



Sarasota County
Solid Waste Operations

RECEIVED

SEP 20 2013

D.E.P. South District

Central County Solid Waste Disposal Complex
Water Quality Monitoring Plan
September 10, 2013

WATER QUALITY MONITORING PLAN

CENTRAL COUNTY SOLID WASTE DISPOSAL COMPLEX SARASOTA COUNTY, FLORIDA

WACS ID No: SWD/58/51614

September 10, 2013

RECEIVED

SEP 20 2013

Prepared From:

D.E.P. South District

Document entitled "Ground Water Monitoring Plan Addendum," prepared by SCS Engineers, dated June 28, 2002, with revisions dated July 24, 2002 [Section 2 – Leachate Sampling Parameters] and September 16, 2002 [Appendix A], received June 28, 2002, July 29, 2002, and September 20, 2002

SCS Engineers, 3012 U.S. Highway 301 North, Suite 700, Tampa, Florida 33619

"Revisions to Section 4.0 of the SCS document" – dated February 22, 2007
PBS&J, 428 South Keller Road, Orlando, Florida 32810-6101

"Water Quality Monitoring Plan Addendum" – April 23, 2009
HDR, 5426 Bay Center Drive, Suite 400, Tampa, Florida 33609-3444

"Water Quality Monitoring Plan Addendum" – dated July 2010
HDR, 5426 Bay Center Drive, Suite 400, Tampa, Florida 33609-3444

"Geotechnical Services: Soil and Groundwater Sampling Analysis, Sarasota County Central Landfill, Sarasota County, FL" dated July 12, 2010, Dunkelberger Engineering and Testing, Inc., 8260 Vico Court, Unit B, Sarasota, Florida 34240

"Natural Attenuation With Monitoring Plan" - dated August 2010, Innovative Waste Consulting Services, LLC (IWCS) and PBS&J, 6628 NW 9th Boulevard, Suite 3, Gainesville, FL 32605

"Background Groundwater Quality Assessment" - dated October 4, 2011, IWCS and Atkins, 6628 NW 9th Boulevard, Suite 3, Gainesville, FL 32605

This Water Quality Monitoring Plan was developed from information contained within the documents listed above at the request of the Florida Department of Environmental Protection (FDEP). During a meeting held on July 17, 2013, FDEP personnel requested that the Water Quality Monitoring Plan be updated and included with the facility's permit renewal application. Each of the documents were signed and sealed by a registered professional geologist or professional engineer prior to submittal to the Florida Department of Environmental Protection. During the meeting, it was noted that sampling and analysis of landfill leachate and gas condensate would no longer be required at this facility, so sampling of these liquids is not part of this Water Quality Monitoring Plan.

TABLE OF CONTENTS

| <u>Section</u> | <u>Page</u> |
|--|-------------|
| 1 INTRODUCTION | 1-1 |
| 2 GROUNDWATER | 2-1 |
| 2.1 Monitoring and Piezometer Wells | 2-1 |
| 2.2 Monitoring Well Installation, Design and Abandonment..... | 2-2 |
| 2.3 Monitoring Well Sampling and Analysis | 2-3 |
| 2.4 Natural Attenuation Monitoring Wells | 2-4 |
| 2.5 Natural Attenuation Monitoring Well Sampling and Analysis..... | 2-5 |
| 3 SURFACE WATER | 3-1 |
| 3.1 Surface Water Monitoring Locations..... | 3-1 |
| 3.2 Surface Water Sampling and Analysis | 3-1 |
| 4 REPORTING | 4-1 |
| 4.1 Water Quality Monitoring Reports | 4-1 |
| 4.2 Evaluation of Water Quality Monitoring Plan..... | 4-1 |

LIST OF TABLES

| <u>Table</u> | | |
|--------------|--|-----|
| 2-1 | Groundwater Monitoring Wells at CCSWDC | 2-1 |
| 2-2 | Staff Gauge Locations at CCSWDC..... | 2-4 |
| 2-3 | Natural Attenuation Monitoring Wells at CCSWDC | 2-5 |
| 3-1 | Surface Water Monitoring Locations at CCSWDC..... | 3-1 |

LIST OF FIGURES

| <u>Figure</u> | |
|---------------|-------------------------------------|
| 1 | Site Plan – CCSWDC |
| 2 | Typical Groundwater Monitoring Well |

RECEIVED

SEP 20 2013

D.E.P. South District

ATTACHMENTS

| <u>Attachment</u> | |
|-------------------|---|
| A | FDEP Form 62-701.900(30) – Monitoring Well Completion Report |
| B | FDEP Form 62-701.900(31) – Water Quality Monitoring Certification |

SECTION 1.0

INTRODUCTION

The Florida Department of Environmental Protection (FDEP), Permit Number S058-299180 to operate the Central County Solid Waste Disposal Complex was issued to the Sarasota County Solid Waste Operations on July 30, 1997. Operation of the landfill began on June 15, 1998. Since this date, the original permit expired and the landfill has been further developed to include an additional Phase, know as Phase II. The current permit for the operation of the landfill is Permit Number 130542-0007-SO/01. It was issued on November 18, 2008 and expires on November 18, 2013. This document is being provided as a submittal to be included with the permit application to renew the permit.

As specified by 62-701.510(2), F.A.C., the permittee shall provide FDEP with a Water Quality Monitoring Plan (WQMP) for the landfill site that describes the ground water and surface water monitoring systems. This document satisfies this requirement.

SECTION 2.0

GROUNDWATER

2.1 MONITORING AND PIEZOMETER WELLS

The standard Solid Waste Facility groundwater monitoring program consists of collecting groundwater samples from the locations listed in Table 2-1. A separate, but related, Natural Attenuation Monitoring groundwater program is discussed below in Sections 2.4 and 2.5 that will fulfill the requirements of Consent Order 08-1728.

The standard monitoring program includes sampling one background well and nine detection wells. All of the monitoring wells are installed in the surficial aquifer. There are no intermediate aquifer (permeable beds of the Hawthorn Group) or Floridan aquifer monitoring wells used as part of the groundwater monitoring program.

Monitoring wells MW-3 and MW-5 are inactive, but are used for water level measurements. These wells are included in the groundwater monitoring program for water level data collection only. Compliance wells CW-8A, CW-9, CW-10R, CW-15, and CW-16 will be converted to piezometers, and will be used only for water level measurements.

Due to poor siting and access issues, MW-18, MW-19, and MW-20 will be abandoned. MW-18 will be replaced with a new well, MW-18R. CW-19 and CW-20 will be re-named as MW-19A and MW-20A, respectively, and will be used as detection wells. Replacement monitoring well MW-18R will be installed as discussed in Section 2.2. Monitoring wells MW-18, MW-19, and MW-20 will be abandoned as discussed in Section 2.2.

Figure 1 shows the monitoring well locations.

TABLE 2-1. GROUNDWATER MONITORING WELLS AT CCSWDC

| Well Number | WACS ID# | Aquifer Monitored | Purpose | Comments |
|-------------|----------|-------------------|------------|--|
| MW-1R | 20585 | Surficial | Background | MW-1 replaced due to groundwater level not in screen |
| MW-3 | 4503 | Surficial | Piezometer | Used for water level elevation only |
| MW-5 | 4505 | Surficial | Piezometer | Used for water level elevation only |
| MW-8A | 21453 | Surficial | Detection | MW-8 replaced due to groundwater level not in screen |

| Well Number | WACS ID# | Aquifer Monitored | Purpose | Comments |
|-------------|----------|-------------------|-----------|--|
| MW-9 | 4509 | Surficial | Detection | Phase I |
| MW-10R | 4510 | Surficial | Detection | MW-10R was a replacement well for MW-10 - May 1996 |
| MW-15 | 23031 | Surficial | Detection | Phase II |
| MW-16 | 23032 | Surficial | Detection | Phase II |
| MW-17 | 23033 | Surficial | Detection | Phase II |
| MW-18R | TBD | Surficial | Detection | Phase II – replacement for MW-18 |
| MW-19A | 27140 | Surficial | Detection | Phase II – replacement for MW-19 (formerly CW-19) |
| MW-20A | 27141 | Surficial | Detection | Phase II – replacement for MW-20 (formerly CW-20) |

TBD = to be determined

2.2 MONITORING WELL INSTALLATION, DESIGN AND ABANDONMENT

Monitoring wells shall be constructed as shown on Figure 2, Typical Groundwater Monitoring Well. Record drawings for all newly installed groundwater monitoring wells shall be submitted to the FDEP on Form 62-701.900(30), Monitoring Well Completion Report, Attachment A.

An initial sampling event shall be conducted within seven (7) days of well installation and development, for the analysis of the field and laboratory parameters currently required by the facility permit.

All groundwater monitoring wells shall have protective bollards or other devices installed around them if they are located in areas of high traffic flow in order to prevent damage to the well. Wells shall be clearly labeled, visible and locked when not in use, in order to minimize the potential for unauthorized access.

FDEP shall be notified in writing when any monitoring well is damaged or site conditions require a well to be abandoned. All wells shall be plugged so that they do not act as a conduit for leachate release to the groundwater.

2.3 MONITORING WELL SAMPLING AND ANALYSIS

FDEP shall be notified 14 days prior to conducting any routine sampling event, so that the Department may collect split samples. This routine sampling applies to MW-1R, MW-8A, MW-9, MW-10R, MW-15, MW-16, MW-17, MW-18R, MW-19A, and MW-20A.

Groundwater monitoring wells are sampled semi-annually for the following parameters:

Field Parameters

- Static water level before purging
- Specific conductance
- pH
- Dissolved oxygen
- Turbidity
- Temperature
- Colors and sheens by observation

Laboratory Parameters (Unfiltered)

- Total ammonia-nitrogen (Ammonia-N)
- Chlorides
- Nitrate
- Sulfate
- Total Dissolved Solids (TDS)
- Iron
- Manganese
- Mercury
- Sodium
- Those parameters listed in 40 Code of Federal Regulations (CFR) Part 258, Appendix I

Groundwater elevations will be measured at all active wells and piezometers during all sampling events to a precision of 0.01 foot. The water surface contour maps prepared for each sampling event will include ground water elevations (measured in feet NGVD) calculated for each well and piezometer well. In addition to the water level measurements taken from the groundwater monitoring wells, surface water elevations shall also be measured at the staff gauge locations listed in Table 2-2 for each sampling event. A water table surface elevation contour map shall be prepared for each set of water level measurements and submitted to FDEP for all routine ground water sampling events and monitoring plan evaluation reports. Figure 1 shows the location of staff gauges.

TABLE 2-2. STAFF GAUGE LOCATIONS AT CCSWDC

| Gauge Name | Location |
|-------------------|-------------------------|
| STW-1 | Storm Pond 1 |
| STW-2 | Storm Pond 2 |
| STW-3 | Storm Pond 3 |
| STW-4 | Storm Pond 4 |
| STW-5A | Storm Pond 5, west side |
| STW-5B | Storm Pond 5, east side |
| STW-6 | Storm Pond 6 |
| STW-7 | Storm Pond 7 |

2.4 NATURAL ATTENUATION MONITORING WELLS

Between 2008 and 2011, a series of studies were conducted to determine the causes of elevated iron, ammonia, and arsenic concentrations in the groundwater at this facility. The studies are summarized in the above-referenced documents: “Natural Attenuation With Monitoring Plan” and “Background Groundwater Quality Assessment”, which are on file with the FDEP. The studies recommended that natural attenuation with monitoring should be used as the site rehabilitation approach for this facility. The studies indicated that the elevated concentrations of arsenic, ammonia, and other constituents were the result of reductive dissolution conditions created in the site’s groundwater by development of the landfill property. The studies noted that the reductive dissolution conditions should be reversed as the groundwater flows through the undeveloped portions of the property. The FDEP agreed, in principle, with the findings of these studies, and Natural Attenuation Monitoring was discussed at the July 17, 2013 meeting between Sarasota County Solid Waste staff and the FDEP. The proposed Natural Attenuation Monitoring program consists of collecting groundwater samples from the locations listed in Table 2-3.

Since 2008, compliance monitoring has been required at the Phase I portion of the landfill, and since 2010, compliance monitoring has been required at the Phase II portion of the landfill. A total of 10 compliance wells have been installed at this facility since 2008. The compliance monitoring was required due to the detections of elevated groundwater concentrations of primarily iron, ammonia, and arsenic, but also isolated occurrences of elevated concentrations of aluminum, chloride, manganese, sodium, and sulfate. The Natural Attenuation Monitoring program is intended to replace the need for compliance monitoring.

The Natural Attenuation Monitoring program includes sampling of four monitoring wells along the south and west sides of the landfill property, but within the undeveloped portions of the property. The Natural Attenuation Monitoring wells are used as temporary points of compliance and to monitor (and in place of) the zone of discharge. These monitoring wells are downgradient of the active landfill cells and will provide monitoring of the groundwater quality as the reductive dissolution process is replaced by more natural processes, along the pathway that the groundwater flows toward the site’s boundaries.

Figure 1 shows the proposed locations of the Natural Attenuation Monitoring wells. The monitoring wells will be installed as discussed in Section 2.2.

TABLE 2-3. NATURAL ATTENUATION MONITORING WELLS AT CCSWDC

| Well Number | WACS ID# | Aquifer Monitored | Purpose | Comments |
|-------------|----------|-------------------|--------------------------------|---|
| NAM-1 | TBD | Surficial | Natural Attenuation Monitoring | Utilize existing well PW-1 |
| NAM-2 | TBD | Surficial | Natural Attenuation Monitoring | Utilize existing well PW-2 |
| NAM-3 | TBD | Surficial | Natural Attenuation Monitoring | Utilize existing well PW-3 |
| NAM-4 | TBD | Surficial | Natural Attenuation Monitoring | Location of TPOC-1 from the 2010 NAM Plan |

TBD = To be determined

2.5 NATURAL ATTENUATION MONITORING WELL SAMPLING AND ANALYSIS

FDEP shall be notified 14 days prior to conducting any Natural Attenuation Monitoring sampling event, so that the Department may collect split samples. Natural Attenuation Monitoring applies to the following wells: NAM-1, NAM-2, NAM-3, and NAM-4.

The Natural Attenuation Monitoring wells will have an initial sampling event that will meet the requirements of 62-701.510(7)(a) and (c), F.A.C, including mercury and nitrate.

Natural Attenuation Monitoring wells are sampled semi-annually for the following parameters:

Field Parameters

- Static water level before purging
- Specific conductance
- pH
- Dissolved oxygen
- Turbidity
- Temperature
- Colors and sheens (by observation)

Laboratory Parameters (Unfiltered)

Parameters required to be sampled as part of Consent Order 08-1728:

- Ammonia-N
- Arsenic
- Iron
- TDS

Parameters required to be sampled due to periodic exceedances of Rule 62-777, F.A.C. criteria in the detection wells:

- Aluminum
- Chloride
- Manganese
- Sodium
- Sulfate

Groundwater elevations will be measured at all the Natural Attenuation Monitoring wells during all sampling events to a precision of 0.01 foot. The water surface contour maps prepared for each sampling event will include the Natural Attenuation Monitoring wells. It is expected that the Natural Attenuation Monitoring will be conducted concurrently with the standard groundwater monitoring, so that the water levels at the Natural Attenuation Monitoring wells can be used with the site-wide groundwater contour map.

The above-referenced laboratory parameters will be compared to Groundwater Cleanup Target Levels (GCTLs), per Rule 62-777, F.A.C., in order to evaluate the effectiveness of Natural Attenuation Monitoring as a remediation approach. The results for aluminum, ammonia-N, arsenic, manganese, and sulfate will be compared to their GCTLs. However, certain parameters have been detected in background monitoring wells at concentrations greater than their GCTLs. Therefore, alternate Cleanup Target Levels are proposed for those parameters. The report entitled "Geotechnical Services: Soil and Groundwater Sampling Analysis, Sarasota County Central Landfill, Sarasota County, FL", dated July 2010, documented elevated concentrations of iron, TDS, sodium, and chloride in monitoring well PW-5. PW-5 is located in the natural, undeveloped area surrounding the landfill proper. The alternate Cleanup Target Levels are proposed, as follows, based on that report:

| <u>Parameter</u> | <u>Alternate Cleanup Target Level</u> |
|------------------|---------------------------------------|
| Iron | 16.32 mg/l |
| TDS | 2,520 mg/l |
| Sodium | 580 mg/l |
| Chloride | 888 mg/l |

SECTION 3.0
SURFACE WATER

3.1 SURFACE WATER MONITORING LOCATIONS

The surface water monitoring sites include Pond 1, along the north side of the active landfill, which is a downgradient (or downstream) surface water sampling location, and Pond 2, along the west side of the active landfill, which is also a downgradient (or downstream) surface water sampling location. The site characteristics are described in Table 3-1, and surface water monitoring locations are shown on Figure 1.

TABLE 3-1. SURFACE WATER MONITORING LOCATIONS AT CCSWDC

| Surface Water Monitoring Location | WACS ID# | Water Body Monitored | Purpose |
|-----------------------------------|----------|----------------------|---|
| Pond 1 (at STW-1) | 28824 | Pond 1 | Surface Water Collection and Downgradient |
| Pond 2 (at STW-2) | 28825 | Pond 2 | Surface Water Collection and Downgradient |

3.2 SURFACE WATER SAMPLING AND ANALYSIS

Surface water locations are sampled semi-annually for the following parameters:

Field Parameters

- Specific conductivity
- pH
- Dissolved oxygen
- Turbidity
- Temperature
- Colors and sheens (by observation)

Laboratory Parameters (Unfiltered)

- Chlorophyll A
- Total hardness (as mg/L CaCO₃)
- Total phosphorus (as mg/L P)
- Iron
- Mercury
- Nitrate
- Total nitrogen

- Un-ionized ammonia
- Biochemical oxygen demand (BOD₅)
- Chemical oxygen demand (COD)
- Total organic carbon (TOC)
- Total dissolved solids (TDS)
- Total suspended solids (TSS)
- Fecal coliform
- Those parameters listed in 40 CFR Part 258, Appendix I

SECTION 4.0

REPORTING

4.1 WATER QUALITY MONITORING REPORTS

Results of all sampling events shall be submitted to FDEP within 60 days from completion of laboratory analyses, unless a different due date has been specified in the permit. Water quality data shall be provided to the FDEP in an electronic format, unless an alternate form of submittal is specified. Form 62-701.900(31) (Attachment B), Water Quality Monitoring Certification, shall be used to certify that the laboratory results have been reviewed and approved by the county. At a minimum, the report shall include the following:

1. The facility name and identification number, sample collection dates and analysis dates;
2. All analytical results;
3. Identification number and designation of all surface water and groundwater monitoring points;
4. Applicable water quality standards;
5. Quality assurance, quality control notations;
6. Method detection limits;
7. STORET code numbers for all parameters;
8. Water levels recorded prior to evaluating wells or sample collection;
9. Updated groundwater table contour map signed and sealed by a professional geologist or profession engineer;
10. A summary of any water quality standards or criteria that are exceeded.

4.2 EVALUATION OF WATER QUALITY MONITORING PLAN

An evaluation of the water quality monitoring plan for the Central County Solid Waste Disposal Complex shall be conducted every two and one-half years. The WQMP evaluation is required to include an assessment of the effectiveness of the existing landfill design and operation as related to the prevention of groundwater contamination. A report detailing the findings and recommendations to improve the WQMP shall be submitted to the Florida Department of Environmental Protection. The requirements of F.A.C. 62-701.510(9)(b) include the following items that, at a minimum, must be included in the evaluation:

1. Tabular and graphical displays of any data which show that a monitoring parameter has been detected, including hydrographs for all monitoring wells.
2. Trend analyses of any monitoring parameters detected.
3. Comparisons among shallow, middle, and deep zone wells.
4. Comparisons between background water quality and the water quality in detection and compliance wells.

5. Correlations between related parameters such as total dissolved solids and specific conductance.
6. Discussion of erratic and/or poorly correlated data.
7. An interpretation of the groundwater contour maps, including an evaluation of groundwater flow rates.
8. An evaluation of the adequacy of the water quality monitoring frequency and sampling locations based upon site conditions.

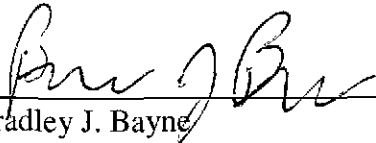
The following environmental professional was responsible for the preparation of this water quality monitoring plan:

Bradley J. Bayne, P.G.
Senior Geologist, Atkins

Mr. Bayne is a Florida-registered professional geologist with over 22 years of experience in the planning and performance of environmental projects.

9-10-13

Date

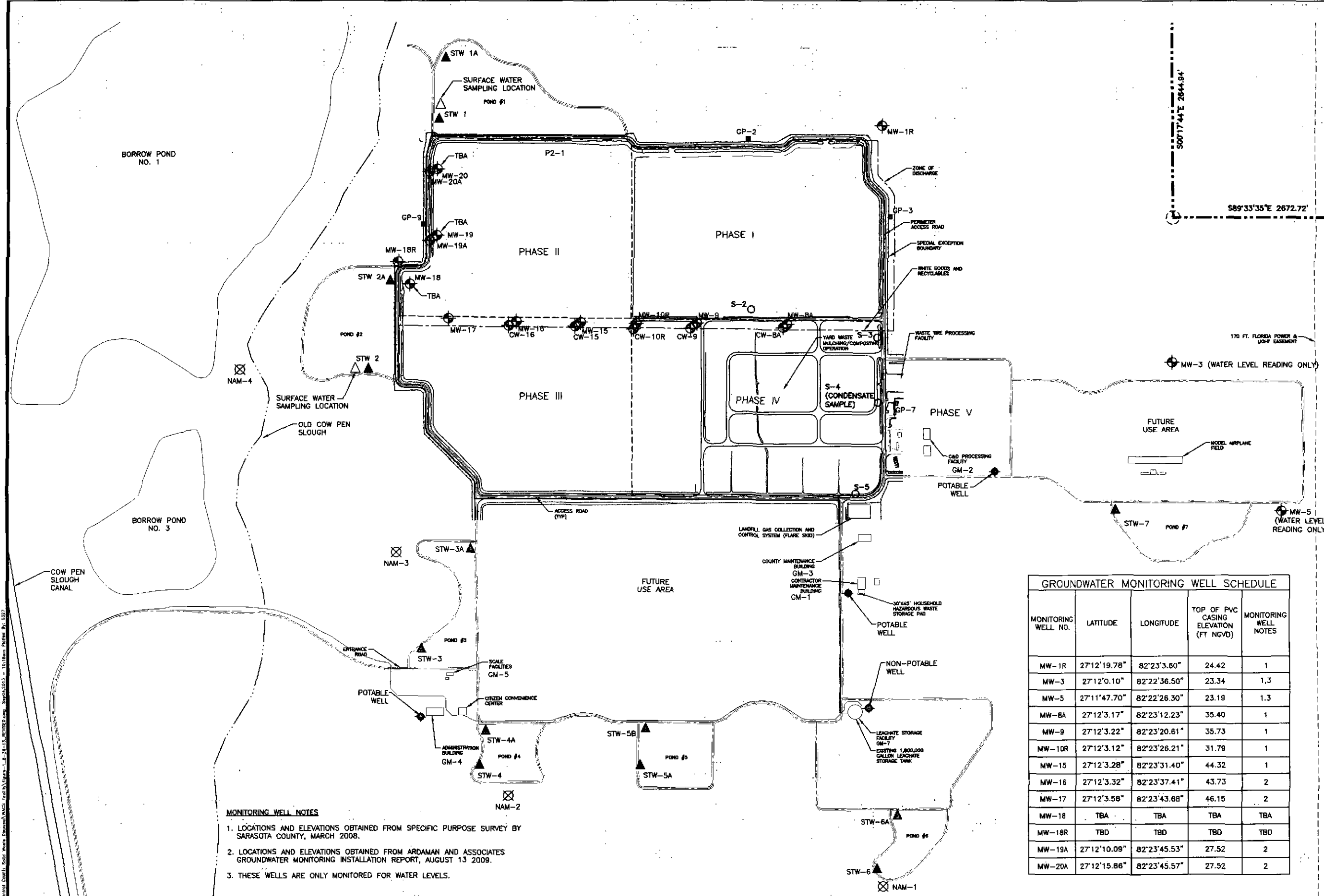


Bradley J. Bayne

Florida P.G. #1733

Figure 1

Site Plan – CCSWDC (figure provided as part of permit renewal submittal)



SITE PLAN NOTES

1. LOCATIONS OF EXISTING PIEZOMETERS, MONITORING WELLS AND STAFF GAUGES OBTAINED FROM SPECIFIC PURPOSE SURVEY BY SARASOTA COUNTY, MARCH 2008.
2. APPROXIMATE LOCATION OF PHASE I LEACHATE FORCEMAIN OBTAINED FROM RECORD DRAWINGS BY CAMP DRESSER & MCKEE, INC. DATED APRIL 1998. VERIFY LOCATION IN FIELD.
3. APPROXIMATE LOCATION OF LEACHATE FORCEMAIN TO OFFSITE WWTP OBTAINED FROM CONFORMED DRAWINGS BY PBS&W DATED JULY 2005. VERIFY LOCATION IN FIELD.
4. LOCATION OF CONDENSATE SUMPS OBTAINED FROM PHASE I LFGCCS AS-BUILT DRAWINGS DATED AUGUST 2010.

LEGEND

- S-2 LANDFILL GAS CONDENSATE SUMP
- GP-1 GAS PROBE
- ⊕ MW-10R GROUNDWATER MONITORING WELL
- ⊕ GM-1 GAS MONITORING LOCATION
- ⊕ WATER SUPPLY WELL
- ⊕ P-S-1 PHASE II BORING/PIEZOMETER LOCATION
- ▲ STW-1 STORMWATER MONITORING STATION
- C-1 LEACHATE MONITORING LOCATION
- △ POND 1 SURFACE WATER MONITORING LOCATION

- ZONE OF DISCHARGE
- WATERWAY
- LIMITS OF EASEMENT
- EASEMENT CENTERLINE
- EXISTING ROADWAY
- PHASE BOUNDARY
- PROPERTY BOUNDARY

⊗ NATURAL ATTENUATION MONITORING WELLS

TBA = TO BE ABANDONED
TBD = TO BE DETERMINED

| GROUNDWATER MONITORING WELL SCHEDULE | | | | |
|--------------------------------------|--------------|--------------|---------------------------------------|-----------------------|
| MONITORING WELL NO. | LATITUDE | LONGITUDE | TOP OF PVC CASING ELEVATION (FT NGVD) | MONITORING WELL NOTES |
| MW-1R | 27°12'19.78" | 82°23'3.60" | 24.42 | 1 |
| MW-3 | 27°12'0.10" | 82°22'36.50" | 23.34 | 1,3 |
| MW-5 | 27°11'47.70" | 82°22'26.30" | 23.19 | 1,3 |
| MW-8A | 27°12'3.17" | 82°23'12.23" | 35.40 | 1 |
| MW-9 | 27°12'3.22" | 82°23'20.61" | 35.73 | 1 |
| MW-10R | 27°12'3.12" | 82°23'26.21" | 31.79 | 1 |
| MW-15 | 27°12'3.28" | 82°23'31.40" | 44.32 | 1 |
| MW-16 | 27°12'3.32" | 82°23'37.41" | 43.73 | 2 |
| MW-17 | 27°12'3.58" | 82°23'43.68" | 46.15 | 2 |
| MW-18 | TBA | TBA | TBA | TBA |
| MW-18R | TBD | TBD | TBD | TBD |
| MW-19A | 27°12'10.09" | 82°23'45.53" | 27.52 | 2 |
| MW-20A | 27°12'15.86" | 82°23'45.57" | 27.52 | 2 |

MONITORING WELL NOTES

1. LOCATIONS AND ELEVATIONS OBTAINED FROM SPECIFIC PURPOSE SURVEY BY SARASOTA COUNTY, MARCH 2008.
2. LOCATIONS AND ELEVATIONS OBTAINED FROM ARDAMAN AND ASSOCIATES GROUNDWATER MONITORING INSTALLATION REPORT, AUGUST 13 2009.
3. THESE WELLS ARE ONLY MONITORED FOR WATER LEVELS.

FIGURE 1

| | | | | | | | | |
|--|---|---|---|--------------------------------------|--|---|---|--|
| | 482 SOUTH KELLER ROAD Orlando, FL 32810-6101 TEL. (407) 647-7275 FAX. (407) 647-0624 www.atkinsglobal.com | SARASOTA COUNTY | CENTRAL COUNTY SOLID WASTE DISPOSAL COMPLEX CLASS I LANDFILL | WATER QUALITY MONITORING PLAN | ORIGINAL 8/01/2012 REVISIONS: 1. 8/19/2013 2. 3. 4. 5. | 6. 7. 8. 9. 10. 11. 12. | Name: _____ Florida P.E. No.: _____ Address: ATKINS 482 S. Keller Road Orlando, FL 32810-6101 Signature _____ Date _____ | JOB NO. 00-000.00 DRAWN GG DESIGN RS CHECKED _____ Q.C. _____ SHEET 1/1 |
| | 5300 W. BOY SCOUT BOULEVARD TAMPA, FLORIDA 33607 FBPR CERTIFICATE OF AUTHORIZATION NO.24 | CLIENT: SARASOTA COUNTY PROJECT: CENTRAL COUNTY SOLID WASTE DISPOSAL COMPLEX CLASS I LANDFILL TASK: WATER QUALITY MONITORING PLAN | | | | | | |

Figure 2
Typical Groundwater Monitoring Well

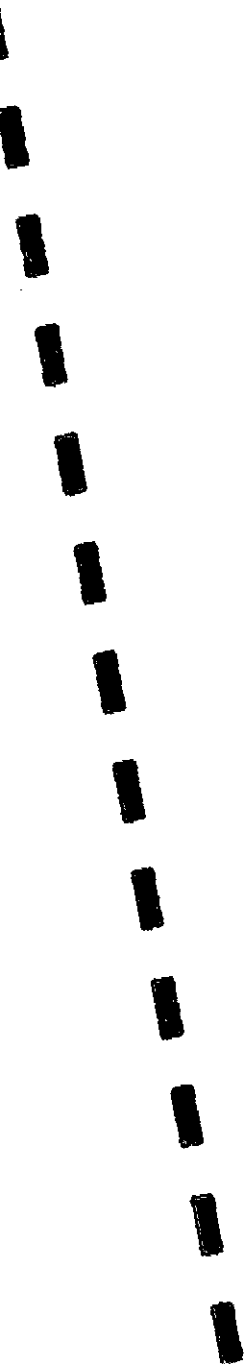
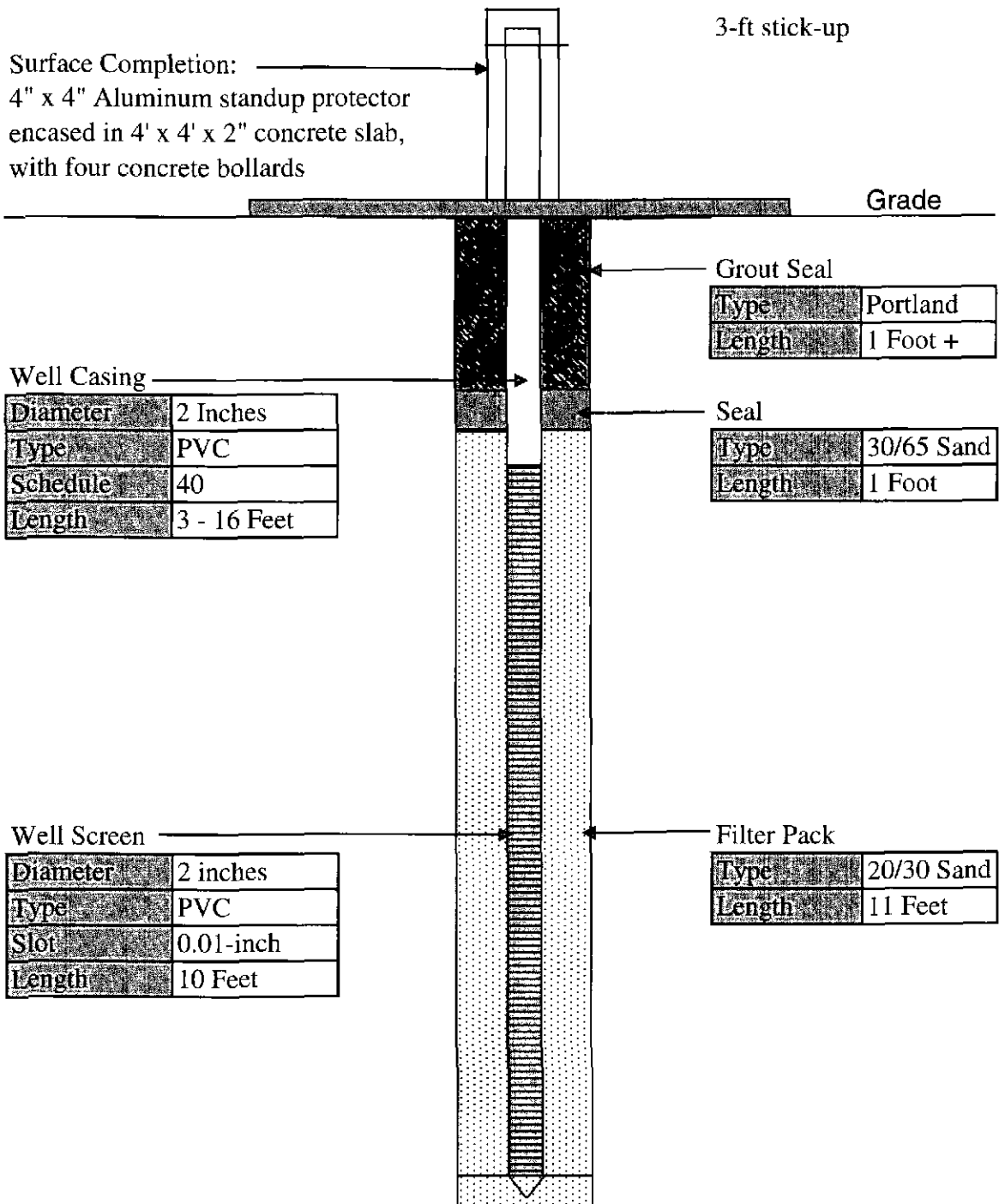


FIGURE 2: TYPICAL GROUNDWATER MONITORING WELL

| | |
|--------------------|--|
| Site: | Central County Solid Waste Disposal Facility |
| Well Identifier: | Typical Monitoring Well |
| Drilling Method: | Hollow-Stem Auger |
| Borehole Diameter: | 8 Inches |
| Total Depth: | 16 - 29 feet below land surface |



Well Casing

| | |
|----------|-------------|
| Diameter | 2 Inches |
| Type | PVC |
| Schedule | 40 |
| Length | 3 - 16 Feet |

Grout Seal

| | |
|--------|----------|
| Type | Portland |
| Length | 1 Foot + |

Seal

| | |
|--------|------------|
| Type | 30/65 Sand |
| Length | 1 Foot |

Well Screen

| | |
|----------|-----------|
| Diameter | 2 inches |
| Type | PVC |
| Slot | 0.01-inch |
| Length | 10 Feet |

Filter Pack

| | |
|--------|------------|
| Type | 20/30 Sand |
| Length | 11 Feet |

Attachment A

FDEP Form 62-701.900(30)

Monitoring Well Completion Report, page 1.



Department of Environmental Protection

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

DEP Form # 62-701.900(30)
Form Title: Monitoring Well Completion Report
Effective Date: January 6, 2010
Incorporated in Rule 62-701.510(3)

MONITORING WELL COMPLETION REPORT

DATE: _____

FACILITY NAME: _____

DEP PERMIT NO.: _____ WACS_FACILITY: _____

WACS MONITORING SITE_NUM.: _____ WACS_WELL: _____

WELL_TYPE: BACKGROUND _____ DETECTION _____ COMPLIANCE _____

LATITUDE AND LONGITUDE (see back for requirements): _____

Coordinate Accuracy _____ Datum _____ Elevation Datum _____

Collection Method _____ Collection Date _____

Collector Name _____ Collector Affiliation _____

AQUIFER MONITORED: _____

DRILLING METHOD: _____ DATE INSTALLED: _____

INSTALLED BY: _____

BORE HOLE DIAMETER: _____ TOTAL DEPTH: _____ (BLS)

CASING TYPE: _____ CASING DIAMETER: _____ CASING LENGTH: _____

SCREEN TYPE: _____ SCREEN SLOT SIZE: _____ SCREEN LENGTH: _____

SCREEN DIAMETER: _____ SCREEN INTERVAL: _____ TO _____
(BLS)

FILTER PACK TYPE: _____ FILTER PACK GRAIN SIZE: _____

INTERVAL COVERED: _____ TO _____ (BLS)

SEALANT TYPE: _____ SEALANT INTERVAL: _____ TO _____ (BLS)

GROUT TYPE: _____ GROUT INTERVAL: _____ TO _____ (BLS)

TOP OF CASING ELEVATION (NGVD): _____ GROUND SURFACE ELEVATION (NGVD): _____

DESCRIBE WELL DEVELOPMENT: _____

POST DEVELOPMENT WATER LEVEL ELEVATION (NGVD): _____

DATE AND TIME MEASURED: _____

REMARKS: _____

NAME OF PERSON PREPARING REPORT: _____

(Name, Organization, Phone No., E-mail)

NOTE: ATTACH AS-BUILT MW CONSTRUCTION DIAGRAM AND LITHOLOGIC LOG.(NGVD) NATIONAL GEODETIC VERTICAL DATUM OF 1988 (BLS) = BELOW LAND SURFACE

Attachment A

FDEP Form 62-701.900(30)

Monitoring Well Completion Report, page 2.

Latitude must be measured in degrees, minutes and seconds, to at least two (2) decimal places.

Longitude must be measured in degrees, minutes and seconds, to at least two (2) decimal places.

Eastings and northings (State Plane Coordinates) **must** be converted to latitude and longitude.

Coordinate Accuracy: the measured, estimated degree of correctness of the measurement. An accuracy of 15 feet or 5 meters is preferred.

Datum: the horizontal reference for measuring locations on the Earth's surface. NAD83-North American Datum of 1983 is preferred.

Elevation Datum: the reference datum from which elevation measurements are made. NGVD88 (National Geodetic Vertical Datum of 1988) is preferred.

Collection Method: the method or mechanism used to derive the measurements, e.g. GPS, map, aerial photo, etc.

Collection Date: the date and time on which the measurements were taken.

Collector Name: the name of the person taking the measurement.

Collector Affiliation: the agency or company for whom the collector works.

Attachment B

FDEP Form 62-701.900(31)

Water Quality Monitoring Certification

