ABSTRACT

REPORT ON A MTSC INTERNSHIP AT THE WARREN COUNTY ENGINEER’S OFFICE

by Donna Marie Whitson

This four-chapter report describes the work I performed as a technical writing intern for the Warren County Engineer’s Office (WCEO) in Lebanon, Ohio, during the summer of 2010. The report provides an overview of the county organization; a description of my role in the Engineer’s Office, and the documents I created for Warren County, including an instructional pamphlet on stormwater drainage maintenance for Home Owner’s Associations (HOA) and a booklet on stream setbacks for the Warren County Soil and Water Conservation District (WCSWCD). (I also include an analysis and comparison of project management to my internship experience and how that affected the development of my documents and the exploration of the internship and how my experience compared to my classroom training as a technical writer.)
REPORT ON A MTSC INTERNSHIP AT THE WARREN COUNTY ENGINEER’S OFFICE

An Internship Report

Submitted to the
Faculty of Miami University
in partial fulfillment of
the requirements for the degree of
Master of Technical and Scientific Communication
Department of English
by
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ACKNOWLEDGEMENTS

“Don't be afraid of change, because it is leading you to a new beginning.” ~ Joyce Meyers ~

When I began my journey at Miami I was facing a change that would affect every aspect of my life, and I was afraid. Now that I have reached my goal and started my new beginning, I hope to not be afraid to face the changes and challenges.

I’d like to thank my committee, Dr. Jean Lutz, my advisor, Dr. Katherine Durack and Dr. Jerry Green. All of you have been there for me at one point or another. I have a special thank you for Dr. Jean Lutz. Thank you for being there when I needed you, for supporting me, encouraging me, and offering a shoulder to cry on when needed; for this I will always be grateful.

I owe many thanks to my wonderful friends and family that patiently encouraged me to finish this report, and held my hand when I couldn’t do it alone anymore. Thanks to my husband for his patience; I didn’t know when I started college as a non-traditional student that the road would be so long. And finally, I wish to thank my Mom for her encouragement and financial assistance, when she was able to give it. I know how proud she would be to see me finally receive this degree. Although my parents can’t be with me when I graduate, I know they will be smiling down and saying, “That’s our girl”.

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Chapter 1 | Understanding the Structure of my Work Environment

This report discusses my 14-week internship as a technical writer with Warren County, Ohio. The internship was completed between May 4th and August 13th, 2010 and fulfilled one of the requirements of the Master of Technical and Scientific Communication (MTSC) degree at Miami University, Oxford, Ohio. This chapter explains the hierarchy of the county offices I dealt with, the location of these offices, and the purpose of my position. As federal, state, and regional government agencies have many complex layers; I will only discuss the organization of the parent agency and the two offices I worked with most directly. While with Warren County, I worked for the Warren County Engineer’s Office (WCEO) and for the Warren County Soil and Water Conservation District (WCSWCD) office. My internship came about because Neil Tunison, Warren County Engineer, was looking for someone to create an informational document to explain the need for stormwater drainage maintenance in local Home Owner’s Associations in Warren County. During my fourteen weeks, my primary work responsibility was to create two documents, one on understanding stormwater drainage maintenance for WCEO and another on stream setbacks for WCSWCD. In order to understand the office environment in which I worked, I explain the structure and culture of the two offices below.

County Organizational Structure and Culture

Warren County is the second fastest growing county in the State of Ohio; the county has a large agricultural base, with The City of Lebanon as the county seat. The large agricultural population and growing population means that the area experiences rapid growth in infrastructure and continued use of green space for farming and recreation. These activities require active soil and water monitoring by a number of offices. The following organizational chart shows each office, followed by a small paragraph describing each office’s responsibility to the county. See Figure 1.1
Each office and district has an acronym. I have created a list of acronyms to help readers determine which office, district or term is being referred to.

**Warren County Board of Commissioners (WCBC)**

County commissioners make up the general administrative body for county government. Their primary responsibilities include approving drainage improvement through the petition ditch process, establishing water and sewer districts, improving the environment, and improving agriculture in their counties. I’ve included the County Commissioners because they were responsible for the final approval of the project I performed for the Warren County Engineer’s Office (WCEO).
**Warren County Engineer’s Office (WCEO)**

The county engineer is the county’s surveyor and civil engineer, whose primary duty is to plan, design, construct, and maintain the county road system, including county bridges. The engineer’s office is also responsible for maintaining the auditor’s tax maps, including reviewing deeds, land transfers, lot splits, and annexation petitions for proper boundary descriptions and township zoning resolutions and amendments. This is the office I was hired by for my internship. I occasionally worked in this office and created one document for Home Owner’s Associations, titled *Understanding Stormwater Drainage Maintenance*.

**Warren County Soil and Water Conservation District (WCSWCD)**

The WCSWCD provides stormwater management services aimed at reducing the effects of flooding, erosion, and sedimentation and helps to protect the quality of water in local streams, lakes, and rivers. Stormwater and its impact on the county’s natural resources is an important issue that needs to be continually addressed to protect local stream health and to stop further property damage. I worked in the WCSWCD offices during most of my internship, and I created three documents: *Stream Setbacks are a Stream Saving Measure*, an article for the Warren Report Newsletter, and environmental education handouts for this group.

**Warren County Stormwater District (WCSD)**

The WCSWCD and WCEO work in partnership to support the Warren County Stormwater District (WCSD). Although each has individual responsibilities, as listed below, they work in partnership with the WCSD. Any of their responsibilities can cross over to assist the WCSD.

**Warren County Engineer’s Office Responsibilities:**

- Stormwater Regulations, Plan Reviews, and Post-Construction
- Stormwater Management
- Phase II Permit Administration
- Mapping
- Driveway Culverts
- Illicit Discharge Detection and Elimination
**Warren County Soil and Water Conservation District Responsibilities:**

Construction Site Runoff Control, Erosion and Sediment Control Plan Reviews  
Drainage Issues  
Streams and Rain Gardens  
Public Education and Outreach  
Retention/Detention Basin Inspections  
Ponds

**Work Environment**

I worked in and for two separate offices, the WCEO and the WCSWCD, during my internship, and each office had a very different work environment. I mostly worked in the WCSWCD office because there wasn’t room physically for me at the WCEO’s site. However, I worked closely with WCEO personnel, even though it was difficult for me to share their space. The WCEO building’s office space is small and shared by other offices and employees. The set-up of this office is open, with few actual offices. Neil Tunison, the County Engineer, has an office on the main floor, and his Administrative Assistant, Savannah Shafer, has a work area outside his office entrance. When I worked at the WCEO office, I usually shared Savannah’s desk and computer. Due to our shared workspace, it was important that I communicate with her regularly to avoid conflicting with her work schedule and responsibilities. Neil and Savannah were the individuals I worked with the most while working on the stormwater drainage maintenance pamphlet.

The WCSWCD was the other office for which I worked and where I spent most of my time. The office is located closer to the main business district in Lebanon, on the other side of town from the WCEO’s office. The office is located in a medium-sized building and is shared with the County Extension Service and the Office of Parole. The office itself is medium sized and is shared by eight employees, each having a separate work area in an average-sized cubicle. The office is quiet and comfortable, with large windows lining one wall allowing natural light into the area. The people who work here have positions pertaining to soil and water issues affecting county and residential land and streams. Their work involves assisting farmers with agricultural soil and water problems on their land, as well as helping residents with urban stormwater issues. These issues usually involve flooding near residences or loss of stream bank property due to erosion. This office also works with local schools and other groups to teach school children...
about the environment. My space in this office consisted of a cubicle with plenty of space to work on my projects; and when I worked on site I usually used this location.

Everyone at WCSWCD, myself included, attended weekly meetings in the office. The meetings were held to discuss individual and group projects that were being worked on, how these projects were progressing, and if any new problems needed to be addressed. Everyone was included in changes or special meetings that were going to be coming up with other county offices or visitors. Managers were not overly visible, and employees were expected to handle the issues they were responsible for and to approach their manager if a situation arose that required assistance. On the Stream Setback booklet, the people I worked most closely with were Marsha Rolph and Caitlyn Botschner. I did have contact with others in the office, but the degree of involvement was less. Frequently, I alternated my time between the WCEO and WCSWCD to work on issues related to my projects.

Nature of my Work
My internship presented me with an opportunity to use skills in a place other than the classroom. In fact, my position was created specifically for a technical writer to develop and produce information for the county. I was hired as that technical writer to fulfill the need for an educational document that would explain stormwater drainage maintenance to Home Owner’s Associations (HOA) and their residents; I also was asked to create an informational document for the WCSWCD that would explain stream setbacks to residents. I created other smaller documents while with WCSWCD as well. In addition to my writing, I had the chance to spend some time outdoors to get to know the physical area.

Warren County has extensive water resources, and issues surrounding these resources need to be treated with care. I became acutely aware of these issues since I was invited into the field to experience first-hand the destructive effects of stormwater on Warren County streams; these effects included stream bank erosion that caused property owners to lose their land and roads that were undermined by the water, causing the infrastructure and soil to fall into the river. Because I saw these effects myself, I knew the importance of explaining the need for stormwater drainage
maintenance. I had to develop a way to help the residents of Warren County understand the problems through an educational document. The impact of stormwater on the county’s natural resources, I realized, is an important issue that needed to be addressed to stop further damage to property and to the local streams.
Mentorship
Marsha Rolph was my mentor during the entire internship. Marsha’s position with the WCSWCD as a stream specialist was very helpful to me as I wrote about various water issues. Marsha frequently took me out to see areas of erosion and other problems along the Little Miami River. Seeing the issues I would be writing about first-hand made it easier for me to express the importance of controlling stormwater and the purpose for stream setbacks.

The documents I created were added to the Warren County Engineer’s Office website and the Warren County Stormwater District website and can be viewed at:

http://www.wceo.us/attachments/2/HOA-Brochure.pdf
http://www.co.warren.oh.us/warrenswcd/owners/streamside_setbacks.pdf
Chapter 2 | Describing My Projects

Introduction
In this chapter, I briefly describe two major projects I worked on during my internship, one with the WCEO and one with the WCSWCD. The WCEO project was to create an educational stormwater drainage maintenance pamphlet and the WCSWCD project was to design an instructional stream setback booklet. In addition to these two major projects, I did smaller writing projects as needed. All of my internship projects were prepared for specific groups of Warren County residents. In this chapter, I provide a brief summary of each of my internship projects.

Project One: Home Owner’s Associations Pamphlet written for WCEO
My first and largest project with Warren County was with the Engineer’s Office. Neil Tunison, County Engineer, and Savannah Shafer, Neil Tunison’s Administrative Assistant, were the people I worked with the most on the pamphlet. We held meetings in Neil’s office to discuss the purpose and content of the pamphlet and for follow-up. A copy of the completed pamphlet is in Appendix A. We decided the pamphlet’s purpose was to inform Home Owner’s Associations (HOA) and residents about stormwater drainage maintenance, the drainage structures, and the residents’ responsibilities in keeping their systems working properly. Savannah and I worked on the layout of text and graphics and determined how to organize the information Neil wanted to include. Warren County had a specific look they used for their written communications, so together Savannah and I were able to create a visually appealing and informative document. An important aspect of the pamphlet was wording it in such a way that a person reading at an 8th grade level could understand what it was explaining. This pamphlet was created only for residents living in specific HOA’s in the county. This pamphlet is titled, Understanding Stormwater Drainage Maintenance, and was added to the Stormwater District’s website and included in a booklet for residents about other stormwater issues. The link to the website is http://www.wceo.us/attachments/2/HOA-Brochure.pdf
Project Two: Stream Setback Booklet

My second large project was for the WCSWCD. I worked most closely with Marsha Rolph and Caitlin Botschner in the WCSWCD office. The organization needed an informational booklet that would explain stream setbacks to land owners who had streams on their property. Stream setbacks are intended to keep waterways clear of constructed objects and unnecessary vegetation. Not only did the WCSWCD want this pamphlet to help keep streams clear, but they thought it would also help in protecting larger local waterways and in improving water quality at the stream source.

I researched information on websites on stream setbacks, and my field research included taking photographs of streams in the county that I used in the booklet. My co-workers in WCSWCD were a great resource for answering questions. They gave me feedback on the booklet’s contents as I created it. However, the design and layout of the document were my responsibility. I decided to incorporate blue in the booklet and used quotes from well known sources who revered water as a natural resource. The same shade of blue used in other areas of the booklet is used for the quotes too. For example, one quote I used was from Jacques Cousteau who said, “We forget that the water cycle and the life cycle are one.” I used this technique to encourage the audience to see water as a resource, not just as water in a stream.

Choosing vocabulary was difficult and I constantly had to remind myself who my audience was. I found myself writing from my point of view as a student with an environmental background, instead of using language that would be more familiar to a lay audience. For example, I used “stream,” instead of “riparian corridor,” which is a less common reference. I had to concentrate on using familiar wording so my audience could follow the information being presented to them and understand the reason for its importance.

This booklet, titled, Stream Setbacks are a Stream Saving Measure, (Appendix B) can be found on the Warren County Soil and Water Conservation District website at http://www.co.warren.oh.us/warrenswcd/owners/streamside_setbacks.pdf
**Project Three: Warren Report Article written for WCSWCD**

When I had time between projects I helped others with what they were working on. For example, Dawn Stiles, the Administrative Assistant for WCSWCD, periodically created a community newsletter for the residents of Warren County. She was having trouble getting enough articles for the newsletter so I offered to write one for her. You can view the article in Appendix C. As I had participated in a Miami University Public Service Project (PSP) with Warren County, I wrote about that experience. A PSP is part of the Institute of Environmental Science program in which a team of students work as a team on an environmental issue for a client. I wrote from the perspective of how Miami University and the WCSWCD had worked together three times on PSP’s. The PSP groups performed services for WCSWCD and in turn gained valuable hands-on knowledge to assist them in their education.

The article that I wrote about Warren County’s collaboration with Miami was printed in the Summer 2010 issue of the Warren Report, titled “Warren County Teams with Miami University on Environmental Issues.” The title I chose for the article was, “Warren County Gives as it Receives”, and this is the article I have included in the appendix.

**Project Four: Environmental Education Handouts for WCSWCD**

At the time of my internship, Warren County had an Education/Marketing Specialist, Amy Pond, who went to various schools in the area to teach grades K-12 about environmental issues and help them develop a knowledge of and reverence for nature. She asked for help with handouts for a 4th grade science class, and I was able to help. I created handouts, each with a different plant to identify. Amy chose three different plants, and I provided specific information about each plant, using three written clues to help the children decide which plant was being described. A picture of each plant was on the handout with the three clues. The students were to determine what the plant was by using the three descriptive clues and the picture given. Amy chose three plants native to the area: Poison Ivy (Appendix D), Sugar Maple (Appendix E), and English Lavender (Appendix F).
Project Timeline
My stormwater pamphlet for the WCEO, the largest of my projects, required approximately 60% of my time. The WCSWCD stream setback booklet was less time consuming and required about 30% of my time, and the smaller projects filled the last 10% of my time. The pie chart below shows the percentage of time spent on all project tasks during the internship. (See Figure 2.1)

![Internship Technical Writer Tasks](image)

Figure 2.1 | Percentage of time spent on all project tasks during internship
Since I worked alone for much of the time, I didn’t have a schedule to follow my time by, so I had to develop my own structure. However, using my journal, I have been able to indicate when I worked on each project and the tasks I was completing on each project at the time. I have broken the timeline down by creating a monthly overview. Each project is broken down into researching, writing, designing, editing, and completing the project. The projects and the stage they were in at the time are shown in Figure 2.2 below.
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<td><strong>Newsletter Article</strong></td>
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*Figure 2.2 | Timeline of projects completed during internship*
Chapter 3 | Developing my Major Project: A Community-Directed Educational Pamphlet about Stormwater Drainage Maintenance

One of my major projects was a community-directed educational pamphlet titled, *Understanding Stormwater Drainage Maintenance*; this pamphlet explains the effects of stormwater in various Home Owner’s Association (HOA) communities. I have chosen to discuss this pamphlet because it was the most challenging to manage and complete. It depended upon input from people in different positions within Warren County, and it was also challenging because of technical problems, budget constraints, the number of people who had input, and the lack of cohesiveness of the information.

**Project – Understanding Stormwater Drainage Maintenance**

The Warren County Engineer’s Office (WCEO) needed a document to explain stormwater drainage maintenance to Home Owner’s Associations (HOA) and their residents in Warren County. The document I created was directed specifically toward HOA’s located in the villages of South Lebanon and Maineville, and the five townships of Turtlecreek, Franklin, Hamilton, Union, and Clearcreek. Stormwater maintenance is important because the stormwater has to be handled within individual associations. Further, the county is responsible for approving drainage systems, and changes are not to be made without notifying the WCEO. In addition, a permit has to be issued by the National Pollutant Discharge Effluent Service II (NPDES II). This permit assures that removal of the stormwater is handled according to the United States Environmental Protection Agency standards.

Getting all of the necessary information in this pamphlet was a challenge mainly because the project required constant updates and revisions and also because of the fragmented nature of the way the information was delivered to me. I applied the principles I learned in my MTSC coursework: audience considerations and information design, because the effective use of text and graphics is part of the foundation that is necessary in getting a complex message across to the audience. To complete this project, I used a systematic approach of defining audience and purpose and then moving forward in the process from this basic information.
**Defining Audience**

To design a successful pamphlet I needed to understand the needs and capabilities of the intended audience, a specific group of property owners who lived in the previously specified HOA’s in Warren County, Ohio. [This pamphlet was not intended for residents in the agricultural community or those individuals who rented their homes.] It was important that I understand the information the WCEO wanted the chosen residents of Warren County to receive, and that I write it so the targeted audience could understand it and its importance. For example, the information was technical and consisted of technical terms and scientific jargon which I tried to avoid using. Rather than *detention* and *retention*, I changed the terms referring to “held” water as *hold* and *contain*. I chose more familiar terms so audience members would be certain what they needed to do. I knew I needed to make this accommodation because I met some of the potential readers of the document. I found that residents I met in the field obviously did not understand their stormwater system and how it was intended to work. Certainly they did not know of the need to maintain the system. From their comments in response to how water flowed in their yard after a storm, it was obvious they didn’t understand how stormwater was controlled. They thought the rushing water at the end of their property was a problem, when in fact the end of their yard was a drainage ditch, part of the stormwater system design. The information in our brochure had to clarify the way in which stormwater needed to be regulated.

In technical writing, according to Reiff (2004), there are three classifications of audience, primary, secondary, and immediate, because different audiences have a different purpose for reading a document. After meeting with Neil Tunison, I determined which audience was primary, secondary, and immediate. The primary audience is the HOA because they are the most directly affected. They are “the audience who makes decisions or acts on the basis of the information presented.” The information in the pamphlet is directed to the HOAs and explains the need for the HOA to act on stormwater drainage maintenance and how to perform the tasks necessary to maintain the system. The secondary audience is the homeowners in the HOA. They are the “audience that is affected by the resulting decisions and actions.” The homeowners will be affected by the actions and decisions made by their HOA. “The immediate audience consists
of those who route the document.” The immediate audience in this situation is the WCSD and “consists of those who route the document, such as the writer’s supervisor or other middle management”, in this case the WCEO routed the document to the WCBC. I feel this last point is very important to audience consideration because it shows how determined the WCSD was in making sure the information was easy for the residents to access. After completion of the stormwater drainage maintenance pamphlet, Warren County added it to the Warren County Stormwater District website and to a booklet for residents explaining other water issues. These documents make it easy for the audience to access the information when needed and are a great reference for stormwater information. This information will always be readily available to the residents of Warren County, and the client and I believed it would be there to help the associations and the residents maintain a more environmentally sound drainage system.

**Defining and Refining Purpose**

After I determined how I needed to write for the audience, I worked on defining the purpose of the pamphlet. During the first week of my internship, I met with Neil Tunison, Warren County Engineer, Savannah Shafer, assistant to Neil, and Caitlin Botschner of the WCSWCD. This meeting with the WCEO began the discussion for developing the stormwater drainage maintenance pamphlet. The discussion focused on the purpose of this document, which was to help the audience understand the effects of stormwater and how to maintain the system that manages excessive flows.

HOAs must have a way to manage the run-off from stormwater in their associations. If the water is allowed to run unimpeded, there is a chance of flooding in local streams and beyond. See figure 3.1 below which shows how stormwater flows in natural areas and the difference in surface flow after construction. As the graphic on the right shows, surfaces such as pavement, structures, and roadways are impervious and do not allow the water to be absorbed into the ground. The graphic on the left shows the water’s flow in areas before construction, with little surface runoff. After construction, the comparison shows there is a large increase in surface runoff. (Schueler, T.R. 1987) The water must take the path of least resistance which may cause water to rise near residences, cause erosion in streams and ponds, and cause flooding due to the lack of stormwater control. Stormwater drainage that is maintained helps to prevent this damage.
The difference in flow, shown in Figure 3.1, was important information for HOA’s to understand. Each HOA has a drainage system specifically designed for its association depending on the areas needs. There are two main types of structures to hold stormwater, retention and detention. After a rain, the stormwater is directed to a drainage area and empties into an area called a retention pond. The retention pond holds the water at a constant level until it rains and stormwater increases the depth. When the water reaches a height higher than the pond was designed for, the overflow drains to an area designed for releasing the water. The detention pond collects the stormwater through a drainage system into an otherwise dry area designed to hold stormwater for a short period of time; therefore, as the water flows out, the speed of the flow is diminished and reduces the chance of too much water entering local streams, or neighborhoods and causing flooding.

The purpose of my pamphlet was to make homeowner’s aware of these systems and their function. A quote from the pamphlet states, “An effective maintenance program will extend the life of your stormwater drainage infrastructure, avert expensive repairs and prevent adverse downstream impacts.” The stormwater drainage system, I had to make clear, was the responsibility of the HOA and the residents, and it had to be maintained to protect the nearby property and the property of others down stream.
Gathering Information
I was readily able to understand the topics I researched because I had previous experience in the environmental field. I found information on various environmental websites, other community stormwater pamphlets, and books on the topic. Not only did I get the opportunity to write about the environment, but I was given the opportunity to go out into the field with technicians from WCSWCD to see what I would be working on in person. In addition to making sure content was accurate and complete, I also considered the visual needs of the document.

I took the majority of the photographs in my documents. I knew what topics I would be discussing in my communications, so I was the best person to select the subject matter of the photographs. Many of the photographs I took were sites on the Little Miami River. I had the opportunity to work on the river and see environmental problems from a fresh and relevant perspective. This perspective proved to be important and helped me feel the importance and impact of my pamphlet.

I learned that the Little Miami River is Ohio’s first State Scenic River and Ohio’s first National Scenic River. The documents I developed were closely related to programs already established to protect the river. The health, diversity, and ecological value of the Little Miami River are very important issues in Warren County and in the State of Ohio, and I felt pictures of the river would help users see what they could help to protect.

Choosing the Design
After I had considered the audience and purpose of the pamphlet, and completed my research, I began to think about how I would design the information. The MTSC program offered several classes in the use of technical tools for creating design. Warren County’s system had Microsoft Office 2007, so I used Microsoft Word exclusively for the textual parts of my document. In the MTSC program, I also learned Adobe Photoshop, InDesign, and Dreamweaver. I did not use
Dreamweaver at Warren County, but I did use Photoshop and InDesign extensively while creating my document during the internship. I worked with Savannah Shafer and Caitlin Botschner on this aspect of the project. Savannah worked on the HOA pamphlet with me, and Caitlin provided technical visuals for the document. Collaborating with these two women provided me with valuable ideas on how to add more interest and local familiarity to the pamphlet.

We decided the HOA pamphlet should be a single, two-sided sheet of paper. As the amount of information to be included in the pamphlet became clear, it was apparent we would not have enough room on an 8 ½ x 11 sheet to include all the information that the WCEO wanted. As there was so much information, we decided to use an 8 ½ x 14 legal sized paper. Relying on my design class from the MTSC program, I used InDesign to work on the layout of text and photographs and Photoshop to make the photos stand out and show what I wanted the audience to see in the pamphlet.

Robin Williams, in *The Non-Designers Design Book*, writes that “The principle of repetition states that you repeat some aspect of the design throughout the entire piece” (Williams 2004). I repeated the font for the headings and text throughout the pamphlet. Savannah suggested Cambria and Calibri for the font and 10pt and 12pt for the text size. These specifications followed the style Warren County used for other documents. We decided to use an aerial photo Caitlin had found as the cover for the pamphlet. The photo (Aerial photography 2008) shown in Figure 3.2 is an actual HOA subdivision, Village on the Green, in Warren County.
By choosing a view of a subdivision, we hoped it would help residents relate to the pamphlet and the information provided within. Further, the cover photo has many shades of green in it, and we continued these shades throughout much of the pamphlet. We decided to choose one of the greens from the photo and use it to provide consistency throughout the pamphlet. For example, we used the green color for text boxes and to provide background for photographs and information that was intended to stand out from the rest. All these features created a coherent document that emphasizes its environmental purpose by the use of text and graphics. Further, since photographs often bring things to mind that we otherwise don’t think of, we hoped that the photographs of the stormwater infrastructures with their proper names and function would catch the audience’s attention and make them recognize these same structures near their homes. The principles of information design were an important part of explaining stormwater issues to residents.

**Testing the Document through Collaboration**

I was unable to do formal usability of the document; however, I learned a lot about stormwater systems and system maintenance through collaboration with my colleagues. As I learned how to discuss stormwater and its aspects, I could put together a more coherent document that the audience could relate to, and therefore, begin to understand the importance of stormwater drainage maintenance myself. My collaboration with the WCEO and WCSWCD in creating this
document was invaluable to me. I appreciate the time my colleagues spent and their willingness to answer my questions and explain things I wasn’t sure of. At various points in the creation of this document, I asked for someone to read what I had written and let me know if I was using the correct terminology and writing clearly. I had many drafts and revisions to this pamphlet, and after getting feedback from my co-workers on my writing, I edited where necessary. Creating this document was fulfilling and it gave me a sense of achievement when I saw the finished product. Receiving a positive response on the finished document from the people at Warren County made me feel I had achieved the ability to create documents with confidence in my career.

Concluding the Project
The Understanding Stormwater Drainage Maintenance pamphlet was not approved for release at the end of my internship; the pamphlet required approval from someone at the County Commissioners Office. This individual did give approval and the pamphlet had a few technical term changes, otherwise it was basically unchanged from my original version. Since I left Warren County, the pamphlet is now being used in a folder on water issues for residents in Warren County and is posted on the Stormwater District’s website, at

http://www.wceo.us/attachments/2/HOA-Brochure.pdf
Chapter 4 | Internship Analysis

My internship with the Warren County Engineer’s Office (WCEO) was my first professional technical/scientific communication position. I was excited to be working in an environmental capacity and writing about topics of personal interest. My studies helped me in various ways, depending on the requirements of each project. What was new to me, however, was managing my project and time.

Effective project management was essential to meeting my 14-week deadline. The timeline for my work was from the beginning of my internship to the last day of my internship a total of 560 hours. However, I had very little structure and guidance in the use of my time and was dependent on other employees’ schedules to find time for discussing content or problems with the project. My time was difficult to manage because I had to drive a few miles between offices when I needed to work with others on the HOA project. I could still work on the HOA project at my WCSWCD office, and this allowed time to manage the project when I didn’t have to travel or meet with someone.

In this final chapter, I will provide an analysis of my internship using project management as a guide and discuss the collaboration and obstacles I faced in creating and completing my projects. I will discuss my personal expectations of the internship and reflect on my professional development.

Project Management

The principles of project management usually relate to the management of projects and people. The nature of my internship made effective project management necessary but difficult. The project was created for a county agency, not for a private business. Therefore, everything was on a smaller scale of communication, needs, and process. When I realized I’d need to develop my own goals and deadlines, I decided to use Robert Wysocki’s, “What is Traditional Project Management?”, Effective Project Management (2003) to look for tasks that I could use to determine my process. The following section explains how I used these management principles to develop my communication.
**Defining the Work**
Defining the work to be done is one of the first tasks in effective project management, and the problem or opportunity to be addressed must be examined. My documents were created for the HOA and the residents of these associations in Warren County to explain stormwater issues and how these issues affected them. I first defined the project’s goal which was to explain how stormwater maintenance and management systems work and the impact they have on residential and environmental areas.

**Setting the Objectives**
A writer must also set objectives in order to manage a project successfully, for the objectives of the project must be met to accomplish the project’s goal. I set three objectives at the outset: The audience had (1) to understand the need and the importance of stormwater maintenance, (2) to be willing to approach the issue with a hands-on attitude and know that it was not something that could be ignored because it affected all residents and (3) to be made aware of the potential for issues in the functioning of the systems and confront them in order for effective and sustainable management to work. All residents affected by stormwater had to see themselves as part of the problem and part of the solution.

**Planning the Schedule**
In addition to defining the work and setting objectives, I had to set a schedule for myself, even though I knew I’d have to work around others’ schedules. Thinking about how to schedule my time also made me think about and address obstacles that I might face. The planning phase of a project has at least three aspects – besides setting a schedule. The first aspect is knowing what is expected. Meeting with Neil Tunison and learning what his goals were for the pamphlet helped reduce planning problems. *Meeting with the individuals involved in the project* at the WCEO was extremely important too. Communicating ideas and asking questions regarding the project, as well as topics or points that were to be included in the pamphlet, were mandatory. Once I understood what was to be discussed in the pamphlet and its purpose, I could begin putting it all together. I had to find a way to take Neil’s intended ideas and make them work with the project. When I began researching stormwater websites for information, reading stormwater documents
from other municipalities that had addressed a similar issue, I could then begin the layout of topics and how to approach them.

The second aspect of planning a schedule was making sure I had the physical resources to complete the project. Fortunately, I was provided with materials such as paper, camera and copier, as well as access to the county’s computer system. These resources, plus access to my co-workers, were critical.

The third aspect of planning my schedule was to know what would constitute completion. For the purpose of my internship, delivering the project didn’t come to fruition for me. The pamphlet wasn’t released to the public until after my internship ended because there were more people with input that wanted their ideas addressed and the commissioner who was responsible for approving the document was on vacation when my internship was completed. Therefore, I couldn’t set a final date for delivery on my project schedule. All I could do was set a date for completing my portion of the work.

**Controlling the Project**

I didn’t have control of the beginning and ending dates of the schedule. However, closing the project was a sign the pamphlet had been finalized. As I stated earlier, the pamphlet was not completed by the end of my internship because of circumstances beyond my control. However, the feedback I got from Neil was positive, and he was very pleased with the “finished” project. I think this pamphlet not only provided information for the HOA’s and the residents, but also the departments that were involved during the development of the pamphlet. I don’t believe they were aware of all the stormwater issues that faced all parties involved.

**Overcoming Obstacles**

Most projects incur some kind of obstacle that may challenge the writer to adjust the normal flow of work. One obstacle I faced was the need to bring my personal laptop computer. Because I needed to bring it to work most days since it had the software needed to create the documents and having two computers was confusing at times and did require more work space. I had a county computer at my desk, which I used to communicate with other employees when
necessary; however, it didn’t have the software I needed to create documents. Further, the office didn’t have a wireless connection I could use with my laptop, so I needed to have two computers to do my work. In addition to having to switch back and forth between computers, my laptop was the only computer with the InDesign and Photoshop software I needed. When it was necessary for me to print or e-mail a document I had (1) to create a PDF copy on my laptop, (2) copy the PDF from my laptop to a flash drive, (3) remove flash drive from laptop and connect to county computer, (4) access the PDF from the flash drive and (5) copy the PDF to the county computer at which point I could e-mail or make copies of the document as needed.

This work situation was challenging and at times stressful since I knew I had to build in extra time for these complications. However, I was able to overcome difficult issues by using skills I learned from my MTSC classes. Overcoming obstacles is one of the five constraints that operate on every project. Resources help to overcome obstacles. “Resources are assets, such as people, equipment, physical facilities, or inventory that have limited availabilities, can be scheduled, or can be leased from an outside party” (Wysocki 2003). The resources that I used in the creation of my projects were the physical facilities the county did offer; my willingness to bring my own equipment, such as the laptop and software; my ability and knowledge of writing, design, and environmental science, and the personnel who were so generous with their time and help. Because I had the assets to develop the documents they needed, we were able to collaborate and get the things we both needed to complete the project.

Concluding this Report
In concluding this report, I’d like to express my thoughts and feelings about my internship. The opportunity to write about environmental issues and spending time outdoors was a window to the type of career I might be interested in. I do feel my internship was limiting in many ways; working with a limited number of people on the documents did not give me the opportunity to feel I was really part of a team. I also feel I was limited in utilizing many of the skills I learned in the MTSC program due to having only two major projects to work on. Having to work with the WCEO across town limited my contact with Neil Tunison, the person I needed to meet with to discuss the document and whose ideas were the basis for the HOA pamphlet. However, overall
this internship was positive; my environmental background provided a good match for writing scientific documentation and I was able to prepare four separate environmental documents of different styles. The education I received from the MTSC program provided me with the skills to create useful and informative documents. As a result of my internship I also learned how my skills will be useful to others in need of environmental information and documentation.
REFERENCE LIST

Cousteau, Jacques. “We forget that the water cycle and the life cycle are one.”
http://www.goodquotes.com/quote/jacques-yves-cousteau/we-forget-that-the-water-cycle-and-the


This information is being provided to help you understand your stormwater system and the steps necessary to keep it operating. More resources can be found on the following department websites. Any questions on the material found in this brochure can be directed to the Warren County Stormwater District.

Chuck Petty, Assistant Warren County Engineer
Phone: (513) 695-3309
E-mail: pettce@co_warren.oh.us
http://www.WCEO.us/stormwater-district.html

WCEO
105 Markey Road
Lebanon, Ohio 45036
Phone: (513) 695-3301
Fax: (513) 695-3323
http://www.WCEO.us/

WCSWCD
320 East Silver Street, Suite 300
Lebanon, OH 45036
Phone: (513) 695-1337
Fax: (513) 695-2923
http://www.warrenswcd.com/

The Warren County Stormwater District provides stormwater management services aimed at reducing the effects of flooding, erosion and sedimentation as well as helping protect the quality of water in local streams, lakes, and rivers.

The mission of the County Engineer is to design, build, and maintain the finest and safest possible county road system for the citizens and traveling public of Warren County.

The Warren County Soil and Water Conservation District's mission is to promote wise stewardship of our natural resources through cooperative partnerships, educational programs, and technical assistance in land and water management.
Introduction
Our goal is to help property owners and Home Owner’s Associations (HOA) understand their stormwater system so they can maintain it to prolong its life and to comply with applicable regulations. The purpose of a stormwater system is to contain, hold, and release stormwater in such a way that the impact downstream is reduced. Homeowner’s actions regarding their property and surrounding land can affect the proper functioning of the stormwater system.

Purpose
Soil and water are meant to go hand-in-hand because soil has the natural ability of absorbing rainwater (percolation) and slowly releasing it into local rivers and streams. Natural drainage prevents heavy runoff and flooding. As development begins this naturally occurring method of handling rainwater is impeded.

Warren County’s residential population is approximately 210,855 with a 26% growth since 2000. Growth is important for any region, but with growth comes construction of homes, businesses, schools, roadways, parking lots, etc. This increase in pavement and structures (impervious surface) reduces percolation. As a result, large quantities of stormwater move at a faster rate to rivers and streams, which causes additional runoff and flooding. This is when the management of stormwater becomes a necessity.

Management
Warren County has adopted rules and regulations regarding stormwater management systems. The Warren County Rules and Regulations for the Design of Storm Sewer and Stormwater Management Systems can be found on the Warren County Engineer’s Office (WCEO) website. The county approves plans for drainage systems and changes should not be made to the stormwater system or to open drainage without notifying the WCEO.

It has been recommended that stormwater systems in Warren County be operated by each respective HOA. Because rainwater flows from the lawns, driveways, and roofs of each home, then into the stormwater system, everyone has a part in being responsible for the system. The HOA should manage the stormwater system by ensuring funding, inspecting and maintaining the system, and handling complaints and questions.

Maintenance Funding
A difficult yet important part of stormwater management is establishing stormwater service fees. The fee structure and rate can be determined by the HOA. There are various ways to calculate rate structures for stormwater maintenance. Rates can be based on impervious area, gross area, percent impervious surface, and land use. Costs might be divided among those who are served in various ways by expenditures for maintenance and operations, capital improvements, and support activities.

It is important to address funding now to prevent losses due to the lack of funds, and to repair and maintain the system as needed now and in the future. Questions on how to set up your maintenance funding program should be directed to the Warren County Stormwater District.
Maintenance

Stormwater systems require regular maintenance in order to function properly and to serve the purpose for which they were designed. Creating a stormwater maintenance plan will help you keep your system operating and extend its life. The county inspects stormwater basins every other year for functionality and makes necessary recommendations.

It is up to the HOA or property owner to perform the required maintenance. A basic approach to maintenance is to regularly check for and repair the following potential problems:

- **Structural** - settling, cracking, misalignment
- **Erosion** - around pipes, gullies, animal burrows
- **Trash & debris** - brush, grass clippings, litter
- **Vegetation** - cattails, trees on the dam and around structures

By taking care of these problems as they happen, you can prevent larger and more costly maintenance problems. For maintenance questions or for a more detailed description of what to inspect, you can contact the Warren County Soil and Water Conservation District (WCSWCD).

Drainage easements exist on private property to provide access for maintenance of the stormwater system. Maintenance of private stormwater infrastructure within these easements is the responsibility of the property owner or the HOA. They are not dedicated to the county.

An effective maintenance program will extend the life of your stormwater drainage infrastructure, avert expensive repairs and prevent adverse downstream impacts.

Stormwater Systems

Each development has its own unique stormwater plan designed by engineers before any construction begins on the land. The plan is a system created for drainage that involves each individual building plot, street, parking lot, etc.

Properly installed stormwater systems are designed to handle statistically predictable rainfall events. The system should also handle an unusually heavy period of rain although you may see more water above ground, within flood routes, and in your detention basins than you are accustomed.

Some of the most common ways to catch and hold stormwater are by retention basins, detention basins, and drainage wells (dry wells). The purpose of each of these structures is to capture excess stormwater runoff from either the soil/grass or through a system of drainage pipes and catch basins within the development. This design allows stormwater to be contained and slowed down until it can be slowly released into a near-by stream or absorbed into the soil.
Types of Stormwater Structures

Drainage pipe – underground pipe drains stormwater runoff away from homes, roads and grassy areas.

Retention/detention basin – collects and holds excess runoff until water has time to release slowly by pipe into a local stream or absorb into the soil.

Catch basin - catches runoff from sidewalks, streets, parking lots, and drainage pipes. The catch basin collects and directs the stormwater through underground pipes before it goes into the retention/detention basin.

Retention Basin

Detention Basin

Flood routes - carries stormwater flows that exceed the capacity of the piped system. A typical flood route is a swale or ditch between two houses within an easement.

The above stormwater structures are some of the more common variations that you may find in your neighborhood. For more specific information on types of stormwater structures, you can contact the Warren County Soil and Water Conservation District (WCSWCD).
Appendix B | Stream Setbacks are a Stream Saving Measure
Stream Setbacks Are A Stream Saving Measure
The Reason for Stream Setbacks

A stream setback is the measured distance from the streambank to an area that is safe for human activity without disturbing the stream. The distance is calculated from the size of the watershed that drains into the stream. Keeping human activity outside of the setback area will help prevent the streambank from eroding as will having a buffer of trees and plants. Vegetation is effective in reducing the amount of exposed soil that can be scoured from the banks and washed away.

Streams are naturally changing systems that respond to disturbances caused by human activities. When left undisturbed, a stream will change its channel, floodplain, etc. without affecting the health of the stream or involvement, will force the stream to find its balance by putting stress on the natural flow. This stress results in ruining the streams structure beginning at the point of disruption and continuing down the stream channel. The effect on one part of a stream is carried along to areas down stream, creating a cascade of drainage and flow problems.

An undisturbed, vegetated stream corridor can reduce the force, height, and volume of floodwaters by allowing them to spread out horizontally and relatively harmlessly across the floodplain. Water that floods vegetated floodplains is absorbed by floodplain wetlands and streamside vegetation, allowing the water to flow back into the main channel slowly. This slower flow can lower flood depth.

ALL THE WATER THAT WILL EVER BE IS, RIGHT NOW
~ NATIONAL GEOGRAPHIC, OCTOBER 1993

Streams down the channel.
Streams are able to maintain and reach a natural balance, but changes to a stream's natural system, due to construction or any other disruption from human reduce the swiftness of the moving water, refresh local groundwater aquifers, and provide temporary water storage.
Benefits of Stream Setbacks

A stream setback can benefit the stream and surrounding land in many ways. Every piece of property is unique and may require special attention to create an effective riparian buffer zone. Property owners that want to protect and preserve their streams will find a riparian zone of native vegetation is the most reliable way to achieve their goal. The benefits of riparian plants are:

- Roots prevent erosion and undercutting of stream banks.
- Branches, stems, and leaves absorb the impact of raindrops.
- Ground cover (decaying leaves and low-growing vegetation) slows runoff by helping to increase water absorption.

Healthy Streambank
1. Overhanging branches provide nesting places and shade to keep the stream cool for aquatic life during the summer.
2. Tree roots filter pollutants before water enters the stream and provide streambank stability.
3. Building away from the stream allows floodplain to function effectively.
Stream setbacks can:

- Increase property value
- Reduce property loss from excessive erosion
- Protect water quality
- Enhance wildlife habitat
- Contribute to the natural beauty of the land
- Reduce maintenance time and related costs

These benefits are not only related to property value, but also to the value added by creating wildlife habitat that will provide food, shelter, clean water, and nesting sites for a variety of insects, amphibians, reptiles, songbirds, mammals and fish.

**Unhealthy Streambank**

4. Solid surfaces like driveways and roofs create runoff that can cause erosion.

5. Building too close to the floodplain can result in property loss.


7. Lawns along water’s edge lack deep roots, lead to erosion.

Source: Catskillstreams.org
The Little Miami River watershed is situated within the Ohio River watershed and is located in parts of 12 Ohio counties. Although, the Little Miami National Scenic River flows through only 5 of those counties. The area affected by this river gives you some idea of how important it is to protect all the tributaries in this watershed as well as the main river.

A WATERSHED IS THE LAND AREA THAT DRAINS TO A COMMON BODY OF WATER, SUCH AS A STREAM, LAKE, ESTUARY, WETLAND OR EVEN THE OCEAN.

~ CENTER FOR WATERSHED PROTECTION
Streams, a Natural Resource

Streams are such a natural part of our landscape we tend to take them for granted. A healthy stream is pleasing to look at with its clear, cool water flowing through the lush green plants, protected and shaded by tall trees along the bank. The things that make a stream enjoyable to be around are the things that make it healthy. A stream and all the vegetation on its banks is known as a riparian zone. Ideally, this zone continues along the length of the stream and is called the stream corridor. If the land area surrounding the stream is covered with trees and plants it is called the buffer and provides streambank stability. These stream features lie within a flood plain, the widest area beside the stream that carries and holds water during flooding.

Land owners that have a stream on their property, either in a town or a rural area, can protect their stream and the streams down the channel from them by following stream setback guidelines and management practices.

In order to maintain a healthy stream, stream setbacks can protect the area on both sides of the stream by preventing soil erosion and controlling flooding due to development or heavy rainfall. Disturbing a stream's ability to flow naturally can be responsible for losing the things that make a stream so special in the first place.

The Little Miami State and National Scenic River is located in Warren County. It is the primary waterway in the County with a watershed that covers two thirds of the area. This booklet explains how stream setbacks work and why creating or maintaining a riparian zone along your stream can enhance the value of your property and allow the stream to function naturally.

The single best management plan for a healthy stream is to avoid building too close to the stream and to keep a buffer of a set width on either side of the stream. Then let nature do the rest.

WE FORGET THAT THE WATER CYCLE AND THE LIFE CYCLE ARE ONE.
~ JACQUES COUSTEAU
Stream Setback Distances

Recommended Stream Setback Distance based on contributing watershed size:

<table>
<thead>
<tr>
<th>Setback</th>
<th>Contributing Watershed Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 feet</td>
<td>Up to 320 acres</td>
</tr>
<tr>
<td>75 feet</td>
<td>320 acres to 3200 acres (5 square miles)</td>
</tr>
<tr>
<td>100 feet</td>
<td>5 square miles to 20 square miles</td>
</tr>
<tr>
<td>300 feet</td>
<td>20 square miles and up</td>
</tr>
</tbody>
</table>

*The setback distance is on each side of the streambank. Your ideal setback distance can be determined by contacting the Warren County Soil and Water Conservation District.*

Natural Stream Balance

Our natural resources are an important part of our lives. Streams are one of the resources that are vital to the health of our environment and natural habitat. By taking responsibility for our actions and being conscious of our actions and the way they impact the natural environment, we can help to preserve our natural resources. Water is vital to the survival of every living thing and clean water is extremely important. How our streams are treated and cared for will impact life along the stream and in the stream. **Remember, by practicing recommended building setbacks from streams, you allow natural and effective management to occur with little to no maintenance required.**

All the water we will ever have on Earth is here now. We can not make new water, so we must protect the streams and all bodies of water to ensure we keep what we have in a useable state for the future.
Mission Statement

The Warren County SWCD mission is to promote wise stewardship of our natural resources through cooperative partnerships, educational programs and technical assistance in land and water management.

August 2010
Warren County Gives as it Receives

Unknown to many, three times over the last decade, Warren County has been an environmental classroom for several Miami University graduate students. Miami University's Institute of Environmental Sciences required students to participate in a Public Service Project (PSP) as part of the curriculum. Thanks to the Warren County Soil & Water Conservation District and the City of Mason, these students were given the opportunity to work on environmental projects with environmental professionals. I know from personal experience, because I was one of those students.

As a graduate student studying Environmental Science at Miami University I studied the environment in the classroom and from hands on experience. My undergraduate studies in Geography and Environmental Science had prepared me for the graduate level courses required and gave me a base of knowledge from which to draw while working on my expanded environmental studies.

In 2004, I was assigned my PSP along with 4 other members of my class. We were the first PSP team to do a project for the Warren County Soil & Water Conservation District (WCSWCD) and the City of Mason. Our project was to collect baseline data that would be used to track the progress of the district's Best Management Practices (BMP's) over time. The BMP's were put in place for the NPDES Phase II permit requirements. Twenty-seven stream sites in eleven watersheds were surveyed using Rosgen's method of stream classification and the Qualitative Habitat Evaluation Index (QHEI) to collect the necessary data.

Since that time, WCSWCD and the City of Mason have given two more PSP teams from Miami University the opportunity to get hands on experience working with environmental issues. In 2006, Miami's PSP team was to assess the water quality in 3 residential retention ponds in 2 watersheds in the City of Mason. A plan was developed to educate homeowners on how their activities impact the water quality in residential retention ponds. Analysis of water contaminants and educational materials were created to help Warren County stay in compliance with NPDES Phase II requirements.

In 2008, another Miami University PSP team worked with WCSWCD and the City of Mason. The NPDES Phase II requirement has six minimum control measures, with #6 being Pollution Prevention/Good Housekeeping. The project was designed and implemented to satisfy the requirement of measure #6 for the county's NPDES Phase II permit, and the goal was the education of public employees in these measures. In addition, the team created a training manual, posters, and handouts applicable to specific departments in Warren County.
1. I am a deciduous woody perennial native to North America. I grow low to the ground, upright and bushy, or as a spreading vine.

2. I spread easily because I can adapt to many habitats, such as woodlands, wetlands, and disturbed areas.

3. I am able to move easily to other areas because birds and other animals eat my seeds and spread them.

4. Some people when they touch me they breakout with itchy bumps. There is a saying about me.
   ‘Leaflets three, let it be ~ berries white, poisonous site.’
1. I am a native of Ohio and my hard, dense, fine grained wood is used for floors, furniture, and musical instruments.

2. My seeds have wings and twirl as they fall from my branches.

3. I am a favorite for giving shade and providing beautiful fall color.

4. Native Americans invented collecting my sap and making sugar and syrup.
1. I am a flower, native to Europe and I grow in mountainous zones of the Mediterranean. I can be found in Southern Europe, Australia, and the United States. I prefer full sun and good drainage.

2. I am an annual, and best known for the fragrance that comes from the oil in my purple flowers.

3. The strong smell of my flowers attracts bees and butterflies, but also repels slugs, flies, and millipedes.

4. I am bushy and my leaves are gray-green in color. I am commonly found in flower gardens and my fragrance is used in soaps.