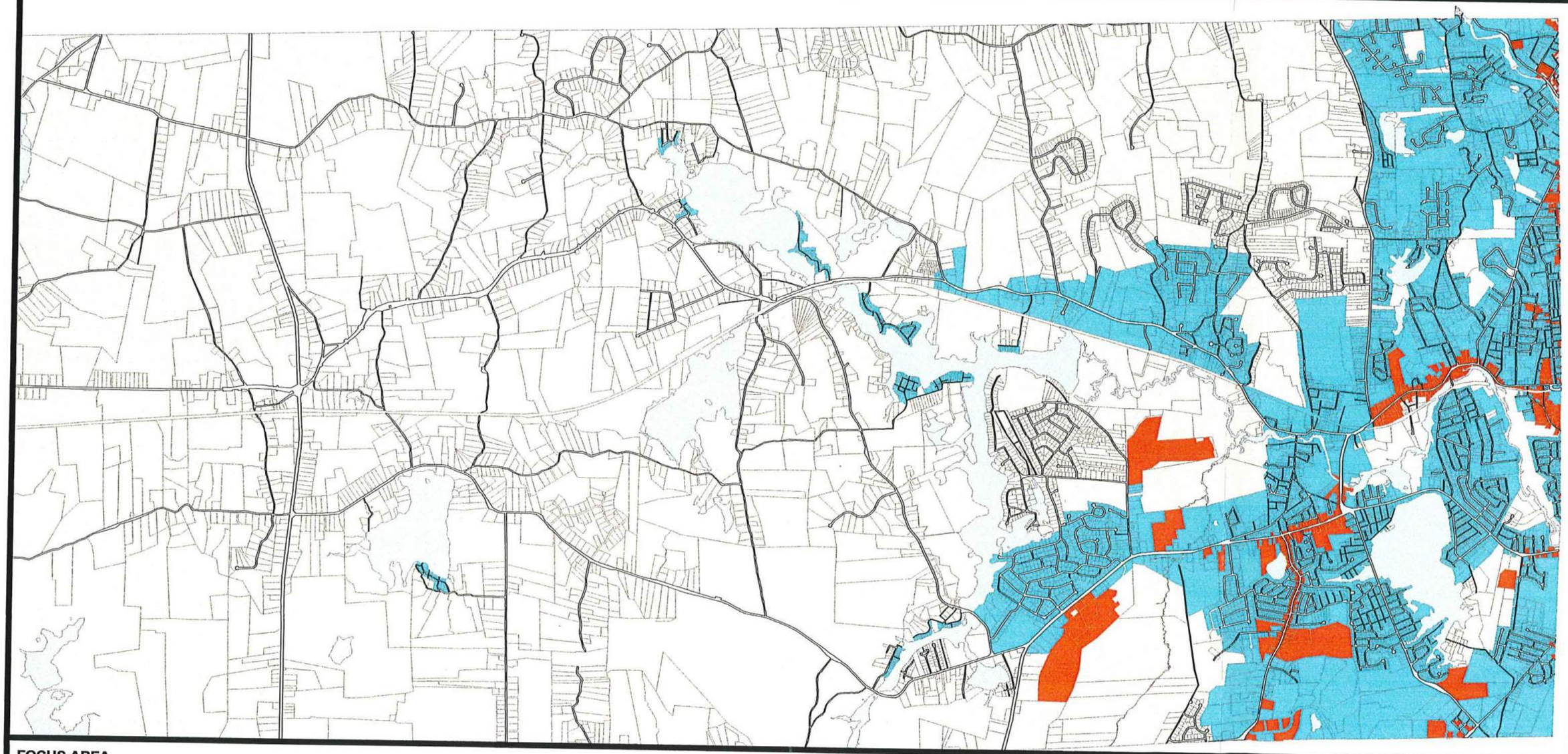
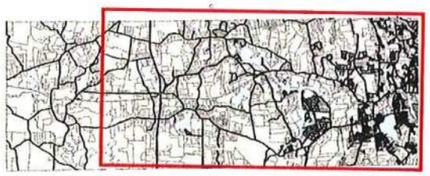


FOCUS AREA



LEGEND

- SEWERED PROPERTIES
- UNSEWERED PROPERTIES IDENTIFIED AS ONSITE WASTEWATER MANAGEMENT PRIORITY AREAS

FIGURE 3
ONSITE MANAGEMENT PRIORITY AREAS
ONSITE WASTEWATER MANAGEMENT PLAN
COVENTRY, RHODE ISLAND

3,500 0 3,500 7,000 FEET

GIS Weston&Sampson Services

Table 3
Anticipated Needs for CSSLP -- Unsewered Scenario

Subarea Number	Number of Homes	Number of Repairs[1]	Percent of Repairs Expected [2]	Number of Repairs to Fund[3]	Annual Cost Per Area [4]
Phase 1 -- Facilities Plan					
6	99	13	13.1%	3	$23,400
7	207	17	8.2%	3	$23,400
16	290	23	7.9%	5	$39,000
21	106	8	7.5%	2	$15,600
			SUBTOTAL	13	$101,400
Phase 2 -- Facilities Plan					
3	167	12	7.2%	2	$15,600
4	245	15	6.1%	3	$23,400
5	297	22	7.4%	4	$31,200
8	346	27	7.8%	5	$39,000
9	109	9	8.3%	2	$15,600
10	316	23	7.3%	5	$39,000
11	288	8	2.8%	2	$15,600
12	373	25	6.7%	5	$39,000
17	314	18	5.7%	4	$31,200
18	89	6	6.7%	1	$7,800
19	90	3	3.3%	1	$7,800
22	163	13	8.0%	3	$23,400
23	190	13	6.8%	3	$23,400
26	196	14	7.1%	3	$23,400
			SUBTOTAL	43	$335,400
Phase 3 -- Facilities Plan					
1	269	15	5.6%	3	$23,400
2	154	10	6.5%	2	$15,600
13	37	4	10.8%	1	$7,800
14	303	19	6.3%	4	$31,200
15	211	5	2.4%	1	$7,800
20	109	9	8.3%	2	$15,600
24	183	11	6.0%	2	$15,600
25	91	8	8.8%	2	$15,600
30	151	12	7.9%	2	$15,600
31	111	5	4.5%	1	$7,800
32	146	11	7.5%	2	$15,600
			SUBTOTAL	22	$171,600
Previously Designated for Sewer -- Facilities Plan[5]					
27	214	7	3.3%	1	$7,800
28	137	11	8.0%	2	$15,600
			SUBTOTAL	3	$23,400
Additional Needs Areas -- OWMP					
Added Areas [6]	268	32	11.9%	6	$46,800
Rest of Town	5370	209	3.9%	42	$327,600
			TOTAL	129	$1,006,200

Notes:

[1] *Number of Repairs* is the number of systems that had repairs or upgrades based on the ISDS file review conducted between 1987-1992.

[2] *Percent of Repairs Expected* is calculated by dividing *Number of Repairs* by the *Number of Homes* . Exceptions: Entire Town and Added Areas are calculated using the *Percent of Systems* found in the FP for the Entire Town.

[3] The *Number of Repairs to Fund* is the *Number of Repairs* divided by 5 years to annualize the five year data.

[4] Annual cost is calculated by multiplying the estimated *Number of Repairs to Fund* by the average cost to repair a system. The average cost is based on the average cost ($7,800) of CDBG funded systems from 1999-2001.

[5] Subareas 27 and 28 were included for sewering in the Facilities Plan but were removed in the FP Update.

[6] The added areas are problem areas that were designated by the OWMP Committee and not previously included in the FP. The number of repairs/upgrades are from RIDEM data for the years 1992-2002; data was converted to five years for compatibility with FP data.

Table 4
Anticipated Needs for CSSLP -- Sewered Scenario

Subarea Number	Number of Homes	Number of Repairs[1]	Percent of Repairs Expected[2]	Number of Repairs to Fund[3]	Annual Cost Per Area[4]
Phase 2 Sewer Program -- Facilities Plan					
3	167	12	3.6%	1	$7,800
4	245	15	3.1%	2	$15,600
5	297	22	3.7%	2	$15,600
8	346	27	3.9%	3	$23,400
9	109	9	4.2%	1	$7,800
10	316	23	3.6%	2	$15,600
11	288	8	1.4%	1	$7,800
12	373	25	3.4%	2	$15,600
17	314	18	2.9%	2	$15,600
18	89	6	3.4%	1	$7,800
19	90	3	1.7%	0	$0
22	163	13	4.0%	1	$7,800
23	190	13	3.4%	1	$7,800
26	196	14	3.6%	1	$7,800
			SUBTOTAL	20	$156,000
Phase 3 Sewer Program -- Facilities Plan					
1	269	15	5.6%	3	$23,400
2	154	10	6.5%	2	$15,600
13	37	4	10.8%	1	$7,800
14	303	19	6.3%	4	$31,200
15	211	5	2.4%	1	$7,800
20	109	9	8.3%	2	$15,600
24	183	11	6.0%	2	$15,600
25	91	8	8.8%	2	$15,600
30	151	12	7.9%	2	$15,600
31	111	5	4.5%	1	$7,800
32	146	11	7.5%	2	$15,600
			SUBTOTAL	22	$171,600
Previously Designated for Sewer -- Facilities Plan[5]					
27	214	7	3.3%	1	$7,800
28	137	11	8.0%	2	$15,600
			SUBTOTAL	3	$23,400
Additional Needs Areas -- OWMP					
Added Areas[6]	268	32	11.9%	6	$46,800
Page Subtotal					$397,800
Rest of Town	5370	209	3.9%	42	$327,600
			TOTAL	93	$725,400

Notes:

[1] *Number of Repairs* is the number of systems that had repairs or upgrades based on the ISDS file review conducted between 1987-1992.

[2] *Percent of Repairs Expected* is calculated by dividing *Number of Repairs* by the *Number of Homes*. Exceptions: Phase 2 is calculated assuming that half of the properties will wait for sewer rather than repairing their system. Entire Town and Added Areas are calculated using the *Percent of Systems* found in the FP for the Entire Town.

[3] The *Number of Repairs to Fund* is the *Number of Repairs* divided by 5 years to annualize the five year data.

[4] Annual cost is calculated by multiplying the estimated *Number of Repairs to Fund* by the average cost to repair a system. The average cost is based on the average cost ($7,800) of CDBG funded systems from 1999-2001.

[5] Subareas 27 and 28 were included for sewering in the Facilities Plan but were removed in the FP Update.

[6] The added areas are problem areas that were designated by the OWMP Committee and not previously included in the FP. The number of repairs/upgrades are from RIDEM data for the years 1992-2002; data was conerted to five years for compatibility with FP data.

3.0

3.1 Onsite Management Alternatives

3.1.1 EPA Guidelines

In the U.S. Environmental Protection Agency (EPA) 'Guidelines For Management of Onsite/Decentralized Wastewater Systems', five separate model programs are provided.

- Model Program 1, System Inventory and Awareness of Maintenance Needs, is a minimum level of management. Program 1 is intended to raise the municipality's awareness of the type and condition of the systems within the community and to raise the homeowners' awareness of system needs.
- Model Program 2, Management Through Maintenance Contracts, is designed to ensure that maintenance contracts with trained operators are in place for more complex system designs.
- Model Program 3, Management Through Operating Permits, is suggested where specific water quality criteria needs to be achieved; operating permits are renewable when the owner demonstrates that the system is in compliance with the conditions of the permit.
- Model Program 4, Utility Operation and Maintenance, is utilized in areas of sensitive resources. Greater control over an onsite system's operation and maintenance is achieved through a wastewater utility.
- Model Program 5, Utility Ownership and Management, is similar to Program 4 but ownership of the individual systems is now with the utility. This increased control reduces the likelihood of dispute between the system operator and the property owner.

Table 5 provides a matrix that breaks down the EPA models. The matrix compares the objectives, benefits and limitations of each program. The management requirements become progressively more rigorous from the first level to the fifth level. Each of the program levels have been successfully employed in the United States.

Table 5
Model EPA Onsite Wastewater Management Program Options

Program	Objectives	Benefits	Difficulties
1. System Inventory and Awareness	Inventory; ensure sited and installed properly, inspected, maintained and repaired as necessary; and periodically provide owners with O&M info.	Easy/inexpensive. Not much resistance.	No operating component. Can't ID problems.
2. Mgmt thru Maintainence Contracts	Maintenance contract required on Alternative Systems to assure timely response.	Reduces risk of failure and contamination from failure.	Difficult tracking & enforcing.
3. Mgmt thru Operating Permits	Establish specific & measureable performance requirements, renewable operating permits and monitoring with maintenance agreements	Enforces mgmt of systems. Reduces risk of failure and contamination.	Same problems as #2. Needs higher level of expertise to implement.
4. Utility O & M	O&M through a professional utility.	O&M performed regularly. Problems ID'd before failure. Reduces burden on local gov't.	Utility must be tech & financially viable. Conflicts between owner & operator. Requires authorizing legislation.
5. Utility Ownership & Mgmt	Ownership and O&M thru pro. utility.	Reduce risk of system failure. Allows area-wide planning. Avoids conflict.	Easements required. Greater financial investment. Utility must be tech & finan. viable. Requires authorizing legislation.

3.1.2 Rhode Island OWMPs

Within Rhode Island, there are 13 municipalities that have standards for ISDS design beyond the State's regulations. The most common design standards that go beyond state standards include stricter setback requirements, certified watertight tanks upon installation, installation of effluent filters and access risers, and the prohibition of garbage disposals.

There are seven municipalities that have management plans in place and there are four communities that require the use of innovative/alternative technologies for certain circumstances. The most common management program includes requiring inspection and pumping and maintenance contracts for systems with mechanical components. Table 6 provides a matrix with management program details for each of the seven communities.

3.2 OWMP Committee Options

The following options were explored by the OWMP Committee:

3.2.1 System Inventory and Awareness of Maintenance Needs

Problem: One of the largest problems that became apparent in the FP questionnaire process was that residents do not understand ISDS operation and maintenance requirements.

Solution: To assist property owners in the understanding of their systems, the town of Coventry will provide additional ISDS education and guidance. Guidance and education will be provided through the use of the town's website, brochures/mailers, and library resources. The following are examples of guidance required:

- Proper inspection, operation and maintenance of the ISDS.
- Recommended upgrades to the ISDS.
- Use of alternative and innovative septic systems.
- ISDS inspectors and contractors.
- Protection of sensitive resources.

- Proper disposal of hazardous waste.
- Water conservation.
- Availability of financial assistance.

The town currently has frequently asked questions regarding ISDS on its website (http://www.town.coventry.ri.us/planning.htm) under the Planning Department page (see Appendix D). A new page is being developed by the Department of Public Works; this web page will provide additional information regarding concerns specific to Coventry, outcomes to the OWMP, and links to the DEM and the University of Rhode Island (URI) websites. DEM and URI each have extensive ISDS guidance (Appendix D) provided for general viewing on their websites.

The DPW reserved a display case in the Public Library for one month for dedication to the OWMP. The case will be used to display ISDS information.

Problem: The town does not have detailed data as to the location, type, and condition of ISDS in town.

Solution: The town should devise a form for the recording of ISDS upgrades, repairs, and new installations. The completed form would be required with the record drawing submission. The town has a Geographical Information System (GIS). The data gained on the aforementioned ISDS form should be entered into an ISDS layer within the town's GIS. Furthermore, the town's GIS could be used to track ISDS inspections and maintenance within the town. This could be handled by appropriating funds to add time for GIS personnel to be dedicated to this task or by offering an internship to a student.

Problem: One problem identified in the questionnaire is that, in many cases, pumping is not happening often enough.

Solution: The town could provide an incentive for ISDS pumping and/or inspection. The incentive could be in the way of a property tax credit or a town-sponsored rebate. One idea is for

Table 6

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
Charlestown[1]	(1) Subdivision --planning commission can require larger lot for safe and effective operation. (2) Setback requirements.	(1) Based on Inspection. (2) Subdivisions reviewed since 1992 deeded with pumpout requirement.	(1) Used state's 1987 "Waste Water Management District....A Starting Point" as a model.	(1) WW Mgmt. District. (2) Planning Commission Subdivision/Land Development. (3) Zoning.	(1) WW Mgmt. Comm. (2) Building/Zoning Official. (3) Town Planner.	Policy for commercial uses, schools, convention centers and multifamily dwellings within densely developed areas; special use permit; sensitive-resource setback variance
Glocester[2]	(1) Setback requirements. (2) No impermeable surfaces above leach field. (3) Certified watertight tank, effluent filter and access risers. (4) Design flow required to account for properties rented > 1 mo./yr. (5) ISDS > 2700 GPD, subdivisions or land development project may have to submit environmental report. (6) Cesspool replaced if fail/repair and in WRPA @ property sale or title transfer. (7) No installation of galley-type leaching fields. (8) Requires advanced treatment based on site conditions.	Based on Inspection.	(1) Used state's handbook for checkup. (2) Requires I&M based on Septic System Checkup. (3) Requires maintenance contracts for any system w/mechanical components. (4) Dependent on treatment levels.	(1) Zoning. (2) Wastewater Management.	(1) WW Mgmt. Board (2) Authorized designee. (3) Building/Zoning Official.	Public Education on Website
Johnston[1]	(1) Used Glocester's ordinance as model.	See Glocester.	See Glocester.	WW Mgmt. District.	?	
Narragansett[1]	(1) 3 overlay districts with special siting requirements. (2) Garbage disposals prohibited. (3) Septic tanks accessible at all times. (4) Use of septic tank additives prohibited.	Every 4 years.		(1) Zoning. (2) Utilities Code.	(1) Zoning staff. (2) Municipal staff.	

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
New Shoreham[1]	(1) Setback requirements. (2) Access risers, effluent filters, tipping D-Box by Dec. 2005. (3) Certified watertight tank in situ. (4) No installation of galley-type leaching fields. (5) Renovate cesspools & failing systems to T1/T2 level by Dec. 2005. (6) ISDS > 900 GPD, subdivisions or land development project may need water quality analysis. (7) Garbage disposals prohibited. (8) Requires water conservation.	Based on Inspection.	(1) Town inspector. (2) Prioritized by critical resource areas. (3) Routine inspection as needed based on initial inspection. (4) NOV issued for repair to failing systems.	(1) Zoning. (2) WW Mgmt. District.	(1) Sewer Commission. (2) Building official.	Locating systems and wells using GPS. Evaluating septic system computer-tracking programs.
North Kingstown[1]	Special use permits and enhanced treatment in proximity of sensitive resources.	Based on Inspection.	Inspect every 3 years by town approved inspectors.	(1) Zoning overlays. (2) WW Mgmt. District.		
South Kingstown[2]	(1) Improper discharges. (2) Garbage disposal requirements. (3) Cesspool replacement. (4) Design flow required to account for properties rented > 1 wk./yr. (5) Certified watertight tank.	Based on Inspection.	First maintenance (baseline) inspection and routine inspections.	(1) WW Mgmt. District. (2) Utilities Code.	ISDS Commission and Public Services Director assisted by Onsite Wastewater Specialist	Education & Technical Assistance

Source:

[1] Final Draft Rhode Island Municipal Septic System Standards and Programs, Prepared by Jim Riordan, RIDEM, Office of Water Resources, March 26, 2001.

[2] Local regulations and ordinances.

the town to raffle off a septic tank pumping and/or a free septic system inspection. The resident would enter the raffle if they had a pumping receipt from within the past two (2) years. The raffle would be limited to those within the need areas identified by the OWMP. A certificate would be issued to the winner that entitled them to up to $200 for services described which must be used within a three-year timeframe. The event would be publicized in the Coventry Courier, and a member of Town Council could be requested to draw the winner(s). The town would commit to two (2) drawings a year and increase if the number if demand was high and if the town's budget allowed for an increase.

Problem: During interviews with local septic haulers, the haulers said that the West Warwick Regional Wastewater Treatment Facility was charging more for receiving septage than the other WWTF in the area. The increased distance that haulers have to travel to discharge septage to more distant facilities is added to the price of each individual septic pump out.

Solution: The town of Coventry has an agreement with the West Warwick Regional WWTF for receiving septage from property owners in Coventry at a reasonable cost; therefore, it is suggested that the DPW review the septage receiving costs and the supporting data from the West Warwick Regional WWTF.

Problem: Until specific water quality problems arise, it is doubtful that there will be an outcry for septic system improvements.

Solution: In an attempt to get the public involved in concern over failing or substandard septic systems and the health of the waters of Coventry, it is recommended that civic groups are encouraged to sample water bodies that the group is affiliated with. The sampling should specifically be geared towards checking for indications of human waste contamination.

Problem: The number one reason that property owners do not upgrade or repair their ISDS is cost.

Solution: This problem is being addressed through this plan by initiating a program that provides financial assistance to homeowners to repair or replace their septic system. As described in Section 1.2, the CSSLP offers a source of funds to provide loans to homeowners for the repair or replacement of failing systems or substandard systems within areas the management areas that are identified within this document.

3.2.2 Management Through Maintenance Contracts

Problem: Many residents have no idea what components make up their ISDS. Alternative/innovative systems or systems with pumps require a higher degree of maintenance. If a resident does not have a maintenance contract in place when failure occurs, they have to begin the process of finding out who maintains their type of system, negotiate price, locate components and have the system repaired. This does not allow for a timely response and, as a result, increases the time that contamination is occurring.

Solution: The town should encourage or require that maintenance contracts be secured for any mechanically complex systems to assure timely response in case of failure. The complex system would cover systems requiring pumps or any alternative/innovative system. This reduces the risk of contamination that can occur as a result of failure. The agreements could be filed with the Planning Department, Building Inspector or GIS.

3.2.3 Management Through Operating Permits

Problem: Malfunctioning ISDS contribute to an overabundance of nutrients in ponds and lakes as well as contamination of drinking water sources.

Solution: In unsewered areas that have exhibited ISDS problems and are within sensitive resource areas, an onsite wastewater management district could be established. Districts could be selected from among the following areas: South Main Street, Tiogue Avenue, Tiogue Lake, Pilgrim Avenue, Hopkins Hill, Shady Valley, Hill Farm (camps), Raymond's Point, Greene Street/Laurel Avenue, Quidnick, Washington, Anthony and Harris Mill Village.

In June of 1987, the Rhode Island General Assembly enacted legislation known as the Rhode Island Septic System Maintenance Act (Title 45 of R.I.G.L., Chapter 24.5). This legislation established the legal basis for communities to establish wastewater management districts (WWMD) to regulate the maintenance of privately owned ISDS. Subsequently, the RI Department of Administration, Division of Planning, published a 1987 report titled "Wastewater Management Districts...A Starting Point" (Report No. 62), which describes the potential benefits of a WWMD for septic system maintenance. This helpful publication also includes a model ordinance for a wastewater management district.

The WWMD is controlled by an administrative body, either specifically created for the WWMD, or already in place in the community (such as a Public Works Department or Planning Department). The WWMD has to have the authority to issue citations and levy fines on the owner of an ISDS system if they are not in compliance with their operating permit. The 1987 legislation allows for fines of up to $500 per day for noncompliance with WWMD regulations. Since an ISDS WWMD requires the imposition of the powers of the district over the rights of the landowner, general public acceptance and financial support of such a program is an absolute necessity for implementation. Regulations governing the onsite wastewater management districts would need to be drafted and gain town approval.

Within the wastewater management district areas, any property with an ISDS would need an operating permit. In order to receive an operating permit, an ISDS should pass inspection. A full inspection would be required in accordance with DEM's guidance document, *Septic System Checkup: The Rhode Island Handbook for Inspection*. The process could require an operating permit for any system over 5 years old. After a system has been installed for five years, an operating permit would need to be secured. Follow-up inspections could be required every three years.

The WWMD could also provide assistance to neighborhood areas in the development of cluster or decentralized systems.

The workload required from this option would require increased staffing. It is anticipated that it would require a person 3-5 days per week. Depending on the number of areas included within the wastewater management district.

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4.0

4.1 Recommended Plan

The program options that were deemed important and feasible in Section 3.2 will be phased in over time, because the town does not have staff in place for ISDS issues and/or there is no money in the budget to fund additional staffing or programs at this time. Table 7 assigns responsibility and estimated cost of each task.

4.1.1 Phase 1

Within the first year of the plan adoption, Phase 1 tasks will be performed as follows:

- Establish Coventry in the CSSLP.
- Advertise the town's acceptance into CSSLP in the *Coventry Courier* and on the town's website, http://www.town.coventry.ri.us.
- Add page to website that specifically addresses ISDS issues.
- Make copies of DEM and/or URI ISDS guidance brochures for public to pickup at Public Library and DPW office.
- For one month every year, setup the display case in the Public Library with ISDS information.
- Perform an annual review of septage receiving costs and the supporting data from the West Warwick Regional Wastewater Treatment Facility. Determine whether receiving costs exceed cost to treat the septage.

4.1.2 Phase 2

Within one to five years from the plan adoption, Phase 2 tasks will be performed as follows:

- Devise a form for the recording of ISDS upgrades, repairs and new installations and enter data into the GIS system in an ISDS layer.
- Consider tracking ISDS and maintenance and pumping in the GIS ISDS layer.

- Institute a septic tank pumping and/or a free septic system inspection raffle. A certificate of up to $200 for septic services would be limited to those in the need areas identified by the OWMP. Drawings to be held twice a year.
- Sequentially mail an ISDS informational brochure to one fifth of the town each year. The DPW will act as lead on this task. The mailings will first target the management areas characterized in the OWMP.
- Draft the necessary ordinance to require property owners of alternative/innovative systems or conventional ISDS with pump components to secure maintenance agreements.
- Encourage civic groups to perform water quality sampling for coliform bacteria on surface water bodies that the group is affiliated with.

4.1.3 Phase 3

Within five to ten years from the plan adoption or as required by the Town Council, Phase 3 tasks will be performed as follows:

- Give consideration to increasing the septic tank pumping and/or a free septic system inspection raffle if demand and budget allow.
- Consider dedicating a town line item in budget to use as match money to leverage ISDS funds from state and federal programs.
- Consider establishing a wastewater management district through the necessary regulations and ordinances.
- Revisit the OWMP and consider updating the plan.

4.2 OWMP Implementation

The purpose of this section is to identify specific events that must take place in order to implement the recommendations presented in this plan. These implementation steps include:

- Submit the draft OWMP to the RI-DEM Division of Water Resources for review and comment. Respond to or incorporate RI-DEM comments as necessary.
- Conduct a public hearing to present the conclusions.

- Finalize the report and submit the final plan to the Town Council for adoption.
- Submit the adopted plan to RI-DEM Division of Water Resources for final review and approval.
- Complete and submit the SRF loan application as provided in Appendix C.
- Obtain Certificate of Approval from RI-DEM Division of Water Resources.
- Write and submit a letter to CWFA requesting a loan from the CSSLP.
    - State an estimated dollar value required to cover repair or replacement of failed or failing systems as contemplated by the OWMP.
    - Provide evidence of Town Council adoption of the OWMP.
    - Describe dedicated source of loan security in event of a loan default by property owner; for instance, property liens, property tax revenue.
    - Describe overall the town's overall operations: legal and management structure, sources of revenue, operating expense, operating surpluses/deficits, actual results versus budget, sources of financial liquidity, legal authorization to borrow from CSSLP, any other information that supports a finding that this loan will not have an adverse impact on the CWFA.
    - Provide a credit review of the town.
- Obtain SRF loan.
- Advertise in the *Coventry Courier* and on the town's website acceptance into the CSSLP to residents.
- Work through tasks in Phase 1 through Phase 3.
    - Items that have an action to be "considered" will at a minimum:
        - Assigned staff will investigate and make recommendations.
        - Town Council will consider the recommendations and handle through one of the following:
            - Adopt recommendations.
            - Table idea until following year.
            - Decide that idea does not work for the town.

4.3 Coventry CSSLP Details

Upon acceptance into the CSSLP, the town will advertise the program details and the appropriate contact information in the local newspaper, *Coventry Courier*, as well as on the town's website, http://www.town.coventry.ri.us. The town's CSSLP liaison is the Director of Planning & Development. The Director will provide the RI Housing and Mortgage Finance Corp. (RI Housing) information packet and a one-page application (similar to the town of Glocester's Community Septic System Loan Program application—Appendix E) to any resident that requests one.

The applicant will be required to file the application with the RI Housing. The applicant will be required to include two bids from licensed installers. The program requirements include an approved credit check and a limit on loan amounts (maximum of $30,000).

To be eligible for Coventry's CSSLP, the applicant must prove that their existing ISDS has failed and the ISDS must be on a lot within Coventry's town boundaries. If an applicant meets the previously defined conditions *plus* one of the following conditions, the applicant qualifies for eligibility in the Coventry CSSLP:

- Owns a parcel, or lot, which does not have access to a Public Sewer and is highlighted in blue on Figure 3, *Onsite Management Priority Areas.*
- ISDS is located on a lot of 10,000 square feet or less and is owner occupied and utilized as a primary residence.
- Receives a waiver from the two above listed conditions from the Director of Planning & Development.

As of December 2001, the CWFA specifies in their *Loan Policies and Procedures Community Septic System Loan Program* that the following are ineligible project costs:

- Group or cluster septic system projects
- Septic system projects on commercially owned property
- Bathroom or kitchen improvements, additions or remodeling

Table 7
Coventry's Onsite Wastewater Management Plan

Task	Responsible Party	Cost
Phase 1: First Year		
Establish Coventry in the CSSLP.	Planning Department	$1,000
Website updates that specifically addresses ISDS issues.	Department of Public Works	$1000/yr.
Make copies of DEM and/or URI ISDS guidance brochures for public to pickup at Library and DPW office.	Department of Public Works	$100/yr.
For one month every year, the DPW will setup the display case in the Library with ISDS information.	Department of Public Works	$100/yr.
Perform an annual review of septage receiving costs and the supporting data from the West Warwick Regional WW Treatment Facility.	Department of Public Works	$2,500
Phase 2: 1 - 5 years		
Raffle septic tank pumping or septic system inspection (2x per yr)	Planning Department	$400/yr.
Record ISDS upgrades, etc., and enter data into GIS layer.	GIS Department Planning Department	$2,500/yr.
Track ISDS and maintenance and pumping in a GIS layer if personnel available.	GIS Department Department of Public Works	$5,000/yr.
Sequentially mail an informational brochure to one fifth of the town each year.	Department of Public Works	$2,500/yr
Draft the necessary ordinance to require property owners of alternative/innovative systems of conventional ISDS with pump components to secure maintenance agreements.	Planning Department	$4,000
Encourage civic groups to perform water quality sampling for coliform bacteria on surface water bodies that the group affiliated with.	Department of Public Works Planning Department	$500
Phase 3: 5 - 10 years		
Expand the raffle system maintenance incentive program if demand and budget allow.	Building Inspector Planning Department	$500/yr.
Consider dedicating a town line item in budget to use as match money to leverage ISDS funds from state and federal programs.	Planning Department	-
Consider establishing a wastewater management district through the necessary regulations and ordinances.	Department of Public Works	-
Revisit the OWMP and consider updating the plan.	Department of Public Works	-

7/31/02

Public Notice

Onsite Wastewater Management Plan (OWMP) Committee Meeting

DATE: August 1, 2002
TIME: 2:30 PM
LOCATION: Conference Room attached to Council Chambers

BUSINESS: This is the first meeting of the OWMP Committee. This meeting will serve to kickoff the OWM Plan and introduce the members to the staff and consultant.

MEETING MINUTES

Coventry Onsite Wastewater Management Plan Kick-Off
August 1, 2002 (2:30 PM)

- List of Attendees

Citizen Representatives
Roy Pruett
Roger Plante
Coventry Staff

Sheila Patnode	DPW Director
Brent Narkawicz	Director of Planning & Development

Weston & Sampson Engineers, Inc.

Kent Nichols	Project Manager
Charlene Johnston	Senior Engineer

- Kent Nichols began by explaining to the group what WSE's role has been in wastewater management planning for the town of Coventry. He explained that the Wastewater Facilities Plan (WWFP) was approved by DEM in 1995. The Plan found that there was a significant need for wastewater solutions within the town. There are different ways to solve wastewater problems:

    1. Onsite – solve problem within the bounds of property – traditionally called ISDS (individual septic disposal systems)
    2. Decentralized – tend to solve localized problems by conveying wastewater to another site nearby
    3. Collection system – conventional sewer system with wastewater treatment – either local treatment plant or regional plant
        - Coventry has the regional plant in West Warwick as an option for some properties but not the majority of properties.

- Kent Nichols explained that the focus of this Committee was onsite wastewater management, but the Committee may chose to deal with concepts that could solve problems for different categories of needs (ie. Lots with no available land). The WWFP included a questionnaire and a DEM file review. The DEM files need to be updated. WSE will characterize the needs area using existing information and the GIS data provided by the town. The scope of this project does not allow for a full DEM file review again.

- Kent Nichols also explained that because of the limited nature of the project scope we will be relying on information that the staff can provide, and what Roger Plante and Roy Pruett can assist with.

- Roger Plante asked what can be done for the ISDS area problems – shared/clusters? Kent explained that there are newer package treatment units available now. Roger said that in the Jefferson Drive/Adams Drive area there are problems. Roger has been in his neighborhood for 23 years.

- Roy Pruett said that he lives on Maple Root Road which is a mobile home area. There is open space surrounding the park and they have individual septic systems, every two years the units are pumped. The park has been there since the 1960s.

- Kent Nichols explained that one of the tasks of this Committee is to consider the water quality of water resources also. All water resources should be considered: both groundwater and surface water. Surface waters of Coventry include Tiogue Lake, Johnson Pond, the river and brooks.

- Kent Nichols said that there are also areas that were not included in the WWFP that need to be considered. Sheila Patnode had mentioned Shady Valley area as being one area that needed solutions.

- Charlene Johnston distributed handouts (copy attached to minutes). The first page states the objective listed in the grant application, which was to produce an OWMP that will gain the approval of the town and RIDEM that allows Coventry residents to seek a loan from CSSLP. The rest of page one reflects WSE's scope of work. One of the scope items is to explore the community assistance program alternatives. The second page of the handout provides five EPA model program options. The matrix provided lists the programs in order of management intensity. That is, as you continue down the matrix, the programs become more management intensive. They may be considered more intrusive as well. They range from not doing much more than Coventry/RIDEM currently does to establishing a private utility with ownership of systems transferred to the utility instead of to the property owner. The programs do not need to be implemented across the whole town--they can be used where needed.

- Sheila Patnode remarked that all of these programs are actually in use somewhere in the country and that Coventry probably is more likely to stay near the top of the matrix. Kent Nichols said that different programs can cover pockets of areas. There are models that can be used in RI too. The most in depth one that he knows is Charlestown.

- Sheila Patnode reminded the committee that residents currently are unable to quality for the CSSLP, so the Committee needs to focus on that as part of the objective. Brent Narkawicz said that onsite systems currently are funded through the Community Development Block Grant (CDBG). They have only been getting $25k per year and don't feel like they are making much headway. **Brent will pull the records from past disbursements and report on at next meeting**. Kent Nichols suggested that maybe this process can get more money from the town in the way of matching the funds of the CDBG. Roy Pruett asked if everybody would be eligible for loans or just those the Committee defined in a needs area. Kent suggested that it should be kept as broad-based as possible, but should target people that don't feel like they can afford a new

system. Roger said that he thought the water quality of the Tiogue Lake was in pretty good shape. Sheila and Kent explained that even if septic systems near the lake are in the groundwater, the groundwater could be migrating away from the lake and toward the river due to conditions such as the topography and soils.

- Kent Nichols reviewed the WWFP figures in the handout. Sheila Patnode remarked that if Roger's area (Area 11) had a high occurrence of problems ten years ago, it was probably having even more problems now since there had been no solutions provided. Brent Narkawicz stated that Figure 3-5 does not show why the problem occurred though. Sheila Patnode asked how the areas were selected, were they based on age and density? Kent Nichols answered that they were primarily neighborhood areas but used criteria like topography to select an area. Kent said that if an area was already having problems in the 80s then we'll assume that the problems have not changed, unless the character of the area has changed substantially.

- The WWFP work done in the early to mid 1980's included a Water Quality Task Force (WQTF). The WQTF identified problem areas in Coventry needing solutions.

- Kent Nichols said since we don't know when or if Coventry will extend the sewers we have to decide what kind of onsite system solutions we can offer to those experiencing problems. Lot size is a very important constraint to consider. WWFP used 8,000 SF as a cut off for a normal size single family home. Less than 8000 SF and there is no space available for a replacement system. Brent Narkawicz said that Coventry 's minimum lot size now is 20,000 SF.

- Roger Plante asked how we can help those on a small lot. Kent said the options include (1) do nothing, (2) require a tight tank (extra costly over the long term and need to look at whose cost it is – could be handled through a loan program or subsidize pumping costs), (3) provide system of technical knowledge and education, and (4) financial assistance for new systems that allow variances. These can be up to the Committee to decide on, but there's a tight schedule. DEM just sent a letter saying that Coventry has until the end of October to complete the process.

- A mission statement should be developed to keep the Committee focused. **Roy Pruett volunteered to work on the mission statement.** Need to meet the October 25, 2002, deadline. **Sheila Patnode asked if the plan has to have town council approval**. Brent Narkawicz said that the action items probably have to. The objective of the first public meeting will be to educate and inform. The second meeting will be to get comment back. Last public meeting will be for town council.

- **Roger Plante will get in touch with his URI contact to get a copy of the updated map that he did volunteer work on.**

- Dates were discussed for future meetings. The next Committee meeting will be August 29, 2002, at 2 PM. The first two public meetings will be held at 7 PM in the Quidnick

School on September 10 or 12 and October 2 or 3. **Brent will call to schedule the rooms.**

- Charlene Johnston will do the minutes for this meeting. Roy Pruett will handle the minutes of the Committee meetings from the next meeting on. A clerk will be supplied by the town for the public meetings.

COVENTRY, RHODE ISLAND

OWM Plan

Objective: Produce OWMP that will gain the approval of the town and the RIDEM that allows town to seek a loan from CSSLP.

Characterize Management Area

99% of Coventry reliant on ISDS
Cesspools in So. Main Street area, Quidnick, Washington, Anthony and Harris Mill Village areas.

Questionnaire: 1 ISDS Problem for every 2 or 3 systems.

ISDS Prob: Tiogue Ave, Greene St./Laurel Ave area, areas along West shore of Tiogue Lake, Quidnick & Anthony areas north of Washington St.

Minimal problems: No. Main St area and outlying north and western suburban areas along Knotty Oak Rd and Flat River Rd.

Explore Community Assistance Program Alternatives

Evaluating:
Type and amount of financial support.
Degree/amount of tech assist.
Number of systems included.
Application criteria/procedure.
Method/location of advertisement.
Funding sources.

Alternatives for ensuring/encouraging regular maintenance

Project Administration

Up to 6 Committee/Public Meetings.

Assist in developing/submitting minutes, notifications, outlined ordinances and resolutions and correspondence.

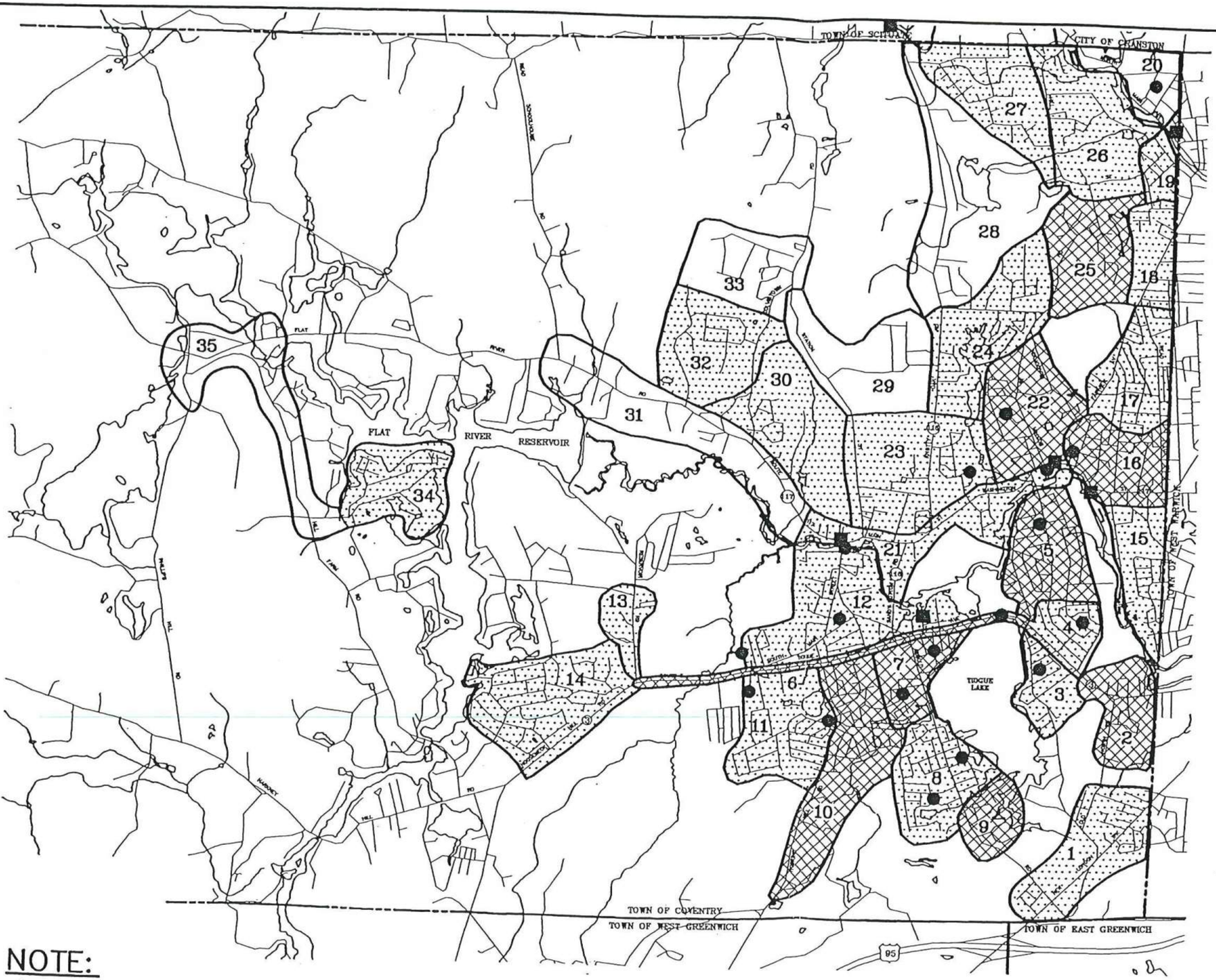
RIDEM Contact.

Assist in developing/carrying out public relations campaign, ordinances special standards in environmentally sensitive areas.

Supplemental Task

GIS Support -- fees established.

Model EPA Onsite Wastewater Management Program Options			
Program	**Objectives**	**Benefits**	**Difficulties**
1. System Inventory and Awareness	Inventory; ensure sited and installed properly, inspected, maintained and repaired as necessary; and periodically provide owners with O&M info.	Easy/inexpensive. Not much resistance.	No operating component. Can't ID problems.
2. Mgmt thru Maintainence Contracts	Maintenance contract required on Alternative Systems to assure timely response.	Reduces risk of failure and contamination from failure.	Difficult tracking & enforcing.
3. Mgmt thru Operating Permits	Establish specific & measureable performance requirements, renewable operating permits and monitoring with maintenance agreements	Enforces mgmt of systems. Reduces risk of failure and contamination.	Same problems as #2. Needs higher level of expertise to implement.
4. Utility O & M	O&M through a professional utility.	O&M performed regularly. Problems ID'd before failure. Reduces burden on local gov't.	Utility must be tech & financially viable. Conflicts between owner & operator. Requires authorizing legislation.
5. Utility Ownership & Mgmt	Ownership and O&M thru pro. utility.	Reduce risk of system failure. Allows area-wide planning. Avoids conflict.	Easements required. Greater financial investment. Utility must be tech & finan. viable. Requires authorizing legislation.



N

LEGEND:

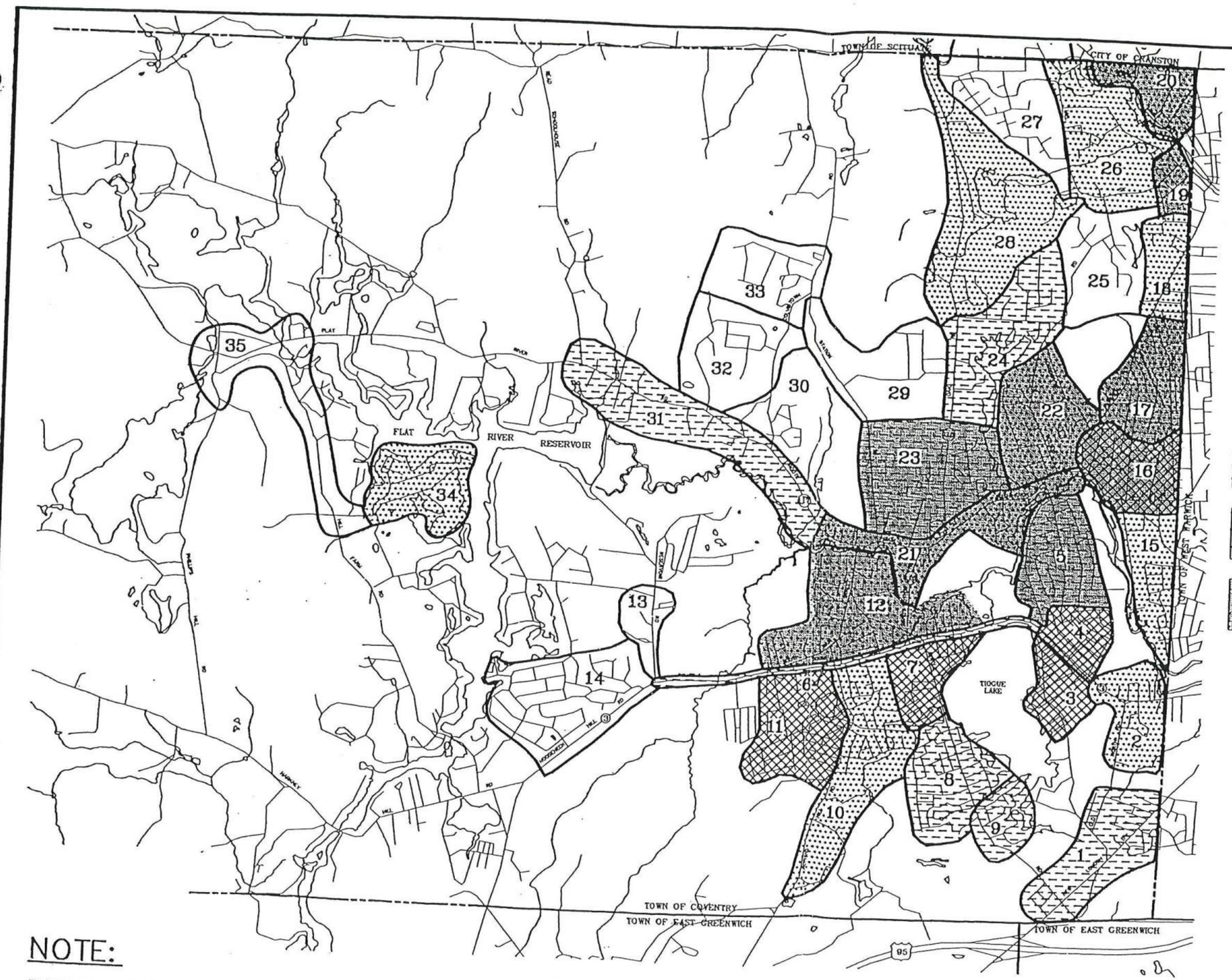
- EXTREMELY HIGH NUMBER OF PROBLEMS (1 OF 2 OR 3 SYSTEMS FAILING)
- HIGH NUMBER OF PROBLEMS (1 OF 4 OR 5 SYSTEMS FAILING)
- MODERATE NUMBER OF PROBLEMS (1 OF 8 OR 10 SYSTEMS FAILING)
- PROBLEM AREAS IDENTIFIED BY COVENTRY WATER QUALITY TASK FORCE
- DIRECT DISCHARGE IDENTIFIED BY RI–DEM

NOTE:

BASEMAP SOURCE: RIGIS

FIG 3–5
ISDS PROBLEM AREAS & DIRECT DISCHARGES

9187\COVE-2



N

LEGEND:

- HIGHEST OCCURRENCE OF LOTS UNDER 8000 SF (1 OF 2)
- SIGNIFICANT OCCURRENCE OF LOTS UNDER 8000 SF (1 OF 3 TO 5)
- MODERATE OCCURRENCE OF LOTS UNDER 8000 SF (1 OF 8 TO 10)
- AREAS WITH SIGNIFICANT NUMBER OF MULTI-FAMILY HOMES

NOTE:

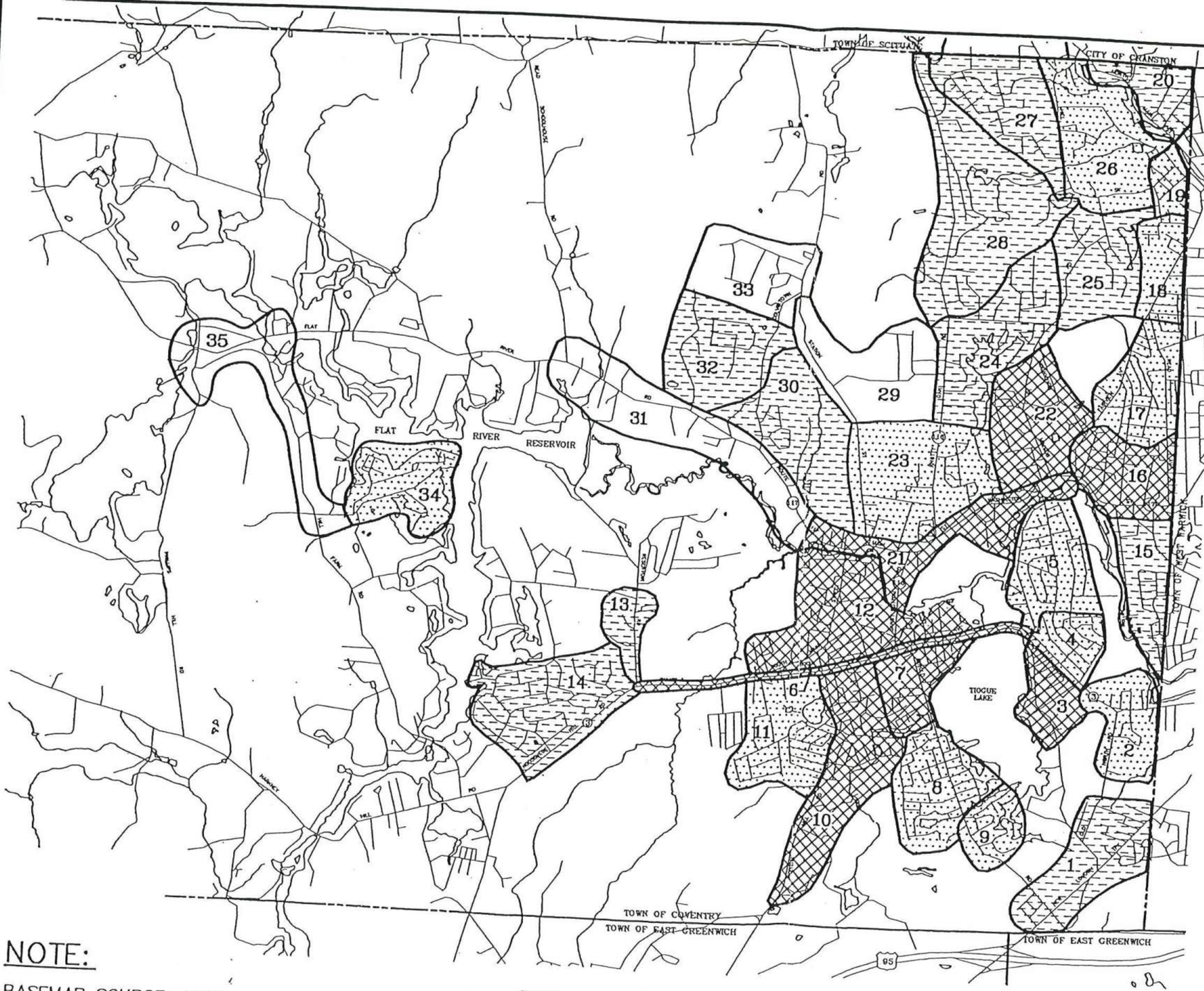
BASEMAP SOURCE: RIGIS

3000 0 3000

SCALE IN FEET

9187\COVE-3

FIG 3-8
RESTRICTIVE LOT SIZES AND MULTI-FAMILY HOMES



N

LEGEND:

- CRITICAL CONDITIONS FOR ISDS USE
- VERY POOR CONDITIONS FOR ISDS USE
- POOR CONDITIONS FOR ISDS USE

NOTE:

BASEMAP SOURCE: RIGIS

3000 0 3000

SCALE IN FEET

9187\COVE-1

FIG 3-9
EXISTING
ISDS CONDITIONS

8/5/2002

Public Notice

Onsite Wastewater Management Plan (OWMP) Committee Meeting

DATE: Thursday, August 29, 2002
TIME: 2:00 PM
LOCATION: Town Hall Conference Room

BUSINESS: This is the second meeting of the OWMP Committee. This meeting will serve to finalize the mission statement, finalize dates for public hearings, identify tasks to be completed before first public hearing, and check on status of assignments from first meeting.

COVENTRY, RHODE ISLAND
OWMP COMMITTEE

August 29, 2002, 2 PM, Meeting
AGENDA

- Minutes of Previous Meeting
- Assignments from First Meeting
- Mission Statement
- RI OWMP
- Public Hearing Dates
- Tasks for Next Meeting

MEETING MINUTES

Coventry Onsite Wastewater Management Plan
August 29, 2002 (2:00 PM)

- List of Attendees

Citizen representatives
Roy Pruett
Roger Plante
Coventry Staff
Sheila Patnode DPW Director
Coventry Town Council
William Hall
Weston & Sampson Engineers, Inc.
Kent Nichols Project Manager
Charlene Johnston Senior Engineer

- Kent Nichols began meeting with the reading of previous meeting minutes.

- Kent Nichols suggested that we need to re-interview local septic haulers to establish problem areas, concerns, and what they would like to see included in Coventry's new wastewater plan.

- Roy Pruett and Roger Plante agreed to undertake interviews and report at next meeting.

- Sheila Patnode confirmed our first public meeting date of September 12, 2002 at
- 7:00 PM at the Middle School. The second public hearing is planned for October 2, 2002 at the Quidnick School. A presentation to the Town Council is planned for
- October 15, 2002.

- Sheila Patnode also reminded us that RIDEM's deadline for submittal of Coventry's OWMP is October 25, 2002.

- Sheila Patnode has booked the glass display case located in the public library for the month of April to showcase water conservation techniques as a part of a public awareness campaign.

- Bill Hall commented that his council area of Arnold Road and South Main Street has some of the worst septic problems in the town.

- Kent Nichols read Roy Pruett's first draft of the mission statement and suggested that it would need to be revisited in the future. Kent stated that the mission statement

needs to reflect the goal of the committee and at what point is the committee's job done.

- Charlene Johnston said that all assignments from the previous meeting had been covered, except for the review of past disbursements from the Community Deveopment Block Grant. Since Brent Narkawicz was not in attendance to report on the review, it will be discussed at the next meeting.

- Charlene Johnston provided literature on South Kingstown's model. Charlene suggested that some of the literature could be used as guidance in developing Coventry's program; for instance, an informational brochure, an ordinance and an ISDS inspection report. Sheila Patnode said that she could foresee an informational brochure happening as a town-wide mailer.

- Kent Nichols explained that for our first public meeting we should present alternative options for a wastewater management plan and have a sense of cost. We should also present the background of the problem, identify our mission and get feedback from the public.

- Sheila Patnode explained that maybe we could adopt something less evasive with intentions of revisiting the plan at a later date.

- Charlene Johnston handed out packets, which explained other Rhode Island municipal wastewater management plans. Charlene asked Roy Pruett and Roger Plante if they could canvas homeowners they knew to see what options they would like included in the plan. Roy Pruett and Roger Plante will report at the next meeting.

- Kent Nichols requested that by Thursday, September 5, each member provide to Sheila Patnode two options that they would like to see included in the OWMP.

- The options will be discussed at a meeting on September 9 at 10:30. The meeting will also be used to outline and prepare for the September 12 public meeting.

Elements of a Successful OWMP
EPA Words of Wisdom

According the the U.S EPA, a successful OWMP includes the following:

- Clear and specific program goals.
- Public education and outreach.
- Technical guidelines for site evaluation, design, construction, and operation/maintenance.
- Regular system inspections, maintenance, and monitoring.
- Licensing or certification of all service providers.
- Adequate legal authority, effective enforcement mechanisms, and compliance incentives.
- Funding mechanisms.
- Adequate record management.
- Periodic program evaluations and revisions.

RI Municipalities
ISDS Requirements Beyond State Regulations

Standards Beyond State Regulations
Burrillville
Charlestown
Foster
Glocester
Narragansett
New Shoreham
North Kinstown
Portsmouth
Scituate
South Kingstown
Tiverton
Warren
West Greenwich

Management Requirements
Charlestown
Glocester
Johnston
Narragansett
New Shoreham
North Kinstown
South Kingstown

Required Use of I/A Tech.
Charlestown
New Shoreham
North Kingstown
Portsmouth

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
Charlestown[1]	(1) Subdivision --planning commission can require larger lot for safe and effective operation. (2) Setback requirements.	(1) Based on Inspection. (2) Subdivisions reviewed since 1992 deeded with pumpout requirement.	(1) Used state's 1987 "Waste Water Management District....A Starting Point" as a model.	(1) WW Mgmt. District. (2) Planning Commission Subdivision/Land Development. (3) Zoning.	(1) WW Mgmt. Comm. (2) Building/Zoning Official. (3) Town Planner.	Policy for commercial uses, schools, convention centers and multifamily dwellings within densely developed areas; special use permit; sensitive-resource setback variance
Glocester[2]	(1) Setback requirements. (2) No impermeable surfaces above leach field. (3) Certified watertight tank, effluent filter and access risers. (4) Design flow required to account for properties rented > 1 mo./yr. (5) ISDS > 2700 GPD, subdivisions or land development project may have to submit environmental report. (6) Cesspool replaced if fail/repair and in WRPA @ property sale or title transfer. (7) No installation of galley-type leaching fields. (8) Requires advanced treatment based on site conditions.	Based on Inspection.	(1) Used state's handbook for checkup. (2) Requires I&M based on Septic System Checkup. (3) Requires maintenance contracts for any system w/mechanical components. (4) Dependent on treatment levels.	(1) Zoning. (2) Wastewater Management.	(1) WW Mgmt. Board (2) Authorized designee. (3) Building/Zoning Official.	Public Education on Website
Johnston[1]	(1) Used Glocester's ordinance as model.	See Glocester.	See Glocester.	WW Mgmt. District.	?	
Narragansett[1]	(1) 3 overlay districts with special siting requirements. (2) Garbage disposals prohibited. (3) Septic tanks accessible at all times. (4) Use of septic tank additives prohibited.	Every 4 years.		(1) Zoning. (2) Utilities Code.	(1) Zoning staff. (2) Municipal staff.	May require Nitrogen reduction in coastal overlay district.

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
New Shoreham[1]	(1) Setback requirements. (2) Access risers, effluent filters, tipping D-Box by Dec. 2005. (3) Certified watertight tank in situ. (4) No installation of galley-type leaching fields. (5) Renovate cesspools & failing systems to T1/T2 level by Dec. 2005. (6) ISDS > 900 GPD, subdivisions or land development project may need water quality analysis. (7) Garbage disposals prohibited. (8) Requires water conservation.	Based on Inspection.	(1) Town inspector. (2) Prioritized by critical resource areas. (3) Routine inspection as needed based on initial inspection. (4) NOV issued for repair to failing systems.	(1) Zoning. (2) WW Mgmt. District.	(1) Sewer Commission. (2) Building official.	Locating systems and wells using GPS. Evaluating septic system computer-tracking programs.
North Kingstown[1]	Special use permits and enhanced treatment in proximity of sensitive resources.	Based on Inspection.	Inspect every 3 years by town approved inspectors.	(1) Zoning overlays. (2) WW Mgmt. District.		
South Kingstown[2]	(1) Improper discharges. (2) Garbage disposal requirements. (3) Cesspool replacement. (4) Design flow required to account for properties rented > 1 wk./yr. (5) Certified watertight tank.	Based on Inspection.	First maintenance (baseline) inspection and routine inspections.	(1) WW Mgmt. District. (2) Utilities Code.	ISDS Commission and Public Services Director assisted by Onsite Wastewater Specialist	Education & Technical Assistance

Source:

[1] Final Draft Rhode Island Municipal Septic System Standards and Programs, Prepared by Jim Riordan, RIDEM, Office of Water Resources, March 26, 2001

[2] Local regulations and ordinances.

REGULATIONS GOVERNING
THE SOUTH KINGSTOWN ONSITE WASTEWATER MANAGEMENT DISTRICT
October 15, 2001 (Rev. October 30, 2001)

SECTION 1.0 FINDINGS AND PURPOSE

South Kingstown Comprehensive Plan recognizes septic systems as a source of ground and surface water contamination in the Town, and states that the "Town shall adopt a town-wide Wastewater Management District." The South Kingstown Onsite Wastewater Management Plan approved by the Town in June of 1999 and RIDEM in October 1999 outlines a town-wide program to ensure the proper design, inspection and management of onsite sewage treatment systems. The Onsite Wastewater Management Ordinance adopted by the Town Council on October 15, 2001 provides a framework for the efficient inspection, repair and maintenance of ISDS in South Kingstown. These regulations provide the technical and administrative procedures governing implementation of the Onsite Wastewater Management Ordinance.

SECTION 2. 0 DEFINITIONS

2.1 Any term not defined herein shall be governed by the definition as it appears in the current RIDEM Rules and Regulations Establishing Minimum Standards Relating to the Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems (hereinafter ISDS Regulations) and the South Kingstown Onsite Wastewater Management Ordinance. Any other term not defined therein shall be governed by the definition as in appears in the South Kingstown Zoning Ordinance

2.2 Access Riser: A structurally sound and water tight inspection port or manhole, which at its lowest point attaches to a septic tank or other component of an ISDS and extends upward to the ground's surface, allowing visual inspection and where necessary physical access to the ISDS for the purposes of maintenance and repair.

2.3 Contaminant: Any physical, chemical, biological or radiological substance which enters the hydrological cycle through human action and may cause a deleterious effect on ground and/or surface water resources; it shall include but not be limited to hazardous waste, nutrients, pathogens and sanitary sewage.

2.4 RIDEM: The State of Rhode Island, Department of Environmental Management or its successor organization.

2.5 Director: The Director of the RI Department of Environmental Management or any subordinate(s) to whom the Director has delegated the powers and duties vested in her/him pursuant to RI General Laws, Chapters 46-12 and 42-17.1, as amended, or any other duly authorized agent.

2.6 Effluent: Sewage, water or other liquid, partially or completely treated or in its natural state, flowing out of any component of an ISDS or flowing over the ground's surface or beneath the ground in groundwater.

2.7 Enhanced Treatment Systems: Onsite wastewater treatment that uses advanced treatment technologies, which provide for enhanced removal of one or more contaminants (e.g. nutrients, microorganisms, BOD, TSS) as compared to conventional septic systems.

2.8 Groundwater Protection Overlay District (GPOD): The area defined by lots of record which are indicated as the GPOD on the official zoning map of the town of South Kingstown. The GPOD is superimposed over any other zoning district established under the Zoning Ordinance of the Town of South Kingstown. The GPOD is governed by Article 20, section 2010 Establishment of District, South Kingstown Zoning Ordinance Nov 7, 1994, as amended.

2.9 Handbook: The Rhode Island Department of Environmental Management's Septic System Check-Up: The Rhode Island Handbook for Inspection as may be amended from time to time.

2.10 Hazardous Waste: (1) Wastes which include, but are not limited to, those which are toxic, corrosive, flammable, or reactive; and/or (2) Wastes as defined in the RI Hazardous Waste Management Act, Section 23-19.1-4 or in any regulation or amendment adopted pursuant thereto; and/or (3) as defined under section 3.25 of the RI. Department of Environmental Management "Rules and Regulations for Hazardous Waste Generation, Transportation, Treatment, Storage and Disposal."

2.11 ISDS Commission: The Commission established to assist the Program Administrator or his/her designee in matters concerning the implementation and administration of this ordinance and the Onsite Wastewater Management Program.

2.12 ISDS Inspections: One of two types of ISDS inspections that may be undertaken to gather baseline information, assess maintenance needs, determine the condition of an ISDS at the point of home sale, or determine the cause of ISDS failure.

a) First Maintenance (Baseline) Inspection: The initial inspection performed on an ISDS and site to gather baseline information. All cesspools and tanks for those ISDS installed prior to 1970 are pumped as part of this inspection to better evaluate the existing condition of the system. First Maintenance Inspections involve the location of system components and more detailed data gathering that is not usually necessary for subsequent routine inspections.

b) Routine Maintenance Inspection: An inspection of an ISDS and system site to determine the need for pumping, establish future inspection schedules and to assess whether any repairs are necessary.

2.13 Maintenance: The periodic cleaning of any leaching chamber, cesspool, septic tank, building sewer, distribution lines, or any other component of an ISDS for the purpose of removing any accumulated liquid scum and/or sludge. The term "maintenance" shall also mean any regularly required servicing or replacement of related mechanical, electrical or other equipment.

2.14 Onsite Wastewater Management Program (OWMP) A town-wide program of various zoning and subdivision regulations, ordinances, educational programs, management practices and financial incentives that are designed to help protect the integrity of South Kingstown's ground and surface water through the proper management, design, siting, maintenance and installation of ISDS.

2.15 Package Treatment Plant: A modular treatment facility of State approved design and construction. For purposes of the Onsite Wastewater Management Ordinance, package treatment plants are considered ISDS.

2.16 Person: Any individual, group of individuals, firm, corporation, association, partnership, or private entity, including a district, county, city, town, or other government unit or agent thereof, and in the case of a corporation, any individual having active and general supervision of the properties of such corporation.

2.17 Wastewater: Any human or animal excremental liquid or substance, putrescible animal or vegetable matter, garbage, or filth, including the discharge of toilets, laundry tubs, washing machines, sinks, dishwashers, and the contents of septic tanks, cesspools, or privies.

2.18 Wellhead Protection Area: The critical portion of a three dimensional zone surrounding a public well or well field, through which water will move towards and reach such well or well field as designated by the Director of RIDEM or as adopted by the Town.

SECTION 3.0 ADMINISTRATION AND PROCEDURES

3.1 Program Administrator and Onsite Wastewater Specialist:

a) The Onsite Wastewater Management District shall be overseen by the Public Services Director who shall serve as Program Administrator. The Onsite Wastewater Specialist may serve as the Program Administrator's designee and is responsible for the day to day operation of the program. The duties of the Onsite Wastewater Specialist shall be in conformance with the Onsite Wastewater Management Ordinance, these regulations and the attached job description.

b) At a minimum, the person should have a demonstrated competency in the area of soils, ISDS functioning, inspection and repair procedures, including innovative and alternative technology. The Town Manager shall be responsible for hiring said individual.

c) The Onsite Wastewater Specialist shall prepare a monthly report for the Program Administrator and ISDS Commission regarding program implementation including progress and any problematic situations. It shall include such items as the status of any associated grants, consent agreements, notice of violations, number of inspections, number of retrofits, septic system repairs, and other pertinent information.

3.2 ISDS Commission:

a) The ISDS Commission shall hold a meeting at the call of the chair, vice-chair, secretary, or by the vote of a majority of its members. The ISDS Commission shall comply with the procedures of the Conservation Commission by-laws.

b) The ISDS Commission will provide guidance in the implementation of the Onsite Wastewater Management Program and associated grant and loan programs

c) The ISDS Commission will carry out its responsibilities as detailed in the Onsite Wastewater Management Ordinance.

d) The ISDS Commission will meet with ISDS owners to provide assistance on issues of onsite wastewater management including repairs to failed systems.

SECTION 4.0 INSPECTIONS

4.1 Inspection Types: The WWM Ordinance requires two types of inspections as described in the Handbook: First Maintenance (Baseline) Inspection and Routine Maintenance Inspection.

a) A First Maintenance (Baseline) Inspection of each ISDS in Town shall be conducted in order to obtain baseline information and to determine a routine maintenance schedule and potential upgrade requirements. All cesspools and those septic tanks for all ISDS installed prior to 1970 shall be pumped as part of this inspection to better evaluate the condition of the system. First Maintenance Inspections involve some data gathering and location of system components that is not usually necessary for subsequent Routine Maintenance Inspections.

b) Routine Maintenance Inspections are generally conducted after the First Maintenance (Baseline) Inspection and may occur between septic tank pump-outs. The frequency of Routine Maintenance Inspections are determined by the conditions found at the First Maintenance (Baseline) inspection. Where appropriate, Routine Maintenance Inspections for any given ISDS may be limited to sludge and scum measurements within a septic tank. A property owner, with proper training through the University of Rhode Island's Onsite Wastewater Training Center or other program approved by the ISDS Commission, may conduct Routine Maintenance Inspections on their own ISDS.

4.2 Inspection Frequency and Notification: The Wastewater Specialist shall send written notice to ISDS owners of the need to schedule the First Maintenance Inspection as well as subsequent Routine Maintenance Inspections. The owner must schedule an inspection with an approved inspector within forty-five (45) days of the date of notice. In general, inspection frequency for Routine Maintenance Inspections shall be based on the results of the First Maintenance Inspection, subsequent Routine Maintenance Inspections and procedures outlined in The Handbook. These include, but are not limited to, system age, household occupancy, tank size, sludge and scum measurements and when the system was last pumped. The Program Administrator shall send written notice to ISDS owners of the need to schedule an inspection of their septic system. This inspection must be scheduled within forty-five days of the date of notice. After a system has been inspected the owner will receive notification of the maintenance requirements and the time frame for the next inspection. The Program Administrator may send a reminder notice to the owner as the date for the next Routine Maintenance Inspection approaches.

4.3 Inspection Reports: Standard inspection forms shall be those used in The Handbook. These forms may be modified by the Program Administrator as needed to meet the technical and administrative needs of the program. The property owner shall provide the ISDS inspector with any available pertinent information, including but not limited to, the use, age, location, maintenance history and design of the ISDS. The completed inspection report shall detail the results of the inspection, pumping or other maintenance requirements, the time frame for the next inspection and/or upgrade requirements for the ISDS. The inspector shall give the property owner and the Program Administrator an inspection report that details the condition of the ISDS, including but not limited to, system components, required maintenance and the date for the next Routine Maintenance Inspection. inspection schedule and maintenance requirements. The ISDS inspector shall provide the Program Administrator and the property owner with a written copy of

the inspection report. The Program Administrator shall be responsible for maintaining ISDS inspection, maintenance and upgrade records.

4.4 ISDS Maintenance and Owner's Responsibility: The ISDS owner(s) shall assume all responsibility for hiring a septage hauler or maintenance contractor to complete the maintenance and inspection requirements contained in the ISDS inspection report within the time frame required. As proof of compliance, the property owner shall submit a receipt for pumping and other system maintenance to the Program Administrator within thirty (30) days of the date stipulated in the ISDS inspection report.

4.5 Failed ISDS: If an inspection reveals a malfunctioning or failed ISDS, the Town-approved inspector shall immediately notify the Program Administrator and the ISDS owner and send a copy of the inspection report to both parties. In the event that frequent pumping records indicate a failed system, the Program Administrator shall notify the owner in writing of a potential problem and the need for a system inspection. Technologies selected to replace failed systems shall be consistent with Town policy regarding treatment standards. At the owner's request, and in order to facilitate the ISDS repair application with RIDEM, the Program Administrator or his/her designee will meet with the owner to provide technical and administrative assistance regarding ISDS repairs. The Program Administrator may request advisory recommendations from the ISDS Commission. Such assistance shall be designed to help the owner through the application process, to understand technical issues and appropriate system choices and to solve the problem in a fair and expeditious manner. It does not preclude the owner's responsibility to hire needed professional assistance.

The Program Administrator shall give the owner of a failed system a written Notice of Violation (NOV) to repair the system. A copy of said notice shall also be sent to the Department of Environmental Management. The owner shall be given thirty (30) days to contact RIDEM and apply for a permit to repair or replace the system as necessary. A copy of the application to RIDEM shall be provided to the Program Administrator. Notification of RIDEM by the Program Administrator or his designee does not replace or preclude the obligation of the owner to notify RIDEM. The property owner shall notify the Town as to the expected timetable for repairs to be completed.

SECTION 5.0 PHASING:

The implementation of Section 7.0 of the WWM Ordinance of shall occur over a period of seven years in accordance with the map titled 'Wastewater Management Inspection Schedule', dated 6-15-01. Phasing shall begin in the Green Hill Pond watershed, and then proceed in order to the watersheds of the other coastal ponds and Narrow River, the Groundwater Protection Overlay District (GPOD) and lastly to the remainder of the Town.

The Program Administrator shall have the authority to alter the phased inspection schedule by ordering the inspection of any ISDS when it has been determined that the ISDS is in need of immediate improvements.

SECTION 6.0 EDUCATION AND TECHNICAL ASSISTANCE

6.1 Education: The Conservation Commission serving in its capacity as the ISDS Commission shall develop and oversee an annual education strategy that is designed to facilitate the effective implementation of the Onsite Wastewater Management Plan, the Onsite Wastewater Management Ordinance and related zoning and subdivision regulations. The education plan shall inform people about the findings, benefits and goals of onsite wastewater management in South Kingstown and will be on file in the Planning Department and Public Services Department. It shall include, but not be limited to the following:

- Proper inspection, operation and maintenance of ISDS.
- Operation and management framework of the program.
- Proper disposal of hazardous waste, including household hazardous waste.
- Water conservation.
- Protection of sensitive resources.
- Use of environmentally sensitive cleaning products.
- Use of alternative and innovative septic systems and associated technologies.
- Availability of financial assistance.
- Costs to homeowners to ensure compliance with WWMO provisions

The plan must be developed by May 31st each year for implementation the following fiscal year.

6.2 Technical Assistance: All persons applying to RIDEM for new ISDS installations, repairs or alterations are encouraged to meet with the Program Administrator Onsite Wastewater Specialist or the ISDS Commission prior to beginning system design in order to ensure that the design is consistent with Town policy regarding treatment standards.

SECTION 7.0 MISCELLANEOUS REGULATIONS FOR ISDS OPERATION AND SITING

7.1 Septage Disposal: Septage or contents pumped from an ISDS shall be discharged at the South Kingstown Wastewater Treatment Facility or other State-approved septage receiving facility.

7.2 Septic Tank Additives and Improper Discharges to ISDS: The use of septic tank additives shall follow RIDEM's policy, which prohibits the use of chemical additives. There is no evidence that biological additives provide any benefit to the functioning and maintenance of an ISDS. The use of biological additives does not relieve a property owner from the obligations of this ordinance. The disposal of hazardous wastes, to an ISDS shall be prohibited. Backwash from a water filtration system into a septic tank is harmful to the operation of the ISDS and is best discharged to a separate infiltration line. There shall be no discharge of rainspouts, basement sumps, floor drains, or any other drains, other than those carrying household wastewater, to an ISDS.

7.3 Garbage Disposal: Garbage disposal discharges to a new ISDS shall be permitted only on systems that are equipped with an oversized tank, capable of handling the excess solids, and with an effluent filter located on the tank's outlet. ISDS with existing garbage disposals may require more frequent pumping.

7.4 Water Saving Devices: Water saving devices shall be required on all appropriate fixtures as per the RI State Building Code, including 1.5 gallon flush toilets on new or remodeled construction.

7.5 Occupancy and Use: In order to ensure proper treatment of effluent functioning of an ISDS must be sized to handle the number of persons living in the house the occupancy or use of the house should not exceed the capacity of the system as calculated using the RIDEM standards. This includes properties that are rented in excess of 1 week per year.

7.6 Accessibility, Effluent Filters and Inspection Ports: It is recommended that all ISDS that presently have no access risers be equipped with three access risers to grade located at the inlet, center and outlet of the septic tank and an effluent filter be installed at the outlet end of the septic tank. It is recommended that all ISDS that have only an existing center access riser be equipped with access risers at the inlet and outlet ends of the septic tank and an effluent filter be installed at the outlet end of the septic tank. Access risers shall be watertight and should be consistent with State standards. These measures will help locate ISDS, facilitate the inspection and pumping of a septic tank and ultimately the longevity of the ISDS. The ISDS Commission and Program Administrator will provide technical information and support regarding the installation of these structures on both new and existing ISDS.

7.7 Watertight Septic Tanks: Per RIDEM regulations, any existing tank that leaks may be declared a failed system. All septic tanks installed after the effective date of the ordinance shall be certified watertight in accordance with ASTM minimum standards or those developed by the ISDS Commission. Tank installation must be done in accordance with manufacturer's requirements. In addition, tanks installed after the effective date of the ordinance must be site tested to ensure that they are watertight. The accepted procedure(s) for site testing tanks as watertight shall be available from the South Kingstown Public Services Department.

7.8 Cesspools: Cesspools are a sub-standard and inadequate means of on-site wastewater treatment. All cesspools are considered to be malfunctioning systems and shall be replaced with an onsite wastewater system which conforms with current state and local standards within 12 months after the sale of a property or within five years of the date of the First Maintenance (Baseline) Inspection, whichever date comes first.

A property owner may request, in writing, a review by the Public Services Director for an alternative to replacing a cesspool. Upon receipt of the request, the Public Services Director shall endeavor to work out with the property owner an economically feasible plan to bring the onsite wastewater system into compliance with state and local standards, which alternative may include an extension of time in which to comply with this section, the imposition of interim measures that ensures the protection of the environment and the public health, safety and welfare, and/or a remediation plan. The Public Services Director may request an advisory opinion from the ISDS Commission regarding these matters. The Public Services Director may allow an alternative to replacing a cesspool upon a finding that all of the following standards are satisfied:

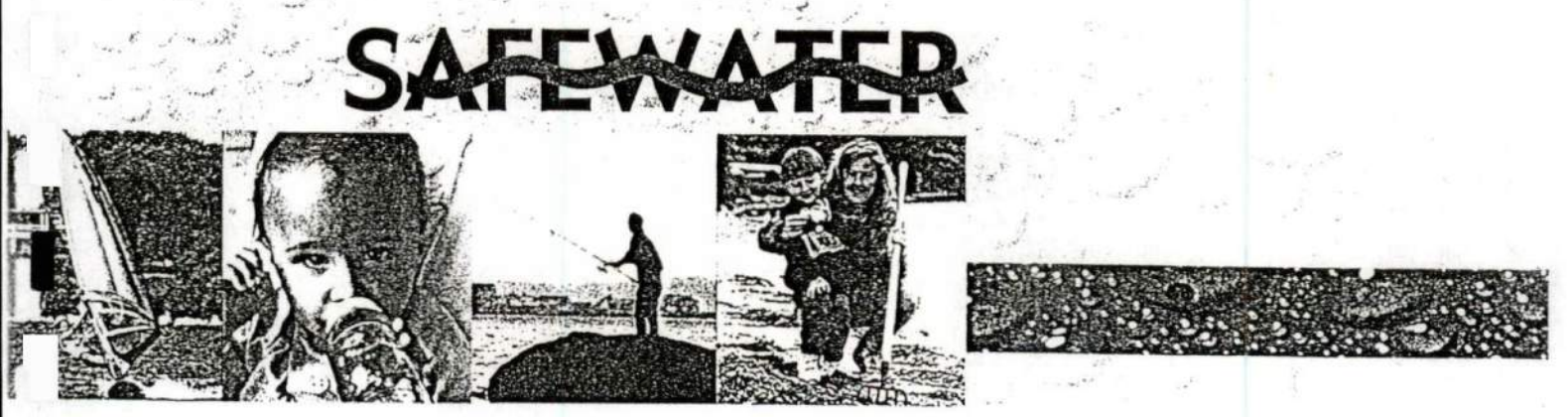
(a) requiring the replacement of the cesspool in strict conformance with this section would be economically infeasible, considering all the relevant facts and circumstances of the individual case; and,
(b) the system does not present an immediate public health and/or environmental threat; and,

(c) the alternative system provides a level of environmental protection that is at least equivalent to that required by RIDEM.

The decision of the Public Services Director shall be in writing and shall state specific reasons for the denial or approval.

IMPORTANT NOTICE ABOUT YOUR SEPTIC SYSTEM

What South Kingstown residents should know about the onsite wastewater management ordinance and regulations



FACTS ABOUT YOUR DRINKING WATER

- *All South Kingstown residents depend on groundwater as the only source of drinking water.*
- *60% of residents use septic systems*
- *About 40% of septic systems predate 1970 State standards and may be substandard.*
- *Private wells have been contaminated and many residents have less than full use of their properties due to failing septic systems.*
- *Portions of our ponds are closed to shell fishing and the trend is towards declining quality. Pollution from runoff and failed septic systems is considered responsible.*

What will happen

1. Upon receiving a notice, you have forty-five days to schedule an inspection with a Town Approved Inspector from the date of the notice.
2. To prepare for the inspection, collect any information about the system and past maintenance, and if possible locate and uncover the system yourself to lower costs.
3. If you have a cesspool or a system installed before 1970, you must have a pump out during the First Maintenance Inspection. If your system was installed after 1970 a pump out is recommended but not mandatory.
4. The Inspector will follow procedures set forth in the RI DEM Inspection Handbook.
5. The Inspector will complete a report that describes the system, identifies maintenance requirements, and recommends a schedule for the next inspection and pump out.
6. The Inspector will submit the inspection report to the Town. The Town will review the inspection results, and send you a reminder before your next inspection and pump out is due.

What's Required After the Inspection

FUNCTIONING SEPTIC SYSTEM IN GOOD CONDITION

- You will get a reminder of the next inspection and pump out date from the Town.

FUNCTIONING SEPTIC SYSTEM THAT NEEDS PUMPING

- The Inspector will give you a copy of the inspection report stating the date you must have your septic system pumped. *(continues on back)*

special thanks to photographers: Vic Dvorak, Jim McElholm and Cindy Horowitz Wilson

The Town of South Kingstown requires homeowners to have their septic systems inspected and maintained on a regular basis. Failing systems will need to be repaired. Inspections will be phased in over seven years.

- You must get the pumping completed and submit a receipt to the Town within thirty days of notice.
- You will get a reminder of the next inspection and pump out date.

SEPTIC SYSTEM NEEDING MAINTENANCE OR REPAIR

- The Inspector will give you a copy of the inspection report, listing the maintenance or repairs needed.
- The Town will issue a notice of violation informing you to repair or replace your system.
- You must submit proof that action has been taken within thirty days of notice.
- You will get a reminder of your next inspection and pump out date.

FUNCTIONING CESSPOOL

- By ordinance, all cesspools must be replaced within 5 years of First Inspection or within 12 months of property sale.
- After replacing your cesspool, you need to submit a copy of the certificate of construction from you installer as proof of completion of the system
- You will get a reminder of the next inspection and pump out date.

FAILED SEPTIC SYSTEM OR CESSPOOL WITH IMMEDIATE THREAT TO PUBLIC HEATH OR ENVIRONMENT

- The Town will issue you a notice of violation.
- You must submit an application for system repair or replacement to RI DEM within 30 days.
- You must repair or replace the system within 12 months of notice of the failed system and submit to the Town the application for repair or replacement and the date of installation of the system.
- Technical assistance to select the most appropriate repair or replacement system for you site is available.

Upgrades for Septic Tanks – highly recommended but not required

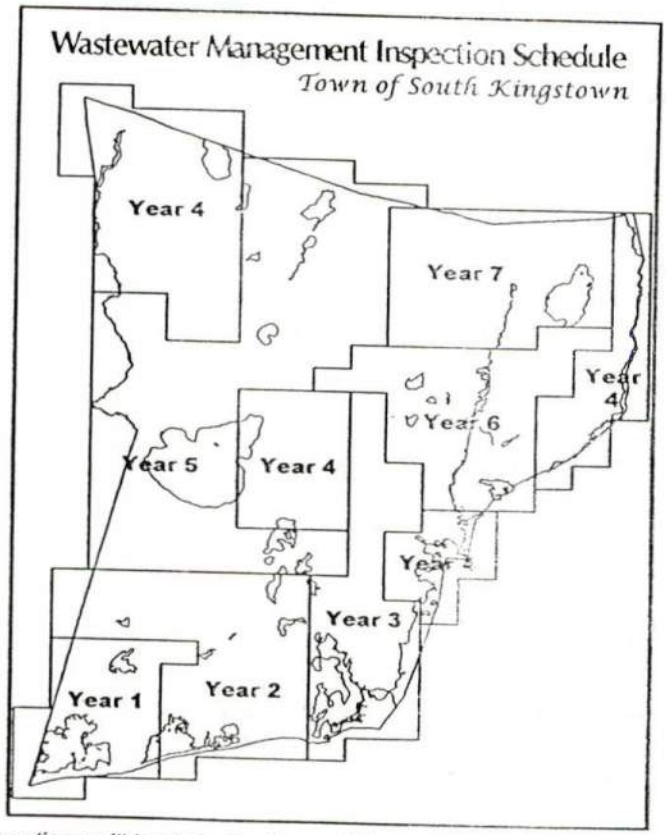
Consider installing access risers to simplify future inspections and reduce inspection costs.
An effluent filter helps keep solids in the tank and prevents drainfield clogging.
Specifications for risers and tank retrofitting are available from the Town.
Only functioning tanks should be retrofitted with risers. Failing tanks must be replaced.

Financial Assistance to Residents

Low interest (4%) loans for system repair/upgrade
Aid locating hard-to-find tanks is available.

More Information is Available

Financial and technical assistance
Inspection schedule map with plat/lots
List of approved inspectors
Wastewater management program fact sheets



Inspections will begin in the Green Hill area in Year 1 during 2002.

CONTACT THE SOUTH KINGSTOWN ONSITE WASTEWATER OFFICE
Tel: 401-789-9331 ext 263
Hours: Wed. 1:00-4:30, Thurs. and Fri. 8:30-4:30
Or go to: www.uri.edu/ce/wq/bighp.html

This project funded by the U.S.EPA Block Island and Green Hill Pond Watershed National Wastewater Treatment Demonstration Project. Technical assistance and training provided by URI Cooperative Extension.

WASTEWATER MANAGEMENT

ABOUT THE WASTEWATER MANAGEMENT BOARD

Glocester's Wastewater Management Board was established in 1999 to administer the Town's "*Waste Water Management District Ordinance*." The Ordinance addresses concerns about proper wastewater disposal in the town. As part of its charge the Board must prepare rules and regulations to carry out this ordinance.

Glocester's Wastewater Management Board Rules and Regulations are available online for viewing and printing. Because they are posted as Adobe pdf* files, you may need to download the Adobe Acrobat Reader in order to view and print the documents.

Download Rules & Regs

Glocester's Wastewater Management Board Rules & Regulations in PDF - 64 KB

Get Acrobat Reader

The ordinance and its rules and regulations are designed to assist town residents in managing wastewater disposal in an environmentally sound, cost effective manner over the long term. Glocester's Town Council in 1998 established as a standard policy of the Town that:

> *"Individual Sewage Disposal System on-site handling of wastewater shall be the first and main method of wastewater disposal. To that end the Waste Water Management District will establish a program to provide technical assistance, financial assistance, and necessary enforcement of safe and effective Individual Sewage Disposal Systems to the property owners of the Town of Glocester."*

The ordinance and its rules and regulations consider waste water management alternatives such as innovative septic systems, system maintenance, home owner education, on-site treatment (individual and community), subsurface disposal, and as a last resort, sewer connections to surrounding communities.

What are the advantages of Glocester having such an ordinance? First, the Town can now apply for federal or state funding to assist homeowners with solving wastewater disposal problems. Second,

Town Council
Boards & Commiss
Building & Zoning C
Finance Departme
Planning Departme
Public Works Depart
Recreation Departm
School Departme
Other Offices

MEETINGS

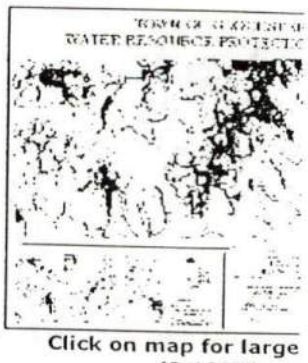
2nd Wednesday of the
7:30 PM
Glocester Town Ha
1145 Putnam Pike
Chepachet, RI

Notice of all meetings shall b
at the Town Hall at least 48 h
before the meeting date. Thi
shall include the date and tin
the date, time, and place of
and a statement specifying t
of the business to be discuss

For interpreter service for th
impaired, call 401-568-6206
than 72 hours in advance of
date. TDD 401-568-1422.

**WATER RESOURC
PROTECTION AREA**

Wastewater Management Districts have more control over the approval process for new and repaired septic systems, rather than leaving this control up to the state. It can also promote the installation of alternative and innovative individual sewage disposal systems, as well as providing technical and financial assistance to homeowners which are more in tune with Glocester's unique environmental conditions.



Click on map for large (2,185K)

*** What is PDF?**

PDF is an acronym for "Portable Document Format." It's a file format created by Adobe that lets you view and print a file exactly as the author designed it, without needing to have the same application or fonts used to create the file. Since its introduction in 1993, PDF has become an Internet standard for electronic distribution that faithfully preserves the look and feel of the original document complete with fonts, colors, images, and layout.

MANAGING YOUR WASTEWATER DISPOSAL SYSTEM

♦ Why Maintaining Your Septic System is Important!

There are three good reasons for maintaining your septic system:

1. For Your Health

If your septic system is working properly, it's doing its job of keeping you and your neigh healthy.

If it's not, it can pollute your drinking water well, or that of your neighbor, and can carry and destructive nutrients to Glocester's lakes and ponds.

Many diseases, such as hepatitis, dysentery, typhoid, and gastroenteritis can be contract drinking polluted water contaminated by bacteria and viruses in wastewater from an imp sited, installed, or maintained septic system.

2. For Glocester's Environment

Glocester's clean and healthy environment is why all of us live in the town. We all enjoy the clean water the town's environment provides for drinking, fishing, and swimming. Wa pollution robs us of all these uses.

Sewage containing nutrients reaching a water body can over-fertilize aquatic plants. The die, turning the water brown and murky with a rotten egg smell, and choking off the wat oxygen supply, thus killing the fish.

The same sewage reaching ground water pollutes our wells with bacteria and viruses whi make us ill or affect taste and odor, thus making our drinking water unfit.

In a properly operating system, wastewater from your house enters a septic tank where solids settle out and grease and oils rise to the top. Naturally-present bacteria help deco solid organic matter, while liquids flow out through a pipe into a leach field and pass into which removes bacteria and viruses from the wastewater.

An essential step in keeping a septic system operating properly is to have the tank pump regularly. Systems fail because solids and scum build up in the tank, then enter and clog

pipes or the soil.

3. For Your Wallet

Repairing or replacing a failed septic system is costly. The cost to replace a leachfield or parts of your system can range from $3,000 to over $12,000. If the entire system must replaced the cost can be much higher.

What does maintenance pumping of your system cost? On average it costs about $150 e

How often should a properly functioning system be pumped for maintenance purposes? (three years is a standard recommendation; however, it may be more or less frequently c upon your individual system.

Proper maintenance is much less costly than the national yearly average of $260 for mur sewer service and its initial hook-up fees which may range from $2,000 to $5,000 or higl each home. These costs may not include the extra burden each homeowner may have to install sewers in the street to hook into.

Regular inspection, pumping and a few common sense tips will keep a septic system wor properly.

♦ How Do I Know If My Septic System is Failing?

It usually isn't hard to tell. A problem-free septic system should work all year long, not cause s back-up in the house, not cause a noticeable odor outside, and not stain the lawn. If your back wet, soggy and smelly in the spring, you have a failed system. If you suddenly find it necessar out the septic tank frequently, say every three to six months, you probably have a failed syste preventive maintenance includes pumping your septic tank once every three to five years to re accumulated solids and grease. If you have ignored this regular maintenance and the system h become plugged or clogged and now needs pumping, it's too late ... you have a failed system t requires repair.

♦ How Can I Maintain My Septic System?

- Know where your system is located. Keep your system's approved plans in a handy and s for reference.
- Know the location of your septic tank cover. Be sure it is in good repair - not cracked or l
- Install a service riser on the tank. This will mark the system location and provide access service.
- Do not disturb the soil in the area of the leachfield.
- Do not allow vehicles to park or drive over the system, especially the leachfield! Their we crush the piping or disposal trenches.
- Do not place an above-ground swimming pool, gym set, shrubs or trees over the leachfie
- Do not pour toxic household chemicals down the drain. Chemicals such as general cleane and toilet cleaners, spot removers, solvents, furniture and silver polishes, pesticides, anc are very persistent in ground water and can travel great distances.
- Do not use septic system cleaners. Chemical additives are illegal and can cause severe d the system as well as contaminating well water. Biological cleaners liquify solids into sma which are known to clog the leachfield.
- Do not flush solids such as disposable diapers, sanitary napkins, tampons or cigarette bu hair down the drain. They do not decompose and will plug the system.
- Do not dispose of grease and oils, including cooking oil, down the drain.

- Do not put pesticides, medicines, paint, paint thinners, disinfectants of any type, or mot down the drain. These will kill beneficial bacteria which operate in your septic system.
- Use a garbage disposal sparingly or, better yet, not at all. It can overload the system wit matter.
- Pour boiling water down your drains weekly.
- Use a mix of one cup baking soda, one cup salt, and one cup white vinegar to unplug a d the mixture into the drain, and after 15 minutes pour in boiling water.
- To clean fixtures use baking soda and vinegar instead of toxic household cleaners. Use p bleach or ½ cup of baking soda instead of chlorine bleach which kills good bacteria.
- Use less water so solids are retained longer and bacteria can work better. Install water s devices, don't flush the toilet after every use, run dishwashers and washing machines on full. Space water use tasks to avoid peak flow times.
- Be sure that the leachfield is graded to prevent surface water from rain and snow, roof d road runoff from collecting over or near the system.

Glocester Town Hall • 1145 Putnam Pike - PO Box B • Chepachet, RI 02814-0702
Tel: 401.568.6206 • Fax: 401.568.5850 • info@GlocesterRI.org
Hours 8:00 AM - 4:30 PM

Meeting Minutes
Coventry Onsite Wastewater Management Plan
September 9, 2002

- Attendees

Citizen Representatives
Roy Pruett
Roger Plante
Arnold Blasbalg
Coventry Staff
Sheila Patnode DPW Director
Weston and Sampson Engineers, Inc.
Kent Nichols Project Manager
Charlene Johnson Senior Engineer

- Sheila Patnode began the meeting by stating that the September 12, 2002, Public Hearing was placed in the Pawtuxet Valley Daily Times and the Westbay section of the Providence Journal. She also mentioned that a notice was placed on the town's public library website.

- Roger Plante contacted D and L septic and Ray Plante septic to get feedback. Roger found that the septic hauler's felt that West Warwick had artificially high septic rates of 7.5 cents per gallon. This forced local septic haulers to go to other treatment facilities.

- Roy Pruett also called six other septic haulers but only two returned messages. Paul Bedard, owner of Modern Septic stated that they hauled septic to the Narragansett Bay Commission for 4.4 cents per gallon. Paul Bedard, owner of Modern Cesspool reported that the majority of septic cleaning was general maintenance, with some failing systems. Sections of Wood Estates had a number of failing systems but over recent years homeowners were repairing or replacing failed systems. Johnson Pond area had a high occurrence of undersized and or failing systems at the present time. Modern Cesspool, being a local business disposes of approximately 20-30,000 gallons of septic discharge a month with approximately 15,000 gallons from Coventry. Mr. Bedard reports that spring and fall are the busiest times of the year. The Narragansett Bay Commission accept residential discharge at a rate of 4.4 cents a gallon/$44.00 a thousand gallons. Commercial septic and grease traps must be brought to the Cranston treatment facility. Also, Paul Bedard has 15 years experience working for Scituate Cesspool before starting his own business 3 years ago. Mr. Bedard would like to see Coventry adopt a policy similar to North Kingston where homeowners are required bi-annual cleanings. John Sliney, owner of Rhode Island Cesspool showed a concern that every time he goes out to a job, he finds himself having to educate homeowners about maintaining their system. The homeowners seem to think Mr. Sliney is just trying to sell them a product. Homeowners feel they

don't need the septic tanks cleaned on a regular basis. John told me that the Tiogue Ave, from Hopkins Hill to Pilgram Ave. has the highest rates of septic system failure. He would like to see the town do something more about educating the homeowner. He also finds that people from Cranston and Warwick moving into Coventry, that never had an ISDS just don't know what they need to do. Mr Sliney didn't provide me with prices per gallon but he advised me he hauls his septic to either Cranston or Lincoln, if they can take it. Sometimes he brings it to Carver, Mass. He also stated that Cranston is the only facility that accepts grease traps.

- Arnold Blasbalg reflected a concern in the Wood Estates area that people walk their dogs in the neighborhood, the people would pick up after their pet. Then they would place it into a plastic bag, then throw it down the storm drain grate, which would then be carried by the next rain fall to Johnson's Pond. This practice could be a potential fecal coliform contaminant to the pond. Arnold also stated that one resident takes his boat on the pond to fish out the plastic bags.

- Kent Nichols brought up the idea of hitting on Roger Plante's contribution of having area real estate agents hand out an owner's manual to your septic system with every house sold. Many people moving into Coventry from Warwick and Cranston who never had septic systems before and just don't know what to do.

- Charlene Johnson told the group that Coventry's planning section on the town web site has a section titled "Frequently asked questions" and there are a few questions regarding septic systems. Charlene suggested that the new website, that Sheila Patnode is planning, have links to DEM's Water Resource Department's website and URI's wastewater management web site. This would minimize duplicating efforts.

- Roger Plante reported that every library in state has received a copy of the Master Gardener's book "Home Access System." Additional copies are available for the cost of $8.00.

- Charlene Johnson presented a preliminary draft of a PowerPoint presentation intended for the public hearing on September 12 at 7:00pm in the auditorium at Washington Oak Middle School. While going through the presentation, Charlene asked the Committee for any additional problem areas that were not showing up on the Facilities Plan. Arnold Blasbalg said that he was surprised that nobody was speaking about Johnson Pond. The group agreed that small lots along Johnson Pond should be included.

TOWN OF COVENTRY
P.O. Box [illegible]
Tel. (401) [illegible] FAX (401) [illegible]
E-Mail: [illegible]@town.coventry.ri.us

September 6, 2002

Coventry Reminder
1049 Main Street
Coventry, RI 02816

ATTENTION: Amy Tilley

Please advertise the following during the week of September 9, 2002.

NOTICE OF PUBLIC HEARING

The Town of Coventry will host a public hearing regarding the development of an Onsite Wastewater Management Plan on Thursday, September 12th at 7:00 pm at the Coventry Middle School Auditorium, 1675 Flat River Road, Coventry (across from the Town Hall.) All persons interested in on-site wastewater management, groundwater and surface water protection are invited to give input to the OWM Committee.


NOTICE OF PUBLIC HEARING

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Robert H. Johnson, CMC
Town Clerk
9/9/2002

Roberta H. Johnson, CMC
Roberta H. Johnson, CMC
Town Clerk

PD 9/25/02
$69.35

Notice of Public Hearing

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Meeting Minutes Public Hearing
Coventry Onsite Wastewater Management Plan
September 12, 2002

- Attendees

Citizen Representatives

Roy Pruett	
Roger Plante	

Coventry Staff

Sheila Patnode	DPW Director
William Hall	Town Council

Weston and Sampson Engineers, Inc

Kent Nichols	Project Manager
Charlene Johnson	Senior Engineer

Public Attendee

Brian Manning	Pawtuxet River Authority

- Sheila Patnode asked those in attendance to reserve any questions for the end of the presentation.

- Kent Nichols and Charlene Johnson presented the PowerPoint presentation describing Coventry's strategic plan for onsite wastewater management. A copy of the presentation is attached.

- Brian Manning from the Pawtuxet River Authority stressed a big concern over KCWA drilling another well in Mishnock swamp and what the effect will be ground water.

- Kent Nichols would like to contact Mike Roberts at the West Warwick sewer treatment plant to ask why are their septic rates are so high.

Coventry, Rhode Island

Onsite Wastewater Management Plan

Public Meeting

September 12, 2002

Weston & Sampson Engineers

Meeting Participants

- **Coventry Staff**
  - ✓ Sheila Patnode, Department of Public Works Director
  - ✓ Brent Narkawicz, Director of Planning & Development
- **Citizen Representatives**
  - ✓ Roy Pruett
  - ✓ Roger Plante
  - ✓ Arnold Blasbalg
- **Coventry Town Council**
  - ✓ William Hall
- **Weston & Sampson Engineers, Inc.**
  - ✓ Kent Nichols, Project Manager
  - ✓ Charlene Johnston, Senior Engineer

Objectives of Tonight's Meeting

- Define terms.
- Review Coventry's history of wastewater planning.
- Present Onsite Wastewater Management Program Options.
- Present and discuss the Committee's DRAFT OWMP.

Definitions

- **Onsite Wastewater Management Plan (OWMP)**
  - A plan that establishes a set of management objectives and activities to protect human health and the environment from wastewater contamination from an ISDS.
- **Individual Sewage Disposal System (ISDS)**
  - Any system designed to convey, store, treat and/or dispose of sewage by means other than public sewer.
- **Department of Environmental Management (DEM)**

Definitions

- **Cesspool**
  - Buried chamber that collects solids and discharges liquids to surrounding soils.
  - DEM considers a substandard method.
- **Conventional system**
  - Traditional ISDS with septic tank, pump chamber or distribution box, and a leach field.
- **Alternative/Innovative/Enhanced system**
  - Any ISDS not meeting location, design or construction requirements as provided by DEM, but has been demonstrated to comply with performance standards.

Project History

- 99% of Coventry properties are unsewered.
- Previous planning recommends sewer for much of eastern portion of town.
- 1995, DEM approved Coventry's Wastewater Facilities Plan.

Weston & Sampson Engineers

N

LEGEND:

- EXTREMELY HIGH NUMBER OF PROBLEMS (1 OR 2 OR 3 SYSTEMS FAILING)
- HIGH NUMBER OF PROBLEMS (1 OR 4 OR 5 SYSTEMS FAILING)
- MODERATE NUMBER OF PROBLEMS (1 OR 8 OR 10 SYSTEMS FAILING)
- PROBLEM AREAS IDENTIFIED BY COVENTRY WATER QUALITY TASK FORCE
- DIRECT DISCHARGE IDENTIFIED BY RI-DEM

NOTE:

BASEMAP SOURCE: RIGIS

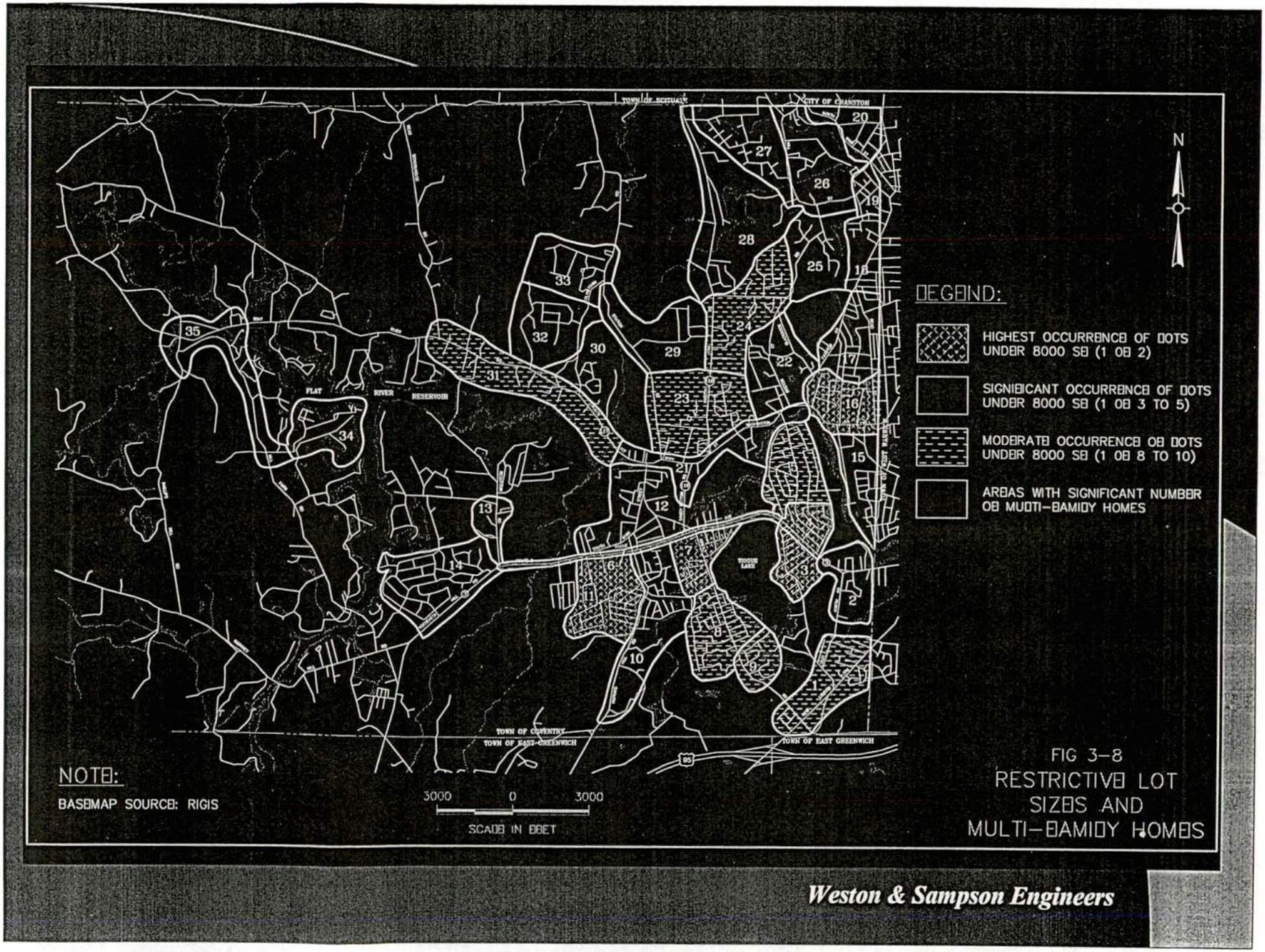
3000 0 3000

SCALE IN FEET

FIG 3-5

ISDS PROBLEM AREAS & DIRECT DISCHARGES

Weston & Sampson Engineers


TOWN OF SCITUATE
CITY OF CRANSTON
FLAT RIVER RESERVOIR
TOWN OF COVENTRY
TOWN OF EAST GREENWICH
TOWN OF EAST GREENWICH
WOOD LAKE
N
LEGEND:
HIGHEST OCCURRENCE OF DOTS UNDER 8000 SF (1 OF 2)
SIGNIFICANT OCCURRENCE OF DOTS UNDER 8000 SF (1 OF 3 TO 5)
MODERATE OCCURRENCE OF DOTS UNDER 8000 SF (1 OF 8 TO 10)
AREAS WITH SIGNIFICANT NUMBER OF MULTI-FAMILY HOMES
NOTE:
BASEMAP SOURCE: RIGIS
3000 0 3000
SCALE IN FEET
FIG 3-8
RESTRICTIVE LOT SIZES AND MULTI-FAMILY HOMES
Weston & Sampson Engineers

N

LEGEND:

CRITICAL CONDITIONS FOR ISDS USE

VERY POOR CONDITIONS FOR ISDS USE

POOR CONDITIONS FOR ISDS USE

NOTE:

BASEMAP SOURCE: RIGIS

3000 0 3000

SCALE IN FEET

FIG 3-9

EXISTING ISDS CONDITIONS

Weston & Sampson Engineers

N

LEGEND:

- PHASE 1 – INITIAL SEWER CONSTRUCTION PROGRAM
- PHASE 2 – CONTINUING SEWER CONSTRUCTION PROGRAM
- PHASE 3 – FUTURE SEWER CONSTRUCTION PROGRAM
- 1995 FACILITY PLAN AREAS REMOVED FROM FUTURE SEWER CONSTRUCTION PROGRAM

NOTE:

BASEMAP SOURCE: RIGIS

FIGURE EPU-1

TOWN OF COVENTRY, RI

FACILITY PLAN UPDATE – 2002

RECOMMENDED PLAN FOR SEWER CONSTRUCTION

DESIGNED BY: JDM	CHECKED BY: KMN	DATE: AUGUST 30, 2002

WESTON & SAMPSON ENGINEERS, INC.

Weston & Sampson Engineers

Project History (Continued)

- Sewer bond referendum failed.
- DEM offers RI towns grants for developing OWMP.
- Coventry submits grant application.
- $25,000 DEM Grant received for OWMP.

DEM Grant Requirements

- Establish a Committee.
- Hold 3 Public Meetings.
- Provide DEM with a DRAFT OWMP for review and comment.
- Provide DEM with a final OWMP for approval.
- Receive Town Council resolution.
- Get CSSLP approval.

Community Septic System Loan Program

- Provides low-interest loans for septic system upgrades.
- Administered by DEM and Rhode Island Housing & Mortgage Finance Corp.
- DEM approved OWMP must be in place to qualify.
- To date, the Agency has given Charlestown a CSSLP of $255,000.

Weston & Sampson Engineers

Committee Mission Statement

The Town of Coventry remains committed to the health and well being of its residents and their environment. Currently, 99% of town residents rely upon individual sewage disposal systems. Preventing contaminates from reaching our groundwater is a far easier task than cleaning up contaminated groundwater. The development of an Onsite Wastewater Management Plan will minimize wastewater contamination and ensure the health of future generations residing in Coventry.

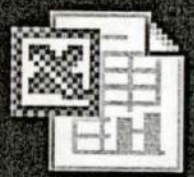
The Committee will continue to serve until the adoption of the OWMP or until Town Council votes that the mission of the Committee is complete.

Weston & Sampson Engineers

Model EPA Onsite Wastewater Management Program Options

Program	Objectives	Benefits
1. System Inventory and Awareness	Inventory; ensure sited and installed properly, inspected, maintained and repaired as necessary; and periodically provide owners with O&M info.	Easy/inexpensive. Not much resistance.
2. Mgmt thru Maintainence Contracts	Maintenance contract required on Alternative Systems to assure timely response.	Reduces risk of failure and contamination from failure.
3. Mgmt thru Operating Permits	Establish specific & measureable performance requirements, renewable operating permits and monitoring with maintenance agreements	Enforces mgmt of systems. Reduces risk of failure and contamination.
4. Utility O & M	O&M through a professional utility.	O&M performed regularly. Problems ID'd before failure. Reduces burden on local gov't.
5. Utility Ownership & Mgmt	Ownership and O&M thru pro. utility.	Reduce risk of system failure. Allows area-wide planning. Avoids conflict.

Weston & Sampson Engineers



Microsoft Excel
Worksheet

Weston & Sampson Engineers

Coventry's DRAFT OWM Plan

- Level 1
  - ✓Town: Provide ISDS guidance to property owners.
  - ✓Town: Inventory ISDS on GIS layer.
  - ✓Town: Provide incentives for ISDS pump outs/inspections.
  - ✓Town: Match money to leverage ISDS funds through State programs.

Coventry's DRAFT OWM Plan

- Level 2
  - ✓ Property Owner: Required to secure maintenance agreements for alternative systems or conventional systems with mechanical components.

Coventry's DRAFT OWM Plan

- Level 3
  - ✓ Town: Establish Onsite Wastewater Management Districts.
  - ✓ Property Owner: Within management district, Required to get ISDS inspections.

THANK YOU!

- Your interest, cooperation and understanding are appreciated!
- Your support of improvements at future annual town meetings is encouraged.
- Let's talk about your specific concerns.

Weston & Sampson Engineers

Meeting Minutes

Coventry Onsite Wastewater Management Plan
September 20, 2002

- Attendees

Citizen Representatives
Roger Plante
Roy Pruett
Coventry Staff

Sheila Patnode	DPW Director

Weston and Sampson Engineers, Inc.

Kent Nichols	Project Manager
Charlene Johnson	Senior Engineer

- Charlene Johnston handed out a preliminary draft OWMP. She stated that she talked to Betsy Dake, Coventry's contact for the Nonpoint Source Program, to discuss where Coventry is at in the OWMP process. Charlene told Ms. Dake that, despite multiple advertisement locations, there had only been one attendee from the public at our public meeting on September 12, 2002. Ms. Dake said that other communities had been having similar problems with attendance.

- Charlene Johnston stated that she had spoken with Tony Simione at the Clean Water Finance Agency regarding the CSSLP process. Charlene described how the loan program works.

- Sheila Patnode stated that Quidnick Reservoir is one of the best quality bodies of water in Coventry but has elevated levels of mercury. Quidnick Reservoir is used to maintain water levels in the Pawtuxet River.

- There was a general consensus among the committee as to where on the map does Johnson Pond end and where does Flat River Reservoir begin. Sheila Patnode told the committee that Johnson Pond is in fact part of Flat River Reservoir.

- Charlene Johnson made suggestions as to what else Coventry could do as part of the OWMP. She suggested the town could hold a septic system workshop for town residents as an educational forum, much like other towns hold well water workshops.

- Sheila Patnode asked "why couldn't septic haulers send out post cards with the individual's next septic pumping date as a reminder." Dentists and eye doctors perform this service. The Committee agreed that it was worth mentioning if haulers showed up at the public meeting.

- Kent Nichols suggested a possible coalition between surrounding towns to educate the public on septic systems.

- Charlene Johnson suggested the possibility of a public service ad placed in the newspaper itemizing the 5 steps to septic maintenance.

- Kent Nichols wants to contact West Warwick Treatment facility and ask them why it costs 7.5 cents a gallon to accept Coventry septage.

- Roy Pruett and Roger Plante volunteered to contact local septic haulers and invite them to the public hearing on October 2, 2002 at 7:00 pm at Quidnick School.

TOWN OF COVENTRY

RESOLUTION

OF THE

TOWN COUNCIL

NO. 90-02-2190

BE IT RESOLVED by the Town Council of the Town of Coventry that the Onsite Wastewater Management Plan developed by Weston and Sampson Engineers under a Contract awarded by the Town Council (#30-02-3130) and the members of the Citizen's Advisory Committee be adopted and forwarded to the Department of Environmental Management for approval. Said Plan is intended to assist Coventry in implementing programs designed to support efforts to abate on point source pollution.

PASSED AND ADOPTED this 7th day of October 2002.

APPROVED Kevin D. McGinn
Council President

ATTEST: Robert H. Johnson, CMC
Town Clerk

Coventry, Rhode Island

Onsite Wastewater Management Plan

Town Council Meeting

September 23, 2002

Weston & Sampson Engineers

Meeting Participants

- Coventry Staff
  - ✓ Sheila Patnode, Department of Public Works Director
  - ✓ Brent Narkawicz, Director of Planning & Development
- Citizen Representatives
  - ✓ Roy Pruett
  - ✓ Roger Plante
  - ✓ Arnold Blasbalg
- Coventry Town Council
  - ✓ William Hall
- Weston & Sampson Engineers, Inc.
  - ✓ Kent Nichols, Project Manager
  - ✓ Charlene Johnston, Senior Engineer

Weston & Sampson Engineers

Objectives of Tonight's Meeting

- Define terms.
- Review Coventry's history of wastewater planning.
- Present Onsite Wastewater Management Program Options.
- Present and discuss the Committee's DRAFT OWMP.

Weston & Sampson Engineers

Definitions

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- Individual Sewage Disposal System (ISDS)
  - Any system designed to convey, store, treat and/or dispose of sewage by means other than public sewer.

Weston & Sampson Engineers

Definitions

- Cesspool
  - Buried chamber that collects solids and discharges liquids to surrounding soils.
  - DEM considers method substandard.
- Conventional system
  - Traditional ISDS with septic tank, pump chamber or distribution box, and a leach field.
- Alternative/Innovative/Enhanced system
  - Any ISDS not meeting location, design or construction requirements as provided by DEM, but has been demonstrated to comply with performance standards.

Weston & Sampson Engineers

Project History

- 99% of Coventry properties are unsewered.
- Previous planning recommends sewer for much of eastern portion of town.
- 1995, Department of Environmental Management approved Coventry's Wastewater Facilities Plan.

Weston & Sampson Engineers

Project History (Continued)

- Sewer bond referendum failed.
- DEM offers RI towns grants for developing OWMP.
- Coventry submits grant application.
- $25,000 DEM Grant received for OWMP.

Weston & Sampson Engineers

DEM Grant Requirements

- Establish a Committee.
- Hold 3 Public Meetings.
- Provide DEM with a DRAFT OWMP for review and comment.
- Provide DEM with a final OWMP for approval.
- Receive Town Council resolution.
- Get CSSLP approval.

Weston & Sampson Engineers

Community Septic System Loan Program

- 0% interest loan provided to the town with 4% loans provided to property owners.
- DEM approved OWMP.
- CSSLP Loans of $250,000-$300,000 to the following communities:
  - Charlestown, Glocester, New Shoreham, So. Kingstown and No. Kingstown.

Weston & Sampson Engineers

CSSLP Process

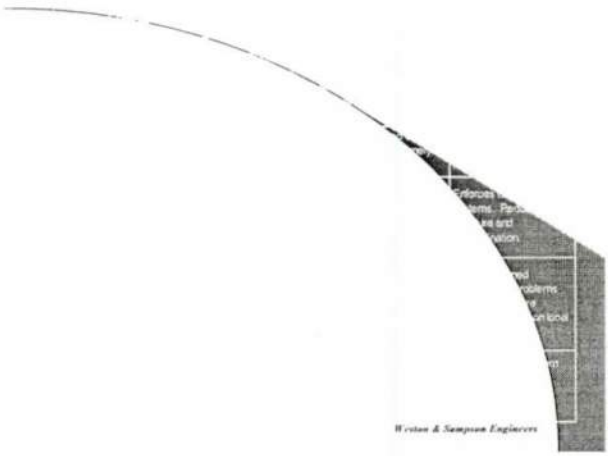
Weston & Sampson Engineers

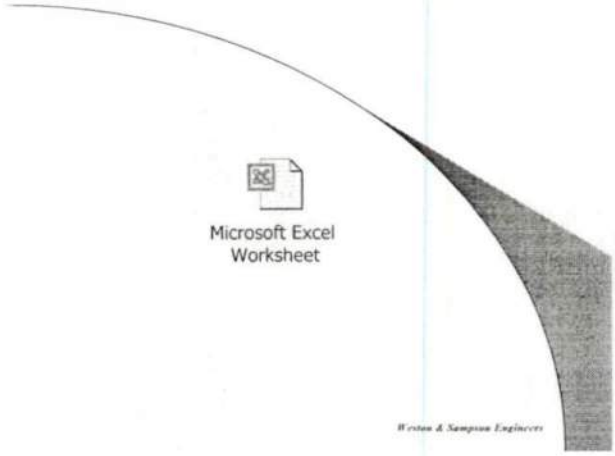
Committee Mission Statement

The Town of Coventry remains committed to the health and well being of its residents and their environment. Currently, 99% of town residents rely upon individual sewage disposal systems. Preventing contaminates from reaching our groundwater is a far easier task than cleaning up contaminated groundwater. The development of an Onsite Wastewater Management Plan will minimize wastewater contamination and ensure the health of future generations residing in Coventry.

The Committee will continue to serve until the adoption of the OWMP or until Town Council votes that the mission of the Committee is complete.

Weston & Sampson Engineers





Coventry's DRAFT OWM Plan

- Level 1: First Year
  - ✓ Add page to website addressing ISDS issues.
  - ✓ Make Copies of DEM and URI ISDS guidance available for pick up.
  - ✓ One month/year utilize Library display case.
  - ✓ Review septage receiving costs of West Warwick WWTF.

Coventry's DRAFT OWM Plan

- Level 2: 1-5 Years
  - ✓ Consider tracking ISDS Upgrades/Repairs/ Pumping in GIS layer.
  - ✓ Mail Brochures to 1/5 of Town Each Year.
  - ✓ Draft ordinance requiring maintenance agreements for ISDS with mechanical components.
  - ✓ Encourage civic groups to perform sampling.

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
Charlestown[1]		(1) Based on Inspection. (2) Subdivisions reviewed since 1992 deeded with pumpout requirement.	(1) Used state's 1987 "Waste Water Management District....A Starting Point" as a model.	(1) WW Mgmt. District. (2) Planning Commission Subdivision/Land Development. (3) Zoning.	(1) WW Mgmt. Comm. (2) Building/Zoning Official. (3) Town Planner.	Policy for commercial uses, schools, convention centers and multifamily dwellings within densely developed areas; special use permit; sensitive-resource setback variance.
Glocester[2]	(1) Setback requirements. (2) No impermeable surfaces above leach field. (3) Certified watertight tank, effluent filter and access risers. (4) Design flow required to account for properties rented > 1 mo./yr. (5) ISDS > 2700 GPD, subdivisions or land development project may have to submit environmental report. (6) Cesspool replaced if fail/repair and in WRPA @ property sale or title transfer. (7) No installation of galley-type leaching fields. (8) Requires advanced treatment based on site conditions.	Based on Inspection.	(1) Used state's handbook for checkup. (2) Requires I&M based on Septic System Checkup. (3) Requires maintenance contracts for any system w/mechanical components. (4) Dependent on treatment levels.	(1) Zoning. (2) Wastewater Management.	(1) WW Mgmt. Board (2) Authorized designee. (3) Building/Zoning Official.	Public Education on Website
Johnston[1]	(1) Used Glocester's ordinance as model.	See Glocester.	See Glocester.	WW Mgmt. District.	?	
Narragansett[1]	(1) 3 overlay districts with special siting requirements. (2) Garbage disposals prohibited. (3) Septic tanks accessible at all times. (4) Use of septic tank additives prohibited.	Every 4 years.		(1) Zoning. (2) Utilities Code.	(1) Zoning staff. (2) Municipal staff.	

RI Communities with ISDS Management Programs

Municipality	Standards Beyond RIDEM	Pumping Requirements	I & M	Affected Policies	Administered By	In Addition
New Shoreham[1]	(1) Setback requirements. (2) Access risers, effluent filters, tipping D-Box by Dec. 2005. (3) Certified watertight tank in situ. (4) No installation of galley-type leaching fields. (5) Renovate cesspools & failing systems to T1/T2 level by Dec. 2005. (6) ISDS > 900 GPD, subdivisions or land development project may need water quality analysis. (7) Garbage disposals prohibited. (8) Requires water conservation.	Based on Inspection.	(1) Town inspector. (2) Prioritized by critical resource areas. (3) Routine inspection as needed based on initial inspection. (4) NOV issued for repair to failing systems.	(1) Zoning. (2) WW Mgmt. District.	(1) Sewer Commission. (2) Building official.	Locating systems and wells using GPS. Evaluating septic system computer-tracking programs.
North Kingstown[1]	Special use permits and enhanced treatment in proximity of sensitive resources.	Based on Inspection.	Inspect every 3 years by town approved inspectors.	(1) Zoning overlays. (2) WW Mgmt. District.		
South Kingstown[2]	(1) Improper discharges. (2) Garbage disposal requirements. (3) Cesspool replacement. (4) Design flow required to account for properties rented > 1 wk./yr. (5) Certified watertight tank.	Based on Inspection.	First maintenance (baseline) inspection and routine inspections.	(1) WW Mgmt. District. (2) Utilities Code.	ISDS Commission and Public Services Director assisted by Onsite Wastewater Specialist	Education & Technical Assistance

Source:

[1] Final Draft Rhode Island Municipal Septic System Standards and Programs, Prepared by Jim Riordan, RIDEM, Office of Water Resources, March 26, 2001.

[2] Local regulations and ordinances.

Coventry's DRAFT OWM Plan

- Level 3: 5-10 Years
  - ✓ Give consideration to an incentive program for pumping.
  - ✓ Consider town match money for leveraging state and federal funds for ISDS improvements.
  - ✓ Consider establishing wastewater management district.
  - ✓ Revisit OWMP and consider updating plan.

Weston & Sampson Engineers

THANK YOU!

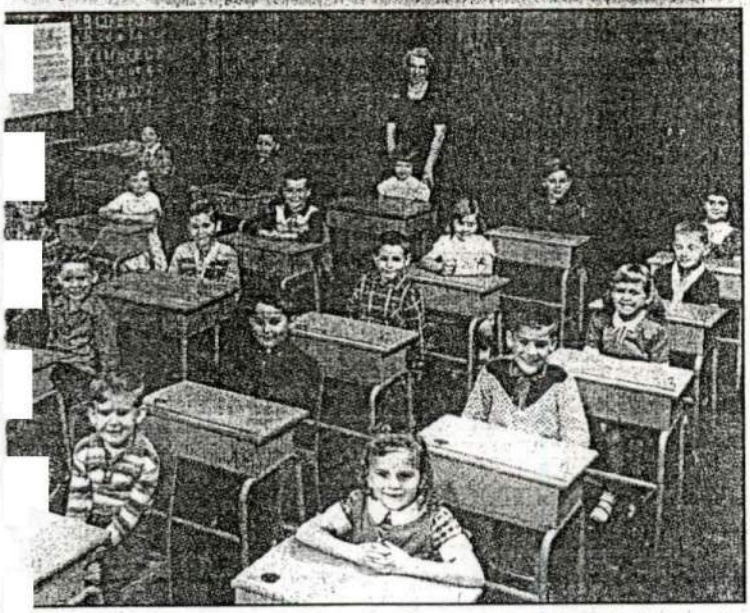
- Your interest, cooperation and understanding are appreciated!
- Your support of improvements at future annual town meetings is encouraged.
- Let's talk about your specific concerns.

Weston & Sampson Engineers

ton, by Arnold Jacobson of Coventry, graces the cover of the
e home itself is currently under restoration by Robert Crowe of

imes a year

ty calendar now on sale



of a classroom at Western Coventry School, taken in
e November page of the Coventry Historical Society 2003
e now. The teacher in the photograph is Abbie L.

she said.

The event, co-sponsored by the *Kent County Daily Times* and the women voters league, was originally on tap for Oct. 8 until Hennedy learned that the date conflicted with a school committee meeting.

Hennedy said in the first scheduling attempt she had everything squared away in making sure each candidate could come from Town Council, school committee and state legislative office until I got to about the last candidate. Then I found out from one of the last candidates I called that there was a school committee meeting that same night."

See FORUM, Page A-2

Coventry seeks help to upgrade septic systems

By BENJAMIN DEMERS
Daily Times Staff Reporter

QUIDNICK — In hopes of improving sewer and water quality throughout Coventry, town officials are putting the finishing touches on a plan that could provide taxpayers with a loan application to receive an updated Individual Sewage Disposal Systems.

If enacted, the plan would allow residents to submit grant applications to the Rhode Island Housing and Mortgage Finance Corporation and receive funding for the wastewater systems.

The program will be extremely beneficial in the eastern part of town where the systems are substandard in one out of every three homes.

The plan, which was put together by the Weston & Sampson Engineering firm of Warwick, must receive passage at next Monday's Town Council meeting before being submitted to the Department of Environmental Management for final consideration.

If DEM does approve the plan, town officials would have to finalize the 0 percent interest loan with the Clean Water Finance Agency and then act as a liaison between property owners and RIHMFC. RIHMFC officials would then administer the 4 percent loan to property owners for terms of either three, five, seven or ten years for as much as $15,000.

A sewage disposal system consists of a septic tank and a leaching field, once in the tank, solids are digested by bacteria before settling to the bottom as sludge.

See SEPTIC, Page A-2

urse on money management

them if they would be willing to come down here if she found a local place. They said they would.

Boschetti contacted Linda Ferrara of Children's Center of New England day care center. "I shared with her the idea to see if it would be possible to do a seven-week course, one night a week and maybe have sponsors pay for babysitting." Ferrara agreed to having the classes at the Center located at 775 Centre of New England Blvd. in Coventry.

The program will teach the core foundations for managing finances in order to save for yourself, your family and eventually your business.

See SEMINAR, Page A-2

INSIDE

MILL

Continued from Page A-1

"So all those things went on and on and on," said Bauer. "Then we were led to believe that other people were interested in the mill but wouldn't touch the mill because Atwood (Clean-Start Redevelopment) had it."

"I just remember the frustration the entire council shared over Clean-Start," said Town Council President Geoffrey Rousselle. He said they thought Clean-Start would dedicate someone full-time to the mill working on the marketing and moving forward with development.

"At the time, the progress hit a wall," said Rousselle. "That's when we severed the relationship."

"We advertised it again, got interested parties, people that probably had the financial resources and construction knowledge but not heavily sophisticated in old mill buildings and tax incentives," said Bauer. "They walked through the buildings and said they were too far gone and they didn't think it was worth investing in it."

"All along we had meetings in my office with the EDC. Senator (Lincoln D.) Chaffee's (R-R.I.) office was represented. Congressman (James R.) Langevin's (D-Dist. 2) office was represented and we asked them for help in two aspects: providing us assistance as far as putting people in the mills and what process to use and then the second aspect was how the new Brownfields Bill was going to come out and if there was some way to help us.

"Concurrently, while that was going on, we were working with Senator (Jack) Reed (D-R.I.) to get the funding...to do the study (on structural soundness)," said Bauer. "And the other thing we asked Senator Reed for was some way to get in the budget a large chunk of money to tear down the mills. Again we were working both sides. We have never given up the idea of redeveloping but if it doesn't get redeveloped it's probably going to go beyond the chance of redeveloping it."

The new developers, who Patricia Morgan escorted in a controversial move about a month ago, are of a different caliber than the ones that showed interest in the past.

"Their perspective of the mill is completely different from people I had talked to previously. They are much more sophisticated about old mill buildings and the value of the buildings, the value of the site with the river running through," said Bauer.

He said, "All of a sudden they were in a different category of developers. I don't know how that worked out."

"I don't know if it's a sign of the economy and funding becoming available for things like this," said Rousselle. "The point is we have been working on this for the last four years, since I have been on the council."

Rousselle said he and Bernard Magiera focused on the mills when they were both elected four years ago and have continued to focus on the mills.

Bauer said they have never let go of the idea of redeveloping the mills but they also had to look

CALENDAR

Continued from Page A-1

The oldest picture Rathbun handed over was of the James Rathbun house, on Main Street, which is believed to have been a stagecoach inn. The house sits where the Coventry Credit Union is.

Two months in the calendar show classes from the Washington Grammar Schools, one in 1888 and the other in 1925. Many students are from the Rathbun family.

Other photograph submissions used in the calendar spotlight the Pawtuxet River, the Greene section of Hopkins Hollow Road, an eighth-grade graduating class in the early 1900s, a house on Route 117 from Sandy Bottom Road, and

The August picture captures a group of World War II veterans at a welcome home party at Paine Field in August 1946. A Western Coventry School class from the 1958-59 school year is featured for November.

The year ends with a shot of Greene's Methodist Church taken in 1903. This picture was provided by Lois Tallman, treasurer for the historical society.

On the cover of the calendar is a picture of the Dr. Smith House blanketed in snow in 1870. Smith's house, which is now being completed renovated, is located at Station and Park streets in Washington.

This year, the historical society dedicated its calendar in the memory of Mathias P. Harpin, a reporter for the *Pawtuxet Valley Daily Times* and the *Providence Journal-Bulletin* in the 1930s. Harpin also wrote a number of historical books, including *Trumpets in Jericho* and *High Road to Zion*.

SEPTIC

Continued from Page A-1

Liquid effluent then drains itself into the leaching field where further natural treatment occurs.

"This is a great opportunity for people in the town," said Weston & Sampson Engineering spokesman Kent Nichols.

The plan that is being submitted to the DEM will be broken up in three phases. The first level will include such tasks as the addition of a page to the town's Web site addressing issues surrounding the new systems and making copies, provided by the DEM and University of Rhode Island, available that will include guidance methods. The second level will include the tracking of system upgrades and repairs, drafting an ordinance requiring maintenance agreements for disposal systems with mechanical components and encouraging civic groups to perform sampling. The final level will try to incorporate an incentive program, establishing a wastewater management district, and updating the original plan.

Individuals who have a keen interest in the project should attend the third and final public hearing at the Coventry Health and Human Services Building on MacArthur Boulevard in Quidnick, at 7 p.m. tomorrow. Financing for the hearing and work came through a $25,000 DEM grant.

"This is a great way for the public, especially homeowners in the eastern section of town, to provide their input to us," said Public Works Director Sheila Patnode, who stressed that achieving the cleanest water possible for the town is the goal.

FORUM

Continued from Page A-1

People attending the forum oriented" so they pertain to both candidates in a district race. the event because of "intense interest in this year's election." a meeting for the towns o Coventry and West Warwick.

PAWTUXET VALLEY

VALLEY BRIEFS

W.W. Elks to host Sunday breakfast

West Warwick Elks, 60 Clyde St., West Warwick, is hosting a Sunday Breakfast on Oct. 6th from 8 a.m. to noon. Donation is $6 per person, children 6 to 11 are $3, children under 6 are free. For information call 821-9807. Proceeds to benefit Elks Charities. (ADVT)

Chamber to host Fall Golf Classic

Pawtuxet Valley Chamber of Commerce and Tourist Center is hosting the second annual Fall Golf Classic and Steak Fry on Monday. The event will be held at Midville Golf Club, 100 Lombardi Lane, West Warwick, with a 2 p.m. shot gun and a steak fry at 5. For details call 823-5349.

Wastewater plan hearing tomorrow

The Town of Coventry will host the final public hearing regarding the development of an On site Wastewater Management Plan tomorrow at 7 p.m. at the Coventry Health and Human Services Building (the former Quidnick School), 1919 MacArthur Blvd., Coventry. All person interested in on-site wastewater management, groundwater and surface water protection are invited to give input to the OWM Committee.

BLAST FROM THE PAST

Daily Times file photo

Was it really that long ago? It sure was — almost 30 years ago, to be almost exact — when Coventry decided to build a new high school. Above, reviewing bids received to build the new school, are, from left, school building committee members Robert Iannotti and Robert DiPadua, Town Solicitor Frank Williams, and committee chairman Arthur Anderson.

BUILDING PERMITS

Coventry

• Robert Lafond, 48 Sharon Drive, Plat 50, Lot 12.4, Permit No. 02-861, for addition

• William Morgan, 247 Nicholas Road, Plat 308, Lot 10, Permit No. 02-856, for addition

• Hector Auger, 172 Pilgrim Ave., Plat 39, Lot 103, Permit No. 02-857, for reroof

• John Kakela, 124 Tiogue, Plat 32, Lot 80, Permit No. 02-858, for kitchen window

• Gary and Jennifer Clarke, 13 Old Mishnock Highway, Plat 4, Lot 4.6, Permit No. 02-859, for garage/bedroom addition

• Paul and Cheryl Burns, 438 Fairview Ave., Plat 63, Lot 142, Permit No. 02-860, for shed

• Robert Lafond, 48 Sharon Drive, Plat 50, Lot 12.4, Permit No. 02-861, for addition

• Maurice and Sally Cotton, 60 Wesleyan Ave., Plat 47, Lot 124, Permit No. 02-862, for reroof

POLICE BLOTTER

Coventry, Rhode Island

Onsite Wastewater Management Plan

Public Meeting

October 2, 2002

Weston & Sampson Engineers

Meeting Participants

- Coventry Staff
  - ✓ Sheila Patnode, Department of Public Works Director
  - ✓ Brent Narkawicz, Director of Planning & Development
- Citizen Representatives
  - ✓ Roy Pruett
  - ✓ Roger Plante
  - ✓ Arnold Blasbalg
- Coventry Town Council
  - ✓ William Hall
- Weston & Sampson Engineers, Inc.
  - ✓ Kent Nichols, Project Manager
  - ✓ Charlene Johnston, Senior Engineer

Weston & Sampson Engineers

Objectives of Tonight's Meeting

- Define terms.
- Review Coventry's history of wastewater planning.
- Present Onsite Wastewater Management Program Options.
- Present and discuss the Committee's DRAFT OWMP.

Weston & Sampson Engineers

Definitions

- Onsite Wastewater Management Plan (OWMP)
  - A plan that establishes a set of management objectives and activities to protect human health and the environment from wastewater contamination from an ISDS.
- Individual Sewage Disposal System (ISDS)
  - Any system designed to convey, store, treat and/or dispose of sewage by means other than public sewer.

Weston & Sampson Engineers

Definitions

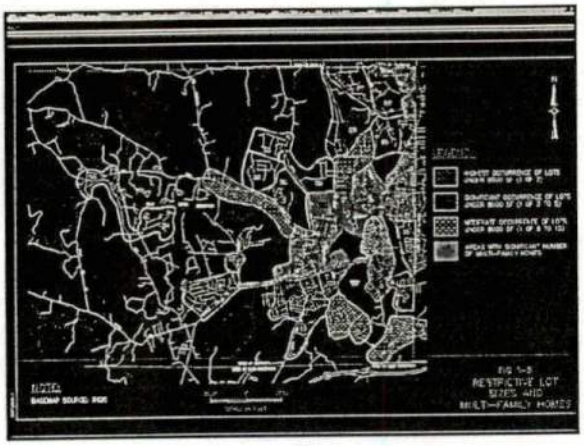
- Cesspool
  - Buried chamber that collects solids and discharges liquids to surrounding soils.
  - DEM considers method substandard.
- Conventional system
  - Traditional ISDS with septic tank, pump chamber or distribution box, and a leach field.
- Alternative/Innovative/Enhanced system
  - Any ISDS not meeting location, design or construction requirements as provided by DEM, but has been demonstrated to comply with performance standards.

Weston & Sampson Engineers

Project History

- 99% of Coventry properties are unsewered.
- Previous planning recommends sewer for much of eastern portion of town.
- 1995, Department of Environmental Management approved Coventry's Wastewater Facilities Plan.

Weston & Sampson Engineers



Project History (Continued)

- Sewer bond referendum failed.
- DEM offers RI towns grants for developing OWMP.
- Coventry submits grant application.
- $25,000 DEM Grant received for OWMP.

Weston & Sampson Engineers

DEM Grant Requirements

- Establish a Committee.
- Hold 3 Public Meetings.
- Provide DEM with a DRAFT OWMP for review and comment.
- Provide DEM with a final OWMP for approval.
- Receive Town Council resolution.
- Get CSSLP approval.

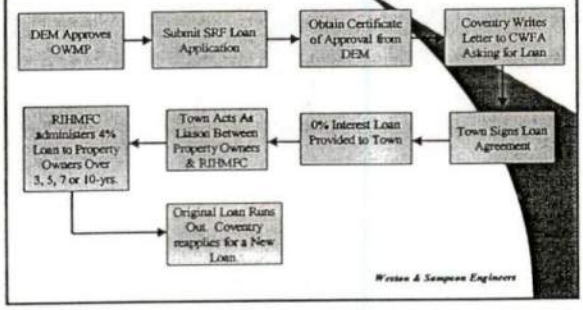
Weston & Sampson Engineers

Community Septic System Loan Program

- 0% interest loan provided to the town with 4% loans provided to property owners.
- DEM approved OWMP.
- CSSLP Loans of $250,000-$300,000 to the following communities:
  - Charlestown, Glocester, New Shoreham, So. Kingstown and No. Kingstown.

Weston & Sampson Engineers

CSSLP Process



Weston & Sampson Engineers

Committee Mission Statement

The Town of Coventry remains committed to the health and well being of its residents and their environment. Currently, 99% of town residents rely upon individual sewage disposal systems. Preventing contaminates from reaching our groundwater is a far easier task than cleaning up contaminated groundwater. The development of an Onsite Wastewater Management Plan will minimize wastewater contamination and ensure the health of future generations residing in Coventry.

The Committee will continue to serve until the adoption of the OWMP or until Town Council votes that the mission of the Committee is complete.

Weston & Sampson Engineers

Management Area Characterization

- Needs Areas Determined in Wastewater Facilities Plan.
- Proximity of small lots next to water bodies.
- General Characteristic all Remaining Parts of Coventry.

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Coventry's DRAFT OWM Plan

- Level 1: First Year
  - ✓ Add page to website addressing ISDS issues.
  - ✓ Make copies of DEM and URI ISDS guidance available for pick up.
  - ✓ One month/year utilize Library display case.
  - ✓ Review septage receiving costs of West Warwick WWTF.

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Coventry's DRAFT OWM Plan

- Level 2: 1-5 Years
  - ✓ Consider tracking ISDS Upgrades/Repairs/ Pumping in GIS layer.
  - ✓ Mail brochures to 1/5 of Town Each Year.
  - ✓ Draft ordinance requiring maintenance agreements for ISDS with mechanical components.
  - ✓ Encourage civic groups to perform sampling.

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Coventry's DRAFT OWM Plan

- Level 3: 5-10 Years
  - ✓ Give consideration to an incentive program for pumping.
  - ✓ Consider town match money for leveraging state and federal funds for ISDS improvements.
  - ✓ Consider establishing wastewater management district.
  - ✓ Revisit OWMP and consider updating plan.

Weston & Sampson Engineers

THANK YOU!

- Your interest, cooperation and understanding are appreciated!
- Your support of improvements at future annual town meetings is encouraged.
- Let's talk about your specific concerns.

Weston & Sampson Engineers

Septic Haulers Interviewed
By Roy Pruett
September 5, 2002

Modern Cesspool	828-9400
Rhode Island Cesspool	397-3167
Bay View Cesspool Cleaners	467-4411
Mr. Cesspool	421-7214
Drain Man Inc.	397-8815
Rick Nunes Construction	821-4038

Paul Bedard, owner of Modern Cesspool reported that the majority of septic cleaning was general maintenance, with some failing systems. Sections of Wood Estates had a number of failing systems but over recent years homeowners were repairing or replacing failed systems. Johnson Pond area had a high occurrence of undersized and or failing systems at the present time. Modern Cesspool, being a local business disposes of approximately 20-30,000 gallons of septic discharge a month with approximately 15,000 gallons from Coventry. Mr. Bedard reports that spring and fall are the busiest times of the year. The Narragansett Bay Commission accept residential discharge at a rate of 4.4 cents a gallon/$44.00 a thousand gallons. Commercial septic and grease traps must be brought to the Cranston treatment facility. Also, Paul Bedard has 15 years experience working for Scituate Cesspool before starting his own business 3 years ago. Mr. Bedard would like to see Coventry adopt a policy similar to North Kingston where homeowners are required bi-annual cleanings.

John Sliney, owner of Rhode Island Cesspool showed a concern that every time he goes out to a job, he finds himself having to educate homeowners about maintaining their system. The homeowners seem to think Mr. Sliney is just trying to sell them a product. Homeowners feel they don't need the septic tanks cleaned on a regular basis. John told me that the Tiogue Ave, from Hopkins Hill to Pilgram Ave. has the highest rates of septic system failure. He would like to see the town do something more about educating the homeowner. He also finds that people from Cranston and Warwick moving into Coventry, that never had an ISDS just don't know what they need to do. Mr Sliney didn't provide me with prices per gallon but he advised me he hauls his septic to either Cranston or Lincoln, if they can take it. Sometimes he brings it to Carver, Mass. He also stated that Cranston is the only facility that accepts grease traps.

STATE OF RHODE ISLAND

2000 303(d) LIST

LIST OF IMPAIRED WATERS

November 21, 2000
(As corrected on June 15, 2001)

Rhode Island Department of Environmental Management
Office of Water Resources
235 Promenade Street
Providence, RI 02908
(401) 222 - 3961
(401) 521 - 4230 FAX

303(d) List Index			
Waterbody ID	**Name**	**Cause**	**Group**
Quinebaug River Basin			
RI0005047R-02	Keach Brook	biodiversity impacts, Cd, Pb	Group 2, 3
Pawtuxet River Basin			
RI0006013L-04	Quidnick Reservoir	Hg in fish tissue	Group 2
RI0006014R-04	Pawtuxet River - South Branch	Pb, Cd	Group 2, 3
RI0006015R-16	Moswansicut Stream	pathogens	Group 2
RI0006016R-06	Pawtuxet River - North Branch	Pb, Cd	Group 2, 3
RI0006017L-02	Three Ponds	hypoxia, nutrients, Cu, Pb, pathogens	Group 2, 4
RI0006017R-03	Pawtuxet River - Main Stem	biodiversity impacts, nutrients, hypoxia, Pb	Group 5
RI0006017R-04	Three Ponds Brook	Pb	Group 2
RI0006017L-05	Roger Williams Park Ponds	pathogens, hypoxia, nutrients, excess algal growth	Group 2
RI0006017L-06	Mashapaug Pond	hypoxia, nutrients	Group 1
RI0006017R-02	Meshanticut Brook	Cu, Pb	Group 3
RI0006018L-03	Simmons Reservoir	nutrients, excess algal growth, siltation, turbidity	Group 2
RI0006018R-01	Cedar Swamp Brook	hypoxia, pathogens, Fe	Group 2
RI0006018R-03	Pocasset River	pathogens, Pb	Group 2
RI0006018R-04	Simmons Brook	pathogens	Group 4
RI0006018L-05	Print Works Pond	pathogens, SS, chlorides, Pb	Group 2, 4
Narragansett Basin			
RI0007019E-01	Seekonk River	hypoxia, nutrients, excess algal growth, pathogens	Group 1, 5
RI0007020E-01A	Providence River	hypoxia, nutrients, metals, pathogens	Group 1, 3, 5
RI0007020E-01B	Providence River	hypoxia, nutrients, metals, pathogens	Group 1, 3, 5
RI0007020L-03	Warwick Pond	hypoxia, phosphorus, excess algal growth	Group 2
RI0007020L-05	Sand Pond (N. of Airport)	hypoxia, phosphorus	Group 2
RI0007020L-06	Prince's Pond (Tiffany Pond)	phosphorus, excess algal growth, hypoxia	Group 2
RI0007021R-01	Runnins River	biodiversity impacts, hypoxia, Pb, pathogens	Group 2, 5
RI0007021E-01	Barrington River	pathogens	Group 5
RI0007022E-01	Palmer River	pathogens, nutrients, hypoxia	Group 1
RI0007024E-01	Upper Narragansett Bay	hypoxia, pathogens	Group 2, 5
RI0007024R-01	Buckeye Brook	biodiversity impacts	Group 2
RI0007025L-01	Gorton Pond	hypoxia, excess algal growth	Group 2
RI0007025L-02	Sandy Pond (Little Pond)	pathogens	Group 2
RI0007025R-01	Hardig Brook	pathogens, biodiversity impacts, Pb	Group 1, 2, 3
RI0007025E-01	Apponaug Cove	nutrients, hypoxia, excess algal growth	Group 1
RI0007025E-02	Brushneck Cove	pathogens, nutrients, hypoxia	Group 1

specific areas of concern identified by RI-DEM. None of the specific areas of concern lie in the heavily developed eastern end of town.

3.4 Existing Individual Sewage Disposal Systems (ISDS)

The town of Coventry is reliant almost exclusively on individual sewage disposal systems (ISDS) for the disposal of wastewater. The type of ISDS systems used in Coventry varies with the age of the dwelling or establishment. Cesspools serve most buildings constructed prior to regulations requiring modern septic systems. Current ISDS regulations require the installation of a septic tank, which settles solids and contains solids which provide a period of anaerobic biological treatment, and a separate soil absorption (infiltration) system, consisting of either series of leaching trenches or a leaching bed or pit. A cesspool serves as both a septic tank and a leaching pit. Cesspools are in use in many of the older sections of town. The current ISDS regulations prohibit the installation of cesspools.

Malfunctioning ISDS systems typically result from inadequate soil absorption of wastewater flows. This generally results in a health hazard or public nuisance. The upward movement and surfacing of partially treated or untreated wastewater, piping system back-ups into homes or rapid transport of septic tank effluent through the soil into the groundwater often result from system malfunctions or failures. These failures are often attributable to one or more of the following causes:

- the soils in the leaching area will no longer absorb wastewater at a sufficient rate,
- the leaching system is located too close to an underlying or adjacent impervious soil layer (such as clay or bedrock),
- insufficient depth to groundwater table,
- the soils in the leaching area have too high a permeability to provide sufficient treatment prior to the leachate reaching the groundwater table,
- harmful substances which could clog the absorption system have been flushed into or added to the system,
- the septic tank, distribution box or system piping is collapsed, broken or clogged,
- the ISDS has not been properly designed and/or constructed,

- a lack of proper maintenance pumping has resulted in excessive solids carry-over into the leaching area,
- excessive or extraneous flows have resulted in hydraulic overloading of the leaching area.

In addition to public health hazards and surface groundwater contamination, inadequate or failed systems can often result in self-imposed restrictions on water use (i.e. limitations on showering, laundry or toilet flushing), frequent pumping of the system or repair or replacement of the ISDS.

As part of this facilities planning process, the eastern portion of Coventry has been evaluated to identify problem areas for (ISDS) construction and operation, and to reaffirm the need for corrective action in those areas. This section summarizes the information utilized in delineating problem areas, including the information obtained from the Coventry Wastewater Management Needs Questionnaire survey performed as part of this study. Most of this information was also used to evaluate the feasibility of ISDS rehabilitation, as discussed in Chapter 5 of this report.

3.41 Wastewater Management Needs Questionnaire

The Coventry Wastewater Management Needs Questionnaire survey was conducted as part of the current facilities planning effort. The survey included sending questionnaires to all homes and businesses in the densely populated eastern areas of Coventry. The less densely populated central and western areas of Coventry were not included in the questionnaire survey. The questionnaire requested information on existing ISDS systems, as well as public opinion on sewer installation. Approximately 39 percent of the questionnaires sent were completed and returned. This can be considered an excellent level of response, and supports the reliability of the data interpreted from the responses. Specific details and results of the questionnaire survey are summarized in **Appendix A** of this report.

For the purposes of this study, the eastern portion of Coventry was separated into 35 study areas. These areas are delineated on **Figure A-1**, included in **Appendix A**. **Table 3-1** shows the types of existing ISDS systems identified by respondents for each study area. As can be seen from these tables, several areas have a high occurrence of older cesspool type systems. These systems are

Table 3-1
Types of Existing ISDS Systems

Subarea Number	Number of Existing Homes	Septic Tank with Leach Field	Septic Tank with Leach Pit	Cesspool	Tight Holding Tank	Drywell for Washing Machine
1	269	67%	5%	25%	1%	0%
2	154	57%	3%	35%	2%	0%
3	167	46%	7%	43%	0%	2%
4	245	70%	7%	23%	0%	0%
5	297	62%	9%	26%	1%	0%
6	99	57%	0%	38%	0%	0%
7	207	44%	5%	37%	4%	1%
8	346	75%	5%	17%	2%	0%
9	109	69%	6%	20%	2%	2%
10	316	57%	3%	36%	1%	0%
11	288	73%	1%	24%	1%	0%
12	373	34%	2%	63%	1%	0%
13	37	0%	0%	100%	0%	0%
14	303	86%	2%	9%	0%	0%
15	211	15%	5%	78%	0%	0%
16	290	23%	4%	66%	1%	1%
17	314	33%	4%	54%	1%	3%
18	89	27%	5%	51%	3%	0%
19	90	34%	3%	60%	0%	0%
20	109	16%	10%	55%	0%	0%
21	106	33%	2%	57%	0%	0%
22	163	34%	4%	58%	2%	0%
23	190	57%	3%	39%	0%	1%
24	183	69%	2%	27%	0%	0%
25	91	69%	3%	29%	0%	0%
26	196	40%	10%	49%	0%	1%
27	214	94%	3%	3%	0%	0%
28	137	55%	5%	34%	0%	0%
29	118	70%	2%	26%	0%	0%
30	151	58%	3%	38%	0%	0%
31	111	38%	13%	50%	0%	0%
32	146	94%	0%	5%	0%	0%
33	117	90%	0%	8%	0%	0%
34	66	48%	11%	41%	0%	0%
35	116	72%	3%	25%	0%	0%
Total	6,418	53%	4%	39%	1%	0%

Note: Percent of systems is calculated by dividing the number of systems by the number of homes in the subarea.

generally antiquated and do not meet the operational guidelines for ISDS systems in Rhode Island. These areas generally coincide with the older residential developments in town, including the South Main Street area (Area 12) and the Quidnick, Washington, Anthony and Harris mill village areas (Areas 15 through 22).

Table 3-2 shows the percentage of respondents noting ISDS problems or failure symptoms, as well as the types of problems most prevalent for each study area. Areas with extremely high occurrences (approximately 1 system in 2 or 3) of ISDS system problems include Tiogue Avenue (Areas 2 and 6), the Greene Street/Laurel Avenue area (Area 5), the areas along the west shore of Tiogue Lake (Areas 7 and 9), and the Quidnick and Anthony areas lying just north of Washington Street (Areas 16 and 22). All of the other study areas in eastern Coventry showed high occurrences (approximately 1 system in 4 or 5) of ISDS system problems, except for the North Main Street area (Area 20) and the outlying north and western suburban areas along Knotty Oak Road (Area 28) and Flat River Road (Areas 29, 31, 33 and 35), which showed moderate occurrences (approximately 1 system in 8 or 10) of ISDS problems. Areas showing moderate occurrences of ISDS problems appeared to correspond generally (except for Area 20) to areas with larger typical lot sizes. **Figure 3-5** shows the areas experiencing problems in each of these categories.

Additional information obtained from the questionnaire survey is included in the following sections.

3.42 ISDS Repair Information

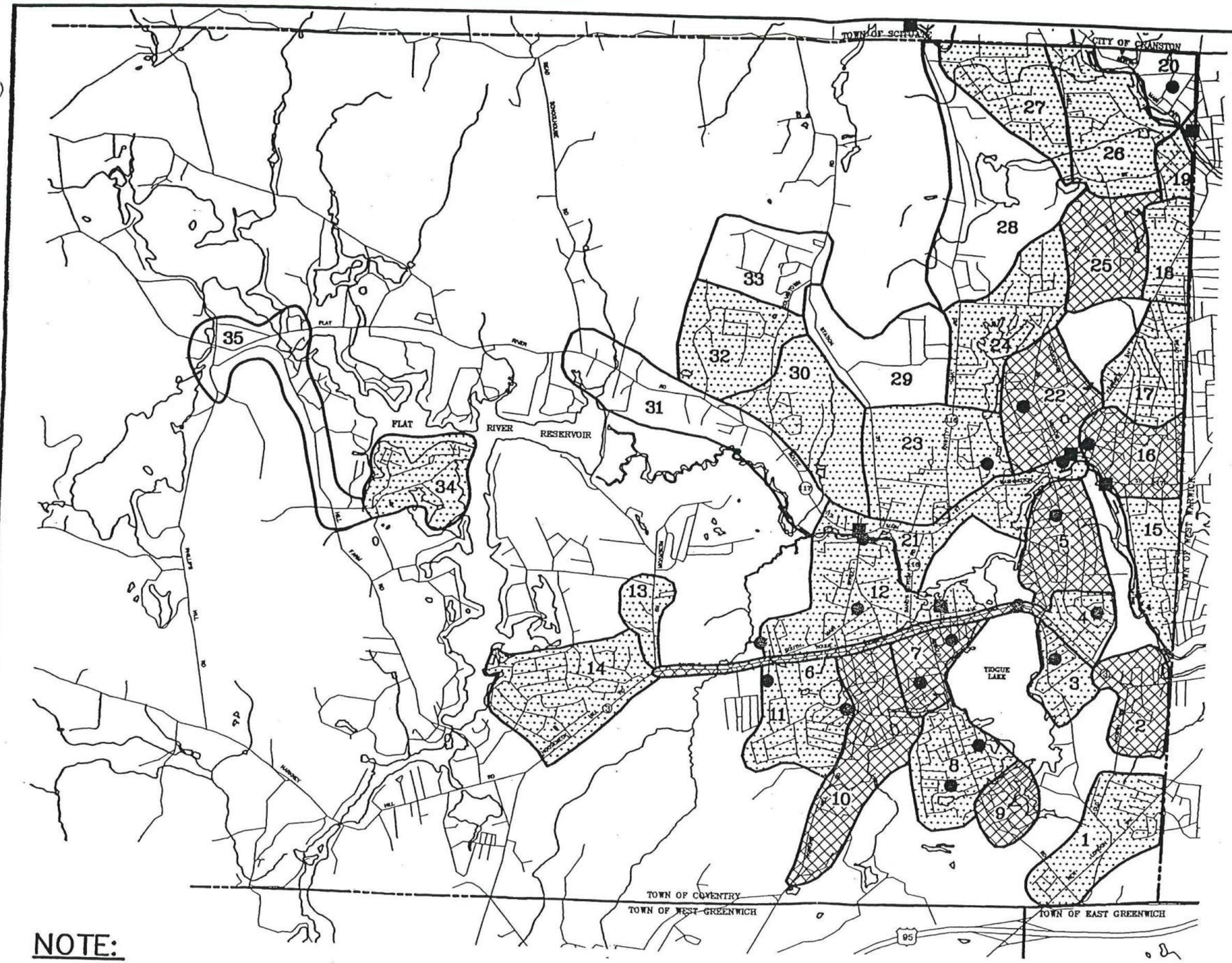
The State of Rhode Island Department of Environmental Management (RI-DEM) is responsible for maintaining all records pertaining to the construction, alteration and repair of individual sewage disposal systems (ISDS) in the state. The 1978 "Preliminary Evaluation of Pollution from Subsurface Waste Disposal Systems," Technical Memorandum, prepared as part of the Section 208 Areawide Water Quality Management Plan (WQMP) for Rhode Island, utilized ISDS records to develop a map identifying concentrations of ISDS repairs and alterations from 1968 to 1976. This map, included herein as **Figure 3-6**, indicates the greatest concentrations of repairs and

Table 3-2
Occurrence and Types of ISDS System Problems

Subarea Number	Number of Existing Homes	Systems Experiencing Problems (1)	Type of Problems Cited on Questionnaire (2)				
			Frequent Cleanouts	System Backups	Odor Problems	Surface Breakout	Limitation of Usage
1	269	22%	41%	64%	41%	36%	50%
2	154	36%	62%	43%	29%	14%	57%
3	167	22%	42%	58%	25%	25%	50%
4	245	18%	88%	71%	41%	59%	0%
5	297	30%	35%	53%	29%	26%	44%
6	99	53%	80%	30%	20%	10%	70%
7	207	31%	18%	71%	25%	14%	61%
8	346	23%	27%	67%	10%	13%	77%
9	109	34%	29%	59%	29%	35%	35%
10	316	29%	49%	57%	20%	17%	63%
11	288	27%	37%	58%	26%	29%	45%
12	373	22%	53%	41%	19%	9%	72%
13	37	50%	50%	50%	0%	0%	100%
14	303	23%	60%	50%	40%	30%	30%
15	211	27%	50%	44%	19%	31%	50%
16	290	31%	33%	45%	13%	15%	73%
17	314	19%	22%	48%	22%	35%	43%
18	89	21%	43%	71%	43%	14%	43%
19	90	21%	43%	43%	14%	29%	57%
20	109	11%	0%	0%	0%	33%	67%
21	106	20%	44%	33%	44%	33%	22%
22	163	30%	38%	69%	19%	25%	56%
23	190	28%	24%	60%	24%	28%	48%
24	183	21%	32%	32%	26%	26%	47%
25	91	29%	50%	50%	20%	20%	60%
26	196	24%	40%	55%	30%	25%	45%
27	214	23%	7%	40%	40%	20%	40%
28	137	11%	33%	50%	33%	33%	33%
29	118	13%	33%	33%	0%	17%	83%
30	151	22%	27%	53%	13%	13%	73%
31	111	13%	0%	100%	0%	0%	100%
32	146	26%	35%	65%	35%	18%	47%
33	117	12%	17%	33%	50%	50%	0%
34	66	19%	60%	40%	0%	20%	80%
35	116	11%	0%	25%	0%	0%	100%
Total	6,418	24%	37%	50%	23%	23%	55%

Notes: (1) Percent of systems is calculated by dividing the number of systems with problems by the total number of responses (Question 13).

(2) Percent of systems is calculated by dividing the number of citing each problem type by the total number of responses (Question 15).



N

LEGEND:

- EXTREMELY HIGH NUMBER OF PROBLEMS (1 OF 2 OR 3 SYSTEMS FAILING)
- HIGH NUMBER OF PROBLEMS (1 OF 4 OR 5 SYSTEMS FAILING)
- MODERATE NUMBER OF PROBLEMS (1 OF 8 OR 10 SYSTEMS FAILING)
- PROBLEM AREAS IDENTIFIED BY COVENTRY WATER QUALITY TASK FORCE
- DIRECT DISCHARGE IDENTIFIED BY RI–DEM

NOTE:

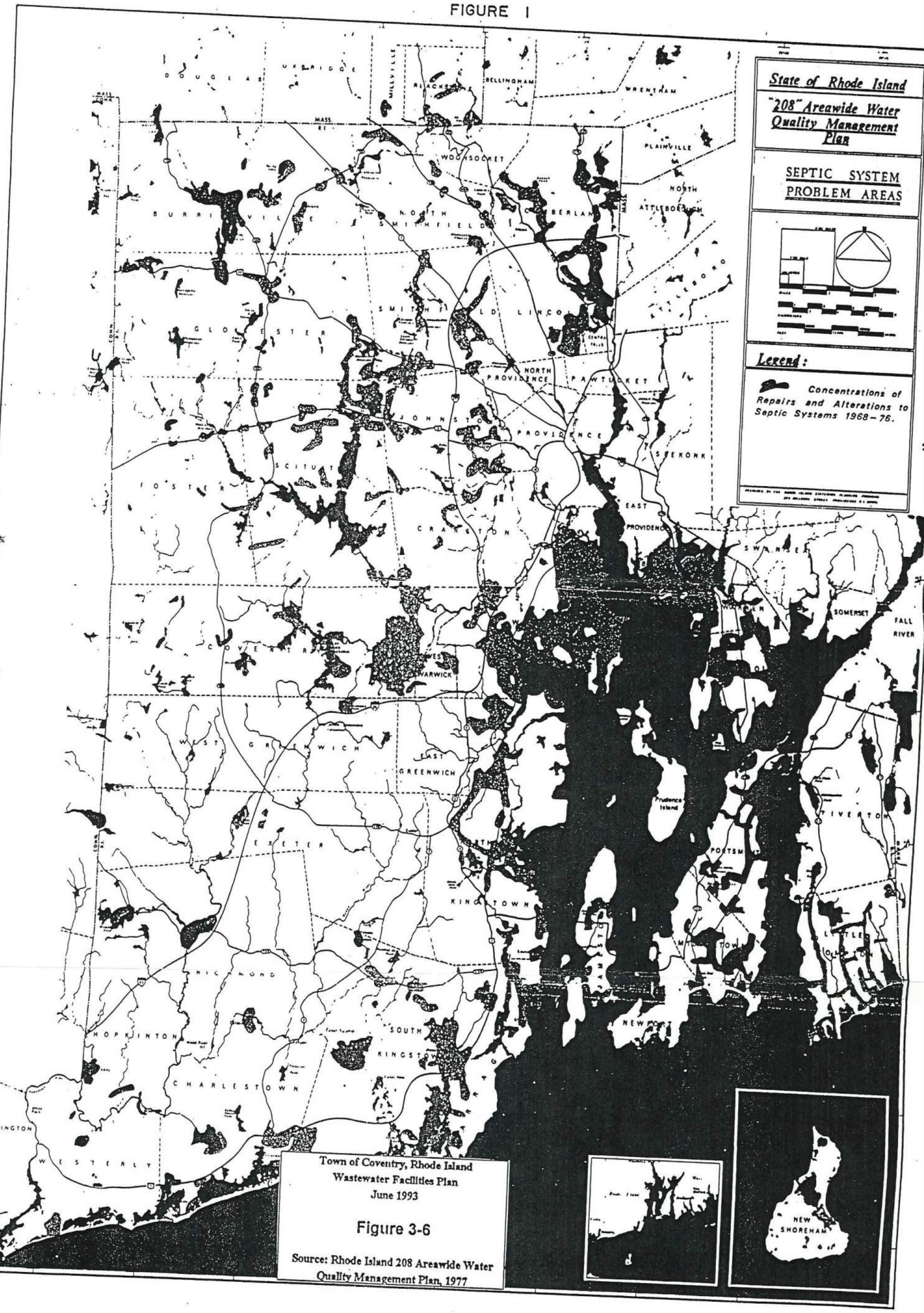
BASEMAP SOURCE: RIGIS

3000 0 3000

SCALE IN FEET

FIG 3–5
ISDS PROBLEM AREAS & DIRECT DISCHARGES

FIGURE 1



Town of Coventry, Rhode Island
Wastewater Facilities Plan
June 1993

Figure 3-6

Source: Rhode Island 208 Areawide Water Quality Management Plan, 1977

alterations are in eastern Coventry, and in the areas surrounding the Flat River Reservoir. The 208 WQMP also listed the Anthony, Washington, Quidnick, Arkwright, Harris and Coventry Center areas as potential problem areas for on-site waste disposal.

As part of the current facilities planning effort, a review of RI-DEM records was conducted to obtain data on recent ISDS repairs. ISDS repair records for the five year period (1987 through 1992) were examined to locate ISDS failures within the proposed study areas. All repairs recorded for this period are listed in **Appendix C**. This data is summarized in **Table 3-3** on an study sub-area basis, along with data compiled from the Wastewater Management Needs Questionnaire survey.

The number of ISDS repairs by itself may not be an indication of poor soil and/or groundwater conditions. Representatives of the RI-DEM Division of Land Resources have indicated during past investigations that many system repairs and alterations are not reported and consequently are not recorded. This may explain the apparent discrepancy between the RI-DEM numbers and those derived from the questionnaire survey.

3.43 Soils Suitability for ISDS

In order for individual sewage disposal systems to operate properly, soils on which they are constructed must be suitable for such use. The following sections include information available on soils in the study area, including Soil Conservation Service information and information obtained from soil borings and wells in Coventry. In addition, some information was obtained from the questionnaire survey on the role that poor soils and high groundwater play in causing ISDS malfunctions.

3.43.1 Soil Conservation Service (SCS) Data

The U.S. Department of Agriculture, Soil Conservation Service (SCS) published a report entitled "Soil Survey of Rhode Island" in July 1981. Detailed soil maps, as well as a summary of the degree of limitations for on-site sewage disposal were prepared for Coventry and included in that report. Copies of these detailed soils maps are included in **Appendix B**. Those soils which are

Table 3-3
Summary of ISDS Repair Records 1987 - 1992

Subarea Number	Number of Existing Homes	RI-DEM ISDS Records		Wastewater Questionnaire Response			
		Number of Repairs	Percent of Systems (1)	Repairs from Response	Percent Response	Extrapolated Repairs (2)	Percent of Systems (3)
1	269	15	5.6%	16	38%	42	15.7%
2	154	10	6.5%	10	39%	26	16.7%
3	167	12	7.2%	5	32%	16	9.4%
4	245	15	6.1%	7	46%	15	6.2%
5	297	22	7.4%	13	38%	34	11.5%
6	99	13	13.1%	4	21%	19	19.2%
7	207	17	8.2%	6	45%	13	6.4%
8	346	27	7.8%	16	37%	43	12.5%
9	109	9	8.3%	9	47%	19	17.6%
10	316	23	7.3%	9	39%	23	7.3%
11	288	8	2.8%	12	50%	24	8.3%
12	373	25	6.7%	14	38%	37	9.9%
13	37	4	10.8%	1	11%	9	24.6%
14	303	19	6.3%	6	14%	43	14.1%
15	211	5	2.4%	4	28%	14	6.8%
16	290	23	7.9%	10	45%	22	7.7%
17	314	18	5.7%	10	40%	25	8.0%
18	89	6	6.7%	3	42%	7	8.0%
19	90	3	3.3%	2	39%	5	5.7%
20	109	9	8.3%	3	28%	11	9.8%
21	106	8	7.5%	3	48%	6	5.9%
22	163	13	8.0%	3	33%	9	5.6%
23	190	13	6.8%	14	47%	30	15.7%
24	183	11	6.0%	7	51%	14	7.5%
25	91	8	8.8%	6	38%	16	17.4%
26	196	14	7.1%	10	42%	24	12.1%
27	214	7	3.3%	5	31%	16	7.5%
28	137	11	8.0%	3	42%	7	5.2%
29	118	9	7.6%	4	40%	10	8.5%
30	151	12	7.9%	10	46%	22	14.4%
31	111	5	4.5%	0	7%	0	0.0%
32	146	11	7.5%	9	45%	20	13.7%
33	117	3	2.6%	2	44%	5	3.9%
34	66	11	16.7%	1	41%	2	3.7%
35	116	22	19.0%	3	31%	10	8.3%
99	5,370	91	1.7%	N/A	N/A	N/A	N/A
Total Study Area	6,418	441	6.9%	240	37%	638	9.9%
Total Entire Town	11,788	532	4.5%				

Notes:
(1) Percent of systems repaired is calculated by dividing the number of repairs by the number of homes in the subarea.
(2) Extrapolated number of repairs is calculated by dividing the number of repairs from the questionnaire responses by the percent response to the questionnaire mailing, therefore providing a theoretical number of repairs for the entire subarea.
(3) Percent of systems repaired is calculated by dividing the extrapolated number of repairs by the number of homes in the subarea.

characterized as having severe and moderate limitations have been delineated on **Figure 3-7**, excerpted from the 1982 FP Supplement. The bases for the classifications of major soil types are summarized in **Table 3-4**.

Soils classified as 'severe' exhibit properties or site features that are extremely restrictive to proper functioning of ISDS systems. Soils classified as 'moderate' exhibit properties or site features that are unfavorable for proper functioning of ISDS absorption fields, that may be overcome through special planning and design. **However, when such conditions are combined with small lot sizes, 'special planning and design' may not be able to provide a solution.**

The soils in some of the residential areas in eastern Coventry are either Canton-Urban land complex or Merrimac-Urban land complex (shown as "insufficient data" areas on **Figure 3-7**). While both are generally characterized as having a slight degree of limitations for on-site systems construction, according to the SCS report, areas with these soils require detailed on-site investigations and evaluation for most uses. Urban land, which consists of areas covered by streets, parking lots and shopping centers and other structures, total 30 to 40 percent of areas with Canton and Merrimac soils. This, combined with the fact that a large percentage of homes are constructed on lots substantially smaller than the lot sizes described in the SCS report, greatly impacts ISDS construction and/or operation in these soils.

3.43.2 Soil Borings and Observation Wells

As part of the 1982 Facilities Plan Supplement, soil boring and well log data compiled by the U.S. Geological Survey (USGS) was utilized to map areas within eastern Coventry where bedrock lies generally within 7 feet and groundwater lies within 5 feet of the ground surface, respectively. Additional boring information compiled in the Keyes Sewerage Report and the 1977 Facilities Plan were used to supplement the USGS data. These areas have also been delineated on **Figure 3-7** as areas with shallow bedrock or groundwater.

Many of the residential areas with slight limitations, including Canton or Merrimac urban land complex soils, on small lots, are areas where no boring or observation well data is available.

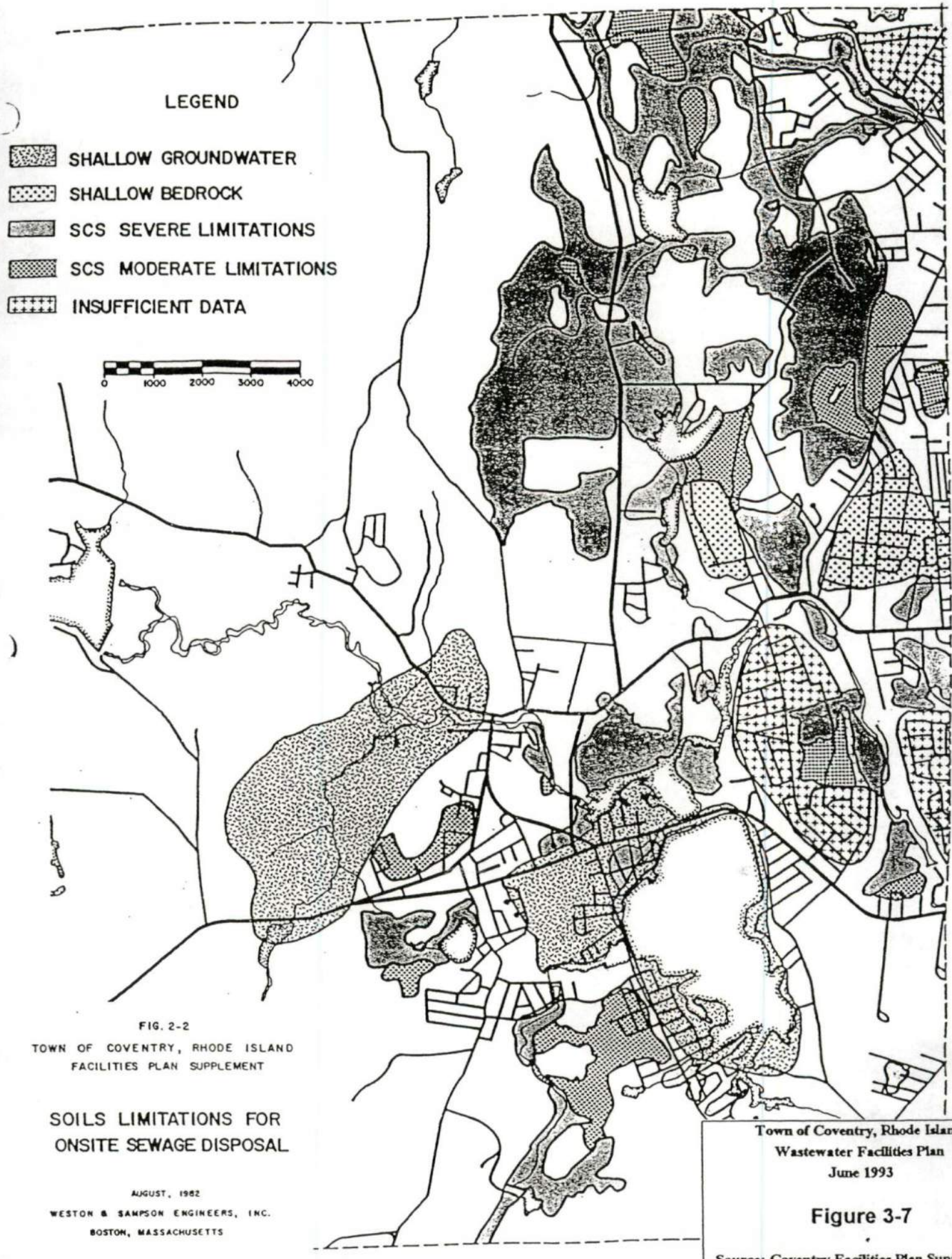


FIG. 2-2
TOWN OF COVENTRY, RHODE ISLAND
FACILITIES PLAN SUPPLEMENT

SOILS LIMITATIONS FOR
ONSITE SEWAGE DISPOSAL

AUGUST, 1982
WESTON & SAMPSON ENGINEERS, INC.
BOSTON, MASSACHUSETTS

Town of Coventry, Rhode Island
Wastewater Facilities Plan
June 1993

Figure 3-7

Source: Coventry Facilities Plan Supple
1982, Weston & Sampson Engineers,

Table 3-4
Basis for ISDS Soil Limitations (1)

Soil Map Symbol	Soil Name	Classification of Limitation	Basis of Limitation
Aa	Adrian	Severe	Wetness
NP	Newport	Severe	Percs Slowly
Rf	Ridgebury	Severe	Percs Slowly, Wetness
Wa	Walpole	Severe	Wetness
WbB	Wapping	Severe	Wetness
WcB	Wapping	Severe	Wetness
WoB	Woodbridge	Severe	Percs Slowly, Wetness
ChB	Canton	Moderate	Large Stones
HkC	Hinckley	Moderate	Steep Slope
LgC	Lippitt	Moderate	Depth to Bedrock
NbB	Narragansett	Moderate	Large Stones

Notes: (1) Source: Soil Survey of Rhode Island: USDA Soil Conservation Service (SCS). July 1981.

Three (3) large areas of eastern Coventry (generally including study areas 4, 5, 15 and 20) are shown on **Figure 3-7**, where no supplemental soil data is available. While this type of data can often refute the SCS classifications, in the absence of such data no specific comment can be made regarding these areas.

3.43.3 Questionnaire Soils Information

The Coventry Wastewater Management Needs Questionnaire survey included a request for information on the seasons during which ISDS problems occurred and the causes for the problems. While many persons did not include this information in their response, some useful information was obtained.

Information on the seasons during which ISDS failures occur can be indicative of the cause of such failures. ISDS failures occurring in the spring are generally caused by the high groundwater conditions typical of that season. Since a significant number of persons indicated springtime failures, high groundwater can be considered to be a major cause of the failures.

Categories of the specific causes of ISDS problems on the questionnaire included poor soils, high groundwater, undersized systems and steep sloping ground. Other reasons for ISDS problems cited on responses included heavy rains, poor drainage and antiquated systems. **Table 3-5** summarizes the questionnaire responses indicative of soils and groundwater related ISDS failures for the study areas. As can be seen from this table, poor soil characteristics and high groundwater conditions are a significant cause of ISDS failures in Coventry.

3.44 Coventry Water Quality Task Force Problem Areas

Additional local technical opinion identifying known problem areas for on-site disposal was provided by the Coventry Water Quality Task Force, which was assembled as part of the 1982 Facilities Plan Supplement effort. The Task Force was comprised of seven (7) residents of Coventry, including engineers, planners, and contractors familiar with on-site systems, and actual soil and groundwater conditions in the town.

Table 3-5
Relationship of High Groundwater and Poor Soils to ISDS Problems

Subarea Number	Number of Existing Homes	Percent of ISDS Problems Occurring in Spring (1)	Percent Citing High Groundwater as Cause of Problem (2)	Percent Citing Poor Soils as Cause of Problem (2)
1	269	89%	47%	35%
2	154	77%	36%	29%
3	167	75%	22%	33%
4	245	56%	39%	61%
5	297	68%	21%	52%
6	99	100%	50%	38%
7	207	71%	71%	14%
8	346	74%	41%	41%
9	109	82%	55%	18%
10	316	85%	35%	27%
11	288	65%	20%	33%
12	373	91%	48%	13%
13	37	100%	0%	50%
14	303	83%	0%	40%
15	211	46%	18%	27%
16	290	79%	38%	31%
17	314	65%	65%	24%
18	89	100%	80%	60%
19	90	100%	50%	25%
20	109	0%	100%	0%
21	106	100%	56%	22%
22	163	47%	57%	36%
23	190	75%	47%	27%
24	183	79%	80%	20%
25	91	29%	67%	33%
26	196	94%	33%	47%
27	214	88%	38%	13%
28	137	86%	33%	50%
29	118	33%	50%	0%
30	151	86%	50%	50%
31	111	0%	100%	0%
32	146	70%	27%	45%
33	117	50%	0%	33%
34	66	40%	50%	50%
35	116	50%	0%	0%
Total	6,418	70% (1)	44% (2)	31% (2)

Notes: (1) Percent of systems is calculated by dividing the number of responses citing spring problems by the total number of responses (Question 14). Includes systems which have indicated year round problems.

(2) Percent of systems is calculated by dividing the number of responses citing each problem cause by the total number of responses (Question 16).

The Water Quality Task Force compiled a list of problem areas, based on their personal knowledge of specific localized conditions within the town. Those problem areas identified by the Task Force, where corrective action is needed, are listed in **Table 3-6** and are shown on **Figure 3-5**. It should be noted that problem areas A, L, P and R are areas with apparently acceptable soil conditions according to the SCS criteria.

3.45 ISDS Lot Size Limitations

Even with acceptable soils, the available lot area can be limited to such an extent that construction of on-site systems may be limited. The 208 Water Quality Management Plan included estimates of minimum lot sizes required to construct ISDS systems. The 208 WQMP determined that the minimum lot size required for a proper ISDS system is estimated at 13,750 square feet for a system with an alternate (reserve) absorption field location, and 8,750 square feet for a system without an alternate (reserve) location.

Many residential areas of eastern Coventry were developed with average lots covering 10,000 square feet or less. These residential areas, which in some cases were developed with lots of less than 5,000 square feet, create significant difficulties when their substandard ISDS systems begin to malfunction. **Table 3-7** shows the average lot sizes in each of the study areas, as well as the occurrences of lots below 8,000 and 5,000 square feet in area. **Figure 3-8** identifies those study areas with a significant number of undersized lots.

In some areas of eastern Coventry, large two-family mill houses have been constructed on lots which could be of acceptable size for smaller single family residences. The large building footprint area minimizes the land available for an on-site system, and combined with the higher wastewater flows from two (or more) families, can preclude construction of an adequate system. The Greene Street/Laurel Avenue area (Area 5) and the Washington, Quidnick and Anthony Areas (Areas 16, 17, 21, 22 and 23) are characterized by such development. **Figure 3-8** identifies those study areas with a significant number of multiple family homes. In addition, numerous commercial buildings and residences between Washington Street and the South Branch of the

Table 3-6
Coventry Water Quality Task Force ISDS Problem Areas (1)

Problem Area Code Letter (2)	Description of Problem Area	Subarea Location Number
A	Laurel Foster Nursing Home - Laurel Avenue and Centre Street area. Entire area has problems.	5
B	Washington Street - Anthony south side. Buildings generally discharge directly into the river.	16/21
C	Anthony district - Edward Street, Knight Street, Hazard Street, Boston Street and Anthony Street generally have bad problems.	16/22
D	Boston Street apartment complex.	22
E	Contentment Drive (elderly housing area) - Problems exist, but severity of problems is unknown.	23
F	"Mister V's, Nicky's and Showboat" on Tiogue Avenue (Route 3).	6
G	Arizona Street area - Area between Tiogue Avenue, Lake Tiogue and Arnold Road.	7
H	Area on west side of Arnold Road, north of Little Tiogue Lake.	7
I	Wood Street, South Main Street, Rathbun Street area - This area has general problems.	12
J	Garland Industries industrial complex on South Main Street.	21
K	Sts. John & Paul School and Rectory - Church property and adjacent residential area has problems.	6/12
L	Oak Haven area - Near the Oak Haven Elementary School.	4
M	Hopkins Hill Road area near Huron Pond.	10/11
N	Area east of Arnold Road, south of Little Tiogue Lake - Tiogue Fire Station to Cardi property.	8/9
O	Arnold Road/Holmes Road area (along brook).	8
P	Mohawk Street area - Area along east side of Tiogue Lake.	3
Q	Apartment housing area behind old town garage off Tiogue Avenue.	6/11
R	Harris area - North side of North Main Street.	20

Notes: (1) ISDS problems areas identified by the Coventry Water Quality Task Force as part of the 1982 Facilities Plan Supplement effort.
(2) Order of listing is not indicative of order of magnitude of ISDS problems.

Table 3-7
Lot Sizes by Study Area

Subarea Number	Number of Existing Homes	Typical Lot Size	Percent of Lots Under 5,000 s.f.	Percent of Lots Under 8,000 s.f.
1	269	10,000 s.f.	0%	11%
2	154	10,000 s.f.	12%	**27%**
3	167	8,000 s.f.	**33%**	**52%**
4	245	8,000 s.f.	0%	**51%**
5	297	10,000 s.f.	1%	10%
6	99	20,000 s.f.	3%	14%
7	207	8,000 s.f.	**27%**	**50%**
8	346	10,000 s.f.	7%	12%
9	109	10,000 s.f.	6%	8%
10	316	10,000 s.f.	2%	**33%**
11	288	10,000 s.f.	0%	**40%**
12	373	10,000 s.f.	9%	**28%**
13	37	1 Ac	0%	3%
14	303	20,000 s.f.	0%	0%
15	211	10,000 s.f.	3%	**34%**
16	290	10,000 s.f.	**20%**	**44%**
17	314	10,000 s.f.	12%	**32%**
18	89	15,000 s.f.	**18%**	21%
19	90	10,000 s.f.	9%	22%
20	109	20,000 s.f.	11%	18%
21	106	20,000 s.f.	**19%**	**30%**
22	163	20,000 s.f.	9%	20%
23	190	10,000 s.f.	2%	**14%**
24	183	20,000 s.f.	0%	10%
25	91	20,000 s.f.	0%	0%
26	196	15,000 s.f.	4%	**27%**
27	214	10,000 s.f.	0%	0%
28	137	25,000 s.f.	9%	19%
29	118	1 Ac	0%	2%
30	151	10,000 s.f.	1%	3%
31	111	1 Ac	0%	10%
32	146	20,000 s.f.	0%	0%
33	117	20,000 s.f.	0%	0%
34	66	10,000 s.f.	**21%**	**33%**
35	116	1 Ac	0%	4%
Total	6,418		7%	19%

Note: Information on lot sizes obtained from Coventry Assessor's Maps.

Pawtuxet River occupy nearly all of the usable area for the parcels. On these lots, there is essentially no land available for construction of any type of on-site disposal system.

3.46 Summary of Existing ISDS Conditions

Based on the above discussions, the overall effectiveness of ISDS systems in the study area can be estimated. The RI-DEM Rules and Regulations Establishing Minimum Standards Relating to Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems defines a 'failed system' as a system which meets any of the following conditions:

a. fails to accept wastewater into the building sewer.
b. discharges to a drain or surface water.
c. wastewater rises to the ground surface.
d. conditions which preclude the adequate treatment and disposal of the wastewater, including damaged or deteriorated systems, and systems which come in contact with the groundwater.

From this definition we can estimate that a significant number of the ISDS systems in eastern Coventry are experiencing failure symptoms.

The available soils and groundwater information, ISDS system repair information, existence of substandard systems (i.e. cesspools), occurrence of system problems and limitations on system construction and operation (such as due to lot size restrictions) were reviewed to identify specific areas where existing conditions preclude the proper operation of individual sewage disposal systems. **Table 3-8** shows the evaluation of the existing ISDS conditions for each project area. For areas where ISDS systems are not performing adequately, the major bases for that evaluation are shown. **Figure 3-9** identifies the areas where ISDS conditions are considered to be unacceptable.

Table 3-8
Summary of Existing ISDS Conditions

Area #	High Number of Cesspools (1)	High Number of Failures (1)	High Number of Repairs (2)	High GW or Poor Soils (3)	Shallow Bedrock or GW (4)	WQTF Problem Area (5)	Small Lot Sizes (6)	General ISDS Conditions
1		22 %	Yes	Yes				Poor
2	35 %	36 %	Yes	Yes			Yes	Very Poor
3	43 %	22 %	Yes	Yes		Yes	Yes	**Critical**
4		18 %	Yes	Yes		Yes	Yes	Very Poor
5		30 %	Yes	Yes		Yes		Very Poor
6	38 %	53 %	Yes	Yes	Yes	Yes		**Critical**
7	37 %	31 %	Yes	Yes	Yes	Yes	Yes	**Critical**
8		23 %	Yes	Yes	Yes	Yes		Very Poor
9		34 %	Yes	Yes	Yes	Yes		Very Poor
10	36 %	29 %	Yes	Yes		Yes	Yes	**Critical**
11		27 %		Yes		Yes	Yes	Very Poor
12	63 %	22 %	Yes	Yes	Yes	Yes	Yes	**Critical**
13	(7)	(7)	Yes	Yes				Poor
14		23 %	Yes	Yes				Poor
15	78 %	27 %					Yes	Poor
16	66 %	31 %	Yes	Yes	Yes	Yes	Yes	**Critical**
17	54 %	19 %	Yes	Yes	Yes		Yes	Very Poor
18	51 %	21 %	Yes	Yes			Yes	Very Poor
19	60 %	21 %		Yes			Yes	Very Poor
20	55 %		Yes			Yes		Poor
21	57 %	20 %	Yes	Yes		Yes	Yes	**Critical**
22	58 %	30 %	Yes	Yes	Yes	Yes	Yes	**Critical**
23	39 %	28 %	Yes	Yes		Yes		Very Poor
24		21 %	Yes	Yes				Poor
25		29 %	Yes					Poor
26	49 %	24 %	Yes	Yes			Yes	Very Poor
27		23 %		Yes				Poor
28	34 %		Yes	Yes				Poor
29			Yes					Fair
30	38 %	22 %	Yes	Yes				Poor
31	50 %							Fair
32		26 %	Yes	Yes				Poor
33								Good
34	41 %	19 %	Yes	Yes			Yes	Very Poor
35			Yes					Fair

Notes: (1) Percentages are summarized from the Coventry Wastewater Needs Questionnaire Survey, see Appendix A.

(2) Based on information presented in Table 3-3.

(3) Based on information presented in Table 3-5.

(4) Based on information presented in Figure 3-7.

(5) Based on information presented in Table 3-6.

(6) Based on information presented in Table 3-7.

(7) Insufficient questionnaire reponse was received from Area 13 to accurately depict conditions.

STATE REVOLVING LOAN FUND (SRF) PROGRAM

R.I.D.E.M., Office of Water Resources
Certificate of Approval Process

Appendix 2: SRF Loan Application Review Checklist

Applicant _____ Project Name _____

Contact Person_____ Telephone _____

A/E Contact _____ Telephone _____

A. Procurement and Scope of Work **(Section 212, 319, 320 projects)**

1. Certification that the procurement meets all state and local requirements
2. A scope of work for A/E services sufficient to result in an approved project based on official DEM policy/criteria/checklists.

B. Programmatic **(Section 212, 319, 320 projects)**

1. Certification of intent to comply with all applicable provisions of federal and/or state laws (App. 3 and 4).
2. Certified copy of the resolution of the governing body of the local governmental unit directing the CEO to submit an application for an SRF loan.
3. A summary sheet listing total project costs
4. A copy of the project schedule showing the date of completion for significant milestones

C. Environmental Review Process **(Section 212 projects and projects with Section 212 attributes)**

Facility Plan Loan - certifications that: an Environmental Assessment and, if necessary, an Environmental Impact Statement on the Facility Plan will be performed; the facility planning assumptions and forecasts will be consistent with the present and forecasted elements of the local Comprehensive Plan; and the DEM-approved Facility Plan is intended to be adopted as detailed sub-elements of the Services and Utilities and Implementation elements of the local Comprehensive Plan.

Design and Construction Loans: documentation that the project is detailed in a DEM-approved Facility Plan and documentation the project is addressed by a DEM-approved CE or a DEM-issued Finding of No Significant Impact or Record of Decision, including specified mitigation measures for the project.

FOR DEM USE ONLY

1. Is this a project listed on the current Priority List? YES_____ NO_____
2. Is this a Section 212 project which is consistent with the 208/303 Plans? YES_____ NO_____
3. Is this a Section 319 project which is consistent with the NPS Plan? YES_____ NO_____
4. Is this a Section 320 project which is consistent with the CCMP? YES_____ NO_____

COMMENTS: _____
_____
_____
_____

Based on review of the contents of the application package for a loan from the SRF, it is my opinion that all requirements for issuing a Certificate of Approval for an SRF loan have been met.

SIGNED:_____

DATE:_____, 20__

RHODE ISLAND CLEAN WATER FINANCE AGENCY (Agency)

LOAN POLICIES AND PROCEDURES

for the

COMMUNITY SEPTIC SYSTEM LOAN PROGRAM (CSSLP)

I. **PURPOSE:** These Loan Policies and Procedures of the Rhode Island Clean Water Finance Agency (Agency) have been established to govern the lending activities between the Agency and local governmental units in the state of Rhode Island in connection with a Community Septic System Loan Program (CSSLP) under and pursuant to Title VI of the Federal Clean Water Act and Chapter 46-12.2 of the General Laws of Rhode Island as amended.

II. **DEFINITIONS:** Except as otherwise defined herein, the words and phrases used within these Loan Policies and Procedures have the same meaning as the words and phrases have in Chapter 46-12.2 of the General Laws of Rhode Island as amended.

III. **FINANCIAL ASSISTANCE:** The objective of these Loan Policies and Procedures is to provide financial assistance to local governmental units to initiate a program of septic system repair in their community. The CSSLP is a source of funds to provide subsequent loans to homeowners for the repair or replacement of failed or failing septic systems or substandard systems within areas identified in the local government unit's On-site Wastewater Management Plan.

The RICWFA and the local governmental unit will establish a relationship to be evidenced by a loan agreement to provide financing for repair or replacement of failed, failing or substandard systems in that community. Rhode Island Housing and Mortgage Financing Corporation (RI Housing) will be the loan servicer on the subsequent homeowner loans. RI Housing will: accept applications from homeowners; coordinate payments to septic system installers/homeowners; collect repayments from homeowners; credit the homeowner repayments to the principal payment responsibility of the local governmental unit; and make monthly reports to both the Agency and the local governmental unit.

IV. **LOAN APPLICATION:** Request for financing under the Community Septic System Loan Program should be submitted in writing by the chief executive officer of the local governmental unit to the Executive Director of the Agency. No particular form of application shall be required but the written request should generally include:

1) A projection of the estimated need for repair or replacement of failed or failing system as contemplated by the Community's program and identified

in the On-site Wastewater Management Plan prepared by the local governmental unit.

2) Indication of approval of the Local Governmental Unit program for on-site septic system repair or replacement as outlined in its On-site Wastewater Management Plan by the Department of Environmental Management (DEM).

3) A description of the dedicated source of loan security in the event of homeowner loan default or non-payment, i.e., pledge of general revenues from property taxes of cities and towns, property liens, or other source available to the local governmental unit and deemed appropriate by the RICWFA.

4) A description of the overall operation of the local governmental unit with an emphasis on (a) legal structure; (b) management; (c) sources of revenues; (d) operating expenses; (e) operating surpluses or deficits; (f) actual results versus budget; and (g) sources of financial liquidity. The most recent annual report or audited financials may be submitted in satisfaction of all or any part of this item.

5) Legal authority or authorities to borrow for the Community Septic System Loan Program.

6) Such other information as will support a finding by the Agency that committing to the loan will not have an adverse impact on the finances of the Agency or its other borrowers.

V. **LOAN APPROVAL PROCESS:** Subject to availability of Agency funds and to prioritization by DEM of programs as outlined in the communities' On-site Wastewater Management Plans, loans will be approved by the Board of Directors of the Agency for any eligible local governmental unit. The local governmental unit will provide a general obligation pledge, note in fully marketable form, or other assurance deemed appropriate by the Agency to ensure repayment of the CSSLP loan. A credit review of the local governmental unit and report by the Executive Director will be taken into consideration:

1) sources of revenue and financial liquidity;
2) historical and projected financial operating results;
3) present and future debt service requirements;
4) impact of dedicated user fees and/or general revenues;
5) socioeconomic conditions and trends; and
6) effects of legal structure and any regulatory control.

VI. **TERMS AND CONDITIONS:** The homeowner repayment stream will be credited towards the community's responsibility for repayment of the principal portion of the CSSLP loan.

1) Rate - The subsequent loans to homeowners will carry a rate equivalent to 4% which will include all homeowner fees to be distributed as follows:

RICWFA	1.0% Community Loan Origination Fee
	0.5% Community Loan Service Fee
RI Housing	1.0% Homeowner Loan Origination Fee
	0.5% Homeowner Loan Service Fee
SRF Fund	1.0% SRF Fund Growth
	4.0% Total CSSLP Rate

(CSSLP loan rates are subject to periodic changes as per Section X of this document.)

2) Community Fees - The local governmental unit will be responsible for its own out of pocket closing costs, i.e. borrower's counsel fees and financial advisor fees.

3) Amortization - The loan repayments from the homeowners will provide the principal and interest repayments to the Agency. As the primary borrower, the local government unit is responsible for any shortfall or default in the repayments from the homeowners. Amortization on the local governmental unit's loan will begin on the first day of the quarter after the loan closing and on a quarterly basis thereafter. RI Housing will collect payments from the homeowners and make principal and interest payments to the Agency on behalf of the local governmental unit.

4) Prepayments - The loan may be prepaid by the borrower at any time but may be subject to a prepayment penalty based on the cost of reinvesting the prepayment or any other negative financial impact to the Agency.

5) Security - Loans will have a pledge of (a) general revenues; and/or (b) may be secured by any revenues or other assets which the Agency deems appropriate to protect the interest of the other participants in the loan programs of the Agency, other creditors of the Agency, bondholders, or the finances of the Agency. The obligations of the Borrower may be subject to and dependent upon appropriations being made by the Borrower for such purposes.

6) Loan Advances - The local governmental unit will indicate in written form an estimate of its yearly requirement for septic system or substandard system repairs. As loans to homeowners are originated, the Agency will advance the necessary amount for disbursement for approved project

costs. RI Housing will act as paying agent on behalf of the local governmental unit for payments to contractors/homeowners for approved project costs.

7) Community Specific Criteria for Homeowner Loans - The community may apply specific homeowner loan criteria such as; number of estimates needed from licensed septic system installers; maximum number of housing units per structure allowed access to CSSLP; owner/non-owner occupied borrowers; whether inhabitants of areas planned for sewer extension are eligible; and other such specific requirements. The community may not raise or lower the current homeowner CSSLP rate of 4% but may combine the CSSLP with other sources of money so as to provide a greater dollar amount available for loans or to provide a greater economic incentive for homeowners to repair or replace the failed septic systems. Any additional criteria applied by the local governmental unit cannot negate or otherwise overrule any federal and state laws and regulations which apply to the CSSLP.

8) Ineligible Project Costs - The funding of group or cluster septic system projects is not allowed under the CSSLP. Septic system projects on commercially owned property are not allowed under the CSSLP. Homeowner loans will be used for septic system repair or replacement only. CSSLP loans cannot be used for bathroom or kitchen improvements, additions or remodeling.

VII. **REPORTING REQUIREMENTS:** Community borrowers will be required to provide information to the Agency during the life of the loan. Required information includes:

1) A record of the number and type of repaired or replaced septic systems funded by this program.

2) A copy of its Annual Audited Financial Statements in accordance with Generally Accepted Government Accounting Standards annually within 180 days of end of fiscal year.

3) Copies of reports submitted to RIDEM, the Environmental Protection Agency (EPA) and any other regulatory agency relating to the septic systems financed by the loan.

4) Other information or reports that the Agency deems appropriate.

VIII. **LOAN DOCUMENTS:** The terms and conditions of each loan will be evidenced by a agreement outlining the specific terms and conditions of the loan and such agreement will be accompanied by an opinion of counsel, as required by the Agency enabling act.

IX. **COMPLIANCE WITH STATE AND FEDERAL LAW:** Recipients (the community) of loans must comply with all applicable state and federal laws and regulations.

X. **MODIFICATIONS:** Where deemed appropriate by the Agency, waiver or variation of any provisions herein may be made or additional requirements may be added.

Anthony B. Simeone, Executive Director

Public Notice Date: November 9, 2001
Public Hearing Date: December 3, 2001
Filed With Secretary of State: December 13, 2001
Effective Date: January 2, 2002

Received

DEC 13 2001

Secretary of State
Administrative Rules

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS
Office of the Secretary of State
Edward S. Inman, III, Secretary of State

Rules and Regulations Filing Form

1. Name and Address of Agency
Clean Water Finance Agency
235 Promenade Street Suite 119 Providence

2. Title of These Rules and Regulations
Community Septic System Loan Policies and Procedures

3. Statutory Source of Authority to Issue These Rules
46-12.2

4. Purpose of New Rules and Regulations or Ammendments
To allow the obligations of the borrower to be subject to and dependent upon appropriation being made by the borrower for such purposes.

5. Type of Filing
- ☐ A. Emergency
- ☑ B1. Amendment 42-35-3
- ☐ B2. Adoption 42-35-3
- ☐ B3. Repeal 42-35-3
- ☐ C. Technical Revision
- ☐ D. Refile 42-35-4.1

Date of Public Notice: 11/09/2001
Date of Public Hearing: 12/03/2001

6. Documents Filed
(all filings must include entire regulation)
- ☐ A. New Rule and Regulation
- ☑ B. Amended Rules and Regulations
- ☐ C. Technical Revision
- ☐ D. Refiling Existing Regulations
- ☐ E. Emergency
- ☐ F. Repealed

**If yes to B1 or C in section 5, identify the amended sections or revision(s) and the original date of filing:*
Section VI, Subsection 5

7. Agency Code

---

8. Certification
I hearby certify that the attached rules and regulations were adopted in accordance with the Administrative Procedures Act (42-35) and that they are true copies of this Department, attest,

Name: Anthony B. Amore

Title: Executive Director

Robert K. Hedges, Notary Public
Notary Public

Subscribed and sworn before me this 13th day of December, 2001

Received
DEC 13 2001
Secretary of State
Administrative Rules

ERLID#: 599

Frequently Asked Questions for the Home Owner - Who do I contact for information?

- I'm thinking of doing a home improvement project, what permits do I need? – Building Official, 822-9156

- How do I know where my property line is? What setbacks do I need to maintain?

  Zoning Official, 822-9181

- How can I get a map of my property? My neighborhood?

  Planning Department, 822-9181

- What do I need to apply for prior to a starting Minor Residential Improvements, such as, pools, decks, sheds, and carports?

  Building Official 822-9181

- What do I need to apply for prior to starting a Major Residential Improvement, such as, additions, reconstruction, or new construction?

  Building Official 822-9181

- How do I know if I need to upgrade my septic system?

  RIDEM/ISDS – Mr. Russell Chateauneuf, 222-7710

  Helpful Information: http://www.state.ri.us/dem/pubs/index.htm

  http://www.state.ri.us/dem/programs/benviron/water/permits/isds/index.htm

- How do I maintain a septic system?

  RIDEM/ISDS – Mr. Russell Chateauneuf, 222-7710

  Helpful Information http://www.state.ri.us/dem/pubs/index.htm

  http://www.state.ri.us/dem/programs/benviron/water/permits/isds/index.htm

- Where is my septic system? When was it installed?

  Records are kept in the building official's office if your house has been built in the last 20 years, or if the system has been replaced or repaired in the last 20 years and an application had been approved by the Department of Environmental Management.

  Helpful Information
  http://www.state.ri.us/dem/programs/benviron/water/permits/isds/index.htm

  Building Officials Office, 822-9156

- How close can I build to my septic system?

  RIDEM/ – Mr. Russell Chateauneuf, 222-7710

- What precautions should I take if I use a well for drinking water?

  RIDEM/Office of Water Resources - Mr. Russell Chateauneuf, 222-6820
http://www.state.ri.us/dem/programs/benviron/water/permits/isds/index.htm

ASSESSMENT 2 - On-Site System Maintenance

Do you know where your system is located and when it was last pumped or inspected?

The exact locations of system components are not obvious, because they are below ground. If the location of your system is not in your home records, a previous owner, health department, pumper, or RI DEM may have a record of the system location. Once located, a sketch of your house and yard with the tank and drainfield should be drawn with accurate distances noted. Keep the map on file with ISDS maintenance records and pass it on to the next owner of your house.

Keeping good records each time your septic system is pumped, inspected or repaired will help you make cost-effective maintenance decisions.

How often should your tank be inspected?

Regular pumping is the most important action you can take to maintain your ISDS. A general rule of thumb is to have a tank pumped by a licensed pumper every three to five years. But how often a tank needs to be pumped depends on the size of the tank, the amount of wastewater generated, the amount of solids carried in the wastewater, and the age of the system. The best way to determine when to pump is to have your tank inspected annually. The tank needs to be pumped if:

- the sum of the solid layers (sludge plus scum) takes up more than half of the tank capacity,
- the top of the sludge layer is less than a foot below the baffle or tee, or
- the bottom of the scum layer is within three inches of the bottom of the outlet baffle (or top of the outlet tee).

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Maps and records	I keep a map and good records of repairs and maintenance.	The location of my tank and date of last pumping are known but not recorded.	The location of my system is unknown. I do not keep a record of pumping and repairs.	☐ Low ☐ Medium ☐ High
Tank pumping (including holding tanks)	The septic tank is pumped on a regular basis as determined by an annual inspection, or about every three to five years. The holding tank is pumped as needed.	The septic tank is pumped, but not regularly.	The septic tank is not pumped. The holding tank overflows or leaks between pumpings.	☐ Low ☐ Medium ☐ High
Condition of tank and baffles	The tank and baffles are inspected for cracks; repairs are made promptly.		The condition of the tank and baffles is unknown.	☐ Low ☐ High
Drainfield protection	Vehicles and other heavy objects are kept from the drainfield area.	Occasionally, the drainfield is compacted by heavy objects or activities.	Vehicles, livestock, heavy objects, or other disturbances are permitted in the drainfield area.	☐ Low ☐ Medium ☐ High
Diverting surface water	All surface runoff is diverted away from the drainfield area.	Some surface water flows into the drainfield area.	Runoff from land, rooftops, driveways, etc. flows into the drainfield.	☐ Low ☐ Medium ☐ High
Plantings over the drainfield	Grass or other shallow rooted plantings over the drainfield.		Trees and shrubs are growing on or near the drainfield.	☐ Low ☐ High
Signs of trouble	Household drains flow freely. There is no sewage odors inside or outside. Soil over the drainfield is firm and dry. Well water tests negative for coliform bacteria.	Household drains run slowly. Soil over the drainfield is sometimes wet.	Household drains back up. Sewage odors can be noticed in the house or yard. Soil is wet or spongy in the drainfield area. Well water tests positive for coliform bacteria.	☐ Low ☐ Medium ☐ High

How can you protect your drainfield?

A septic system depends on good soil conditions for treatment and disposal of effluent. Water must be able to percolate through the soil at a reasonable rate. To protect the drainfield:

- do not drive vehicles onto the drainfield,
- do not pave, build, pile logs or other heavy equipment, or put a swimming pool over the drainfield,
- divert roof runoff, footer drains, sump pumps, and other surface runoff away from the drainfield,
- avoid planting trees and shrubs over the drainfield (grass is the best cover), and
- install an effluent filter or screen on the septic tank outlet to prevent the carryover of solids into the drainfield.

What are the signs of trouble?

Respond quickly to any problems you observe:

- foul odors in the house or yard,
- slow or backed up drains,
- wet, spongy ground or lush plant growth,
- repeated intestinal illnesses in your family, or
- algae blooms and excessive weed growth in nearby lakes or ponds.

This information was provided by Barbara Kneen Avery, Extension Associate, College of Human Ecology, Cornell Cooperative Extension in cooperation with the University of Rhode Island Cooperative Extension and the Rhode Island Home *A*Syst Program. For more information on your Individual Septic Disposal System, contact the RI DEM / Office of Water Resources / Permitting Section at 235 Promenade Street, Providence, RI 02908-5767 or 401-277-4700.

ASSESSMENT 3 - Septic or Sewage System Inputs

What wastes are acceptable?

Your wastewater treatment system is not a substitute for the trash can or a compost pile. Because they do not break down easily, dispose of solid waste with regular garbage and not down the toilet.

Common household chemicals can harm septic tank microbes and can also pass untreated through the system contaminating the earth and groundwater. Instead of pouring them down the drains/toilet, proper disposal of chemical products should be taken.

Using a garbage disposal in the kitchen sink puts an excess load on the system, as well as clogging it. Composting food and some paper waste should be considered as an alternative.

Why save water?

Reducing the flow of wastewater through the septic tank allows more time for solids to settle out and less chance of solid particles being carried over to the drainfield. Less water in the drainfield means better aeration for the soil microbes at work in the system.

- Install low-flow toilets
- Take shorter showers
- Repair leaky faucets and toilets immediately
- Run dishwashers and washing machines with full loads
- Adjust water softener settings to reduce the amount of water needed for backwashing and regeneration
- Do laundry and other major water-using chores over the course of the week

	LOW RISK	MEDIUM RISK	HIGH RISK	YOUR RISK
Solid wastes	There is no garbage grinder (dispose-all) in the kitchen. No grease or coffee grounds are put down the drain. Only toilet tissue is put in the toilet.	There is moderate use of a garbage grinder, and some solids are disposed of down the drain.	There is heavy use of a grinder, and many solids are disposed of down the drain. Many paper products or plastics are flushed down the toilet.	☐ Low ☐ Medium ☐ High
Cleaners, solvents and other chemicals (also applies to holding tanks)	There is careful use of household chemicals (paints, cleaning products). No solvents, fuels, or other hazardous chemicals are poured down the drain.	There is occasional disposal of hazardous household chemicals in the wastewater system.	There is heavy use of strong cleaning products that end up in wastewater. Hazardous chemicals are disposed of in the wastewater system	☐ Low ☐ Medium ☐ High
Water conservation	Only water-conserving fixtures and practices are used. Drips and leaks are fixed immediately.	Some water-conserving steps are taken (such as using low-flow shower heads or fully loading washing machines and dishwashers).	Standard high-volume bathroom fixtures are used (toilets, showers). No effort is made to conserve water. Leaks are not repaired.	☐ Low ☐ Medium ☐ High
Water usage	Laundry and other major water uses are spread out over the week.		Several water-using appliances and fixtures are in use in a short period of time.	☐ Low ☐ High

This information was provided by Barbara Kneen Avery, Extension Associate, College of Human Ecology, Cornell Cooperative Extension in ccoperation with the University of Rhode Island Cooperative Extension and the Rhode Island Home *A*Syst Program. For more information on your Individual Septic Disposal System, contact the RI DEM / Office of Water Resources / Permitting Section at 235 Promenade Street, Providence, RI 02908-5767 or 401-277-4700.

Does Your Septic System Meet State Standards?

If you're planning to renovate all or part of your home or add on living space to your existing home, you should be aware that the Rhode Island Department of Environmental Management (RIDEM) regulations may require that your septic system be altered or upgraded. The RIDEM septic system regulations or "code", formally known as the "Rules and Regulations Establishing Minimum Standards for Location, Design, Construction and Maintenance of Individual Sewage Disposal Systems" (ISDS), apply not only to the design of new septic systems, but also to the on-going use and operation of all existing septic systems.The purpose of this

Why Isn't My Septic System OK the Way It Is?

☑ Prior to the late 1960's, no standardized code existed in Rhode Island for the design of septic systems. Most systems in use today predate the regulatory program. Many systems consist of cesspools which do not properly provide for degradation or removal of contaminants in sewage. Other systems may be "repaired systems" which often do not meet the standards or offer the reliability provided under the current code. Consequently, these systems present potential risks to public health and the environment.

☑ However, it is not RIDEM's policy to compel all homeowners to upgrade their septic systems immediately. Generally, homeowners are allowed to use their existing septic systems provided they have not failed. A more opportune time to consider upgrading one's septic system is when a major new investment in the home or property is planned. The ISDS code has been carefully developed to require an upgrade based on the scope of improvement planned, the type of sewage disposal system in use, and its age. For example, because cesspools present the greatest risks to public health and environmental resources, a septic system upgrade is appropriate when the level of improvement exceeds 25% of the house's replacement value.

☑ In other cases, the septic system may meet current standards, but won't be large enough to handle flow resulting from increased occupancy. Increased occupancy generally is associated with an increase in the number of bedrooms. Therefore, if you plan to add a bedroom, it is likely that you will need to expand your leaching field and possibly the septic tank size in order to ensure the septic system will work properly.

System Suitability Determination Process

☑ To find out if your septic system is suitable for your proposed home improvement, you must submit a System Suitability Determination (SSD) application to RIDEM. Please note, you are generally not required to submit an SSD if your improvement does not require a building permit.

☑ The SSD application asks several questions regarding the scope of the improvements proposed and details about the existing septic system. The application is a multi part form and is available by calling the Permitting Section at RIDEM (277-6820). Your local Building Official also may have these forms available. The forms are intended for completion by the homeowner, but some may wish to seek the assistance of a person know- ledgeable on sewage disposal matters, such as the professional who designed the ISDS system or the contractor who services it. The completed application must be submitted, along with the proper fee, directly to RIDEM or mailed to the Office of Management Services, Room 340, 235 Promenade Street, Providence RI 02908.

☑ RIDEM will review the application and visit your property. Conditions bearing on the suitability of the septic system will be observed and noted. A decision will be given in writing indicating that the system is either acceptable for the proposed improvement or unacceptable.

☑ In general, you will be required to upgrade your septic system if your home improvement project meets one or more of the following criteria:

- improvement will add one or more bedrooms,
- scope of improvement will affect 50% or more of the floor space, or
- cost of improvement will be greater than 25% of the replacement value of the home and the existing sewage disposal system is a cesspool.

☑ If your system is determined to be acceptable, you have satisfied the RIDEM requirement under this process. If deemed unacceptable, further work is usually required. This may include hiring a professional to evaluate your existing system more thoroughly or to design a new system. A copy of RIDEM's decision also will be given to the local building official.

Who is Responsible for Submitting an SSD?

☑ You, the homeowner, are! Like all other laws and regulations which affect you, it is your responsibility to be aware of these requirements and plan accordingly. Notwithstanding, your local building official may, upon review of your building permit application, require that you present a RIDEM approved System Suitability Determination or Individual Sewage Disposal System design application prior to issuing a building permit.

☑ Prospective buyers are urged to request an SSD for additions or renovations which are essential to their plans before making final decisions.

Can I Forego the SSD Process and Instead Apply Directly for an Alteration Permit?

☑ Yes. If after reviewing this pamphlet or reading the RIDEM septic system rules you believe you will need a new system before undertaking a property improvement, you can apply directly for an alteration permit and forego the SSD process. The rules require that you retain a professional engineer or land surveyor to design the system. Names are often listed in the yellow pages of the telephone directory. These "designers" should be able to answer specific questions about design and installation issues.

Is It a Bedroom or Is It a Study?

☑ Septic systems are sized and designed based on the number of bedrooms to be served. Bathrooms and fixtures are not normally counted in the design process. RIDEM rules define a bedroom to be a room greater than 100 square feet in area which may be used as a private sleeping area and which has at least one window and one interior doorway. The State Building Code defines a bedroom somewhat differently and has other requirements for housing based on number of occupants. Many rooms intended to be used as study rooms or offices meet both definitions. Generally, RIDEM will consider such a room to be a bedroom if it is likely to be used as one by the present or future owner.

☑ RIDEM is most concerned with older dwellings of one or two bedrooms being renovated into two or three bedroom homes. Renovations involving the conversion of seasonally-used homes to year-round use are also a concern. Often the septic systems of such homes are substandard according to current regulations. On the other hand, if a home has a more modern septic systems which is already of substantial size, and the addition of a family room or study is planned, RIDEM will generally not require an expansion of the ISDS system under the increased flow criterion provided the septic system is otherwise up to code.

Alterations versus New Building Requirements

☑ The SSD rendered by RIDEM may indicate that some level of ISDS alteration or improvement is needed. Certain projects or circumstances may warrant that an ISDS be

Water Conservation

Since your septic system's effectiveness in treating household waste depends on how you use and operate the system, your water conservation practices can play a big part in proper wastewater treatment. Water use in the home and what you pour down the drain affect how well your system works.

The ideal situation is to have wastewater entering your system as evenly as possible throughout the day. When large volumes of wastewater enter your system within a short period, it can mix up and re-suspend the solids and scum in the tank. These re-suspended solids can move into the drainfield, causing it to clog.

Conserving water in your home will reduce the load of wastewater on your septic system. In most homes, toilet flushing is the largest use of water, followed by bathing, laundry, and dishwashing. Reducing the amount of wastewater entering your system allows more time for solids to settle in the tank and less chance of these solids being carried into the drainfield. Reducing wastewater flow will provide for better treatment in your system, help prolong the life of the septic system, and reduce your energy and water bills.

Don't use your septic system as a substitute for the trash can or compost pile. Septic systems are not designed to treat the variety of household chemicals and products, like paints, solvents, acids, pesticides, and oils. These products should not be poured down the drain, instead, read the label for directions on proper disposal.

There are many steps you can take to conserve water and protect your septic system. Here are a few simple suggestions:

- ▲ Repair leaky faucets and toilets immediately.
- ▲ Install low-flow water fixtures such as toilets, showerheads, and faucet aerators.
- ▲ Take shorter showers.
- ▲ Spread laundry and other major water-using chores out over the week. Wait until washing machines and dishwashers are full before doing a load.
- ▲ Place only toilet paper in the toilet. Do not use the toilet as an ashtray or trash receptacle.
- ▲ Turn water off while brushing teeth and shaving.

Permitting and State Regulations

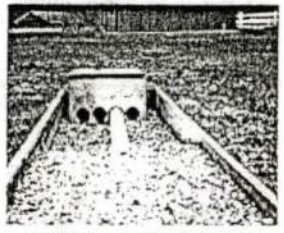
Contact the ISDS section of the RI Department of Environmental Management (401) 222-6820, Website: www.state.ri.us/dem/regs/isdsnew.htm

In coastal areas, contact the RI Coastal Resources Management Council (401) 222-2476

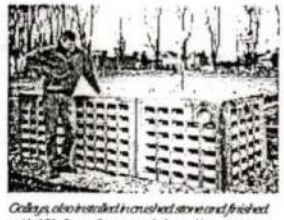
University of Rhode Island, United States Department of Agriculture and local governments cooperating. Cooperative Extension in Rhode Island provides equal opportunities in programs and employment without regard to race, color, national origin, sex, or preference, creed or disability. This publication is supported by URI Cooperative Extension. It is contribution #3873 of the College of the Environment and Life Sciences, University of Rhode Island with support from the Rhode Island Agricultural Experiment Station. Partial funding for this project provided by CSREES, Fund for Rural America #97362005273.

Printed on recycled paper. 5/01

At URI's On-Site Wastewater Training Center, examples of conventional drainfields have been installed above ground for demonstration purposes.



PVC piping installed in crushed stone. These drainfields are finished with stone over the pipe and filter fabric over the stone. Eighteen inches of topsoil is placed on filter fabric and then the area is planted in grass.



Galleys, also installed in crushed stone and finished with 18" of topsoil cover and planted in grass.

Flow diffusers are another conventional drainfield option. Installed in crushed stone and finished with 18" of topsoil and planted in grass.

For More Information: Technical Assistance, training programs and information. URI Cooperative Extension's On-Site Wastewater Training Center George Loomis, Program Director, (401) 874-4558, gloomis@uri.edu David Dow, Program Manager, (401) 874-5950, dbdow@uri.edu Website: www.uri.edu/ce/wq

Septic System Information for Rhode Islanders

MAINTAINING YOUR SEPTIC SYSTEM

Sewage Disposal Facts

Approximately 22 million households (1/3 of the U.S. population) use a septic system to treat their domestic wastewater. In Rhode Island, about 150,000 septic systems are in use. When a septic system is properly located, designed, installed and maintained, it serves as a simple, effective and economical domestic wastewater treatment system. Maintenance is typically the homeowner's responsibility and is the key to a long lasting wastewater treatment system. The homeowner can hire a professional to perform the maintenance. In some cases, the homeowner can purchase a maintenance contract similar to one you may have for your heating system. Many communities are establishing wastewater management programs, designed to manage the operation and maintenance of on-site septic systems. Each of these programs will have their own set of requirements and will differ from town to town.

How the septic system works

The standard conventional septic system consists of a septic tank followed by a drainfield, also called a leachfield or soil absorption field. Wastewater flows out of the house and into the septic tank through the building sewer pipe. Once in the septic tank, most solids, in the wastewater settle to the bottom of the tank to form a sludge layer. Other solids such as grease and fats, float and form a scum layer on top of the wastewater. The primary function of the septic tank is to trap and store solids, most of which will be broken down by anaerobic bacteria (bacteria that live without oxygen). In a properly functioning septic tank, up to 80% of the solids will be broken down into gases and liquids.

The liquid leaving the septic tank is usually cloudy and contains many pollutants and disease-causing microbes. The liquid flows into the drainfield. The drainfield may be a network of perforated plastic pipes surrounded by crushed stone, galleys, or trenches. The drainfield acts mainly to store wastewater until the wastewater flows through to the underlying soil. Treatment of the effluent occurs as it flows through the soil between the drainfield and the groundwater table.

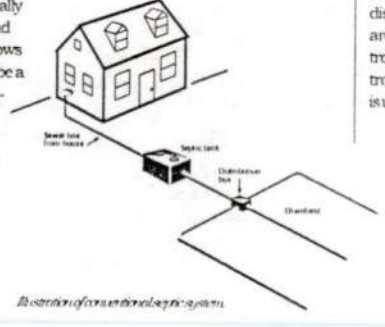


Illustration of a conventional septic system.

Alternative or advanced treatment systems cover a wide variety of treatment technologies and drainfield options. Most of these systems generally include an additional treatment step, which follows the settling of solids in a watertight septic tank. A pump, which may be in the septic tank or a separate basin, is often used to convey the effluent to a treatment unit that may be placed above or below ground. Examples of treatment units include sand filters (single pass, bottomless, or recirculating), RUCK, trickling filters, aerobic units, and biofilters, such as peat, foam, or geotextile.

The treated effluent then flows by gravity to a conventional trench or is pumped under pressure to an alternative drainfield. A pressure-dosed shallow trench located within the native soil layer discharges effluent into biologically active soils for additional pollutant removal by natural processes. This alternative drainfield can be reduced in size and site disturbance is minimized. Where pumps are used to distribute effluent to the treatment unit and drainfield, or to control a blower, an electrical control panel is used.

Installation of a recirculating sand filter.

Rhode Island Regional Water Quality Program
University of Rhode Island College of Environment & Life Sciences
Department of Natural Resources Science
Cooperative Extension On-Site Wastewater Training Center

Wastewater Treatment

Wastewater treatment truly begins in the home, where homeowner recognition of what should and should not enter the septic tank is critical. Once the proper type of waste enters the septic tank, biological treatment of that waste, and solids settling will begin to occur. (This is known as primary treatment.)

Wastewater flows from the septic tank and travels to the drainfield, beneath which should be a zone of unsaturated soil. Many of the harmful bacteria and microbes are filtered out as the wastewater passes through the unsaturated soil zone. Some of the smaller microbes (viruses) and nutrients such as phosphorus and some forms of nitrogen are trapped and held by soil particles. Once effluent reaches the groundwater table or underlying bedrock, little treatment occurs. Soils can differ markedly in their pollutant removal efficiency. The ability of the soil to remove pollutants impacts the quality of wastewater eventually reaching the groundwater beneath the drainfield.

Basic maintenance starts with inspection. This device is used to measure scum and sludge depth in the septic tank.

Septic System Maintenance

Septic Tank

A septic tank must be maintained. Inspection is done by measuring scum depth and sludge depth in the tank on a routine basis, usually every 1-3 years. The septic tank is pumped (discussed below) based on the amount of scum and sludge in the tank. The procedure for measuring scum and sludge depth is outlined below.

During the septic tank inspection, the condition of the inlet and outlet baffles or tee assemblies should be checked for structural soundness. If you do not know where the tank is located, a steel rod gently pushed into the ground, starting ten feet from where the building sewer pipe leaves the house, should help you find it.

If the house was built since 1970, a copy of the septic system site plan may be on file at the RI Department of Environmental Management.

Always wear protective gloves and eyewear when working around your septic system.

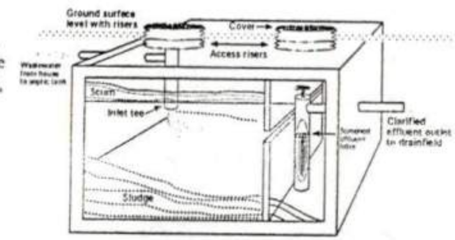
Measuring Scum Depth

1. Attach a short board or stick to the bottom of a 6-8 feet long pole or stick to create an "L".
2. At either the outlet end or the pump-out access of the septic tank, extend the stick down through the scum layer until you feel no more resistance (which means you have reached the liquid wastewater layer).
3. Twist the stick a quarter turn and raise the stick until you "feel" or see the bottom of the scum layer.
4. Mark this level on the stick and measure it. This is the depth of scum layer.
5. Add this measurement to the sludge depth.

Measuring Sludge Depth

1. Wrap a white rag or towel around the bottom of the 6-8 foot stick.
2. Insert the stick through the sludge to the bottom of the tank.
3. Hold the stick there for a few minutes. Make a mark on the stick to show the top of the waste level in the tank.
4. Remove the stick. Measure and note the sludge line at the bottom portion of the stick. Measure and note the total depth of the septic tank (this is the top most mark you made on the stick in step 3).
5. Add the scum and sludge depths together.
6. If the total amount of the scum and sludge depths is more than 50% of the total depth of the septic tank, then the tank should be pumped.

If you do not clean and pump your tank at these critical times, solid materials will begin to leave the tank and enter the drainfield, which will lead to system failure and costly repairs.



Schematic of 1000 gallon, two compartment septic tank

Septic Tank Pumping

A general rule of thumb to determine whether or not the tank needs to be pumped is that if the combined depth of the sludge and scum is greater than or equal to half the total liquid depth of the tank, the tank should be pumped.

To avoid costly repair bills, do not wait until your septic system backs up to have it pumped! When inspection results indicate pumping is needed, consult the yellow pages of your phone book under "septic" for a certified pumper in your area. A professional pumper can also perform the inspection. Some communities may offer a cash rebate to help with the cost of pumping. Ask your town building inspector or planning department if such a rebate exists in your community.

When the septic system is pumped, make sure that all solids are removed and the inlet and outlet tees or baffles are not damaged (figure 2). If either is damaged, make repairs promptly. This will prevent solids from entering the drainfield. In order to prevent the outlet from clogging with solids, clean effluent filters at time of pumping.

It is not necessary to leave any of the sludge in the septic tank as a "seed". The incoming sewage contains all the bacteria needed for proper operation.

Access risers to grade and an effluent filter have been installed on this septic tank. These two simple retrofits allow for ease of maintenance and help to prolong the life of your system.

Drainfield

A conventional drainfield usually does not require any maintenance. However, to protect and prolong the life of the drainfield, observe these simple precautions:

1. Be absolutely sure your septic tank is in good operating order. Never allow sludge or scum to escape from the septic tank. It will clog your drainfield and cause it to fail. Observe the following "Recommendations" below.
2. If your system is equipped with a dosing chamber, be sure the submersible pump is operating properly and maintains a uniform discharge of effluent to the drainfield. You may need the help of a professional for this.
3. Keep automobiles and all heavy vehicles off the drainfield.
4. Don't allow puddles of stormwater to form over a drainfield.
5. Don't cover the drainfield with a hard surface such as asphalt or concrete.
6. Dense grass cover and other shallow rooted plants are beneficial over a drainfield.
7. Think ahead when planting trees and shrubs. Keep them 10 feet from drainfield. Although they promote moisture removal from the drainfield, their roots may clog nearby drain pipes.
8. Don't stockpile snow or soil on your drainfield.
9. Don't allow downspouts to drain onto or into your drainfield.
10. Mark the boundaries of your drainfield as a reminder.

Septic System Maintenance Recommendations

To prolong the life of your septic system and minimize maintenance costs observe the following:

1. Every 1-3 years, inspect the scum and sludge depth in your septic tank and clean the effluent filter as needed (if installed).
2. Pump tank as needed based on scum and sludge measurements. If inspections are not performed, then tanks should be pumped every 2-4 years, depending on usage.
3. Don't use a kitchen garbage disposal unit; instead start a compost pile.
4. Don't put harmful materials in the tank. Avoid fats, solvents, oils, disinfectants, paints, chemicals, poisons, coffee grounds, paper towels, disposable diapers, sanitary napkins and tampons.
5. Install an effluent filter at the outlet of the tank to enhance primary treatment and protect drainfield from an overflow of solids.
6. Install a simple high-water alarm to indicate clogging or the need for tank pumping.
7. Install access risers above the inlet and outlet for easy access at time of inspection and pumping.

System Additives

The use of acids and organic chemical solvents in any septic system is prohibited under Rhode Island law. Acids will deteriorate your concrete septic tank and distribution box. These chemical additives are ineffective in cleaning the tank or drainfield and can contaminate groundwater supplies.

The use of biological enzymes and other "miracle" system additives, although not prohibited by law, have not been shown to be of any value. Similarly, hydrogen peroxide treatments have only short-term beneficial effects on drainfields. Under no circumstances should biological additives be used in place of regular pumping. For more information, see the septic system additive factsheet.

Septic System Information
for Rhode Islanders

WHAT YOU SHOULD KNOW ABOUT SEPTIC SYSTEM INSPECTIONS

Septic systems should be inspected regularly as part of your septic system's maintenance. If your town does not have a management program with prescribed inspection times, you should have your system inspected every 1-3 years. Check with your town to find out if there are inspection requirements.

In 2000, the RI Department of Environmental Management published the Septic System Check-Up: The Rhode Island Handbook for Inspection. The handbook spells out a recommended inspection procedure. Many community wastewater management programs require inspections to be done according to the Handbook's procedure. Again, check with the town to find out if they require a standardized method of inspection.

There are three types of inspections outlined in this handbook; the First Maintenance Inspection, the Routine Inspection, and the more comprehensive Functional Inspection used to determine cause of failure. The First Maintenance Inspection is important. It determines the general status of your septic system and provides the homeowner and the town with baseline information. This inspection determines if the tank is structurally sound and if the hydraulic function of the system is in tact (solids are settling and effluent flows to the drainfield). A septic tank pump-out is usually done at the time of the First Maintenance Inspection. There needs to be coordination between the homeowner and the inspector to arrange for a septic hauler to be present at the inspection.

Once the First Maintenance Inspection is completed, the inspection report may have to be submitted to the town if a community management program exists. Be sure to determine whose responsibility (the homeowner's or the inspector's) it is for doing so.

If you are part of a community management program, the town may determine an appropriate follow up inspection schedule. If your community does not have a management program, there is a guide in the Handbook that you or the inspector can use to determine inspection frequency. The follow up Routine Inspection is to determine the need for pumping and if any problems have occurred since the last inspection. A septic pumper does not need to be present at the Routine Inspection, however, this inspection may reveal the need for a septic tank pump-out.

No matter what type of inspection you need, it is important that your inspector be registered. A list of registered inspectors is available through the University of Rhode Island or your town hall. Your town may have additional requirements of the inspector. Check with the town to see if they have a list of approved inspectors.

Saving Time and Money

When preparing for an inspection, there are a number of things you can do to reduce the time and money spent. These preparations include gathering records and data about your system, locating your system, and providing access to your system components.

Gathering Records

Important information you should gather, if available, before the inspection includes:

▲ The ISDS application, applications for any repairs or alterations, the Certification of Conformance or Certification of Construction and as-built or design plans.

▲ System pumping records.

▲ Any previous inspection reports.

▲ Approved ISDS design if your home has recently been built.

You can get this information through the RI Department of Environmental Management, your town building official, or your builder or engineer if your house has been built recently. If not, you may need to determine the location of the septic tank yourself, or have the inspector do it.

For More Information: Technical Assistance, training programs and information. URI Cooperative Extension's On-Site Wastewater Training Center George Loomis, Program Director, (401) 874-4558, gloomis@uri.edu David Dow, Program Manager, (401) 874-5950, dbdow@uri.edu Website: www.uri.edu/ce/wq

Rhode Island Regional Water Quality Program
University of Rhode Island College of Environment & Life Sciences
Department of Natural Resources Science
Cooperative Extension On-Site Wastewater Training Center

Locating Septic Tanks and Cesspools

In general, a septic tank will be located within 5 - 15 feet from the foundation of the house and usually 1-3 feet below grade. A cesspool could be located up to 50 feet or more from the foundation.

Locate the septic tank by probing with a metal rod. Be sure to avoid underground electric lines. Do not probe where there may be underground electric lines.

Check past inspection reports or other written records such as the ones listed above. Look for access risers at the ground level. Tanks installed after 1990 should have risers to the surface. In addition, many cesspools have access risers at the surface.

Look for the building sewer in the basement. This is the sewer pipe that carries wastewater out of the building to the septic tank or cesspool. Usually the pipe will leave the basement from the area under the bathroom. After determining the general location of the sewer pipe, use a rod to probe the ground for the tank, starting five feet from the house.

If the tank can't be located by probing, open the building sewer access closest to where it exits the basement and insert a plumber's snake. The inlet baffle, tee, or the furthest wall of the septic tank or cesspool should obstruct the snake as it is inserted. The length of the tool inserted estimates the distance to the tank or cesspool from the building sewer access. While the building sewer usually runs in a straight line to the septic tank or cesspool, it may bend or corner, offsetting it from the outlet in the basement.

Locating the Distribution Box and Drainfield

The following techniques may be used to estimate the location for your distribution box or D-Box and your drainfield (soil absorption system). These components typically are not part of a cesspool.

▲ Refer to past inspection reports or as-built plans.

▲ If system reports or drawings are not available, observe the direction of the outlet pipe of the septic tank to determine the general location of the distribution box and drainfield. In some cases, the d-box will have an inspection port at the ground level.

▲ A plumber's snake can be used to determine the distance from the septic tank to the d-box or drainfield. Insert the snake at the septic tank outlet and feed the snake into the pipe until the wall of the d-box obstructs it. Measure the length of snake. In some cases the snake may travel through the d-box and get into a drainfield pipe, making it difficult to determine the distance to the box.

Improvements

If your system does not already have access risers, you may want to install them. Risers installed to grade save you the cost of digging out access ports to the septic tank every time the system is inspected. An effluent filter installed in the outlet tee is also a worthwhile investment in an existing system. This filter keeps solids from clogging the drainfield. The first maintenance inspection is a good time to install these components. Information about risers and filters is available through URI.

Questions to ask when hiring an inspector:

▲ Is the inspector registered? Check with the town hall for any additional requirements before hiring an inspector.

▲ Is the inspector using the DEM inspection method outlined in Septic System Checkup: The Rhode Island Handbook for Inspection?

▲ Will the inspector be arranging for the pump out, or should the homeowner?

▲ How much will the inspection cost? (Typical cost ranges from $50 to $150, plus $150-$175 for pump out if needed).

▲ Is the cost lower when the homeowner locates and digs around the septic tank access ports before the inspector arrives?

▲ Can the inspector also install access risers and filters?

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5/01

Septic System Information for Rhode Islanders

FREQUENTLY ASKED QUESTIONS

About Septic System Operation and Maintenance

▲ What are the basic septic system maintenance requirements?

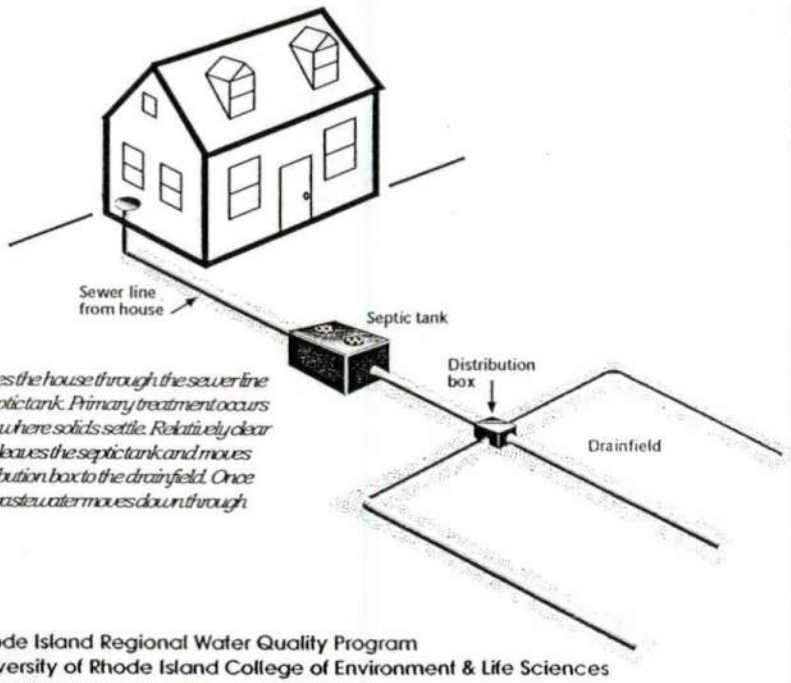
Your town may have specific requirements. At the very least, we recommend a scheduled inspection every 1-3 years. Pump and repair the septic system as needed, based on the inspection. The system should be pumped if the depth of sludge and scum layer is 50% or more of the liquid level in the tank.

▲ Should I use septic system additives?

No. There is no scientific proof indicating septic system additives improve septic system function. In fact, they may eventually harm your system. Save your money for inspections and pumping.

▲ I've had my septic system for 20 years and never had to do anything to it. It must be okay, right?

With a properly functioning septic system, up to 80% of the solids can be broken down into gases and liquids. However, every system needs pumping eventually. If your system has never been pumped then the solids are going somewhere, including direct discharge to a surface water body, the groundwater, or into the drainfield. Pumping frequency depends on number of people, household water use and the size of the tank.



Wastewater leaves the house through the sewer line and enters the septic tank. Primary treatment occurs in the septic tank, where solids settle. Relatively clear wastewater then leaves the septic tank and moves through the distribution box to the drainfield. Once in the drainfield, wastewater moves down through the soil.

▲ Are there certain areas within the town where enhanced treatment septic systems should be used rather than conventional systems?

Yes, in sensitive resource areas such as the coastal salt ponds and around drinking water supplies. Enhanced treatment septic systems are necessary to remove pathogens and nitrate-nitrogen from your household wastewater. Conventional systems do not provide this necessary treatment even when working properly. Also, enhanced treatment systems should be used at existing home sites requiring repairs or replacement where the site cannot accommodate a conventional system.

Rhode Island Regional Water Quality Program
University of Rhode Island College of Environment & Life Sciences
Department of Natural Resources Science
Cooperative Extension On-Site Wastewater Training Center

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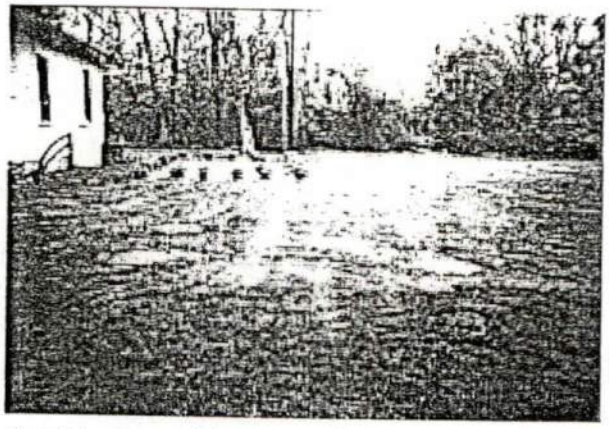
Website: www.uri.edu/ce/wq

▲ Are there basic retrofits that I can have done to my conventional septic system to enhance treatment and maintenance?

Yes, you can have an effluent filter and access risers installed to help enhance primary treatment (solids settling and breakdown) in the tank. Both risers and effluent filters should be included in every new tank installation and can be retrofitted within most existing tanks.

▲ What can I plant near and around my septic system?

Grass cover is best over the system. Within a 10' perimeter around the drainfield, there should be no woody plants or plants with invasive roots, which can damage or clog the drainfield.



Grass is the recommended cover over your septic system.

An effluent filter, installed at the outlet end of the septic tank, is easily maintained when an access riser is installed to grade on the septic tank.

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Septic System Information for Rhode Islanders

FREQUENTLY ASKED QUESTIONS

About Enhanced Individual Sewage Disposal Systems (ISDS) in Rhode Island

What are enhanced treatment septic systems?

Enhanced (or alternative, or innovative) septic systems provide additional treatment to your household wastewater. These systems include an additional component such as a sand filter. Each component plays a different role in treating the effluent. One component may reduce waste strength or remove pathogens, another may remove nitrate-nitrogen, while others, working in combination, do all three. The type of treatment system that you install will depend upon the water resource you are interested in protecting.

When should an enhanced treatment system be installed instead of a conventional septic system?

When enhanced treatment is desired to protect a critical water resource and the desired outcome is greater nutrient or pathogen reduction. For example, conventional systems do not reduce nitrate-nitrogen from wastewater and sandy soils may not adequately treat pathogens. Also, enhanced treatment is used when an existing repair site cannot accommodate a conventional technology or when new construction would require extra fill material being hauled on site, the construction of a retaining wall, or extensive mounding.

How much does an enhanced system cost?

Costs range from $10,000 - $20,000 or more for a complete system. Keep in mind, however, that in some repair situations on small lots there is only enough room for an enhanced system. Also, the cost of a conventional system in some applications (very wet or stoney lots) can far exceed the cost of an enhanced system, especially if fill and retaining walls are required.

Does the property owner need a variance or special permit?

If a certain type of enhanced system is not approved for general use by the Rhode Island Department of Environmental Management (RIDEM), a special variance will be required.

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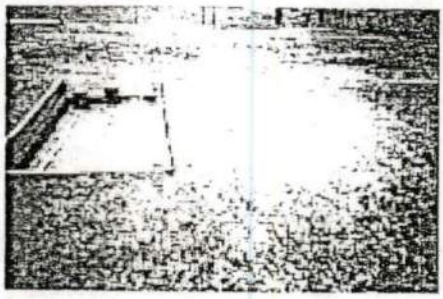
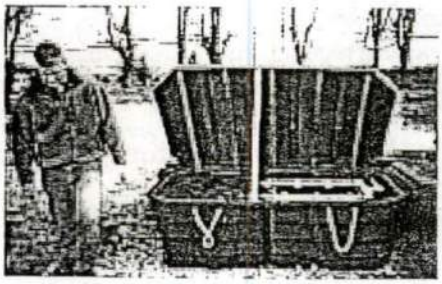
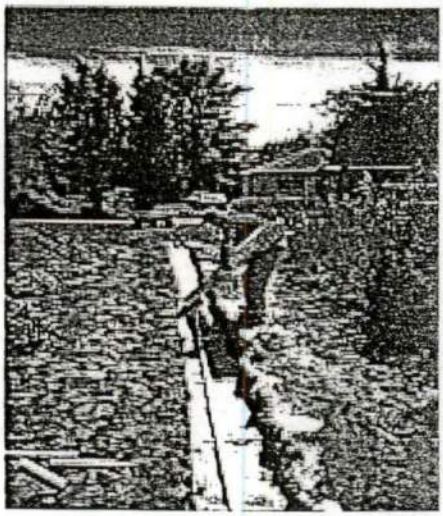


Part of this single pass sand filter is exposed at URI's On-Site Wastewater Training Center for demonstration purposes. It is one example of an enhanced treatment component approved for use in Rhode Island.



A peat filter is an enhanced treatment option.



The shallow, narrow drainfield design is a typical component of the enhanced treatment system.

How do I know if an enhanced system is approved for general use?

You can find a list of currently approved technologies not requiring a variance at RIDEM's ISDS section website at http://www.state.ri.us/dem/regs/water/isdsnew.htm.

How does an enhanced system improve treatment to protect water quality?

The additional component(s) built into these systems put the wastewater through aerobic or a combination of aerobic and anaerobic treatment before effluent is released to the environment. Based on the system design, this increases the removal of nitrogen, pathogens, or both from the wastewater. Many of these systems also incorporate a shallow, narrow drainfield design. This design uses the existing upper-level soil to provide additional treatment of the wastewater.

What kind of site constraints can be overcome with these systems?

Sloping sites, high groundwater, soils with either slow or very rapid percolation rates, and sites close to wetlands, coastal ponds, drinking water supplies or other critical water resources.

Will an enhanced ISDS allow development of land that otherwise could not be developed with a conventional ISDS?

Not according to present RIDEM policy. In Rhode Island, all new development sites must meet existing requirements for conventional systems before being granted a permit to install an enhanced treatment system.

Can multiple homes or businesses be hooked up to a single enhanced ISDS?

Yes, in some situations.

How long does an alternative ISDS last?

When properly engineered, installed, and maintained, the overall system (i.e. tank, drainfield, treatment zone) should last indefinitely. Individual components such as pumps, electrical components, and filter media may require eventual replacement.

How much does an alternative ISDS cost to run and maintain?

Annual costs vary depending upon the type of system and its configuration. For example, a single-pass sand filter costs approximately $15 per year in electricity, whereas a system that utilizes an aeration system that operates 24-hours a day can cost $300 or more a year. Maintenance providers offer service contracts. These can range from $150 - $400 per year depending on the type of system and frequency of maintenance.

Who will maintain and repair the system?

A service and maintenance contract can be established with a septic service professional similar to that of your heating system maintenance.

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Septic System Information
for Rhode Islanders

SEPTIC SYSTEM ADDITIVES

With over 1200 products currently on the market, many homeowners have concerns and questions regarding septic tank additives. The position of URI Cooperative Extension's On-site Wastewater Training Center is that additives are not necessarily beneficial to septic tanks and may, in fact, be harmful. Instead of spending money on additives, we recommend that you use the money for regular septic system inspection and maintenance (the real solution to extending the life of your septic system). Here's why:

RI regulation prohibits "the use of acid and organic chemical solvents in any individual sewage disposal system" (RI ISDS Regulation SD 2.12). Acids and other chemical additives can destroy the biological function of the septic tank, re-suspend solids causing drainfield clogging, damage soil structure, and can contaminate groundwater. Acids and base materials corrode concrete tanks and distribution boxes, causing them to leak and fall apart.

Biological additives are not necessary and may reduce system life by allowing solids to move from the tank and clog your drainfield. Some manufacturers claim that such additives enhance biological treatment, reduce or eliminate pumping by liquefying solids and grease, and provide a head start with bacteria or enzymes when the system is stressed, new, or recently pumped. These claims are not supported by research.

A properly functioning septic tank retains solids. Solids slowly decompose and accumulate. Eighty percent of solids decompose to liquid or gas. Twenty percent accumulate in the tank. As solids build up within the septic tank, eventually, they must be pumped out. The nature of a properly functioning septic tank necessitates periodic maintenance pumping. How often you need to pump depends on the type of system, its use, and inspection findings. Using additives to avoid pumping may cause bigger problems by allowing solids to flow into and clog the drainfield.

The amount of bacteria or enzyme in each dose of additive is very small compared to the bacteria already in the tank or introduced with the first flush of human waste (in the case of a new system). Thus its effectiveness is slight or undetectable. No manufacturer has submitted evidence that these minute doses can benefit septic tanks.

Excessive use of cleaning agents can stress your system by killing beneficial bacteria, though it will recover rapidly under normal use. Always follow the manufacturer's recommendations when using cleaning products. A University of Arkansas study determined that a high dose of cleaning agents (i.e. 1.3 gallons of bleach), killed the beneficial bacteria in the tank, but within 3 days the bacteria were back to normal amounts. These doses are obviously higher than any normal use would require and are not recommended.

For More Information: Technical Assistance, training programs and information. URI Cooperative Extension's On-Site Wastewater Training Center George Loomis, Program Director, (401) 874-4558, gloomis@uri.edu David Dow, Program Manager, (401) 874-5950, dbdow@uri.edu Website: www.uri.edu/ce/wq

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University of Rhode Island College of Environment & Life Sciences
Department of Natural Resources Science
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Septic System Information
for Rhode Islanders

HOW TO HIRE A CONTRACTOR FOR SEPTIC SYSTEM INSTALLATION OR REPAIR

Hiring a contractor is often a difficult task. Here are a few suggestions to reduce your risk and help you get the contractor that is best for your job.

▲ Make sure the contractor is licensed and insured to install septic systems in Rhode Island.

▲ Discuss the job with, or request bids from, two or more contractors to get a realistic idea of the costs. Be sure the bids are based on the same scope of work and system components. There should be a design plan upon which the contractors can study and base their bid. Be sure the contractor is specifying components that are called for in the plan. If a new septic tank is being installed, be sure the contractor warrants that it is watertight. Refer to URI Cooperative Extension Fact Sheet "How to Order and Buy a Septic Tank" for more information on septic tanks. All contractors should specify a tank according to the information provided in this fact sheet.

▲ Before selecting a contractor, ask for references and check the references to see how previous jobs have gone. Did the contractor do what was promised and were any problems or discrepancies promptly corrected?

▲ The installation procedure should be spelled out in the contract and the costs and payment schedule should be clearly defined. The bid procedure should include a list of components, as well as any proposed finish landscaping or property restoration the contractor will provide.

▲ If the system is an enhanced treatment system, has the contractor installed this type of system before? If not, does he/she have a resource to help him/her through the installation such as the product supplier or manufacturer? Most product suppliers have technical staff to help with installations. There may be a fee for this service, and it should be understood ahead of time who is responsible for that fee.

Your contractor should install access risers to grade on your septic tank.

The conditions for any contract cost adjustments should be clear before the contract is signed. Unexpected site conditions such as the need to blast or hammer ledge where none was indicated before excavation could constitute a problem that warrants additional cost. It is important for the contractor to outline and write into the contract situations where an unplanned increase in the price of the system would occur before the contract is signed. Another potential for additional costs is the need to retrofit plumbing inside the house or to re-direct the building sewer. Be sure the responsibility for these costs are spelled out in the contract.

The seam of this concrete septic tank is sealed with a butyl strip that provides additional assurance that it is watertight. The inlet and outlet have cast in place rubber boots with stainless steel clamps.

For More Information: Technical Assistance, training programs and information. URI Cooperative Extension's On-Site Wastewater Training Center George Loomis, Program Director, (401) 874-4558, gloomis@uri.edu David Dow, Program Manager, (401) 874-5950, dbdow@uri.edu Website: www.uri.edu/ce/wq

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TOWN OF GLOCESTER COMMUNITY SEPTIC LOAN PROGRAM

Please attach the following items to your application:

☐ A copy of your most recent signed tax return, along with W-2s from last 2 years
☐ A copy of 2 of the most recent pay stubs for each applicant
☐ A copy of the warranty or property deed

Please complete and mail this application along with the items requested above. If you have any questions, or would like to apply by telephone please call **1-888-744-4770**. RI Housing and Mortgage Finance Corp. will give you an answer fast.

Please tell us about your borrowing needs: **Purpose:** Repair ☐ or Replace ☐ Failed Septic System in the Town of Glocester

Desired Amount $ _____ Term: ☐ Years (up to 5)

Applicant
Please tell us about yourself:

Full Name _____ Date of Birth _____

Home Address _____

City _____ State _____ Zip _____

Telephone _____ Social Security Number _____

Employer _____ Position _____

Years There _____ Employer Phone No. _____ Monthly Gross Income (before taxes) _____

Marital Status: ☐ Married ☐ Separated ☐ Unmarried (Includes single, divorced, widowed)

Please tell us about your property: What is the address of the property you will be using as security for this loan?

Is this your primary residence? ☐ Yes ☐ No

Home Type: ☐ Single Family ☐ 2-4 Family ☐ Condo ☐ Other_____

Year Purchased: _____ Original Purchase Price $_____

Current Estimate of Property Value $_____

Annual R.E. Tax Bill: $_____ Assessed Value $_____

Annual Property Insurance Premium $_____

Monthly Mortgage Principal and Interest Payment $_____

List Full Names of all Other Joint Owners:

Applicant Current Debts: Please tell us where and to whom you currently owe money. Be sure to include all mortgages, other loans and credit cards. For each debt over $500, please tell us if you plan on paying it off and source of funds.

Creditor	Balance	Monthly Payment	Paying off Debt
	$	$	☐ Yes ☐ No
1st Mortgage	$	$	☐ Yes ☐ No
2nd Mortgage/Equity Line	$	$	☐ Yes ☐ No
Auto Loan(s)	$	$	☐ Yes ☐ No
Other Debt Including Credit Card(s)		$	
Alimony/Child Support/Separate Maintenance			

Co-Applicant
Please tell us about yourself:

Full Name _____ Date of Birth _____

Home Address _____

City _____ State _____ Zip _____

Telephone _____ Social Security Number _____

Employer _____ Position _____

Years There _____ Employer Phone No. _____ Monthly Gross Income (before taxes) _____

Marital Status: ☐ Married ☐ Separated ☐ Unmarried (Includes single, divorced, widowed)

Please List Other Sources of Income You Want Us To Consider: If you are receiving a pension or rental income, include 2 years of signed tax returns. Alimony, Child Support, or Separate Maintenance need not be revealed if you do not choose to have it considered for repayment of this loan. Alimony, Child Support, or Separate Maintenance received under ☐ Court Order ☐ Separation Agreement. Include a copy of the agreement.

Applicant Source: _____ Amount: $_____ Co-Applicant Source: _____ Amount: $_____

Source: _____ Amount: $_____ Source: _____ Amount: $_____

Please Read and Sign

Certification: Everything that I/We have stated in this application is true and complete to the best of My/Our knowledge. You are authorized to check My/Our credit and employment history and to answer questions about your credit experience with Me/Us.

Applicant Signature _____ Date _____

Co-Applicant Signature _____ Date _____

EQUAL HOUSING OPPORTUNITY LENDER

RHODE ISLAND HOUSING AND MORTGAGE FINANCE CORPORATION

TOWN OF GLOCESTER COMMUNITY SEPTIC LOAN PROGRAM

Administered by the Rhode Island Housing and Mortgage Finance Corporation in partnership with the Rhode Island Clean Water Finance Agency and the State Department of Environmental Management for the town.

The program goal is to safeguard your town water resources from failing or improperly designed individual sewage disposal systems (ISDSs) by ensuring the proper functioning and maintenance of all septic systems in Glocester.

The program makes low interest loans available to Glocester residents.

Loan Terms:

- 4% fixed annual interest rate
- Loan amounts from $1,000 to $15,000
- Loan terms *up* to 10 years
- Debt to income ratio less than 45%
- Residential (not commercial) owner occupied or non-owner occupied one to four family properties

Program Requirements

- Licensed installer: At least one bid obtained and must complete all work
- Must be current with all credit obligations
- No late payments in last 12 months
- No current bankruptcies
- No current Federal Tax Liens
- Certificate of Conformance for payment

No Loan Fees
There is no application, title, credit report, appraisal fees or points to pay.

Fast Answers
Call today, toll free **1-888-744-4770** or complete and mail this application.

Septic System Contacts

State Permits and Regulations

- ISDS Section of RIDEM (401) 222-6820
  www.state.ri.us/dem/regs/water/isdsnew.htm

Septic System Installers

- RI Independent Contractors Association
  (401)-785-1830

Technical Information on Conventional and Alternative Septic Systems

- URI Cooperative Extension On-Site Wastewater Training Center
  David Dow (401)-874-5950
  www.uri.edu/ce/wq

System Maintenance Information and Homeowner Workshops

- URI Cooperative Extension
  Home*A*Syst Program
  Alyson McCann (401)-874-5398
  alyson@uri.edu

Water Testing and Treatment

- RIDOH, Drinking Water Quality Division
  (401)-222-6867

Town of Glocester Wastewater Management District Board Coordinator

- **John Alfano, jalfano@cox.net**
  1145 Putnam Pike
  Chepachet, RI 02814
  Tel: (401)-568-1102 or 6206
  Fax: (401)-568-5850
  www.glocesterRI.org

GLOCESTER

TOWN OF GLOCESTER COMMUNITY SEPTIC LOAN PROGRAM

Financial Assistance for Septic System Repairs and Replacements

Better effluent treatment and maintenance produces better ground water recharge value.

Rhode Island Housing and Mortgage Finance Corporation
44 Washington Street, Providence, RI 02903
1-888-744-4770
An Equal Housing Opportunity Lender

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Offices Throughout New England

Appendix M

Planning Areas – Opinion of Cost

FUSS & O'NEILL

Planning Area Project Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 8 - Gravity Sewer Alternative

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Gravity Sewer Installation				
	8-Inch Gravity Sewer	L.F.	12,370	$160	$1,979,200
	6-inch Service Connection[1]	L.F.	2,865	$130	$372,450
	6-inch Service Connection Wye/Tee	EA.	191	$540	$103,140
	Sanitary Sewer Manholes	EA.	25	$8,800	$220,000
	Gravity Sewer Installation Total				*$2,680,000*
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	EA.	58	$11,000	$638,000
	1.5-inch HDPE Low Pressure Sewer	L.F.	700	$80	$56,000
	2-inch HDPE Low Pressure Sewer	L.F.	1,710	$85	$145,350
	3-inch HDPE Low Pressure Sewer	L.F.	1,160	$90	$104,400
	1.25-inch Low Pressure Service Connection[2]	L.F.	2,320	$75	$174,000
	Low Pressure Sewer Lateral Kits	E.A.	58	$710	$41,180
	Air/Vacuum Release Valve	E.A.	1	$3,600	$3,600
	Low Pressure Cleanout Chambers	EA.	10	$8,000	$80,000
	Low Pressure Sewer Installation Total				*$1,250,000*
	Dewatering	L.S.	1	$150,000	$150,000
	Rock Excavation[3]	C.Y.	300	$200	$60,000
	Temporary Bituminous Repair	L.F.	19,680	$35	$688,800
	Permanent Bituminous Repair	L.F.	19,680	$65	$1,279,200
	Mill and Overlay (Town Road)[4]	S.Y.	49,150	$40	$1,966,000
	Construction Mobilization[5]	L.S.	1	$242,140	$242,140
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$1,830,000
	Subtotal				$10,160,000
	Contingency		25%		$2,540,000
	Total Opinion of Project Cost				**$12,700,000**
			TOTAL COST (-30% TO +50% ROUNDED)		$8,890,000 TO $19,050,000

This is an order of magnitude cost estimate that is expected to be within -30 to +50 percent of the actual project cost. Fuss & O'Neill has no control over the cost of labor, materials, equipment or services furnished by others, or over the Contractor(s)' methods of determining prices, or over competitive bidding or market conditions. Fuss & O'Neill's opinion of probable Total Project Costs and Construction Cost are made on the basis of Fuss & O'Neill's experience and qualifications and represent Fuss & O'Neill's best judgment as an experienced and qualified professional engineer, familiar with the construction industry; but Fuss & O'Neill cannot and does not guarantee that proposals, bids or actual Total Project or Construction Costs will not vary from opinions of probable cost prepared by Fuss & O'Neill. If prior to the bidding or negotiating Phase the Owner wishes greater assurance as to Total Project or Construction Costs, the Owner shall employ an independent cost estimator.

Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 15 linear feet of service connection for each property connecting to gravity sewer system.
2.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
3.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
4.) Based on 27.75 average foot wide road width.
5.) Construction Mobilization is assumed to be 3% of the total construction costs
6.) Costs developed in 2022 dollars
7.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
8.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
9.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
10.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 8

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	E.A.	249	$11,000	$2,739,000
	Low Pressure Sewer Lateral Kits	E.A.	249	$710	$176,790
	1.5-inch HDPE Low Pressure Sewer	L.F.	2,330	$80	$186,400
	2-inch HDPE Low Pressure Sewer	L.F.	8,410	$85	$714,850
	3-inch HDPE Low Pressure Sewer	L.F.	4,960	$90	$446,400
	1.25-inch Low Pressure Service Connection[1]	L.F.	9,960	$75	$747,000
	Low Pressure Cleanout Chambers	E.A.	16	$8,000	$125,600
	Air/Vacuum Release Valve	E.A.	5	$3,600	$18,000
	Low Pressure Sewer Installation Total				*$5,160,000*
	Rock Excavation[2]	C.Y.	290	$200	$58,000
	Temporary Bituminous Repair	L.F.	19,440	$35	$680,400
	Permanent Bituminous Repair	L.F.	19,440	$65	$1,263,600
	Mill and Overlay (Town Road)[3]	S.Y.	48,410	$40	$1,937,000
	Construction Mobilization[4]	L.S.	1	$273,100	$273,100
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$2,070,000
	Subtotal				$11,460,000
	Contingency		25%		$2,870,000
	Total Opinion of Project Cost				**$14,330,000**
				TOTAL COST (-30% TO +50% ROUNDED)	$10,040,000 TO $21,500,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
2.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
3.) Based on 27.75 average foot wide road width.
4.) Construction Mobilization is assumed to be 3% of the total construction costs
5.) Costs developed in 2022 dollars
6.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
7.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
8.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
9.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 9

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Gravity Sewer Installation				
	8-Inch Gravity Sewer	L.F.	6,300	$160	$1,008,000
	6-inch Service Connection[1]	L.F.	1,845	$130	$239,850
	6-inch Service Connection Wye/Tee	EA.	123	$540	$66,420
	Sanitary Sewer Manholes	EA.	14	$8,800	$119,680
	Gravity Sewer Installation Total				*$1,440,000*
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	EA.	117	$11,000	$1,287,000
	Low Pressure Sewer Lateral Kits	E.A.	117	$710	$83,070
	1.5-inch HDPE Low Pressure Sewer	L.F.	1,030	$80	$82,400
	2-inch HDPE Low Pressure Sewer	L.F.	3,430	$85	$291,550
	3-inch HDPE Low Pressure Sewer	L.F.	1,430	$90	$128,700
	1.25-inch Low Pressure Service Connection	L.F.	4,680	$75	$351,000
	Low Pressure Cleanout Chambers	EA.	6	$8,000	$47,120
	Air/Vacuum Release Valve	E.A.	2	$3,600	$7,200
	Low Pressure Sewer Installation Total				*$2,280,000*
	Pumping Station & Force Main Construction				
	Briar Point Pump Station	L.S.	1	$2,000,000	$2,000,000
	Odor Control System	L.S.	1	$200,000	$200,000
	6-Inch Force Main, Cleanouts and Valves Chamber	L.F.	2,270	$250	$567,500
	Pumping Station & Force Main Construction Total				$2,770,000
	Dewatering	L.S.	1	$150,000	$150,000
	Rock Excavation[3]	C.Y.	240	$200	$48,000
	Temporary Bituminous Repair	L.F.	15,790	$35	$552,650
	Permanent Bituminous Repair	L.F.	15,790	$65	$1,026,350
	Mill and Overlay (Town Road)[4]	S.Y.	37,590	$40	$1,504,000
	Construction Mobilization[5]	L.S.	1	$293,115	$293,120
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$2,220,000
	Subtotal				$12,300,000
	Contingency		25%		$3,080,000
	Total Opinion of Project Cost				**$15,380,000**
			TOTAL COST (-30% TO +50% ROUNDED)		$10,770,000 TO $23,070,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 15 linear feet of service connection for each property connecting to gravity sewer system.
2.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
3.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
4.) Based on 27.75 average foot wide road width.
5.) Construction Mobilization is assumed to be 3% of the total construction costs
6.) Costs developed in 2022 dollars
7.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
8.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
9.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
10.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 9

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	E.A.	240	$11,000	$2,640,000
	Low Pressure Sewer Lateral Kits	E.A.	240	$710	$170,400
	1.5-inch HDPE Low Pressure Sewer	L.F.	3,040	$80	$243,200
	2-inch HDPE Low Pressure Sewer	L.F.	7,246	$85	$615,910
	3-inch HDPE Low Pressure Sewer	L.F.	1,810	$90	$162,900
	4-inch HDPE Low Pressure Sewer	L.F.	1,390	$95	$132,050
	6-inch HDPE Low Pressure Sewer	L.F.	710	$100	$71,000
	1.25-inch Low Pressure Service Connection[1]	L.F.	9,600	$75	$720,000
	Low Pressure Cleanout Chambers	E.A.	14	$8,000	$113,568
	Air/Vacuum Release Valve	E.A.	5	$3,600	$18,000
	Low Pressure Sewer Installation Total				*$4,890,000*
	Rock Excavation[2]	C.Y.	270	$200	$54,000
	Temporary Bituminous Repair	L.F.	17,800	$35	$623,000
	Permanent Bituminous Repair	L.F.	17,800	$65	$1,157,000
	Mill and Overlay (Town Road)[3]	S.Y.	43,780	$40	$1,752,000
	Construction Mobilization[4]	L.S.	1	$254,500	$254,500
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$1,930,000
	Subtotal				$10,680,000
	Contingency		25%		$2,670,000
	Total Opinion of Project Cost				**$13,350,000**
				TOTAL COST (-30% TO +50% ROUNDED)	$9,350,000 TO $20,030,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

Assume no rock excavations for force main and low pressure sewer.

1.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.

2.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench

3.) Based on 27.75 average foot wide road width.

4.) Construction Mobilization is assumed to be 3% of the total construction costs

5.) Costs developed in 2022 dollars

6.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.

of septic system (this cost is to be paid by the homeowner).

8.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.

9.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 12

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Gravity Sewer Installation				
	8-Inch Gravity Sewer	L.F.	22,680	$160	$3,628,800
	6-inch Service Connection[1]	L.F.	5,210	$130	$677,300
	6-inch Service Connection Wye/Tee	EA.	347	$540	$187,380
	Sanitary Sewer Manholes	EA.	48	$8,800	$425,568
	Gravity Sewer Installation Total				*$4,920,000*
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	EA.	254	$11,000	$2,794,000
	Low Pressure Sewer Lateral Kits	E.A.	254	$710	$180,340
	HDPE Low Pressure Sewer	L.F.	13,140	$90	$1,182,600
	1.25-inch Low Pressure Service Connection[2]	L.F.	10,160	$75	$762,000
	Low Pressure Cleanout Chambers	EA.	13	$8,000	$105,120
	Low Pressure Sewer Installation Total				*$5,030,000*
	Rock Excavation[3]	C.Y.	670	$200	$134,000
	Temporary Bituminous Repair	L.F.	44,840	$35	$1,569,400
	Permanent Bituminous Repair	L.F.	44,840	$65	$2,914,600
	Mill and Overlay (Town Road)[4]	S.Y.	110,450	$40	$4,418,000
	Construction Mobilization[5]	L.S.	1	$868,173	$868,173
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$4,380,000
	Subtotal				$24,250,000
	Contingency		25%		$6,070,000
	Total Opinion of Project Cost				**$30,320,000**
				TOTAL COST (-30% TO +50% ROUNDED)	$21,230,000 TO $45,480,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 15 linear feet of service connection for each property connecting to gravity sewer system.
2.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
3.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
4.) Based on 27.75 average foot wide road width.
5.) Construction Mobilization is assumed to be 3% of the total construction costs
6.) Costs developed in 2022 dollars
7.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
8.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
9.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
10.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 1

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Gravity Sewer Installation				
	8-Inch Gravity Sewer	L.F.	17,866	$160	$2,858,560
	6-inch Service Connection[1]	L.F.	2,570	$130	$334,100
	6-inch Service Connection Wye/Tee	EA.	171	$540	$92,340
	Sanitary Sewer Manholes	EA.	36	$8,800	$314,442
	Gravity Sewer Installation Total				*$3,600,000*
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	EA.	225	$11,000	$2,475,000
	Low Pressure Sewer Lateral Kits	E.A.	225	$710	$159,750
	HDPE Low Pressure Sewer	L.F.	10,880	$90	$979,200
	1.25-inch Low Pressure Service Connection[2]	L.F.	9,000	$75	$675,000
	Low Pressure Cleanout Chambers	EA.	11	$8,000	$87,040
	Low Pressure Sewer Installation Total				*$4,380,000*
	Rock Excavation[3]	C.Y.	5,200	$200	$1,040,000
	Temporary Bituminous Repair	L.F.	34,690	$35	$1,214,150
	Permanent Bituminous Repair	L.F.	34,690	$65	$2,254,850
	Mill and Overlay (Town Road)[4]	S.Y.	88,640	$40	$3,546,000
	Construction Mobilization[5]	L.S.	1	$720,613	$720,613
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$3,690,000
	Subtotal				$20,460,000
	Contingency		25%		$5,120,000
	Total Opinion of Project Cost				**$25,580,000**
				TOTAL COST (-30% TO +50% ROUNDED)	$17,910,000 TO $38,370,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 15 linear feet of service connection for each property connecting to gravity sewer system.
2.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
3.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
4.) Based on 27.75 average foot wide road width.
5.) Construction Mobilization is assumed to be 3% of the total construction costs
6.) Costs developed in 2022 dollars
7.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
8.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
9.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
10.) Total cost (-30% To 50%) does not include contingency of 25%

FUSS & O'NEILL

Planning Area Sanitary Buildout Opinion of Cost
Sewer Facility Plan
Coventry, Rhode island

Planning Area 2

Item No.	Description	Unit of Measure	Quantity	Unit Cost	Extended Cost
	Gravity Sewer Installation				
	8-Inch Gravity Sewer	L.F.	1,535	$160	$245,600
	10-Inch Gravity Sewer	L.F.	4,598	$180	$827,640
	18-Inch Gravity Sewer	L.F.	2,025	$200	$405,000
	6-inch Service Connection[1]	L.F.	300	$130	$39,000
	6-inch Service Connection Wye/Tee	EA.	20	$540	$10,800
	Sanitary Sewer Manholes	EA.	3	$8,800	$27,016
	Gravity Sewer Installation Total				*$1,560,000*
	Low Pressure Sewer Installation				
	Simplex Grinder Pump	EA.	423	$11,000	$4,653,000
	Low Pressure Sewer Lateral Kits	E.A.	423	$710	$300,330
	HDPE Low Pressure Sewer	L.F.	29,780	$90	$2,680,200
	1.25-inch Low Pressure Service Connection[2]	L.F.	16,920	$75	$1,269,000
	Low Pressure Cleanout Chambers	EA.	30	$8,000	$238,240
	Low Pressure Sewer Installation Total				*$9,140,770*
	Rock Excavation[3]	C.Y.	6,700	$200	$1,340,000
	Temporary Bituminous Repair	L.F.	44,590	$35	$1,560,650
	Permanent Bituminous Repair	L.F.	44,590	$65	$2,898,350
	Mill and Overlay (Town Road)[4]	S.Y.	116,980	$40	$4,680,000
	Construction Mobilization[5]	L.S.	1	$956,568	$956,568
	Record Drawings	L.S.	1	$10,000	$10,000
	Engineering/Legal/Administrative		22%		$4,880,000
	Subtotal				$27,030,000
	Contingency		25%		$6,760,000
	Total Opinion of Project Cost				**$33,790,000**
	TOTAL COST (-30% TO +50% ROUNDED)				$23,660,000 TO $50,690,000

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Date: December 2022	Prepared By: RM	Checked By: DB

Notes:

1.) Assumes 15 linear feet of service connection for each property connecting to gravity sewer system.
2.) Assumes 40 linear feet of service connection for each property connecting to low pressure sewer system.
3.) Assume 1 foot of rock excavation for entire length of gravity sewer and low pressure for 4-foot wide trench
4.) Based on 27.75 average foot wide road width.
5.) Construction Mobilization is assumed to be 3% of the total construction costs
6.) Costs developed in 2022 dollars
7.) Typical planning level costs carry contingencies of -30% to +50%. Opinion of costs will continue to be refined during subsequent phases.
8.) For those properties connecting via gravity, cost does not include gravity service connections from the building to the sewer stub in the street and abandonment of septic system (this cost is to be paid by the homeowner).
9.) For those properties connecting via low pressure sewer, cost does not include abandonment of existing septic system or electrical upgrades that are necessary to support the grinder pump.
10.) Total cost (-30% To 50%) does not include contingency of 25%

Appendix N

Pressure Sewer Analysis – Coventry, Rhode Island

Environment One Corporation

Pressure Sewer Preliminary Cost and Design Analysis For Coventry, Rhode Island

Prepared For:
Fuss & O'Neill, Inc.
146 Hartford Rd
Manchester CT 06040 USA
Tel: 860-327-6008
Fax:
Prepared By: M. Crowley
January 10, 2023

Coventry, Rhode Island

Prepared by : M. Crowley **On:** January 10, 2023

Notes :
Analysis based upon drawings and data provided. Station recommendations are preliminary.

GPD values impact retention times only, not line sizing or hydraulics. GP laterals to be 1.25".

Analysis valid only with pipe type listed.

General recommendations for valve placement are: clean out valves at intervals of approximately 1,000 ft and at branch ends and junctions; isolation valves at branch junctions; and air release valves at changes in grade of 20 to 25 ft or more and/or at intervals of 2,000 to 2,500 ft. Lateral kits comprised of a ball and check valve are required to be installed between the pump discharge and street main on all installations. Laterals should be located as close to the public right of way as possible.

Quantities of grinder pumps, pipe, and valves are indicated on the cost page. The model of grinder pump(s) indicated is based upon the initial information provided to us but may not be the most appropriate for the specific location or requirements of the project. Costs of these items and their installation are best obtained from sources in your region. We recommend you contact your local distributor of Environment One products for additional recommendations.

01.06.2023 - Initial analysis. Zones 1, 2, 12, 16, 27 represnt existing 3" SDR21 PVC. Zone 110 represents existing 6" C900 DR18 PVC (6.09" ID vs 5.99" ID for SDR21 PVC).

<<<<< E N D O F N O T E S >>>>>

January 10, 2023

Budgetary Low Pressure Sewer System Costs

Coventry, Rhode Island

	Quantity	Description	Unit Cost	Installation	Sub Total
Valves	10	Air/Vacuum Release Valve	$0.00	0.00	$0.00
	70	Clean Out	$0.00	0.00	$0.00
					$0.00
Pumps	489	DH071-93	$0.00	0.00	$0.00
	489	Lateral Kits (Includes Ball\Check Valve Assembly)	$0.00	0.00	$0.00
	489	Lateral (Boundary) Installation	$0.00	0.00	$0.00
	489	Pump/Panel Installation	$0.00	0.00	$0.00
	24,450	LF of 1.25" Lateral Pipe	$0.00	0.00	$0.00
					$0.00
Piping	5,369	1.50" Pipe	$0.00	0.00	$0.00
	15,650	2.00" Pipe	$0.00	0.00	$0.00
	8,715	3.00" Pipe	$0.00	0.00	$0.00
	1,389	4.00" Pipe	$0.00	0.00	$0.00
	2,173	6.00" Pipe	$0.00	0.00	$0.00
					$0.00

Number of Connections	**489**		
Total Per Connection	**$0.00**	**Total (w/o other)** >>>>>>>>>>>>>	**$0.00**
Grand Total Per Connection	**$0.00**	**Grand Total (including other)** >>>>>>>>>>>>>	**$0.00**

Note: The System Costs above are based on piping sized for, and Grinder Pumps manufactured by Environment One Corporation.

Prepared By:
M. Crowley

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS
Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR21PVC											Friction loss calculations were based on a Constant for inside roughness "C" of: 150						
1.00	2.00	3	3	200	11.00	2	22.00	3.00	0.90	340.00	0.11	0.38	40.54	275.00	270.00	5.00	45.54
2.00	12.00	4	7	200	11.00	3	33.00	3.00	1.34	375.00	0.23	0.88	40.16	265.00	265.00	0.00	40.16
3.00	4.00	3	3	200	11.00	2	22.00	1.50	3.04	174.00	2.15	3.74	62.58	265.00	245.00	20.00	82.58
4.00	6.00	2	5	200	11.00	3	33.00	2.00	2.92	84.00	1.54	1.30	58.84	265.00	250.00	15.00	73.84
5.00	6.00	2	2	200	11.00	2	22.00	1.50	3.04	137.00	2.15	2.95	60.49	265.00	250.00	15.00	75.49
6.00	7.00	2	9	200	11.00	3	33.00	2.00	2.92	133.00	1.54	2.05	57.54	265.00	255.00	10.00	67.54
7.00	11.00	8	17	200	11.00	4	44.00	2.00	3.89	454.00	2.63	11.93	55.49	265.00	245.00	20.00	75.49
8.00	9.00	3	3	200	11.00	2	22.00	1.50	3.04	134.00	2.15	2.88	57.25	265.00	245.00	20.00	77.25
9.00	10.00	6	9	200	11.00	3	33.00	2.00	2.92	281.00	1.54	4.34	54.37	265.00	245.00	20.00	74.37
10.00	11.00	4	13	200	11.00	4	44.00	2.00	3.89	246.00	2.63	6.47	50.03	265.00	245.00	20.00	70.03
11.00	12.00	6	36	200	11.00	6	66.00	3.00	2.69	506.00	0.85	4.28	43.56	265.00	255.00	10.00	53.56
12.00	16.00	3	46	200	11.00	6	66.00	3.00	2.69	357.00	0.85	3.02	39.28	255.00	255.00	0.00	39.28
13.00	14.00	3	3	200	11.00	2	22.00	1.50	3.04	159.00	2.15	3.42	56.09	250.00	230.00	20.00	76.09
14.00	15.00	6	9	200	11.00	3	33.00	2.00	2.92	253.00	1.54	3.90	52.67	250.00	230.00	20.00	72.67
15.00	16.00	7	16	200	11.00	4	44.00	2.00	3.89	476.00	2.63	12.51	48.77	250.00	235.00	15.00	63.77
16.00	27.00	10	72	200	11.00	7	77.00	3.00	3.14	577.00	1.12	6.49	36.26	250.00	240.00	10.00	46.26
17.00	18.00	3	3	200	11.00	2	22.00	1.50	3.04	79.00	2.15	1.70	50.96	250.00	230.00	20.00	70.96
18.00	19.00	6	9	200	11.00	3	33.00	2.00	2.92	340.00	1.54	5.25	49.26	250.00	230.00	20.00	69.26
19.00	21.00	4	13	200	11.00	4	44.00	2.00	3.89	306.00	2.63	8.04	44.01	250.00	230.00	20.00	64.01
20.00	21.00	4	4	200	11.00	3	33.00	2.00	2.92	310.00	1.54	4.78	40.75	250.00	230.00	20.00	60.75
21.00	26.00	8	25	200	11.00	5	55.00	3.00	2.24	643.00	0.60	3.88	35.97	250.00	230.00	20.00	55.97
22.00	25.00	3	3	200	11.00	2	22.00	1.50	3.04	207.00	2.15	4.45	40.19	250.00	235.00	15.00	55.19
23.00	24.00	3	3	200	11.00	2	22.00	1.50	3.04	134.00	2.15	2.88	49.19	250.00	235.00	15.00	64.19
24.00	25.00	7	10	200	11.00	4	44.00	2.00	3.89	402.00	2.63	10.57	46.31	250.00	235.00	15.00	61.31
25.00	26.00	0	13	200	11.00	4	44.00	2.00	3.89	139.00	2.63	3.65	35.74	250.00	235.00	15.00	50.74
26.00	27.00	3	41	200	11.00	6	66.00	3.00	2.69	274.00	0.85	2.32	32.09	250.00	235.00	15.00	47.09
27.00	35.00	3	116	200	11.00	9	99.00	3.00	4.03	305.00	1.79	5.46	29.77	250.00	235.00	15.00	44.77
28.00	29.00	3	3	200	11.00	2	22.00	1.50	3.04	88.00	2.15	1.89	60.05	285.00	285.00	0.00	60.05
29.00	30.00	6	9	200	11.00	3	33.00	2.00	2.92	344.00	1.54	5.31	58.16	280.00	280.00	0.00	58.16
30.00	31.00	9	18	200	11.00	4	44.00	2.00	3.89	532.00	2.63	13.98	52.85	275.00	270.00	5.00	57.85
31.00	32.00	12	30	200	11.00	5	55.00	3.00	2.24	620.00	0.60	3.74	38.87	275.00	275.00	0.00	38.87
32.00	34.00	17	47	200	11.00	6	66.00	3.00	2.69	776.00	0.85	6.56	35.13	250.00	245.00	5.00	40.13
33.00	34.00	4	4	200	11.00	3	33.00	2.00	2.92	208.00	1.54	3.21	31.78	250.00	240.00	10.00	41.78
34.00	35.00	4	55	200	11.00	7	77.00	3.00	3.14	379.00	1.12	4.26	28.57	250.00	235.00	15.00	43.57
35.00	38.00	2	173	200	11.00	10	110.00	4.00	2.71	168.00	0.64	1.08	24.31	250.00	240.00	10.00	34.31

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
M. Crowley

Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR21PVC											Friction loss calculations were based on a Constant for inside roughness "C" of: 150						
36.00	37.00	3	3	200	11.00	2	22.00	1.50	3.04	151.00	2.15	3.25	32.85	250.00	230.00	20.00	52.85
37.00	38.00	6	9	200	11.00	3	33.00	2.00	2.92	413.00	1.54	6.37	29.60	250.00	235.00	15.00	44.60
38.00	52.00	1	183	200	11.00	11	121.00	4.00	2.98	179.00	0.76	1.37	23.23	250.00	240.00	10.00	33.23
39.00	40.00	3	3	200	11.00	2	22.00	1.50	3.04	232.00	2.15	4.99	58.91	290.00	280.00	10.00	68.91
40.00	41.00	6	9	200	11.00	3	33.00	2.00	2.92	304.00	1.54	4.69	53.92	290.00	290.00	0.00	53.92
41.00	42.00	9	18	200	11.00	4	44.00	2.00	3.89	445.00	2.63	11.70	49.23	275.00	275.00	0.00	49.23
42.00	44.00	2	20	200	11.00	5	55.00	3.00	2.24	192.00	0.60	1.16	37.53	275.00	270.00	5.00	42.53
43.00	44.00	4	4	200	11.00	3	33.00	2.00	2.92	213.00	1.54	3.29	39.66	275.00	265.00	10.00	49.66
44.00	47.00	9	33	200	11.00	6	66.00	3.00	2.69	462.00	0.85	3.91	36.37	275.00	265.00	10.00	46.37
45.00	46.00	3	3	200	11.00	2	22.00	1.50	3.04	98.00	2.15	2.11	41.22	275.00	275.00	0.00	41.22
46.00	47.00	4	7	200	11.00	3	33.00	2.00	2.92	431.00	1.54	6.65	39.11	275.00	275.00	0.00	39.11
47.00	51.00	4	44	200	11.00	6	66.00	3.00	2.69	286.00	0.85	2.42	32.46	275.00	275.00	0.00	32.46
48.00	49.00	3	3	200	11.00	2	22.00	1.50	3.04	190.00	2.15	4.09	50.90	270.00	265.00	5.00	55.90
49.00	50.00	6	9	200	11.00	3	33.00	2.00	2.92	341.00	1.54	5.26	46.81	270.00	270.00	0.00	46.81
50.00	51.00	7	16	200	11.00	4	44.00	2.00	3.89	438.00	2.63	11.51	41.55	270.00	265.00	5.00	46.55
51.00	52.00	14	74	200	11.00	7	77.00	3.00	3.14	727.00	1.12	8.18	30.04	250.00	250.00	0.00	30.04
52.00	56.00	1	258	200	11.00	13	143.00	4.00	3.52	61.00	1.04	0.63	21.86	250.00	245.00	5.00	26.86
53.00	54.00	3	3	200	11.00	2	22.00	1.50	3.04	211.00	2.15	4.54	37.87	250.00	230.00	20.00	57.87
54.00	55.00	6	9	200	11.00	3	33.00	2.00	2.92	302.00	1.54	4.66	33.33	250.00	230.00	20.00	53.33
55.00	56.00	3	12	200	11.00	4	44.00	2.00	3.89	283.00	2.63	7.44	28.67	250.00	240.00	10.00	38.67
56.00	59.00	4	274	200	11.00	13	143.00	4.00	3.52	229.00	1.04	2.38	21.23	250.00	245.00	5.00	26.23
57.00	58.00	3	3	200	11.00	2	22.00	1.50	3.04	437.00	2.15	9.40	35.81	245.00	230.00	15.00	50.81
58.00	59.00	5	8	200	11.00	3	33.00	2.00	2.92	490.00	1.54	7.56	26.41	245.00	235.00	10.00	36.41
59.00	62.00	5	287	200	11.00	14	154.00	4.00	3.79	279.00	1.19	3.33	18.85	245.00	240.00	5.00	23.85
60.00	61.00	3	3	200	11.00	2	22.00	1.50	3.04	343.00	2.15	7.38	28.38	245.00	230.00	15.00	43.38
61.00	62.00	3	6	200	11.00	3	33.00	2.00	2.92	355.00	1.54	5.48	21.00	245.00	235.00	10.00	31.00
62.00	65.00	5	298	200	11.00	14	154.00	4.00	3.79	243.00	1.19	2.90	15.52	245.00	240.00	5.00	20.52
63.00	64.00	3	3	200	11.00	2	22.00	1.50	3.04	235.00	2.15	5.06	24.14	245.00	230.00	15.00	39.14
64.00	65.00	5	8	200	11.00	3	33.00	2.00	2.92	419.00	1.54	6.46	19.08	245.00	235.00	10.00	29.08
65.00	85.00	4	310	200	11.00	14	154.00	4.00	3.79	230.00	1.19	2.75	12.62	245.00	240.00	5.00	17.62
66.00	67.00	3	3	200	11.00	2	22.00	1.50	3.04	153.00	2.15	3.29	20.95	245.00	230.00	15.00	35.95
67.00	85.00	5	8	200	11.00	3	33.00	2.00	2.92	505.00	1.54	7.79	17.66	245.00	240.00	5.00	22.66
68.00	69.00	3	3	200	11.00	2	22.00	1.50	3.04	115.00	2.15	2.47	32.41	275.00	265.00	10.00	42.41
69.00	70.00	6	9	200	11.00	3	33.00	2.00	2.92	257.00	1.54	3.97	29.94	275.00	265.00	10.00	39.94
70.00	73.00	4	13	200	11.00	4	44.00	2.00	3.89	375.00	2.63	9.86	25.97	265.00	250.00	15.00	40.97

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
M. Crowley

Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR21PVC											Friction loss calculations were based on a Constant for inside roughness "C" of: 150						
71.00	72.00	3	3	200	11.00	2	22.00	1.50	3.04	228.00	2.15	4.91	36.27	270.00	270.00	0.00	36.27
72.00	73.00	7	10	200	11.00	4	44.00	2.00	3.89	580.00	2.63	15.25	31.36	265.00	260.00	5.00	36.36
73.00	79.00	2	25	200	11.00	5	55.00	3.00	2.24	282.00	0.60	1.70	16.11	265.00	260.00	5.00	21.11
74.00	75.00	3	3	200	11.00	2	22.00	1.50	3.04	144.00	2.15	3.10	39.13	265.00	255.00	10.00	49.13
75.00	77.00	3	6	200	11.00	3	33.00	2.00	2.92	161.00	1.54	2.48	36.03	265.00	265.00	0.00	36.03
76.00	77.00	2	2	200	11.00	2	22.00	1.50	3.04	202.00	2.15	4.35	37.90	265.00	265.00	0.00	37.90
77.00	79.00	8	16	200	11.00	4	44.00	2.00	3.89	728.00	2.63	19.14	33.55	265.00	260.00	5.00	38.55
78.00	79.00	4	4	200	11.00	3	33.00	2.00	2.92	361.00	1.54	5.57	19.98	265.00	265.00	0.00	19.98
79.00	84.00	2	47	200	11.00	6	66.00	3.00	2.69	232.00	0.85	1.96	14.41	265.00	265.00	0.00	14.41
80.00	81.00	3	3	200	11.00	2	22.00	1.50	3.04	230.00	2.15	4.95	23.22	265.00	245.00	20.00	43.22
81.00	84.00	6	9	200	11.00	3	33.00	2.00	2.92	377.00	1.54	5.82	18.27	265.00	245.00	20.00	38.27
82.00	83.00	3	3	200	11.00	2	22.00	1.50	3.04	108.00	2.15	2.32	17.50	265.00	265.00	0.00	17.50
83.00	84.00	3	6	200	11.00	3	33.00	2.00	2.92	177.00	1.54	2.73	15.18	265.00	265.00	0.00	15.18
84.00	85.00	0	62	200	11.00	7	77.00	3.00	3.14	229.00	1.12	2.58	12.45	265.00	265.00	0.00	12.45
85.00	90.00	6	386	200	11.00	17	187.00	6.00	2.44	242.00	0.36	0.88	9.87	245.00	240.00	5.00	14.87
86.00	87.00	3	3	200	11.00	2	22.00	1.50	3.04	219.00	2.15	4.71	27.97	255.00	230.00	25.00	52.97
87.00	89.00	4	7	200	11.00	3	33.00	2.00	2.92	131.00	1.54	2.02	23.26	240.00	230.00	10.00	33.26
88.00	89.00	2	2	200	11.00	2	22.00	1.50	3.04	150.00	2.15	3.23	24.47	240.00	230.00	10.00	34.47
89.00	90.00	9	18	200	11.00	4	44.00	2.00	3.89	466.00	2.63	12.25	21.24	240.00	230.00	10.00	31.24
90.00	92.00	2	406	200	11.00	17	187.00	6.00	2.44	188.00	0.36	0.68	8.99	240.00	240.00	0.00	8.99
91.00	92.00	4	4	200	11.00	3	33.00	2.00	2.92	328.00	1.54	5.06	13.37	250.00	250.00	0.00	13.37
92.00	110.00	6	416	200	11.00	18	198.00	6.00	2.58	278.00	0.40	1.12	8.31	240.00	235.00	5.00	13.31
93.00	94.00	3	3	200	11.00	2	22.00	1.50	3.04	117.00	2.15	2.52	19.50	240.00	230.00	10.00	29.50
94.00	95.00	6	9	200	11.00	3	33.00	2.00	2.92	207.00	1.54	3.19	16.98	240.00	230.00	10.00	26.98
95.00	110.00	6	15	200	11.00	4	44.00	2.00	3.89	251.00	2.63	6.60	13.79	240.00	230.00	10.00	23.79
96.00	97.00	3	3	200	11.00	2	22.00	1.50	3.04	173.00	2.15	3.72	26.85	260.00	260.00	0.00	26.85
97.00	100.00	6	9	200	11.00	3	33.00	2.00	2.92	407.00	1.54	6.28	23.13	255.00	255.00	0.00	23.13
98.00	99.00	3	3	200	11.00	2	22.00	1.50	3.04	59.00	2.15	1.27	24.09	240.00	240.00	0.00	24.09
99.00	100.00	6	9	200	11.00	3	33.00	2.00	2.92	387.00	1.54	5.97	22.82	240.00	240.00	0.00	22.82
100.00	103.00	4	22	200	11.00	5	55.00	3.00	2.24	298.00	0.60	1.80	16.85	240.00	240.00	0.00	16.85
101.00	102.00	3	3	200	11.00	2	22.00	1.50	3.04	134.00	2.15	2.88	24.10	240.00	240.00	0.00	24.10
102.00	103.00	5	8	200	11.00	3	33.00	2.00	2.92	400.00	1.54	6.17	21.22	240.00	240.00	0.00	21.22
103.00	106.00	4	34	200	11.00	6	66.00	3.00	2.69	233.00	0.85	1.97	15.05	240.00	240.00	0.00	15.05
104.00	105.00	3	3	200	11.00	2	22.00	1.50	3.04	221.00	2.15	4.76	20.68	245.00	240.00	5.00	25.68
105.00	106.00	2	5	200	11.00	3	33.00	2.00	2.92	184.00	1.54	2.84	15.92	245.00	240.00	5.00	20.92

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

PRELIMINARY PRESSURE SEWER - PIPE SIZING AND BRANCH ANALYSIS

Prepared By:
M. Crowley

Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Number of Pumps in Zone	Accum Pumps in Zone	Gals/day per Pump	Max Flow Per Pump (gpm)	Max Sim Ops	Max Flow (GPM)	Pipe Size (inches)	Max Velocity (FPS)	Length of Main this Zone	Friction Loss Factor (ft/100 ft)	Friction Loss This Zone	Accum Fric Loss (feet)	Max Main Elevation	Minimum Pump Elevation	Static Head (feet)	Total Dynamic Head (ft)
This spreadsheet was calculated using pipe diameters for: SDR21PVC											Friction loss calculations were based on a Constant for inside roughness "C" of: 150						
106.00	109.00	6	45	200	11.00	6	66.00	3.00	2.69	395.00	0.85	3.34	13.08	240.00	240.00	0.00	13.08
107.00	108.00	3	3	200	11.00	2	22.00	1.50	3.04	107.00	2.15	2.30	18.61	245.00	240.00	5.00	23.61
108.00	109.00	5	8	200	11.00	3	33.00	2.00	2.92	426.00	1.54	6.57	16.31	240.00	240.00	0.00	16.31
109.00	110.00	1	54	200	11.00	7	77.00	3.00	3.14	227.00	1.12	2.55	9.74	240.00	240.00	0.00	9.74
110.00	110.00	4	489	200	11.00	20	220.00	6.00	2.87	1,465.00	0.49	7.19	7.19	240.00	230.00	10.00	17.19

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One.

Prepared By:
M. Crowley

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME(HR)

Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR21PVC								Gals per Day per Dwelling		200
1.00	2.00	3	3.00	40.90	340.00	139.05	600	4.32	5.56	10.27
2.00	12.00	7	3.00	40.90	375.00	153.36	1,400	9.13	2.63	4.71
3.00	4.00	3	1.50	12.07	174.00	21.00	600	28.57	0.84	4.93
4.00	6.00	5	2.00	18.84	84.00	15.83	1,000	63.18	0.38	4.09
5.00	6.00	2	1.50	12.07	137.00	16.54	400	24.19	0.99	4.70
6.00	7.00	9	2.00	18.84	133.00	25.06	1,800	71.83	0.33	3.71
7.00	11.00	17	2.00	18.84	454.00	85.54	3,400	39.75	0.60	3.38
8.00	9.00	3	1.50	12.07	134.00	16.17	600	37.10	0.65	4.55
9.00	10.00	9	2.00	18.84	281.00	52.95	1,800	34.00	0.71	3.91
10.00	11.00	13	2.00	18.84	246.00	46.35	2,600	56.09	0.43	3.20
11.00	12.00	36	3.00	40.90	506.00	206.93	7,200	34.79	0.69	2.77
12.00	16.00	46	3.00	40.90	357.00	146.00	9,200	63.01	0.38	2.08
13.00	14.00	3	1.50	12.07	159.00	19.19	600	31.26	0.77	3.78
14.00	15.00	9	2.00	18.84	253.00	47.67	1,800	37.76	0.64	3.01
15.00	16.00	16	2.00	18.84	476.00	89.69	3,200	35.68	0.67	2.38
16.00	27.00	72	3.00	40.90	577.00	235.97	14,400	61.03	0.39	1.70
17.00	18.00	3	1.50	12.07	79.00	9.54	600	62.92	0.38	4.67
18.00	19.00	9	2.00	18.84	340.00	64.06	1,800	28.10	0.85	4.29
19.00	21.00	13	2.00	18.84	306.00	57.66	2,600	45.09	0.53	3.43
20.00	21.00	4	2.00	18.84	310.00	58.41	800	13.70	1.75	4.65
21.00	26.00	25	3.00	40.90	643.00	262.96	5,000	19.01	1.26	2.90
22.00	25.00	3	1.50	12.07	207.00	24.99	600	24.01	1.00	2.88
23.00	24.00	3	1.50	12.07	134.00	16.17	600	37.10	0.65	3.44
24.00	25.00	10	2.00	18.84	402.00	75.75	2,000	26.40	0.91	2.79
25.00	26.00	13	2.00	18.84	139.00	26.19	2,600	99.27	0.24	1.88
26.00	27.00	41	3.00	40.90	274.00	112.05	8,200	73.18	0.33	1.64
27.00	35.00	116	3.00	40.90	305.00	124.73	23,200	186.00	0.13	1.31
28.00	29.00	3	1.50	12.07	88.00	10.62	600	56.49	0.42	5.30
29.00	30.00	9	2.00	18.84	344.00	64.82	1,800	27.77	0.86	4.88
30.00	31.00	18	2.00	18.84	532.00	100.24	3,600	35.91	0.67	4.01
31.00	32.00	30	3.00	40.90	620.00	253.55	6,000	23.66	1.01	3.34
32.00	34.00	47	3.00	40.90	776.00	317.35	9,400	29.62	0.81	2.33
33.00	34.00	4	2.00	18.84	208.00	39.19	800	20.41	1.18	2.69
34.00	35.00	55	3.00	40.90	379.00	154.99	11,000	70.97	0.34	1.52
35.00	38.00	173	4.00	67.65	168.00	113.65	34,600	304.43	0.08	1.18

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

Prepared By:
M. Crowley

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME(HR)
Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR21PVC								Gals per Day per Dwelling		200
36.00	37.00	3	1.50	12.07	151.00	18.23	600	32.92	0.73	2.87
37.00	38.00	9	2.00	18.84	413.00	77.82	1,800	23.13	1.04	2.14
38.00	52.00	183	4.00	67.65	179.00	121.10	36,600	302.24	0.08	1.10
39.00	40.00	3	1.50	12.07	232.00	28.00	600	21.43	1.12	5.42
40.00	41.00	9	2.00	18.84	304.00	57.28	1,800	31.42	0.76	4.30
41.00	42.00	18	2.00	18.84	445.00	83.85	3,600	42.93	0.56	3.54
42.00	44.00	20	3.00	40.90	192.00	78.52	4,000	50.94	0.47	2.98
43.00	44.00	4	2.00	18.84	213.00	40.13	800	19.93	1.20	3.71
44.00	47.00	33	3.00	40.90	462.00	188.94	6,600	34.93	0.69	2.51
45.00	46.00	3	1.50	12.07	98.00	11.83	600	50.72	0.47	3.69
46.00	47.00	7	2.00	18.84	431.00	81.21	1,400	17.24	1.39	3.22
47.00	51.00	44	3.00	40.90	286.00	116.96	8,800	75.24	0.32	1.82
48.00	49.00	3	1.50	12.07	190.00	22.93	600	26.16	0.92	3.90
49.00	50.00	9	2.00	18.84	341.00	64.25	1,800	28.01	0.86	2.98
50.00	51.00	16	2.00	18.84	438.00	82.53	3,200	38.77	0.62	2.12
51.00	52.00	74	3.00	40.90	727.00	297.31	14,800	49.78	0.48	1.50
52.00	56.00	258	4.00	67.65	61.00	41.27	51,600	1,250.39	0.02	1.02
53.00	54.00	3	1.50	12.07	211.00	25.47	600	23.56	1.02	3.31
54.00	55.00	9	2.00	18.84	302.00	56.90	1,800	31.63	0.76	2.29
55.00	56.00	12	2.00	18.84	283.00	53.32	2,400	45.01	0.53	1.54
56.00	59.00	274	4.00	67.65	229.00	154.92	54,800	353.73	0.07	1.00
57.00	58.00	3	1.50	12.07	437.00	52.75	600	11.38	2.11	4.43
58.00	59.00	8	2.00	18.84	490.00	92.33	1,600	17.33	1.38	2.32
59.00	62.00	287	4.00	67.65	279.00	188.75	57,400	304.11	0.08	0.94
60.00	61.00	3	1.50	12.07	343.00	41.40	600	14.49	1.66	3.85
61.00	62.00	6	2.00	18.84	355.00	66.89	1,200	17.94	1.34	2.19
62.00	65.00	298	4.00	67.65	243.00	164.39	59,600	362.55	0.07	0.86
63.00	64.00	3	1.50	12.07	235.00	28.37	600	21.15	1.13	3.11
64.00	65.00	8	2.00	18.84	419.00	78.95	1,600	20.27	1.18	1.97
65.00	85.00	310	4.00	67.65	230.00	155.60	62,000	398.46	0.06	0.79
66.00	67.00	3	1.50	12.07	153.00	18.47	600	32.49	0.74	2.90
67.00	85.00	8	2.00	18.84	505.00	95.15	1,600	16.81	1.43	2.16
68.00	69.00	3	1.50	12.07	115.00	13.88	600	43.23	0.56	3.56
69.00	70.00	9	2.00	18.84	257.00	48.43	1,800	37.17	0.65	3.00
70.00	73.00	13	2.00	18.84	375.00	70.66	2,600	36.80	0.65	2.36

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

Prepared By:
M. Crowley

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME(HR)
Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR21PVC								Gals per Day per Dwelling		200
71.00	72.00	3	1.50	12.07	228.00	27.52	600	21.80	1.10	4.12
72.00	73.00	10	2.00	18.84	580.00	109.29	2,000	18.30	1.31	3.02
73.00	79.00	25	3.00	40.90	282.00	115.33	5,000	43.36	0.55	1.71
74.00	75.00	3	1.50	12.07	144.00	17.38	600	34.52	0.70	3.48
75.00	77.00	6	2.00	18.84	161.00	30.34	1,200	39.56	0.61	2.79
76.00	77.00	2	1.50	12.07	202.00	24.38	400	16.41	1.46	3.64
77.00	79.00	16	2.00	18.84	728.00	137.17	3,200	23.33	1.03	2.18
78.00	79.00	4	2.00	18.84	361.00	68.02	800	11.76	2.04	3.19
79.00	84.00	47	3.00	40.90	232.00	94.88	9,400	99.07	0.24	1.15
80.00	81.00	3	1.50	12.07	230.00	27.76	600	21.61	1.11	2.97
81.00	84.00	9	2.00	18.84	377.00	71.04	1,800	25.34	0.95	1.86
82.00	83.00	3	1.50	12.07	108.00	13.04	600	46.03	0.52	2.10
83.00	84.00	6	2.00	18.84	177.00	33.35	1,200	35.98	0.67	1.58
84.00	85.00	62	3.00	40.90	229.00	93.65	12,400	132.41	0.18	0.91
85.00	90.00	386	6.00	127.92	242.00	309.56	77,200	249.39	0.10	0.73
86.00	87.00	3	1.50	12.07	219.00	26.43	600	22.70	1.06	2.70
87.00	89.00	7	2.00	18.84	131.00	24.68	1,400	56.72	0.42	1.64
88.00	89.00	2	1.50	12.07	150.00	18.11	400	22.09	1.09	2.31
89.00	90.00	18	2.00	18.84	466.00	87.81	3,600	41.00	0.59	1.22
90.00	92.00	406	6.00	127.92	188.00	240.48	81,200	337.65	0.07	0.63
91.00	92.00	4	2.00	18.84	328.00	61.80	800	12.94	1.85	2.42
92.00	110.00	416	6.00	127.92	278.00	355.61	83,200	233.97	0.10	0.56
93.00	94.00	3	1.50	12.07	117.00	14.12	600	42.49	0.56	1.92
94.00	95.00	9	2.00	18.84	207.00	39.00	1,800	46.15	0.52	1.36
95.00	110.00	15	2.00	18.84	251.00	47.29	3,000	63.43	0.38	0.84
96.00	97.00	3	1.50	12.07	173.00	20.88	600	28.73	0.84	3.96
97.00	100.00	9	2.00	18.84	407.00	76.69	1,800	23.47	1.02	3.12
98.00	99.00	3	1.50	12.07	59.00	7.12	600	84.25	0.28	3.36
99.00	100.00	9	2.00	18.84	387.00	72.92	1,800	24.68	0.97	3.07
100.00	103.00	22	3.00	40.90	298.00	121.87	4,400	36.10	0.66	2.10
101.00	102.00	3	1.50	12.07	134.00	16.17	600	37.10	0.65	3.21
102.00	103.00	8	2.00	18.84	400.00	75.37	1,600	21.23	1.13	2.56
103.00	106.00	34	3.00	40.90	233.00	95.29	6,800	71.36	0.34	1.43
104.00	105.00	3	1.50	12.07	221.00	26.68	600	22.49	1.07	3.00
105.00	106.00	5	2.00	18.84	184.00	34.67	1,000	28.84	0.83	1.93

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

PRELIMINARY PRESSURE SEWER - ACCUMULATED RETENTION TIME(HR)

Prepared By:
M. Crowley

Coventry, Rhode Island

January 10, 2023

Zone Number	Connects to Zone	Accumulated Total of Pumps this Zone	Pipe Size (inches)	Gallons per 100 lineal feet	Length of Zone	Capacity of Zone	Average Daily Flow	Average Fluid Changes per Day	Average Retention Time (Hr)	Accumulated Retention Time (Hr)
This spreadsheet was calculated using pipe diameters for: SDR21PVC								Gals per Day per Dwelling		200
106.00	109.00	45	3.00	40.90	395.00	161.54	9,000	55.71	0.43	1.10
107.00	108.00	3	1.50	12.07	107.00	12.92	600	46.46	0.52	2.39
108.00	109.00	8	2.00	18.84	426.00	80.27	1,600	19.93	1.20	1.87
109.00	110.00	54	3.00	40.90	227.00	92.83	10,800	116.34	0.21	0.67
110.00	110.00	489	6.00	127.92	1,465.00	1,873.97	97,800	52.19	0.46	0.46

Note: This analysis is valid only with the use of progressive cavity type grinder pumps as manufactured by Environment One

Appendix O

RIIB Application – Coventry, Rhode Island

Municipal Infrastructure Grant Program Application Form

Municipality:	Coventry, Rhode Island
Project Title:	Sewer Line Extension Planning & Design
Grant Administrator Contact: Department: Address:	Maria T. Broadbent, Asst. Town Manager Town Manager 1670 Flat River Road Coventry, RI 02816
Telephone: Email:	401.615.0777 mbroadbent@coventryri.org
Project Manager Contact: Department: Address:	Joe Levesque, PE, Town Engineer Engineering 1670 Flat River Road Coventry, RI 02816
Telephone: Email:	401.822.9182 jlevesque@coventryri.org

Proposed funding:	
Total Project Cost:	$470,250
Grant Request:	$352,688
Municipal Match (at least 25% of grant request):	$117,562

Project Description:

This project is to hire an engineering firm to develop a preliminary design for a sanitary sewer extension for a sewer planning area identified in the Town's Sewer Facilities Plan, including performance of formal land surveys, subsurface investigations, and preliminary engineering design. The deliverable will be a preliminary design representing approximately a 30% complete milestone in the design effort. The design report will outline issues identified in survey and subsurface investigations, present preliminary design plans, define design criteria and constraints, include a list of contract specifications, and present and engineer's opinion of cost of construction.

The planning area to be covered by this design consists of 597 unsewered parcels, and 33,821-34,943 linear feet of paved roads. The total estimated future wastewater generation is approximately 85,000 gallons per day, a 28.5% increase over current wastewater generation from parcels already sewered within the Town. This planning area is currently served by on-site wastewater treatment systems, including some cesspools.

Project Narrative:

a. **Preparation for Success**: *Discuss how the project will integrate completed community planning efforts and promote economic development. Have various economic development tools and strategies been explored?*

The Town of Coventry is nearing completion of updates to both its Comprehensive Plan and its Sewer Facilities Plan. Both of these plans outline a need to invest in sanitary sewer expansion to meet further investment in economic development and to mitigate environmental issues. The Comprehensive Plan Steering Committee explored various strategies to increase development and to stabilize the economy in this planning area. Ease of connection to a public sanitary sewer system was one of the strategies that the Plan outlines as a factor in economic development.

The Sewer Facilities Plan has been divided into planning areas for future sewer services based on census income data. This grant proposes to extend sewer service to the Sewer Planning Area 12, PA12. This area of town has an average median income of $58,769, $11,536 below the statewide median income of $70,305.

As part of the Sewer Facilities Plan process, a survey was sent to about 9,000 property owners in the planning areas. About 1,600 completed surveys were returned. Of the 31 sewer planning areas, PA12, ranked second in the overall matrix due to its income level, proximity to impacted waterbodies and wetlands, cost of construction, ease of design and public support. Extending sewer lines in PA12 allows for connection to an existing sewer line and will not require construction of a pumping station. PA12 is in the top tier of proposed projects in the Sewer Facilities Plan.

PA12 is located within a horseshoe curve of the Pawtuxet River and contains wetlands and their buffers. Connecting properties to sanitary services will mitigate water quality discharges from on-site wastewater treatment systems from those properties connecting to the system.

b. **Leverages Private Development:** *Discuss how the project directly and immediately unlocks private development at or near the project site. How will the project promote new jobs and/or housing units?*

The areas proposed for sewer extension design through this grant includes residential neighborhoods and commercial properties with aging on-site wastewater treatment systems, including cesspools, where residents reported needing to make repairs to correct problems with their systems. If able to connect to these properties to a sewer system, they will increase the value of these properties, make commercial properties more desirable for redevelopment and infill and maintain a more stable tax base. As this areas has the lowest income in the community, completing the design for a sewer

system will lower the cost for connections to the system, as the design cost will not be assessed to the property owners.

The project will promote new jobs by making the commercial properties more desirable to investors, who would otherwise have regular expenses to maintain on-site waste disposal systems. Many of the commercial properties in the area proposed by this grant are older, independently owned, family-owned businesses with little capital funds to invest in upgraded septic systems. Cost for maintenance and repairs of on-site systems will be eliminated once these commercial properties are able to connect to the system.

Adding more sewer connections will move the Town's sewer fund a step closer to reaching the critical mass of connections needed to stabilize the sewer fund. Additionally, jobs will be created to construct the system once the system design has been completed.

c. **Connectivity & Social Equity:** *How does the proposed project increase connectivity to and within underserved communities? Discuss how the project will achieve either of the following: strengthen transit options along growth corridors and/or promote equitable development and redevelopment of commercial and residential areas.*

The Sewer Facilities Plan has been divided into planning areas for future sewer services based on census income data. This grant proposes to extend sewer service to the PA12, the area of town with the lowest median income. This area has an average median income of $58,769, $11,536 below the statewide median income of $70,305.

As properties change hands, the cost of upgrades, maintenance and repairs for properties with on-site wastewater systems will be all but eliminated if these properties are able to connect to the sewer system, making the properties more attractive to developers and easing the financial burden on current property owners.

Access to the sanitary sewer system will increase the value of aging commercial properties in this area, making them more desirable for future development.

d. **Alignment with the State's economic development plan: How does the project align with the current plan?**

The State's economic development plan calls for investment equity in access by underserved populations, coordinates economic development strategies, takes into account resiliency/climate change and increases the state's competitive advantage. This project will plan and design the sewer infrastructure in the area of town with the lowest median income, and commercial properties that are ripe for redevelopment. The area to be covered by this grant has many aging, failing on-site wastewater treatment systems located in the curve of the Pawtuxet River. With the increase in short-duration, high energy storms and localized flooding, many of the properties in this area are experiencing problems with their systems, particularly after major rain events.

e. **Project Management and Partners: Who is leading the project and what groups/stakeholders are involved?**
The project is being led by Joe Levesque, PE, Town Engineer. Mr. Levesque, Kevin McGee, Public Works Director and Maria Broadbent, Asst. Town Manager, have been worked closely with consultants from Fuss and O'Neil to update the Sewer Facilities Plan. The Plan and its related implementation is in conformance with the current update to the Comprehensive Plan process. The two consultants involved, Fuss & O'Neil for the Sewer Facilities Plan and BETA for the Comprehensive Plan, have been collaborating as they individually work through their contracted scopes of work. This plan is being designed with an eye toward creating a future Sewer Department and adding enough sewer connections in the future to make the Department financially self-sufficient.

As the Town is traversed by the Pawtuxet River and the location of many freshwater ponds, environmental concerns related to flooding and groundwater level changes due to climate change are a serious concern. As part of the planning process for the Sewer Facilities Plan, outreach events have been held, and a community survey was conducted to gather the opinion of the community. Of 9,000 surveys mailed, nearly 1,600 were returned. The survey results indicate a desire from the community for more access to connect to the sewer system, and need to mitigate the cost of maintaining on-site septic and cesspool systems. Outreach to community organizations has included lake and pond community organizations.

f. **Project Timeline: What is the timeline for the proposed project and funding requested? The estimated timeline, and the amount requested, should be realistic and adequate for the project. Please detail by each project task.**
The completion of this project will take approximately two years from the time a contract is signed with an engineering firm.

g. **Statement of Match:**
The Town of Coventry proposes to provide a 25% cash match in the amount of $117,562 using ARPA funds.

11/30/22	
Date	Signature of Chief Municipal Officer
Name and Title (Typed)	Ben Marchant, Town Manager
Duration of Term	No term limit
Mailing Address:	1670 Flat River Road Coventry, RI 02816
Telephone:	401.615.0777

FUSS & O'NEILL

November 29, 2022

Maria Broadbent
Assistant Town Manager
Town of Coventry
1670 Flat River Rd
Coventry, RI 02816

RE: Budgetary Estimate - Preliminary Design of Sewer Extension
Fuss & O'Neill Reference No.: 20220052.D10

Dear Ms. Broadbent:

Fuss & O'Neill, Inc. offers this budgetary estimate to provide preliminary sewer extension design services for Planning Area Number 12 (PA-12), depicted in **Figure 1**, attached.

Our preliminary design services will include performance of formal land surveys, subsurface investigations, and preliminary engineering design. Our deliverable will be a preliminary design report, representing approximately a 30% complete milestone of the design effort. The preliminary design report will outline issues identified in survey and subsurface investigations, present preliminary design plans, define design criteria and constraints, include a list of contract specifications, and present an engineer's opinion of costs (OOC) that carries a contingency of 25%.

Our budgetary estimate for preliminary design services totals $470,250, which is based upon the following presumptions and estimations:

- PA-12 consists of 597 unsewered parcels, 601 total parcels, and 33,821-34,943 linear feet of paved roadways (*Google Earth* and GIS sources, respectively). A *Google Earth* image of PA-12 with marked roadways is included as **Figure 2**, attached.
- The total estimated future wastewater generation associated with the 597 unsewered parcels is approximately 85,000 gallons per day. Extending sewer service to 100% of PA-12 reflects a 28.5% increase over current wastewater generation (approximately 298,000 gpd) from parcels already sewered within the Town.
- Estimated construction costs associated with extending sewer service to the 597 parcels is $11,400,000.

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California
Connecticut
Maine
Massachusetts
New Hampshire
Rhode Island
Vermont

- The construction cost estimate is based on $325 per linear foot of sewer (installed unit cost) and using 100% of 35,000 linear feet of maximum roadway length as the estimated total length of new sewer line. This estimate includes installation of gravity sewer lines, pavement repairs and contingency; however, it does not include design or construction administration costs.
- Total engineering costs include design phase and construction phase efforts and is typically budgeted as an allowance of 25% of construction costs. For this $11,400,000 construction project, engineering costs are expected to be an estimated $2,850,000.
- Design phase efforts include preliminary and detailed designs. Construction phase efforts include construction administration (CA), and resident project representation (RPR).
    - Design Phase Engineering services are expected to reflect 50% of the engineering costs, or $1,425,000 with an estimated value of $470,250 for Preliminary Design and $997,500 for Detailed Design.
    - Construction Phase Engineering Services are expected to reflect the remaining 50% of the engineering costs, or $1,425,000.

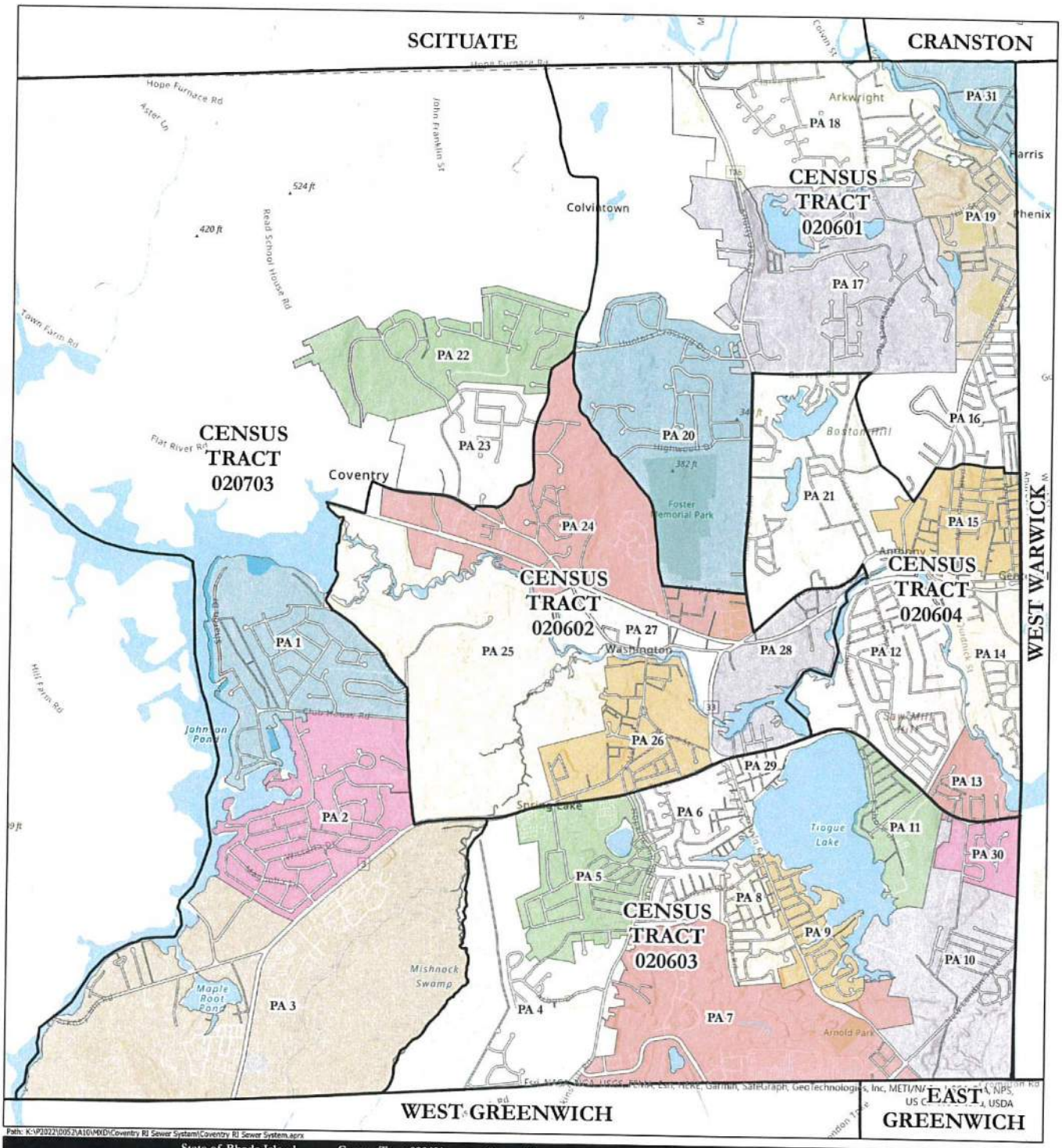
We appreciate the opportunity to work with the Town. Design services will be in accordance with our existing Agreement, and a firm proposal will be developed and submitted upon request. Please feel free to contact me with any questions or comments.

Sincerely,

Laura R. Marcolini, PE
Vice President, Business Line Manager

Virgil J. Lloyd, PE
Senior Vice President

Attachments: Figure 1 - Town of Coventry Planning Areas & Income Levels
Figure 2 - Google Earth Roadway Measurements



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	State of Rhode Island	Census Tract 020601	Census Tract 020602	Census Tract 020603	Census Tract 020604	Census Tract 020703
Median income (dollars)	$70,305	$91,994	$61,250	$75,591	$58,769	$123,397
Mean income (dollars)	$92,427	$106,562	$76,290	$94,874	$71,887	$135,731
	Number of households					
Income Range	414,730	2,354	1,548	2,928	2,497	2,423
Less than $10,000	5.6%	2.1%	9.5%	2.2%	3.4%	1.2%
$10,000 to $14,999	4.9%	1.5%	4.4%	7.5%	3.4%	3.4%
$15,000 to $24,999	8.1%	3.6%	7.2%	15.5%	16.6%	3.9%
$25,000 to $34,999	7.8%	7.0%	7.0%	3.6%	6.5%	4.1%
$35,000 to $49,999	10.8%	7.0%	9.3%	11.0%	13.9%	4.8%
$50,000 to $74,999	15.8%	11.9%	19.0%	9.4%	19.0%	10.4%
$75,000 to $99,999	13.3%	19.9%	12.6%	18.8%	11.0%	12.3%
$100,000 to $149,999	18.3%	32.1%	23.2%	17.0%	15.4%	21.7%
$150,000 to $199,999	7.8%	8.8%	3.0%	4.1%	9.1%	20.6%
$200,000 or more	7.7%	6.1%	4.8%	10.9%	1.8%	17.6%

Legend

Census Tract

0 1,500 3,000 6,000 Feet

N

Source: 2020: ACS 5-Year Estimates of Income, https://data.census.gov/

Town of Coventry
Planning Areas With 2020 ACS 5-Year Estimates of Income Data
Coventry Sewer Facility Plan

Coventry Rhode Island

FUSS & O'NEILL
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Providence, RI 02908
860.646.2469 | www.fando.com

Figure 1

Planning Area 12 Unsewered Road Length

Coventry Sever Facility Plan

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Figure 2

Appendix P

Coventry, RI Storyboards

FUSS & O'NEILL

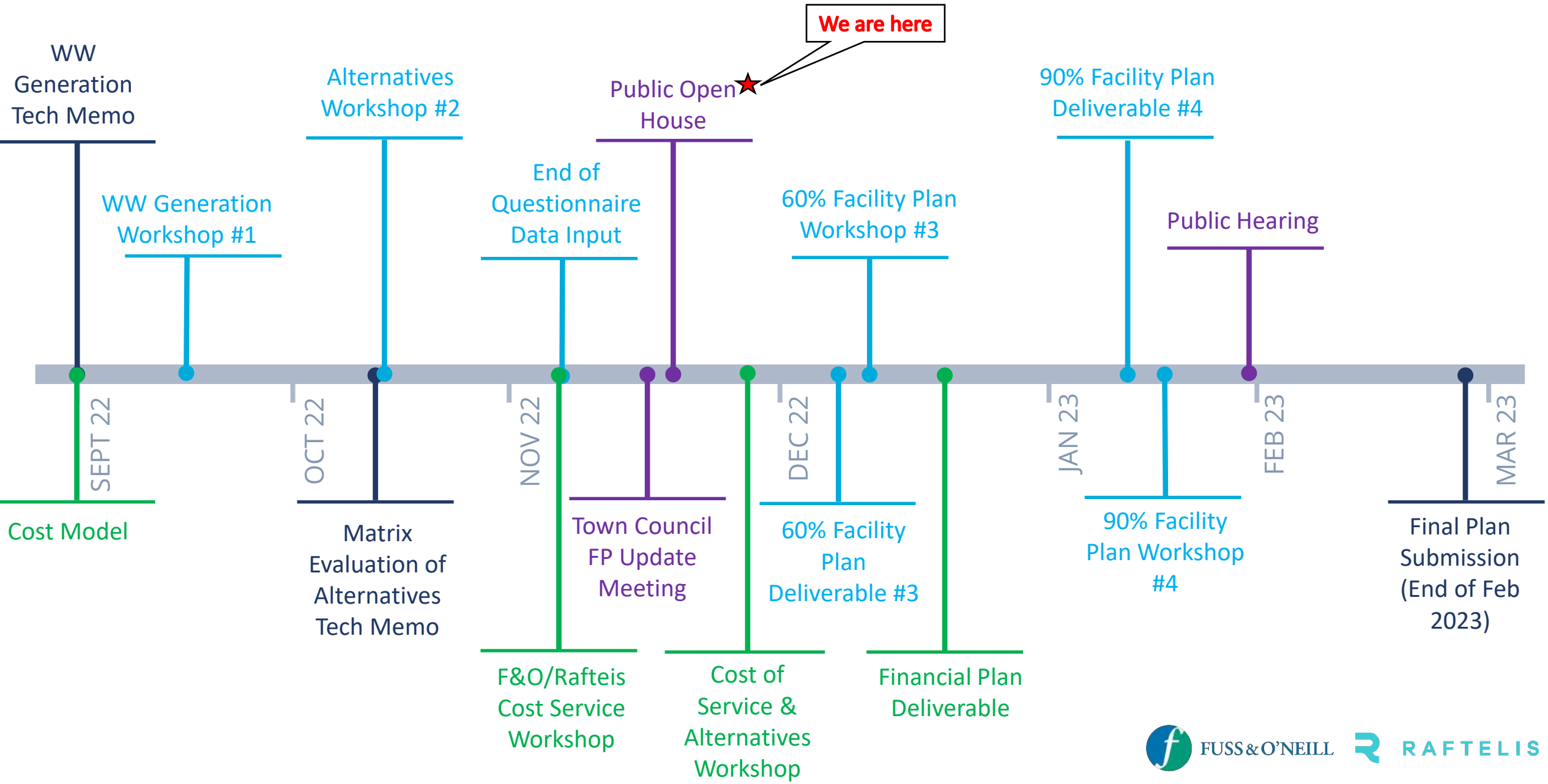
RAFTELIS

Wastewater Facility Plan
Public Open House

Town of Coventry, RI

November 17, 2022

Facility Planning Milestones and Anticipated Schedule



FUSS & O'NEILL RAFTELIS

Story Boards for Open House

1. Informational Flyer
2. Coordination of Town Documents
3. Upper Dam Pond & Tiogue Lake Water Quality Studies
4. Questionnaire Results (Public Input)
5. Planning Area & Census Tract Mapping
6. Potential Funding Sources
7. Matrix Evaluation of Prioritized Sewer Extensions
8. Cost Modeling
    1. *Do Nothing*
    2. *Alternate Cash Flow*
    3. *Customer Impacts – Based on Alternate Cash Flow*
    4. *Comparison of Septic and Sewer Customer – Based on Alternate Cash Flow*
9. Typical Timeline for a Sewer Extension Project

FUSS & O'NEILL RAFTELIS

WASTEWATER PLANNING FOR Town of Coventry, RI

DEM RHODE ISLAND

FUSS & O'NEILL
ENGINEERS • SCIENTISTS • PLANNERS

WHY?

Sewer Facility Plan Update Required by RIDEM

Facility Planning by Town of Coventry's Consultant Fuss and O'Neill Inc.
(Summer 2022 – Winter 2023)

Public Awareness

PARCELS WITH ON-SITE SYSTEMS

Systems compliant with standards may remain.

Repair or replace with advanced system.

RESOURCES AVAILABLE TO YOU:

Community Septic System Loan Program (CSSLP)

https://www.Rihousing.Com/community-septic-system-loan-program-csslp/

Licensed Inspectors, Designers

https://dem.Ri.Gov/environmental-protection-bureau/water-resources/permitting/septic-onsite-wastewater-treatment-3

Not every parcel needs sewer access.

SEWER FACILITY PLANNING

Planning areas based on sensitive areas, constricted lot sizes with failed ISDS.

Recommendations may include shared treatment and groundwater discharge, or sewer extension with goal to minimize assessments, especially for areas with limited income.

Need will determine priority for phased sewer extension or community-based shared systems.

PARCELS ALREADY SEWERED

Tiogue Avenue, and areas in Eastern Districts will continue to have sewer service and receive usage invoices.

No Planned Changes

PUBLIC PARTICIPATION

Before the facility plan is finalized, the public will be invited to participate in:

OPEN HOUSE

DATE: Thursday November 17, 2022
TIME: 6:30 – 8:00 pm
LOCATION: Coventry Resource and Senior Center - 50 Wood Street

PUBLIC HEARING

WINTER 2022
Date will be posted on the Town's website.

Your participation is important!

https://www.coventryri.org/sewer-authority

Coordination of Town Documents

CURRENTLY UNDERWAY

1

Sewer Facility Plan - by Fuss and O'Neill & Coordination with BETA

2

Community Comprehensive Plan - by BETA & Coordination with Fuss and O'Neill

FUTURE NEEDS

3

Onsite WW Mgt Plan

- Coordination of FP Sewer Planning Areas & Onsite System Areas
- Key to Community Septic System Loan Program Participation

4

Sewer Ordinance

- Consider Ordinances from Other Towns
- Coordination of Cost of Service & FP Recommendations

5

Intermunicipal Agreement (IMA) with West Warwick

- Coordination of sewer ordinance, fees, legal requirements for adjacent Towns connected to Coventry's collection system.

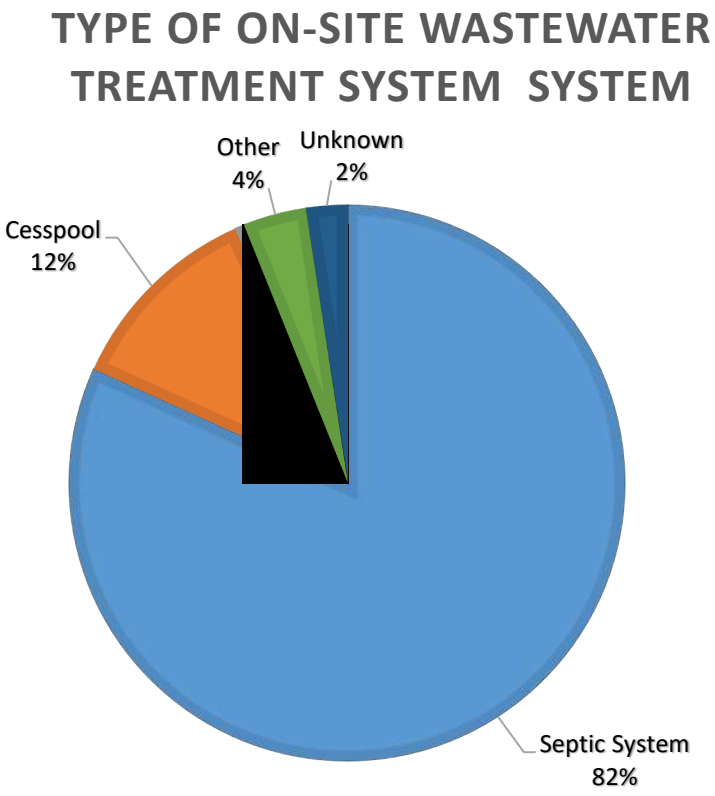
FUSS & O'NEILL RAFTELIS

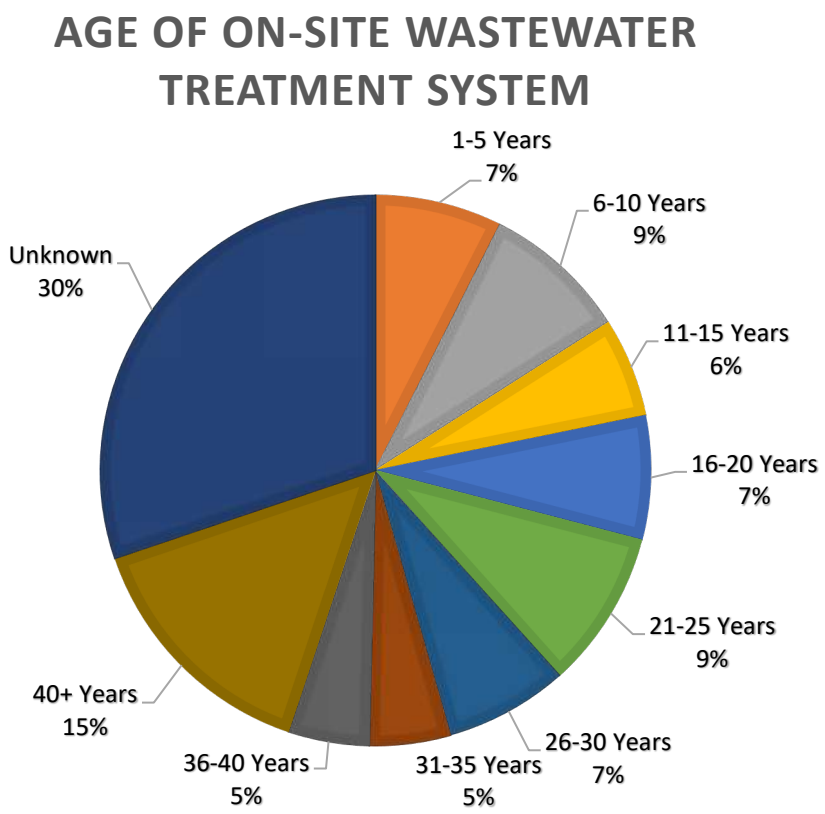
Upper Dam Pond & Tiogue Lake Water Quality Studies

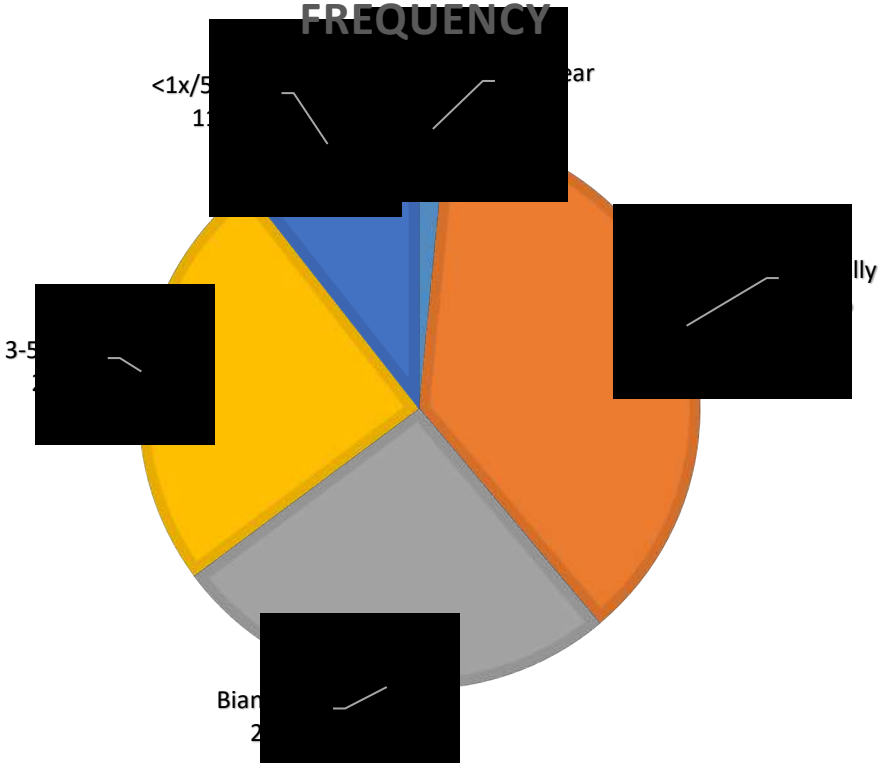
- Incorporate results of previous water quality studies
  - Upper Dam Pond – June 2019
  - Tiogue Lake – August 2022
- External source(s) having negative impact on water quality, such as:
  - Stormwater Runoff,
  - Failing Septic System(s),
  - Illicit Discharge(s)
- Upper Dam Pond – Phosphorus Loading
- Tiogue Lake – Bacteria (Enterococcus)

FUSS&O'NEILL RAFTELIS

Questionnaire Results (Public Input)

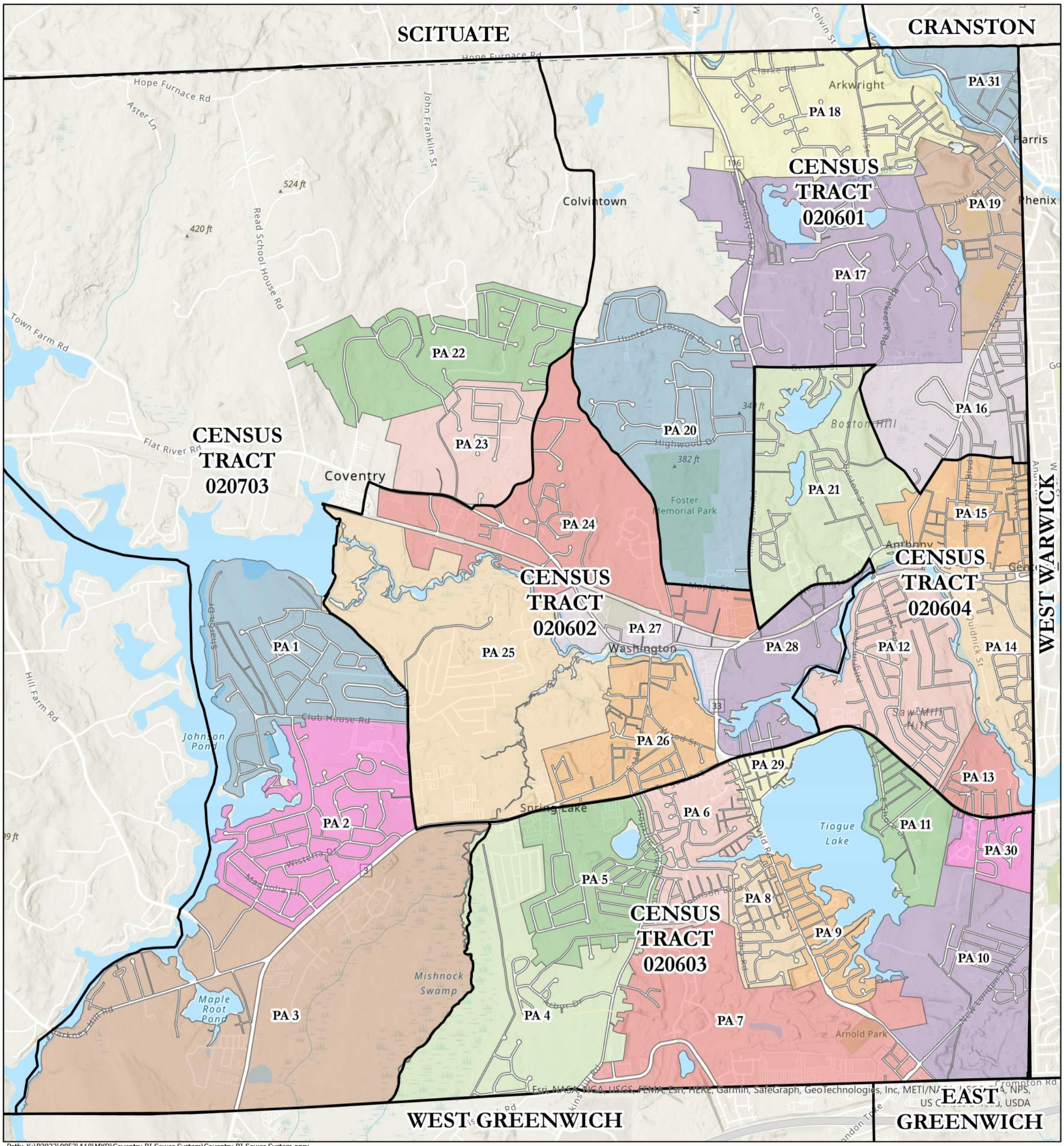






Over 1,600 Responses out of 9,000 requests (18%)

FUSS & O'NEILL RAFTELIS



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Legend

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Town of Coventry
Planning Areas With 2020 ACS 5-Year Estimates of Income Data
Coventry Sewer Facility Plan
Coventry Rhode Island

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Figure 1

Potential Funding Sources

- American Rescue Plan Act (ARPA) Funds
  - Briar Point Sewer Extension and Arnold Road Pump Station
  - Woodland Manor Pump Station
  - Sandy Bottom Pump Station
- RIDEM/RIIB SRF Loan and Loan Forgiveness Determination
  - Facility Plan SRF Loan Availability
- RIIB Municipal Resilience Program & Action Grants
- RIIB Municipal Infrastructure Grant Program

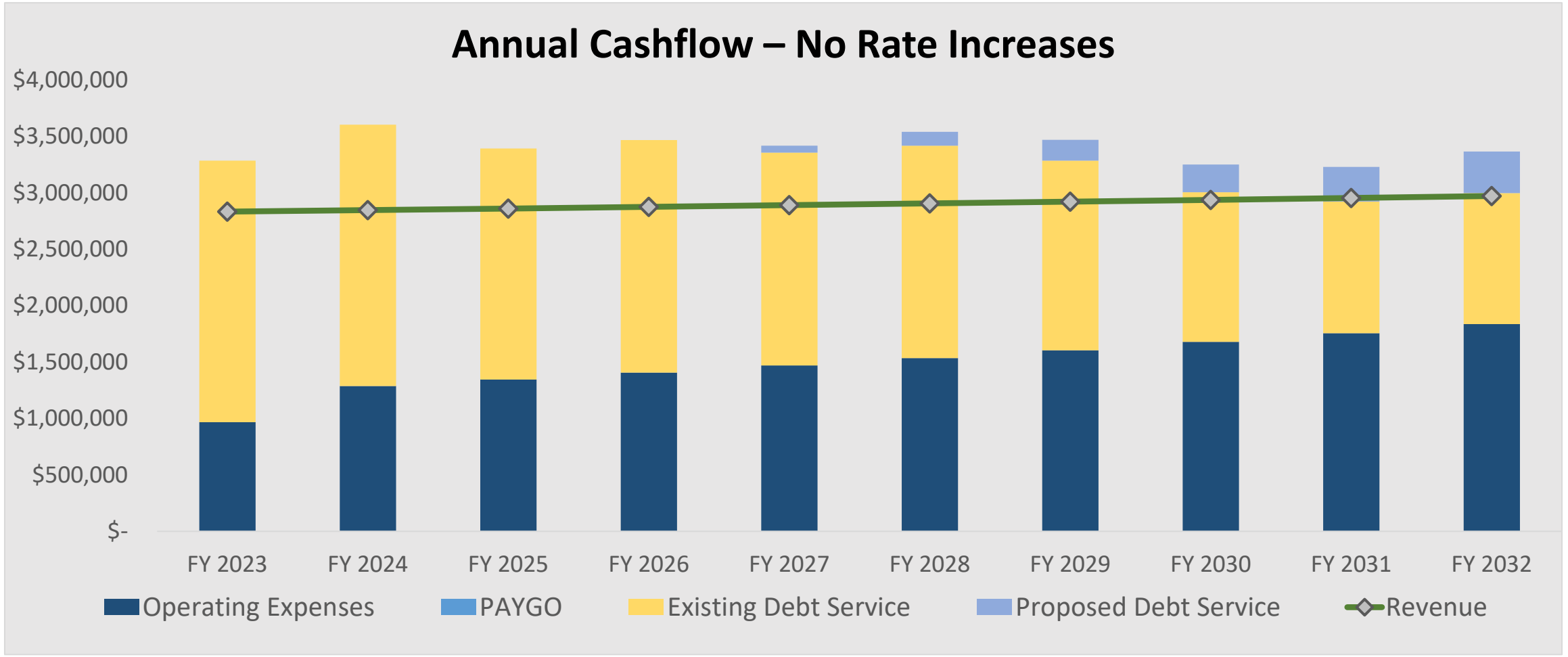
FUSS & O'NEILL RAFTELIS

Matrix Evaluation

Evaluation Criteria			
Environmental Impact	**Affordability**	**Onsite Wastewater Treatment System Problems In Planning Areas**	**Site Suitability for Continued Use of Onsite Wastewater Treatment System**
Factors Considered			
✓ Proximity to impacted waterbody ✓ Proximity to wetlands	✓ Census tract median household income ✓ Approximate cost to construct sewer ✓ Necessity for wastewater pump station ✓ Depth to bedrock	✓ Percentage of reported cesspools ✓ Reported age of existing OWTS ✓ Percentage of repairs reported ✓ Percentage of problems reported ✓ Percentage concerned about onsite wastewater treatment	✓ Median Lot Size ✓ Parcel Density ✓ Soil suitability for continued onsite wastewater treatment systems

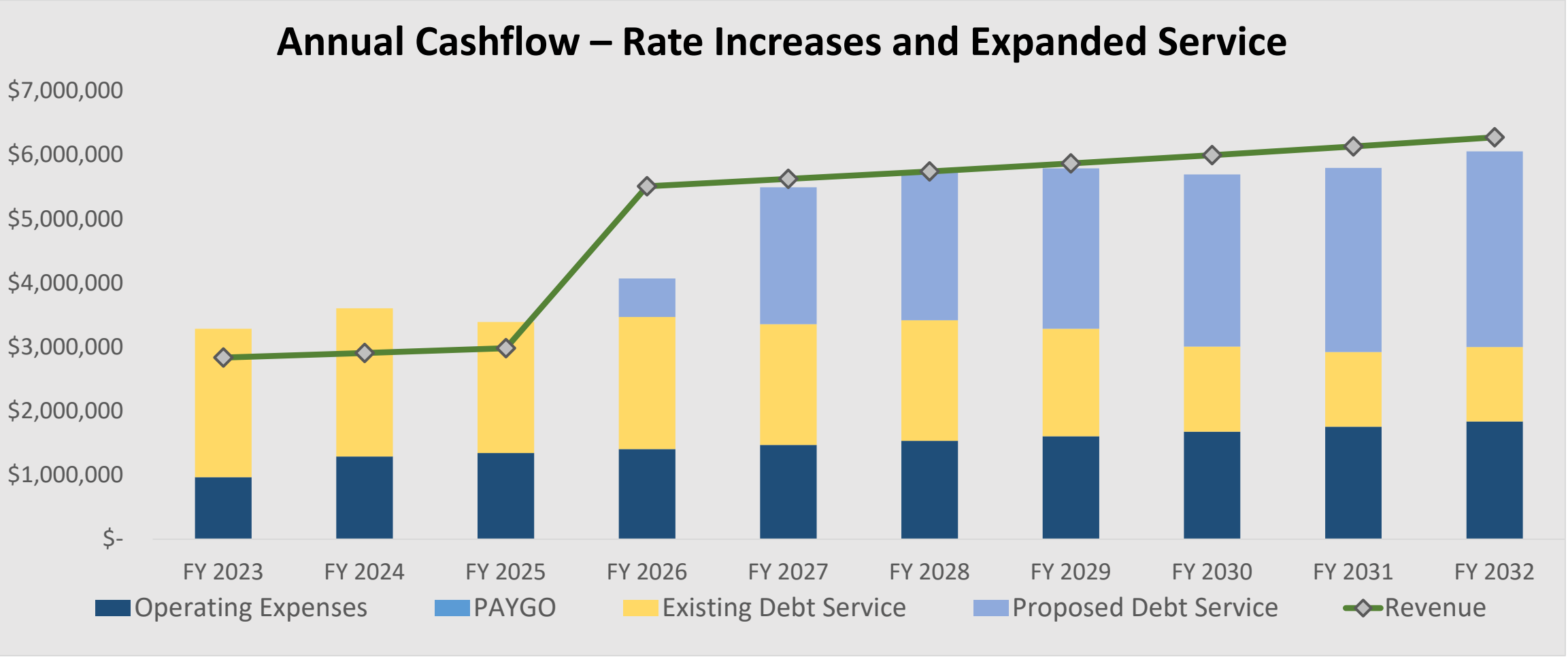
FUSS & O'NEILL RAFTELIS

Cost Modeling: Connections, Possible Sewer Rates, Break-even Point



FUSS & O'NEILL RAFTELIS

Cost Modeling: Connections, Possible Sewer Rates, Break-even Point



- Requires 5% rate increases annually, starting in FY 2024
- Assumes $15,000 assessments for new connection

FUSS & O'NEILL RAFTELIS

Cost Modeling: Connections, Possible Sewer Rates, Break-even Point

- Customer Impacts for Existing Customers

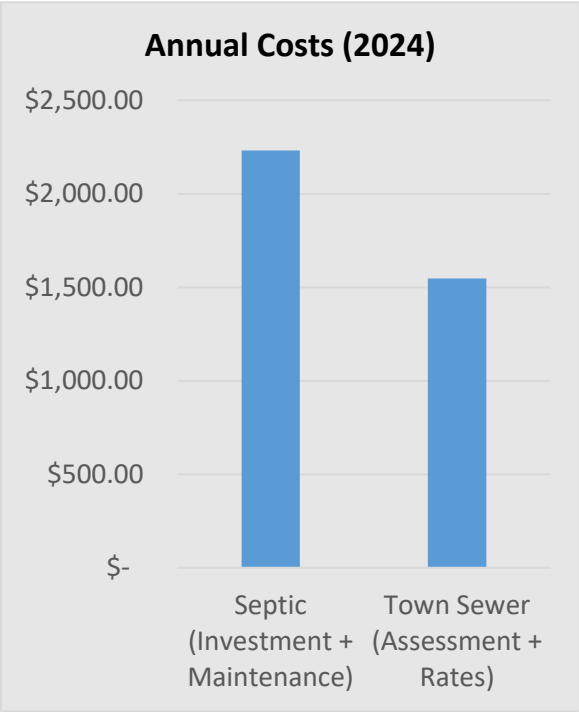
– A typical residential customer is currently paying approximately $630 per year for sewer service. With the first step (FY24) of the alternative financial plan, that same customer's bill would increase to approximately $655 per year. This amounts to an increase of:
  - *$25 per year*
  - *$6 per quarter*
  - *$2 per month*
  - *$0.07 per day*

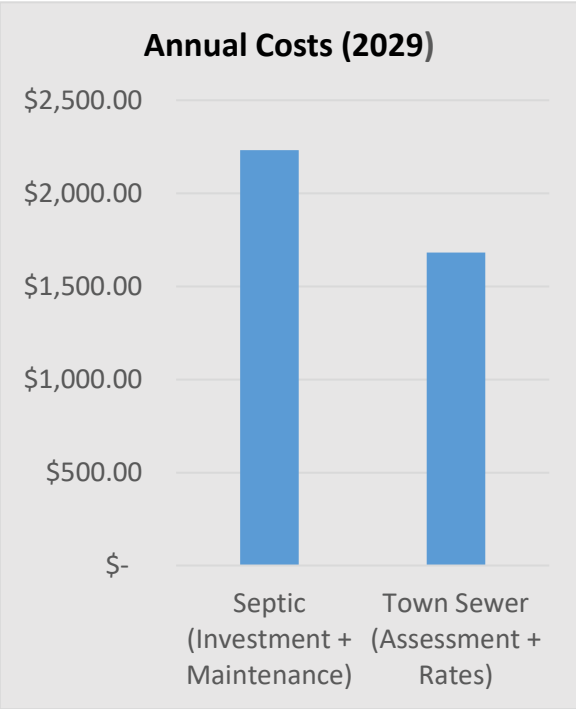
– Similar increases are assumed to occur annually over the 10-year planning horizon, although the financial plan will be updated annually, and necessary adjustments will be made

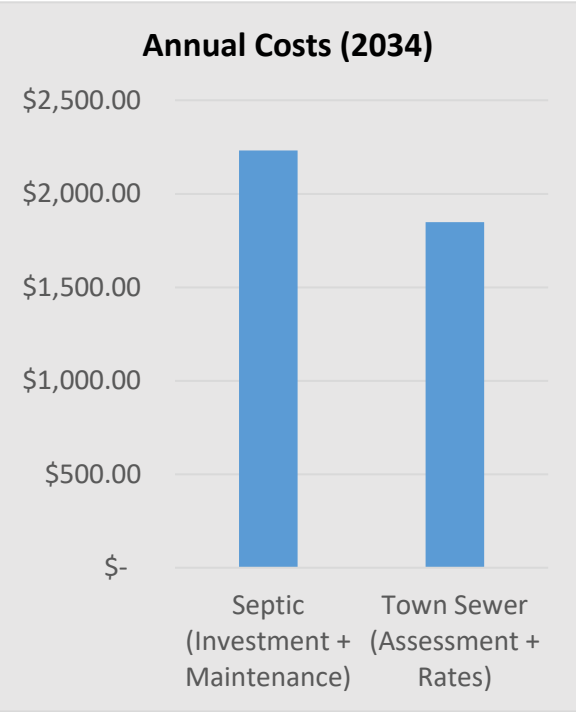
FUSS & O'NEILL RAFTELIS

Cost Modeling: Connections, Possible Sewer Rates, Break-even Point

- Customer Impacts for New Customers
  - New customers to the sewer system are assumed to be required to pay a $15,000 assessment, amortized. An alternative to connecting to the system would be an investment and on-going maintenance of a private septic system







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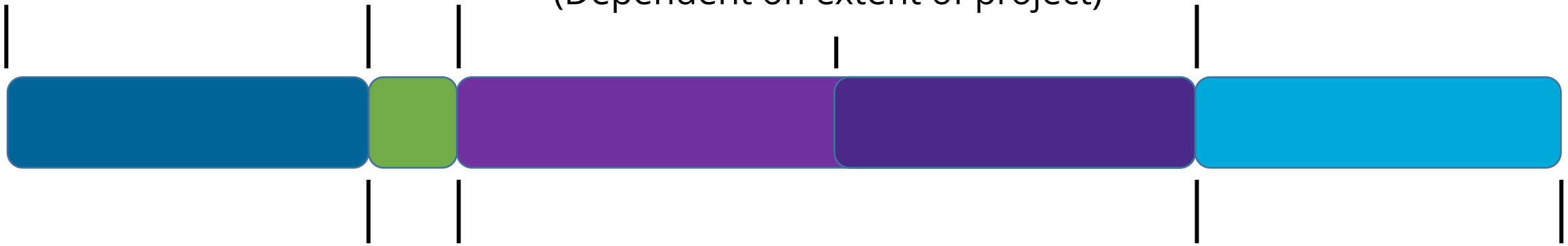
TYP. Timeframe for a Sewer Extension Project

Approximately 3 to 4 years

DESIGN
~ 1 Year

CONSTRUCTION
~ 1 - 2 Years
(Dependent on extent of project)



BIDDING, CONTRACTOR SELECTION, OWNER-CONTRACTOR AGREEMENT
~ 3 Months

PERMIT TO CONNECT
1 Year

- Properly decommission existing on-site wastewater treatment system
- Extend building outlet to collection system.

FUSS & O'NEILL RAFTELIS

Thank You!

Laura Marcolini, PE

845.452.6801

lmarcolini@fando.com

www.fando.com

FUSS & O'NEILL

RAFTELIS

Appendix Q

Public Hearing Presentation – Coventry, Rhode Island