

Public Water System Operator Regulations Course

Sponsored by the CT Department of Public Health, Drinking Water Section and funded by the Environmental Protection Agency

Well Construction



About the Presenter

Vicky Carrier, P.E.

Sanitary Engineer 3

Drinking Water Section, DWS
Operator Certification Program

Agenda: Well Construction

- 💧 Public Health Code (RCSA Section 19-13-B51)
- 💧 DCP Well Drilling Code (briefly)
- 💧 Groundwater sources
 - 💧 Casing requirements
 - 💧 Watertight well caps
 - 💧 Source Metering
 - 💧 Water Quality testing for a new well
 - 💧 Avoiding/retrofitting well pits
 - 💧 Casing extensions

Types of groundwater sources

- 💧 Drilled bedrock wells (only type covered since they are more common)
- 💧 Gravel wells
- 💧 Shallow dug wells
- 💧 Springs
- 💧 Well points

Well Construction

- 💧 Section 19-13-B51a-m provides the minimum Public Health Code well construction requirements for all water supply wells in CT
- 💧 Chapter 482 of the Connecticut General Statutes provides the description of organization, rules of practice, and regulations for the well drilling industry (water supply and non-water supply wells) commonly referred to as the “Well Drilling Code”

Drilled Bedrock Wells

- 💧 Deep Wells
- 💧 Construction (PHC Sect. 19-13-B51(f)) and CGS Section 25-128 (Well Drilling Code)
- 💧 Upper casing must be min. 6" above grade
- 💧 Watertight sanitary seal/well cap
- 💧 Vented well cap if drawdown is 10' or more, vent must be shielded and screened

Well Location (RCSA Section 19-13-B51(d))

- 💧 Reasonably high point on property
- 💧 In a direction away from groundwater flow from existing or potential sources of pollution (Example: up gradient from septic and drainage systems)
- 💧 Protected against surface wash
- 💧 Separating distance requirements covered in well siting portion

Radial Separation Distances

Minimum Requirements

	10 gpm	10-50 gpm	>50 gpm
Sewage System	75 ft	150 ft	200 ft
Surface Water	25 ft	50 ft	50 ft
Storm Drainage	25 ft	50 ft	50 ft
Foundation Drainage	25 ft	50 ft	50 ft
Other Pollution Sources	75 ft	150 ft	200 ft

Water Meters

(RCSA Section 19-13-B102(n))

- 💧 Community Water Systems are required to have flow meters (capable of providing readings of instantaneous flow rate and total quantity of water delivered) installed on each individual well discharge line.
- 💧 Weekly readings of instantaneous flow (gpm, cfm) and total quantity of water delivered (gallons, cf) must be taken, recorded, and retained for reference.
- 💧 Meters recommended for all systems

Well Yield Testing To Determine Quantity & Stability of Flow

Anticipated Withdrawal Rate of Well	Minimum Duration of Yield Test
<10 gpm	18 hrs.
10 to 50 gpm	36 hrs.
>50 gpm	72 hrs.

Water Quality Analysis of a Proposed Well

- 💧 Varies by type of water system
- 💧 Includes VOC's for TNC water systems
- 💧 GWUI must be complete ahead of putting well on-line
- 💧 Document entitled "Water Quality Monitoring of Proposed New Wells/Sources of Supply" is on our website (go to quick links "forms")

Watertight Well Caps

(RCSA Section 19-13-B51(j)(a) drilled wells equipped with pitless adapters)

- 💧 In CT, drilled well caps must meet PAS-97 (Pitless Adapter Standard – 1997) standard developed by the Water Systems Council (WSC)
- 💧 PAS-97 standard was implemented in December 2000
- 💧 Although vented, PAS-97 well caps offer a watertight joint between the well cap and the well casing







BAD Well Caps

(wells equipped with pitless adapters)

- 💧 Generally do not provide a watertight joint between the cap and the well casing allowing insects and mice to enter the well
- 💧 Easy to remove or knock off
- 💧 Very common on wells installed before 2001



05/15/2007

Well pits (RCSA Section 19-13-B51(h)&(i))

- 💧 PHC Section 19-13-B51h-i
- 💧 Well pits should be avoided whenever practical
- 💧 May be considered a “Confined Space” requiring special entry procedures and/or forced ventilation. Check with OSHA.
- 💧 Must be equipped with ladder, lighting, screened and shielded vent
- 💧 Dehumidifier recommended to reduce corrosion

Common Well Pit Deficiencies

- 💧 Non-watertight construction
- 💧 Well head located below high ground water table (best time to inspect would be Feb-May and after a period of heavy precipitation)
- 💧 Inadequate or no drainage
- 💧 Inadequate protection from surface water entering pit (pit cover flush with or below grade)
- 💧 Often buried and can be difficult to find
- 💧 Excessive corrosion due to damp environment









01/25/2006

Flooded Well Pits





11/03/2006

Buried Well Heads

- 💧 No well should EVER be directly buried
- 💧 Difficult to locate for repair work
- 💧 Highly subject to contamination from surface water run-off and groundwater table
- 💧 Appurtenances subject to corrosion
- 💧 Violates Section 19-13-B51 of the RCSA that requires casings to extend as least 6 inches above grade



Well Casing Extensions Public Water Systems

- 💧 Considered “repair work” to a well
- 💧 Work is required to be performed by a CT registered well contractor
- 💧 Permit is required from Department of Consumer Protection and the local health department
- 💧 “Guidance Document for Well Casing Extension” is on our website

Improper casing extension



Well Head Protection

- Where well heads are raised in areas that may be likely to result in vehicle collision or collision from snow plowing activities special well head protection measures should be taken:
 - Curbing and grading for drainage
 - And/or installation of concrete filled steel bollards around the well



Casing Material and Height (RCSA Section 19-13-B51(f)(d))

- 💧 Casing shall be extended a minimum of 6" above the established grade at the well (12-24" is recommended)
- 💧 Casing shall be new steel having min. weights and thickness per diameter as specified in Table 1 of RCSA 25-128 (most commonly 17 lbs/ft for 6" casing)

Yes, you can improve your system...

- 💧 Step 1- Find the pump house (bring bug repellent)



Yes, you can improve your system...

💧 Step 2- Uncover the pump house



Yes, you can improve your system...

💧 Step 3- Open the pump house door



Yes, you can improve your system...

- 💧 Step 4- Raise well casing & eliminate pit/pump house



Any questions on topics just covered?

- 💧 Health code (RCSA Section 19-13-B51)
- 💧 DCP Well Drilling code (briefly)
- 💧 Groundwater sources
 - 💧 Casing requirements
 - 💧 Watertight well caps
 - 💧 Source Metering
 - 💧 Water Quality testing for a new well
 - 💧 Avoiding/retrofitting well pits
 - 💧 Casing extensions

Feedback

Other comments?

