



# Washtenaw County

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Department of Planning & Environment  
Development Services Division

## PROCEDURES AND GUIDELINES FOR PRIVATELY OWNED COMMUNITY SEWAGE SYSTEMS

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# SECTION 1

## 1.1 INTRODUCTION

This publication describes engineering standards and procedural requirements for Privately Owned Community Sewage Systems (POCSS) in Washtenaw County. These procedures and guidelines are adopted by reference in Section 2.4 of the Washtenaw County Regulations for Privately Owned Community Sewage Systems.

It is the intent of this document to provide standards by which judgments regarding the design, construction, and operation of POCSS are made. In the event that there may be a conflict in interpretation between this document and the regulation, the regulation shall take precedence.

The developer, or a designated representative, is encouraged to consult with Washtenaw County Department of Planning and Environment (WCDPE) before a POCSS is prepared. The WCDPE will make recommendations using the following:

- A. Existing available records
- B. Soils maps
- C. Well information of surrounding properties in the vicinity of the development
- D. USGS topographical maps
- E. Aerial photos
- F. Municipal water and sewer plans
- G. Other available records

## 1.2 REVIEW AGENCIES

- A. The WCDPE has varying responsibilities under the Privately Owned Community Sewage Systems Regulation, including but not limited to:
  - 1. Serving as the authorized representative of the Washtenaw County Public Health Officer.
  - 2. Reviewing and issuing permits for the construction, alteration, addition to, or improvement of any POCSS utilizing subsurface disposal with daily flows up to 20,000 gallons per day (GPD).
  - 3. Assuring that POCSS facilities are constructed according to approved plans and specifications.
  - 4. Issuing operating permits for all POCSS facilities in Washtenaw County.
  - 5. Coordinating implementation of the POCSS Regulation and these Guidelines and Procedures with other review agencies.

- B. The Michigan Department of Environmental Quality (MDEQ) has varying responsibilities under State Law, including but not necessarily limited to:
  - 1. Reviewing and issuing permits for groundwater discharge under Part 22, Groundwater Quality Rules of Act 451, as amended.
  - 2. Reviewing and issuing NPDES discharge permits.
  - 3. Reviewing and issuing permits for the construction, alteration, addition to, or improvement of public sewer systems.
  - 4. Certification of operators for public sewer facilities.
  
- C. Local units of government may have varying degrees of responsibilities depending on local ordinances, but as a minimum are responsible for the following:
  - 1. Review of compliance with local zoning for any proposed development utilizing a POCSS.
  - 2. Determining the availability of municipal sewer.
  - 3. Any other requirements as determined by local ordinances.
  - 4. Implementation of a local community wastewater regulation.

## SECTION 2

### 2.1 NOTIFICATION OF INTENT

- A. To assure compliance with the Regulation and coordination of the permit, Section 2.5 of the POCSS Regulation requires a **Notification of Intent** to create, alter, add to, or improve a POCSS. The Notification shall be submitted with applicable established fees and include the following:
1. Name and address of the applicant.
  2. Engineering plan showing potential locations of the pertinent major features of the POCSS.
  3. Documentation of the necessary steps and the level of efforts taken by the developer to ensure compliance with local zoning.
  4. Documentation of the unavailability of municipal sewer.
- B. Within 30 days from receipt of the Notification, the Health Officer shall issue a finding which details areas of compliance or noncompliance with this Regulation and any additional preliminary comments on the proposed POCSS. The finding shall address the following:
1. Availability of Municipal Sanitary Sewer.
  2. Compliance with local regulations.
  3. Consistency with local zoning.
  4. Any other special conditions to be considered such as but not limited to; limitations or environmental concerns with the receiving waters; limitations due to the proposed site location; or other environmental factors.

## SECTION 3

### 3.1 PRELIMINARY DESIGN REVIEW PROCEDURES

Once the initial findings determine that a POCSS is feasible to install and that it has met the Notification of Intent requirements, a preliminary design shall be submitted for review and comments for POCSS generating less than 20,000 GPD.

### 3.2 APPLICATION FOR PRELIMINARY DESIGN REVIEW FOR POCSS WITH SUBSURFACE DISPOSAL AND FLOWS <20,000 GPD

- A. Applicant shall submit a **Preliminary Design Review Application** that includes:
1. Applicable fees.
  2. Name, phone, and address of applicant(s).
  3. Name, phone, and address of designer, engineer, etc., (if known).
  4. Name, phone, and address of any other contact person, legal owners, site address, and tax parcel number.
  5. **Narrative:** The narrative should be a brief explanation of the proposed project or concept. It should indicate the nature of the project, type of facilities to be served, and other relevant information (such as phased development, time frames, etc.).
  6. **Physical Description of Site:** The document should provide the legal description of the site. It should address site conditions, soils and any limiting features. Soil information may be limited to Soil Conservation Service reports or independent soils investigations. A scaled drawing showing prominent site features shall be provided, noting as much of the site information as is available.
  7. **Water Supply:** A statement indicating the type of proposed water supply shall be provided. The statement shall provide a general assessment of the groundwater supply within 300 feet of the proposed development.
  8. **Disposal Concept:** This shall address the total anticipated wastewater flows, desired design features, any planned phased development, unique conditions or other relative information.
  9. **Treatment Concept:** This shall address how the sewage is to be treated and adequately disposed of without adverse effects on the environment.
  10. A list of similar compatible projects designed under the supervision of the design engineer.
  11. The proposed management entity for providing on-going operation and maintenance should be indicated.
  12. Description of any existing system including design criteria
  13. Activity or land use of area (present and anticipated).
  14. The design shall be limited to domestic wastewater only.
  15. Schedule for Phase Development, if any.

### 3.3 SOILS

- A. Soil suitability will be determined based on The Michigan Criteria for Subsurface Sewage Disposal, 1994, or any subsequent guidelines published by MDEQ or the WCDPE, whichever is appropriate.

- B. Preliminary soil data, if available, in the proposed primary and reserve soil absorption system areas shall be submitted by a Certified Soil Scientist, Professional Engineer or Registered Sanitarian.

### **3.4 DESIGN CRITERIA**

- A. The criteria should include, but not be limited to:
  - 1. Soil loading rate – **Table 3** notes the maximum loading rates in gallons per day per square foot that must be used for sizing the system. These rates shall apply to bottom area only.
  - 2. All pre-treatment methods shall meet the appropriate effluent limits imposed under Part 22 of the Groundwater Quality Administrative Rules, Promulgated pursuant to part 31 of NREPA, Act 451, 1994.
- B. Design calculations shall show basis of design, flow calculations, biological and hydraulic loading rates, pump and tank sizing with all pump curves submitted, timer settings, alarms, recirculation ratios, recirculation tank sizing, pipe sizing, friction losses through the piping network and any pertinent information deemed necessary for the design of the system.

### **3.5 SITE EVALUATION PROCEDURE**

Submit a Soil Evaluation application to the WCDPE, along with applicable fees.

- A. Provide a plan with proposed location of the sewage disposal system. The area must be pre-staked and clearly identified on the plan.
- B. Schedule a site evaluation with the presence of the design engineer and a WCDPE representative.
- C. Backhoe pits need to be dug to develop soil logs.
  - 1. The desired number will vary depending on the uniformity of soils on the site. At a minimum, there shall be two pits in each of the primary and reserve soil absorption systems.
  - 2. The following shall be accurately recorded by a competent soil consultant:
    - a. Thickness
    - b. USDA soil texture class
    - c. Soil mottles and redoximorphic features
    - d. Structure
    - e. Perched water table
    - f. Saturated soils, groundwater table
    - g. Disturbed soils
  - 3. If a sieve analysis of the soil material is required, then it shall be in conformance with ASTM C 136, Method for Sieve Analysis of Fine and Coarse Aggregates, ASTM E 11, Specification for Wire-Cloth Sieves for Testing Purposes, ASTM C 117, Methods for Materials Finer than .0075 mm (No. 200) Sieve in Mineral Aggregates by Washing, and ASTM D 422, Method for Particle Size Analysis of Soils.
  - 4. WCDPE, upon evaluation the site along with the design engineer:
    - a. Shall render a decision on the suitability of the soils for use as a POCSS.

- b. May require water table measurements to be recorded during months of probable high-water-table conditions, if insufficient information is available to determine the highest seasonal water table; if required, these measurements shall be made with applicable County or State requirements.
- c. May require any other soil and site information affecting location, design, or installation; and
- d. A hydrogeological/environmental impact study to determine any adverse impact on the environment and the groundwater supply may be required.
- e. A groundwater mounding study may be required.

### **3.6 GROUNDWATER INFORMATION**

- A. Depth to groundwater from natural grade.
- B. If an unconfined aquifer exists that is usable for potable purposes, then water quality information on the aquifer shall be submitted.
- C. Direction of flow in the aquifer. Must be determined by the Triangular well method. Provide groundwater contours and an estimate of groundwater flow velocity in the subject area.
- D. Locations, capacities, and well logs, if available, for all wells within 300 feet. This distance may be increased if area is environmentally sensitive with high risk of contamination.
- E. A study assessing the impact on the groundwater aquifer prepared by a qualified engineer or hydrogeologist must be submitted.

### **3.7 PRELIMINARY DESIGN PLANS**

- A. A detailed area map showing the entire proposed development, adjacent areas, and all acreage under development.
- B. A development plan drawn to scale which includes the following:
  - 1. The area designated for the primary and reserve soil absorption systems, as well as other treatment and disposal system components.
  - 2. Any surface waters or wells within 300 feet of the disposal area.
  - 3. Structures, roads, and parking areas adjacent to the disposal area.
  - 4. Any on-site storm water systems, retention basins, or drainage areas for the projects.
  - 5. Contour lines should be drawn on 2-foot intervals, if available at this stage.
  - 6. All public water and sewer lines within 1,000 feet.
  - 7. Location of the 100-year flood boundaries, if applicable.
  - 8. Drainage basins and drainage patterns throughout the development site.
  - 9. Any classified wetlands within 500 feet of the soil absorption system area.
  - 10. Type of treatment proposed.

## SECTION 4

### 4.1 CONSTRUCTION PERMIT PROCEDURES

Construction permits will be issued for all POCSS generating flows of less than 20,000 GPD that utilizes a subsurface final absorption system for final treated effluent disposal. In order to proceed with a POCSS construction permit process, the proposed POCSS shall have met all Notification of Intent and preliminary design review requirements.

### 4.2 APPLICATION FOR POCSS WITH SUBSURFACE DISPOSAL AND FLOWS <20,000 GPD

In order to proceed with obtaining a construction permit for POCSS with Subsurface Disposal and domestic sewage flows with less than 20,000 GPD, the applicant shall submit the following:

- A. Documentation that the project has complied with local zoning, platting, and building requirements as they relate to sewer utilities.
- B. Documentation that the project has obtained all required permits from the MDEQ office having jurisdiction as determined by WCDPE.
- C. A completed WCDPE construction permit application with applicable fees.
- D. Complete plans and specifications prepared, stamped and signed by a qualified Professional Engineer (PE).
- E. Four (4) copies of the final plans and specifications. If desired, a draft set of plans and specifications may be submitted for initial comments. The plans and specifications, whether draft or final, should be complete when submitted.

### 4.3 PLANS AND SPECIFICATIONS

- A. **Design Flow Rates** - POCSS systems shall be capable of accepting and treating normal peak events without compromising performance. The following table, based on research data and Type I water supply water usage figures, is presented to help guide designers in determining peak design flows:

**TABLE 1 – Design Flow Rates for 3 Bedroom Homes or Less:**

Number of Homes	Average gal/day	% Peaking Factor	Design Flows gal/day
2 - 10	210	25%	260
11 - 20	210	20%	250
21 - 30	210	15%	240
30+	210	10%	230

**TABLE 2 – Design Flow Rates for 4 Bedroom Homes or More:**

Number of Homes	Average gal/day	% Peaking Factor	Design Flows gal/day
2 - 10	260	25%	325
11 - 20	260	20%	310
21 - 30	260	15%	300
30 +	260	10%	285

Deviations from the above flows may be required. Justification for such deviations may include flow measurements from similar comparable facilities, developments, or uses. A minimum of three similar establishments or developments shall be used to compare design flows. Average flow data shall take into account peaking factors.

- B. **Soil Loading Rates** - The soil loading rate is the volume of effluent that can be applied on a unit area of the receiving soil, usually expressed in gallons per day per square foot. Loading rates are dependent on several factors including, but not limited to, soils structure, texture and effluent strength.

**TABLE 3 – Maximum Soil Loading Rates (GPD/SF)**

Soils Texture	Trenches	Bed
	BOD5 <30 mg/l	BOD5 <30 mg/l
Coarse/medium sand	2.0	1.8
Fine sand/loamy sand	1.25	1.0
Sandy loam	1.0	0.5
Loam/sandy clay loam	0.5	NA
Clay loam/silt loam	0.3	NA
Clay/organic soils	NA	NA

Minimum Absorption Bed Area (SF) = Q (GPD) / Maximum soil loading rate (GPD/SF)  
 Linear Foot of Trench Required (LF) = Absorption Area (SF) / Trench Width (FT)

- C. **Final Disposal System Location and Configuration**
1. The maximum slope on which soil absorption system construction is allowed shall be 25 percent.
  2. There shall be a minimum vertical separation of 4 feet between the bottom of all portions of the bed and any restrictive layer or water table.
  3. Setbacks shall be as noted in **Table 5 – Minimum Required Isolation Distances** of this document.

**4.4 GENERAL PLAN REQUIREMENTS**

The plans submitted for a construction permit shall at a minimum include:

- A. Design criteria and calculations.
- B. A schematic flow diagram.
- C. The location, dimensions, and elevations of all treatment and pumping units.

- D. Plans shall cover (both plan and profile views, where applicable):
  - 1. Sewer lines - Sizes, materials, etc.
  - 2. Pump stations - Capacity, materials, etc.
  - 3. Septic tanks - Size, materials, baffling, liquid volume, scum and sludge volumes
  - 4. Final disposal area - Detail on width, depth and length, pipe sizes and materials, configuration, etc.
  - 5. Plans shall be drawn to a scale of 1:50 or better (1 = 50 feet or less)
  - 6. Alarm systems
  - 7. Telemetric devices
  
- E. The proposed provisions for inspection of the work during construction by the design engineer. A pre-testing of the pressure distribution network shall be conducted or witnessed by the design engineer and WCDPE. A minimum of 72 hours notice shall be given to WCDPE to schedule an inspection.

#### **4.5 MINIMUM SPECIFICATIONS**

Specifications shall be in conformance with nationally recognized standards, including, but not limited to: APWA, Ten States Standards and Criteria for Sewage Works, NSF, MDEQ, MDOT, WCDPE and National Precast Concrete Association (NPCA) for concrete tanks. The specifications shall include all construction information which is not shown on the drawings and is necessary to inform the installer in detail of the design requirements. These include, but are not limited to:

- A. The quality of materials.
- B. Workmanship and fabrication of the project.
- C. The type, size, strength, operating characteristics, and rating of equipment.
- D. Allowable leakage of joints, including machinery, valves, piping, and jointing of pipe.
- E. Electrical apparatus; wiring.
- F. Operating tools.
- G. Construction materials.
- H. Special filter materials.
- I. Miscellaneous appurtenances.
- J. Instructions for testing materials and equipment as necessary to meet design standards.
- K. Operating tests for the completed works and component units.
- L. Proposed measures such as fencing may be required to ensure proper protection of the final disposal area and address safety concerns that arise from the installation of onsite sewage pretreatment and final disposal system.

#### 4.6 DISPOSAL FIELD DESIGN STANDARDS

The two most common approaches of final absorption systems (beds and trenches) are addressed here. Other systems may be considered and must be addressed on a case-by-case basis.

- A. Whether bed or trench, the final disposal system shall be designed as a pressure distribution network.
- B. The required disposal area shall be sized in accordance with applicable soils loading rates as determined by WCDPE. A 100% reserve area meeting all location requirements shall be required.
- C. Final disposal bed areas shall be designed to be long and narrow to encourage linear loading.
- D. Barrier material covering the bed shall be as follows:
  - 1. The **geotextile shall be non-woven**, and meet or exceed the following "Minimum Average Roll Values." The fabric shall be free of any chemical treatment or coating which reduces permeability and shall be inert to chemicals commonly found in soil.

**TABLE 4 – Barrier Material Specifications**

Property	Test Procedure	Unit	Minimum Value
Grab Strength	ASTM D4632	Lbs	60
Puncture Tear	ASTM D4833	Lbs	18
Trapezoid Tear	ASTM D4533	Lbs	25

- E. Monitoring ports are required and shall be located at a minimum at the center and ends of each disposal area.
- F. The bottoms of all disposal areas shall be constructed level. The installer or design engineer shall assure proper construction practices are used (i.e. lasers, construction levels or transits) to complete trenches or beds in conformance with approved plans and specifications.
- G. The aggregate below and above the final disposal system laterals shall be 6A stones and meet WCDPE specifications.
- H. Fill material, when required, shall be 2NS sand only.
- I. All system components must be properly housed and protected from extreme weather conditions.
- J. The system must have monitoring ports to measure any anticipated liquid at critical depths within the final disposal area. A sufficient number of ports must be located in disposal fields to adequately assess operating conditions. The ports shall be a minimum of four inches in diameter and be located at representative points in the final disposal area.

- K. All bed systems shall be a 100% cut to the approved sand formation.
- L. Trenches shall be:
  - 1. A minimum of 1 foot and a maximum of 3 feet in width
  - 2. A minimum of 6 inches and a maximum of 12 inches in depth
  - 3. Each trench must have a monitoring port
  - 4. A minimum of 4% slope is required for trenches proposed in loam/sandy clay loam and clay loam/silt loam soils
  - 5. A minimum of a 50 foot greenbelt area meeting soils and slope requirements is required on all trench systems
  - 6. Bottom of stone must be kept a minimum of 24 inches above seasonal high-water table
  - 7. Interface between stone and final cover must be lined with approved geotextile fabric
  - 8. Trench installation shall commence between June 1 and October 1 unless approved by the WCDPE
  - 9. Bottom of trench shall be leveled
  - 10. Trenches must be installed along the contours
  - 11. Slopes, if required, shall be convex and uniform
  - 12. Trench spacing requirements measured center to center and assuming a 2 foot wide trench are:
    - a. 5 feet for coarse/medium sand
    - b. 7 feet for fine and loamy sand
    - c. 8 feet for sand loam
    - d. 10 feet for loam/sandy clay loam/clay loam and silt loam
- M. Final cover of final absorption system shall be loam or sandy loam material only. A layer of topsoil may be allowed to help establish a vegetative cover.

#### **4.7 SEPTIC TANKS**

- A. Pre-cast concrete tanks shall be approved by WCDPE and meet the Washtenaw County Engineering Guidelines.
- B. All concrete tanks shall meet National Precast Concrete Association (NPCA) standards. The tank manufacturer shall be NPCA accredited and certified.
- C. All tanks shall be watertight and tested per ASTM C 1227 sections 9.2.1 and 9.2.2 Testing for Leakage.
- D. All tanks shall have a sealed rubber boot per ASTM Standards C-923.
- E. Any individual septic tank shall be a minimum of a 1500 gallon, double compartment tank.
- F. All tanks shall be equipped with an approved effluent filter that meets WCDPE specifications.
- G. In a STEP system, the second compartment can be used to locate the high head effluent pump. The pump must be properly designed and equipped with a screened pump vault.

- H. Water tight risers shall be flush with final proposed grade and be properly secured and safe to prevent unauthorized access.
- I. All tanks shall be located in areas not subject to flooding.
- J. All tanks shall bear the manufacturer's name, manufacture date and volume.
- K. All tanks shall have outlet baffles. The outlet sanitary tees of both compartments should extend below the liquid level a distance approximately equal to 40% of the liquid depth.
- L. All recirculation tanks shall have a minimum volume equal to 1/3 the total peak flow.
- M. All tanks shall have a minimum 18 inch diameter opening with a watertight monolithically cast-in riser.
- N. If pour-in concrete tanks are to be used, the design and specifications of the tanks must be submitted by a PE and approved by WCDPE before installation.
- O. Tank construction and specifications shall meet WCDPE standards in effect at the time of construction.
- P. All tanks shall have a compacted sand base to minimize settling.
- Q. Any non-concrete tanks, if proposed, shall be approved by WCDPE after reviewing manufacturer specifications and any other data deemed necessary by WCDPE.

#### **4.8 TANK TIGHTNESS TEST**

Tank tightness testing is a method used to determine whether a septic tank and/or pump chamber leaks. In certain instances, WCDPE will require tightness testing as a permit condition. Typically, such instances would include engineered/alternative septic system installations and locations where tank placement into saturated soils is likely. The testing shall be conducted in accordance with American Society for Testing and Materials (ASTM) Standard C1227, Section 9.2 Testing for Leakage:

- A. *9.2.1 Vacuum Testing* – Seal the empty tank and apply a vacuum to 2 in. or 50 mm of mercury. The tank is approved if 90% of vacuum is held for 2 minutes.
- B. *9.2.2 Water-Pressure Testing* – Seal the tank, fill with water, and let stand for 24 hours. Refill the tank. The tank is approved if water level is held for 1 hour.

In the event that a tank or chamber fails testing, repairs or replacement shall be required to the extent necessary to resolve the leaking condition.

#### 4.9 MINIMUM REQUIRED ISOLATION DISTANCES

**TABLE 5 – Minimum Required Isolation Distances**

ISOLATION	SEPTIC TANK	SOIL ABSORPTION SYSTEM
Property line	10 feet	50 feet
Drains designed to lower water table	50 feet	100 feet
Top of drop-off	N/A	20 feet
Storm drains	N/A	25 feet
Footing drains	N/A	50 feet if no direct connection to water; otherwise 100 feet
Building foundation (no basement)	5 feet	10 feet
Basement wall	10 feet	15 feet
Residential water supply 25 feet or deeper	50 feet	100 feet*
Lake or stream	25 feet	100 feet

**Note:** Isolation distances may be increased as required for wells serving other than individual dwellings or if the wells are drawing water from an unprotected aquifer. A well shall not be located in an area subject to flooding. No swimming pool shall be located within 20 ft of any soil absorption system or its expansion area.

*\*Other isolation distances shall conform to Part 127 of Act 327, known as the Groundwater Quality Control Act.*

#### 4.10 COLLECTION SYSTEM

Gravity or pressure sewer collection system design and approval must be obtained from MDEQ under Act 41 of NERPA, as amended.

- A. The plans shall show a cross section of the energy grade line (EGL) with all noted elevations in USGS datum. The slope of the EGL shall fall between 0.005 and 0.015 ft/ft (0.5 and 1.5 percent).
- B. The use of grinder pump pressure sewers in a POCSS which discharge into a subsurface sewage disposal system shall be prohibited.
- C. A minimum 2 ft/sec cleansing velocity shall be maintained at a given design pumping rate.
- D. Air release valves shall be placed at high points in the force main to prevent air locking.
- E. Vacuum relief valves are required at low points in the force main.
- F. All terminal points shall be provided with cleanouts.
- G. PVC and SDR 21 or heavier wall section with push-on gasketed joints shall be used for all force mains.

H. Friction losses through the force main shall be based on the Hazen Williams formula:

$$V = 1.318C R^{0.63} S^{0.54}$$

Where, V = Velocity, ft/sec

C = Hazen Williams Coefficient

R = Hydraulic Radius, ft

S = Slope of energy grade line, ft/ft

- I. Pressure sewer lines shall be tested by pneumatic means. Pressure the line to a minimum of two times the working pressure of the system, or the pressure rating of the pipe, whichever is greater. The loss of pressure over a 4 hour period shall be less than 2 psi.
- J. Septic tank(s) requirements prior to pretreatment devices:
  - 1. STEP systems utilizing a recirculation tank shall have a minimum tank capacity at the treatment facility equal to a minimum of 80% the peak daily flow.
  - 2. Properly sized effluent filters shall be an integral part of the septic tank.

#### 4.11 GRAVITY SEWERS

The following standards apply to conventional collection systems consisting of gravity sewers with standard pump or lift stations.

- A. **Inflow** - No new sewage collection systems will be approved by WCDPE which allow for the introduction of rainwater, surface drainage, sump pump discharges, non-contact cooling water or any other source of inflow.
- B. **Design Flows** - New sewage collection systems at small-scale installations shall be designed on the basis of the sewage flow estimates previously developed. An appropriate allowance for infiltration shall be added to this flow when sewers are installed in areas of high ground water.
- C. **Minimum Diameter** - No gravity sewer shall be less than 6 inches in diameter. No building sewer shall be less than 4 inches in diameter.
- D. **Depth of Cover** - Sewers should be designed to be deep enough to drain basement fixtures (where feasible) and to prevent freezing. Insulation may be required for sewers that cannot be placed at depths greater than 4 feet.
- E. **Minimum Velocities** - All sewers shall be designed and constructed to yield a velocity of not less than 2.0 feet per second when flowing full, based on "Manning's" formula. An "n" value of 0.013 constant with depth shall be used for all pipes constructed of materials other than PVC. An "n" value of 0.011 shall be used for PVC pipe.
- F. **Maximum Velocities** - Velocities greater than 12 feet per second shall not be allowed under any flow conditions.

**TABLE 6 – Minimum Slope Requirements**

<b>Pipe Size</b>	<b>Min. Slope (feet/100 feet)</b>
6 inches	0.5
8 inches	0.4
10 inches	0.28
12 inches	0.22
14 inches	0.17
15 inches	0.15
16 inches	0.14
18 inches	0.12
21 inches	0.10
24 inches	0.08

- G. **Alignment** - Sewers shall be laid with uniform slope and straight alignment between manholes. When a sewer joins one of a larger diameter, the connection shall be made at a manhole. The invert of the larger sewer shall be lowered sufficiently to maintain the same energy gradient. An approximate method for securing this result is to place the 0.8 depth point of both sewers at the same elevation.
- H. **Pipe Materials** - Sewers shall be constructed of SDR - 35 PVC. All sewer piping located beneath any street, roadway, driveway or passageway upon which vehicular traffic could occur, shall be designed for approved loading by MDEQ.
- I. **Material Strength** - Proper allowance for loads on the sewer shall be made based upon the width and depth of the trench. When standard strength sewer pipe is not sufficient, the additional strength needed shall be obtained using extra strength pipe, appropriate bedding or encasement. Sewers greater than 20 feet in depth shall be constructed of SDR - 80 PVC or Schedule 40 ductile iron pipe or equivalent.
- J. **Leakage Testing** - The method of joining pipes and the materials used shall be included in the specifications. Sewer joints shall be designed to minimize leakage and to prevent the entrance of roots. Leakage tests shall be specified in the specifications and may include water or low pressure air testing.
- K. **Manholes** - Manholes shall be installed at the end of each line, at all changes in grade, size or alignment, at all intersections, and a distance not greater than 400 feet.
- L. **Minimum Manhole Diameter** - The minimum diameter of manholes shall be 48 inches. A minimum access diameter of 24 inches (61cm) shall be provided. Larger openings shall be provided for manholes that house equipment.
- M. **Manhole Materials** - Precast or cast-in-place concrete manholes with O-ring gasketed joint manhole covers adjusted to grade using concrete spacer rings shall be used. Manhole cover type shall be specified on the plans and shall be steel, cast iron or ductile iron. Water tight, gasketed covers shall be used in areas subject to flooding.
- N. **Watertightness** - The specifications shall include a requirement for inspection of manholes for watertightness prior to placing into service. Leakage tests may include appropriate water or vacuum testing.



- 6. The designer shall submit a manufacturer's operation and maintenance manual.
- 7. An acceptable telemetric component.

**4.14 PUMP STATIONS**

- A. Pumps/electrical panels shall be sewage effluent rated and meet state electrical code requirements for installation and testing.
- B. Each pump shall have an elapse time meter and dose counter to record pump running time. Elapse time meter and dose counter shall be located in the pump panel.
- C. Quick disconnect couplers shall be required for all sewage pumps.
- D. Suitable non-corrosive screening or effluent filters shall be provided prior to the pump chamber for effluent pumps discharging to soil absorption system areas. Effluent screening acceptable to WCDPE guidelines shall be installed on the outlet of all septic tanks.
- E. All pump chambers shall have access to finish grade for inspection and maintenance.
- F. All pump chambers shall meet the requirements outlined in the Washtenaw County Engineering Guidelines or any subsequent design manual established by WCDPE.

**4.15 FILL MATERIAL**

- A. All fill material used in the backfilling of the final disposal area shall meet 2NS grade specifications.

**TABLE 7 – Requirements for Backfilling Material**

Passing the 3/8 inch sieve in Percent	100%
Passing the #4 sieve in Percent	95% - 100%
Passing the #8 sieve in Percent	65% - 95%
Passing the #16 sieve in Percent	35% - 75%
Passing the #30 sieve in Percent	20% - 55%
Passing the #50 sieve in Percent	10% - 30%
Passing the #100 sieve in Percent	0% - 10%
Passing the #200 sieve in Percent	0% - 3%

- B. Use MDOT 6 A stones for final disposal area construction.

**TABLE 8 – Stone Requirements for Final Disposal Area**

Passing the 1½ inch sieve in Percent	100%
Passing the 1 inch sieve in Percent	95% - 100%
Passing the ½ inch sieve in Percent	30% - 50%
Passing the # 4 sieve in Percent	0% - 8%
Loss by wash in Percent	0%

- C. MDOT Class II material shall be used to backfill around pipes and structures.
- D. Bedding around all tanks shall be class II sand and be compacted to a minimum of 95% Standard Proctor Density.

#### **4.16 ODOR CONTROL FEATURES**

All POCSS shall be equipped with odor control mitigation features that will effectively overcome the potential for odor release at air release valves.

#### **4.17 MOUNDING ANALYSIS**

All proposed POCSS shall prepare a groundwater mounding analysis. Procedures developed by Finnemore and Hantzsche (1983) can be used.

#### **4.18 OTHER REQUIREMENTS**

- A. POCSS shall include recirculation and surge tanks as part of the pretreatment device.
- B. All buildable units of the project shall be connected to the POCSS.
- C. In areas of high groundwater sensitivity, WCDPE shall require a means of testing the aquifer by installing a minimum of 3 monitoring wells triangulated around the final disposal area. The wells shall be screened in the receiving aquifer and be constructed in accordance with applicable MDEQ standards for monitoring well installations. If required, WCDPE shall establish a sampling frequency and parameters as it sees fit.
- D. If a utility building is required at a wastewater treatment facility, the building shall meet applicable building code standards.
- E. A fencing system shall be required around the wastewater treatment facility.
- F. A separate telephone service for each pump station and at the wastewater treatment facility is required for emergency purposes.
- G. The wastewater treatment facility must have access for vehicular traffic and provide adequate road access and parking facilities.
- H. All exposed metal or wood material must be painted.
- I. A bar chart showing the construction schedule with dates of construction commencement, testing, startup and hookup to the POCSS must be submitted.

## **SECTION 5**

### **5.1 APPROVAL TO CONSTRUCT**

Prior to commencing construction on any part of a POCSS, the applicant/owner must obtain an "Approval to Construct" from the WCDPE. It is required that all applicable Washtenaw County, local unit of government and MDEQ regulations and ordinances are in compliance before an "Approval to Construct" will be issued.

### **5.2 CONSTRUCTION INSPECTIONS**

- A. Construction inspections shall be conducted as required by WCDPE and as described in the "Approval to Construct". To the extent possible, WCDPE shall coordinate construction oversight with the applicant, local unit of government and MDEQ.
- B. To perform all required inspections as stipulated in the construction permit, WCDPE must be notified at least 72 hours in advance of the requested inspection time.
- C. Inspections that may be conducted by the design engineer or authorized representative shall be identified on the approved construction plans. Special inspections shall be performed by the design engineer or an authorized representative during system construction for the following type of work:
  - 1. Alternative systems.
  - 2. Placement of select fill material or final elevation of fill or special excavation requirements.
- D. Any substantial deviations from the approved engineering report or plans and specifications must be approved by WCDPE for approval prior to making the change.
- E. Within 7 days following the completion of and prior to the use of any portion of the project for which approval has been obtained, an engineer's certification is to be submitted to the approval agency by the P.E. who submitted the plans and specifications. As-built drawings must be submitted if changes from the approved plans and specifications occurred during construction.

### **5.3 ENGINEER'S CERTIFICATION**

Upon completion of the construction of all parts of the POCSS, the design engineer is required to submit a certification that the system installation was completed in substantial compliance with the construction permit and the approved plans.

## SECTION 6

### 6.1 OPERATING PERMITS

In accordance with Article IV of the Washtenaw County POCSS Regulation, a POCSS owner shall obtain a POCSS Operating Permit. Routine reports shall be submitted as outlined in the Operating Permit.

An operating permit that shall have a fixed term which shall not exceed 5 years and WCDPE shall make every effort to coordinate its Operating Permit with any state issued discharge or operating permit.

An owner of a POCSS shall apply for a re-issuance of the Operating Permit not less than 180 days before the expiration of the permit on a form to be supplied by the WCDPE.

An Operating Permit for a POCSS is not transferable to a new owner. Upon the transfer of ownership of any POCSS the new owner must apply for a new Operating Permit.

**Prior to issuance of an Operating Permit the following shall be provided to WCDPE:**

- A. Identification of the owner of the system.
- B. A detailed cost analysis/rate study of the system that identifies annual costs to manage, operate and maintain the system including the establishment of adequate reserves for repair and maintenance of equipment.
- C. An escrow account, line of credit or other financial assurance acceptable to the Health Officer.
- D. A recorded deed document that clearly establishes the responsibilities of each user of the system including the requirement to pay all costs needed to manage, operate and maintain the system and specifically consenting to the establishment of a special assessment district encompassing all users of the system.
- E. An operational plan that identifies the certified operator, the required routine maintenance to be performed, emergency procedures, identification of ongoing costs and any other items deemed necessary by the Health Officer.

**The Operating Permit shall include terms and conditions, established and reviewed from time to time by the Health Officer, which address at a minimum:**

- A. Facility contact information including the owner and certified operator.
- B. Operation of the facility by a certified and Washtenaw County-registered operator.
- C. An operational plan that assures proper operation of all facilities in the POCSS including the routine maintenance of items located on individual properties such as septic tanks, pump systems or other appurtenances.
- D. Ongoing financial assurance of facility operations including an operating budget which assures appropriate repair and replacement reserves.
- E. Monitoring requirements.
- F. Reporting requirements including routine operational reporting and notification of non-compliance.
- G. Facility effluent or performance standards and flow limitations as established by MDEQ.
- H. Compliance schedule if required.
- I. Access to the facility by representatives of the Health Officer.
- J. Requirements for deed restrictions on all properties served by the POCSS.
- K. Notification and disclosure requirements to all users or potential new users of the POCSS.

- L. Routine information to be provided to homeowners regarding the proper use of the system.
- M. Any additional requirements as determined necessary by the Health Officer.

## **6.2 ROUTINE OPERATIONAL RECORDS**

Records should be kept of all inspections, monitoring, work performed, conditions found, etc. The records should be available for inspection by the WCDPE at any time. Annually, summary reports of the system maintenance and operation shall be sent to WCDPE in accordance with the requirements for a POCSS Operating Permit as outlined in the POCSS Regulation.

## **6.3 OPERATOR REGISTRATION**

All operators of a POCSS facility within Washtenaw County shall be State Certified and required to register on a form provided by the WCDPE. Such registration shall include copies of all certifications, identification of responsible individuals and any other information deemed appropriate by the Health Officer. Any change in the information contained in the registration shall result in the re-submittal of the registration form.

## **6.4 FINANCIAL SUSTAINABILITY**

A budget shall be prepared to calculate total annual costs to manage, operate and maintain each POCSS. The calculation shall include cost variables such as inflation and calculation of sinking funds to replace system components. Costs and charges must be tabulated to include the following:

- A. Monthly inspections, sampling and testing
- B. Annual pumping of tanks and sludge disposal
- C. Pump replacement cost
- D. Media replacement cost
- E. Electrical cost
- F. System telemetry cost
- G. Minor repairs
- H. Contingency funds for unforeseen emergencies
- I. Any other costs associated with system O&M

## **6.5 PROPERTY DEDICATION AND ACCESS**

The treatment devices and the final disposal shall be located on a parcel exclusively dedicated for this purpose. Proper delineation of such purpose must be identified in the plat or condominium document of said development.

All applicable easements must be properly recorded with the register of deeds.

Access to the wastewater treatment facility and final disposal area must be specifically granted to the WCDPE. The WCDPE shall have exclusive rights to monitor, sample and check unit processes and bill the owner of record for these activities.

## 6.6 OPERATION AND MAINTENANCE MANUALS

- A. The type and size of a POCSS dictate what operation and maintenance (O&M) activities will be necessary. A draft O&M manual shall be submitted with plans and specifications. The final O&M manual shall be stamped, signed and dated by a PE and shall be submitted with the "as-built" drawings and the engineer's certification of the project.
  
- B. The manual shall include, but not be limited to, schedules and/or procedures for the following items:
  - 1. Response to emergencies. Emergency procedures should include provisions for:
    - a. Notifying the users and WCDPE of the emergency.
    - b. Determining the cause of any failure or malfunction. The findings should be submitted in a written format to WCDPE.
    - c. Making repairs, replacements, or modifications of design as required to restore functioning of system.
  - 2. Periodic inspection of facilities to ascertain efficiency of operation and general condition of equipment - checklists.
  - 3. Periodic pumping of septic tanks, pump chambers or other storage tanks by licensed septic tank haulers or periodic pumping/maintenance of other pretreatment mechanisms by appropriate qualified personnel. Copies of any pumping contracts should be included.
  - 4. Periodic maintenance of pumps, motors, and switches.
  - 5. Replacement or repair of worn or damaged equipment.
  - 6. Monitoring of water usage/wastewater generation.
  - 7. Dosing/resting cycles for the final disposal system.
  - 8. Determining water levels in final disposal areas.
  - 9. Monitoring of groundwater or adjacent surface water quality, if deemed necessary.
  - 10. Other specified activities depending on type of system.
  - 11. Sample forms for all O&M activities.
  
- C. The limit of responsibilities to manage, operate and maintain the POCSS must be clearly identified in the O&M manual.
  - 1. Homeowner responsibility shall include:
    - a. Piping from the house to the septic tanks
    - b. Electrical power to the control panel
    - c. Payment of all applicable fees
  - 2. Management entity responsibility shall include:
    - a. Septic tank and control panel
    - b. Sludge removal from the septic tanks on a periodic basis as stated in the O&M manual
    - c. All sewer leads
    - d. Collection system
    - e. Pump stations
    - f. Treatment and final disposal area
    - g. Electrical power to pump stations, treatment and final disposal area

## **6.7 EFFLUENT DISCHARGE LIMITATIONS**

No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage or water softener backwash to any sanitary sewer.

No person shall discharge or cause to be discharged any of the following described waters or wastes to any sewers:

- A. Any gasoline, kerosene, benzene, naphtha, fuel oil, or other flammable or explosive liquid, solid, or gas.
- B. Any non-latex paints, paint thinners, paint removers, or strippers.
- C. Any organic solvent or any liquid containing any organic solvent.
- D. Any lubricating or hydraulic fluids including waste crankcase oil, brake fluid, transmission fluid and lithium grease.
- E. Any photographic fluids including waste developer, fixer and rinse water.
- F. Any pesticide including insecticides, fungicides, rodenticides and herbicides of any sort.
- G. Any waters or wastes containing toxic or poisonous solids, liquids, or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters.

## **6.8 MANAGEMENT ENTITY**

For systems approved by WCDPE, management shall be provided by an entity approved by the WCDPE as follows:

- A. For single family and/or multi-family subdivisions where the parcels/lots are individually owned, a public entity (municipal) or a private entity (HOMEOWNERS ASSOCIATION) can provide management via an appropriate contract or recorded deed document.

## **SECTION 7**

### **7.1 TRANSFER OF POCSS OWNERSHIP**

Any owner of a POCSS, including any legally established “user association”, shall be required to form a legal entity such as an LLC, LLP or registered partnership and such entity shall be the POCSS owner of record. Any owner of a POCSS shall notify the Health Officer of a transfer of ownership to successor entity prior to the transfer. Upon transfer of ownership, the owner must complete a *POCSS Transfer of Ownership* form and submit it to WCDPE.

### **7.2 TRANSFER OF DWELLING OR UNIT SERVED BY A POCSS**

Upon the transfer of ownership of any dwelling or structure served by a POCSS the seller shall disclose by written notification in the seller’s disclosure statement to the buyer that the buyer will be served by a POCSS and that the buyer shall be required to pay for the proper operation and maintenance, repair and replacement of the POCSS. A notification shall be placed in the Master Deed or in the legal document of the project.

## APPENDIX A - REQUIRED PERMITS

Flows GPD/DISPOSAL	WC Notification Required	WC Construction Permit	WC Operating Permit	MDEQ Part 22 Groundwater Discharge Permit	MDEQ Part 22 Groundwater Discharge Permit Notification	MDEQ Part 41 Permit	MDEQ NDPES Permit	LUG
≤ 20,000 Subsurface	X	X	X	X	NA	X	NA	*
> 20,000 Subsurface	X	NA	X	X	NA	X	NA	*
6000 ≤ Q ≤ 10,000 Subsurface	X	X	X	X	X	X	NA	*
Q < 10,000 Subsurface	X	X	X	NA	IF >6000 BUT <10,000	X	NA	*
Any flow (Surface water discharge or non subsurface)	X	NA	X	NA	NA	X	X	*

\* CHECK WITH LOCAL UNIT OF GOVERNMENT ON REQUIRED PERMITS