

## **Environmental Impact Evaluation**

### *Chester Wastewater Planning Study Recommending Abandonment of Community Septic System and Limited Sewer Extension to Deep River*

Dear Reviewer:

The Environmental Impact Evaluation has been prepared pursuant to Section 22a-1b of the Connecticut General Statutes and Section 22a-1a-10 of the Regulations of Connecticut State Agencies for the extension of sewers from the Town of Chester to Deep River. A planning study was completed to evaluate existing conditions and future needs of the Town of Chester's village area, the associated problems involving failing septic systems in that area, the ability to effectively treat wastewaters using its current community subsurface disposal system, and alternative approaches. The study recommended abandonment of the community subsurface disposal system and connection into the Town of Deep River's collection system as the cost-effective long-term solution.

For the proposed project, wastewaters from the village area would be collected and transferred to the sewer collection system in the Town of Deep River by gravity sewers, a force main, and an existing pump station. The connection with the Deep River collection system would occur at the intersection of Middlesex Avenue (RT 154) and Winter Street located in Deep River. Sewer construction is proposed on the following roads: Main Street, Maple Street, and Middlesex Avenue (RT 154).

The Department of Environmental Protection has assessed this project and has determined that it will have no significant adverse impact on the surrounding environment. This document has been prepared and is being circulated in support of that determination.

Your review of this Environmental Impact Evaluation is encouraged. Written comments should be submitted to Stacy Pappano, Department of Environmental Protection, Bureau of Water Protection and Land Reuse, Planning & Standards Division, 79 Elm Street, Hartford, CT 06106-5127. The deadline for this submission is Friday, October 19, 2007.

Sincerely,

Betsey Wingfield  
Chief  
Bureau of Water Protection and Land Reuse

Date: August 30, 2007

# ENVIRONMENTAL IMPACT EVALUATION

## Project Identification

The Chester wastewater planning study recommending abandonment of the Maple Street community septic system and a limited sewer extension to connect to the Town of Deep River's public sewer system.

Town of Chester, Connecticut

## Summary of Environmental Review

This Environmental Impact Evaluation is prepared pursuant to Section 22a-1b of the Connecticut General Statutes and Section 22a-1a-10 of the Regulations of Connecticut State Agencies for the extension of sewers from the Town of Chester to the Deep River sanitary sewer system.

Engineering reports entitled "*Chester Wastewater Planning Study*" dated April 2004, "*Screening Analysis for Chester Fairgrounds SSDS Alternative*" dated August 2006, and "*Amendment to Draft Chester Wastewater Planning Study Report – April 2004*" dated February 2007 were prepared by Fuss & O'Neill to evaluate feasible options for corrective action to the pollution problems caused by the Maple Street community septic system. The engineering report developed recommendations for addressing the environmental issues related to failing septic systems and the problems facing the village area's community subsurface disposal system during the twenty-year planning period. The identified study area is depicted in Figure 1 and will be discussed in this summary.

Additionally this Environmental Impact Evaluation is prepared in facilitation of expenditure of Small Town Economic Assistance Program (STEAP) grants in the amounts of \$500,000 awarded to the Town of Chester, which is administered by the Department of Environmental Protection (DEP). This is also an eligible project for Clean Water Funding under the Small Community set aside category.

The agency contact for this project is:

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Bureau of Water Protection and Land Reuse  
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## 1. Project Description

In order to provide for a long-term viable solution to wastewater treatment needs in Chester's village area, the Town of Chester will transfer wastewater from the village area and along Main Street to the Town of Deep River for treatment and disposal via force main, gravity sewers, and an upgrade to an existing pump station on Water Street.

The project area was defined on the basis of lot size, poor soils, health concerns, high groundwater, and failing septic systems (Figure 2). It consists of the following streets in the village area of the Town of Chester: Main Street, Water Street, North Main Street, Spring Street, Maple Street, Hickory Hill Road School Lane, Old Depot Road, Railroad Avenue, Pratt Street, Gilbert Hill Road, and Middlesex Avenue (RT 154). These areas were adopted as the sewer service area and consist of approximately 180 properties (Figure 3).

The existing community subsurface disposal system located on Maple Street that serves 38 properties will be abandoned and the collection system will be connected to the existing public sewer system in the neighboring Town of Deep River. This connection site in Deep River is approximately 1 mile from the existing site of Chester's subsurface disposal system. The sewer extension to the connection will run along Main Street and down Route 154 (Middlesex Avenue) to Winter Street in Deep River (near the town line), where the sewer will be connected to the Town of Deep River's collection system. The proposed sewer extension area shown in Figure 4 and the proposed sewer route depicted in Figure 5 will provide service to a total of 67 properties.

The infrastructure will be composed of approximately 2,800 feet of gravity sewers and 4,300 feet of force main (Figure 6). The existing Water Street pump station and generator will be upgraded to accommodate the new system needs. Although sewers are not being extended to all streets indicated in the sewer service area, the sewer mains in the proposed limited expansion (Figure 5) are being sized to accommodate future flows. The sizing of the sewer extension to Deep River will be sufficient to address projected needs during the twenty-year planning period and sewers can be extended to other streets in the defined project area based upon the needs of the Town. The properties along Main Street that abut the gravity sewer line not already connected to the existing community subsurface disposal system will have the option to tie into the sewer system, with the exception of the Chesterfields Health Care Center. Chesterfields will be required to connect due to site constraints and their failing septic system.

The WPCA has adopted policies that will not require automatic mandatory hook-ups to the new sewer line. If a septic system at a property in the sewer service area requires a repair, the property owner will have the option to implement a repair in full compliance with the current public health code, or to hook up to the sanitary sewer. If a system were determined by the local Sanitarian to be incapable of repair to a compliant condition, then a hook up to the sewer would be mandated.

The additional properties identified in the adopted sewer service area are included as future service areas since these areas (streets) have been determined through the twenty-year planning study to have characteristics that can be problematic to support on-site wastewater treatment. These factors include age of system, soil conditions, groundwater elevations, size of the property, and history of wastewater problems in the area, and are good indications of potential or future wastewater needs in planning of a project.

## **2. Existing Conditions**

In 1984 a subsurface treatment disposal system (SSDS) was installed on Maple Street in the village area of the Town of Chester as a solution to direct discharges of sewage from properties in the village area into the Pattaconk Brook. A permit was issued on February

18, 1985 by the DEP for a design peak flow of 10,000 gallons per day. Shortly after the start of operations, high levels of ammonia and total nitrogen were identified in the monitoring wells for the system, which triggered the issuance of a Consent Order on October 16, 1990. The galleries of the system were continuously ponded and investigation of the site revealed that the westerly part of the system was installed in groundwater and silty material. These conditions are severely detrimental to effective subsurface treatment of wastewaters. Several physical modifications to the system in response to the Consent Order were conducted, including abandonment of part of the system and the addition of leaching galleries; however, the system is still unable to meet permit requirements and treat pollutants to acceptable levels to protect water quality.

**a. Zoning**

The study area consists of mostly residential properties with varying lot sizes, with the exception of the areas of North Main Street and the western portion of Main Street, which are primarily commercial properties with small lot sizes. The majority of commercial properties along Main Street are classified as legacy non-conforming uses. The zoning within the study area is designated as ½ acre and 1 acre residential lots. Half-acre lot sizes exist in the areas of Maple Street, Spring Street, Gilbert Hill Road, Pratt Street, Old Depot Road, the eastern portion of Main Street, the western portion of Middlesex Avenue, and the northern portion of Railroad Avenue. One-acre lot sizes exist on the eastern portion of Middlesex Avenue and the southern portion of Railroad Avenue.

Within the sewer service area there are six undeveloped lots. The Town owns three of the parcels: the North Quarter Park located on Main Street, the municipal parking lot on Maple Street (current SSDS site), and a parcel at the corner of Middlesex Avenue and Railroad Avenue. The remaining three lots are located on Gilbert Hill Road, Main Street, and Spring Street.

Underdeveloped commercially zoned parcels exist in the existing service area, but they cannot be further developed due to an existing sanitary sewer connection moratorium. This moratorium was imposed as a result of the limited capacity of the existing treatment system.

**b. Flow Needs and Service Area**

The adopted sewer service area has approximately 180 residential and commercial properties; of these properties approximately 129 are served by public water. Water consumption data were used to determine a base water usage in the proposed sewer service area. This analysis estimated water consumption at 137 gallons per day per residential dwelling. This is a relatively low estimate compared to other communities that are comparable to Chester, so for estimates of future flow projections a rate of 157 gallons per day per dwelling was used, which is also comparable to the rate used by the Town of Deep River. For commercial properties, actual water consumption rates were used for future flow projections. The table below summarizes the anticipated wastewater flow projections for the Town's twenty-year need.

Wastewater contributed from existing sewer service area (38 properties)	Residential	3,610 gpd
	Commercial/Industrial	5,520 gpd
Wastewater contributed from future sewer extension area	Residential	22,920 gpd
	Commercial/Industrial	8,620 gpd
Infiltration and Inflow *		10,000 gpd
Allowance **		8,000 gpd
<b>TOTAL 20-Year PROJECTION</b>		<b>58,670 gpd</b>

\* Based upon recorded I/I from existing system and a rate of 300 gpd for each inch of diameter of pipe and mile length of pipe for the proposed sewer extension

\*\* This allowance is used as an estimate for more intensive use of existing development, such as adding additional tables to the outside of a restaurants, in addition to the six vacant lots existing in the sewer service area.

In response to feedback from the public, the Town of Chester’s WPCA scaled back the initial proposal to extend sewers to all streets (properties) identified in the adopted sewer service area (Figure 3). The current proposal is for a limited expansion along Main Street (Figure 4), in which a gravity sewer will extend from the existing collection system along Main Street to the intersection of Middlesex Avenue (Route 154). The only additional property that will be required to tie into the new gravity sewer line is the Chesterfields Health Care Center. This facility has an estimated average flow need of 4,000 gallons per day, taking into account the water reductions already being implemented at the facility. The projected wastewater flows for the limited expansion area in the current proposed project are as follows.

Existing users on SSDS system *	11,300 gpd
Chesterfields Health Care Center	4,000 gpd
Additional connections along Main Street and more intensive use from existing commercial users	4,600 gpd
<b>Totals:</b>	<b>19,900 gpd</b>

\* Includes an allowance for infiltration and inflow

Although the projected wastewater flows are less than the identified twenty-year wastewater flow needs, the sewerage system will be sized for all possible flows and connections identified for the twenty-year planning period and adopted sewer service area (Figure 3).

**c. Soils Evaluation**

Soils are reviewed for purposes of evaluating efficacy of continued on-site disposal. The National Resource Conservation Service (NRCS) data were utilized to identify areas within

the study area of concern for sustaining subsurface systems that would provide adequate treatment. The soils in the study area are designated as severely, moderately, or slightly restrictive for adequate operation of on-site subsurface disposal systems. Properties along Spring Street and Gilbert Hill Road have recorded septic repairs and are located within areas of severely restrictive soils. Other repaired systems in moderately restrictive soils are located on Maple Street and Spring Street. Several properties on Main Street and Middlesex Avenue are in areas designated as slightly restrictive soils, but have also had recorded septic repairs. Other areas with concern for on-site wastewater disposal systems are along Middlesex Avenue and North Main Street due to hardpan soils over bedrock with relatively high groundwater.

### **3. Purpose and Need**

The community subsurface disposal system located off Maple Street in Chester serves the central portion of the Town of Chester commonly referred to as the “village area”. The system is not currently treating wastewaters to a level that protects the waters of the State, has exceeded its design capacity, and is not adequate to meet future needs. The system has had chronic performance problems from its inception. In an attempt to resolve those problems, the DEP and the Town of Chester entered into consent order (WC4977) on October 16, 1990. The Consent Order directed the WPCA to investigate the performance of the existing subsurface disposal system, recommend modifications to protect the waters of the State, and implement corrective actions.

#### **a. The Existing Subsurface Disposal System**

In the 2004 engineering report, calculated wastewater flows from the current users based upon water usage were 8,896 gallons per day. In determining the design flow to use in sizing a system, a factor of safety of 1.5 is applied to that average daily value, resulting in 13,344 gallons per day. An inflow and infiltration estimate, which according to a study performed by Nathan L. Jacobson Associates (NLJ) in 2002 was approximately 2,500 gallons per day, was added to the design flow. Therefore, the current flow needs estimated for the 38 properties currently tied into the community subsurface disposal system is 15,844 gallons per day.

The DEP’s Subsurface Disposal Group regulates the existing system. The permit (UI000181) was issued by the DEP for this discharge in February 1985 for a design (peak) flow 10,000 gallons per day, which is a maximum daily flow. The design flow of 10,000 gallons per day equates to an average daily flow of 6,700 gallons per day. The current discharge rate to the system exceeds its permitted capacity. Current average daily flows to the system are approximately 11,000 gallons per day and peak flows are in excess of 16,000 gallons per day. This system cannot sustain the current flows entering the system, and provides no capacity for the projected additional flows estimated by the engineering report’s evaluation.

Certain design and treatment requirements are needed to adequately protect the environment and meet water quality standards specified in the permit conditions. Groundwater monitoring is conducted as part of the operation and maintenance of the system and the results indicate treatment effectiveness and the system’s ability to meet permitted discharge limits. The monitoring is also used to ensure that the ground water in the area is not being negatively impacted from the system. The permit issued by the

DEP has a limitation on the total nitrogen discharged of 10 mg/l measured at the property boundary or the point of concern (such as the wetlands and/or stream on the property). The levels at the monitoring wells at those locations indicate that permit limitations have consistently been exceeded for over fifteen years at levels up to four times the accepted permitted levels.

There are additional system design concerns with nitrogen dilution. An installed system should reduce the presence of nitrogen compounds (ammonia, nitrite, nitrate) to less than 10 parts per million at the property boundary or at a resource of concern (wetland or water body). Even with optimistic assumptions about the dilution water available from adjoining properties and the system's ability to remove nitrogen, the site cannot handle more than approximately 6,000 gallons per day and still meet the permitted limit. If more realistic dilution assumptions are used, this volume decreases to 1,500 to 2,000 gallons per day.

Elevated concentrations of pollutants have persisted in the groundwater despite improvements to the community system in 1992 and 1997 that were performed in response to the Consent Order issued in 1990. The improvements included relocating portions of some of the galleys away from high ground water and ledge and installing infiltrators and surface drainage structures to capture stormwater runoff. In spite of these improvements, the system remains insufficient to adequately treat the volume of wastewater currently discharged and to protect water quality.

Additional concerns with the current system include the inability to meet DEP design criteria such as travel time. Travel time defines the subsurface transport time needed for treated wastewater leaving a leaching system to reach the point where it encounters an environmentally sensitive receptor and minimizes the risk of viral or bacterial contamination. Through various studies, DEP has recommended 21 to 42 days as the appropriate time-of-travel to provide an adequate level of protection for the environment. The DEP, using less conservative criteria in calculating the time-of-travel, has determined that the Maple Street system only has a travel time of up to 15 days.

These evaluations have determined that the system's site is not adequate to meet the DEP guidelines and criteria necessary for a permit to be reissued for the current system.

#### **b. Community Pollution**

Another identified pollution problem exists at the Chesterfield Health Care Center located on Main Street. The wastewaters generated at this facility are not and cannot be adequately treated on-site. The Chesterfield Health Care Center has restricted flows to their system and has had to frequently pump out the system to abate surface failures and health risks. The Chesterfields Health Care Center does not have an on-site disposal option available to them to meet the wastewater disposal needs. A permanent repair to the system that would allow the system to function and meet DEP criteria is not feasible and consequently the DEP is unable to issue a permit for the system or discharge. Therefore, in accordance with Section 22a-428 of the Connecticut General Statutes, the Chesterfields facility can be declared a community pollution problem which can best be abated by the actions of a Municipality, more particularly in this instance, the Town of Chester's WPCA.

**c. Additional Problem Areas**

The defined study area beyond the 38 properties connected to the Maple Street community septic system has a history of water pollution problems from the failure of on-site wastewater disposal facilities to adequately treat wastewater (Figures 7 and 8). These historic problems are a result of high groundwater, dense development, small lot sizes, and poor soils. The Chester WPCA is proposing to expand the existing sewer service area in the center of Chester to address these on-site septic system problems. An engineering study evaluated typical parameters such as soil types, age of septic systems, local health department records, the area's depth to groundwater and ledge or rock and conducted surveys of the study area. The study's report concluded that the area had soils too poor to support septic systems, had septic systems located in high groundwater areas, and that the ages of the systems were such that they did not comply with current health code. All of these factors determined that there are needs in the local area of the existing system that must be addressed to protect water quality and the public health. Subsequent to the engineering report, the local Health Department official sent letters to the WPCA identifying properties with septic system problems, confirming that the service area had been accurately characterized.

**4. Discussion of Alternatives**

**a. No Action**

"No action" is an unacceptable alternative because, without any actions taken to mitigate the pollution source, the ongoing pollution will continue and threaten public health and degradation of the environment will increase with time. The current and future needs of the existing users, and the community pollution problem, will not be addressed. In addition, the Town will not be in compliance with the consent Order issued in 1990 to abate pollution to the groundwater from the existing system.

**b. Provide Additional Treatment at Maple Street Site**

The first alternative considered was to modify the existing community subsurface system to meet current and future needs. The expansion option is not possible due to the physical limitations of the current site. These limitations include insufficient area required for a leaching system that would meet treatment requirements that would be required for an increase in flow. Additionally, this option is not viable because the current system site does not meet the required 21-day travel time to a discharge point. Therefore, even if wastewaters were pretreated, the system would still be insufficient to meet current design and regulatory requirements. The flows to the site are currently above the allowable permitted amount. There are no additional treatment options that would address this limitation or rectify the capacity (allowable flows to the system) constraints. Therefore, renovations to the existing site do not represent a long-term viable solution for either current or future needs, so this option was not considered further.

**c. Abandon existing Maple Street site and reconstruct new subsurface disposal system**

As a result of public input, the Town WPCA expanded the scope of study for their facility plan to investigate additional sites for subsurface disposal of their wastewaters.



By consensus, the property known as the Chester Fairgrounds was determined to be the only additional potential site within the area. The WPCA went forward with an investigation to relocate the subsurface sewage disposal system (SSDS) at the Fairgrounds. A preliminary screening analysis was performed in July 2006 to evaluate sizing and pollutant renovation capabilities of the site. It was determined that inadequate land area existed to meet the requirements of nitrogen dilution and pollutant renovation and, therefore, pretreatment of the wastewater discharged to the site would be required in order for the site to be permitted by the DEP.

Although it was difficult to determine the depth to ground water and groundwater flows on the site in the screening analysis performed in July 2006, it did appear that the site footprint would be acceptable to handle the design wastewater flows for the needs projected in 2004 and 2006. If the site were developed for on-site wastewater disposal, treatment beyond what a conventional septic system could provide would be required (pretreatment system), along with additional staffing (licensed operator) to operate the system and negotiations and easements for utilization of the property before a DEP permit to authorize the discharge could be issued.

A sewer would need to be extended along Main Street and Water Street to the fairgrounds site. The current users of the Maple Street SSDS would be tied into the new system via a force main route up Water Street. The capital cost for this alternative in 2006 dollars is approximately \$2,900,000 and does not include the costs of negotiations or easements for use of the property. The further investigation of the feasibility of utilizing this site revealed that it would be more expensive than other options evaluated. Since this alternative is not economically feasible, and would pose additional evaluations and timeline delays, it was not considered any further.

**d. Supplement Existing Site with Additional Site**

Another option considered was supplementing the existing subsurface system with an additional site. Since the existing site is limited by capacity to an average flow of 6,700 gallons per day, flows beyond the 6,700 gallons per day would need to be redirected to another site or facility. If an additional site, such as the Chester Fairgrounds, were to be developed to handle the flows in excess of the 6,700 gallons per day, then a repair to the existing SSDS would be required in order for the DEP to reissue a permit for the use of the site. These repairs would be required because of the site constraints and the inabilities of the current system to meet current design criteria. These repairs would include: additional treatment for the reduction of nitrogen to meet the allowable limits at the point of concern on the property, addition of ultraviolet disinfection to address time of travel and pathogen reduction, and pressure dosing of the influent to the leaching galleries to address (hydraulic capacity) acceptance of wastewaters into the system.

The additional treatment facilities at the existing site as well as the Chester Fairgrounds site would require an increase in staffing (licensed operator) to operate these systems and the operation and maintenance of the sites would also be a cost increase.

The capital and O & M costs to repair the current system in conjunction with developing the Chester Fairgrounds site to meet the current and future flow and treatment needs would be far more costly than other alternatives considered. An

estimate of the capital cost for this alternative is \$3,800,000, which includes the costs to repair the existing site, install a new treatment system at the Fairgrounds, add a pump station and piping infrastructure. Although this alternative is a viable solution to the needs of the village area in Chester, this alternative was not developed further due to cost and implementation considerations.

**e. Replace Existing System at Maple Street with Alternative Treatment**

Since the existing subsurface disposal system was determined not to be a viable option, to meet the needs of the community and the treatment of wastewaters from the proposed service area, replacing the existing system with alternative treatment and a surface water discharge to the Connecticut River was evaluated. The costs (presented in 2003 dollars) of the following technologies were estimated:

Alternatives	Capital Cost *	Annual O & M
FAST system	\$2,050,000	\$186,000
Sequencing Batch Reactor (SBR)	\$1,850,000	\$168,000
Amphidrome	\$2,030,000	\$187,000

\* These costs are only the equipment installation cost and do not include additional costs for permits, easements, and an outfall pipe.

The permitting process for a new surface water discharge is lengthy and difficult. The treated effluent would need to be piped to the Connecticut River. Capital costs to build a new treatment facility including an outfall pipe to the River, permitting costs, and operation and maintenance costs are significantly more in the long run for a new treatment system in the Town of Chester.

In addition to the capital costs for constructing the treatment facility and outfall, the change from the current disposal system to a surface water discharge will require additional significant costs for feasibility studies, environmental permitting, additional staffing to operate and maintain the facilities, and extensive design. The annual operation and maintenance costs for these facilities would be significantly higher than those of a subsurface discharge. For economic reasons, this option was not considered further.

**f. Connect to Deep River WPCF**

An alternative to maintaining and modifying the existing wastewater treatment system or develop additional subsurface disposal sites is to connect to the Town of Deep River sewer system. If a connection were to be made to Deep River’s system, the existing subsurface disposal system at the Maple Street site would be abandoned. The connection would also mitigate long-term environmental impacts from Chester’s existing community subsurface system, which is inadequate in its current state. The Deep River Water Pollution Control Facility has a permissible capacity of 220,000 gallons per day, and capacity to accept the Chester discharge. Deep River operates a secondary treatment facility with an effluent discharge to the Connecticut River. The discharge has consistently met its permitted requirements to protect water quality. Further, the Deep River Water Pollution Control Facility is able to receive and treat the

additional flows with no reduction in treatment efficiency. In order to connect to the Deep River system an Intermunicipal agreement is necessary, and has been executed between the two municipalities.

An evaluation of the costs of this alternative was performed. The cost analysis demonstrated that this option is the most cost effective solution with a construction cost in 2006 dollars of \$1,500,000. A further advantage to this alternative is that it builds on existing infrastructure, therefore, additional costs towards permits, energy, and construction are avoided when comparing to the other alternatives which would require items such as adding a pump station and seeking permits for a new discharge.

## **5. Recommended Alternative – Connection to Deep River WPCF**

The evaluation of alternatives determined that only two were viable: the connection to the Deep River treatment facility and supplementing the existing site with an additional site. By evaluating the capital costs, O & M costs, which are specific to users only, and limitations posed by utilizing the dual systems, it was concluded that the connection to Deep River is the most cost effective solution that will satisfy the Town's 20-year wastewater planning needs and will be the most protective of the environment.

## **6. Impact of Proposed Project on the Environment**

The existing community subsurface disposal system is inadequate to meet existing and future needs to abate pollution to the waters of the state. Construction of the recommended sewer extension and abandonment of the existing community system will have a positive impact on the environment. Additionally, the potential to provide sewer extensions in the future to areas where failing septic systems occur will mitigate effects to groundwater quality in those areas.

### **a. Direct Impacts**

#### **i. Air Quality**

Any air quality impacts resulting from the project will be minimal and generally short term in nature. It is expected that short-term effects on the air quality in the immediate vicinity of a sewer extension would occur from dust and exhaust emissions. The dust resulting from construction activities will occur along Main Street and Middlesex Avenue. The contractor will be required to mitigate levels of excessive dust to minimize air quality issues and this temporary impact.

The pump station will be designed and equipped with odor control equipment for effective operation and maintenance of the facility and to minimize any impacts to the area.

#### **ii. Noise**

A temporary increase in noise may occur during the construction of the sewers in the roadways of the project area. Restricting construction activities to normal work hours will minimize any impacts.

An emergency generator will be provided for the pump station. This generator will be located within the existing concrete structure, or will be equipped with noise muffling housing.

**iii. Water Quality**

The transfer of the Town's wastewaters to the Town of Deep River's treatment facilities will be beneficial to groundwater quality, since Chester's SSDS is not meeting conditions and requirements of the permit, including nitrogen reduction. Groundwater recharge from the existing system is not significant in comparison to other sources of recharge. In addition, the potable water supply has its source outside of the sewer service area watershed, so its loss to that watershed is not an appropriate concern.

The Deep River Water Pollution Control Facility is regulated under EPA's and Connecticut's National Pollution Discharge Elimination System (NPDES) permitting program to discharge 220,000 gallons per day of advanced treated wastewaters to the Connecticut River. The Deep River facility is currently operating at an average flow of 80,000 gallons per day. By accepting the discharge from Chester, the plant will still be operating well within their permitted flows. The Deep River plant in the past five years has not had a permit violation of its major discharge parameters as set by their NPDES permit requirements.

If surface water and groundwater is encountered during construction of the sewer lines, the contractor will be required to take measures to minimize impacts with sedimentation measures and dewatering activities. Dewatering activities will require particulate settling prior to discharging to either surface water or the ground. A general permit for stormwater discharged during construction and dewatering activities will be required from the DEP for the construction phase of the project.

**iv. Environmentally Sensitive Areas:**

***Wetlands, Flood Plains, Stream Crossings:***

The existing pump station located off Water Street is located within the 100-year FEMA designated floodplain. The pump station was designed for water tightness and the station's hatch is located above the 100-year flood elevation. The proposed sewer extension along Main Street and Middlesex Avenue will not be constructed in these designated floodplain areas, and any undeveloped properties within the 100-year floodplain will not be served by the proposed sewer.

A potential wetlands crossing exists near the existing pump station by Chester Creek if it is determined in the future that the existing force main buried beneath the creek needs to be refurbished. However, in this proposed project no ground disturbances in the vicinity of the existing pump station are planned in order to mitigate potential wetlands impacts. An unnamed brook tributary to Chester Creek crosses Main Street within the Chester Creek buffer; minimal impacts are expected in this area since it is in the existing sewer service area where no planned construction activities will occur.

The proposed sewer extension down Middlesex Avenue (RT 154) needed for the connection to Deep River’s collection system crosses a stream in Deep River. It is anticipated that an inland wetlands permit application will be required to be filed with the Town of Deep River; however, the sewer line will most likely be installed above the culvert with minimal impact to the stream crossing or wetlands. A permit from the Army Corp of Engineers may be required for the stream crossing in Deep River.

Impacts to the floodplains and wetlands are limited to the duration of construction activities and will be mitigated through the use of proper erosion and sedimentation control measures. Any surface restoration will occur as soon as possible after construction.

**v. Socio-Economic Impacts**

The cost for design and construction of expanding the sewer system and connecting into Deep River’s collection system is estimated at \$2.5 million. The project is eligible for funding under the Clean Water Fund (CWF). The project has also qualified for a Small Town Economic Assistance Program (STEAP) grant in the amount of \$500,000. This grant will be administered by the DEP and go towards the administrative expenditures for planning, design, and construction.

This project is also eligible for funding under the CWF as a small community project. This category of funding provides a 25% grant of eligible costs and a loan for the balance at a 2% interest rate. The loan term is for 20 years. If Chester applies for funding and there is adequate funding available in the small community reserve set aside in that fiscal year, Clean Water Funding could be afforded towards expenditure of the project. If funding is available, the following depicts the level of grant and loan assistance that would be applied to the project.

The estimated project costs are shown below:

Construction	\$1,500,000
Engineering – Planning/Design	\$436,000
Engineering – Construction	\$162,000
Administrative and Legal	\$181,000
<u>Contingency</u>	<u>\$225,000</u>
<b>Total</b>	<b>\$2,500,000</b>

<u>Funding Sources</u>	<u>Amount</u>
STEAP Grant (awarded 2002)	\$500,000
STEAP Grant (allocated 2007)	\$500,000 *
CWF Grant	\$329,750
CWF Loan	\$1,170,250

\* The Town of Chester did not approve at the June 2007 referendum the expenditure of the second STEAP grant allocated toward the project in 2007. Therefore, these monies would not be covered under the CWF program and would need to be funded with local borrowing. This will impact the local tax needed to fund 75% of the project and increase the annual cost per EDU by approximately \$50.

**a. User Charge System**

The user charge system is a revenue generating system to recover the total cost of operating and maintaining, including intermittent replacement of significant mechanical components, a municipal wastewater collection and treatment system. A user charge system is a requirement for any municipality receiving financial assistance through the Clean Water Fund. Chester currently utilizes the “unit Charge method” in which each residential unit is charged the same rate, called an Equivalent Dwelling Unit (EDU). The commercial properties are charged on a similar basis in which each commercial property is assigned EDU’s based upon their particular use.

The current system is based upon an EDU system that assesses each single-family residential or commercial property at an initial baseline of 0.5 EDUs, meaning that a single-family residential unit is charged at 1.5 EDUs. Based upon the current user charge rates of \$547.34 for the fiscal budget year of 2007-2008, a single-family residential unit is billed at \$821.01. This system will change with the implementation of the proposed project. All single-family residential properties will be based upon the “actual volume method” and a single-family residential unit will be assigned one (1) EDU.

The actual volume method is based upon the billings of the actual volume of water that the user discharges to the sewer and is based upon actual metered readings from the public water company. Using water consumption for sewer use charges is the most equitable billing method because those who use greater volume of water are billed for that volume. For sewer users that are not on public water, an approximation is generally made in order to generate their sewer user bill. The average of all residential users or of similar residential customers is calculated. An estimated annual cost per EDU for the users is \$780. Therefore with the implementation of the new sewer user system, single-family units will actually pay less, approximately \$40 from the current bill (≈\$820).

**b. Debt Service**

The Chester WPCA has developed a plan for general taxation and assessment in order to finance the proposed sewer extension and pump station upgrades and a sewer user charge system for the operation and maintenance costs of the system. The assessments will be set at \$2,000 per single-family residential dwelling with an equivalency of 1 EDU and \$6,000 per commercial property with an equivalency of 1 EDU. Properties that are above one EDU of usage will be assessed a surcharge. That surcharge will be an additional \$750 per additional EDU or portion thereof for residential properties and an additional \$1,000 per additional EDU or portion thereof for commercial properties. Assessments can be paid in one lump sum or over the twenty-year duration of financing the project at a 2% interest rate. If homeowners choose to pay the assessment over the allowable 20-year payback period at a 2% interest rate, it would be an added charge to their annual EDU charge of approximately \$120 per year.

The remaining debt service will be divided between the Town's general fund (taxpayers) at 75% and the users of the system at 25%. This is an increase in the local tax bill by \$25- \$30, or less than a 1/10 of a mill.

For the proposed project of connecting to Deep River's system, the annual costs charged to the Town of Chester for the use of the system are related to operation and maintenance, which is directly related to the actual metered flow discharged to Deep River from Chester. The rates the sewer users in Chester will pay are set by the rates charged to Deep River residents. These rates are subject to public hearing at each proposed rate change. Since the Deep River treatment plant was built in the 1980's, user rates have been sustained at between \$330 and \$350 per EDU. Therefore, from past history of the charges to Deep River residents, the rates have been consistently maintained without vast inflations.

**vi. Historical/Archeological and Nation Landmarks**

The study area is recognized as a moderately to highly sensitive area with respect to archaeological resources. Although this is a sensitive area, minimal concerns are anticipated since the project work will take place primarily in the roadways and already disturbed areas. The State Historic Preservation Office (SHPO) of the Connecticut Commission of Culture and Tourism was consulted to determine if further investigations with regard to archeological or historical artifacts in the project area is required. The SHPO has determined these areas are not sensitive for archeological resources.

**vii. Endangered Species**

The DEP Natural Resource Center's Natural Diversity Data Base was reviewed to identify known extant populations of Federal or State Endangered, Threatened, or Special Concern species. Mapping showed an area in the northern portion of Middlesex Avenue and School Lane as an indicated area for potential concern or for further investigation regarding these endangered species. It also indicated that Main Street may be an area for further investigation. However, after further discussions with the DEP, it was determined that these areas did not warrant further investigation due to the purpose and scope of the proposed project. The project will have minimal impact on species that occur within the project boundaries.

**viii. Coastal Zone Management**

Portions of Middlesex Avenue and Main Street are within a coastal boundary area. Therefore, any proposed activity would need to demonstrate that it is consistent with all applicable goals and policies of the Connecticut Coastal Management Act. Since the proposed sewer extension is for the purpose of abating pollution, the activity is consistent with the sewer and water line policy of the Connecticut Coastal Management Act. Additionally the planned construction activity will incorporate measures to mitigate any adverse impacts on coastal resources.

**ix. Wild and Scenic Rivers**

This project area contains no wild or scenic rivers.

**x. Prime Farmland**

There are a few locations within the proposed study area that are defined as prime farmland soils. However, these areas are developed residentially and are no longer available as farmland. The proposed construction will not take place in any designated prime farmland soils.

**b. Indirect Impacts**

A sewer extension has the potential to promote population growth and development in a proposed sewer service area. However, Municipalities can control induced development through WPCA sewer ordinances and sewer service area mapping as well as the Town's Plan of Development and planning and zoning regulations. In the Town of Chester, where the sewer extension is proposed, there are two vacant or undeveloped lots on Main Street, one of which is the North Quarter Park. For that reason, potential for additional development in the sewer service area is limited and expected population growth is minimal.

A moratorium established by the WPCA exists for the current sewer service area, which limits property owners' ability to expand uses in existing buildings. The WPCA may lift the moratorium once the sewer connection to Deep River is completed. In turn the intensity from a wastewater perspective of those existing parcels may change.

**c. Irreversible and Irretrievable Commitment of Resources**

Resources committed to the implementation of the project include all fuel, labor, and materials required for the construction of sanitary sewers, force mains, and pumps, and pump station. A long-term commitment for labor and maintenance resources will be needed to properly operate and maintain the system.

**d. Relationship of Project to Approved Land Use Plans**

**i. Local Plans**

The proposed project appears to be consistent with the Town of Chester's Plan of Development last published in 1995. The plan discusses growth and development projections. The plan promotes continuing to preserve open space and limitations for potential growth through planning and zoning regulations.

**ii. State Plans**

The Conservation and Development Policies Plan for Connecticut contains multiple classifications for the study area. The area includes lands that are designated as rural community centers, rural land, existing preserved open spaces, conservation areas, and preservation areas on the C & D Plan's Locational Guide Map. The majority of the area is classified as "rural community centers". This area consists of the southern



portion of the “village area”, Main Street, Maple Street, Spring Street, School Lane, Pratt Street, Old Depot Road, Railroad Avenue, the beginning portion of Hickory Hill Road, and the northern boundary of Gilbert Hill Road. These areas are already developed residentially and commercially. Limited growth from development is anticipated in this area. Intensification of use may occur on some commercially developed properties with existing sewer connections on the western portion of Main Street when the proposed sewer extension project is completed and the moratorium discussed earlier is lifted.

A small portion of the sewer study area is classified as “conservation areas”. This designation covers a southern portion of Middlesex Avenue near the Chester/Deep River town line. The proposed sewers are to support existing development with no provisions for additional growth in this conservation area. Additionally, a manhole located south of the town line in Deep River already exists in this designation area into which the proposed sewers from Chester will connect. Since sewers where the proposed connection will take place already exist in this vicinity, OPM has indicated that sewers will be allowed in this area for that purpose only.

A parcel along Main Street, between School Lane and Middlesex Avenue, is designated as “existing preserved open space”. This parcel is the North Quarter Park and is included on the sewer service area for the sole purpose of accommodating sanitary facilities, which support the use of the parcel as a park.

Areas classified as “Preservation Areas” exist along West Main Street, North Main Street, Water Street, and a small segment of Hickory Hill Drive. Existing sewers and the sewer service area are in the “village area” vicinity, which includes, West Main Street, North Main Street, and Water Street. Sewers proposed on Hickory Hill Drive will not be extended far enough down to reach the parcels in the designated preservation area. A sewer extension is not being proposed to the existing sewer line on West Main Street. Sewers are being proposed on Water Street and North Main Street to reach parcels with documented septic system problems and wastewater treatment needs. All proposed work in these areas will occur in the roadways.

To summarize, infilling in the study area is within the area identified as rural community centers. The proposed sewers are to support existing development and no growth in areas of conservation and preservation designations is anticipated as a result of the proposed sewer extension. Given the above considerations, the proposed plan is consistent with goals of the Conservation and Development Plan for Connecticut.

**e. Mitigation of Adverse Environmental Impacts**

Adverse impacts associated with the project are construction related and short term in nature. There will be an increase in noise and some local traffic congestion at the construction area. Traffic control measures will be undertaken as part of the construction specifications. Air and dust impacts will be controlled and measures will be undertaken as part of the contract specifications. Erosion and sedimentation may occur during the construction of sewers near wetlands and surface waters. The contractor will be required to utilize hay bale barriers, silt sacks and silt fencing consistent with state and local requirements to control erosion and sedimentation during construction. This is anticipated to be minimal since the majority of the

construction work will be in roadways and new sewers are not in wetland areas. Additionally, the contractor will be required through contract specifications not to violate any applicable ordinances, regulations, or laws pertaining to air, water, noise, and traffic issues.

**f. Energy Considerations**

Energy expenditures for the project fall into two categories: construction and operation. In terms of construction, energy consumption will be primarily that needed to power construction vehicles and produce construction materials. This expenditure will not be significant. In terms of operation, the energy expenditures will be those needed to power grinder pumps in the collection system and pumps at the pumping station. An increase in energy consumption may occur at the pump station with the installation of larger capacity pumps for the proposed service area. An insignificant increase in the energy expenditure is expected at the Deep River WPCF for handling and processing the wastewater from the Chester collection system.

**7. Licenses, Permits, & Certifications Needed**

Applications and possible permits will be required for activities conducted in wetlands and stream crossing areas. Permits may be required from the following agencies: the Army Corps of Engineers, the Department of Environmental Protection, and the Town of Chester Inland Wetlands Commission and Town of Deep River Inland Wetlands Commission. Permits from the DOT will be required for construction along state highways (RT 154) and for the approval of the method of crossing the Deep River culvert in Deep River. A general permit for the discharge of dewatering and stormwater discharges during construction will also be filed with the DEP for the construction activities of the project.

Approval of the plans and specification for bidding the construction of the project are also required under section 22a-416 of the Connecticut General Statutes.

**8. Summary of Agency and Public Consultations**

The Chester WPCA has held on average two meetings per month over the past three years to discuss the proposed project and listen to the concerns of the citizens. A public hearing for the wastewater planning study was held on January 13, 2004. In April 2004 the plan to extend sewers to Deep River was approved by the WPCA as the recommended action. On May 17, 2005 a public hearing was held for the recommended sewer service area. Additional evaluations of alternatives and decisions on how to pay for the recommended plan were developed during 2006. The most recent public hearing was held May 30, 2007 to discuss the recommended project, the cost of the project, user charges and assessments. A Town meeting was held on June 13, 2007 in which the Town citizens' petitioned for a referendum vote on the project. The expenditure of a second STEAP grant and the bonding of the project were voted down at the referendum on June 26, 2007. The WPCA plans to bring the project back to a referendum vote later this fall.

A scoping notice was prepared for this proposed project by the DEP. The notice was published in the CEQ Environmental Monitor on August 17, 2004. The notice generated minor comments from the Office of Policy and Management.

## 9. List of Figures

The following figures from the Chester Wastewater Planning Study prepared by Fuss & O'Neill, Inc. are attached.

Figure 1: Locus Map –Chester Planning Study

Figure 2: Recommended Study Area

Figure 3: Recommended Sewer Service Area

Figure 4: Limited Sewer Service Extension Area

Figure 5: Proposed Project and Sewer Service Area

Figure 6: Recommended Sewer Route for Proposed Project

Figure 7: Evaluation of Septic System Problems in Study Area

Figure 8: Recommended Sewer Service Area vs. Lots with Septic System Problems

## 10. Reference

### Reports/Letters

Chester Wastewater Planning Study Report prepared by Fuss & O'Neill dated April 2004  
Screening Analysis for Chester Fairgrounds SSDS Alternative prepared by Fuss & O'Neill dated August 16, 2006

Addendum to Draft Chester Wastewater Planning Study Report prepared by Fuss & O'Neill dated February 16, 2007

Sewer Extension to Town of Deep River Preliminary Design Report prepared by Fuss & O'Neill dated March 7, 2007

Letter and Technical Memorandum dated January 6, 2006 from William R. Hogan, DEP to Richard Harrall as representative of Chester First

Letter from Yvonne Bolton, DEP to First Selectman Thomas Marsh dated February 17, 2007

## 11. Distribution List:

### State Review Agencies

Department of Environmental Protection  
Office of Policy and Management  
Council on Environmental Quality  
Connecticut Commission on Culture and Tourism  
Department of Public Health (Water Supply and Environmental Health)  
Department of Transportation

Municipal Review Agencies

**Chester Town Hall, Chester, CT**

Town Clerk  
First Selectman  
Director of Health  
Sanitarian  
Inland Wetlands Commission  
Planning & Zoning Commission  
Economic Development Commission  
Water Pollution Control Authority

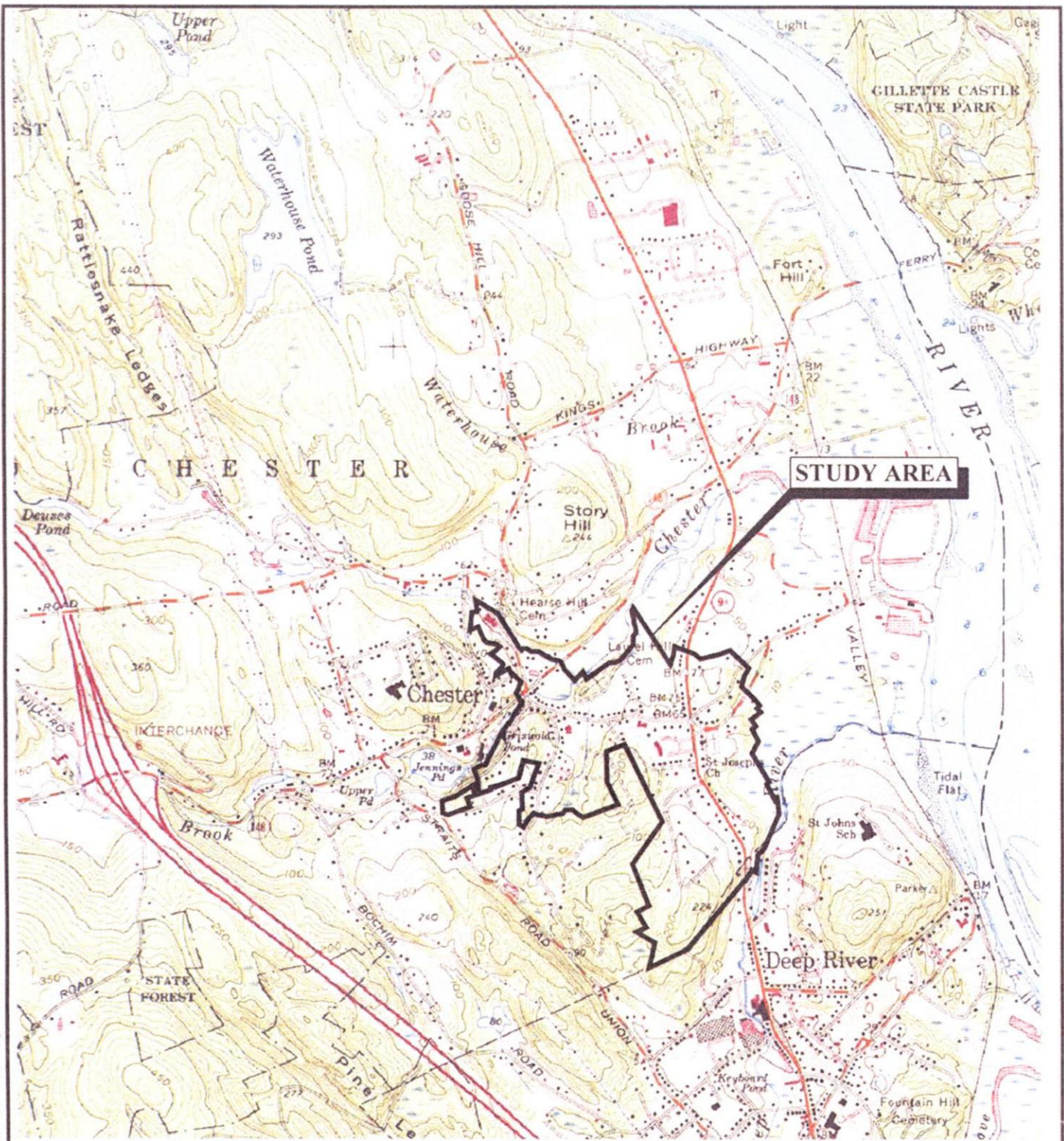
**Deep River Town Hall, Deep River, CT**

Planning & Zoning  
Water Pollution Control Authority

**Regional Planning Agencies**

Connecticut River Estuary, RPA

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**MAP REFERENCE**  
 THIS MAP WAS PREPARED FROM THE  
 FOLLOWING 7.5' SERIES USGS MAP:  
 Deep River 1961; PHOTOREVISED 1988



<b>SCALE</b>	
HORZ	1" = 2000'
VERT	N/A
<b>DATUM</b>	
HORZ	N/A
VERT	N/A
GRAPHIC SCALE	



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 860.646.2469

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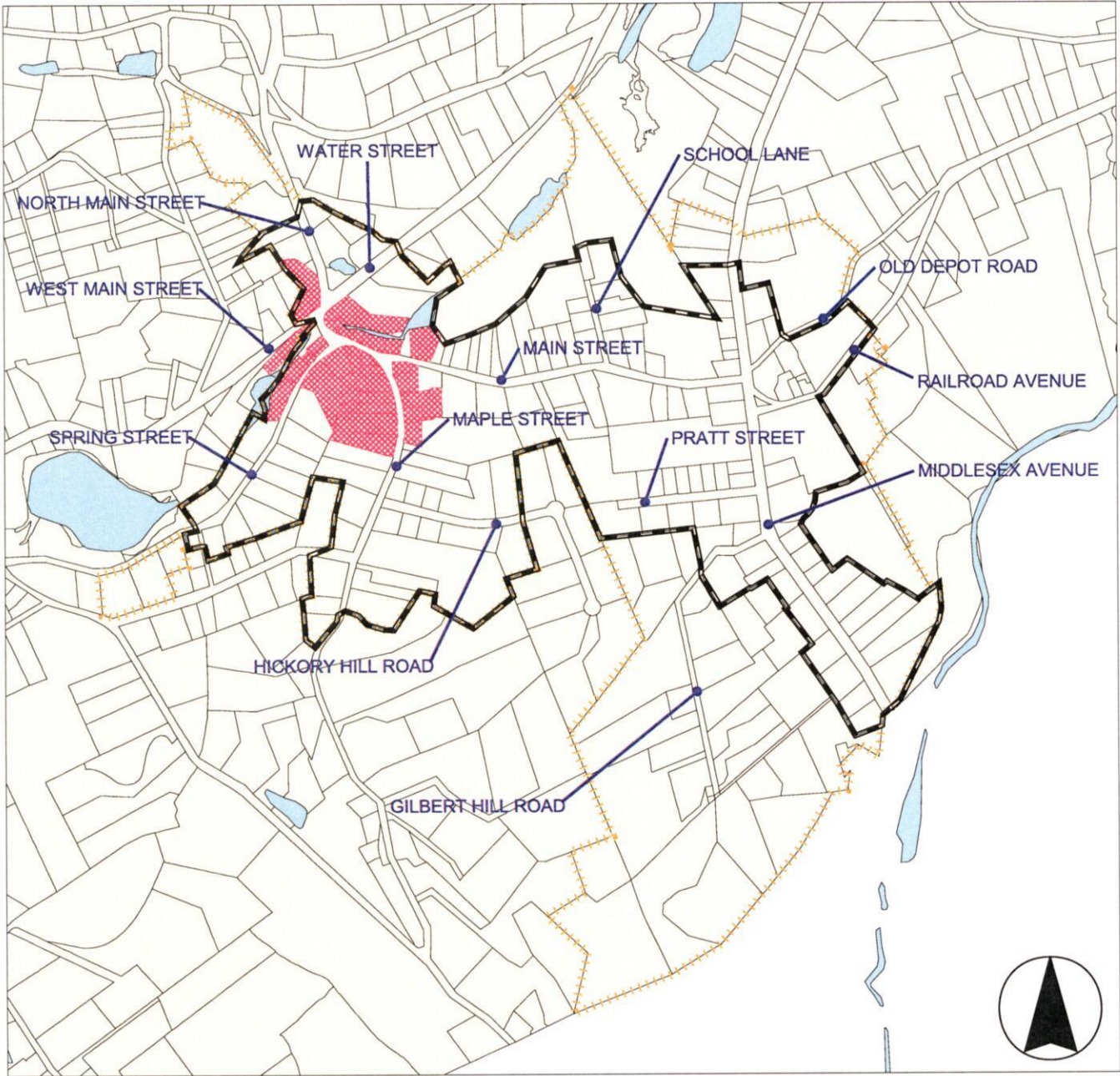
**TOWN OF CHESTER**  
**LOCUS MAP**  
**CHESTER PLANNING STUDY**

CHESTER CONNECTICUT

PROJ No	02523 A10
DATE	SEPT 2003
<b>FIGURE 1</b>	

# CHESTER PLANNING STUDY

**FIGURE 2** RECOMMENDED STUDY AREA



**Legend**

- Water
- Property Boundary (1)
- Existing Sewer Service Area (2)
- Limits of Initial Study Area
- Proposed "Shrink-Wrapped" Study Area

NOTES:  
 (1) Property lines taken from Marin Environmental townwide parcel base coverage file received 01/02/03.  
 (2) Existing Sewer Service Area Boundary taken from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers, 04/01/82.









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SEPTEMBER 2003  
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## RECOMMENDED SEWER SERVICE AREA TOWN OF CHESTER

-  Property Boundaries
-  Buildings (Within Recommended SSA)
-  Water
-  Marsh
-  Existing Sewer Service Area
-  Recommended Sewer Service Area
-  Non-Sewered Area (On-Site Wastewater Disposal)

### NOTES:

- 1) Recommended Sewer Service Area to include all existing Sewer Service Area parcels.
- 2) Property lines taken from Marin Environmental townwide parcel base coverage file received 01/02/03.
- 3) Existing Sewer Service Area from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers on 04/01/82.
- 4) Existing Sewer Service Area verified April 2005 with the 2003-2004 Sewer Usage Fees and Addresses report, First Selectman's Office, and Town Engineer.
- 5) Hydrography data sets downloaded from the Department of Environmental Protection GIS website.
- 6) Building locations (shown within the Recommended Sewer Service Area) imported from April 2001 40-scale aerial survey for the Chester Wastewater Facilities Plan.



### FIGURE 3

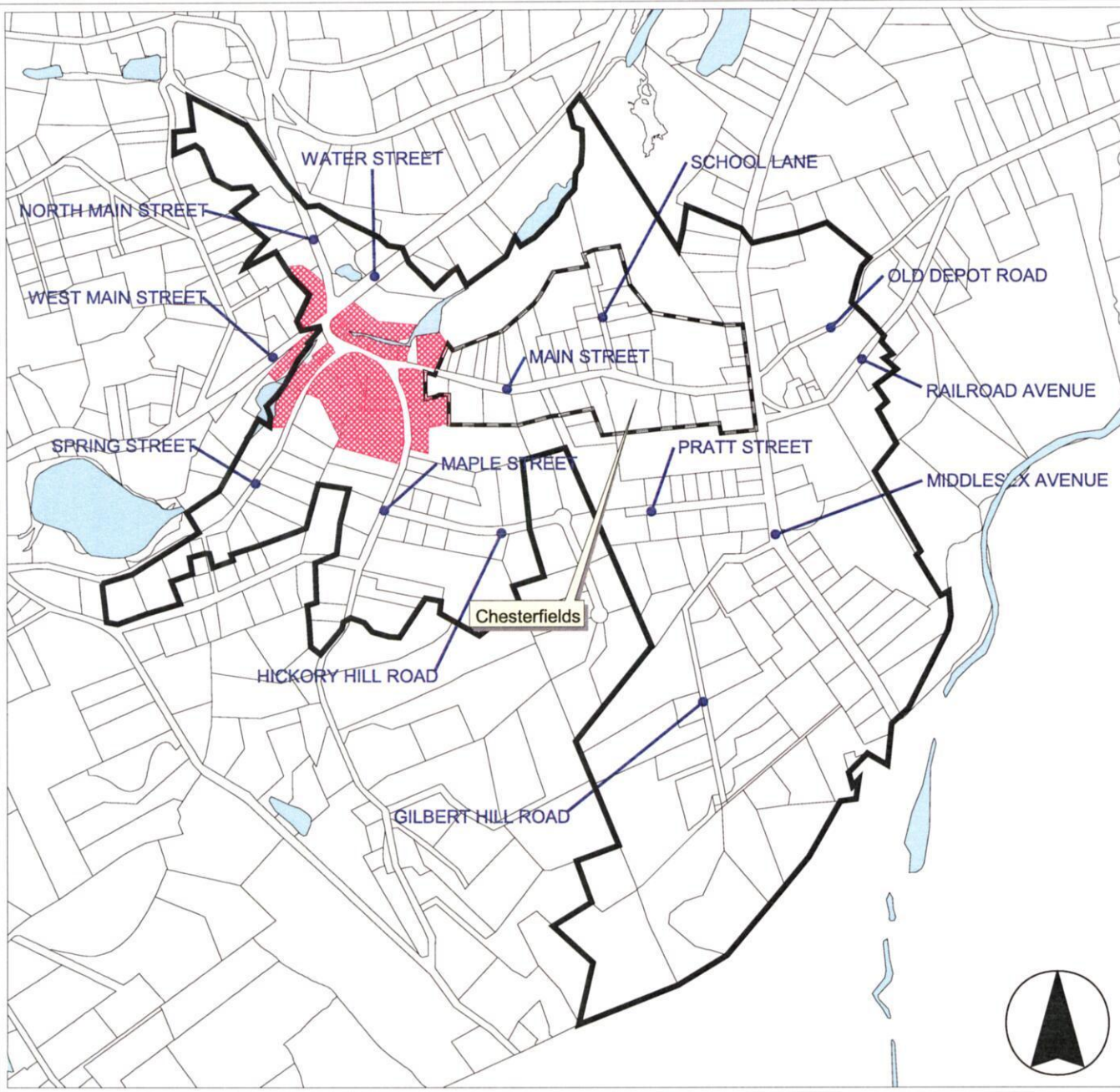


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




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# Chester Wastewater Planning Study

**FIGURE 4 LIMITED SEWER SERVICE EXTENSION AREA**

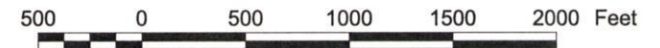


## Legend

-  Water
-  Property Boundary (1)
-  Existing Sewer Service Area (2)
-  Limited Expansion of Sewer Service for Proposed Project
-  Initial Study Area

### NOTES:

- (1) Property lines taken from Marin Environmental townwide parcel base coverage file received 01/02/03.
- (2) Existing Sewer Service Area Boundary taken from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers, 04/01/82.

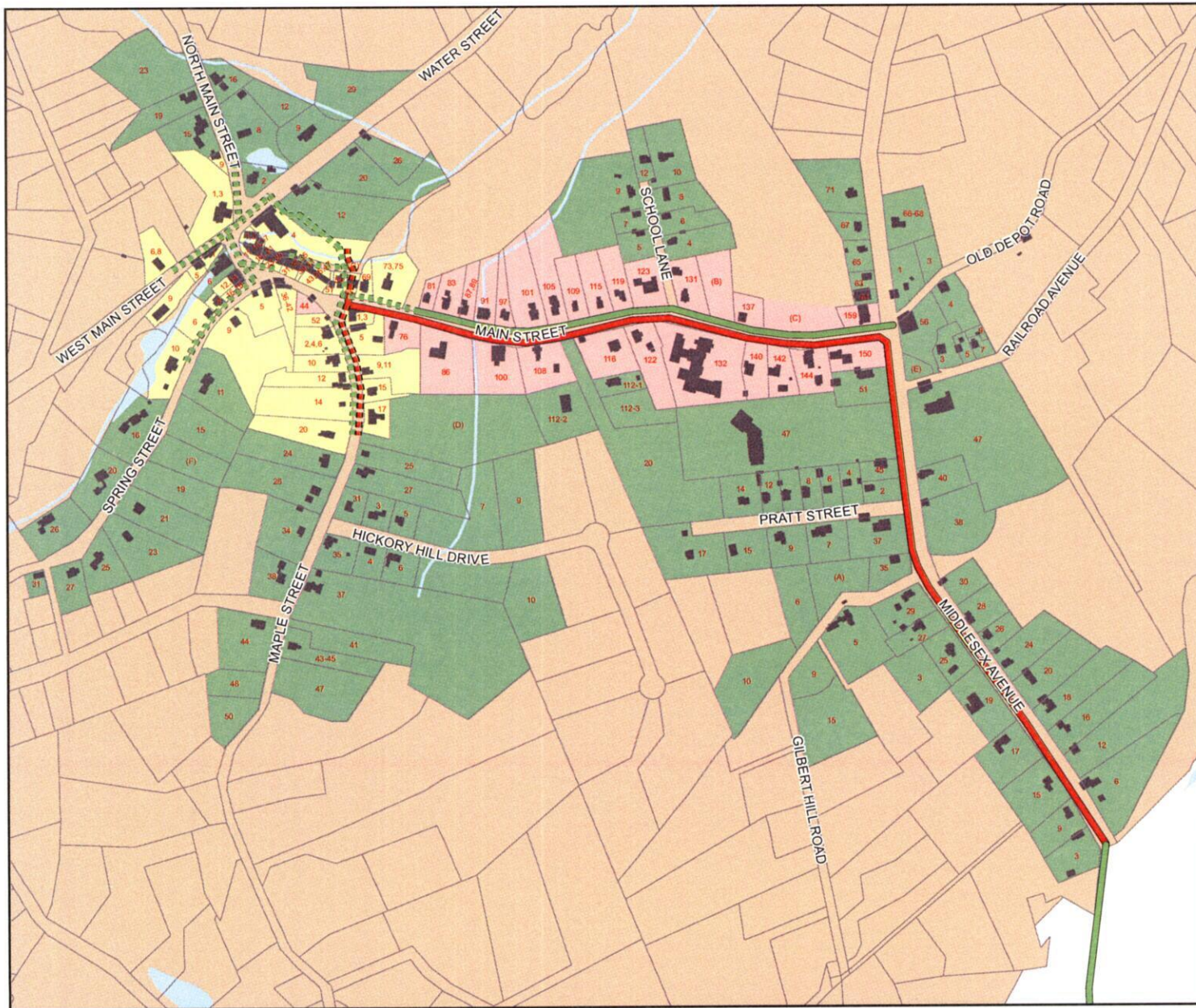


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## PROPOSED PROJECT AND SEWER SERVICE AREA

TOWN OF CHESTER

- Property Boundaries
- Buildings (Within Recommended SSA)
- Water
- Sewers**
  - E-SSWR-FORC
  - Existing Gravity
  - Proposed Gravity
  - Proposed Force Main
- Wastewater Management Plan**
  - Sewer Extension Area
  - Existing Sewer Service Area
  - Recommended Sewer Service Area
  - Non-Sewered Area (On-Site Wastewater Disposal)

**NOTES:**

- 1) Recommended Sewer Service Area to include all existing Sewer Service Area parcels.
- 2) Townwide parcel base received from Tighe & Bond on 04/26/2005.
- 3) Existing Sewer Service Area from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers on 04/01/82.
- 4) Existing Sewer Service Area verified April 2005 with the 2003-2004 Sewer Usage Fees and Addresses report, First Selectman's Office, and Town Engineer.
- 5) Data of open water bodies downloaded from the CT Department of Environmental Protection GIS website.
- 6) Building locations (shown within the Recommended Sewer Service Area) imported from April 2001 40-scale aerial survey for the Chester Wastewater Facilities Plan.



**FIGURE 5**

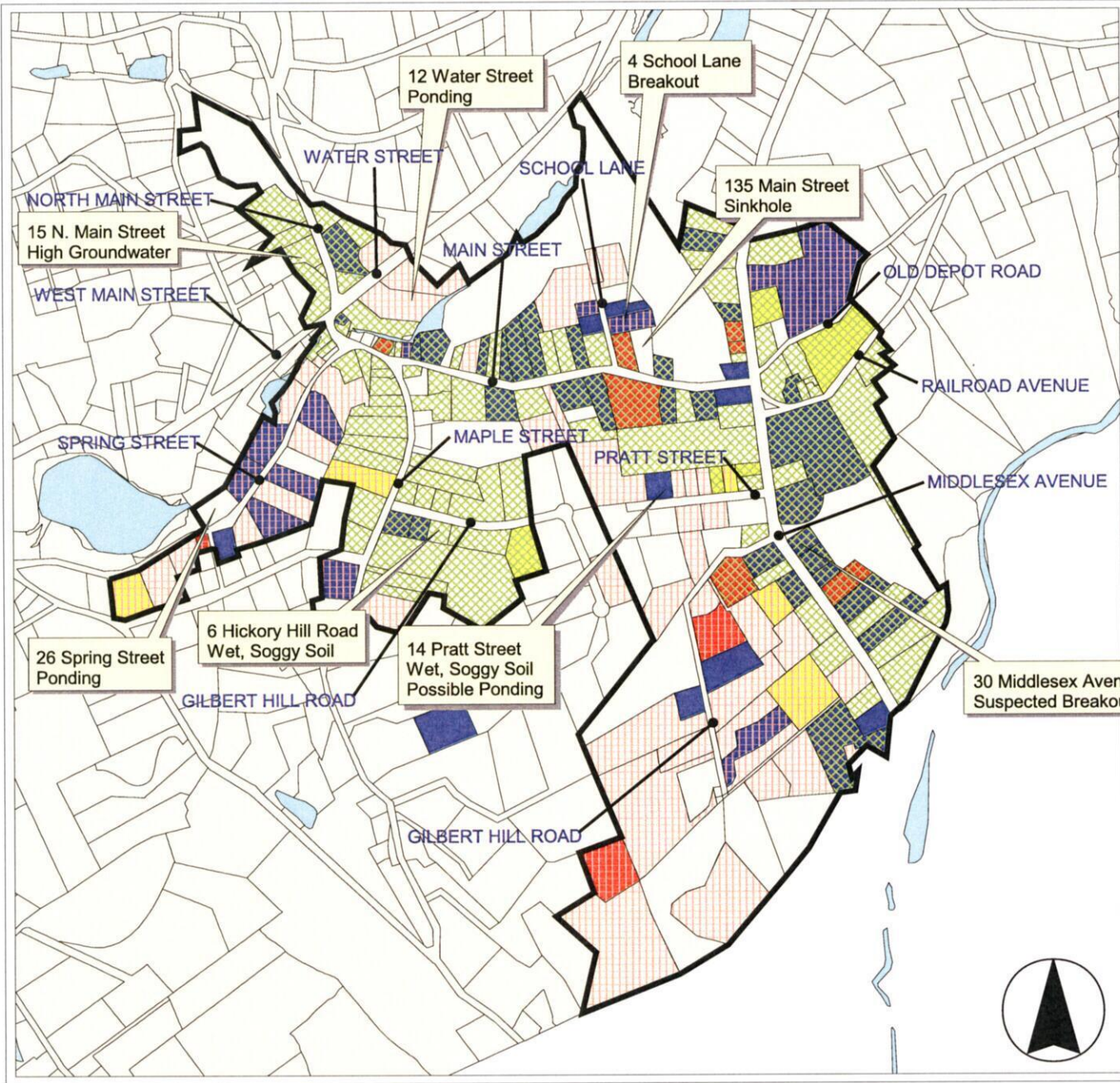


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









# Chester Wastewater Planning Study

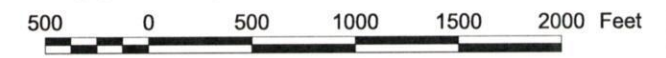
Figure 7 Evaluation of Septic System Problems in Study Area



## Legend

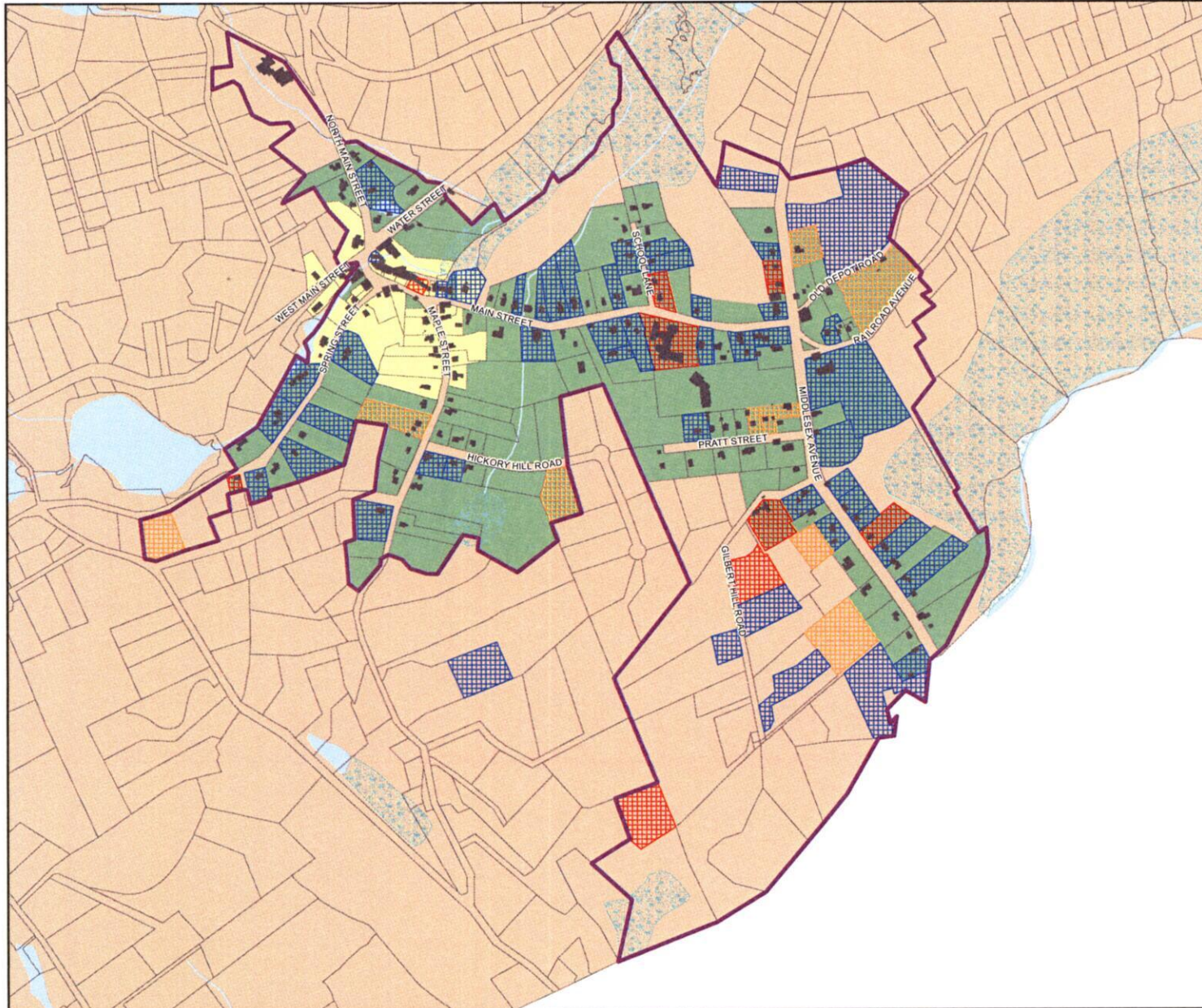
-  Water
-  Property Boundary (1)
-  Study Area
- Drinking Water Supply (2)**
  -  Private Well
  -  Public Drinking Water
- Septic System Problems**
  -  Past (2, 4, 5)
  -  Present (2, 6)
  -  Both Past and Present

- NOTES:
- (1) Property lines taken from Marin Environmental townwide parcel base coverage file received 01/02/03.
  - (2) Information based on Questionnaire Results last updated 05/08/03.
  - (3) Existing Sewer Service Area Boundary taken from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers, 04/01/82.
  - (4) Information gathered from Chester Sanitarian files on 12/11/02.
  - (5) Past septic system problems based on the Sanitarian files' lot repair history and Questionnaire Results for septic system repairs.
  - (6) Present septic system problems based on the Questionnaire Results for sewage backup, ground discharge, odor, other failures and frequency of occurrences.



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## RECOMMENDED SEWER SERVICE AREA VS. LOTS WITH SEPTIC SYSTEM PROBLEMS TOWN OF CHESTER

- Buildings (Within Recommended SSA)
- Water
- Marsh
- Property Boundaries
- Limits of Initial Study Area
- Septic System Problems**
- Past
- Present
- Both Past and Present
- Sewer Service Area**
- Existing Sewer Service Area
- Recommended Sewer Service Area
- Non-Sewered Area (On-Site Wastewater Disposal)

**NOTES:**

- 1) Recommended Sewer Service Area to include all existing Sewer Service Area parcels.
- 2) Property lines from Marin Environmental townwide parcel base coverage file (01/02/2003).
- 3) Existing Sewer Service Area from "Contract No. 2: Construction of Sewage Collection and Treatment System" created by Hewitt Engineers on 04/01/82.
- 4) Existing Sewer Service Area verified April 2005 with the 2003-2004 Sewer Usage Fees and Addresses report, First Selectman's Office, and Town Engineer.
- 5) Hydrography data sets downloaded from the Department of Environmental Protection GIS website.
- 6) Building locations (shown within the Recommended Sewer Service Area) imported from April 2001 40-scale aerial survey for the Chester Wastewater Facilities Plan.
- 7) Information for Septic System Problems based on Questionnaire Results last updated 05/08/2003, records gathered from Chester Sanitation files on 12/11/2002. Past problems based on the Sanitation files' fix repair history and Questionnaire Results for septic system repairs. Present problems based on the Questionnaire Results for sewage backup, ground discharge, odor, other failures, and frequency of occurrences.

0    250    500    1,000  

 Feet



**FIGURE 8**



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