78	160	Deriso, Joel	RT 3 BOX 945	27 04 18.28	81 58 59.63
WCP-152	516355	516355 - 1	DOMESTIC	2	60	160	Edward Buchy	8174 NANCY LANE	27 04 37.94	81 58 38.02
WCP-153	533436	533436 - 1	DOMESTIC	2	77	160	Russell Stoke	ROUTE 596-B OAK HAVEN	27 04 37.94	81 58 38.02
WCP-154	602409	602409 - 1	DOMESTIC	2	66	160	Lisa A Moran	11173 SW BRANSON AVE	27 03 29.56	82 00 30.74
WCP-155	664671	664671 - 1	DOMESTIC	3	98	160	Roy Tarman	11255 SW CRENSHAW BLK C	27 03 20.33	82 00 52.79
WCP-156	700687	700687 - 1	DOMESTIC	4	80	160	M A Pittard	8360 SW Merry Drive	27 04 48.03	81 58 43.57
WCP-157	711927	711927 - 1	DOMESTIC	4	105	160	Bonnie Chandler	11355 Crenshaw ave	27 03 20.33	82 00 52.79
WCP-158	701107	701107 - 1	DOMESTIC	4	50	160	Dmi Inc	10863 SW Kissimmee rd	27 04 27.45	81 58 43.10
WCP-159	354726	354726 - 1	DOMESTIC	2	70	160	Waldron, Ron	PO BOX 855	27 05 12.92	81 58 50.50
WCP-160	503279	503279 - 1	DOMESTIC	2	58	158	Gulf Coast Farms	OFF 761	27 06 43.02	82 00 57.82
WCP-161	542943	542943 - 1	DOMESTIC	2	120	155	Ronnie Shizarig	10288 CITY ROAD	27 04 37.83	81 58 52.54
WCP-162	760898	Proposed WCP Well	DOMESTIC	4	88	155	Rutherford Thomas R Ii	7501 LABADOR DR SW	27 06 44.64	81 59 53.42
WCP-163	392506	LOUIS CORBETT (HRS) INT	DOMESTIC	2	63	150	Louis Corbett	RT 3 BOX 708	27 03 46.20	82 00 12.29
WCP-164	675437	675437 - 1	DOMESTIC	4	75	150	Phillip D Rizzo	9779 KISSIMMEE RD	27 05 06.37	81 58 57.71
WCP-165	701574	701574 - 1	IRRIGATION	4	80	150	Richard Meese	9674 SW ANCHOR DR	27 03 49.52	82 00 10.18
WCP-166	731612	731612 - 1	DOMESTIC	3	95	150	Paul Tincher	11105 WELCH AVENUE	27 03 36.10	82 00 58.06

APPENDIX E-1

SWFWMD Well Construction Permits Within 2-Mile AOR (Figure 2-11, 2-13, and 2-14)

INVENTORY FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-167	383320	383320 - 1	DOMESTIC	2	70	147	Hudson, Elven M.	RT 3, BOX 604 PEACE RIVER ACRE	27 05 06.37	81 58 57.71
WCP-168	348790	348790 - 1	DOMESTIC	2	72	147	Edward Leer	RT 5, BOX 437-A	27 04 18.28	81 58 59.63
WCP-169	357215	357215 - 1	DOMESTIC	2	52	147	Foulk, Dolley	RT 3, BOX 709	27 03 45.88	82 00 21.94
WCP-170	353617	353617 - 1	DOMESTIC	2	84	147	Desneaux, Joseph E.	412 CRESTWOOD DR	27 03 33.12	82 01 21.94
WCP-171	486273	486273 - 1	DOMESTIC	2	80	141	Ted Swiatek	DESOTO CT.	27 04 05.53	82 00 00.33
WCP-172	473879	473879 - 1	DOMESTIC	2	69	140	Keller, Leonard	RT. 3, BOX 600H	27 06 42.94	81 59 58.92
WCP-173	489172	489172 - 1	DOMESTIC	2	69	140	Roy Dodd	JUDY LN	27 04 18.28	81 58 59.63
WCP-174	493744	493744 - 1	DOMESTIC	2	61	140	Darrell Steele	9983 SW LETTUCE LAKE RD	27 04 18.28	81 58 59.63
WCP-175	599984	599984 - 1	DOMESTIC	4	65	140	Meagan & Sokratis Simes	11107 SW BRANSON AVE	27 03 31.36	82 00 30.72
WCP-176	665720	665720 - 1	DOMESTIC	4	77	140	Gail Dunham	10405 SW RIVERVIEW CIR BLK E	27 03 45.98	82 00 07.42
WCP-177	709763	709763 - 1	DOMESTIC	4	70	140	Steve Cantz	10058 SW VICTORY DR	27 03 32.25	82 00 30.94
WCP-178	710798	710798 - 1	DOMESTIC	4	55	140	David Klassen	9651 S W MARINA DRIVE	27 03 45.96	82 00 08.95
WCP-179	699141	699141 - 1	DOMESTIC	4	70	140	Quality Homes Of Port Charlotte Inc	9761 Riverview Circle	27 03 55.31	82 00 14.27
WCP-180	344306	ALLEN LESLIE (HRS) INT	DOMESTIC	2	63	136	C Leslie	NO ADDRESS	27 05 06.37	81 58 57.71
WCP-181	697809	697809 - 1	DOMESTIC	4	70	135	Gail Dunham	10405 SW Riverview Circle	27 03 41.30	82 00 14.29
WCP-182	366730	366730 - 1	DOMESTIC	2	42	130	Winstanley, Herbert	RT 3, BOX 717	27 04 05.53	82 00 00.33
WCP-183	430757	430757 - 1	DOMESTIC	2	50	130	Bachman, Kenneth E	RT 3 BOX 766	27 04 05.53	82 00 00.33
WCP-184	599985	599985 - 1	DOMESTIC	2	110	130	Mrs Williams	12125 SW LEVESKY	27 04 59.92	81 58 50.39
WCP-185	670468	670468 - 1	DOMESTIC	4	92	130	Robert & Mary Rosasco	10376 SW PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-186	355210	355210 - 1	DOMESTIC	2	67	130	Frederici, David F.	RT 3, BOX 903-F	27 05 51.52	82 00 58.43
WCP-187	350849	350849 - 1	DOMESTIC	2	71	128	Keith Traylor	Off North 761 off Fort Ogden Hwy. 17	27 03 33.91	82 02 06.56
WCP-188	473755	473755 - 1	DOMESTIC	2	80	126	Henry Stevens	RT.3 BOX 1294	27 05 51.89	81 59 00.65
WCP-189	551203	551203 - 1	DOMESTIC	4	75	120	J Anderson Inc	1381 MARKET CIRCLE	27 04 46.92	81 58 50.28
WCP-190	586470	586470 - 1	DOMESTIC	2	58	120	David Briley	10082 S W VICTORY DR	27 03 32.25	82 00 30.99
WCP-191	591694	591694 - 1	DOMESTIC	4	75	120	J Anderson Inc	10250 SW PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-192	588990	588990 - 1	LIVESTOCK	2	80	120	Roger Lowe	10735 S W KISSIMEE ST	27 04 24.76	81 58 43.11
WCP-193	514096	514096 - 1	DOMESTIC	2	75	114	Melvin Lee	8354 S.W. KISSIMMEE	27 04 24.63	81 59 21.47
WCP-194	587044	587044 - 1	DOMESTIC	4	60	110	Robert Law	10265 RIVERVIEW CIR SW	27 03 42.98	82 00 14.29
WCP-195	720675	720675 - 1	DOMESTIC	4	75	107	Peter Van Houten	10149 PEACE RIVER S ARCADIA	27 03 33.44	82 00 38.38
WCP-196	720676	720676 - 1	DOMESTIC	4	75	107	Rudy Yoder	10159 PEACE RIVER S ARCADIA	27 03 33.44	82 00 38.38
WCP-197	527148	527148 - 1	DOMESTIC	2	80	100	Bill Brilley	10115 PEACE RIVER	27 03 33.44	82 00 38.38
WCP-198	731157	731157 - 1	DOMESTIC	4	83	100	Robert Shaver	9946 Riverview Arcadia	27 03 46.19	81 59 38.38
WCP-199	362489	362489 - 1	DOMESTIC	2	51	100	Frank Hendrickson	.	27 05 06.37	81 58 57.71
WCP-200	624769	624769 - 1	DOMESTIC	4	84	96	Carl Stevens	9895 S W BURNHILL RD	27 05 57.86	82 00 21.60
WCP-201	753018	753018 - 1	DOMESTIC	2	60	95	Ken Mobley	8269 CR 769, ARCADIA	27 05 51.52	81 59 59.75
WCP-202	750866	750866 - 1	DOMESTIC	4	38	91	Walter Widenhofer	10235 RIVERVIEW CIR, ARCADIA	27 03 43.34	82 00 14.29
WCP-203	750179	750179 - 1	DOMESTIC	4	40	91	Walter Widenhofer	9997 RIVERVIEW CIR SW, ARCADIA	27 03 46.13	82 00 14.28
WCP-204	675977	675977 - 1	DOMESTIC	4	60	90	Steve Kindle	11042 SW WELCH BLK 1	27 03 33.23	82 01 07.42
WCP-205	730524	730524 - 1	DOMESTIC	4	57	90	Zaltan Sabo	9689 SW ANCHOR DR ARCADIA	27 03 49.52	82 00 10.21
WCP-206	746320	746320 - 1	DOMESTIC	4	43	61	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 45.98	82 00 07.42
WCP-207	746317	746317 - 1	DOMESTIC	4	42	60	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 39.30	82 00 14.59
WCP-208	746318	746318 - 1	DOMESTIC	4	45	59	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 45.98	82 00 07.42
WCP-209	523845	523845 - 2	MONITOR	2	12	25	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-210	525839	525839 - 4	MONITOR	2	15	25	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-211	525839	525839 - 5	MONITOR	2	15	25	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-212	745814	745814 - 2	MONITOR	2	5	25	Raymond J Smith	7173 SW CR 769, ARCADIA	27 06 42.94	81 59 58.92
WCP-213	745814	745814 - 1	MONITOR	2	5	25	Raymond J Smith	7173 SW CR 769, ARCADIA	27 06 42.94	81 59 58.92
WCP-214	528460	528460 - 2	MONITOR	2	8	15	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-215	528460	528460 - 4	MONITOR	2	8	15	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-216	528460	528460 - 1	MONITOR	2	8	15	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-217	528460	528460 - 3	MONITOR	2	8	15	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-218	528460	528460 - 5	MONITOR	2	8	15	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-219	776457	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 05 44.45	82 02 15.59
WCP-220	776457	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 05 44.45	82 02 15.59
WCP-221	776461	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 05 10.55	82 01 41.70
WCP-222	776461	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 05 10.55	82 01 41.70

APPENDIX E-1

SWFWMD Well Construction Permits Within 2-Mile AOR (Figure 2-11, 2-13, and 2-14)

INVENTORY FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-223	776464	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 06 22.68	82 01 48.37
WCP-224	776464	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 06 22.68	82 01 48.37
WCP-225	776464	Proposed WCP Well	MONITOR	2	15	15	Southwest Florida Water	.	27 06 22.68	82 01 48.37
WCP-226	497590	497590 - 1	MONITOR	2	14	14	Lee Stevenson	4 W OAK ST	27 04 05.53	82 00 00.33
WCP-227	497591	497591 - 1	MONITOR	2	14	14	Lee Stevenson	4 W OAK ST	27 04 05.53	82 00 00.33
WCP-228	497592	497592 - 1	MONITOR	2	14	14	Lee Stevenson	4 W OAK ST	27 04 05.53	82 00 00.33
WCP-229	497589	497589 - 1	MONITOR	2	8	13	Lee Stevenson	4 W OAK ST	27 04 05.53	82 00 00.33
WCP-230	523845	523845 - 1	MONITOR	2	5	10	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-231	525839	525839 - 1	MONITOR	2	5	10	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-232	525839	525839 - 2	MONITOR	2	5	10	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-233	525839	525839 - 3	MONITOR	2	5	10	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 39.54	82 01 36.43
WCP-234	388335	388335 - 1	PUBLIC SUPPLY	2	0	0	Wilcoxn, E	RT 3 BOX 629	27 05 06.37	81 58 57.71
WCP-235	415471	415471 - 1	DOMESTIC	2	0	0	Bachman, Kenneth E	RT 3 BOX 766	27 04 05.53	82 00 00.33
WCP-236	415472	415472 - 1	DOMESTIC	2	0	0	Norman, Lyle	RT 3	27 04 05.53	82 00 00.33
WCP-237	444871	444871 - 1	DOMESTIC	2	0	0	Mccloud, Harvey	JERNIGAN ROAD	27 06 42.94	81 59 58.92
WCP-238	523845	523845 - 3	MONITOR	2	0	0	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 58.88	82 01 58.39
WCP-239	523845	523845 - 4	MONITOR	2	0	0	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 58.88	82 01 58.39
WCP-240	523845	523845 - 5	MONITOR	2	0	0	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 58.88	82 01 58.39
WCP-241	528460	528460 - 6	MONITOR	2	0	0	Atlantic Gulf Communities	HYW 769 & 761 KINGS HYW	27 04 58.88	82 01 58.39
WCP-242	576672	576672 - 1	IRRIGATION	4	0	0	French Connection C/O Wayne Kiem	JERNIGAN & KINGS HWY	27 06 42.94	81 59 58.92
WCP-243	636453	636453 - 1	DOMESTIC	4	0	0	Crew Or Barbara Blackmon	7432 KINGS HWY (SW HWY 769)	27 06 42.94	81 59 58.92
WCP-244	631240	631240 - 1	IRRIGATION	4	0	0	Wade Cartee	9990 KINGS HIGHWAY	27 04 06.16	82 00 59.41
WCP-245	651342	651342 - 1	IRRIGATION	2	0	0	Marvin Franklin	OFF KINGS HWY	27 04 06.16	82 00 59.41
WCP-246	675849	675849 - 1	DOMESTIC	4	0	0	Phillip D Rizzo	9779 KISSIMMEE RD SW	27 04 59.72	81 59 19.44
WCP-247	737910	737910 - 1	DOMESTIC	4	0	0	Edward Diaz	7500 LABRADOR LANE, ARCADIA	27 06 42.94	81 59 58.92
WCP-248	768059	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	.	27 04 53.32	82 01 58.93
WCP-249	768059	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	.	27 04 53.32	82 01 58.93
WCP-250	768059	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	.	27 04 53.32	82 01 58.93
WCP-251	768064	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	9225 CO RD 769 SW	27 05 23.47	82 00 35.76
WCP-252	768064	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	9225 CO RD 769 SW	27 05 23.47	82 00 35.76
WCP-253	768064	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	9225 CO RD 769 SW	27 05 23.47	82 00 35.76
WCP-254	768064	Proposed WCP Well	MONITOR	2	0	0	Southwest Florida Water	9225 CO RD 769 SW	27 05 23.47	82 00 35.76
WCP-255	768073	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 Co. Rd 769	27 06 01.19	82 02 00.44
WCP-256	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-257	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-258	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-259	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-260	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-261	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-262	768081	Proposed WCP Well	MONITOR	2	0	0	Swfwmd	9225 S.W. Co. Rd.769	27 06 08.32	82 00 57.71
WCP-263	340449	340449 - 1	DOMESTIC	2	0	0	Laupen,R	NO ADDRESS	27 05 06.37	81 58 57.71
WCP-264	853626	Proposed WCP Well	IRRIGATION	4	0	0	JOHNSON THOMAS C & ROBERTS CAROL ANN TIC	10124 RIVERVIEW CIR SW	27 03 59.92	82 00 14.75
WCP-265	361324	361324 - 1	DOMESTIC	2	0	0	Williams, Albert L.	RT # BOX PICE RIVER HEIGHTS	27 04 05.53	82 00 00.33

APPENDIX E-2

SWFWMD Water Use Permits Within 2-Mile AOR (Figure 2-12, 2-13, and 2-15)

INVENTORY FIGURE ID	SITE ID	WUP PERMIT NUMBER	OWNER NAME	TYPE	WELL TYPE	WATER USE	AVG ANNUAL GPD	PEAK MONTH GPD	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	LATITUDE	LONGITUDE
WUP-1	639249	11788	C-Hack LLC	Existing	Withdrawal of Groundwater	IRRIGATION	25700	255000	10	0	1000	27 04 02.37	82 02 11.30
WUP-2	639250	11788	C-Hack LLC	Existing	Withdrawal of Groundwater	IRRIGATION	25700	255000	6	0	940	27 03 53.96	82 01 51.12
WUP-3	639245	11788	C-Hack LLC	Existing	Withdrawal of Groundwater	IRRIGATION	1000	2000	6	0	835	27 04 15.45	82 01 36.25
WUP-4	639247	11788	C-Hack LLC	Existing	Withdrawal of Groundwater	IRRIGATION	1000	2000	6	0	835	27 04 44.38	82 01 12.87
WUP-5	639246	11788	C-Hack LLC	Existing	Withdrawal of Groundwater	IRRIGATION	1000	2000	2	0	835	27 04 41.41	82 01 09.21
WUP-6	613443	2899	Kings Ranch Iii LLC	Existing	Withdrawal of Groundwater	IRRIGATION	21100	145000	6	0	800	27 06 13.59	82 00 05.19
WUP-7	630388	9478	Michael Boran	Proposed	Withdrawal of Groundwater	IRRIGATION	222300	644000	12	500	800	27 06 46.08	82 01 04.99
WUP-8	635388	11288	Southwest Fla Water Mgt District	Existing	Withdrawal of Groundwater	LIVESTOCK	1350	1625	10	84	716	27 04 53.07	82 01 50.36
WUP-9	635385	11288	Southwest Fla Water Mgt District	Existing	Withdrawal of Groundwater	LIVESTOCK	1350	1625	10	63	627	27 04 07.82	82 02 33.98
WUP-10	609544	1376	Rw And Marie Patterson	Existing	Withdrawal of Groundwater	IRRIGATION	17600	120800	6	0	600	27 06 07.55	82 00 43.37
WUP-11	250721	6564	Kings Highway Grove, LLC Attn: Callon Keen Jr.	Existing	Withdrawal of Groundwater	IRRIGATION	26300	123800	6	0	600	27 05 53.13	82 00 05.31
WUP-12	613444	2899	Kings Ranch Iii LLC	Existing	Withdrawal of Groundwater	IRRIGATION	20200	138900	6	80	599	27 06 11.74	82 00 17.45
WUP-13	92006	2075	Eagleton Groves, Inc. / Attn: Sue Ann & Glenn Eagleton	Capped	Withdrawal of Groundwater	UNKNOWN (CAPPED)	0	0	6	0	515	27 05 32.92	81 58 25.26
WUP-14	631656	9962	Kevin P & Catherine Sugrue	Existing	Withdrawal of Groundwater	IRRIGATION	12600	108100	6	100	500	27 06 20.23	81 59 52.68
WUP-15	640223	12116	Cary M & Kaye E Mercer	Existing	Withdrawal of Groundwater	IRRIGATION	47500	326100	8	104	476	27 07 00.52	81 59 51.84
WUP-16	610979	2076	DeSoto King 61, LLC/Attn: Craig Schembri	Existing	Withdrawal of Groundwater	IRRIGATION	30400	66200	6	0	455	27 06 30.90	81 59 54.20
WUP-17	860075	10673	Spanish Trail Land & Cattle Co., LLC / Attn: Greg A. Betterton	Existing	Withdrawal of Groundwater	IRRIGATION	2200	10600	4	140	335	27 07 01.97	82 00 17.76
WUP-18	643093	2076	DeSoto King 61, LLC/Attn: Craig Schembri	Existing	Withdrawal of Groundwater	IRRIGATION	12400	21600	5	80	300	27 06 41.51	81 59 37.59
WUP-19	242601	9429	River Oaks Rv Inc	Existing	Withdrawal of Groundwater	IRRIGATION	15800	63800	6	90	195	27 04 43.10	82 00 44.50
WUP-20	211662	9429	River Oaks Rv Inc	Capped	Withdrawal of Groundwater	PUBLIC SUPPLY (CAPPED)	0	0	6	90	180	27 04 44.80	82 00 44.30
WUP-21	211661	9429	River Oaks Rv Inc	Existing	Withdrawal of Groundwater	IRRIGATION	15800	63900	6	60	160	27 04 45.40	82 00 41.80
WUP-22	609576	1399	E. Donald and Dona R. Gant	Existing	Withdrawal of Groundwater	IRRIGATION	17600	120800	6	0	0	27 06 18.22	82 00 36.02
WUP-23	608548	899	Samuel Jones Godfrey, III	Existing	Withdrawal of Groundwater	IRRIGATION	17600	120800	6	0	0	27 06 50.99	81 59 36.24
WUP-24	635384	11288	Southwest Fla Water Mgt District	Existing	Withdrawal of Groundwater	LIVESTOCK	1350	1625	10	0	0	27 05 08.92	82 02 36.71

APPENDIX E-3

FGS Wells Within 2-Mile AOR

INVENTORY ID	WELL NUMBER	WELL NAME	WELL USE	WELL DEPTH (FT.)	OWNER NAME	LATITUDE	LONGITUDE	YEAR DRILLED
FGS-1	10650	D. Daughtry	Unknown	834	David Daughtry	27 04 10.13	82 02 33.33	1970
FGS-2	12244	Desoto #5	Stratigraphic Test	80	FGS	27 06 45.54	81 59 53.02	1974

APPENDIX E-4

FDOH Wells Within 2-Mile AOR Domestic and Public Supply (Figure 2-13)

INVENTORY FIGURE ID	FLUWID	PERMIT NUMBER	WELL NAME	WELL USE	MAILING ADDRESS	LATITUDE	LONGITUDE
FDOH-1	AAC7143	6144845	S. 761 GROCERY	Non-Community PWS	-	27 04 47.64	81 58 52.68
FDOH-2	AAC7266	6141066	LETTUCE LAKE CAMPGROUND	Non-Community PWS	-	27 04 33.60	81 59 09.60
FDOH-3	AAC7282	6144832	PEACE RIVER OUTWARD BOUND	Non-Community PWS	8806 SW STSRT CENTER ST	27 06 43.66	81 59 19.19
FDOH-4	AAC7284	6142032	OAK HAVEN CAMPGROUND	Non-Transient Non-Community PWS	10307 SW LETTUCE LAKE AVE	27 04 28.31	81 59 53.34
FDOH-5	AAC7285	6141066	LETTUCE LAKE TRAVEL RESORT	Non-Transient Non-Community PWS	REESE ST	27 04 34.30	81 59 08.51
FDOH-6	140000601	0	-	Limited Use PWS	PO BOX 97	27 04 32.51	81 59 17.42

APPENDIX E-5

SWFWMD Well Construction Permits Within 2-Mile AOR Domestic and Public Supply (Figure 2-13)

FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-2	305595	305595 - 1	DOMESTIC	8	63	834	Doughtry, David D	RT 1 BOX 267	27 04 59.23	82 02 57.67
WCP-16	497685	497685 - 1	PUBLIC SUPPLY	4	70	400	Kavanaugh, Clinch	P O BOX 35193	27 04 18.28	81 58 59.63
WCP-18	622433	622433 - 1	DOMESTIC	4	75	380	French Connection C/O Wayne Kiem	JERNICAN RD	27 06 42.94	81 59 58.92
WCP-19	473864	473864 - 1	PUBLIC SUPPLY	2	100	360	Elizabeth Wilcoxen	RT 3 BOX 629	27 05 06.37	81 58 57.71
WCP-21	316890	316890 - 1	DOMESTIC	4	66	360	L Hones	NO ADDRESS	27 06 42.94	81 59 58.92
WCP-22	339625	339625 - 1	DOMESTIC	4	105	358	Christ,D R	NO ADDRESS	27 06 42.94	81 59 58.92
WCP-24	618025	618025 - 1	DOMESTIC	4	95	340	Futuristic Construction Inc	10230 SW CO RD769	27 04 12.61	82 01 06.73
WCP-25	626672	626672 - 1	DOMESTIC	4	110	340	Mike Marquis	7356 START CENTER RD	27 06 42.94	81 59 58.92
WCP-26	634757	634757 - 1	DOMESTIC	4	110	340	Keith Gant	10326 SW CR 769	27 04 12.61	82 01 06.73
WCP-27	677674	677674 - 1	DOMESTIC	4	96	340	Kevin Brozanski	9393 START CENTER SW	27 06 42.94	81 59 58.92
WCP-28	446370	446370 - 1	DOMESTIC	2	82	330	Mcleod, Harvey W	21508 EDGEWATER DRIVE	27 06 42.94	81 59 58.92
WCP-29	757874	Proposed WCP Well	DOMESTIC	4	106	330	Donovan Jamie & Jennifer	10580 CO RD 769 SW	27 04 04.49	82 01 05.47
WCP-30	338876	338876 - 1	PUBLIC SUPPLY	4	120	330	Steele,D S	NO ADDRESS	27 04 18.28	81 58 59.63
WCP-31	812385	Proposed WCP Well	DOMESTIC	4	104	330	MILLER GREGORY L & GINGER D	9750 JERNIGAN ST SW	27 06 26.20	82 00 09.57
WCP-33	590249	590249 - 1	DOMESTIC	4	83	320	Donald Gant	10058 S W GANT RD	27 06 43.02	82 00 57.82
WCP-34	593745	593745 - 1	DOMESTIC	4	110	320	Bobby Carlton	10442 SW COUNTY RD 769	27 03 59.61	82 01 06.61
WCP-35	597670	597670 - 1	DOMESTIC	4	110	320	Thomas & Teri Provencal	OFF PEACE RIVER ST	27 03 59.61	82 01 06.61
WCP-36	616624	616624 - 1	DOMESTIC	4	105	320	J. William Gaddy	10174 CR769 KINGS HWY	27 04 06.16	82 00 59.41
WCP-37	618464	618464 - 1	DOMESTIC	4	100	320	Jimmy Allen Hall	10096 SW COUNTY RD	27 04 25.61	82 01 06.85
WCP-38	694783	694783 - 1	DOMESTIC	4	97	318	Edward Diaz	OFF START CENTER RD	27 06 42.94	81 59 58.92
WCP-39	448104	448104 - 1	DOMESTIC	2	77	315	Aurin A Collins	PO BOX 341	27 06 11.17	81 59 38.14
WCP-40	603967	603967 - 1	DOMESTIC	4	94	310	Louis Sorrentino	10023 SW HWY 769	27 03 59.61	82 01 06.61
WCP-41	602856	602856 - 1	DOMESTIC	4	135	304	Holiday Builders	675 TAMIAMI TR	27 05 51.52	81 59 59.75
WCP-42	381957	381957 - 1	DOMESTIC	2	70	300	Walker, William Donald	RT 3, BOX 581 SOUTH ON 761	27 04 18.28	81 58 59.63
WCP-43	582325	582325 - 1	DOMESTIC	4	75	300	Phillip Hue	8827 RED HAWK ROAD	27 06 43.02	82 00 57.82
WCP-45	581018	581018 - 1	DOMESTIC	4	80	300	Cara Vandiver	JERIGAN ROAD	27 06 42.94	81 59 58.92
WCP-46	597839	597839 - 1	DOMESTIC	4	110	300	John Merrill	10508 PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-48	645371	645371 - 1	DOMESTIC	4	117	300	Crew Or Barbara Blackmon	7432 SW HWY 769	27 06 42.94	81 59 58.92
WCP-49	661923	661923 - 1	DOMESTIC	3	110	300	Ken Herndon	7500 SW CO RD 769	27 06 42.94	81 59 58.92
WCP-50	711324	711324 - 1	DOMESTIC	4	90	300	Dirk Hinga	7558 Sw 769	27 06 42.94	81 59 58.92
WCP-51	723997	723997 - 1	DOMESTIC	4	100	300	Jerry Taylor	OFF RIVER ST/FT OGDEN	27 05 26.02	81 58 36.09
WCP-52	729609	729609 - 1	DOMESTIC	4	90	300	David Gutierrez	COW PASTURE - ACREAGE	27 05 06.37	81 58 57.71
WCP-54	738858	738858 - 1	DOMESTIC	4	85	300	David & Debra Manolakos	10018 JUDY AVE, ARCADIA	27 05 06.37	81 58 57.71
WCP-55	820172	Proposed WCP Well	DOMESTIC	4	108	300	DAUGHTREY DAVID & ANN	9394 SW CO RD 769	27 05 05.69	82 00 35.55
WCP-56	849665	Proposed WCP Well	PUBLIC SUPPLY - LIMITED USE/DOH	4	114	300	NEGLEY MARK A	8476 CO RD 769 SW	27 05 54.50	81 59 55.30
WCP-58	591476	591476 - 1	DOMESTIC	4	145	292	Mark Collins	10268 SW CR 769 KINGS HWY	27 03 59.61	82 01 06.61
WCP-59	520919	520919 - 1	PUBLIC SUPPLY	4	85	290	Florida Southern College	8788 CR 761	27 05 57.96	82 00 07.07
WCP-60	728687	728687 - 1	DOMESTIC	4	110	290	Steven D Gant	9900 Jernigan St. Arcadia	27 06 42.94	81 59 58.92
WCP-61	767730	Proposed WCP Well	DOMESTIC	4	101	287	Provencal Thomas & Teri L	9940 PEACE RIVER ST SW	27 03 45.20	82 00 25.00
WCP-62	405233	405233 - 1	DOMESTIC	4	110	280	Steele, Darrell & Marie	RTE. 3, BOX 596	27 06 43.02	82 00 57.82
WCP-63	598101	598101 - 1	DOMESTIC	4	110	280	Carolyn Dewitt	7339 SW START CENTOR ST	27 06 50.37	81 59 56.65
WCP-64	826228	Proposed WCP Well	DOMESTIC	4	80	280	HUTCHISON FREDERICK JAY	9982 SW LETTUCE LAKE AVE	27 04 46.62	81 58 56.27
WCP-65	851158	Proposed WCP Well	DOMESTIC	4	96	280	NEADS DANIEL E & SUSAN	8086 NANCY DR SW	27 04 42.17	81 58 33.43
WCP-66	333235	333235 - 1	DOMESTIC	6	120	279	Condon E A	NO ADDRESS	27 04 18.28	81 58 59.63
WCP-67	695559	695559 - 1	DOMESTIC	3	100	278	Donald Wheeler	9899 SW LEUSKI ST ARCADIA	27 04 59.92	81 58 50.39
WCP-68	801188	Proposed WCP Well	DOMESTIC	4	98	278	Anthony & Aida Brignoni	7713 VINEYARD TER SW	27 06 36.09	81 59 30.67
WCP-69	786771	Proposed WCP Well	DOMESTIC	4	95	268	Al Baker	10111 LEVSKY AVE SW	27 04 37.94	81 58 38.37
WCP-70	308160	308160 - 1	DOMESTIC	4	84	267	E Turner	NO ADDRESS	27 04 58.63	82 00 00.13
WCP-71	611172	611172 - 1	DOMESTIC	4	125	262	Ray Fiedler	9878 CO RD 769(KINGS HWY)PARC 32	27 04 39.20	82 00 51.59
WCP-72	468677	468677 - 1	DOMESTIC	4	100	260	Burchfield, Lawrence J.	P.O. BOX 94	27 05 06.37	81 58 57.71
WCP-73	559876	559876 - 1	DOMESTIC	4	60	260	Delmar Carter	8278 SW EASY ST.	27 04 51.49	81 58 45.37
WCP-74	614701	614701 - 1	DOMESTIC	4	74	260	James B Hobbs	9924 KINGS HIGHWAY-PARCEL 31	27 04 58.65	82 00 59.03
WCP-75	692467	692467 - 1	DOMESTIC	4	90	260	Bill Pesti	10028 PEACE RIVER ST ARCADIA`	27 04 06.16	82 00 59.41
WCP-76	778060	Proposed WCP Well	DOMESTIC	4	90	260	Robert E Aiken	8471 NANCY DR SW	27 04 40.23	81 58 55.59
WCP-79	776586	Proposed WCP Well	DOMESTIC	4	90	258	Mcgonigle Thomas S	10042 VICTORY DR SW	27 03 32.98	82 00 32.76
WCP-80	782757	Proposed WCP Well	DOMESTIC	3	77	258	Keith Davis	Pastureland	27 06 02.95	81 59 28.18
WCP-81	786269	Proposed WCP Well	DOMESTIC	4	98	258	Provencal Thomas & Teri L	9990 PEACE RIVER ST SW	27 03 44.08	82 00 28.29
WCP-82	785389	Proposed WCP Well	DOMESTIC	4	91	258	Fluty Mary L	11107 BRANSON AVE SW	27 03 33.32	82 00 30.97
WCP-83	474738	474738 - 1	DOMESTIC	2	71	255	Roland A. Wolfe	STATE RD. 761 RT.3 BOX 909-Z	27 04 18.28	81 58 59.63
WCP-84	856379	Proposed WCP Well	DOMESTIC	4	82	255	HAUG GREGG	10306 PEACE RIVER ST SW	27 03 45.53	82 00 47.67
WCP-85	560259	560259 - 1	PUBLIC SUPPLY	4	65	250	Grace Presbyterian Church of Charlotte County, Inc.	10548 SW CR 769	27 04 12.71	82 00 52.21

APPENDIX E-5

SWFWMD Well Construction Permits Within 2-Mile AOR Domestic and Public Supply (Figure 2-13)

FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-86	586969	586969 - 1	DOMESTIC	4	60	250	Raymond Decosta	10384 S W CR769	27 03 46.72	82 00 51.98
WCP-87	844469	Proposed WCP Well	DOMESTIC	4	90	250	Robert & Gail Strickland	8234 SW River St	27 05 27.48	81 58 39.90
WCP-88	356559	356559 - 1	DOMESTIC	2	80	250	Crawford, Richard	HWY 671 LETTUCE LAKE	27 04 18.28	81 58 59.63
WCP-89	493616	493616 - 1	DOMESTIC	2	90	240	William P Anderson	BOX 763 RT 3 PALM CT	27 04 05.53	82 00 00.33
WCP-91	611760	611760 - 1	DOMESTIC	4	95	240	Rick Guina	10124 SW CR 769	27 04 12.50	82 01 21.25
WCP-93	717679	717679 - 1	DOMESTIC	4	180	240	George Stratford	9345 Start Center Arcadia	27 06 42.94	81 59 58.92
WCP-94	703392	703392 - 1	DOMESTIC	3	100	238	Max Keller	8230 S W EASY ST	27 04 52.00	81 58 40.68
WCP-95	532509	532509 - 1	DOMESTIC	2	176	236	John Ress	736 RIVERVIEW CIR	27 04 24.98	82 00 07.77
WCP-96	376291	376291 - 1	DOMESTIC	2	83	230	Floyd E Hester	PO BOX 95	27 04 58.63	82 00 00.13
WCP-97	405890	405890 - 1	DOMESTIC	2	63	230	Johnston, Reginald A	RT 3 BOX 583-K	27 04 37.73	81 59 07.07
WCP-98	570858	570858 - 1	DOMESTIC	4	125	230	James Flanigan	PEACE RIVER ST.	27 04 05.53	82 00 00.33
WCP-99	694991	694991 - 1	DOMESTIC	5	70	230	Michael Andrew Mardis	8200 BARBARA DR SW ARCADIA	27 04 59.92	81 58 50.39
WCP-100	719713	719713 - 1	DOMESTIC	4	87	230	James Broderick	10490 Co Rd 769 SW Arcadia	27 03 59.61	82 01 06.61
WCP-101	850227	Proposed WCP Well	DOMESTIC	4	87	230	BRAUCH ROGER F & MARY JO	10200 CO RD 761 SW	27 04 37.73	81 58 39.88
WCP-102	592075	592075 - 1	DOMESTIC	4	86	224	Wade Cartel	9990 S W CR 769	27 04 52.10	82 01 06.23
WCP-103	734261	734261 - 1	DOMESTIC	4	85	220	Dave Niklas	LABRADOR LANE ARCADIA	27 06 42.94	81 59 58.92
WCP-104	733648	733648 - 1	DOMESTIC	5	80	220	Darrell Mitchell	8307 SW EASY STREET	27 04 51.52	81 58 48.38
WCP-105	858805	Proposed WCP Well	DOMESTIC	4	60	220	Joseph Herring	9689 ANCHOR DR SW	27 03 49.10	82 00 10.41
WCP-106	767143	Proposed WCP Well	PUBLIC SUPPLY	4	100	217	Desoto Co Bocc	.9695 SW Peace River	27 03 37.40	82 00 19.40
WCP-107	709005	709005 - 1	DOMESTIC	4	78	210	Ron Carter	9900 Drop Tine Drive SW	27 04 11.73	81 59 06.84
WCP-108	430758	430758 - 1	DOMESTIC	2	50	207	Norman, Lyle	RT 3	27 04 05.53	82 00 00.33
WCP-109	457443	457443 - 1	DOMESTIC	4	110	205	Gregory, James F.	RT. 3 BOX 600	27 05 06.37	81 58 57.71
WCP-110	696597	696597 - 1	DOMESTIC	4	90	205	Jarrett Black	8057 NANCY LANE SW ARCADIA	27 05 06.37	81 58 57.71
WCP-111	530005	530005 - 1	DOMESTIC	2	90	200	Carl Denison	10268 S.W. JUDY AVE	27 04 37.94	81 58 38.02
WCP-112	544407	544407 - 1	DOMESTIC	4	120	200	Scott Langfang	9182 SE JEANS ROAD	27 04 52.20	82 00 51.71
WCP-113	555699	555699 - 1	DOMESTIC	2	80	200	William Stacy Hall	LOT 8 SW NANCY LANE	27 04 37.83	81 58 52.54
WCP-114	588969	588969 - 1	DOMESTIC	4	100	200	Mary Ferron	10056 LETTUCE LAKE RD	27 04 46.02	81 58 30.80
WCP-115	589962	589962 - 1	DOMESTIC	4	72	200	Roger Lowe	10735 S W KISSIMEE	27 04 24.76	81 58 43.11
WCP-116	607043	607043 - 1	DOMESTIC	4	80	200	Lloyd G Bentley	10087 S W VICTORY DR	27 03 32.25	82 00 31.01
WCP-117	618024	618024 - 1	DOMESTIC	3	110	200	Alex Grantham	4831 SW BARBARA DR	27 05 06.37	81 58 57.71
WCP-118	613070	613070 - 1	DOMESTIC	4	70	200	Mr Callagher	10187 SW CIRCLE DR	27 04 18.28	81 58 59.63
WCP-119	657181	657181 - 1	DOMESTIC	3	109	200	James Gill	9894 SW BARNHILL DR	27 05 51.52	82 00 58.43
WCP-120	687660	687660 - 1	DOMESTIC	4	84	200	Dale & Wendy Wadsworth	19022 SW JUDY ST	27 05 00.02	81 58 35.87
WCP-121	704230	704230 - 1	DOMESTIC	4	50	200	Andy Franklin	KING HIGHWAY	27 04 12.61	82 01 06.73
WCP-122	779820	Proposed WCP Well	DOMESTIC	4	70	200	Lukach Edward W & Mary Lou	8114 BARBARA DR SW	27 04 56.05	81 58 35.11
WCP-123	628983	628983 - 1	DOMESTIC	4	65	197	George Blake	9980 SW PEACE RIVER RD	27 04 05.53	82 00 00.33
WCP-124	506108	506108 - 1	PUBLIC SUPPLY	6	90	195	River Oaks Rv Inc	9770 CR 769	27 04 43.10	82 00 44.50
WCP-125	684308	684308 - 1	DOMESTIC	4	80	195	Ray And Stacey Kanwischer	10034 RIVERVIEW CIR BLK A	27 03 45.73	82 00 14.28
WCP-126	748391	748391 - 1	DOMESTIC	4	73	195	David & Wendy Homan	8011 SUNNYOAKS DR, ARCADIA	27 04 18.28	81 58 59.63
WCP-127	560578	560578 - 1	DOMESTIC	2	96	190	James W Gregory	9966 SW LEVESKY DRIVE	27 05 06.37	81 58 57.71
WCP-128	566509	566509 - 1	DOMESTIC	2	86	190	Steele, Darrell & Marie	9827 S.W. KISSIMMEE RD.	27 05 06.37	81 58 57.71
WCP-129	408379	408379 - 1	DOMESTIC	2	79	189	Smith, Teddy & Gail	RT 3 BOX 671	27 03 20.23	82 01 07.30
WCP-130	412108	412108 - 1	DOMESTIC	2	63	189	Cummins, Jack	PO BOX 214	27 04 59.72	81 59 19.44
WCP-131	381537	381537 - 1	DOMESTIC	2	92	182	Glerum, Donald J.	123 SE PECKHAM ST	27 04 58.65	82 00 59.03
WCP-132	475166	475166 - 1	PUBLIC SUPPLY	6	90	180	River Oaks Rv Inc	9770 CR 769	27 04 44.80	82 00 44.30
WCP-133	526710	526710 - 1	DOMESTIC	2	62	180	Barbara Eckman	R. R. 3 BOX 680	27 03 20.44	82 00 38.27
WCP-134	554981	554981 - 1	DOMESTIC	2	68	180	Home Builders Construction Inc.	RT 7 BOX 73E	27 04 37.83	81 58 52.54
WCP-135	640147	640147 - 1	DOMESTIC	4	78	180	Helmut Ehrhard	8327 SW GULF ST	27 04 35.92	81 58 45.40
WCP-136	671252	671252 - 1	DOMESTIC	3	98	180	Russell W Muse Jr	10248 SW JUDY AVENUE	27 04 35.36	81 58 33.18
WCP-137	739325	739325 - 1	DOMESTIC	4	81	180	Corry Walters	8176 MERRY DRIVE, ARCADIA	27 05 26.02	81 58 36.09
WCP-138	743594	743594 - 1	DOMESTIC	3	98	180	Brad Hatch	8087 S W BARBARA LANE	27 04 47.02	81 58 35.76
WCP-139	743389	743389 - 1	DOMESTIC	4	70	180	Greg Hatcher	9967 LEVSKY, ARCADIA	27 05 12.92	81 58 50.50
WCP-140	758572	Proposed WCP Well	DOMESTIC	4	100	180	Mccormack Thomas	11148 WELCH AVE SW	27 03 32.00	82 00 57.10
WCP-141	587049	587049 - 1	DOMESTIC	4	95	175	Roy Tarman	11255 SW CRENSHAW	27 03 20.33	82 00 52.79
WCP-142	850739	Proposed WCP Well	DOMESTIC	4	68	175	REED BRYAN H	8431 NANCY DR SW	27 04 39.95	81 58 53.03
WCP-143	577979	577979 - 1	DOMESTIC	4	85	170	Rick Taggart	10433 JERNIGAN RD.	27 06 42.94	81 59 58.92
WCP-144	384013	384013 - 1	DOMESTIC	2	65	168	Bryant, O.	HWY 761 SW	27 05 06.37	81 58 57.71
WCP-145	672446	672446 - 1	DOMESTIC	3	103	168	Harley E Simmons	11269 SW CRENSHAW AVE	27 03 33.33	82 00 52.90
WCP-146	357908	357908 - 1	DOMESTIC	2	70	168	Crawford, Mrs E.	RT 3,-LETTUCE LAKE RD	27 04 18.28	81 58 59.63
WCP-147	496200	496200 - 1	DOMESTIC	2	79	165	Centers, Millard	RT 3 PO 583N	27 04 18.28	81 58 59.63
WCP-148	754404	Proposed WCP Well	DOMESTIC	4	82	165	Ken Mobley	8269 CO RD 769 SW	27 06 04.61	82 00 00.91
WCP-149	411692	411692 - 1	DOMESTIC	2	73	160	Hawkes, Bonnie	LOT 10 OLIVE LOOP ROAD	27 03 21.13	82 01 37.41

APPENDIX E-5

SWFWMD Well Construction Permits Within 2-Mile AOR Domestic and Public Supply (Figure 2-13)

FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-150	475165	475165 - 1	PUBLIC SUPPLY	6	60	160	River Oaks Rv Inc	9770 CR 769	27 04 45.40	82 00 41.80
WCP-151	496696	496696 - 1	DOMESTIC	2	78	160	Deriso, Joel	RT 3 BOX 945	27 04 18.28	81 58 59.63
WCP-152	516355	516355 - 1	DOMESTIC	2	60	160	Edward Buchy	8174 NANCY LANE	27 04 37.94	81 58 38.02
WCP-153	533436	533436 - 1	DOMESTIC	2	77	160	Russell Stoke	ROUTE 596-B OAK HAVEN	27 04 37.94	81 58 38.02
WCP-154	602409	602409 - 1	DOMESTIC	2	66	160	Lisa A Moran	11173 SW BRANSON AVE	27 03 29.56	82 00 30.74
WCP-155	664671	664671 - 1	DOMESTIC	3	98	160	Roy Tarman	11255 SW CRENSHAW BLK C	27 03 20.33	82 00 52.79
WCP-156	700687	700687 - 1	DOMESTIC	4	80	160	M A Pittard	8360 SW Merry Drive	27 04 48.03	81 58 43.57
WCP-157	711927	711927 - 1	DOMESTIC	4	105	160	Bonnie Chandler	11355 Crenshaw ave	27 03 20.33	82 00 52.79
WCP-158	701107	701107 - 1	DOMESTIC	4	50	160	Dmi Inc	10863 SW Kissimmee rd	27 04 27.45	81 58 43.10
WCP-159	354726	354726 - 1	DOMESTIC	2	70	160	Waldron, Ron	PO BOX 855	27 05 12.92	81 58 50.50
WCP-160	503279	503279 - 1	DOMESTIC	2	58	158	Gulf Coast Farms	OFF 761	27 06 43.02	82 00 57.82
WCP-161	542943	542943 - 1	DOMESTIC	2	120	155	Ronnie Shizarig	10288 CITY ROAD	27 04 37.83	81 58 52.54
WCP-162	760898	Proposed WCP Well	DOMESTIC	4	88	155	Rutherford Thomas R Ii	7501 LABADOR DR SW	27 06 44.64	81 59 53.42
WCP-163	392506	LOUIS CORBETT (HRS) INT	DOMESTIC	2	63	150	Louis Corbett	RT 3 BOX 708	27 03 46.20	82 00 12.29
WCP-164	675437	675437 - 1	DOMESTIC	4	75	150	Phillip D Rizzo	9779 KISSIMMEE RD	27 05 06.37	81 58 57.71
WCP-166	731612	731612 - 1	DOMESTIC	3	95	150	Paul Tincher	11105 WELCH AVENUE	27 03 36.10	82 00 58.06
WCP-167	383320	383320 - 1	DOMESTIC	2	70	147	Hudson, Elven M.	RT 3, BOX 604 PEACE RIVER ACRE	27 05 06.37	81 58 57.71
WCP-168	348790	348790 - 1	DOMESTIC	2	72	147	Edward Leer	RT 5, BOX 437-A	27 04 18.28	81 58 59.63
WCP-169	357215	357215 - 1	DOMESTIC	2	52	147	Foulk, Dolley	RT 3, BOX 709	27 03 45.88	82 00 21.94
WCP-170	353617	353617 - 1	DOMESTIC	2	84	147	Desneaux, Joseph E.	412 CRESTWOOD DR	27 03 33.12	82 01 21.94
WCP-171	486273	486273 - 1	DOMESTIC	2	80	141	Ted Swiatek	DESOTO CT.	27 04 05.53	82 00 00.33
WCP-172	473879	473879 - 1	DOMESTIC	2	69	140	Keller, Leonard	RT. 3, BOX 600H	27 06 42.94	81 59 58.92
WCP-173	489172	489172 - 1	DOMESTIC	2	69	140	Roy Dodd	JUDY LN	27 04 18.28	81 58 59.63
WCP-174	493744	493744 - 1	DOMESTIC	2	61	140	Darrell Steele	9983 SW LETTUCE LAKE RD	27 04 18.28	81 58 59.63
WCP-175	599984	599984 - 1	DOMESTIC	4	65	140	Meagan & Sokratis Simes	11107 SW BRANSON AVE	27 03 31.36	82 00 30.72
WCP-176	665720	665720 - 1	DOMESTIC	4	77	140	Gail Dunham	10405 SW RIVERVIEW CIR BLK E	27 03 45.98	82 00 07.42
WCP-177	709763	709763 - 1	DOMESTIC	4	70	140	Steve Cantz	10058 SW VICTORY DR	27 03 32.25	82 00 30.94
WCP-178	710798	710798 - 1	DOMESTIC	4	55	140	David Klassen	9651 S W MARINA DRIVE	27 03 45.96	82 00 08.95
WCP-179	699141	699141 - 1	DOMESTIC	4	70	140	Quality Homes Of Port Charlotte Inc	9761 Riverview Circle	27 03 55.31	82 00 14.27
WCP-180	344306	ALLEN LESLIE (HRS) INT	DOMESTIC	2	63	136	C Leslie	NO ADDRESS	27 05 06.37	81 58 57.71
WCP-181	697809	697809 - 1	DOMESTIC	4	70	135	Gail Dunham	10405 SW Riverview Circle	27 03 41.30	82 00 14.29
WCP-182	366730	366730 - 1	DOMESTIC	2	42	130	Winstanley, Herbert	RT 3, BOX 717	27 04 05.53	82 00 00.33
WCP-183	430757	430757 - 1	DOMESTIC	2	50	130	Bachman, Kenneth E	RT 3 BOX 766	27 04 05.53	82 00 00.33
WCP-184	599985	599985 - 1	DOMESTIC	2	110	130	Mrs Williams	12125 SW LEVESKY	27 04 59.92	81 58 50.39
WCP-185	670468	670468 - 1	DOMESTIC	4	92	130	Robert & Mary Rosasco	10376 SW PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-186	355210	355210 - 1	DOMESTIC	2	67	130	Frederici, David F.	RT 3, BOX 903-F	27 05 51.52	82 00 58.43
WCP-187	350849	350849 - 1	DOMESTIC	2	71	128	Keith Traylor	Off North 761 off Fort Ogden Hwy. 17	27 03 33.91	82 02 06.56
WCP-188	473755	473755 - 1	DOMESTIC	2	80	126	Henry Stevens	RT.3 BOX 1294	27 05 51.89	81 59 00.65
WCP-189	551203	551203 - 1	DOMESTIC	4	75	120	J Anderson Inc	1381 MARKET CIRCLE	27 04 46.92	81 58 50.28
WCP-190	586470	586470 - 1	DOMESTIC	2	58	120	David Briley	10082 S W VICTORY DR	27 03 32.25	82 00 30.99
WCP-191	591694	591694 - 1	DOMESTIC	4	75	120	J Anderson Inc	10250 SW PEACE RIVER ST	27 04 06.16	82 00 59.41
WCP-193	514096	514096 - 1	DOMESTIC	2	75	114	Melvin Lee	8354 S.W. KISSIMMEE	27 04 24.63	81 59 21.47
WCP-194	587044	587044 - 1	DOMESTIC	4	60	110	Robert Law	10265 RIVERVIEW CIR SW	27 03 42.98	82 00 14.29
WCP-195	720675	720675 - 1	DOMESTIC	4	75	107	Peter Van Houten	10149 PEACE RIVER S ARCADIA	27 03 33.44	82 00 38.38
WCP-196	720676	720676 - 1	DOMESTIC	4	75	107	Rudy Yoder	10159 PEACE RIVER S ARCADIA	27 03 33.44	82 00 38.38
WCP-197	527148	527148 - 1	DOMESTIC	2	80	100	Bill Brilley	10115 PEACE RIVER	27 03 33.44	82 00 38.38
WCP-198	731157	731157 - 1	DOMESTIC	4	83	100	Robert Shaver	9946 Riverview Arcadia	27 03 46.19	81 59 38.38
WCP-199	362489	362489 - 1	DOMESTIC	2	51	100	Frank Hendrickson	.	27 05 06.37	81 58 57.71
WCP-200	624769	624769 - 1	DOMESTIC	4	84	96	Carl Stevens	9895 S W BURNHILL RD	27 05 57.86	82 00 21.60
WCP-201	753018	753018 - 1	DOMESTIC	2	60	95	Ken Mobley	8269 CR 769, ARCADIA	27 05 51.52	81 59 59.75
WCP-202	750866	750866 - 1	DOMESTIC	4	38	91	Walter Widenhofer	10235 RIVERVIEW CIR, ARCADIA	27 03 43.34	82 00 14.29
WCP-203	750179	750179 - 1	DOMESTIC	4	40	91	Walter Widenhofer	9997 RIVERVIEW CIR SW, ARCADIA	27 03 46.13	82 00 14.28
WCP-204	675977	675977 - 1	DOMESTIC	4	60	90	Steve Kindle	11042 SW WELCH BLK 1	27 03 33.23	82 01 07.42
WCP-205	730524	730524 - 1	DOMESTIC	4	57	90	Zaltan Sabo	9689 SW ANCHOR DR ARCADIA	27 03 49.52	82 00 10.21
WCP-206	746320	746320 - 1	DOMESTIC	4	43	61	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 45.98	82 00 07.42
WCP-207	746317	746317 - 1	DOMESTIC	4	42	60	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 39.30	82 00 14.59
WCP-208	746318	746318 - 1	DOMESTIC	4	45	59	Mark A Wolff	10520 RIVERVIEW CIR. SW, ARCADIA	27 03 45.98	82 00 07.42
WCP-234	388335	388335 - 1	PUBLIC SUPPLY	2	0	0	Wilcoxn, E	RT 3 BOX 629	27 05 06.37	81 58 57.71
WCP-235	415471	415471 - 1	DOMESTIC	2	0	0	Bachman, Kenneth E	RT 3 BOX 766	27 04 05.53	82 00 00.33
WCP-236	415472	415472 - 1	DOMESTIC	2	0	0	Norman, Lyle	RT 3	27 04 05.53	82 00 00.33
WCP-237	444871	444871 - 1	DOMESTIC	2	0	0	Mccloud, Harvey	JERNIGAN ROAD	27 06 42.94	81 59 58.92
WCP-243	636453	636453 - 1	DOMESTIC	4	0	0	Crew Or Barbara Blackmon	7432 KINGS HWY (SW HWY 769)	27 06 42.94	81 59 58.92

APPENDIX E-5

SWFWMD Well Construction Permits Within 2-Mile AOR Domestic and Public Supply (Figure 2-13)

FIGURE ID	WCP PERMIT NUMBER	SITE NAME	WELL USE	CASING DIA. (IN.)	CASING DEPTH (FT.)	WELL DEPTH (FT.)	OWNER NAME	MAILING ADDRESS	LATITUDE	LONGITUDE
WCP-246	675849	675849 - 1	DOMESTIC	4	0	0	Phillip D Rizzo	9779 KISSIMMEE RD SW	27 04 59.72	81 59 19.44
WCP-247	737910	737910 - 1	DOMESTIC	4	0	0	Edward Diaz	7500 LABRADOR LANE, ARCADIA	27 06 42.94	81 59 58.92
WCP-263	340449	340449 - 1	DOMESTIC	2	0	0	Laupen,R	NO ADDRESS	27 05 06.37	81 58 57.71
WCP-265	361324	361324 - 1	DOMESTIC	2	0	0	Williams, Albert L.	RT # BOX PICE RIVER HEIGHTS	27 04 05.53	82 00 00.33

Appendix F

Partially Treated Surface Water – Water Quality Data

Appendix F-1

Reservior Water Quality Data (May 2012- May 2016)

Station_ID	Sample Date	Color PCU	Chlorides mg/L	Total Alkalinity mg/l Ca CO3	T. Hardness mg/l CaCO3	C. Hardness mg/l CaCO3	Sulfate mg/l	Total Dissolved Solids mg/l	Total Iron ug/l	Total Nitrogen mg/l	Nitrite / Nitrate mg/l	Nitrate mg/l	TKN mg/l	Ammonia mg/l	T. Phosphorus mg/l	Ortho Phosphorous mg/l	Copper ug/l	Chlorophyll mg/m^3	Geosmin ug/l (1,2,7,7-tetramethyl-2-norborneol)	MIB ug/l (2-methylisoborneol)	Nitrite Nitrogen (mg/L)	Aluminum (ug/L)	Zinc (ug/L)	Thallium (ug/L)	Fluoride (mg/L))	Glyphosate (ug/L)	Endothall (ug/L)
Composite of Reservoir 1 South	05/16/12	57	60	61	178	110	119.0	380	117.0	0.660	0.004 I	0.004 U	0.656	0.008 I	0.151	0.085	70.3	14.20	<2.0	15.8							
Composite of Reservoir 1 South	05/30/12	52	61	58	184	110	107.0	376	80.1 I	0.744	0.050 U	0.050 U	0.740	0.008 U	0.145	0.092	241.0	7.59	<2.0	8.3							
Composite of Reservoir 1 South	06/12/12	54	58	65	188	112	119.0	360	45.4	0.844	0.004 U	0.004 U	0.844	0.067	0.120	0.088	302.0	11.00	<2.0	<2.0	0.003 U						
Composite of Reservoir 1 South	07/12/12						121.0	408	121.00	1.050	0.004 U	0.004 U	1.050	0.008 U	0.360	0.258	27.90	39.500			0.003 U						
Composite of Reservoir 1 South	07/12/12																		<2.0	19.9							
Composite of Reservoir 1 South	07/16/12	90	55	63	172	108																					
Composite of Reservoir 1 South	07/26/12	118	52	61	166	104													<2.0	19.9							
Composite of Reservoir 1 South	07/26/12						118.0	308	184.00	1.170	0.116	0.116	1.050	0.008 U	0.432	0.311	19.50	26.800			0.003 U						
Composite of Reservoir 1 South	08/09/12						94.5	284	184.00	1.180	0.216	0.216	0.966	0.008 U	0.439	0.347	16.90	22.300			0.003 U						
Composite of Reservoir 1 South	08/09/12	128	51	63	160	105													<2.0	27.5							
Composite of Reservoir 1 South	09/12/12																		<2.0	<2.0							
Composite of Reservoir 1 South	09/12/12	121	44	60	145	92																					
Composite of Reservoir 1 South	09/12/12						91.9	260	180.00	1.120	0.123	0.123	1.000	0.072	0.309	0.228	22.60	18.500			0.003 U						
Composite of Reservoir 1 South	10/10/12																		1.1	2.0							
Composite of Reservoir 1 South	10/10/12						74.7	232	188.00	1.220	0.285	0.281	0.931	0.008 U	0.281	0.230	21.70	11.300			0.004 I						
Composite of Reservoir 1 South	11/07/12	134	42	59	137	87																					
Composite of Reservoir 1 South	11/07/12																		<1.0	<1.0							
Composite of Reservoir 1 South	11/07/12						73.9	248	203.00	1.380	0.325	0.325	1.050	0.008 U	0.326	0.250	22.50	22.900			0.003 U						
Composite of Reservoir 1 South	12/05/12																		<1.0	<1.0							
Composite of Reservoir 1 South	12/05/12						80.5	300	161.0	1.290	0.372	0.372	0.916	0.008 U	0.311	0.296	20.7	9.91			0.003 U						
Composite of Reservoir 1 South	12/06/12	115	41	63	140	90																					
Composite of Reservoir 1 South	01/02/13	106	41	63	145	95																					
Composite of Reservoir 1 South	01/02/13																		2.4	<1.0							
Composite of Reservoir 1 South	01/02/13						78.4	244	149.0	1.190	0.380	0.380	0.811	0.016 I	0.315	0.269	15.5 I	12.70			0.003 U						
Composite of Reservoir 1 South	02/12/13																		7.4	2.1							
Composite of Reservoir 1 South	02/12/13	97	46	65	167	93																					
Composite of Reservoir 1 South	02/12/13						87.4	276	136.00	1.160	0.273	0.273	0.882	0.008 U	0.328	0.228	18.50	14.900			0.003 U						
Composite of Reservoir 1 South	02/26/13	85	46	68	157	100																					
Composite of Reservoir 1 South	02/26/13																		10.4	4.0							
Composite of Reservoir 1 South	02/26/13						82.8	312	117.0	1.020	0.103	0.103	0.915	0.008 U	0.250	0.195	18.0	27.00			0.003 U						
Composite of Reservoir 1 South	03/13/13																		8.3	5.3							
Composite of Reservoir 1 South	03/13/13	76	47	70	160	104																					
Composite of Reservoir 1 South	03/13/13						93.9	260	119.0	0.945	0.197	0.193	0.748	0.008 U	0.282	0.205	17.5	11.00			0.004 I						
Composite of Reservoir 1 South	04/16/13																		5.5	4.8							
Composite of Reservoir 1 South	04/16/13	67	49	63	155	98																					
Composite of Reservoir 1 South	04/16/13						97.6	324.00	75.30 I	0.706	0.005 I	0.005 I	0.701	0.008 U	0.205	0.130	13.80 I	17.800			0.003 U						
Composite of Reservoir 1 South	05/23/13	55	51	70	158	108																					
Composite of Reservoir 1 South	05/23/13																		14.4	26.3							
Composite of Reservoir 1 South	05/23/13						61.0	308.00	75.50 I	0.792	0.004 U	0.004 U	0.792	0.008 U	0.163	0.055	12.50 I	6.170			0.003 U						
Composite of Reservoir 1 South	06/19/13																		<1.0	4.6							
Composite of Reservoir 1 South	06/19/13	64	49	59	159	102																					
Composite of Reservoir 1 South	06/19/13						89.9	256	69.9 I	0.904	0.004 U	0.004 U	0.904	0.022 I	0.132	0.080	252.0	18.60			0.003 U						
Composite of Reservoir 1 South	07/18/13																		<1.0	8.7							
Composite of Reservoir 1 South	07/18/13	96	43	54	138	88																					
Composite of Reservoir 1 South	07/18/13						78.2	252	185.0	0.182	0.182	1.070	0.891	0.008 U	0.237	0.182	41.3	12.30			0.003 U						
Composite of Reservoir 1 South	08/21/13																		1.2	10.9							
Composite of Reservoir 1 South	08/21/13	125	39	55	127	83																					
Composite of Reservoir 1 South	08/21/13						68.5	268	185.0	1.220	0.243 V	0.243	0.980	0.008 U	0.591	0.229	77.4	10.60			0.003 U						
Composite of Reservoir 1 South	09/26/13	120	36	52	130	84																					
Composite of Reservoir 1 South	09/26/13																		<1.0	2.3							
Composite of Reservoir 1 South	09/26/13						62.4	224	210.0	1.360	0.302	0.302	1.060	0.008 I	0.287	0.223	26.9	9.25			0.003 U						
Composite of Reservoir 1 South	10/23/13																		1.1	1.4							
Composite of Reservoir 1 South	10/23/13	118	35	55	126	75																					
Composite of Reservoir 1 South	10/23/13						58.9	220	208.0	1.210	0.275	0.275	0.933	0.107	0.313	0.229	20.0	10.70			0.003 U						
Composite of Reservoir 1 South	11/21/13	105	37	59	138	80																					
Composite of Reservoir 1 South	11/21/13																		<1.0	<1.0							
Composite of Reservoir 1 South	11/21/13						60.7	256.00	201.00	1.220	0.282	0.282	0.938	0.008 U	0.414	0.257	26.10	17.100			0.003 U						
Composite of Reservoir 1 South	12/17/13	86	37	64	140	88																					
Composite of Reservoir 1 South	12/17/13																		<1.0	<1.0							
Composite of Reservoir 1 South	12/17/13						68.9	244	176.0	1.190	0.306	0.301	0.881	0.010 I	0.384	0.281	22.1	8.14			0.005 I						
Composite of Reservoir 1 South	01/22/14	79	39	70	155	94																					
Composite of Reservoir 1 South	01/22/14																		1.0	1.2							
Composite of Reservoir 1 South	01/22/14						75.1	264	105.0 I	1.120	0.262	0.249	0.858	0.008 U	0.306	0.297	19.4	7.00			0.013						
Composite of Reservoir 1 South	02/18/14																		2.5	4.8							
Composite of Reservoir 1 South	02/18/14	71	40	68	170	98																					
Composite of Reservoir 1 South	02/18/14						80.6	272	87.9 I	1.100	0.268	0.265	0.836	0.008 U	0.324	0.289	16.9	12.70			0.003 I						
Composite of Reservoir 1 South	03/26/14																		3.0	5.1							
Composite of Reservoir 1 South	03/26/14	68	43	68	172	100																					
Composite of Reservoir 1 South	03/26/14						84.3	296.00	82.30 I	0.952	0.129	0.118	0.823	0.010 I	0.349	0.257	15.60 I	9.370			0.011 I						
Composite of Reservoir 1 South	04/23/14	61	44	72	182	104																					
Composite of Reservoir 1 South	04/23/14																		2.5	4.8							
Composite of Reservoir 1 South	04/23/14						87.4	316.00	77.60 I	0.904	0.021	0.018	0.883	0.024 I	0.283	0.253	13.90 I	10.400			0.003 I	284					
Composite of Reservoir 1 South	04/23/14																						4	< 0.981	0.563	< 5.4	< 4.1
Composite of Reservoir 1 South	05/22/14						96.5	300	65.2 I	0.752	0.004 U	0.004 U	0.752	0.008 U	0.303	0.212	81.1	6.92			0.005 I	280					
Composite of Reservoir 1 South	05/22/14																		2.1	7.2							
Composite of Reservoir 1 South	05/22/14	57	46	73	192	104																					

Appendix F-1

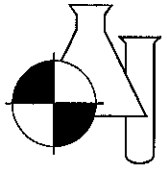
Reservior Water Quality Data (May 2012- May 2016)

Station_ID	Sample Date	Color PCU	Chlorides mg/L	Total Alkalinity mg/l Ca CO3	T. Hardness mg/l CaCO3	C. Hardness mg/l CaCO3	Sulfate mg/l	Total Dissolved Solids mg/l	Total Iron ug/l	Total Nitrogen mg/l	Nitrite / Nitrate mg/l	Nitrate mg/l	TKN mg/l	Ammonia mg/l	T. Phosphorus mg/l	Ortho Phosphorous mg/l	Copper ug/l	Chlorophyll mg/m^3	Geosmin ug/l (1,2,7,7-tetramethyl-2-norborneol)	MIB ug/l (2-methylisoborneol)	Nitrite Nitrogen (mg/L)	Aluminum (ug/L)	Zinc (ug/L)	Thallium (ug/L)	Fluoride (mg/L))	Glyphosate (ug/L)	Endothall (ug/L)
Composite of Reservoir 1 South	05/28/14																		2.2	4.9							
Composite of Reservoir 1 South	06/02/14																		3.4	4.0							
Composite of Reservoir 1 South	06/09/14																		5.5	2.9							
Composite of Reservoir 1 South	06/16/14																		2.5	9.2							
Composite of Reservoir 1 South	06/18/14																		3.1	16.9							
Composite of Reservoir 1 South	06/18/14						94.4	284	55.3 I	0.721	0.007 I	0.007 I	0.714	0.008 U	0.200	0.194	92.2	6.47			0.003 U	251					
Composite of Reservoir 1 South	06/19/14	51	46	70	180	104																					
Composite of Reservoir 1 South	06/19/14																		1.5	12.8							
Composite of Reservoir 1 South	06/23/14																		<1.0	14.2							
Composite of Reservoir 1 South	07/01/14																		<1.0	11.2							
Composite of Reservoir 1 South	07/07/14																		<1.0	11.7							
Composite of Reservoir 1 South	07/14/14																		<1.0	6.3							
Composite of Reservoir 1 South	07/21/14																		<1.0	7.5							
Composite of Reservoir 1 South	07/24/14																		<1.0	17.3							
Composite of Reservoir 1 South	07/24/14	79	42	70	160	94																					
Composite of Reservoir 1 South	07/24/14						79.4	272.00	107.00 I	0.844	0.007 I	0.004 U	0.837	0.071	0.533	0.199	25.10	14.500			0.003 I	284					
Composite of Reservoir 1 South	07/28/14																		<1.0	24.3							
Composite of Reservoir 1 South	08/04/14																		<1.0	15.3							
Composite of Reservoir 1 South	08/11/14																		1.6	14.7							
Composite of Reservoir 1 South	08/19/14																		4.9	10.4							
Composite of Reservoir 1 South	08/25/14																		9.3	9.9							
Composite of Reservoir 1 South	08/27/14																		8.1	8.8							
Composite of Reservoir 1 South	08/28/14	81	42	64	152	90																					
Composite of Reservoir 1 South	09/04/14																		5.2	7.0							
Composite of Reservoir 1 South	08/27/14						82.8	256 Q	107 I	0.836	0.037	0.037	0.799	0.008 U	0.45	0.215	10.7 I	4.92			0.003 U	224					
Composite of Reservoir 1 South	09/25/14																		3.7	8.3							
Composite of Reservoir 1 South	09/25/14	79	39	65	142	89																					
Composite of Reservoir 1 South	09/25/14						66.3	252	133	0.957	0.076	0.072	0.881	0.008 U	0.373	0.186	16.5	18.6			0.004 I	381					
Composite of Reservoir 1 South	10/29/14	87	37	61	140	83																					
Composite of Reservoir 1 South	10/29/14																	1.3	3.6								
Composite of Reservoir 1 South	10/29/14						67.5	236.00	147.00	1.010	0.069	0.069	0.946	0.008 U	0.355	0.244	15.10 I	19.700			0.003 U	337					
Composite of Reservoir 1 South	11/20/14	93	37	62	148	83																					
Composite of Reservoir 1 South	11/20/14																		1.0	7.2							
Composite of Reservoir 1 South	11/20/14						66.2	224	163	1.15	0.196	0.196	0.953	0.01 I	0.344	0.272	17.7	11			0.003 U	393					
Composite of Reservoir 1 South	01/29/15																		2.8	2.5							
Composite of Reservoir 1 South	01/29/15	88	40	63	153	92																					
Composite of Reservoir 1 South	02/25/15	86	39	63	154	87	67.6	232.00	129.00	1.210	0.240	0.240	0.965	0.011 I	0.348	0.271	17.30	11.300			0.003 U	279					
Composite of Reservoir 1 South	02/25/15																		9.7	2.3							
Composite of Reservoir 1 South	02/25/15						69.8	256	116	1.03	0.122	0.122	0.904	0.03 I	0.281	0.228	17.2	17.8			0.003 U	279					
Composite of Reservoir 1 South	03/26/15	74	38	62	147	90																					
Composite of Reservoir 1 South	03/26/15																		6.8	8.4							
Composite of Reservoir 1 South	03/26/15						68.6	236	106 I	0.975	0.055	0.045	0.92	0.008 U	0.32	0.204	13.7 I	17.1			0.01 I	266					
Composite of Reservoir 1 South	04/21/15																		10.7	11.3							
Composite of Reservoir 1 South	04/22/15	68	44	68	170	90																					
Composite of Reservoir 1 South	04/21/15						70.6	236	120	1.06	0.025	0.021	1.04	0.011 I	0.264	0.208	13.7 I	21.8			0.004 I	267					
Composite of Reservoir 1 South	06/22/15	50	46	64	156	100																					
Composite of Reservoir 1 South	06/22/15																		1.6	27.7							
Composite of Reservoir 1 South	07/21/15																		3.9	12.1							
Composite of Reservoir 1 South	07/21/15	54	41	62	158	89																					
Composite of Reservoir 1 South	06/22/15						73.5	220.00	58.8 I	1.39	0.300 U	0.300 U	1.39	0.008 U	0.216	0.140	21.80	8.59			0.005 I	234					
Composite of Reservoir 1 South	07/21/15						75.3	268	83.1 I	0.939	0.004 U	0.004 U	0.939	0.031 I	0.242	0.156	15.7 I	16.9			0.004 I	332					
Composite of Reservoir 1 South	08/24/15	62	40	57	147	92																					
Composite of Reservoir 1 South	08/24/15																		6.2	5							
Composite of Reservoir 1 South	09/28/15	80	35	55	128	74																					
Composite of Reservoir 1 South	08/24/15						69.4	216	73.1 I	1.01	0.004 U	0.004 U	1.01	0.008 U	0.180	0.119	9.20 I	18.6			0.003 I	176					
Composite of Reservoir 1 South	09/28/15																		<1.0	<1.0							
Composite of Reservoir 1 South	10/21/15	86	34	53	127	80													1.4	1.4							
Composite of Reservoir 1 South	09/28/15						60.1	208	163	0.968	0.06	0.056	0.908	0.008 U	0.198	0.122	22.1	21.8			0.004 I	397					
Composite of Reservoir 1 South	11/19/15																		<1.0	<1.0							
Composite of Reservoir 1 South	11/20/15	101	35	56	130	76																					
Composite of Reservoir 1 South	10/21/15						57.3	208	151	1.06	0.113	0.1	0.95	0.042	0.204	0.139	11.7 I	12.8			0.013	348					
Composite of Reservoir 1 South	1/20/16						59.6	224	153	1.21	0.252	0.252	0.958	0.015 I	0.226	0.175	12.3 I	6.59			0.003 U	347					
Composite of Reservoir 1 South	2/17/16						58.0	248	129	1.12	0.209	0.206	0.909	0.034 I	0.239	0.147	7.6 I	8.63			0.003 I	283					
Composite of Reservoir 1 South	3/22/16						61.3	188	129	1.10	0.159	0.159	0.940	0.008 U	0.200	0.118	14.3 I	12.80			0.003 U	307					
Composite of Reservoir 1 South	4/13/16						66.7	220	79.8 I	1.13	0.064	0.060	1.070	0.020 I	0.180	0.110	11.0 I	9.74			0.004 I	263					
Composite of Reservoir 1 South	5/17/16						66.4	216	78.5 I	0.68	0.004 U	0.004 U	0.683	0.008 U	0.152	0.111	33.4	18.60			0.005 I	363					
AVG		84	43	62	152	93	79	267	129	1	0.151	0.168	0.906	0.018	0.285	0.203	32.7	13	4.8	10	0.004	293	3.5	0.981	0.539	4.5 #	4.1
MAX		134	61	73	195	112	121	408	237	1	0.432	1.20	1.23	0.190	0.601	0.360	424	50	37	62	0.041	601	4.7	0.981	0.607	5.4 #	4.1
Drinking Water Standard MCL		15	250	-	-	-	250	500	300	-	10	10	-	-	-	-	1000	-	-	-	1	200	5	2	4	700	100

Appendix F-2

Reservoir No. 1 Primary and Secondary Water Quality Analysis

BENCHMARK
EnviroAnalytical Inc.



FDOH Certification #E84167

Peace River/Manasota R W S
8998 Sw County Road 769
Arcadia, FL 34269

Sam Stone

ANALYTICAL TEST REPORT
THESE RESULTS MEET NELAC STANDARDS

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
	TOTAL HARDNESS (CACO3)		MG/L	118		SM2340C	0.682	06/28/2016	08:45	E84167

INORGANIC ANALYSIS
62-550.310 (1)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
1040	NITRATE NITROGEN	10	MG/L	0.020 U	U	300.0	0.020	06/23/2016	22:29	E84167
1041	NITRITE NITROGEN	1.0	MG/L	0.020 U	U	300.0	0.020	06/23/2016	22:29	E84167
1038	NITRATE+NITRITE AS N	10	MG/L	0.020 U	U	300.0	0.020	06/23/2016	22:29	E84167
1094	ASBESTOS		MFL	0.48 UQ	QU	100.2	0.48	07/07/2016	09:04	E87804
1005	ARSENIC	0.010	MG/L	0.001 I	I	SM3113B	0.00069	06/27/2016	20:44	E84167
1010	BARIUM	2	MG/L	0.011		200.7	0.002	06/28/2016	13:22	E84167
1015	CADMIUM		MG/L	0.00009 U	U	200.8	0.00009	06/30/2016	09:54	E83182
1020	CHROMIUM	0.1	MG/L	0.002 I	I	200.7	0.002	06/28/2016	13:22	E84167
1024	CYANIDE	0.2	MG/L	0.005 U	U	335.4	0.005	06/29/2016	11:49	E84167
1025	FLUORIDE	4.0	MG/L	0.451		300.0	0.030	07/01/2016	14:05	E84167
1030	LEAD		MG/L	0.00016 U	U	200.8	0.00016	06/30/2016	09:54	E83182
1035	MERCURY	2	NG/L	1.25 C1	C1	1631E	0.191	06/29/2016		E87688

INORGANIC ANALYSIS

62-550.310 (1)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
1036	NICKEL	0.1	MG/L	0.008		200.7	0.00118	06/28/2016	13:22	E84167
1045	SELENIUM	0.05	MG/L	0.00157 U	U	SM3113B	0.00157	07/15/2016	12:08	E84167
1052	SODIUM	160	MG/L	21.4		200.7	0.034	06/28/2016	13:22	E84167
1074	ANTIMONY	0.006	MG/L	0.00226 U	U	SM3113B	0.00226	06/30/2016	16:58	E84167
1075	BERYLLIUM	0.004	MG/L	0.000078 U	U	200.7	0.000078	06/28/2016	13:22	E84167
1085	THALLIUM	0.002	MG/L	0.00169 U	U	200.9	0.00169	07/05/2016	12:12	E84167

VOLATILE ORGANICS

62-550.310 (4) (a)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
2378	1,2,4-TRICHLOROBENZENE	70	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2380	CIS-1,2-DICHLOROETHENE	70	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2955	XYLENES	10000	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2964	METHYLENE CHLORIDE	5	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2968	O-DICHLOROBENZENE	600	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2969	PARA-DICHLOROBENZENE	75	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2976	VINYL CHLORIDE	1	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2977	1,1-DICHLOROETHENE	7	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2979	TRANS-1,2-DICHLOROETHENE	100	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2980	1,2-DICHLOROETHANE	3	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2981	1,1,1-TRICHLOROETHANE	200	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2982	CARBON TETRACHLORIDE	3	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2983	1,2-DICHLOROPROPANE	5	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2984	TRICHLOROETHENE	3	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2985	1,1,2-TRICHLOROETHANE	5	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2987	TETRACHLOROETHENE	3	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2989	MONOCHLOROBENZENE	100	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2990	BENZENE	1	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2991	TOLUENE	1000	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167

VOLATILE ORGANICS

62-550.310 (4) (a)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
2992	ETHYLBENZENE	700	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167
2996	STYRENE	100	UG/L	0.5 U	U	524.2	0.5	06/29/2016	11:00	E84167

SYNTHETIC ORGANICS

62-550.310 (4) (b)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
2005	ENDRIN	2.0	UG/L	0.0021 UC3	C3U	508	0.0021	06/28/2016	19:11	E87052
2010	GAMMA-BHC (LINDANE)	0.2	UG/L	0.0023 U	U	508	0.0023	06/28/2016	19:11	E87052
2015	METHOXYCHLOR	40	UG/L	0.0075 U	U	508	0.0075	06/28/2016	19:11	E87052
2020	TOXAPHENE	3.0	UG/L	0.056 U	U	508	0.056	06/28/2016	19:11	E87052
2031	DALAPON	200	UG/L	0.95 U	U	515.1	0.95	07/05/2016	16:20	E87052
2032	DIQUAT	20	UG/L	0.40 U	U	549.2	0.40	06/28/2016	19:24	E87052
2033	ENDOTHALL	100	UG/L	6.3 UC3	C3U	548.1	6.3	07/01/2016	12:44	E87052
2034	GLYPHOSATE	700	UG/L	5.0 U	U	547	5.0	07/01/2016	00:50	E87052
2035	DI(2-ETHYLHEXYL)ADIPATE	400	UG/L	0.59 U	U	525.2	0.59	07/01/2016	22:22	E87052
2036	OXAMYL	200	UG/L	0.37 U	U	531.1	0.37	06/28/2016	07:46	E87052
2037	SIMAZINE	4.0	UG/L	0.034 U	U	525.2	0.034	07/01/2016	22:22	E87052
2039	DI(2-ETHYLHEXYL)PHTHALATE	6.0	UG/L	.059 U	U	525.2	.059	07/01/2016	22:22	E87052
2040	PICLORAM	500	UG/L	0.073 U	U	515.1	0.073	07/05/2016	16:20	E87052
2041	DINOSEB	7.0	UG/L	0.14 U	U	515.1	0.14	07/05/2016	16:20	E87052
2042	HEXACHLOROCYCLOPENTADIENE	50	UG/L	0.041 U	U	525.2	0.041	07/01/2016	22:22	E87052
2046	CARBOFURAN	40	UG/L	0.25 U	U	531.1	0.25	06/28/2016	07:46	E87052
2050	ATRAZINE	3.0	UG/L	0.022 U	U	525.2	0.022	07/01/2016	22:22	E87052
2051	ALACHLOR	2	UG/L	0.032 U	U	525.2	0.032	07/01/2016	22:22	E87052
2063	2,3,7,8-TCDD		PG/L	0.684 U	U	1613B	0.684	07/18/2016		E87688
2065	HEPTACHLOR	0.4	UG/L	0.0061 U	U	508	0.0061	06/28/2016	19:11	E87052
2067	HEPTACHLOR EPOXIDE	0.2	UG/L	0.0016 U	U	508	0.0016	06/28/2016	19:11	E87052
2105	2,4-D	70	UG/L	0.035 U	U	515.1	0.035	07/05/2016	16:20	E87052
2110	2,4,5-TP (SILVEX)	50	UG/L	0.057 U	U	515.1	0.057	07/05/2016	16:20	E87052

SYNTHETIC ORGANICS

62-550.310 (4) (b)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
2274	HEXACHLOROBENZENE	1.0	UG/L	0.040 U	U	525.2	0.040	07/01/2016	22:22	E87052
2306	BENZO(A)PYRENE	0.2	UG/L	0.028 U	U	525.2	0.028	07/01/2016	22:22	E87052
2326	PENTACHLOROPHENOL	1.0	UG/L	0.036 U	U	515.1	0.036	07/05/2016	16:20	E87052
2383	PCB	0.5	UG/L	0.044 U	U	508	0.044	06/28/2016	19:11	E87052
2931	1,2-DIBROMO-3-CHLOROPROPANE	0.20	UG/L	0.014 U	U	504.1	0.014	06/23/2016	17:00	E84167
2946	ETHYLENE DIBROMIDE	0.02	UG/L	0.01 U	U	504.1	0.01	06/23/2016	17:00	E84167
2959	CHLORDANE	2.0	UG/L	0.12 U	U	508	0.12	06/28/2016	19:11	E87052

RADIONUCLIDES

62-550.310 (6)

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
4000	GROSS ALPHA	15	PCI/L	1.5 U	U	900.0	1.5	07/01/2016	09:45	E83033
4006	URANIUM		PCI/L	0.6 U	U	908.1	0.6	07/13/2016	06:45	E83033
4006	URANIUM		UG/L	0.9 U	U	CALC	0.9	07/13/2016	06:45	E83033
4020	RADIUM-226	5	PCI/L	0.4+/-0.2		903.1	0.2	07/08/2016	09:56	E83033
4030	RADIUM-228	5	PCI/L	1.0+/-0.8		Ra-05	1.0	07/07/2016	11:16	E83033

SECONDARY CONTAMINANTS

62-550.320

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
	COLOR PH		UNITS	7.97		SM4500H+B		06/24/2016	16:29	E84167
1002	ALUMINUM	0.2	MG/L	0.336 X	X	200.7	0.023	06/28/2016	13:22	E84167
1017	CHLORIDE	250	MG/L	27.2		300.0	0.353	06/29/2016	13:23	E84167
1022	COPPER	1	MG/L	0.034		200.7	0.004	06/28/2016	13:22	E84167
1025	FLUORIDE.	4.0	MG/L	0.451		300.0	0.030	07/01/2016	14:05	E84167
1028	IRON	0.3	MG/L	0.074 I	I	200.7	0.029	06/28/2016	13:22	E84167

SECONDARY CONTAMINANTS

62-550.320

REPORT NUMBER: 16061060 - 001
SYSTEM NAME: Reservoir 1 Station 4-Pri &Sec
SYSTEM ID:

PARAMETER ID	PARAMETER NAME	MCL	UNITS	ANALYSIS RESULT	QUALIFIER	ANALYTICAL METHOD	MDL	ANALYSIS DATE	ANALYSIS TIME	LAB ID
1032	MANGANESE	0.05	MG/L	0.010		200.7	0.00098	06/28/2016	13:22	E84167
1050	SILVER		MG/L	0.000029 U	U	200.8	0.000029	06/30/2016	09:54	E83182
1055	SULFATE	250	MG/L	68.9		300.0	0.339	06/29/2016	13:23	E84167
1095	ZINC	5	MG/L	0.021		200.7	0.0014	06/28/2016	13:22	E84167
1905	COLOR, APPARENT	15	PCU	80 X	X	SM2120B	2.5	06/24/2016	16:29	E84167
1920	ODOR	3	TON	4 X	X	140.1	1	06/23/2016	14:00	E84167
1925	PH		UNITS	7.97 Q	Q	SM4500H+B		06/23/2016	16:39	E84167
1930	TOTAL DISSOLVED SOLIDS	500	MG/L	228		SM2540C	7.26	06/27/2016	10:57	E84167
2905	SURFACTANTS	0.5	MG/L	0.03 U	U	SM5540C	0.03	06/23/2016	11:25	E84167

DATA QUALIFIERS THAT MAY APPLY:

I = Reported value is between the laboratory MDL and the PQL.
J = Estimated value.
J3 = Estimated value. Quality control criteria for precision or accuracy not met.
J4 = Estimated value. Sample matrix interference suspected.
Q = Sample held beyond accepted hold time.
U = Analyte analyzed but not detected at the value indicated.
V = Analyte detected in sample and method blank. Results for this analyte in associated samples may be biased high. Standard, Duplicate, and Spike values are within control limits. Reported data are usable.

NOTES:

PQL = 4 x MDL.
MBAS calculated as LAS; molecular weight = 340.
ND = Not Detected at or above adjusted reporting limit.
X = Value exceeds MCL.

C1 = Method Deviation: Sample was received without an associated Field or Trip Blank for Low Level Mercury Analysis.
C3 = Estimated value; value may not be accurate. Spike recovery or RPD outside of criteria.
Surrogates for Method 515.1 = Estimated value; value may not be accurate. Surrogate recovery outside of criteria.

For questions or comments regarding these results, please contact us at (941)723-9986.

Results relate only to the samples.

TDT 7/29/16

Benchmark EnviroAnalytical, Inc.
1711 Twelfth Street East
Palmetto, FL 34221
(941) 723-9986
(941) 723-6061 fax
WWW.Benchmarkea.com

Report by 07/15/16

Client:

Peace River/ Manasota RWS
8998 SW County Road 769
Arcadia, FL 34269
(863) 491-7567
(863) 491-7569 (Fax)

Cl_2 - 3.5
Temp - 30.9
Ntu - 0.38
per MC. 07/07/16 BB

Chain of Custody Form: Reservoir 1 Primary & Secondary Analysis
Sample Type[1]: Grab
Method of Discharge: 62-302 Class 1 Treated SW to DW Sample Matrix[2]: DW

Laboratory Submission #: 160610G0

Sample ID	Sb, As, Ba, Be, Cr, Ni, Se, Na, Tl, Al, Cu, Fe, Mn, Zn ~~Hg~~*	Cd, Pb, Ag (200.8)	CN	Gross α, Radium-226 & 228 Uranium	Dioxin	Asbestos	VOCs	SOC's (Pesticides and PCB's)							MBAS (Foaming Agents)	Hg (1631E)	Total Hardness	Odor	Cl SO4 TDS Color/pH pH***** NO_2 (300.0) NO_3 (300.0) NO_3-NO_2 (Calc.) Fluoride	Lab ID #
								Carabamates 531.1	Pesticides 508	EDB/DBCP 504.1	Herbicides 515.3	Semivolatiales 525.2	Glyphosate 547	Endothall 548.1	Diquat 549.2					
	1: 4 HNO_3 pH<2 ☑	1: 4 HNO_3 pH<2 ☑	NaOH pH>9 ☑	1:4 HNO_3 pH<2 ☑	Plain	Plain	NaThio 1:1 HCl*	MCAA NaS_2O_3	NaS_2O_3	NaS_2O_3	NaS_2O_3	NaS_2O_3 1:1 HCl***	NaS_2O_3	NaS_2O_3	NaS_2O_3 H_2SO_4**	Plain	Pre-preserved from sublab	1:4 H2SO4 pH<2 □	Plain	Plain	
	1 x 1 Quart Plastic	1 x ½ Pint Plastic	1 x 250mL Plastic	2 x 2 Quart Plastic	2 x 950mL Amber Glass	1 x 1 Qt. Plastic	3 x 40mL Glass Vials****	2 x 60mL Glass Vials	2 x 1 Liter Glass	2 x 40mL Glass Vials	2 x 1 Liter Glass	2 x 1 Liter Glass	2 x 40mL Glass Vials	2 x 250mL Amber Glass	1 x 500mL Opaque Plastic	1 x 1 Quart Plastic	2 x 40mL Glass Vials	1 x ½ Pint Plastic	1 x 250mL Amber Glass	1 x 1 Quart Plastic	
Reservoir 1 Station 4	Date: 6/23/16 Time: 1000																			1

* 07/27/16 BB

*** Add 3 drops of HCl to each Vial.** ****Add H_2SO_4 to sample.**
***** Add ENTIRE vial of HCl to each sample bottle.**
******Fill all 3 vials COMPLETELY, there can be NO AIR BUBBLES.** *******pH Received after 15 minute hold time, ok to run.**

1 "Sample Type" is used to indicate whether the sample was a grab (G) or whether it was a composite (C).
2 "Sample Matrix" is used to indicate whether the sample is being discharged to drinking water (DW), groundwater (GW), surface water (SW), soil, sediment (SDMNT), or sludge (SLDG).
3 "Container Type" is used to indicate whether the container is plastic (P) or glass (G).
4 **Sample must be refrigerated or stored in wet ice after collection. The temperature during storage should be less than or equal to 6°C (42.8°F).**
Under "Preservative," list any preservatives that were added to the sample container.

Laboratory Sample Acceptability
pH<2 ☑
Temperature: 2.1°C

Instructions:
1. Each bottle has a label identifying sample ID, premeasured preservative contained in the bottle, sample type, client ID, and parameters for analysis.
2. The following information should be added to each bottle label after collection with permanent black ink: date and time of collection, sampler's name or initials, and any field number or ID.
3. All bottles not containing preservative may be rinsed with appropriate sample prior to collection.
4. The client is responsible for documentation of the sampling event. Please note special sampling events on the sample custody form.

	Collected / Relinquished By:	Date:	Time:	Received By:	Date:	Time:
1	Morgan Jacque	6/23/16	1111		6/23/16	1111
2	Relinquished By:	6/23/16	1140	Received By:	6/23/16	1140
3	Relinquished By:	6/23/16	1400	Received By:	6/23/16	1400
4	Relinquished By:	Date:	Time:	Received By:	Date:	Time:

Peace River Regional Water Supply Authority
8998 SW County Road 769
Arcadia, FL 34269
Phone: 863-491-7567
Fax: 863-491-7569

PROJECT: Reservoir 1 Primary and Secondary Analysis

Sample Description	Date / Time	pH (std. units)	Temperature (°C)	Specific Conductivity (µmhos/cm)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	
Reservoir 1 Station 4	6/23/16 1600						
Depth (ft)							
(Surface) 1 Ft		8.01	31.9	362	7.88	4.21	
10.25 ft		7.99	31.1	367	7.72	4.96	
20.5 ft		7.96	31.2	364	7.68	5.63	
							Total Depth 21.5 Ft

Notes: BENCHMARK
24.5 ft Reservoir level

Signature of collector / Date and Time: Morgan Cuevas 6/23/16

INTERLABORATORY SAMPLE TRANSMITTAL FORM

Benchmark EnviroAnalytical, Inc.
1711 12th Street East
Palmetto, FL 34221
(941) 723-9986
(941) 723-6061 fax

Office QC Check: _____
Bottle Check: _____

Date:	06/24/16		
# of Samples:	1	Total # of Bottles:	2
Method of Shipment:			
Subcontract Laboratory:	Florida Radiochemistry 5456 Hoffner Ave. #201 Orlando, Fl. 32812 Phone: 407-382-7733 Fax: 407-382-7744		
Page	1	of	1

Report by 07/15/16

Laboratory Submission #	Collection		Method of Discharge	Collection Method**	Preservative	Container			Parameters	Field Conductivity µs/cm
	Date	Time				Qty	Capacity	Type***		
16061060-1	06/23/16	1000	62-302 Class 1 Treated SW to DW	Grab	1:4 HNO_3	2	2 Qt	P	Gross Alpha, Radium 226 & 228 Uranium	

* Sample Matrix abbreviations: Groundwater (GW), Surface Water (SW), Saline Surface Water (SSW), Fresh Surface Water(FSW), Drinking Water (DW), Sludge (Sldg), Solid (Sol), Soil (Soil), Domestic Effluent (Dom Eff), Industrial Effluent (Ind Eff).
** Sample Method abbreviations: Grab (G), Composite (C), 24 Hour Composite (24HR Comp.).
*** Container Type abbreviations: Plastic (P), Glass (G).

Relinquished By: (Benchmark)	Sign Name:		Date:		Received By:		Date:	6-29-16
	Print Name:	Annah Jensen	Time:			MIKE NAUMANN	Time:	11:35
Relinquished By:	Sign Name:		Date:		Received By:		Date:	
	Print Name:		Time:				Time:	

OrderID: 341606486

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Asbestos Chain of Custody

EMSL Order Number *(Lab Use Only)*: 341606486

EMSL ANALYTICAL, INC.
5125 ADANSON STREET,
SUITE 900
ORLANDO, FL, 32804
PHONE: 407-599-5887
FAX: 407-599-9063

Company : Benchmark EnviroAnalytical, Inc.	**EMSL-Bill to:** ☐ Same ☒ Different If Bill to is Different note instructions in Comments** *Third Party Billing requires written authorization from third party*
Street: 1711 12th Street East	
City: Palmetto / **State/Province: FL**	**Zip/Postal Code: 34221** / **Country: USA**
Report To (Name): Bettina Beilfuss	**Fax #: 941-723-6061**
Telephone #: 941-723-9986	**Email Address: Bettina.Beilfuss@benchmarkea.net**
Project Name/Number:	
Please Provide Results: ☐ Fax ☒ Email / **Purchase Order:**	**U.S. State Samples Taken: FL**

Turnaround Time (TAT) Options* – Please Check

☐ 3 Hours ☐ 6 Hours ☐ 24 Hrs ☐ 48 Hrs ☐ 3 Days ☐ 4 Days ☐ 5 Days ☐ 10 Days

**For TEM Air 3 hours/6 hours, please call ahead to schedule. *There is a premium charge for 3 Hour TEM AHERA or EPA Level II TAT. You will be asked to sign an authorization form for this service. Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide.*

PCM - Air
- ☐ NIOSH 7400
- ☐ w/ OSHA 8hr. TWA

PLM - Bulk (reporting limit)
- ☐ PLM EPA 600/R-93/116 (<1%)
- ☐ PLM EPA NOB (<1%)

Point Count
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

Point Count w/Gravimetric
- ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
- ☐ NYS 198.1 (friable in NY)
- ☐ NYS 198.6 NOB (non-friable-NY)
- ☐ NIOSH 9002 (<1%)

TEM - Air
- ☐ AHERA 40 CFR, Part 763
- ☐ NIOSH 7402
- ☐ EPA Level II
- ☐ ISO 10312

TEM - Bulk
- ☐ TEM EPA NOB
- ☐ NYS NOB 198.4 (non-friable-NY)
- ☐ Chatfield SOP
- ☐ TEM Mass Analysis-EPA 600 sec. 2.5

TEM – Water: EPA 100.2
- Fibers >10µm ☐ Waste ☒ Drinking
- All Fiber Sizes ☐ Waste ☐ Drinking

TEM- Dust
- ☐ Microvac - ASTM D 5755
- ☐ Wipe - ASTM D6480
- ☐ Carpet Sonication (EPA 600/J-93/167)

Soil/Rock/Vermiculite
- ☐ PLM CARB 435 - A (0.25% sensitivity)
- ☐ PLM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - B (0.1% sensitivity)
- ☐ TEM CARB 435 - C (0.01% sensitivity)
- ☐ EPA Protocol (Semi-Quantitative)
- ☐ EPA Protocol (Quantitative)

Other:
- ☐

☐ **Check For Positive Stop – Clearly Identify Homogenous Group**

Samplers Name: Client / **Samplers Signature:**

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
16061060	Reservoir 1 Station 4	1 Qt	6/23/16 1000
			30.1°

Client Sample # (s): 16061060 - **Total # of Samples: 1**

Relinquished (Client): Melinda Merchant **Date:** 6/23/16 **Time:** 1545

Received (Lab): **Date:** 6-27-16 **Time:** 10:50AM

Comments/Special Instructions: Email invoice to: Invoicing@benchmarkea.net

ENVIRONMENTAL CONSERVATION LABORATORIES CHAIN-OF-CUSTODY RECORD

10775 Central Port Dr.
Orlando, FL 32824
(407) 826-5314 Fax (407) 850-6945

4810 Executive Park Court, Suite 111
Jacksonville, FL 32216-6069
(904) 296-3007 Fax (904) 296-6210

102-A Woodwinds Industrial Court
Cary, NC 27511
(919) 467-3090 Fax (919) 467-3515

Client Name: Benchmark EA	Project Number: 16061060
Address: 1711 12th Street East	Project Name/Desc: Res. 1 Sta. 4
City/ST/Zip: Palmetto Fl 34221	PO # / Billing Info:
Tel: 941-723-9986 Fax:	Reporting Contact: Bettina
Sampler(s) Name, Affiliation (Print): Client	Billing Contact: Nathan
Sampler(s) Signature:	Facility # (if required):

Requested Analyses

Preservatives (See Codes) (Continue as necessary)

Item #	Sample ID (Field Identification)	Collection Date	Collection Time	Comp / Grab	Matrix (see codes)	Total # of Containers	Cd, Pb, Ag (200.8)	N									Sample Comments
1	16061060-1	06/23/16	1000	G	*	1	X										
						1											

← Total # of Containers

Requested Turnaround Times

Note: Rush requests subject to acceptance by the facility

___ Standard

___ Expedited

Due 7/15/16

Lab Workorder: A6043981

Sample Kit Prepared By:	Date/Time:	Date/Time: 6/24/16 1200	Received By:	Date/Time: 6/24/16 0800
		Date/Time:	Received By: S. Chesley	Date/Time: 6/25/16 0800
		Date/Time:	Received By:	Date/Time:

Comments: * 62-302 Class 1 Treated SW to DW

Via FLX

Cooler #'s & Temps on Receipt: (9.7+1) 0.6°C

Condition Upon Receipt: X Acceptable ___ Unacceptable

Matrix: GW-Groundwater, SO-Soil, SE-Sediment, SW-Surface Water, WW-Wastewater, A-Air, O-Other (detail in comments)

Preservatives: H-HCl, N-HNO3, S-H2SO4, NO-NaOH, O-Other (detail in comments)

Note: All samples submitted to ENCO Labs are in accordance with the terms and conditions listed on the reverse of this form, unless prior written agreements exist.

INTERLABORATORY SAMPLE TRANSMITTAL FORM

Benchmark EnviroAnalytical, Inc.
1711 12th Street East
Palmetto, FL 34221
(941) 723-9986
(941) 723-6061 fax
WWW.Benchmarkea.com
Office QC Check: _____
Bottle Check: _____

16061760-01
CSV

Report by 07/15/16

Date:	06/23/16		
Project Name:	Res. 1 Sta. 4		
# of Samples:	1	Total # of Bottles:	4
Method of Shipment:	UPS – 2 Day Air		
Subcontract Laboratory:	Summit Environmental 3310 Win Street Cuyahoga Falls, Ohio. 44223 (330) 253-8211		
Page	1	of	1

Laboratory Submission #	Collection Date	Collection Time	Sample Matrix[1]	Collection Method[2]	Preservative	Container Qty	Container Capacity	Container Type[3]	Parameters	Comments
16061060-1	06/23/16	1000	DW	G	Plain	2	950mL	G	Dioxin	62-302 Class I Treated Sub to Ow
16061060-1	06/23/16	1000	DW	G	Pre-Preserved	2	40mL	G	Low Level Mercury (1631E)	

1. "Sample Matrix" abbreviations: Groundwater (GW), Surface Water (SW), Drinking Water (DW), Sludge (Sldg), Solid (Sol), Soil (Soil), Domestic Effluent (Dom Eff), Industrial Effluent (Ind Eff)
2. "Sample Method" abbreviations: Grab (G), Composite (C)
3. "Container Type" abbreviations: Plastic (P), Glass (G)

Relinquished By: (Benchmark)	Sign Name:		Date:	06/23/16	Received By:		Date:	06/23/16
	Print Name:	Annah Jensen	Time:	1600		UPS	Time:	1600
Relinquished By:	Sign Name:		Date:		Received By:		Date:	6-27-16
	Print Name:		Time:				Time:	1010

INTERLABORATORY SAMPLE TRANSMITTAL FORM

Benchmark EnviroAnalytical, Inc.
1711 12th Street East
Palmetto, FL 34221
(941) 723-9986
(941) 723-6061 fax
www.Benchmarkea.com
Office QC Check: _____
Bottle Check: _____

Date:		06/23/16		
# of Samples:	1	Total # of Bottles:	13	
Method of Shipment:	Hand Delivery			
Subcontract Laboratory:	Test America Laboratories - Tampa 6712 Benjamin Road Suite 100 Tampa, Fl 33634 813-885-7427 ext.139 Keaton Conner: keaton.conner@testamericainc.com			
Page	1	of	1	

Report by 07/15/16

Laboratory Submission #	Collection Date	Collection Time	Method of Discharge	Collection Method**	Preservative	Container Qty	Container Capacity	Container Type***	Parameters SOC's (Pesticides and PCB's)	Comments
16061060-1	06/23/16	1000	62-302 Class I Treated SW to DW	Grab	MCAA $Na_2S_2O_3$	2	60mL	G	Carabamates (531.1)	*
					$Na_2S_2O_3$	2	1 L	G	Pesticides (508)	*
					$Na_2S_2O_3$	2	1 L	G	Herbicides (515.3)	*
					$Na_2S_2O_3$ HCl	2	1 L	G	Semivolatiles (525.2) Dioxin Screen	*
					$Na_2S_2O_3$	2	40mL	G	Glyphosate (547)	*
					$Na_2S_2O_3$	2	250mL	G	Endothall (548.1)	*
					$Na_2S_2O_3$ H_2SO_4	1	500mL	P	Diquat (549.2)	*
									*Do NOT Dilute sample. Call Dale Dixon for OK first!	

* Sample Matrix abbreviations: Groundwater (GW), Surface Water (SW), Saline Surface Water (SSW), Fresh Surface Water(FSW), Drinking Water (DW), Sludge (Sldg), Solid (Sol), Soil (Soil), Domestic Effluent (Dom Eff), Industrial Effluent (Ind Eff).
** Sample Method abbreviations: Grab (G), Composite (C), 24 Hour Composite (24HR Comp.).
*** Container Type abbreviations: Plastic (P), Glass (G).

Relinquished By: (Benchmark)	Sign Name:		Date:	06/24/16	Received By:		Date:	6/24/16
	Print Name:	Amish Jensen	Time:	830			Time:	830
Relinquished By:	Sign Name:		Date:	6/24/16	Received By:		Date:	6/25/16
	Print Name:	Kristin Southers	Time:	1800		680-126866	Time:	0705

660-126866-4

3.3|2.7|3.2|2.9|(c)3.6|3.0|3.5|3.2c

Page 17 of 18

7/19/2016

APPENDIX F-3
PTSW Pilot Test - PTSW Water Quality

SAMPLE DATE	PH (SU)	TEMP (C°)	SPECIFIC COND. (µS/cm)	ORP (mV)	DO (mg/L)	TURBIDITY (NTU)	Cl- (mg/L)	SO4 (mg/L)	TDS (mg/L)	TSS (mg/L)	TKN (mg/L)	AMMONIA (mg/L) Q	COLOR (Color Units)	NITRATE As N (mg/L) Q	ALUMINUM (mg/L)	TOC (mg/L)	ARSENIC (µg/L) Q	TOTAL COLIFORM (CFU/100mL) Q	E.COLI (CFU/100mL) Q
2/9/2017	8.2	22.5	351	45	8.94	4.54	22.9	59.4	196	5.16	0.579	0.054	70	0.02 U	0.362	12	1.54 I	488	1
2/10/2017	7.98																	921	3
2/14/2017	8.05	21.1	362	245.2	9.04	4.94	24.2	62.3	220	5.11	0.813	0.028 I	70	0.02 U	0.37	11.6	1.12 I	2420 Z	1 U
2/14/2017	8.05	21.1	362	245.2	9.04	4.94												2420 Z	1 U
2/16/2017	8.21	23.1	353	-36.8	8.84	4.71		61.4										2420 Z	2
2/21/2017	8.26	22.2	370	-150.2	8.86	3.83	25.3	65.0	204	4.89	0.676	0.055	60	0.02 U	0.466	11.2	1.12 I	1986	2
2/24/2017	8.13	21.2	377	21.6	8.85	4.43		64.8										1046	1
2/27/2017	8.22	23.6	376	-20.8	9.01	5.06	24.8	64.0	188	4.94	0.645	0.043	50	0.02 U	0.338	11.8	0.692 I	1300	1 U
3/2/2017	8.26	24.2	375	-106.2	8.72	5.17		64.9										1203	1
3/7/2017	8.28	22.5	379	-121.7	8.87	4.62	25.9	67.4	192	12.2	0.702	0.1	60	0.02 U	0.341	11.1	0.897 I	517	1 U
3/9/2017	8.38	24.0	394	17.4	8.96	3.48		66.6										816	1
7/11/2017	7.8	30.8	441	100.4	6.88	5.04	34.4	89.8	256	8.6	1.27	0.119	140	0.03	0.573	14	1.13 I	770	2
7/11/2017	7.8	30.8	441	100.4	6.88	5.04													
7/13/2017	7.82	29.2	430	102.9	6.91	5.79		86.3										980	1 U
7/18/2017	7.56	27.7	442	192.8	7.18	7.05	33.2	85.1	240	8.2	1.45	0.392	100	0.104	0.413	15	1.2 I	1203	1
7/21/2017	7.44	27.0	434	20.7	7.21	7.68		84.1										1986	3
8/3/2017	7.55	28.0	406	73.8	6.78	6.70	29.1	75.0	312	4.67	0.912	0.008 U	150	0.303	0.332	16.9	0.937 I	1553 1	1 U
8/4/2017	7.48	29.3	392	262.7	6.66	7.21		75.4										2420 Z	1 U
8/10/2017	7.53	30.4	377	124.9	7.15	8.20	28.2	73.6	280	6.67	1.13	0.008 I	180	0.337	0.329	17.2	1.15 I	1733	1 U
8/11/2017	7.58	29.2	379	222.2	6.99	6.99		71.3										921	1 U
8/14/2017	7.41	29.5	370	87.8	6.76	6.58	28.3	75.0	280	5.4	1.13	0.045	200	0.378	0.382	18.6	0.689 U	1203	1
8/18/2017	7.3	30.0	364	189.4	6.94	6.70		70.0										1120	2
8/21/2017	7.44	30.2	356	163.7	7.02	7.03	27.3	70.2	248	16.2	1.26	0.008 U	150	0.324	0.335	18.5	1.41 I	1203	1 U
8/23/2017	7.48	29.7	362	166.2	6.92	7.95		75.3										1203	1 U
8/28/2017	7.38	29.5	337	220.1	6.49	18.30	61.1	78.8	236	8.6	1.2	0.008 U	200	0.515	0.493	18.1	1.14	2420 Z	1
8/30/2017	7.25	28.9	341	266.1	6.77	9.71		66.6										1986 U	1
9/19/2017	7.39	27.0	323	14.9	7.43	7.08	25.9	65.8	244	8.8	1.19	0.008 U	150	0.445	0.47	16.6	0.689 U	1553	1 U
9/21/2017	7.58	28.7	319	-8.1	7.55	5.99		58.7										1553	1 U
9/25/2017	7.27	26.7	331	60	7.22	7.92	22.2	57.2	208	15.7	1.04	0.008 U	180	0.486	0.437	16.1	1.07 I	2420	1 U
9/26/2017	7.63	28.0	319	18.4	7.55	6.21		59.1										2420	1
10/2/2017	7.29	28.2	314	93.9	7.3	7.24	22.5	58.5	208	7.0	0.94	0.014 I	200	0.505	0.461	16.4	1.2 I	1733	1
10/5/2017	7.71	26.4	308	70.7	7.64	6.49		58.9										2420 Z	1
10/11/2017	7.23	27.1	301	79.9	7.53	5.92	21.6	55.9	236	14.3	1.18	0.087	180	0.498	0.499	19.5	2.5	1986	1
10/12/2017	7.33	28.0	294	75	7.68	6.54		57.0										1986	1
10/17/2017	7.56	27.5	300	31.6	7.43	6.35	21.6	55.4	224	5.0	0.903	0.03 I	160	0.546	0.67	19.4	1.59 I	2420 Z	1 U
10/20/2017	7.74	26.5	291	2.8	7.62	6.40		50.1										2420	1
10/24/2017	7.59	26.4	289	-31.6	7.54	9.31	21.1	53.8	204	24.5	0.875	0.008 U	180	0.558	0.609	17.7	2.62 I	2420	2
10/26/2017	7.23	23.1	294	94.2	7.95	12.40		50.9										2420	1
10/30/2017	7.38	21.4	290	175.9	8.4	7.20	21.3	53.7	212	11	1.21	0.008 U	150	0.493	0.493	17.8	1.22 I	2420 Z	6

Legend:

Z Too many colonies were present (TNTC). The numberic value represents the filtration volume

U Analyte analyzed but not detected

I Reported value is between the laboratory MDL and PQL