

Inspector – Need To Know

I. Understand administrative requirements required by the local ordinance

- A. Statute 115.55 requirements
- B. Local ordinance per 7080
- C. How relates to DNR shoreland rules
- D. How relates to MDH well code
- E. Alternative local standards
- F. Requirements for seepage pits, drywells, leaching pits
- G. Provision that requires MPCA registered and licensed professionals (Qualified Employees and Designated Registered Professionals)
- H. LUG cannot issue additional licenses
- I. Ordinance requirements
 - 1. Two sites for lots
 - 2. Provision that failing systems be upgraded
 - a. Process
 - 3. Complaints on surface discharges
 - a. County authority – 7080 (ISTS rules) and 145A (Public Health Act)
 - b. MPCA authority (NPDES permit requirement)
 - 4. Compliance schedule
 - 5. New construction or replacement
 - 6. Repair scenarios
- J. When an onsite system is required
- K. System classifications
 - 1. Failing
 - 2. Imminent threat to public health and safety threat to drinking water well
 - 3. Conforming
- L. Local units of government must enforce their ordinance
- M. Permit requirements
 - 1. General permitting requirements
 - 2. Permit application requirements
 - 3. Permit review, approval and procedures
 - 4. Recordkeeping
 - 5. Operating permits
 - 6. Operating and mitigation plans
- N. Inspection Requirements
 - 1. M.S. 115 requirements
 - 2. Job responsibilities of the Inspector
 - 3. New construction
 - a. Each system
 - b. Number inspections per system
 - c. Process to inspect new construction
 - d. Tools required for inspections
 - e. Issuance of certificates of compliance
 - 4. Existing systems

- a. Bedroom/bathroom additions (statute requirements)
 - (a) Schedule for inspections (winter vs. non-winter)
 - (b) Upgrade timeframe requirements
 - (c) Certificates of compliance
 - b. Disclosure requirements when buying, selling, or transferring property
 - c. Difference between bedroom/bathroom additions and disclosure
 - d. Process of inspecting existing systems
 - (a) Compliance inspections
 - (i) Plumbing in structure
 - (ii) Back-up in structure
 - (iii) Septic tank and components
 - (iv) Pumping records
 - (v) Lift station and components
 - (vi) Advanced treatment system
 - (vii) Soil treatment system-trenches, beds, at-grades, mounds, drip distribution
 - (viii) Vertical separation investigation
 - (ix) Recordkeeping, forms, submittal requirements
 - (x) Certification (reasonable assurance)
 - (xi) Recommended certificate of compliance (components)
- O. Variances
- 1. Local ordinance variances - required at local level
 - a. property line
 - b. building setback
 - 2. State agencies variances - required at state level
 - a. Chapter 4720 – Public Water Supplies
 - b. Chapter 4725 – Well Code
 - c. Chapter 6105 – Wild and Scenic Rivers
 - d. Chapter 6120 – Shoreland/Floodplain
 - e. Chapter 7080 – ISTS
 - (1) MPCA variance requests
 - (2) Documentation required
- P. Recordkeeping Requirements
- 1. Certificates of compliance
 - 2. Notices of non-compliance
 - 3. Permit applications
 - 4. Site evaluation records
 - 5. Design records
 - 6. Construction records
 - a. Dates of construction
 - b. Weather conditions
 - c. Plan changes
 - d. Plastic limit
 - e. Sand and rock cleanliness
 - f. Problems encountered
 - g. Inspections

- h. Record drawing
- Q. Annual Reporting Requirements to MPCA
 - 1. standard permits
 - 2. inspection forms
 - 3. program administrator
 - 4. qualified employees or contracted licensees
 - 5. number and type of permits issued
 - 6. number and method of inspections
 - 7. number and types of systems
 - 8. number and type of alternative, performance, other systems
 - 9. percentage of systems in compliance
- R. Commissioner review of Ordinances

II. Inspection of Building Sewers

- A. Building sewers
 - 1. Acceptable pipe materials
 - 2. Slope, diameter
 - 3. Bedding pipes
 - 4. Min and max depths
 - 5. Frost protection
 - 6. Pipe penetration into septic tanks
 - 7. Cleanouts, accessibility, diameter, spacing

III. Inspection of Septic and Pump Tanks

- A. Depth of burial considerations (water table, cover needed)
- B. Tank inspection for structural integrity, cracks, seams/joints
- C. Water-tight testing (methods and procedures)
- D. Placement and bedding tanks (concrete, fiberglass, plastic)
- E. Insulating tanks
- F. Backfilling tanks
- G. Pipe penetrations (water-tight connections, sealants)
- H. Baffles and screens
- I. Riser connections and lid (insulation)
- J. Maintenance holes
- K. Inspection pipes and connections
- L. Final cover and crowing, surface water diverted
- M. Setbacks, easement
- N. New installation
- O. Existing

IV. Inspection of Pumps, Floats, and Controls

- A. Maintenance access
- B. Correct pump, placement and connections

- C. Drawdown test
- D. Verify dose frequency and volumes
- E. Wiring safe
- F. Float placement and tie downs
- G. Confined space

V. General Compliance Inspection

- A. Inspect for imminent threat and/or failing to protect groundwater conditions
 - 1. Surfacing effluent
 - 2. Evidence of hydraulic failure
 - 3. Depth of separation
- B. Indicators of potential hydraulic failure / failure to protect groundwater
 - 1. Ponding of water on surface
 - 2. Spongy soil conditions
 - 3. Condition and composition of vegetation
 - 4. Odors
- C. Inspect for setbacks
 - 1. Local Units of Government
 - 2. Minnesota Pollution Control Agency
 - 3. Minnesota Department of Health
 - 4. Department of Natural Resources
 - 5. Check for variance status with permitting authority is encroachment is observed
- D. Verify Soil conditions for determination of system sizing and separation distance
 - 1. Describe soil texture
 - 2. Describe soil structure
 - 3. Identify soil characteristics constituting a limiting layer – redoxomorphic features, textural changes, soil structure
- E. Identify the number, width and length of trenches or other appropriate dimensions of the dispersal system for appropriate sizing relative to soil conditions
- F. Verify building classification characteristics
- G. Identify natural landform slope at the soil treatment and dispersal system
- H. Identify the landscape position of the soil treatment and dispersal system
- I. Evaluate potential for unnecessary hydraulic additions to treatment and dispersal area due to runoff
- J. Identify and diagnose potential causes of failures
 - 1. Flows greater than soil permeability
 - 2. Soil compaction
 - 3. Malfunction and/or plugging of the distribution system

VI. Inspection of Distribution Systems (gravity and pressure)

- A. New installation

1. Proper sizing and connections (eg: proper priming and glued, pressure fittings where needed)
 2. Verify pipe size, hole size, spacing, orifice shields as per design
 3. Clean-outs, as required, and covers
 4. Verify squirt height, equal distribution
- B. Existing
1. Drop boxes, valve boxes, distribution boxes for water tightness – cracks and roots as negative evidence.
 2. Drop boxes, etc for indications of system malfunction – presence of sludge, staining from high effluent level marks.
 3. Inspect observation pipes for the presence of excessive standing water

VII. Inspection of Trench and Bed Systems – Special Needs

- A. New installation
1. Observe excavated trench for evidence of compromised soil conditions – excavation during plastic conditions
 2. Compaction of trench bottom due to excessive foot traffic
 3. Evaluate trench rock for excessive presence of fines
- B. Existing
1. Verify soil separation
 2. Verify tank integrity
 3. Verify system operation and maintenance
 4. Verify system hydraulic performance

VIII. Inspection of At-grade Systems

- A. New installation
1. Perform soil probes to check for 36 inches of vertical separation requirement; redoxomorphic features
 2. Identify at least 12 inches consists of original soil
 3. Evaluate slope of landform system is constructed on
 4. Knowledgeable of required setbacks
 5. Use design linear loading rate and soil observations to verify rock bed width and length
 6. Absorption area preparation: vegetation removal, soil moisture content below plastic limit and proper rough up techniques
 7. Identify landform contour for proper system orientation
 8. Inspection pipe installation and perforation location
 9. Top soil depth and presence of erosion control protection prior to establishment of vegetative cover
- B. Existing
1. Verify soil separation
 2. Verify tank integrity
 3. Verify system operation and maintenance

4. Verify system hydraulic performance

IX. Inspection of Mound Systems

A. New installation

1. Perform soil probes to check for vertical separation requirements; redoxomorphic features
2. Verify 12 inches of original soil as opposed to the presence of fill soils
3. Check for setback distances
4. Mound location and orientation relative to concave landform features and contours.
5. Rock bed sizing against design flow
6. Use soil observations and the design linear loading rate to check the rock bed width
7. Evaluate mound sand quality for particle size grading requirements
8. Use soil observations to verify the absorption area sizing
9. Absorption area preparation: vegetation removal, soil moisture content below plastic limit and proper rough up techniques
10. Mound sand for signs of compaction from equipment
11. Inspection pipe installation and perforation location
12. Top soil depth and presence of erosion control protection prior to establishment of vegetative cover

B. Existing

1. Verify soil separation
2. Verify tank integrity
3. Verify system operation and maintenance
4. Verify system hydraulic performance

X. Inspection of Alternative Systems

A. New installation

1. Flood Fringe Standard Systems
 - a. Recognize alternate requirements are to minimize impacts from septic systems during flooding conditions
 - b. Inspection piping not installed
 - c. Elevated site preferences for ISTS system or water supply well
 - d. Controls to allow for dosing device shut down in the event of inundation from flooding
 - e. Distribution media elevation requirements in trench and mound systems relative to 10 and 100 year flood elevations – land surveying may be required for this determination
2. Privies
 - a. Three feet of separation required for pit privies
 - b. Vaults required in separation distance insufficient
 - c. Minimum volume requirement of 25 cubic feet
 - d. Insect proof for vector control
3. Holding Tanks
 - a. Holding tanks must be specifically approved by local unit of government

- b. Tank construction requirements similar to septic tank requirements for strength
- c. Cleanout location construction requirements
- d. Maintenance accessibility for regular pumping

XI. Inspection of Other Systems

- A. New installation
 - 1. Ensure that system installed per design
 - 2. Ensure flow measurement device is employed
 - 3. Ensure monitoring and mitigation plan is drafted
- B. Existing
 - 1. Verify soil separation
 - 2. Verify tank integrity
 - 3. Verify system operation and maintenance
 - 4. Verify system hydraulic performance

XII. Inspection of Performance Systems

- A. New installation
 - 1. Ensure that system installed per design
 - 2. Ensure flow measurement device is employed
 - 3. Ensure monitoring and mitigation plan is drafted
- B. Existing
 - 1. Verify soil separation
 - 2. Verify tank integrity
 - 3. Verify system operation and maintenance
 - 4. Verify system hydraulic performance

XIII. Basic Math Requirements

- A. Add, subtract, multiply and divide
 - 1. Slope
 - 2. Unit conversion
 - a. Metric to English
 - b. English unit conversion
- B. Use powers and percentages
- C. Graphing (pump curves)
- D. Basic algebra/geometry

XIV. Inspector in theory needs to be the most knowledgeable of all professional as the responsibilities and skills needed cover all areas of ISTS

- A. Ability to recognize disturbed sites