

REPORT

SUSSEX COUNTY SURFACE WATER MANAGEMENT LEVEL OF SERVICE ANALYSIS



Prepared for
DNREC Division of Soil and Water Conservation
Sussex Conservation District
Sussex County

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EXECUTIVE SUMMARY

This analysis began in June of 2007 and was funded equally by the Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Soil and Water Conservation, the Sussex Conservation District, and Sussex County. Representatives from these agencies oversaw its preparation as the Joint Coordinating Committee (JCC). The purposes of the project were to determine the current level and costs of surface water management offered in Sussex County and to identify the levels and costs needed to adequately meet the needs of current residents and the rapidly expanding population.

This project built upon previous efforts such as the Stormwater Facility Maintenance Needs Assessment for Sussex County (2004), Governor Minner's Task Force on Surface Water Management (2005), and the Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure (2006). In addition to the sponsoring agencies, meetings were also held with numerous other government entities and stakeholders including DelDOT, tax ditch managers, municipal representatives, the Center for the Inland Bays, the Low Impact Development Roundtable and University of Delaware Sea Grant College, and the Positive Growth Alliance.

Information obtained through interviews and document research was used to categorize program areas and responsibilities, determine current expenditures, identify issues of concerns, project future funding needs, and develop alternative governance structures to provide services.

Twelve program areas were developed as follows:

- Stormwater Program
- General Drainage
- Tax Ditch Assistance
- Tax Ditch Management
- Watershed Modeling for Quantity and Quality Management
- Maintenance of and Improvements to Public Infrastructure
- Maintenance of and Improvements to Private Infrastructure
- Source Reduction Strategies
- Flood Plain Protection and Improvement
- Dam Safety
- Public Outreach and Public Involvement
- Planning and Regulatory Aspects

Responsible parties were identified for each and three levels of service developed: Current Level, Minimum Additional, and Optimum Program. Program aspects and funding needs for each element and service level were developed and have been summarized on pages 3-6 of this Executive Summary. It was found that current expenditures in a typical year total \$9,930,000. The additional annual funds to meet the Minimum Additional Program are \$10,260,000 for total expenditures of \$20,190,000 with an additional \$18,165,000 needed for the Optimum Program for total expenditures of \$28,095,000. One time costs were found to add \$800,000 and \$1,225,000 to these sums for the Minimum Additional and Optimum Program respectively.

Nearly half of the current annual expenditures are spent on public infrastructure. General tax appropriations are the primary source. This estimate is a reflection of more day to day costs and does not include isolated major expenditures. A majority of the Minimum Additional needs is comprised of 21st Century Fund shortfalls but recognizes additional expenditures on tax ditch assistance, dam safety, and watershed studies as well as additional personnel, computer capabilities, and office space. The Optimum Program represents more emphasis on source reduction programs and greater allowance for private parties such as Tax Ditch Organizations and homeowner associations (HOAs).

The most notable prior effort to quantify these costs was the Governor's Task Force though it offered Statewide projections. This Level of Service analysis made certain assumptions regarding the Task Force's annualized needs and determined that approximately \$9,000,000 of the over \$40,000,000 Statewide would be realized in Sussex County. The \$10,260,000 Minimum Additional Program needs identified is comprised of approximately \$9,000,000 in project needs with the remaining allotted to additional staffing and related expenses. Though some needs were quantified in one document but not the other, the nearly identical projections developed independently would seem to validate the estimates.

Three potential governance structures were developed and presented at a public meeting:

- Shared Governance
- Existing Framework
- Countywide Approach

The Shared Governance concept keeps the current framework but formalizes responsibilities. It would improve efficiency by reassessing resources and needs and increasing financial support to better address future funding. The Existing Framework makes no substantive changes to current responsibilities. It is the least expensive and easiest governance structure to implement but does not improve efficiencies or address current or potential future funding shortfalls. The Countywide Approach restructures service delivery through a new Authority with greater funding. It is the most expensive governance concept but also the most proactive and comprehensive. Those in the audience at the public meeting appeared to favor an approach somewhere in between the Shared Governance and Existing Framework approaches. There was little support for the Regional Approach and creation of a new entity.

The JCC oversaw the preparation of this study but there are also other groups in existence investigating many of the same topics. The JCC should reconvene, potentially in an expanded form with other stakeholders, to decide if it or another existing or new group is most appropriate for the furtherance of the policy discussions and program enhancements recommended. These recommendations focus more on the larger policy-level themes as opposed to specific program changes and are presented in three contexts.

- Short-term Recommendations which can be accomplished quickly and with minimal additional resources. These include communications strategies, new or updated regulations and planning initiatives, and clarity of agency responsibilities.
- Mid-term Recommendations that may require a higher degree of planning and resources. These include inventory of privately-owned and maintained surface water management structures and facilities, resolution of issues related to the reliance on private entities such as HOAs, and education and outreach efforts.
- Long-term Recommendations that necessitate approaches or tactics on an entirely new level. These include developing better or alternative funding mechanisms, discussions on the reliance on tax ditch organizations, and approaches to addressing aging infrastructure.

This report completes this Level of Service Analysis. It is intended to provide a framework for budgetary conversations and guidance for moving forward. It is not an end point but rather a blueprint for future action.

PROGRAM SUMMARY

Program Area	Current Level	Minimum Additional	Optimum Program
A. Stormwater Program	<ul style="list-style-type: none"> \$220,000 in DNREC salaries to oversee administration of State's Sediment and Stormwater Regulations 	<ul style="list-style-type: none"> \$75,000 for additional DNREC engineer to improve coordination with SCD and DelDOT 	<ul style="list-style-type: none"> \$150,000 for two additional DNREC engineers to improve coordination with SCD and DelDOT
	<ul style="list-style-type: none"> \$1,100,000 in SCD salaries for plan reviews, inspections, and program management 	<ul style="list-style-type: none"> \$400,000 for additional Conservation District employees to better disperse current workloads and handle backlogged projects \$75,000 for additional Conservation District office space 	<ul style="list-style-type: none"> \$800,000 for additional Conservation District employees to better disperse current workloads and handle backlogged projects \$75,000 for additional Conservation District office space
	<ul style="list-style-type: none"> \$150,000 in DelDOT salaries for plan reviews, inspections, and program management 		
B. General Drainage	<ul style="list-style-type: none"> \$400,000 in DNREC salaries for technical assistance, complaint response, surveying, and project management \$400,000 for DNREC projects utilizing 21st Century funds \$380,000 in DNREC contractual (also supports Stormwater program) 	<ul style="list-style-type: none"> \$3.4 million for 21st Century Fund projects \$175,000 for additional DNREC engineer, planner, and inspector to manage additional 21st Century Fund projects 	<ul style="list-style-type: none"> \$3.4 million for 21st Century Fund projects \$175,000 for additional DNREC planner and inspector to manage additional 21st Century Fund projects
	<ul style="list-style-type: none"> \$100,000 in Sussex County salaries 		

C. Tax Ditch Assistance	<ul style="list-style-type: none"> • \$600,000 in DNREC salaries • \$155,000 in SCD salaries for technical assistance to Tax Ditch organizations 	<ul style="list-style-type: none"> • \$50,000 for additional DNREC Tax Ditch Coordinator to provide inspections and technical assistance • \$100,000 for DNREC computer system upgrades and associated costs (one time cost) 	<ul style="list-style-type: none"> • \$100,000 for two additional DNREC tax ditch coordinators to provide inspections and technical assistance • \$100,000 for DNREC computer system upgrades and associated costs (one time cost)
D. Tax Ditch Management	<ul style="list-style-type: none"> • \$350,000 for Cost Share projects to address major maintenance activities ○ \$350,000 for Cost Share projects to address major maintenance activities • \$100,000 from CTF's for DelDOT projects 	<ul style="list-style-type: none"> ○ \$1.1 million for Cost Share projects to address major maintenance activities ○ \$1.1 million for Cost Share projects to address major maintenance activities 	<ul style="list-style-type: none"> • \$2.2 million for Cost Share projects to address major maintenance activities • \$2.2 million for Cost Share projects to address major maintenance activities
E. Watershed Modeling	<ul style="list-style-type: none"> • \$250,000 for the Nanticoke Watershed Stormwater Management Plan 	<ul style="list-style-type: none"> • \$125,000 for one major watershed plan every two years • \$50,000 for one minor watershed plan annually • \$100,000 for DNREC GIS computer system upgrades and associated costs (one time cost) • \$75,000 for additional DNREC employee to manage data and track projects • \$50,000 for five municipal plans annually 	<ul style="list-style-type: none"> • \$250,000 for two major watershed plans every two years • \$100,000 for two minor watershed plans annually • \$100,000 for DNREC GIS computer system upgrades and associated costs (one time cost) • \$75,000 for additional DNREC employee to manage data and track projects • \$100,000 for five comprehensive municipal plans annually

F. Maintenance Of And Improvements To Public Infrastructure	<ul style="list-style-type: none"> • \$1,700,000 in DeIDOT salaries to manage 4,000 lane miles of roads • \$2,300,000 in DeIDOT projects 	<ul style="list-style-type: none"> • \$850,000 in DeIDOT salaries for increased maintenance capabilities • \$1,150,000 for DeIDOT projects 	<ul style="list-style-type: none"> • \$1,700,000 in DeIDOT salaries for increased maintenance capabilities • \$2,300,000 for DeIDOT projects
	<ul style="list-style-type: none"> • \$200,000 in municipal projects such as inlet repairs, pipe replacements, etc. 	<ul style="list-style-type: none"> • \$100,000 for municipal projects such as inlet repairs, pipe replacements, etc. 	<ul style="list-style-type: none"> • \$200,000 for municipal projects such as inlet repairs, pipe replacements, etc.
G. Maintenance of And Improvements To Private Infrastructure	<ul style="list-style-type: none"> • \$500,000 for minor maintenance such as grass cutting by home owner associations 	<ul style="list-style-type: none"> • \$500,000 for minor maintenance such as control of invasive plants, erosion repair, etc. • \$400,000 for major renovations and retrofits 	<ul style="list-style-type: none"> • \$1,000,000 for minor maintenance such as control of invasive plants, erosion repair, etc. • \$800,000 for major renovations and retrofits
		<ul style="list-style-type: none"> • \$100,000 for inventory of stormwater management basins (one time cost) 	<ul style="list-style-type: none"> • \$100,000 for inventory of stormwater management basins (one time cost)
H. Source Reduction Strategies	<p>Current expenditures are negligible</p>	<ul style="list-style-type: none"> • \$700,000 for placement and construction of BMPs in select agricultural and urban areas of the Nanticoke watershed 	<ul style="list-style-type: none"> • \$2.8 million for placement and construction of BMPs in select agricultural and urban areas of remaining watersheds
I. Flood Plain Protection and Improvement	<ul style="list-style-type: none"> • \$350,000 for flood plain mapping of 67 stream miles 	<ul style="list-style-type: none"> • \$350,000 for flood plain mapping of an additional 67 stream miles (one time cost) 	<ul style="list-style-type: none"> • \$700,000 for flood plain mapping of an additional 134 stream miles (one time cost)

J. Dam Safety	<ul style="list-style-type: none"> • \$40,000 in DNREC salaries to oversee dam safety program • \$85,000 for the preparation of Emergency Action Plans 	<ul style="list-style-type: none"> • \$400,000 for the preparation of Emergency Action Plans for 38 dams over a five year time frame • \$500,000 for structural modifications to one dam every two years 	<ul style="list-style-type: none"> • \$800,000 for the preparation of Emergency Action Plans for 38 dams over a two and a half year time frame • \$1 million for structural modifications to one dam every year
K. Public Outreach and Public Involvement	Current expenditures are negligible	<ul style="list-style-type: none"> • \$60,000 for assorted programs such as literature, advertisements, and volunteer programs • \$25,000 for half time additional SCD employee to coordinate programs 	<ul style="list-style-type: none"> • \$90,000 for assorted programs such as literature, advertisements, and volunteer programs • \$50,000 for full time additional SCD employee to coordinate programs
L. Planning and Regulatory Aspects	Current expenditures are negligible	<ul style="list-style-type: none"> • \$50,000 to Sussex County (one time cost) to prepare a Drainage Code and/or Lines and Grades ordinance • \$100,000 to municipalities (one time cost) for various code writing tasks 	<ul style="list-style-type: none"> • \$100,000 to Sussex County (one time cost) to prepare a Drainage Code and/or Lines and Grades ordinance • \$125,000 to municipalities (one time cost) for various code writing tasks

Legend:

DNREC	Municipalities
Conservation District	Tax Ditch Organizations
Sussex County	Private Entities
DeIDOT	Not Yet Identified

I. INTRODUCTION

This Level of Service Analysis of Surface Water Management Needs in Sussex County was initiated in June of 2007 with the retaining of URS Corporation. The project was funded equally by the Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Soil and Water Conservation, the Sussex Conservation District, and Sussex County and representatives from these agencies oversaw the preparation of the analysis.

The purpose of this project was to determine the current level and extent of public services offered in Sussex County related to surface water management, and to identify both the cost and the degree to which they may be initiated or increased to adequately meet the needs of the rapidly expanding population within the County. Analyses built upon previous efforts such as the Stormwater Facility Maintenance Needs Assessment for Sussex County (2004), Governor Minner's Task Force on Surface Water Management (2005), and the Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure (2006).

A kick-off meeting for the project was held on July 11, 2007 and was attended by representatives from the three funding agencies. The issues were framed, approaches developed, and potential outcomes discussed. Additional meetings of the oversight committee were held on September 26, October 30, November 28, 2007, and January 17, March 6, April 1, April 21, and May 29, 2008. Minutes of each meeting are included in Appendix C. Multiple meetings and "one on one" interviews were held with each funding agency as well as DeIDOT.

The Sussex County Association of Towns (SCAT) was contacted and a brief presentation made at their August 3, 2007 Steering Committee meeting to explain the project and the need to obtain information from municipalities. Following this, survey forms were provided to each of the 25 municipalities in the County (18 were returned) and a meeting with six (Dagsboro, Georgetown, Millsboro, Milton, Ocean View, and Seaford) was held on November 6, 2007. Please see Appendix C for minutes from this meeting and Appendix E for as summary of municipal functions.

A similar approach was used for the 136 tax ditch organizations in the County. Surveys were provided to each (53 were returned) and a meeting with seven managers overseeing 11 tax ditches was held on December 11, 2007. Please see Appendix C for minutes from this meeting.

Interviews were also held with interested stakeholders. These included the Center for the Inland Bays, the Low Impact Development Roundtable and University of Delaware Sea Grant College, and the Positive Growth Alliance.

These surveys and interviews formed the basis for this analysis. Areas of responsibility, surface water management functions, concerns and unmet needs, and budgets and expenditures were identified. Databases were developed to more easily analyze municipal operations and tax ditch organization efforts.

Utilizing information obtained through interviews and document research, 12 program areas were identified, costs were estimated, and alternate approaches developed. These were discussed at a stakeholder meeting on April 29, 2008. Please see Appendix G for information from this meeting.

II. BACKGROUND

A. Sussex County Characteristics and Trends

A significant amount of background information is available in the Sussex County Comprehensive Plan. As of July 2006, the County was home to 180,275 residents according to recent estimates by the Delaware Population Consortium. This population represents a growth of 15% from 2000. Sussex County has the largest land area of Delaware’s three counties with 938 square miles. Traditionally it has been the State’s leading agricultural producer but in addition to large farming regions, the County also encompasses small towns, growing population centers, and ocean-side vacation areas.

Development pressures have been significant in recent years. However, according to the Delaware Population Consortium, these will moderate in each of the two decades following 2010. While many large developments are proposed in the central and western parts of the County, the majority of the new home construction continues to occur in the areas closest to the Inland Bays and the coastal communities. County records show that through 2006, a total of 26,233 residential lots have been recorded but not yet developed. That number includes proposed development in both incorporated and unincorporated areas.

Three prior efforts are notable in providing context for this Level of Service Analysis. The first is a Stormwater Facility Maintenance Needs Assessment in 2004 which, according to the introduction to the report, was an initial exploration of stormwater facility maintenance issues in Sussex County. The second is the work and subsequent report by Governor Minner’s Task Force on Surface Water Management, completed in 2005. The third is the Delaware Public Policy Institute’s Dialogue on Financing Wastewater and Stormwater Infrastructure undertaken in 2006.

B. Stormwater Facility Maintenance Needs Assessment - 2004

This assessment was funded through an EPA 319 grant and was overseen by a committee with representation from diverse groups including DNREC, Sussex Conservation District, Sussex County, University of Delaware Cooperative Extension, University of Delaware Sea Grant Marine Advisory Service, DeIDOT, municipalities, homeowner associations, and developers. This committee participated in two planning sessions as well as three public workshops. The Needs Assessment identified four critical issues each applicable to this study as detailed in Table I below:

Table I	
<u>Issue</u>	<u>Applicability</u>
<p>Develop an equitable funding mechanism for stormwater facility maintenance. The Committee determined that homeowners are “clueless” as to their fiscal responsibility for stormwater maintenance and unless a funding mechanism is developed, people would continue to be flooded but there would be no money to “deal with it”. Numerous barriers were also identified including resistance from property owners and a lack of clearly defined responsibilities.</p> <p>Action items included adding assessment and enforcement strategies into homeowner bylaws, exploring the establishment of a stormwater utility as well as investigating other funding options, incorporating issues into county land use plans, and assuring that homeowners know their responsibilities for stormwater facility management when they purchase property.</p>	Yes

<p>Clearly define for all parties their responsibility for stormwater facility maintenance. The Committee felt that the lack of a formal agreement on responsibility for stormwater will continue the “mish mash” of stormwater problems. Barriers included lack of communication among cities and agencies, lack of leadership on the issues, regulatory limitations, and uncooperative developers regarding maintenance and vegetation management.</p> <p>It was recognized that improving regulations on multiple levels would be beneficial. The State should allow for innovative solutions and more flexibility in pond design and homeowner associations should be given operations and maintenance plans including long range financial obligations and responsible parties as well as vegetation management strategies. Agencies should mandate disclosure of policy for stormwater ponds and developers should assure that ponds do not have immediate maintenance needs such as vegetation when transferred to homeowner associations.</p>	<p>Yes</p>
<p>Determine who ensures compliance and develop a concurrence policy for agencies. It was understood by the Committee that the Sussex Conservation District has limited enforcement capabilities and that current penalties are no deterrent presumably for failure to adhere to codes and regulations. It was agreed that no one wants to pass on poorly constructed projects to homeowner associations. The primary barriers identified were (1) no single agency has the lead for creating policies and (2) no one wants to be the “bad guy”. Political acceptance was also identified as a potential barrier.</p> <p>Future development pressure was identified as a priority. Sussex County should develop a drainage code and penalties and mechanisms to collect should be clarified. Bonds should be initiated for stormwater facility construction and maintenance. For existing facilities, a cost share for retrofits is needed with the option that compliance penalties could be used for retrofits.</p>	<p>Yes</p>
<p>Clearly link the stormwater design and maintenance processes. The Committee did not address the consequences if this issue is not addressed but did identify several barriers including the large need for education, lack of resources, regional analyses and measuring cumulative impacts, and the hesitation to raise either taxes or homeowner association fees.</p> <p>Actions centered around formally linking maintenance to the stormwater design/approval process. Clarification is needed to identify who is responsible for design review, and thereby establishing operations and maintenance requirements, performing operations and maintenance and enforcing if it does not occur. A better definition of developer responsibilities in the formation of homeowner associations is also needed.</p>	<p>Yes</p>

C. Governor Minner’s Task Force on Surface Water Management - 2005

The Task Force was created in 2005 by the Governor’s Executive Order Sixty-two and tasked with, among other charges, developing strategies for integrating drainage, flood control, and stormwater management and exploring potential costs and funding sources for implementing a strategy. It was comprised of a broad representation of government employees as well as representatives from the private and nonprofit sectors. In order to accomplish the work mandated by and within the time frame stated in the Executive Order, the Task Force created four subcommittees: Governance, Finance, Land Use and Regulation, and Maintenance and Restoration with membership in each broadened to include other interested stakeholders. A total of 30 recommendations were made. Only those relevant to this Level of Service Analysis are shown in Table II below along with their applicability.

Table II	
<u>Recommendation</u>	<u>Applicability</u>
Recommendation #2. A central response unit coordinated by DNREC in conjunction with county or municipal utilities should be created for handling public calls related to drainage, stormwater, and flood control. A new process and response procedure for addressing citizen complaints related to stormwater facilities and flooding needs to be established. Citizens should be provided with a single point of contact.	Already done
Recommendation #3. The State Department of Safety and Homeland Security and local emergency response agencies should review flooding emergencies and determine that adequate protocols exist to ensure seamless and effective communication, coordination, and response to endangered citizens and property, and that their respective responsibilities be clearly delineated.	Yes
Recommendation #5A. Stormwater utilities operating at the county or local level should be formed as a funding vehicle for the purpose of providing a simplified and comprehensive approach to drainage and flooding problems throughout each county. The utility would be a mechanism to provide necessary funding for implementing improved surface water management.	Yes
Recommendation #5B. A proposed stormwater utility fee should be utilized for the purpose of planning, maintenance, capital construction and administration. To minimize additional administrative costs associated with the utility, the fee should be set and collected at the county or municipal level, possibly utilizing the existing real estate tax or sewer billing process. The individual counties or municipalities should receive compensation for billing and collection costs. Funds and funding decisions should be kept at county or municipal level but associated annual work plans should be presented to the Surface Water Advisory Council (SWAC). Municipalities may elect not to join a county level utility but must establish their own utilities or other funding sources that meet the established Statewide standards.	Not yet
Recommendation #5C. The fees would be established at a level appropriate to fund the needs identified without the use of general obligation or other special or exceptional (e.g., 21 st Century) funding. The utility operating units should have the latitude to make modifications to its fee for credits and enhancements as appropriate subject to the approval of the SWAC. The county level units would establish cooperative agreements with municipal level units or local governments. Financial audits to be provided to the SWAC on an annual basis.	Not yet
Recommendation #5D. The Stormwater Utility fee should be levied on all property in the state recommended for inclusion by the SWAC. The fee should be assessed on residential customers using a flat rate fee structure for all residential properties of a specific nature (e.g., residential properties with similar zoning would be assessed identical rates). The fee will be levied on all developed nonresidential properties using equivalent residential runoff units which are essentially a measure of impervious surface. A credit system should be established for developed non-residential utility customers that recognizes existing and/or planned on-site stormwater quantity/quality management practices. A Board of Appeals at the utility level or similar board should handle appeals.	Not yet
Recommendation #6. Stormwater utilities should have the ability to sell revenue bonds to leverage the collected fee to the extent practicable.	Not yet

Recommendation #7. Urban, suburban, and defunct tax ditch organizations may be considered for inclusion into the county or municipal stormwater utility.	Yes
Recommendation #12. The stormwater utilities, DNREC, designated agencies, and delegated agents should have the authority to enter onto private lands or waters for the purpose of surveys, assessments, and emergency repairs. However, entry except for emergency repairs will require a 48 hour notice and said agency would at all times be responsible for any and all damages which shall be done to the property of any such person or persons.	Partially
Recommendation #13. The stormwater utilities should be authorized and empowered to acquire by gift, devise, purchase, exchange, or any other method of acquiring real property or any estate, interest, or right therein, provided that such acquisition shall not be made through the exercise of the power of eminent domain.	Not yet
Recommendation #14. Right of entry for essential maintenance and repairs, in the form of recorded easements, should be a condition of approval if public funds are used or if the maintenance is to be assumed by a public entity (such as stormwater utilities). A 48 hour notice would be required.	Yes
Recommendation #17. State funding for property buyouts on a reactive basis (after damage) should be legislated at the State level for consistency. The possession of flood insurance should be a prerequisite for buyouts which should also consider FEMA funding and processes. No stormwater utility fees should be used for buyouts.	Partially
Recommendation #21. The development and utilization of “shared” stormwater facilities should be strongly encouraged to minimize costs, encourage environmental protection, and support ecosystems. Decisions should be made by teams of competent and qualified engineering, scientific, technical, and regulatory personnel (interdisciplinary teams).	Yes

D. Delaware Public Policy Institute Dialogue on Financing Wastewater and Stormwater Infrastructure - 2006

At the request of Governor Minner, the Delaware Public Policy Institute (DPPI) convened a policy dialogue on financing wastewater and stormwater infrastructure for the 21st Century in the winter of 2006. The dialogue was organized around three questions: what are the current and future Statewide challenges facing wastewater and stormwater infrastructure, is a dedicated, longer-term funding source for wastewater and stormwater infrastructure needed, and if such a funding source were established, what mechanism(s) might be used to provide those funds?

The dialogue offered numerous recommendations to the State, the Clean Water Advisory Council (CWAC) and DNREC, and municipalities and utilities. Table III provides a listing of the recommendations applicable to this assessment:

Table III	
<u>Recommendation</u>	<u>Applicability</u>
Recommendation B1. The Clean Water Advisory Council shall provide for and DNREC should develop detailed watershed plans for all of Delaware's waters.	Yes
Recommendation B2. The Clean Water Advisory Council shall encourage and provide for increased education on stormwater management.	Partially
Recommendation B3. The Clean Water Advisory Council should review and refine projected stormwater infrastructure capital and operations and maintenance funding gaps.	Partially
Recommendation B4. The Clean Water Advisory Council should detail the public benefit provided by its funding assistance to counties and municipalities.	Partially
Recommendation C1. Counties and municipalities should review their current impact fees related to development of growth-related wastewater and stormwater infrastructure.	Yes
Recommendation C2. Stormwater utilities should be created and implemented, when possible, to provide for a consistent, coordinated, clear, comprehensive and funded approach to stormwater management.	Yes

III. AGENCY ACTIVITIES

A. Overview

There are numerous entities responsible for and performing surface water management work in Sussex County. Government agencies include the Delaware Department of Natural Resources and Environmental Control (DNREC), the Delaware Department of Transportation (DelDOT), the Sussex Conservation District, Sussex County, and the 25 incorporated municipalities in the County. Private organizations include 136 tax ditches, numerous homeowner associations, and nonprofit groups. These are described below and a summary of responsibilities is included in Appendix B.

B. Delaware Department of Natural Resources and Environmental Control (DNREC)

DNREC's surface water management functions are complex. Work is performed out of offices in Georgetown and Dover by two programs, Stormwater which is regulatory and Drainage which is non-regulatory. Positions are funded through General Fund (GF) appropriations, fees collected through activities such as Notice of Intent applications, contractual appropriations (also through the GF), and payroll savings from unexpended personnel funds due to vacancies. Contractual positions are actually contracted by DNREC through the Kent Conservation District even though their assignments are often in Sussex County. Also, most DNREC employees have responsibilities in all three counties further complicating precise calculations of personnel dollars spent. Table IV summarizes DNREC personnel and responsibilities.

Table IV			
Position	Program	Duties	% time in Sussex Cnty.
State of Delaware Positions -- General Funded			\$565,000
Environmental Program Administrator	All	Administration	33%
Engineer IV	All	Division Engineer	33%
Environmental Program Manager II	Drainage	Restoration	20%
Environmental Program Manager I	Drainage	Sussex Cnty. Program Manager	100%
Environmental Program Manager I	Drainage	Environmental Permitting	50%
Environmental Program Manager I	Drainage	Kent Cnty. Program Manager (Statewide duties for 21st funding program)	20%
Administrative Specialist II	Drainage	Administrative support for Drainage Program	75%
Engineering Planning Surveying Technician IV	Drainage	Drainage Assistance & Inspection	100%
Engineering Planning Surveying Technician II	Drainage	CAD Tech for Tax Ditch Program	75%
Engineering Planning Surveying Technician III	Drainage	CAD Tech for Drainage Projects	50%
Environmental Program Manager II	Stormwater	Administration for Stormwater Program	33%
Engineer VI	Stormwater	Stormwater Engineer	33%

Engineer IV	Stormwater	Stormwater Engineer	33%
Planner IV	Stormwater	Watershed Planner	33%
Engineer III	Stormwater	Stormwater Engineer	33%
Engineer IV	Dam Safety	Dam Safety Engineer	33%
State of Delaware Positions -- ASF\NSF (Fee Funded)			\$60,000
Environmental Program Manager I	Stormwater	Manager of Erosion and Sediment Control Program	33%
Environmental Scientist III	Stormwater	Scientist for Stormwater Program	33%
Administrative Specialist II	Stormwater	Administrative Support for Stormwater Program	33%
District Contractual			\$560,000
Engineering Planning Surveying Technician III	Drainage	Survey Crew Chief	100%
Engineering Planning Surveying Technician II	Drainage	Survey Crew	100%
Engineering Planning Surveying Technician II	Drainage	Survey Crew	100%
Engineering Planning Surveying Technician III	Drainage	Drainage Project Planner	100%
Engineering Planning Surveying Technician II	Drainage	Drainage Project Planner	100%
Administrative Specialist I	Drainage	Admin. Support for Georgetown Field Office	100%
Engineering Planning Surveying Technician I	Drainage	CAD Tech for Tax Ditch Program	50%
Engineer I	Drainage	Design Engineer for Drainage Projects	50%
Environmental Scientist I	Drainage	Scientist for Environmental Permitting	50%
Senior Applications Support Specialist	Drainage	Application support for Drainage Program	50%
Conservation Technical III	Drainage	Small Projects Crew	50%
Conservation Technical II	Drainage	Small Projects Crew	50%
Conservation Technical I	Drainage	Small Projects Crew	50%
Conservation Technical I	Drainage	Small Projects Crew	50%
Casual\Seasonal and Part Time Employees			\$51,000
Clerical Assistant	Drainage	Clerical Assistance to Georgetown Field Office	100%
Clerical Assistant	Drainage	Clerical Assistance to Georgetown Field Office	75%
Engineering Planning Surveying Technician I	Drainage	Tax Ditch Right of Way Research	50%
Engineering Planning Surveying Technician I	Drainage	Tax Ditch GIS Development	50%
Clerical Assistant	Stormwater	Clerical Assistance for Stormwater Program	33%
Total			\$1,235,000

The Stormwater Program (more formally known as Delaware’s Sediment and Stormwater Management Program), employs a comprehensive approach to sediment control (both during and after construction) and stormwater management that includes monitoring of stormwater quantity and water quality control. Specifically, the program includes:

- Stormwater management engineering plan approval
- Sediment control and inspection during construction
- Post-construction inspection of permanent stormwater facilities
- Stormwater quantity and water quality control
- Education and training relating to stormwater

Whereas the Stormwater Program focuses more on current construction projects and “big picture” perspectives of surface water management, the Drainage Program is responsible for addressing more isolated drainage problems, often involving private properties, such as those projects typically funded by 21st Century and other legislative funds. The Drainage Program provides technical assistance to landowners, tax ditch organizations, Conservation Districts, federal, state and local agencies in the areas of drainage, water management and restoration.

C. Sussex Conservation District

The Sussex Conservation District performs surface water management functions under two programs, the Sediment and Stormwater Management Program and the Equipment Program.

DNREC assures compliance with the State’s Sediment and Stormwater Management Program through delegation of program elements to various public agencies throughout the State such as conservation districts. The responsibility to regulate this program in Sussex County has been delegated to the Sussex Conversation District for the entire county with the exception of DelDOT and other State-sponsored projects. The District’s responsibilities under the Sediment and Stormwater Regulations include the following:

- Review and approval of Sediment and Stormwater Management Plans
- Construction inspection to assure compliance with approved Plans
- Annual inspection of permanent stormwater facilities
- Assistance and education for local communities on management of stormwater facilities

The District has approximately 10 employees engaged in the Sediment and Stormwater Management Program as summarized in Table V.

Table V	
Position	Duties
Program Manager	Management of Program
Inspector	Site inspections of active projects
Inspector	Site inspections of active projects
Inspector	Site inspections of active projects
Inspector	Site inspections of active projects
Maintenance Inspector	Site inspections after project completion
Plan Reviewer	Review of construction plans and calculations
Engineer (20-30 hours per week)	Review of construction plans and calculations

Engineer (20-30 hours per week)	Review of construction plans and calculations
Administrative Assistant	Administration of Program
Total	\$1,100,000

The Sussex Conservation District currently has four inspectors and one maintenance inspector. Inspectors handle projects under construction and the maintenance inspector is responsible for handling complaints in closed out subdivisions.

The Equipment Program provides support to tax ditch organizations in the form of construction or relocation of ditches, clean outs, weed wiper applications, and spoils leveling. Other activities include pond construction, clean out, and maintenance as well as drainage pipe installation and shoreline restoration. Most of these activities are accomplished on a fee basis but funds are provided to the District for administrative purposes by the State, Sussex County, and tax ditch organizations through the Cost Share Program.

D. Sussex County

Since DNREC’s Sediment and Stormwater Program has been delegated to the Sussex Conservation District, Sussex County has limited involvement in surface water management issues. The Public Works group within the County Engineer’s office is responsible for the regulation of private road construction which includes drainage but not the costs of maintaining these systems. It is also noted that the County is currently revising its Subdivision Regulations but does not have a Drainage Code. Also, the County is in the process of updating its Comprehensive Plan. The Plan does not have a surface water management section although portions of the Conservation Element section address related topics such as Total Maximum Daily Loadings (TMDLs).

Sussex County's general approach towards flood plain management and mitigation relies more on private interests such as landowners than on County services. This is reflected, for example, in County regulations which do not prohibit development within the 100-year flood plain. Nor do County regulations seek to minimize the density of developments allowed. Similarly, the County does not consistently participate in certain FEMA grant programs which could aid in buy-outs of homes within flood plains. However, the County did take part in a FEMA program in 2002 and 2003 to raise 14 homes. The County does regulate building construction within flood plains. For example, floor elevations must be above the 100-year flood elevation and utilities must meet Federal regulations. While these measures may reduce risk, they do not eliminate it. The County relies on a single employee who also has other duties to handle flood plain issues.

The County provides a grant in the amount of \$175,000 to the Conservation District each year for the Cost Share Program as well as approximately \$50,000 each year to fund salaries in the District office. The Public Works Department spends approximately 10 percent of their time on stormwater-related issues which equates to about \$90,000 which, along with administrative support, totals about \$100,000. Finally, the County was an equal funding partner for this Level of Service Analysis but since this was a single expenditure and not typical in other years, these funds were not included in the assessment.

E. Delaware Department of Transportation (DelDOT)

As with DNREC, DelDOT staff provide surface water management functions in both Georgetown (and throughout the County) and Dover. The South District, headquartered in Georgetown, maintains approximately 4,000 lane miles in Sussex County and, therefore, an assumed 4,000 miles of roadside swales. There are also enclosed drainage systems of inlets and pipes both where swales exist as well as where they do not. On average, the Department has four work orders per lane mile on an annual basis of which 50 percent are estimated to be drainage-related for items such as catch basin maintenance, pavement edge repair, etc. This equates to about 8,000 surface water management work orders each year.

There are 20 full time equivalent employees working on drainage in the County. These employees are supplemented with correctional facility inmates frequently used for some activities (trash pick-up, mowing, minor grading, etc.). Expenditures for surface water management in the 2006 fiscal year were approximately \$4 million and included:

- \$1,700,000 Department personnel and overhead
- Project Costs Total \$2,300,000
 - \$1,100,000 closed drainage
 - \$600,000 open drainage
 - \$200,000 entrance pipes
 - \$200,000 materials (pipe and stone)
 - \$200,000 contractors

There are three organizational sections with surface water management functions in Dover. The National Pollutant Discharge Elimination System (NPDES) Section is tasked with assuring that the Department is complying with the provisions of its NPDES stormwater and related permits. Since the Delmar area (as part of the Salisbury, Maryland Urbanized Area) is the only portion of Sussex County covered by a Municipal Separate Storm Sewer System (MS4) NPDES permit, the Section's activities in this County are rather limited. However, they are overseeing retrofits at some Department maintenance yards and through efforts such as public education and outreach and the on-going storm drain inventory, are essentially complying with NPDES requirements on a voluntary basis. If additional areas of Sussex County fall under the regulatory umbrella of this program in the future, additional costs for compliance based on current permit conditions may be minimal. This section also coordinates with road designers. For example, as pollution control strategies are developed and approved, new roadways will need to comply with these strategies. Accordingly, the NPDES Section has been active in several watershed action teams. During this study, it was noted that more and more new roadways are privately owned and maintained. This may be problematic as these roads may not be built to Department standards and private owners often are not aware of their responsibilities. Assuring adequate upkeep of Best Management Practices (BMPs) could be particularly challenging with private land owners.

The Drainage Engineering Section in Dover performs numerous tasks including review of development plans, providing *letters of no objection*, overseeing the drainage components of DelDOT design projects, and assuring the proper functioning of the Departments 600 detention facilities and BMPs Statewide. It was noted that most of the more easily drained land in the County has already been developed and that which remains sometimes has no positive outfall. As land is developed, channeling runoff off-site results in pressure on existing conveyances such as DelDOT roadside channels and tax ditches, neither of which were designed to account for the additional flows. Also, new residents often move from more urbanized areas and expect high levels of public service including better maintained roads and drainage systems.

The Planning Division, also located in Dover, is responsible for long range planning of Department needs and for the review of development plans. As a policy, the Division is not supporting developments in Level IV areas, seeking to eliminate or at least minimize additional discharges into State rights-of-way. In addition, the Division is providing comment on the need for BMPs when reviewing development plans. It was identified that getting the Department involved in the drainage aspects of projects earlier would result in fewer discharges to rights-of-way. The need for watershed plans was also cited as a strategy that could result in projects evaluated on a larger scale, increasing the likelihood of effective drainage solutions. Finally, the Division is also concerned about the proliferation of private roads in the County and believes they are a hidden, unplanned expense due to future maintenance needs. It was noted that the Department's Rules for Subdivision Streets are being revised but these will not be applicable to private roads.

F. Municipalities

A questionnaire was distributed to each of the 25 incorporated municipalities in the County via facsimile from the Sussex County Association of Towns (SCAT). To better ensure that the questionnaires were received, an electronic version was also provided via email. Follow-up phone calls were made to each municipal contact, typically the manager, about a month later. In cases when actual voice contact could not be established, a second call was made. Through these efforts, 18 questionnaires were returned.

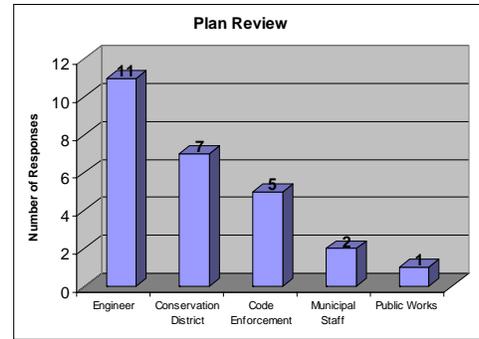
A follow up meeting was held with representatives from DNREC, the Sussex Conservation District and municipal representatives from the following selected municipalities: Dagsboro, Georgetown, Millsboro, Milton, Ocean View and Seaford on November 6, 2007. Please see Appendix D for minutes from this meeting. The purpose of the meeting was to review the survey information, to discuss in further detail the answers in the questionnaire, and to gather additional pertinent information that may not have been retrieved from the survey. In general, the discussion was intended to help shape the observations and recommendations regarding stormwater management in the County.

Survey results are summarized below:

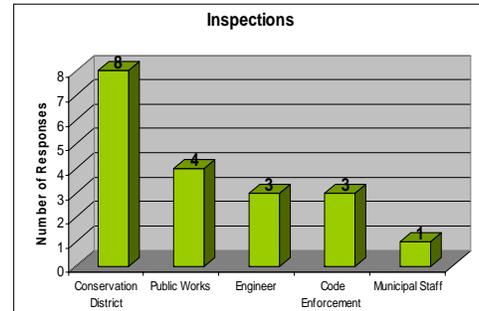
Stormwater Functions

General. Respondents were asked to indicate what stormwater functions are performed in their municipality and by whom. The functions were divided into 1) New Development Plan Review; 2) Stormwater Facility Inspection; 3) Stormwater Facility Maintenance; and 4) New Construction Oversight. In general, the survey results reflected that multiple organizations/agencies perform varying stormwater functions. The operations are performed by a municipal employee(s) (such as engineer, inspector, public works department), the Sussex Conservation District, a hired consultant, a contractor, or a combination thereof. The majority of municipalities have some combination of the aforementioned organizations that appear to perform multiple functions. In addition, there are only four occurrences where a function is not performed. The type of functions and the agency that serves the function by municipality are shown in Appendix E.

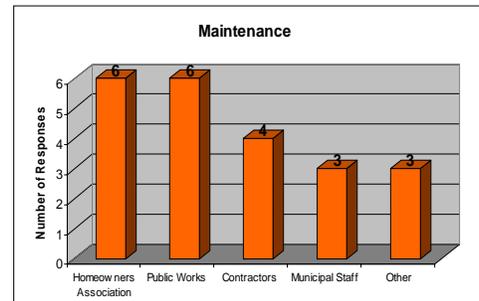
Plan Review. With the exception of the Town of Slaughter Beach that has no stormwater facilities, all the municipalities stated that plan review of stormwater facilities in new developments is performed in their municipality. Eleven of the 18 respondents indicated an engineer, either a municipal employee or a hired consultant, carry out or share plan review services. The Sussex Conservation District had the remaining seven indications.



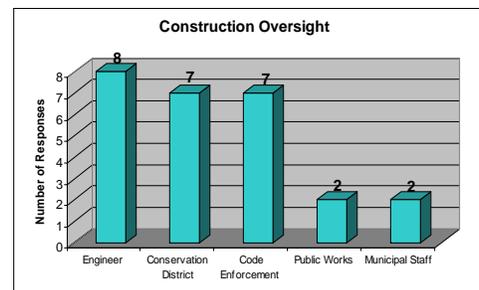
Inspections. With the exception of the Town of Slaughter Beach, all of the municipalities stated that inspection of stormwater facilities is performed in their municipality. Eight of the 18 respondents indicated that the Sussex Conservation District provides inspection support in their city/town. The municipal staff including the public works department, engineer, and/or code enforcement personnel also perform inspection duties.



Maintenance. With the exception of the Towns of Slaughter Beach, Milford and Millsboro, all of the municipalities stated that maintenance of stormwater facilities is performed in their municipality. The responsibilities appear distributed throughout the County. The maintenance responsibilities appear distributed among homeowners associations, public works personnel, hired contractors and other municipal staff.



Construction Oversight. With the exception of the Towns of Slaughter Beach and the City of Rehoboth Beach, all of the municipalities stated that new construction and oversight is performed in their municipality. This responsibility is typically performed by the engineer, the Sussex Conservation District and/or code enforcement personnel.



Maintenance

According to the survey responses, 28 basins, 123,620 linear feet of open channels, 348,132 linear feet of storm pipes, and 2,673 inlets are being maintained by the incorporated municipalities. Three municipalities, Fenwick Island, Lewes and Seaford, indicated that they are implementing some degree of Best Management Practices (BMPs).

It is noted that the aforementioned facilities do not include those that are maintained by other agencies, such as homeowners associations or state agencies. Further, some respondents stated that the number of facilities that they are responsible for is unknown.

Budget

According to the survey responses, the annual capital expenses for stormwater management including operations and maintenance ranges from \$5,000 to \$480,000. The high end of this range from Bethany Beach is assumed to include non-drainage related expenses. Also, City of Lewes Board of Public Works indicated that their annual expense is \$10,000,000 but stormwater functions were not isolated. The total annual expenses of the incorporated municipalities that responded to the survey question excluding these two outliers are about \$200,000.

In general, the sources of funding for the annual stormwater management expenses are municipal general funds, taxes (property tax and real estate transfer tax), state grants and loans. Indicated state grants include 21st Century funding and Municipal Street Aid.

Four respondents stated that they have a five-year capital improvement plan. Four others have stated that they are considering instituting a capital improvements plan.

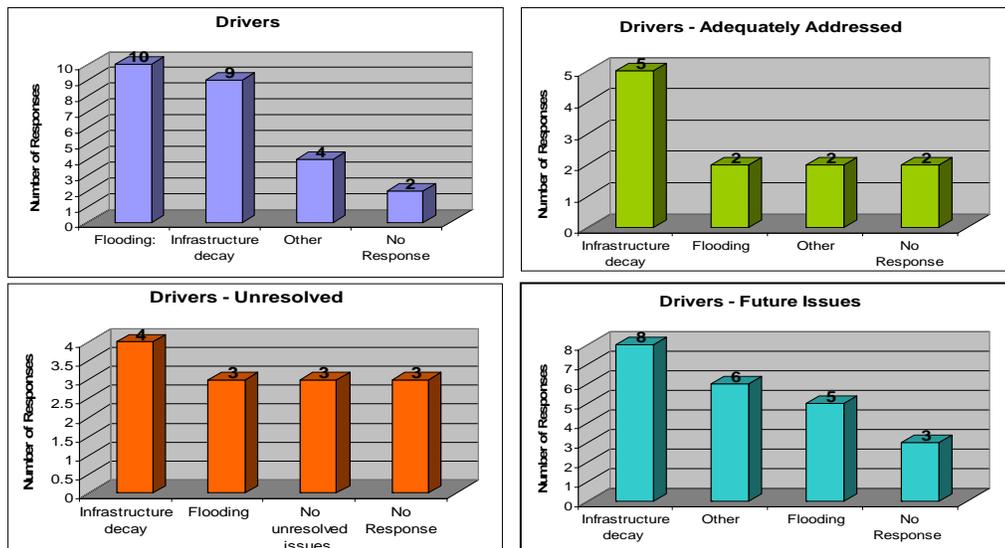
Resources

Seven of the 18 respondents stated that they have at least one full time employee responsible for stormwater management duties but it appears that municipal employees often perform multiple roles. Eight respondents indicated that they own equipment dedicated to drainage related work. Common responses include backhoes, dump trucks, general service trucks, and street cleaners. It is assumed that the equipment is utilized for public works projects other than stormwater.

Drivers

Of the 13 respondents, 10 stated that flooding is a primary driver of their stormwater management programs. Nine stated infrastructure decay. Only two stated that flooding is adequately addressed. Five asserted that infrastructure decay is adequately addressed. Five stated that flooding will be an important issue in the next five years. Eight stated that infrastructure decay will be an important future issue.

Some other responses of current and future drivers include government agency mandates, citizen complaints, the need for new infrastructure and upgrades, among others.



Priorities and Permitting

Of the 14 respondents to this question, there were 12 different responses on how municipalities set their stormwater priorities. The top responses included the severity of the problem, complying with outside agency regulations and the number of properties that are impacted. Other responses include recommendations by support staff, as problems/needs arise, and the available resources, such as budgetary and work force.

In general, municipalities did not report having issues complying with stormwater permitting requirements, such as TMDLs or NPDES. The City of Lewes Board of Public Works stated that they have permitting issues concerning nutrient trading at the Water Reclamation Plant.

Desires

Respondents were asked if budget was not a limitation, what they would do to improve their municipal program and services. Of the 13 responses, seven indicated that upgrading existing infrastructure as a top priority. Four respondents stated to create or enhance a stormwater management program. Expanding the facilities, mapping the system and increasing funding all received two responses.

G. Tax Ditch Organizations

A questionnaire was distributed to the managers for each tax ditch organization in the County. Fifty-three (53) questionnaires of the one hundred thirty-six (136) have been returned equating to a response rate of thirty-nine (39) percent. A follow up meeting was held with representatives from DNREC, the Sussex Conservation District and seven selected tax ditch managers. Minutes from this meeting are in Appendix C. The purpose of the meeting was to review the survey information, to discuss in further detail the answers in the questionnaire, and to gather additional pertinent information that may not have been retrieved from the survey. In general, the discussion was intended to help shape the observations and recommendations regarding tax ditch management in the County.

Survey results are summarized below:

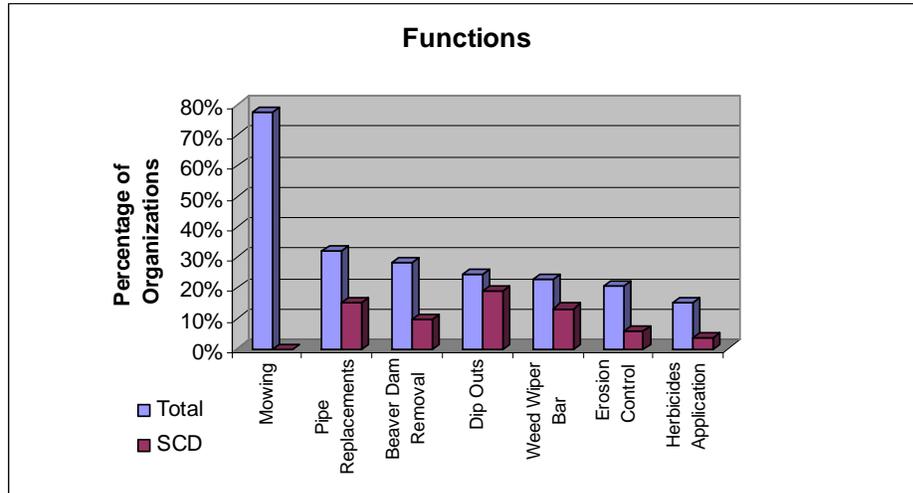
Functions

General. Respondents were asked to indicate what operations were performed in the year 2006, by whom and how often. The functions included mowing, weed wiper, herbicides application, dip outs, erosion repair, beaver dam removal, and pipe replacements. Approximately 77 percent of the tax ditch organizations responding to the survey stated that they perform mowing. In general, the tax ditch organization or a private contractor mows once a year, and in some once every other year. In some cases, the Sussex Conservation District assists organizations in carrying out these functions. The percentage of tax ditch organizations that performed each function, either independently and/or with the assistance of the Sussex Conservation District, is shown in the accompanying figure.

Activities

The majority of survey respondents indicated that an annual meeting, an audit of financial records, and an inspection of their tax ditch was performed in the year 2006. Only one of the fifty-four respondents stated that they did not have an annual meeting. Ten stated that they did not have an audit. Seven stated that a ditch inspection did not occur in the year.

Operations



The majority of survey respondents stated that they receive financial and technical assistance from the Sussex Conservation District, and that they are familiar with the District's cost share program. The majority further stated that the responsibilities of their organization are clearly known and understood. Only 17 percent of respondents replied that they were aware of any work that is not being performed due to lack of funds. Nevertheless, 85 percent of the organizations appear willing to attend a workshop to learn how to better manage their organizations. Seven percent stated that their tax ditch organization is bonded.

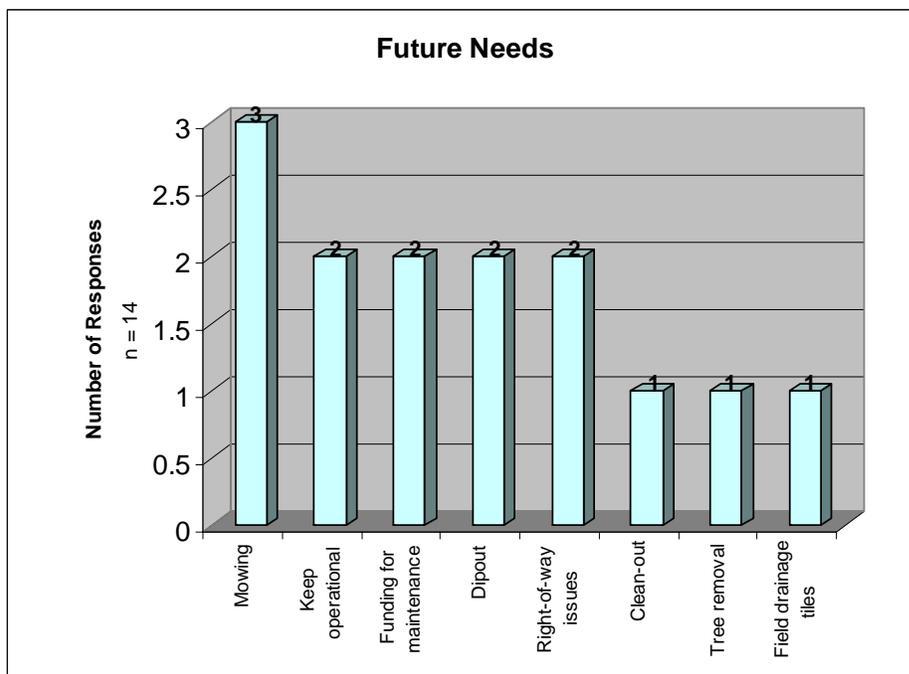
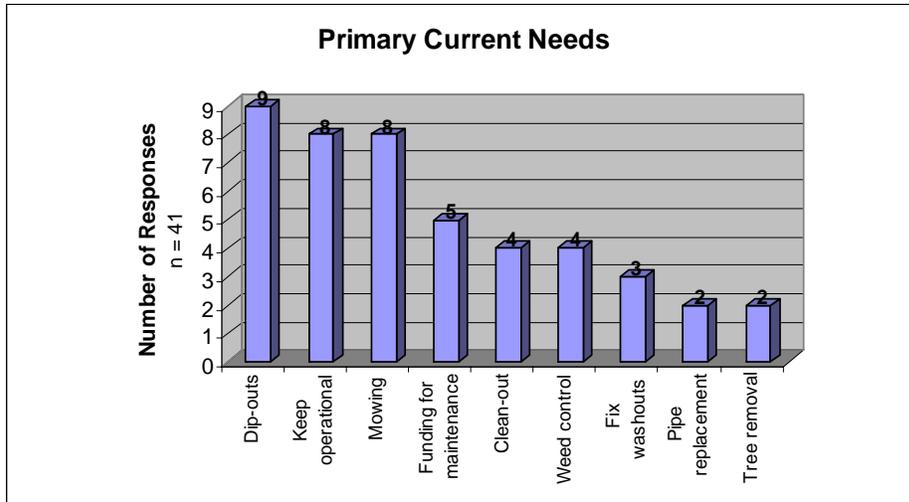
Budget

According to the survey responses, the expense for tax ditch functions, activities and operations in the year 2006 ranged from \$20 to \$21,822. The total combined annual expense of the organizations was \$133,157. The mean average annual expense was \$4,035.

Nearly all (48 of 49) of the respondents to this question indicated that they fund their general operations through tax revenue. Approximately one quarter of the respondents stated they receive additional funding from the cost share program. Only two respondents stated that they have a long-term budget.

Needs/Issues

Respondents were asked what the primary current needs of their tax ditch are, and if these needs are being met. Of the 41 respondents, the common responses were general maintenance needs, such as dip-outs and mowing. Twelve respondents indicated that these needs are being met. When asked what they believe their needs will be in five years, the responses were similar to current needs. About 61 percent of respondents to the survey indicated that they have adequate funding to meet their tax ditch needs. For a breakdown of responses, please see the following figures.



Respondents were further asked what the current issues of their tax ditch are. Of the 40 respondents, 82 percent stated general maintenance issues such as dip-outs, mowing and general clean-out, among others. Fifty-seven percent of respondents indicated that they have problems with obstructions and invasive species, trees, overgrowth and phragmites, among others. Twenty-five percent stated encroachment in rights-of way is a issue, and ten percent stated property owner awareness and education is currently important.

The respondents were also asked what they believe will be important issues in the next five years. Several examples of the 14 responses are provided below.

- “With the current population growth in lower Sussex County, will the tax drainage ditch be adequately funded to maintain proper service?”
- “Preserving right-of-ways”

- “More pipes and more bridges will be degrading so we will need to replace them”
- “Establishing right-of-ways and maintaining this necessary space”
- “As more farms are sold to developers, more problems with the right-of-way”
- “Ability to get thru right-of-ways and receiving cost share on maintenance”

Desires

Respondents were asked if budget was not a limitation, what they would do to improve their tax ditch program and services. Of the 25 responses, 17 indicated a general desire to better maintain their tax ditches by doing more preventive work and increasing the number of clean-outs, dip-outs and tree removal, among others. Three respondents stated a desire is to have the Sussex Conservation District Manage their tax ditch. Three respondents indicated that they desire the education of land development stakeholders and the public on the importance of tax ditches.

IV. STAKEHOLDER OBSERVATIONS

A. Center for the Inland Bays

Ed Lewandowski (Director) and Eric Buehl (Habitat Coordinator) were interviewed on October 9, 2007. The Center for the Inland Bays (CIB) was created in 1995 after a presence of many years through the National Estuary Program. It has an annual budget of \$700,000 with eight employees. The percentages of this budget and employee time spent on stormwater and drainage issues are not known. Their primary activities include research, restoration, and shaping public policy by working with legislators and other decision-makers. In addition, during the past several years, the CIB has assisted with the development of pollution control strategies such as buffer requirements and septic management programs for the Inland Bays. The Center performs public education and outreach programs on topics such as maintenance of stormwater management facilities by homeowner associations, the need for urban watershed and storm basin retrofits, and the use of rain barrels.

Issues

- ***Enforcement and penalties.*** Lack of adequate enforcement is a “decades long issue”. Existing codes are sporadically enforced and violators often not pursued. Grading permits should be required by the County. Fines for penalties have not changed since the State Sediment and Stormwater Regulations were promulgated in 1991. In general, erosion and sediment controls are not adequate. This may be the result of improper design, poor construction, or both. A more robust program is needed which could include assistance and education to private entities on how to be better stewards.
- ***Improvements to the Certified Construction Reviewer (CCR) Program.*** Conflicts of interest can be created when a CCR works for the same firm as a project’s designer. Developers can “shop around” for CCR’s to satisfy their objectives and needs. At the very least, relationships between CCR’s and engineers should be disclosed but it would be better if these two individuals do not work for the same firm. Alternatively, the State could establish a pool of reviewers that developers would pay into and CCR’s would be assigned on a rotating basis. Also, it is believed that public agencies are understaffed and this results in problems being addressed in more of a reactionary as opposed to a proactive mode. Increased staffing is needed.
- ***Growth Pressures.*** There is concern about how continued growth will affect water resources. As the amount of impervious surface increases, natural areas such as forested tracts will diminish and groundwater problems could become more frequent through changes in hydrology. Wells are already drying up south and west of Sussex County.
- ***Coordination among service providers.*** In general, coordination between the various agencies in the County is good, particularly at lower levels. Politics can get involved at higher levels though which can influence the prioritization process. It was noted that more than 40 of the 62 members of the General Assembly have houses or own property within the Inland Bays watershed.
- ***Future Structural Solutions.*** Future needs include retrofitting of existing storm basins that may have been designed and/or constructed without stormwater quality components as well as installing basins in more developed areas that currently have no controls. The Center believes that the use of common or shared stormwater facilities on a more regional basis, perhaps owned by a public agency, would reduce the problem of lack of maintenance by private entities at individual basins.

B. Low Impact Development (LID) Roundtable and University of Delaware Sea Grant College

Joe Farrell, LID Roundtable facilitator and coordinator, sponsored by the Nonprofit Education for Municipal Officials (NEMO) Program, was interviewed on October 18, 2007. The Roundtable is educational in purpose and was formed to share low impact/conservation design techniques and bring diverse parties to share and understand institutional constraints to low impact design and better stormwater management design. Mr. Farrell, also through NEMO and in partnership with the Sussex Conservation District and DNREC Sediment and Stormwater Section, worked with the Stormwater Maintenance Advisory Committee. The Committee is a collation of developers, design consultants, state agency representatives, and local officials. The Committee developed the document Stormwater Facility Maintenance Needs Assessment (see Section Two) and hosted a series of public workshops to hear community concerns. Activities related to the University's Sea Grant College Program include applying research to communities, watershed and water quality education, and water quality monitoring. These activities are funded by grants or enveloped by University programs. Specific costs are not available.

Issues

- ***Maintenance of privately-owned facilities.*** The most significant problem now and in the foreseeable future is the lack of maintenance of privately-owned stormwater management facilities. Homeowner associations do not have an understanding of the technical or financial resources that are needed. Approval of maintenance plans prepared by a qualified professional should be part of the approval process. There is a disconnect between design approvals and what is actually built, particularly when a development is "flipped" or the original developer sells an approved project to another developer, often one from another state.
- ***Down-stream impacts from development.*** The externalities of development such as the effects of off-site and downstream drainage are another concern.
- ***Service provider coordination.*** Coordination between public agencies is good and it is perceived that a significant amount gets accomplished because of this. However, it is acknowledged that the responsible party for many activities is not always known and efforts should be made to clarify roles. Coordination could be better between public and private entities. A list of homeowner associations is not known and there is no database of privately-owned and maintained stormwater facilities. An inventory of facilities by location and ownership is a valuable tool that should be created.
- ***Retrofits.*** There is a need to retrofit existing storm basins that may have been designed and/or constructed without stormwater quality components, as well as a need to install basins in more developed areas that currently have no controls. Criteria are needed to guide how projects are prioritized.

C. Positive Growth Alliance

Richard Collins from the Positive Growth Alliance (PGA) and Kenneth Christenbury from Axiom Engineering were interviewed on January 17, 2008. PGA has two main concerns regarding surface water management in Sussex County. First, new development projects should be looked at in the context that they may, if designed and constructed properly, improve existing conditions or problems. The Alliance believes that too often it is automatically assumed that development will be detrimental. Second, overly restrictive regulations may have costs in excess of benefits and break even points need to be known. Those that greatly limit or even prohibit development infringe upon private property rights.

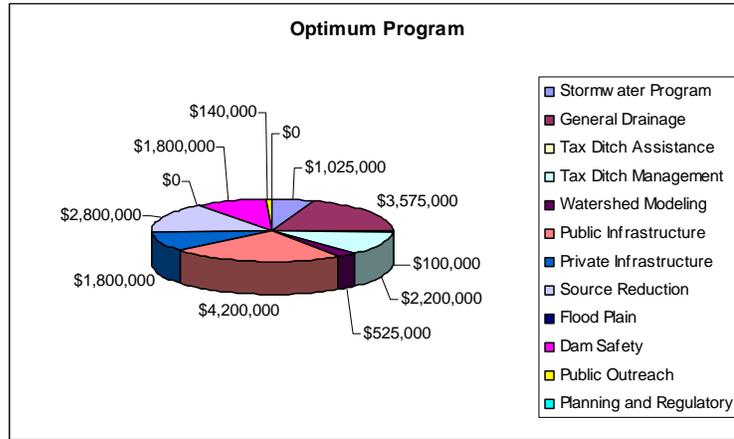
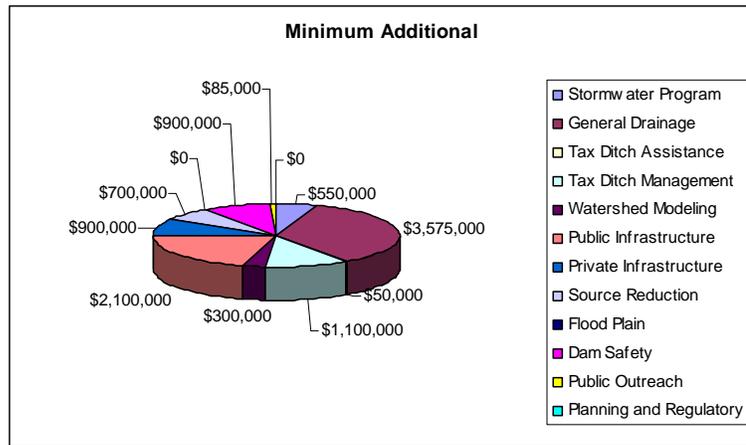
Issues

- ***DeIDOT/Developer relations.*** The relationship with DeIDOT is too adversarial and, therefore, optimum solutions to problems are often not realized. For example, DeIDOT has adopted a policy of not allowing additional drainage onto their rights-of-way, presumably since the agency would then have increased maintenance costs. Even if costs do increase, there are situations where a developer could provide improvements as part of a development. DeIDOT often seeks off site improvements during the plan review process such as intersection modifications or new traffic signals but does not have the same philosophy regarding drainage.
- ***Private-ownership responsibilities for drainage.*** There is too much reliance on private entities such as homeowner associations. These associations are frequently tasked with maintaining stormwater management basins but often do not have the financial resources or technical ability to adequately do so. This function could be taken over by an appropriate government agency but lack of funds to perform the necessary tasks would need to be addressed. A public/private partnership could be formed where a single or small group of contractors with the proper experience could be granted a “franchise” to perform maintenance County-wide but collectively funded by the homeowners.
- ***Use of dry basins.*** Dry basins have very limited aesthetic appeal. The State should continue its movement towards more functional drainage management controls such as wet ponds or best management practices.
- ***Multiple property impacts.*** It was recognized that drainage problems usually affect multiple properties and improvements. Therefore, this requires access to be granted by several owners. In cases where a single land owner refuses to grant access and a project is abandoned, a provision is needed which would allow DNREC or the Conservation District to enter the property so long as a clear need is demonstrated, proper notice made, and restoration provided at completion.
- ***Value of land development.*** In general, PGA believes that the revenues generated and jobs provided by development more than offset any detrimental affects. The plan review process does not recognize these benefits and is too slow. Additional government influence into the process is not the answer.

V. PROGRAM AREAS

Twelve surface water management program elements were identified through the analytical process. An overview of each is provided in this section along with current service levels and projected expenditures to address identified issues. Expenditures are projected at two levels: “Minimum Additional” and “Optimum Program”.

As detailed in the following sections and also tabularized in Appendix A, it was found that current expenditures in a typical year total \$9,930,000. The additional annual funds to meet the Minimum Additional Program are \$10,260,000 for total expenditures of \$20,190,000 with an additional \$18,165,000 needed for the Optimum Program for total expenditures of \$28,095,000. One time costs were found to add \$800,000 and \$1,225,000 to these sums for the Minimum Additional and Optimum Program respectively.



The rationale for these increases over current levels is offered below. Assumptions and methodologies to reach the totals are included in the program descriptions. Note that these assessments are intended to offer a general understanding of the costs and do not include debt service or inflation. All estimates are annual expenditures unless noted as one-time costs and the estimates for Minimum Additional and the Optimum Programs reflect new expenditures and do not include existing resources. Similarly, both programs use the Current Level of funding as their benchmarks.

The most notable prior effort to date to quantify these costs was the Governor’s Task Force which made the following projections in 2005 (with assumptions for this study noted):

FY 2006 21 st Century Fund Requests (1/3 of total assumed)	\$2,500,000
21 st Century Fund Requests	\$10,750,000
Watershed Planning (five assumed)	\$3,750,000
Watershed Capital Implementation (two assumed)	\$20,000,000
Tax Ditches	\$5,000,000
Other Identified Needs	<u>\$3,100,000</u>
Total Five Year Projected Capital Needs	\$45,100,000
Projected Annualized Needs	\$9,000,000

The \$10,260,000 Minimum Additional Program needs identified is comprised of approximately \$9,000,000 in project needs with the remaining allotted to additional staffing and related expenses. Though this study included some programs that were not included in the Task Force assessment such as dam safety, the nearly identical projections developed independently would seem to validate the estimates.

While a substantial percentage of these additional funds are for project-related costs, some are for personnel salaries. In order to keep from increasing the overall payroll or to balance the workload during exceptionally busy or less busy times, agencies could retain the services of consultants or contractors instead. This could potentially reduce the total costs since these contracts would be on a part-time or as needed basis. However the higher hourly rate of consultants may offset salary savings. Regardless, the estimates in this section are based on full time positions with salaries commensurate with anticipated employee classifications.

A. Stormwater Program

Overview of Current Service Level

As a State agency, DNREC is tasked with the overall responsibility for assuring compliance with the Delaware Sediment and Stormwater Regulations. This is accomplished in Sussex County by delegating program management to the Sussex Conservation District. DeIDOT is also a delegated agency for its own projects and DNREC maintains responsibility for State projects. Program costs for DNREC include general oversight as well as plan reviews and construction inspection. For the Conservation District and DeIDOT, program costs are mostly reviews and inspections along with some administrative support. Total current expenditures including salaries and overhead costs are approximately \$220,000, \$1,100,000, and \$150,000 for DNREC, the Conservation District, and DeIDOT respectively.

Stormwater Program
<p>Current Level</p> <ul style="list-style-type: none"> • \$220,000 in DNREC salaries • \$1,100,000 in Sussex Conservation District salaries • \$150,000 in DeIDOT salaries
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$75,000 for additional DNREC engineer • \$400,000 for additional Conservation District employees • \$75,000 for additional Conservation District office space
<p>Optimal Program</p> <ul style="list-style-type: none"> • \$150,000 for two additional DNREC engineers • \$800,000 for additional Conservation District employees • \$75,000 for additional Conservation District office space

Staffing at current levels is able to keep up with most urgent needs while many long term aspects of surface water management are not being addressed and cumulative impacts could be significant.

Minimum Additional

There are over 1,500 development projects that have been completed in the County and more are finished each year. Annual inspections of stormwater facilities in these developments are currently handled by a single inspector. State-of-the-art stormwater management practices are driving a decentralized approach where multiple smaller control facilities are used in lieu of larger basins and ponds. Therefore, this work load will increase not only due to additional developments being completed but by the number of facilities within each development. It is anticipated that at least two additional District maintenance inspectors for post-construction annual facility inspections are needed.

The number of projects under construction at any given time is market driven. The District's four existing inspectors each are responsible for between 100 and 150 projects. Based on the backlog of approved but not yet started projects, it is anticipated that two additional inspectors are needed for these tasks too. Also, as stormwater management becomes increasingly complex at the design phase, an additional engineer is needed for stormwater planning as well as to review plans and assure that calculations are correct.

For design plans review, construction site inspection and post-construction inspection, it is projected that a total of five new District employees are needed. These additional employees would necessitate an administrative assistant for a total of six new positions. Assuming a salary including benefits of \$50,000 per year for the inspectors and administrative personnel and \$75,000 for an engineer, this equates to \$325,000. Other overhead costs would add about 20 percent or \$65,000 for a total of \$390,000 rounded up to \$400,000.



The District's office space is also limited as demonstrated by lack of storage. Documents for many projects are currently stored in boxes. For comparison, DNREC expends about \$135,000 annually for its 4,500 square foot Georgetown office. Assuming Sussex Conservation District expands into roughly half this much space, an additional \$75,000 would be needed.

DNREC will continue to provide programmatic oversight and has identified the need for an additional engineer to work with Sussex Conservation District. This cost has been estimated at \$75,000. It is assumed that DelDOT needs will be addressed by that agency.

Groups such as the Center for the Inland Bays (CIB) have stated that enforcement as well as penalties need to be increased. Staffing shortages have resulted in sporadic inspections and even when violations occur, the violators often are not pursued. In fact, fines for penalties have not changed since the State Sediment and Stormwater Regulations were promulgated in 1991. Response time for plan review could be improved with additional engineers and inspectors which groups such as the Positive Growth Alliance believe are already too long.

Unless new funding measures were developed, DNREC staff increases would be funded by the General Assembly. Currently the Conservation District recoups review and inspection costs through fees. In a typical year the District reviews plans representing about 4,000 acres. Therefore, the additional staff described above would necessitate, in very round numbers, \$100 per acre increases in review and inspection fees.

Optimum Program

While the pace of development has slowed at the beginning of 2008, there are still over 26,000 lots that have been recorded but not yet developed in the County. When the real estate market recovers, these development projects will likely begin as will those being recorded during this period of a slow-down in construction. In order to adequately manage this amount of development, it is assumed that the additional funds for personnel represented as Minimum Additional will need to be doubled. This equates to \$800,000 for the Conservation District and \$150,000 for DNREC. The need for additional office space for the District described for the Minimum Additional is assumed to be the same for the Optimum Program.

B. General Drainage

Overview

General drainage work is performed by DNREC and Sussex County. Projects typically include isolated drainage problems often involving private properties. Many projects are funded through the 21st Century fund. Program costs for DNREC and DeIDOT include salaries for personnel either performing this work directly or for oversight of staff and/or contractors. Sussex County’s costs are limited to personnel. For the Conservation District and DeIDOT, program costs mostly provide reviews and inspections along with some administrative support.

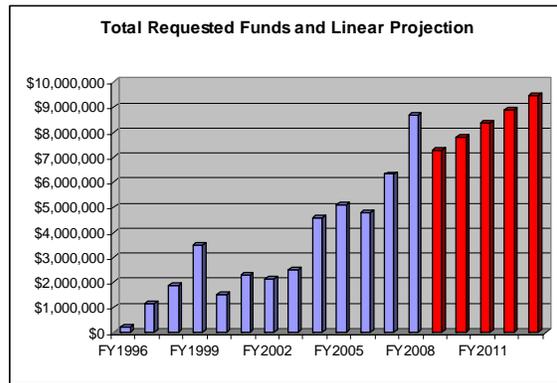
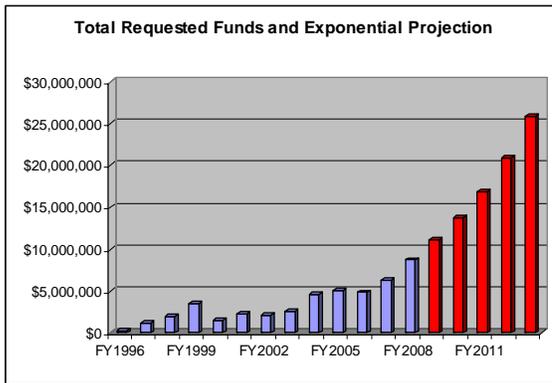
At current levels most critical needs are met but backlog is increasing. Dwindling funds such as 21st Century Fund and a growing population will result in an increasing demand for service with a growing funding gap for new capital projects. As watershed studies are completed, new projects will be identified as well.

There is common agreement in Sussex County that even though precise areas of responsibility for miscellaneous drainage problems are not always known, problems seem to be resolved due mostly to the level of cooperation among the various agencies. The spreadsheet in Appendix B sought to identify the responsible party for various drainage scenarios. This spreadsheet has been used to develop alternate approaches to drainage problems identified in Section VI.

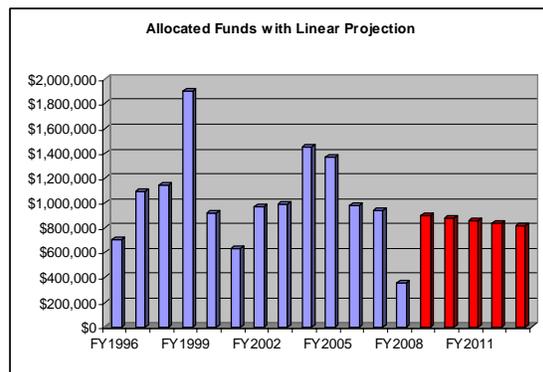
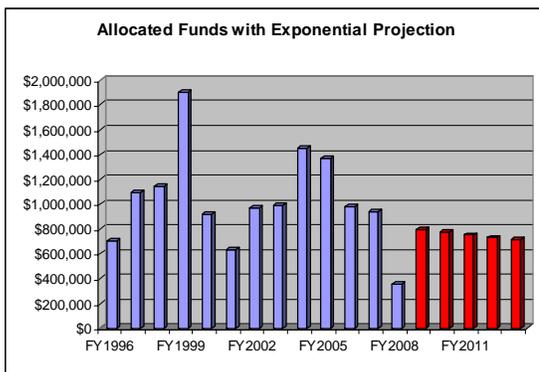
General Drainage	
Current Level	<ul style="list-style-type: none"> • \$400,000 in DNREC salaries • \$400,000 for DNREC projects • \$380,000 in DNREC contractual (also supports Stormwater program) • \$100,000 in Sussex County salaries
Minimum Additional	<ul style="list-style-type: none"> • \$3.4 million for 21st Century Fund projects • \$175,000 for additional DNREC engineer, planner, and inspector
Optimal Program	<ul style="list-style-type: none"> • \$3.4 million for 21st Century Fund projects • \$175,000 for additional DNREC planner and inspector

Minimum Additional

A significant shortfall exists in project funding due to reductions in available 21st Century funds. Prior to and including fiscal year 2000, there were no under-funded balances. Starting in fiscal year 2001, the under-funded balance for Sussex County projects was just over \$700,000. It has been steadily increasing and is \$6.5 million for fiscal year 2008. When new projects are added, the total requested funds are \$8.7 million for fiscal year 2008. Five year projections based on past years' trends were made using either an exponential or a linear fit and are graphically shown below:



The total funds allocated have fluctuated over the years but have shown a slight downward trend. Five year projections were made for these as well and are shown below:



Since neither projection can be solely relied upon, an average between the exponential projections and linear projections were made. These are shown in Table VII below:

Table VII			
Average Total Requested Funds			
	<u>Exponential</u>	<u>Linear</u>	<u>Average</u>
FY2009	\$11,096,679	\$7,274,544	\$9,185,611
FY2010	\$13,706,000	\$7,822,395	\$10,764,198
FY2011	\$16,928,888	\$8,370,247	\$12,649,568
FY2012	\$20,909,621	\$8,918,098	\$14,913,860
FY2013	\$25,826,401	\$9,465,949	\$17,646,175
Average Total Allocated Funds			
	<u>Exponential</u>	<u>Linear</u>	<u>Average</u>
FY2009	\$792,017	\$892,868	\$842,442
FY2010	\$770,274	\$872,660	\$821,467
FY2011	\$749,127	\$852,452	\$800,790
FY2012	\$728,562	\$832,244	\$780,403
FY2013	\$708,560	\$812,036	\$760,298
Projected Funding Gaps			
	<u>Total Requested</u>	<u>Allocated</u>	<u>Funding Gap</u>
FY2009	\$9,185,611	\$842,442	\$8,343,169
FY2010	\$10,764,198	\$821,467	\$9,942,731
FY2011	\$12,649,568	\$800,790	\$11,848,778
FY2012	\$14,913,860	\$780,403	\$14,133,457
FY2013	\$17,646,175	\$760,298	\$16,885,877

The Minimum Additional program assumes that this potential \$17 million funding gap be eliminated within five years. Funding in the amount of \$3.4 million would be needed to accomplish this.

DNREC typically provides management and oversight on about eight to ten projects each year along with another dozen staffed by violators of parole (VOP). Other duties include complaint response, technical assistance to home owner associations and individual home owners, and surveying. Staffing has been adjusted as 21st Century Funds have decreased. Therefore, if additional projects are undertaken, DNREC will need another engineer, planner, and inspector. Together these three positions would cost about \$175,000.

Without additional funds, projects will continue to be delayed. At the current level of 21st Century funding, a project added today may not have full funding for 20 years. However, if the trend of fewer dollars being allotted from this fund coupled with increases in projects continues, this situation is going to worsen.

DNREC, through the Finance Committee of the Clean Water Advisory Council is investigating the feasibility of leveraging funds associated with the Water Pollution Control Revolving Fund and cross-collateralizing the Water Pollution Control Revolving Fund and Drinking Water Revolving Fund. This may make additional funds available for grants or loans.

Optimum Program

The Optimum Program assumes the same scenario as the Minimum Additional in that the funding gap for the 21st Century Fund is eliminated within five years. The additional DNREC engineer, planner, and inspector are assumed to be adequate for the Optimum Program.

It is noted that as watershed master plans are completed, need for additional resources may require a greater annual allocation to keep pace.

C. Tax Ditch Assistance

Overview

Both DNREC and the Conservation District provide technical assistance to the 136 tax ditch organizations in the County. Each provides funds for projects as well.

The Sussex Conservation District provides financial and technical assistance to Sussex County's tax ditch organizations. Financial assistance includes cost-share funds for clean out, spreading spoil, mowing, emergency repairs, and weed wiper bar. A water resource planner is the contact person for the District with the tax ditch officers. He attends annual meetings when requested and provides guidance with financial assistance programs. The district also holds a Tax Ditch Officers' Breakfast every other year to convey important information to the managers. Tax ditch issues are addressed in a quarterly newsletter and issues and legislation that may affect the tax ditch systems are monitored. DNREC assists with many of these programs as well.

Tax Ditch Assistance
<p>Current Level</p> <ul style="list-style-type: none"> • \$600,000 in DNREC salaries • \$155,000 in Sussex Conservation District salaries
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$50,000 for DNREC Tax Ditch Administrator • \$100,000 for DNREC computer system upgrades and associated costs (one time cost)
<p>Optimal Program</p> <ul style="list-style-type: none"> • \$100,000 for two DNREC Tax Ditch Administrators • \$100,000 for DNREC computer system upgrades and associated costs (one time cost)

Minimum Additional

In addition to the survey of tax ditch organizations performed for this analysis, a separate meeting was held with seven tax ditch managers. Please see Appendices C and F. These managers would welcome the creation of a Tax Ditch Administrator position to help coordinate and administer various tasks, such as conduct inspections, organize and facilitate annual meetings, and be point of contact for managers and landowners. The administrator could coordinate with the County staff and officials, consult individual tax ditch organizational managers on best management practices, and identify funding mechanisms. Tax ditch organizations would continue to function without an Administrator but some administrative functions may be done only sporadically if at all.



DNREC is the agency primarily responsible for the assistance given to tax ditch organizations. Considering the public's reliance on tax ditches and trends that will increase that reliance as a critical part of the drainage infrastructure, it is anticipated that the new tax ditch coordinator will be needed by DNREC and this position would cost about \$50,000. DNREC also maintains a database of tax ditch organizations but it has not been updated in many years. DNREC has estimated that \$100,000 is needed to upgrade its GIS system, obtain ARC View licenses, and further develop the database. This cost estimate also includes legal fees associated with recordation and tax ditch rights-of-way issues.

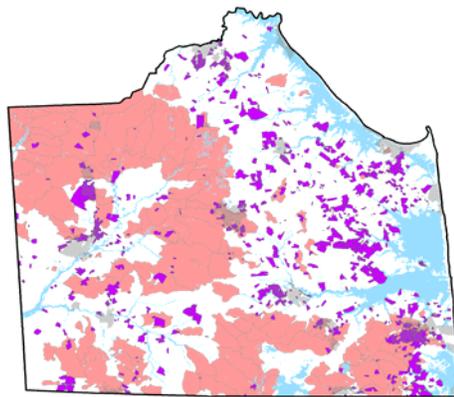
Optimum Program

Many tax ditch managers have been in office for decades and it is uncertain how active new residents will be in managing these crucial organizations. It is likely that DNREC will play an increasing role in coming years and that two tax ditch coordinators will really be needed. These positions would cost \$100,000. The computer upgrades at \$100,000 are deemed sufficient for the Optimum Program.

D. Tax Ditch Management

Overview

Over 20,000 parcels in Sussex County are drained by tax ditches. These comprise 394 square miles or about 42 percent of the County. Statewide, tax ditches provide benefits to almost half of the roads maintained by the State. Most of the growth planned in the County is outside of tax ditch watersheds but some development will occur within these areas. Please see exhibit below.



Tax Ditch Management
<p>Current Level</p> <ul style="list-style-type: none"> • \$700,000 for Cost Share projects • \$100,000 from CTF's for DelDOT projects
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$1.1 million for Cost Share projects
<p>Optimal Program</p> <ul style="list-style-type: none"> • \$2.2 million for Cost Share projects

Two types of maintenance are common with tax ditches. First is minor maintenance which is essentially the control of woody vegetation by mowing or applying herbicides. Major maintenance is activities related to the dip-out and spreading of accumulated sediments. Minor maintenance is often performed at least annually while major maintenance may occur only once every 10 or 20 years. Tax

ditch managers reported that the tax assessments more or less provide adequate funding for minor maintenance but only about half collect funds for major maintenance and therefore these tasks cannot be performed without funding from the Sussex Conservation District Cost Share Program. Even those that do collect for major maintenance often find their assessments are not sufficient. The Cost Share results in approximately \$700,000 in projects each year and DeIDOT estimates they spend about another \$100,000 from Community Transportation Funds. Although funding is not abundant, there does not appear to be an urgent need to increase assessments at this time. However, without the Cost Share Program, the managers would not be able to adequately maintain the ditches without significantly raising taxes.

Minimum Additional

Tax ditches appear able to be relatively self sufficient for minor maintenance. For major maintenance, it is assumed that each tax ditch will require a dip out every 20 years. For the 136 tax ditch organizations in Sussex County, this would equate to about seven dip outs each year. This can be better quantified by assuming that all 1,200 miles of ditches will need to be cleaned every 20 years or 60 miles a year. At an average price of \$2.00 per linear foot or about \$10,000 a mile, this results in a major maintenance need of \$600,000 annually.



Reviewing the 2008 Cost Share Program summary, dip outs represent only about a third of expenditures with construction of new ditches, court order changes of existing ditches, emergency repairs, technical assistance, etc., comprising the remaining two thirds. Assuming this ratio remains constant, total annual needs would be more on the order of \$1.8 million or \$1.1 million over current Cost Share funding.

Optimum Program

Since 42 percent of County land drains into a tax ditch, there is concern about the affects of new and future developments. Tax ditch managers believe that as development increases, so does the cost to maintain ditches as the costs for clean-up including disposal of trash and debris (tires, leaves, etc.) typically rises. Furthermore, watershed master plans may indicate other needed investments. Therefore, doubling the Minimum Additional program would result in \$2.2 million each year.

E. Watershed Modeling For Quantity And Quality Management

Overview

Watersheds know no political boundaries but planning and project assessment on this scale is needed. Every agency involved in the Level of Service analysis stated that problems need to be analyzed in the context of the larger watershed and downstream impacts of development need to be better addressed. Currently developers’ engineers address drainage on a site by site basis. Furthermore, resolution of a problem in one jurisdiction sometimes necessitates work in another but these situations cannot be easily identified without a more comprehensive approach. The DPPI Dialogue recommended that the Clean Water Advisory Council should provide for and DNREC develop detailed watershed plans for all of Delaware’s waters.

Watershed models are often viewed on three levels:

- Major streams – these watersheds are usually measured at the square mile scale and models are used to develop policies to manage resources.
- Tributaries – these watersheds are usually measured more on an acreage scale and used to identify specific projects to protect or restore resources.
- Municipalities – DNREC has developed an outline for municipal drainage plans that describes activities in a number of categories associated with three programmatic levels that were more or less patterned after the requirements of the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program.

Minimum Additional

For all intents and purposes, there have been few if any watershed models prepared in Sussex County. This will be changing in the coming year as DNREC has contracted for the creation of the Nanticoke Watershed Stormwater Management Plan in the upper reaches of the watershed which will encompass the area generally between Seaford and Bridgeville upstream of Williams Pond. DNREC is currently funding this study for \$250,000 which is a good estimate for major streams. The Minimum Additional level of effort assumes that one major stream watershed management plan is prepared every two years or \$125,000 annually. Similar studies for tributaries are assumed to cost \$50,000 each so one such study each year would cost \$50,000. Municipal plans at a baseline level are assumed to cost \$10,000 each or \$250,000 for all 25 municipalities. At five a year, this would equate to \$50,000 annually.

Assuming watershed studies are initiated as described, there will be significant costs associated with managing the technical data developed as well as tracking projects resulting from the studies. GIS costs would be on the same scale as that needed for tax ditch assistance and \$100,000 has been estimated to support data management needs. An additional DNREC employee at \$75,000 has also been allotted.

Watershed Modeling
<p>Current Level</p> <ul style="list-style-type: none"> • \$250,000 for the Nanticoke Watershed Stormwater Management Plan
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$125,000 for one major plan every two years • \$50,000 for one minor plan • \$50,000 for five municipal plans • \$100,000 for DNREC GIS computer system upgrades and associated costs (one time cost) • \$75,000 for additional DNREC employee
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$250,000 for two major plans every two years • \$100,000 for two minor plans • \$100,000 for five comprehensive municipal plans • \$100,000 for DNREC GIS computer system upgrades and associated costs (one time cost) • \$75,000 for additional DNREC employee

Major stream watersheds in Sussex County have already been recognized by DNREC as follows:

Nanticoke River Watershed

- Nanticoke River
- Marshyhope Creek
- Gum Branch
- Gravelly Branch
- Deep Creek
- Broad Creek

Inland Bays Watershed

- Indian River
- Indian River Bay
- Rehoboth Bay
- Iron Branch

Delaware Bay Watershed

- Mispillion River
- Cedar Creek
- Broadkill River
- Lewes and Rehoboth Canal

Assorted Watersheds

- Assawoman Bay
- Little Assawoman Bay
- Buntings Branch
- Pocomoke River
- Wicomoco River

Optimum Program

Many years would be needed to complete watershed plans in all areas of the County using the Minimum Additional approach. A more aggressive approach would double the pace of plan development for both major and minor plans. While major plans typically take two years to prepare, two could run simultaneously as could two minor plans doubling the Minimum Additional program. The Optimum Program also assumes that municipal plans would be more comprehensive and therefore cost \$20,000 each or \$500,000 for all cities and towns and \$100,000 annually over five years. The GIS computer upgrades and additional DNREC employee are also included in the Optimum Program.

F. Maintenance Of And Improvements To Public Infrastructure

Overview

It was generally acknowledged that constituent expectations are changing as new residents move into the County from other states. For example, it is common for agencies to receive complaints after rain events that open channels have not yet drained without realizing that 48 hours drain time is commonly used in their design.

A cornerstone of infrastructure maintenance is an inventory of assets. However, few if any inventories exist of storm drainage systems (DeIDOT and municipalities) or stormwater management basins (private entities such as homeowner associations). An inventory of inlets, basins, and swales effort is underway by DeIDOT. Many municipal interviewees stated that the restoration of their aging infrastructure is one of the major concerns.

DeIDOT reported that they expend about \$4,000,000 annually on drainage projects related to the 4,000 lane miles of roads the agency maintains in Sussex County.

Maintenance Of And Improvements To Public Infrastructure
<p>Current Level</p> <ul style="list-style-type: none"> • \$1,700,000 in DeIDOT salaries • \$2,300,000 in DeIDOT projects • \$200,000 in municipal projects
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$850,000 in DeIDOT salaries • \$1,150,000 for DeIDOT projects • \$100,000 for municipal projects
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$1,700,000 in DeIDOT salaries • \$2,300,000 for DeIDOT projects • \$200,000 for municipal projects

Municipalities are expending significant resources on other infrastructure improvements. Seaford and Bethany Beach for example each have major stormwater projects planned that are projected to cost \$2,000,000 and \$6,000,000 respectively. Since these projects are still in the planning stage and funding sources have not yet been identified, they have been excluded from the Expenditures and Funding Sources spreadsheet in Appendix A and from the summary herein. Other municipalities reported varying levels of annual expenditures for more routine maintenance that totaled about \$200,000.

The DPPI Dialogue stated that the Clean Water Advisory Council should review and refine projected stormwater infrastructure capital as well as operations and maintenance funding gaps.

Minimum Additional

A 50 percent increase to DelDOT’s drainage expenditures would be \$2 million comprised of salary increases of \$850,000 and project expenditures of \$1.15 million. A similar increase for municipalities would be \$100,000. However, final recommendations on funding for maintenance should be completed once an inventory and system assessment is completed.



Optimum Program

The inventory described above is necessitated regardless of whether a Minimum or Optimum Program is implemented. A doubling of current expenditures would be \$4 million for DelDOT comprised of salary increases of \$1.7 million and project expenditures of \$2.3 million. A similar increase for municipalities would be \$200,000.

G. Maintenance Of And Improvements To Private Infrastructure

Overview

As noted in the Introduction to the Sussex County Comprehensive Plan, the County “strongly respects private property rights”. A spillover effect of this inclination is that numerous private entities are responsible for the maintenance of portions of the overall drainage system. Examples include tax ditch organizations as previously described and homeowner associations (HOAs) responsible for stormwater basins and roadways. This can create false expectations regarding who is maintaining these facilities. While tax ditch managers appear to generally be very aware of their responsibilities and, by and large, perform their duties quite well, there is growing concern that the HOAs often are uninformed about their responsibilities. Many also question if the HOAs have the financial resources or technical wherewithal to properly perform the tasks.

Maintenance of And Improvements To Private Infrastructure
<p>Current Level</p> <ul style="list-style-type: none"> • \$500,000 for minor maintenance by home owner associations
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$100,000 for inventory of stormwater management basins (one time cost) • \$500,000 for minor maintenance • \$400,000 for major retrofits
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$100,000 for inventory of stormwater management basins (one time cost) • \$1,000,000 for minor maintenances • \$800,000 for major retrofits

The maintenance of privately-owned basins was cited as a major concern by each agency performing drainage work in Sussex County as well as by the municipalities. This issue was also noted in the 2004 Stormwater Facility Maintenance Needs Assessment in Sussex County.

It is very difficult to estimate current expenditures without an inventory of privately maintained stormwater management basins. Furthermore, some communities spend a considerable amount of money on the upkeep of amenities such as fountains and aerators whereas others simply cut the grass several times a year. For the purposes of this assessment, it was assumed that there are 200 basins in Sussex County and an average of \$2,500 is spent each year for a total of \$500,000. Many communities also are responsible for open channels but these costs are even harder to quantify so for simplicity have been assumed to be incidental to the upkeep of the basins.



Minimum Additional

Without an inventory it is difficult to estimate costs to prepare one. A database of facilities should be completed as a one-time cost, to include a geo-spatial reference tied to tax-data for ownership and changed in development conditions. For privately owned stormwater management basins, the basis of an inventory could be established by reviewing past development plans. A significant amount of field work would be needed nonetheless. Together these tasks are assumed to cost \$100,000.

Maintenance of basins falls into two general categories, minor and major. Minor maintenance operations like grass cutting are usually addressed. However, other frequent tasks such as the control of invasive plants, repair of eroded banks, or removal of obstructions from outlets are often not. The doubling of the average cost or \$5,000 each for the assumed 200 basins would necessitate \$1 million each year or \$500,000 over that currently being spent.

Major maintenance usually involves the reconstruction or retrofit of an existing basin. Depending on the design, construction, and maintenance activities, this often significant amount of work may be needed every 25 years. Though few retrofits have been done in Sussex County, experience in New Castle County indicates these projects can cost at least \$50,000 and sometimes several hundred thousand dollars. Continuing the assumption of 200 facilities in Sussex County each with a life span of about 25 years, eight would require a retrofit each year. Using the lower cost of \$50,000 for the Minimum Additional program, this would necessitate \$400,000 each year.

Optimum Program

A more aggressive program would assume that minor maintenance of privately owned facilities could be more comprehensively handled and doubles the Minimum Additional estimate to \$1 million annually. A similar approach to major maintenance would result in \$800,000 each year.

H. Source Reduction Strategies

Overview

All of the land in Sussex County drains to an impaired stream. A listing of these watersheds and their impairments are shown in Table VIII below. Each of these watersheds has already had Total Maximum Daily Loads (TMDLs) assigned to them and several have Tributary Action Teams developing Pollution Control Strategies. Though some expenditures have been reported, it is difficult to quantify the current level of effort.

New BMPs and retrofit of those already existing could be a critical part of Pollution Control Strategies for TMDL waterways.

Source Reduction Strategies
Current Level <ul style="list-style-type: none"> • Current expenditures are negligible
Minimum Additional <ul style="list-style-type: none"> • \$700,000 for initial efforts in the Nanticoke watershed
Optimum Program <ul style="list-style-type: none"> • \$2.8 million for remaining watersheds

Table VIII

<u>Watershed</u>	<u>Impairment</u>
Broadkill	Bacteria, Nutrients, Dissolved Oxygen
Bunting’s Branch	Nutrients, Dissolved Oxygen
Cedar Creek	Bacteria, Nutrients, Dissolved Oxygen
Marshyhope	Bacteria, Nutrients, Dissolved Oxygen
Pocomoke	Bacteria, Nutrients, Dissolved Oxygen
Inland Bays	Bacteria, Nutrients
Mispillion	Bacteria, Nutrients, Dissolved Oxygen
Nanticoke and Broad Creek	Bacteria, Nutrients
Chesapeake Bay	Bacteria

Though difficult to generalize over these diverse watersheds, nonpoint sources of bacteria and nutrients are often traced to two land uses, agricultural and urban. Adding stormwater quality best management practices in these areas could be one of the more strategic investments that can be made to improve or restore water quality. Similarly, retrofitting existing facilities in developed areas that may not have been designed or constructed with water quality considerations or may have fallen into a state of disrepair could have a similar positive return on the investment. The Center for the Inland Bays (CIB) noted this as one of the most important needs. CIB also noted that criteria are needed to guide prioritization efforts.

The most comprehensive Pollution Control Strategies developed to date for TMDL watersheds in Sussex County are those still in draft form dated April 2007 related to the Inland Bays watershed. That draft document noted that approximately \$700,000 has already been spent on BMPs.

Minimum Additional

Appendix F of the draft Inland Bays Pollution Control Strategies provided cost bases for numerous BMPs. Agricultural BMPs included natural features such as grassed waterways and filter strips as well as structural measures like basins and compost sheds. Urban BMPs were focused on constructed facilities such as basins, infiltration structures, sand filters, and biofilters.

The natural agricultural BMPs averaged over \$200/acre/year and the urban BMP’s averaged about \$1,500/acre/year. Using the Nanticoke watershed as an example, the costs to implement these BMPs could be enormous. Agricultural and urban land uses comprise approximately 128,000 acres and 6,000 acres in the Nanticoke respectively. For demonstration purposes, it is assumed that BMPs are placed in 10 percent of the area of each of these land uses or 12,800 acres and 600 acres of agricultural and urban land respectively. Using the cost estimates, these result in \$2.56 million for agricultural lands and \$900,000 for urban areas or a total of about \$3.5 million. Over a five year time period, this would equal \$700,000 a year.



Optimum Program

A robust program would provide more aggressive and substantial funding for the Inland Bays and Nanticoke watersheds as well as other watersheds where similar efforts are just now beginning. It is assumed that these efforts would cost at least four times the Minimum Additional program or \$2.8 million annually.

I. Flood Plain Protection And Improvement

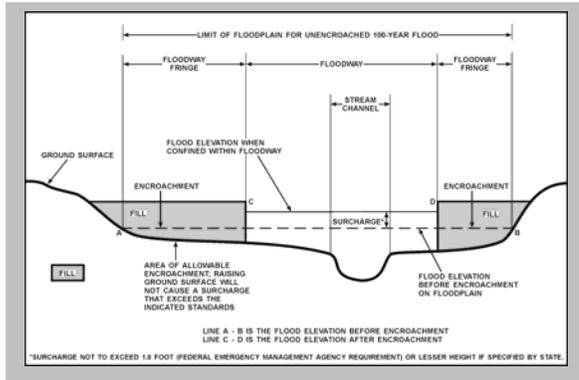
Overview

Flood plains in Sussex County fall into two general categories: tidal and non-tidal of which tidal make up the majority. As in other counties and states, these two types of flood plains are addressed differently. Development including fill in tidal flood plains is usually allowed since for all intents and purposes, the extent of the flood plain is so vast that fill in any one location would not appreciably raise elevations in other locations. Non-tidal or riverine flood plains are different as development resulting in fill could theoretically raise elevations elsewhere as well as place structures at risk. In these

Flood Plain Protection and Improvement
<p>Current Level</p> <ul style="list-style-type: none"> • \$350,000 for flood plain mapping
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$350,000 for flood plain mapping (one time cost)
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$700,000 for flood plain mapping (one time cost)

cases, unless the County mandates that the developer performed the necessary studies to calculate offsite impacts and the appropriate on site elevations, adjacent properties may be affected and individual homeowners are left to determine adequate building heights.

In those streams where detailed studies have been performed, the floodway (the channel and adjacent land areas that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot) is known and is often very close to the flood plain itself. However, a majority of streams in the County have not had detailed flood studies performed and,



therefore, floodways have not been determined. FEMA floodplain maps have been developed for those that meet the criteria for draining at least a one square mile or greater watershed. As development continues to occur which rely on tax ditches for downstream conveyance, more frequent updates to these maps may become necessary.

Similarly, County regulations do not prohibit development in the 100 year flood plain. Lack of these controls can affect adjoining properties as well as the development itself.

Minimum Additional

DNREC is currently having mapping updates performed on 67 stream miles at a cost of about \$350,000. It is assumed that this effort could be applied at another 67 stream miles as a minimum for another \$350,000.

Sussex County should consider revising its development regulations to address development within the 100-year flood plain, either by forbidding or at the very least restricting it such that the density is greatly reduced. The County should also participate more actively in FEMA grant programs which could aid in areas such as buy-outs of homes within flood plains. It is noted that the County participated in a FEMA program to raise 14 homes in 2002 and 2003. It is assumed that these activities could be accomplished with existing County employees and/or included in cost estimates for Planning and Regulatory Aspects.

Also, it is estimated that the County relies on a single employee who also has other responsibilities to handle flood plain issues. As development increases, this should be reviewed to ensure that adequate protection is provided to all developed areas.

Optimal Program

An aggressive program assumes doubling the Minimum Additional Program or \$700,000 and also includes the development of regulations as described under Minimum Additional.

J. Dam Safety

Overview

Delaware's Dam Safety Law was passed by the General Assembly and signed by Governor Minner in 2004. It requires DNREC to establish a dam safety program for the State and to promulgate regulations. Part of this work includes determining the hazard classification of dams which forms the basis for their regulation.

DNREC's current efforts are focused on the preparation of Emergency Action Plans (EAPs) which identify potential emergency conditions at a dam and specifies pre-planned actions to be followed to minimize property damage and loss of life. An EAP specifies actions to moderate or alleviate problems at a dam and contains procedures and information to assist the owner in issuing early warning and notification messages to responsible authorities of an emergency situation. The Plan also contains inundation maps to show the critical areas for action in case of an emergency. Currently \$250,000 is being spent annually throughout Delaware of which \$85,000 is estimated in Sussex County. DNREC staff is overseeing the preparation of these plans by consultants.

Minimum Additional

EAPs cost about \$50,000 each and there are 38 dams in Sussex County which DNREC's consultant has classified as high hazard and in need of an EAP. Therefore a total of \$1.9 million is needed. Rounding up to \$2 million and preparing these plans over a five year time frame would necessitate \$400,000 a year.

Numerous dams in Sussex County were identified as having potential risks such as under-designed spillways. Costs to provide structural modifications are often on the order of \$1 million. Structurally modifying one dam every two years would require \$500,000 a year.

Optimum Program

A more aggressive program would double the Minimum Additional expenditures and prepare EAPs over two and half years and fund a structurally modify a dam every year. The resulting costs would be \$800,000 and \$1 million respectively.

Dam Safety
Current Level <ul style="list-style-type: none">• \$40,000 in DNREC salaries and overhead• \$85,000 for Emergency Action Plans
Minimum Additional <ul style="list-style-type: none">• \$400,000 for Emergency Action Plans• \$500,000 for structural modifications
Optimum Program <ul style="list-style-type: none">• \$800,000 for Emergency Action Plans• \$1 million for structural modifications



K. Public Outreach And Public Involvement

Overview

A majority of public outreach and involvement efforts in Sussex County is performed by three organizations, DNREC, the Conservation District, and the Center for the Inland Bays (CIB). This work includes the following:

Stormwater Pond Maintenance Workshops – Each year DNREC (with assistance from the Conservation District and CIB) offers two training workshops on stormwater facility maintenance and open space management. On average, 60 individuals participate per workshop (about 120 per year).

Technical Assistance – DNREC and the Conservation District respond to approximately 25 requests for technical information pertaining to stormwater facility maintenance each year in Sussex County. While some of the requests can be resolved by distributing printed information and information posted on the website, 5-10 per year require further assistance, such as a site visit, vegetation sampling, or a stormwater pond inspection.

Public Outreach/Education Activities – Both agencies meet with communities on a somewhat as needed basis throughout the year to provide technical assistance on stormwater issues and DNREC participates throughout the year in various outreach and education activities such as the Delaware State Fair and Coast Day.

CIB’s efforts include educating homeowner associations on the maintenance of stormwater management facilities and the general public on the need for urban watershed and storm basin retrofits and the use of rain barrels.

A widely recognized benchmark for public outreach and involvement related to drainage concerns is the National Pollutant Discharge Elimination System (NPDES) stormwater permitting program. Two of the six program components are Public Education and Outreach and Public Involvement and Participation.

Public Education and Outreach efforts are intended for citizens to gain greater understanding of the reasons why stormwater-related programs are necessary and important and to become aware of the personal responsibilities expected of them and others in the community, including the individual actions they can take to protect or improve the quality of area waters. Examples include the preparation of documents such as the following:

- Brochures or fact sheets for general public and specific audiences;
- Recreational guides to educate groups such as golfers, hikers, paddlers, climbers, fishermen, and campers;

Public Outreach and Public Involvement
<p>Current Level</p> <ul style="list-style-type: none"> • Existing expenditures are nominal
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$60,000 for assorted programs • \$25,000 for half time additional SCD employee
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$90,000 for assorted programs • \$50,000 for full time additional Sussex Conservation District employee



- Alternative information sources, such as web sites, bumper stickers, refrigerator magnets, posters for bus and subway stops, and restaurant placemats;
- A library of educational materials for community and school groups;
- Volunteer citizen educators to staff a public education task force;
- Event participation with educational displays at home shows and community festivals;
- Educational programs for school-age children;
- Storm drain stenciling of storm drains with messages such as “Do Not Dump - Drains Directly to Lake”
- Stormwater hotlines for information and for citizen reporting of polluters;
- Economic incentives to citizens and businesses (e.g., rebates to homeowners purchasing mulching lawnmowers or biodegradable lawn products); and
- Tributary signage to increase public awareness of local water resources.

A Public Participation and Involvement program would work in concert with the education and outreach efforts and include activities that engage the public directly. For example:

- Public meetings/citizen panels allow citizens to discuss various viewpoints and provide input concerning appropriate stormwater management policies and BMPs;
- Volunteer water quality monitoring gives citizens first-hand knowledge of the quality of local water bodies and provides a cost-effective means of collecting water quality data;
- Volunteer educators/speakers are utilized who can conduct workshops, encourage public participation, and staff special events;
- Storm drain stenciling is an important and simple activity that concerned citizens, especially students, can do;
- Community clean-ups that organize volunteer who work along local waterways, beaches, and around storm drains have a positive impact on stream health;
- Citizen watch groups can aid local enforcement authorities in the identification of polluters; and
- “Adopt a Storm Drain” programs encourage individuals or groups to keep storm drains free of debris and to monitor what is entering local waterways through storm drains.

While these types of projects could and should be performed by multiple organizations, both public and non-profit, it would be best if one agency lead the efforts, if for no other reason than to keep track of projects and quantify expenditures by all. Considering the Conservation District is already engaged in many such activities, they would likely be the best organization for this role.

The DPPI Dialogue recommended that the Clean Water Advisory Council encourage and provide for increased education on stormwater management.

Minimum Additional

Costs on a per capita basis for these sorts of education programs vary significantly across the country and range from between \$0.20 on the low end to about \$0.50 per capita on the high end. Using a mid point average of \$0.35 and a population of 180,000 residents, \$63,000 would be needed annually. This has been rounded down to \$60,000. This increased level of expenditure would also necessitate additional staff time and a half time person at \$25,000 has been allotted.

Optimum Program

A more aggressive program would be equated with the high end average of \$0.50 per capita or \$90,000 for the County. These funds could be directed to a more proactive outreach, rather than rely significantly on volunteer efforts. The half time position has been upgraded to a full time position for \$50,000.

L. Planning And Regulatory Aspects

Overview

Several of the organizations interviewed for this analysis noted that Sussex County as well as many of the cities and towns in the County do not have a Drainage Code or a Lines and Grades Ordinance. This same issue was discussed in the Stormwater Facility Maintenance Needs Assessment. Interviewees expressed concern that grading changes can be made on lots without any approval process or tracking mechanism which can cause effects on adjoining properties. As-built plans prepared after construction are needed.

Sussex County is, however, currently revising its Subdivision Regulations. It is also in the process of updating its Comprehensive Plan. Many municipalities are or soon will be as well. While most Comprehensive Plans have chapters on water and sewer, few include water resources.

Planning and Regulatory Aspects
<p>Current Level</p> <ul style="list-style-type: none"> • Current expenditures are negligible
<p>Minimum Additional</p> <ul style="list-style-type: none"> • \$50,000 to Sussex County (one time cost) • \$100,000 to municipalities (one time cost)
<p>Optimum Program</p> <ul style="list-style-type: none"> • \$100,000 to Sussex County (one time cost) • \$125,000 to municipalities (one time cost)

It is important to have a comprehensive approach when setting forth strategies and implementation recommendations to resolve drainage issues in areas targeted for growth and development in the future land use and annexation plan. The County and municipalities should consider drainage and stormwater management in updates and amendments to their comprehensive plans to set the framework for other regulatory actions if needed.

Basics to incorporate stormwater management in the comprehensive plans:

- List the functions and responsibilities of stormwater management.
- State goals, issues, strategies and recommendations.
- Create or recommend creating the necessary mapping and GIS data.
- Consider a comprehensive and watershed level approach.
- Integrate stormwater management with the land use, annexation, community facilities, utilities, and natural resource components of the Plan.
- Provide joint planning and coordination as essential elements with county government and neighboring municipalities.

State the goals, issues, strategies and recommendations:

Goals:

- State the goals that the County or municipality generally desires to achieve.
- *Example:* Continue to grow while protecting water quality.

Issues:

- List and describe the issues that the County or municipality desires to mitigate.
- *Examples:* Flooding, infrastructure decay, lack of oversight and maintenance, among others.
 - Identify specific locations and extent of impacts.
 - Recommend or conduct a County or municipal-wide drainage study, which will provide an inventory of facilities and issues, and sets priorities. (*See Steps 3, 4 and 5 below*)

Strategies:

- List and describe specific strategies to achieve the goals.
- *Examples:*
 - Preserve large, continuous areas of open space and recharge areas.
 - Preserve critical ecological areas, such as wetlands, floodplains and riparian corridors.
 - Minimize overall land disturbance and impervious surface.
 - Protect water resources through high-density development by transferring development to where deemed appropriate and protect/conservate sensitive areas, stream corridors and groundwater recharge areas.

Implementation Recommendations:

- Evaluate options to resolve the issues that are aligned with the strategies.
- Designate locations as sensitive areas or growth areas, and include specific policy recommendations.
- *Examples:*
 - Zoning - Recommend land use type and intensity in a Future Land Use Plan, such as low, medium and high residential and link to sensitive areas, groundwater recharge areas, stormwater management areas, growth areas, etc.
 - Recommend Best Management Practices (BMPs) in a land use context by providing specific BMP options in a designated land use type (high density or urban, medium density or suburban, or rural conservation areas).
 - Reference DNREC low impact approaches that reduce the need for stormwater management basins.
 - Recommend growth management techniques such as neo-traditional design, transfer of development rights, cluster developments, purchase of development rights, overlay zoning, among others.
- Information from a study should be used to develop a capital improvements plan for specific improvements.
- Identify sources of funding such as developer impact fees, grants, loans, etc.

Steps to incorporate watershed management in the comprehensive plans:

The following provides a comprehensive and regional approach that the County or a municipality can take to manage stormwater on a watershed level. Coordination amongst all levels will be imperative. Jurisdictions will likely need assistance and coordination from DNREC and the Sussex Conservation District.

- **Step 1. Land Use Plan.** Consider population projections for the planning period and choose a land use plan that will result in desired development densities and locations, given all of the goals and recommendations of the comprehensive plan. This land use plan might be a first draft and revisions might be necessary as the County or a municipality explores water resource demands and impacts of the plan. Deciding on a land use plan will require significant county and municipal cooperation.
- **Step 2. Land Use Pattern.** After choosing the land use plan and defining the zoning that will be needed to implement the plan, forecast the likely land use patterns that will result (e.g., development densities and locations)
- **Step 3. Stormwater Runoff.** For each watershed, given current land use patterns and BMP locations and types, calculate current stormwater loads. Then, considering future land use patterns and BMP locations and types, calculate future and total stormwater loads.
- **Step 4. Overall Development Impacts.** For each watershed, calculate the total nutrient load, which includes nutrient loads from current and future WWTP discharge, septic tanks and stormwater runoff. Compare the total nutrient load for each watershed with the assimilative capacity of the water body.
- **Step 5. Impervious Cover.** For each watershed, given current land use patterns, calculate impervious cover. Then, considering future land use patterns, calculate future and total impervious cover.
- **Step 6. Adjust Land Use Plan or Identify Options to Address Limitations.** If limits are reached at any of the above steps, the land use plan from Step 1 may need to be adjusted, or options should be identified that will help mitigate the limitations.

Minimum Additional

Current personnel at the County level could provide updates to existing codes or author new codes as needed as part of their regular duties. It is however assumed that a professional code writer could assist on a contract basis for \$50,000. Some municipalities, particularly those smaller in size, could benefit from the guidance of a professional code writer as well. It is assumed that \$100,000 spread out to multiple cities and towns would be adequate to meet the minimum needs. A county-wide standard for design and maintenance strategies may be appropriate, following similar approaches in other states. A state-wide design and maintenance standards manual may be an alternative as well. This is another approach unfolding across the nation. This set of standards would be incorporated into local ordinance by reference and could be prepared with location specific conditions to address the variability in drainage and stormwater challenges throughout the state.

Optimum Program

The services of a professional code writer for Sussex County could be more fully engaged for \$100,000. Assuming individual municipal needs could be fulfilled for \$25,000 for each of the 25 cities and towns in the County, \$625,000 or \$125,000 a year for five years would be needed.

VI. ALTERNATIVE GOVERNANCE STRUCTURES

Section V detailed the program elements that comprise surface water management in Sussex County. Current and projected expenditures for each were also provided without regard for how these programs are or should be provided. This section describes three governance structures that may be adopted to implement the programs described: Shared Governance, Existing Framework, and Regional Approach. Each of these is described below along with benefits, drawbacks, and implementation steps. These governance structures are not necessarily mutually exclusive and in actuality components of each could be blended to form an overall program. Also provided are relevant observations which were offered by stakeholders during the interview process that could be used for specific program areas within these governance structures.

Regardless of which structure or combination of structures is deemed most appropriate, responsible agencies should begin addressing their services on more of a watershed scale. It is commonly recognized that watersheds vary and issues and concerns in one may not be the same as those in another. Sussex County could be broken down into three or four watersheds as described in Section V.E. with comprehensive models managed and development activity overseen in each. This approach could be funded by development through impact fees or other mechanism such as increasing of existing review fees. Development plans would not simply be reviewed but would be considered within the context of upstream and downstream issues as well as other initiatives such as DNREC's dam safety program.

A. Shared Governance

Overview

The Shared Governance concept is similar to the Existing Framework in that multiple agencies would perform the various program elements. However, the roles of each would be better articulated and Memoranda of Understanding would be signed formalizing these roles. This would allow for discussions about which agency is best suited to perform certain tasks. Agreements could also be structured between public bodies and private organizations.

For example, DNREC and the Conservation District both perform certain tasks as demonstrated in the table in Appendix B. While this overlap does provide safeguards, it could also result in inefficiencies if not managed properly. One of the 2004 Needs Assessment's recommendations was to clearly define for all parties their responsibility for stormwater facility maintenance. The Committee felt that the lack of a formal agreement on responsibility for stormwater will continue the "mish mash" of stormwater problems.

Regarding delegation of the oversight of State's Sediment and Stormwater Program, the Sussex Conservation District is the delegated agency for the entire County, incorporated as well as unincorporated. However, the larger municipalities in the County have well developed stormwater programs and could be capable of assuming a larger role. This would keep plan reviews and project inspections at the local level.

Signed inter-agency agreements exist in Delaware. In New Castle County, the County and DelDOT are co-permittees along with 12 of 13 municipalities on an NPDES Municipal Separate Storm Sewer System (MS4) permit.

There are also examples of formal agreements between public and private entities. New Castle County developed its Amnesty Program in 2005. Under this program, the County is performing major

maintenance of basins and in some cases is rebuilding those that have failed. In return, homeowner associations sign an agreement where they pledge to perform routine inspections and subsequent maintenance such that the basins do not fall again into a state of disrepair. While funds for this work were provided by the State, the County contributed funding as well. A total of approximately \$10 million was spent over three years.

Benefits

This governance structure has numerous benefits. Formal agreements would provide better visibility to the public as agency roles would be clearly defined and known. There would be less opportunity for a problem or project to “fall through the cracks”. This approach would also provide an opening to develop arrangements with private entities to address potential funding and responsibility issues described under the Existing Framework.

The Governor’s Task Force recommended that the development and utilization of shared stormwater facilities should be strongly encouraged to minimize costs, encourage environmental protection, and support ecosystems. The Center for the Inland Bays believes that the use of common or shared stormwater facilities on a more regional basis, perhaps owned by a public agency, would reduce the problem of lack of maintenance by private entities at individual basins. The efficacy of these types of facilities could only be done with a watershed model. The realization of shared facilities would be far easier if there were a shared governance concept.

Since DNREC and the Conservation District already partner on numerous drainage issues, an alternate approach to providing additional staff to both could be to have a position jointly funded to handle drainage complaints. This individual could be the primary point of contact and then assign the response to one of the two agencies or perhaps another entity such as DeIDOT, a municipality, or a tax ditch organization. Efficiencies would be gained as multiple agencies would not be investigating the same complaint. A Memorandum of Understanding would make the use of shared employees easier.

Drawbacks

A shared governance concept structured with Memoranda of Understanding could introduce rigidity into a system that functions reasonably well in a less formal setting. Barriers to communication could also result. Furthermore, each and every possible scenario or situation cannot be anticipated and agreements therefore would need to be periodically revised or updated. Agencies would need to perform functions outside of their designated area of responsibility in emergency situations. Finally, this approach presupposes that each agency or government body will want to sign a Memorandum.

Implementation Steps

The Areas of Responsibility spreadsheet in Appendix B could be used as a starting point in clarifying or even redefining agency activities. While conversations about which agency or organization is best suited to perform a certain task could be limited to just those agencies or organizations, it may be better to conduct a series of workshops with the public.

After comments are received and multiple perspectives considered, draft Memoranda of Understanding could be prepared for further discussion. It is assumed that multiple drafts would be needed and that the overall process could be time consuming. It is also possible that mutually agreeable language may not be developable.

Relevant Observations

In incorporated areas, agreements between DelDOT and municipalities vary from town to town and often multiple agreements exist within a given town. While crafting of a standard agreement applicable to all situations within all municipalities would be difficult, it would clarify areas of responsibilities.

The Center for the Inland Bays raised the issue that conflicts of interest can be created when a Certified Construction Reviewer (CCR) works for the same firm as a project's designer. For example, if a design flaw is discovered during construction, an inspector could be inclined to adopt a different approach to address the problem than if he or she had no financial ties to the designer. The State could establish a pool of reviewers that developers would pay into and CCR's would be assigned on a rotating basis. This would eliminate any conflicts of interest and would also be revenue neutral.

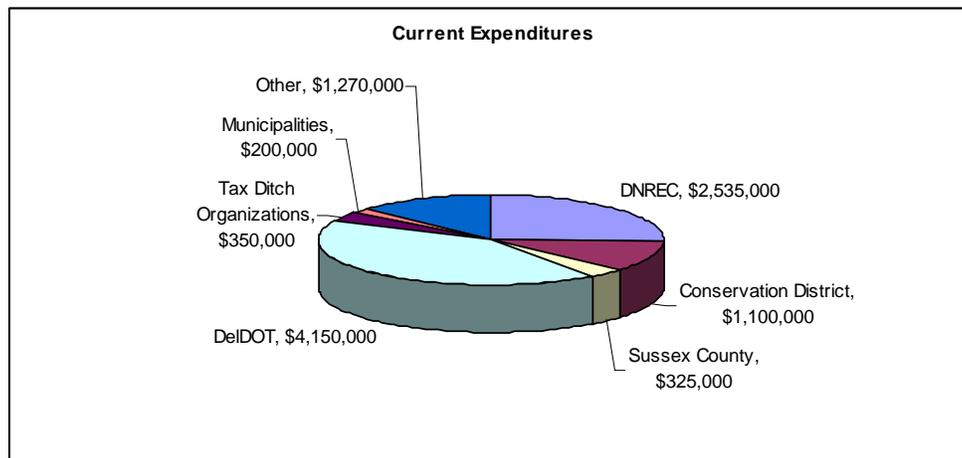
An approach suggested by the Positive Growth Alliance would be to develop a public/private partnership where a single or small group of contractors with the proper experience be granted a franchise of sorts and perform maintenance County-wide but collectively funded by HOAs. This could be a good first step towards improved oversight of these privately owned facilities.

A second approach was identified by municipalities. Developers could pay into a special fund and a public entity could assume the maintenance responsibilities. This process could also better define responsibilities so government agencies are not left with repair in the event of a major failure or maintenance tasks if an association dissolves. The amount of maintenance needed is difficult to determine since most basins are still relatively new and without an inventory, data is sparse.

B. Existing Framework

Overview

The Existing Framework assumes that there are no substantive changes to current delivery mechanisms. The Sussex Conservation District would continue to be the delegated agency for implementation of the State's Sediment and Stormwater Program, DNREC would be responsible for addressing miscellaneous drainage problems as they arise, and both would support tax ditch organizations. Sussex County's role would remain comparatively minor. Current expenditures by agency or entity for a typical year are shown below:



Benefits

The primary benefit of this approach is its ease of implementation. In essence, nothing would change from the current process. Many interviewees, agency representatives as well as stakeholders, agreed that responsibilities are reasonably well defined and one way or the other, urgent needs are usually met. Please see Appendix B which summarizes these responsibilities. Some may embrace the argument that if the system is not broken it should not be changed.

Drawbacks

While informal agreements regarding agency duties may generally be sufficient, in practice these lines of responsibility can become somewhat blurred. Currently this does not seem to be a problem due to the high level of communication and cooperation among agencies. DelDOT acknowledged that the Department will sometimes work outside of the right-of-way, for example, if clearing is needed that does affect a roadway. Similarly DNREC and the Conservation District occasionally if not frequently overlap in their duties.

On the other hand, there are no guarantees that the level of coordination occurring today will exist in the future. If current trends continue, increases in projects coupled with decreases in funding will make financing more difficult. Agencies may not be as willing to work outside of their jurisdictional areas. Furthermore, over years attrition will result in new employees which may or may not have the same level of commitment to their counterparts in other agencies.

Preserving the current structure would also mean continuing the reliance on private entities for maintaining components of the overall system. While tax ditch organizations are by and large capable of this task, many believe that homeowners and homeowner associations are not. The 2004 Stormwater Facility Maintenance Needs Assessment opined that homeowners are “clueless” as to their fiscal responsibility for stormwater maintenance.

Implementation Steps

As the Existing Framework would simply be a continuation of the current system, implementation steps are few. However, some actions could be initiated. For example, a more structured gathering of agencies and stakeholders involved or interested in surface water management could be held monthly or quarterly. It is acknowledged that DNREC, the Conservation District, and DelDOT meet periodically to review projects. This group could be expanded to include municipalities, tax ditch representatives, and potentially non-government entities such as nonprofits or the development community. This would provide a venue for discussions more on a process than project scale.

The reliance on private entities could have severe consequences in future years if development continues under this practice. Not only will more and more facilities be under private ownership but those that already exist will sooner or later need repairs or renovation. The 2004 Needs Assessment recommended adding assessment and enforcement strategies into homeowner bylaws and assuring that homeowners know their responsibilities for stormwater facility management when they purchase property. Homeowner associations that do not take steps such as these could have significant costs without any means to pay for them.

A similar situation exists with roads which fall into three categories in Sussex County: private, dedicated to public use, and State maintained. Whereas the maintenance responsibility for the private and State maintained or public roads is fairly clear, it is less clear for those roads dedicated to public use. Typically the responsible party is not identified when these roads, often in subdivisions, are built.

When a maintenance issue related to stormwater arises, DNREC's Drainage Section will try to address it with 21st Century funds or a State legislator may fund a repair. As with stormwater facilities, it is anticipated that these needs will increase.

Relevant Observations

DelDOT recently developed the policy of not allowing new drainage discharges into their conveyance system. The Positive Growth Alliance believes that policies such as this result in optimum solutions to drainage problems perhaps not being realized. DelDOT often seeks off-site improvements during the plan review process such as intersection modifications or new traffic signals but does not typically seek the same types of improvements related to drainage. Relaxation of this policy could result in a reduction in expenditures in rights-of-way.

C. Regional Approach

Overview

Whereas the Existing Framework and Shared Governance approaches would maintain in some degree the current framework, the Regional Approach would be a major overhaul. This approach would involve the creation of new agency within DNREC, the Conservation District, or Sussex County that would absorb the responsibilities of existing agencies. This sort of stormwater utility was recommended by the Governor's Task Force, the Delaware Public Policy Institute Dialogue, and the Stormwater Facility Maintenance Needs Assessment. There are over 400 stormwater utilities throughout the Country and some project the number to be as high as 10,000 by 2010. New Castle County is currently investigating the implementation of utility as is the Board of Public Works in Lewes. The City of Wilmington has already created one.

If a stormwater utility were created, either the current funding streams would be to be transferred to the new entity or new revenue streams created (or both). Ideally the utility would function similarly to other utilities where revenues and expenditures associated with surface water conveyance and management would be accounted for on an individual property basis. Under the utility concept, residences and businesses are assessed a fee based on the amount of runoff generated on their property which is more or less a function of the amount of impervious surfaces. The objective is to provide an equitable, stable, and dedicated source of funds.

The Governor's Task Force noted that stormwater utilities operating at the county or local level should be formed as a funding vehicle for the purpose of providing a simplified and comprehensive approach to drainage and flooding problems throughout each county. The utility would be a mechanism to provide necessary funding for implementing improved surface water management. The Needs Assessment recommended the development of an equitable funding mechanism for stormwater facility maintenance such as exploring the establishment of a stormwater utility as well as investigating other funding options.

Benefits

A regional or countywide entity would enable a more comprehensive surface water management program to be created. While each of the 12 program elements detailed in Section V is being addressed in one form or another, the numerous agencies and organizations involved results in potential inefficiencies. A single entity could better leverage the work currently being performed by multiple groups and provide a more unified approach. This could perhaps be the best framework for the public as there would be no confusion over who to contact for a particular issue.

Drawbacks

The complexities of absorbing various programs being performed by several government organizations into a single entity could be substantial. Issues to be considered would include employee seniorities, agreements and benefit packages as well as inventories of equipment and supplies. If new funding streams based on impervious surfaces are to be created, up front costs to determine appropriate rates and institute a billing system could be significant.

Implementation Steps

The approach to implementing a utility would be similar to that for the Shared Governance in that a series of lengthy meetings among agencies and workshops with the public would be needed. If alternate funding sources were sought, much more precise estimates of expenditures would be needed than was performed for this Level of Service Analysis and resident expectations would need to be determined.

Relevant Observations

Even though tax ditch law is about 200 years old, development pressures in Sussex County may warrant discussion about whether or not relying on private entities for such an integral part of the drainage infrastructure is still appropriate. One of the Governor's Task Force's recommendations was that these organizations should be considered for inclusion into a county or municipal stormwater utility. Whether a utility is developed or not, dialogue should be considered on the role of tax ditches into the future. Many tax ditch managers have been in office for decades and at the very least continuity assurance needs to be provided.

One of the recommendations of the DPPI Dialogue was that "Counties and municipalities should review their current impact fees related to development of growth-related wastewater and stormwater infrastructure." These types of fees were discussed at the meeting of municipalities and it was thought that DNREC could provide a model for how collection and distribution issues could be resolved. Transferring funds could somewhat reward jurisdictions that do not plan as well as those that do.

D. Public Meeting

A meeting was held on April 29, 2008 where these alternative governance structures were presented to approximately 100 stakeholders. Please see Appendix G for the handout developed for meeting attendees and notes of public comments received.

Though difficult to determine a consensus, it appeared that those in the audience favored an approach somewhere in between the Shared Governance and Existing Framework approaches. There was little support for the Regional Approach and creation of a new entity. Many believed that the current system works reasonably well but recognized that some "tweaks" may be beneficial. Others were surprised to learn that private organizations such as HOAs have such a large degree of maintenance responsibilities and agreed that this issue needs to be addressed.

RECOMMENDATIONS

The purpose of this project was to determine the current level and extent of public services offered in Sussex County related to surface water management, and to identify both the cost and the degree to which they may be initiated or increased to adequately meet the needs of the rapidly expanding population within the County. Analyses built upon previous efforts such as the Stormwater Facility Maintenance Needs Assessment for Sussex County (2004), Governor Minner's Task Force on Surface Water Management (2005), and the Delaware Public Policy Institute (DPPI) Dialogue on Financing Wastewater and Stormwater Infrastructure (2006).

Potential program enhancements were described for each of the 12 service areas specified in Section V. Since some themes transcend multiple service areas, the recommendations that follow focus more on the larger policy-level themes as opposed to specific program changes. They acknowledge the previous assessments as appropriate.

The Joint Coordinating Committee (JCC) comprised of representatives from Sussex County, the Sussex Conservation District, and the Division of Soil and Water Conservation at DNREC was formed to oversee the preparation of this study. There are also other groups in existence investigating many of the same topics such as the Delaware Clean Water Advisory Council at the State level and the Conservation District's Stormwater Regulatory Advisory Committee at the County level. Furthermore, DNREC, the Conservation District, and DelDOT meet on a periodic informal basis. The JCC should reconvene, potentially in an expanded form with other stakeholders, to decide if it or another existing or new group is most appropriate for the furtherance of the policy discussions and program enhancements recommended. Since there are numerous interested parties as evidenced by the number of attendees at the April 29, 2008 public meeting, it is important to identify the ideal organization to continuing refining program needs, set priorities, follow up on requests of other agencies or organizations, and develop policies for private entities.

A. **Short-term Recommendations**

The following recommendations can be accomplished quickly and with minimal additional resources.

Communications Strategy

A communication strategy should be developed for distribution of the report and its findings. At a minimum, the report findings should be presented to every organization interviewed or represented at the public meeting. Members of the General Assembly representing Sussex County should be made aware of the current and future funding gaps as should the Clean Water Advisory Council. Sussex County Council and municipalities as applicable should understand the long-term implications of current policies.

Regulations and Planning

Several interviewees indicated that the absence of drainage codes has resulted in a lack of consistent grading and periodic inadequate drainage on private lots which can affect adjacent lots. Public agencies are often expected to address these types of problems. Though most drainage-related issues are deferred to the Conservation District, Sussex County may find that providing the District with more progressive codes and ordinances could result in improved services to their common

constituents. The County may also want to explore better limitations or even prohibitions against development in flood plains. Some of these observations apply to municipalities as well.

Both the County as well as its municipalities should consider incorporating stormwater management into their comprehensive plans. Creation of stormwater design and development standards from the local to statewide levels is becoming more widely acceptable today. These approaches acknowledge the reality that stormwater runoff impacts are created watershed-wide and are not limited to the geographical boundaries of local, regional, or state stormwater management programs.

Clarity of Agency Responsibilities

The current informal system of agency communication appears to be working well. However, increased dialogue could provide more visibility to the public regarding the responsibilities of the numerous entities involved in surface water management. More formal arrangements between agencies could result in greater efficiencies with shared resources or in addressing multi-jurisdictional projects and assure that the level of cooperation continues into the future. Similar arrangements between public and private organizations may also be a necessity in resolving the issues inherent to maintenance of private facilities and could provide opportunities for greater reliance on the private sector to address stormwater issues.

B. Mid-term Recommendations

The following recommendations may require a higher degree of planning and resources.

Reliance on Private Entities

The issue of relying upon private entities such as homeowner associations (HOAs) to perform maintenance on stormwater management facilities was also identified in prior efforts and was reinforced by this study. The concern with this approach is twofold. First, HOAs may be uninformed about their responsibilities and second, even if aware, financial resources and technical wherewithal may not be sufficiently provided. The Stormwater Facility Maintenance Needs Assessment noted that homeowners are “clueless” as to their responsibilities and one of its recommendations was that the responsibility for maintenance needs to be clearly understood by all parties. Each agency interviewed for this study as well as many municipalities identified this as major concern. Stakeholders at opposite ends of the spectrum agreed from the Low Impact Development Roundtable to the Positive Growth Alliance.

The development of an inventory of privately-owned and maintained surface water management structures and facilities including stormwater management basins, best management practices (BMPs), and roadside channels would be a key first step. Perhaps the most important aspect to include in an inventory is the identification of the organization responsible for maintenance and the determination of their ability to adequately do so. Policies should be developed by DNREC or the Conservation District guiding the documentation of routine maintenance activities as well as demonstrating adequate long-term financing to assure their proper upkeep. Other options should also be discussed such as public/private partnerships or the assumption of maintenance by a public agency.

Education and Outreach

Public education on environmental issues is recognized as a key component for success. As a comparison, the raising of public awareness for the need to conserve resources through recycling of consumer materials such as paper, bottles, can and other previously discarded “wastes” has lead to

reduced environmental impacts of landfills. Transferring that approach to stormwater is recognized as an important step in addressing local drainage issues.

Several interviewees opined that greater stormwater knowledge by not only responsible parties such as HOAs but the public at-large would result in increased awareness of the issues and understanding of the circumstances moving forward. Tax ditch organizations specifically noted the lack of awareness regarding their role and rights-of-ways. While there are no parts of the County covered by the Federal NPDES stormwater permitting program, two of the six program components that permitted jurisdictions must address are Public Education and Outreach and Public Involvement and Participation. The DPPI Dialogue recognized the important role of education in stormwater management. Modest investments in literature, advertisements, and volunteer programs could yield significant returns particularly in the area of pollution prevention, the major focus of Pollution Control Strategies.

C. Long-term Recommendations

The following recommendations necessitate approaches or tactics on an entirely new level.

Approaches to Funding

This Level of Service study found that the additional annual funds to meet the Minimum Additional Program is \$10,260,000 for total expenditures of \$20,190,000 with an additional \$18,165,000 needed for the Optimum Program for total expenditures of \$28,095,000. One time costs were found to add \$800,000 and \$1,225,000 to these sums for the Minimum Additional and Optimum Program respectively. About a third of the Minimum Additional Program shortfall is the projected gap in funding for the 21st Century Fund. At the current level, projects added today may not have full funding for 20 years. Other critical programs needing additional funds include tax ditch assistance, dam safety, and watershed studies. The Optimum Program would enable more emphasis on source reduction programs as well as greater allowance for private parties such as homeowner associations and tax ditch organizations.

Each of the previous studies recognized the need to establish more stable and adequate funding. The first recommendation in the Stormwater Facility Maintenance Needs Assessment is “develop an equitable funding mechanism for stormwater facility maintenance”. The Governor’s Task Force was more specific stating that “stormwater utilities operating at the county or local level should be formed as a funding vehicle for the purpose of providing a simplified and comprehensive approach to drainage and flooding problems throughout each county”. This recommendation was reinforced by the DPPI Dialogue which declared “stormwater utilities should be created and implemented, when possible, to provide for a consistent, coordinated, clear, comprehensive and funded approach to stormwater management”.

The concept of a utility was discussed at the April 29, 2008 public meeting but those in attendance seemed to favor a more gradual approach adjusting existing programs as opposed to enacting more sweeping changes. Regardless, it needs to be recognized that this approach will not close the funding gaps which exist today nor does it account for likely widening of these gaps particularly with respect to 21st Century Fund as well as the Cost Share program for tax ditches. Other funding mechanisms such as leveraging of the Water Pollution Control Revolving Fund as currently being assessed by the Clean Water Advisory Council or the raising of review and inspection fees may need to be considered. Proceeding without developing approaches to address funding needs could have dire consequences.

Reliance on Tax Ditch Organizations

Though not as urgent as addressing the maintenance of stormwater management facilities by HOAs, the appropriateness of tax ditch organizations each privately managed and which drain about 42 percent of the county should be considered. One of the Governor's Task Force recommendations was that urban, suburban, or defunct tax ditches may be considered for inclusion into a stormwater utility to provide adequate funding and allow the organizations to better address development pressures and environmental concerns. While the development of a utility does not appear to be on the immediate horizon, the policy aspect of privately-owned components of the overall drainage infrastructure should be discussed.

Aging Public Infrastructure and Flooding

Though a significant amount of development has occurred in recent years, there are parts of the county particularly in or near cities and towns with public infrastructure such as inlets and pipes which have or are nearing the end of their life span. This can result in several issues including safety considerations to the public should grates collapse or sink holes form over deteriorated pipes. In addition, isolated flooding may occur should capacities be exceeded due to growth of development in the watershed. Indeed a majority of the respondents to the municipal survey indicated that flooding and infrastructure decay were major drivers of their program. Many indicated that upgrading existing infrastructure was a top priority. At least two municipalities reported they are planning multi-million dollar stormwater projects but had not identified funding sources.