APPENDIX N

WASTEWATER FLOWS FOR SELECTED PROPERTIES IN ESSEX VILLAGE

Estimated Water Usage - Essex Village Properties

Map	Lot	Street	Description	GPD	Total GPD	Permit to Discharge
47	105	Main Street	Black Seal - Separate System	1,800		Yes
			Bldg. #2 - 2 Offices, 2 Apts. System shared	340		
			Bldg. # 3 - 2 Apts. (2 Bed) with lot	600		
			Bldg. # 4 - 1 3-B-Room House 104	450		
					3,190	
47	116	1-3 Main Street	3 Retail Shops	120		Yes 225 GPD
			Maximum 6 employees		120	
47	98	1 Main Street	3 Business 1 with 2 employees - Retail 1 with 2 employees - Nail Salon (No Extra Water) 1 with 10 employees - Realty Office			
			14 @ 20 GPD	280		
					280	
47	78	12 Main Street	Post Office	450		
			System Leaching Capacity (2 Drywells 6 X 8) is 452 GPD = 22 employees max. entire Bldg. is Office & Post Office currently less than 22 employees			
			Easement to use Town property for septic 1/29/54		450	
47	107.1	19 Main Street	3 Bedroom House w/shop attached	436		
			New System 1979 1250 tank + 40LF 4 X 4 galleries 2 Employees in shop			
					436	
47	106	7 Main Street	J. Alden Clothes - Retail Only	60		
			3 Employees			
					60	

Estimated Water Usage - Essex Village Properties

Map	Lot	Address	Description	GDP	Total GPD	Permit to Discharge
47	103	11 Main Street	That's The Spirit Shop - 2 Employees Office Upstairs - 2 Employees Limited to 4 Employees	80	80	Yes
47	104	13 Main Street	4 Employees - Retail - Downstairs shares system 2 Employees - Office - Upstairs with lot 105	120	120	
47	101	9 Main Street	Essex Savings Bank 4 Employees	80	80	
47	100	7 Main Street	Liberty Bank 5 Employees	100	100	
47	117	12 North Main Street	Clipper Ship Bookshop	40	40	

APPENDIX O

1997 ESSEX VILLAGE SSDS REPAIR COMPUTATIONS

Fuss & O'Neill Inc. Consulting Engineers	PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
Essex WW Mgmt	MDA	4/11/97	AS	5/9/97	88-057 E
Dr-Site Repairs for Lots On Main St, Cross St., & Pratt St.					SHEET NO. 1 of

Leaching area for 10' ϕ dry well

12" thickness of crushed stone around dry well

diameter of wetted perimeter is 12'

Eff area / vert. ft = πd

$= \pi\ 12\ ft = 37.6\ ft^2$ / vert ft of dry well

Depths of 10' ϕ dry wells req'd to provide req'd leaching area

2 BR	3 BR	4 BR
375 ft² req'd	495 ft² req'd	660 ft² req'd
9.97 ft depth	13.16 ft	17.55 ft

based on a percolation rate of 1-10 minutes / inch.

Note: If a lot existing before 1/1/94 cannot fit a septic system based on the 1-10 min./in percrate, a system can be installed based on 1-5 min/in perc rate

Purpose: Determine whether dry wells could be installed on specific lots on Main St, Cross St, and Pratt St.

The specific lots are Assessor's map 48

Lots 107, 107-1, 108, 109 (see sheet 2 for lot locations)

Sketches of the lots are shown on sheet 3

① The 10' ϕ wet well with 1' of crushed stone is 12' ϕ

Lot 107 Lot 107 has a 3BR house req'd eff. area (perc 1" in 1 to 10 min) = 495 ft²

This structure will fit on Lot 107.

Req'd height of dry well will be 13.16 ft

1 ft of cover plus 1.5 ft separation to gw → 15.66 ft req'd

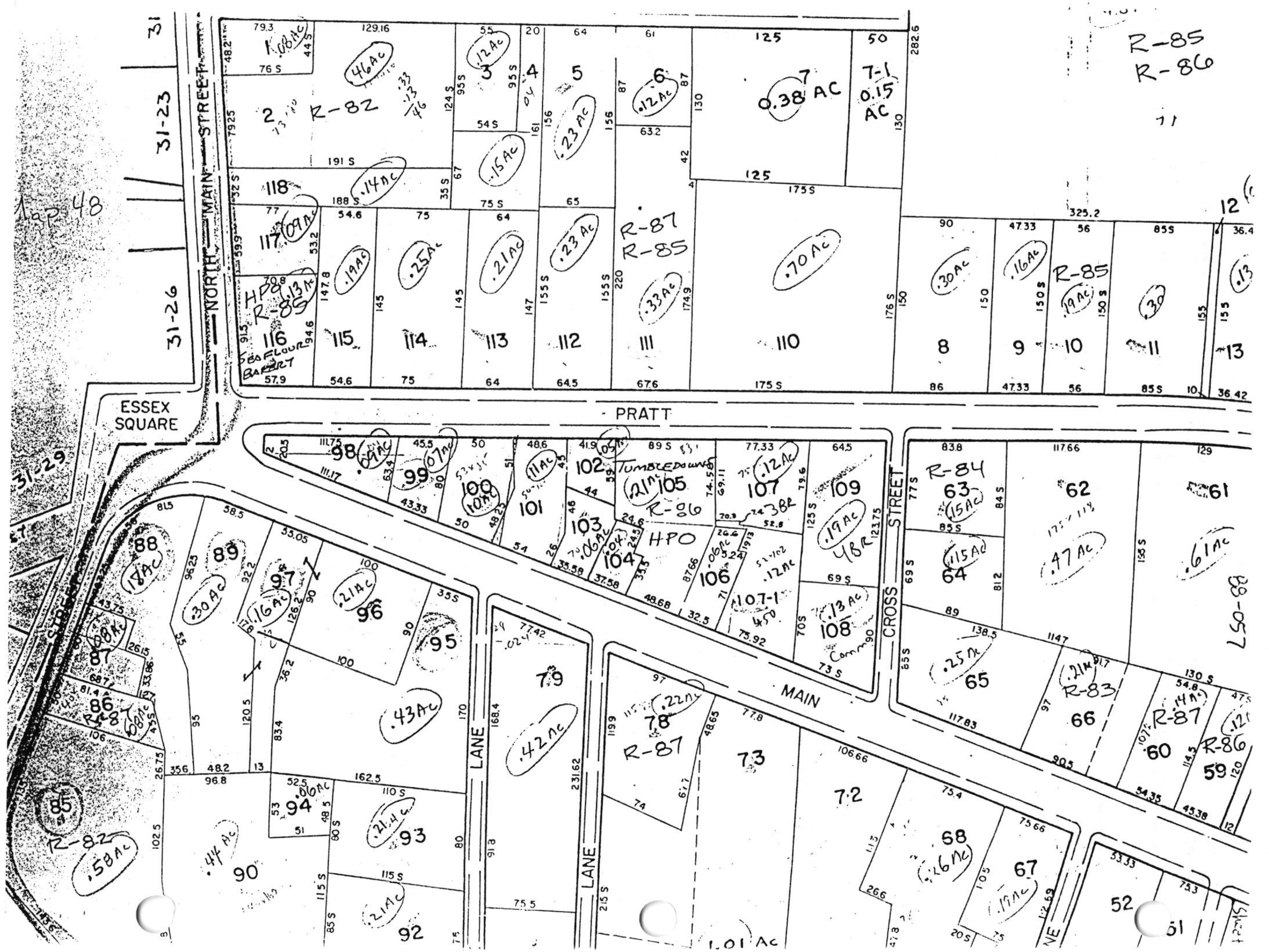
depth to gw 16.93 ft on 5/1 in MW-5 ∴ OK

② Lot 109 has a 4 BR house req'd eff area = 660 ft² (perc 1" in 1 to 10 min)

Lot 109

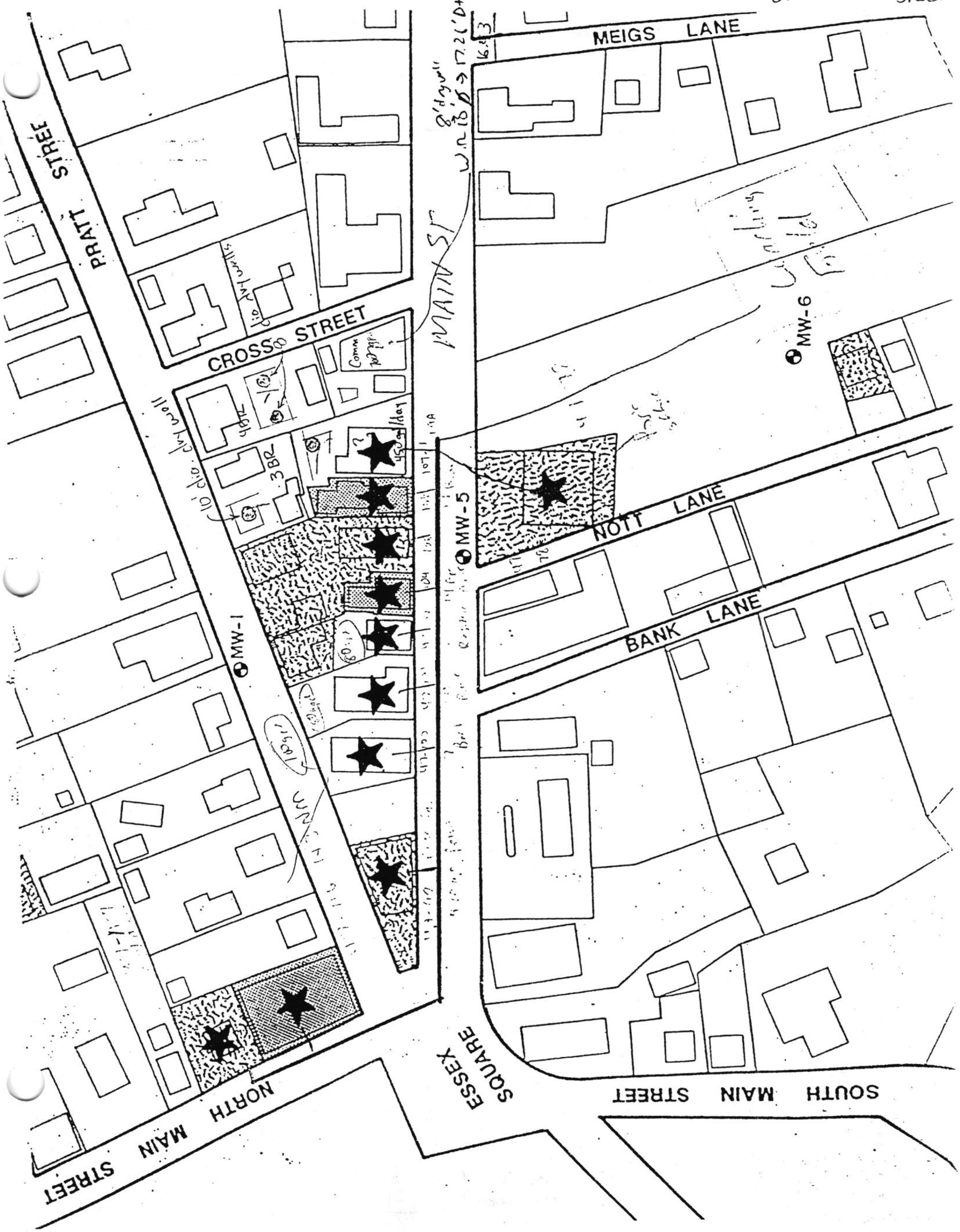
∴ a 10' ϕ dry well will be too deep (≈ 20.05 = 17.55 + 1' cov. + 1.5' dist. to gw)

Use 2 of the 8' ϕ dry wells w/ 1' of stone surrounding them.



NORTH MAIN STREET
ESSEX SQUARE
PRATT
MAIN
CROSS STREET
LANE
LANE
R-85
R-86
R-82
R-87
R-85
R-84
R-83
HPO
31-23
31-26
31-29

88-057 sheet



MEIGS LANE
PRATT STREET
CROSS STREET
MAIN ST
MW-6
MW-5
MW-1
NOTT LANE
BANK LANE
NORTH MAIN STREET
ESSEX SQUARE
SOUTH MAIN STREET

Eff. area / vert ft = $\pi r d$ $\quad d = 8' + 1' + 1' = 10'$ (stone stone)

$= \pi (10\text{ ft}) = 31.4 \frac{\text{ft}^2}{\text{v. ft}}$

Height of dry wells = $\frac{\text{Req'd eff area}}{(2 \text{ dry wells}) \rightarrow 2 \times \frac{\text{Eff area}}{\text{v. ft}}} = \frac{660\text{ ft}^2}{2 \cdot \frac{31.4\text{ ft}^2}{\text{v. ft}}} = 10.5\text{ ft}$

Req'd depth to gw = Ht. of dry well + cover + dist between bot. dry well & gw

$= 10.5' + 1' + 1.5' = 13'$

OK depth to GW on 5/1 at MW-5 = 16.93 ft

Req'd ℄ separation between dry wells is 4 × dia of shallow structure

Separ. = $4 \times 8' = 32'$

See sheet 3 for dry well layout

(3) Lot 107-1

Lot 107-1 has a reported daily flow of 450 gal/day

Treat it as a 3BR house per Elizabeth Troop's instruc.

use 10' dia dry well w/ 1' crushed stone

Ht of dry well = $\frac{\text{Req'd eff area}}{\frac{\text{Eff. area}}{\text{vert ft}}} = \frac{495\text{ ft}^2}{\frac{37.6\text{ ft}^2}{\text{v. ft}}}$ ← from Public Hc Code (rev. 1/

$= 13.16\text{ ft}$

Req'd dist to gw = 13.16 ft + (1 ft (cover) + 1.5 (dist to gw) = 15.66 ft

OK depth to gw in MW-5 on 5/1 was 16.93 ft

Note: This system (10' ℄ dry well w/ 1' stone around it) may or may not fit on the lot using the prescribed setback distances (15' from bldg 10' from prop. line) depending on the exact locations. It is too close to call exactly from 100 scale map.

(4) The Essex sanitarian reports that the flow from this lot is

Lot 10, 700 gal/day.

This flow cannot be disposed of while meeting the req'd setback distances from homes and property lines because the available disposal area is only ~ 10' wide (see calcs below)

∴ It should be added to the sewer line which will connect to the Community leaching system at the park on Main St

Assuming a Residential Bldg. using an 8' dia drywell

$$\frac{700 \text{ gal}}{\text{day}} \Big/ \frac{0.8 \text{ gal}}{\text{ft}^2 \text{ day}} = \frac{875 \text{ ft}^2}{\frac{31.4 \text{ ft}^2}{\text{vert ft drywell}}} = 23.3 \text{ ft deep drywell}$$

too deep

Exist. depth to gw = 16.93 ft on 5/1 in MW-5

8' dia drywell w/ 1' of crushed stone around circum.

$$\frac{\text{Eff area}}{\text{vert ft}} = \pi d = \pi (8' + 1' + 1') = \frac{31.4 \text{ ft}^2}{\text{vert ft}}$$

APPENDIX P

HARBOR MANAGEMENT

6.0 HARBOR MANAGEMENT

While a combination of on and off-site subsurface disposal plans may be sufficient to manage wastewater disposal and water quality for the land portion of Essex, water quality management in Essex Harbor may require further measures. Four marinas and five yacht clubs provide slips and moorings for a total of 512 boats. Private facilities include 126 moorings and 80 slips thereby bringing the total number of boats in Essex Harbor to 718. Currently, there are no pumpout facilities for these boats.

Included in this number of boats are some live-aboards. Estimates of the the number of year-round live-aboards range from less than 10 (Harbormaster) to 30 (Harbor Management Plan). It is believed that the residents of these boats use shore-based sanitary facilities most of the time, but this is inconvenient in the middle of the night. Many other boats are used as summer cottages, and it is thought that the same sanitary practices are followed as in the live-aboards.

Very few sanitary facilities are available for daytrippers. There are no public rest rooms in Essex, so boaters typically use facilities at the Steamboat Dock Museum. The marinas in Essex also have sanitary facilities available. Transients boats with holding tanks are likely to discharge in open waters, but some boaters may not be likely to take the boat out into the ocean just to dump the holding tank.

Water quality samples taken in August and October did not meet Class SB surface water criteria due to excessive coliform counts. May coliform levels were low. Nitrogen concentrations were not significantly impacted during any sampling event.

Possible sources of coliform are boats and upstream municipal wastewater discharges to the Connecticut River. As discussed previously, one analytical tool suggests that the coliform may not be from the swans that live in the harbor. Although evidence of the source of the bacterial contamination is not conclusive, it would be advisable to consider facilities to handle marine sanitation wastes. The Essex Harbor Management Commission has also recommended that pumpout facilities be installed in the future.

Methods of treating the wastewater generated from these pumpouts have been considered. Estimates of sewage flow from boats range from approximately 12,000 to 27,000 gpd for active boating days. These estimates were developed according to methodologies developed by the DEP and EPA. The method resulting in the lower flow estimates was based on an average of 3.6 passengers per boat and 5.6 hours per outing developed by EPA. These figures were used with an estimate that between 25 and 50% of boats were active on any given day to develop flow rates of approximately 12,000 to 24,000 gpd. The 27,000 gpd flow was based on an estimate of boat sewage flows and number of boats by length. This higher estimate included flows at shore based facilities (i.e. from boaters on small boats without head facilities).

Wastewater is generally chemically treated to prevent odor before it is discharged to a marine holding tank. These treatment chemicals could make the wastewater more difficult to treat than typical domestic sewage by inhibiting biological growth. The high strength and variability of the waste would also make treatment at a dedicated plant difficult. Therefore, it would not be advisable to treat only this waste using a package treatment plant or subsurface disposal system at a marina. However, it should be noted that a solar aquatic system has been proposed in Marion, Massachusetts for this purpose.

Use of existing facilities to treat the wastewater generated on boats was also considered. Discharge of this wastewater to the Essex septage lagoons is not likely to be feasible because the flow is very high relative to the maximum day septage flows of approximately 4700 gpd and the lagoons have hydraulic constraints which limit their capacity.

Discharge for treatment at a municipal wastewater treatment plant could provide another means of treating the wastewater generated by boats. Since sewage is often chemically treated before it is discharged to a marine holding tank, it would be preferable to discharge this boating sewage to a relatively large plant where the treatment chemicals would be diluted and not have an impact.

Marinas in Westbrook, Clinton, Old Saybrook and Mystic with pumpout facilities were contacted to determine the disposal methods they use for marine sanitary waste. Waste from some of the pumpout facilities is hauled to the Clinton septage lagoons. A marina in Mystic is connected to the public sewer, and has to dilute the pumpout waste with potable water because of its high strength. A marina in Old Saybrook reportedly has an on-site treatment plant with a direct discharge to the Connecticut River.

APPENDIX Q

AQUIFER PROTECTION

7.0 ON-SITE WASTEWATER MANAGEMENT

A vital part of any wastewater management program which includes the use of on-site subsurface disposal systems is management of the use and maintenance of these systems. To encourage proper use and maintenance, the WPCA has drafted the following on-site sewage disposal policy:

7.1 Subsurface Disposal Policy

1. The WPCA encourages town policies which will avoid potential future problems with on-site sewage disposal. These include:

   - o Zoning regulations which limit new development to that which can be supported by on-site disposal.
   - o Vigorous enforcement of technical standards for subsurface disposal systems for new development and conversions in use.

2. The WPCA intends to adopt a Management Plan for Subsurface Disposal Systems. The goals of this plan will include:

   - o Promoting proper operation of on-site disposal systems.
   - o Monitoring of on-site systems and possible effects on surface waters and groundwater.
   - o Identification of poorly-functioning systems and implementation of effective repairs.
   - o Where repairs are not feasible on site, alternative solutions would be implemented, such as purchase of vacant land for construction of new leaching fields.

   The Management Plan is intended to be dynamic and may be changed to meet changing needs.

3. The WPCA recognizes the need to provide adequate septage disposal facilities to meet town-wide needs.

8.0 AQUIFER PROTECTION

As part of the modified order from the Department of Environmental Protection (DEP), the Town of Essex is required to focus on the interrelationship between wastewater disposal and land use management of the aquifer recharge areas in the town. Defining this interrelationship is a two step process of first identifying aquifer areas and then developing means of protecting them.

8.1 Aquifer Identification

8.1.1 Yield Criteria

Connecticut General Statutes (section 22a-354h) define an aquifer as "a geologic formation ... that contains sufficient saturated, permeable materials to yield significant (emphasis added) quantities of water to wells and springs". There is no clear consensus on how much water is considered "significant".

For the purposes of identifying aquifers for this report, three production rates were considered: 50 gallons per minute (gpm), 100 gpm and 250 gpm. These flows were used to give possible ranges of flows which would be considered for development into public water supplies in the future if the need should arise. Experience has shown that wells are often developed in Connecticut that can produce flows such as these.

8.1.2 Aquifer Delineation

For the purposes of this analysis, only stratified drift aquifers were considered. Stratified drift is a well-sorted sediment which is laid down by or in meltwater from glaciers and includes sand, gravel, silt and clay arranged in interbedded layers. Areas of stratified drift are the most important aquifers in regions where they are present. Yield is highest for coarse grained sediments and lower for fine grained sediments. Potential bedrock aquifers

were not included because Essex has numerous stratified drift deposits and they contain significantly more water per unit volume than do bedrock aquifers. Only stratified drift aquifers are proposed for inclusion in forthcoming DEP regulations.

Groundwater availability in stratified drift is a function of thickness of saturated material and transmissivity. Saturated thickness is a measure of the thickness of stratified drift found below the water table. Transmissivity is a measure of an aquifer's ability to transmit water.

Areas of significant groundwater sources were delineated in Essex based on saturated thickness and transmissivity through a multiple step process. First areas of coarse and fine grained stratified drift and their thicknesses were mapped. Data published by the United States Geologic Survey (USGS) and DEP was used as a resource in this analysis. Lines (isopleths) connecting points of equal saturated thickness were developed and are shown on Figure 7. Further explanation of these procedures can be found in Appendix F.

Transmissivities were estimated based on boring logs showing the types of soils encountered when wells and test holes were drilled. Transmissivity depends on the soil characteristics (grain size, etc.) and on the thickness of the soil layer. Transmissivity is higher for coarse grained thick deposits than for fine grained thin deposits. Drilling logs obtained from the State Well Drilling Board were used to supplement information found in Water Resources Inventory of Connecticut, Part 10, Lower Connecticut River Basin (USGS and DEP, 1982) to confirm depths to groundwater and bedrock. Transmissivities of individual wells and isopleths of equivalent transmissivities are plotted in Figure 8.

Information on transmissivity and saturated thickness were combined to determine areas in which it is likely that a well could be drilled which would produce a minimum of 50 gpm. Although the relationship is not simple, transmissivity and saturated thickness are inversely related to give a flow (i.e. higher transmissivities require less saturated thickness to produce the same flow). This is illustrated in the table below:

Hydrogeologic Parameters Required for 50 gpm	
Saturated Thickness (feet)	Required Transmissivity (sq.ft./day)
10	3000
20	1200
30	900
40	800
60	650
80	500
120	500

Areas which meet the above criteria indicating a theoretical yield of 50 gpm, along with the direct and indirect recharge areas are illustrated in Figure 9. The direct recharge area is the area from which groundwater flows directly to the area of contribution. The area of contribution, or cone of depression, is the area where the water table is lowered due to pumping of a (hypothetical) well in the aquifer. The indirect recharge area is the area in which water flows to surface water which flows into the area of contribution.

8.2 Existing Land Use over Aquifer and Recharge Areas

A windshield survey was conducted in July 1991 to determine the existing land uses over the aquifers and direct recharge areas identified as part of this study. All non-residential uses were

recorded and located on a map of the town Figure 10. A table in Appendix G lists the names of the 85 businesses in these areas and the types of activities conducted at these locations. Activities were determined from signs identifying the businesses, and in some cases from discussions with workers at these establishments and with the Town Assessor.

Activities which have potential for contamination of the town's aquifers were then identified on a preliminary basis based on a suggested list of "activities of concern" published by the DEP. It should be noted that no followup site investigations have been conducted to confirm or deny existence of these potentially harmful activities.

8.3 Aquifer Value

The quantity and quality of groundwater that can potentially b withdrawn from an aquifer, and the demand for same, should be considered in determining an appropriate strategy for protecting the aquifer. Groundwater withdrawals for both public water supply wells and private wells must be considered.

Much of the Town of Essex has water supplied by the Connecticut Water Company. The majority of the water supply (present and future) for the town is obtained from reservoirs in Chester, which is supplemented, at least seasonally, by the Dennison Road well in Essex. The Dennison Road well reportedly has a pumping capacity of 0.25 mgd, and has a high degree of induced infiltration from the Falls River.

A second Connecticut Water Company well, on Brookside Lane, had a reported pump capacity of 0.50 mgd. This well ceased operation in the mid-1980's due to contamination (by surfactants) and the water company plans to abandon this facility.

In recent discussions with representatives of the Connecticut Water Company regarding the aquifer areas in Essex, they have indicated they are not interested in exploring new groundwater sources in the town. They are planning to develop the Holbrook well which is in Westbrook just south of the Essex boundary, but given the extensive development, especially industrial and commercial, over the aquifers in Essex, the water company does not plan to pursue additional wells in town. They plan to continue using surface water supplies to meet the needs of Essex and neighboring towns in the future.

The majority of the aquifer and recharge areas of Essex are within the service area of the Connecticut Water Company. The significance of this fact is that there are relatively few private wells used for drinking water which tap these aquifers, those wells that are located outside (albeit close to) the public water supply system.

8.4 Aquifer Protection Measures

8.4.1 Land Use Controls - General

This evaluation focuses on both the aquifer areas and the direct recharge areas and considers possible methods of protection for water resources in these areas. Land use controls are a recommended means of protecting groundwater resources. Implementation of land use controls can be considered to have two phases: controls for undeveloped land and controls for existing development.

For undeveloped land the technical implementation concept is relatively straight-forward. Land uses should be limited to those which would not be expected to adversely impact groundwater quality. An aquifer protection zone could be incorporated into the

zoning regulations and certain land uses could be prohibited in that zone. A list of suggested prohibited uses is included in Appendix H. This list can be used as a starting point from which zoning regulations to protect groundwater quality can be developed. Social and economic issues may also need consideration during the establishment of such a set of regulations.

For developed land, implementation of land use controls is generally more difficult. Existing land uses may include some that would be prohibited from being developed as new activities in aquifer protection areas.

8.4.2 Existing Regulations

Essex has had an aquifer protection regulation since the mid-1980's. Town regulations include water resources districts as overlay districts in the Zoning Regulations. A copy of the regulation is included in Appendix I. Two areas are defined: Water Resources District I includes cones of depression of public water supply wells and upgradient areas. Water Resources District II includes surrounding stratified drift, till, or bedrock to the boundary of the watershed, as modified by the Zoning Commission.

Land uses within these districts are regulated to "prevent contamination of ground and surface water resources providing water supply". Principal activities which manufacture, use, store, or disperse hazardous materials, landfills, junkyards, salt stockpiles, gasoline stations, car washes, and auto repair and auto body shops are prohibited from both districts. Underground storage of fuel, oil, gasoline, or hazardous materials is also prohibited in both districts. In District I areas parking lots with over 200 spaces, impervious areas greater than 30 percent of total lot area,

and disruption of more than 70% of natural vegetation are all prohibited. Certain other activities are only allowed by obtaining a special exception from the Zoning Commission.

It is important to note that the water resources districts do not correspond to the aquifers delineated in this study. In general the districts include much of the Falls River Valley (as these areas are upgradient of the Dennison Road well), but exclude the aquifer along the Mud River to great extent.

8.4.3 Recommended Controls

NOTE: As of the date of this draft, discussions are not complete regarding the degree of land use restriction desired for the aquifer and recharge areas as well as long-term responsibility for administration of these regulations.

APPENDIX R

BROOKSIDE LANE WELL CORRESPONDENCE

THE CONNECTICUT WATER COMPANY

A SUBSIDIARY OF CONNECTICUT WATER SERVICE, INC.

GENERAL OFFICE: 93 WEST MAIN STREET
CLINTON, CONNECTICUT 06413-1600
TEL. 860-669-8636

January 30, 1998

Ms. Carol Speers, Sanitarian
Essex Town Hall
West Avenue
Essex, CT 06426

Re: Brookside Well
Brookside Lane, Essex

Dear Ms. Speers:

It is my understanding the Town of Essex is in the process of updating its wastewater management study. This study addresses existing and potential water supplies within the Town, including those owned and maintained by The Connecticut Water Company. In addition to our 0.25 Million Gallon per Day public water supply well located off Dennison Road (the "Dennison Well"), the Company also maintains a 0.5 MGD well at the foot of Brookside Lane (the "Brookside Well"). While the Brookside Well has been inactive for many years due to water quality concerns, the Company is presently assessing the feasibility of returning this well to service.

You recently requested water quality information from the Brookside Well to be included in your assessment of ground water conditions throughout town. Enclosed are water quality data collected as part of our ongoing feasibility study. These data are representative of existing raw water quality conditions and underscore the importance of protecting the Mud River aquifer.

If you have any further questions, please feel free to contact me at (860) 669-8630, extension 252.

Very truly yours,

David L. Radka
Senior Scientist

enc.
cc: K. W. Kells
C. S. Fazendeiro

LABORATORY REPORT
WELL WATER ANALYSIS

Client: Connecticut Water Co.
93 West Main St.
Clinton, CT 06413

Lab No.....: 117302
CTL Sample #...: 14256
CWC Source #.. : 1119

Date Collected.: 11/21/97
Date Received..: 11/21/97
Collected By...: Client
Time Collected.: NA

Location : 1119 Brookside Well

RESULTS OF WELL WATER TESTING:

	Results	Date Tested	Analyst	EPA Method #
pH (Units)	6.2	11/21/97	DFG	150.1
Color (PCU)	ND<5	11/21/97	DFG	110.2
Odor (0-5)	0(NONE)	11/21/97	DFG	140.1
Turbidity (NTU)	0.32	11/21/97	DFG	180.1
Chloride-mg/L	66	11/25/97	LJ	325.3
Hardness-mg/L	116	12/5/97	JS	130.2
Ammonia-N-mg/L	0.11	12/9/97	LP	350.2
Nitrite-N-mg/L	0.010	11/21/97	LP	354.1
Nitrate-N-mg/L	1.9	11/21/97	LP	352.1
HPC CFU/mL	----------		---	-----
Iron, Total-mg/L	ND<0.05	12/8/97	MH	236.1
Total Coliform /100ml	----------		---	-----
Manganese, Total-mg/L	1.56	12/8/97	MH	243.1
Sodium-mg/L	41.7	12/9/97	MH	273.1
Alkalinity-mg/L	36	12/9/97	LP	310.2
Total Diss. Solids-mg/L	219	12/2/97	JS	120.1

Laboratory Director PH-0547

Connecticut Testing Laboratories, Inc.
165 Gracey Avenue/Meriden, CT 06451
(203)-634-3731/(Fax) 630-1336

Date Samples Received : 11/21/97
Date Samples Collected: 11/21/97

Client Name: **Connecticut Water Co.**	CTL Lab. No. 117302
Report Date: 12/9/97	PO/Job No. 6781G

RESULTS OF ANALYSIS

Matrix Type		**W**			
CTL Sample No.		**14256**			
Field Id.		**1119 Brookside Well**			
MBAS-mg/L		0.10			

Matrix Types : W = Water/Aqueous
S = Soil/Solid
O = Oil/Hydrocarbons

1005 BOSTON POST ROAD
MADISON, CT 06443

ENVIRONMENTAL
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Connecticut Certification PH-0535
Massachusetts Certification M-CT019

Thomas Gaidish
Connecticut Water Company
93 West Main Street
Clinton, CT 06413

Project: Shoreline Region
Sample Type: Water
Collected By: Client
Date Collected
and Received: November 21, 1997

Report Date: November 26, 1997
Report No.: M97-2687

Client I.D.	1119 Brookside Well	Analysis Date
ECL Sample No.:	97-5530	
Parameter		
EPA Method 524.2 Volatile Organics (mg/L)		11/24/97
Dichlorodifluoromethane	ND<0.0005	
Chloromethane	ND<0.0005	
Vinyl Chloride	ND<0.0005	
Bromomethane	ND<0.0005	
Chloroethane	ND<0.0005	
Trichlorofluoromethane	ND<0.0005	
Chlorobenzene	ND<0.0005	
Total Xylenes	ND<0.0005	
Isopropylbenzene	ND<0.0005	
n-Propylbenzene	ND<0.0005	
2-Chlorotoluene	ND<0.0005	
4-Chlorotoluene	ND<0.0005	
Tert-Butylbenzene	ND<0.0005	
Sec-Butylbenzene	ND<0.0005	
1,3 Dichlorobenzene	ND<0.0005	
1,4 Dichlorobenzene	ND<0.0005	
1,2 Dichlorobenzene	ND<0.0005	
Benzene	ND<0.0005	
Toluene	ND<0.0005	
Ethylbenzene	ND<0.0005	
Styrene	ND<0.0005	
Bromobenzene	ND<0.0005	
1,2,3 Trimethylbenzene	ND<0.0005	
1,3,5 Trimethylbenzene	ND<0.0005	
1,2,4 Trimethylbenzene	ND<0.0005	
p-Isopropyltoluene	ND<0.0005	
n-Butylbenzene	ND<0.0005	
1,2,4 Trichlorobenzene	ND<0.0005	
Naphthalene	ND<0.0005	
1,2,3 Trichlorobenzene	ND<0.0005	
1,1 Dichloropropylene	ND<0.0005	
1,2 Dichloroethane	ND<0.0005	

Client I.D.	1119 Brookside Well	Analysis Date
ECL Sample No.:	97-5530	

EPA Method 524.2
Volatile Organics (mg/L)
(Continued)

		11/24/97
Trichloroethene	0.0006	
1,2 Dichloropropane	ND<0.0005	
C-1,3 Dichloropropene	ND<0.0005	
T-1,3 Dichloropropene	ND<0.0005	
1,1,2 Trichloroethane	ND<0.0005	
1,3 Dichloropropane	ND<0.0005	
1,3 Dichloropropene	ND<0.0005	
1,2 Dibromoethane	ND<0.0005	
1,1,1,2 Tetrachloroethane	ND<0.0005	
1,1,2,2 Tetrachloroethane	ND<0.0005	
1,2,3 Trichloropropane	ND<0.0005	
1,2 Dibromo3chloropropane	ND<0.0005	
Hexachlorobutadiene	ND<0.0005	
1,1 Dichloroethane	ND<0.0005	
2,2 Dichloropropane	ND<0.0005	
Chloroform	ND<0.0005	
1,1,1 Trichloroethane	ND<0.0005	
Carbon Tetrachloride	ND<0.0005	
Bromochloromethane	ND<0.0005	
Dibromomethane	ND<0.0005	
Tetrachloroethylene	0.0107	
Bromoform	ND<0.0005	
1,1 Dichloroethylene	ND<0.0005	
Methylene Chloride	ND<0.0005	
T1,2 Dichloroethylene	ND<0.0005	
C1,2 Dichloroethylene	<0.0005	
Bromodichloromethane	ND<0.0005	
Dibromochloromethane	ND<0.0005	
Methyl-tert-Butyl-Ether	ND<0.0020	

EPA Method 504 (ppb)		11/25/97
1,2-Dibromoethane (EDB)	<0.02	
1,2-Dibromo-3-Chloropropane (DBCP)	<0.02	

ND - None Detected

Report Prepared By:

Nancy R. Ballou

Report Certified By:

David C. Barris

APPENDIX S

ESSEX WASTEWATER MANAGEMENT ORDINANCE AND SUPPORTING DOCUMENTATION

APPENDIX S.1

ESSEX WASTEWATER MANAGEMENT ORDINANCE TEXT

RAFT

WASTEWATER MANAGEMENT ORDINANCE

TOWN OF ESSEX, STATE OF CONNECTICUT

Be it resolved by the Town of Essex in meeting convened that the following Ordinance be adopted:

Section 1 Purpose of Ordinance.

The purpose of this ordinance is to:

(a) Protect the public health and welfare of the town through the prevention of public health nuisances and environmental degradation that may have a detrimental impact on the quality of the town's subsurface and surface water resources.

(b) Affirm and declare that a policy of sewer avoidance should be applied to all areas of the Town of Essex where onsite treatment and disposal of wastewater is deemed feasible.

(c) Define wastewater management practices and generate inspection data. Information so generated may be used to develop and modify a wastewater management plan.

(d) Regulate and control the design, construction, operation and maintenance of septic systems in the town, and require periodic inspection and maintenance of these systems.

(e) To educate property owners about proper care and maintenance procedures for septic systems.

Section 2 Definitions

For the purpose of this ordinance, the following words and terms shall have the meaning hereto assigned. The word "shall" is always mandatory:

(a) AUTHORITY The Water Pollution Control Authority for the Town of Essex, Connecticut.

(b) DIRECTOR The Director of Health of the Town of Essex, or his designees, including the Town Sanitarian.

(c) SEWAGE Water and human excretions or other waterborne wastes incidental to the occupancy of a residential or a nonresidential building, but not including disposal of manufacturing process water, cooling water, wastewater from water-softening equipment, commercial laundry wastewater, blow-down from heating or cooling equipment, water from cellar or floor drains, surface water from roofs, paved surfaces or yard drains, wastewater from marine toilets or other such chemical toilets or holding tanks, hazardous or toxic wastes, or the like.

(d) SEPTIC SYSTEM A subsurface sewage disposal system consisting of a house or collection sewer, a septic tank followed by a leaching system, any necessary pumps or siphons, and any groundwater control system on which the operation of the leaching system is dependent.

(e) SEPTAGE Any water or material removed from a septic system used to treat sewage.

(f) PUMPOUT The removal of septage from a septic system by a septic cleaner.

(g) DISPOSAL PERMIT A permit issued by the Authority for permission to dump septage at the Essex Septage Lagoon.

(h) PERMIT TO DISCHARGE A permit issued by the Director for permission to use a septic system.

(i) ESSEX SEPTAGE LAGOON The septage disposal facility operated by the Authority on land currently adjacent to the town landfill, or at any future location.

(j) OWNERS Owners of record of property situated within the Town of Essex.

(k) USERS Owners of property upon which is located one or more septic systems.

(l) COMMERCIAL & INDUSTRIAL USERS Owners of septic systems for all buildings other than dwellings, except for special users and other users.

(m)DWELLING A building used solely as a residence.
(n) MULTIPLE DWELLING PROJECT All units of residential condominiums, apartment houses, planned communities and the like.
(o) RESIDENTIAL USERS Owners of septic systems for dwellings.
(p) SPECIAL USERS Owners of septic systems for public schools, municipal offices and buildings, churches, museums and not-for-profit organizations.
(q) OTHER USERS All other users not defined above.

Section 3 Adoption of Public Health Code

Sections 19-13-B100, B103, and B104 of the Connecticut Department of Public Health and Addiction Services, Public Health Code Regulations, and all amendments including technical standards thereto hereinafter adopted, are hereby incorporated by reference in this ordinance and made a part hereof, and are hereinafter referred to in this Ordinance as the Public Health Code.

Section 4 Adoption of Regulations

(a) The Authority is authorized to adopt, and amend as needed, reasonable regulations and fee schedules for the effective enactment and enforcement of this ordinance.
(b) The Authority is authorized to establish, and amend, as needed, a schedule of fines or other penalties for non-compliance with the mandatory pumpout schedules or other requirements of this ordinance. Such fine and penalty schedules and amendments to same shall be approved by a Town Meeting prior to their enactment and shall comply with applicable Connecticut General Statutes and Regulations of State Agencies.

Section 5 Design, Construction and Operation of Septic Systems

(a) All new septic systems, and improvements to existing septic systems, in the Town of Essex, shall be designed and constructed in compliance with the Public Health Code, Ordinances and Special Acts of the Town of Essex, and any applicable regulations and standards of the Connecticut Department of Environmental Protection, whichever are more restrictive.
(b) New Construction: Prior to the issuance of a building permit for any new structure requiring a septic system, there shall be a design of the proposed septic system prepared by a licensed professional engineer registered in the state of Connecticut. Such design shall include a report of all soil testing done on said property. No building permit shall be issued until such design has been approved by the Director.
(c) Building Conversions, Change in Use: No building shall be converted so as to allow continuous occupancy, winterization or any change in use that will potentially increase water usage unless the owner or the owner's authorized agent submits to the Director soil test data, design plans or a sketch which demonstrates that after the conversion or use change, suitable area will exist on the lot for installation of a septic system that meets all requirements of Section 5 (a) above except for the one hundred percent reserve leaching area required by the Public Health Code. This determination shall be based upon analysis of existing soil data or, if such is not available, the property owner shall be required to perform additional soil testing. The property owner or the owner's authorized agent must also submit documentation that the current system has been pumped and inspected within the previous five years, and that the system was working properly at the time of inspection. The Director may require expansion of the existing septic system or installation of a new septic system at the time of conversion or use change for those properties where sufficient size, proper location or adequate hydraulic capacity of the underlying naturally occurring soils of the existing septic system has not been demonstrated by the applicant or where the proposed conversion or change in use results in a 50% or greater increase in design flow.

(d) Additions or Renovations: No addition or renovation to a building that will potentially increase water usage shall be permitted unless the owner or the owner's authorized agent submits to the Director soil test data, design plans or a sketch which demonstrates that after such addition or renovation, suitable area will exist on the lot for installation of a septic system that meets all requirements of Section 5 (a) above except for the one hundred percent reserve leaching area required by the Public Health Code. This determination shall be based upon analysis of existing soil data or, if such is not available, the property owner shall be required to perform additional soil testing. The property owner or the owner's authorized agent must also submit documentation that the current system has been pumped and inspected within the previous three years, and that the system was working properly at the time of inspection. The Director may require expansion of the existing septic system or installation of a new septic system at the time of addition or renovation for those properties where sufficient size, proper location or adequate hydraulic capacity of the underlying naturally occurring soils of the existing septic system has not been demonstrated by the applicant or where the proposed addition or renovation results in a 50% or greater increase in design flow or number of bedrooms. If the applicant submits soil test data, design plans or a sketch and is unable to demonstrate that adequate area on the lot is available for a code compliant system, such addition or renovation shall be permitted provided the addition does not reduce the available area on the lot for sewage disposal facilities and does not increase either the estimated design flow or the number of bedrooms.

(e) Garages, sheds, decks, and swimming pools: No garage, accessory structure or in-ground or above-ground swimming pool shall be permitted unless the owner or the owner's authorized agent submits to the Director soil test data, design plans or a sketch which demonstrates that after such construction, suitable area will exist on the lot for installation of a septic system that meets all requirements of Section 5 (a) above except for the one hundred percent reserve leaching area as required by the Public Health Code. This determination shall be based upon analysis of existing soil data or, if such is not available, the property owner shall be required to perform additional soil testing. If compliance with these requirements cannot be proved, such addition or renovation shall be permitted provided the addition does not reduce the available area on the lot for sewage disposal facilities. Separating distances from such a structure to any part of the existing septic system shall comply with the requirements of Section 5 (a) above.

(f) Lot Line Modification: No lot line shall be modified or any other activity performed that affects soil characteristics or hydraulic conditions so as to reduce the area available to repair an existing septic system, unless the property owner or the owner's authorized agent submits soil test data, design plans or a sketch to the Director that demonstrates that after the proposed lot line change or other activity, adequate area will exist on the lot for installation of a septic system that meets all requirements of the Public Health Code except for the one hundred percent reserve area as required by the Public Health Code. This determination shall be based upon analysis of existing soil data or, if such is not available, the property owner shall be required to perform additional soil testing. In no case shall a modified lot line violate Subsection (d) of Section 19-13-B103d of the Public Health Code which requires that each septic system shall be located on the same lot as the building served.

(g) Soil Testing: The Director may require that investigation for maximum ground water level in areas of special concern, or for subdivisions with proposed building lots in areas of special concern, as defined in Section 19-13-B103d(e)(1) of the Public Health Code, be made between February 1 and May 31, or such other times when the ground water level is determined by the Commissioner of Public Health to be near its maximum level.

(h) Right of Entry: The Director shall have the right of entry to any land in the Town of Essex for the purpose of conducting inspections of water wells or septic systems.

(i) Malfunction: A septic system shall be deemed to be a malfunctioning system if sewage is allowed to discharge or flow from it into any storm drain, stream, water body, gutter, street, roadway or public place, or

if sewage discharges from said system to the surface or sub-surface of any property so as to create a nuisance or condition detrimental to health as determined by the Director or as designated by the Public Health Code.

Section 6 Water Usage

The Authority is authorized to obtain from any water company providing water service to users of the Town, all necessary records to determine the consumption of water by customers of such companies. The Authority may enter into such contracts and agreements, as it deems necessary and appropriate, with such water companies for the purpose of obtaining access to the above-mentioned records.

Section 7 Registration of Septic Cleaners

Any person, firm, corporation or partnership engaged in the business of cleaning, pumping or disposing of septage in the Town of Essex shall be licensed by the appropriate regulating agency of the State of Connecticut.

Section 8 Cleaning, Inspection and Disposal Requirements

(a) All residential users, except for those within Multiple Dwelling Projects of ten or more dwelling units, shall have their septic systems cleaned and inspected at least once every five (5) years. The septage may be dumped at the Essex Septage Lagoon during normal operating hours upon purchase of a Disposal Permit, or at an out-of-town facility in conformance with the policies, regulations and ordinances of the Town of Essex, the out-of-town facility and the State of Connecticut.

(b) Special users shall have their septic systems cleaned and inspected at least once every five (5) years, unless otherwise designated by the Authority. The septage may be dumped at the Essex Septage Lagoon during normal operating hours upon purchase of a Disposal Permit, or at any-out-of-town facility in conformance with the policies, regulations and ordinances of the Town of Essex, the out-of-town facility and the State of Connecticut.

(c) Residential users occupying Multiple Dwelling Projects of ten or more family dwelling units shall use a pumpout schedule approved by the Director. The septage may be dumped at the Essex Septage Lagoon only in as scheduled by the Director and upon purchase of a Disposal Permit, or at any-out-of-town facility in conformance with the policies, regulations and ordinances of the Town of Essex, the out-of-town facility, and the State of Connecticut.

(d) Commercial, industrial and other users shall have their septic systems cleaned and inspected at least once every five (5) years, unless otherwise designated by the Authority or the Director. These users may not use the Essex Septage Lagoon, and their septage shall be dumped at any out-of-town facility in conformance with the policies and regulations of the facility and the State of Connecticut.

(e) For all septage generated in the Town of Essex, a record of the cleaning and inspection shall be completed by the septic cleaner and forwarded to the Director on a form or forms provided for that purpose by the Authority. Such record shall include the size and origin of the load, the date of pumping, and such other data as required by the Authority.

(f) A septic cleaner attempting to discharge septage which was pumped or generated in a town other than Essex (even if it is only part of a load) into the Essex Septage Lagoon shall be ordered to remove the vehicle from the site immediately by an agent of the Town or Authority.

(g) The Authority may set appropriate fees for Disposal Permits and policies for use of the Essex Septage Facility, and may modify these fees policies as required from time to time. The fee schedule and policies shall be made publicly available by the Authority or its designated agent.

ction 9 Permits to Discharge

(a) Permits to Discharge shall be issued or renewed by the Director to owners whose septic systems meet the conditions listed below. Permits to Discharge will permit the owner to discharge a specified number of gallons per day (peak or average) to the septic system described on the permit.

(b) Permits to Discharge shall be valid, unless revoked or suspended, for a period of five years, or as specified by the Director.

(c) A Permit to Discharge shall be issued or renewed by the Director:

1. Upon the final inspection of a newly constructed septic system which is deemed by the Director to meet at that time all the requirements of this ordinance, or
2. Upon repair and final inspection of a malfunctioning septic system which is deemed by the Director to meet at that time all the requirements of this ordinance, or
3. Upon cleaning and inspection of an existing septic system, provided that no malfunction is detected during the inspection and the appropriate inspection report is submitted to the Director.

(d) A Permit to Discharge may be revoked or suspended due to a malfunction disclosed by an inspection by the Director or another party. If a malfunction has been identified, a Permit to Discharge shall not be renewed until the Director determines that any and all malfunctions have been corrected in accordance with the applicable sections of this ordinance

(e) The Director shall have the authority to extend the expiration date of a Permit to Discharge if the property owner provides proof of (1) recent septic system inspection or (2) limited use of the system sufficient to warrant such extension.

Section 10 Non Compliance with Septic System Cleaning and Inspection Requirements

It is the intent of the Authority and the Director to implement enforcement of this ordinance and any other regulations it may adopt through education and cooperation with residents, commercial establishments and other owners. Enforcement of this ordinance is provided for as follows:

(a) The Director shall be empowered to order any owner to have his septic system cleaned and inspected if (1) such system has not been cleaned and inspected within the past five years, or as previously designated by the Director or his agent, or (2) there is cause to believe there exists a malfunction of the system. Such order shall be sent by certified mail to the last known address of the owner.

(b) In the case of an order issued pursuant to subsection (a)(1) of this section, upon the failure, neglect, or refusal of any owner to have his system cleaned and inspected within the time period specified in the order, or if the order is returned to the sender as undeliverable, the Director shall be empowered to bring a civil action in Superior Court to compel compliance with the order.

(c) In the case of an order issued pursuant to subsection (a)(2) of this section, upon the failure, neglect, or refusal of any owner to have his system cleaned and inspected within the time period specified in the order, or if the order is returned to the sender as undeliverable, the Director is hereby authorized and empowered to effect the cleaning and inspection of the system, at the owner's expense, by employing the services of any licensed person, firm, corporation or partnership engaged in the business of cleaning, pumping or disposing of septage. The Director is authorized to pay the costs of such cleaning and inspection and, if such costs are incurred, shall demand reimbursement for such costs from the owner. Such demand will be sent by certified mail. In the event that the owner fails, neglects or refuses to reimburse the director for said costs within thirty days of demand, or if the demand is returned as undeliverable, the director is empowered to bring a civil action in Superior Court to collect such costs from the owner. The Director is further empowered to bring a civil action in Superior Court to compel compliance with any order issued pursuant to subsection (a)(2) of this section.

(d) In the event of the failure, neglect or refusal of a owner to comply with an order issued by the Director pursuant to subsections (a)(1) and (2) of this section, the director shall have the authority to impose and collect fines in accordance with the Connecticut General Statutes and Regulations of State Agencies. For purposes of calculating any such fine, each day following the expiration of the time period specified in the Director's order shall be deemed a separate violation of said order and of this ordinance until the day upon which the owner takes the action required in such order. The Director may collect all fines incurred under this section by making demand upon owners. Such demand will be sent by certified mail and shall state the amount of the fine and the reason therefor. In the event that the owner fails, neglects or refuses pay such fine within thirty days of demand, or if the demand is returned as undeliverable, the director is empowered to bring a civil action in Superior Court to collect such fine from the owner.

(e) In the event that an owner fails, neglects or refuses to comply with any order issued by the Director pursuant to this section, the owner's Permit to Discharge shall be revoked, and the building department shall be informed of such revocation.

Section 11 Inspections by the Director

The Director shall develop and maintain and amend as required a plan to inspect the septic systems of all or most of the owners within the Town of Essex within five years of the effective date of this ordinance and at least once every five years thereafter. The Director shall have the right to inspect the septic system and/or to observe the septic system cleaning at his discretion. The Director shall have the right to perform such tests as he deems appropriate to determine whether or not said septic system is malfunctioning.

Section 12 Replacement of Other Ordinances and Special Acts

This ordinance replaces, and makes null and void the following ordinances and special acts of the Town of Essex, Connecticut - SANITARY CODE (as adopted March 23, 1960); AN ORDINANCE GOVERNING INDIVIDUAL SEWAGE DISPOSAL SYSTEMS AND GROUND WATER SUPPLY SYSTEMS (as adopted September 18th, 1967); 1969 SUPPLEMENT TO ORDINANCES AND SPECIAL ACTS (dated February 21, 1968).

Attachments for presentation at the Public Meeting for passage of this Ordinance
(not part of the ordinance)

1. State Public Health Code: Sections 19-13-B100, B103, B104

2. Permit to Discharge

3. Disposal Permit

4. Schedule of Fees

5. Town Ordinances that are being replaced

6. Schedule of Fines for Non-Compliance With Orders:
   Non-compliance with Section 10 (a)(1) $25/day
   Non-compliance with Section 10 (a)(2) $250/day

APPENDIX S.2

APPLICATION TO CONSTRUCT A NEW SEPTIC SYSTEM

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

APPLICATION TO CONSTRUCT A NEW SEPTIC SYSTEM

FEE SCHEDULE: RESIDENTIAL $75.00 COMMERCIAL/INDUSTRIAL $150.00

LOCATION: _____ **MAP:** _____ **LOT:** _____
NUMBER STREET TOWN

SUBDIVISION NAME: _____ **LOT:** _____

OWNER NAME: _____ **PHONE:** _____
ADDRESS: _____

INSTALLER NAME: _____
ADDRESS: _____
PHONE NO. _____
LICENSE NO.: _____

ENGINEER NAME: _____
ADDRESS: _____
PHONE NO. _____
LICENSE NO.: _____

ALL NEW SUBSURFACE SEWAGE DISPOSAL SYSTEMS IN THE TOWN OF ESSEX WILL REQUIRE ENGINEERED DESIGN UNLESS SPECIAL EXCEPTION IS GRANTED IN WRITING BY THE ESSEX HEALTH DEPARTMENT. ALL APPLICATIONS MUST BE ACCOMPANIED BY 1 INCH TO 20 FOOT SCALE PROPOSAL DRAWING.

SYSTEM INFORMATION

	RESIDENTIAL
	COMMERCIAL
	SOIL TESTING COMPLETED
	CT DEP APPROVAL
	CT HEALTH DEPT. APPROVAL

NO. OF BEDROOMS	
DESIGN FLOW IN GAL./DAY	
TANK SIZE	
LEACHING SIZE IN SQ. FT.	
LEACHING TYPE	

SPECIAL CONDITIONS:
_____ SELECT FILL _____ FOOTING DRAIN _____ CURTAIN DRAIN
ADDITIONAL SPECIAL REQUIREMENTS:

ALL SYSTEMS WILL REQUIRE:
WELL AND SEPTIC FIELD STAKED BY ENGINEER PRIOR TO START OF CONSTRUCTION
RECORD DRAWING BY ENGINEER PRIOR TO PERMIT TO DISCHARGE

PLAN APPROVAL AND PERMIT TO CONSTRUCT

PERMIT NUMBER: _____ **DATE FEE PAID:** _____ **CK. NO.** _____

APPROVAL IS HEREBY GRANTED TO CONSTRUCT A SEPTIC SYSTEM AT THE ABOVE SITE WITH THE SPECIFICATIONS AND CONDITIONS DESCRIBED HEREIN. THERE SHALL BE NO DEVIATION FROM THE SPECIFICATIONS UNLESS AUTHORIZED BY THE SANITARIAN OR HIS AGENT IN WRITING.
DATE ISSUED: _____ THIS PERMIT EXPIRES ONE YEAR FROM DATE OF ISSUE.

Sanitarian Approval: _____
Carol L. Speer, R.S.

Cls 2/97

APPENDIX S.3

PLAN REQUIREMENTS FOR ENGINEERED SEPTIC SYSTEMS

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

To: Engineers, Developers, and Builders

From: Carol L Speer, R.S., Chief Sanitarian

Re: Essex Health Department Requirements for Engineered Septic Systems

Attached please find an outline of the requirements of the Essex Health Department for new construction or repairs to existing systems which this Department has designated as having technical complexities which require design by an engineer.

Due to site conditions encountered on the majority of Essex lots, and the complexity of current Public Health Code requirements, all new subsurface sewage disposal systems will require design by a professional engineer licensed in the State of Connecticut. This department will require engineered designs for new construction even if they are not specified on prior sub-division approvals.

The procedures that should be followed by engineers and property owners with regard to engineered systems are outlined in the enclosed document. Items highlighted are important considerations that may differ from prior requirements of this Department. If you have any questions regarding these procedures, please contact the Essex Health Department at the above number.

CLS
Revised 11/17/97

TOWN OF ESSEX Health Department
P.O. Box 98 Essex, CT 06426 860-767-4343 Fax 860-767-8509

REQUIREMENTS FOR ENGINEERED ON-SITE SEWAGE DISPOSAL SYSTEMS

1. **Prior to plan submission:**
   a. Soil testing - Contact the Essex Sanitarian to schedule soil testing. Prior test results may be accepted at the discretion of the Sanitarian. A minimum of two test holes will be required in the primary area, and one in the reserve area, and a perc test in the area of the primary system. Soil testing applications are available in the Health Department office.
   b. **No grading or other disturbance of the area of the proposed system will be allowed prior to installation. No parking, equipment storage or traffic in the area of the septic system will be allowed before or after installation of the system.**

2. Plans must be prepared by a professional engineer registered in the State of Connecticut, and his original stamp and signature should appear on the plan.

3. **The Engineer must field stake well location, house corners and septic locations prior to commencement of any construction activity.**

4. Plans submitted must include:
   a. Scale of 1 " to 20 ' for residential lots; larger scale only for larger complexes. Legend and north arrow.
   b. Map and lot numbers, street address, subdivision name.
   c. A stable benchmark adjacent to proposed building and leaching area.
   d. Existing and proposed contours in leaching and house area.
   e. Layout and invert elevations of sewer line, tank, pump chambers, distribution and leaching.
   f. Cross sections of leaching area, tanks, pump chambers, leaching structures, curtain drains.
   g. Specifications for materials such as fill, piping, pumps, H-20 loading, etc.
   h. The basis of system design, required leaching by Code, and MLSS calculations if required.
   i. All soil test data, including perc test data, and locations of test holes.
   j. Well location and 75' radius, or location of city water line.
   k. Well, septic and house locations on adjoining lots. If no conflicts, note.

l. Proposed footing drains, curtain drains, drainage easements, as well as existing or proposed storm drains, streams or other watercourses.
m. Existing structures on same lot, ledge outcrops, old bury holes, filled-in foundations, etc.
n. Driveway location., easements and right-of-ways across property.
o. Reserve area - if system design different from primary note on plan.
p. Revisions, with dates.

5. Notes on drawing should include the following:
   a. No deviation from plan will be allowed without approval of Engineer and Essex Sanitarian.
   b. Engineer and Essex Sanitarian will be contacted if soil conditions other than those shown on plan are encountered, and work will be halted pending review of those conditions.
   c. Engineer and Essex Sanitarian will be notified at least 48 hours prior to beginning of construction. No portion of system will be covered without inspection and approval by Engineer and Essex Sanitarian.

6. Design must comply with all current requirement of the Connecticut Public Health Code, or include request for variance from code requirement (repairs only).

7. **An as-built drawing of the completed system, with ties and elevations of system components will be completed by the Engineer, and submitted prior to application for a Permit to Discharge or Certificate of Occupancy.**

8. The Health Department reserves the right to require the supervision of the Engineer at the job site if necessary to ensure conformance to the approved system plan.

9. Applications requiring approval of the Connecticut Department of Environmental Protection or the Connecticut State Department of Health should be submitted with appropriate documentation and fees.

C. Speer 1/22/97 revised

APPENDIX S.4

APPLICATION FOR SOIL TESTING

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

APPLICATION FOR SOIL TESTING - LOTS/SUBDIVISIONS

FEE SCHEDULE: EXISTING LOT $20.00/LOT NEW SUBDIVISION $40.00/LOT

LOCATION: _____ MAP: _____ LOT: _____

STREET LOCATION (IF ASSIGNED): _____
NUMBER STREET TOWN

EXISTING LOT: _____ YES
_____ NO

NO. OF LOTS TO BE CREATED _____

OWNER NAME: _____ PHONE: _____

ADDRESS: _____

SURVEYOR NAME: _____ ENGINEER NAME: _____

ADDRESS: _____ ADDRESS: _____

LICENSE NO.: _____ LICENSE NO.: _____

SYSTEM INFORMATION

	RESIDENTIAL		ENGINEERED SYSTEM
	COMMERCIAL		CT DEP APPROVAL
	INDUSTRIAL		CT HEALTH DEPT. APPROVAL

PLEASE SUBMIT THE COMPLETED APPLICATION TO THE ESSEX HEALTH DEPARTMENT WITH FEE PAYMENT AND A SITE MAP SHOWING EXISTING OR PROPOSED LOT LINES.

IF THERE IS AN EXISTING DWELLING ON THE PROPERTY, SHOW WELL AND SEPTIC LOCATIONS.

APPLICANT SIGNATURE: _____
NAME DATE

OFFICE USE: FEE PAID: DATE _____ CHECK NO. _____

DATE OF TESTING: _____

cls
5/96

APPENDIX S.5

APPLICATION FOR PLAN REVIEW

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

APPLICATION FOR PLAN REVIEW

FEE: $20.00 (Checks to Town of Essex) DATE FEE PAID: _____ CK. NO._____

ALL REQUESTS FOR ADDITIONS, MAJOR RENOVATIONS, WINTERIZATION, USE CHANGES, SWIMMING POOLS, HOT TUBS, GARAGES OR SHEDS ON PERMANENT FOUNDATIONS, REQUIRE APPROVAL ON THIS FORM FROM THE HEALTH DEPARTMENT PRIOR TO ISSUANCE OF A BUILDING PERMIT.

STREET LOCATION _____ MAP: _____ LOT:_____
NUMBER STREET TOWN

OWNER: _____ PHONE: _____

ADDRESS: _____

APPLICANT: _____ PHONE: _____
ADDRESS: _____

I hereby request Health Department approval of a plan to:

- ☐ Build an addition or renovate an existing building. This addition or renovation will:
  - ☐ Increase the lot coverage by _____ square feet.
  - ☐ Increase the number of bedrooms from _____ to _____.
  - ☐ Increase number of employees from _____ to _____.
- ☐ Winterize a seasonal building.
- ☐ Change the use of an existing building so as to increase the potential water use (increase in number of employees, number of seats in restaurant, change to food service, laundry, beauty salon operation).
- ☐ Construct a garage, deck, porch or accessory building with foundation.
- ☐ Construct an in-ground pool, above-ground pool or hot tub.

Submit a brief description of the proposed modification, including a sketch which shows property limits, existing and proposed buildings, and locations of existing septic system and well or public water line. If you have as-built drawings of the septic system or prior soil testing information, please submit them with this application.

HEALTH DEPARTMENT REVIEW /APPROVAL

☐ Plan is approved with no modification of existing septic system.

☐ Plan approval is contingent upon further soil testing results; please contact Health Department.

☐ Plan approval is contingent upon completion of the following modifications to the septic system:

☐ This plan is not approved by the Essex Health Department for the following reason(s):

Department Signature: _____
Carol L. Speer, R.S., Sanitarian Date

APPENDIX S.6

ESSEX PLANNING COMMISSION SUBDIVISION REGULATIONS

Planning Commission Subdivision Regulations

Essex
Ivoryton
Centerbrook

1995 Revision

Effective: September 1, 1995

Town of Essex, Connecticut

located within 200 feet of the nearest existing public water supply service line.

Where such service is available, each lot shall be served by and provided with a curb connection to a central water supply system. Such system and connection shall meet all the technical and administrative requirements of the Director of Health of the Town of Essex, the State of Connecticut, and the utility company providing the service. The Commission may approve individual private wells if it determines that a central water system is not available or cannot reasonably be provided or extended by the applicant to serve the lot.

a. If a public water supply is to be used for the subdivision, the applicant shall submit written evidence of agreement by the water company to provide a safe and adequate public water supply.

b. If private water supply wells for individual lots are proposed, the applicant shall submit a written statement from the Director of Health, Town of Essex, or his designated agent, stating that a well can be located in compliance with the separation requirements of the Connecticut Public Health Code, latest revision, or the Ordinances and Special Acts of the Town of Essex, whichever is more restrictive.

c. For any subdivision containing 25 or more lots in which private water supply wells are proposed, the Commission may require a water study, prepared by a certified hydrogeologist, addressing the adequacy of ground water supplies and the effect of the proposed subdivision on surrounding wells.

5.6.2 Sewage Disposal: A private subsurface sewage disposal system shall be provided for each lot in accordance with the Connecticut Public Health Code, latest revision, or the Ordinances and Special Acts of the Town of Essex, whichever is more restrictive.

b. For all lots, soils tests shall be required in accordance with Section 6.3.1 of these Regulations. Written evidence must be submitted that the subsurface sewage disposal system proposal is acceptable to the Essex Director of Health or his authorized agent.

c. For lots in Flood Hazard Areas, the applicant shall submit a report by a professional engineer, currently licensed in the State of Connecticut, giving assurances that each lot is capable of accommodating on on-site sewage disposal system in a manner that avoids impairment of the system and contamination from the

system as a result of flooding.

5.7 STORM DRAINAGE

Storm drainage shall be designed and constructed to be capable of accommodating additional runoff which can reasonably be expected to result from future development of the upstream drainage area. Due consideration shall be given to minimizing the disruption of existing drainage patterns.

The design engineer shall evaluate and comment on the consequences of failure of the proposed drainage design. Where the proposed development is likely to cause an increase in the volume or rate of stormwater runoff so as to overload the existing drainage system, causing flooding and damage downstream, measures shall be taken by the developer to prevent or alleviate such harmful effects. Such measures may include runoff retardance by vegetative plantings, stormwater detention or retention basins, replacement of existing inadequate downstream drainage structures and facilities, erosion protection, and other measures deemed effective by the Commission or its engineer.

5.7.1 Discharge: All storm water from the subdivision shall be discharged only to suitable streams or rivers, or into town or state drains, ditches, or other Town or State drainage facilities with adequate capacity to carry the additional water. Where the discharge is onto private property adjoining the subdivision, proper easement and discharge rights shall be secured by the applicant prior to approval of the subdivision plan. Discharge shall be designed with particular regard to discharge points and velocities, and in a manner that protects streams and wetlands from pollution and flooding due to increase in runoff. Where the developer is unable to obtain the required easements, the subdivision shall be designed to detain any increase in rate of runoff due to development on the site.

If in its judgement there will be no substantial danger from soil erosion to the public health and safety, the Commission may approve, on lots of one acre or larger, the discharge of storm water in open ditches, swales, or detention basins, except that such structure shall not be located in that portion of the lot customarily used for front and side yards, or which might be used for on-site sewage disposal or water supply systems.

5.7.2 Diversion Prohibited: In general, stormwater runoff shall not be diverted from one watershed or watercourse to another.

g. easements at least 10 feet in width for pedestrian ways to parks, playgrounds, schools and other public or semi-public places where the street system does not conform to a convenient pattern of pedestrian circulation; and

h. for shared driveways in accordance with Section 6.9.

6.3 SEWAGE DISPOSAL REQUIREMENTS

Suitable sewage disposal shall be provided in accordance with Section 5.6.2. No proposed lot shall be approved unless a written report endorsed by the Director of Health, Town of Essex, or his/her designated agent, is submitted to the Commission, concurring with the adequacy of plans for sewage disposal facilities.

6.3.1 Soil tests required: If private subsurface sewage disposal systems on individual lots are proposed, percolation tests and deep observation pits shall be required on each lot, in the vicinity of the primary and reserve leaching areas, at the subdivider's expense. These tests shall be conducted to conform with requirements of the Connecticut Public Health Code or the Ordinances and Special Acts of the Town of Essex, whichever are more restrictive. The Director of Health or his designated agent may prescribe the location and depth of tests, number of tests, specifications for testing, season of year necessary for valid testing, and stage of site preparation suitable for relevant testing. All soil tests shall be witnessed by the Director of Health or his designated agent, whose findings and recommendations shall be submitted to the Commission. All proposed lots shall provide for a reserve leaching area in accordance with the Connecticut Public Health Code or the Ordinances and Special Acts of the Town of Essex, whichever are more restrictive.

6.3.2 Site capacity for individual lots and site capacity for multiple lots: Using the Minimum Leaching System Spread (MLSS) criteria in the Connecticut Public Health Code or the Ordinances and Special Acts of the Town of Essex, whichever are more restrictive, the applicant shall demonstrate to the satisfaction of the Commission's reviewing engineer that each proposed lot can accommodate a subsurface sewage disposal system for a single family residence having four bedrooms. The applicant may be required to demonstrate that the cumulative effect of all the sanitary systems to be built in the subdivision will not degrade the groundwater quality at the boundaries of the subdivision, the total sewer shed area, or at areas of concern, ie. wetlands, ledge outcroppings and the like. The analysis of the cummulative effect shall include, but

not be limited to nitrogen rennovation, bacteria rennovation, and hydraulic capacity.

6.3.2 Larger Lots: When the results of deep test pits and percolation tests indicate a need for larger lots, final approval of the subdivision plan shall not be granted until such larger lots as required are shown on the maps.

6.3.3 Test Results on Plan: Location, test dates and results of deep test pits and percolation tests shall be shown on Detailed Layout Maps.

6.3.4 Compliance With Code: All subsurface sewage disposal systems shall be designed and constructed in accordance with the Connecticut Department of Public Health and Addiction Services, Public Health Code Regulations, Section 19-13 B100, B103, and B104, Ordinances and Special Acts of the Town of Essex, and any applicable regulations and standards of the Connecticut Department of Environmental Protection, whichever are more restrictive.

6.3.5 Septic Systems in Flood Hazard Areas: For lots in Flood Hazard areas, the applicant shall submit a report by a professional engineer, currently licensed in the State of Connecticut, giving assurances that each lot is capable of accommodating an on-site sewage disposal system in a manner that avoids impairment of the system and contamination from the system during flooding.

6.4 WATER SUPPLY

A suitable water supply shall be provided in accordance with Section 5.6.1. A written report, prepared by the applicant and endorsed by the Director of Health, Town of Essex, or his designated agent, shall be submitted to the Commission concurring with the adequacy of plans for a permanent means of water supply.

6.5 STREET CONSTRUCTION

6.5.1 Construction Survey Procedure: The center line of the traveled portion of the road shall be run in the field by a land surveyor, currently licensed in the State of Connecticut, and suitable construction ties established at all control points. These ties shall be protected during construction so that the center line may be re-established at any time.

a. **Stations:** Stations shall be established every fifty feet and at all radius points. The beginning of this line shall be designated as Station 0+0. A construction

APPENDIX S.7

SAMPLE PERMIT TO DISCHARGE

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

PERMIT TO DISCHARGE

ISSUE DATE: **EXPIRATION DATE:**

APPROVAL IS HEREBY GIVEN TO DISCHARGE A SUBSURFACE SEWAGE DISPOSAL SYSTEM LOCATED IN THE TOWN OF ESSEX, CONNECTICUT, WHICH WILL RECEIVE TREATED DOMESTIC SEWAGE FROM THE PROPERTY DESCRIBED BELOW:

LOCATION: _____ **MAP:** _____ **LOT:** _____
NUMBER STREET TOWN

OWNER NAME: _____ **PHONE:** _____
ADDRESS: _____

SYSTEM INFORMATION

	NEW PERMIT
	RENEWAL

	NO. OF BEDROOMS - RESIDENTIAL
	DESIGN FLOW GPD - COMMERCIAL

NEW CONSTRUCTION ☐ **REPAIR** ☐
PERMIT NO.: **FINAL INSPECTION DATE:** **BY:**

PERMIT RENEWAL
WALKOVER DATE: **BY:**
PUMPOUT DATE: **BY:** **GALLONS PUMPED:**
SANITARIAN WAIVER DATE: **REASON:**

GENERAL PERMIT CONDITIONS:

1. **THE SEPTIC TANK SHALL BE CLEANED AND INSPECTED NOT LESS FREQUENTLY THAN EVERY FIVE YEARS.**
2. **FOR RESIDENTIAL SYSTEMS, THE AVERAGE LIQUID DISCHARGE VOLUME SHALL NOT EXCEED 100 GALLONS PER BEDROOM PER DAY.**

SPECIAL REQUIREMENTS, RESTRICTIONS OR EXCEPTIONS:

THIS PERMIT TO DISCHARGE SHALL NOT BE CONSTRUED TO PERMIT ANY SEWAGE OVERFLOW, NUISANCE, OR SIMILAR CONDITION OR THE MAINTENANCE THEREOF. IF SUCH A CONDITION IS FOUND TO EXIST, THE PERMIT TO DISCHARGE MAY BE REVOKED, SUSPENDED, MODIFIED OR OTHERWISE LIMITED AND ANY SUCH CONDITION IS SUBJECT TO AN ORDER TO ABATE THE CONDITION PURSUANT TO CONNECTICUT GENERAL STATUTES SECTION 19-79 AND ANY RELEVANT ORDINANCES OF THE TOWN OF ESSEX.

Sanitarian Approval: _____
Carol L. Speer, R.S.

APPENDIX S.8

SEPTAGE TREATMENT AND DISPOSAL POLICY

TOWN OF ESSEX
Water Pollution Control Authority
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426

TOWN OF ESSEX
SEPTAGE TREATMENT
AND DISPOSAL POLICY

TOWN OF ESSEX
WATER POLLUTION CONTROL AUTHORITY
ESSEX, CONNECTICUT

1. The WATER POLLUTION CONTROL AUTHORITY (WPCA) for the Town of Essex, Connecticut is the Town's designated water pollution control authority, as provided in Section 7-245 et, seq., of the Connecticut General Statutes, as amended and has the powers and responsibilities conferred by said statutes and Town ordinances. The WPCA is responsible for regulating septage treatment and disposal in the Town of Essex, in accordance with federal, state and local regulations.

2. DEFINITIONS:

a. Commercial User: A commercial user shall be as defined in the current Town of Essex Zoning Regulations including healthcare, daycare, retail, restaurants, medical and residential life care facilities.

b. Industrial User: An industrial user shall be as defined in the current Town of Essex Zoning Regulations.

c. Residential User: A residential user shall be defined as single and multi-family residences, public schools, municipal offices and buildings, non-profit organizations (such as churches and museums).

d. Other Users: All users not defined above.

3. SEPTAGE DISPOSAL POLICY

a. Commercial users shall be required to provide transportation, treatment and disposal of septage waste at an out-of-town facility in conformance with policies, regulations and ordinances of the Town of Essex and the State of Connecticut.

b. Industrial users shall be the same as commercial users.

c. Residential users shall be allowed to use the Essex Septage Lagoon Site for transportation, treatment and disposal of on-site generated septage waste.

d. Septage disposal for those users identified as "Other Users" in Item 2.d. above will be reviewed and acted upon by the WPCA on an individual basis as requested.

4. ESSEX SEPTAGE LAGOON SITE DISPOSAL SCHEDULES

a. Single family residences shall be allowed use of the Essex Septage Lagoon Site during all normal hours of operation. Normal hours of operation shall be as scheduled by the WPCA.

TOWN OF ESSEX

Water Pollution Control Authority
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426

b. Multi-family residential developments with ten(10) family dwelling units or less are allowed use of Essex Septage Lagoon Site as per 4.a. Single family residence.

c. Multi-family residential developments with more than ten(10) family dwelling units and that will be using the Essex Septage Lagoon Site for septage treatment and disposal shall be required to set up an annual disposal schedule with the Town Sanitary or Chairman, WPCA. Unscheduled use of the Essex Septage Lagoon Site outside the approved dumping schedule will not be allowed unless it is an emergency authorized by the Town Sanitarian or Director of Health.

d. Dumping schedules for those users identified as "Other Users" in 2.d. above will be reviewed and acted upon by the WPCA on an individual basis.

5. FEE SCHEDULES:

a. Users of the Essex Septage Lagoon Site are required to purchase one (1) disposal permit prior to septic system pumping for each individual septic system site up to a maximum of 1500 gallons or portion thereof to be discharged at the Essex Septage Lagoon Site. The disposal permit is entitled ESSEX WATER POLLUTION CONTROL AUTHORITY PERMIT TO DISPOSE OF SEPTIC TANK PUMPING.

b. Each disposal permit shall be properly completed and all information requested shall be supplied at the time of septic system pumping.

c. The required number of properly completed disposal permits shall signed by the Essex Septage Lagoon Site attendant prior to use of the Essex Septage Lagoon Site. No discharge at the Essex Septage Lagoon Site will be allowed without proper disposal permits. The attendant has the right to verify disposal permit information prior to allowing discharge at the Essex Septage Lagoon Site.

d. The fee schedule for treatment and disposal of septage waste at the Essex Septage Lagoon Site is currently $ 25/disposal permit. The WPCA reserves the right to periodically modify this fee.

e. A sample disposal permit is attached for reference.

This POLICY has been adopted by the Water Pollution Control Authority, Town of Essex. Connecticut on December 9, 1996.

Alvin G. Wolfgram, Chairman
Water Pollution Control Authority
Town of Essex, Connecticut

RECEIVED FOR RECORD
12-12 19 96 at 9:20 AM
[illegible]
ESSEX. CT. TOWN CLERK

APPENDIX S.9

SEPTAGE DISPOSAL PERMIT

Disposal Permit No. **Office Use: Map ____ Lot ____**

ESSEX WATER POLLUTION CONTROL AUTHORITY
PERMIT TO DISPOSE OF SEPTIC TANK PUMPAGE

ONE PERMIT MUST BE PREPAID AND COMPLETED FOR EACH ADDRESS PUMPED
A MAXIMUM OF 1500 GALLONS MAY BE PUMPED PER PERMIT
LARGER TANKS REQUIRE ONE PREPAID DISPOSAL PERMIT FOR EACH 1500 GALLONS

RECEIVED FOR RECORD
12-12 1996 at 9:20
Geri D Saunders
ESSEX, CT TOWN CLERK

PUMPOUT INFORMATION

Date: _____ Company Name: _____
Truck Marker No.: _____ Tank Capacity: _____ Vehicle Condition: _____
Service Type: Routine_____ Repair _____ Suspected Problem _____ Buyer Insp. _____

Address Pumped: _____ Amount Pumped: _____
Owner/Resident: _____ Phone: _____

Property Type: Residential Single Family____ Residential Multi-Family ____ No. of Units ____
Commercial ____ Industrial ____ Other _____

INSPECTION REPORT

Septic Tank
Size:_____ Gal.
No. Compartments: _____
Cesspool Only _____
Baffles: Inlet Condition: _____
Replaced/Repaired
Outlet Condition: _____
Replaced/Repaired
Depth of Scum: _____ Inches
Depth of Sludge: _____ Inches

Pump Chamber _____ Yes _____ No
If Yes, Pumped? _____
Pump Condition: _____

Leaching
Effluent Runback: _____ Yes _____ No
Effluent Surfacing: _____ Yes _____ No
Pumped Drywell: _____ Yes _____ No

Diagram of System
Tank Top _____ Inches Below Grade

Form must be completed by pumper and signed by Lagoon Attendant prior to dumping.

Driver: _____ Attendant: _____

APPENDIX S.10

SAMPLE DEEP RIVER SEPTAGE REPORT

J.T

DEEP RIVER WATER POLLUTION CONTROL FACILITY No. 5440

99 Winter Avenue, Deep River, CT 06417 • 526-3450

Name of Hauler: Olsen

Address:

Phone Number:

ORIGIN OF LOAD:

Name: Tower Lab

Address: SX Ind Park

Town: Essex

Phone #:

Date & Time Pumped: 2-11-97

Waste Volume: 1500

Grey Water ☐ Grease ☐ Septic ☑

Signature of Hauler: MO

Received by Deep River WPCF

Operator: _____ Date: _____ Time: _____

Sample Bottle #: _____

NOTE: If the above named address has had septage removed to Deep River W.P.C.F. within the last 365 days, a charge will occur to the trucking firm. **Septic Tanks Only.**

When the Haulers agent signs this permit they certify that the contents of the load is only domestic sewage, with no hazardous or toxic chemicals or elements. Furthermore, the said hauler hereby agrees to accept financial responsibility for any damage caused to the water pollution control facility and parts thereof or effluent arising from the haulers negligence, or any hazardous or toxic chemicals contained in the wastes off loaded by hauler.

WHITE - WPCF YELLOW - TOWN PINK - HAULER

APPENDIX S.11

WALKOVER INSPECTION REPORT

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

WALKOVER INSPECTION REPORT

DATE: _____ TIME: _____ INSPECTOR: _____

LOCATION: _____
NUMBER STREET TOWN

MAP: _____ LOT: _____ LOT SIZE (acres): _____ ZONE: _____ BUILT: _____

OWNER NAME: _____ PHONE: _____

OWNER ADDRESS, IF DIFFERENT: _____

PROPERTY DESCRIPTION

☐ RESIDENTIAL: NO. FAMILIES: _____ NO. BEDROOMS: _____
☐ COMMERCIAL/INDUSTRIAL: DESIGN SIZE (gpd) : _____ NO. EMPLOYEES: _____
☐ PUBLIC WATER SUPPLY ☐ PRIVATE WELL: TYPE: _____ LAST DATE TESTED _____
☐ WETLANDS

SEWAGE DISPOSAL SYSTEM

DISCHARGE PERMIT DATE: _____ ☐ ONE SYSTEM ☐ MULTIPLE SYSTEMS (NO.: _____)

SEPTIC TANK(S):

DATE INSTALLED: _____ CAPACITY: _____ MATERIAL: _____
LAST PUMPOUT/INSPECTION: DATE: _____ INSPECTOR: _____

TANK CONDITION:
☐ SATISFACTORY
☐ UNSATISFACTORY - PROBLEM: _____

LEACHING SYSTEM(S):

TYPE: _____ SIZE: _____ CAPACITY: _____ ORIG. INSTALLED: _____ BY: _____
REPAIR DATE(S): _____ BY: _____ REASON: _____

LEACHING SYSTEM CONDITION:
☐ SATISFACTORY - NO REPORTED PROBLEMS OR EVIDENCE OF POLLUTION
☐ UNSATISFACTORY:
☐ INSUFFICIENT SYSTEM CAPACITY, BUT NO OBVIOUS FAILURE
☐ BACKUP TO HOUSE PLUMBING ☐ EVIDENCE OF SURFACE BREAKOUT
☐ RUNBACK TO TANK ☐ EVIDENCE OF SURFACE/GROUNDWATER CONTAMINATION

USE THE REVERSE SIDE OF THIS FORM TO SKETCH THE PROPERTY, INCLUDING WELLS, WATER LINES, SEPTIC TANK, LEACHING AREA AND ALL STRUCTURES ON THE LOT. INCLUDE ANY ADJACENT BODIES OF WATER, CATCH BASINS OR DRAINAGE SYSTEMS.

ADDITIONAL NOTE: _____

☐ OWNER NOT PRESENT; LEFT LITERATURE

APPENDIX S.12

PUBLIC EDUCATION LETTERS AND DPH INFORMATION

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

Dear Homeowner:

Our records indicate that you have recently built or purchased a home in Essex, Ivoryton or Centerbrook. The Essex Health Department would like to welcome you to the area and remind you that all homes in our town are served by on-site sub-surface sewage disposal systems. Although some main roads are served by a public water supply, most residents also have individual water wells on their property.

Essex has no sewers and actively pursues a Sewer Avoidance Policy. Therefore the proper operation and maintenance of both your septic system and your well is important to you and to your town.

Please read the enclosed brochure describing the basic design and operation of a simple septic system. **Septic tanks should be pumped every three to five years to safeguard your leaching system and the area groundwater**. In addition, the outlet baffle should be inspected when the tank is pumped - it works to protect your drainage system. If solids are allowed to clog the leaching area, expensive repairs to the system may be necessary.

Well water is tested at the time of installation, but no further follow-up is done by the Health Department. **We recommend you test your well water periodically, especially if you notice a change in its quality**. At a minimum, we suggest you retest the water quality every three to five years. Bottles for this purpose may be obtained at Town Hall or from area laboratories.

Best wishes in your new residence. If you have further questions, please call the Essex Health Department at 767-4343.

Sincerely,

Carol L. Speer

Carol L. Speer, R.S.
Sanitarian

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

Dear Homeowner:

Our records show you have recently made a repair to your subsurface sewage disposal system. Your contractor has completed the proper permit forms, the repair has been inspected by a representative of the Essex Health Department, and an as-built drawing of the repaired system is on file in this department.

The most important part of maintaining your newly-repaired system is now up to you! Septic tanks should be pumped every three to five years to safeguard your leaching system and the area groundwater. Solids which accumulate in the bottom of the tank can be released to clog the leaching areas if they are not pumped from the tank regularly. In addition, the outlet baffle should be inspected when the tank is pumped - it also works to protect your drainage system from future failure.

Enclosed with this letter you will find (1) a copy of the repair permit filed by your contractor, (2) a copy of his as-built drawing of the system, and (3) a brochure to help you understand the operation and maintenance of your newly-repaired system.

If you have further questions, please call the Essex Health Department at the above number.

Sincerely,

Carol L. Speer, R.S.
Sanitarian

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

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Enclosed with this letter you will find (1) a copy of the repair permit filed by your contractor, (2) a copy of his as-built drawing of the system, and (3) a brochure to help you understand the operation and maintenance of your newly-repaired system.

If you have further questions, please call the Essex Health Department at the above number.

Sincerely,

Carol L. Speer, R.S.
Sanitarian

STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

BUYING GUIDE

What You Should Know Before Buying

A Home Served by a Septic System

April 7, 1997

I. PURPOSE

Frequently prospective buyers of a single family home have many questions regarding the septic system serving the dwelling: What does the existing septic system consist of? Is it working properly? How long will it last? If it fails, how much will a replacement system cost?

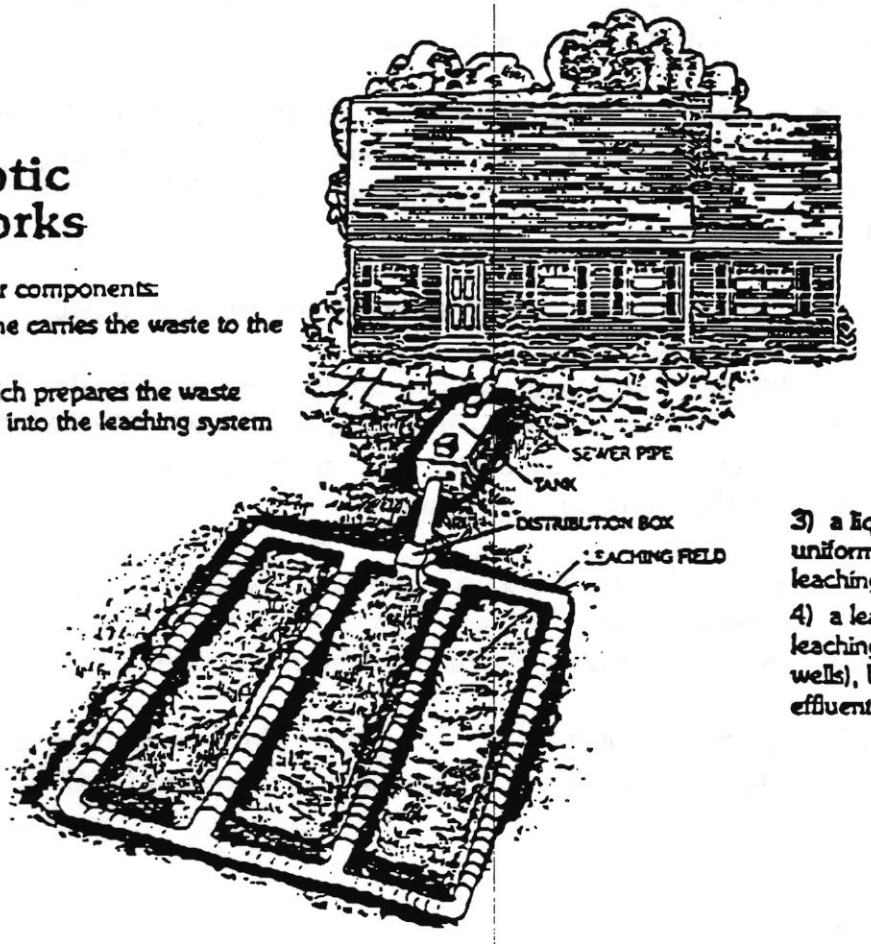
In order to help buyers obtain information which address these concerns, we have put together this Fact Sheet to guide them in making informed decisions regarding the potential problems and costs associated with a property's septic system.

II. OVERVIEW

The purpose of a home's subsurface sewage disposal system (septic system) is to dispose of the waste water generated by the occupants in such a manner that the soils on the property can disperse it without causing an adverse effect on groundwater and in turn on public health and the environment. To accomplish this a system consists of the following elements: (1) A sewer line, which connects the home's plumbing to the septic tank; (2) A septic tank, which allows for the settling of solids and provides the initial treatment of the sewage. This is where waste material is broken down by bacterial action. A properly functioning septic tank will reduce pollutant levels and produce an effluent of fairly uniform quality. This is accomplished by providing inlet and outlet baffles to reduce the velocity of liquid moving through the tank. New tanks (installed since January, 1991) consist of two compartments in order to do an even more effective job of obtaining the above objective; (3) A distribution system which directs the flow of effluent from the septic tank to the drainage system in such a manner to insure full utilization of the system. Most systems are "gravity" systems, meaning the flow runs through piping and distribution boxes without the assistance of any mechanical device, such as a pump or siphon; (4) A drainage (leaching) system, which disperses the sewage effluent into the surrounding natural soils. There are many types of drainage systems. The specific type utilized on a particular property is usually dependent on the soil conditions which exist on the site. Most residential installations utilize stone-filled leaching trenches, but galleries, pits and beds have historically been used.

Phone:
Telephone Device for the Deaf (860) 509-7191
410 Capitol Avenue - MS # _____
P.O. Box 340308 Hartford, CT 06134
An Equal Opportunity Employer

A drawing of a typical subsurface sewage disposal system is provided below:



For a drainage system to function properly it must:

1. Provide enough application area. The application area is the amount of surface area of soil provided by the particular drainage system (sides and bottom area of leaching units) where sewage effluent is applied (referred to as "wetted" area). The amount of application area needed for a given house depends on the characteristics of the soils on the property and the daily flows (in gallons) generated from the house. The anticipated flow from a house is usual predicated on the number of bedrooms in the dwelling.

2. Be surrounded by natural soil conditions which will be able to dissipate and disperse the septic tank effluent discharge without becoming over saturated.

3. Provide enough capacity to store effluent during periods of unusually heavy use or when rainfall or subsurface flooding reduces the ability of the system to disperse the liquid. Note: Curtain drains/groundwater interceptor drains are sometimes installed upgrade of the drainage system to minimize high groundwater conditions.

It is important to realize that, once a system has been installed, only one of the above factors can be controlled by the homeowner. The homeowner can control how much water is actually being discharged to the system. Since each system has a set maximum capacity, it behooves the homeowner not to exceed that amount.

If a system starts to experience difficulties, what are some of the common symptoms?

1. Plumbing fixtures may exhibit difficulty in releasing its contents (slow draining, bubbling, backups, etc.). This condition may be system related but it could also indicate just a clog in the interior piping or sewer line. You should have the interior piping checked before proceeding with an investigation of the sewage disposal system.

2. Large volume discharges (such as, washing machines, dishwashers and bathtubs) cause either a backup, as noted above, or, an overflow of sewage above the septic tank or leaching field. This condition is usually at its worst during and/or directly following a heavy rain event.

3. Foul septic odors in storm drainage piping, catch basins, footing drain piping or curtain drain discharges may indicate that sewage from your or an adjacent property is entering these groundwater systems.

III - SOURCES OF INFORMATION

What can a prospective purchaser of a home do to gather as much information as possible relative to the present condition and possible future expenses associated with the existing septic system? Here are a few suggestions:

1. Obtain Information from the Present Property Owner

   a. Ask for any drawings regarding the actual location (an "as-built" drawing) of the existing septic system. Another source would be the town's health department (see Paragraph 3, below).

b. Ask for the records regarding maintenance of the system; Has the septic tank been pumped at a frequency of at least 3 to 5 years?; What pumping contractor was used?; If the system contains a pump, how often has it been maintained?; If major repairs have been made, when and to what extent?

c. Ask about the past performance of the system. Have any of the symptoms described in Section II manifested during the life of the system?

2. Do a Site Inspection of the Property

a. Once the location of the septic tank and drainage fields are known, walk over the entire area and observe whether there is evidence of a sewage overflow condition. Greener grass in the drainage area may not necessarily indicate a system problem. If, however, the area is completely saturated and odorous you should be very concerned. It most likely indicates an active failure.

b. Try to get a sense of how natural conditions are effecting the capacity of the property to disperse water. Is the sewage disposal area located in a depression which would have a tendency to collect run-off of rain water? Is the lot flat? Is there a watercourse or wetland (swamp) near the drainage system and is the system virtually at the same elevation? Are there steep slopes and/or ledge outcrops which reduce the available area for leaching purposes? All of the above factors could indicate that the existing system will experience difficulty or, that there may not be much additional area suitable for sewage disposal on the lot if needed in the future.

3. Go to Town Health Department to Review Property's File

a. Ask the town sanitarian to review the file with you. Is there enough information in it for him/her to give you an opinion on how the existing system and/or lot meets present health code requirements?

b. Your goal is to confirm and supplement information received from the property owner.

c. Obtain guidelines concerning the proper maintenance of a subsurface sewage disposal system.

d. If you are contemplating an addition to the home or plan on renovating an unfinished basement, discuss the possibilities with the sanitarian and determine the procedures you would have to follow to accomplish your plans. In some cases, it will not be possible to "enlarge" an existing home.

e. Ask about the general neighborhood, the frequency of repairs, ability to install proper size repair systems, average life of systems in the areas, etc.

4. Obtain Additional Information from Outside Sources

a. Presently, many home sales are contingent upon a home inspection. Depending on whether or not the present owner of the property will permit it, opening up and examining key elements of an existing sewage disposal system is the most reliable means to determine the present condition of the system. Examining the inside of the septic tank(s) and distribution boxes may indicate that the system is experiencing difficulties in dispersing the volume of sewage generated by the home. If access to the existing system is not available, home inspectors sometimes use other methods in which to ascertain the status of an existing system. Unfortunately some of the people performing these tests do not have a complete understanding of how a system functions. Therefore, the conclusions reached from these tests can be misleading. For example, testing a system in the summer months may indicate a functioning system, when in fact that same system may be under groundwater in the Spring and unable to function properly.

Three common tests performed during home inspections are as follows:

1) The Dye-Test is used to trace the movement of septic tank effluent into the leaching system. The theory is that if the dye "surfaces" to the ground or appears in a brook or catch basin the system is in trouble. Although this is indeed true, the opposite result does not necessarily mean the system is functioning or will function properly in the future. In order for the dye to appear it must flow through the septic tank and leaching fields prior to arriving at the breakout point. This usually would take a large amount of water and sufficient time to occur, and most home inspections do not last long enough to fulfill this requirement. This type of test would only detect grossly failed systems (ones which have a direct discharge of sewage to the environment).

2) The Probe-Test is a procedure whereby the inspector attempts to locate the "key" elements of the system (septic tank and drainage fields) and determine if they are experiencing overflow conditions (meaning the septic tank and fields are flooded). This test is basically inaccurate since it only takes a single "snapshot" of the condition of the system. It may be a "good" day for the system (very little water was used by the homeowner that day; the house may have been empty for some time; it may be the middle of the summer when soil conditions are at their best) and a judgment is being made with very little long-term information.

3) The Flooding Test (sometimes referred to as a "push test") is actually the process of discharging a substantial quantity of water into the existing septic system to simulate a typical "peak" usage of water by a family. The purpose of the test is to expose those systems which no longer have the capability to disperse "peak" flows and, therefore, may not be adequate to satisfy the needs of the prospective buyers. After a certain amount of water is "flushed" down sinks, tubs and toilets, the inspector examines the leaching area to observe any signs of an "overflow" condition. If an "overflow" is noted, the conclusion reached by the inspector is that the system is not functioning properly. It should be noted, however, that "passing" the test does not necessarily mean that the system is working properly. This type of test is conducted by many inspectors, who feel it would be a disservice to their clients not to obtain information on the present status of an existing system. We, however, have concerns that unless this test is performed in a responsible, site specific manner, it could cause harm to the existing system or lead to erroneous conclusions. If this test is conducted, we suggest the following items be considered before conclusions are reached:

   1. The present occupancy of the home.

   2. The possible water usage of the occupants within the last 24 hours prior to conducting the tests.

   3. Soil conditions in the leaching area, such as, the degree of saturation due to groundwater levels, rain fall events or time of year.

   4. That the application of water to the system (by running water through the plumbing fixtures) be performed in a slow, uniform manner to prevent a "slug" of water from entering the septic tank and disturbing the contents.

   5. That the procedure limit the amount of water utilized for the test based on the information listed above, but should not exceed 50 gallons per bedroom in a fully occupied (two people per bedroom) home.

   To repeat, the above testing is meant to discover obvious malfunctioning septic systems. None of the above tests can lead to a guarantee that the existing sewage disposal system for a home will continue to work properly in the future.

b. Use the Soil Conservation Service County Maps (through the town sanitarian) to try to identify the type of soil most likely present on the site in order to predict the feasibility of future repairs to the existing leaching system.

c. Talk to neighbors about the general performance of septic systems in the area and specifically the system on the property you're interested in. However, this is suggested only for those "comfortable" in approaching this subject with "strangers" and with the realization that the information gathered may not be totally factorial for various reasons (devaluation of their own property; not wanting to "spoil" the sale of a friendly neighbor, etc.).

d. Hire your own consultant, either a professional engineer, who specializes in septic system designs or, a licensed septic system installer, who performs a great deal of work in the particular town. They can give you advise as to the conditions of the soils and septic systems in the area and what might be expected (especially pertaining to costs) if you did have problems with the existing system.

e. Obtain water meter readings (if the home is serviced by a municipal water supply) to determine what the present occupants of the home are utilizing. Then compare those results with what your family is presently using. If your family is using significantly more water than the former occupants you may be asking for trouble if the sewage system is "undersized" to today's standards.

IV. FINAL OBJECTIVE

It is our opinion that when buying an existing home, especially one which is old and does not have a sewage disposal system which meets today's standards, the fundamental question which should be answered is: If the existing system fails, how will we repair it and how much will those repairs cost? If accurate soil test data is not available through the local health department, the only sure way of answering this question is to actually perform all the deep hole testing and percolation tests required by code. As you can understand, most sellers would take a dim view of prospective buyers wanting to tear up their property to perform these tests. Therefore, the more information a buyer can obtain, the better able he or she will be to judge the adequacy of the existing system and what will most likely be required to repair the system, when needed. In that way, the buyer will not be caught unaware when that day arrives, since it was part of the financial assessment establishing the value of the property at the time of purchase.

Prepared by:
State Department of Public Health
On-Site Sewage Disposal Section
April 7, 1997

APPENDIX S.13

SEPTIC SYSTEM MANAGEMENT ARTICLES

ESSEX EVENTS

News from the best small town in the USA

Volume 1, Number 2, FALL 1996

Essex on the Web;

Number of 'Hits' Nears 1,000

by Jack Savage

The Essex Internet site has grown and flourished over the past months. The average number of hits has surpassed 900 each month since May and continues to grow. This is in contrast to past years when Internet activity trails off in summer months, due to the fact that students pack away their computers and head for the beach. One can only conclude that the driving force of the Internet has changed from students (who

(Continued on page 3)

35 YEARS of FIRST SELECTMENSHIP: On the 24th of July this year, with all the stars and moons in rare alignment, a unique assemblage occurred in the office of the First Slectmen. A gathering of all six living past First Selectmen (and the current office holder) took place, and a very pleasant hour was spend exchanging memories and getting caught up. We hope, in future issues of this newsletter, to feature the recollections of each of the former First Selectmen recounting some of the high and low points of each administration. Pictured, from left to right, are Carl Ellison (73-77), Richard Riggio (77-85), Escott MacWhinney (61-67), Kelso Davis (69-73), John Johns (85-91), Bruce Glowac (91-95) and current First Selectman Pete Webster. Richard Batley, deceased, served from 1967-1969.

New 'Pooper Scooper Law'

An Essex "Ordinance Concerning Removal of Animal Waste" was passed at a town meeting in July. This legislation was proposed by the board of selectman after much thought and discussion going back at least three years that I have been on the board, due to pet owners (more specifically dog owners) not taking responsibility for cleaning up after their animals.

While the ordinance covers all three villages of Essex, the worst areas appear to be downtown Essex, from the park down to the Connecticut River Museum and North Main Street.

There will be a mail box with plastic bags installed at the Main Street Park for the convenience of those who walk their dogs unequipped to handle their unexpected deposits.

We hope the attention focused on this recurring problem will result in a cleaner, more sanitary town, the intent is certainly not to balance the town budget by levying $35 fines, but make our parks once again suitable for spreading out picnic blankets and enjoying the open spaces.

Editor's Note: I think our visitors from New York City can relate to this problem and pet owners will respond positively.

Pete Webster
First Selectman

Leadership Development Program Now Available To Residents

In an article in USA Weekend about the time Essex was selected as the Number One Small Town in America, a local businessman, Bruce Lawson, saw that America's best small towns had set up some formal training programs to prepare residents to become effective leaders of community organizations.

In Lawson's role as president of a managing consultant firm, The Essex Group, and also as president of the New England Center for Organizational Effectiveness, he is continually preparing people to assume leadership roles.

Since another key part of being one of the best small towns in America is a

(Continued on page 3)

Septic Tank Cleaning Helps Prevent System Failure

When I asked a smart Essex resident when the last time his septic tank was pumped, he replied immediately, "Four years ago, I have done it each time there was a presidential election." Whether you use this memory technique or not, the Essex Health Department would like to remind all homeowners that septic tank cleaning every three to five years is very important routine maintenance.

Failure to clean the scum and solids from a septic tank is a common reason for septic tank failure. It typically costs $3,000 to $8,000 to replace a failed septic system with a new one, compared to less than $200 to have a tank pumped and inspected, certainly an economic justification for regular pump-outs! In addition, failed septic systems contribute to surface and ground water pollution and can contaminate wells on your neighbor's property or your own.

(Continued on page 3)

Septic Tank Cleaning

(Cont. from page 1)

Essex, Centerbrook and Ivoryton are clean, beautiful towns. Because we want them to stay that way, the Health Department strictly enforces the Connecticut Public Health Code regulations regarding new construction and modifications to existing properties.

But to avoid the expense of centralized sewer systems and mandated public water supplies, each homeowner must learn to maintain his on-site, sub-surface disposal system and water well in an environmentally responsible manner.

SEPTIC SYSTEM QUIZ:

Do you know the answers to these questions?

Where are your septic tank and leaching fields?

When was the last time your septic tank pumped?

How do household cleaners affect a septic system?

Does it help to use additives in a system?

How can you tell if your septic system has failed?

Information to help answer these questions is available from the Essex Health Department, 29 West Avenue, Essex.

Come in and pick up a brochure about system maintenance, and do your part to maintain the quality of life we all enjoy in the Town of Essex.

Carol Speer
Sanitarian

"Essex Events"®
A Quarterly Newsletter

— Publisher —
ESSEX PRINTING COMPANY, LLC.
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Tel. 767-9087 / FAX 767-0259

Leadership Development

(Cont. from page 1)

high rate of volunteerism, Lawson has volunteered his time and effort to develop the future leaders of Essex.

After several discussions, the selectmen have determined that they would like a program that becomes a vehicle that will help people become more effective in leadership positions, to help non-active people become more active, and to seed the community with an attitude of responsibility while learning to cope with the frustrations of the democratic process. In return for sponsoring the program, the town expects that graduates will run or volunteer for leadership positions in town government and service agencies.

A leadership selection committee has been assembled and is now accepting applications from town residents and employees who would like to be part of this pilot program. Candidates can volunteer or be nominated by others. In order to apply, call the selectman's office to get your name or the name of someone you think should be part of the program, in front of the selectman's committee. The application itself will be simple: in 150 words or less, explain what you personally expect to get from the program and what you expect to give back because of the program. The group is to be diverse, especially in terms of age and gender.

The selection committee will be accepting applications throughout the month of September and expects to make its selection during October. The program itself will begin in November.

While many volumes have been written about leadership, it remains for many, a misunderstood and elusive quality, the capacity for leadership exists in everyone, but most people never take the time to develop it.

Positive leadership assumes that goals can be accomplished.The problem can be solved, the job can be done, and obstacles can be overcome. In other words, an effective leader creates the future. This program is pragmatic, structured, yet open-ended approach to leadership development. It is designed to help an individual develop the attitudes, skills, and qualities necessary for effective leadership it is a process designed to engage people in a program that results in both personal and professional growth.

Lawson is planning to work with 10 to 15 participants in the first leadership group. He will facilitate the meetings at his offices on Main Street in Centerbrook. The participants are expected to attend 10 weeks of evening instruction and complete daily homework assignments designed to enhance their personal leadership capabilities. There will be follow up meetings with the leadership group and the selectmen to monitor the progress.

Since this is a volunteer program, participants are expected to pay the cost of materials, approximately $350, plus tax. If this amount is an issue for a potential participant, please include justification for a scholarship in the application.

Essex on the Web

(Cont. from page 1)

generally have free access privileges) to a growing number of adult "surfers."

On the other side of the coin, the number of commercial sites has grown 20,000% in six months! (that is correct - 100 per day domain names registered per day in February has changed to 20,000 domain names registered per day when last queried.) "Surfers" (Internet users) exceed 100 million, and the competition for their attention is relentless.

At the end of 1994 there were 5,000 sites to visit; at the end of 1995 there were 20,000 sites; at the end of 1996 I estimate there will be in excess of 3.6 million!

The Essex pages are standing up to the challenge due to the support of 150 advertisers. These advertisers are largely responsible for the "hits" by displaying the address in their businesses, including the address in their printed advertising and purchasing their own sub addresses under the EssexCT.com domain. In addition, the Essex site has been "marketed" to the web, that is, numerous other sites have been advised of its existence and content. The pages are updated regularly and new material is continually brought into the site.

The site now features a walking tour, messages from the selectman, a history of the town, maps, a dining guide, photo gallery, Essex Art League section, Ivoryton Playhouse section, attractions, directions, links to surrounding towns and even WVIT weather.

Most recently the Hollycroft exhibit, Don Malcarne's history of the Burning of the Ships, Cross Lots and the Pratt House have been given new space.

In addition to the comments, there is space for letters to the editor and we are pleased to receive and publish commentary on any subject. Write to Savage Systems, Box 451, Essex, 06426 or E-Mail Savage@snet.net

Sign Of A Great Teacher

Instructor At American School For The Deaf Has National Award

By ROBIN STANSBURY
Courant Staff Writer

Teacher Jane Davol still gets teary-eyed when she describes her first trip to the American School for the Deaf, in West Hartford, where she arrived as a novice teacher ore than 15 years ago.

"I still remember driving down with my id and seeing the pillars," said Doval, 37, her es watering as she sat in her classroom at ie school, the oldest such school in the na- on. "I guess it's just all the history here."

Davol contributed her own bit of history to ie North Main Street school when she was iosen last year as "teacher of the year" by ie Convention of American Instructors of the eaf. Selected from candidates throughout the nited States and Canada, Davol is the first teacher from the American School for the Deaf to be selected for the award.

"It's a little humbling," said Davol, of Farmington, who teaches fifth- and sixth-grade students with special learning needs. "I work with a lot of great people. It's a little embarrassing that I was picked, but it was also a great honor."

WEST HARTFORD

And one well-deserved in the opinion of Davol's supervisors and peers.

"She is a super teacher, the kind of teacher every parent wishes their child could have," said Jean Joseph, principal of the lower school for students aged 3 through sixth grade. "She's very dynamic, innovative and creative and very interested in helping the children be the best that they can be, and providing experiences for them that they will remember for a lifetime."

Like the time this school year when Davol helped her students "ride" a bike all the way to the Connecticut shore. The teacher brought a stationary bike to her classroom and students took turns riding one mile a day. When they accumulated all the miles necessary to ride to Madison, Davol organized a field trip to the shore. Along the way the students learned about math estimation, directions, recorded the trip on video and learned about the creatures who live in the ocean.

"When I think of Jane I think of 'I Can,' " said Kathleen Quirk, the school's assistant principal who supervises the special needs program and nominated Davol for the honor after she was selected as the school's own

Please see **TEACHER, Page B7**

to be called up to get the place functioning. 'It doesn't take too many employees to do the work."

Meanwhile, the auction of the factory's contents, which had been tentatively set for this weekend, has been delayed for about a month while inventory of the contents continues, Pyatt said. It will probably be rescheduled for late February or March, he said.

The event has been the subject of considerable interest both because of Dickinson's historic role in the community and the unusual nature of some of the objects to be sold.

The centerpiece of the auction is expected to be Dickinson's signature, handcrafted copper witch weathervane. Bidding for the unique piece is slated to start at $25,000.

A buyer is still being sought for the 11-acre complex, which includes buildings on both sides of the track used by the Valley Railroad steam trains. The asking price is $1.9 million.

'ses On Aiding Youth

roject is today, at 7 p.m., in the school auditorium.

ganizers will present the re- of a survey given to local mid-

OLD SAYBROOK

and high school students last . They will also recommend e preliminary ideas drawn from survey results.

ommittee members will not dis- e the survey results or their rec- nendations before the meeting. ead, they want people to attend 90-minute program to receive a full presentation, said Ashworth, an Old Saybrook resident.

The Rev. Paul Lutz, pastor of St. Paul's Lutheran Church and an Old Saybrook resident, learned of the national program last year and brought it to the attention of community members. About 30 volunteers have been involved with the project to date, but organizers hope the forum will launch a community-wide effort.

"Once the forum happens, we really hope it stimulates people to

Please see **YOUTH, Page B6**

Septic Tank Rules Proposed

By LOUISE BEECHER
Courant Correspondent

ESSEX — The water pollution control authority is proposing that the town aggressively police septic systems to satisfy a state order to improve the quality of the town's groundwater.

If the state accepts the idea, it will mark the end of an almost decade-long effort by the town to meet that order without installing an expensive sewer system.

The plan would require property owners to pump out their septic systems every five years and put every system on a regular inspection schedule.

ESSEX

Although no final decision has been made, it might also lead to the construction of a multi-user septic field under a Main Street park.

"It is something that we have to seriously consider as a possibility," said pollution control Chairman Ken Wexler, who explained the field would serve properties too small for adequate septic systems.

The plan, which was devised with the help of consulting engineers Fuss & O'Neill, will be presented to the board of selectmen and the finance board in February. Approval there would be followed by a public hearing and a town meeting to put the provisions into law.

The plan would also have to be approved by the state Department

Please see **SEWER, Page B6**

Investigation

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with assault and breach of peace. He is accused of striking Northwest's assistant coach. Ryan Ferguson, 17, of 7 Chimney Crest, Bristol, was charged with breach of peace. Ferguson also was arrested in November in connection with a string of paintball gun attacks on several Plainville houses. His case is pending in Bristol Superior Court.

Both Davis and Ferguson are scheduled to be arraigned in Bristol Court on Jan. 26.

Five students were issued tickets and fined $88 each for creating a public disturbance. They are: Kenneth Paradis Jr., 18, of 75 Pickney Ave.; Scott Rossignol, 18, of 41 Glenwood Drive; Raymond Gudat, 18, of 10 Hanson Place; Daki Koutouvides, 17, of 131 Hollyberry Lane; and Charles Sic, 17, of 32 Mountain View Drive.

Courant Staff Writer Roberto Gonazalez contributed to this report.

Sewer

Continued from Page B1

of Environmental Protection. However, Wexler said, the town had been working closely and amicably with the state and that approval was expected.

The state wants the town to bring the groundwater into a classification that makes it fit to drink, said town Sanitarian Carol Speer. The water, which is contaminated with nitrates and other chemicals as well as small amounts of bacteria, is in the same category as South Cove and the Connecticut River, she said.

The contamination is mainly in Essex Village and does not pose a health problem because residents in that area do not get their water from private wells.

The proposal would require residents to pump out their septic tanks at least every five years. "Pumping your septic tank every five years is the best and cheapest insurance against blowing out your leaching field," Speer said.

It would also establish a five-year inspection system whereby one-fifth of all the properties containing septic systems would be visited each summer. The town did this last summer with a temporary employee and found few problems, Speer said.

One of the reasons that the densely settled Essex Village section showed groundwater contamination was that buildings and pavement prevented rain from soaking into the ground and into the leaching fields, she said.

"The solution to pollution is dilution," is a slogan among sanitarians, she noted.

The plan would also call on the town staff to closely track renovations and additions to make certain that they did not overwhelm existing septic systems, she said.

Implementing the plan would probably require the installation of new software because it would demand more record-keeping by the town, the sanitarian acknowledged. However, no new full-time staff would be required.

The Hartford Courant.

SHORELINE

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THURSDAY
JANUARY 15, 1998
SECTION
B

$38 Million Budget Proposed

Reductions Are Likely Before Final Approval

By JANE E. DEE
Courant Staff Writer

MADISON — Taxpayers will be asked to support a $38 million budget to keep the town and schools running in the next budget year.

But it is likely that the budget will be reduced by about 3 percent before it is presented to voters for approval in April, First Selectman Thomas Rylander said.

The largest chunks of money in the proposed budget would finance the town's debts and pay salaries. Most of the expenses related to debt are the result of the recent decision by residents to buy the 649-acre Braemore property in north Guilford, Rylander sa[illegible]

Town officials [illegible] have several workshops to review the proposal before it is finalized by the board of finance on April 15.

The town's portion of the budget proposal is $12.2 million, which represents a 5.53 percent increase over current spending. School Superintendent H. Kaye Griffin has proposed a $26 million budget, a 5.25 percent increase.

MADISON

Griffin said the increase is due mainly to an expected increase in the number of students enrolled in town schools. "We've had an increase of students from 1992-1993," Griffin said.

Some schools are already understaffed, Griffin said. There is a large second-grade class at Island Avenue School and a large fourth-grade class at Academy School, she said. "We need to add more teachers to balance that."

When classrooms are created, other teachers, such as those who teach art and physical education, also are needed, Griffin said.

There will be workshops on the education budget Jan. 27 and Feb. 5, at 7:30 p.m., in the Hammonasset Room at the town campus.

Rylander already has reduced the proposed town budget by more than $750,000, including $[illegible]900 for a police officer's posi[illegible] Most of the money came from scrapping a $462,000 request by the health department to install public water mains in the Garnet Park neighborhood.

According to the health department, there are 44 homes in the neighborhood that are served by shallow, dug wells. Most of the homeowners would have been in favor of having the town loan them the money for the water main installation. They would have repaid the money over the course of 20 years, with interest.

Before the budget can be finalized, more information is needed on how the police department will be restructured, Rylander said. A consultant recommended the restructuring, although the board that oversees the department has yet to say how it will be accomplished.

Also, the budget will be affected by two contracts that the town is negotiating with members of the International Brotherhood of Police Officers and the National Association of Government Employees. The town Monday approved a new contract with the town's four-member maintenance workers union that calls for pay increases of about 3 percent through 2001.

Highlights of the town's budget proposal include:

■ A $72,000 request for the beach and recreation commission's athletic field reserve account to be used to irrigate the three athletic fields on

Please see [illegible]ET, Page B6

YOUR SEPTIC SYSTEM:
Septic System Additives, Septic Tank Cleaners and Hazardous Household products

What are septic tank cleaners and additives? How useful are they? What is their impact on the environment?

When properly designed, installed and maintained, on-site septic systems may function trouble-free for many years. Some systems, however, develop problems due to outdated designs, improper installation or improper maintenance. The owner of a failing system is faced with several choices, most of them expensive.

What do Septic System Additives claim to do for your septic system?

Homeowners are often tempted by the seemingly low cost of septic tank additives that claim to be alternatives to costly repairs. Some 12,000 septic system additive products on the market claim that they save maintenance cost or prevent failures. They claim to do this, for example, by regularly feeding your system with bacteria or yeast, or to fix an already existing problem by reopening or unclogging your leaching facility.

Why is there concern about the use of these products?

There are three concerns connected with the use of commercial septic system additives:

- using them may harm your system;
- using them may contaminate ground water;
- using them may be ineffective, but will discourage you from investing in maintenance and repair when needed.

Septic System Additives fall into three categories:

1. Yeast, bacteria, enzymes

Manufacturers of these products usually recommend that you regularly add these products to the septic system via the toilet. They are harmless to the environment and of little value to your system. Sewage naturally contains vast amounts of yeast and bacteria that maintain themselves without need for supplements under normal operating conditions.

In fact, use of these products may damage your septic system. Research has shown that some of these products may cause the production of methane. This gas bubbles through the septic tank and refloats sludge particles that flow into the leaching area and then may end up clogging the soil.

Yeast, enzymes and bacteria are also not required to restart your system after you have had your tank pumped. There are enough microorganisms in the tank to perform that role.

2. Inorganic chemicals

Inorganic septic system additives, such as sulfuric acid, sodium hydroxide or hydrogen peroxide, are used to restore a clogged leaching area, (the primary cause of septic system failure). These additives destroy the excessive organic matter that has accumulated around the leaching facility keeping the wastewater from getting into the soil. They should be applied directly to the leaching facility. Application through the septic tank dilutes the product and reduces its effectiveness. Also, sulfuric acid and sodium hydroxide may corrode the concrete in the tank, cesspool or seepage pit.

In concentrated forms, these chemicals should be handled only by professionals. They are very caustic and may lead to personal injury or damage to your septic system.

Hydrogen peroxide should be used only in specific soil conditions. If used improperly, it will make leaching problems worse rather than improve soil permeability.

These products bring temporary (a few months) relief from a clogged leaching area and do not address the basic cause of the failure. At best, they should be used only in emergencies thereby allowing more time to consider repairs that truly address the cause of the failure.

Inorganic compounds may affect groundwater by increasing the concentrations of salts or metals (such as copper) in the water that flows out of the septic tank. However, given the total volume of water used in the average system, these effects can be considered negligible under normal conditions.

3. Solvent-based, non-biodegradable products

Compounds, such as methylene chloride (MC) and trichloroethylene (TCE), were commonly used as degreasers or drain openers. They are hazardous substances. TCE is a carcinogen. Because of their potential to contaminate groundwater, manufacturers have removed TCE and MC from their products. Before applying any product, the user should read the label to ensure that these chlorinated hydrocarbons are not present.

University of Massachusetts, United States Department of Agriculture and Massachusetts counties cooperating.
Cooperative Extension offers equal opportunity in programs and employment. CP 0368 10M 12/94

Economic Considerations

Before considering use of an additive, you should compare its price with that of regular septic tank pumping. Pumping every three to five years may be less expensive than using additives over the same period. Most important, pumping has been proven to work by extending the life of your system. Most additives make claims that cannot be substantiated.

Legal Issues connected with Septic System Additives:

As of April 1, 1995 it is illegal to use or recommend septic system additives unless they are on a list of state approved products. The criteria used for approval of products is that they do not harm the system's components or function and do not adversely affect the environment. The state, however, is quick to point out that this does not constitute an endorsement of the product's effectiveness.

Additional Information

More information on environmentally safe and cost effective septic system management methods may be obtained by contacting your local Board of Health, your regional DEP office or nearest UMass Extension Center.

How do Hazardous Household Products Affect Your System?

How can I dispose of household chemical products in a manner that does not harm the septic system or the environment?

Many owners of homes with on-site wastewater systems are concerned about how their systems will be affected by the use or disposal of hazardous household products such as bleach, laundry detergents, left-over paint thinners, drain cleaners or pesticides.

What About Home Cleaners and Detergents?

Harmful effects of ordinary household chemicals on septic system operation are often overemphasized.

Home care products designed to go down the drain, including soaps, detergents, bleach, disinfectants and drain cleaners, when used at the recommended rate, will not adversely affect septic system performance or the environment. The septic tank, when properly sized and maintained, acts as a buffer against most negative impacts.

Chlorine bleach

Research shows that it takes several gallons of liquid household bleach to destroy all the bacteria in the septic tank. The bacteria population recovers its original strength within 30 hours of normal septic system operation. This means that normal use of household bleach has no negative effect on your system.

Disinfectants

Similarly, it takes about five gallons of Lysol* to destroy the bacteria population, with a similar recovery time of a day and a half.

Crystallized drain cleaners

However, it takes only one cup of crystallized drain cleaner to destroy the bacteria in the septic tank and the recovery time is three days.

Soaps and detergents

These substances used in normal amounts do not harm your septic system. Powdered detergents contain filler substances that do not settle out in your tank. Liquid detergents do not burden the tank in this manner.

Salt brine from water softeners

Dumping the regeneration brine from water softeners into your septic system should have no adverse effect on the life of microorganisms in your tank but may shorten the life of your leaching facility if it is in clay soils.

Do not use your septic system as a household hazardous waste depository:

While there is little reason to worry about normal use of the above substances, you do not want to dump leftover liquid floor wax, furniture polish, pesticides, paint thinner, automotive liquids such as antifreeze, brake fluid or battery acid down your drains. While they do not harm your system's performance, they do pass right through it into the ground water supply and could end up in your neighbor's drinking well.

To maintain your system: keep your leach field free of brush, and trees. Do not drive or park over any part of your system. Have your tank pumped regularly and do not use your system as a trash can. Follow the simple maintenance rules described on other fact sheets.

**Lysol is a brand name for the disinfectant used in the research. Its use does not constitute an endorsement.*

This material is based upon work supported by The Massachusetts Environmental Trust. Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the United States Department of Agriculture. Robert G. Helgesen, Dean and Director, Cooperative Extension, University of Massachusetts. The Cooperative Extension System offers equal opportunity in programs and employment. *Prepared by Gisela Walker, Extension Specialist; David Gordon, M.S.; Peter Veneman, Ph.D.*

APPENDIX S.14

APPLICATION TO MODIFY/REPAIR AN EXISTING SEPTIC SYSTEM

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

APPLICATION TO MODIFY / REPAIR AN EXISTING SEPTIC SYSTEM

FEE SCHEDULE: RESIDENTIAL $30.00 COMMERCIAL/INDUSTRIAL $50.00

LOCATION: _____ MAP: _____ LOT: _____
NUMBER STREET TOWN

REASON FOR REPAIR

AGE OF SYSTEM: YRS	SYSTEM FAILURE: ☐ YES ☐ NO
ADDITION/RENOVATION	FAILURE MODE:
USE CHANGE	

	RESIDENTIAL - NO. BEDROOMS:
	COMMERCIAL - DESIGN FLOW :

EXISTING TANK:
EXISTING LEACHING:

PROPOSED MODIFICATION (USE BACK OF FORM OR SUBMIT PROPOSAL DRAWING):

TANK:

LEACHING:

OWNER NAME: _____ PHONE: _____
ADDRESS: _____

INSTALLER NAME: _____
ADDRESS: _____
LICENSE NO.: _____

ENGINEER NAME: _____
ADDRESS: _____
LICENSE NO.: _____

PERMIT TO MODIFY / REPAIR AN EXISTING SEPTIC SYSTEM

PERMIT NUMBER: _____ DATE FEE PAID: _____ CK. NO._____

TEST PIT INFORMATION
DATE: SOIL CONDITIONS:

SPECIAL CONDITIONS
____ WATER/SEWAGE RESTRICTION
____ OCCUPANCY/USE RESTRICTION
____ CURTAIN DRAIN / FOOTING DRAIN
____ SITE PREPARATION
____ WELL RELOCATION/RETEST
____ OTHER:

COMMENTS

Sanitarian Approval: _____
Carol L. Speer, R.S. Date

APPENDIX S.15

SAMPLE ORDER FOR SEPTIC SYSTEM REPAIR

SAMPLE ORDER - ESSEX VILLAGE

NOTICE OF VIOLATION AND ORDER TO ABATE

Date: December 2, 1996

Mr. Joseph [redacted]
[redacted], CT [redacted]

RE: Septic System Failure, [redacted]

Dear Mr. [redacted]:

You are hereby notified that a nuisance injurious to public health has been documented by an inspection done on November 20, 1996, at the above address.

The nuisance or violation is as follows: **Effluent overflowing septic tank manhole in rear parking lot. Distinct odor and appearance of sewage. Laboratory analysis confirms presence of fecal coliform bacteria (septic effluent).**

This condition is a violation of the Connecticut Public Health Code, Section 19-13-B103c(f) which states, "No sewage shall be allowed to discharge or flow into any storm drain, gutter, street, roadway or public place, nor shall such material discharge onto any private property so as to create a nuisance or condition detrimental to health". This nuisance condition must be abated immediately, and remain abated until a repair can be made to this failing septic system.

Authority: Connecticut General Statutes Sections 19A-206; 19A-207.
Penalty: Connecticut General Statutes Sections 19a-36; 19a-206; 19a-230.

By the authority of the Department of Health of the Town of Essex, you are hereby ordered to remedy this situation on or before **January 1, 1997. This repair must be designed by a professional engineer licensed in the State of Connecticut and implemented by a licensed septic contractor. Please contact the Essex Health Department at 767-4343 on or before December 10, 1996, to discuss the required repair to this system.**

Failure to comply with this order may result in referral to Town Counsel for appropriate legal action.

Appeal: Section 19a-229 of the General Statutes states, "Any person aggrieved by an order issued by a town, city or borough director of health may, within forty-eight (48) hours after the making of such order, appeal to the commissioner of health services, who shall thereupon immediately notify the authority from whose order the appeal was taken, and examine into the merits of such case, and may vacate, modify or affirm such order."

Carol L. Speer, R.S.
Sanitarian

Christopher Goff, M.D.
Director of Health

Sent By Certified Mail to Owner
cc: Mr. [redacted], Essex, CT 06426

APPENDIX S.16

SAMPLE HEALTH DEPARTMENT ORDERS LOG

HEALTH DEPARTMENT ORDERS LOG

Date Issued	Map	Lot	Street Address	Town	Owner Name	Respond Date	Modified Date	Comments/Status	Closed Date
4/4/97	25	6	15 Dennison Lane	SX	Carlson	4/11/97	5/15/97	Garbage/cats	6/6/97
11/22/96	27	67	38 No. Main St.	SX	Essex Village Condos	12/15/96	4/15/97	Monoflo repair	4/15/97
3/6/97	34	4-1	87 Dennison Road	SX	Rossi	3/30/97	5/31/97	Running toilet fixed	8/1/97
6/26/96	38	7	7 Budney St.	IVTN	Hmielewski	7/15/96		Zanardi repair 3/18/97	7/3/96
4/24/97	39	11	7 Oak St.	IVTN	McGuire	4/30/97	5/31/97	Doerrer repair	7/1/97
3/24/97	40	32	13 Blake St.	IVTN	Curran	4/30/97	3/30/97	Monoflo to do in May	6/2/97
7/11/97	40	6	19 No. Main St.	IVTN	Wilcox	8/1/97		Leak repaired	10/15/97
1/28/97	46	44	48 So. Main St.	SX	Sears	3/1/97		Zanardi repair 3/18/97	3/18/97
12/2/96	47	20	77 Main St.	SX	Olive Oyl's/ Karpinsky	1/1/97	2/28/97	Doane/Rhodes repair	2/19/97
11/19/96	50	5-5.2	13 Novelty Lane	SX	Essex Yacht Club	ASAP	5/30/97	Zanardi	7/19/97
12/23/96	56	4	6 Comstock Ave.	IVTN	Cyr	1/15/97		Monoflo repair	1/15/97
6/14/96	57	62	69 Comstock Ave.	IVTN	Chrystal	7/1/96		Possible condemnation	
6/12/97	58	43	173 Main St.	IVTN	Schreier	7/15/97	tests done	Swaney repair	10/6/97
10/25/96	63	17-19	20 Comstock Ave.	IVTN	Oakridge Condo Assoc.	per DEP		Twin oaks	7/15/97
4/3/97	69	36	29 Cedar Grove Terrace	SX	Reeves	5/15/97		CTDPH App'd-Monoflo	5/22/97
5/2/97	74	32	174 Saybrook Road	SX	Fannie Mae	5/15/97		Garbage	5/15/97
6/12/97	78	2-01	15 Ingham Hill Rd.	SX	Holt	Immed.		Garbage/mattresses	6/14/97
7/11/97	79	32	200 Westbrook Road	SX	Savoie	8/1/97		Washer dry well	7/15/97
10/28/96	79	34	192 Westbrook Road	SX	Michelle St. John	11/15/96		Pending Doane plan	
6/23/96	83	10	70 Pond Meadow Rd.	IVTN	Hemlock Apts./ Ellis	8/15/96	1/30/97	Reiss repair	1/10/97
LETTERS									
6/12/97	47	15	Essex Landing Pratt St.	SX	Croft	Immed.		cleaned	7/15/97
7/21/97	55	2-11	1 Earl St. Extension	CNTB	Clark	Immed.		re-inspect in wet season	
5/5/97	74	35	160 Saybrook Rd.	SX	Keszler			Monoflo	7/14/97
4/17/97	89	36-5	7 Townwoods	SX	Gazikias		2/4/98	Agreement pending	
8/15/97	89	36-6	10 Townwoods	IVTN	Schaffrath			Re-inspect in wet season	

APPENDIX S.17

SAMPLE DOCUMENTATION OF ENFORCEMENT ACTIONS

file copy

TOWN OF ESSEX
Department of Health
Essex Town Hall
West Avenue
Essex, Connecticut 06426
767-8201

October 11, 1988

John & Marcella Vesy
7 Collins Lane
Essex, Ct 06426

RE: 19 Main Street, Essex Map 47 Lot 103

Dear Mr. & Mrs. Vesy,

Per you request, please be advised that it is not contrary to Public Health Code for two individual office or retail business enterprises occupying the same premise to share the same rest room facilities provided mutual agreement of facility maintenance is clearly understood by the concerned parties which must include the property owner.

As you know Essex Zoning Regulations has limited to two (2) the number of floors that can be used for retail business in the subject building. The third level to be used for storage purpose only.

Because of sewage disposal limitations the number of employees for both businesses are not to exceed four (4).

If you have any further questions please feel free to call the Health Department office.

Very truly yours,

Rod LeMaire

Rod LeMaire
Sanitarian/Health Official

cc. Dr. Christopher Goff, Director of Health
Larry Gilliam, Zoning Enforcement Agent
Richard Leighton, Building Official

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

December 5, 1996

Mr. Michael McCulley
Re-Max Commercial Advantage
213 Court Street
Suite 602
Middletown, CT 06457

Re: Retail Property at 1-3 Main St., Corner of Pratt St. and Main St., Essex, CT
(Also known as 8-10 Main St.) Map 47 Lot 116

Dear Mr. McCulley:

I have reviewed the Health Department file on the above property, the water usage records covering the period 6/95 to 9/96, and the report from Monoflo from their pumpout and inspection on 12/5/96, and have the following comments:

- This 0.14 acre property, as you know, has had a history of septic problems. The land area available for the septic system is extremely limited, and in fact the tank is in Pratt Street, adjacent to the building. The leaching field and pump chamber are located in the four foot wide area to the rear of the property. I have attached a summary of the Health Department file for your information.

- The property is in an area of concern to the Essex Water Pollution Control Authority and any future repair at this site may be subject to review by that Board.

- Permits to discharge issued by the Health Department in August, 1990 and again in November, 1993, contain the following conditions:
  1. Maximum average daily flow of 225 gallons per day.
  2. Low flow fixtures to be installed.
  3. Water usage numbers to be submitted to Health Department quarterly.
  4. No food service operation of any type will be permitted on this property.
  5. The septic tank will be pumped and inspected annually.

- Current reports indicate that:
  1. Average daily flow has been less than the 225 gallons per day allowed over the past year.
  2. Low flow fixtures have been installed.

3. The tank was pumped and inspected and appeared to be properly baffled and in working condition.
4. A visual inspection of the leaching/pump chamber area showed no evidence of overflow or breakout of septage to the ground area.

- Any future usage of this building will be subject to the Permit to Discharge conditions listed above. Should evidence of system malfunction occur, these conditions may of course be altered by the Essex Health Department, in accordance with the Connecticut Public Health Code.

If I can be of further help, please call me at the above number.

Sincerely,

Carol L. Speer, R.S.
Sanitarian

cc: Larry Gilliam, Zoning Enforcement Officer
Property File

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

NOTICE OF VIOLATION AND ORDER TO ABATE

July 23, 1996

Hemlock Park Associates
c/o J. Ellis & Associates
39 Bristol Street
New London, CT 06320

RE: Hemlock Apartments, 70 Pond Meadow Rd., Ivoryton, CT
Map 83 Lot 10

Dear Mr. Ellis:

You are hereby notified that a nuisance injurious to public health has been documented at the above address.

The nuisance or violation is as follows:

Significant breakout of septic effluent in wooded area at rear of first building w. right of entrance. Standing water over an area of 6 feet by 10 feet, distinct septic odor.

This condition is a violation of the Public Health Code of the State of Connecticut, Section 19-13-B103c (f).
Authority: Connecticut General Statutes Sections 19A-206; 19A-207.
Penalty: Connecticut General Statutes Sections 19a-36; 19a-206; 19a-230.

This is a condition detrimental to the public health and must be abated. By the authority of the Department of Health of the Town of Essex, you are hereby ordered to remedy this situation on or before August 15, 1996. Failure to comply with this order may result in referral to Town Counsel for appropriate legal action.

Appeal: Section 19a-229 of the General Statutes states, "Any person aggrieved by an order issued by a town, city or borough director of health may, within forty-eight (48) hours after the making of such order, appeal to the commissioner of health services, who shall thereupon immediately notify the authority from whose order the appeal was taken, and examine into the merits of such case, and may vacate, modify or affirm such order."

Carol L. Speer, R.S.
Sanitarian

Christopher Goff, M.D.
Director of Health

Certified Mail:

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

August 20, 1996

Hemlock Park Associates
c/o J. Ellis & Associates
39 Bristol Street
New London, CT 06320

RE: Hemlock Apartments, 70 Pond Meadow Road, Ivoryton, CT
Septic System Repair - Conditions of Permit

Dear Mr. Ellis:

This letter is to outline the current status and plan for repair of the subsurface disposal systems at the Hemlock Apartments, Ivoryton. The complex consists of six buildings, each containing four two-bedroom apartments, making a total of 48 bedrooms in the complex. Only building # 2 has laundry facilities - two washers and dryers in the basement which may be used by any of the residents. The design flow of the combined systems for this complex exceeds 5000 gallons per day, thereby requiring overview by the Connecticut Department of Environmental Protection.

In July, 1996, a septage breakout was noted in the wooded area at the rear of Building #2, and your company was ordered to abate the septic nuisance. Since no as-built drawings exist of the systems, a septic contractor was hired to uncover the system. Property Manager Frank Stellato, Engineer Bob Pfanner and I met at the site on Thursday, August 15th, to observe the work. At Building #2 excavation showed a 2000+ gallon tank, cracked distribution box and five dry wells. The two lower drywells were dirty and overfull, one drywell in the front of the building was half-full, and two were dry and unused. All distribution piping was orangeburg or cast iron and broken, degraded or unevenly pitched.

The septic system in Building #3 had been backing up, requiring frequent pumping, and was uncovered on the same day. The tank was unbaffled, and the distribution box was filled with solids. Cast iron and orangeburg distribution piping was degraded and broken. The galleries, hand-constructed with a poured solid cover, appeared to be in good condition, with clean stone some to no water in the trench. There did appear to be a water leak in the building which had undoubtedly stressed the system.

Following these observations, I discussed the repair requirements with Warren Herzig, Bureau of Water Management, Department of Environmental Protection. We agreed that we first must learn the condition and location of all of the systems on the site (a request which the DEP had made at the time of a repair to Building #5 two years age), repair any systems or portions thereof which are non-functional at present, and institute a more rigorous inspection and maintenance program. To meet these goals, the following items must be done and approved by both the Essex Health Department and Mr. Herzig:

By the Engineer:

1. **Survey and inspect all sub-surface systems at the location, and provide as-built drawings for all buildings by September 30, 1996.** All drawings must be stamped and signed by a professional engineer licensed in the State of Connecticut. Drawings must be approved by the Essex Health Department. These drawings will include:
   a) ties from building locations to major components of system
   b) elevations of major components and spot grades or grade lines of the area of the system
   c) specifications to the best of your knowledge of the size and capacity of the system components
   d) location of all water wells and water pipes on the property
   e) any additional observations of soil conditions, surface water problems, etc.
2. Inspect and approve all repairs to the system as required.

By the Property Manager:

1. **Contract with licensed installer to excavate, inspect and repair if necessary all systems in complex.** Installer must pull permit for each building repair from Essex Health Department.
2. Oversee repairs and properly cover excavations, including reseeding, following engineering and repair work.
3. Keep copies of as-built drawings on file for inspection and maintenance purposes.
4. Locate and correct any plumbing leaks in buildings.
5. **Remove washing machines from Building #2, and strictly enforce regulation against portable washers or dishwashers.**
6. Install water meters at each building to monitor water usage.
7. Install an outside signal light for pump chamber alarm.
8. **Set up and enforce a regular inspection and maintenance program, as follows:**
   a) Monthly - inspect pump chamber of system at Building #5 and any other pumps which may be installed. Verify that alarm, signal light and pumps are working properly.
   b) Monthly - read water usage meters for each building.

c) Monthly - walkover area of septic system looking for effluent breakout or soggy patches.
d) Monthly - schedule pumpout based on schedule below - maintain one-year cycle.
e) Quarterly - pull outlet covers of all septic tanks to check for clogged baffle, runback from leaching, or plumbing leaks.
f) **Quarterly - submit report (form enclosed) to Essex Health Department.**

ANNUAL PUMPOUT SCHEDULE - HEMLOCK APARTMENTS	
Building #1: September	**Building #4: March**
Building #2: November	**Building #5: May**
Building #3: January	**Building #6: July**

Septage should be transported to Essex Septage Lagoons.
If emergency pumpout is required, contact the Sanitarian's office prior to pumping.

To avoid future failures of these systems, it is imperative that you implement the above course of action in a timely manner. **Please note that all repairs and engineered as-built plans must be completed by September 30, 1996. Please sign in the space provided below that you have read and understand the conditions of this repair approval.** Thank you for your cooperation in this matter.

Sincerely,

Carol L. Speer, R.S.
Sanitarian

I have read and understand the conditions of this permit approval.

_____ _____
Property Owner Date

cc: Warren Herzig, DEP
Frank Stellato, Property Manager
J. Robert Pfanner, J. Robert Pfanner & Assoc., P.C.
Dr. Christopher Goff, Health Director
Al Wolfgram, Chairman, WPCA

HEMLOCK APARTMENTS
QUARTERLY REPORT

SUBSURFACE DISPOSAL SYSTEM MAINTENANCE

TIME PERIOD COVERED BY THIS REPORT:

MONTHS OF _____ _____ _____ **YEAR** _____

Inspection Item:	Building Number					
	1	2	3	4	5	6
Dates of Monthly Inspections: Walkover of septic area						
Pump Chamber Inspection(#5)						
Average Monthly Water Usage:						
Scheduled Pumpouts: Gallons Pumped						
Emergency Pumpouts: Gallons Pumped						
Quarterly Inspections (All Units)						
Date Tank Checked						
Baffle Condition						
Runback From Leaching?						
Obvious Plumbing Leaks?						
Other Comments:						

SEND THIS REPORT QUARTERLY TO:

ESSEX HEALTH DEPARTMENT
P.O. BOX 98
ESSEX, CT 06426

APPENDIX S.18

1996 AND 1997 ANNUAL REPORTS

TOWN OF ESSEX
Water Pollution Control Authority
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426

October 20, 1997

Water Management Bureau – Municipal Facilities
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Att: Dennis Greci, Supervising Sanitary Engineer

Dear Mr. Greci:

In compliance with DEP Orders 3099 Step C and 3100 Step C, we are pleased to submit the attached Annual On-Site Wastewater Management Report for the year 1996. This report includes data previously submitted in our report dated February 4, 1997, as well as additional information and analysis requested by your department.

If you have any questions regarding this report, please contact Carol L. Speer, Chief Sanitarian, at 860-767-4343.

Submitted by:

Alvin Wolfgram, P.E.
Chairman, Essex WPCA

Carol L. Speer, R.S.
Chief Sanitarian

Enclosures

TOWN OF ESSEX
WATER POLLUTION CONTROL AUTHORITY

ON-SITE WASTEWATER MANAGEMENT
1996 ANNUAL REPORT

CONTENTS:

1996 ANNUAL REPORT

SUMMARY FINDINGS

Wastewater management proposals for the Town of Essex were the subject of critical analysis and substantive revision during the year 1996. Pursuant to DEP Order No. 4768, as revised, the Water Pollution Control Authority has retained the firm of Fuss & O'Neill to finalize a study of the town's wastewater disposal needs, and to prepare a schedule for implementation of the selected alternative. The final draft of the Facilities Study and an accompanying Wastewater Management Ordinance must be presented to the Essex Town Meeting for approval prior to official submission to the Department of Environmental Protection. Finalization of these approvals is currently scheduled for winter, 1998.

During the year 1996 the Essex Septage Treatment Facility received and treated almost 480,000 gallons of septage from Essex properties. In addition, the Deep River Sewage Treatment Facility received over 287,000 gallons of septage from Essex pumpouts. One lagoon was cleaned and refurbished this year. A policy change was made limiting use of the Essex Treatment Facility to residential customers; as of June 1996, all commercial and industrial septage generated in Essex will be taken to other treatment facilities.

Review of prior water testing results, along with more recent testing in the Essex village area, indicates that overall water quality in the three villages is not adversely affected by the use of on-site sewage disposal systems. Recommended improvements in the Essex Village area will be addressed in the Facilities Study. Structural improvements to undersized or poorly functioning septic systems in the area have been on-going during 1996.

The Essex Health Department instituted a number of programs and procedures in 1996 designed to strengthen enforcement of Public Health Code requirements for septic installations and repairs in all areas of Essex. Other wastewater management practices implemented this year were record keeping improvements, increased abatement order compliance and development of public education programs.

I. OVERVIEW OF WASTEWATER MANAGEMENT SYSTEM

A. Prior Wastewater Studies

An engineering report entitled, "Wastewater Facilities Plan for a Sewer Avoidance Program for the Town of Essex Connecticut", dated September 1979, revised March, 1980 and May 1981, by Malcolm Pirnie, Inc., and approved in part on July 20, 1981, was the basis for Orders No. 3099 and 3100 issued by the Connecticut Department of Environmental Protection and dated August 10, 1981. This Annual Report is prepared in compliance with Step C of those orders.

The original study by Malcolm Pirnie proposed several structural solutions to the wastewater disposal needs of the Essex village area. These proved unfeasible, and in a 1987 report the firm recommended additional studies to determine an alternative plan for wastewater treatment. Malcolm Pirnie also identified one section of Ivoryton as an area of concern that would need additional monitoring. The remaining areas of town had no disposal problems that could not be managed by on-site wastewater treatment.

B. Current Engineering Study

Subsequently, DEP Order No. 4768, issued on December 21, 1988 and modified on June 15, 1990, required the town to retain an engineering firm to evaluate the town's wastewater disposal needs, develop alternative solutions and prepare a schedule for implementation.

The firm of Fuss & O'Neill, Inc., has prepared a draft of such a report, and this draft is currently being evaluated by town officials. It is hoped that the report will be finalized and presented to the Town Meeting in early 1998.

C. Proposed Wastewater Management Ordinance

In conjunction with, and as part of, the proposed wastewater management program outlined in the current engineering study, a Wastewater Management Ordinance was prepared by the Water Pollution Control Authority during 1996. This ordinance is currently being reviewed by legal and technical resources and will be finalized along with the engineering report in early 1998.

D. 1996 Wastewater Management Improvements

Many of the procedures and policies for managing on-site wastewater disposal systems that will be recommended in the above-mentioned engineering report have already been implemented during the year 1996. Specific changes made by the Health Department during this year include:

- Computerized record keeping of all well and septic permits, plan approvals, septic pumpout reports and well potability reports.

- Engineered plans are required for all new septic installations in the Town of Essex; as-built drawings are also prepared by the engineer.
- More stringent requirements for subdivision testing were instituted.
- Budgeting during 1996 will allow for sanitary survey walkovers to be done during the summer of 1997.
- All building permit applications are reviewed by the Health Department and signed off prior to issuance by the Building Department. Septic improvements are required when justified by type of improvement or current septic capacity.

Further procedural changes will be implemented when the proposed ordinance has been approved.

II. SEPTAGE COLLECTION AND DISPOSAL

A. Septage Generation

The Essex Septage Treatment Facility received and treated 479,850 gallons of septage during 1996. Of that total, 329,950 gallons were from one or two family residential properties, while 149,900 gallons were from multi-family residential or commercial properties. In addition, the Deep River Wastewater Treatment Facility received 287,950 gallons of septage and/or grease from Essex properties. Please see Attachment 1 for detailed gallonage by month.

A cursory analysis of these numbers shows that a minimum of 330 homes (at 1000 gallons/home) pumped their septic tanks during 1996 – a minimum of 16% of the 2105 residential properties in Essex. Since some of the Deep River septage was generated from residential properties at times when the Essex Lagoon was closed, the actual number and percentage would be higher. It is difficult to estimate the number of commercial or multi-family properties which pumped in 1996 since the raw data is not computerized and we would have to go through the individual reports from Deep River to obtain the data. There are 188 non-single-family properties in Essex.

During 1996 the lagoon accepted both residential and commercial septage, but in December 1996, the policy was changed so that only residential septage was allowed at the Essex facility. Attachments 2, 3, and 4 were sent to haulers at that time. Future reports will thus be able to more definitively estimate the number of properties pumped each year. As we initiate a Permit to Discharge renewal system, we will also track pumpouts and inspections at that time.

B. Septage Disposal Facilities

The Essex Septage Disposal Facility is maintained on leased land by the Essex Water Pollution Control Authority. The facility is staffed at all hours when the lagoon is available, and kept locked at other times. Pumpers obtain permits to dump at a cost of $25.00 per 1500 gallons, and no dumping is permitted unless the operator is presented with properly completed permit (see Attachment 5). Only residential septage is accepted at the facility. The WPCA has instituted a program to clean one lagoon each year to improve the operational efficiency of the facility. As part of this program, lagoon #3 was cleaned and refurbished during 1996, and all three lagoons are now performing well.

It is our understanding that a regional septage lagoon study was to be undertaken by the DEP in an effort to evaluate the needs and resources of the many area towns who now depend on lagoon facilities. This study was initially proposed in 1994, but we have not heard from the DEP regarding their findings.

Commercial and industrial wastewater may be hauled to any appropriate disposal site by a licensed hauler. At present, most of this septage appears to be going to the Deep River facility. Further refinements of our tracking system and Permit to Discharge system may give us better information in this regard. At present, the Town of Essex does not have a contract with the Deep River facility. Should this become an attractive or essential requirement for the town, the Water Pollution Control Commission will investigate such an agreement.

III. SURFACE AND GROUND WATER TESTING

A. Prior Test Results – Connecticut River and Coves

Surface water test results from seven sites in North and Middle Coves, and the Essex channel of the Connecticut River are listed in Attachment 6. Testing was done in 1989 and 1993. These results show no significant concentrations of ammonia or nitrate nitrogen (average concentrations <0.61 mg/L, max 1.47 mg/L). Fecal coliform concentrations were well within reasonable limits with the exception of August 1989, in Middle Cove. These results are unusual enough to suggest a specific one-time event – perhaps related to bird concentrations, vessel pumpouts, or a land-based septic problem. Testing results from October 1989 and August 1993 showed no evidence of this coliform event.

B. Prior Test Results – Falls River Watershed

Attachment 7 shows water quality testing done in May and August 1989 at nine surface water site along the Falls River watershed. All parameters meet drinking water standards with the exception of low background levels of fecal coliform, usually attributed to bird or animal activity. Only one reading was above the bathing water standard for coliform bacteria, and that event showed no elevations of nitrate, ammonia or surfactant levels which might indicate a septic event.

C. Essex Village Testing

Attachment 8 (Fuss & O'Neill correspondence to Randy May) lists nitrate-N, ammonia-N and total coliform levels in ten monitoring wells in the Essex Village area from 1989 through 1996. Coliform bacteria levels in 1996 were all well below background levels. Replacement of a broken cover on MW-5 in April 1996 is reflected in the low coliform levels in July 1996. Ammonia and nitrate levels in eight of ten wells were within drinking water limits in July 1996. Two wells showed nitrate levels just above the drinking water standard of 10 mg/l (MW-7A, 12.6 mg/l and MW-10A, 12.6 mg/l). Monitor wells 2 and 8 showed elevated ammonia levels (3.93 mg/l and 8.89 mg/l).

We note the following two conditions in this area: (1) Essex Village includes many old residential properties served by undersized, and probably underperforming, septic systems, and (2) much of the surface runoff is diverted to understreet drainage and moved directly to the Connecticut River at the ends of Pratt and Main Streets. These factors undoubtedly impact the normal nitrogen renovation and dilution processes in this area.

Essex Village is served by a public water utility, and the aquifer area beneath the town is not proposed for any public or private water well sites. The Facilities Plan now being prepared will address all of these issues in further detail.

D. Current Well Water Testing

Well water sampling done in May 1989 and August 1989 (Attachment 9) showed drinking water standards consistently met in all but three of the fourteen wells tested. These were all shallow dug wells, and unsealed casings or surface events may have affected water quality. The parameters of greatest concern were elevated levels of chlorides (although below drinking water limit) and sodium (three wells above notification level). Of the thirty well water tests reported to this department in the past 18 months, only one coliform bacteria level was detected, and that did not appear in repeat testing.

IV. ON-SITE SANITARY SYSTEMS

A. Repairs

Thirty-two existing septic systems, or 1.4% of Essex properties, were repaired or modified during 1996 (see Attachment 10, and map Attachment 11). In the future, both the reason for the repair and the age of the system will be tracked in our data base, but that information was not noted on repair permits during 1996. My review shows that the majority of those repairs which were related to failures involved systems older than 20 years (one repair replaced an outhouse). A major repair was completed, with DEP approvals, for the Hemlock Apartments on Pond Meadow Road.

B. New Systems

Nineteen new septic installations were done in Essex during 1996. All were residential installations that met public health code standards.

C. Plan Approvals and Procedural Changes 1996

It is anticipated that the policy and procedural changes implemented during 1996, as outlined in Section I.D. above, will be a major factor in improving the quality of future on-site sewage disposal facilities installed in Essex. In addition, walkovers scheduled to begin in 1997 will identify problem systems and problem areas in a systematic fashion. Wastewater management policies that could be implemented without ordinance approval are in place at this time. Further information on these items will be included in the Fuss & O'Neill study.

V. PUBLIC AWARENESS PROGRAM

Information on proper operation and maintenance of subsurface sewage disposal systems is sent to all owners of newly installed, repaired or modified systems, and to purchasers of existing properties in town. Additional information is available at the Health Department. Well water testing results are explained in a memo to the homeowner, along with suggestions for water treatment, if necessary or recommended.

We have written newspaper and town newsletter articles highlighting proper maintenance for septic systems, and will continue to do so at every opportunity. Further information on town-wide wastewater management will be addressed during the public hearing sessions in consideration of the proposed ordinance.

VI. ATTACHMENTS

ATTACHMENT 1

ESSEX SEPTAGE PUMP-OUTS

1996 ANNUAL REPORT

MONTH	*ESSEX RESIDENTIAL*	*COMMERCIAL & CONDOS*	*ESSEX TOTAL*	*DEEP RIVER TOTAL*	*1996 TOTAL*
January	16,250	5,000	21,250	9,100	30,350
February	13,100	25,600	38,700	12,650	51,350
March	19,400	7,200	26,600	15,700	42,300
April	31,750	13,000	44,750	9,800	54,550
May	24,250	18,700	42,950	33,050	76,000
June	16,350	6,450	22,800	32,900	55,700
July	26,500	17,250	43,750	27,000	70,750
August	17,150	18,500	35,650	40,700	76,350
September	40,500	5,000	45,500	28,450	73,950
October	30,750	5,200	35,950	46,450	82,400
November	42,200	15,000	57,200	30,650	87,850
December	51,750	13,000	64,750	1,500	66,250
TOTAL	**329,950**	**149,900**	**479,850**	**287,950**	**767,800**

ATTACHMENT 2

TOWN OF ESSEX
SEPTAGE TREATMENT
AND DISPOSAL POLICY

TOWN OF ESSEX
WATER POLLUTION CONTROL AUTHORITY
ESSEX, CONNECTICUT

1. The WATER POLLUTION CONTROL AUTHORITY (WPCA) for the Town of Essex, Connecticut is the Town's designated water pollution control authority, as provided in Section 7-245 et, seq., of the Connecticut General Statutes, as amended and has the powers and responsibilities conferred by said statutes and Town ordinances. The WPCA is responsible for regulating septage treatment and disposal in the Town of Essex, in accordance with federal, state and local regulations.

2. DEFINITIONS:

a. Commercial User: A commercial user shall be as defined in the current Town of Essex Zoning Regulations including healthcare, daycare, retail, restaurants, medical and residential life care facilities.

b. Industrial User: An industrial user shall be as defined in the current Town of Essex Zoning Regulations.

c. Residential User: A residential user shall be defined as single and multi-family residences, public schools, municipal offices and buildings, non-profit organizations (such as churches and museums).

d. Other Users: All users not defined above.

3. SEPTAGE DISPOSAL POLICY

a. Commercial users shall be required to provide transportation, treatment and disposal of septage waste at an out-of-town facility in conformance with policies, regulations and ordinances of the Town of Essex and the State of Connecticut.

b. Industrial users shall be the same as commercial users.

c. Residential users shall be allowed to use the Essex Septage Lagoon Site for transportation, treatment and disposal of on-site generated septage waste.

d. Septage disposal for those users identified as "Other Users" in Item 2.d. above will be reviewed and acted upon by the WPCA on an individual basis as requested.

4. ESSEX SEPTAGE LAGOON SITE DISPOSAL SCHEDULES

a. Single family residences shall be allowed use of the Essex Septage Lagoon Site during all normal hours of operation. Normal hours of operation shall be as scheduled by the WPCA.

ATTACHMENT 2

b. Multi-family residential developments with ten(10) family dwelling units or less are allowed use of Essex Septage Lagoon Site as per 4.a. Single family residence.

c. Multi-family residential developments with more than ten(10) family dwelling units and that will be using the Essex Septage Lagoon Site for septage treatment and disposal shall be required to set up an annual disposal schedule with the Town Sanitary or Chairman, WPCA. Unscheduled use of the Essex Septage Lagoon Site outside the approved dumping schedule will not be allowed unless it is an emergency authorized by the Town Sanitarian or Director of Health.

d. Dumping schedules for those users identified as "Other Users" in 2.d. above will be reviewed and acted upon by the WPCA on an individual basis.

5. FEE SCHEDULES:

a. Users of the Essex Septage Lagoon Site are required to purchase one (1) disposal permit prior to septic system pumping for each individual septic system site up to a maximum of 1500 gallons or portion thereof to be discharged at the Essex Septage Lagoon Site. The disposal permit is entitled ESSEX WATER POLLUTION CONTROL AUTHORITY PERMIT TO DISPOSE OF SEPTIC TANK PUMPING.

b. Each disposal permit shall be properly completed and all information requested shall be supplied at the time of septic system pumping.

c. The required number of properly completed disposal permits shall signed by the Essex Septage Lagoon Site attendant prior to use of the Essex Septage Lagoon Site. No discharge at the Essex Septage Lagoon Site will be allowed without proper disposal permits. The attendant has the right to verify disposal permit information prior to allowing discharge at the Essex Septage Lagoon Site.

d. The fee schedule for treatment and disposal of septage waste at the Essex Septage Lagoon Site is currently $ 25/disposal permit. The WPCA reserves the right to periodically modify this fee.

e. A sample disposal permit is attached for reference.

This POLICY has been adopted by the Water Pollution Control Authority, Town of Essex. Connecticut on December 9, 1996.

Alvin G. Wolfgram, Chairman
Water Pollution Control Authority
Town of Essex, Connecticut

ATTACHMENT 3

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

To: All Septic Cleaners

Re: Town of Essex Septage Disposal Policy

Enclosed please find a copy of the Town of Essex Septage Treatment and Disposal Policy. Please read the policy and pass the pertinent information on to your employees. Please note the following items contained in this policy:

- **ALL RESIDENTIAL SEPTAGE IS ACCEPTED AT THE ESSEX LAGOONS.** Septage from both single and multi-family residential units is accepted, although complexes with more than 10 residential units are scheduled by the Health Department. See Mike Birner or Carol Speer if you have questions regarding this schedule.

- **SEPTAGE FROM TOWN BUILDINGS, PUBLIC SCHOOLS, AND NON-PROFIT ORGANIZATIONS IS ACCEPTED AT THE ESSEX LAGOONS.** Examples of non-profit organizations include the museums, veteran's organizations, and churches.

- **NO COMMERCIAL OR INDUSTRIAL SEPTAGE IS ACCEPTED AT THE ESSEX LAGOONS.** Health care, daycare, retail, restaurants, medical and residential life care facilities are considered Commercial Users per this policy.

- Septage from each property shall be accompanied by a disposal permit paid for in advance, submitted at time of disposal. One permit is good for up to 1500 gallons. A sample permit is enclosed for your review.

- **ALL PERMITS MUST BE FILLED OUT COMPLETELY.** We are implementing a Sewer Avoidance Policy which includes a regular pump out schedule for all properties in town. We prefer to use the information supplied by licensed cleaners during normal pumpouts rather than requiring scheduling with a Health Department employee to oversee the pumpout and inspection. This means that we must be able to rely on your cleaners for <u>complete and accurate system information.</u>

Thank you for your cooperation and support in keeping the Essex Septage Disposal Facility operating as a low-cost disposal option for the town's residents. If you have further questions, please call the Essex Health Department at 860-767-4343.

Attachment 4

THE ESSEX LAGOON

DOES ACCEPT

SEPTAGE FROM:

ALL SINGLE FAMILY RESIDENCES

ALL CONDOS

ALL APARTMENT BUILDINGS

TOWN BUILDINGS

PUBLIC SCHOOLS

NON-PROFIT ORGANIZATIONS
(Churches, Museums, Civic Organizations)

THE ESSEX LAGOON

DOES NOT ACCEPT

SEPTAGE FROM:

RESTAURANTS

HEALTH CARE FACILITIES

DAY CARE FACILITIES

RETAIL STORES

INDUSTRIES

MEDICAL OFFICES

LIFECARE (Essex Meadows)

ATTACHMENT 5

Disposal Permit No. **Office Use: Map ____ Lot ____**

ESSEX WATER POLLUTION CONTROL AUTHORITY
PERMIT TO DISPOSE OF SEPTIC TANK PUMPAGE

ONE PERMIT MUST BE PREPAID AND COMPLETED FOR EACH ADDRESS PUMPED
A MAXIMUM OF 1500 GALLONS MAY BE PUMPED PER PERMIT
LARGER TANKS REQUIRE ONE PREPAID DISPOSAL PERMIT FOR EACH 1500 GALLONS

PUMPOUT INFORMATION

Date: _____ Company Name: _____
Truck Marker No.: _____ Tank Capacity: _____ Vehicle Condition: _____
Service Type: Routine _____ Repair _____ Suspected Problem _____ Buyer Insp. _____

Address Pumped: _____ Amount Pumped: _____
Owner/Resident: _____ Phone: _____

Property Type: Residential Single Family ____ Residential Multi-Family ____ No. of Units ____
Commercial ____ Industrial _____ Other _____

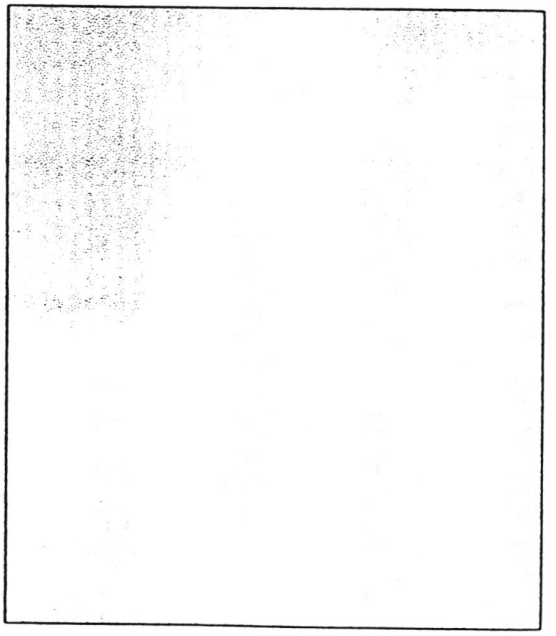
INSPECTION REPORT

Septic Tank
Size: _____ Gal.
No. Compartments: _____
Cesspool Only _____
Baffles: Inlet Condition: _____
Replaced/Repaired
Outlet Condition: _____
Replaced/Repaired
Depth of Scum: _____ Inches
Depth of Sludge: _____ Inches

Pump Chamber _____ Yes _____ No
If Yes, Pumped? _____
Pump Condition: _____

Leaching
Effluent Runback: _____ Yes _____ No
Effluent Surfacing: _____ Yes _____ No
Pumped Drywell: _____ Yes _____ No

Diagram of System
Tank Top _____ Inches Below Grade



Form must be completed by pumper and signed by Lagoon Attendant prior to dumping.

Driver: _____ Attendant: _____

ATTACHMENT 6

TABLE 1
CONNECTICUT RIVER WATER QUALITY DATA
ESSEX WASTEWATER MANAGEMENT STUDY

SURFACE WATER (CLASSIFICATION SB)

LOCATION	DATE	NO_3	NH_3	F.C.
SW-10	5/23/89	1.40	0.13	1
	8/29/89	0.2	0.88	117
	10/27/89	<0.5	0.32	144
	8/27/93	0.36	0.08	26
SW-11	5/23/89	1.34	0.13	0
	8/29/89	0.25	0.61	84
	10/27/89	<0.5	0.29	158
	8/27/93	0.44	<0.05	46
SW-12	5/23/89	1.34	0.13	10
	8/29/89	<0.1	0.44	71
	10/27/89	<0.5	0.28	180
	8/27/93	0.47	0.08	38
SW-13	5/23/89	1.40	<0.05	0
	8/29/89	0.25	0.61	>2,400
	10/27/89	<0.5	0.28	350
	8/27/93	0.48	<0.05	61
SW-14	5/23/89	1.34	0.66	4
	8/29/89	0.3	0.61	>2,400
	10/27/89	<0.5	0.26	154
	8/27/93	0.42	<0.05	46
SW-15	5/23/89	1.34	0.13	1
	8/29/89	0.2	0.53	>2,400
	10/27/89	<0.5	0.28	350
	8/27/93	0.42	0.09	83
SW-16	5/23/89	---	---	---
	8/29/89	0.25	0.53	400
	10/27/89	<0.5	0.24	800
	8/27/93	0.41	<0.05	67
AVERAGE	8/29/89	0.21	0.60	
	8/27/93	0.43	0.05	

STANDARD FOR SB			---	200 log mean 400 for <10% of samples

NOTES:
NO_3 = Nitrate, mg/L as N
NH_3 = Ammonia, mg/L as N
F.C. = Fecal Coliforms, Colonies/ 100 ml

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 5/23/89

PARAMETER	SW-1 AM	SW-2 AM	SW-3 AM	SW-4 AM	SW-5 AM	SW-6 AM	SW-7 AM	SW-8 AM	SW-9 AM
COLIFORM, FECAL (per 100 mls)	<1.1	32	<1.0	11	1	18	17	7	1
SURFACTANTS (MBAS) (mg/l)	<.01	<.01	0.04	0.01	0.04	0.02	0.02	<.01	<.01
PHOSPHATE, ORTHO (mg/l)	<0.01	<0.01	0.01	<0.01	<0.01	0.15	<0.01	<0.01	0.01
CHLORIDE (mg/l)	11.78	7.0	18.8	11.78	14.1	14.1	30.6	14.1	11.78
SODIUM (mg/l)	4.5	5.5	13	6.0	8.2	14	19	7.0	8.1
NITRATE as N (mg/l)	0.48	1.83	2.00	1.50	2.00	1.60	2.00	1.34	1.68
AMMONIA as N (mg/l)	<.05	<.05	6.6	<.05	.198	<.05	.85	<.05	<.05
FIELD CONDITIONS									
TEMPERATURE (oC)	20.0	20.4	13.7	20.6	20.0	21.8	26.7	23.0	20.8
SPECIFIC CONDUCTANCE (umhos/cm)	61.05	66.0	140.8	64.8	105.45	162.64	194.0	81.12	97.2
pH	5.18	5.0	5.17	4.93	4.81	4.73	4.9	4.85	4.86

ATTACHMENT 7

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 5/23/89

PARAMETER	SW-1 PM	SW-2 PM	SW-3 PM	SW-4 PM	SW-5 PM	SW-6 PM	SW-7 PM	SW-8 PM	SW-9 PM
COLIFORM, FECAL (per 100 mls)	<1.0	0	3	2	4	27	13	15	6
SURFACTANTS (MBAS) (mg/l)	<.01	<.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
PHOSPHATE, ORTHO (mg/l)	<0.01	<0.01	0.01	0.01	0.02	0.07	0.01	<0.01	0.06
CHLORIDE (mg/l)	7.0	11.78	21.2	9.42	14.1	14.1	30.6	7.0	14.1
SODIUM (mg/l)	4.5	5.7	13	6.0	8.2	10	19	7.2	8.1
NITRATE as N (mg/l)	0.50	1.80	2.03	1.54	2.00	2.06	1.80	1.34	1.58
AMMONIA as N (mg/l)	<.05	.066	.26	<.05	.198	.26	.59	<.05	0.66
FIELD CONDITIONS									
TEMPERATURE (oC)	22.0	20.2	15.3	20.3	19.6	21.2	23.0	21.4	20.8
SPECIFIC CONDUCTANCE (umhos/cm)	68.9	77.7	146.4	65.4	100.8	172.8	208.0	80.25	88.56
pH	4.93	4.98	4.89	5.08	4.97	4.89	4.96	4.99	4.96

ATTACHMENT 7

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 8-25-89

PARAMETER	SW-1 AM	SW-2 AM	SW-3 AM	SW-4 AM	SW-5 AM	SW-6 AM	SW-7 AM	SW-8 AM	SW-9 AM
COLIFORM, FECAL (per 100mls)	7	56	50	70	50	80	60	31	50
MBAS SURFACTANTS (mg/l)	0.062	0.044	1.76	0.031	0.032	0.037	0.047	0.041	0.032
O-PHOSPHORUS (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
CHLORIDE (mg/l)	3.8	10.4	15.1	7.5	13.2	12.3	21.7	10.4	11.3
SODIUM (mg/l)	4.7	6.0	15	5.3	8.1	9.8	16	5.9	6.9
NITRATE AS N (mg/l)	<0.1	0.56	2.05	0.1	<0.10	0.88	<0.1	0.18	0.2
AMMONIA AS N (mg/l)	<0.05	0.21	0.76	0.08	0.17	0.42	0.34	0.34	0.17
FIELD CONDITIONS									
TEMPERATURE (oC)	19.4	18.8	17.1	20.4	19.9	19.6	25.7	22.8	22.3
SPECIFIC CONDUCTANCE (umhos/cm)	68.32	90.4	165.2	65.4	108.78	181.44	88.11	72.8	82.95
pH	6.23	6.23	6.4	6.33	5.82	6.37	8.72	6.58	6.38

ESS8

ATTACHMENT 7

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 8-25-89

PARAMETER	SW-1 PM	SW-2 PM	SW-3 PM	SW-4 PM	SW-5 PM	SW-6 PM	SW-7 PM	SW-8 PM	SW-9 PM
COLIFORM, FECAL (per 100mls)	4	40	>2400	55	34	46	5	45	32
MBAS SURFACTANTS (mg/l)	0.045	0.026	0.063	0.04	0.162	0.04	0.046	0.042	0.042
O-PHOSPHORUS (mg/l)	<0.01	<0.01	0.03	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
CHLORIDE (mg/l)	6.6	11.3	16.9	8.5	13.2	12.3	23.6	11.3	11.3
SODIUM (mg/l)	4.8	6.9	15	5.6	8.2	10	16	6.4	6.7
NITRATE AS N (mg/l)	<0.10	0.46	0.38	0.23	<0.1	0.85	0.21	0.19	0.21
AMMONIA AS N (mg/l)	0.42	0.17	0.51	0.08	0.68	0.25	0.34	0.42	0.17
FIELD CONDITIONS									
TEMPERATURE (oC)	24.8	21.5	18	22.1	20.3	21.7	27.4	23.6	23.5
SPECIFIC CONDUCTANCE (umhos/cm)	78	95.23	161	66.78	111.18	187.25	171	75.19	82.4
pH	6.22	6.24	6.36	6.36	5.86	6.43	9.03	6.46	6.34

ESS8

ATTACHMENT 7

ATTACHMENT 8

TABLE 2
HISTORICAL GROUNDWATER QUALITY DATA
ESSEX WASTEWATER MANAGEMENT STUDY

	STANDARD	NITRATE 10	AMMONIA	COLIFORM Note (1)
WELL	**DATE**			
MW-2	08/29/89	ND<0.1	12.1	NS
	08/26/93	ND<0.1	8.7	ND<2
	10/04/94	ND<0.1	4.2	9
	1/31/95	ND<0.1	4.5	23
	5/1/95	0.16	5	2
	7/14/95	ND<0.1	6.8	1600
	10/23/95	ND<0.4	5.2	34
	1/22/96	ND<0.01	3.85	42
	4/15/96	ND<0.01	4.24	8
	7/10/96	0.02	3.93	500
MW-5	08/29/89	5.75	0.35	NS
	08/26/93	7.7	0.13	8
	10/04/94	8.5	0.09	280
	1/31/95	7.7	0.09	>1600
	5/1/95	2.1	0.1	1600
	7/14/95	2.9	0.5	>1600
	10/23/95	0.11	ND<0.07	>1600
	1/22/96	2.16	0.70	>1600
	4/15/96	3.20	0.41	110
	7/10/96	5.77	0.29	23
MW-5A	1/22/96	13.2	2.61	300
	4/15/96	17.1	1.54	90
	7/10/96	10.7	0.30	90
MW-6	08/29/89	16	0.44	NS
	08/26/93	8.6	ND<0.05	ND<2
	10/04/94	16	ND<0.07	ND<10
	1/31/95	13	0.15	ND<2
	5/1/95	8.9	0.10	ND<2
	7/14/95	11	ND<0.07	80
	10/23/95	15	ND<0.07	50
	1/22/96	8.22	0.02	4
	4/15/96	8.43	0.10	ND<2
	7/10/96	8.58	0.03	11
MW-6A	1/22/96	0.55	0.12	>1600
	4/15/96	3.73	0.24	>1600
	7/10/96	1.58	0.13	170

ATTACHMENT 8

WELL	DATE	NITRATE	AMMONIA	COLIFORM
MW-7	08/29/89	6.9	0.18	NS
	08/26/93	2.1	0.84	ND<2
	10/04/94	0.99	0.46	ND<2
	1/31/95	1.9	0.37	500
	5/1/95	1.9	0.24	11
	7/14/95	3	0.3	190
	10/23/95	5	1.1	23
	1/22/96	2.92	1.58	900
	4/15/96	1.42	0.73	>1600
	7/10/96	5.22	1.77	13
MW-7A	1/22/96	16.0	0.34	50
	4/15/96	11.1	0.11	30
	7/10/96	12.6	0.12	0
MW-8	08/29/89	0.2	49.4	NS
	08/26/93	ND<0.1	45	ND<2
	10/04/94	4.7	14	ND<2
	1/31/95	0.47	9.2	ND<2
	5/1/95	0.50	6.2	ND<2
	7/14/95	NS	NS	NS
	10/23/95	0.53	2.9	14
	1/22/96	20.1	4.35	23
	4/15/96	3.24	6.09	ND<2
	7/10/96	3.83	8.89	0
MW-9	08/29/89	3.9	0.44	NS
	08/26/93	5.2	ND<0.05	ND<2
	10/04/94	ND<0.1	ND<0.07	20
	1/31/95	3.9	ND<0.07	ND<2
	5/1/95	4	ND<0.07	ND<2
	7/14/95	4.6	ND<0.07	4
	10/23/95	4	0.14	80
	1/22/96	3.70	0.18	220
	4/15/96	3.95	ND<0.02	27
	7/10/96	4.75	0.06	0
MW-10A	1/22/96	8.00	0.06	300
	4/15/96	10.9	0.06	900
	7/10/96	12.6	0.09	23

NOTES:

(1) Not to exceed a monthly average of 1, or 4 in any single sample.

NO3 = Nitrate, mg/l
NH3 = Ammonia, mg/l
T.C. = Total Coliform, Colonies or MPN per 100 ml
ND = Not Detected
NS= Not Sampled

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 5/17/89, 5/19/89

PARAMETER	W-1	W-2	W-3	W-4	W-5	W-6	W-7
COLIFORM, FECAL (per 100 mls)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
SURFACTANTS (MBAS) (mg/l)	0.02	0.01	0.032	0.03	0.03	0.02	<0.01
PHOSPHATE, ORTHO (mg/l)	0.05	0.02	0.02	0.04	0.03	0.02	<0.01
CHLORIDE (mg/l)	33.6	2.16	125.8	184.4	20.6	7.59	10.8
SODIUM (mg/l)	20	2.6	76	99	14	4.1	6.4
NITRATE as N (mg/l)	0.88	0.24	0.85	1.62	3.23	0.35	1.18
AMMONIA as N (mg/l)	<.05	.132	<.05	<.05	<.05	<.05	<.05
FIELD CONDITIONS							
DEPTH TO WATER (FT)	N/A	4.0	N/A	8.7	3.2	4.2	6.0
TEMPERATURE (oC)	12	12.0	12	11	12	12	15
SPECIFIC CONDUCTANCE (umhos/cm)	219.5	66.5	480.0	698.7	199.5	106.4	93.0
pH	6.63	6.63	5.99	6.07	6.34	6.08	6.01

ATTACHMENT 9

ESSEX - WASTEWATER MANAGEMENT STUDY
WATER QUALITY TESTING RESULTS

DATE SAMPLES TAKEN: 8-25-89

PARAMETER	W-1	W-2	W-3	W-4	W-5	W-6	W-7	W-8	W-9	W-10
COLIFORM, FECAL (per 100mls)	2	0	0	0	0	11	0	0	0	0
MBAS SURFACTANTS (mg/l)	<0.01	<0.01	0.03	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
O-PHOSPHORUS (mg/l)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
CHLORIDE (mg/l)	16.9	3.8	83	74.5	16.9	11.3	7.5	19.8	7.5	4.7
SODIUM (mg/l)	16	3.3	76	65	16	6.7	6.3	16	7.1	5.1
NITRATE AS N (mg/l)	0.9	0.1	6.4	1.8	5	0.1	1.1	1.2	1.9	0.15
AMMONIA AS N (mg/l)	0.17	0.42	0.61	0.25	0.42	0.34	0.18	0.7	0.44	0.35
FIELD CONDITIONS										
DEPTH TO WATER (FT)	5.29	6.21	N/A	8.96	3.21	7.21	6	9.5	7.88	7.21
TEMPERATURE (oC)	18.6	18.3	17.4	17.3	16.9	17.1	19.3	20.5	18	16.8
SPECIFIC CONDUCTANCE (umhos/cm)	160.74	68.4	446.6	407.16	180.54	133.34	77.28	136.25	81.65	94.4
pH	6.09	5.99	5.78	5.79	5.57	5.46	5.63	5.65	5.8	5.86

ESSE

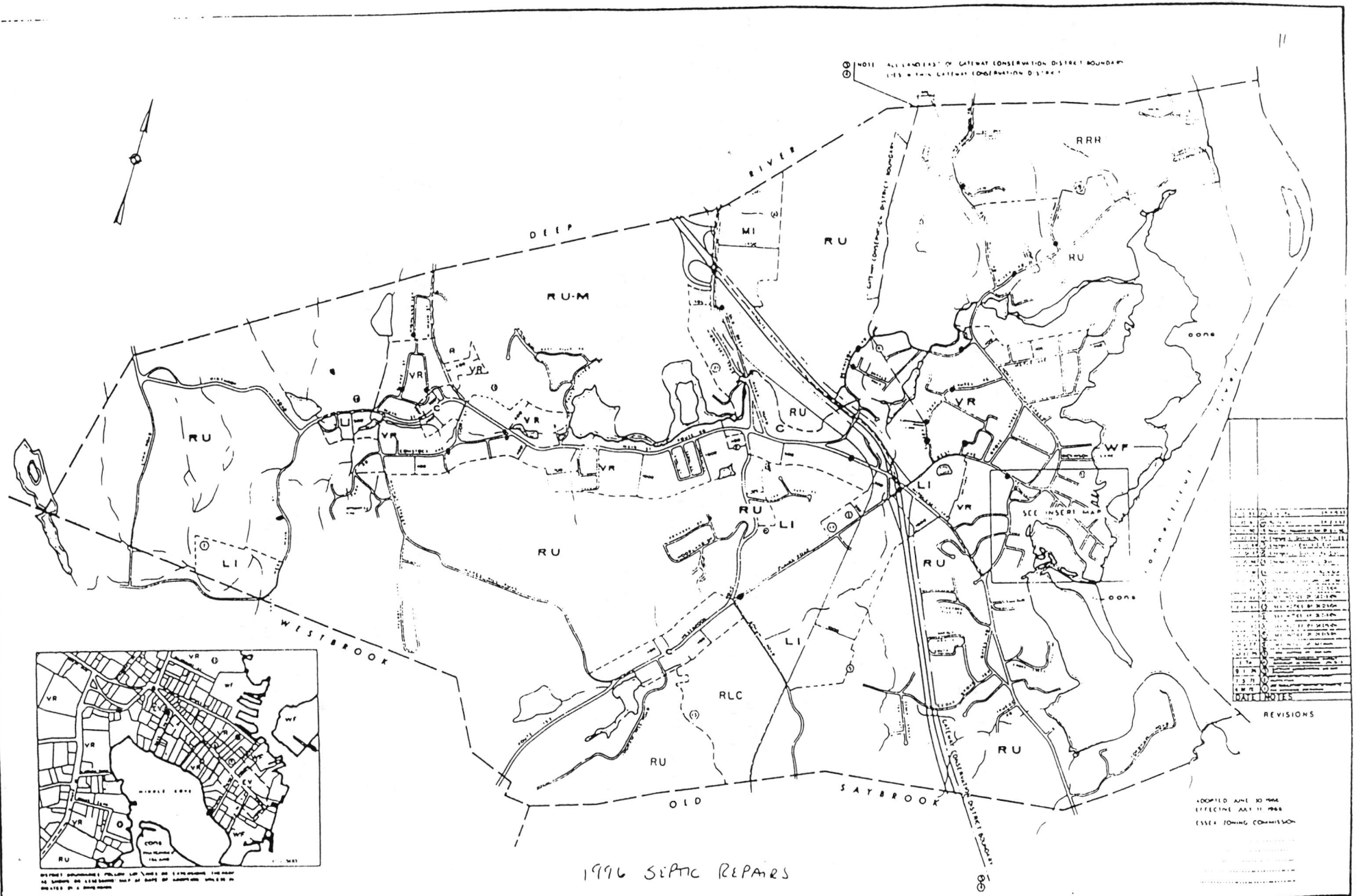
ATT ACHMENT 9

ATTACHMENT 10

ESSEX SEPTIC REPAIRS

1996 ANNUAL REPORT

MONTH	ADDRESS
January	
February	3 Dogwood Drive, Centerbrook
	38 River Road, Essex
March	5 Blake Street, Ivoryton
	16 Scholes Lane, Essex
April	27 Parker Terrace, Essex
	28 Laurel Road, Essex
	12 Hudson Lane, Essex
	15 Ridge Road, Centerbrook
May	
June	6 Comstock Avenue, Essex
July	7 Budney Hill, Ivoryton
	16 Main Street, Centerbrook
	19 West Avenue, Essex
	46 Ebony Lane, Ivoryton
	20 Meadow Woods, Essex
	3 Donald Road, Essex
	35 Old Deep River Road, Centerbrook
August	10 Main Street, Essex
	70 Dennison Road, Essex
	70 Pond Meadow Road, Ivoryton (Hemlock Apt.)
	70 Pond Meadow Road, Ivoryton (Hemlock Apt.)
	72 Main Street, Ivoryton
	10 Chestnut Street, Ivoryton
September	70 Pond Meadow Road, Ivoryton (Hemlock Apt.)
	70 Pond Meadow Road, Ivoryton (Hemlock Apt)
	70 Pond Meadow Road, Ivoryton (Hemlock Apt.)
	32 + 34 Pratt Street, Essex
	1 Main Street, Essex
	13 Highland Terrace, Ivoryton
	7 Dennison Road, Essex
October	36 Comstock Avenue, Ivoryton
	One Essex Square, Essex
	16 Main Street, Centerbrook
November	24 Navy Lane, Essex
	25 Sunset Terrace, Essex
	2 Champlin Square, Essex
December	Plains Road, Essex
	18 Sunset Terrace, Essex
TOTAL	32 REPAIRS



ATTACHMENT 11

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

January 26, 1998

Water Management Bureau – Municipal Facilities
Department of Environmental Protection
79 Elm Street
Hartford, CT 06106-5127

Att: Dennis Greci, Supervising Sanitary Engineer

Dear Mr. Greci:

In compliance with DEP Orders 3099 Step C and 3100 Step C, we are pleased to submit the attached Annual On-Site Wastewater Management Report for the year 1997. The report summarizes Essex wastewater management activities during the past year, and notes specific planned activities for the year 1998.

If you have any questions regarding this report, please contact Carol L. Speer, Chief Sanitarian, at 860-767-4343.

Submitted by:

Kenneth Wexler
Chairman, Essex WPCA

Carol L. Speer, R.S.
Chief Sanitarian

Enclosures
Cc: Peter Webster, First Selectman
Dr. Christopher Goff, Director of Health
Members, WPCA

TOWN OF ESSEX
WATER POLLUTION CONTROL AUTHORITY

ON-SITE WASTEWATER MANAGEMENT 1997 ANNUAL REPORT

CONTENTS:

1997 ANNUAL REPORT

SUMMARY FINDINGS

Wastewater management proposals for the Town of Essex were the subject of critical analysis and substantive revision during the year 1997. Pursuant to DEP Order No. 4768, as revised, the Water Pollution Control Authority has retained the firm of Fuss & O'Neill to finalize a study of the town's wastewater disposal needs, and to prepare a schedule for implementation of the selected alternative. The final draft of the Facilities Study and an accompanying Wastewater Management Ordinance must be presented to the Essex Town Meeting for approval prior to official submission to the Department of Environmental Protection. Finalization of these approvals is currently scheduled for winter, 1998.

During the year 1997 the Essex Septage Treatment Facility received and treated over 365,000 gallons of septage from Essex properties, a decrease of 24% from the previous year. In addition, the Deep River Sewage Treatment Facility received 362,500 gallons of septage from Essex pumpouts. The primary lagoon was cleaned and refurbished this year. Use of the Essex Treatment Facility is limited to residential customers; as of June 1997, all commercial and industrial septage generated in Essex was taken to other treatment facilities.

Review of prior water testing results, along with more recent testing in the Essex village area, indicates that overall water quality in the three villages is not adversely affected by the use of on-site sewage disposal systems. Recommended improvements in the Essex Village area will be addressed in the Facilities Study.

Repairs were made to 41 failed systems during 1997, 18 of which were more than 20 years old. An additional 16 systems were modified to accommodate additions, use changes or a property sale. Permits for 24 new residential and 3 new commercial systems were approved in 1997. Fifty-six plans for additions/renovations were reviewed by this department, and soil testing was done on 27 existing lots and 35 newly created lots.

Walkovers were done on 452 properties during the spring and summer of 1997. Of these properties, only 5, or 1.3% had confirmed septic failures. Data on well, septic and other drainage locations on these properties was collected for future use.

The Essex Health Department continued throughout 1997 to update procedures designed to strengthen enforcement of Public Health Code requirements for septic installations and repairs in all areas of Essex. A newly designed wastewater management database with GIS capabilities is being considered for implementation during 1998.

I. OVERVIEW OF WASTEWATER MANAGEMENT SYSTEM

A. Prior Wastewater Studies

An engineering report entitled, "Wastewater Facilities Plan for a Sewer Avoidance Program for the Town of Essex Connecticut", dated September 1979, revised March, 1980 and May 1981, by Malcolm Pirnie, Inc., and approved in part on July 20, 1981, was the basis for Orders No. 3099 and 3100 issued by the Connecticut Department of Environmental Protection and dated August 10, 1981. This Annual Report is prepared in compliance with Step C of those orders.

The original study by Malcolm Pirnie proposed several structural solutions to the wastewater disposal needs of the Essex village area. These proved unfeasible, and in a 1987 report the firm recommended additional studies to determine an alternative plan for wastewater treatment. Malcolm Pirnie also identified several sections of Centerbrook and Ivoryton as areas of concern that might need additional monitoring. The remaining areas of town had no disposal problems that could not be managed by on-site wastewater treatment.

B. Current Engineering Study

Subsequently, DEP Order No. 4768, issued on December 21, 1988 and modified on June 15, 1990, required the town to retain an engineering firm to evaluate the town's wastewater disposal needs, develop alternative solutions and prepare a schedule for implementation.

The firm of Fuss & O'Neill, Inc., has prepared a draft of such a report, and this draft is currently being evaluated by town officials. The report will be finalized and presented to town officials and the Town Meeting in early 1998.

C. Proposed Wastewater Management Ordinance

In conjunction with, and as part of, the proposed wastewater management program outlined in the current engineering study, a Wastewater Management Ordinance was prepared by the Water Pollution Control Authority, the draft of which underwent significant review and revision during 1997. This ordinance will be finalized along with the engineering report in early 1998.

D. 1997 Wastewater Management Improvements

Many of the procedures and policies for managing on-site wastewater disposal systems that will be recommended in the above-mentioned engineering report have already been implemented during the year 1997. The Health Department made substantitive improvements in the following areas during 1997:

- Computerized record keeping of all well and septic permits, plan approvals, septic pumpout reports and well potability reports.
- Engineered plans are now required for all new septic installations in the Town of Essex; as-built drawings are also prepared by the engineer.
- Following changes in well potability requirements by the CT Department of Public Health, a policy was written by the Essex Health Department and distributed to all local laboratories as well as builders and realtors. Results of new and existing well potability testing are now being stored in this office on a computerized database.
- More stringent requirements for subdivision testing were instituted and enforced.
- Walkovers on 452 properties were done during 1997.
- All building permit applications are reviewed by the Health Department and signed off prior to issuance by the Building Department. Septic improvements are required when justified by type of improvement or current septic capacity.

It is anticipated that further procedural changes will be implemented when the proposed ordinance has been approved.

II. SEPTAGE COLLECTION AND DISPOSAL

A. Septage Generation

The Essex Septage Treatment Facility received and treated 365,200 gallons of septage during 1997. Only those property types listed in Attachment 3 were allowed to send septage to the Essex Facility. For the most part, these are single or multi-family residential properties. In addition, the Deep River Wastewater Treatment Facility received 362,500 gallons of septage and/or grease from Essex properties. Please see Attachment 1 for detailed gallonage by month.

A simplified analysis of these numbers shows that a minimum of 365 properties (at 1000 gallons/property) pumped their septic tanks during 1997 – a minimum of 15% of the 2460 residential properties in Essex. Since some of the Deep River septage was generated from residential properties when the Essex Lagoon was closed for repairs during August and September, the actual number and percentage would be higher.

During 1997 the lagoon accepted only residential septage. Attachments 2, 3, and 4 define this policy and are sent to haulers regularly as a reminder. We have designed a Permit to Discharge (Attachment 5) renewal system, for all town properties. As of January 1, 1998, Permits to Discharge will be issued for both new and repaired systems. As the total database program is implemented, Permits to Discharge will be issued for all systems with satisfactory pumpout and inspection reports.

Commercial and industrial wastewater may be hauled to any appropriate disposal site by a licensed hauler. At present, most of this septage appears to be going to the Deep River facility. Further refinements of our tracking system and Permit to Discharge system may give us better information in this regard. At present, the Town of Essex does not have a contract with the Deep River facility. Should this become an attractive or essential requirement for the town, the Water Pollution Control Commission will investigate such an agreement.

B. Septage Disposal Facilities

The Essex Septage Disposal Facility is maintained on leased land by the Essex Water Pollution Control Authority. The facility is staffed at all hours when the lagoon is available, and kept locked at other times. Pumpers obtain permits to dump at a cost of $25.00 per 1500 gallons, and no dumping is permitted unless the operator is presented with properly completed permit (see Attachment 6). Only residential septage is accepted at the facility. The WPCA has instituted a program to clean one lagoon each year to improve the operational efficiency of the facility. As part of this program, lagoon #1 was cleaned and refurbished during 1997, and all three lagoons are now performing well.

It is our understanding that a regional septage lagoon study was to be undertaken by the DEP in an effort to evaluate the needs and resources of the many area towns that now depend on lagoon facilities. This study was initially proposed in 1994, but we are not aware of any current work in progress on such a report.

III. SURFACE AND GROUND WATER TESTING

A. Prior Test Results – Connecticut River and Coves

Surface water test results from seven sites in North and Middle Coves, and the Essex channel of the Connecticut River was done in 1989 and 1993. Results of this testing were included in our 1996 Annual Report, and will also be included in the final Fuss & O'Neill study. No further testing of the coves or river sites is planned at this time.

B. Prior Test Results – Falls River Watershed

Water quality testing done in May and August 1989 at nine surface water site along the Falls River watershed. These results were included in our 1996 Annual Report, and will also be included in the final Fuss & O'Neill study. In addition, several sites along the Falls River and Mud River watersheds have been identified for further testing, and a program will be instituted during 1998 to obtain these results.

C. Essex Village Testing

Testing was done of groundwater from several monitor wells located in the Essex village area during 1989 and again during the 1993-1996 period. These results were included in our 1996 Annual Report, and will also be included in the final Fuss & O'Neill study. A modified testing program for this area will be implemented in early 1998.

We note again the following two conditions in this area: (1) Essex Village includes many old residential properties served by undersized, and possibly underperforming, septic systems, and (2) much of the surface runoff is diverted to understreet drainage and moved directly to the Connecticut River at the ends of Pratt and Main Streets. These factors undoubtedly impact the normal nitrogen renovation and dilution processes in this area. The eighteen repairs or modifications done to systems contributing to the Essex Village/Middle Cove watershed during the past year will begin to improve the quality of this groundwater.

Essex Village is also served by a public water utility, and the aquifer area beneath the town is not proposed for any public or private water well sites. The surrounding river and cove areas are designated SB waters as a result of other impacts. The Facilities Plan now being prepared will address all of these issues in further detail.

D. Current Well Water Testing

Well water sampling done in May 1989 and August 1989, as included in the 1996 Annual Report, showed drinking water standards consistently met in all but three of the fourteen wells tested. These were all shallow dug wells, and unsealed casings or surface events may have affected water quality. All new drinking water wells are drilled bedrock wells, and there was no evidence of bacterial or nitrate contamination in the 29 wells installed during 1997. Existing homes that had wells tested during the past year also showed no coliform or nitrate problems. A complete listing of these well water potability reports is included in Attachment 7. The Essex Health Department procedure, instituted during 1997, for potability testing of well samples is included in Attachment 8. The Health Department sends a notification to the owner of each well tested regarding well water quality findings and recommended options for addressing higher than recommended secondary contaminant levels.

ON-SITE SANITARY SYSTEMS

A. Repairs

A total of 57 on-site systems were repaired or modified in 1997, as compared to 32 during the previous year. Of this total, 45 existing residential septic systems (2.0%) and 12 commercial or industrial properties (4.3%) were repaired or modified during 1997. Sixteen of the above modifications were made to non-failing systems to accommodate additions, renovations, use changes or conditions of a property sale. Of the remaining 41 failed systems (1.5%), 17 of those were at least thirty years old. Attachment 9 summarizes all system repairs and modifications done in 1997. Of the 23 failures reported in systems less than 20 years old (0.8%), 9 were due to hydraulic failure, 5 to component failure and another 9 to significantly undersized original installations (see Attachment 10, and map Attachment 11).

B. New Systems

Twenty-four new residential septic installations and three new commercial septic installations were done in Essex during 1997. All were installations that met the current public health code standards, and were inspected at completion by the Health Department.

C. Plan Approvals

Plans approval requests for additions, renovations or use changes to 56 properties were received in 1997. All plans must now be reviewed by the Health Department prior to approval of the building permit (Attachment 12). Modifications to the septic system may be made a condition of such approval.

D. Walkovers

In June 1997, an Environmental Assistant was hired by the Health Department to conduct walkovers on selected properties during the spring and summer of 1997. During the following ten weeks, 452 properties were inspected. The Executive Summary prepared by the Environmental Assistant is included as Attachment 13. Five failures (1.3%) were identified at the time of the survey, as well as five problems reported by owners, and six systems which had possible evidence of a problem and were to be rechecked. Total possible, reported or confirmed failures were 16 of 374 developed properties inspected, or 4.2%.

The areas chosen for walkovers during 1997 were areas denoted as presenting some potential problems for subsurface sewage disposal systems in previous reports. These included the Melody Lane/Hickory Lane area, Comstock Avenue, central Ivoryton, and the Blake Street/Summit Avenue area.

The Environmental Assistant position is included in next year's budget, and the department goal is to inspect each property in town at least once every five years.

E. 1997 Policy and Procedural Changes

It is anticipated that the policy and procedural changes implemented during 1997, as outlined in Section I.D. above, will be a major factor in improving the quality of future on-site sewage disposal facilities installed in Essex. Wastewater management policies that can be implemented without ordinance approval are in place at this time. Further information on these items will be included in the Fuss & O'Neill study.

IV. PUBLIC AWARENESS PROGRAM

Information on proper operation and maintenance of subsurface sewage disposal systems is sent to all owners of newly installed, repaired or modified systems, and to purchasers of existing properties in town. Additional information is available at the Health Department. Well water testing results are explained in a memo to the homeowner, along with suggestions for water treatment, if necessary or recommended.

We have written newspaper and town newsletter articles about wastewater management for individual homeowners, as well as in explanation of the ordinance and management study. Additional articles are planned prior to the public hearing. Further information on town-wide wastewater management will be addressed during the public hearing sessions in consideration of the proposed ordinance.

VI. ATTACHMENTS

ATTACHMENT 1

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 · Fax 767-8509

ESSEX SEPTAGE PUMP-OUTS
1997 ANNUAL REPORT

MONTH	ESSEX TOTAL	DEEP RIVER TOTAL	1997 TOTAL
January	25,250	13,000	38,250
February	29,650	6,000	35,650
March	40,550	31,850	72,400
April	45,800	29,600	75,400
May	31,450	33,000	64,450
June	28,650	39,400	68,050
July	37,000	46,650	83,650
August	21,250	42,650	63,900
September	lagoons closed	30,850	30,850
October	35,950	35,450	71,400
November	44,550	21,450	66,000
December	25,100	32,600	57,700
TOTAL	**365,200**	**362,500**	**727,700**

ATTACHMENT 2

TOWN OF ESSEX
SEPTAGE TREATMENT
AND DISPOSAL POLICY

TOWN OF ESSEX
WATER POLLUTION CONTROL AUTHORITY
ESSEX, CONNECTICUT

1. The WATER POLLUTION CONTROL AUTHORITY (WPCA) for the Town of Essex, Connecticut is the Town's designated water pollution control authority, as provided in Section 7-245 et, seq., of the Connecticut General Statutes, as amended and has the powers and responsibilities conferred by said statutes and Town ordinances. The WPCA is responsible for regulating septage treatment and disposal in the Town of Essex, in accordance with federal, state and local regulations.

2. DEFINITIONS:

a. Commercial User: A commercial user shall be as defined in the current Town of Essex Zoning Regulations including healthcare, daycare, retail, restaurants, medical and residential life care facilities.

b. Industrial User: An industrial user shall be as defined in the current Town of Essex Zoning Regulations.

c. Residential User: A residential user shall be defined as single and multi-family residences, public schools, municipal offices and buildings, non-profit organizations (such as churches and museums).

d. Other Users: All users not defined above.

3. SEPTAGE DISPOSAL POLICY

a. Commercial users shall be required to provide transportation, treatment and disposal of septage waste at an out-of-town facility in conformance with policies, regulations and ordinances of the Town of Essex and the State of Connecticut.

b. Industrial users shall be the same as commercial users.

c. Residential users shall be allowed to use the Essex Septage Lagoon Site for transportation, treatment and disposal of on-site generated septage waste.

d. Septage disposal for those users identified as "Other Users" in Item 2.d. above will be reviewed and acted upon by the WPCA on an individual basis as requested.

4. ESSEX SEPTAGE LAGOON SITE DISPOSAL SCHEDULES

a. Single family residences shall be allowed use of the Essex Septage Lagoon Site during all normal hours of operation. Normal hours of operation shall be as scheduled by the WPCA.

ATTACHMENT 2

b. Multi-family residential developments with ten(10) family dwelling units or less are allowed use of Essex Septage Lagoon Site as per 4.a. Single family residence.

c. Multi-family residential developments with more than ten(10) family dwelling units and that will be using the Essex Septage Lagoon Site for septage treatment and disposal shall be required to set up an annual disposal schedule with the Town Sanitary or Chairman, WPCA. Unscheduled use of the Essex Septage Lagoon Site outside the approved dumping schedule will not be allowed unless it is an emergency authorized by the Town Sanitarian or Director of Health.

d. Dumping schedules for those users identified as "Other Users" in 2.d. above will be reviewed and acted upon by the WPCA on an individual basis.

5. FEE SCHEDULES:

a. Users of the Essex Septage Lagoon Site are required to purchase one (1) disposal permit prior to septic system pumping for each individual septic system site up to a maximum of 1500 gallons or portion thereof to be discharged at the Essex Septage Lagoon Site. The disposal permit is entitled ESSEX WATER POLLUTION CONTROL AUTHORITY PERMIT TO DISPOSE OF SEPTIC TANK PUMPING.

b. Each disposal permit shall be properly completed and all information requested shall be supplied at the time of septic system pumping.

c. The required number of properly completed disposal permits shall signed by the Essex Septage Lagoon Site attendant prior to use of the Essex Septage Lagoon Site. No discharge at the Essex Septage Lagoon Site will be allowed without proper disposal permits. The attendant has the right to verify disposal permit information prior to allowing discharge at the Essex Septage Lagoon Site.

d. The fee schedule for treatment and disposal of septage waste at the Essex Septage Lagoon Site is currently $ 25/disposal permit. The WPCA reserves the right to periodically modify this fee.

e. A sample disposal permit is attached for reference.

This POLICY has been adopted by the Water Pollution Control Authority, Town of Essex. Connecticut on December 9, 1996.

Alvin G. Wolfgram, Chairman
Water Pollution Control Authority
Town of Essex, Connecticut

ATTACHMENT 3

TOWN OF ESSEX
Department of Health
Essex Town Hall
29 West Avenue, P.O. Box 98
Essex, CT 06426
Phone 767-4343 Fax 767-8509

To: All Septic Cleaners

Re: Town of Essex Septage Disposal Policy

Enclosed please find a copy of the Town of Essex Septage Treatment and Disposal Policy. Please read the policy and pass the pertinent information on to your employees. Please note the following items contained in this policy:

- **ALL RESIDENTIAL SEPTAGE IS ACCEPTED AT THE ESSEX LAGOONS.** Septage from both single and multi-family residential units is accepted, although complexes with more than 10 residential units are scheduled by the Health Department. See Mike Birner or Carol Speer if you have questions regarding this schedule.

- **SEPTAGE FROM TOWN BUILDINGS, PUBLIC SCHOOLS, AND NON-PROFIT ORGANIZATIONS IS ACCEPTED AT THE ESSEX LAGOONS.** Examples of non-profit organizations include the museums, veteran's organizations, and churches.

- **NO COMMERCIAL OR INDUSTRIAL SEPTAGE IS ACCEPTED AT THE ESSEX LAGOONS.** Health care, daycare, retail, restaurants, medical and residential life care facilities are considered Commercial Users per this policy.

- Septage from each property shall be accompanied by a disposal permit paid for in advance, submitted at time of disposal. One permit is good for up to 1500 gallons. A sample permit is enclosed for your review.

- **ALL PERMITS MUST BE FILLED OUT COMPLETELY.** We are implementing a Sewer Avoidance Policy which includes a regular pump out schedule for all properties in town. We prefer to use the information supplied by licensed cleaners during normal pumpouts rather than requiring scheduling with a Health Department employee to oversee the pumpout and inspection. This means that we must be able to rely on your cleaners for <u>complete and accurate system information.</u>

Thank you for your cooperation and support in keeping the Essex Septage Disposal Facility operating as a low-cost disposal option for the town's residents. If you have further questions, please call the Essex Health Department at 860-767-4343.

Attachment 4

THE ESSEX LAGOON

DOES ACCEPT

SEPTAGE FROM:

ALL SINGLE FAMILY RESIDENCES

ALL CONDOS

ALL APARTMENT BUILDINGS

TOWN BUILDINGS

PUBLIC SCHOOLS

NON-PROFIT ORGANIZATIONS
(Churches, Museums, Civic Organizations)

THE ESSEX LAGOON

DOES NOT ACCEPT

SEPTAGE FROM:

RESTAURANTS

HEALTH CARE FACILITIES

DAY CARE FACILITIES

RETAIL STORES

INDUSTRIES

MEDICAL OFFICES

LIFECARE (Essex Meadows)

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

PERMIT TO DISCHARGE

ISSUE DATE: **EXPIRATION DATE:**

APPROVAL IS HEREBY GIVEN TO DISCHARGE A SUBSURFACE SEWAGE DISPOSAL SYSTEM LOCATED IN THE TOWN OF ESSEX, CONNECTICUT, WHICH WILL RECEIVE TREATED DOMESTIC SEWAGE FROM THE PROPERTY DESCRIBED BELOW:

LOCATION: _____ **MAP:** ____ **LOT:** ____
NUMBER STREET TOWN

OWNER NAME: _____ **PHONE:** _____
ADDRESS: _____

SYSTEM INFORMATION

	NEW PERMIT
	RENEWAL

	NO. OF BEDROOMS - RESIDENTIAL
	DESIGN FLOW GPD - COMMERCIAL

NEW CONSTRUCTION ☐ **REPAIR** ☐
PERMIT NO.: FINAL INSPECTION DATE: BY:

PERMIT RENEWAL
WALKOVER DATE: BY:
PUMPOUT DATE: BY: GALLONS PUMPED:
SANITARIAN WAIVER DATE: REASON:

GENERAL PERMIT CONDITIONS:

1. THE SEPTIC TANK SHALL BE CLEANED AND INSPECTED NOT LESS FREQUENTLY THAN EVERY FIVE YEARS.
2. FOR RESIDENTIAL SYSTEMS, THE AVERAGE LIQUID DISCHARGE VOLUME SHALL NOT EXCEED 100 GALLONS PER BEDROOM PER DAY.

SPECIAL REQUIREMENTS, RESTRICTIONS OR EXCEPTIONS:

THIS PERMIT TO DISCHARGE SHALL NOT BE CONSTRUED TO PERMIT ANY SEWAGE OVERFLOW, NUISANCE, OR SIMILAR CONDITION OR THE MAINTENANCE THEREOF. IF SUCH A CONDITION IS FOUND TO EXIST, THE PERMIT TO DISCHARGE MAY BE REVOKED, SUSPENDED, MODIFIED OR OTHERWISE LIMITED AND ANY SUCH CONDITION IS SUBJECT TO AN ORDER TO ABATE THE CONDITION PURSUANT TO CONNECTICUT GENERAL STATUTES SECTION 19-79 AND ANY RELEVANT ORDINANCES OF THE TOWN OF ESSEX.

Sanitarian Approval: _____
Carol L. Speer, R.S.

ATTACHMENT 6

Disposal Permit No. **Office Use: Map ____ Lot ____**

ESSEX WATER POLLUTION CONTROL AUTHORITY
PERMIT TO DISPOSE OF SEPTIC TANK PUMPAGE

ONE PERMIT MUST BE PREPAID AND COMPLETED FOR EACH ADDRESS PUMPED
A MAXIMUM OF 1500 GALLONS MAY BE PUMPED PER PERMIT
LARGER TANKS REQUIRE ONE PREPAID DISPOSAL PERMIT FOR EACH 1500 GALLONS

PUMPOUT INFORMATION

Date: _____ Company Name: _____
Truck Marker No.: _____ Tank Capacity: _____ Vehicle Condition: _____
Service Type: Routine_____ Repair_____ Suspected Problem _____ Buyer Insp. _____

Address Pumped: _____ Amount Pumped: _____
Owner/Resident: _____ Phone: _____

Property Type: Residential Single Family____ Residential Multi-Family ____ No. of Units ____
Commercial ____ Industrial _____ Other _____

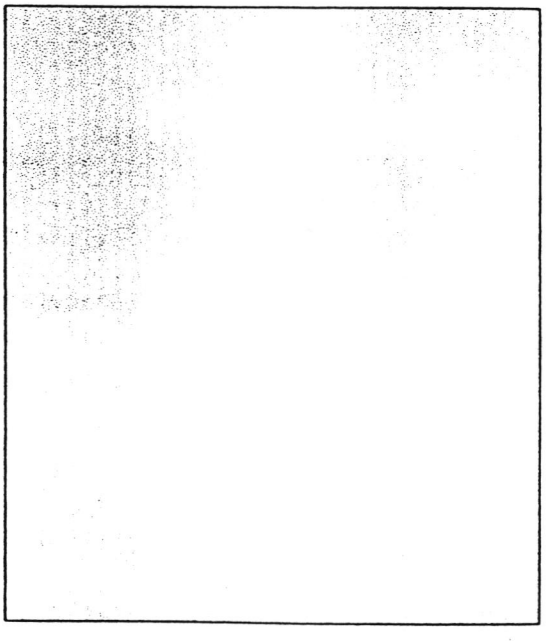
INSPECTION REPORT

Septic Tank
Size:_____ Gal.
No. Compartments: _____
Cesspool Only _____
Baffles: Inlet Condition: _____
Replaced/Repaired
Outlet Condition: _____
Replaced/Repaired
Depth of Scum: _____ Inches
Depth of Sludge: _____ Inches

Pump Chamber _____ Yes _____ No
If Yes, Pumped? _____
Pump Condition: _____

Leaching
Effluent Runback: _____ Yes _____ No
Effluent Surfacing: _____ Yes _____ No
Pumped Drywell: _____ Yes _____ No

Diagram of System
Tank Top _____ Inches Below Grade



Form must be completed by pumper and signed by Lagoon Attendant prior to dumping.

Driver: _____ Attendant: _____

ATTACHMENT 7

WELL WATER POTABILITY TESTING

1997

Map	Lot	New/Existing	Type	Address	Fail Potability	Pass All ML	Fail Second MCL
06	11	Existing	Drilled	8 Meadow Woods Road		x	
06	14	Existing	Drilled	99 Book Hill Road			x
25	10	Existing	?	46 Dennison Road		x	
25	25	New	Drilled	85 Dennison Road			x
37	1-67	Existing	Drilled	34 Mitchel Terrace			x
39	1-12	New	Drilled	14 Rosewood Lane		x	
39	1-20	New	Drilled	19 Rosewood Lane			x
39	1-27	New	Drilled	37 Ebony Lane			x
40	1-2-2	New	Drilled	17 Highland Terrace			x
40	26	Existing	Dug	8 Chestnut Street			x
42	35	Existing	?	7 Verona Street		x	
43	70	Existing	Drilled	8 View Street			x
46	16	Existing	Drilled	6 Collins Lane			x
55	30	Existing	Drilled	59 Woodland Drive			x
59	3-13	New	Drilled	11 Brooks Lane			x
60	19A	Existing	Drilled	108 Bushy Hill Road			x
61	12-11	Existing	Drilled	15 Oakledge Drive		x	
63	26	Existing	Drilled	44 Walnut Street			x
65	38A-3	Existing	Drilled	21 Old Dobbin Lane		x	
66	6	Existing	Drilled	50 Woodland Drive		x	
74	37-7	Existing	Drilled	3 Squires Lane		x	
74	37-10	Existing	Drilled	6 Squires Lane		x	
76	9	Existing	Drilled	22 Cedar Grove Terr. Ext.		x	
79	19	Existing	Dug	6 Ingham Hill Road		x	
82	32-11	New	Drilled	12 Chord Lane			x
82	32-10	New	Drilled	16 Chord Lane			x
82	27	Existing	Drilled	16 Melody Lane			x
82	32-6	New	Drilled	27 Chord Lane		x	
82	32-12	New	Drilled	8 Chord Lane			x
83	13-3	Existing	Drilled	56A Pond Meadow Road		x	
84	84-1-28	New	Drilled	12 Winthrop Hill Road			x
84	84-1-15	New	Drilled	15 Winthrop Hill Road		x	
84	84-1-27	New	Drilled	16 Winthrop Hill Road		x	
84	1-21	New	Drilled	33 Winthrop Hill Road			
89	24	Existing	Dug	27 Melody Lane		x	
89	24A	Existing	?	31 Melody Lane		x	
91	2-4	Existing	Drilled	18 Mares Hill Road			x

ATTACHMENT 8

TOWN OF ESSEX HEALTH DEPARTMENT
P.O. Box 98 Essex, CT 06426 767-4343 Fax 767-8509

HEALTH DEPARTMENT MEMO

Date: June 24, 1997

To: Well Water Testing Laboratories, Realtors, Builders and Contractors

From: Carol L. Speer, R.S., Chief Sanitarian

Re: **REVISED Private Well Water Quality Regulations**

The Connecticut Department of Public Health has issued an "emergency regulation" which amends PHC Section 19-13-B101 (Water Quality in Private Residential Wells) to conform to the newly passed House Bill 6944. I have enclosed a copy of the revised regulation. These changes were made in response to the concerns of realtors and others that the December changes to the water quality code were too restrictive.

Important changes to the regulations include:

- **PRIVATE WELL WATER TESTING IS NOT REQUIRED FOR SALES OF EXISTING HOMES.** But if a well is tested, for any reason, within the time period of six months before to six months after the sale of an existing property, the sample must be obtained by a "qualified individual" (see below), and the results of whatever testing is done must be reported to the local health department within 30 days.

- If sampling is done from a property provided with a water treatment system, the sample shall be obtained from a cold water faucet located after treatment has occurred. The Code does not require testing at the source as well as post-treatment.

- **PRIVATE WELL WATER TESTING IS REQUIRED FOR NEW WELLS PRIOR TO ISSUANCE OF A CERTIFICATE OF OCCUPANCY.** Bacterial, chemical and physical parameters listed in Section 19-13-B101 (Section A on enclosed list) must be analyzed and the results reported to the local health department within 30 days. Samples must be obtained by a "qualified individual" and tested by an approved laboratory or operator.

- The MCL for total coliform bacteria in a private water system is exceeded if the sample tests positive for total coliform bacteria. Any occurrence of coliform is grounds for denying a Certificate of Occupancy.

- Testing for volatile organic chemicals shall be done if the local Health Department specifically requires it, and presents "reasonable grounds" for such a requirement. "Reasonable grounds" are defined in the revised code.

- Testing for pesticides may be required by a local Health Department if (1) nitrates are at or greater than 10 mg/l in a well water sample, **and** (2) the Health Department has "reasonable grounds" for such a request. "Reasonable grounds" are defined in the revised code.

- Qualified individuals who sample private well water now include certain governmental employees and others approved by the laboratory director. Samples must be provided by a qualified individual who signs a statement indicating the location of the sample and the address of the private water supply. "Qualified individuals" need not be employees of the laboratory but must be approved by the laboratory to submit samples to that lab.

Please note the enclosed list of "Potable Water Standards" for private well water testing. All parameters in Section A must be tested for a new well. Results above MCL levels for the shaded parameters (total coliform, nitrate, nitrite and chloride) may be used to deny a Certificate of Occupancy. Results above desirable levels for the other tested parameters will be addressed by an advisory letter from the Health Department. We recommend that the parameters in Section A be tested when existing homes are sold, but there is no legal requirement to do this.

Section B contains the organic chemical and pesticides for which testing may be required by the Essex Health Department, in accordance with the "reasonable grounds" specification of the new Code.

The Essex Health Department will review well test results as they are submitted. If this department has "reasonable grounds" for requiring either organic chemical or pesticide testing, the property owner will be notified, and will be responsible for providing additional test results to the Health Department. The Essex Health Department does not provide sampling services. Please contact the testing laboratories to arrange for a "qualified operator" to do the sampling.

Please copy and distribute this memo to your employees. We understand that the changes in these regulations during the past six months have been confusing, both to you and to the local health departments. We appreciate your patience and hope this will bring you up to date on the current status of the Public Health Code requirements. Please call the Essex Health Department at 767-4343, or your laboratory director, if you have further questions.

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

PRIVATE WELL WATER TESTING

POTABLE WATER STANDARDS, EFFECTIVE 6/17/97

Per Section 19-13-B101 of the Connecticut Public Health Code and Section 19a-37 of the Connecticut State Statutes, parameters in Section A below must be tested for new private well water supplies. These same parameters are recommended for testing of existing water supply wells. Parameters in Section B below must be tested only if required by the Essex Health Department. Only the shaded parameters have Maximum Contaminant Levels which may be enforced as determinants of potable water.

Parameter	Enforceable MCL	Desirable Level	Potable Standard
SECTION A			
Biological Parameters			
Total Coliform	Absent		Yes
Physical Parameters			
Apparent Color		15 Std. Units	No
Turbidity		5 Std. Units	No
Odor		2 (faint)	No
pH		6.4 to 10.0	No
Inorganic Chemicals			
Nitrate	10.0 mg/l as N		Yes
Nitrite	1.0 mg/l as N		Yes
Chloride	250 mg/l		Yes
Sulfate		250 mg/l	No
Sodium		28.0 mg/l	Notification only
Iron		0.30 mg/l	No
Manganese		0.05 mg/l	No
Hardness ($CaCO_3$)		200 mg/l	No
SECTION B			
Organic Chemicals			
If Required by E.H.D.	Per Code		Yes
Pesticides			
If Nitrate > 10.0 mg/l			
and required by E.H.D.	Per Code		Yes

ATTACHMENT 9

1997 SEPTIC REPAIR/MODIFICATION SUMMARY

Repair/Modification Classification		*Number of Failed Systems*	*Number of Non-failed Systems*
A. Modifications done to accommodate			
use change or addition/renovation			
Residential			8
Commercial			4
Total			**12**
B. Repairs to non-failing systems			
as a condition of sale contract			**4**
C. Repairs made to systems older			
than 20 years (A in chart)			
Age 20-29 years		1	
Age 30-39 years		10	
Age over 40 years/unknown		7	
Total		**18**	
D. Premature Failures (systems			
less than 20 years old)			
Hydraulic Failure		9	
Component Failure		5	
Undersized (< 50% code)		9	
Total		**23**	
Total Residential		**33**	**12**
Total Commercial		**8**	**4**
Total 1997		**41**	**16**

C. Speer
1/26/98

1997 SEPTIC REPAIRS/MODIFICATIONS

MAP	LOT	DATE	PERMIT	RES./COM.	APPLICANT	STREET ADDRESS	OWNER	REASON	FAILURE
27	7	5/8/97	97-069	Residential	Monoflo Systems	34 Laurel Road	Robert & Erica Naviasky	A - 40	N
28	59	7/9/97	97-098	Residential	Monoflo Systems	51 North Main Street	John & Muriel Zacharias	A - ?	N
32	51	1/6/97	97-001	Residential	A & W Sanitation	41 Prospect Street/West Avenue	Morris Propp & Martha Morrell	A - 34	N
82	24	9/5/97	97-122	Residential	John J. Doerrer, Inc.	15 Melody Lane	Robert & Judith Hilley	A - 35	N
06	3	8/11/97	97-114	Residential	Douglas Adams	30 Meadow Woods Road	Douglas Adams	R	N
28	50	3/18/97	97-029	Residential	Stevens Excavating Inc.	15 New City Street	James & Carol Denham	R	N
31	19	4/17/97	97-053	Residential	Zanardi	7 Dickinson Lane	Ned & Helene Johnson	R	N
32	2	8/26/97	97-119	Residential	Keith C. Nolin	13 Sunset Terrace	Andrew MacWhinney	R	N
32	41	4/24/97	97-055	Commercial	Stevens Excavating Inc	16 Prospect Street	Our Lady of Sorrows	R	N
42	36	5/1/97	97-060	Residential	Riverview Construction	7 Conklin Avenue	Kenneth & Judith Kells	R	N
47	86	9/23/97	97-130	Residential	Monoflo Systems	5 South Main Street	Glenn & Nancy Sherwood	R	N
47	95	3/31/97	97-040	Commercial	Don Bargelski	8 Main Street Xs	The 1838 House	R	N
57	23	1/13/97	97-005	Commercial	Scott's Excavating, Inc.	98 Main Street Ivtn.	Pearl Weinstein	R	N
61	17	1/23/97	97-010	Residential	Twin Oaks Construction	24 Bushy Hill Road	Philip & Doreen Miller	R	N
74	20	7/23/97	97-105	Residential	Higganum Septic Tank Co	14 Hemlock Drive	Paul Elliott & Barbara Gilkison	R	N
87	2	7/28/97	97-106	Commercial	A.A. Zanardi Co., Inc.	110 Pond Meadow Road	Turbo Products International	R	N
06	14	10/14/97	97-140	Residential	Higganum Septic Tank Co.	99 Book Hill Road	Martin & Kristen Madden	A - 22	Y
27	16	3/4/97	97-022	Residential	Doris Allison	8 Laurel Road	Allison Doris (Trust)	A - 40	Y
27	69	8/19/97	97-117	Residential	Monoflo Systems	4 Prospect Street	Edwin & Patricia Pape	A - 35	Y
28	5	2/25/97	97-019	Residential	Bleak Rock, Inc.	10 Dennison Lane	McGrath	A - 40	Y
28	21	1/30/97	97-012	Residential	John J. Doerrer, Inc.	14 Kings Lane	Kenneth Chandler	A - 40	Y
28	69	4/2/97	97-041	Residential	Duncan Downie	3 New City Street	Christopher Shane	A - ?	Y
31	26 & 27	10/20/97	97-145	Commercial	Shoreline Sanitation, Inc.	1 Essex Square	Talbots	A - 30	Y
32	56	12/4/97	97-161	Commercial	Thomas Botts	2 South Main Street	Robert Baldwin	A - 50	Y
39	11	7/29/97	97-107	Residential	John J. Doerrer, Inc.	7 Oak Street	Lucia Sola & Vincent Maguire	A - 30	Y
40	32	6/9/97	97-085	Residential	Monoflo Systems	13 Blake Street	Christopher Curran	A - 34	Y
43	70	6/16/97	97-089	Residential	Twin Oaks Construction	8 View Street	John & Patricia Burdick	A - 50	Y
51	10	9/24/97	97-131	Residential	Monoflo Systems	12 Racketts Lane	Stephen Kenna & Amy Friedman	A -34	Y
58	43	10/6/97	97-137	Residential	Swaney & Son	173 Main Street Ivtn	William & Janine Schreier	A - 30	Y
58	4	3/11/97	97-024	Residential	Allan S. Honer	16 Blake Street	Allan & Diane Honer	A - 34	Y
69	36	5/8/97	97-068	Residential	Monoflo Systems	29 Cedar Grove Terrace	Kenneth & Jean Reeves	A - 35	Y
70	10	3/3/97	97-021	Residential	Jon Samburg	9 Crosstrees Hill Road	Jonathon & Mary Samburg	A - 32	Y
70	19	9/5/97	97-121	Residential	Monoflo Systems	24 Crosstrees Hill Road	Mary Lou Coviello	A - 40	Y
74	35	7/7/97	97-097	Residential	Monoflo Systems	160 Saybrook Road	Kornela Keszler	A -30	Y
06	11	12/15/97	97-164	Residential	Rhodes Construction	8 Meadow Woods	Bogaert	C	Y
31	19-2	12/1/97	97-158	Residential	Thomas Botts	27 North Main Street	Megan Watts(Dickinson Condo)	C	Y
43	43	10/6/97	97-136	Commercial	A.A. Zanardi Co., Inc.	108 Main Street Ctbk.	Essex Elementary School	C	Y
58	23	5/8/97	97-067	Residential	Monoflo Systems	39 Summit Street	Peter & Linda Muscolino	C	Y
46	2	3/26/97	97-036	Commercial	Tuscarora Plastics Inc	23 Saybrook Road	Tuscarora Plastics Inc	C	Y

MAP	LOT	DATE	PERMIT	RES/COM	APPLICANT	STREET ADDRESS	OWNER	REASON	FAILURE
10	26 & 27	7/10/97	97-100	Residential	Thad D. King	14 Book Hill Road	Thad King & Cathy Marble	H	Y
27	67	4/2/97	97-043	Residential	Monoflo Systems	38 North Main Street	Essex Village Condo	H	Y
35	9	2/6/97	97-014	Residential	Kimberley F. Smith	12 Sheagren Hill	Timothy & Kimberly Smith	H	Y
46	10-1A	5/8/97	97-066	Residential	Daniel Zanardi	7 Collins Lane	John Vesy	H	Y
46	44	3/17/97	97-028	Residential	Daniel Zanardi	48 South Main Street	Cushman & Kathleen Sears	H	Y
56	4	1/22/97	97-009	Residential	Monoflo Systems	6 Comstock Avenue	Albe & Carmen Cyr	H	Y
56	22	12/10/97	97-163	Residential	John J. Doerrer	8 Verona Street	Edwin & Mary Heinold	H	Y
80	80-1-29	6/9/97	97-084	Residential	Shoreline Sanitation, Inc	27 Mares Hill Road	David & Carol Fowler	H	Y
85	16-15	4/22/97	97-054	Residential	Twin Oaks Construction	35 Deer Lane	Joanne & David Pomeroy	H	Y
32	39	1/7/97	97-002	Residential	Monoflo Systems	8 Prospect Street	First Baptist ociety	S	Y
44	14	4/2/97	97-042	Residential	Essex Housing Authority	16 Main Street Ctbk	Essex Housing Authority	S	Y
44	29	10/17/97	97-144	Residential	Rodney Davis Contracting	37 Main Street Ctbk	Hugo Nickse	S	Y
44	28	3/25/97	97-033	Commercial	Doane's Pharmacy	31 Main Street Ctbk.	Doane's Pharmacy(SDG Realty)	S	Y
47	20	2/13/97	97-016	Commercial	Joseph E. Karpinski	53 Main Street Sx	Joseph Karpinski	S	Y
47	105	7/30/97	97-108	Commercial	Twin Oaks Construction	15C Main Street	B & G Realty	S	Y
50	50 & 5-2	3/12/97	97-025	Commercial	Essex Yacht Club Inc.	13 Novelty Lane	Essex Yacht Club	S	Y
63	17,18,19	7/1/97	97-095	Residential	Twin Oaks Construction	20 Comstock Avenue	3 C Oakridge Village	S	Y
79	32	9/12/97	97-126	Residential	Monoflo Systems	200 Westbrook Road	Leona Savoie	S	Y

A	Age - Older than 20 years
S	Undersized, less than 25 years
H	Hydraulic Failure, less than 25 years
R	Renovation/Addition
U	Use Change
C	Component Failure, less than 25 years

ATTACHMENT 12

ESSEX HEALTH DEPARTMENT
29 West Avenue P.O. Box 98 Essex, Connecticut 06426
860-767-4343 FAX 860-767-8509

APPLICATION FOR PLAN REVIEW

FEE: $20.00 (Checks to Town of Essex) PERMIT NO. _____ DATE: _____ CK. NO._____

ALL REQUESTS FOR ADDITIONS, MAJOR RENOVATIONS, WINTERIZATION, USE CHANGES, SWIMMING POOLS, HOT TUBS, GARAGES OR SHEDS ON PERMANENT FOUNDATIONS, REQUIRE APPROVAL ON THIS FORM FROM THE HEALTH DEPARTMENT PRIOR TO ISSUANCE OF A BUILDING PERMIT.

STREET LOCATION _____ MAP: _____ LOT:_____
NUMBER STREET TOWN

OWNER: _____ PHONE: _____

ADDRESS: _____

APPLICANT: _____ PHONE: _____
ADDRESS: _____

I hereby request Health Department approval of a plan to:

- ☐ Build an addition or renovate an existing building. This addition or renovation will:
  - ☐ Increase the lot coverage by _____ square feet.
  - ☐ Increase the number of bedrooms from _____ to _____.
  - ☐ Increase number of employees from _____ to _____.
- ☐ Winterize a seasonal building.
- ☐ Change the use of an existing building so as to increase the potential water use (increase in number of employees, number of seats in restaurant, change to food service, laundry, beauty salon operation).
- ☐ Construct a garage, deck, porch or accessory building with foundation.
- ☐ Construct an in-ground pool, above-ground pool or hot tub.

Submit a brief description of the proposed modification, including a sketch which shows property limits, existing and proposed buildings, and locations of existing septic system and well or public water line. If you have as-built drawings of the septic system or prior soil testing information, please submit them with this application.

HEALTH DEPARTMENT REVIEW /APPROVAL

☐ Plan is approved with no modification of existing septic system.

☐ Plan approval is contingent upon further soil testing results; please contact Health Department.

☐ Plan approval is contingent upon completion of the following modifications to the septic system:

This plan is not approved by the Essex Health Department for the following reason(s):

Department Signature: _____
Carol L. Speer, R.S., Sanitarian Date

ATTACHMENT 13

EXECUTIVE SUMMARY

WALKOVER PHASE, 1997 SEWER AVOIDANCE PROGRAM

INSPECTIONS: Since June, 452 properties in Essex have been assessed as part of the Sewer Avoidance Program. Forty-seven of those properties were undeveloped. With the exception of new houses or ongoing construction projects, the Environmental Assistant inspected most developed properties. Due to the presence of loose resident dogs, inaccessibility, or at the property owner's request, 31 properties were not inspected.

MUNICIPAL FILE REVIEW: Municipal files were reviewed for all of the developed subject properties, including those that were not inspected. Assessor's records provided information regarding lot size and identification, property ownership, and construction dates. Information researched in Building and Health Department street files included permit and system installation details, proposed and as-built system plans, well installation documentation, inspection records, and pumpout histories.

PUMPOUT RECORDS: Pumpout data was available for only 165 of the developed properties. Thirteen of those were pumped more than five years ago. Many of the 290 properties for which there are no such records are presumed to have had unrecorded pumpouts.

FAILURES: Five septic systems were found to have failed at the time of the Environmental Assistant's inspection. Five systems were reported to have failed by owner, tenant or neighbor, but that failure could not be confirmed by walkover inspection. An additional six systems showed some evidence of failure, but it was not conclusive. These systems were noted as having "Possible" failures. Total possible, reported or confirmed failures were seventeen of 374 developed properties inspected, or 4.5%. Confirmed failures were five of 374 or 1.3%.

RECOMMENDATIONS FOR RECHECKING: The Environmental Assistant recommends that certain properties be rechecked when the return of wet conditions is likely to reveal failures that, at this point, are only suspected to have occurred. Due to this year's unusually dry summer, there are 48 recommended rechecks. These have been classified as Priority A (23 lots) or Priority B (25 lots). Those lots which are likely to have a severe problem, or which (if failing) may have an immediate impact on surface water quality, have been given Priority A. Those whose suspected problems are relatively minor have been given Priority B. In addition, there are three properties that should be rechecked to determine whether the system components are properly covered.

WATER SUPPLIES: Of the 171 properties known to have private water supply wells, 43 (25%) are known to be shallow wells. Some analytical data is available for 69 of the drilled wells and 7 of the dug wells.

DATABASE INFORMATION: With the exception of the sketches, wetlands information, and minor notes, all of the information from the walkover inspection forms, and selected information from the assessor's records and street files has been included in the database.

Recommendations for next year:

Research the municipal files before performing the inspections, and use the database to generate the inspection forms complete with lot ID and size, ownership, etc. This way you only transfer that information once, rather than twice, as I did this year. Also, it's faster to get some kinds of information from the files than from the property occupants, if any are home. However, be sure to confirm things like the number of bedrooms with the occupant, as there's often a discrepancy between the records and actual property use.

APPENDIX T

PRELIMINARY OPINIONS OF COST FOR MULTI-USER SSDS AND PRETREATMENT

OPINION OF COST - SEWER		ESTIMATOR: MDA			
PROJECT: PARK ON MAIN ST.		DATE PREPARED: 4/11/97			
LOCATION: ESSEX, CT.		CHECKED BY:			
PROJECT NO.: 88-057 B1		DATE:			
ITEM NO.	ITEM DESCRIPTION	UNIT MEAS.	# OF UNITS	PER UNIT COST	TOTAL COST
1	8" PVC Gravity Sewer Pipe (1)	L.F.	875	$80	$70,000
2	Temporary Pvmt. Repair for Sewer (1)	L.F.	825	$15	$12,375
3	Permanent Pvmt Repair for Sewer (1)	L.F.	825	$20	$16,500
4	Subtotal				$98,875
5	15% Engineering				$14,831
6	Subtotal				$113,706
7	10% Contingency				$11,371
8	Subtotal				$125,077
9	5% Financing				$6,254
10	Total				$131,000

ENR CONSTRUCTION COST INDEX = 523 (7/96)

Notes (1) Costs from contractor's bids for other sewer jobs.

OPINION OF COST - LEACHING FIELD		ESTIMATOR: MDA			
PROJECT: PARK ON MAIN ST.		DATE PREPARED: 4/11/97			
LOCATION: ESSEX, CT.		CHECKED BY:			
PROJECT NO.: 88-057 B1		DATE:			
ITEM NO.	ITEM DESCRIPTION	UNIT MEAS.	# OF UNITS	PER UNIT COST	TOTAL COST
1	Septic Tank (10,000 Gal.)	L.S.	1	$10,000	$10,000
2	Dosing Tank (8,000 Gal.)	L.S.	1	$8,000	$8,000
3	Dosing System & Pipes	L.S.	1	$15,000	$15,000
4	48" High Concrete Galleys (4' Long) (2)	EA.	200	$255	$51,000
5	Excavation of Trenches	C.Y.	900	$3.50	$3,150
6	1" Crushed Stone Installed (3)	C.Y.	190	$26	$4,940
7	Rake, Seed, & Mulch Topsoil	M.S.F.	20	$154	$3,080
8	Subtotal				$95,170
9	15% Engineering				$14,276
10	Subtotal				$109,446
11	10% Contingency				$10,945
12	Subtotal				$120,390
13	5% Financing				$6,020
14	Total				$126,000

ENR CONSTRUCTION COST INDEX = 523 (7/96)

Notes (1) Costs from Means Site Work & Landscape Cost Data - 1997.
(2) Hydraulic application rate assumed to be 1.2 gal/sq. ft./day due to pretreatment of wastewater
(3) Crushed stone assumed to be 6" thick around bottom and sides of galleys.

The SBR pretreatment system will be located downstream of a septic tank and upstream of a leaching field. The SBR system will likely require **additional denitrification measures** and **effluent filtration** to meet the req'd concentrations.

Influent (to SBR system) Concentrations:

BOD_5 = 240 mg/L
TSS = 240 mg/L
TKN = 51 mg/L
Elev. = 50 feet
Temp = 50 deg F

Note: The concentrations above have already been reduced (by 40% from the original concentrations) due to the fact that the influent to the SBR system has already gone through a septic tank.

Req'd Effluent Concentrations:

BOD_5 = 30 mg/L
TSS = 10 mg/L
TN = 10 mg/L
(Note TN is Total Nitrogen = TKN + NO_2^- + NO_3^-)

ALTERNATIVE PRETREATMENT SYSTEMS
PARK ON MAIN ST. - ESSEX, CT

FAST SYSTEM

1	Equipment (1)	L.S.	1	$80,000	$80,000
2	Installation of Eqpt.	L.S.	1	$60,000	$60,000
3	Process Tank (14,000 Gal.)	EA.	1	$14,000	$14,000
4	Construct Building	S.F.	400	$40	$16,000
5	Extend Electric Service to Park	L.S.	1	$3,000	$3,000
6	UV Disinfection System	LS.	1	$6,000	$6,000
7	Install UV System (100% of Eqpt. Cost)	LS.	1	$6,000	$6,000
8	Subtotal				$185,000
9	15% Engineering				$27,750
10	Subtotal				$212,750
11	10% Contingency				$21,275
12	Subtotal				$234,025
13	5% Financing				$11,701
14	Total				$246,000

Notes (1) Opinion of cost from J & R Engineered Products.

AMPHIDROME

1	Equipment (1)	L.S	1	$60,000	$60,000
2	Installation of Eqpt. (1)	L.S	1	$60,000	$60,000
3	Process Tank (6,000 Gal.)	EA.	1	$6,000	$6,000
4	Clear Well Tank (5,000 Gal.)	L.S.	1	$5,000	$5,000
5	Denitrification Tank (1,000 Gal.)	L.S.	1	$1,000	$1,000
6	Construct Building	S.F.	400	$40	$16,000
7	Extend Electric Service to Park	L.S.	1	$3,000	$3,000
8	UV Disinfection System	L.S.	1	$6,000	$6,000
9	Install UV System (100% of Eqpt. Cost)	L.S.	1	$6,000	$6,000
10	Subtotal				$163,000
11	15% Engineering				$24,450
12	Subtotal				$187,450
13	10% Contingency				$18,745
14	Subtotal				$206,195
15	5% Financing				$10,310
16	Total				$217,000

Notes (1) Opinion of cost from F.R. Mahony & Associates.

ZENON

1	Design & Construction (1)	L.S	1	$260,000	$260,000
2	Construct Building	S.F.	400	$40	$16,000
3	Extend Electric Service to Park	L.S	1	$3,000	$3,000
4	UV Disinfection System	L.S	1	$6,000	$6,000
5	Install UV System (100% of Eqpt. Cost)	L.S	1	$6,000	$6,000
6	Subtotal				$291,000
7	10% Contingency				$29,100
8	Subtotal				$320,100
9	5% Financing				$16,005
10	Total				$336,000

Notes (1) Opinion of cost from Applied Environmental Systems

SEQUENCING BATCH REACTOR

1	SBR Treatment System & Filter	LS	1	$200,000	$200,000
2	Install SBR System & Filter (50% of Eqpt	LS.	1	$100,000	$100,000
3	3,000 Gallon Tank Installed	EA	2	$3,000	$6,000
4	14,000 Gallon Tank Installed	EA.	1	$14,000	$14,000
5	Construct Building	S.F.	400	$40	$16,000
6	Extend Electric Service to Park	L.S	1	$3,000	$3,000
7	UV Disinfection System	L.S.	1	$6,000	$6,000
8	Install UV System (100% of Eqpt. Cost)	L.S	1	$6,000	$6,000
9	Subtotal				$351,000
10	15% Engineering				$52,650
11	Subtotal				$403,650
12	10% Contingency				$40,365
13	Subtotal				$444,015
14	5% Financing				$22,201
15	Total				$466,000

APPENDIX U

PRETREATMENT LITERATURE

F R MAHONY & associates, inc.

131 WEYMOUTH STREET
ROCKLAND, MASSACHUSETTS 02370

(617) 982-9300
Fax: (617) 982-1056
COMPUSERVE 102650, 1744

August 1, 1996

Mr. Andy Stachowiak
Fuss & O'Neill Inc.
146 Hartford Road
Manchester, CT 06040

Re: Amphidrome™ Wastewater Treatment System

Dear Mr. Stachowiak:

Based on the following, estimated waste stream parameters: BOD = 275 mg/l, TSS = 275 mg/l, and TKN = 70 mg/l, an effluent containing less than 10 mg/l of total nitrogen can be obtained with the Amphidrome™ Wastewater Treatment System. These numbers were assumed to be the influent parameters to the Amphidrome™ Reactor.

To treat the waste stream at a rate of 20,000 gal/day with the Amphidrome™ Wastewater Treatment System would require one 9.5'X10' rectangular Amphidrome™ reactor. The system would also include one separate, 4' diameter Amphidrome™ Plus reactor, for additional denitrification. Please see the attached schematic diagram. The estimated cost of the Amphidrome™ system, not including tanks, is $80,000. Also required is one 25,000 gal. anoxic tank and one 8,000 gal. clear well. The estimated cost of these tanks and the Amphidrome™ Plus reactor is $26,000 delivered and $35,000 installed. The cost of the 100 sq. ft., cast in place, Amphidrome™ reactor can best be estimated by using your standard cast in place concrete cost.

The Amphidrome™ Wastewater Treatment System consists of; reactor internals, media, under drains, pumps, blowers, control panel, a methanol feed system, (for denitrification), and other appurtenances.

Anoxic tank, clear well tank, Amphidrome™ Plus reactor tank, interconnecting and internal piping are by others. Installation and piping of reactors is by contractor.

The preliminary design is based on the aforementioned parameters. The above assumptions should be confirmed by sampling and by measuring the flow prior to the start of a

ENGINEERS • PROPERTY OWNERS • DEVELOPERS

The ultimate solution in wastewater processing is

Amphidrome™ PAT. PENDING

This innovative process for wastewater treatment is especially designed for filtration with the simultaneous removal of BOD, ammonia, suspended solids and nitrate-nitrogen. The system is a fixed film sequencing batch biological filter. The performance of the deep-bed Amphidrome™ is guaranteed to produce an effluent which meets or surpasses regulatory standards.

ECONOMICAL

FILTRATION

HIGH TREATMENT LEVEL

REDUCED LEACHING AREA

APPROVED UNDER MASSACHUSETTS TITLE V FOR PILOTING

from

F.R. MAHONY & ASSOCIATES, INC.

and

TETRA TECHNOLOGIES, INC.

The Amphidrome™ Process is best envisioned as being analogous to a tidal bay which receives both an incoming unidirectional flow from a river and a bidirectional tidal flow from a connected body of water such as an ocean. In the Amphidrome™ Process, an alternating aerobic/anoxic cycle is created by alternately providing and denying air to the filter. The cyclical action of the system is created by allowing a batch of flow to pass from the equalization tank through the granular biological filter to the clearwell, and then reversing flow by the use of a pump. The reverse flow passes from the clearwell up through the filter and back to the equalization tank. These cycles are repeated multiple times, with cycles alternating between the aerobic and anoxic filter modes. After sufficient cycles have been repeated to insure the degree of treatment required, a batch of effluent is discharged.

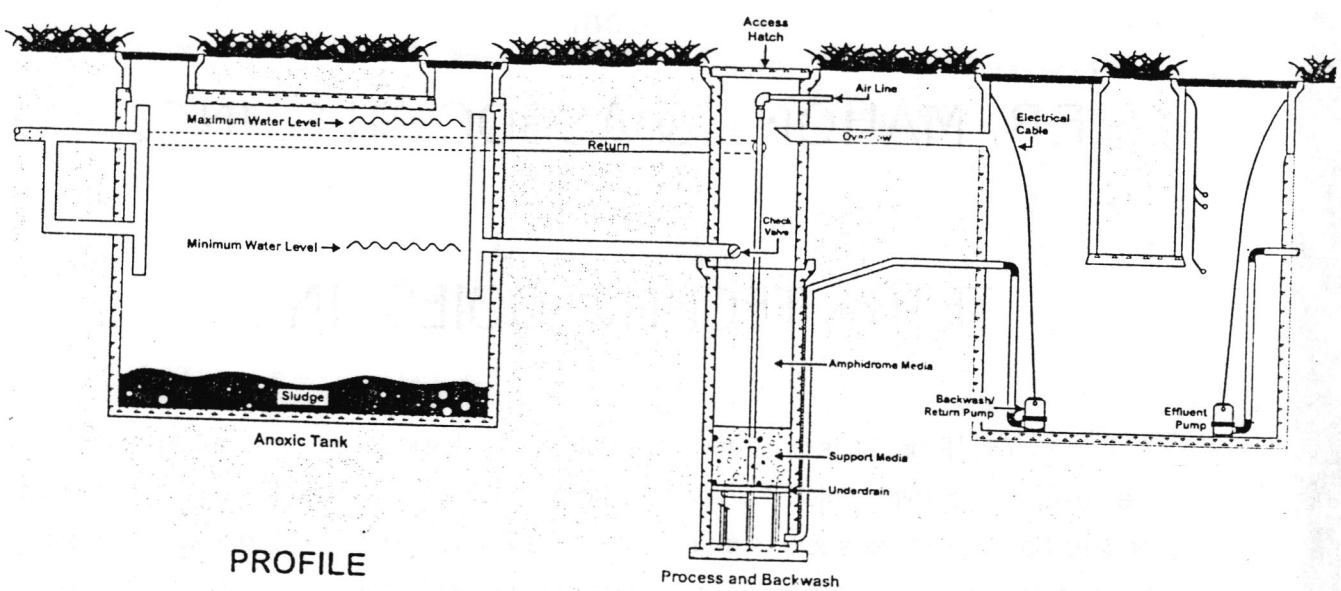
The Amphidrome™ Process

In a configuration of Tetra Technologies' ColOX™ and Denite® processes, the Amphidrome™ Process begins with wastewater flowing from a building sewer. As the diagram below shows, that flow is joined by recycled flow from the system clearwell. The combined flows enter an equalization/return flow storage area, then move to an anoxic pretreatment/sludge storage area.

The equalization/return flow area and the anoxic pretreatment/sludge storage area may be in the same tank with a fluctuating water level, or in separate tanks. When a single tank is used, the upper portion of the tank has a fluctuating water level and functions as the equalization/return flow storage area, and the lower level of the tank has a fixed volume and functions as an anoxic pretreatment/sludge storage area. If separate tanks are used, the equalization/return flow tank has a fluctuating level, and the anoxic pretreatment/sludge storage tank has a fixed level. The system may also use a combination of these two configurations.

The equalization/return flow storage area is intended to equalize and store forward flow prior to treatment in the biological media filter. The anoxic pretreatment/sludge storage area is intended to: (1) settle solids from incoming material and return flow for storage in the sludge storage area, and (2) provide a degree of denitrification for the return flow using the incoming flow as a carbon source (soluble carbon released from the stored sludge is also a source of carbon for the denitrification process), and (3) to store and biologically digest settled sludge.

The granular media biological filter is multifunctional. It functions as a filter and as a fixed-film reactor. As a fixed film reactor it oxidizes carbonaceous BOD, ammonia and organic nitrogen-based compounds while operating in an aerobic mode, and reduces nitrite and nitrate while operating in an anoxic mode. The incoming waste and the accumulated biomass are used as the primary sources of carbon for the denitrification process. For high strength nitrogenous wastes, supplementary carbon from an outside source may be required. The final component in the flow train is the clearwell, which provides storage for flow to be recycled or used for backwash.



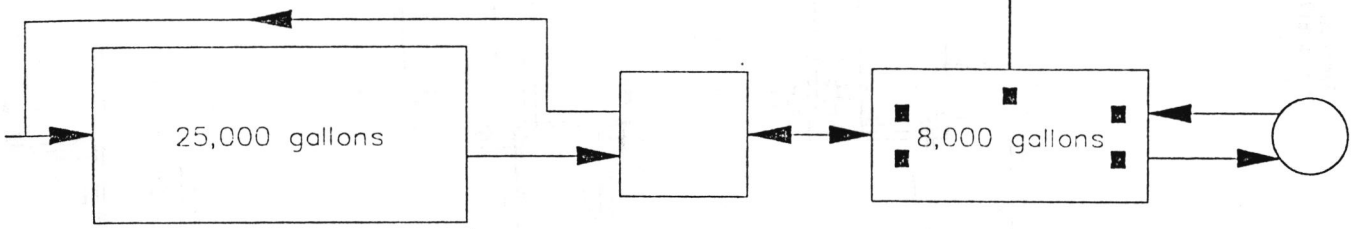
E.B. Mahony & Associates, Inc. provides process design, equipment, technical guidance and testing of a complete Amphidrome™ System:

- Amphidrome™ Biological Filter Media
- Stainless Steel Internals
- Instrumentation and Controls
- Valves, Backwash Air Blowers and Pumps
- Startup, Testing and Instruction by a Trained Representative
- Operations and Training Manuals

Amphidrome™ System

Design Parameters
Flow Rate 20,000 gpd
CBOD 275 mg/l
TSS 275 mg/l
TKN 70 mg/l

Effluent Requirements
CBOD 30 mg/l
TSS 30 mg/l
Total N 5 mg/l

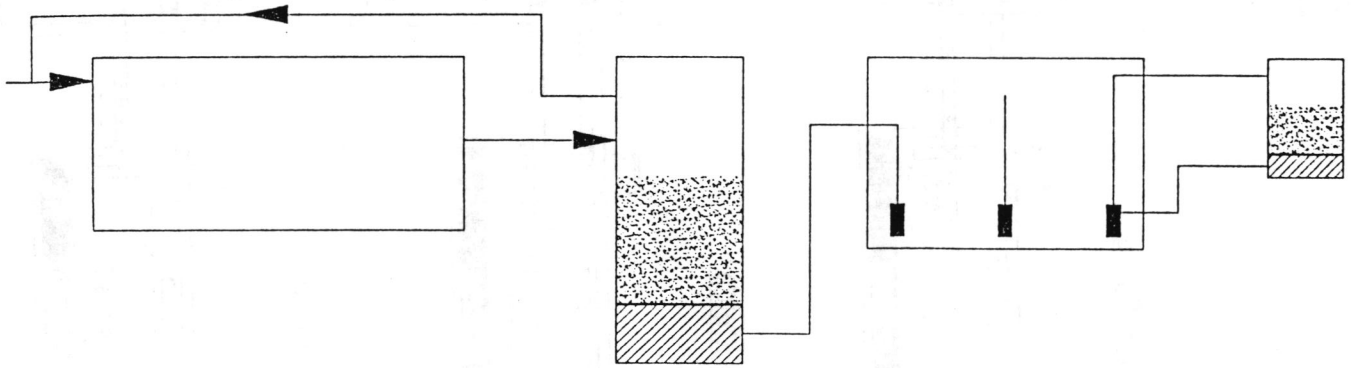


Anoxic Tank

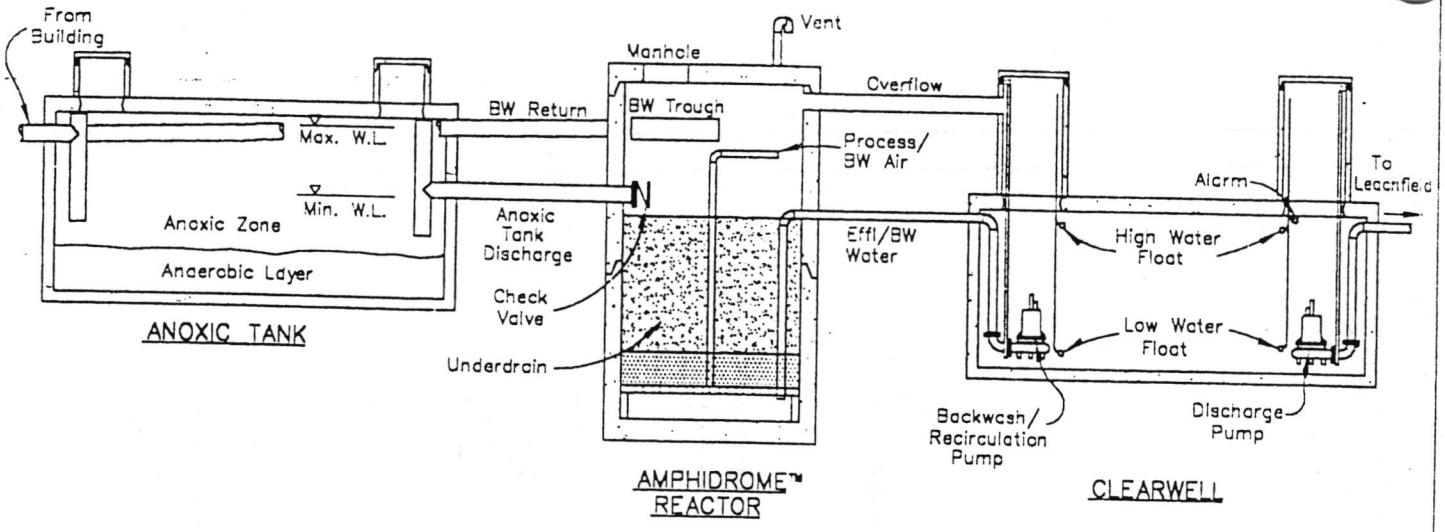
Amphidrome™ Reactor

Clear Well

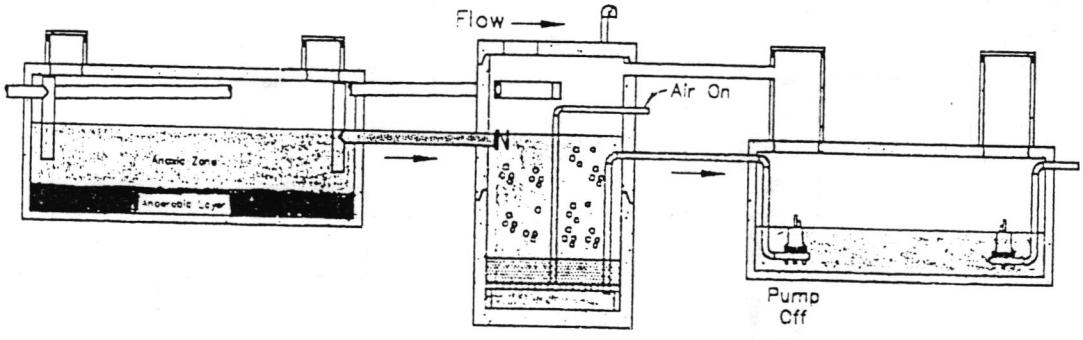
Amphidrome™ Plus Reactor



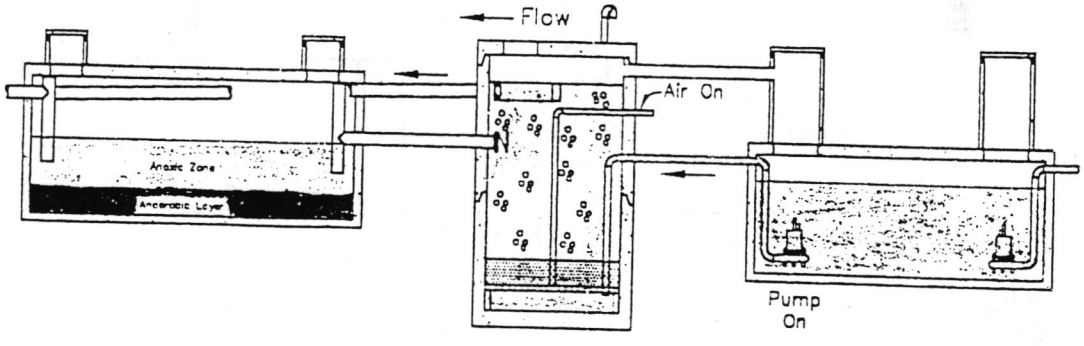
AMPHIDROME™ PROCESS



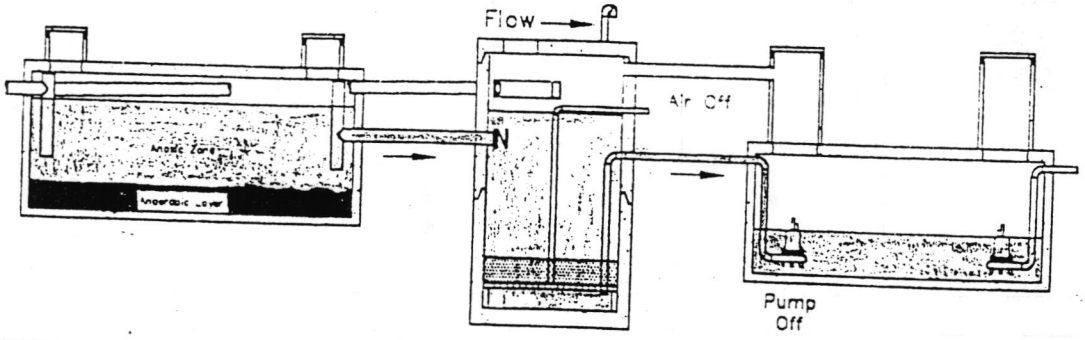
ColOX™ Cycle



Return ColOX™



Denite® Cycle



ZENON

ADVANCED SANITARY WASTEWATER SYSTEMS

INCREMENTAL EXPANSION

All Zenon systems - whether new or upgrades - can be expanded incrementally as appropriate. Our plants can be built for today's capacity with built-in capability for easy incremental expansion as the population increases, and municipalities obtain the added tax incentives to pay for increased sewage treatment.

SERVICE

With ZMS, you can obtain either, or both, of the ZenoGem™ and the Cycle-Let™ systems under a wastewater management service agreement. This service provides frequent plant inspections and monitoring to meet state and local reporting requirements.

In addition, it provides:

- complete routine maintenance,
- emergency service,
- parts replacement,
- annual maintenance, using trained technicians and licensed operators.

ZMS operates many of its systems.

CERTIFICATION / APPROVALS

ROSELAND, NEW JERSEY

ZenoGem™ and/or Cycle-Let™ systems have been approved in many U.S. states, including: California (under Title 22 for unrestricted irrigation); New Jersey (Wastewater Recycling General NJPDES Permit); Texas; New York; Michigan; Massachusetts; Ohio; Pennsylvania, etc. In addition, Cycle-Let™ has been through comprehensive testing by the National Sanitation Foundation and has been certified NSF Standard No. 41.

PRINCETON, NEW JERSEY

ZENON Municipal Systems Inc.

P.O. Box 1285, Ann Arbor, Michigan 48106
Phone: 1-800-443-3006 or 313-769-9574 Fax: 313-761-7842
Amsterdam • Budapest • Chicago • Edmonton • Detroit • Milan
Montreal • New Jersey • Norfolk • Toronto • Vancouver

Printed in USA

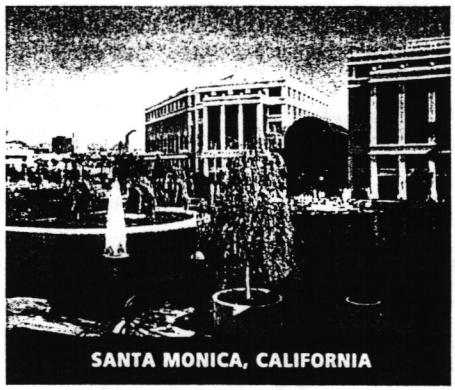
BENEFITS - APPLICATIONS - UPGRADES

THE BENEFITS

ZMS advanced sanitary wastewater treatment systems offer many benefits over conventional technology.

ECONOMICAL:

- Minimal or no use of chemicals
- Low sludge production
- Highly efficient biological process
- Low energy requirements
- Low operator maintenance
- Compact in size, with easy site integration



SANTA MONICA, CALIFORNIA

RELIABLE:

- Resistant to process upsets
- Consistently meets the effluent quality
- Automated operation
- Few process control parameters

Your plant benefits from effluent quality which minimizes your risk of permit violations and possible fines.

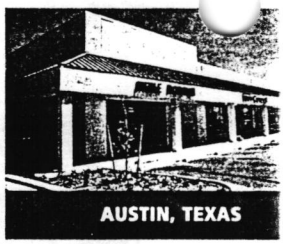
THE APPLICATIONS

Our systems are designed for conventional municipal and commercial sanitary wastewater application, including:

- Multi-family developments,
- Planned unit developments,
- Community systems,
- Onsite sanitary wastewater treatment applications.

Engineers commonly choose our system when:

- Water needs to be recycled,
- Tertiary effluent quality is required,
- Space is tight,
- Providing full-time operators is costly,
- Sludge disposal is expensive.



AUSTIN, TEXAS

UPGRADING EXISTING SYSTEMS

We can also upgrade existing municipal, community and commercial sanitary wastewater systems which:

- Are out of compliance with discharge parameter limitations
- Need more advanced treatment (tertiary BOD_5 and TSS, nitrification, denitrification, phosphorus removal)
- Need additional capacity

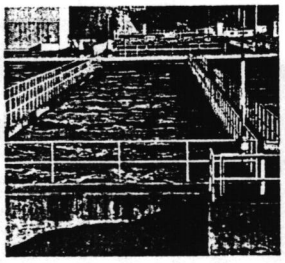
LA PLATA, MARYLAND

If you would like a cost-effective method to upgrade your existing facilities, Zenon can help you replace some or all of the existing clarifiers with membrane systems, and operate existing biological reactors at much higher MLSS. The ZenoGem™ process will enable the existing reactors to be operated at flows more than three times higher than conventional capacity. The efficiency of the upgraded plant will reduce sludge production rates, reduce operator maintenance, and reduce disinfection costs due to the consistent tertiary quality effluent.

ZENON

ADVANCED SANITARY WASTEWATER SYSTEMS

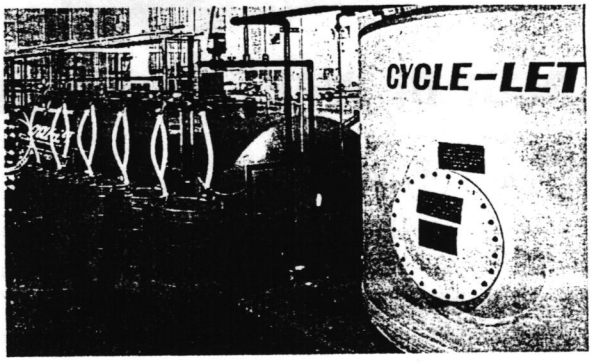
Zenon Municipal Systems (ZMS) is the leading manufacturer of advanced sanitary wastewater treatment and reclamation systems. Since 1974, engineers, architects, developers, government officials and Fortune 500 Corporations have relied on Zenon systems. We've earned our reputation for reliability and excellent performance.



When we started in 1974, we began with the belief that water was a precious commodity, and that someday, sanitary effluent would be recycled throughout the world. We initially developed our Cycle-Let™ systems to recycle flush water in remote locations. Over time, our patented technologies and their applications have continued to evolve. Today, we handle virtually every type of sanitary wastewater, and we are still providing proven, cost-effective and unique biological solutions to meet our customers increasingly stringent effluent requirements.

As the leader in the manufacture and operation of sanitary wastewater systems for water recycling, ZMS has developed the systems engineering and field operations capability to deal with demanding sanitary wastewater problems.

THE INNOVATIVE ZENOGEM™ TECHNOLOGY IS THE HEART OF OUR SYSTEMS



This technology is based on the unique combination of bio-oxidation and membrane separation.

Bio-oxidation is needed to oxidize the organic matter to the feed. Membranes ensure that the substance and bacteria are retained in the system as long as necessary for essentially complete oxidation to carbon dioxide and water.

Unlike conventional systems, where operational changes can cause bacteria loss, the ZenoGem™ system is stable to feedwater changes and sludge production is less. The membrane separator ensures a consistently high effluent quality.

For unrestricted recycle wastewater use, the ZenoGem™ system can polish the effluent further. This modified ZenoGem™ system - known as the Cycle-Let™ system - is designed to handle even the most challenging water reuse application.

RECYCLED WATER QUALITY

BOD	**<5 mg/1**
SUSPENDED SOLIDS	**<5 mg/1**
NITROGEN REMOVAL	**85-90%**
TURBIDITY	**<2 NTU**
TOTAL COLIFORM	**≤ 2.2/100 ml**

Introducing

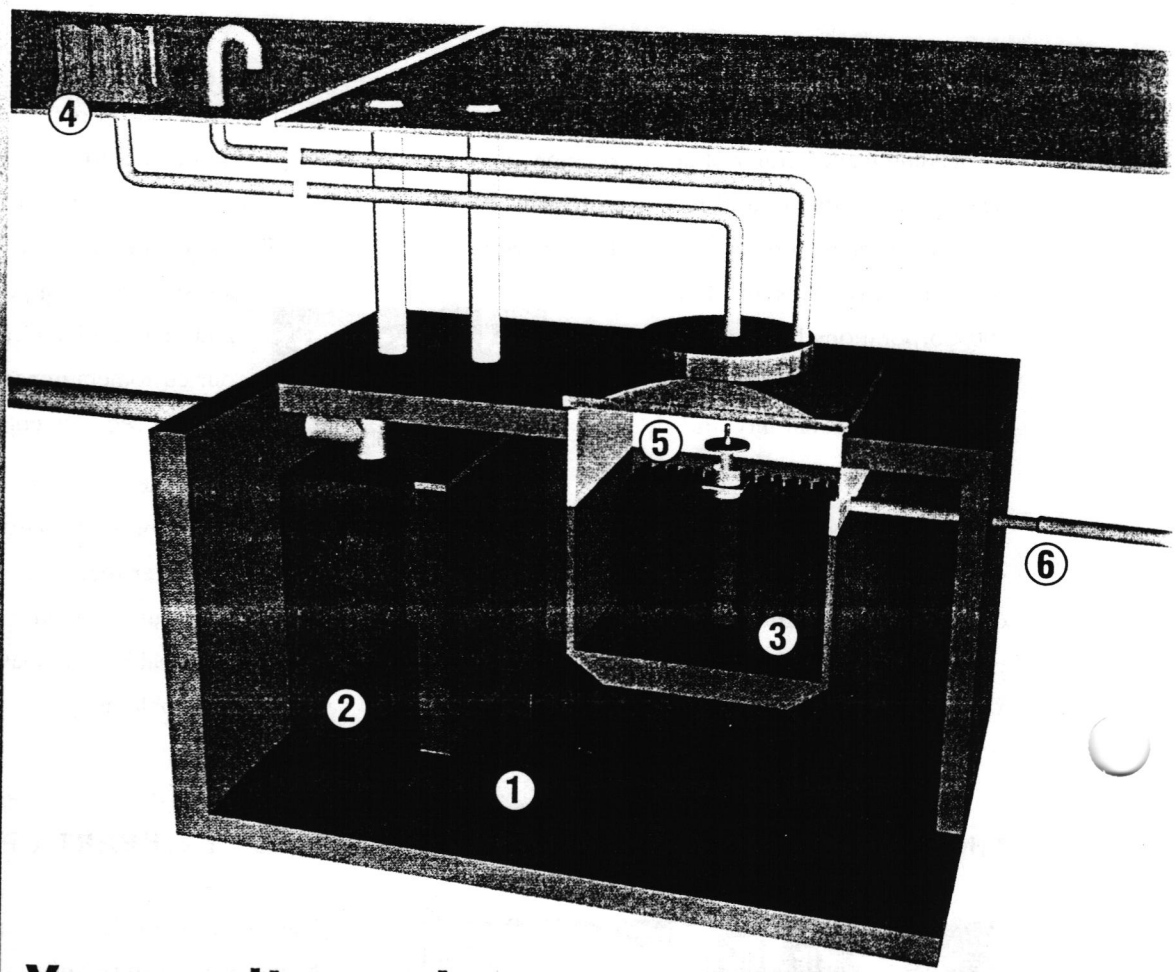
Single Home FAST®

wastewater treatment system

Nothing to disturb your view.

You'll like the view your Single Home FAST® wastewater treatment system affords—because you can't see it. Everything is tucked neatly underground, except for an unobtrusive blower housing that can be located up to 100 feet away. For years to come you won't notice a thing about your Single Home FAST system except how well it's working. And the beautiful view.

- Buried underground
- Quiet, automatic operation
- Efficiently accommodates low or peak usage levels
- Reduces nitrate levels below 10 mg/L in a single tank
- Landscape-friendly
- Environmentally safe



You won't see, hear or smell it working.

(1) Capacity: Designed to process wastewater produced by typical water usage activities (bath, laundry, kitchen, etc.) for up to 12 people.

(2) Large solids settle rapidly upon entering underground system. Only occasional septic tank pumpout is required.

(3) Inner FAST media chamber serves as ideal home for "friendly bacteria" (and sets the Single Home FAST wastewater treatment system apart from all others).

(4) Blower (the system's only moving part) supplies vital oxygen, creating perfect environment for bacteria to grow and multiply.

(5) Wastewater is dispersed evenly over bacteria-laden FAST media surface. Large surface area-to-volume ratio of bacteria to wastewater allows for extraordinary treatment levels.

(6) Clear, odorless liquid effluent is ready for discharge into leach field or disposal by other approved method. (Check your local regulations for details.)

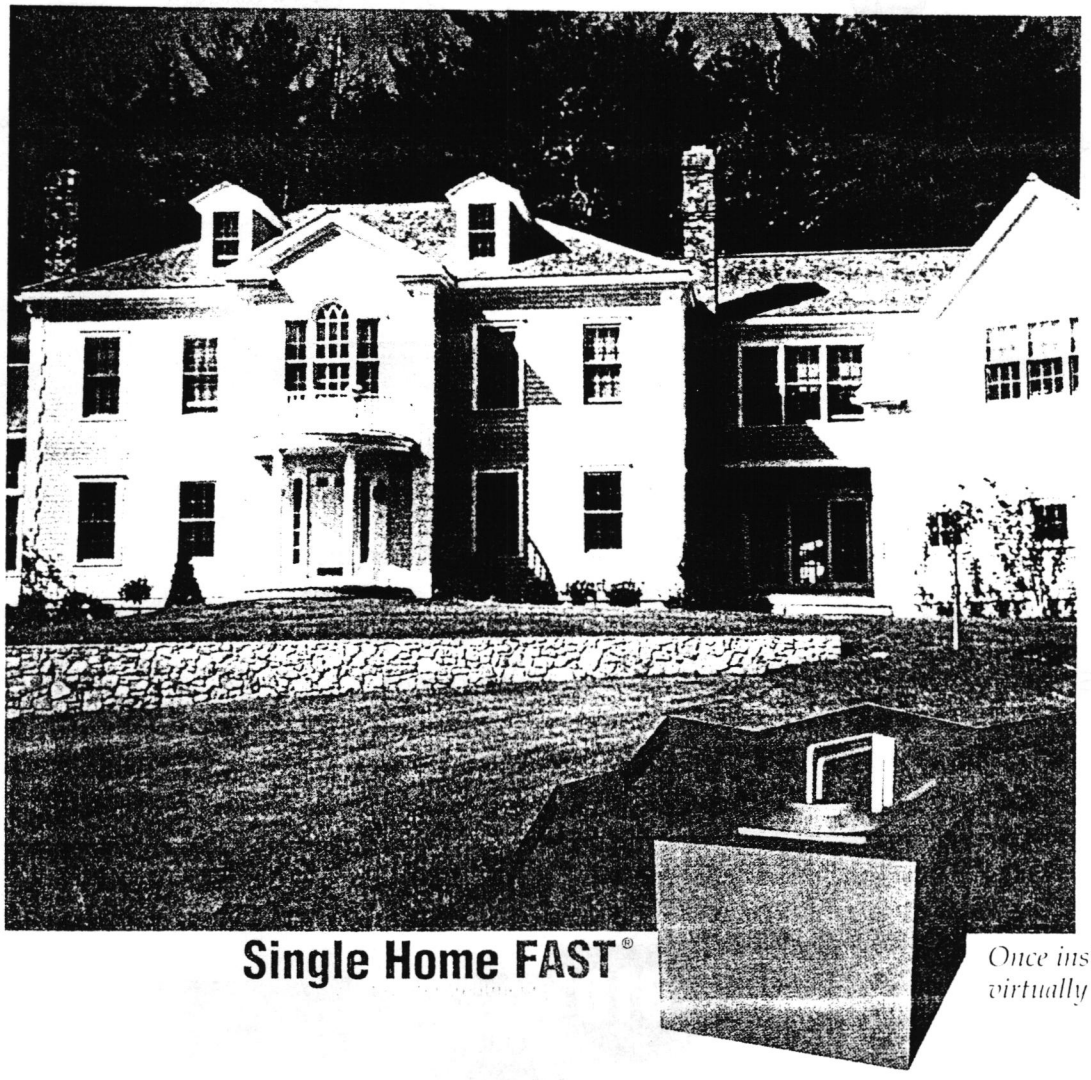
The real beauty of this remarkable system is how well it works.

The science behind Single Home FAST® is environmentally sound, and simple. FAST is an acronym for Fixed Activated Sludge Treatment. Here's why this technology is so effective.

The Single Home FAST system relies on "friendly bacteria" in the inner chamber to digest the sewage coming from your home and turn it into a clear, odorless, high-quality effluent. Keeping the "friendly bacteria" colony alive and thriving is essential for efficient operation.

That's what the inner FAST media chamber is designed to do. It provides an ideal home for the "friendly bacteria" colony, so more bacteria remain inside the system instead of being flushed out with the cleaned effluent, even during times of peak usage (for example, during large social gatherings or on multiple-washload laundry days). It also helps prevent friendly bacteria from "dying off" during low-usage times, making it equally suited for vacation-home use.

Once installed, the FAST system is virtually maintenance free. The only moving part, the aerating blower, is conveniently placed above ground for easy access in the unlikely event it should ever require service. Only an occasional septic tank pumpout is necessary.



Single Home FAST®

Once installed, the unit is virtually invisible to the eye.

- Landscape-friendly
- Remote blower can be located up to 100 feet away
- Effectively manages low and peak usage levels
- No messy filters to clean or replace
- Garbage disposal and dishwasher compatible
- Meets or exceeds EPA recommendations
- Comprehensive two year warranty

Proven, safe, reliable.

The advanced technology behind Single Home FAST® was developed by Smith & Loveless, Inc., a worldwide leader in the design and manufacture of wastewater treatment equipment since 1946. Originally, FAST technology was created for use in municipal, industrial, marine and commercial biological treatment systems. The residential application of Single Home FAST is designed to exceed even next generation performance requirements and provide reliable home wastewater treatment well into the next century.

Single Home FAST greatly reduces groundwater contamination and helps protect the delicate ecosystem. You're also assured that Single Home FAST technology is designed to meet or exceed the requirements of all known discharge standards, worldwide.

Certifications:

U.S. Coast Guard
Canadian Great Lakes
International Maritime Organization (IMO)
UK Department of Trade
NSF Standard 40, Class 1

tested and Certified by NSF

Ideally suited to today's busy households

- Capacity: Designed to process wastewater produced by typical water usage activities (bath, laundry, kitchen, etc.) for up to 12 people.
- Dishwasher and garbage disposal compatible
- Minimal routine maintenance required
- Quiet, automatic operation
- Produces clear, odorless, high-quality effluent
- Easy to install
- Extended warranty available

Technical Specifications

- Power Required: 120v, 60 Hz.
- Constructed of 100% corrosion-resistant materials
- Underground housing construction: concrete or fiberglass
- Check your local regulations:
  —Drain areas may possibly be reduced
  —Effluent may possibly be used for landscaping
  —Other discharge options may be acceptable
- Consistently reduces nitrate levels to below 10 mg/L

J&R SALES & SERVICE, INC.
534 New State Highway
Raynham, MA
02767

Bio-Microbics, Inc.
8271 Melrose Drive
Lenexa, KS 66214

913-492-0707

1-800-753-FAST

Fax: 913-492-0808

E-mail: onsite@biomicrobics.com
Web site: www.biomicrobics.com

BIO-MICROBICS® INCORPORATED

AquaCAM-D Aerator/Mixer/Decanter

The AquaCAM-D is a performance-proven aerator/mixer/decanter designed for use in Sequencing Batch Reactor systems treating flows up to 100,000 GPD (378.5 M^3/D). It can be used to provide pre-treatment or secondary treatment of industrial or municipal wastewater.

The AquaCAM-D provides aeration and mixing in the SBR reactor, as well as decanting final effluent. By opening the unit's electrically-operated air valve, the AquaCAM-D is operated as an aerator. Closing the air valve enables the unit to operate as a mixer, allowing for anoxic mixing during selected phases of the SBR cycle.

Operation and Process Description

High velocity movement of water through the air induction volute creates a pressure differential. Atmospheric air is drawn into the volute through the air intake port and forcefully discharged into the basin, enhancing oxygen transfer.

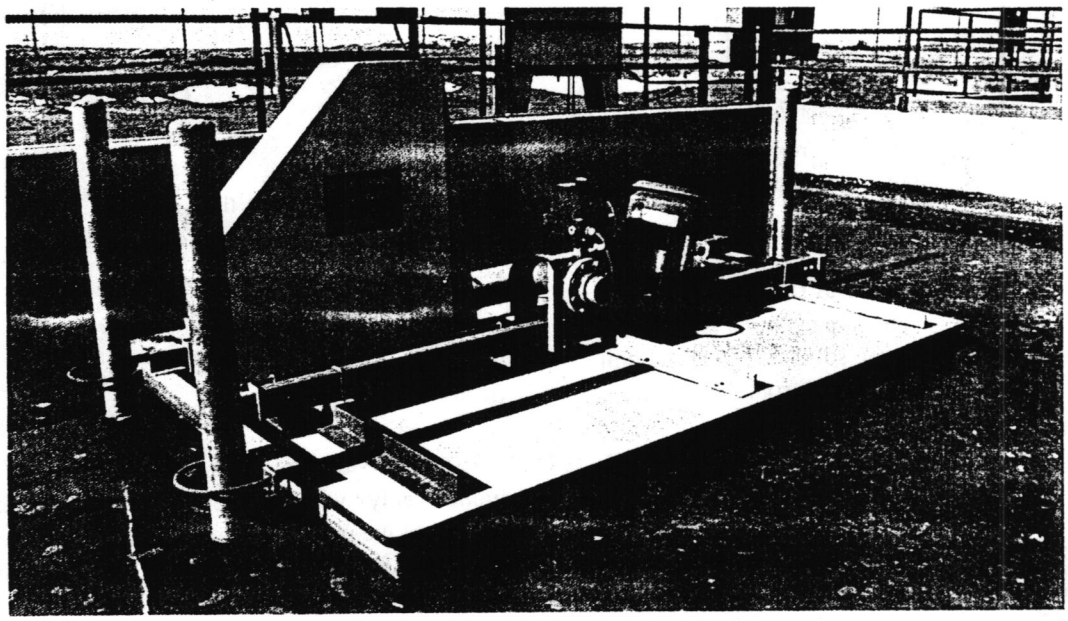
Various operating formats may require reactor mixing without aeration. During the Mixed Fill phase of the SBR cycle, the system's microprocessor closes the electrically-operated air valve to provide anoxic mixing of the reactor contents.

Complete mix of the reactor in the absence of oxygen:

- Depletes the reactor of oxidized nitrogen that remains from the previous treatment cycle
- Enhances biological phosphorus removal
- Provides for anoxic conditioning of the sludge mass

The decanter of the AquaCAM-D is a smaller version of the AquaDecanter employed in larger AquaSBR systems. Following the Settle phase of the SBR cycle, the submerged weir of the decanter opens and draws clear effluent from below the water surface.

Operation of the AquaCAM-D is controlled by the SBR system's microprocessor, with automatic level overrides controlling the system during conditions of greater than peak flow.



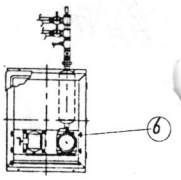
Aqua-Aerobic Systems, Inc.
6306 N. Alpine Rd. • P.O. Box 2026
Rockford, IL 61130
TEL. 815/654-2501
FAX 815/654-2508

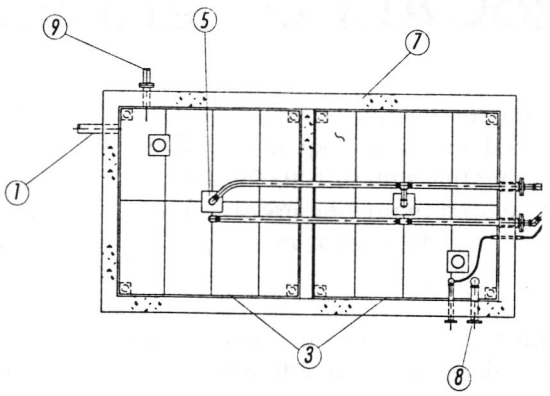
Patent #4,695,376 and #4,997,557. Canadian Patent #540,851. Patents pending. Other patents may apply.

Bulletin No. 951C 11/94

Modular FAST®

Biological Wastewater Treatment System

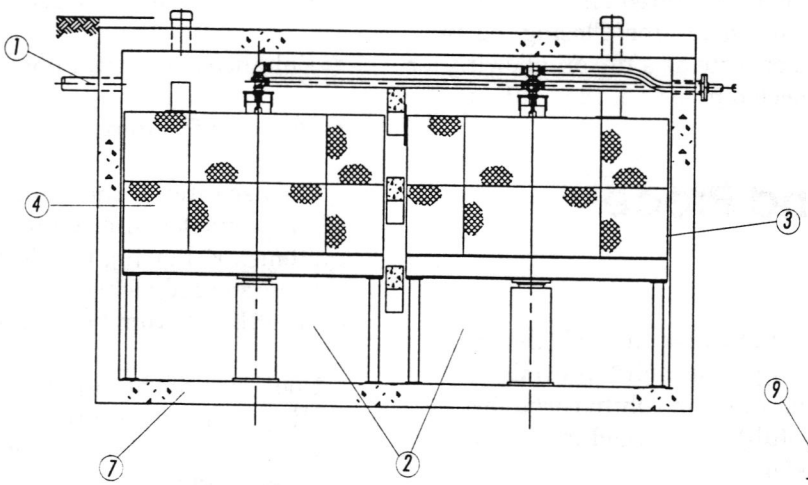


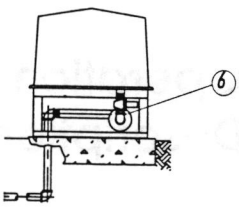


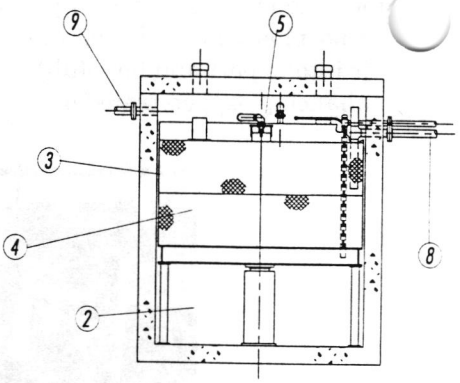
The remote blower (6) allows for tremendous location flexibility. Depending upon the site conditions, possible remote blower locations include the roof, the basement, the boiler room, or the yard.

Certifications

FAST® was the first sewage treatment system to obtain Canadian Great Lakes certification (the most stringent marine standard in the world) and one of the first systems to obtain U.S. Coast Guard certification. FAST® is also certified under the International Maritime Organization (IMO) rules by the UK Department of Trade. In short, FAST® effluent meets or exceeds the requirements of all known discharge standards world-wide.







Standard Features:

1. Influent Pipe - connects directly from the waste disposal system into the container

2. Solids Collection Zone - encourages rapid settling of large solids entering the unit and away from the media

3. Module - packed with bacteria-laden Fast ® media, this factory-built unit circulates the liquid continuously through media. The liquid is essentially clear and free of suspended solids, unlike those in conventional activated sludge systems

4. FAST® Media - houses the "friendly bacteria" in an environment ideal for rapid bacterial growth. The high surface area-to-volume ratio ensures a continuous level of treated effluent

5. Draft Tube - disperses the liquid evenly over the upper surface of the media, providing continuous circulation of the wastewater

6. Blower -supplies air which provides oxygen for the bacteria to grow and multiply

7. System Tank- any tank which is suitable for the application - concrete, steel or fiberglass

8. Odorless Liquid Effluent - discharges into the existing leaching field or disposal well

9. Vent - ventilates treatment section, similar to the earthy smell of a well-maintained compost pile

Represented By:

Smith & Loveless, Inc.
4040 Santa Fe Trail Drive
Lenexa, KS 66215-1284
United States of America
Phone: 913-888-5201
Fax: 913-888-2173

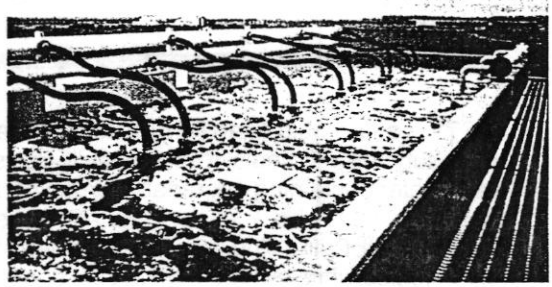
Solutions for a World of Water Problems

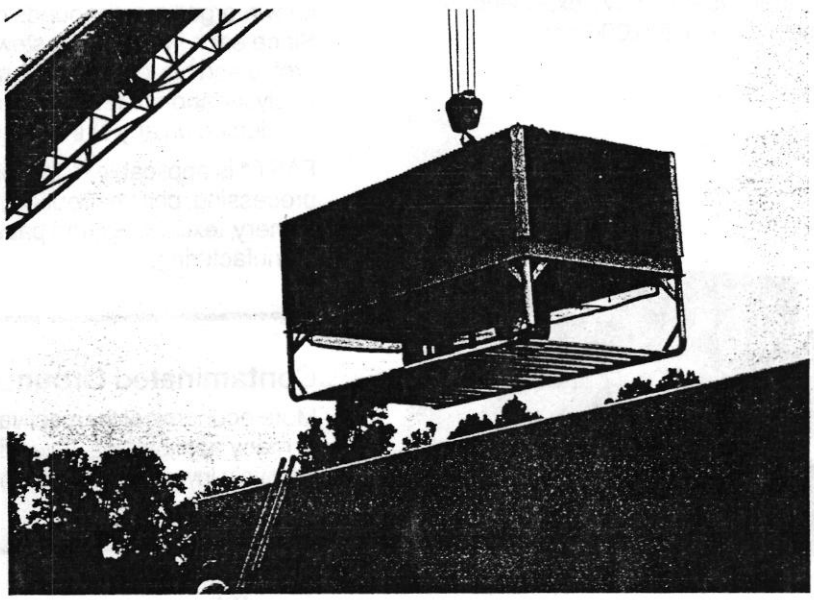
Modular FAST®

Biological Wastewater Treatment System

J&R ENGINEERED PRODUCTS, INC.
534 New State Highway
Raynham, MA
02767
Tel. 508-823-9566
FAX 508-880-7232

The Modular FAST® system, below, arrives ready to install. The oxygen-rich water enhanced by FAST® media, right, provides an ideal environment for bacterial growth .





A FAST® Start

Many schools', hospitals', apartments' and businesses' traditional septic systems and even enhanced on-site sewage treatment systems can no longer meet today's environmental and health laws and regulations.

The Modular FAST® (Fixed Activated Sludge Treatment) system is a proven technology that can meet or exceed the existing laws and regulations governing treatment and effluent requirements. The Modular FAST® system installs above ground or underground and can be installed in any tank which is suitable for the application - such as concrete, steel or fiberglass.

The Modular FAST® system has no filters to clean or replace and contains only one moving part - the air blower. The FAST® media's high surface-to-volume ratio and settling zones maintain constant bacterial growth during both low and peak usage. Constant bacterial growth ensures a continuous level of treated effluent.

Founded in 1946, Smith & Loveless, Inc. is a worldwide leader in the design and manufacture of wastewater treatment equipment. Its FAST® technology has been used in municipal, industrial, marine, and commercial biological treatment systems. A product of this technology, the Modular FAST® system was designed especially for small flow applications.

S&L®

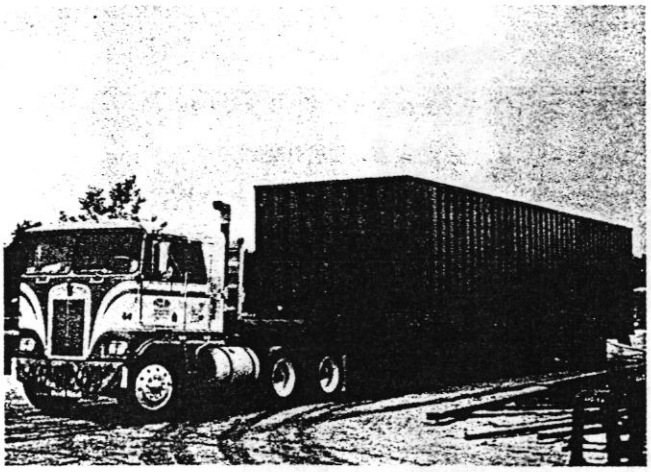
Smith & Loveless, Inc.

Smith & Loveless, Inc.

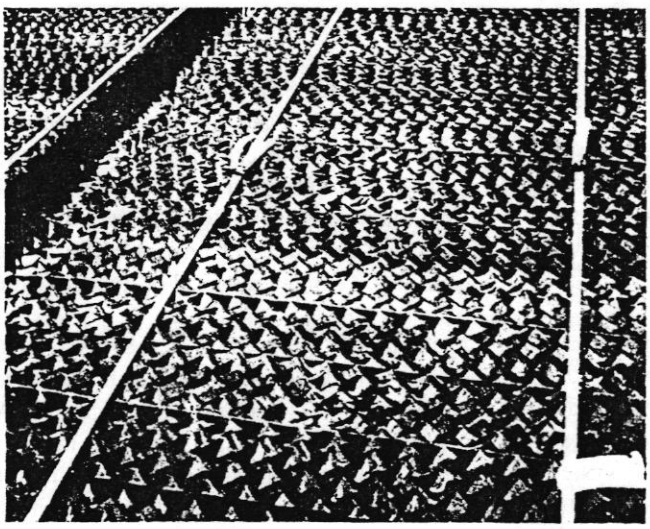
FAST®

Fixed Activated Sludge Treatment System

FAST® is an aerobic, fixed film, packed bed reactor with 100% submerged media. It successfully treats any wastewater containing degradable organics, and is ideal for peak, toxic or shock loads. The FAST® system offers the best of RBC, trickling filter and activated sludge technologies while eliminating the cost or operational disadvantages these other systems have experienced. FAST® plants are available up to 200,000 gpd.



FAST® plant ready for shipment.



Media in v-crimp tank.

Industrial Process Wastewater

Handles both direct discharge and pretreatment applications. Suitable for combined flows and small flow, specialized sidestream applications. The fixed film type biomass growth means that shock loading is more readily absorbed by the FAST® process. 99.99% of all known organic compounds can be degraded by bacteria. Since each industrial wastewater stream exhibits its own profile and bio-degradation rate constant, laboratory analysis, and sometimes pilot plant studies, should be conducted on any of the uncommon streams.

FAST® is applicable to the following industries: food processing, pharmaceutical, petrochemical, chemical, refinery, textile, pulp and paper, plastics and general manufacturing.

Contaminated Groundwater

More economical than activated carbon and air stripping in many applications. Fixed film biomass able to handle relatively low organic concentrations.

Landfill Leachates

Excellent for high strength leachates from both sanitary and hazardous waste landfills. Direct discharge or pretreatment. Less susceptible to heavy metal poisoning. May also be used to treat the contents of impoundments prior to closure.

Schools, Resorts, Camps and Factories

Ideal for intermittent, variable flow sanitary applications. When unattended operation is important, FAST® provides a self-regulating treatment system that produces low effluent BOD and suspended solids. The FAST® Addigest® version includes flow equalization, sludge storage and disinfection in a common steel structure.

Check FAST® First for Dependable, Economical Treatment

As an aerobic process with 100% submerged, open media, FAST® is the simplest and most reliable of the fixed film biological processes.

Compared to Trickling Filters, FAST® avoids filter flies, media clogging, odors and problems with media wetting and effluent recycle. FAST® is less susceptible to heat loss and process suppression from cold weather.

Compared to Rotating Biological Contractors (RBCs), FAST® has no drive unit, no moving parts and no bearings and shafts that can break as a result of unpredictable and fluctuating biomass loads. FAST® eliminates odor problems and does not need to be covered to avoid cold weather problems. FAST®'s rectangular media allows more treatment capacity in equivalent space than RBC.

Compared to Biological Aerated Filters (BAF), FAST® features simpler operation and controls, does not require primary clarification and media backwash. FAST® is not subject to septic conditions and odor.

Check FAST®'s Important Benefits!

- **Long sludge age**... Eliminates the need for sludge reseeding after short flow interruption as in the case of conventional activated sludge; more tolerant of toxic shock.
- **Reduced loading of clarifier**... Increases the settling rate in the clarifier and improves performance.
- **Nitrification**... Reduces conventional aeration volume and operating cost.
- **Compact, factory-built design**... Lower installed costs, less space, fully inspected and proven prior to shipping.
- **Optional design for complete portability**... Easily moved from site to site.

Compare FAST®'s Treatment Cost Efficiencies! For treatment of organic wastewater, nothing can beat a FAST® System.

Method	Waste Strength	
	100 mg/l	1,000 mg/l
	Cents/Gallon	Cents/Gallon
FAST® System	0.03- 0.10¢/gal.	0.10- 0.40¢/gal.
Carbon Absorption	0.50- 1.00¢/gal.	5.00-10.00¢/gal.
Chemical Treatment	0.60- 1.30¢/gal.	6.00-12.00¢/gal.
Hauling	6.00-50.00¢/gal.	6.00-50.00¢/gal.

Proven Treatment Efficiencies for Industrial Applications!

Application	Influent BOD, (mg/l)	% BOD Removal
Cheese Factory	2,000	80+
Soft Drink Plant	1,000	90+
Transport Washdown	500	94
Fragrance/Flavor Operation	2,200	90
Creosote Plant	1,200	80

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Solutions for a World of Water Problems

APPENDIX V

CONCEPTUAL DESIGN AND OPINION OF COSTS FOR TREATMENT SYSTEM IN HUBBARD PARK

2. Bacterial Travel Distance – 21 days

$$V_{GW} = \frac{K_c}{n} = \frac{28\ ft/day\ (0.045)}{(0.30)} = 4.2\ ft/day$$

$$d = V_{GW} \cdot t = 4.2 \frac{ft}{day} \times 21\ day = 88.2\ ft$$

OK to down gradient prop line = 110 – 120 ft > 88.2 ft

However dist to side property lines is only ~ 40 ft
∴ we would need add'l work to make sure this is OK

Jo. Wiltman at DEP said impervious material could be placed on the sides of the system to make sure it works for bacterial travel. This would increase costs if we had to do it.

3. Nitrogen Dilution

From calculations dated 2/20/97 by MDA

$$Q_{WW} = 1{,}396 \frac{gal}{day \cdot Ac} \cdot A$$

A from REM's notes on report total A = 3.2 Ac
avail A = 2.4 Ac

$$= 4{,}467 \frac{gal}{day}$$ based on total A

Potential Problem

Malcolm Pirnie estimated that there are 7.4 add'l acres req'd to accomplish N dilution (Site itself is 3.2 Ac
so the total A req'd = 10.6 Ac
Based on the formula above

$$Q_{WW} = 1{,}396 \frac{gal}{day \cdot Ac} \cdot 10.6\ Ac = 14{,}798\ gal$$

However Malcolm-P. claimed a flow of 18,200 gal/day
(Maybe they used a lower N conc.)

The ww disposal capacity of Hubbard Park on North Main St. was evaluated by Malcolm Pirnie, in a report. Ray Myette of F&O reviewed their calculations (see calcs dated 9/15/89)

Below, I calculate the max flows based on hydr. capacity, bacteria travel and nitrogen dilution.

1. Hydraulic capacity
   use 2-dim. Darcy's law

$Q = k \cdot i \cdot A$ $\quad k = 28$ ft/day (estimated by REM based on the LTAR)

based on SCS soils report $k = 6 - 20$ in/hr → 12 - 40 ft/day
∴ we have general agreement w/ SCS

i - ranges from 10'/220' = 4.5% to 10'/420 = 2.4% use 4.5%

$A = d \times l$ $\quad l_{max} = 250$ ft
$d = 8$ ft (max) 13' unsat - (3' gley + 2 ft ...

$$Q = 28 \frac{ft}{day} \cdot (0.045) \cdot (250 ft \cdot 8 ft) \times \frac{7.48 gal}{ft^3} = 18,850 \frac{gal}{day}$$

Malcolm Pirnie estimated 34,400 gal/day by Darcy and 18,000+ gal/day by the Hantush 3-D model

∴ Malcolm-P may have add'l information showing the gw depth to be greater than the 13 max. depth of the test pits that were dug by them. or they may have used a higher k or higher gw slope.

Fuss & O'Neill Inc. Consulting Engineers	PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
Essex WW Mgmt	MDA	2/21/97	AS	5/9/97	88-057 B
Hubbard Park - Issues					SHEET NO. of

1. Permeability → Malcolm Pirnie uses 0.80 $\frac{gal}{ft^2 \cdot day}$ = LTAR

REM calculated k ≈ 28 ft/day which is correct

$LTAR = 5K - \frac{1.2}{\log K}$ K in ft/min from Rein Leak WW Eng. Design for Unsewered Areas, 1986

from SCS → Soils are Agawam AfA or AfB

Depth(in)	permeability (in/hr)	
0-14	2.0-6.0	mult. by 2 to get ft/day
14-24	2.0-20	
24-60	6.0 20	∴ 28 $\frac{ft}{day}$ is within the range

May need to ascertain gw slope in field for design purposes

REM estimated 7% for his calcs.
Ground surface slope is 3-4 % max.

Fuss & O'Neill Inc. Consulting Engineers	PREPARED BY	DATE	CHECKED BY	DATE	PROJECT NO
Essex	MDA	4/8/97	AS	5/9/97	88-05-

North Main St in Essex
Estimate of Cost of Transmission & Leach Sys @ Hubbard P.

SHEET 1 of

Total Cost = Transmission Facilities + Leaching Sys @ Hubbard Park

Transmission Facilities (estimated by Mike Anderson in calculations dated 9/29/94).

Piping	$315,000
Pump Sta	$150,000
	$465,000

Leaching System - scale estimate from Main St Park

$$\frac{\text{Hubbard Park cap.}}{\text{Main St Park capacity}} = \frac{12{,}000 \text{ gal/day}}{8{,}000 \text{ gal/day}} = 2.25$$

Main St leaching sys -

Mike Anderson estimated the cost of this system to be $108,460 (see calcs dated 1/27/92)

To bring this cost up to 1996 $, I multiply the cost by $\frac{\text{ENR Constr. Cost Index 7/96}}{\text{ENR Constr. Cost Index 1/92}} = \frac{523}{455}$

$$1996 \text{ Cost} = \$108{,}460 \times \frac{523}{455} = \$124{,}669$$

∴ use $125,000

Hubbard Park Estimated Cost = 2.25 × $125,000 = $281,250
for Leaching Sys — use $281,000

Total Constr. Cost = $465,000 + $281,000 = $746,000

Proj. Cost = 1.4 × Constr Cost = $1,044,000