UNIVERSITY OF MINNESOTA

# Onsite Sewage Treatment
## 2010 Program Update

October 7th, 2010

Website: http://septic.umn.edu

Email: septic@umn.edu

# Presentation Topics

- Manual & Worksheets
- Workshops
- Project Updates
- Product Registration

# OSTP Staff

| OSTP Staff | Primary Responsibilities | Email |
|---|---|---|
| Sara Heger | Professional and research | sheger@umn.edu |
| Dave Gustafson | Professional and research | gusta002@umn.edu |
| Nick Haig | Workshop administration & program support | haigx003@umn.edu |
| Dan Wheeler | Professional and research | dwheeler@umn.edu |
| Jessica Wittwer | Workshop administration, research and soils assistance | wittw001@umn.edu |

# New OSTP Manual


- Updated to match 2008 Rule
- Options to access
  - Through workshop registration/at workshops
  - Downloadable/on-line
  - Order through Extension:
    - http://shop.extension.umn.edu
    - 1-800-876-8636

# http://septic.umn.edu/sstsmanual/index.htm

Onsite Sewage Treatment Program | Water Resources Center | University ... http://septic.umn.ed

Campuses : Twin Cities Crookston Duluth Morris Rochester Other Locations

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Water Resources Center

## Onsite Sewage Treatment Program

**Who Are We?**

- Home
- Staff
- Research
- Publications
- Onsite Industry Links

Water Resources Center
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The Water Resources Center is affiliated with the College of Food, Agricultural and Natural Resource Sciences and University of Minnesota Extension.

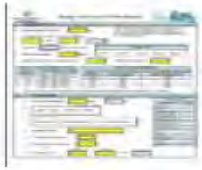
The Onsite Sewage Treatment Program (OSTP) protects both public health and the environment through training and certification, consulting and professional development opportunities related to onsite wastewater treatment systems.

SSTS Professionals

Septic System Owners

Workshops and Events

Small Community Wastewater Issues



Forms and Worksheets


SSTS Manual

**Who are You?**

- SSTS Professional
- Septic System Owner
- Small Community Member
- Real Estate Agents
- Committee Volunteer

**Quick Links**

- OSTP Workshops
- SSTS Manual
- SSTS Forms and Worksheets
- SSTS Regulations

# Design Worksheets

- Updated to match new rule
- Microsoft Excel
- Download procedure:
  - Open file
  - Enable macros if your computer asks you
  - Security level must be at medium or low
  - Save file – keep a master copy
  - Save the file you are going to use with a different file name
  - Read instructions
  - Go back to original if you run into problems

Minnesota Pollution Control Agency

## Instructions for 2009 OSTP SSTS Design Forms

University of Minnesota

The 2009 Design forms included in this file are intended to meet the new 2008 Chapter 7080 Rules. Due to the many changes there will be updates over the next months and year. Please check back to the website frequently and download the most current version. There are 20 worksheets and additional supporting information in the 2009 SSTS Design Form Workbook, they are:

| | | |
|---|---|---|
| 1. Preliminary Evaluation | 9. Mound > 1% | 17. Single-Pass & Recirculating Filter |
| 2. Field Evaluation | 10. Mound < 1% | 18. Flow Estimate for Existing Dwellings |
| 3. Soil Observation | 11. Mound Materials | 19. Measured Flow-Other Establishment |
| 4. Additional Soil Observations | 12. At-Grade | 20. Estimated Flow-Other Establishment |
| 5. Site Evaluation Map | 13. Pressure Distribution | 21. Final Flow Total |
| 6. Percolation Test | 14. Non-Level Pressure Distribution | 22. LISTS & MSTS Flow & System Summary |
| 7. Design Summary | 15. Pump Selection | 23. Supporting Information |
| 8. Trench & Bed | 16. Pump Tank | 24. Tables |

These worksheets were created in Microsoft Excel. You must have a software program that can open .xls documents to use these forms. If you do not have Microsoft Excel, you can download a similar program named OpenOffice online: http://www.openoffice.org/

There are two ways you can utilize this workbook:

1. You can use the Excel worksheet on a computer and fill in the values on a computer & print out the results or email them. Using this function you must be sure to enable macros if asked this by Excel, or

2. You can print blank copies of the worksheets and fill them out by hand.

# http://septic.umn.edu/professional/worksheets/

Onsite Sewage Treatment Program | Water Resources Center | University ... http://septic.umn.ed

Campuses : Twin Cities Crookston Duluth Morris Rochester Other Locations

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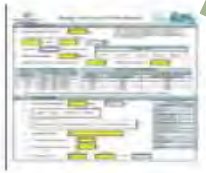

Forms and Worksheets


SSTS Manual

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- SSTS Forms and Worksheets
- SSTS Regulations

***Updated Version coming Fall 2010***

## INPUTS

In each worksheet, you will notice each cell is colored either green (or grey depending on your system settings) or yellow.

Yellow cells are user input cells, that is, these are the cells where you as the designer must manually enter the value that t worksheet is requesting.

Green cells are cells that will fill in automatically as you enter values into the yellow cells.

## CHECK BOXES

Many of the worksheets have check boxes that one may check on the computer. not working, you are most like is "design mode" in excel. To fix this, from the menu, select View, Toobars, and "Control Toolbox". Now a new tooblar will appear in your menu bar. There is a button that looks like a ruler ar quare. Click it to get out of design mode. Now the check boxes should work.

## DROP DOWN MENUS

Some of the yellow cells have a drop-down menu function. A small arrow pointing downwards will appear in the lower righ corner of the cells with a drop-down menu. You MUST choose one of the values in the drop-down menu. To erase the valu simply highlight the cell and press the Delete key on your keyboard.

NOTE: Most of the cells in this workbook have a great deal of complex formatting and formulas in the background. If you alter the formulas, the workbook will not function properly. It would be a good idea to copy this workbook and always wor with the the copy, so the original can be utilized for back-up purposes only.

## PRINTING

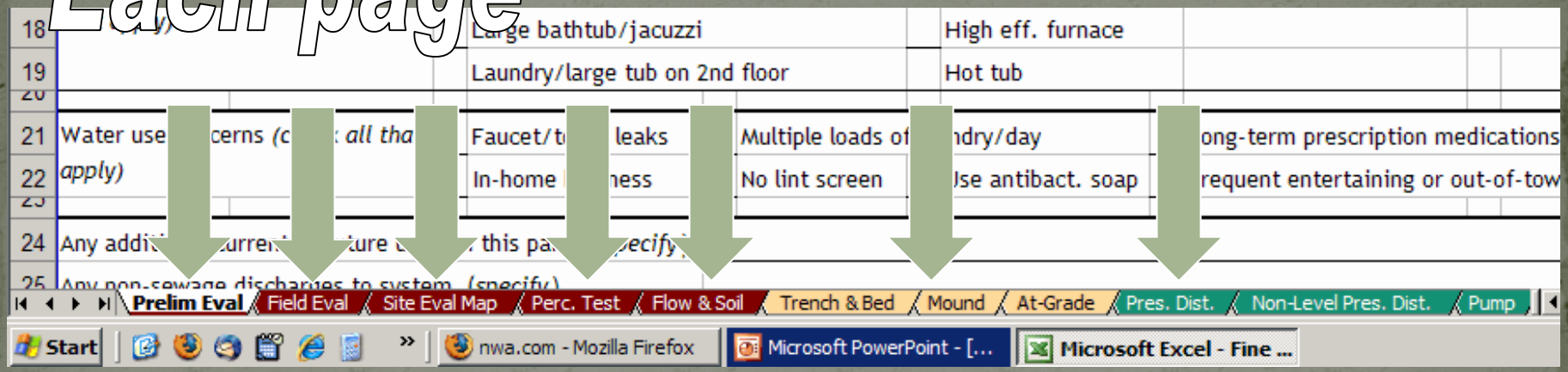
The worksheets should display and print at 100%. This makes the worksheets readable and able to be filled in by hand.The worksheets can either be printed in either colo or black and white. You may need to set your computer/printer to graysca option or you may wish to change the colored portions of the worksheets. Each sheet that is part of your design must be printed separately as there is not a way to print them all at one time

## SAVING

Each time a design is done the file should be saved with a unique file name. Keep an origional version of the workbook with no data entered. To have a version which can not be alter d you can create at PDF. Creating a PDF requires the full versi of Adobe Acrobat which is software you may not have. The other option is to go to "Tools"..."Protection"..."Protect Worksheet" and save the file for that particular job which it what the overall plan for how to do this.

# Working the Sheets

**Each page**



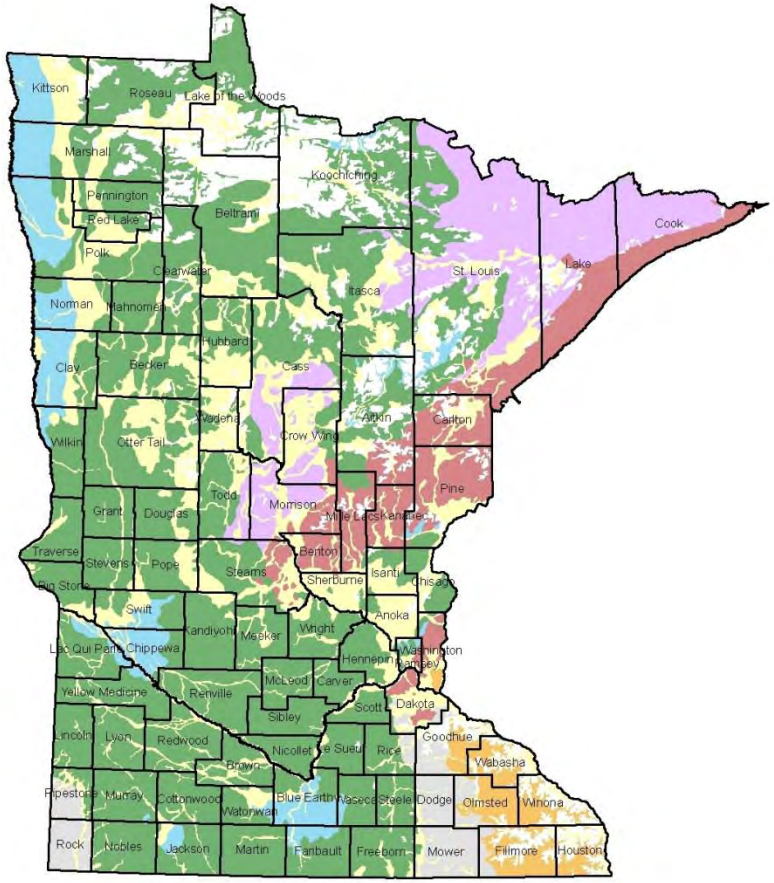

**Excel Spread sheets**

# Workshop Highlights in 2010 - 2011

- Advanced Design & Inspection
  - Fall 2010
    - Cancelled due to low enrollment
  - Spring 2011
    - March 29-31 & May 24-27 Mankato
- Service Provider
  - Mankato - May 3-6
  - Brainerd – August 23-26
- Soils CE to match new 6 hours soils CE requirement –
  - Farmington – May18
  - Forest Lake – June 15
  - Worthington – June 21
  - St. Cloud – June 29
  - Contact Dan Wheeler if you are interested in hosting a Soils CE in your area

# Minnesota's Soil Training Regions

- Des Moines and Wadena Lobes
- Sandy Alluvium and Outwash
- Superior Lobe
- Rainy Lobe
- Lake Sediments/Lacustrine
- Iowan Erosion Surface
- Bedrock



# Project Updates

# MOWA Annual Conference

- In Duluth January 31 – February 2
- January 31 - Preconference Topic – System Rejuvenation
  - Troubleshooting, products, management
- Main Conference February 1 -2
  - Tracks on Control Panels, LGU topics, Rules, and a lot more
- More info:  www.mowa-mn.com

# Specialized Training in 2010

- Grant received to do specialized training with Leech Lake Band of Ojibwe and other tribes
  - Goal:  to get more of their staff certified to 7080 standards.
  - Training occurred in Cass Lake area this summer
- Grant received from EPA to do one Professional Training class in South Dakota, North Dakota & Wyoming

# Small Community Activities

- OSTP is working with over 20 Minnesota small communities
- Education and facilitation provided on:
  - Wastewater treatment basics
  - The decision-making process
  - Working with professionals
  - Treatment options
  - Management of systems

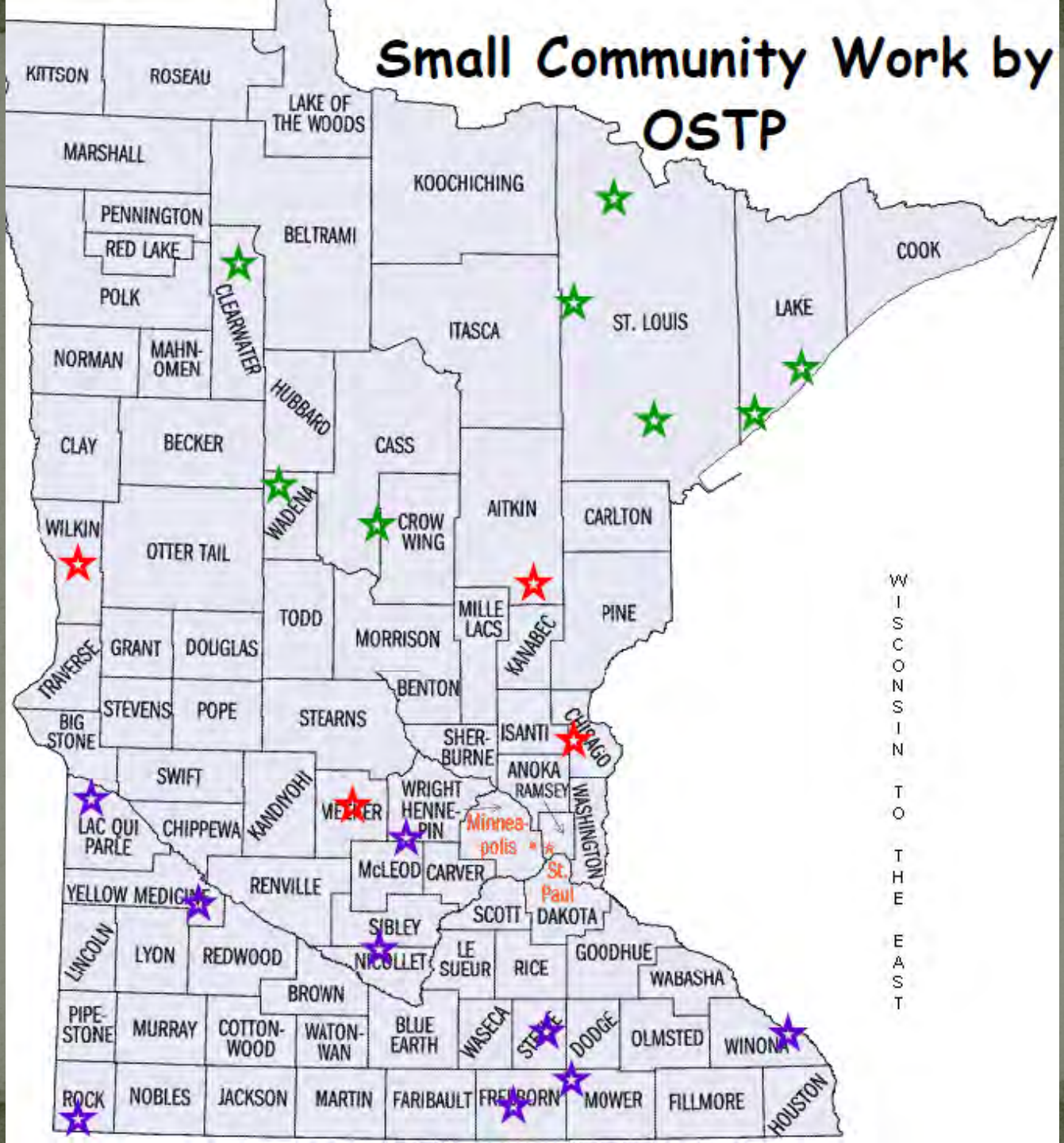
# Small Community Technical Assistance

- OSTP  is involved with reviewing:
  - The community assessment report (CAR) process to determine
    - the current status of wastewater treatment
    - the potential for on-lot and cluster soil-based treatment systems
  - Preliminary engineering report based on CAR
  - Decentralized system design
  - Community wide management plan
- Construction inspection oversight

# OSTP Community Involvement

- Hazel Run
- Bixby
- Myrtle
- Andyville
- Dakota
- Louisburg
- Trotsky
- Biscay
- Nicolville
- Jenkins
- Leonard
- Side Lake
- Larsmont
- Blueberry Twp.
- Crane Lake
- Doran
- Barry
- Forest City Twp
- McGrath
- Carlos
- Hiawatha Beach in Ham Lake
- Amelund

# Small Community Work by OSTP



# WERF Project - Projecting Costs of Decentralized Wastewater Management Options

- This project developed software that contains:
  - a spreadsheet-based economic model and
  - contains fact-sheet style educational modules
- The tool provides users with fundamental information about:
  - the operation of various wastewater management options and
  - cost estimates for these options based on local cost indices

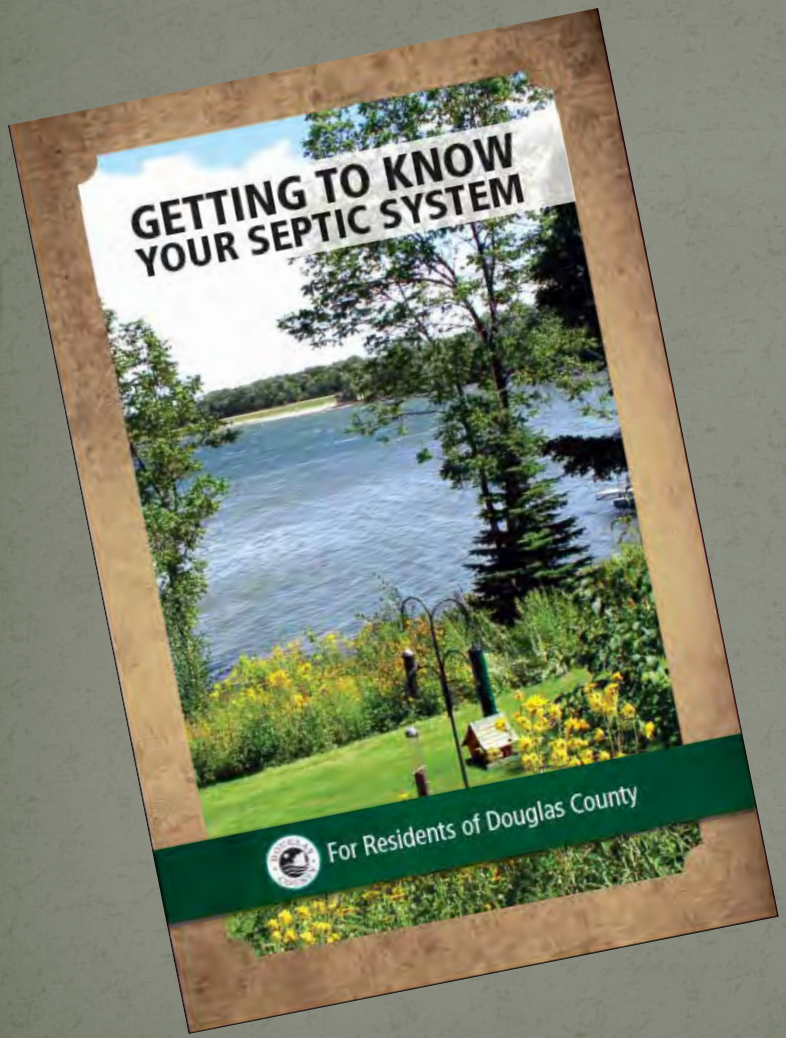
# WERF Continued

- The model was designed to be realistic and dynamic;
  - It includes estimates for initial capital costs and for life-cycle costs.
- Using this tool, a decision-maker is able to evaluate several wastewater management options

# Douglas County Project Overview

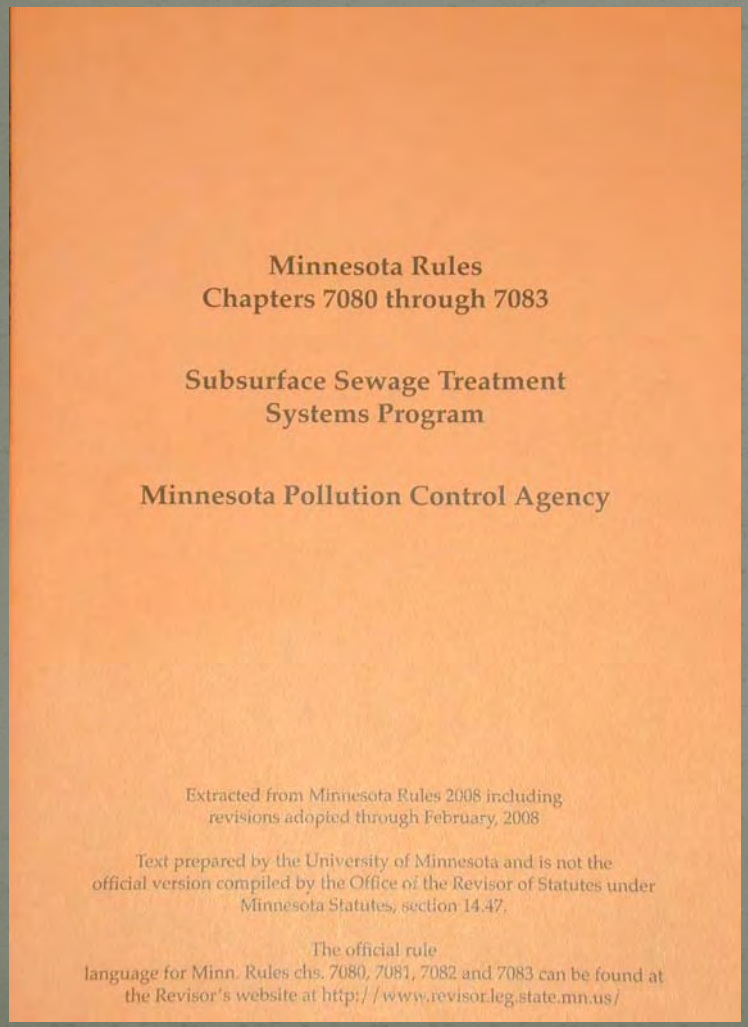
- Project:  Utilizing Clean Water Legacy funds to enhance a local SSTS Program
- 1. Brochure targeting owners of systems found to be in non-compliance
- 2. Development of a group of SSTS owners that understand and support Douglas County efforts
- 3. Focused training for SSTS Professionals that work in Douglas County on soils and procedures that support this new approach

# OSTP's Role



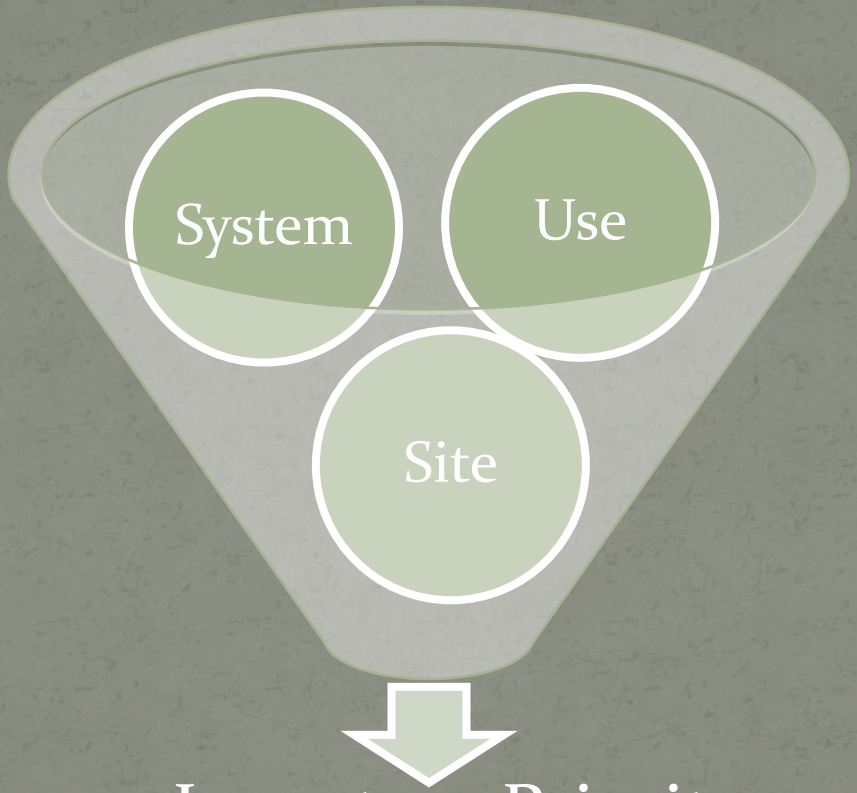

- Delivery of six homeowner operation and maintenance workshops
- Delivery of three-part series of Knowledgeable Local Citizen trainings
- Development of custom brochure for Douglas County lakeshore residents
- Distrubution of 1000 Septic System Owners Guides

# 1. Implement a local ordinance that embraces performance management concepts




- U of M provided a detailed review of the ordinance to improve its outcomes

# 2. Develop an inventory plan that utilizes three risk characteristics




*U of M helped to develop and ground truth this concept.*

1. Inventory Priority
2. Management Frequency

# 3. Utilize a robust database tool

- Track inventory progress
- Serve as a repository of SSTS lifecycle data
- U of M provided suggestions to consider based on their capacity to manage data

# U-Tube Videos in Partnership with Faribault County

- Four short (3-5 minute) videos are being developed
- Will be placed on the internet
- Primary audience is homeowners
- Optional video could be used in professional training program.

# Effective Dates &Renewal

- February 4, 2010
  - Treatment products
  - Distribution media products
- February 4, 2011
  - Sewage tanks
- Renewals
  - Registration good for up to 3 years (December expiration date)
  - Renewal by manufacturer
    - Submit new results, if changed – or-
    - Provide affidavit verify product has not changed
  - MPCA will request field assessment comments from LGU's (in October for products to be renewed)

# Recommended Standards and Guidance Documents

- Public domain distribution technologies
  - Drainfield rock – done 2009
- Public domain treatment technologies
  - Sand filters – done 2009/2010
- Others (to be done)
  - Remediation
  - Proprietary drip dispersal

Chapter 7083.4000 Subp.1.

# Sewage Tanks

- Listing of Tanks not until Feb. 4, 2011
- Application - document tanks meet rule requirements
- Water-tight testing, 1 model per year minimum
- Contact Corey Hower, MPCA Rochester
- MPCA website, future documents and list

# Registered Treatment Products

- Type IV Systems
  - Otherwise - Type V Systems
- Allows reduced vertical separation for Treatment Levels A and B and increased hydraulic loading rates, but…
  - Requires pressure distribution to the soil
  - Requires timed dosing for most soils

7080.2350 – Tables XI and XII

# Minnesota - Performance Requirements for Treatment Products

| Treatment Level | CBOD | TSS | O&G | FC | Nutrient |
|---|---|---|---|---|---|
| A | 15 | 15 | -- | 1,000 | -- |
| B | 25 | 30 | -- | 10,000 | -- |
| C | 125 | 80 | 20 | -- | -- |
| TN | -- | -- | -- | -- | 20 |
| TP | -- | -- | -- | -- | 2 |

# Table XI - Treatment Levels & Method of Distribution by Soil Group

| Vertical Separation (inches) | Soil Group from Table XII | | |
|---|---|---|---|
| | 1 -5 | 6-9 | 10-11 |
| 12 to 17 | Treatment level A<br>Pressure distribution<br>Timed dosing | Treatment level A<br>Pressure distribution<br>Timed dosing | Treatment level A<br>Pressure distribution<br>Timed dosing |
| 18 to 23 | Treatment level B<br>Pressure distribution<br>Timed dosing | Treatment level B<br>Pressure distribution<br>Timed dosing | Treatment level B<br>Pressure distribution |
| 24 to 36 | Treatment level B<br>Pressure distribution<br>Timed dosing | Treatment level B<br>Pressure distribution | Treatment level B<br>Pressure distribution |

# Product Listing – MPCA Website

- How to Use the Listing of Products
  - Treatment Products
    - 5 treatment levels
    - A, B, C
    - Total Nitrogen
    - High Strength Waste
  - Distribution Media Products
    - 4 performance standards

# Product Listing – MPCA Website

- How to Use the Listing of Products
  - Notice of Product Listing
  - Submitted Drawings
  - Known Limitations
  - Installation Information
  - Operation and Maintenance
  - Owners information
  - Service Contract
  - Regulators Checklist
  - Operating Permit Template
  - Management Plan

# Notice of Product Listing (MPCA letter)

- Letters to manufacturers
  - General product information
  - Treatment Levels – with & without UV disinfection
  - Design flows per Model (rated for lbs BOD treated)
  - Conditions of product registration in MN
  - Expiration date
  - State does not endorse any product

| Manufacturer | Registration |
| --- | --- |
| Delta Ecopod with Disinfection | A, B, C (just C without disinfection) |
| Orenco Advantex | A, B, C and TN |
| Bio-Microbics FAST | A, B, C, TN (C without disinfection), HSW |
| Premier Tech Environment- Ecoflo Peat Filters | A, B, C |
| Hoot | A, B, C (B &C without disinfection) |
| Bord Na Mona Peat Filters | B &C |
| Enviro-Guard | A, B, C (just C without disinfection) |

| Manufacturer | Registration |
| --- | --- |
| Multi-Flo | A, B, C (just C without disinfection) |
| SludgeHammer | C |
| Vacuum Bubble Technology | C and HSW |
| Nyadic | C |
| Fusion | C |
| Hydro-Action | B |
| Nibbler | HSW |

# At A Glance Listing for Residential Treatment Products

Minnesota Pollution Control Agency

## 'At A Glance' Listing of Proprietary Treatment Products for Typical Residential Strength

**Subsurface Sewage Treatment Systems**

Updated February 4, 2010

| Proprietary Products Name and Models | Treatment Levels | | | |
|---|---|---|---|---|
| | A | B | C | TN |
| AdvanTex: AX-20<br>AX20, AX20-2, AX20-3, AX20-4, AX20-5 | | | X | X |
| AdvanTex; AX-20<br>AX20, AX20-2, AX20-3, AX20-4, AX20-5 with Salcor 3G UV disinfection | X | X | X | X |
| Ecoflo Biofilter; Closed Bottom, STB Models with:<br>Fiberglass shell<br>• STB-500, STB-500-2, STB-650, STB-650-2, STB-650-3<br>Concrete shell (gravity discharge)<br>• STB-650B, STB-650B-2, STB-650B-3<br>Concrete shell (pump discharge)<br>• STB-650BR, STB-650BR-2, STB-650BR-3 | X | X | X | |
| Ecopod<br>E50, E60 | | | X | |
| Ecopod<br>E50, E60 with Salcor 3G UV disinfection | X | X | X | |
| Enviro-Guard (non-modular)<br>ENV- 0.75 | | | X | |
| Enviro-Guard (non-modular)<br>ENV-0.750 with Salcor 3G UV disinfection | X | X | X | |
| Enviro-Guard (modular)<br>ENV- 0.75M | | | X | |
| Enviro-Guard (modular)<br>ENV-0.750M with Salcor 3G UV disinfection | X | X | X | |
| Fusion<br>ZF-450, ZF-600, and ZF-800 | | | X | |
| Hoot H-Series<br>H-500, H-600, H-750, and H-1000 | | X | X | |
| Hoot H-Series<br>H-500, H-600, H-750, and H-1000 with Salcor 3G UV disinfection | X | X | X | |
| MicroFAST<br>0.5, 0.75, 0.9,1.5, 3.0, 4.5, and 9.0 | | | X | X |
| MicroFAST<br>0.5, 0.75, 0.9, and 1.5 with Salcor 3G UV disinfection | X | X | X | X |
| MicroFAST<br>3.0, 4.5, and 9.0 with Norweco chlorine disinfection | X | X | X | X |

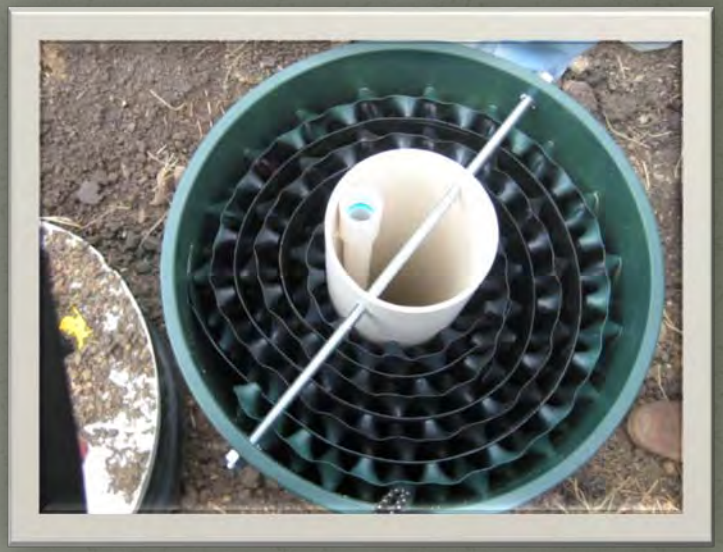


Minnesota Pollution Control Agency • 520 Lafayette Rd. N., St. Paul, MN 55155-4194 • www.pca.state.mn.us
651-296-6300 • 800-657-3864 • TTY 651-282-5332 or 800-657-3864 • Available in alternative formats

| Proprietary Products Name and Models | Treatment Levels | | | |
|---|---|---|---|---|
| | A | B | C | TN |
| Multi-Flo<br>FTB-0.5, FTB-0.6, FTB-0.75, FTB-1.0, and FTB-1.5 | | | X | |
| Multi-Flo<br>FTB-0.5, FTB-0.6, FTB-0.75, FTB-1.0, and FTB-1.5 with Salcor 3G UV disinfection | X | X | X | |
| Nayadic<br>M-6A, M-8A, M-1050A, M-1200A, and M-2000A | | | X | |
| Puraflo Peat Fiber Biofilter; Open and Closed Bottom<br>• Open Bottom 1A to 10A<br>• Closed Bottom 1B to 10B | | X | X | |
| RetroFAST<br>0.15, 0.25, and 0.375 | | | X | X |
| RetroFAST<br>0.15, 0.25, and 0.375 with Salcor 3G UV disinfection | | X | X | X |

# Conditions of Product Registration

- Know conditions associated with the use of registered treatment products as Type IV systems
- Operating Permit template (for LGU to use)
- Training by the product's manufacturer required
- Advanced Designer prepares Management Plan
  - Templates developed - product specific (see U of M site)



# Operating Permit – template and examples

<Insert logo/address here>

## Wastewater Treatment and Dispersal Operating Permit

**Operating Permit No. _____**

**Note:** To **unlock** this form for editing for MS Word 2003 users, select the Tools Menu/Unprotect Document; for MS Word 2007 users, select the Developer Tab/Protect Document/Restrict Formatting & Editing and click on Stop Protection in lower right corner of screen. (To add Developer Tab to Ribbon, click on the icon in the upper left corner of screen, select Word Options/Popular and check Show Developer Tab.)

### Facility Information

Permittee name: _____ Phone number: _____

Mailing address: _____

City: _____ State: _____ Zip code: _____

Property ID number (GPS location): _____

_____ authorizes the Permittee to operate a wastewater treatment and dispersal system at the address named above in accordance with the requirements of this operating permit. The attached Management Plan is hereby incorporated as part of the requirements of this operating permit.

Issuance date: _____ Expiration date: _____

System type: _____ Treatment level: _____

System design flow: _____ Residential/Commercial: _____

System components: _____

_____

### Monitoring Requirements

| Parameter | Effluent limits | Frequency | Location |
|---|---|---|---|

# Management Plans

- All new and replacement systems will need to have a management plan developed by the designer
- LGUs make sure the plan is submitted as part of their permit issuance process
- LGUs not required to enforce adherence to the plan, but it is recommended.
- Management plan templates on website
  - Below grade – trenches and beds
  - Above grade – mounds and at-grades
  - Holding tanks

# Management Plans – go to U of M website

UNIVERSITY OF MINNESOTA

*Onsite Sewage Treatment Program*
*Septic System Management Plan*
**Premier Tech Environnement**
**Ecoflo Biofilter**

This Management Plan identifies some basic requirements for proper operation and maintenance of the Ecoflo Biofilter wastewater treatment device for residential use. Refer to the manufacturer's Operation and Maintenance Manual for Ecoflo Biofilter wastewater treatment products for detailed instructions on proper system operation and maintenance. Refer to your soil treatment system management plan (below or above-grade) for additional management requirements.

The Ecoflo Manual, submitted by the manufacturer (Premier Tech Environnement) as part of the registration of this product in Minnesota, can be found at the Minnesota Pollution Control Agency's website http://www.pca.state.mn.us/programs/ists/productregistration.html.

| SYSTEM COMPONENT | TASK | FREQUENCY | RESPONSIBLE PARTY |
|---|---|---|---|
| **Ecoflo Wastewater Treatment Device** | Monitor alarm (if pump is in system) | On-going | Homeowner & Service Provider |
| | Check for proper ventilation | Annually | Homeowner &/or Service provider |
| | Check for excessive odor and pest infestation | Annually | Homeowner &/or Service Provider |
| | Monitor flow | Annually | Service Provider |
| | Annual maintenance on the Ecoflo biofilter checking integrity of all components, pounding, rake peat, picture of peat and infiltration zone, etc.) | Annually | Service Provider |
| | Perform operational field tests on influent/effluent quality including odor, color, turbidity, temperature, and pH as appropriate. | Annually | Service Provider |
| | Sample effluent as required in the local Operating Permit* | See Operating Permit | Service Provider |
| | For seasonal use, follow manufacturers guidelines | As required based on seasonal usage | Service Provider |

* Systems designed to meet treatment level A or B without UV disinfection must collect effluent sample for fecal coliform annually at a minimum.

At the time of each service visit, Form 7-1: Media Filter should be completed. See http://www.onsiteconsortium.org/omspchecklists.html

**Items not permitted** in the Ecoflo Biofilter are specified in the Ecoflo Biofilter Owner's Manual for Minnesota.

# Public Domain and Proprietary Distribution Media

**Registered***

- Drainfield Rock
- Rock substitutes
  - Chambers
    - ADS
    - Infiltrator
  - Geocomposites
    - Infiltrator EZflow

**Not Registered**

- Gravelless pipe
- Drip distribution

**Registered for use in Trenches, Bed, At-grades & Mounds*

# Drainfield Rock Distribution Media

- Public domain product
- Recommended Standards & Guidance Document
- MnDOT Spec 3137
- Abrasion & soundness testing - soft rock of concern
- Design and installation
- Quality control, field screening tools
- Best Management Practices to keep rock clean

# Summary

- ‘New’ process tries to provide consistent review of products
- Listing on MPCA website, information readily available
- Products subject to conditions of use in MN
- Product manuals tailored to MN rules
- Management plans and operating permit examples
- Feedback loop on product performance  (renewal)

# Product Registration Process

**Barbara McCarthy**
**MPCA Duluth Office**

**218-302-6647**
**Barbara.mccarthy@state.mn.us**

# Additional UMN Information & Resources

http://septic.umn.edu

800-322-8642

612-625-9797

septic@umn.edu