

Decentralized Wastewater Management Principles

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Today's Webinar:

Part 1: Juli Beth Hinds

- Management Overview
- Types of Management Programs & Applications
- Establishing a Management Program
- Evaluating Costs

Part 2: Khalid Alvi

TWIST Wastewater Management Database Tool



Today's Theme:

CHICKENS AND EGGS.

Why did the...

public sector provide wastewater treatment?

- Prevent or reduce the discharge of pollutants to waters of the United States
- Provide wastewater management to support settlements and growth
- Achieve permit compliance
- Protect public health and natural resources
- Provide a framework for financing and managing infrastructure over time as an area evolves
- Provide a cost-effective solution to meet those objectives

Conventional central sewers are getting stuck...

COSTS...\$20k/hh or \$50-60k/hh...

Receiving water limitations

Energy demand

Politics!

*Responding to environmental & land use settings

- localized re-use needs
- CSOs
- Growth (too much/not enough)

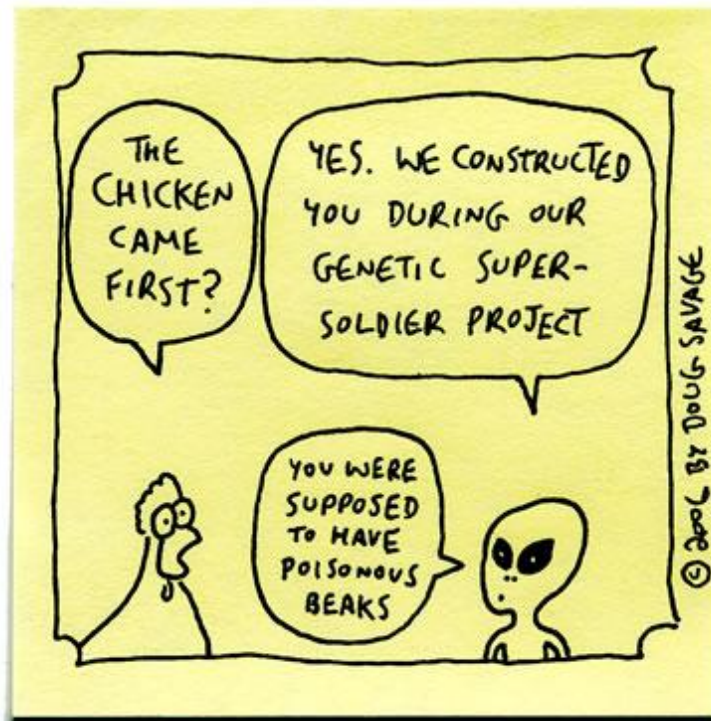


Decentralized Management and Responsible Management Entities:

When a community needs wastewater treatment capacity, ask which comes first...the community's goals, or the sewer solution?

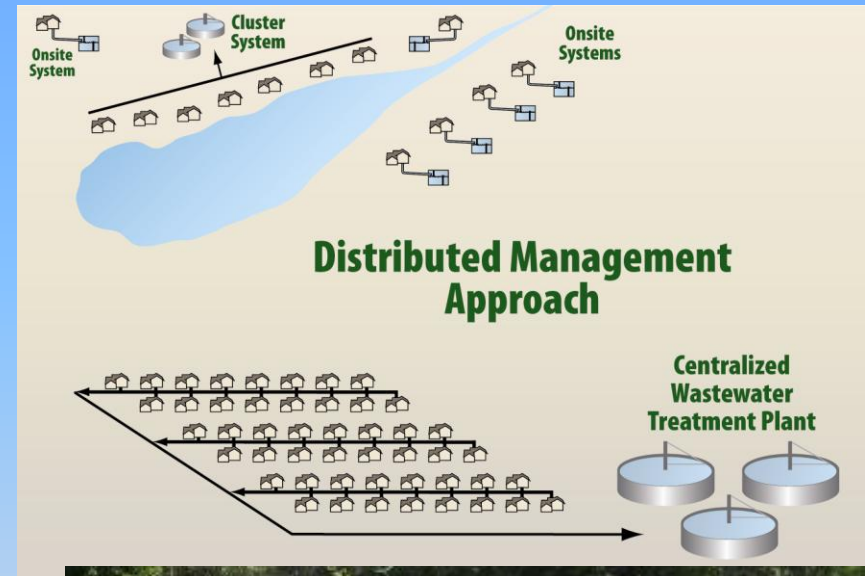
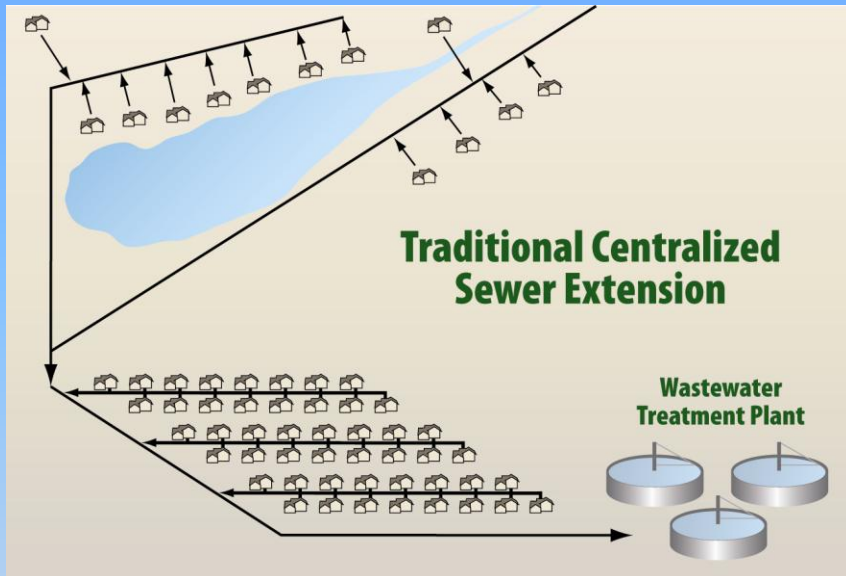
Savage Chickens

by Doug Savage



www.savagechickens.com

Properly managed, decentralized systems CAN adapt infrastructure to land use/environmental settings



OH NO!



Properly managed, decentralized systems CAN adapt infrastructure to land use/environmental settings

- Physically centralized sewer infrastructure becomes too expensive and energy-intensive in many land use settings – and contradicts land use goals
 - Urban fringe/exurban areas
 - Sewer capacity leading to sprawl/growth pressures
 - Rural centers and villages
 - Lakeside/coastal and resort areas
- Matching a set of distributed systems and their finance and management to the land use & environmental goal
- **Optimization:** combining use of cluster systems, managed on-site systems, and sewer areas to provide capacity, avoid problems, and further goals

When we mix up the players in on-site and small community systems...

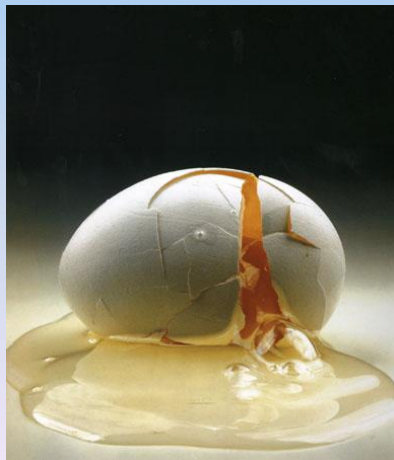
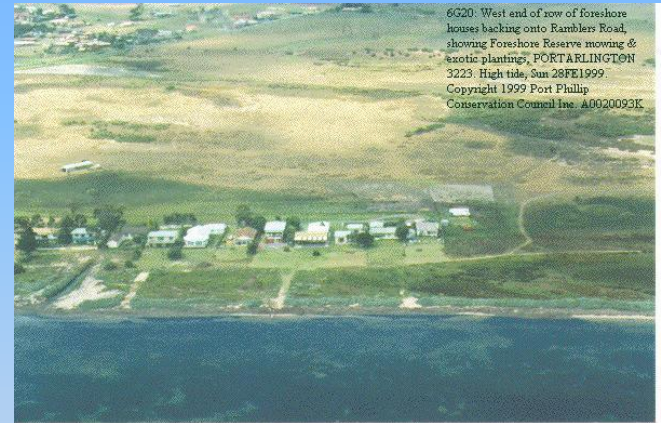
- State agencies
 - Set regulatory standards and dole out \$ - key determinant of what infrastructure choices are available
 - Decide what small-scale system technologies are allowable
- Local/County health departments
 - issue permits for small systems
 - investigate complaints
 - respond to public health threats
- Tribal environmental agencies
 - ensure system operation
 - investigate complaints
 - ensure compliance
 - monitor water quality
- Homeowners/Businesses!



...the outcome isn't exactly what we were looking for:

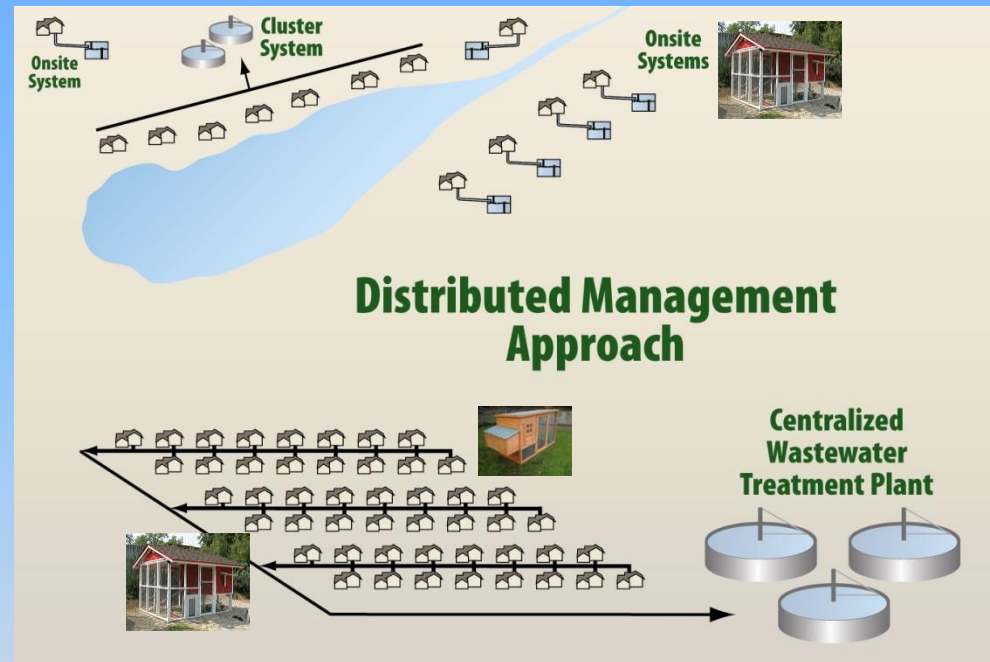


OR



The idea of “management” is...

- To create an **ALTERNATIVE** or **COMPLIMENT** to conventional central sewer service that still meets these goals
- Connect through management agreements, not pipes



The Responsible Management Entity:

The term “Responsible Management Entity” (RME) was coined by the EPA in its Voluntary National Guidelines for the Management of Decentralized (Onsite and Cluster) Wastewater Systems. Briefly, the EPA defines an RME as ***a legal entity responsible for providing management services to ensure that decentralized onsite or clustered wastewater treatment facilities meet established criteria.***

(www.epa.gov/owm/septic/pubs/septic_guidelines.pdf.)

1. Creates a common set of working principles for ALL of those involved in providing, funding, planning and regulating wastewater management
2. Ranges from simple education and awareness through actual ownership of distributed systems by a utility-like entity

What a management program/RME can do that sewers typically don't:

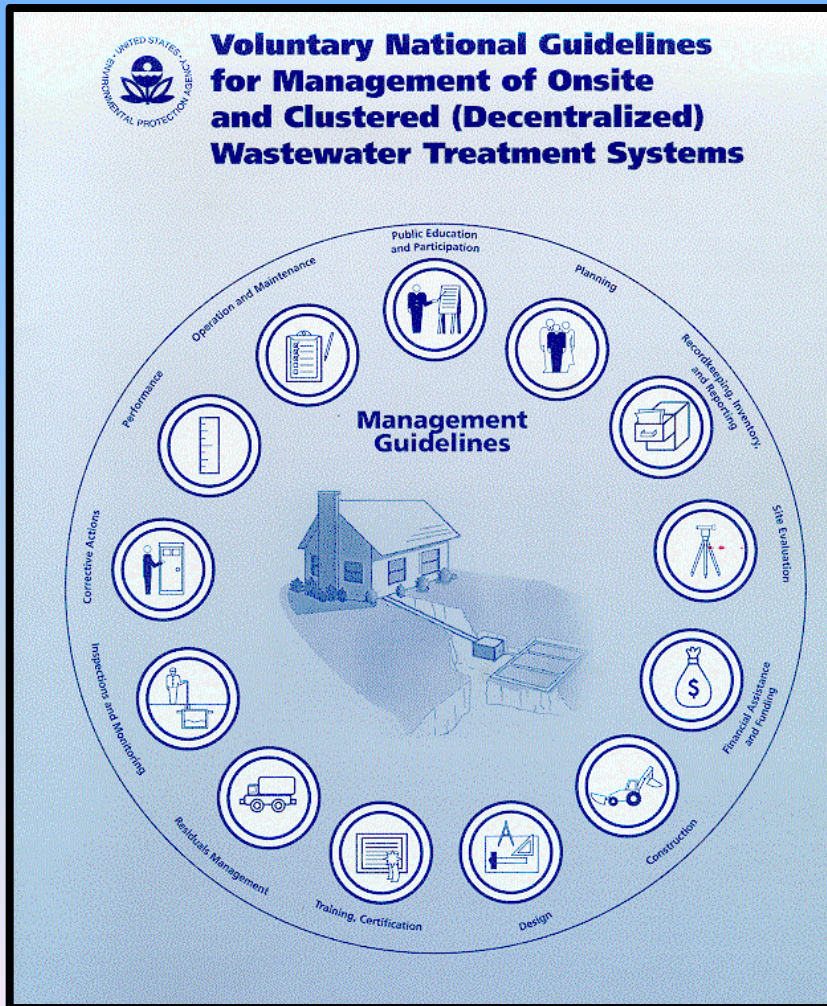
- Consideration of all options (decentralized and centralized)
- Work without superceding existing laws
- Cover surface and subsurface discharges
- For existing, new, and all size systems
- Direct outreach to improve owner awareness
- Outreach to practitioners/installers
- Routine Operation & Maintenance for compliance
- Effective and affordable options for difficult sites
- Management for existing systems: Assess surface & groundwater quality; Assess treatment systems & risks; Find & fix problems
- Plan for New systems: Capacity, Planning, Design, FINANCE, Operation & Maintenance

The First Step is Always the Hardest



EPA Management Guidelines

A series of 5 conceptual models that may be used by local units of government OR utilities to assist in developing management programs for on-site and/or cluster systems



**The type and intensity of management services is directly related to the type and number of systems in the jurisdiction, and the complexities of the land use & environmental setting!*

Management models: highlights

- **Program Model 1: Homeowner Awareness**
 - Prescriptive system designs
 - Proactive maintenance encouraged through education and reminders
- **Program Model 2: Maintenance Contracts**
 - Allows enhanced treatment units on individual sites
 - Required maintenance contracts between owner and operator
- **Program Model 3: Operating Permits**
 - Entry to performance-based programs & local standard-setting
 - Compliance based on performance rather than technology or design
- **Program Models 4 & 5: RME O&M or Ownership**
 - Responsibilities given to responsible management entity (4-third party O&M; 5-third party ownership)
 - Enables more watershed-wide planning.

Elements of a Comprehensive Management Program *write these down!*

- Public Involvement
- Planning
- Performance Requirements
- Training & Certification/Licensing
- Site Evaluation
- Design
- Construction
- *Regulatory , local & private relationships!

Appendix A: Management Model

MANAGEMENT MODEL 3: OPERATING PERMITS

Objective: To issue renewable/revocable operating permits to system Owner that stipulate specific and measurable performance criteria for the treatment system and periodic submittals of compliance monitoring reports. The performance criteria are based on risks to public health and water resources posed by wastewater disposal in the receiving environment. Operating permits allow the use of clustered or onsite systems on sites with a greater range of site characteristics.

PROGRAM ELEMENT	RESPONSIBLE PARTY	ACTIVITY*
PUBLIC EDUCATION AND PARTICIPATION	Regulatory Authority	<ul style="list-style-type: none"> • Educate Owner/user on purpose, use, and care of treatment system. • Provide public review and comment periods of any proposed program and/or rule changes.
	Service Provider	<ul style="list-style-type: none"> • Be informed of existing rules, and review and comment on any proposed program or rule changes. • Participate in advisory committees established by the Regulatory Authority.
	Owner/user	<ul style="list-style-type: none"> • Be informed of purpose, use, and care of treatment system. • Be informed of existing rules, and review and comment on any proposed program or rule changes. • Participate in advisory committees established by the Regulatory Authority.
PLANNING	Regulatory Authority	<ul style="list-style-type: none"> • Coordinate program rules and regulations with state, tribal, and local planning and zoning and other water-related programs. • Evaluate potential risks of wastewater discharges to limit environmental impacts on receiving environments during the rule making process. • Limit potential risks of environmental impacts from residuals management program and evaluate available landfill/treatment capacities. • Inform local planning authority of rule changes and recommend re-evaluation of potential impacts on land use.
	Developer	<ul style="list-style-type: none"> • Hire planners, certified site evaluators, and designers to ensure that all lots of proposed subdivisions/plat meet requirements for onsite treatment prior to final plat.
PERFORMANCE	Regulatory Authority	<ul style="list-style-type: none"> • Establish system failure criteria to protect public health, e.g., wastewater backups in building, wastewater ponding on ground surface, insufficient separation from ground water wells. • Establish minimum maintenance requirements for approved systems. • Establish performance criteria necessary to protect public health and water resources for each defined receiving environment in Regulatory Authority's jurisdiction.
	Owner/user	<ul style="list-style-type: none"> • Operate and regularly maintain system in proper working order. • Operate system to comply with performance criteria stipulated in operating permit.
TRAINING AND CERTIFICATION/LICENSING	Issuing Body/Regulatory Authority	<ul style="list-style-type: none"> • Develop and administer a training, testing, and certification/licensing program for the evaluators, designers, contractors, operators, pump installers, and inspectors. • Maintain a current certified/licensed Service Provider listing.
	Service Provider	<ul style="list-style-type: none"> • Obtain appropriate certification/licensing and continuing education as required. • Obtain training from the manufacturer or vendor regarding appropriate use, installation requirements, and O&M procedures of any proprietary equipment to be installed. • Comply with applicable federal, state, tribal, and local requirements.
	Developer	<ul style="list-style-type: none"> • When using third party services, contract with only the appropriate certified/licensed Service Provider.
SITE EVALUATION	Regulatory Authority	<ul style="list-style-type: none"> • Codify prescriptive requirements for site evaluation procedures. • Codify criteria for treatment site characteristics suitable for permitted design that will prevent unreasonable impacts on ground and surface water resources. • Establish defining characteristics for each receiving environment in the Regulatory Authority's jurisdiction.
	Site Evaluator	<ul style="list-style-type: none"> • Obtain certification/license to practice. • Describe site and well characteristics, determine suitability of site with respect to code requirements, and estimate site's hydraulic and treatment capacity. • Comply with applicable federal, state, tribal, and local requirements in the evaluation of sites for wastewater treatment and disposal.
	Owner	<ul style="list-style-type: none"> • Hire a certified/licensed site evaluator to perform site evaluation.

*Activities in bold are activities added to program elements from the preceding Management Model.

- O&M
- Residuals Management
- Inspections/Monitoring
- Corrective Actions
- Record-Keeping/Reporting
- Financing

Table 4. *A framework for exploring management issues*****Expect a lot of chicken-and-egg questions!**

Issue	Questions to be addressed
<i>Time frame</i>	<ul style="list-style-type: none">◆ At what point will the planned management program structure be sustainable?◆ If the program is sequentially implemented, when will each sequence be completed?◆ When will the management program be fully operational?
<i>Service area</i>	<ul style="list-style-type: none">◆ What areas or which systems will the management program serve?◆ Are these areas compatible with a local public jurisdiction that would have the necessary powers to make the program effective and sustainable?◆ Do specific subareas need different management approaches (system designs, staffing, regulatory controls)?
<i>Purpose</i>	<ul style="list-style-type: none">◆ What public health and water resource problems will be addressed?◆ What measurements should be made (monitoring) to verify success?
<i>Structure</i>	<ul style="list-style-type: none">◆ Can existing entities be modified or be included in a partnership to provide management services or will a new entity be needed?◆ Should the management program be limited to decentralized wastewater treatment, or should other water, stormwater, or wastewater infrastructure be included?◆ How will the program elements of the management program be staffed and administered?◆ Will formal agreements, ordinances, or other legal mechanisms (articles of incorporation, public charter) be needed to create the structural elements of the program?
<i>Authority and liability</i>	<ul style="list-style-type: none">◆ Which systems will be under the jurisdiction of the management program?◆ Will the onsite treatment systems be privately or publicly owned?◆ How will future wastewater systems be planned, designed, installed, operated, maintained, inspected, and repaired or replaced?◆ What is the relationship between the management program and the regulatory authority?◆ What formal agreements, ordinances or other legal mechanisms (e.g., with system or property owners) are necessary to implement each element of the program?◆ How will the program be funded (planning, construction and operational phases)?

Very important!

Matching system SIZE, COST and COMPLEXITY to the land use setting served

- Functions to consider:
 - Number of households/users potentially served
 - Initial capital cost/user at different sizes
 - Environmental protection objective (sensitive resources, nutrient removal, etc.)
 - Water re-use opportunities (consider before locating proposed infrastructure)
 - Maintenance complexity: number of visits/month and at what LEVEL/cost of service professional
- **Beware the proliferation of expensive, maintenance-intensive on-site treatment systems



Keep things in proportion!

How is an RME like my husband's omelets?

- Revolving loan funds for wastewater treatment
- Easements
- Public outreach/awareness
- Maintenance contracts
- Property owner associations
- Special purpose districts
- User fees
- Watershed assessment
- Permit reporting
- Enforcement

You're making a meal out of ingredients already hiding in your refrigerator!

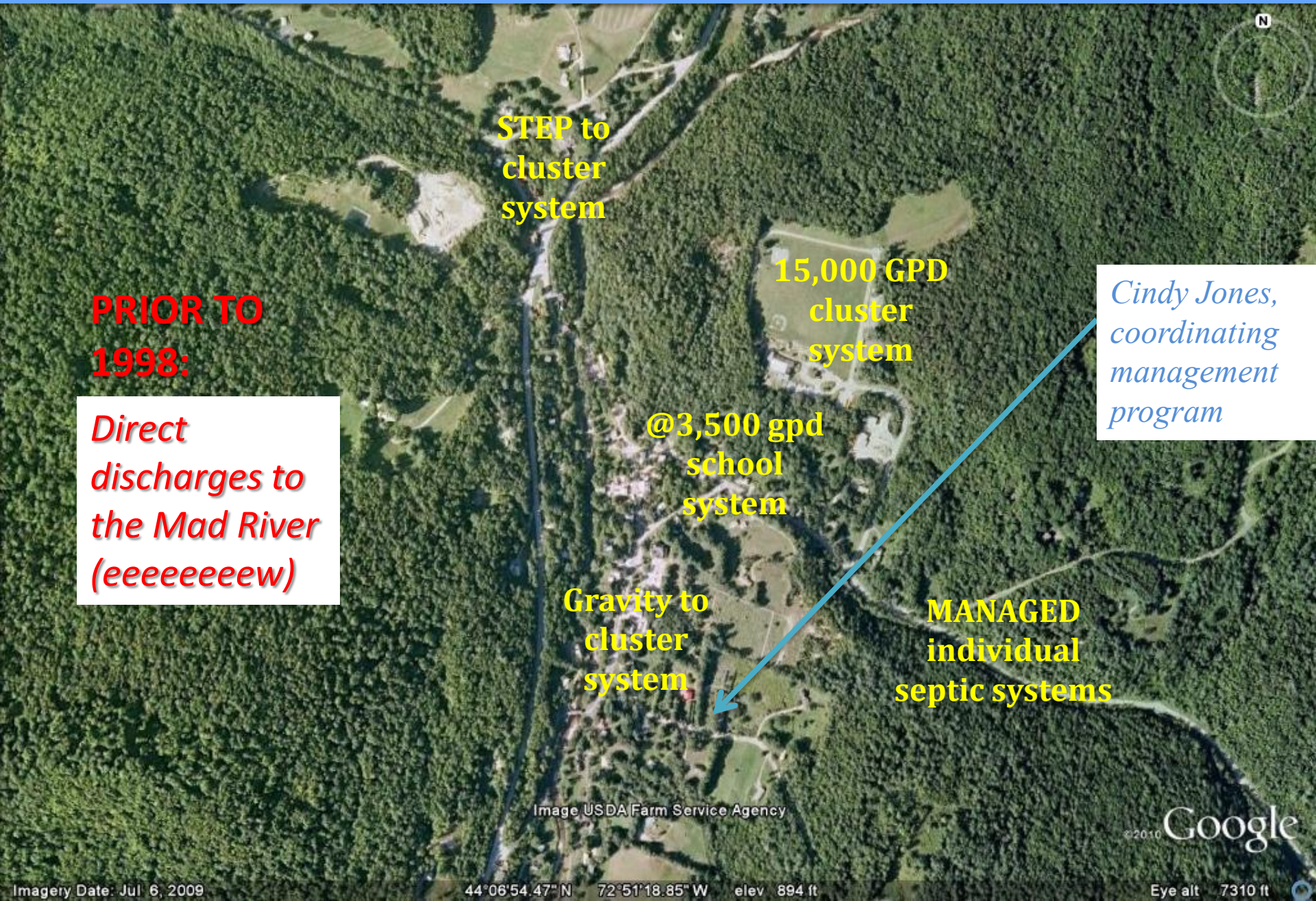
Real, Live Places with RME-Managed Decentralized Wastewater

RME as described in webinars



An effective RME in the field





PRIOR TO 1998:

Direct discharges to the Mad River (eeeeeeew)

STEP to cluster system

15,000 GPD cluster system

@3,500 gpd school system

Gravity to cluster system

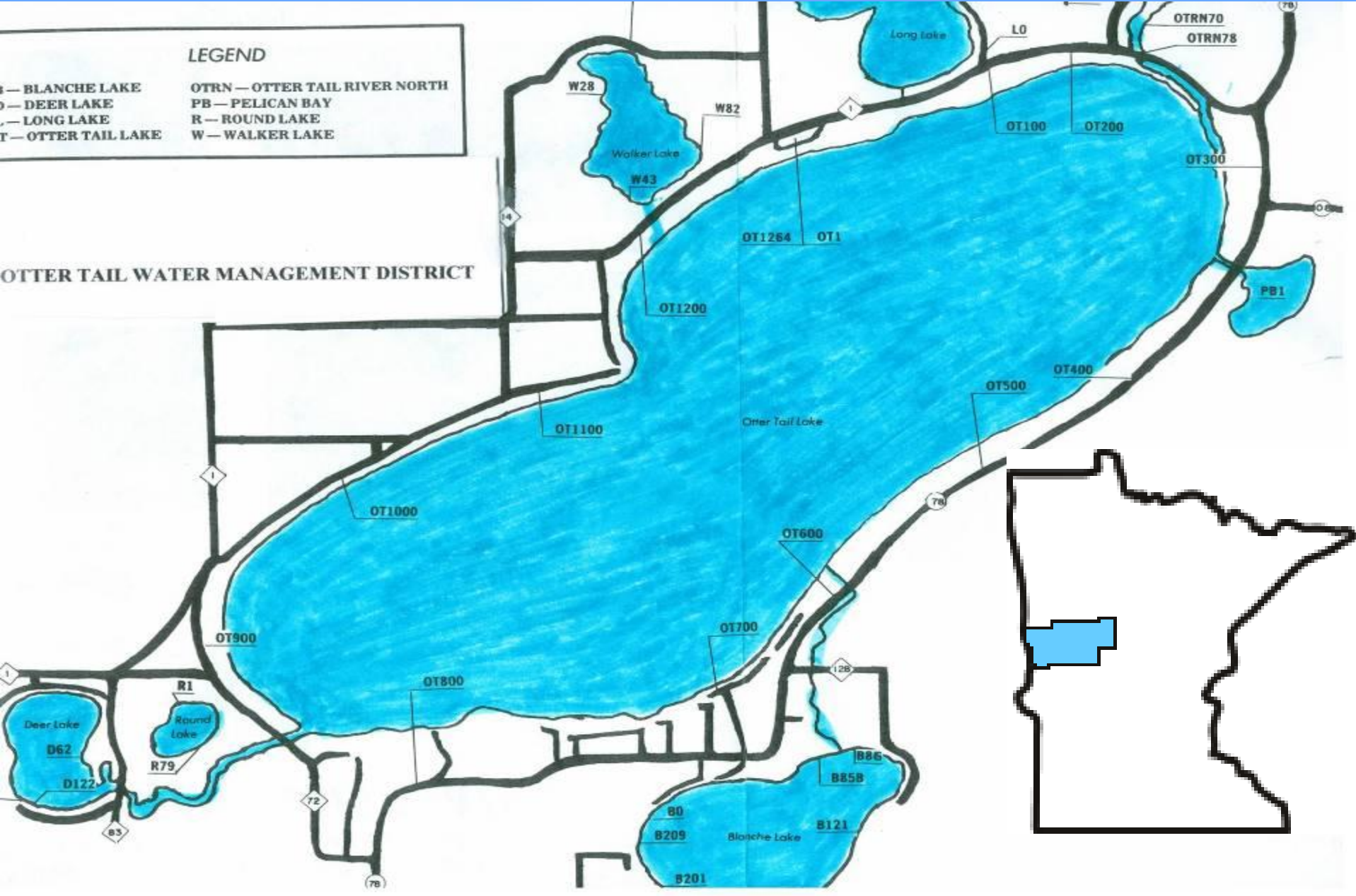
MANAGED individual septic systems

Cindy Jones, coordinating management program

Image USDA Farm Service Agency

©2010 Google

OTter Tail, MN – serving 1600 connections since 1984; 75% seasonals
**Options to be part of ACTIVE (RME level 4) or PASSIVE (RME level 3) maintenance plan



Developing System Cost Estimates:

- Big hairy problem #1: sewer costs/unit
 - Capital: \$20,000+ /unit...\$50,000+/Cape Cod estimates
- Big hairy problem #2: people think decentralized is “free.” Until it’s not.
- Big hairy problem #3: decentralized does require the establishment of annual operation and maintenance fees, rather than install & forget
- Big hairy problem #4: collection, treatment and dispersal systems complexity increases maintenance cost/time and potential for problems



	Treatment Method	Technology	Capital Cost (NATIONAL AVERAGE RANGE)	Annual O/M Cost
Complete	Conventional	Septic tank – gravity - soil	\$6,000 - ? (STOP LAUGHING!)	\$200 pump-out/ 5 yrs.
(1) Treatment +	Advanced Pre-Treatment Systems	Suspended Growth aerobic treatment unit	\$7,000 - \$8,000	\$1150
		Attached Growth a.t.u.	\$9 - \$13,000	\$450
	Advanced Treatment Systems	Intermittent media filter	\$6 - \$10,000	\$200
		Recirculating media filter	\$8 - \$11,500	\$300
		Vegetative submerged bed	\$7 - \$9,000	\$350
(2) Dispersal	Advanced Dispersal Systems	Pressure distribution	\$4 - \$8,000	\$200-\$250
		Drip dispersal	\$6 - \$10,000	\$250-\$300
+ (3) if cluster, collection	Cluster Treatment System	Conventional Sewer	\$20 - \$30,000	\$200-\$600
		STEG	\$7,500	\$230/ERU
		STEP	\$10,000	\$260/ERU
		Vacuum	\$10,000	\$130-\$160/ERU
		Grinder Pump	\$9,500	\$280/ERU

Besides providing capacity, many other applications & adaptations for distributed management!

- HIGH RISK environmental areas:
 - Coastal or aquifer areas with specific nitrogen removal concerns (La Pine, OR)
 - Enables tailoring pre-treatment/removal to the risk, rather than a blanket solution (Block Island)
- Areas with REUSE needs:
 - Sewer mining: going into the “grid” to remove and treat water for irrigation, urban greening (Mobile, Los Angeles)
 - Site-scale reuse for irrigation, industrial, cooling, etc.
- CSO/SSO removals:
 - Removing flows from a central system at a point where it's overloaded

And now, an actual RME financial plan in development

CAPITAL BUDGET	Capitalization	PHASE I		PHASE II			PHASE III		
		FY 2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
STAG grant		\$1,000,000							
Winter Park System Installation		\$100,000							
Fiddler's Green			\$100,000						
Village Green Expansion				\$50,000					
Walt House/Fire Station			\$100,000						
Additional Cluster Systems					\$100,000	\$100,000			
Subtotal Waitsfield/Grasville Capital		\$100,000	\$200,000	\$50,000	\$100,000	\$100,000			
System sinking fund/repairs, replacement		\$5,000	\$10,000	\$20,000	\$25,000	\$30,000			
Total Capital		\$105,000	\$130,000	\$70,000	\$125,000	\$130,000			
ANTICIPATED NUMBER OF ERUS	assume 5 ERUs/add'l cluster		11 21	26	31	36			

PROGRAM INCOME						total	net total RME	discounted net
LOAN REPAYMENT TO RME	FY 2011	FY2012	FY2013	FY2014	FY2015	repayment	income	program income
Winter Park	\$6,567.17	\$6,567.17	\$6,567.17	\$6,567.17	\$6,567.17	\$131,343.46	\$31,343.46	\$23,863.74
Fiddler's Green	\$6,567.17	\$6,567.17	\$6,567.17	\$6,567.17	\$6,567.17	\$131,343.46	\$31,343.46	\$23,863.74
Village Green			\$3,283.59	\$3,283.59	\$3,283.59	\$65,671.73	\$15,671.73	\$11,931.87
Walt House/Fire Station		\$6,567.17	\$6,567.17	\$6,567.17	\$6,567.17	\$131,343.46	\$31,343.46	\$23,863.74
Additional System				\$6,567.17	\$6,567.17	\$131,343.46	\$31,343.46	\$23,863.74
Interest Rate	2.75%	\$6,567.17	\$19,701.52	\$22,985.11	\$29,552.28	\$36,119.45	\$172,389.04	\$131,250.57
Term (years)	30							
Assumed rate of inflation	2.75%							
Cost per inspection visit	\$450							

RME OPERATION AND MAINTENANCE BUDGET	PHASE 1		PHASE 2			PHASE 3		
	FY2011	FY2012	FY2013	FY2014	FY2015	FY2016	FY2017	FY2018
Program/Grant Management	\$10,000	\$10,275	\$10,558	\$10,848	\$11,146			
Permit reports & inspections	contractual through water district	\$0	\$0	\$0	\$0			
Legal Fees	maintenance done privately	\$5,000	\$5,138	\$5,279	\$5,424	\$5,573		
Water quality sampling	it's inevitable	\$0	\$0	\$0	\$2,700	\$5,400		
Administration/overhead	done privately	\$2,500.00	\$2,569	\$2,639	\$2,712	\$2,787		
Capital/sinking fund transfer	% of operation & maintenance	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00		
Planning/other assistance	not that!	\$0.00	\$0	\$2,500	\$2,500	\$3,000		
Application fees	\$100/new system - privately paid	0	0	100	200	200		
Application review fee	\$1755 + \$0.08/gpd over 6500 - privately paid	0	0	2555	5110	5110		
Operating permits	\$400 + \$0.035/gpd over 6500 - privately paid	0	0	750	1500	1500		
		\$22,500	\$22,981	\$29,381	\$35,994	\$39,716		
DETERMINING USER FEES								
Loan repayment		\$6,567.17	\$19,701.52	\$22,985.11	\$29,552.28	\$36,119.45		
Grant support		\$22,500.00	\$0.00	\$0.00	\$0.00	\$0.00		
Surplus/deficit		\$6,567	(\$3,283)	(\$6,396)	(\$6,442)	(\$3,596)		
Fee/ERU for break-even		n/a	\$156	\$246	\$208	\$100		
Typical total annual cost/ERU		\$1,094	\$1,130	\$1,161	\$1,103			

CLUSTER SYSTEM OWNERS' BUDGET									
Program/Grant Management	contractual, \$225/week	\$10,000	\$10,275	\$10,558	\$10,848	\$11,146			
Permit reports & inspections	maintenance done privately	\$0	\$0	\$0	\$0	\$0			
Legal Fees	it's inevitable	\$5,000	\$5,138	\$5,279	\$5,424	\$5,573			
Water quality sampling	done privately	\$0	\$0	\$0	\$0	\$0			
Administration/overhead		\$2,500.00	\$2,569	\$2,639	\$2,712	\$2,787			
Capital/sinking fund transfer	% of operation & maintenance	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00	\$5,000.00			
Planning/other assistance	not that!	\$0.00	\$0	\$2,500	\$2,500	\$2,500			
Application fees	\$100/new system - privately paid	0	0	0	0	0			
Application review fee	\$1755 + \$0.08/gpd over 6500 - privately paid	0	0	0	0	0			
Operating permits	\$400 + \$0.035/gpd over 6500 - privately paid	0	0	0	0	0			
		\$22,500	\$22,981	\$25,976	\$26,484	\$27,006			
DETERMINING USER FEES									
Loan repayment		n/a	\$156.18	\$245.99	\$207.79	\$99.30			
Grant support		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00			
Net income		#VALUE!	(\$22,825)	(\$25,730)	(\$26,276)	(\$26,906)			
Fee/ERU to cover costs		#VALUE!	\$5	\$5	\$5	\$5			
Typical total annual cost/ERU		#VALUE!	\$5	\$5	\$5	\$5			

TWIST: The Wastewater Information System Tool

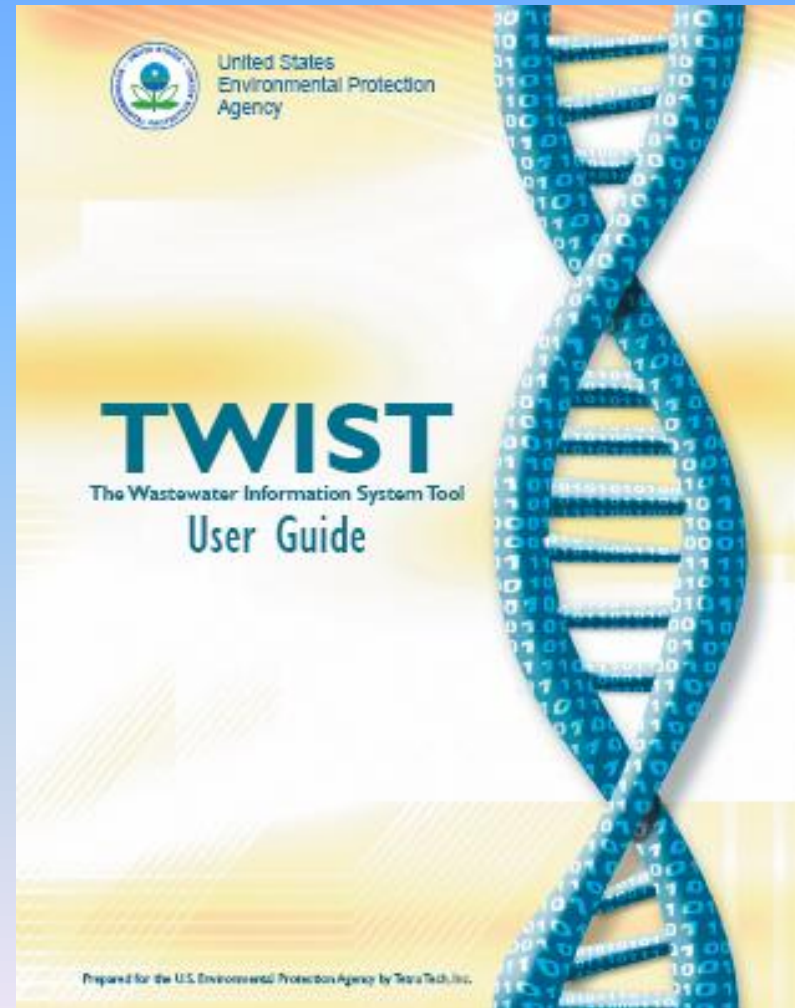
*for Managing Onsite and Clustered (Decentralized)
Wastewater Treatment Systems*



Khalid Alvi, Tetra Tech

Overview

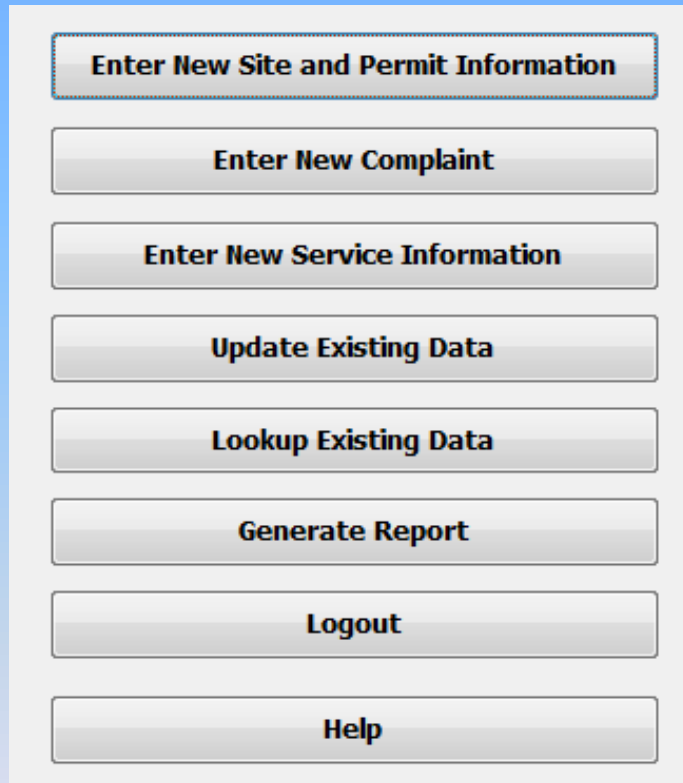
- TWIST application overview
- Data entry workflow
- System implementation
- Functionalities
- Customizing the tool



System overview - database concept

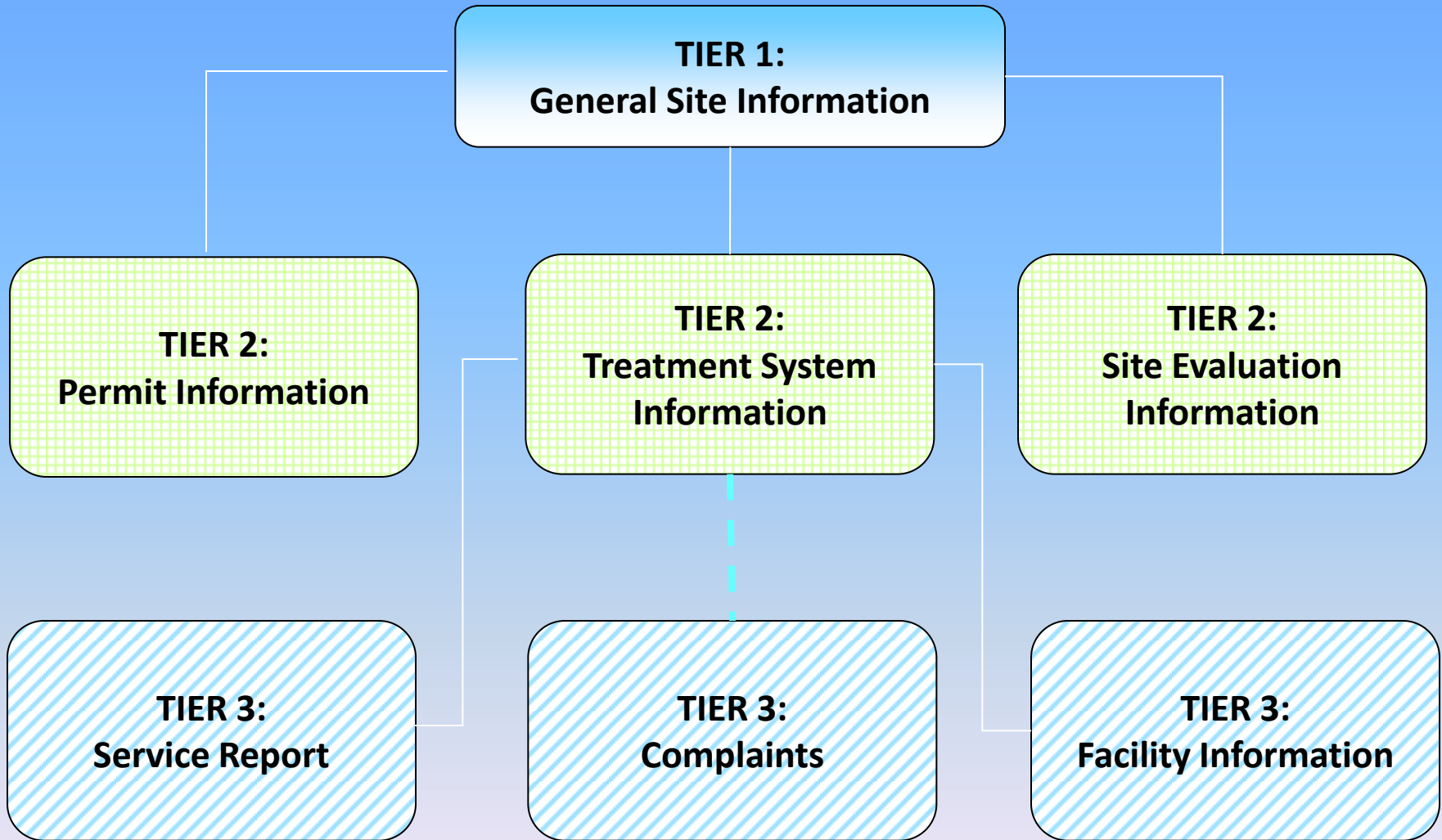


System overview – contd.

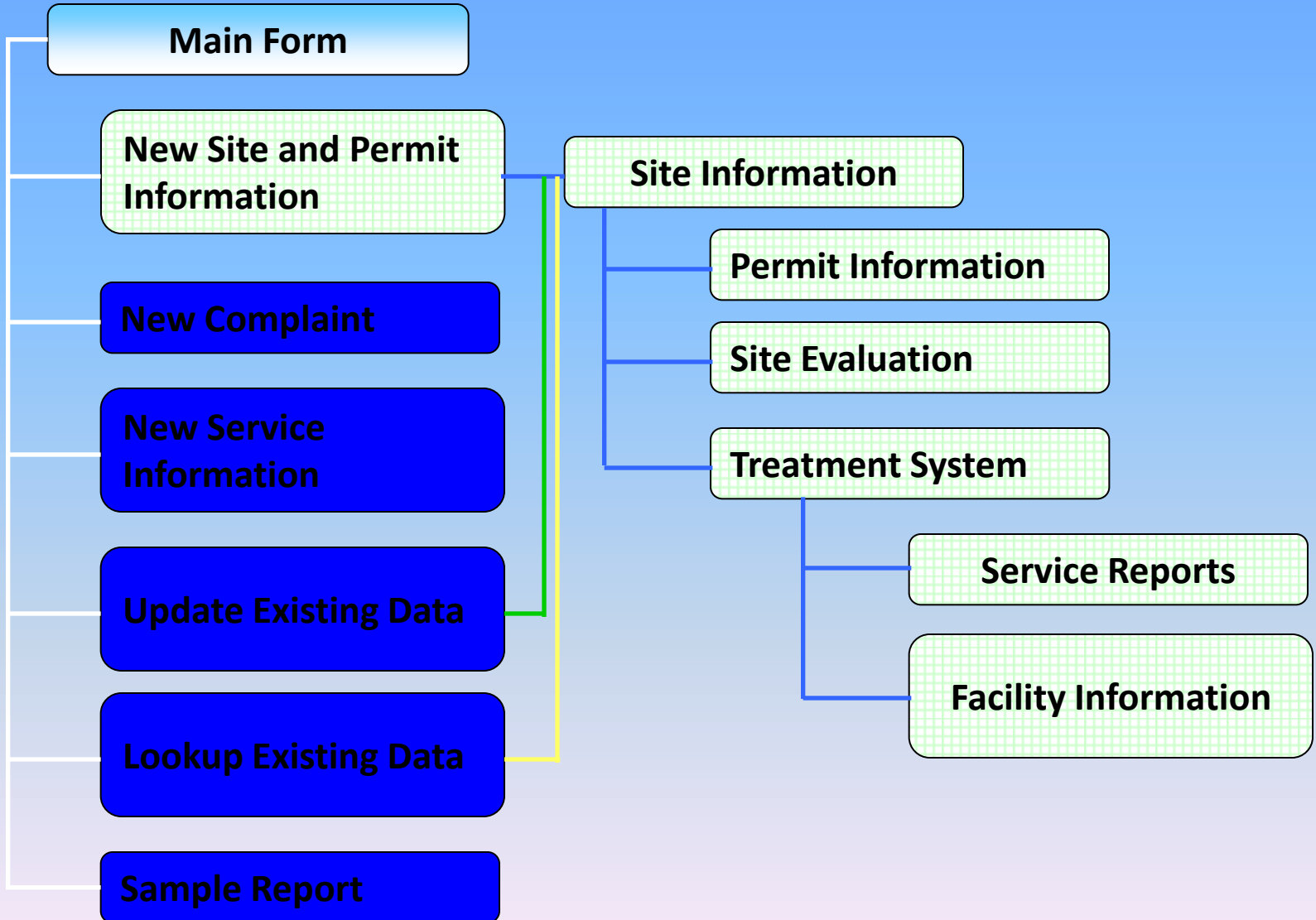


- MS Access database developed with EPA's guidance to help local, county, and state health departments
 - adaptable tool for tracking and managing onsite and clustered wastewater treatment systems
- Asset management system or Inventory tool
 - To enter new data
 - To update existing data
 - To view existing data and
 - To view report (sample available)

Data entry workflow



Data entry workflow – contd.



System implementation

- Backend database
- Front-end data entry forms

The screenshot shows the 'General Site Information' form in the TWIST application. It is divided into two main sections: 'Property Owner Details' and 'System Owner Details'. The 'Property Owner Details' section includes a dropdown for 'Select name to autofill address' and text input fields for 'Name', 'Apartment Or Suite', 'Street', 'City', 'State', 'Zip Code', 'Phone Number', and 'Email'. The 'System Owner Details' section has a checkbox for 'Same as Property Owner' and a 'Name List' dropdown, followed by text input fields for 'Name', 'Apartment Or Suite', 'Street', 'City', 'State', 'Zip Code', 'Phone Number', and 'Email'. A 'Help' button is located to the right of the form. At the bottom, there are navigation buttons for back, forward, and search.

Twist.mdb

The screenshot shows the 'FacilityTypes : Table', 'PermitTypes : Table', and 'ComplaintTypes : Table' in the TWIST application. A red arrow points from the 'General Site Information' form to the 'FacilityTypes : Table'.

FacilityType_ID	FacilityType_Name	IsCommercial
1	Single family residence	<input type="checkbox"/>
2	Multi-family residential	<input type="checkbox"/>
3	Multiple single family homes	<input type="checkbox"/>
4	Office building	<input checked="" type="checkbox"/>
5	Retail store	<input checked="" type="checkbox"/>
6	Restaurant	<input checked="" type="checkbox"/>
7	Service station	<input checked="" type="checkbox"/>

PermitType_Id	PermitType_Name
1	New System Installation
2	Replacement System
3	System Repair
4	Holding Tank Only
5	Other
*	(AutoNumber)

ComplaintType	ComplaintType_Desc
1	Sewage surfacing
2	Discharge to waterbody
3	Odors
4	No installation permit
5	Installation Irregularities
6	Sewer line backup/blockage
*	(AutoNumber)

Twist_data.mdb

System implementation – contd.

Opening Twist.mdb without backend database linkage

The screenshot displays the TWIST application window titled "TWIST: Login - The Wastewater Information System Tool (TWIST)". The interface includes a ribbon with tabs for "Home", "Clipboard", "Font", "Rich Text", "Records", "Sort & Filter", "Window", and "Find". The main content area features the following text:

The Wastewater Information System Tool (TWIST)
Draft Beta-Test Version of July 2005.

USEPA's Microsoft Access based Data Management Tool developed to manage onsite and clustered wastewater treatment systems.

User Login

User Name

Password

Buttons: Login, Exit Database, Register, Help

A red arrow points from the "Register" button to a "Microsoft Office Access" dialog box. The dialog box contains the following text:

Microsoft Office Access

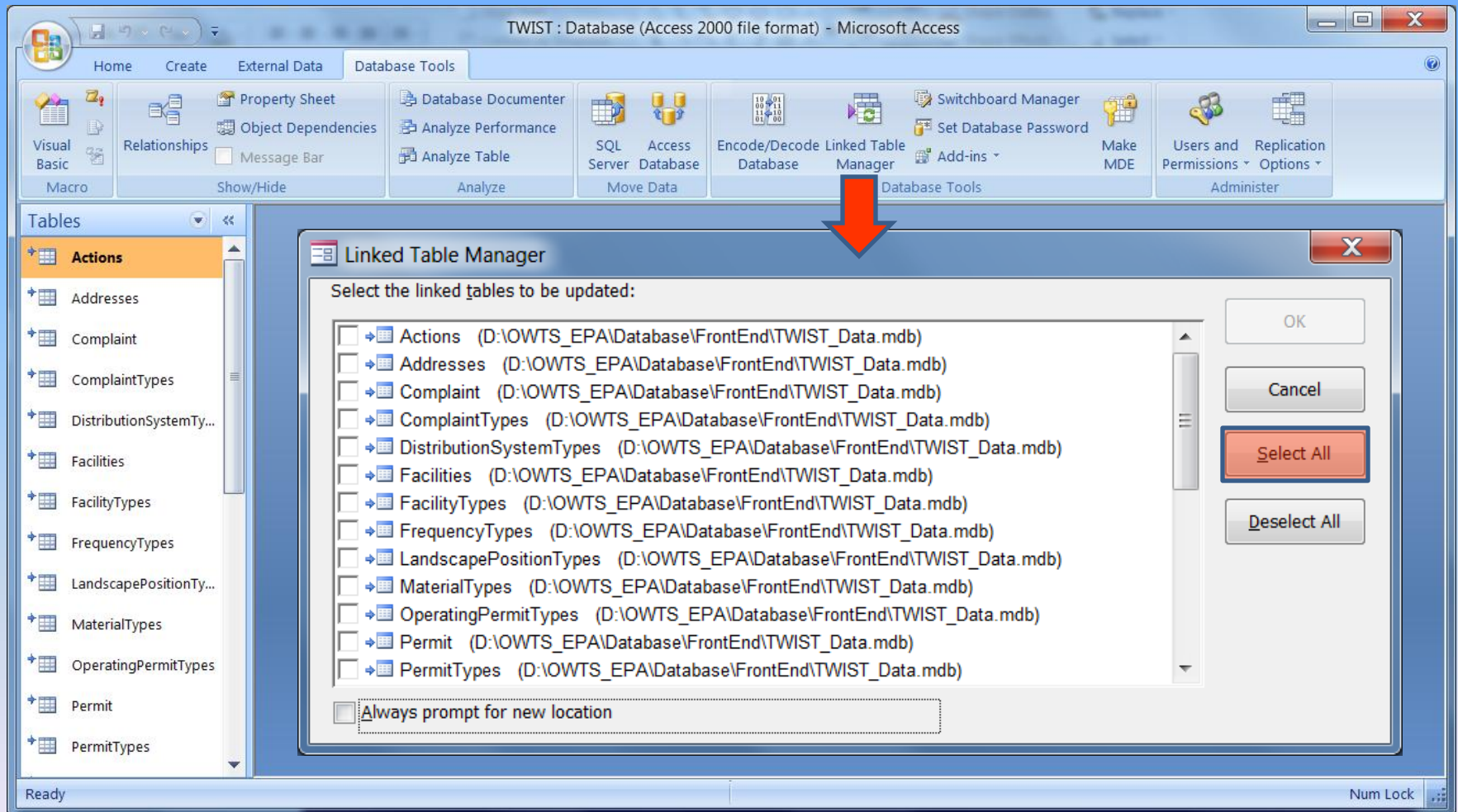
Your network access was interrupted. To continue, close the database, and then open it again.

OK

At the bottom left of the application window, it says "Form View". At the bottom right, there is a "Num Lock" indicator.

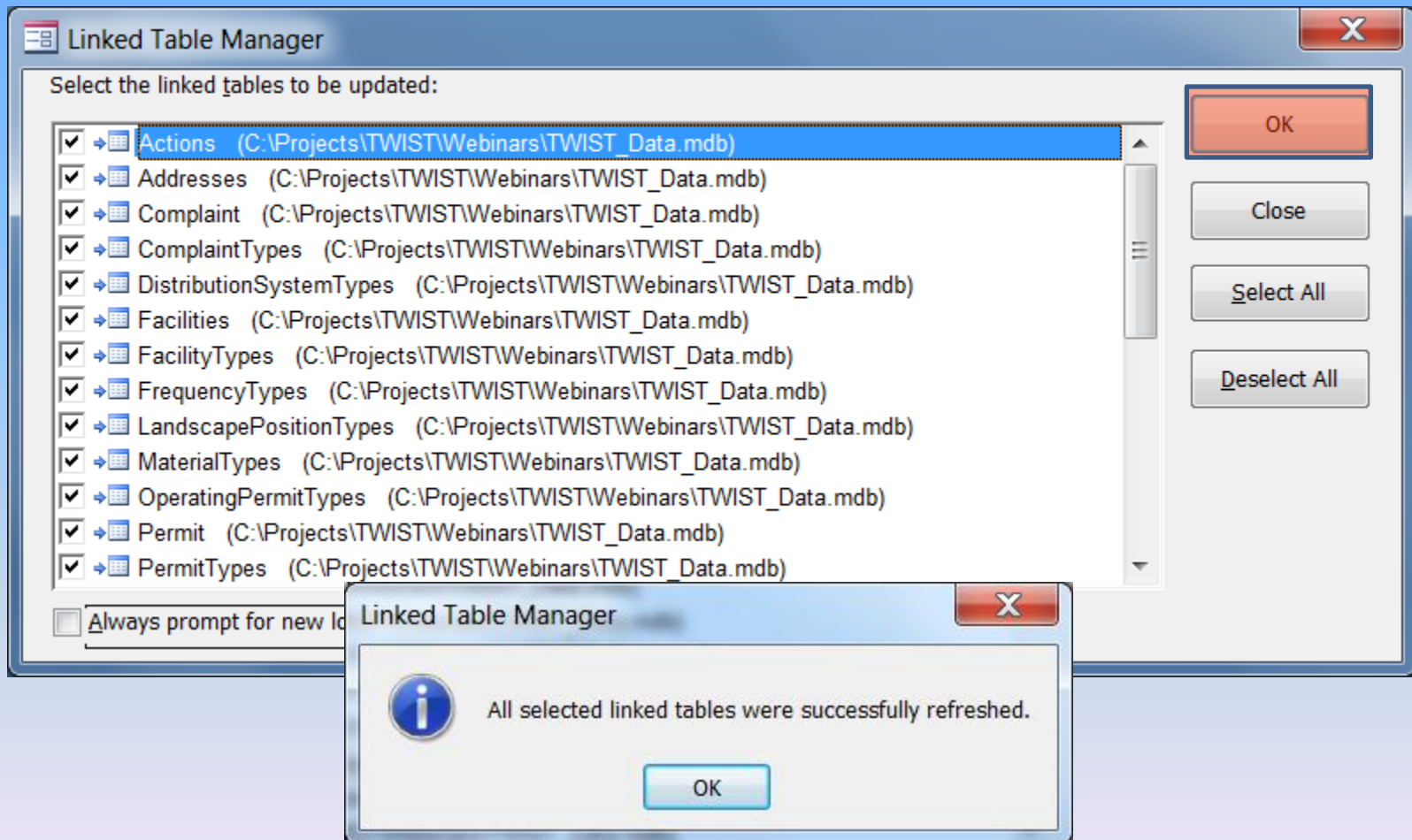
System implementation – contd.

Hold shift key while opening Twist.mdb



System implementation – contd.

Link backend database file Twist_Data.mdb



User authentication

The screenshot shows a web browser window titled "The Wastewater Information System Tool (TWIST) - [TWIST: Login]". The browser's address bar contains "Type a question for help". The main content area features the title "The Wastewater Information System Tool (TWIST)" and a subtitle "Draft Beta-Test Version of July 2005.". Below this, a text block describes the tool as "USEPA's Microsoft Access based Data Management Tool developed to manage onsite and clustered wastewater treatment systems.". A "User Login" form is centered, containing two input fields: "User Name" and "Password". Below the form are four buttons: "Login", "Exit Database", "Register", and "Help". The "Register" button is highlighted with a red border. At the bottom of the page, a footer contains the text: "This tool was developed for US EPA by Tetra Tech as a service to state and local agencies involved with managing decentralized wastewater treatment systems. No updates are planned. Users may adapt or amend this tool without restriction." The browser's status bar at the bottom left shows "Form View".

The Wastewater Information System Tool (TWIST)
Draft Beta-Test Version of July 2005.

USEPA's Microsoft Access based Data Management Tool developed to manage onsite and clustered wastewater treatment systems.

User Login

User Name

Password

[Login](#) [Exit Database](#) [Register](#) [Help](#)

This tool was developed for US EPA by Tetra Tech as a service to state and local agencies involved with managing decentralized wastewater treatment systems. No updates are planned. Users may adapt or amend this tool without restriction.

Form View

User authentication – contd.

The screenshot shows a software window titled "The Wastewater Information System Tool (TWIST) - [TWIST: Personnels]". The window has a menu bar with "File", "Edit", "Insert", "Records", "Window", and "Help". A search bar in the top right corner contains the text "Type a question for help". The main content area is titled "The Wastewater Information System Tool (TWIST): User Registration". Below this title is a section labeled "First Time Registration" which contains a form with the following fields: "Name", "Agency Division", "Local Office Name", "User Name", "Password", and "Verify Password". Each field is represented by a text input box. At the bottom of the form are three buttons: "Help", "Cancel", and "Register". The status bar at the bottom left of the window displays "Form View".

The Wastewater Information System Tool (TWIST) - [TWIST: Personnels]

File Edit Insert Records Window Help

Type a question for help

The Wastewater Information System Tool (TWIST): User Registration

First Time Registration

Name

Agency Division

Local Office Name

User Name

Password

Verify Password

Help Cancel Register

Form View

TWIST: main form

The Wastewater Information System Tool (TWIST): Main Form

Current User Demo

Agency Division

Local Office Name

Enter New Site and Permit Information

Enter New Complaint

Enter New Service Information

Update Existing Data

Lookup Existing Data

Generate Report

Logout

Help

Form View Num Lock Filtered

General site information: ownership

**The Wastewater Information System Tool (TWIST):
General Site Information**

Ownership **Property Information** Next tab

Property Owner Detail:

Select name to autofill address

Name

Apartment Or Suite

Street

City

State

Zip Code

Phone Number

Email

System Owner Detail:

Same as Property Owner

Name List

Name

Apartment Or Suite

Street

City

State

Zip Code

Phone Number

Email

Alaska
Alabama
Arkansas
Arizona
California
Colorado
Connecticut
District of Columbia
Delaware
Florida
Georgia
Hawaii
Iowa
Idaho
Illinois
Indiana

Help Document

To related forms

Help

Permit Info

Site Evaluation

Treatment System

Return to Main Form

To Main Form

Save record

*Edits will only be saved by clicking the Save button

Form View Num Lock

Previous record

Next record

Add new record

General site information: property information

**The Wastewater Information System Tool (TWIST):
General Site Information**

Ownership | **Property Information**

Property Details

County	<input type="text"/>	Place Type	<input type="text" value="City"/>
Township	<input type="text"/>	Place Name	<input type="text"/>
Range	<input type="text"/>	Zoning Classification	<input type="text"/>
Section	<input type="text"/>	In Overlay Zone?	<input type="text" value="No"/>
Plat	<input type="text"/>	Overlay Zone Designation 1	<input type="text"/>
Lot Number	<input type="text"/>	Overlay Zone Designation 2	<input type="text"/>
Tax Number	<input type="text"/>	Property Control ID	<input type="text"/>
Parcel Or Lot Size:	<input type="text"/>		

Geographic Coordinates

Latitude	<input type="text" value="0"/>	Longitude	<input type="text" value="0"/>
----------	--------------------------------	-----------	--------------------------------

Buttons: Help, Permit Info, Site Evaluation, Treatment System, Return to Main Form

Navigation:

Warning: *Edits will only be saved by clicking the Save button

Type of place Num Lock

Permit information: permit details

The Wastewater Information System Tool (TWIST): Permit Information

Permit Details | **Permittee** | Operating Permit | Maintenance | Permit Violations

General Information

System Permit Number:

Permit Type:
New System Installation
Replacement System
System Repair
Holding Tank Only
Other

Permit Issuance Date (MM/DD/YYYY):

Permit Fee:

Permit Fee Paid?:

Building Permit Fee Paid?:

Other Fee Paid?:

Special Permit Conditions

Variance Issued?:

Type Of Variance:

Other Conditions:

Operating Permit Needed?:

Maintenance Contractor Needed?:

Help

Back to Site

Return to Main Form

*Edits will only be saved by clicking the Save button

Type of permit Num Lock

Permit information: permittee

The Wastewater Information System Tool (TWIST): Permit Information

Permit Details | **Permittee** | Operating Permit | Maintenance | Permit Violations

Permittee Details

Name List

Permittee Name

Apartment or Suite

Street

City

State

Zip Code


Phone Number

Email

Help

Back to Site

Return to Main Form

← →  ▶*

***Edits will only be saved by clicking the Save button**

Form View Num Lock

Permit information: operating permit

The Wastewater Information System Tool (TWIST): Permit Information

Permit Details | **Permittee** | **Operating Permit** | Maintenance | Permit Violations

Operating Permit Details

Name List	<input type="text"/>	Operating Permit Type	<input type="text"/>
Name	<input type="text"/>	Operating Permit Number	<input type="text"/>
ID Number	<input type="text"/>	Operating Permit Expiration Date (MM/DD/YYYY)	<input type="text"/>
Apartment or Suite	<input type="text"/>	Operating Permit Fee (amount)	<input type="text"/>
Street	<input type="text"/>	Operating Permit Fee Paid?	<input type="text"/>
City	<input type="text"/>	Inspection Frequency Type	<input type="text"/>
State	<input type="text"/>	Inspection Frequency	Monthly Quarterly Annually YearIncrement
Zip Code	<input type="text"/>	Pumpout Frequency Type	<input type="text"/>
Phone Number	<input type="text"/>	Pumpout Frequency	<input type="text"/>
Email	<input type="text"/>	Effluent Sampled?	<input type="text"/> No
		Effluent Sampling Frequency Type	<input type="text"/>
		Ground Water Sampled?	<input type="text"/> No
		Ground Water Sampling Frequency Type	<input type="text"/>

***Edits will only be saved by clicking the Save button**

Type of inspection frequency Num Lock

[Help](#)
[Back to Site](#)
[Return to Main Form](#)

Permit information: maintenance


The Wastewater Information System Tool (TWIST): Permit Information

Permit Details | Permittee | Operating Permit | Maintenance | Permit Violations


Maintenance Contractor Details

Control ID	<input type="text"/>
Name List	<input type="text" value="▼"/>
Name	<input type="text"/>
Apartment or Suite	<input type="text"/>
Street	<input type="text"/>
City	<input type="text"/>
State	<input type="text" value="▼"/>
Zip Code	<input type="text"/>
Phone Number	<input type="text"/>
Email	<input type="text"/>

Help
Back to Site
Return to Main Form

← →  ▶*

***Edits will only be saved by clicking the Save button**

Form View Num Lock 

Permit information: permit violations

The Wastewater Information System Tool (TWIST): Permit Information

Permit Details | Permittee | Operating Permit | Maintenance | **Permit Violations**

Permit Violation Details

Permit Violation Date (MM/DD/YYYY)	<input type="text"/>
Permit Violation Number	<input type="text"/>
Investigator Name	<input type="text"/>
Investigator ID	<input type="text"/>
Type of Violation	<input type="text" value="v"/>
Action Taken	<input type="text"/>
Compliance Date (MM/DD/YYYY)	<input type="text"/>
Compliance Confirmed?	<input type="text" value="v"/>
Fine Assessed?	<input type="text" value="v"/>
Fine Amount	<input type="text"/>
Fine Paid?	<input type="text" value="v"/>

Click Save button to commit changes

***Edits will only be saved by clicking the Save button**

Form View Num Lock

Site evaluation information

The Wastewater Information System Tool (TWIST): Site Evaluation Information

Site Description

Control ID

Date of Evaluation (MM/DD/YYYY)

Evaluator Name

Evaluator ID

Did Site Pass Evaluation? No

Area System Density

Infiltration Area Landscape Information

Landscape Type

Landscape Position

Slope Angle (Hor to Ver)

Soil Analysis

Soil Analysis Type
Backhoe Pit
Auger Holes
Percolation Test
Other

If Other, Specify

Soil Analysis Result

Depth of Pit (for Pit/Bore Hole)

Percolation Rate (minutes/in.)

Is Soil Compacted? No

Depth To Seasonal Ground Water

Perched Ground Water? No

Depth To Bedrock

Curtain Drain Needed? No

Curtain Drain Installation

Available Drainfield Area

Drainfield Area Replaced? No

Replaced Area

***Edits will only be saved by clicking the Save button**

Form View Num Lock

Treatment system information: general information

The Wastewater Information System Tool (TWIST): Treatment System Information

General InfoTank InfoTreatmentElectrical/Mechanical FeaturesInfiltration Setback

System Details

Control Id

Number of Structures

Date Installed (MM/DD/YYYY)

Installer Detail:

Name List ▼

Name

Apartment or Suite

Street

City

State ▼

Zip Code

Phone

Email

Registration/License

System Manager

Name List ▼

Name

Apartment or Suite

Street

City

State ▼

Zip Code

Phone

Email

Help

Service Reports

Facility Served

Return to Site Info

Return to Main Form

←→📄▶*

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Form ViewNum Lock

Treatment system information: tank information

The Wastewater Information System Tool (TWIST): Treatment System Information

General Info | **Tank Info** | Treatment | Electrical/Mechanical Features | Infiltration Setback

Waste Flow Information

Design Flow

Waste Strength

Non Conventional Wastes (Specify)

Tank Risers Above Final Grade? ▼

Effluent Filters on Tanks? ▼

Grease Trap Tank Detail

Tank #1 Size (Total Gallons)

Tank #1 Material Type ▼

Tank #2 Size (Total Gallons)

Tank #2 MaterialType ▼

Septic Tank Detail:

Tank # 1

Size (Total Gallons)

Material ▼
Concrete
Plastic
Fiberglass
Metal

Compartments

Manufacturer

Tank # 2

Size (Total Gallons)

Material ▼

Compartments

Manufacturer

Tank # 3

Size (Total Gallons)

Material ▼

Compartments

Manufacturer

Help

Service Reports

Facility Served

Return to Site Info

Return to Main Form

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***Edits will only be saved by clicking the Save button**

Form View Num Lock

Treatment system information: treatment

**The Wastewater Information System Tool (TWIST):
Treatment System Information**

General Info | Tank Info | **Treatment** | Electrical/Mechanical Features | Infiltration Setback

Treatment Details

Post Tank Treatment	<input type="text" value="Soil infiltration only"/>
Recirculation?	<input type="text" value="Soil infiltration only"/>
Soil Infiltration Area (Sq Ft)	<input type="text" value="Soil infiltration only"/>
Soil Infiltration Depth (Inches)	<input type="text" value="Soil infiltration only"/>
Distribution System Type	<input type="text" value="Soil infiltration only"/>
Number of Trenches	<input type="text" value="Soil infiltration only"/>
Total Length of Trenches (Ft)	<input type="text" value="Soil infiltration only"/>
Observation Wells in Trenches?	<input type="text" value="No"/>
Receiving Water Name	<input type="text"/>
NPDES Permit Number	<input type="text"/>
Flow Type	<input type="text"/>

Help
Service Reports
Facility Served
Return to Site Info
Return to Main Form

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Form View Num Lock

Treatment system information: electrical/mechanical features

**The Wastewater Information System Tool (TWIST):
Treatment System Information**

General Info | Tank Info | Treatment | **Electrical/Mechanical Features** | Infiltration Setback

Equipment Details

Has Pumps?	<input type="text" value="No"/>
Number Of Pumps	<input type="text"/>
Has Timers?	<input type="text" value="No"/>
Has Float Switches?	<input type="text"/>
Has Siphon?	<input type="text"/>
Has Alarms?	<input type="text"/>
Alarm Type (Specify)	<input type="text"/>
Has Modem or Remote Sensor?	<input type="text" value="No"/>

Help
Service Reports
Facility Served
Return to Site Info
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Form View Num Lock

Treatment system information: infiltration setback

**The Wastewater Information System Tool (TWIST):
Treatment System Information**

General Info | Tank Info | Treatment | Electrical/Mechanical Features | **Infiltration Setback**

Setback Details

Groundwater Well Within 200 Ft?	<input type="text" value="No"/>
Distance To Well (Ft)	<input type="text"/>
Groundwater Well in Use?	<input type="text" value="No"/>
Depth of Well	<input type="text"/>
Distance to Stream/Lake/Wetland	<input type="text"/>
Stream/Lake/Wetland Name	<input type="text"/>
Distance to Property Line (Ft)	<input type="text"/>
Distance to Nearest Structure	<input type="text"/>

Help
Service Reports
Facility Served
Return to Site Info
Return to Main Form

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***Edits will only be saved by clicking the Save button**

Form View Num Lock

Service reports – general information

The Wastewater Information System Tool (TWIST): Service Reports

Select Treatment System Control ID

Treatment System Site Address

Street

City

State

Zip

General Information

Inspection Info

Components Info

Repair Info

Service Information

Service Date:

Name List

Service Provider Name

Apartment or Suite

Street

City

State

Zip Code

Phone Number

Email

Registration/License

Help

Treatment System

Return to Main Form



* Edits will only be saved by clicking the Save button

Service reports – inspection info

The Wastewater Information System Tool (TWIST): Service Reports

Select Treatment
System Control ID

Treatment System Site Address

Street

City

State

Zip

General Information

Inspection Info

Components Info

Repair Info

Inspection Details

Pre-Coverup Construction Inspection?

Regular/Scheduled Inspection?

Complaint Received Date
(MM/DD/YYYY)

Complaint Control ID

Nature of Complaint

Complaint Referred To (Specify)

Sewage surfacing
Discharge to waterbody
Odors
No installation permit
Installation Irregularities
Sewer line backup/blockage

System in Compliance?

Repair Needed?

System Needs to be Replaced?

New Permit Number

Help

Treatment System

Return to Main Form



* Edits will only be saved by clicking the Save button

Service reports – components info

The Wastewater Information System Tool (TWIST): Service Reports

Select Treatment System Control ID

Treatment System Site Address

Street

City

State

Zip

General Information | Inspection Info | **Components Info** | Repair Info

Components Inspected

Number of Tank(s) Inspected

Number of Infiltration Area(s) Inspected?

Float Switches Inspected?

Alarms Inspected?

Instrument Panel Inspected?

Pumps Inspected?

Other Components Inspected (Specify)

Help

Treatment System

Return to Main Form

* Edits will only be saved by clicking the Save button

Service reports – repair info

The Wastewater Information System Tool (TWIST): Service Reports

Select Treatment System Control ID

Treatment System Site Address

Street

City

State

Zip

General Information | Inspection Info | Components Info | **Repair Info**

Repair Details

Tank Repair Needed?

Infiltration Field Repair Needed?

Pump Repair Needed?

Media Filter Repair Needed?

Complete System Repair Needed?

Compliance Required Date (MM/DD/YYYY)

Compliance Achieved Date (MM/DD/YYYY)

Control Panel Repair Needed?

Tank Pumpout Details

Number of Tanks Pumped

Gallons Pumped

Septage Destination

Septage Destination ID

Manifest Control

Help

Treatment System

Return to Main Form

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*** Edits will only be saved by clicking the Save button**

Facility information

The Wastewater Information System Tool (TWIST): Facility Information

Facility Address

Apartment or Suite

Street

City

State

Zip Code

Facility Details

Facility Type

Other Facility Type

Facility Area

Number of Bathrooms

Number of Bedrooms

Number of Occupants/Employees

Number of Guests

Seasonal Use Only?

Season Period (MM-MM)

Has In-Sink Grinders?

Single family residence
Multi-family residential
Multiple single family homes
Office building
Retail store
Restaurant
Service station
Park
Campground
Youth or other camp
RV park camp
Resort
Church
Airport
Bar or tavern
Hotel or motel

Has Hot Tubs?

Number of Hot Tubs

Capacity of Hot Tubs

Has Water Softener?

Additional Special Fixtures

Year Structure Built

Is Rental Property?

Last Property Transfer

Water Supply Source

Other Water Supply Source

Help

Return to Treatment System

Return to Main Form

*Edits will only be saved by clicking the Save button

Type of facility

Num Lock

Complaint

Enter New Site and Permit Information

Enter New Complaint

Enter New Service Information

Update Existing Data

Lookup Existing Data

Generate Report

Logout

Help

The Wastewater Information System Tool (TWIST): Complaint

Treatment System Location

Apartment or Suite

Street

City

State

Zip Code

General Information

Complaint Control ID

Complaint Type

Complaint Description

- Sewage surfacing
- Discharge to waterbody
- Odors
- No installation permit
- Installation Irregularities
- Sewer line backup/blockage



*Edits will only be saved by clicking the Save button

Site information report

Enter New Site and Permit Information

Enter New Complaint

Enter New Service Information

Update Existing Data

Lookup Existing Data

Generate Report

Logout

Help

State Wastewater Information System Enumerator (StateWISE): Site Information Report

<i>Property Owner Details</i>		<i>System Owner Details</i>	
Name	Alex Jackson	Name	Alex Jackson
Apartment or Suite	201	Apartment or Suite	201
Street	2100 Anderson St	Street	2100 Anderson St
City	Faircity	City	Faircity
State	VA	State	VA
Zip Code	66555	Zip Code	66555
Phone	9990007778	Phone	9990007778
Email	s@b.com	Email	s@b.com
<i>General Information</i>			
County	Fairfax	Tax Number	9766655
Township		Parcel or Lot Size	67
Range		Property Control I	199888
Section		Latitude	-77.57083
Pct	1223	Longitude	34.94383
Place Name	Jermantown	Zoning Class	A
Place Type	Village	Is Overlay Zone?	<input type="checkbox"/>
Lot Number	23	Overlay Zone Designation 1	
		Overlay Zone Designation 2	

Customizing the tool

- User Guide - Section IV
 - Data structure
 - Security

IV. Database Design

The regular menus and toolbars are disabled when the user opens the database. To be able to modify the database design or functionalities, press and hold the Shift key while opening the database. The database is in an editable mode when the screen shown in Figure 15 appears.

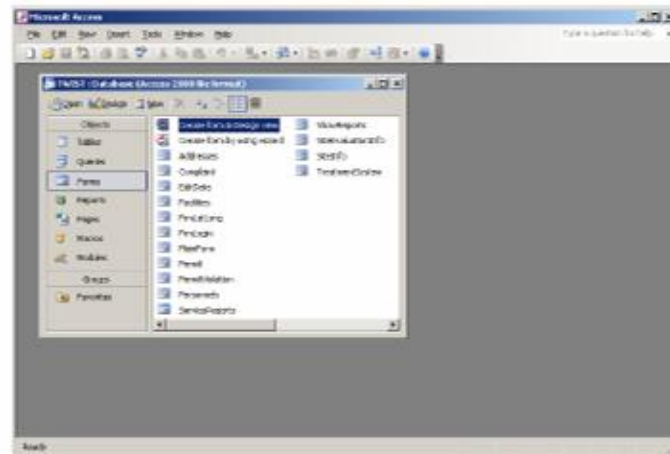


Figure 15. TWIST database window, showing the database's list of forms.

Adding New Data Fields or Modifying Fields

With the database in the "editable" mode and the screen in Figure 15 is showing, select **Tables** in the **Objects** list.

Right-click the table to be modified and then click on **Design View**. This will open the desired table in design view.

To add a new field move below the last existing field, type the field name in the *Field Name* column and select the field data type under the *Data Type* column (Figure 16). The user can optionally insert information about the newly-added field under the *Description* column.

How to get TWIST

- Download from EPA Website

http://cfpub.epa.gov/owm/septic/septic.cfm?page_id=220

- In a CD from EPA

- User guide

- PDF format