

Wastewater Treatment Systems, Wastewater Issues and Permits

Lucas Gregory

Texas Water Resources Institute

November 29, 2017

Debbie Magin
Guadalupe Blanco River Authority

Ryan Gerlich
Texas A&M AgriLife Extension Service

Two General Types

Centralized WWTF



Decentralized Onsite System



Information to convey to your stakeholders about wastewater treatment facilities

- TCEQ has “primacy” – review, issue and regulate permits to dispose of wastewater
 - Discharge permits
 - Land application permits (zero discharge)
- EPA still reviews, comments and approves major permits (> 1 MGD) – new and renewals
- Other agencies will review permits

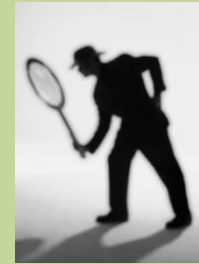


Water Quality Permits

– Issued on five-year basin cycle



– Inspected by TCEQ regional offices



– Constructed under TCEQ design standards



– Operated by

licensed operators



Water Quality Permits

- Permits specify:
 - Discharge, land application, subsurface



Discharge Volume and Quality

Guadalupe-Blanco River Authority

TPDES Permit No. WQ0010210002

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall Number 001

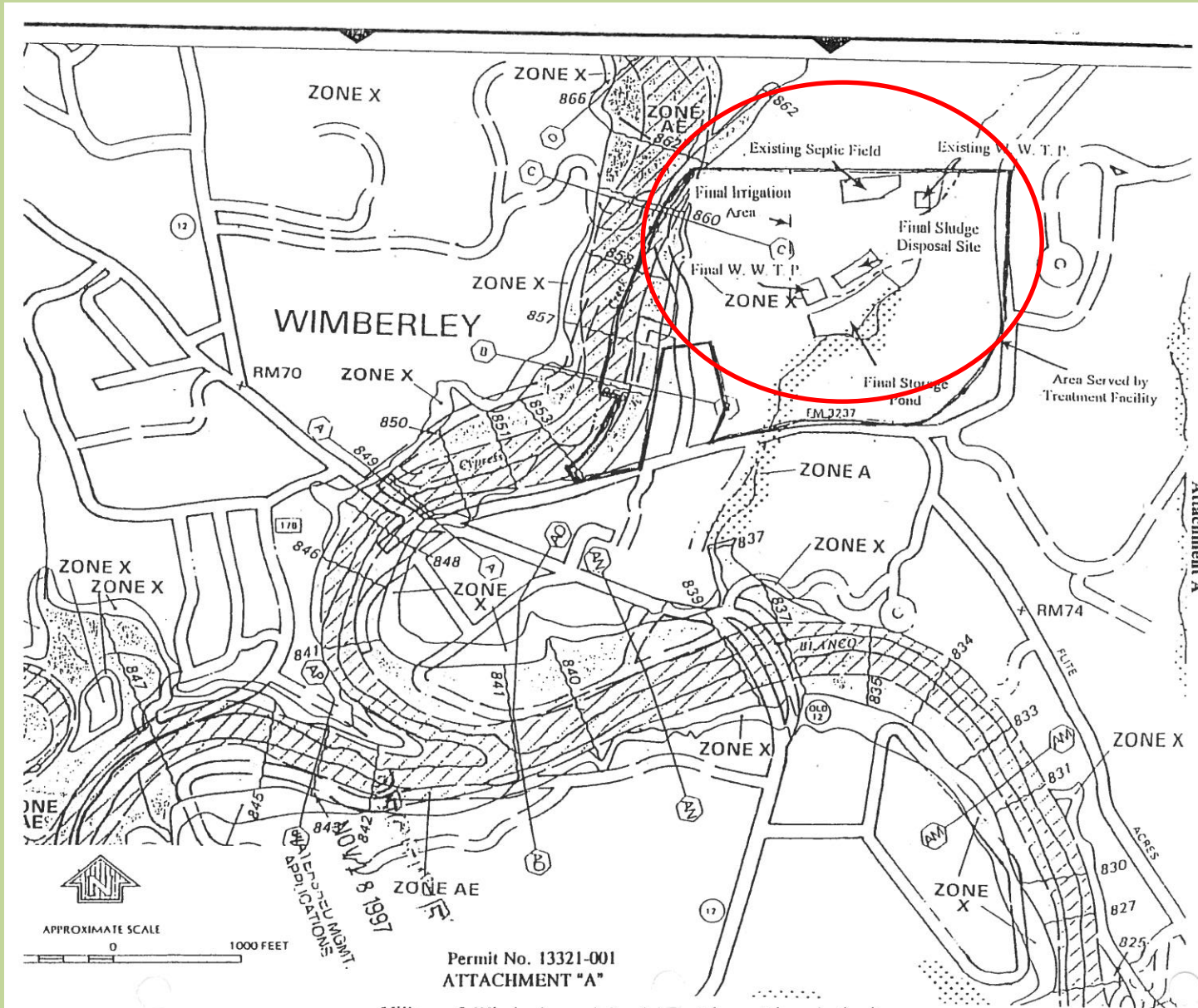
1. During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

The annual average flow of effluent shall not exceed 1.5 million gallons per day (MGD); nor shall the average discharge during any two-hour period (2-hour peak) exceed 3,125 gallons per minute (gpm).

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>				<u>Minimum Self-Monitoring Requirements</u>	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Daily Max. Measurement Frequency	Sample Type
Flow, MGD	Report	N/A	Report	N/A	Continuous	Totalizing Meter
Carbonaceous Biochemical Oxygen Demand (5-day)	10 (125)	15	25	35	Two/week	Composite
Total Suspended Solids	15 (188)	25	40	60	Two/week	Composite
Ammonia Nitrogen	3 (38)	6	10	15	Two/week	Composite
<i>E. coli</i> , colonies per 100 ml	126	N/A	394	N/A	One/day	Grab

2. The permittee shall utilize an Ultraviolet Light (UV) system for disinfection purposes. An equivalent method of disinfection may be substituted only with prior approval of the Executive Director.
3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.
4. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
5. Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.
6. The effluent shall contain a minimum dissolved oxygen of 5.0 mg/l and shall be monitored twice per week by grab sample.
7. The annual average flow and maximum 2-hour peak flow shall be reported monthly.

Discharge Point or Application Area



City of Wimberly and Guadalupe-Blanco River Authority

Permit No. WQ0013321001

Permit No. 13321-001
ATTACHMENT "A"

Village of Wimberly and Guadalupe-Blanco River Authority

Monitoring and Reporting Frequency

Guadalupe-Blanco River Authority

TPDES Permit No. WQ0010210002

EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall Number 001

- During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

The annual average flow of effluent shall not exceed 1.5 million gallons per day (MGD); nor shall the average discharge during any two-hour period (2-hour peak) exceed 3,125 gallons per minute (gpm).

<u>Effluent Characteristic</u>	<u>Discharge Limitations</u>				<u>Minimum Self-Monitoring Requirements</u>	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Single Grab mg/l	Report Daily Avg. & Daily Max. Measurement Frequency	Sample Type
Flow, MGD	Report	N/A	Report	N/A	Continuous	Totalizing Meter
Carbonaceous Biochemical Oxygen Demand (5-day)	10 (125)	15	25	35	Two/week	Composite
Total Suspended Solids	15 (188)	25	40	60	Two/week	Composite
Ammonia Nitrogen	3 (38)	6	10	15	Two/week	Composite
<i>E. coli</i> , colonies per 100 ml	126	N/A	394	N/A	One/day	Grab

- The permittee shall utilize an Ultraviolet Light (UV) system for disinfection purposes. An equivalent method of disinfection may be substituted only with prior approval of the Executive Director.
- The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored once per week by grab sample.
- There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.
- Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.
- The effluent shall contain a minimum dissolved oxygen of 5.0 mg/l and shall be monitored twice per week by grab sample.
- The annual average flow and maximum 2-hour peak flow shall be reported monthly.

Water Quality Permits

- TCEQ considers:
 - Receiving body of water and/or aquifer protection
 - Designated uses
 - 303d list
 - TMDL
 - Other discharges and WLAs

Water Quality Permits

- Issues - new or being considered
 - Bacterial limits – in permits after January 2010
 - De-chlorination for smaller facilities
 - Water Quality Standards and Implementation Procedures
 - Nutrient stream standards -> nutrient limitations

Resources for Watershed Coordinators and Stakeholders

- TCEQ Website: www.tceq.texas.gov
- Find a permit application:
<https://www.tceq.texas.gov/agency/data/lookup-data/status-stormwater-wastewater.html>
- Permit status (Central Registry):
<http://www15.tceq.texas.gov/crpub/index.cfm?fuseaction=addnid.IdSearch>
- EPA ECHO – Enforcement and Compliance History Online
<http://echo.epa.gov/?redirect=echo>



After the Storm

All-out effort at TCEQ to help state recover from Harvey

[More TCEONews](#)

News

TCEQ Newsroom

[TCEQ Approves Fines Totaling \\$326,187](#)
Nov. 1, 2017

Penalties assessed against 39 regulated entities

[Dr. Michael Honeycutt named chair of EPA Science Advisory Board](#)
Oct. 31, 2017

Texas' chief toxicologist tapped to serve

[Texas Multi-Year Implementation Plan for RESTORE grants submitted](#)
Oct. 31, 2017

U.S. Treasury to begin the process of funding

[Newsroom](#)



Spotlight

[Response to Comments on a City of Dripping](#)

Permits and Licenses You Might Need

Permits and Registrations

Occupational Licensing

Reporting

Status of Permits and Registrations

Environmental Permitting: Participating in the Process

How's our Customer service? Please fill out our Customer Satisfaction Survey.

You are here: Home / Permits, Registrations, and Reporting / Permits and Registration

Questions or Comments: ac@tceq.texas.gov

Permits and Registration

We issue a variety of permits, registrations, and other authorizations.

By Business

- Permits and Licenses You Might Need

By Type

- 401 Certificaton Reviews (for dredged or fill discharges)
Air
Bioenergy
Dry Cleaners
Edwards Aquifer Plans
Mining and Mineral Extraction
Petroleum Storage Tanks (PSTs)
Public Water Systems (permit by rule)
Radioactive Materials
Stormwater
Waste Management
Wastewater
Water Rights
Water Diversions (in watermaster areas)

Compliance

- Compliance Assistance
Compliance Histories

Enforcement

- Policies and Procedures
Reports and Status
Supplemental Environmental Projects

Fees and Financial Assurance

- Fees
Financial Assurance
Pay Online with ePay



- [Water Home](#)
- [Drinking Water](#)
- [Groundwater and Wells](#)
- [Water Quality in Rivers, Lakes, and Estuaries](#)
- [Wastewater and Stormwater](#)
- [Water Rights and Availability](#)

[Home](#) / [Permits, Registrations, and Reporting](#) / [Wastewater Treatment](#)


>> [Questions or Comments:](#)
wqap@tceq.texas.gov

Wastewater and Stormwater

Types of wastewater and stormwater permits and registrations, and how to apply for them. Permitting requirements. Participating in the permitting process.

Related Content

- [Delinquent Fees and Penalties](#)
- [Occupational Licensing](#)
- [Advisory Groups](#)
- [Water Quality Management Plan](#)

 How's our Customer service? Please fill out our [Customer Satisfaction Survey](#).

HOT [Response to Comments on a City of Dripping Springs Wastewater Discharge Permit](#)


The TCEQ received and responded to public comments on the draft permit number WQ0014488003. You can review the Executive Director's Response to Comments.

Participating in the Process

[Wastewater Permit Applications: Participating in the Review Process](#)

In our review of wastewater permit applications, the public's opportunity to participate is different for each type of application.

Data and Records

- [TCEQ Data and Records](#)
Environmental data and records available from the TCEQ.
- [Status of Stormwater and Wastewater Applications and Specifications](#)
Track the status of applications for general permits, applications for individual permits, and approval of wastewater system design plans and specifications.
- [Records Needed Most Often for Wastewater Investigations](#) 
TCEQ investigators send this document to a plant that is about to undergo a wastewater investigation to ensure availability of records needed to complete the process expeditiously.

- [Permit Types](#)

- [Sanitary Sewer Overflow](#)

- [Wastewater Reuse](#)



After the Storm

All-out effort at TCEQ to help state recover from Harvey

▶ [More TCEQNews](#)

Rules, Data, Forms and Reporting

[Rules and Rulemaking \(proposals, adoptions, and agreements\)](#)

[Data and Records](#)

[Forms](#)

[Maps and Searches Using Map Format](#)

[Public Notices](#)

[Reporting \(report data or file a complaint\)](#)

[Publications](#)

Commissioner's Corner

[Agenda Meetings and Work Sessions](#)

[View Pending Matters and File Documents](#)

[Orders Issued](#)

[About the Commissioners](#)

[Executive Director's Agendas](#)

Licenses and Permits

[Occupational Licensing](#)

[Permits and Registrations](#)

[Occupational Licensing Benefits for Military Service Members, Veterans, or Military Spouses](#)

Search Central Registry

[Search by Facility/Site \(regulated entity\)](#)

[Search by Name/Company \(customer\)](#)

[Search by Permit/Registration \(program ID number\)](#)



Online Services

[eRegistrations \(STEERS, SUNSS\)](#)

Get Involved / Customer Services

✉ [Get email or text updates of your choice of](#)

Nov. 1, 2017

Penalties assessed against 39 regulated entities

📧 [Dr. Michael Honeycutt named chair of EPA Science Advisory Board](#)

Oct. 31, 2017

Texas' chief toxicologist tapped to serve

📧 [Texas Multi-Year Implementation Plan for RESTORE grants submitted](#)

Oct. 31, 2017

U.S. Treasury to begin the process of funding

▶ [Newsroom](#)



Spotlight

[Response to Comments on a City of Dripping Springs Wastewater Discharge Permit](#)

[Profiles and Success Stories in Air Pollution Control: AAPCA Report](#)

[Hurricane Harvey Response](#)

[Water Study: Review of the Water Resource Management Account](#)



[RestoreTheTexasCoast.org: Find Info on Funding Sources for Texas Resulting from Deepwater Horizon Oil Spill](#)



[Visit the Texas Veterans Portal](#)

Take Care of Texas

Take Care of Texas Video Contest

Win scholarship funds or GoPro packages.



Central Registry Query - Additional ID Search

Search for a regulated entity by the permit, registration, or other ID number issued by TCEQ program areas.

Additional ID Search

Search by entering an ID and selecting whether to search for the full ID or use a partial match, i.e. return all IDs containing the string. You may also select a program area to narrow the search results.

Program ID: (Permit, registration, or other program identifier.)

Search Type: full ID partial ID

ID Status: (ID status, only used if program or ID entered.)

Program:

Central Registry Query - ID Search Results List

Your Search Returned **2** Records. Click on a column name to change the sort or an RN to view the regulated entity information. In some cases the Additional Id will be a link to the Additional Id Details.

1-2 of 2 Records

RN Number	Regulated Entity Name ▲	Location	County	Program	ID	Type	Status
RN101325926	GBRA LOCKHART WWTP 2	No location on file	CALDWELL	WASTEWATER LICENSING	WQ0010210002	LICENSE	INACTIVE
RN101325926	GBRA LOCKHART WWTP 2	No location on file	CALDWELL	WASTEWATER	WQ0010210002	PERMIT	ACTIVE

1-2 of 2 Records

The following search criteria was entered:

Additional ID: WQ0010210002

Search Type: full

Central Registry

Detail of: **Wastewater Permit WQ0010210002** [View Permit](#)

For: **GBRA LOCKHART WWTP 2 (RN101325926)**

No physical location description on file.

Permit Status: **ACTIVE**

Held by: **GUADALUPE-BLANCO RIVER AUTHORITY (CN601180565)**

OWNER [View Compliance History](#)

Mailing Address: 933 E COURT ST SEGUIN, TX 78155-5819

Related Information:

- [Commissioners' Actions](#)
- [Complaints](#)
- [Discharges](#)
- [Investigations](#)
- [Notice of Violations](#)
- [Permit Information](#)

There is no information related to this Permit in the following categories:

- Correspondence Tracking**

Other resources on TCEQ Website

[Commissioners' Integrated Database](#)

Tracks status of all matters pending before the Commission and Executive Director for approval, after notice issued, if applicable. Includes enforcement cases, rules, permit and license applications, registrations, actions involving water districts.

<http://www14.tceq.texas.gov/epic/eCID/>

[Search the TCEQ Central Registry](#)

To find the permit number by site, facility name, permit holder, county, or other information, look in our Central Registry. Here you can also find out whether a site had a permit at any point in the past, as well as the name and contact information of the permit holder.

[Licensing and Registration Information](#)

Find licensing, training credits, and registration information for individuals and companies.

Other thoughts....

- Invite representatives from WWTP operations to serve on stakeholders committee or serve on technical advisory committee
- Tour wastewater treatment plants
- Have speakers from TCEQ or consulting firms to explain permitting process, treatment process, specific to the permits in watershed
- Use on-line modules to demonstrate related discussion items (<http://www.gbra.org/flash/education.aspx>)

Future Considerations: 210

Authorization – Wastewater Reuse

Reuse of treated wastewater

- must maintain an approved wastewater discharge permit
 - quality of wastewater will govern what wastewater can be used for

Benefits:

- takes pressure off potable water sources
- reduces nutrients discharged to stream

Concerns:

- reduces flow in creek – biotic communities established because of consistent flow
- downstream appropriated water rights



WWTF Issues: Sanitary Sewer Overflows

Sanitary Sewer Overflow (SSO) – occurs when significant inflow/infiltration (I/I) in the collection system; the system is not properly operated and maintained; or its capacity is inadequate for collection, storage or treatment

Unauthorized discharge of untreated or partially treated wastewater from collection system components (manhole, lift station, or cleanout) before reaching a treatment facility



Management: Sanitary Sewer Overflow (SSO) Initiative

Goal -

Reduce the number of SSOs that occur each year and address SSOs before they harm human health, safety, or the environment before they become enforcement issues.



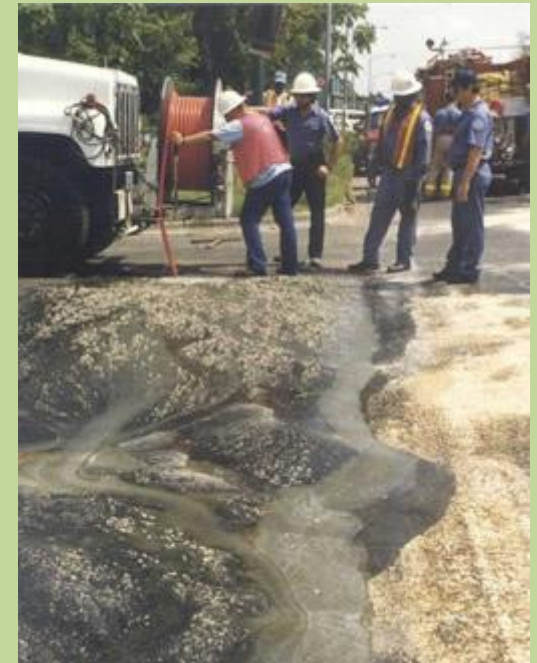
SSO Initiative - Benefits

Participating facility not subject to formal enforcement for most SSO violations if the SSO plan addresses them

Participation allows resource spending to correct issues rather than paying penalties associated with an enforcement order, in addition to the money required to complete corrective action.

- Pipeline inspections and repairs or replacements
- Lift station upgrades
- SCADA system installations

Participation ensures that SSOs addressed by the SSO plan will not affect the facility's compliance history rating.



WWTF Issues: Meeting Permit Limits

Permit Limit Exceedances – occur from a variety of reasons including significant inflow/infiltration (I/I) in the collection system; the system malfunctions; or the inability to meet a new permit limit

Management:

- Upgrade infrastructure
- Increase capacity
- Decrease inflow and infiltration
- Increase monitoring
- Combine smaller 'package' plants



Introduction to Onsite Wastewater Treatment

Ryan Gerlich

Office # 979-458-4185

RAGerlich@ag.tamu.edu

<http://ossf.tamu.edu/>

TEXAS A&M
AGRILIFE
EXTENSION

Overview

- ⦿ What is an On Site Sewage Facility (OSSF)?
- ⦿ Why are we concerned about wastewater?
- ⦿ Evolution of onsite wastewater treatment
- ⦿ Identifying OSSF issues
- ⦿ Addressing OSSF issues
- ⦿ Education and outreach



Onsite wastewater treatment system



Onsite wastewater treatment systems?

- ⦿ Rural and Exurban wastewater infrastructure
- ⦿ Water Quality Protection
- ⦿ 25 - 40%, Wastewater Infrastructure
- ⦿ What is the system called?
 - ⦿ OWTS – Onsite Wastewater Treatment System; Nationally
 - ⦿ OSSF – On-Site Sewage Facility; Texas
 - ⦿ Septic System



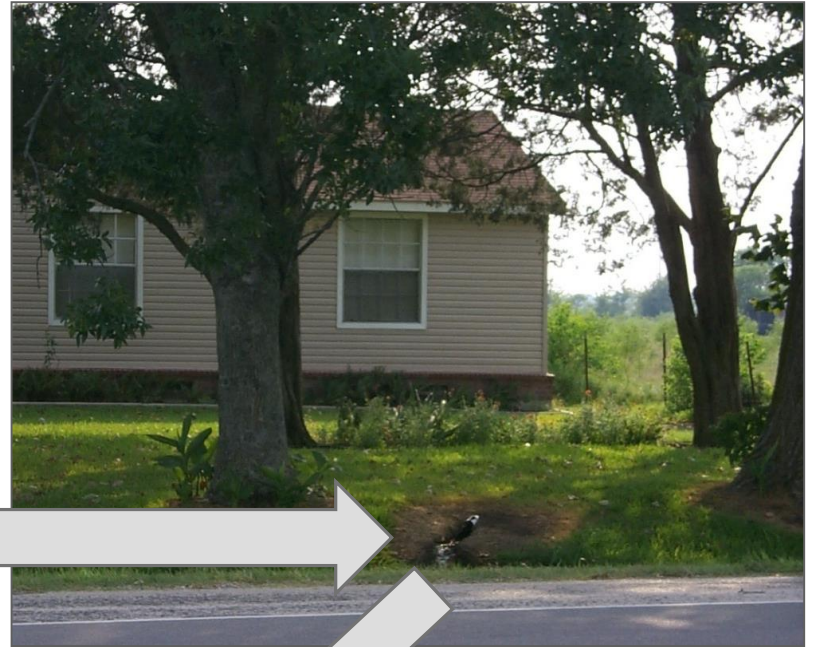
Permitting wastewater treatment systems in Texas

- ⦿ Texas Commission on Environmental Quality (TCEQ), Chapter 285, 5000 gallons per day or less
 - ⦿ Local Authorized Agent – Usually local Health Department
 - ⦿ TCEQ Regional Office
- ⦿ TCEQ, Chapter 217, Greater than 5000 gallons per day.

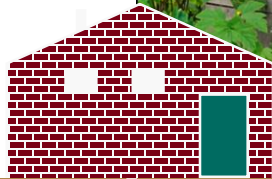
Malfunctioning onsite system



Evolution of wastewater treatment



Well



Groundwater



Aerobic soil

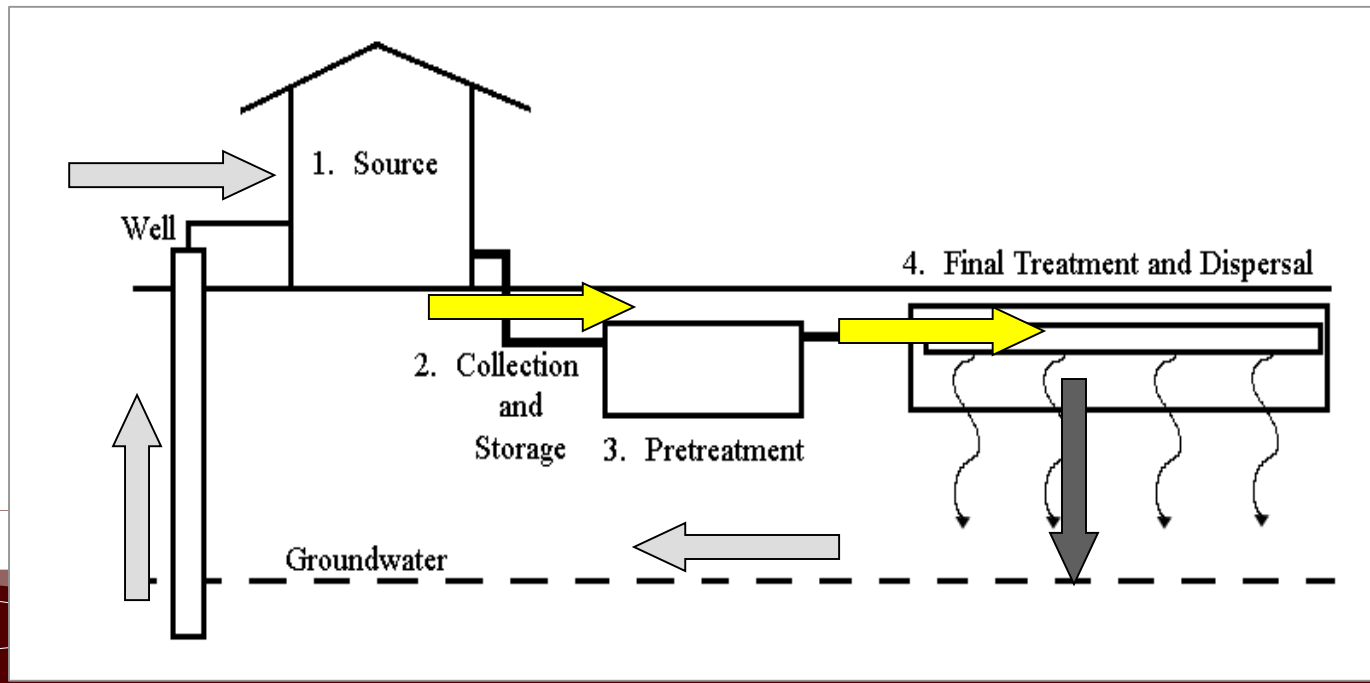
Changing treatment goals mean:

- ⦿ Approach must also change
 - ⦿ Siting requirements
 - ⦿ Choice of treatment components and systems
 - ⦿ System O&M
 - ⦿ Management program
- ⦿ Public acceptance of change
- ⦿ Public willing to pay for additional service, \$\$\$
- ⦿ Enforcement on participants not willing to change – public will to support enforcement

Education

What is an onsite wastewater treatment system?

1. Wastewater source
2. Collection and storage
3. Pretreatment components
4. Final treatment and dispersal components



Wastewater source



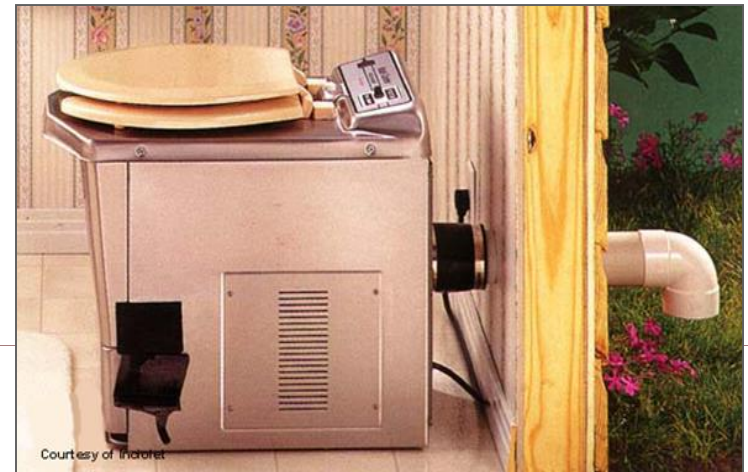
- Facility type
 - Domestic
 - Commercial

- User
 - Owner/family
 - Employees



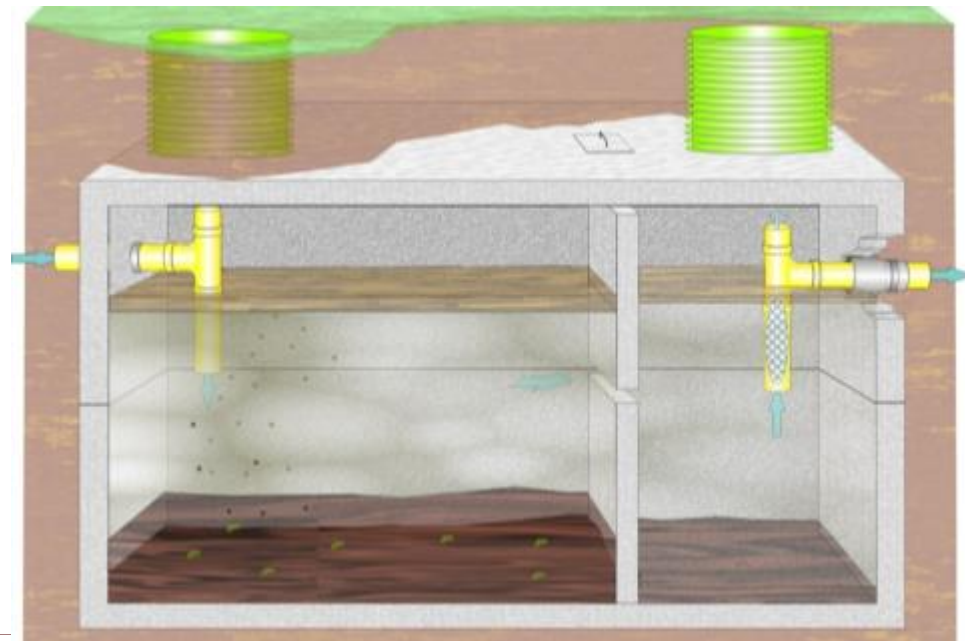
Collection

- ⦿ Piping from facility with cleanout
 - ⦿ Blackwater
 - ⦿ Graywater
- ⦿ Collection Options
 - ⦿ Holding tanks
 - ⦿ Composting toilets
 - ⦿ Incinerating toilets



Pretreatment

- ⦿ Pre-treating waste before it reaches the soil
 - ⦿ Septic tanks
 - ⦿ Aerobic treatment units
 - ⦿ Media filters
 - ⦿ Constructed wetlands
 - ⦿ Disinfection



Final treatment and dispersal

- Final treatment occurs in the soil
 - Conventional trench or bed distribution
 - Low pressure distribution
 - Drip field
 - Spray field
 - Evapotranspiration beds



How do we make the OSSF work?

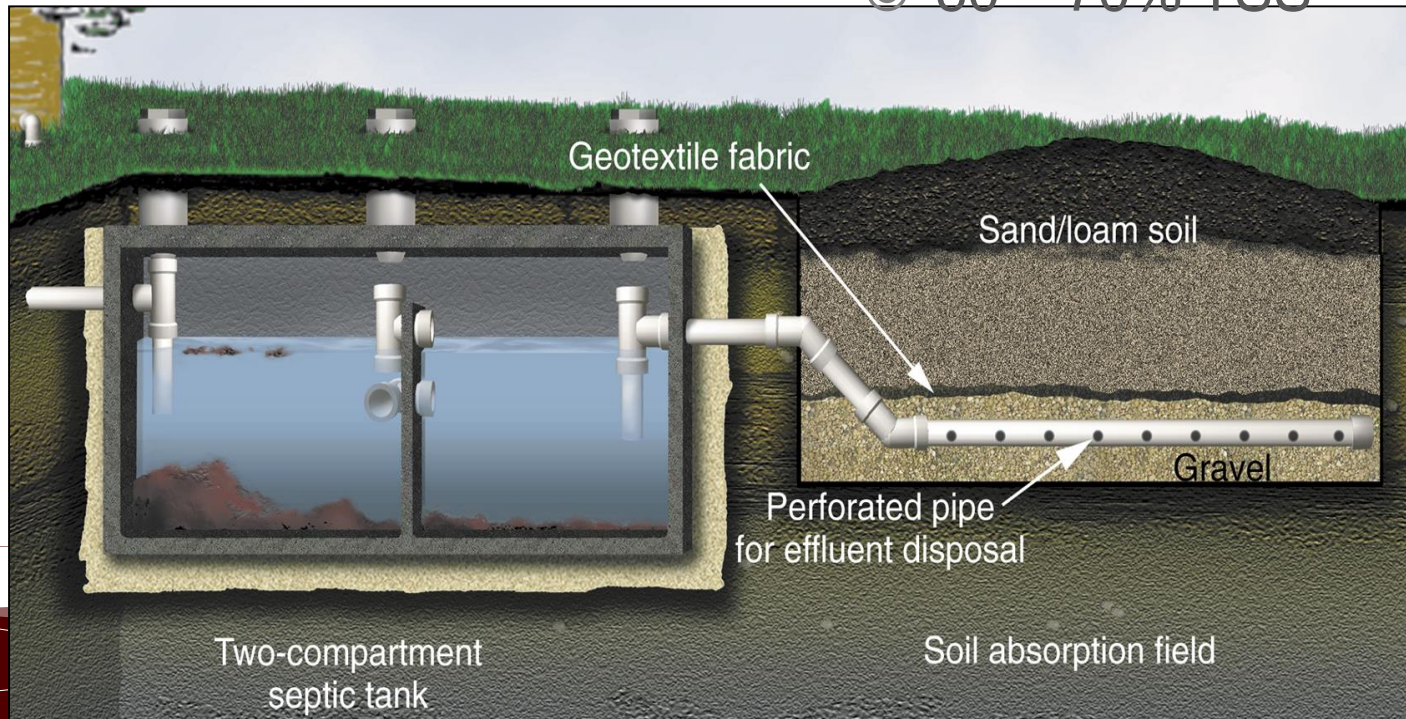


- ⦿ Evaluate the wastewater source:
 - ⦿ Hydraulic and organic loading
- ⦿ Evaluate site
 - ⦿ Wastewater treatment
 - ⦿ Wastewater acceptance
- ⦿ Choose a final treatment and dispersal component
- ⦿ Choose the appropriate pretreatment system
- ⦿ Operation and maintenance

What quality do you desire?

Pretreatment

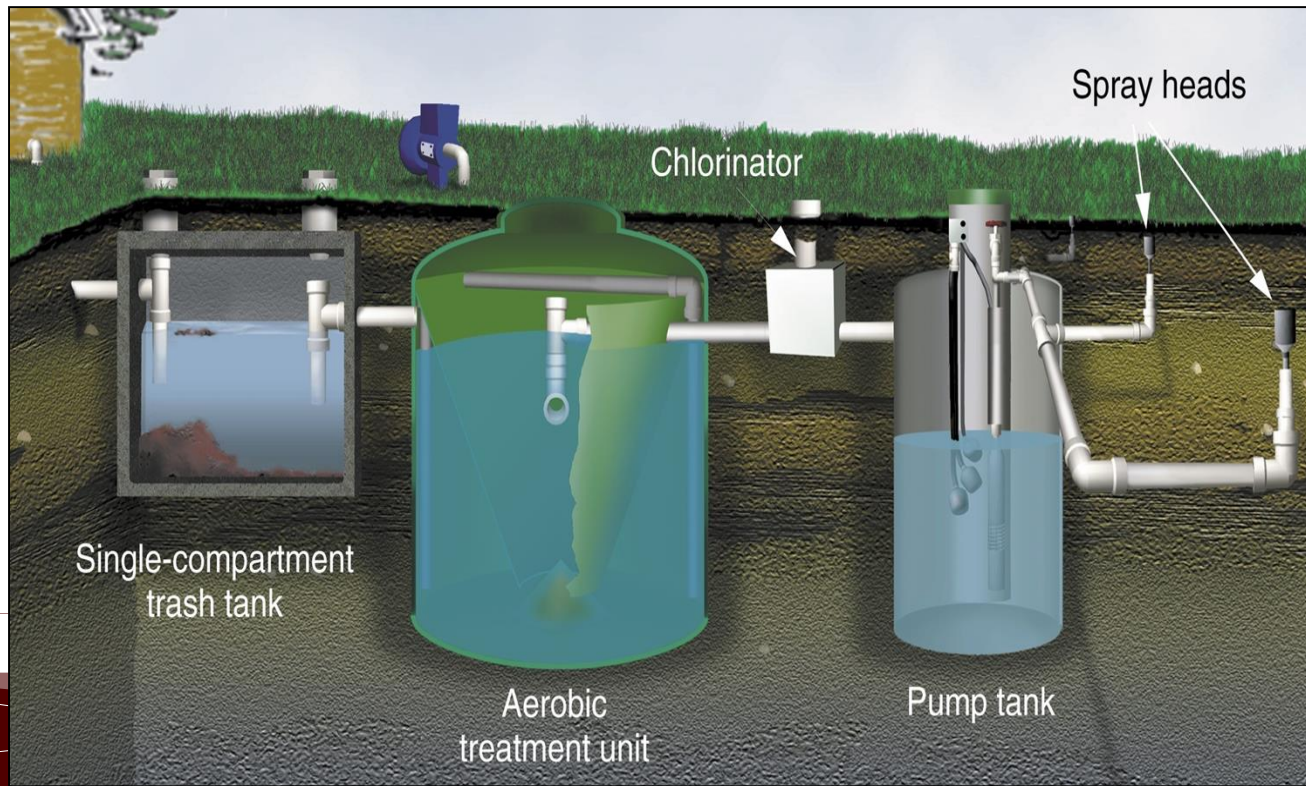
- Primary treatment
 - Gross solids removed
 - Septic Tank / Trash Tank
 - Effluent screen
- A properly operating septic tank can remove
 - 30 - 40% BOD
 - 60 - 70% TSS



What quality do you desire?

Advance pretreatment

- Secondary treatment
 - Aeration, media filters, sand filter
- Removal of:
 - 85 – 98% BOD
 - 85 – 98% TSS



Advance pretreatment

- Disinfection
 - Chlorine
 - Ultraviolet Light
 - Ozone
 - **NOT Sterilization!**
- Tertiary treatment
 - Nitrogen and phosphorous removal



Water quality – spray field

- ⦿ High potential for human contact
- ⦿ This is effluent – ***NOT DRINKING WATER!!!!***
- ⦿ Soil microbes are the final treatment!
- ⦿ A healthy cover crop is essential for proper system function
 - ⦿ Take up water and nutrients
 - ⦿ Stabilize the soil and prevent erosion
 - ⦿ Provide food and habitat for beneficial soil organisms



Roles with septic system management

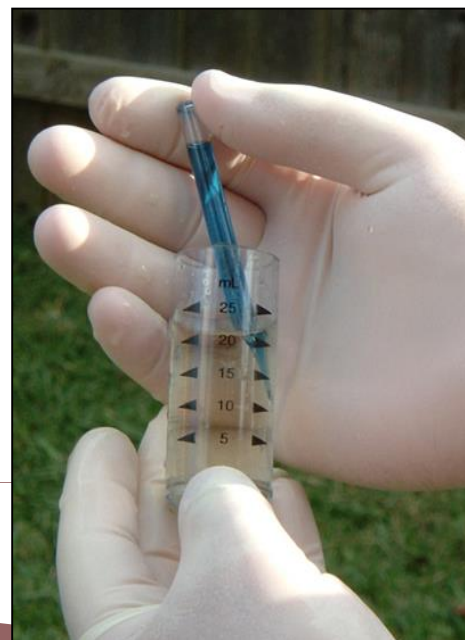
- ⦿ Site evaluation
- ⦿ Design
- ⦿ Installation
- ⦿ Startup
- ⦿ Inspection
- ⦿ Operation
- ⦿ Maintenance
- ⦿ Monitoring
- ⦿ Pumping



Operation and maintenance

- ⦿ Operation
 - ⦿ Assessing whether each component of the system is functioning properly
- ⦿ Maintenance
 - ⦿ taking care of the pieces
- ⦿ Monitoring
 - ⦿ verifying performance for a regulatory authority or a manufacturer

***OSSF Maintenance Provider /
Technician***



OSSF issues in your watershed

- ⦿ Identifying issues
 - ⦿ Reconnaissance
 - ⦿ Voluntary inspections
- ⦿ Addressing issues
 - ⦿ Homeowner education
 - ⦿ Replacement / upgrades



Identifying issues

- ⦿ Consult local Authorized Agent
 - ⦿ Permit records - age and location of systems
 - ⦿ Complaints history
- ⦿ Soil types and water table
- ⦿ Separation distances
 - ⦿ Wells
 - ⦿ Property lines
 - ⦿ Surface water
- ⦿ 1990 Census Data
- ⦿ Reconnaissance
- ⦿ Inspections

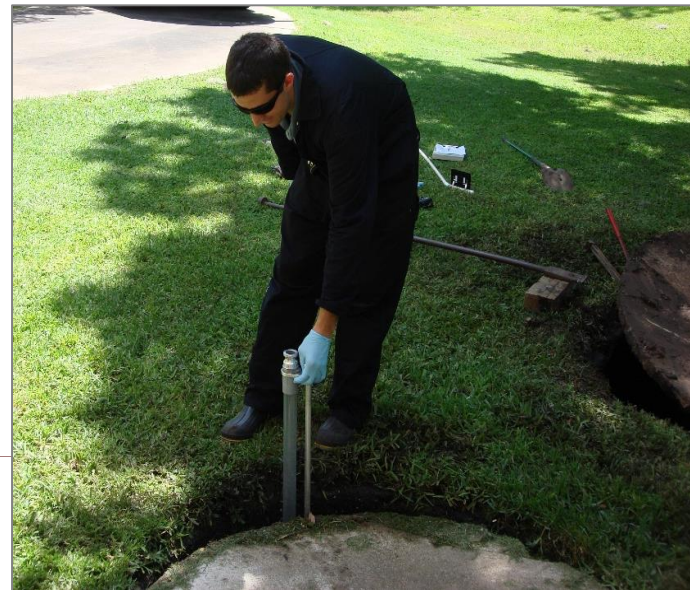


Reconnaissance



OSSF inspections

- ⦿ Voluntary inspections
- ⦿ Visual inspection of septic tank
- ⦿ Operational status of the system
- ⦿ Participants receive:
 - ⦿ Free system pump out
 - ⦿ Visual inspection of the septic tank
 - ⦿ Report of operational status
 - ⦿ A better understanding of OSSF operation and maintenance
 - ⦿ Suggestions to improve accessibility



Point of sale inspection

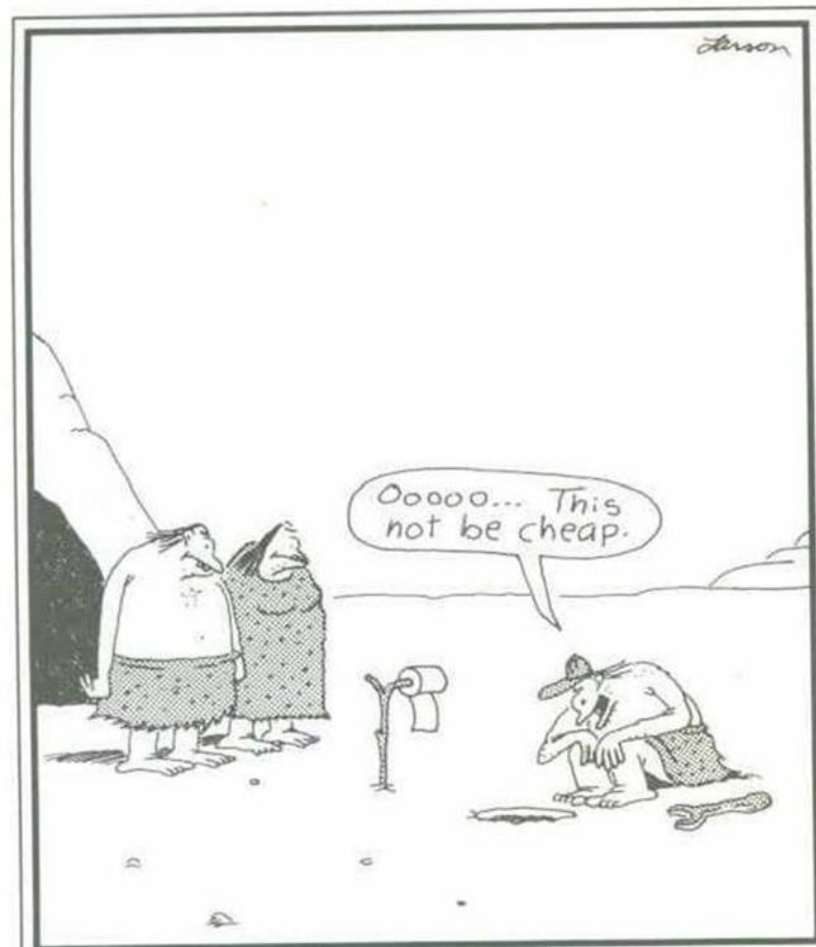
- ⦿ Inspect the treatment system at the time of property sale.
- ⦿ Chance to upgrade the wastewater treatment system if needed.
- ⦿ Must have trained professionals.
- ⦿ No licensing in Texas for this person.

Good time to fix problems!



Homeowner education

- ⦿ Address homeowners' FAQs
 - ⦿ What is a septic tank?
 - ⦿ How do you live with an OSSF?
 - ⦿ 1st home with an OSSF?
 - ⦿ Maintenance requirements
- ⦿ Education and outreach
 - ⦿ Classes
 - ⦿ Website
 - ⦿ Factsheets, publications, & manuals



Early plumbers

Summary

- ⦿ OSSFs will play a vital role in our future infrastructure needs.
- ⦿ Environmental regulations will continue to be more stringent.
- ⦿ A site evaluation is critical to determining the potential for a site to treat wastewater.
- ⦿ Advanced pretreatment and final treatment and dispersal technologies are available for most situations.
- ⦿ Operation and maintenance is critical for long-term function
- ⦿ Identifying and addressing OSSF issues

OSSF Management

Prescribed to address system failures due to:

- System age
- Lack of or poor maintenance
- Deficient design
- Unknown status of system

Measures Commonly Include:

- Development of watershed wide OSSF database
- OSSF inspection campaigns
- Repair and replacement programs
- Intensive education and outreach