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WQCD

Developing Effective Onsite Wastewater Regulations for Colorado's Diverse Landscape

*Materials being presented represent my own opinions, and do NOT reflect the opinions of NOWRA.

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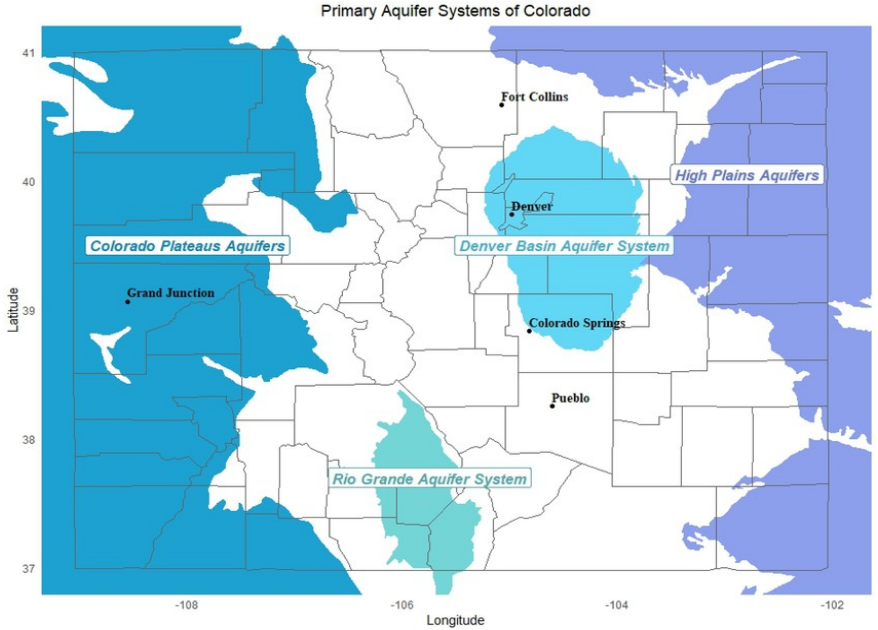
Agenda

- ❑ Why Onsite Wastewater Regulation Matter
- ❑ Colorado's Diverse Landscape
- ❑ Changing Population
- ❑ Technical Challenges
- ❑ Regulatory Challenges
- ❑ State Consistency vs. Local Flexibility
- ❑ Environment and Public Health Concerns
- ❑ What makes a Regulation Effective
- ❑ Implementation
- ❑ Key Takeaways

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Why Onsite Wastewater Regulation Matters

- Why does Onsite Wastewater Regulation Matter?
- Protect Ground Water
- Play a significant role in Colorado's rural and developing communities
- Protect Public Health
- Creates consistency and understanding



Map of aquifer locations in Colorado (Image Base-layer: https://apps.nationalmap.gov/downloader/) Shaded areas represent aquifers, including the Ogallala or High Plains aquifer system in the east, the Rio Grande aquifer system in the south, the central Denver Basin aquifer system, and the Colorado Plateaus aquifer system in the west (U.S. Geological Survey, 2016, USGS National Hydrography Dataset Downloadable Data Collection).

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Colorado's Diverse Landscape

- Mountain and high-elevation communities
- Steep slopes and rocky/shallow soils
- Eastern Plains and arid environments
- Areas with shallow groundwater
- Differences in climate, precipitation, soils, geology, and hydrology



Key message: Environmental conditions vary substantially across the state, creating different wastewater treatment challenges and risks.

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- Colorado has a remarkably diverse landscape
  - Great Plains in the east
  - Rocky Mountains in the center
  - High desert plateaus in the west
- We have towering peaks, alpine lakes, forests, and expansive valleys. Farther west, the terrain becomes drier, with red-rock canyons, mesas, and desert landscapes. Colorado also contains grasslands, rivers, sand dunes, and extensive wilderness areas, creating a wide variety of ecosystems within a relatively compact state.

Diverse Soils

- Colorado has highly variable soils because of its range of plains, mountains, valleys, and high-desert terrain. Common soil conditions include sandy and gravelly soils, loams, clay-rich soils, shallow or rocky mountain soils, and sodic soils. Soil characteristics can change significantly over short distances.







Diverse Soils

- Slow-percolating or clay-rich soils
- Very permeable sand and gravel
- Shallow bedrock or restrictive layers
- High groundwater
- Steep or mountainous terrain
- Expansive or shrink-swell soils
- Cold and snow conditions







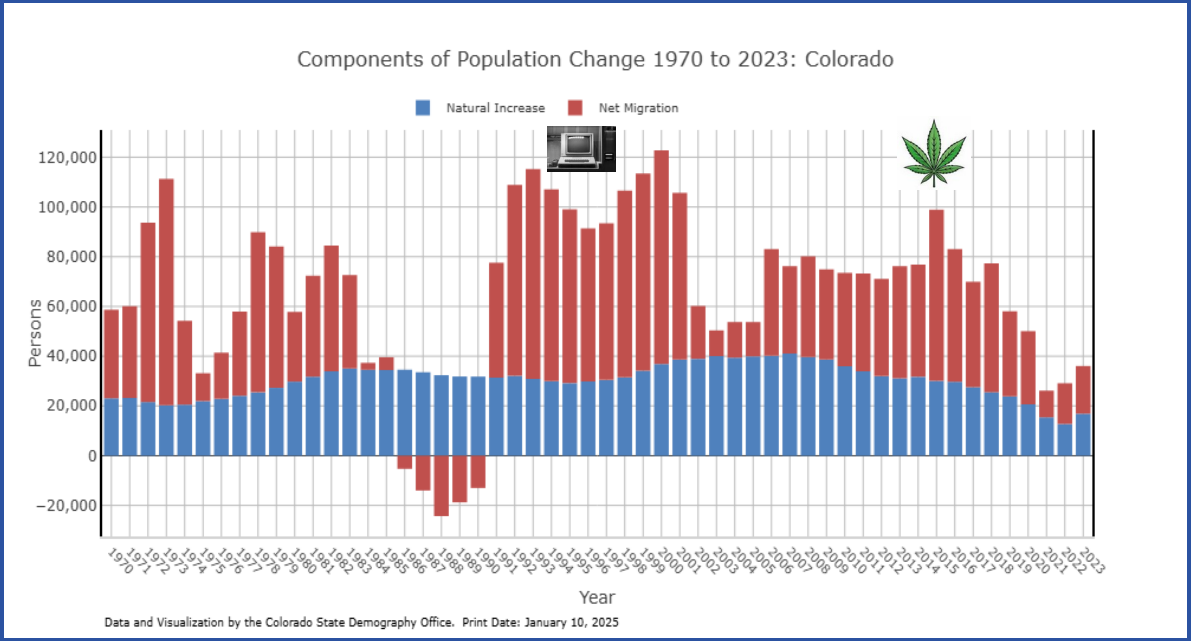
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Changing Population

- Population growth and development pressures
- Expansion of communities into rural and previously undeveloped areas (All good sites are gone)
- Increasing wastewater treatment demand
- Changes in development
- Differences between:
  - Established rural communities
  - Rapidly urbanizing areas
  - Remote mountain communities



Changing Population 6,012,561



Technical Challenges

- Soil and site limitations
- Groundwater separation and nutrient concerns
- Hydraulic loading and system sizing
- Cold temperatures and high elevations
- Steep terrain and difficult construction conditions
- Long-term operation and maintenance





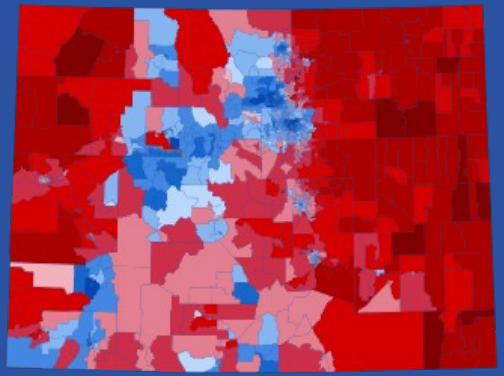


Regulatory Challenges

- Wild West
- Differences in local environmental conditions
- Variation in local government capacity and expertise
- Enforcement and inspection challenges
- Costs to property owners and communities
- Keeping regulations technically current
- Avoiding unnecessary regulatory complexity

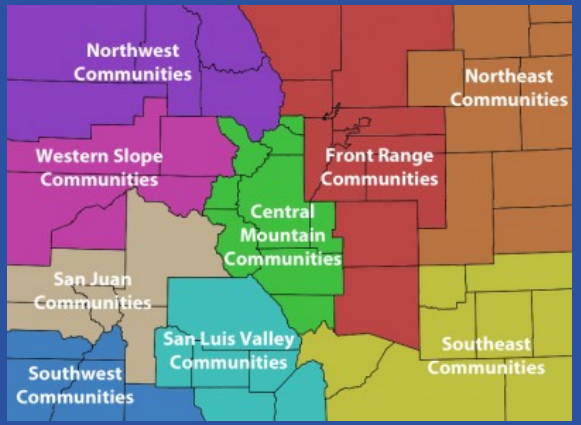






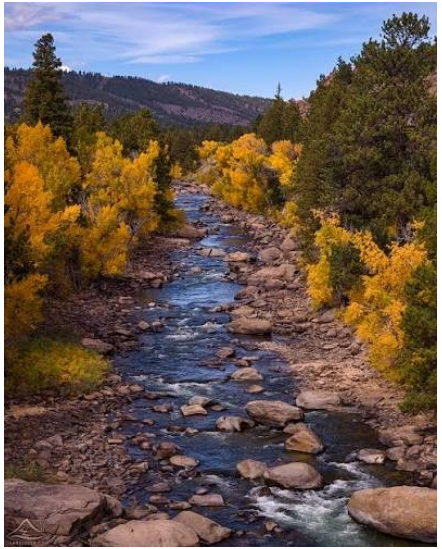
Statewide Consistency vs. Local Flexibility

- **Statewide consistency**
  - Common minimum standards
  - Predictable requirements
  - Consistent public-health protections
  - Easier regulatory administration
- **Local flexibility**
  - Site-specific conditions
  - Local environmental risks
  - Community resources and capacity
  - Different development patterns
  - Ability to address unique geographic conditions



Environmental and Public Health Considerations

- Protection of groundwater
- Protection of rivers, streams, and other surface waters
- Pathogen and contaminant control
- Nutrient impacts
- Cumulative impacts from multiple systems



Central question: How can Colorado develop regulations that are consistent enough to protect public health while flexible enough to address local conditions?

What Makes a Regulation Effective?

- **Technically sound** — based on appropriate science and engineering
- **Protective** — addresses public-health and environmental risks
- **Practical** — can realistically be implemented and enforced
- **Adaptable** — accommodates changing conditions and technology
- **Predictable** — provides clear expectations for homeowners, developers, and regulators
- **Equitable** — considers differences in community resources and economic circumstances

Colorado Potential Framework

Statewide baseline

→ Establish minimum public-health and environmental protections

Risk/site assessment

→ Incorporate soils, groundwater, slope, climate, density, and receiving-water sensitivity

Local flexibility

→ Allow jurisdictions to adopt requirements appropriate to local conditions

Performance-based approaches

→ Focus on treatment outcomes where appropriate rather than relying exclusively on prescriptive requirements

Adaptive management

→ Monitor outcomes and revise requirements as conditions, science, and technology change

So where are we?



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OWTS Regulation History in Colorado

- 1858-1893-Major mining boom Gold, Silver, Etc 30,000-400,000
- **1973** = The Individual Sewage Disposal System Guidelines mandated by Article 10 of Title 25,as temporary emergency guidelines. The state needed immediate, enforceable minimum standards to prevent the spread of disease, infection, and aerosol contamination caused by failing or unmitigated private sewage setups.
- 1979 = The Guidelines adopted in May of 1979, contained a provision that the Guidelines became the local ISDS regulations for any jurisdiction, which failed to adopt its own regulations within one year.
- 1984 = The advent of alternatives in on-site treatment and disposal technology and the 1983 passage of HB 1400, which redefined an individual sewage disposal system.
- 1988 = Updated Language for Technology Review
- standards in response to the Court of Appeals ruling.
- 1994 = Further advances in on-site treatment and disposal technologies
- 2000 = Variance Procedure added
- **2013 = Regulation 43**
- 2017 = Regulation 43 update
- 2022 = Revised for penalties clarification- R-Type Soils
- 2025= Regulation update with changes to R-Type soils and addition of tools for determining fractured bedrock and deteriorated bedrock

- 50+ Years

Core Regulation Framework

- **State Oversight:** The Water Quality Control Commission adopts Regulation 43, and the Water Quality Control Division of the Colorado Department of Public Health and Environment implements state-level oversight and product/technology acceptance.

- **Local Administration (≤ 2,000 gpd)(Reg 43):** For systems with a design capacity of 2,000 gallons of wastewater per day or less, local county public health agencies issue permits and enforce rules. Local boards of health must adopt regulations that are *at least as stringent* as Regulation 43.

- **Large Systems (> 2,000 gpd) (Reg 22):** Systems with flows exceeding 2,000 gallons per day require formal state design review, facility approval, and a Colorado Discharge Permit System permit.

Local Regulatory Agencies



- 58 local OWTS programs covering all 64 counties; LPHA (Env. Health), Bldg. Dept., Land Use
- Must develop local regulations that are at *least as stringent* as Regulation 43.Within one year of Reg. 43 effective date
- State OWTS Coordinator (That's Me) Will review all local regulations and provide state approval prior to adoption.
- Administer all aspects of the OWTS program; permitting, inspections, enforcement, file maintenance, etc.

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Focus on Treatment



- Regulation 43 – was a move away from Disposal ⟶ Treatment
- More science based and technical
- Created a regulation for where we wanted to be as a state
- Tried not to leave anyone behind (still the wild west)
- Local Flexibility
- Incorporated possible solutions for legacy systems
- Created a support mechanism (OWTS Coordinator)



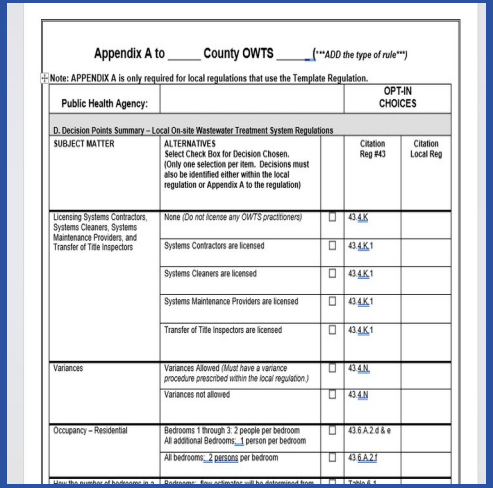
Major Components

- Provides Prohibitions
- Variances
- Reductions for technology or specified sand usage
- Certification or licensure requirements
- Required site and soil evaluations
- Engineering specific requirments
- Tables for soils classifications -LTAR's, R-Type Soils, DBR and FBR
- Potential design flows for commercial or nonresidential applications
- Alternative technology review requirements
- Design standards
- Setbacks
- Design criteria for materials used

Opt-in/Opt-out Approach

- Like an A La Carte Menu
- A solution for Statewide application of a best practices regulation
- Addresses a minimum regulation with the option to become more technical based on staffing and resources
- Creates consistency between programs and jurisdiction





Appendix A to _____ County OWTS _____(***ADD the type of rule***)

Note: APPENDIX A is only required for local regulations that use the Template Regulation.

Public Health Agency:			OPT-IN CHOICES	
D. Decision Points Summary – Local On-site Wastewater Treatment System Regulations				
SUBJECT MATTER	ALTERNATIVES Select Check Box for Decision Chosen. (Only one selection per item. Decisions must also be identified either within the local regulation or Appendix A to the regulation)		Citation Reg #43	Citation Local Reg
Licensing Systems Contractors, Systems Cleaners, Systems Maintenance Providers, and Transfer of Title Inspectors	None *(Do not license any OWTS practitioners)*	☐	43.4.K	
	Systems Contractors are licensed	☐	43.4.K.1	
	Systems Cleaners are licensed	☐	43.4.K.1	
	Systems Maintenance Providers are licensed	☐	43.4.K.1	
	Transfer of Title Inspectors are licensed	☐	43.4.K.1	
Variances	Variances Allowed *(Must have a variance procedure prescribed within the local regulation.)*	☐	43.4.N.	
	Variances not allowed	☐	43.4.N	
Occupancy – Residential	Bedrooms 1 through 3: 2 people per bedroom All additional Bedrooms: 1 person per bedroom	☐	43.6.A.2.d & e	
	All bedrooms: 2 persons per bedroom	☐	43.6.A.2.f	
How the number of bedrooms is a	Bedrooms: Any estimate will be determined from	☐	Table 6-1	

Key Takeaways

- No regulation is perfect
- You cant write a regulation for every situation
- Change is constant
- It takes everyone at the table

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Thank you!



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