

# Onsite Wastewater Prescriptive vs. Performance

1974 Michigan Criteria for Subsurface Disposal vs 2013  
Michigan Criteria for Onsite Wastewater Treatment

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## Happy SepticSmart Week 2017

**MARK YOUR CALENDAR FOR**  
**SepticSmart**  
**Week 2017**  
September 18-22, 2017

SepticSmart Week is an annual event focused on educating homeowners and communities on the proper care and maintenance of their septic systems.

Learn more about the core messages of SepticSmart Week:

- Think at the Sink
- Don't Overload the Commode
- Don't Strain Your Drain
- Shield Your Field
- Test Your Drinking Water Well

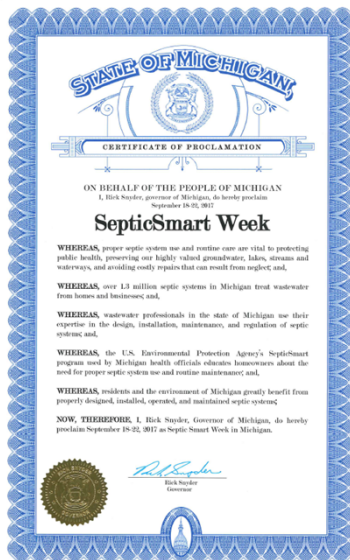
Visit [www.epa.gov/septic](http://www.epa.gov/septic) for more homeowner resources and information about SepticSmart Week 2017. Be a good neighbor and do your part to be SepticSmart!

**septicSMART**  
U.S. Environmental Protection Agency

**EPA**



## September 18–22, 2017



DEQ

## Why SepticSmart in Michigan?

- Michigan has a vision to protect and promote the wise use of its globally unique water resources.
- This vision is outlined in the Strategy for Sustaining Michigan's Water Heritage (Water Strategy).
- Within the Water Strategy, a key recommendation is to ensure clean and safe water through passing a statewide sanitary code.



DEQ

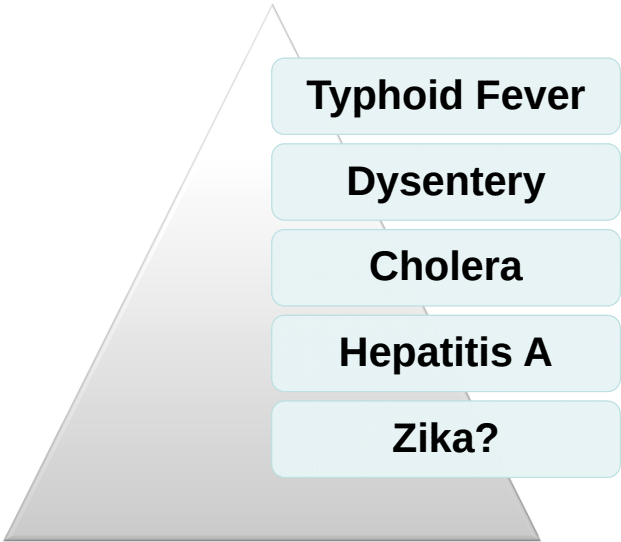


## Overview

- History
- Science
- Prescriptive vs Performance
- Criteria vs Draft
- Risk Level



## History - Waterborne Diseases Epidemics



- Typhoid Fever
- Dysentery
- Cholera
- Hepatitis A
- Zika?

## History – Regulatory Structure

**Clean Water Act  
1972**

**Regulation  
Adoption in  
Michigan**

**EPA Report to  
Congress 1997**

**National Onsite  
Demo Program**

**NSF – 3<sup>rd</sup> Party  
Testing**

**Legislative Efforts  
in Michigan**

### **Regional Efforts –**

- Regional Technical Group
- DEQ across the Flows



## Science -Treatment in Soils

- **History of soil based treatment**
- **1970 University Studies – Madison – Penn State – Washington State - Other**
- **Pressure Dosing**
  - Treatment efficiency
  - Viruses
- **Placement of system in the soil profile**



## Science – Dispersal into Environment

### Fluid movement in Soils

Application Rate – get it in

Transmissivity Rate – get it away



## Prescriptive vs Performance

### Performance-based regulation.

- A regulatory approach that focuses on desired, measurable outcomes, rather than **prescriptive** processes, techniques, or procedures.



## Michigan

How  
do we  
permit?

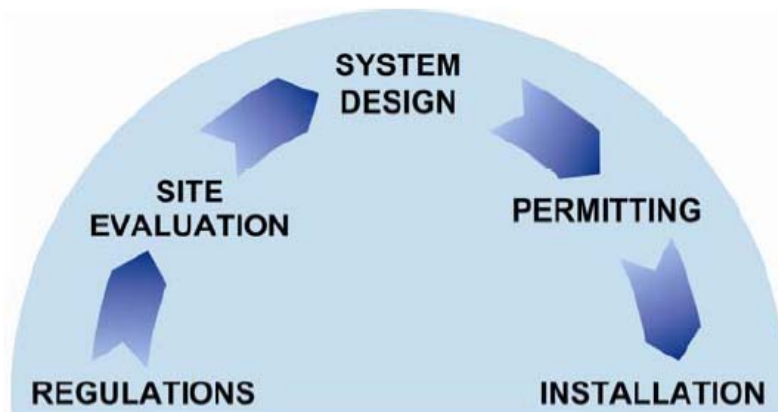


## Prescriptive

- **Formulaic**
- **Find this do that**
- **The same**
- **Leave it and forget it**



## Classic Decentralized Regulatory Oversight



Credit NJ Pineland Commission/ Mike Hoover 1997

## Out of Sight

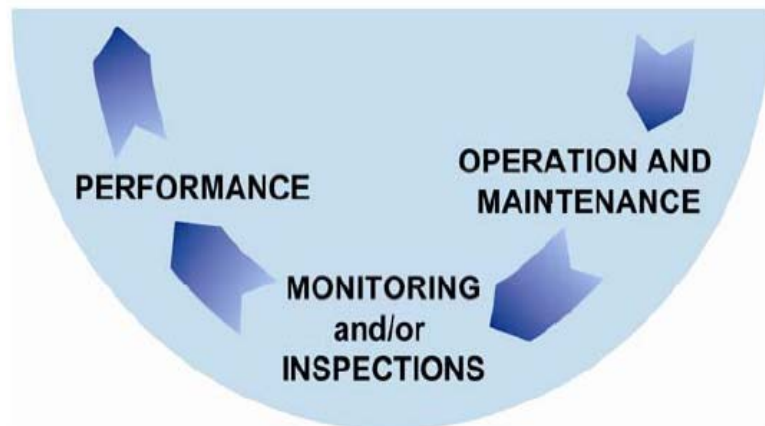
### EPA reports that:

- at least 10 % of decentralized systems in a state of failure
- In some communities failure rates 70%

Michigan LHD with Time of Sale report 25% + lead to corrective issues.

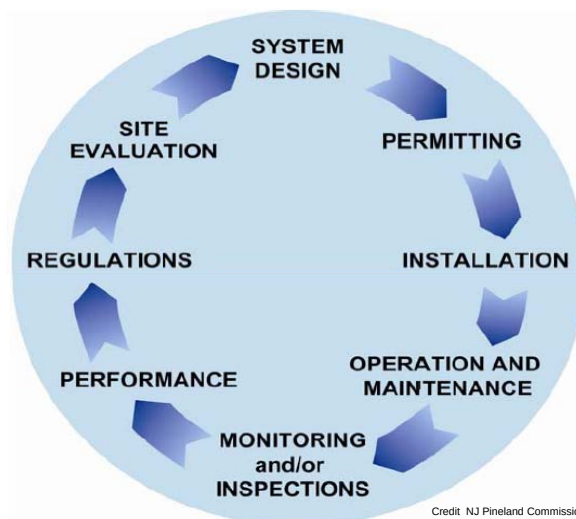


## Typical Missing Components



Credit NJ Pineland Commission/ Mike Hoover 1997

## Comprehensive Regulatory Oversight



Credit NJ Pineland Commission/ Mike Hoover 1997

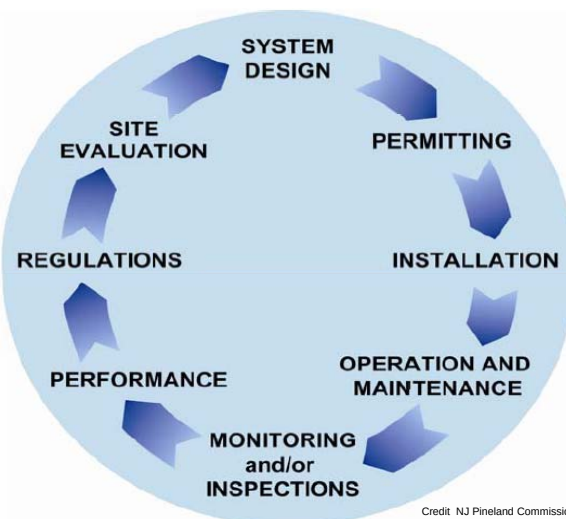


## Performance

- Meeting Goals
- Specific evaluation of site and waste
- Specific design for situation
- Inspect and monitor



## Comprehensive Regulatory Oversight



## Michigan Criteria vs. Draft Criteria

### What is in a name?

Michigan Criteria for  
Subsurface Sewage Disposal

Michigan Criteria for Onsite  
Wastewater Treatment



## Michigan Criteria for Subsurface Sewage Disposal

1974 – Predominantly Prescriptive

### Site Suitability

- 2 Feet of Natural – Dry soil
- Area Primary and Replacement

Design based on gallon per day (50's  
plumbing code)



## Michigan Criteria for Subsurface Sewage Disposal

No Advanced  
Treatment  
Systems  
Allowed

All  
wastewater  
equal

Big Beds  
take up less  
room

No required  
inspections  
or  
maintenance  
after  
installation



## Michigan Criteria for Onsite Wastewater Treatment

- **2013 – Based on current science a mix of prescriptive and performance**
- **Health – Level of risk**
  - Systems design to meet acceptable Risk
    - *3 feet of suitable aerobic soil*
    - *Or equivalent*
- **Site Suitability**
  - 1.5 Feet of Natural – Dry soil
    - *More complete evaluations of soil properties*
  - Area Primary and Replacement



## Michigan Criteria for Onsite Wastewater Treatment

### Design Basis

- Gallons per day
  - *Low flow Fixture & Census Data*
  - *Flow Equalization*
- Strength of Wastewater
  - *Impacts Application Rates*
- Treatment allowed to control design
- Dispersal controlled to maintain unsaturated zone



## Michigan Criteria for Onsite Wastewater Treatment

### Evaluate Environmental Risk

#### Nutrient Reduction

- *Phosphorus – Surface Waters*
- *Nitrogen – Public Health, impacted waters*



## Michigan Criteria for Onsite Wastewater Treatment

- **Ongoing system Operation and Maintenance**
  - All systems need their tanks pumps – Maintenance
  - Operation and Maintenance dependent on complexity
  - Inspection and monitoring of performance
- **Qualified Practitioners**



## Regulatory Goals

**Public Health  
– Level of risk**

**Environmental  
Health – Level  
of risk**



## Public Health – Level of risk

- **Pathogens –**
  - **Time of Travel**
    - *Bacterial – 30 days*
    - *Viral – 2 years*
    - *Sand vs Clay*
  - **Disinfection**
- **Nutrients**
  - **Nitrogen - Nitrate methemoglobinemia**  
**Blue Baby**

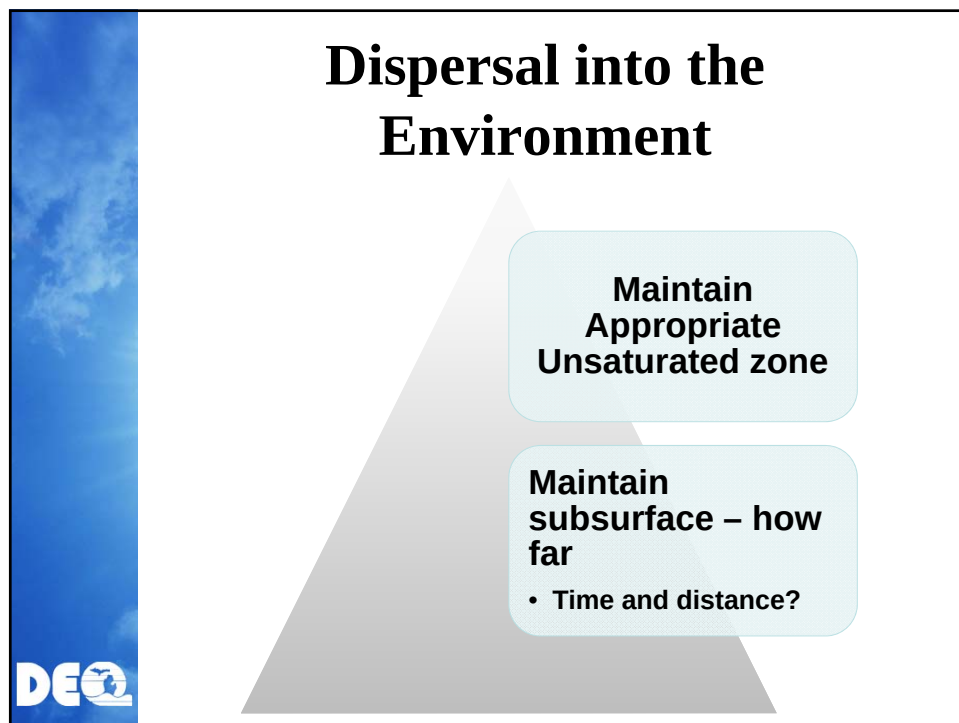
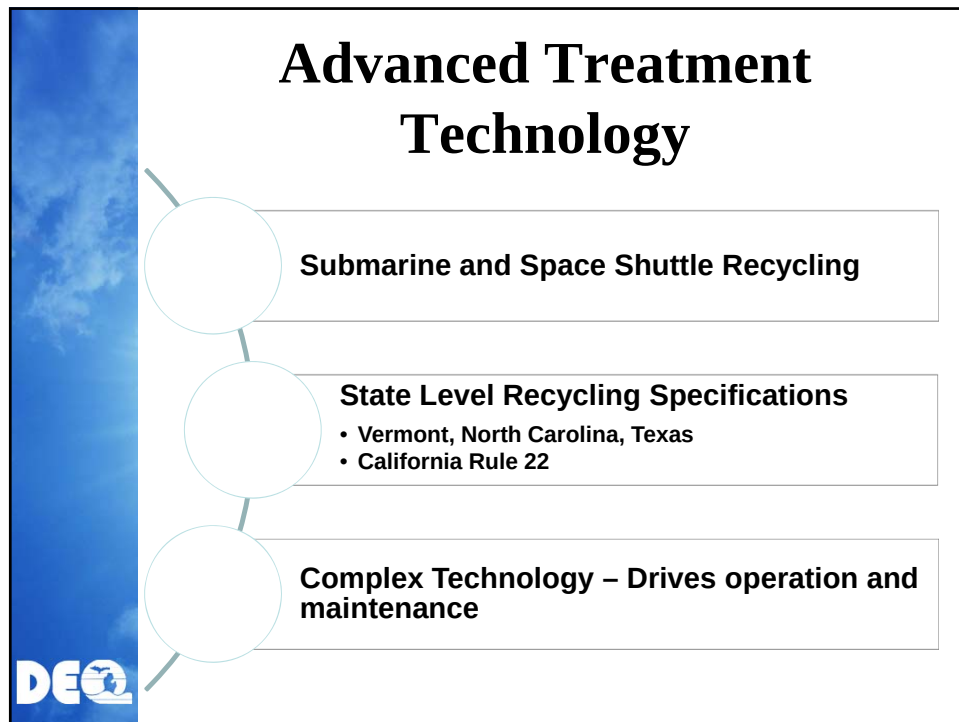


## Environmental Health – Level of Risk

### Nutrients

- **Nitrogen - Ammonia in surface waters**
- **Phosphorus – Algae Blooms, toxic conditions**



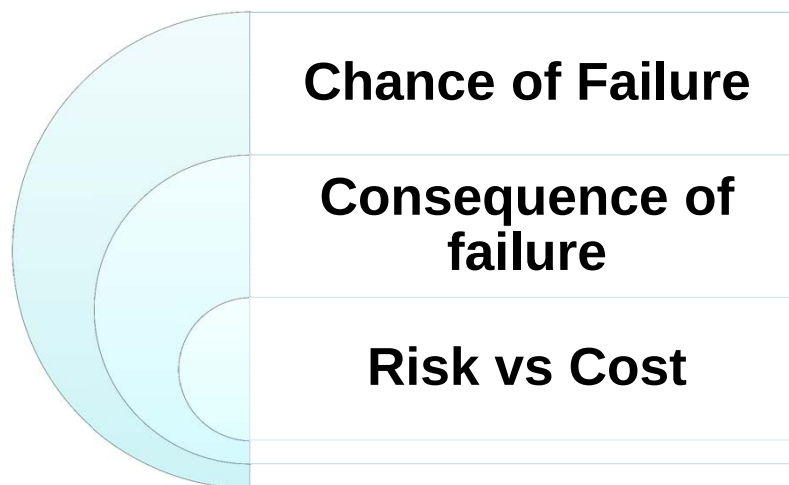


## Conclusions?

- **Need to Evaluate Risk**
- **Set Acceptable Risk Level**
- **Regionally Appropriate Design Based on Geology**
- **Approve Alternative Treatment Technology and Maintenance Requirements**
- **Manage our Wastewater Infrastructure**



## Setting Risk levels





## Acceptable Risk Should Drive Regulation

Need/Economy is the driver of innovation

Differing geology impacts design

- Treatment and dispersal



## How do WE Go Forward

Comments & Discussion



# **Thank you from the Onsite Wastewater Program MDEQ**

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