

**Town of Ridgefield
Draft Annual Report # 1
November 2004**

**General Permit for the Discharge of Stormwater from Small
Municipal Separate Storm Sewer Systems (MS4)**

Permit Number GSM 000041

Introduction

The Town of Ridgefield is submitting this annual report as required by the Connecticut Department of Environmental Protection's (CT DEP) "General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (Permit)". This report will describe the town's performance on the Best Management Practices (BMP) listed in the Stormwater Management Plan (SWP), dated June 23, 2004. This annual report falls in the middle of the town's fiscal year, which will not have complete year end totals of completed BMP's for this annual report. Typically, these reports are completed at the end of the town's fiscal year. The subsequent annual reports will have yearly BMP fulfillment totals.

The town has submitted the Part B permit application and completed the SWP as required. The town has been completing typical daily, weekly and monthly tasks that meet the requirements of some or all of the minimum control measures and the BMP's listed in the SWP. The land development departments (Engineering, Planning and Zoning, Health and Highway) complete various tasks and generate records that are and were managed prior to the issuance of the Permit. This Permit will require the town to further expand its stormwater management practices to fulfill all the BMP's in the minimum control measures.

This report will discuss specific BMP's and the efforts used to complete the plan and have supporting documents from the coordinating Town department(s). This annual report will be available to public for review and comment for thirty days as required in the Permit. A copy of the legal notice is attached in Appendix A.

Minimum Control Measures

1. Public Education and Outreach

The town has started the development of a draft stormwater Internet page to be a part of the town homepage. The approved stormwater web page will be the main tool to educate and inform the community on stormwater and the impacts of pollutants to the town and state watercourses. All materials developed and implemented in conjunction with this Permit will be made available on the site when completed and approved. There may potentially be third party documents and links made available upon review and approval to the site. The town has developed a list of BMP's that will be added to the website when completed, see the table below for BMP's and their schedule.

The town has sent some of its employees to a two-day University of Connecticut training seminar on the 2002 CT Guidelines for Soil Erosion and Sediment Control, including the Planning Director, ZEO, Town Engineer and the Director of Public Services. Attached in Appendix B is a copy of the agenda of the two-day seminar. This seminar will be used, as a guide for the proposed E&S Controls seminar that will be held by the Planning and Zoning Department in Year 3 for the public and contractors.

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BMP ID	Public Education – BMP Action	Responsible Department	Status
1-1	Wetlands Viewing Platform	Engineering	Open for viewing
1-2	Develop Stormwater Internet Page	Engineering	Navigate to webpage – Year 2
1-3	Expand Haz. Waste & Recycling Brochures	Highway	Brochures available to public – Year 2
1-4	Pet Droppings Fact Sheet	Health	Factsheet available to public – Year 3
1-5	Environmental Friendly Pesticides and Fertilizers Factsheet	Engineering	Factsheet available to public – Year 3
1-6	Illegal Connections Factsheet	Health	Factsheet available to public – Year 4
1-7	Review 3 rd Party BMP's for Potential Use	Engineering	Completed annually at Team meeting
1-8	Link Existing\New BMP's to Stormwater Internet Page	Engineering	Completed during corresponding year
1-9	E&S Controls Seminar	P&Z	Beginning – Year 3

2. Public Involvement/Participation

The Town currently maintains several BMP's that meet the requirements of this minimum control measure. Attached in Appendix C, is a memorandum that further describes specific BMP's that are organized and managed by the Highway Department. The public is involved on a daily basis via walk-ins, telephone calls and site visits that generates new issues that can be incorporated into the existing BMP's or a proposed BMP.

The Freedom of Information policies followed by all Town departments are the requirements listed in the Connecticut State Statute, XXX. Listed below is a table that lists specific BMP's and their status to fulfill the requirements of this minimum control measure.

In a specific case of public involvement, a homeowners association as drafted a proposed watershed guideline packet. The Planning and Zoning Commission is reviewing these guidelines for potential adoption. The effort of this homeowner association taps both minimum control measures numbers 2 and 4. The proposed guideline packet, if accepted, can show how a specific neighborhood can impact this Permit and the community. A copy of the **draft** watershed guideline packet is attached in Appendix D.

BMP ID	Public Participation – BMP Action	Responsible Department	Status
2-1	Develop Public Involvement & Participation Program	Engineering	The town maintains a current policy.
2-2	Follow FOI Requirements	Engineering	The Town follows State

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			Statue XXX.
2-3	Rid Litter Day	Highway	Completed May 2004.
2-4	Adopt-A-Street	Highway	The program is a year round policy.
2-5	Waste Oil Collection Day	Highway	Conducted October 30, 2004.
2-6	Hazardous Waste Collection Day (Multi Town)	Highway	Completed in September 2004.
2-7	Develop and Implement a Adopt-A-Stream BMP	Engineering	The program will be drafted Year 4 and implemented Year 5

3. Illicit Discharge Detection and Elimination

The town allows only stormwater discharges to be connected to the stormwater system. If an illicit discharge is found connected to the system, the owner will be notified and required to properly disconnect the discharge. The Health Department handles calls regarding these potential discharges coming from a failing septic system. The review of septic system designs and inspection of septic system installations can eliminate one aspect of an illicit discharge. The town’s fat, oil and grease “FOG” ordinance requires and regulates restaurants and other facilities to have a grease trap connected to the sanitary sewer to further eliminate a pollutant migrating to the stormwater system.

The stormwater sampling events and future stormwater sampling may lead to area(s) that will shows signs of illicit discharges that can be further investigated and eliminated. The development of the illicit discharge detection and elimination ordinance will be approved by the fifth year of this Permit. The town policy will remain in place and will continue to develop to form the draft illicit discharge detection and elimination ordinance. Attached in Appendix E is a copy of a memorandum from the Health Department listing details of potential illicit discharges and their elimination.

Mapping Requirements

As stated in the SWP, the town will try to procure the necessary funds to begin the purchase of the town base mapping to complete the mapping required in this minimum control measure. If the proposed funding of the town-wide base mapping is not approved, the town will have to wait until the State completes statewide flyover and has the data available to the municipalities. The town-wide base mapping is expensive and the funding will need to be sent through the budget process, attached in Appendix F is a copy of the GIS Executive Summary that will discuss the funding necessary to obtain the base mapping.

This mapping will require the continuous survey (global positioning survey, GPS) of stormwater system structures to complete the inventory of all stormwater structures, both in and outside of the Urbanized Areas (UA’s). The GPS survey is limited to certain

conditions requiring both ample satellite and weather cooperation to complete the fieldwork. The town has found that late fall to early spring is the most efficient time of the year to complete the GPS work. The proposed scheduling will send field personnel into the field two or three days a week to continue the GPS work to complete the stormwater structure database inventory.

Listed below are the BMP's slated to fulfill the requirements of this minimum control measure, which includes the current status of each BMP.

BMP ID	Illicit Discharge Detection & Elimination – BMP Action	Responsible Department	Status
3-1	Map Outfalls Greater than 15” in UA’s	Engineering	Inventory of the stormwater structures is underway, being collected via GPS.
3-2	Map Outfalls Greater than 15” entire town	Engineering	Inventory of the stormwater structures is underway, being collected via GPS.
3-3	Map Outfalls Greater than 12” in UA’s	Engineering	Inventory of the stormwater structures is underway, being collected via GPS.
3-4	Program to Detect & Eliminate Illicit Discharges	Health	Currently the Health Department handles illicit discharges complaints
3-5	Develop Illicit Discharge Ordinance	Engineering	The Engineering Dept will begin drafting an Ordinance in Year 3 and complete the approval by Year 5
3-6	Basemap Development – Contingent on Procurement of Funds	Engineering	See details in MCM #3 regarding the timeline
3-7	Review of Septic Designs to Verify Proper Distances from Storm Sewer Systems	Health	Currently the Health reviews all septic designs to verify compliance
3-8	“FOG” Ordinance – Management of Grease Traps	Health	All restaurants are required to install a grease trap to collect associated wastes

4. Construction Site Stormwater Runoff Control

The Planning and Zoning Department manages the land use regulations and has been implementing many of these BMP's prior to this Permit requirement. There were two BMP's (4-7 and 4-8) the Permit was requiring the land use regulations to also regulate. The recommendation to refer developers to review the GP for Construction Site Dewatering (BMP 4-7) is being reviewed by the Planning and Zoning Department and the Town Counsel to verify whom will perform the reference to the general permit. The proposed plan will be to allow third engineers and reviewers to complete the reference of the General Permit to the applicant for submission to the DEP. The on-site trash policy (BMP 4-8) has been drafted and approved by the Planning and Zoning Department and is required of all new applicants to comply. Attached in Appendix G is a memorandum from the Planning and Zoning Department that further describes activities completed throughout the year regarding the efforts undertaken to comply with this Permit.

BMP ID	Construction Site Runoff Control – BMP Action	Responsible Department	Status
4-1	Review Land Use Regulations	P&Z	Review of guidelines completed and deficiencies have been addressed.
4-2	Plan Review Completed by P&Z	P&Z	Included in Zoning Regulations
4-3	Plan Provides Calculations for Disturbed Areas	P&Z	Included in Zoning Regulations
4-4	Installation of Proper E&S Controls	P&Z	Included in Zoning Regulations
4-5	Inspection Procedures for E&S Controls	P&Z	Included in Zoning Regulations
4-6	Public Hearings and Pre-App Meetings with Public	P&Z	Included in Zoning Regulations
4-7	Add Reference to GP for Construction Site Dewatering	P&Z	Reference to the GP is under review with Town Counsel.
4-8	Complete On Site Trash Management policy	P&Z	Policy has been approved and is listed in the development application.

5. Post-construction Stormwater Management in New Development and Redevelopment

The submission of a development application currently requires the applicant to submit proposed engineering plans to address the on-site stormwater run-off and discharge. There is not an ordinance that requires the applicant to manage post-construction

stormwater, however the review of these proposed developments includes provisions for stormwater management after construction has been completed. This ordinance will be drafted and approved by the Engineering Department and adopted by the Board of Selectman by the end of the fifth year of the Permit. The on-going review of the development applications has led to new requirements to be followed by certain applicants pending the size of the development and/or the area(s) impacted. The potential requirements the applicants are facing may include; drafting BMP's by third party engineers to maintain the proposed on-site stormwater system and setting up bonding for the on-site stormwater system prior to obtaining the certificate of occupancy for future maintenance.

As the Permit states now, there may be a potential conflict with project sites that are less than 1 acre, this may not be allowable under the existing State General Statues. The Town's Counsel will be reviewing the Permit guidelines and verify the conflicts, if any, resulting in the proper modifications to this ordinance or requirements developed by the town.

The proposed BMP's for this minimum control measure are listed in the table including the status of each.

BMP ID	Post Construction Runoff Control – BMP Action	Responsible Department	Status
5-1	Review Land Use Regulations	Engineering	BMP's are proposed to address deficiencies See 5-2 thru 5-5
5-2	Develop Post Construction Ordinance	Engineering	The proposed Ordinance will be drafted and approved by the end of Year 5
5-3	Develop and Implement Post Construction BMP Strategy	Engineering	Current plan review may require developer to complete; Ordinance will require all sites to comply.
5-4	Develop Program to Ensure long-term O&M of BMP's	Engineering	Current plan review may require developer to complete; Ordinance will require all sites to comply.
5-5	A BMP that will Require the Engineer to Certify the Site Complies with Phase II Goals	Engineering	Submission of plans that will provide research of Phase II, included in Ordinance.

6. Pollution prevention/good housekeeping for municipal operations

The Town Highway Department completes many of the BMP's that are required by this minimum control measure. All Town roads are swept annually in the spring, in addition there are roads that require additional sweeping for various reasons. Roads that are swept twice may be located within a watershed area(s), centrally located within the town or the road is being repaired which requires additional sweeping. The storm drainage structures, including catchbasins, plunge pools and channels, are cleaned throughout the year. The catchbasins are cleaned using a vactor-truck, however only a portion of the catchbasins can be cleaned in a given year. There are approximately 4000 catchbasins located within the Town and in early to mid June the Health Department will install mosquito larvacide tablets that stop the catchbasin cleaning process, in order to control the West Nile Virus. The repair or replacement of storm drainage structure(s) is completed on an annual basis. Many of the requests to repair structures come from telephone calls fielded at several town departments (Highway and Engineering). Some of the requests can be handled immediately and some need further research requiring a storm drain system upgrade. In Appendix C is a copy of the Highway Department memorandum that describes these BMP's.

The Highway and Parks & Recreation Department's are trained annually under the Phase I General Permit, Permit Number GSI001485. A formal training program for the Phase II Permit will be drafted and completed by the end of the second year. The O&M Plan will be addressed in the fourth year of the Permit. The table below describes the BMP's and the status of each for this minimum control measure.

BMP ID	Good Housekeeping – BMP Action	Responsible Department	Status
6-1	Develop Training Program	Engineering	Use training from Phase I GP as outline for new program
6-2	Sweep Streets Once a Year	Highway	Completed annually each Spring
6-3	Evaluate Streets to Swept Twice a Year in UA	Highway	The secondary road sweep list changes due to need or lack of sweeping necessity.
6-4	Clean Stormwater Structures Once a Year	Highway	Completed annually until West Nile Monitoring begins
6-5	Develop a System to Repair and/or Replace MS4 Structures	Highway	The repairs completed as necessary and additions are completed in conjunction with road resurfacing projects.

6-6	Develop and Implement O&M Plan	Engineering	A O&M plan will be drafted and amended to the SWP by the end of Year 4
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Stormwater Sampling Results

The Town has completed the required stormwater sampling at six representative locations throughout the Town. The sample locations are concentrated to two specific areas to determine if stormwater discharges contain pollutants or illicit discharges. The sampling events occurred over two separate storms to fully comply with sampling protocol. All stormwater sampling protocol was followed during the sampling of the six discharge locations. Listed in the table below is the analytical data for the stormwater sampling events for Year 1 of this permit registration;

Sample ID	MS4-1	MS4-2	MS4-3	MS4-4	MS4-5	MS4-6
Sample Date	9/8/04	9/8/04	9/8/04	11/12/04	11/12/04	11/12/04
Sample Time	08:55	09:17	09:22	09:18	09:26	09:41
Location	Barnum Pl	Shadow Lake Rd	Crosby Ct	Indian Cave Rd	Rowland Ave	Grove St
Rainfall pH	7.1	7.6	7.3	7.3	7.6	7.8
Parameters (Units)						
pH (SU)	7.0	7.8	7.2			
Hardness (mg/L)	6	6	150			
Conductivity (uS/cm)	27	425	306			
Oil & Grease (mg/L)	<1.4	<1.4	<1.4			
COD (mg/L)	6	12	11			
Turbidity (ntu)	6.5	9.2	14.7			
TSS (mg/L)	11.4	13.2	24			
TP (mg/L)	0.16	0.13	0.32			
Ammonia (mg/L)	0.28	0.56	0.28			
TKN (mg/L)	0.28	0.56	0.56			
Nitrate (mg/L)	ND	ND	ND			
E. coli	740	12,970	7,330			

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Attached in Appendix H are the Stormwater Report Forms and lab reports for the six discharges sample points.

Future Goals

The town will attempt to complete the schedules developed for all BMP's associated with this Permit. In order to meet the proposed schedules the town will need proper funding and manpower to complete, if funding is not available the town will look to the State for any available funding. In the case of no or minimal funding the town will amend the necessary BMP(s) schedule as allowable in the Permit guidelines.

APPENDIX A
Legal Notice

APPENDIX B
Erosion and Sedimentation Controls Seminar Agenda

APPENDIX C
Highway Department Memorandum

MEMORANDUM

Date: November 22, 2004
To: Jake Muller
Cc: Peter Hill, Director of Public Services
Charles Fisher, Town Engineer
From: Bill Hoff
Subject: Annual Report on Stormwater Pollution Prevention Measures

This memo will serve to update your information on activities related to stormwater pollution prevention which have taken place between January 1, 2004 and November 15, 2004.

Street Sweeping

The Town of Ridgefield carries out a comprehensive street sweeping operation which includes the use of Highway Department equipment and personnel, as well as contracting a commercial sweeping company through an open bid process (see attached copy of legal notice). In this way we can ensure that all town roads are cleared of winter sand as early as possible in the spring, weather permitting.

The first priority each year is to sweep roads located in environmentally sensitive watershed areas, such as Rainbow Lake, Lake Mamasasco, Pierrepont Lake, Fox Hill Lake, Great Pond and Twin Ridge. As soon as the winter weather breaks, we begin in these areas utilizing town resources, following up again with a second cleaning once our full scale sweeping operation is in gear, either with town crews or with our commercial contractor.

All roads which are to be resurfaced each year are swept at least twice. In 2004, this totalled 13 miles of road (see attached).

We also clean Main Street every week between May and October.

Attached is a comprehensive listing of our sweeping program.

Drainage

This year the Town of Ridgefield has spent in excess of \$300,000 to improve our stormwater system by repairing the existing infrastructure as well as by new installation of catch basins and pipe. Again, we utilize town equipment and personnel, as well as a number of independent contractors to perform this work. In 2004, we repaired or replaced 91 sumps and 186 catch basin tops. We also installed 41 new sumps and tops and laid 4,880 feet of new pipe.

During the spring and fall, we carry out a regular program of catch basin cleaning and pipe flushing, utilizing the town's vactor/ jet truck and personnel. Again we concentrate on watershed areas first. Please note that in recent years, due to the seeding of basins by the Health Director to combat the spread of the West Nile Virus, we have not been able to perform this function between July 1 and October 1 unless it is an emergency situation. In 2004, we were able to clean approximately 350 catch basins and flush approx. 500 feet of pipe.

In addition, we utilize our two excavators and our backhoe to perform reclamation of silt from drainage channels and discharge areas as necessary.

In 2004, we repaired or replaced headwalls in several locations.

We find that many of the drainage jobs we perform are in response to phone calls, letters or visits from town residents. Attached is a listing of 50 work order created from these contacts which we were able to complete between January 1 and November 15 of this year.

Community Programs

The Town has a number of programs in place which are aimed at reducing the amount of pollutants entering the stormwater system. Below is a brief explanation of each.

➤ **Adopt-A-Street**

This program was initiated by an environmentally concerned resident, in cooperation with the Selectman's Office and this department, approximately eight years ago. Residents, businesses and associations volunteer to monitor and maintain the roads and right-of way, collecting and bagging garbage which is picked up by the Highway Department staff. The timing of these clean-ups is decided by the volunteers who then advise the Highway Office to schedule pickup and disposal. Most roads are done several times each year. Please note the attached list of "Adopt-A-Street" roads.

➤ **Rid Litter Day**

This program has been in place for over fifteen years and is sponsored by the town and several local environmental groups. This year "Rid Litter Day" was held on April 24th. Residents are asked to pickup loose garbage and other, larger items (i.e. carpets, appliances, tires, etc.) which have been discarded along roadsides, and to deliver them to designated drop-off sites located strategically throughout town. Town Highway and Parks Dept. personnel, with the assistance of volunteers, load the garbage into town vehicles and dispose of the items at the Ridgefield Transfer Station.

➤ **Waste Motor Oil**

On October 30, 2004 the town held its second annual "Waste Motor Oil Collection Day". This program is sponsored by the town and offers each resident the opportunity to dispose of up to five gallons of used oil at the Highway Department garage. Clean Harbors Inc. is contracted to handle, package and haul to a disposal site. They are assisted in the collection by up to six Highway employees during a 5 hour period. In our first two events, we have averaged approximately 500 gallons per collection day.

➤ **Hazardous Materials Day**

The "Hazardous Waste Collection Day" is a cooperative effort by six area towns, under the auspices of the Housatonic Resource Recovery Authority (HRRA), to allow residents to dispose of a large variety of chemicals, and other items which are known pollutants. This year, the collection day was held on September 11th at the Danbury Public Works facilities. Attached is a copy of the flyer which lists the items accepted.

We have also opened discussions with the newly elected president of HRRA to attempt to compile a list of disposal options for residents who have items which are not accepted at the Hazardous Waste Collection Day.

If you need any further information, please feel free to call my office at extension 2749.

Sincerely,

Bill Hoff
Office Manager
Department of Public Services

APPENDIX D
Draft Lake Mamasco Watershed Guideline Packet

APPENDIX E
Health Department Memorandum

APPENDIX F
GIS Executive Summary

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Introduction

The Town of Ridgefield currently does not have town wide data storage or digital mapping system capabilities. In the past, there has been discussions and reports about connecting the various town department data with an accurate town base map and creating a Geographic Information System (GIS). The budgets that have been reported for this would start at approximately \$175,000. These proposed budgets included; GIS software, hardware components (CPU's, digitizer and collection instruments) and data conversion by vendors. Since those reports, the Engineering Department has procured a Trimble Global Positioning System (GPS) receiver in November of 2001 and has been collecting the Town's infrastructure. The Engineering Department has completed data collection of structures in the sewer system and has a database of the sewer manhole inventory from the 1992 manhole inspection report. This data is currently not being maintained and it is not shared with other town departments efficiently. The data is stored on a network drive that can be viewed by software only the Engineering uses and is in a raw format. If there were a GIS implemented this data would be useful to many departments in a software package that would be easily distributed and implemented.

GIS Proposal

Building and implementing a town-wide GIS would be costly and obstacles may occur during the design\build and implementation phases. The GIS that the Engineering Department is proposing will be to develop a comprehensive system in the sewer areas, to start, which will reduce and potentially eliminate the implementation obstacles. The GIS would include a "landbase" layer developed from the Town tax maps and the purchase of the SNET\SBC digital orthro photographs and vector data. The combination of these datasets would create an accurate landbase to build the GIS. The landbase will be geo-referenced and connected using the assessor map and lot identifier as the primary key. This will consistent throughout any and all layers. The development of new layers would continue to use the assessor map and lot identification to allow the to implemented to the GIS. We are proposing to limit the area of the converted tax maps to save on the initial costs associated with building the landbase for the GIS. This proposal will include all sewer areas, District 1, Route 7 and Turner Hill, converting 26 tax maps, approximately 2,200 parcels, to complete the parcel layer and database in the sewer areas. The tax map conversion will include; scanning, vectorizing and geo-referencing the parcels to connect to the appropriate map and lot identification number. The accuracy of the parcel geo-referencing will update of the revision date of the tax map, attached in Appendix 1 is a copy of the vector-imaging quote. The SNET\SBC data will cover the entire town. The SNET\SBC data is accurate to mapping accuracy of 3' and is available for purchase. The data is generated from aerial photography to outputs of digital orthro photos and vector data. The SNET\SBC data is valuable data; they have completed a full update of the state, by re-flying approximately 1/3 of the state each year, beginning in 2000. Starting in 2004, SNET\SBC will be flying the state using color and black & white film, allowing for both color and black & white digital orthro photographs to accompany the vector data. The

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vector data in the SNET\SBC dataset package includes; street centerlines, some buildings, watercourses and more. The complete SNET\SBC data specifications are attached in Appendix 2.

The combination of the vectorized tax map data and the SNET\SBC will generate an accurate Town of Ridgefield landbase to develop the GIS. The GPS data, coordinate information, which the town has collected, will be connected to the coordinating database attributes to complete the specific GIS layer to be viewed and analyzed with the GIS software. Typically the GPS data collected is at “sub-meter”, $\pm 3'$, accuracy that can be post-processed to a higher accuracy. The Engineering Department envisions the development of several layers to be part of the GIS. Layers would include physical information collected via the GPS system connected to data located within a database or text file. For example potential data layers may include;

GIS Data Layer	Layer Description
Landbase	The landbase will be comprised of tax map parcel line information and the SNET\SBC orthro photos and vector data.
Sanitary Sewer System	Location of main & structures, billing information, manhole inventory data, record drawings and future studies and reporting.
Storm Drain system	Location of structures and development of watersheds and drainage basins, will be helpful to generate requirements of the CT DEP Phase II MS4 permit.
Zoning	The zoning districts and the historic districts can become separate layers.
Health	Connection with electronic data from the Health department via map & lot or address.
Building	Connection with electronic data from the Building department via map & lot or address.
Fire Department Routes	Vehicular routing maps to various locations in the town.
Tree Inventory	The tree committee data can be located and added as a layer to the GIS.
Map Data	Record map data, soils and aquifer protection maps, could be scanned and become separate layers.
School Districts	The various school districts could be located on the base map.

This is a brief list and with time layers will continue to evolve and new layers will be developed. Scanning map information, rubber sheeting and geo-referencing the image to the landbase for presentation and reporting purposes will generate additional layers. The landbase layer, tax parcel info & tax id and the SNET\SBC data, will create a sound and accurate foundation to build the GIS and continue its development in the future.

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GIS Benefits

There will be immediate and future benefits to having this GIS built and implemented. The GIS would begin to efficiently share accurate data and to help to eliminate redundancies and discrepancies in data with many departments. The Engineering Department and the WPCA would be immediately impacted with this GIS proposal. An up to date sanitary sewer system map would be readily available to employees and customers. As briefly described above, this sanitary sewer layer will have a geo-referenced map showing all sanitary sewer structures and pipes located in the system, connection with WPCA data showing billing information and even future project data, possibly television inspection video and associated data. The Engineering Department, WPCA and OMI will be able to share and confirm data for manhole information, pipe sizes and locations, reporting, mark outs and other important data. The Engineering Department will maintain the data and all three departments would verify the integrity of the data. The sanitary sewer layer, as a part of a GIS application, will be very helpful and useful for year-end reporting, including; NPDES permit application renewals, GASB-34 reporting, sewer system maintenance, future rehabilitation projects and customer service. The Connecticut Department of Environmental Protection has issued a new permit called the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. This permit will require annual reports and a comprehensive storm drain system map to be developed and managed. This data will be very helpful as a layer in the GIS to facilitate the reporting and maintenance of this permit requirement. Attached in Appendix 3, is a sample of the entry screen and a printed report from the sanitary sewer manhole database. The ultimate goal of this GIS will be to present the system to other departments to gain support and eventually run it over an intranet and even the internet. Similar detail can be inputted in other department's data layer as the layers are developed. As data layers are developed and implemented many departments will gain access to efficient and accurate data that will help their daily tasks.

GIS Development

The development of the GIS will need a commitment of funding, not the funding that has been mentioned in the introduction and in past reports. This initial funding will allow the GIS to develop over time and in the future become a town-wide software service. This proposed GIS will be a very helpful presentation package for other departments to see the impacts and service provided and will generate support for future funding commitment and expansion. I have drafted a list of necessary hardware, software and data to procure to begin the development of this GIS. The list below describes various components that the Engineering Department is requesting funding to begin this GIS project;

Component	Description	Cost
CPU Workstation	ESRI\Dell special offer "package 1" item #94516, includes a Dell Workstation 650 and ArcEditor 8.x, see specifications in <u>Appendix 4</u> for details on CPU and ArcEditor 8.x. Purchasing this package is an	\$9,700

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	approximate cost saving of \$825 to buy these items individually.	
HP Designjet 815MFP*	The HP Designjet 815 MFP is a 42” multifunction Scanner, Printer and Copier. This HP 815 MFP unit will be very helpful to expand the parcel landbase in-house. The HP 815 MFP has many long term advantages; outside of building a GIS the unit could be used for printing, archiving plans sets and copy maps. This unit would be able to pay for itself. See the specification sheet in <u>Appendix 4</u> for details on the unit.	\$18,956
ESRI ArcEditor	ArcEditor 8.x will be the main software development tool for GIS program The cost of ArcEditor 8.x is built in to the CPU workstation and the specs are attached in <u>Appendix 4</u> .	The price is included in the CPU total.
ESRI ArcView	GIS user will run ArcView to navigate, query and analyze the GIS.	\$1220
Tax map vector data	There will be 24 tax maps scanned, vectorized and georeferenced. These maps will encompass approximately 2100 parcels that will be closed polygons and have the corresponding map and lot number connected to a parcel database. The vector-imaging quote is attached in <u>Appendix 4</u> .	\$2100
SNET\SBC landbase	The SNET\SBC landbase would include several layers to the GIS. The data is compiled from April 2003 areal photography and has many attribute layers to the digital orthro photographs. The costs associated with this data are expensive, however the purchase of the data would reduce the costs of hiring a consultant to fly the town and develop the same vector data. The cost includes a 3-year maintenance fee for the updated 2006 digital orthro photos. A complete list of the data integrity and data layers is attached in <u>Appendix 5</u> .	\$20874
Training	Initially training may not need to take place. I have found that working with the software package and developing questions and trial and error is a good approach. The costs are anticipated to be \$500 per day for 5 people on-site, assume 4 days.	\$2,000
	Totals	\$54,760

The above mentioned hardware and software components are essential, however the HP Designjet 815 MFP printer, scanner and copier *is the only item that is not a necessity*. Eliminating the HP 815 MFP will reduce the start-up cost to **\$35,804**. The capabilities of

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the HP 815 MFP will allow the town to complete in-house data archiving, expand the parcel database layer for further landbase development and the ability print out receivables for a profit. The HP 815 MFP will help to recoup the costs associated with the initial implementation of the GIS. Initially, the HP 815 MFP can be used to generate funds by completing large format copies of hard copy maps on file in the Mapping Department, while the GIS is being designed and implemented. The other items listed in the GIS development section will be necessary to begin the landbase and GIS data set layers.

This proposal does not account for a dedicated server, which will be required as the GIS data set expands to allow for greater security and data sharing. Initially, the development of the landbase will not require a server, however as the GIS expands and grows the dedicated server will be necessary to accommodate for a well-powered secure GIS. The dedicated server is anticipated to cost approximately \$3,500.

GIS Security, Maintenance and Expansion

The development of a GIS will require software security parameters to limit access to certain data sets to avoid corruption and maintain good data integrity. The initial security issues will be to restrict certain users from the individual data files and allow users to access the data sets through the GIS browser software to analyze, modify and interpret the data layers. The maintenance of the GIS will be required in two areas; 1.) the GIS system has a whole (landbase, communications and database integrity) and 2.) the individual department data layers. The GIS will require overall database clean up and other debugging as necessary to maintain an efficient running system. The proposed system will administered by the Engineering Department and have the respective town department's maintain their individual data layer. The individual data layer maintenance will take place in the original data file (database, excel or word file), which will not create additional work for the employees. The security privileges will allow for these types of data maintenance protocols to continue through the life of the GIS. The development of the landbase and the sanitary sewer data layer will allow the other town departments to see the effectiveness of a GIS and should promote additional layer development. As stated in the GIS proposal section, the additional layers to be developed will take place after the completion of the sanitary sewer layer that will require the involvement of other town departments and funding. As the GIS expands the funding should be spread through the various departments to encompass the specific needs of each department's data layers.

Conclusion

The proposed GIS will be a helpful tool to complete analysis of data, generate reports and expedite daily tasks. The anticipated timeline for the implementation for the GIS with sanitary sewer will be approximately 6 months after receiving the proposed hardware, software and landbase development. As mentioned in this report, additional layers will be installed in the GIS as they are developed. The GIS project will continue to evolve and develop creating a continuous maintenance project, which will allow new layers to be

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developed and implemented into the system. The use of the assessor map and lot identifier will allow for communication between existing and future software packages to happen easily and will allow for the GIS to grow. The end vision of this GIS will be to start with a compact GIS (sewered areas) and expand to a town wide comprehensive GIS.

APPENDIX G
Planning & Zoning Department Memorandum

APPENDIX H
Stormwater Sampling Analytical Data
Stormwater Report Forms