

Well Cleaning Methods

By

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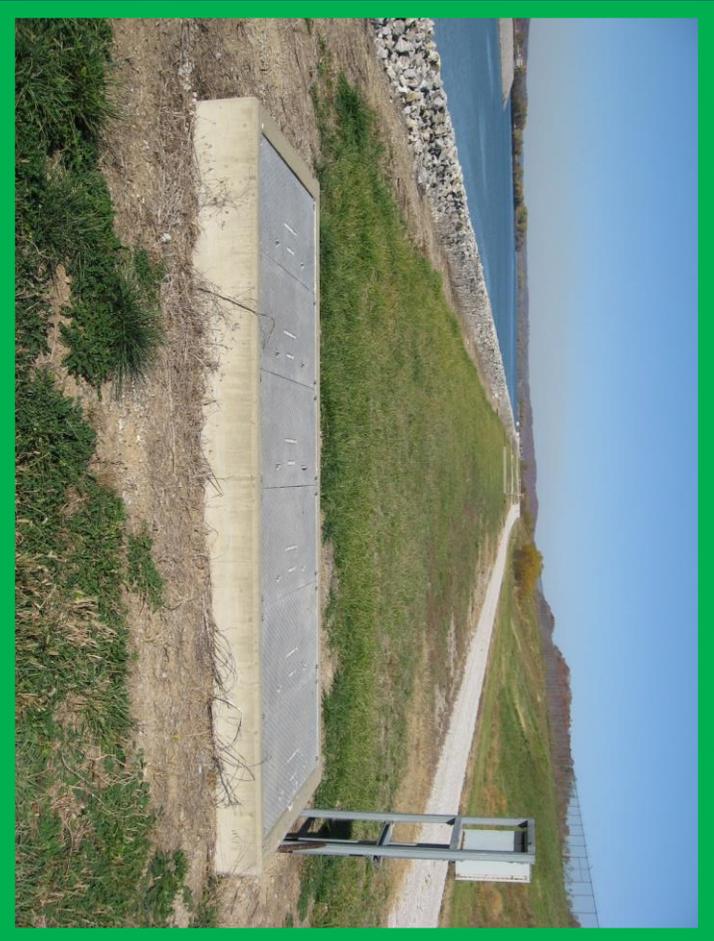
**Why clean a well?
How do you clean a well?**



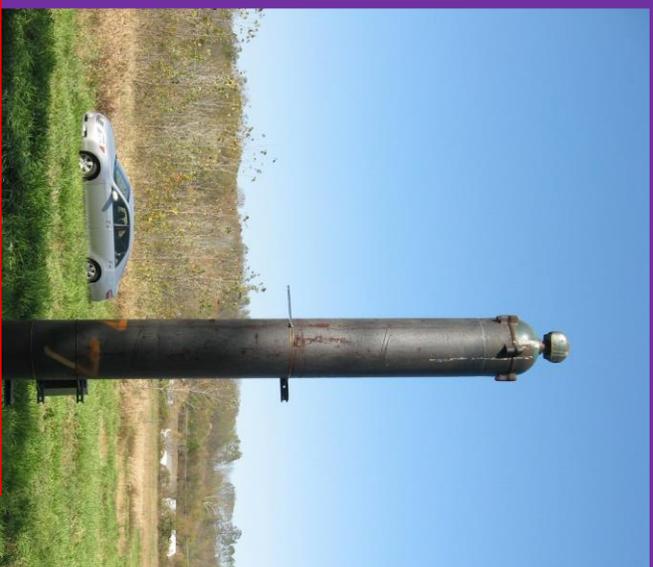
Wells



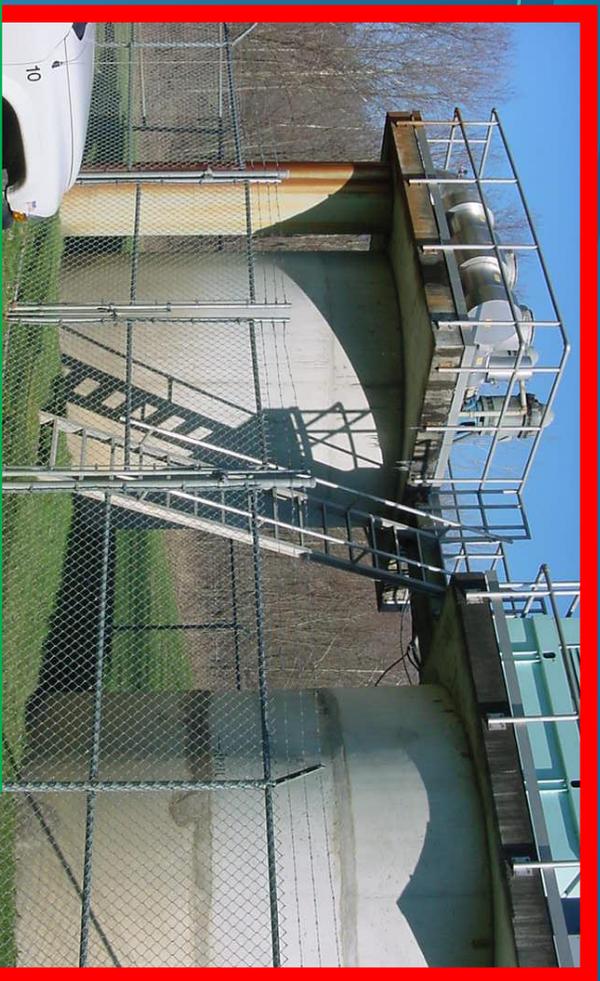
Wells



Wells



Wells



Why Clean a Well?

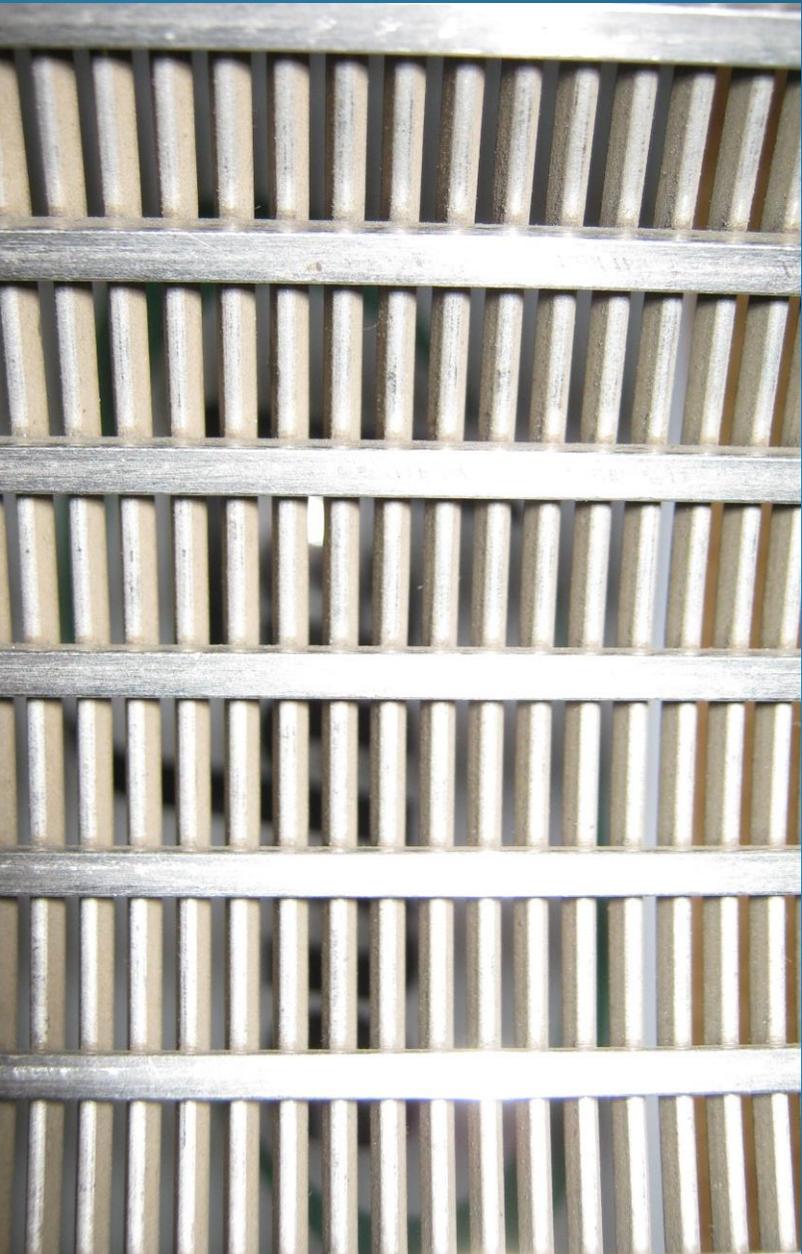
- **Because they get dirty!**
 - Decreased Efficiency
 - Higher energy costs
 - Jeopardizing pump and motor



What gets dirty?



Clean Screen



Dirty Screen



How do you determine if a well needs to be cleaned?

- Operator's observations
- TV survey
- Flow test -- specific capacity



TV Survey



Specific Capacity

- Easily determined by a flow test
- Ratio of pumping rate to drawdown
- Expressed in gpm / foot of drawdown



Specific Capacity

TIME	INCHES ON ORIFICE	G.P.M.	P.S.I.	AMPS	PUMPING LEVEL (ft)	DRAW DOWN (ft)	SPECIFIC CAPACITY (gpm/ft)	TDH (ft)
10:30	Closed Valve	0	155		5.80	0.00		364
10:35	6.0	305	137	64-65-65	15.53	9.73	31.3	333
10:40	6.0	305	137		15.73	9.93	30.7	333
10:45	6.0	305	137		15.75	9.95	30.7	333
10:50	30.0	682	110	70-71-71	27.23	21.43	31.8	282
10:55	30.0	682	110		27.93	22.13	30.8	282
11:00	30.0	682	110		27.94	22.14	30.8	282
Well broke suction over 682 gpm.								



How do you clean a well?

- Straight Surge
- Standard Surge
- Twin-Disk Pneumatic Surge
- Tank Surge
- Blasting



How do you clean a well?

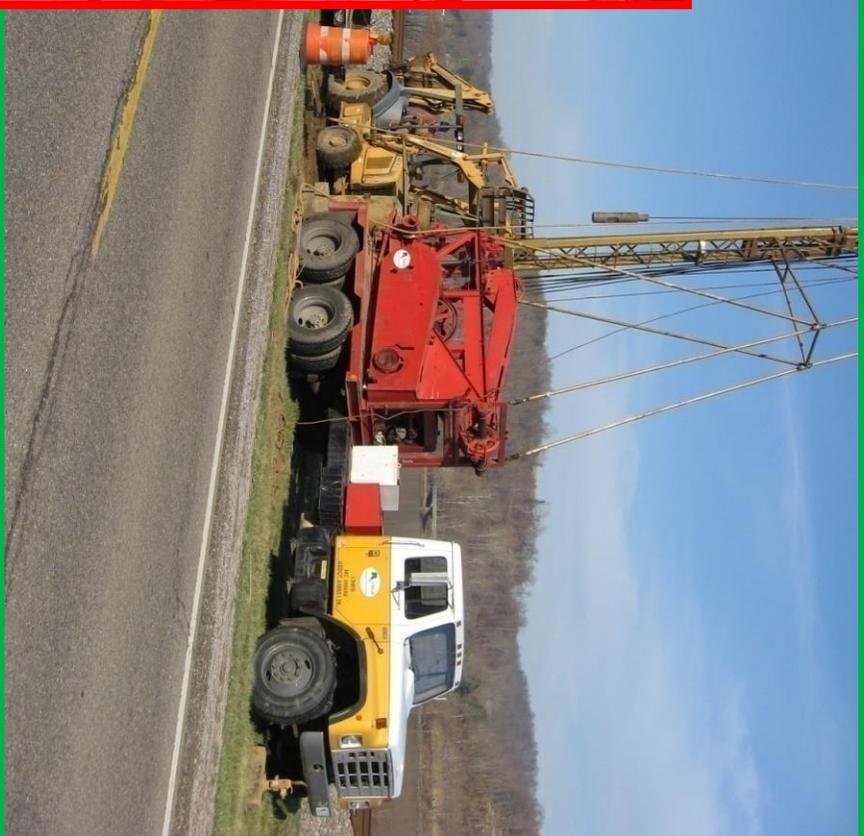
All five methods involve a physical component, a chemical component, or both.



Straight Surge



Straight Surge



Straight Surge: Advantages

- Tried & True Method
- Imparts high energy into well
- Can be used with low water table



Straight Surge: Disadvantages

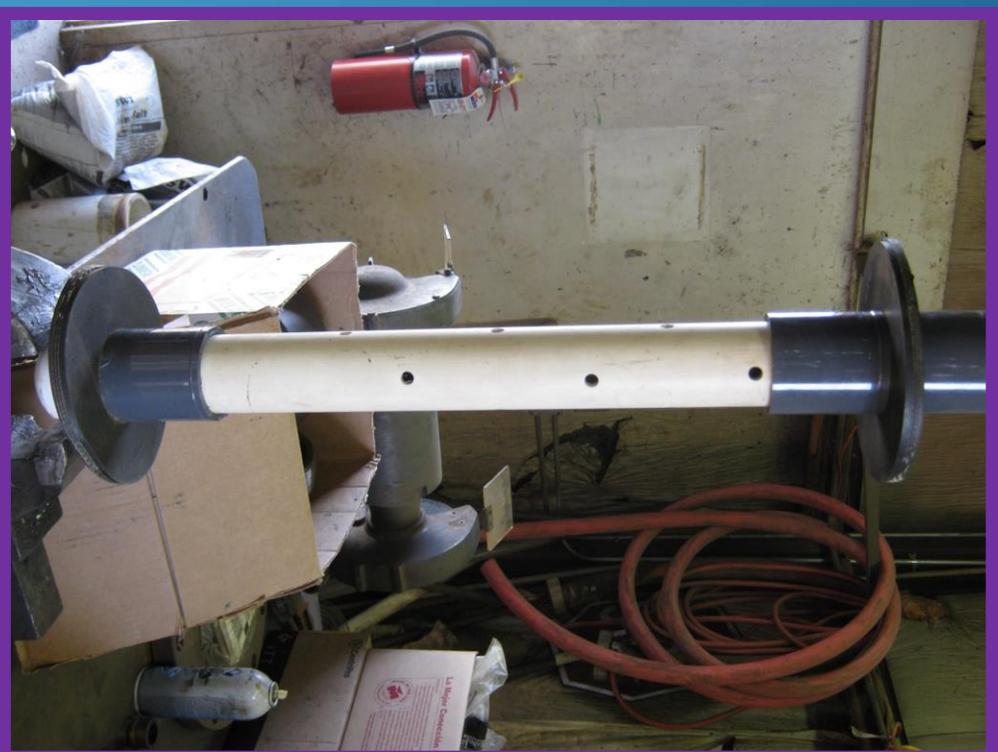
- Tough to setup over some wells
- Actual screen typically not surged



Standard Surge

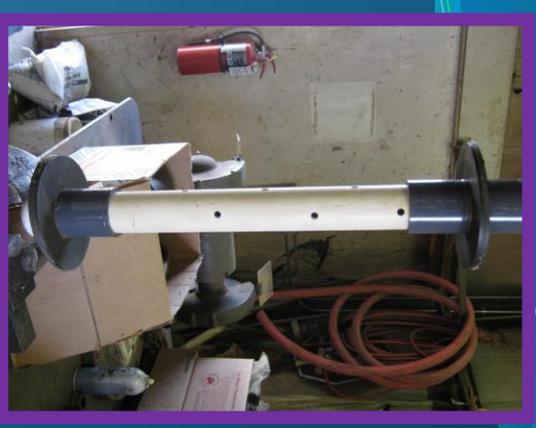


Standard Surge



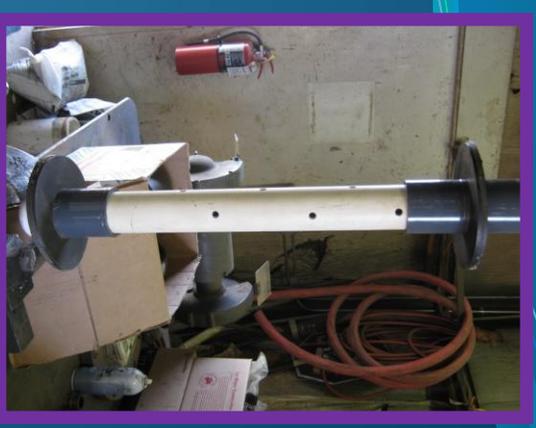
Standard Surge: Advantages

- Tried & true method
- Energy / air controlled to disc interval



Standard Surge: Disadvantages

- Requires time to set surge tool / air line
- Slight risk to old or damaged screen



Twin-Disk Pneumatic Surge





Twin-Disk Pneumatic Surge



Twin-Disk Pneumatic Surger: Advantages

- Easy access to wells with crane
- Even energy output over entire screen
- Less potential for damage to well



Twin-Disk Pneumatic Surge: Disadvantages

- Not cold-weather friendly
- Less energy than straight surge
- Slight risk to old/damaged screen



Tank Surge



Tank Surge



Tank Surge: Advantages

- Less expensive
- Generally easy setup



Tank Surge:

Disadvantages

- Considered “interim” cleaning method
- Chemicals not always compatible w/ pumps
- Generally not as effective as other methods



Blasting

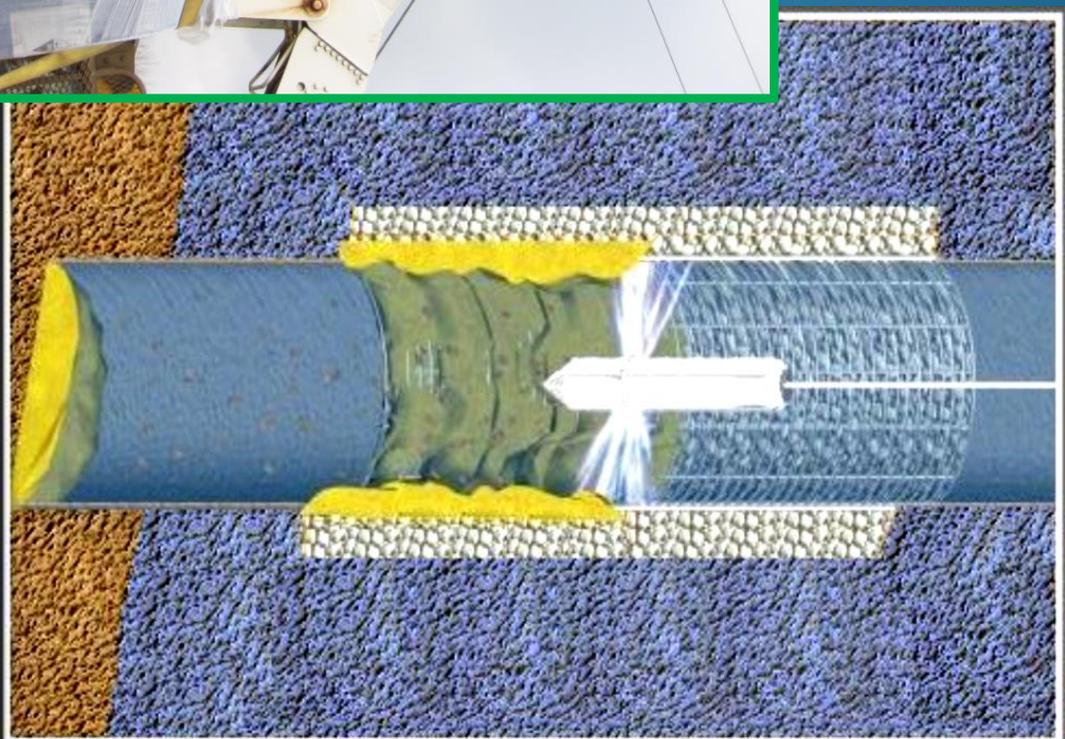
- Primacord
- BoreBlast®



BoreBlast



BoreBlast



BoreBlast



Bore Blast



BoreBlast: Advantages

- Can be used without chemicals
- Easy setup
- Good for problem wells
- Usually less costly



BoreBlast: Disadvantages

- Poorly installed surface seals
- Must proceed carefully w/pressure



Typical Cleaning Chemicals

- Bleach
- Acid
- Surfactant



Bleach

- Calcium hypochlorite
- Sodium hypochlorite or bleach
- Oxidizer or biocidal agent
- Most effective when pH controlled

Acid

- Inhibited muriatic (HCl)
- Sulfamic
- Phosphoric
- Hydroxyacetic



Surfactants

- Wetting agent
- Reduce surface tension
- Water moves more quickly along surface
- Solution better penetrates small pores



Other

- pH buffers
- Acid-inhibitors
- Acid-neutralizing chemicals
- Chlorine-neutralizing chemicals



Summary

- Diagnose problem / well history
- Site investigation (pre-clean pump test / video)
- Rehabilitation
- Post rehab evaluation (post-clean pump test / video)
- Data Assessment / compilation



Questions ???





Thank you