



GROUNDWATER and SAMPLING PROCEDURES for the Status and Trend Networks

Groundwater

Sections 4 (GW Sampling) & 12 (Documentation)
Status & Trend Networks Sampling Manual.

Groundwater (GW) Trivia

Quantity of GW in
US is greater than
20 – 30 times that
of lakes, streams,
& rivers combined

About 25% of all
rainfall ultimately
becomes GW



Groundwater

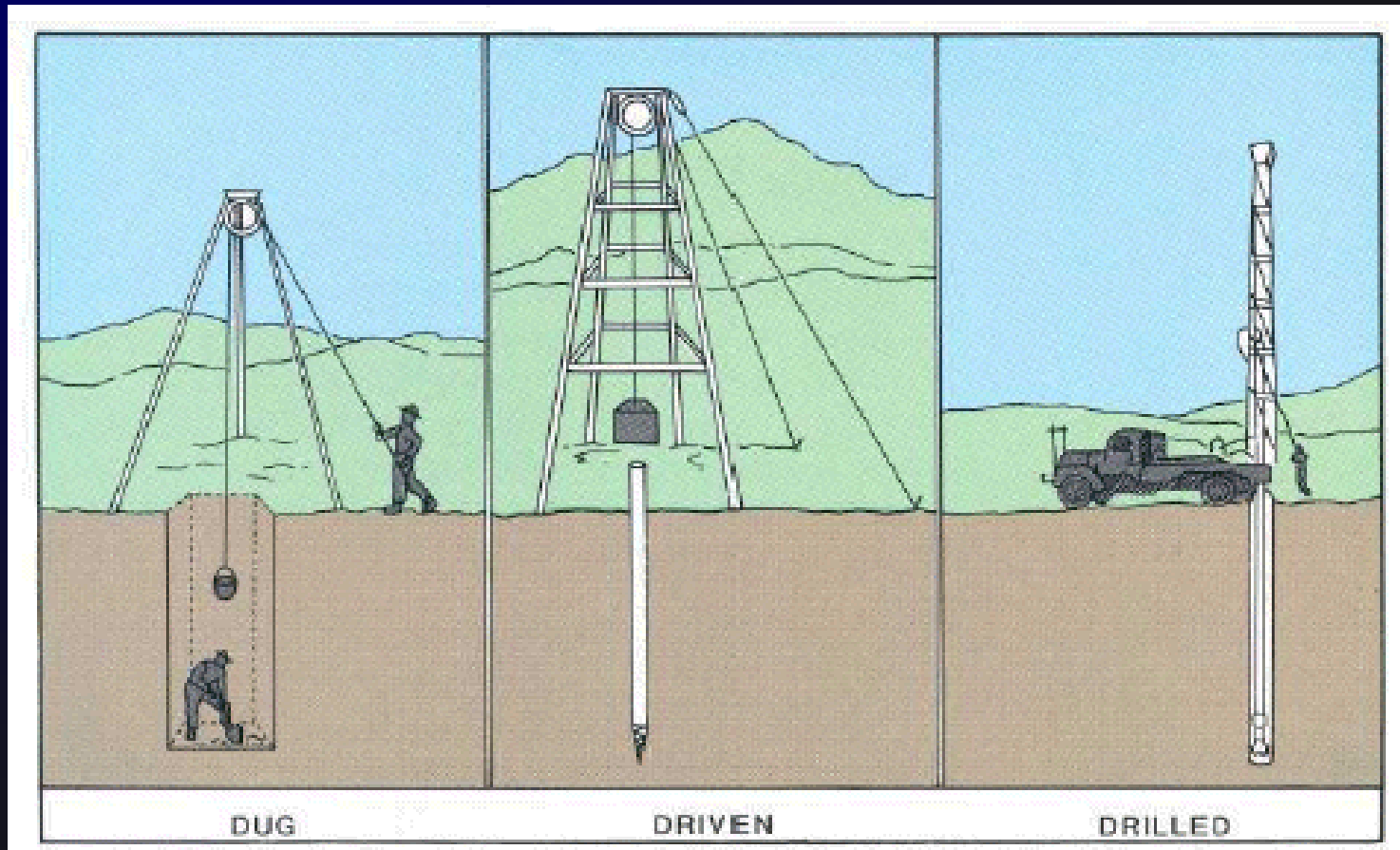


Did you know: 90% of the state's population relies on groundwater resources for their drinking water and over 50% of all other water needs including agricultural, industry, mining, and electric power generation are supplied by groundwater resources.

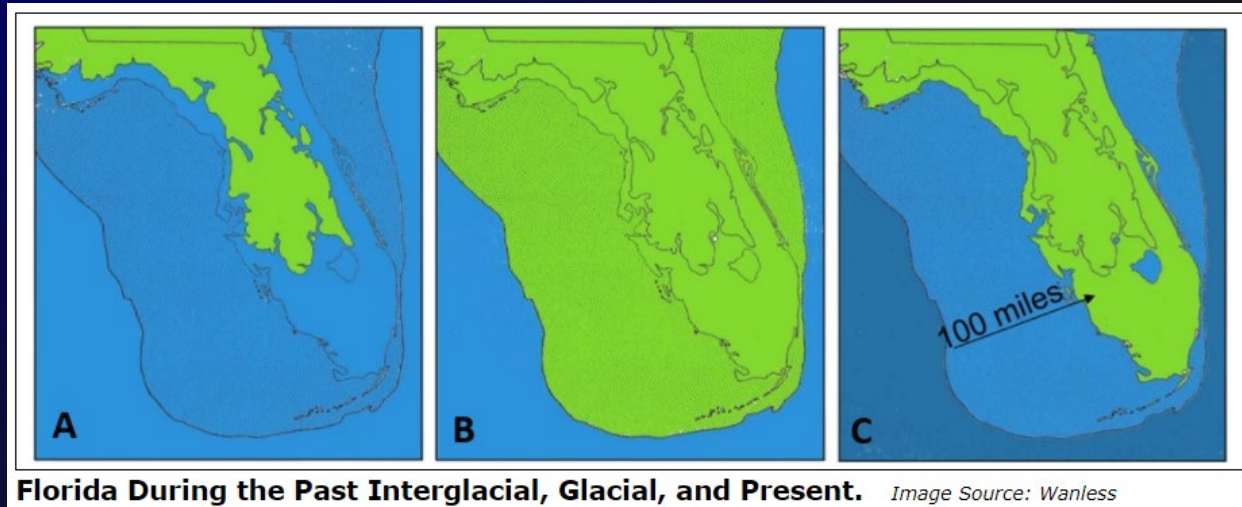
(Fresh GW use in Florida: ≈ 200 gal/day/person)



Methods of Installing Wells



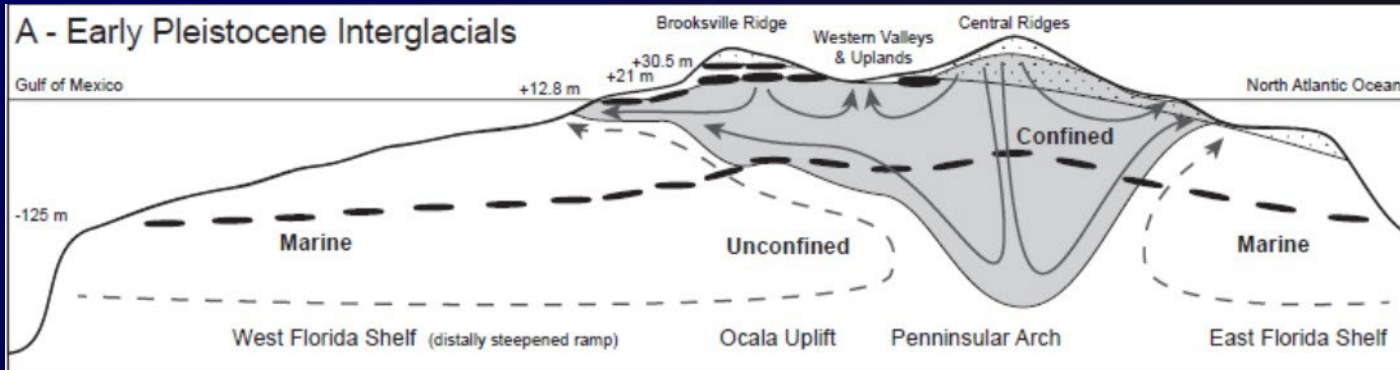
Effect of Sea Level Changes and Florida's Groundwater



Pleistocene Minimum Interglacial (A)
Pleistocene Maximum Glacial (B)
Present (C)

(Florida Atlantic University)

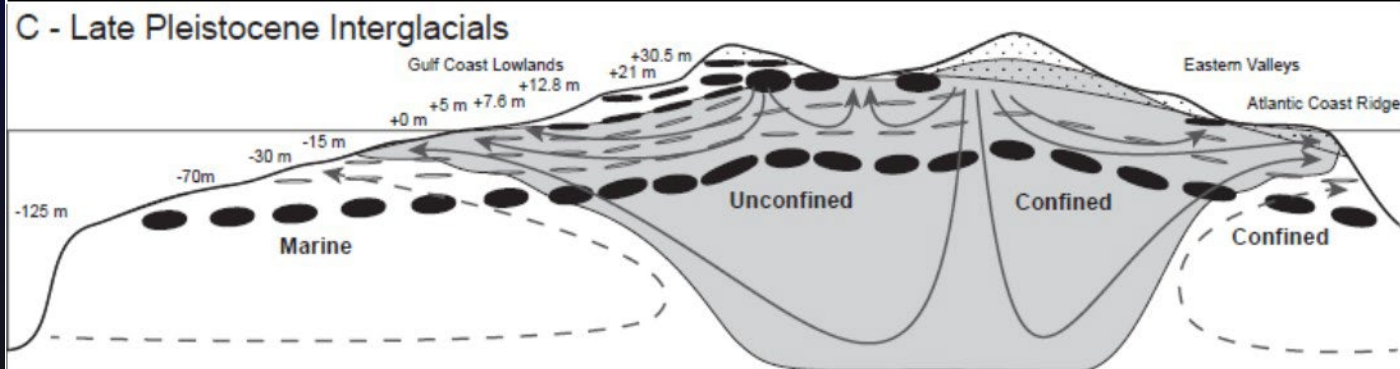
<http://www.ces.fau.edu/nasa/impacts/i4-sea-change/explanation3a.php>



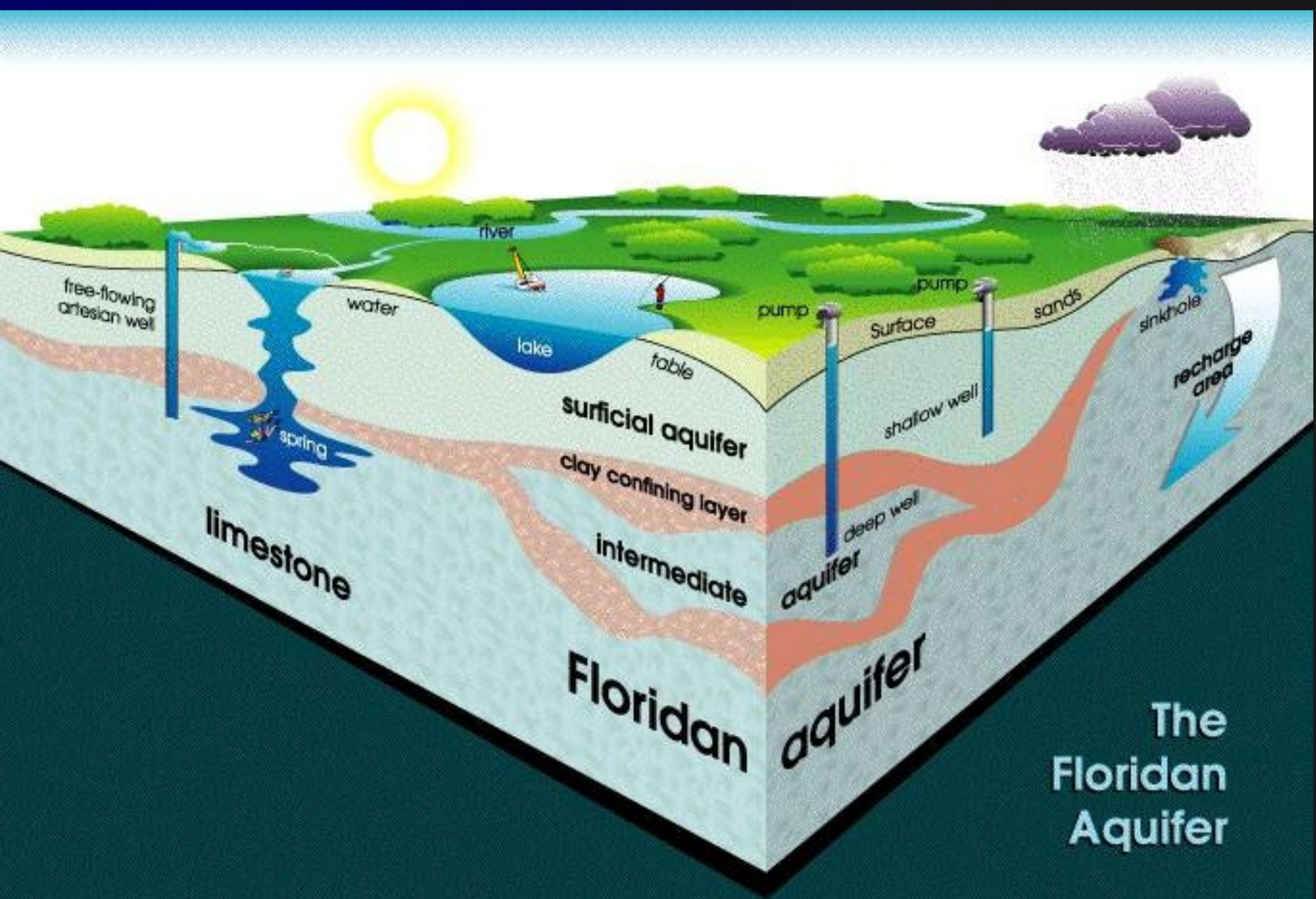
“Gray” – approximation of freshwater in aquifers

Top – Sea level higher by about 42 ft.

Bottom – Sea level about as it is today

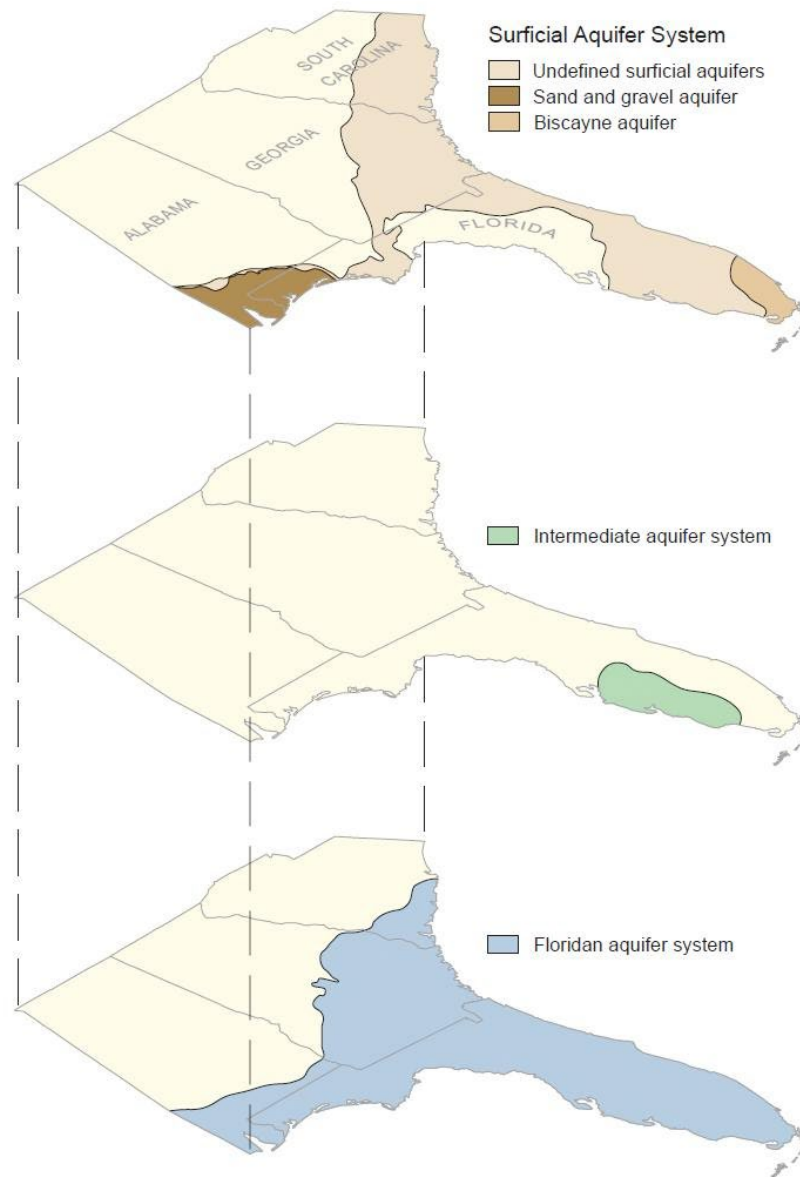


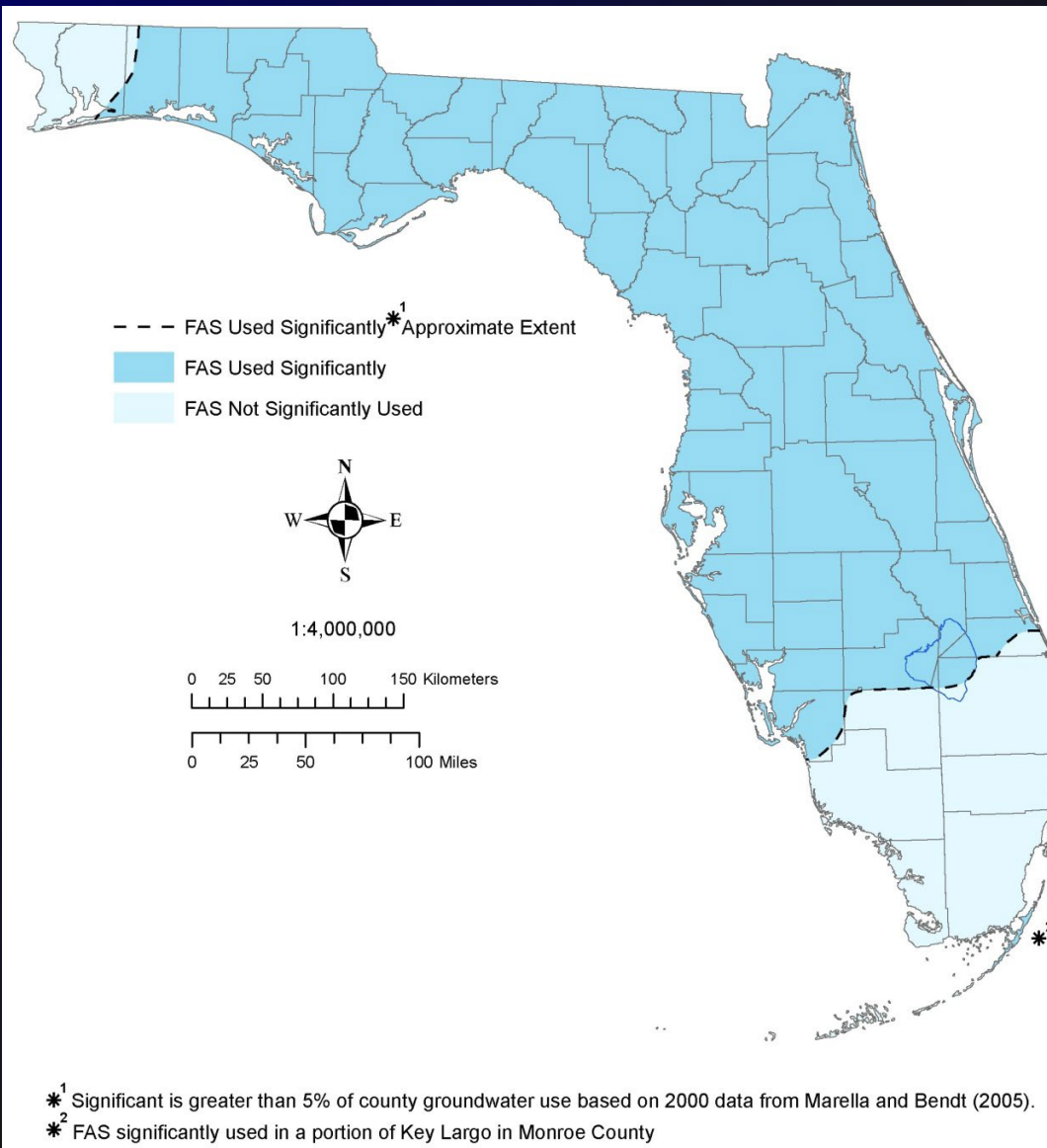
Gulley and Florea (2016)

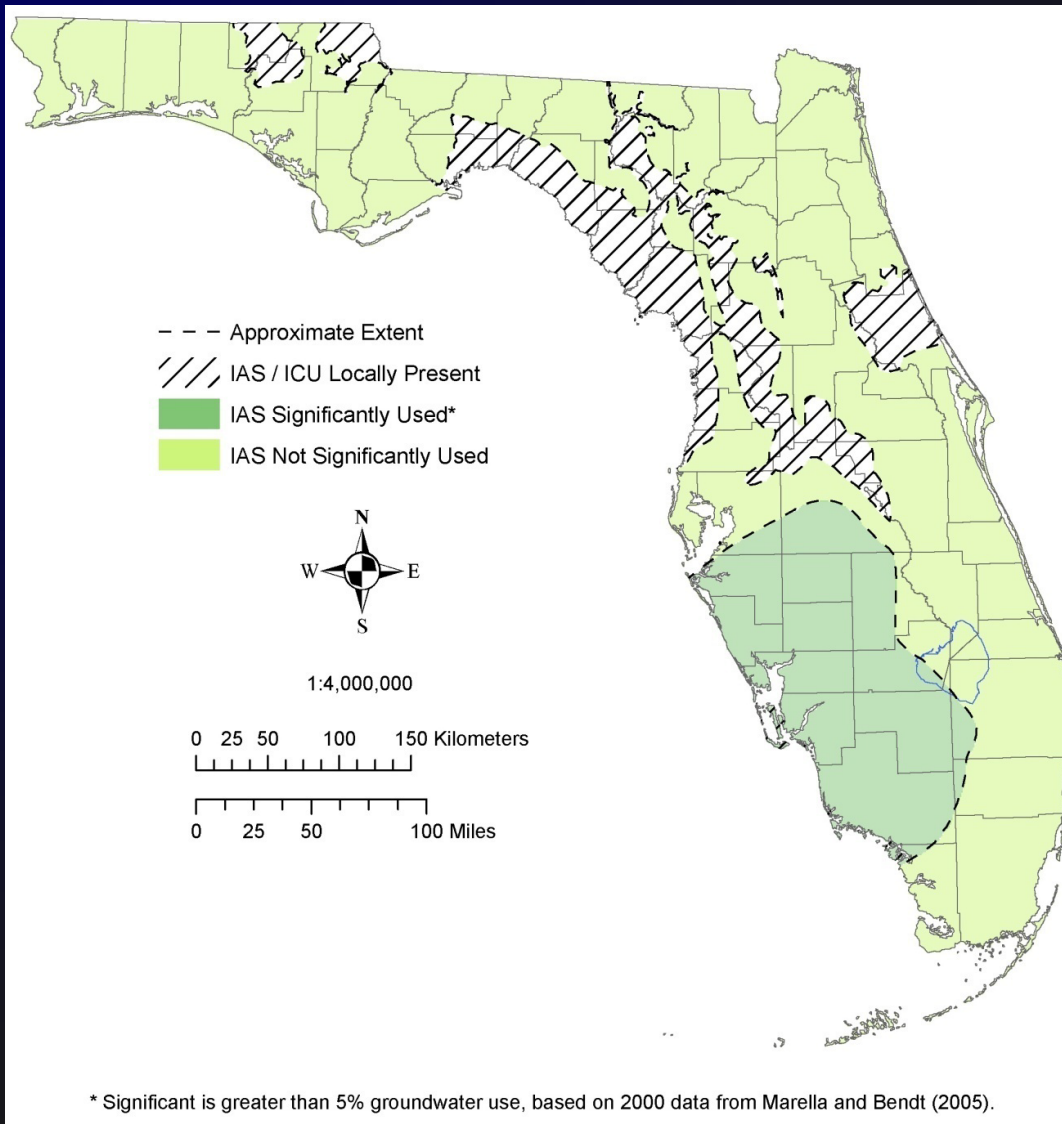


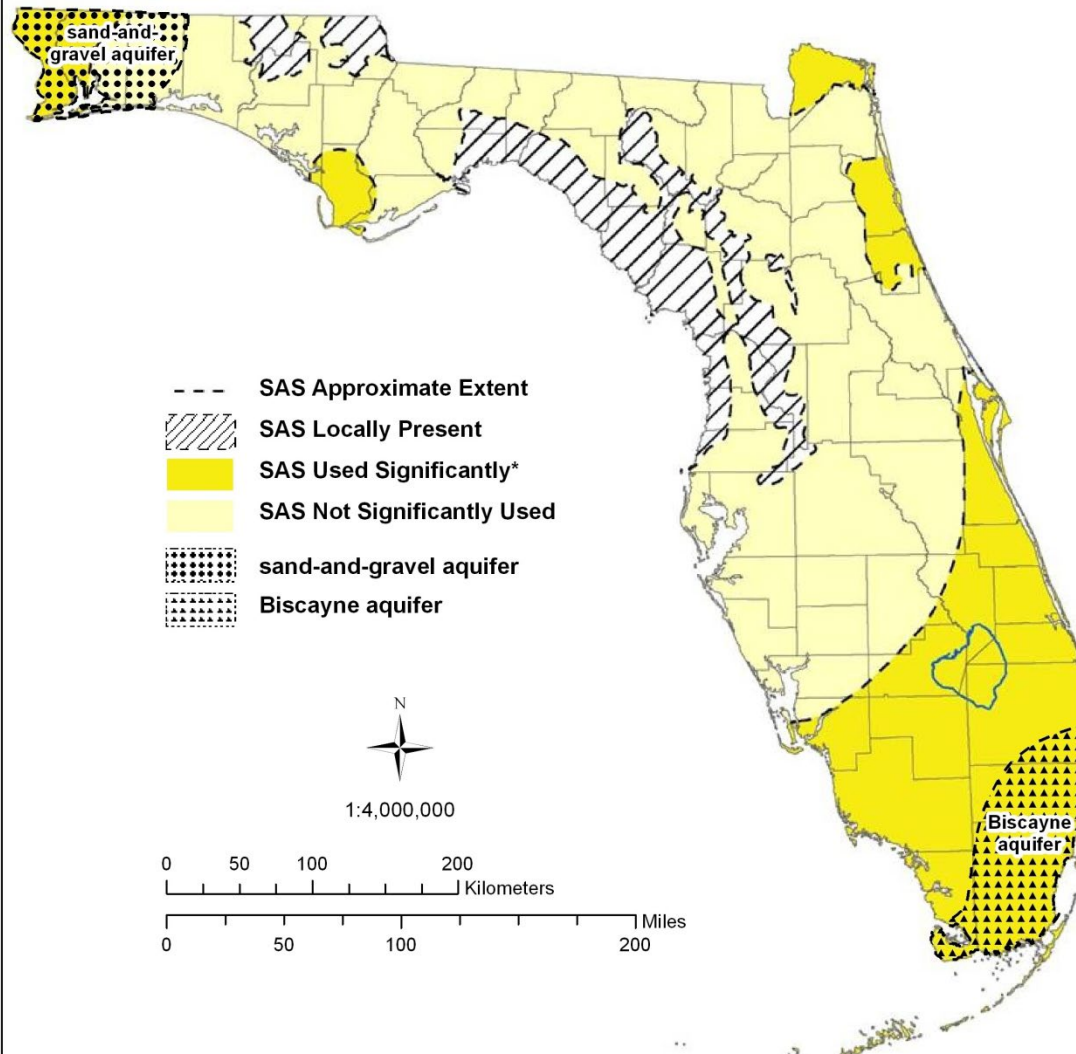
The
Floridan
Aquifer

Sequence of Aquifers

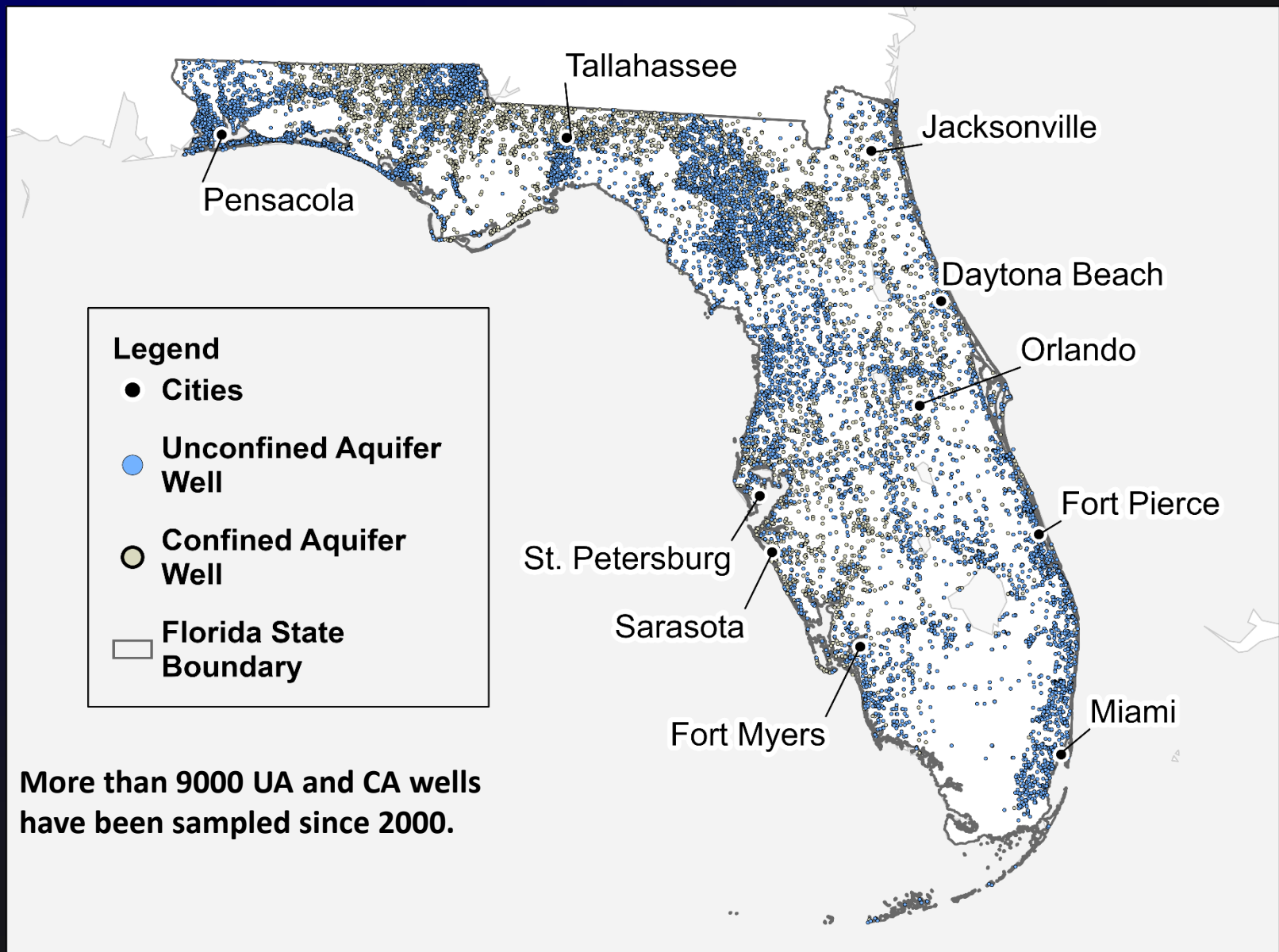








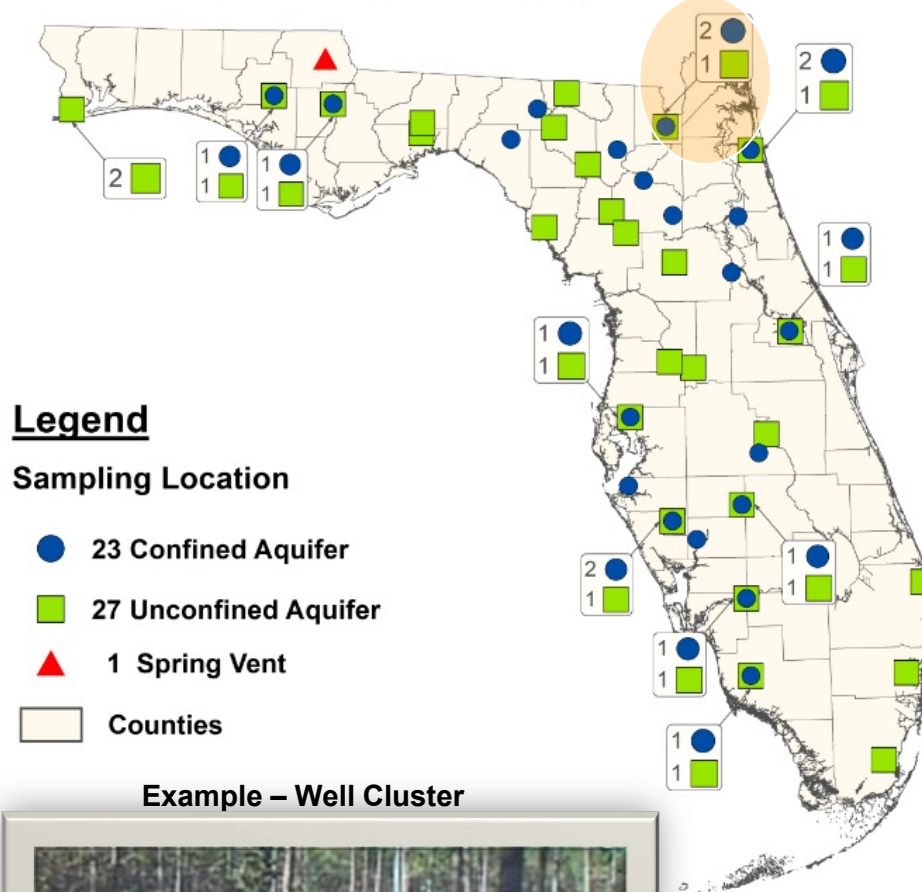
* Significant is greater than 5% of county groundwater use, based upon 2000 data from Marella and Bendt (2005)



Status Network Sampled Wells (2000-2021)

Trend Network

Watershed Monitoring Ground Water Trend Stations



Types of Wells

- **Confined and Unconfined Wells can be:**
 - **Monitoring**
 - **Private (Residential, Domestic)**
 - **Public Water Supply (PWS)**
 - **Industrial**
 - **Agricultural**

Note that the last 4 categories often have in-place plumbing

Monitor Wells



**Below Grade:
Stickup is negative**

Monitor Wells

There may, or may not, be in-place plumbing for this type of well but check and be prepared to use your own pump

Well information should be readily available from station comments & reconnaissance



Monitoring Wells with Recorders

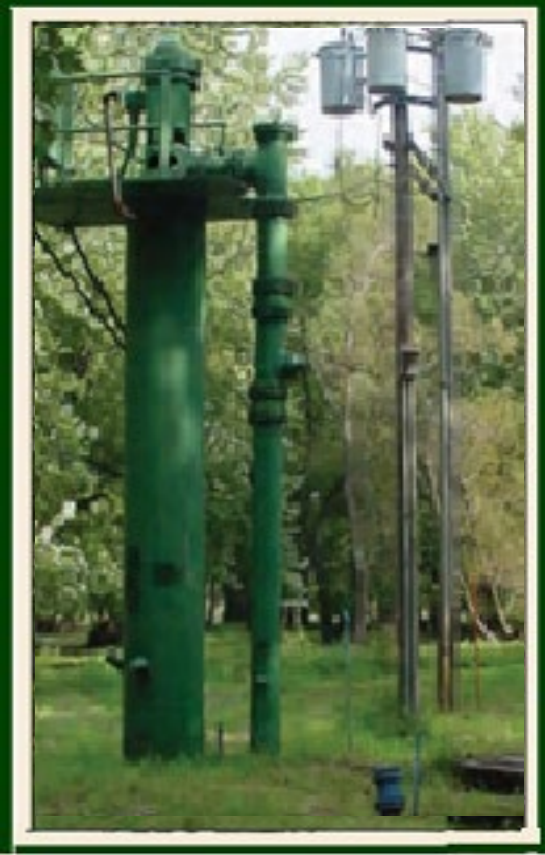
Wells can have a water level recorder instrument installed. Communication with owners of the recording equipment so their data is not corrupted is essential.



Contact agency that installed the recorder to let them know you want to sample the well.



Public Supply Wells



- Larger pumps and longer screened intervals
- Pumped for longer periods of time with large water volumes (250 gpm to 4,500 gpm flow rate)
- Groundwater withdrawals remove large amounts of water from the aquifer.
- The withdrawals can potentially change the groundwater flow direction and velocity
- Required by law to have spigot

Typical Public Supply Wells Turbine Pumps

**Raw Water
Sampling Point**

*Required by rule on
all PWS wells*



Agriculture Supply Wells

Turbine Pump



Submersible Pump

Get reconnaissance info and
contact owner or manager



Industrial Wells

Both are Turbine Pumps
(Often run continuously)



Sampling Point Check For Compatibility
This one requires a reducing adapter made of PVC

Private wells can be complex ...



Softener
Tanks

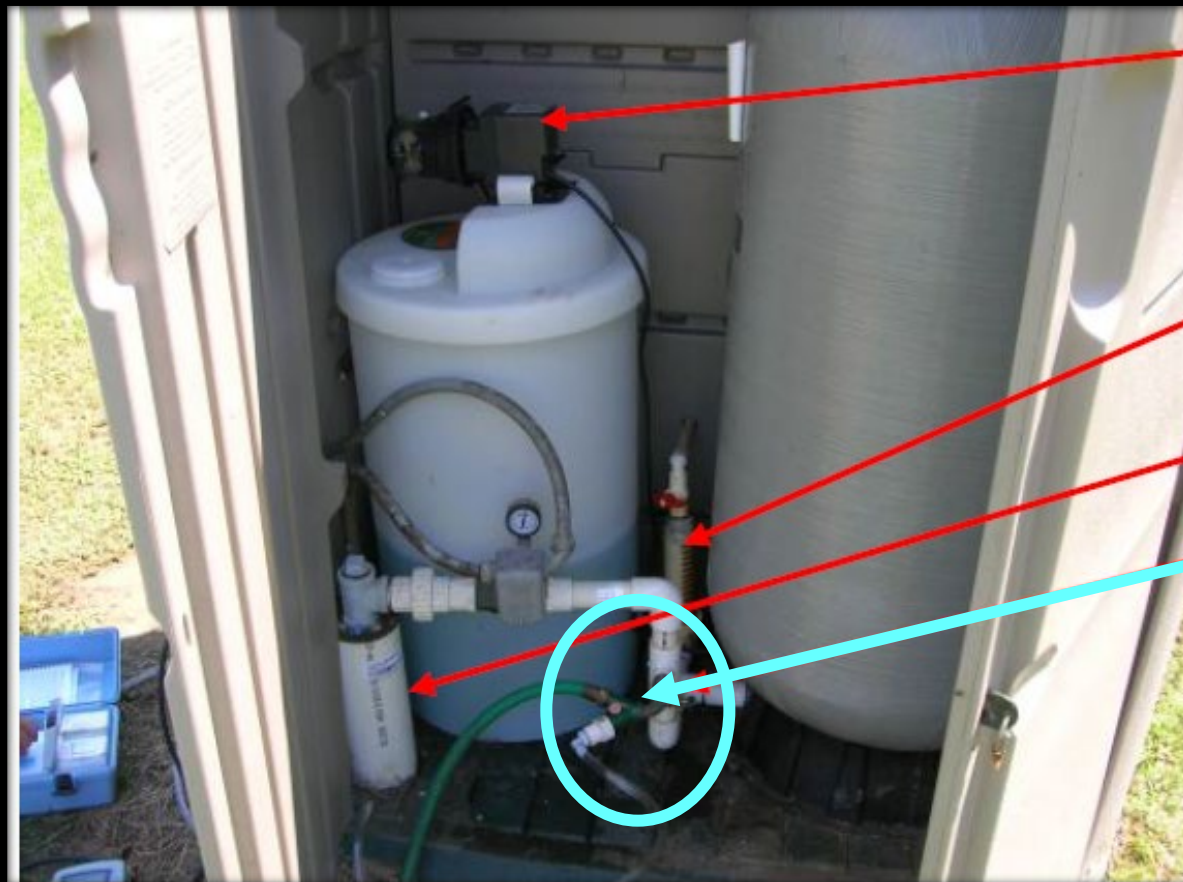
Filter

Spigot

Well

Sampling
End Point

Private Wells add-ons and Chlorinators



Chlorinator

Chlorine
Injector

Well

Spigot

Notice hose
attached

FLORIDA UNIQUE WELL ID
AAJ6106



DO NOT
REMOVE

FOR INFORMATION CALL: FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION AT 1-800-245-8545

386-752-1840
HUGHES WELL DRILLING
& PUMP SERVICE
SALES - SERVICE - INSTALLATION

Lt. & Son
LAWSON, FL 32050

Part 2: Sampling

1. Pre-Sampling

Inventory equipment / supplies

**For Status Network wells: recon and
obtain permission to sample**

**For Trend wells, need to include
in-line filter (ortho-phosphate)
& account for 3 weeks**

2. Well Sampling Procedures

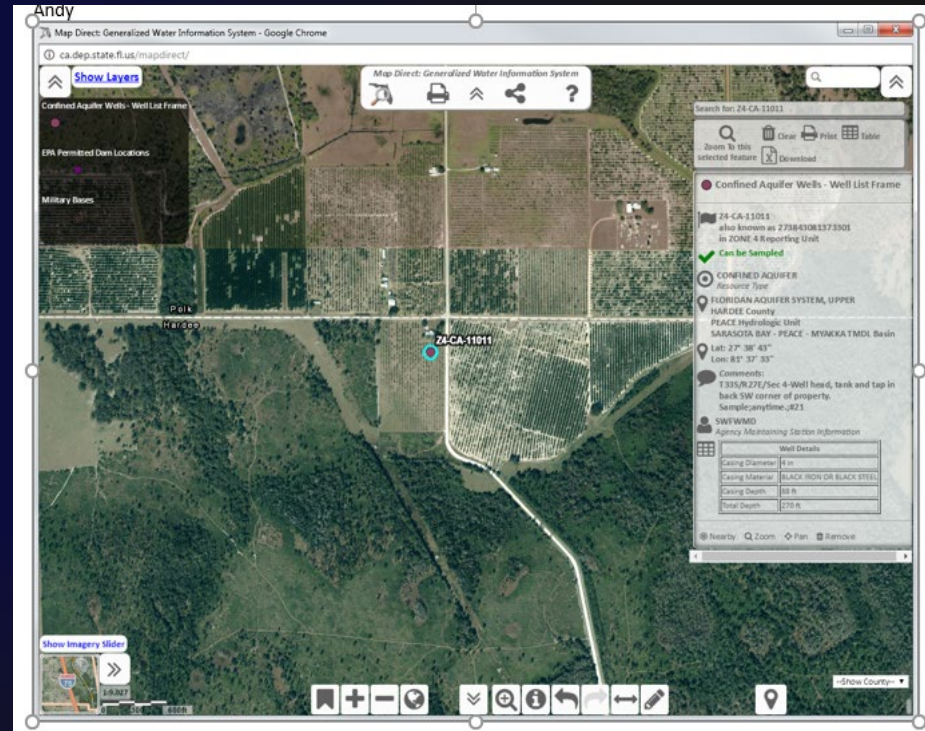
3. Clean equipment between each site

Well Reconnaissance

- Use GWIS Utility App
- Use Maps
- Use Recon Info
- Check Well Tags
- Check Historical data



Photo



Map

Important “What If”

Arrive at site, find out designated well has been destroyed, but owner has another well that can be used.

- 1. Exclude old well (unsampleable)**
- 2. Well addition form (for new well)**
- 3. New well will be considered for addition to List Frame**
- 4. DO NOT SAMPLE NEW WELL!**

WELL ADDITION FORM

The following information is required for a well to be listed as a candidate to be randomly sampled for Florida's Ground Water Quality Status Monitoring Network.

Please enter as much of the following information as possible to have your well considered for sampling. Completion of this form does not guarantee your well will be added to the database or sampled.

Owner Information

Owner's Name: _____

Owner's Address: _____

City: _____ State: _____ Zip Code: _____

Owner's Phone Number: (____) _____

Contact Person Information (if other than Owner)

Contact's Name: _____

Contact's Address: _____

City: _____ State: _____ Zip Code: _____

Contact's Phone Number: (____) _____

Well Information

County: _____ Construction Date: _____

Well Driller's Information:

Name: _____

Address: _____

City: _____ State: _____ Zip Code: _____

Phone Number: (____) _____

Well Addition Form (not in Survey 123)

Well Information (Continued)

Water Management District Permit Number: _____

*Location: Latitude _____ Longitude _____ Datum/Source _____

Section-Township-Range: _____

Physical Address: _____

Aquifer: (Circle one)	Confined Floridan	Intermediate	Biscayne	
	Sand & Gravel	Unconfined Floridan	Surficial	Unknown

Total Well Depth (feet): _____ Total Casing Depth (feet): _____

Casing Diameter (inches): _____

Casing Material: (Circle one)	Steel	PVC Plastic	Iron	Rock	Concrete	None
	Tile	Brick	Stainless Steel	Galvanized Metal	Unknown	

Is the Well Screened? (Circle one) Yes No Don't Know

Screen Length (feet): _____

Well Use: (Circle one)	Private Drinking Water	Irrigation	Agricultural	Supply Monitoring
	Public Drinking Water	Industrial Supply	Other	

* Please draw a sketch map of the location of the well, roads, and other items such as gates. Also include any other comments.

Please return this form to:

Florida Department of Environmental Protection
Watershed Monitoring Section
2600 Blair Stone Road, MS 3525
Tallahassee, Florida 32399-2400
Phone (850) 245-8533; Fax (850) 245-7601

Sampling Procedures Outline

1. If no FLUWID on well, check GWIS, order reprint or apply new tag if necessary
 2. Measure Depth to Water (DTW) in the well
 3. Purge well (remove stagnant GW)
 4. Take field measurements of well water
 5. Collect GW samples
 6. Take photographs of well, including FLUWID
 7. Note land uses adjacent to well
- Document information re: sampling event

Always Remember

- We are in the documentation business. We are not in the assumption business.



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATUS & TREND NETWORKS FIELD SHEET - GROUND WATER

Effective: October 2023

Collection Agency: _____ Project Name: _____ Date: _____

On-site Time (24hr): _____ Off-site Time (24hr): _____ Time Zone (for all times listed on this form): ☐ ETZ / ☐ CTZ

Trend Network Station Name: _____
OR
Status Network Random ID: _____

Water Resource: ☐ UNCONFINED AQUIFER / ☐ CONFINED AQUIFER RQ: _____

FLUWID: _____ FLUWID Condition: Normal / Needs Reprint / Applied New / Applied Reprint / No ID

Station Name: _____ Casing Material: _____

Total Depth (ft): _____ Casing Depth (ft): _____ Casing Diam. (in): _____ Storage Tank Vol. (gal): _____

Land Surface Elevation (LSE)(ft): _____ Measuring Point Elevation (MPE)(ft): _____ Stickup (ft)*: _____

*Measure stickup for Status Network. Calculate stickup for Trend Network (Stickup = MPE - LSE), if MPE & LSE have the same vertical datum.

Well Condition: Normal / Other: _____ Well Use: Potable / Non-Potable / Unknown

Sampling Team Member Names	Field Measurements	Water Sample Collection	Documentation	Sample Preservation	Field/Equip. Blank Collection	Signatures or Initials

Additional Personnel / Visitors On-site: _____

Weather Conditions: _____

Photos Taken: ☐ Yes / ☐ No (Required for all Status stations. Required annually for all Trend stations.)

Micro Land Use Data Collected: ☐ Yes / ☐ No (Required for all Status stations. Required annually for all Trend stations.)

Major Land Use Group: _____ Feature Codes Observed: _____

QA/QC Blank Collected at this station? ☐ None / ☐ Field Blank / ☐ Equip. Blank

QA/QC Blank Field ID: _____ Collection Time (24 hr): _____

Equip. Type: Submersible / Peristaltic Equip. ID / Name: _____ Cleaning: ☐ Lab / ☐ Field

INITIAL DEPTH TO WATER FROM MEASURING POINT (DTW)
Select one method, measure twice, report second number. Measurements must be within ± 0.01 ft. Report as negative # if above MPE.

☐ 1) Electronic Sensor 1st Reading _____ ft 2nd Reading _____ ft

☐ 2) Tape / Chalk (Held At - Wetted At) = DTW 1st Reading (_____ ft - _____ ft) = _____ ft
2nd Reading (_____ ft - _____ ft) = _____ ft

☐ 3) Hose / Tape for Flowing Artesian Well (meas. from top of hose to MPE) 1st Reading _____ ft 2nd Reading _____ ft

☐ 4) Pressure Gauge for Flowing Artesian Well 1st Reading _____ PSI X (-2.31) = _____ ft
2nd Reading _____ PSI X (-2.31) = _____ ft Adjust for diff. btwn. gauge & MPE (if needed) _____ ft

☐ 5) DTW Not Measured. List reason in DTW result comment below.

DTW Value (ft):	DTW Qualifier(s):	DTW Result Comment:

FIELD SHEETS

- Complete the GW Field Sheet (front & back) & GW sample details page
- Use the most recent version ("October 2023")
- Preferred - Use **Survey123** Status & Trend Groundwater form to complete field sheets

FIELD SHEETS

- Preferred - Use Survey123 Status & Trend Groundwater form to complete field sheets & custody sheets

FL DEP Status and Trend Networks - Groundwater

Well Information

Station Name: *

Well Condition *

Normal Other

FLUWID: *

FLUWID Tag Condition *

Total Depth (ft) *

Casing Depth (ft) *

Casing Diameter (in) *

Casing Material *

Storage tank present between well and sampling point? *

YES NO

LSE (Land Surface Elevation) (ft)

2 of 11

FL DEP Status and Trend Networks - Groundwater

DTW, WCH, and Purge Volume Calculations

Initial Depth to Water (DTW) from Measuring Point

DTW Measurement Method *

(Please click selection button once and wait a few seconds for associated information to load.)

Electronic Sensor

Tape / Chalk

Hose / Tape for Flowing Artesian Well

Pressure Gauge for Flowing Artesian Well

DTW Not Measured

Purge Method Information

Purge Method

Method 1A: Conventional Purge Method, at least 1.5 well volumes & stability

Method 1B: Conventional Purge Method, ≥ 5 well volumes

Method 1C: Conventional Purge Method, Outer / middle well in series of concentric wells, at least 1.5 well volumes & stability

Method 2: In-Place Plumbing w/ Continuous / Intermittently Running Pump

Method 3: Other

Water Column Height (WCH) Calculations

WCH calculation performed? *

YES NO

Minimum Purge Volume Calculations

3 of 11

FL DEP Status and Trend Networks - Groundwater

Stability Measurements 1

Time (24hr)

Minimum Time Required: 10:00 + min (if purge rate = 5 gal/min)

Purge Rate (gal/min)

Cumulative Vol. Purged (gal)

Minimum Volume Required: N/A, Invalid Total Depth Value gal

DTW (ft)

Initial DTW:

Temperature (°C)

D.O. (% SAT)

D.O. (mg/L)

Specific Conductance ($\mu\text{mhos/cm}$)

pH (SU)

5 of 11



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATUS & TREND NETWORKS FIELD SHEET - GROUND WATER

Effective: October 2023

Collection Agency: _____ Project Name: _____ Date: _____

On-site Time (24hr): _____ Off-site Time (24hr): _____ Time Zone (for all times listed on this form): ☐ ETZ / ☐ CTZ

Trend Network Station Name: _____

OR

Status Network Random ID: _____

Water Resource: ☐ UNCONFINED AQUIFER / ☐ CONFINED AQUIFER RQ- _____

FLUWID: _____ FLUWID Condition: Normal / Needs Reprint / Applied New / Applied Reprint / No ID

Station Name: _____ Casing Material: _____

Total Depth (ft): _____ Casing Depth (ft): _____ Casing Diam. (in): _____ Storage Tank Vol. (gal): _____

Land Surface Elevation (LSE)(ft): _____ Measuring Point Elevation (MPE)(ft): _____ Stickup (ft)*: _____

*Measure stickup for Status Network. Calculate stickup for Trend Network (Stickup = MPE - LSE), if MPE & LSE have the same vertical datum.

Well Condition: Normal / Other: _____ Well Use: Potable / Non-Potable / Unknown

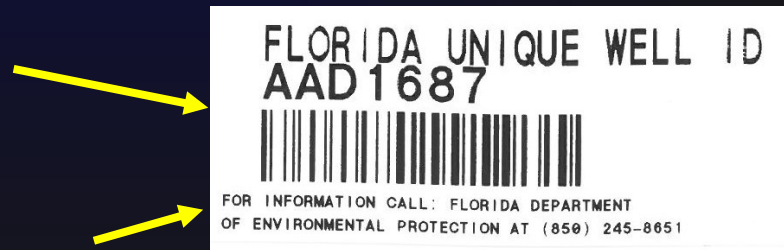
Top section of field sheet contains general information about well & sampling event.

- FLUWID & Station Name
- Well & FLUWID condition
- Total Depth
- Elevation (LSE & MPE)
- Casing diameter, material & depth
- Stickup
- Well Use
- Collection Agency
- Project Name
- Water Resource
- Time zone indicator
- Date & time on- / off- site
- Storage Tank Volume

FLUWID

Florida Unique Well ID

- Research well before visiting. Has a FLUWID tag been previously attached?
- Never tag a well that already has a tag.
- Order reprint if old tag is missing or damaged.
- Place labels on permanent well components.
- **ONE label on well**



(If new tag, use program FLUWID. If old FLUWID tag is faded, replace.)

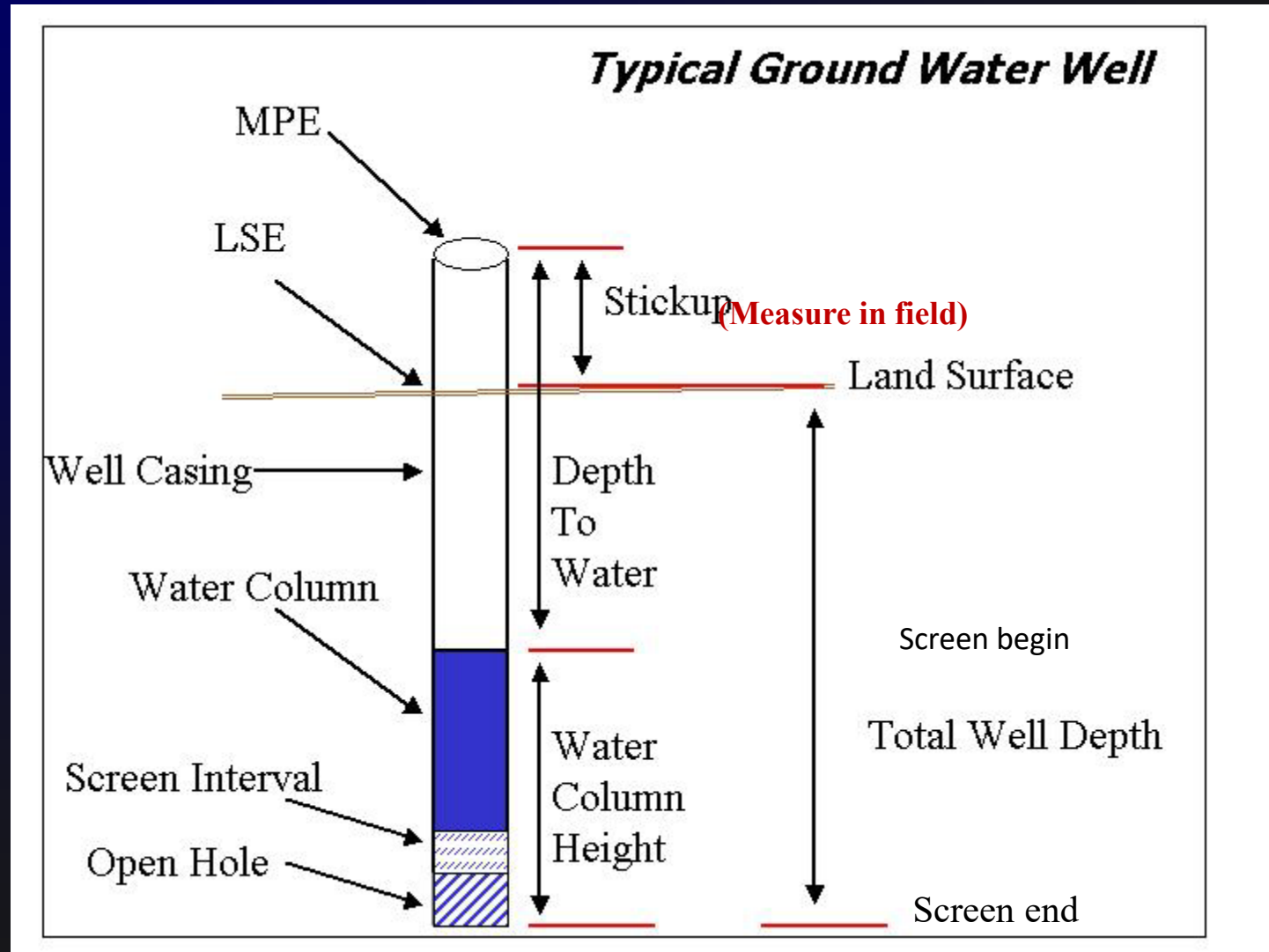
FLUWID Condition:

- Normal (good condition)
- Needs (FLUWID) Reprint
- New Applied (to well)
- Reprint Applied (to well)

Well must have FLUWID tag action



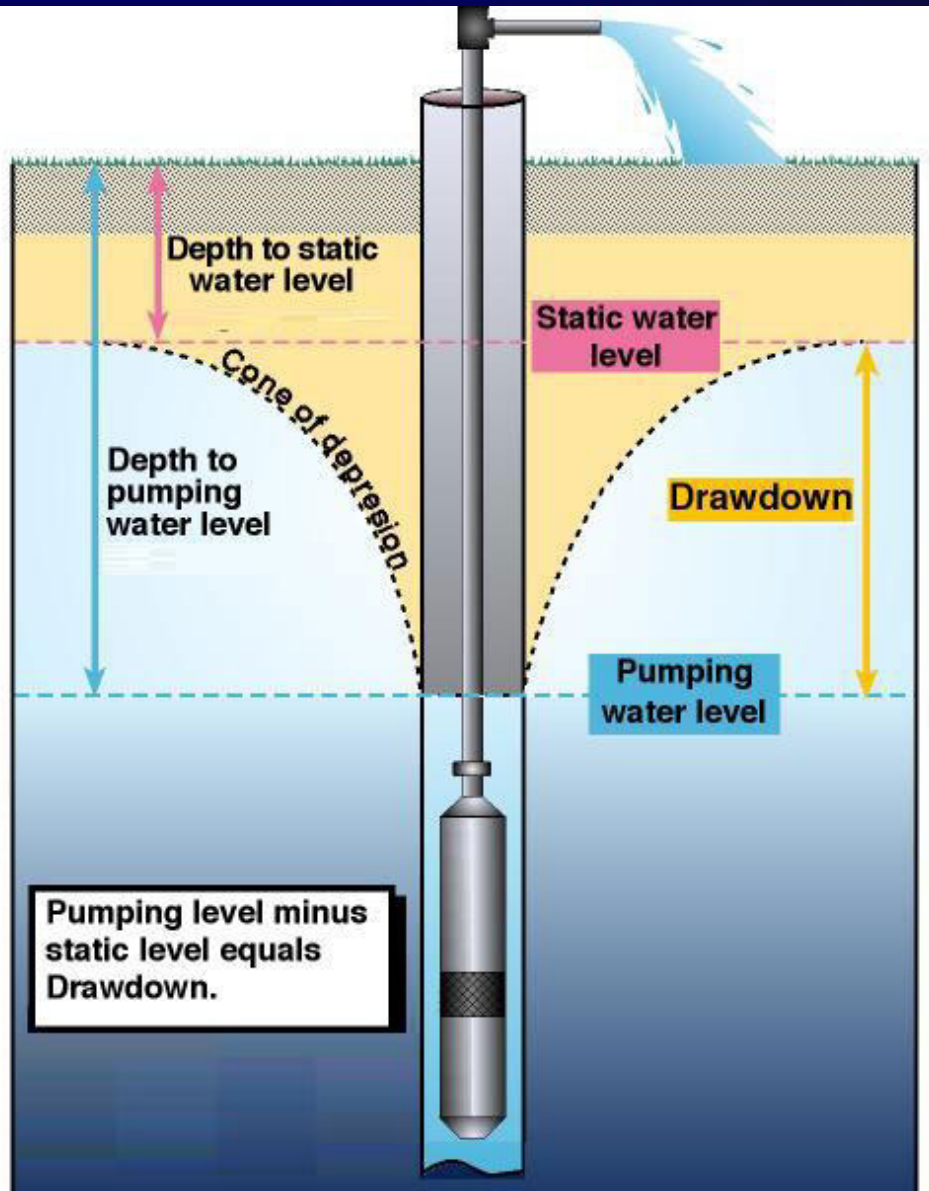
Well Guide



Monitoring Well with Slotted Intervals



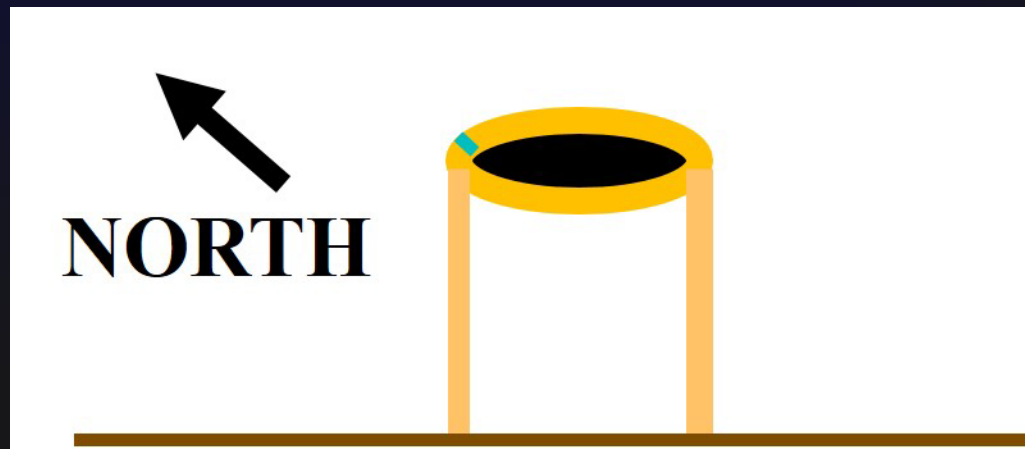
Determining Depth to Water (DTW)



- Measure the Static Water Level
- Before you purge
- To remove stagnant water from well

Determining Depth to Water

- Always measure DTW from the same MPE reference point or survey mark on top of the well casing.
- If there is no reference mark, measure from the north side of the casing.



Determining Depth to Water

- Measure to nearest 0.01ft.
- Measure twice.
- Two consecutive measurements within ± 0.01 ft.
- Report 2nd meas. as initial (undisturbed) DTW
- Use 2nd meas. in WCH calculation.

INITIAL DEPTH TO WATER FROM MEASURING POINT (DTW)

Select one method, measure twice, report second number. Measurements must be within ± 0.01 ft. Report as negative # if above MPE.

- ☐ 1) **Electronic Sensor** 1st Reading _____ ft 2nd Reading _____ ft
- ☐ 2) **Tape / Chalk** (Held At - Wetted At) = DTW 1st Reading (_____ ft - _____ ft) = _____ ft
2nd Reading (_____ ft - _____ ft) = _____ ft
- ☐ 3) **Hose / Tape for Flowing Artesian Well** (meas. from top of hose to MPE) 1st Reading _____ ft 2nd Reading _____ ft
- ☐ 4) **Pressure Gauge for Flowing Artesian Well** 1st Reading _____ PSI X (-2.31) = _____ ft
2nd Reading _____ PSI X (-2.31) = _____ ft Adjust for diff. btwn. gauge & MPE (if needed) _____ ft
- ☐ 5) **DTW Not Measured.** List reason in DTW result comment below.

DTW Value (ft):	DTW Qualifier(s):	DTW Result Comment:
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Determining Depth to Water

- Non-flowing wells:

Use electronic sensor or tape and chalk

INITIAL DEPTH TO WATER FROM MEASURING POINT (DTW)

Select one method, measure twice, report second number. Measurements must be within ± 0.01 ft. Report as negative # if above MPE.

- ☐ 1) **Electronic Sensor** 1st Reading _____ ft 2nd Reading _____ ft
- ☐ 2) **Tape / Chalk** (Held At - Wetted At) = DTW 1st Reading (_____ ft - _____ ft) = _____ ft
- ☐ 2nd Reading (_____ ft - _____ ft) = _____ ft



Example – Tape and Chalk

Held at = 20.00 ft

Chalk from 0.00 to 10.00 ft

Wet at = 5.20 ft

$$\begin{array}{rcl} \text{Held at} & - & \text{Wetted at} & = & \text{DW} \\ 20.00 & - & 5.20 & = & 14.80 \end{array}$$

Determining Depth to Water (but only for flowing artesian wells)

☐ 3) **Hose / Tape for Flowing Artesian Well** (meas. from top of hose to MPE) 1st Reading _____ ft 2nd Reading _____ ft

☐ 4) **Pressure Gauge for Flowing Artesian Well** 1st Reading _____ PSI X (-2.31) = _____ ft

2nd Reading _____ PSI X (-2.31) = _____ ft Adjust for diff. btwn. gauge & MPE (if needed) _____ ft

☐ 5) **DTW by MPE** (if MPE is known) DTW = _____ ft

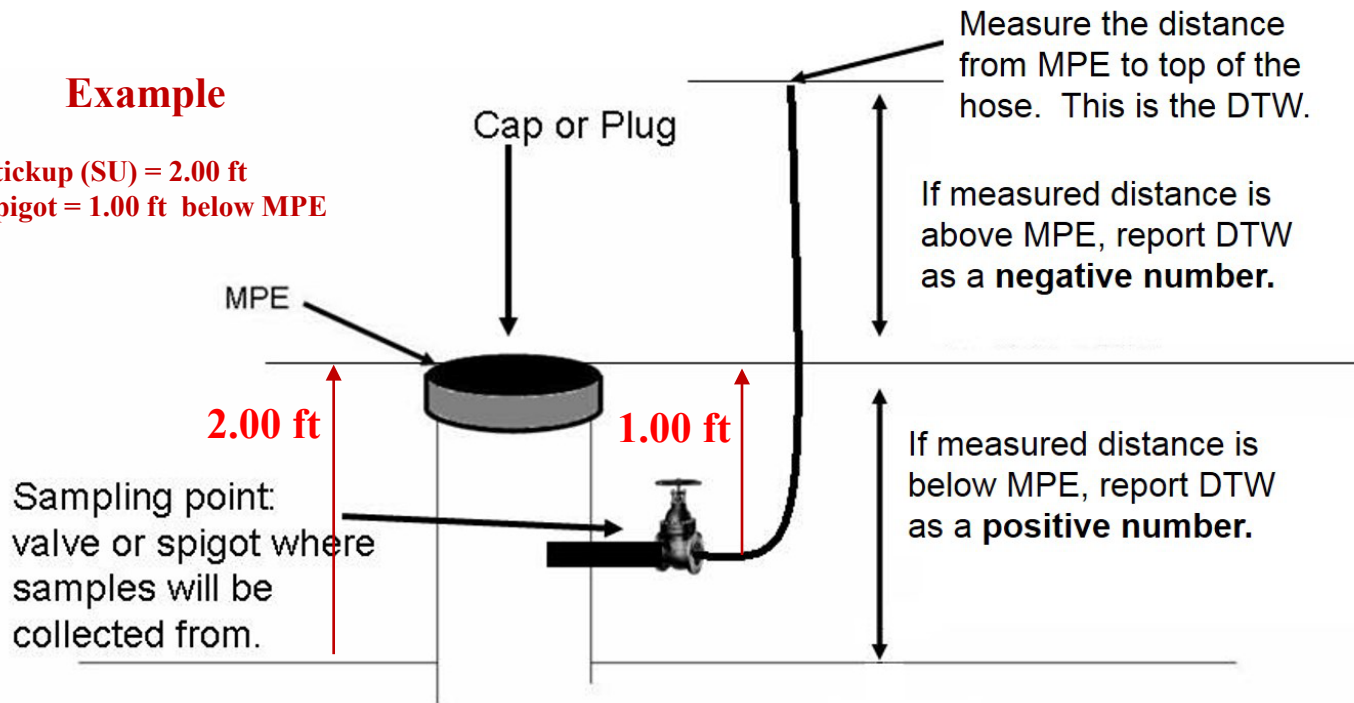
- **Flowing wells: Use hose / tape or pressure gauge**
- **Record as negative number if above MPE**



Depth to Water – Hose / Tape

Example

Stickup (SU) = 2.00 ft
Spigot = 1.00 ft below MPE



E.G. DTW = - 2.01 ft from MPE (-3.01 ft from spigot)

For a correct measurement, the water meniscus should be bulging slightly above the end of the hose. Incorrect measurements are made when the water level is below the end of the hose or when water is allowed to flow out of the hose.

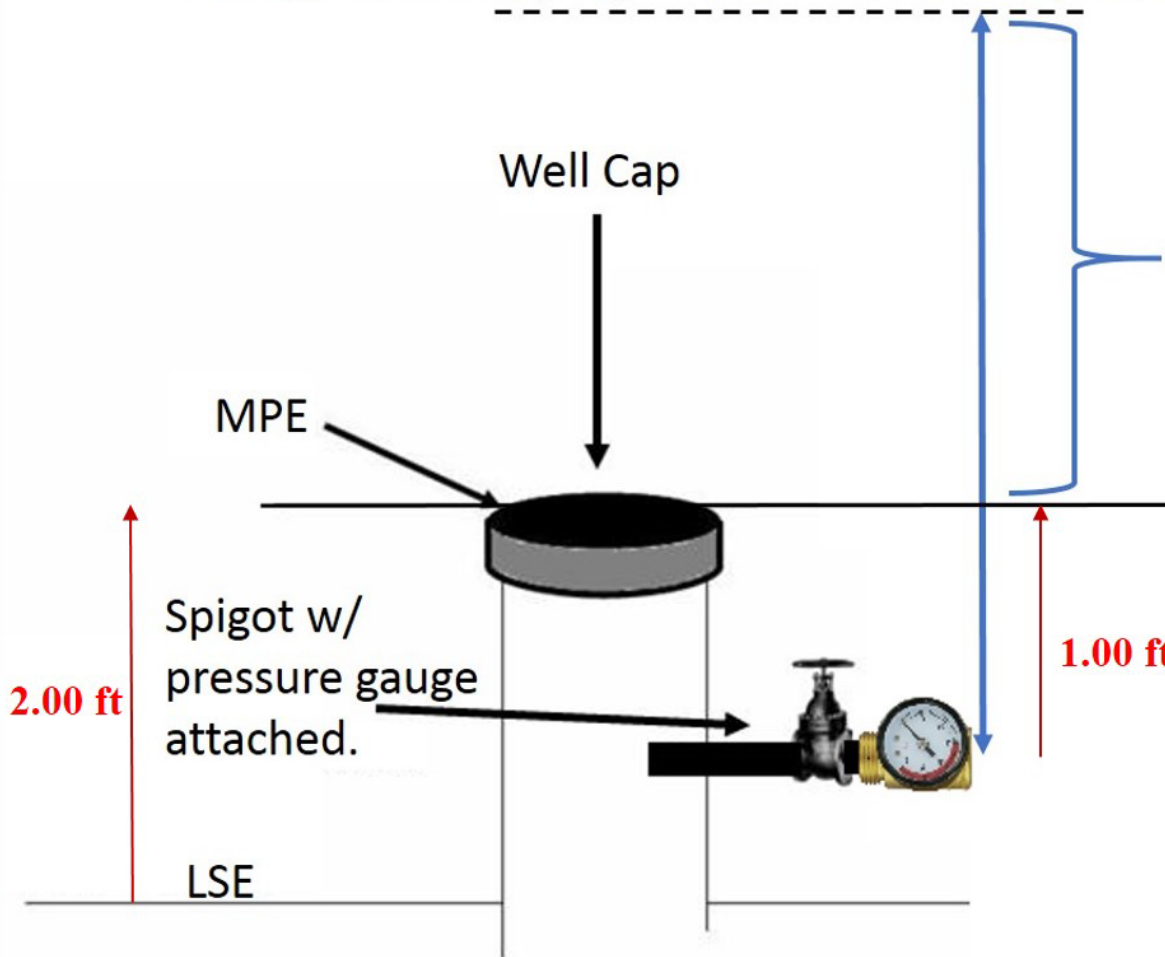
“Water seeks its own level”. Therefore the length of hose does not matter.

See Sampling Manual page 166 for more information.

Depth to Water – Pressure Gauge

Use conversion factor to calculate Depth to Water (DTW) from pressure gauge reading.

Gauge Reading (PSI) * 2.31 = feet above pressure gauge



For Status & Trend Networks, record Depth to Water (DTW) from MPE.

Because gauge & MPE are not at same height, we must adjust the reading.

If adjusted DTW is above MPE, record as negative number.

E.G. Gauge = 1.30
(1.30) x (2.31) = 3.01
Above MPE: record as
- 2.01 ft

See Sampling Manual page 167 for more information.

DTW for Wells with Closed System & In-Place Plumbing

- For many wells with in-place plumbing, it is not possible to measure DTW
- Select “DTW not measured” on the field sheet and describe the reason

(e.g. “Closed System In-Place plumbing”)



INITIAL DEPTH TO WATER FROM MEASURING POINT (DTW)

Select one method, measure twice, report second number. Measurements must be within ± 0.01 ft. Report as negative # if above MPE.

- ☐ 1) Electronic Sensor 1st Reading _____ ft 2nd Reading _____ ft
- ☐ 2) Tape / Chalk (Held At - Wetted At) = DTW 1st Reading (_____ ft - _____ ft) = _____ ft
2nd Reading (_____ ft - _____ ft) = _____ ft
- ☐ 3) Hose / Tape for Flowing Artesian Well (meas. from top of hose to MPE) 1st Reading _____ ft 2nd Reading _____ ft
- ☐ 4) Pressure Gauge for Flowing Artesian Well 1st Reading _____ PSI X (-2.31) = _____ ft
2nd Reading _____ PSI X (-2.31) = _____ ft Adjust for diff. btwn. gauge & MPE (if needed) _____ ft
- ☒ 5) DTW Not Measured. List reason in DTW result comment below.

DTW
Value (ft):

DTW
Qualifier(s):

DTW Result
Comment:

Calculating Water Column Height

- Use measured DTW to calculate Water Column Height

$$\text{WCH} = \text{Total depth} - (\text{DTW} - \text{stickup})$$

WATER COLUMN HEIGHT (WCH) Do not complete if using purge method #2 above. **DTW = NA in calc. if negative or if not meas.

_____ ft - (_____ ft - _____ ft) = _____ ft
Total Depth DTW Stickup WCH

OR ☐ Check here if WCH calculation not performed. List reason: _____

- Use “NA” for DTW in calc. if DTW is negative number or not measured
- Always double check your calc. before proceeding

Example

Total depth (TD) = 30.00 ft

DTW meas. = 15.00 ft

Stickup (SU) = 1.00 ft

$$\text{TD} - (\text{DTW} - \text{SU}) = \text{WCH}$$

$$30.00 - (15.00 - 1.00) = 16.00$$

WELL PURGING SET UP



- Keep area clean.
- Place gas power sources downwind
- Direct water away from well and surface water bodies

WELL PURGING EQUIPMENT



- **Purge with centrifugal, peristaltic or submersible pump**
 - (Do not sample with centrifugal pump)
- **Check valve to prevent backflow when using a centrifugal or submersible pump**
- **Appropriate tubing (see page 35)**



Field ID: _____ Project Name: _____ Date: _____

Purge Method: #1) Conventional Purge Method: ☐ at least 1.5 well volumes & stability;
☐ ≥ 5 well volumes without stability; ☐ Outer / Middle well in series of concentric wells.
☐ #2) In-place plumbing w/ Continuous / Intermittently running pump purge & stability;
☐ #3) Other

Action	Equip. Type	Fuel Powered	Pump Name	Tubing Material(s) (Describe Other in Comments)	Equip. Vol. (gal)	Pump/Intake Placement (ft)	Corrected Due to Drawdown?
Purge	IPP / Sub. / Perist. / Centrif.	Y / N		PE / PP / PVC / Si / Other / NA			Y / N
Sample	IPP / Sub. / Perist. / NA	Y / N		PE / PP / PVC / Si / Other / NA			NA

Document equipment used for purging and sampling
(back of field sheet)

- Type of pump & unique ID (e. g. Peristaltic #1)
- Tubing Material(s)
- Equipment Volume
- Pump / intake placement
- Use of fuel powered equipment (Y / N)

Purging Methods

- 1) Conventional Purge Method
 - 1A) ≥ 1.5 well volumes (V) & stability
 - 1B) ≥ 5.0 V
 - 1C) ≥ 1.5 V & stability for series of concentric wells
- 2) In-place plumbing and stability
 - Method depends on frequency of pump use
- 3) Other (e. g. Fully dry purge) – Not used

Conventional Purge Method



Field ID: _____ Project Name: _____ Date: _____

Purge Method: #1) Conventional Purge Method: ☒ at least 1.5 well volumes & stability;
☐ ≥ 5 well volumes without stability; ☐ Outer / Middle well in series of concentric wells.
☐ #2) In-place plumbing w/ Continuous / Intermittently running pump purge & stability;
☐ #3) Other _____

- Use WCH to calculate one well volume (V).
- Purge at least 1 well volume before initiating stability readings
- Purge at least $\frac{1}{4}$ well volumes between subsequent stability readings.
- Purge at least $1\frac{1}{2}$ well volumes before samples are collected.

Calculating Purge Volumes

One Well Volume (V) - Equation 1 example

$$V = 0.041 \times d \times d \times h$$

2 in. diameter well

90 ft. water column height

$$V = 0.041 \times 2 \times 2 \times 90$$

$$V = 14.8 \text{ gallons (1}^{\text{st}} \text{ stability readings)}$$

$$0.25 V = 3.7 \text{ gallons}$$

$$1.25 \text{ well volumes} = 18.5 \text{ gallons (2}^{\text{nd}} \text{ readings)}$$

$$1.5 \text{ well volumes} = 22.2 \text{ gallons (3}^{\text{rd}} \text{ readings;}$$

Min. purge volume)

PURGE VOLUME

One Well Volume (V) - Equation 2

$$V = (Gfw) \times h$$

**Gfw = gallons per foot of
water (constant, based on
diameter)**

h = height of the water column in feet

PURGE VOLUME

One Well Volume using Equation 2

$$V = (Gfw) \times h$$

2 - inch diameter well

90 ft. water column height

Well Volume Constants (Gfw)

Casing Internal Diameter	GFW (Gallons per Foot of Water)
0.75"	0.02
1"	0.04
1.25"	0.06
2"	0.16
3"	0.37
4"	0.65
5"	1.02
6"	1.47
8"	2.62
10"	4.10
12"	5.88

PURGE VOLUME

One Volume using Equation 2

$$V = (Gfw) \times h$$

2-inch diameter well

(GFW = 0.16)

h = 90 ft. water column height

$V = 0.16 \times 90 = 14.4$ gallons

Purge Volume Equation 2

- Note if the **constant** for a particular well diameter is unknown - Use Equation 1

MINIMUM PURGE VOLUME

MINIMUM PURGE VOLUME DETERMINATION (Do not complete if using purge method #2 above.)			
Well Diameter inches → Gfw Gallons per foot of water) If diameter not listed use Equation 1. 0.75" → 0.02; 1" → 0.04; 1.25" → 0.06; 2" → 0.16; 3" → 0.37; 4" → 0.65; 5" → 1.02; 6" → 1.47; 8" → 2.62; 10" → 4.10; 12" → 5.88			
☐ Equation 1:	$\frac{\text{Storage Tank}}{\text{gal}} + \left(\frac{0.041}{\text{Diameter}} \times \frac{\text{in}}{\text{Diameter}} \times \frac{\text{WCH}}{\text{ft}} \times \frac{1.5}{\text{Min. Purge Vol.}} \right) = \frac{\text{gal}}$		
☐ Equation 2:	$\frac{\text{Storage Tank}}{\text{gal}} + \left(\frac{\text{WCH}}{\text{Gfw}} \times \frac{1.5}{\text{Min. Purge Vol.}} \right) = \frac{\text{gal}}$		
☐ Outer / Middle well in series of concentric wells (show calc. in comments): _____ Well Diameter; _____ Inner Well Diameter.			
Purge Rate (gal/min):	Manual check of all calculations complete? Y / N		
Description	# of Well Vol. (Purge Method 1)	Vol. (gal)	Time (min)
Volume to purge before first stability reading.	1 + storage tank		
Volume to purge between subsequent stability readings.	0.25		
Min. purge vol. before sample collection (if stability criteria met).	1.5 + storage tank		

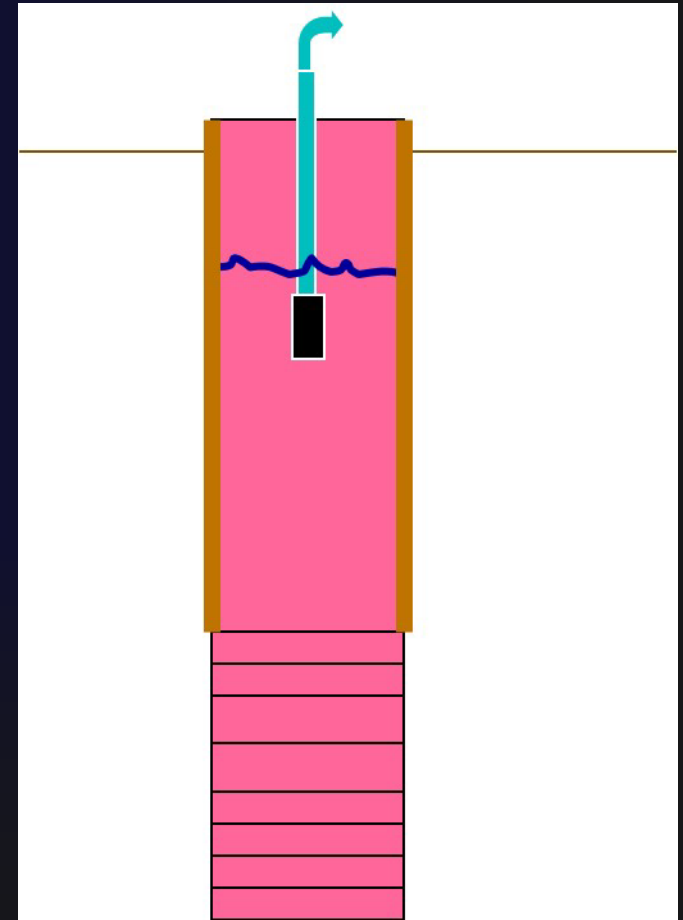
Enter calculated WCH value into either purge volume equation.

Wells without in-place plumbing

Conventional Purge Procedures

Purge Procedures:

- Position pump near top of water column
- Measure DTW during purging
- Avoid draw down by adjusting pumping rate so it is equivalent to well recovery rate



PURGE RATE



Use stopwatch and graduated bucket / container to measure flow rate of water being purged

MINIMUM PURGE VOLUME DETERMINATION (Do not complete if using purge method #2 above.)**Well Diameter inches → Gfw Gallons per foot of water** If diameter not listed use Equation 1.

0.75" → 0.02; 1" → 0.04; 1.25" → 0.06; 2" → 0.16; 3" → 0.37; 4" → 0.65; 5" → 1.02; 6" → 1.47; 8" → 2.62; 10" → 4.10; 12" → 5.88

☐ Equation 1: $\frac{\text{Storage Tank}}{\text{gal}} + \left(\frac{0.041}{\text{in}} \times \frac{\text{Diameter}}{\text{in}} \times \frac{\text{Diameter}}{\text{in}} \times \frac{\text{WCH}}{\text{ft}} \times 1.5 \right) = \frac{\text{Min. Purge Vol.}}{\text{gal}}$

☐ Equation 2: $\frac{\text{Storage Tank}}{\text{gal}} + \left(\frac{\text{WCH}}{\text{ft}} \times \frac{\text{Gfw}}{\text{in}} \times 1.5 \right) = \frac{\text{Min. Purge Vol.}}{\text{gal}}$

☐ Outer / Middle well in series of concentric wells (show calc. in comments): _____ Well Diameter; _____ Inner Well Diameter.

Purge Rate (gal/min): _____**Manual check of all calculations complete?** Y / N

Description	# of Well Vol. (Purge Method 1)	Vol. (gal)	Time (min)
Volume to purge before first stability reading.	1 + storage tank		
Volume to purge between subsequent stability readings.	0.25		
Min. purge vol. before sample collection (if stability criteria met).	1.5 + storage tank		

Time Purge Begin (24hr): _____**Time Purge Stop (24hr):** _____**Sulfur Odor?** Y / N**Total Purge Time (min):** _____**Total Purge Volume (gal):** _____**Water****Time Sampling Begin (24hr):** _____**Time Sampling Stop (24hr):** _____**Color:** _____

(Time sampling begin must be same as time purge stop or later. "N/A" if only collecting field measurements.)

- Document purge rate & start time.
- Calc. min. purge time (min. purge volume / purge rate).
- Calc. purge volume & time before 1st stability reading.
- Calc. purge volume & time between subsequent stability readings.

Action	Equip. Type	Fuel Powered	Pump Name	Tubing Material(s) (Describe Other in Comments)	Equip. Vol. (gal)	Pump/Intake Placement (ft)	Corrected Due to Drawdown?
Purge	IPP / Sub. / Perist. / Centrif.	Y / N		PE / PP / PVC / Si / Other / NA			Y / N
Sample	IPP / Sub. / Perist. / NA	Y / N		PE / PP / PVC / Si / Other / NA			NA

WATER COLUMN HEIGHT (WCH) Do not complete if using purge method #2 above. **DTW = NA in calc. if negative or if not meas.

_____ ft - (_____ ft - _____ ft) = _____ ft
 Total Depth DTW Stickup WCH

OR ☐ Check here if WCH calculation not performed. List reason: _____

MINIMUM PURGE VOLUME DETERMINATION (Do not complete if using purge method #2 above.)

Well Diameter inches → Gfw Gallons per foot of water If diameter not listed use Equation 1.

0.75" → 0.02; 1" → 0.04; 1.25" → 0.06; 2" → 0.16; 3" → 0.37; 4" → 0.65; 5" → 1.02; 6" → 1.47; 8" → 2.62; 10" → 4.10; 12" → 5.88

☐ Equation 1: _____ gal + (0.041 X _____ in X _____ in X _____ ft X 1.5) = _____ gal
 Storage Tank Diameter Diameter WCH Min. Purge Vol.

☐ Equation 2: _____ gal + (_____ ft X _____ X 1.5) = _____ gal
 Storage Tank WCH Gfw Min. Purge Vol.

☐ Outer / Middle well in series of concentric wells (show calc. in comments): _____ Well Diameter; _____ Inner Well Diameter.

Purge Rate (gal/min):

Manual check of all calculations complete? Y / N

Description	# of Well Vol. (Purge Method 1)	Vol. (gal)	Time (min)
Volume to purge before first stability reading.	1 + storage tank		
Volume to purge between subsequent stability readings.	0.25		
Min. purge vol. before sample collection (if stability criteria met).	1.5 + storage tank		

Time Purge Begin (24hr): _____

Time Purge Stop (24hr): _____

Total Purge Time (min): _____

Total Purge Volume (gal): _____

Time Sampling Begin (24hr): _____

Time Sampling Stop (24hr): _____

(Time sampling begin must be same as time purge stop or later. "N/A" if only collecting field measurements.)

Sulfur Odor? Y / N

Water

Color: _____

- Document pump placement & drawdown
- Note watercolor & presence of sulfur odor

PURGING CRITERIA

(to reach chemical/physical stabilization)
(once reached  sample)

3 consecutive measurements within range:

– DO	$\leq 20\%$ of saturation
– Turbidity	≤ 20 NTUs
– Temperature	± 0.2 °C
– pH	± 0.2 standard units
– Sp Conductance	$\pm 5.0\%$ of reading

Example of Stability – pH

(± 0.2 standard units
(3 consecutive measurements))

<u>PV</u>	<u>pH</u>	<u>Criteria Met?</u>		
• 1.00	7.2			
• 1.25	7.4			
• 1.50	7.6	No		
• 1.75	7.0		No	
• 2.00	7.1			No
• 2.25	7.2			Yes

PURGING CRITERIA

Alternatively, if DO and/or turbidity are high (>20% or >20 NTU), purge until 3 consecutive measurements are within:

- Temperature ± 0.2 °C
- pH ± 0.2 standard units
- Sp Conductance $\pm 5\%$ of reading
- DO ± 0.2 mg/L, or 10% (greater)
- Turbidity ± 5 NTUs, or 10% (greater)

Note presence of conditions that may contribute to high DO or turbidity.

PURGING CRITERIA

[illegible]

No stabilization after purging 5 well volumes?

If field measurements do not stabilize after purging 5 well volumes:

- Check calibrations, connections, flow rate**
- Contact Project Manager or QA Officer**
- Proceed to sample collection and document conditions on field sheet**

Wells with in-place plumbing

- **Always select the spigot nearest wellhead**
- **Spigot must be before any softeners or filters**
- **Select spigot before storage tanks if possible**

Wells with in-place plumbing

Select purge method based on frequency of pump use

- How often is pump used for purposes other than sampling? (e.g. monitoring)**

(e.g. irrigation, domestic use)

1. Infrequent / unknown (conventional) vs

2. Continuous / intermittent

Wells with in-place plumbing

1. If pump is infrequently run or
if pump use frequency is unknown.

- Use conventional purge methods: (1A, 1B)
- If DTW cannot be measured:
 - Calculate minimum purge volume as though entire well was full of water
 - For purge equations, enter
(Total Depth + Stickup) as WCH

Wells with In-Place Plumbing

2. If pump is continuously / intermittently running

- Use purge method #2 (i.e. in-place plumbing)



Field ID: _____ Project Name: _____ Date: _____

Purge Method: #1) Conventional Purge Method: ☐ at least 1.5 well volumes & stability;
☐ ≥ 5 well volumes without stability; ☐ Outer / Middle well in series of concentric wells.
☒ #2) In-place plumbing w/ Continuous / Intermittently running pump purge & stability;
☐ #3) Other _____

- Purge lines, tanks & spigot to flush stagnant water.
- Collect stability measurements no sooner than two minutes apart.
- If you have any doubt as to 1. or 2.; USE 1

Alternative Purge Methods Exist

- Fully dry purge not recommended.
- Requires special considerations to avoid damaging equipment.
- WMS does not recommend using other alternative methods.

See page 41 if interested.



Field ID: _____ Project Name: _____ Date: _____

Purge Method: #1) Conventional Purge Method: ☐ at least 1.5 well volumes & stability;
☐ ≥ 5 well volumes without stability; ☐ Outer / Middle well in series of concentric wells.
☐ #2) In-place plumbing w/ Continuous / Intermittently running pump purge & stability;
☒ #3) Other _____

Purging

- Record purge time stop
- Sampling start time must be the same as or later than purge stop time
- Total Purge Vol $\geq$ Min Purge Vol

Time Purge Begin (24hr): _____

Total Purge Time (min): _____

Time Sampling Begin (24hr): _____

(Time sampling begin must be same as time purge stop or later. "N/A" if only collecting field measurements.)

Time Purge Stop (24hr): _____

Total Purge Volume (gal): _____

Time Sampling Stop (24hr): _____

Sulfur Odor? Y / N

Water
Color: _____

Sampling Equipment

Without In-Place Plumbing:

- **Peristaltic or Submersible Pumps**
 - Constructed of stainless steel, Teflon, & other approved materials.
 - When possible, use a variable-speed pump
- **Do not use a centrifugal pump to collect samples!**

With In-Place Plumbing:

You'll have to use pump installed in the well. (Typically submersible, jet, centrifugal, or turbine pump.)

Approved Sampling Pumps



Submersible

- Variable Speed
- Will pump water from most depths encountered
- Must be used with a check valve (No H₂O back into well)



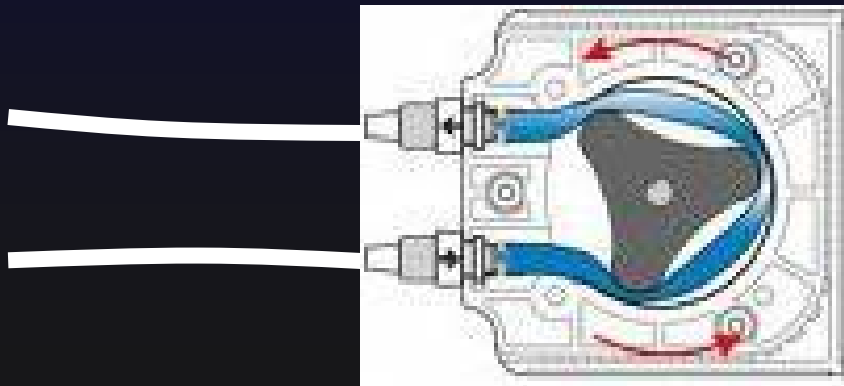
Peristaltic

- Low flow
- Variable Speed
- Will not pump water when the water is 28' (1 atm.) below pump

Sampling Equipment -*Continued*

Peristaltic Pumps: *

- Install 1-foot maximum length of silicone tubing in pump head assembly.
- Decontaminate or replace silicon tubing for each well.



Field Analytes



- Measure field analytes using flow chamber
- Fill flow chamber from the bottom up
(H₂O covers probes)
- Keep flow slow to avoid damage to the probes from pressure



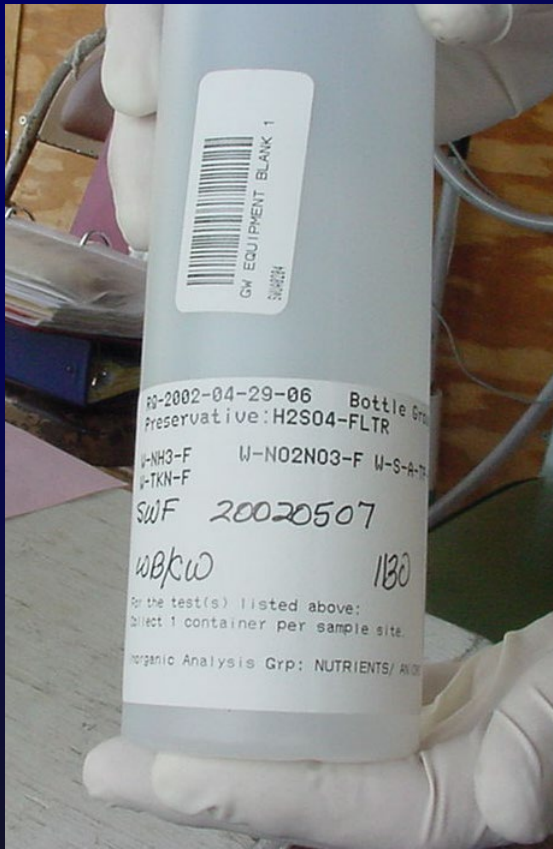
Turbidity

Use Hach Meter

- Place meter on level surface
- Use only clean cuvettes.
- Rinse cuvette with sample water.
- Fill with sample water, avoid air bubbles.
- Wipe dry with lint-free cloth.
- Always rinse the cuvette with DI water at end of each sampling event



SAMPLE CONTAINER LABELING



- Place Station ID Label vertically on all sample containers
- Record date, time, & sampler initials on Lab ID label of each container.
- Time on sample bottle must match sampling start time on back of field sheet.

Time Purge Begin (24hr): _____

Total Purge Time (min): _____

Time Sampling Begin (24hr): _____

(Time sampling begin must be same as time purge stop or later. "N/A" if only collecting field measurements.)

Time Purge Stop (24hr): _____

Total Purge Volume (gal): _____

Time Sampling Stop (24hr): _____

Sulfur Odor? Y / N

Water

Color: _____

SAMPLE COLLECTION



- Collect samples immediately after purging – do not stop flow.
- Wear clean gloves whenever handling sample containers.
- Reduce flow to fill bottles (< 500 mL/min).
- Do not rinse bottles.
- Leave slight air space.

Sample Collection Order - STATUS NETWORK

Follow order on the Groundwater Sample Details Page!

Check Boxes for Each Container Submitted to Lab				Preservation (Must be completed within 15 min of sample collection)	# Bottles sent to Lab	Bottle Group
Parameter Suite	Lab Test Codes Trend Core	Lab Test Codes Status Core	Lab Test Codes Special Projects			
Tracers (BG-500ML)			☐ W-E8321-DI / W-E8321-MS	☐ Ice		
Pesticides – Carbamates (BG-500ML)			☐ W-CARB-AA	☐ 1 vial MCAA Buffer ☐ Ice MCAA Lot #: _____		
Pesticides - Organochlorine (BG-500ML)			☐ W-PCL-TQ-R	☐ Ice		
Pesticides – Organo-N/P (BG-500ML)			☐ W-PSNP-TQ	☐ Ice		
Nutrients (P-500ML)	☐ W-NH3 / W-NO2NO3 / W-S-T-P / W-TN / W-TOC	☐ W-NH3 / W-NO2NO3 / W-S-T-P / W-TN / W-TOC		☐ 2ML H ₂ SO ₄ ☐ pH < 2 ☐ Ice		
Metals (P-500ML)	☐ W-HARD / W-ICP / W-ICPMS	☐ W-HARD / W-ICP / W-ICPMS		☐ 2ML HNO ₃ ☐ pH < 2 ☐ Ice		
Anion / Phys. Aggregate (P-1L)	☐ ALKALINITY / TURBIDITY / W-CL-IC / W-COLOR / W-COND / W-F/ W-SO4-IC / W-TDS	☐ ALKALINITY / TURBIDITY / W-CL-IC / W-COLOR / W-COND / W-F/ W-SO4-IC / W-TDS		☐ Ice		
Microbiology (P-250ML or P-120ML)	☐ ECOLI-18QT / TCOLI-18QT	☐ ECOLI-18QT / TCOLI-18QT		☐ Ice		
Filtered Nutrient (P-125ML)	☐ W-PO4-F			☐ Field Filtered w/ in-line 0.45 um PES filter ☐ Ice		

1. 500 mL nutrients

2. 500 mL metals

3. 1 L anions, Turbidity, and physical analytes

4. Bacteria Container(s)

****NO FILTERING****

Sample Collection Order - TREND NETWORK

Check Boxes for Each Container Submitted to Lab				Preservation (Must be completed within 15 min of sample collection)	# Bottles sent to Lab	Bottle Group
Parameter Suite	Lab Test Codes Trend Core	Lab Test Codes Status Core	Lab Test Codes Special Projects			
Tracers (BG-500ML)			☐ W-E8321-DI / W-E8321-MS	☐ Ice		
Pesticides – Carbamates (BG-500ML)			☐ W-CARB-AA	☐ 1 vial MCAA Buffer ☐ Ice MCAA Lot #: _____		
Pesticides - Organochlorine (BG-500ML)			☐ W-PCL-TQ-R	☐ Ice		
Pesticides – Organo-N/P (BG-500ML)			☐ W-PSNP-TQ	☐ Ice		
Nutrients (P-500ML)	☐ W-NH3 / W-NO2NO3 / W-S-T-P / W-TN / W-TOC	☐ W-NH3 / W-NO2NO3 / W-S-T-P / W-TN / W-TOC		☐ 2ML H ₂ SO ₄ ☐ pH < 2 ☐ Ice		
Metals (P-500ML)	☐ W-HARD / W-ICP / W-ICPMS	☐ W-HARD / W-ICP / W-ICPMS		☐ 2ML HNO ₃ ☐ pH < 2 ☐ Ice		
Anion / Phys. Aggregate (P-1L)	☐ ALKALINITY / TURBIDITY / W-CL-IC / W-COLOR / W-COND / W-F/ W-SO4-IC / W-TDS	☐ ALKALINITY / TURBIDITY / W-CL-IC / W-COLOR / W-COND / W-F/ W-SO4-IC / W-TDS		☐ Ice		
Microbiology (P-250ML or P-120ML)	☐ ECOLI-18QT / TCOLI-18QT	☐ ECOLI-18QT / TCOLI-18QT		☐ Ice		
Filtered Nutrient (P-125ML)	☐ W-PO4-F			☐ Field Filtered w/ in-line 0.45 um PES filter ☐ Ice		

1. 500 mL Nutrients bottle
2. 500 mL Metals bottle
3. 1 L anions, Turbidity, and physical analytes
4. Bacteria container(s)
5. Then attach in-line filter, flush, and collect 125 mL Ortho-Phosphate bottle *Filtered* (only for Trend Network)

AFTER SAMPLES ARE COLLECTED:

Place Station ID barcode (digital barcode or barcode label) on the sample details page.



Lab Page ____ of ____

RQ-2020-_____ Collected By (Agency Code): _____

Project Name: _____ Sampler Names: _____

Customer: AMBIENT Lab Project ID: ☐ GW-TREND / ☐ STATUS / ☐ BMAP

Place
Station
ID
Label
Here

Comments:

Sulfuric Acid Lot #:

Nitric Acid Lot #:

Matrix: **W-GROUND**

☒ Grab

Date Collected	Time Collected	D.O. (% SAT)	Temp (°C)	pH (SU)	Sp. Cond. (umhos/cm)
	☐ ETZ ☐ CTZ				

Check Boxes for Each Container Submitted to Lab

Preservation

Bottles

CUSTODY SHEETS / SAMPLE DETAILS PAGE



Lab Page ____ of ____

RQ-2020-_____
 Project Name: _____
 Customer: AMBIENT

Collected By (Agency Code): _____
 Sampler Names: _____
 Lab Project ID: ☐ GW-TREND / ☐ STATUS / ☐ BMAP

Place Station ID Label Here	Comments: Sulfuric Acid Lot #: Nitric Acid Lot #:
---	--

Matrix: **W-GROUND**

☒ Grab

Date Collected	Time Collected	D.O. (% SAT)	Temp (°C)	pH (SU)	Sp. Cond. (umhos/cm)
	☐ ETZ ☐ CTZ				

Check Boxes for Each Container Submitted to Lab

Preservation

Bottles

- **Transfer sampling event information to GW sample details page.**
- **Field data must be last set of field measurements recorded for stability monitoring.**
- **Time collected must match time recorded on bottles.**



FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
STATUS & TREND NETWORKS FIELD SHEET - GROUND WATER
Effective: October 2023

Collection Agency: _____ Project Name: _____ Date: _____
On-site Time (24hr): _____ Off-site Time (24hr): _____ Time Zone (for all times listed on this form): ☐ ETZ / ☐ CTZ

Trend Network Station Name: _____
OR
Status Network Random ID: _____
Water Resource: ☐ UNCONFINED AQUIFER / ☐ CONFINED AQUIFER RQ: _____
FLUWID: _____ FLUWID Condition: Normal / Needs Reprint / Applied New / Applied Reprint / No ID
Station Name: _____ Casing Material: _____
Total Depth (ft): _____ Casing Depth (ft): _____ Casing Diam. (in): _____ Storage Tank Vol. (gal): _____
Land Surface Elevation (LSE)(ft): _____ Measuring Point Elevation (MPE)(ft): _____ Stickup (ft)*: _____
*Measure stickup for Status Network. Calculate stickup for Trend Network (Stickup = MPE - LSE), if MPE & LSE have the same vertical datum.
Well Condition: Normal / Other _____ Well Use: Potable / Non Potable / Unknown _____

Sampling Team Member Names	Field Measurements	Water Sample Collection	Documentation	Sample Preservation	Field/Equip. Blank Collection	Signatures or Initials

Additional Personnel / Visitors On-site: _____
Weather Conditions: _____
Photos Taken: ☐ Yes / ☐ No (Required for all Status stations. Required annually for all Trend stations.)
Micro Land Use Data Collected: ☐ Yes / ☐ No (Required for all Status stations. Required annually for all Trend stations.)
Major Land Use Group: _____ Feature Codes Observed: _____
QA/QC Blank Collected at this station? ☐ None / ☐ Field Blank / ☐ Equip. Blank
QA/QC Blank Field ID: _____ Collection Time (24 hr): _____
Equip. Type: Submersible / Peristaltic Equip. ID / Name: _____ Cleaning: ☐ Lab / ☐ Field
INITIAL DEPTH TO WATER FROM MEASURING POINT (DTW)
Select one method, measure twice, report second number. Measurements must be within ± 0.01 ft. Report as negative # if above MPE.
☐ 1) Electronic Sensor 1st Reading _____ ft 2nd Reading _____ ft
☐ 2) Tape / Chalk (Held At - Wetted At) = DTW 1st Reading (_____ ft - _____ ft) = _____ ft
2nd Reading (_____ ft - _____ ft) = _____ ft
☐ 3) Hose / Tape for Flowing Artesian Well (meas. from top of hose to MPE) 1st Reading _____ ft 2nd Reading _____ ft
☐ 4) Pressure Gauge for Flowing Artesian Well 1st Reading _____ PSI X (-2.31) = _____ ft
2nd Reading _____ PSI X (-2.31) = _____ ft Adjust for diff. btwn. gauge & MPE (if needed) _____ ft
☐ 5) DTW Not Measured. List reason in DTW result comment below.
DTW Value (ft): _____ DTW Qualifier(s): _____ DTW Result Comment: _____

FIELD SHEET FRONT SIDE

- Record printed names, tasks performed, and signatures or initials of all samplers.

Photo Documentation

- 6 photos per well (N, E, S, W, overall well, FLUWID tag on well)
- Required for all Status Network wells
- Required once per year for Trend Network wells



Z4-UA-12002 N



Z4-UA-12002 E



Z4-UA-12002 S



Z4-UA-12002 W

Note, lid is up

Z4-UA-12002
overall well



Z4-UA-12002
FLUWID

Photo Documentation

Recommend taking photos with Survey123 app and tablet computers

- **Photos will be stamped with station ID, date, and direction (N / E / S / W) in lower-left corner.**
- **Photo files will be automatically named and transferred to DEP One Drive.**

MICRO LAND USE



Micro Land Use Form:

- Complete annually for Trend Network
- Every well in Status Network
- Draw and check off major land uses around well, take pictures



MICRO LAND USE FORM

Collection Agency: _____ Project Name: _____ Date: _____

Trend Network Station Name
OR Status Network Random ID:
(Use station ID label if available.)

Micro Land Use Sketch	Major Land Use Group (check one): 1 - Low Impact (LI) 2 - Urban/Suburban (US) 3 - Mining/Excavation (ME) 4 - Intense Agriculture (AG) 5 - Industrial (IN)
	List Codes for All Features Observed Within 300 Feet of Well:
	Micro Land Use Comments or Other Unlisted Features:

Reference Table of Feature Codes (listed alphabetically)

(47) Agri. Chemical Mixing/Storage	(55) Dry Cleaners	(04) Landfill	(16) Roads, Major Highway	(19) Transmission Lines and Towers
(02) Airports	(41) Food Processing Plant	(11) Mine	(36) Roads, Other	(29) Water Softener
(52) Animal Feeding Operation	(12) Golf Course	(43) Mineral Processing Plant	(13) Septic Tank(s)	(30) Well(s), Injection
(10) Borrow Pit	(48) Groves, Citrus	(01) Nursery / Greenhouse	(07) Service Station	(31) Well(s), Irrigation
(57) Campground	(49) Groves, Other	(20) Parking Lot(s)	(14) Sewage Treatment Plant	(32) Well(s), Oil & Gas
(21) Canal(s)	(23) Holding Pond(s), Industrial	(44) Petroleum Processing Plant	(15) Sewage Treatment Sprayfield	(33) Well(s), Private Supply
(40) Cave(s)	(24) Holding Pond(s), Urban	(17) Pipeline(s) & Pump Station	(39) Sinks/Sinkholes	(34) Well(s), Public Supply
(03) Cemetery	(45) Hospitals/Clinics	(46) Power Plant	(27) Spring(s)	(28) Wetland(s)
(51) Crops, Field	(56) Hunting Camp	(18) Railroad(s)	(08) Storage Tanks (Above Ground)	(54) Zoos
(50) Crops, Row	(35) Junk Yard	(06) Repair Shops (e.g. Automotive)	(09) Storage Tanks (Below Ground)	
(22) Ditch, Drainage	(53) Kennel(s)	(05) Residence	(38) Stream(s)	
(37) Ditch, Irrigation	(25) Lake(s)	(26) River	(42) Timber Processing Plant	

The following topics will be covered in separate sections of today's training:

- Sample Preservation
- Sample Shipment
- Equipment Cleaning
- Quality Assurance





Questions?

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**For More Information, See Watershed
Monitoring Information Center:**

<https://publicfiles.dep.state.fl.us/dear/Watershed%20Monitoring/Info%20Center/>