

# Monitor Well, Monitor Well, Where For Art Thou?

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Volusia County Environmental Management



# Monitor Well, Schmonitor Well, Who Cares ?

- Monitor Wells:
  - Provide Valuable Data
  - Help Measure The Progress Of Clean Up
  - Cost Money To Install Or Replace

# What Does A Monitor Well Cost?

- Time:

Planning, Installation,  
Sampling,  
Technical Review

- Money:

Guess Where THAT  
Comes From



# Typical Costs For A Monitor Well Installation

|                                             |               |
|---------------------------------------------|---------------|
| • Typical <20 ft. monitor well              | 431.07        |
| • 2 person mobilization                     | 721.68        |
| • 2 person oversight (1/2 day ea.)          | 796.04        |
| • Drilling Costs (Drilling, Set Up, Sample) | 1732.77       |
| • Permit (Approximate)                      | 50.00         |
| • Letter Report (As A Minimum)              | <u>251.26</u> |

Approximate Minimum Cost **3982.82**

Source: 2005 FDEP SOP

# Labeling Monitor Wells

FDEP BPSS SOP PCS-006

*Design, Installation, and Placement*

*Of*

*Monitoring Wells*

(Effective May 2, 2005)

Well Construction, Section G-4:

“The well designation must be secured to the plastic tie or permanently affixed to the well pad using a steel tag or etched into the concrete pad.”

# Why Label The Monitor Well ? (After All, We Have A Site Map)

- Site Maps Aren't Always Accurate
- It Is Easy To Confuse Wells
- “Clustered” Wells
- Inexperienced / New Personnel
  - The Wrong Well(s) Could Be Sampled

# So What If It's The Wrong Well ?

- Inaccurate Reports:
  - Inaccurate Groundwater Elevation Tables & Maps
  - Inaccurate Contaminant Tables & Plume Maps
  - Incorrect Conclusions and Recommendations
- Potentially Expensive Ramifications:
  - If The RAP Is Based On The Erroneous Data
  - Erroneous Off Site Noticing
  - Wasted Time, Money, Effort

# Not-So-Permanent Markings

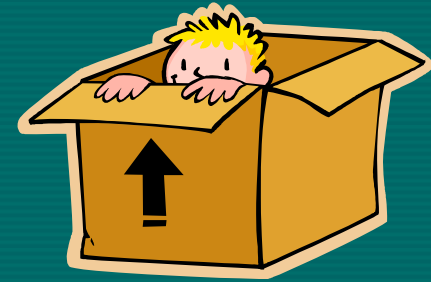
- Duct Tape Labels
  - Fade & Degrade Rapidly
- “Permanent” Markers (i.e.: Sharpie)
  - Fade Rapidly
- Pen / Pencil / Crayon
  - Fade & Wash off

# More-Permanent Markings

- Paint ( In Non-Traffic Applications )
- Metal Tags ( PCS-006 )
- Etching The Concrete Pad ( PCS-006 )
- Engraving / Embossing The Road Box

# Painted Label





# Hide And Seek

Come Out, Come Out,  
Wherever You Are....





What's The Matter ?

I Lost My Well !!!



# How Can You “Lose” a Well ?

The Well Is Actually Destroyed (Rare)

OR

The Well Is Hiding

(More Common)

Construction / Site Activities

Mother Nature

# Construction Activities



# Mother Nature



# So The Well Is Reported As Destroyed – Now What ?

- Is There Evidence Of Well Destruction ?
  - Pieces Of The Well / Road Box Have Been Found
- Why Is The Well Hiding ?
  - What Has Changed At The Site ?
- Was A Thorough Search Conducted?





# Remember, Before You Replace A “Lost” Monitor Well...

|                                             |               |
|---------------------------------------------|---------------|
| • Typical <20 ft. monitor well              | 431.07        |
| • 2 person mobilization                     | 721.68        |
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Approximate Minimum Cost

3982.82



Source: 2005 FDEP SOP

# OK, I've Lost My Well. Now What?

- In The Office

The Search Plan Should Be Discussed

(HINT: PPPPP)

- Gather Some Tools

Shovels, Metal Detector, Spud Bar, Pick Ax, etc.

2 Measuring Tapes ( 100'-200' each ), Distance  
Wheel, Powdered Chalk

Note: Inexpensive Metal Detectors Are Designed To  
Ignore Iron & Steel !!!



# OK, I've Lost My Well. Now What?

- Use An Accurate Map  
( Preferably the PLS )  
-An Inaccurate Map Is Useless



NOTE: The Contractor Is Responsible For Keeping The  
PLS Map Up-To-Date

(FDEP SOP 2005, Section 7.8)

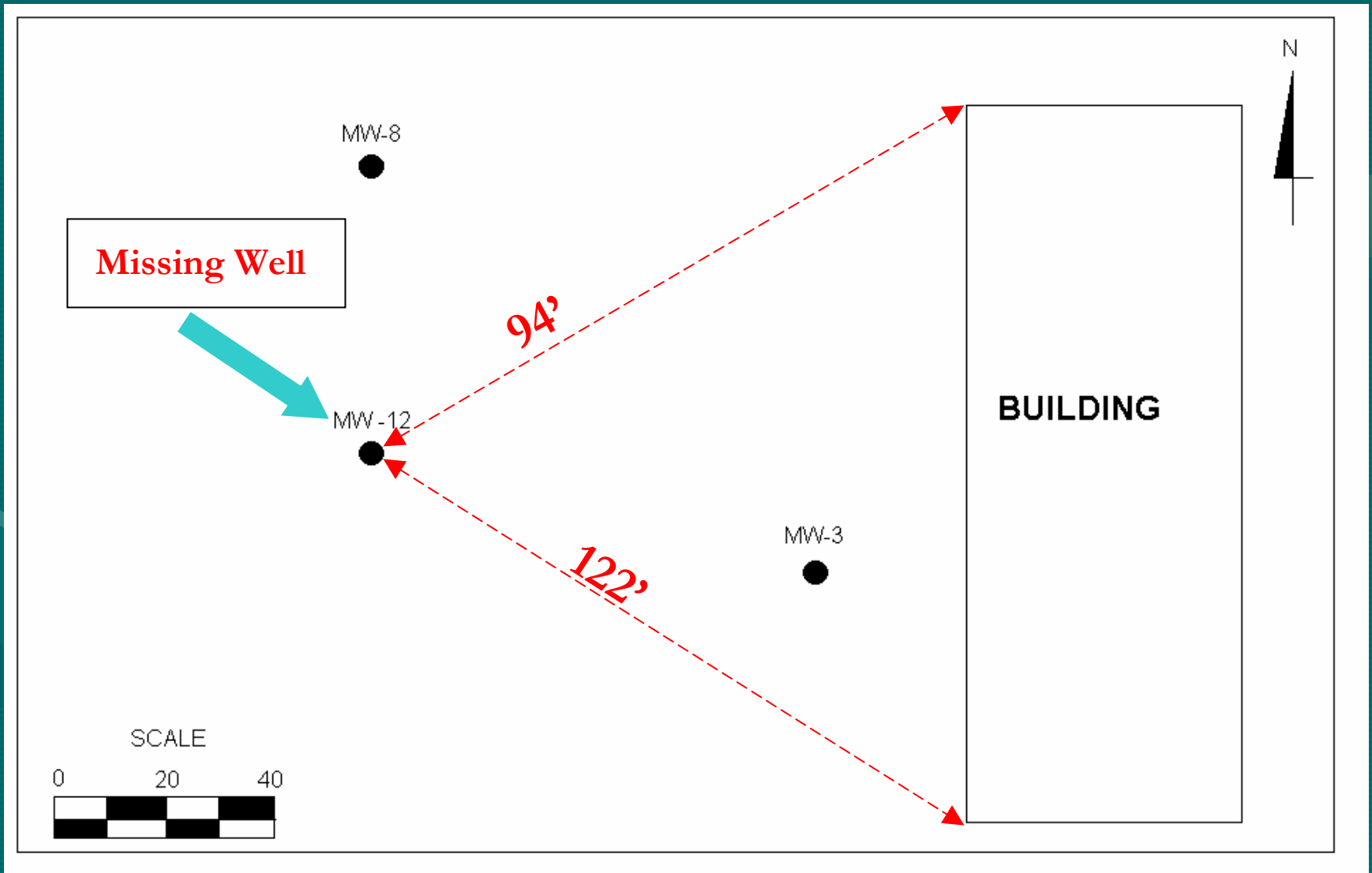


# How Do I Search ?

Verify That The Map Matches What Is On Site.

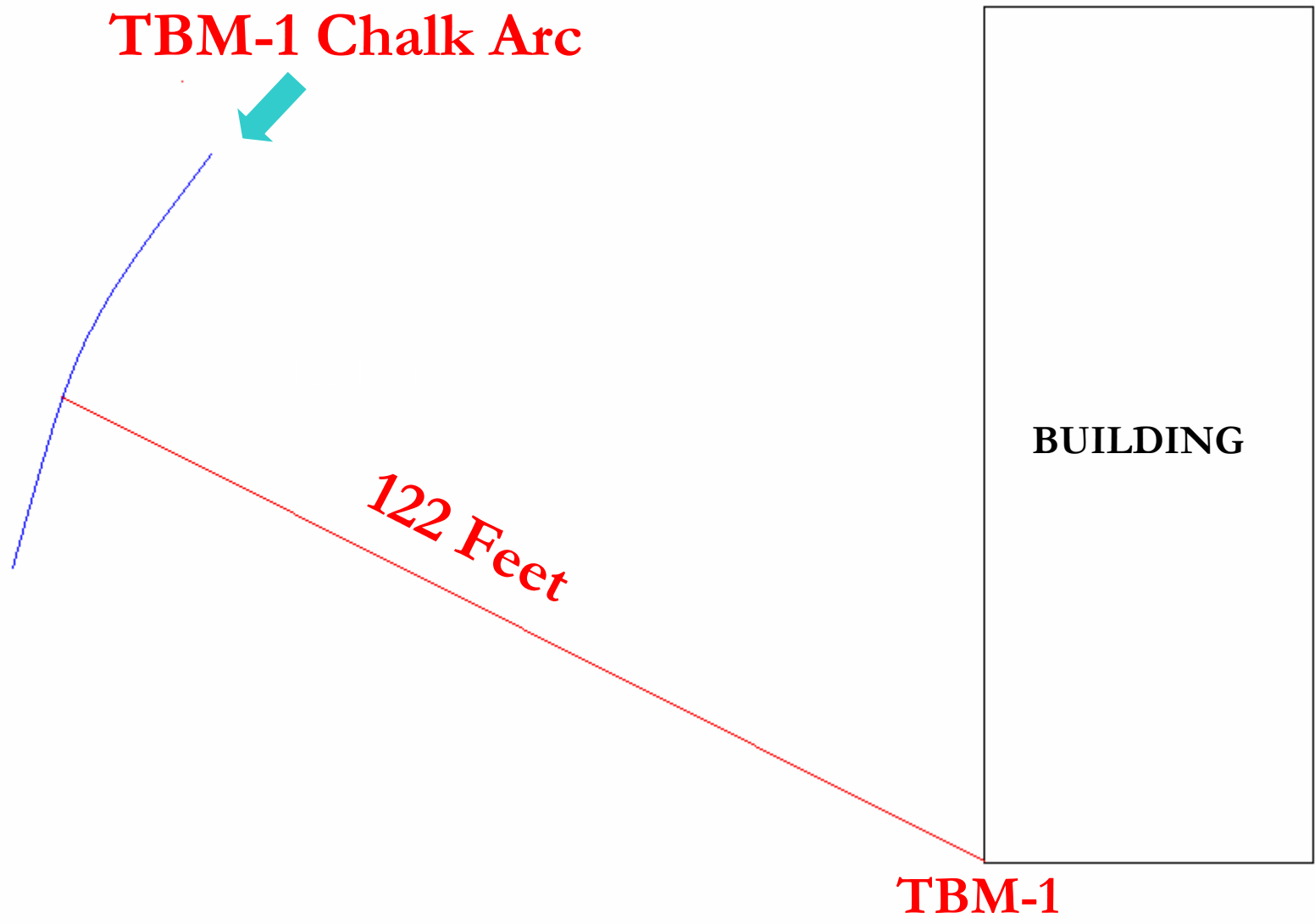
- 1) Measure Well Locations And Permanent Structures And Compare To The Map.
- 2) On The Map, Measure The Distances From Known Wells / Structures To The Missing Well.

# Typical Site Map



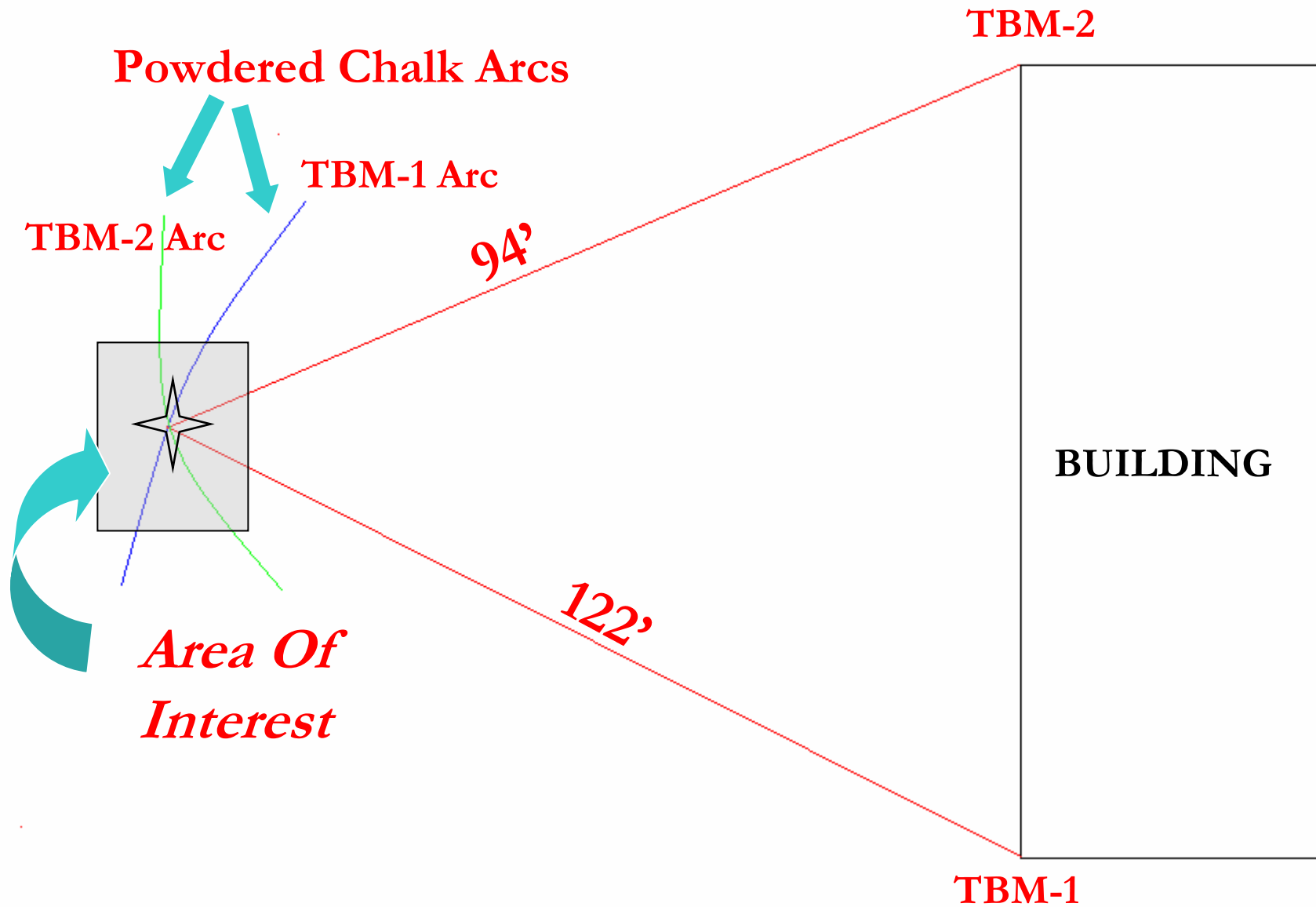
# Searching

- 3) Anchor One End Of The Measuring Tape At A Temporary Benchmark (TBM-1).
- 4) Mark An “Arc” At 122 ft. From TBM-1 Using The Powered Chalk.



# Searching

- 6) On The Map, The Distance From TBM-2 To The Missing Well Is 94 ft.
- 7) Mark An “Arc” (So That It Intersects The TBM-1 Arc) At 94 ft. From TBM-2.
- 8) Theoretically, The Intersection Of The 2 Arcs Is The Location Of The Missing Well.



TBM-2 (Out of Picture)

TBM-1 (Bldg. Corner Post)

122 feet

Chalk "Arc"

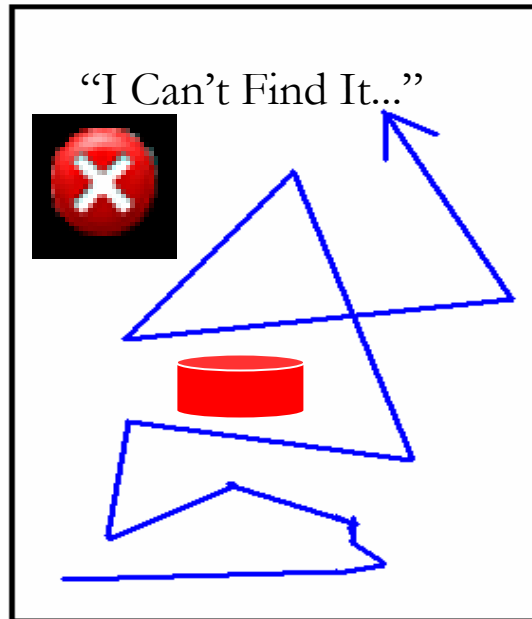


# Search Pattern

Get The Metal Detector And Search  
The “Area Of Interest” Using A “Mowing  
The Grass” Search Pattern.



# Search Patterns



***NO !!!!***



***YES !!!***

**The Proper  
Search  
Pattern Will  
Greatly  
Minimize  
Search And  
Digging  
Efforts**

# When The Metal Detector Gives A Solid “Hit”, Your Co-Worker Can Start Digging.



%\$\*#

**Monitor  
Well !**

# Well, That Was Easy, Wasn't It ?



# Success Is SOOO Sweet

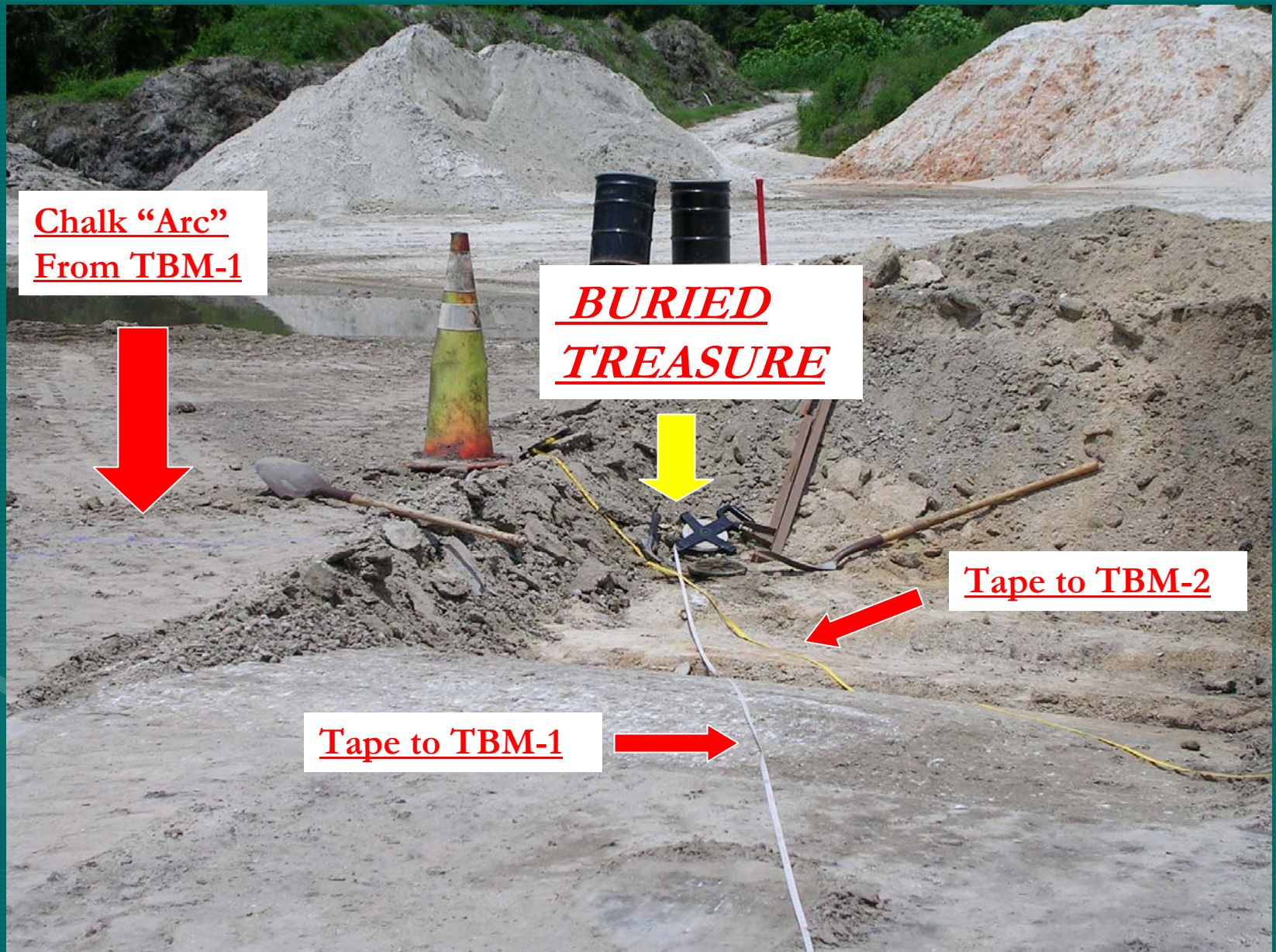


Chalk "Arc"  
From TBM-1

*BURIED*  
*TREASURE*

Tape to TBM-2

Tape to TBM-1



**Now You'll Want To  
Prominently Mark The  
Location Of The Found Well**

**(You Don't Want To Have All Of  
This Fun Again, Do You ?????)**









# Results in Volusia County

- Monitor Wells Reported As Destroyed 17
- “Destroyed” Wells Found By VCEM( '05-'06 ) 13

Minimum Dollar Savings For The Taxpayer



\$51,776.66



Satisfaction in finding “destroyed” wells:

PRICELESS

# Your Tax Dollars At Work



# Special Thanks

- Volusia County Road & Bridge Department
  - (Front End Loader)
- Volusia County Environmental Management
  - Gabor ***“Don’t Come Back Until...”*** Matrai, P.E.
    - (Motivation)
  - Susan ***“I Broke A #@&! Nail”*** Tessensohn
    - (Blood, Sweat, Tears, and Language Lessons)