



Stepping Toward Better Watershed Management in Nebraska

**A Community Based Approach
to the
Watershed Management Planning Process**

STEPPING TOWARD BETTER WATERSHED MANAGEMENT IN NEBRASKA

A COMMUNITY BASED APPROACH to the WATERSHED MANAGEMENT PLANNING PROCESS

Adapted from USDA area-wide planning process

April 2003

Contributors

| | |
|----------------|------------------|
| Paul Sweeney | <i>NRCS/NDEQ</i> |
| Paul Brakhage | <i>NDEQ</i> |
| Elbert Traylor | <i>NDEQ</i> |
| John Holz | <i>UNL</i> |
| Kyle Hoagland | <i>UNL</i> |

Written by

Audrey Heisey *UNL/NDEQ*

Edited by

Leah Bomberger *UNL/NDEQ*

**Sponsored By The Nebraska Department of Environmental Quality
Water Quality Planning Unit**

For additional copies contact NDEQ's
Water Quality Planning Unit

**Nebraska Department of Environmental Quality
1200 N. 12th Street-STE 400
Lincoln, Nebraska 68509-8922**

Table of Contents

Section 1

| | |
|--|---|
| Introduction..... | 1 |
| How to use this book | 3 |
| Timeline | 4 |
| Lake properties and watershed systems..... | 5 |
| Definitions..... | 8 |

Section 2

| | |
|--|----|
| The twelve pre-planning activities..... | 9 |
| • Identify a project sponsor | 10 |
| • Sponsor endorsement of watershed planning process | 11 |
| • Obtain a written commitment from the sponsor | 12 |
| • Establish a project manager or coordinator | 14 |
| • Establish a definition and role for each group and agency | 16 |
| • Define the planning area | 17 |
| • Establish a technical advisory team | 19 |
| • Select an educator for the project and develop a public education action plan | 20 |
| • Gather existing data and maps of the area | 21 |
| • Brainstorm a list of necessary information and data needed for the project..... | 22 |
| • Identify types of stakeholders in the planning area | 23 |
| • Identify a list of stakeholders to be invited to the first public meeting..... | 24 |

Section 3

| | |
|---|----|
| Develop a watershed plan using the community based approach | 25 |
| Putting on a public meeting | 27 |

| | |
|--|----|
| Public meeting #1 | 30 |
| Example group activity - Getting to know you | 33 |
| Example - Agenda for first public meeting | 36 |
| Example - Concerns and opportunities lists | 37 |
| Public meeting #2 | 41 |
| Example - Agenda for second public meeting..... | 44 |
| Example - Vision statement..... | 45 |
| Taking a resource inventory | 46 |
| Where to look for information on your watershed | 48 |
| Example - Resource inventory worksheet..... | 51 |
| Resource analysis..... | 53 |
| Formulate alternatives..... | 54 |
| Public meeting #3 | 55 |
| Project sponsor choice of alternatives included in watershed plan | 57 |
| Draft a watershed management plan..... | 58 |
| Example - Management plan “Walnut Creek Watershed” using community based approach | 62 |
| Public meeting #4 | 68 |
| Final management plan with changes accepted..... | 70 |

Appendices

| | |
|--|----|
| Appendix A. Best management practices (BMPs) to address identified nonpoint source water quality concerns | 74 |
| Appendix B. Key to abbreviations..... | 85 |
| References..... | 86 |

Introduction

What is this Guidebook?

This guidebook demonstrates the Community Based Approach to the Watershed Management Planning process.

It guides the local stake holders through the step-by-step planning process from the point of organizing themselves through the implementation of their plan.

Who should use this Guidebook?

Community groups designing to improve water quality in their watershed.

Leaders of stakeholder groups to guide them through the planning process.

How will this Guide be Helpful?

It gives a clear idea of how to organize and pursue watershed management initiatives.

It provides step by step advice on producing an organized watershed plan with community involvement.

It offers technical information and hints throughout plan development and implementation of management practices.

It provides **Examples** and **What to Do?** steps for each planning activity.

Why was this Guide Developed?

To provide a resource for developing a sound Watershed Management Plan (WMP).

To encourage the development of Watershed Management Plans (WMPs) for watersheds of planned recreational reservoirs and watersheds with water quality problems.

To provide direction to entities responsible for identifying and addressing water quality problems.

****Note-Do not worry about the funding for the project. When the group has a sponsor discuss funding options. Good watershed management plans have excellent chances to receive funding. Focus on developing a plan your community will support. Funding options are available and distributed to good management plans.***

Purpose: This guidebook was produced in response to the community's need for technical facts and usable direction on developing and implementing watershed management plans. The Community Based Approach to the Watershed Management Planning Process is a process whereby local people lead the watershed planning based on locally identified needs. Local people determine the resource issues (i.e., opportunities and problems), define the geographic area that affects these issues (e.g., a watershed), and then carry out a planning process that will help achieve the desired resource conditions. Agencies, programs, and others provide the technical and financial resources to help solve those needs and implement solutions. The Community Based Approach to Watershed Management Planning guidebook follows the fourteen steps. It incorporates practical examples from community based plans already successful in Nebraska communities. It will walk you through what to do and how to proceed through the steps to a successful plan.

The Community Based Approach to the Watershed Management Planning Process

Is a comprehensive problem solving process that integrates social, economic, and ecological concerns over a defined geographical area (e.g., a state, region, basin, district, county, or watershed). This process strives to sustain and improve environmental health through a natural resource management approach that integrates locally driven initiatives.

This Process Has Many Benefits:

- Helps educate people about the issues impacting their quality of life, the health of their land, and encourages them to participate.
- Coordinates community actions toward a common vision allowing communities to coordinate their activities and work toward common goals.
- Ensures that local concerns are fully integrated by putting the planning process in the hands of the local people.
- Involves a diversity of interests, agencies, and individuals and supports participation and acceptance. Diverse involvement results in actions that everyone can support.
- Targeting resources focuses labor and funding on the important issues identified by the community.
- Forms partnerships to improve working relationships and communication, improves information sharing, minimizes conflict, and promotes cooperation.
- Leverages resources by combining the talents, expertise, funding, and time of many individuals, organizations, and agencies and provides a workforce better able to achieve large-scale goals.
- Increases efficiency by reducing duplication of effort and by providing information for others to utilize and build upon.

How To Use This Guidebook

Choose one person within your community group to keep and maintain the guidebook. This person should be either the sponsor or manager, someone who will be around during all phases of watershed planning.

The person chosen should obtain a three-ring binder with folder sleeves to store your manual and other materials gathered during planning (e.g., public meeting agendas and minutes, press releases or articles, anything pertaining to the watershed plan).

All of the steps of the plan are given in chronological order and divided into sections beginning with the pre-planning activities and ending with the final draft. There are also sections provided for information and outreach.

Each section explains the procedure pertaining to that section and provides examples.

Each section should utilize a folder for storing collected information.

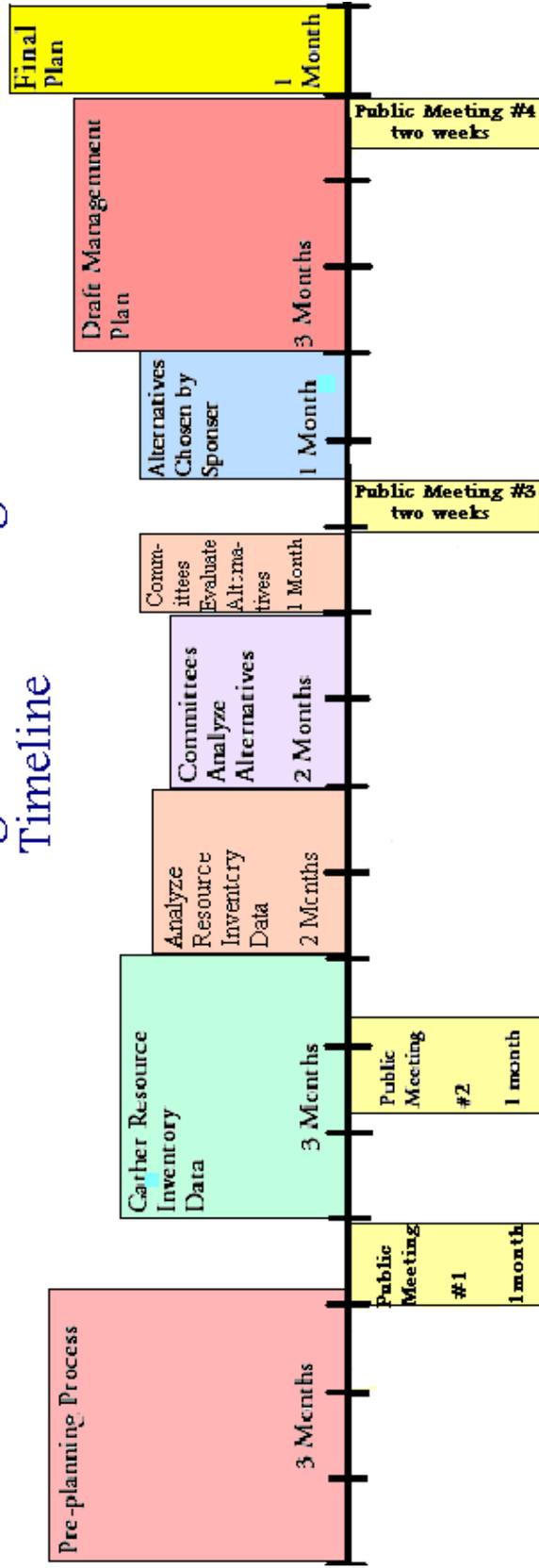
This guidebook explains practical procedures and tasks based on experience derived from working with communities on watershed management plans.

This guidebook has pages to be removed so example materials can be easily duplicated during your planning process.

It also should have removable pages so that selected pages can be removed and added to the **final draft** of the watershed management plan.

This manual will assist local watershed councils in conducting successful and organized community-based watershed planning. This manual provides procedures and highlights issues that will help planning committees maintain a community atmosphere while addressing stakeholder concerns and environmental issues in the watershed. Communities that are interested in maintaining, revitalizing, or adding to their watershed will benefit from the information given in this manual. The manual aims to clearly explain the twelve actions necessary to pre-plan and the fourteen steps for developing a Watershed Management Plan. The planning process takes about 18 months. The next page offers a timeline of the entire process and visually segments the time each area of the plan usually requires. Please refer to the timeline periodically to help stay on schedule.

Community Based Approach to the Watershed Management Planning Process Timeline



* timeline spans 18 months

* each increment \approx 1 month

Lake Properties and Watershed Systems Information

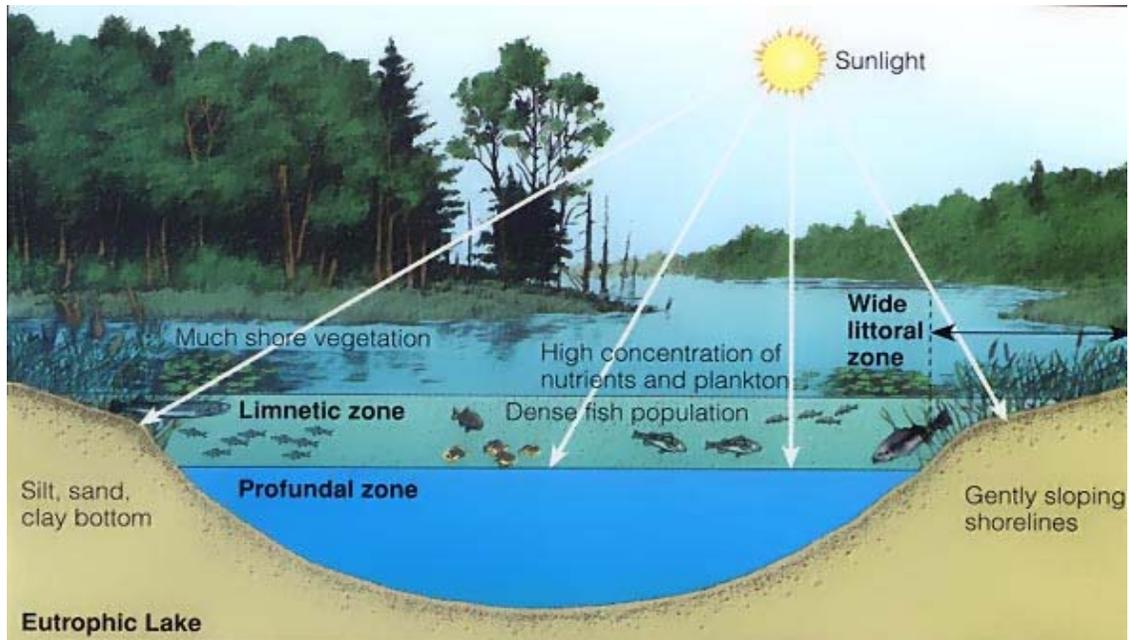
This manual is helpful to groups with both first time or advanced watershed restoration and maintenance experience. This section on the lake system and the properties of watersheds provides background information to first time watershed planning groups and refreshes information for advanced planning groups. This section provides some preliminary knowledge about the natural processes characteristic of a watershed and its components to make the planning process a little clearer.

Watershed - A region or area bounded peripherally by a divide and draining ultimately to a particular watercourse or body of water (Webster's Collegiate Dictionary, tenth edition).

The US EPA (Environmental Protection Agency) and USGS (United States Geological Survey) help define and map the regional basins of the United States, which catch and direct precipitation to a lake, marsh, stream, river, or groundwater, and eventually to the ocean. USGS has delineated the system of water routes into sections based on surface hydrologic features. The system for directing water is referred to as a watershed and is given an eight to fourteen digit number called a Hydrologic Unit Code (HUC). The first two digits refer to the region of the watershed and the last six to twelve digits refer to the three successively smaller units of the watershed. This system attempts to unify the language used when referring to United States natural drainage systems. The unified language helps create improved workability and understanding for parties involved with planning watersheds.

There are certainly many other definitions for the term "watershed", but simply, it is a natural feature, large or small, that catches (e.g., lake, ocean, or pond) and directs water (e.g., stream, river, or creek). It is also commonly referred to as a drainage basin. When people understand the interconnection of the elements in a watershed, they are able to address watershed issues more effectively. In contrast, instances in which watershed issues are addressed individually, the result often does not endure. For example, a lake may be dredged to remove sediment and increase depth. However, dredging does not prevent erosion upstream in the watershed so sediment still travels down and quickly refills the lake. A more effective approach is to recognize the interconnectedness of all elements in the watershed system and to address them in a coordinated manner. For maximum effectiveness and cost-efficiency, it is imperative that watershed planning address the cause (e.g., erosion) of the identified problems in the watershed (e.g., lake is too shallow), rather than develop short-term solutions that do not address the cause (e.g., dredging the lake). The first two diagrams exhibit the details of a eutrophic lake, the type most common in the midwest. The third is a diagram of a watershed, accentuating how the lake in the center is a catchment for upland activities.

A eutrophic lake is commonly known to have a muddy, shallow bottom. They are typically older and more advanced geologically compared to other lake classifications. These lakes are also higher in nutrient content compared to other types of lakes.



Living in the Environment-Tenth Edition, by G. Tyler Miller, Jr. (page 198)

A temperate zone lake with identification of species common to specific domains.

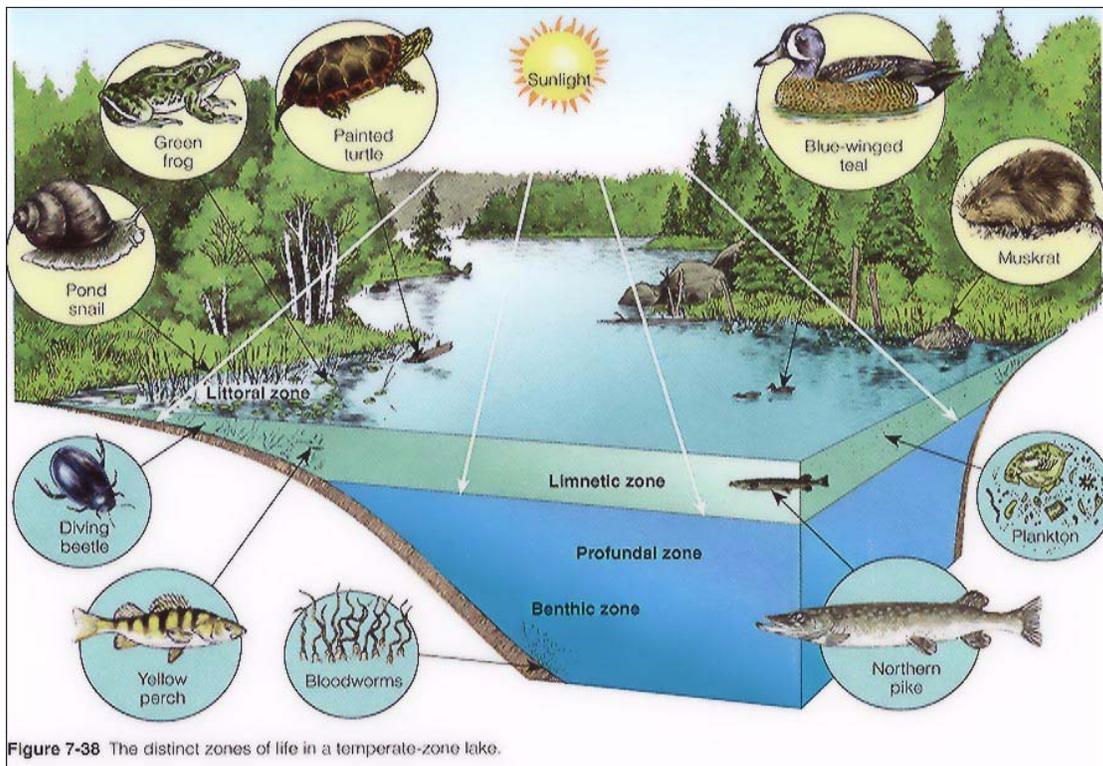
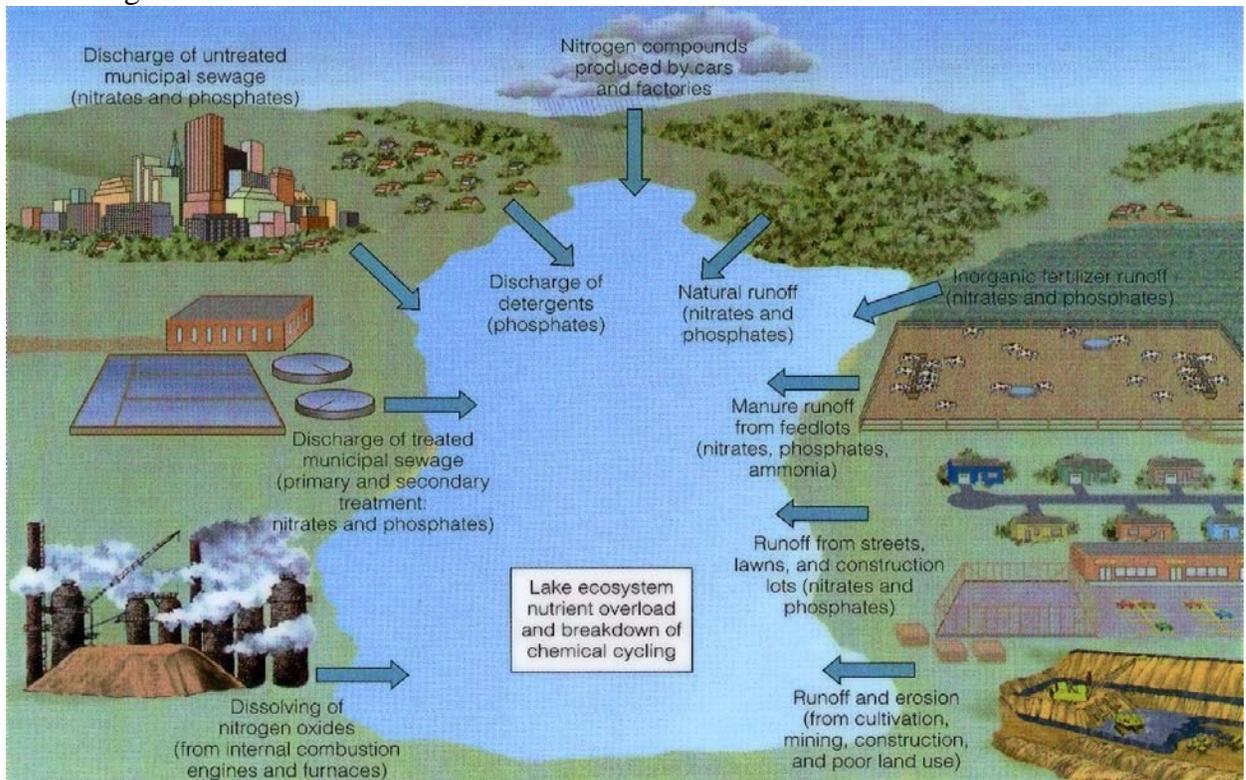


Figure 7-38 The distinct zones of life in a temperate-zone lake.

Living in the Environment-Tenth Edition, by G. Tyler Miller, Jr. (page 198)

An aerial view of common routes for pollutants and other discharge from daily activities in a watershed. Pollutants and discharge navigate a watershed through streams, and rivers to enter a catchment (e.g., a lake or pond) at a low point and may eventually enter the ground water.



Living in the Environment-Tenth Edition, by G. Tyler Miller, Jr. (page 521)

Most changes affecting a lake or pond, like the one pictured above, are a result of activities from upland sources. Excessive nutrients entering the catchment stem from human activities can lead to increased algae and aquatic plant growth and lower dissolved oxygen content. Excessive nutrients and lower dissolved oxygen content can lead to reduced fish populations as well as reduced aesthetic and recreational significance within the lake. These and other factors that affect water quality within the watershed are one of the motives behind this manual. The next section defines the most common terms you will be using throughout this process.

Definitions

◇**Sponsor**-A person, agency, or group of people who have a direct interest in the project. They will implement the plan after final draft approval, manage and allocate funds to the appropriate tasks outlined in the management plan, and monitor progress and success of the emerging plan and final plan.

◇**Educator**- An educator should be able to develop comprehensive information and have the ability to relay that information in a creative and interesting manner. The focus of this position is to build awareness of the planning committee's activities and of the watershed's components.

◇**Stakeholders** Those who have an interest in and may be affected by actions recommended in the resource management plan.

◇**Facilitator**-A person who uses some level of intuitive or explicit knowledge of group process to formulate and deliver some form of process interventions, at a basic or complex level **to help a group achieve what they want to do**. To help increase the ease and motivation of the group's performance in the Community Based Watershed Planning process.

◇**Council**- Made up of 6-15 individuals who have a stake in the planning process and who are the primary decision makers during the planning process. They work with technical advisors and interact with the public to develop a resource plan that can be supported and implemented in the planning area. Identify stakeholders who are interested in developing a management plan as members for the council. There are clear characteristics that are helpful in identifying council members. For example, they are able to represent the group as well as their individual interests; they can serve as decision makers in the planning area; they represent all of the social, economic, cultural aspects, and they represent all of the views, opinions, and interests in the planning area.

◇**Technical Advisory Team**-This is a group of individuals with specialty knowledge in different aspects of the plan (e.g. a limnology specialist when the water quality plan is focusing on lake restoration).

◇**Technical Advisory Team Liaison**- A person that is on the Technical Advisory Team. The Planning Committee will contact this person throughout the planning process. The liaison is available between the Planning Committee meeting times and is responsible for reviewing concerns, progress, and future commitments of the committee to the other team members. They help facilitate the local planning process and emphasize the benefits of working together to accomplish the community goals for the project. The next section discusses the tools necessary to begin a watershed planning initiative.

What is Necessary to Begin?

There are **twelve pre-planning activities** suggested for a successful management initiative. Pre-planning is the basis for the rest of the project and, if executed carefully, will benefit the rest of the planning process. All twelve activities should be finished in about three months. Pre-planning activities do not have to be carried out in any particular order. If difficulty is encountered on one step just move on to one of the actions that can be accomplished and come back to the other when possible. A short list provided in the following pages and a brief description of each necessary step is given.

COMMUNITY BASED APPROACH to the WATERSHED PLANNING PROCESS **12 Pre-Planning Activities Checklist:**

(Not Necessarily in Order)

- A Project Sponsor is identified.
- The Community Based Approach to the Water Quality Planning Process and its benefits are understood and endorsed by the sponsor.
- A written commitment is obtained from the sponsor to initiate the planning process.
- A Project Manager/Coordinator is appointed and duties defined.
- The role of each group and agency is defined.
- The planning area is defined on a map.
- A Technical Advisory Team made up of key resource people is established.
- Educator for the Project is selected, and a public education action plan is developed.
- Any existing data and maps are gathered for use.
- Brainstorm what other information and data is needed.
- Use a brainstorming session to identify key stakeholders in the planning area.
- Identify the stakeholders, local partners, agencies, and organizations to be invited to the initial public meeting.

Pre-Planning Activity

□ Identify a Project Sponsor

The main function of the project sponsor is to aid and monitor progress of plan formation, as well as, implement and manage plan after final approval. They will responsibly carry out the steps, allocate funding, and monitor the progress of the final management plan. The sponsor will be an excellent partner in the planning efforts, because he/she will have knowledge and experience in executing watershed planning initiatives.

The project sponsor meets these basic criteria:

- Has authority within state or district boundaries
- Knows the rules and regulations of local and area governments within your watershed
- Knows how to lawfully carry out the accepted plan to implement the plan in the planning area
- Has the time to monitor and manage the implementation of the plan
- Has organizational capabilities to manage the funds provided for the implementation plan.

Listed below are some examples of sponsor criteria.

What to Do?

- ◆ Council and initial stakeholders identify general or broad resource concerns (note: these can be as broad as, “the lake is no longer suitable for fishing and/or swimming” or “the section of the stream through this area is too shallow” More specific concerns will be addressed in Public Meeting #1).
- ◆ Select the sponsor that best suits planning efforts based on the general resource concerns designated by the Council and Stakeholders as priorities.
- ◆ Contact and request sponsor’s cooperation
- ◆ Have the sponsor sign a letter like the example letter given in the “Obtain a Written Commitment from Sponsor to Initiate the Planning Process” to verify their partnership.

Examples:

- State Game and Parks Commission
- Natural Resource Districts
- City of Fantastic
- University Extension Offices
- (USDA) Natural Resources Conservation Service
- USA Universities
- Parks and Recreation Departments

□ Sponsor Endorsement of Watershed Planning Process

This is a simple step. Offer the sponsor the small brochure that came with the manual, a copy of the timeline and any other information necessary to convey the process that you will be using to bring together a management plan for your watershed. The brochure and timeline are both provided. These two pieces of information will help the sponsor understand the community based approach. The sponsor will see an organized and definitive route, from a dedicated group, by which to form a successful plan. This pre-planning activity is designed to ensure that the methods used in the development of the plan are consistent and acceptable with sponsor's idea of what method will be followed for developing the watershed management plan. The purpose of this step identifies an agreement between the stakeholders group and the sponsor on the functions that will be employed by the planning effort.

The sponsor may already support the initiative to plan the watershed, but may not be familiar with the community based approach. The community based approach will be a positive selling item because it shows an organized planning effort by your group.

What to Do?

- ◆ Gather the brochure and timeline
- ◆ The initial Stakeholders Council will present to possible sponsor so that the sponsor can get a better definition of the proposal -OR- present to existing sponsor for promotion of the community based approach.

Examples

→ a copy of the timeline is offered in Appendix C with the other worksheets. The brochure is stored in the front folder of your manual. Use them as yours and make copies if necessary.

Pre-Planning Activity

❑ Obtain a Written Commitment From the Sponsor to Initiate the Planning Process

This simple step documents acknowledgment by the sponsor of the use of this specific type of planning format. Basically a legally binding document must be used to enforce a legal agreement between the stakeholders and the sponsor. Obviously, this activity is best completed after “Endorsement of Water Quality Watershed Management Process by Sponsor” activity.

What to Do?

- ◆ Copy the letter of documentation found in Appendix C, and a sample can be found on the next page or devise a similar letter
- ◆ Make three copies, one for the sponsor and two for the Council
- ◆ The sponsor and a representative for the planning council need to sign all copies
- ◆ Save one copy to insert in the Final Plan that will be sent out when the planning process is finished. Keep one copy documenting the Pre-planning Activities for your records and give one to the sponsor for their records

Examples

→ See the **letter of endorsement** sample on the next page. Make copies from the copy in Appendix C.

Pre-Planning Activity

❑ Establish a Project Manager or Coordinator to Oversee the Project

The project manager is one of the many leadership positions in the planning process and requires critical evaluation of events throughout the project. This position must be filled by someone who is willing to commit to becoming a regular member of the group, has considerable interest in the planning procedure, and has time to oversee preparation for the events and prepare the written management plan. A reasonable decision would entail an individual with organizational capabilities, leadership capabilities, strong diplomatic or negotiation skills, and a strong interest in the best solution for everyone. In the examples of actual community planning initiatives used in this manual, an affiliate of the sponsor was selected for the project manager role. Selecting a sponsor's affiliate for the Project Manager role seems to work well because, as an affiliate, this person is often paid for project manager activities. He/she is also usually familiar with the planning process.

What to Do?

- ◆ Use members input to form an educated list of the people suited for project manager and select the best fit the role. There are examples of the types of people that would work well to the right.
- ◆ Make a decision based on the willingness of each possible candidate.
- ◆ Inform them of their responsibilities to the group (listed to the lower right) and also, that the tasks can be divvied up between many people to lessen their labor.

Examples

- Council member
- Stakeholder
- A State (USDA) Natural Resources Conservation Service Assistant
- Someone from state natural resources organizations.

Responsibilities of the Project Manager

- ☐ Organize the times and dates of the public meetings
- ☐ Find speakers that are pertinent to concerns of the public stakeholders and planners.
- ☐ Organize the agenda for the public meetings and print them for handout
- ☐ Locate and reserve the meeting venues - try to rent a room appropriate to the number of people expected to attend (This will help encourage comfortable open communication.)
- ☐ Try to reserve the date, place, and time of the next meeting in time to tell the attendees at the present meeting. Advance notice will improve attendance and give participants enough time to clear their schedule to attend the next meeting
- ☐ Gather the necessary materials (e.g. markers, copying need, overhead projectors, etc.) for the public meetings
- ☐ Initiate discussion within the group
- ☐ Keep the council informed of pending activities
- ☐ Record minutes of public meetings and copy for handout at the next meeting
- ☐ Determine who will be track, organize, and keep the records and documents involved in the plan for future reference
- ☐ Write the Final Management Plan for agency submittal.

Pre-Planning Activity

❑ Establish a Definition and Role for Each Group and Agency

One of the greatest and most attainable resources are the stakeholders and those involved with the planning process. Evaluating individual stakeholder's personal and professional interests will benefit the outcome of the final watershed plan by allowing you to link those skills and interests to particular tasks that need to be done.

Agencies, along with stakeholders, are critical in making sure the plan is both legal and helpful for your purpose. Also, the functions of the groups will be important to the plan implementation and success. The integration and involvement of the different groups and agencies are a key component to the Community Based Approach to the Watershed Management planning process. Below are some guidelines and definitions that are helpful in initiating and forming an overall interactive Council.

What to Do?

- ◆ Develop a questionnaire to help determine what talents, skills, and interests your members possess.
- ◆ Select and ask members to participate in the planning process based on the role for which they are best suited.
- ◆ They will make up most of the planning committee and Council

Examples

→ See "Some Definitions" on page 12 for further explanation.

Pre-Planning Activity

☐ Define the Planning Area

It is necessary to know the planning boundaries when trying to identify local stakeholders, conduct a resource inventory, and identify a project sponsor.

A definition of the planning area can identify the stakeholders in the area and the natural qualities of the watershed that are directly affected by the pending alternatives and options for management action. This step will, through the examination of natural and social constructs in the area, help direct what kind of Technical Advisory Committee should be formed. Also, identifying and clearly marking visual aids (maps, resource allocation, etc.) will expedite the inventory process.

A concise and accurate definition of the area will allow you to more easily communicate your needs to people who do not know about the area or impending plans. Be sure to include a common definition, such as the township, range, and quarter section of your area. Maps may also be attained from NRCS, DEQ, GPC, and other natural resource agencies or libraries.

What to Do?

- ◆ Identify the planning area early with a group of initial stakeholders.
- ◆ Usually resource planning is conducted on a watershed basis.
- ◆ Optimal watershed size for effective resource planning is about 5 to 20 square miles, but community planning can work for larger or smaller watershed.
- ◆ A resource professional (e.g., NRCS, DEQ) will help stakeholders identify the drainage area relevant to their concerns. Start by reviewing a watershed map such as a Hydrologic Unit map.
- ◆ All upstream watershed acreage should be included in the planning area, while downstream acreage is usually limited to juncture with the next major water body
- ◆ Along with stakeholder input, consider the Conservation Partners activities. Try to limit the size of the watershed because the larger the watershed, the more complicated the planning process. Also, larger watersheds necessitate more general plans, which tend to be less effective.

Examples:

- quarter section, township, range and county
- whether or not the watershed is in a wellhead protection area
- whether or not the watershed includes groundwater
- natural features such as topography, vegetation, and land uses.
- approximate width and length of the area
- hydrologic unit number
- geographic name

Pre-Planning Activity

❑ Establish a Technical Advisory Team

The purpose of the technical advisory team is ultimately to work together with the planning committee and make a decision for a plan based on the complete picture of the plan's impacts. The team is made up of subject-area specialists from public and private organizations. The technical team helps assess and inventory the area, develop alternatives, assess effects of particular alternatives on the natural area and on the area's people. The technical advisors are also available for specialty advice during and after implementation of the chosen plan. It is imperative that the technical advisory team is chosen on the basis of merit and knowledge of desired subject matter. Such individuals offer, at a minimum, advice that could alter the entire course of the end result. The technical advisory committee is separate from the planning group, the technical committee offers technical advice and helps facilitate the planning process to benefit the stakeholder. A technical advisor liaison should be selected out of the technical team. The technical advisor liaison will be the planning committee's "go-to" person in case a question arises.

What to Do?

- ◆ Identify someone with excellent knowledge in the desired subject matter
- ◆ Identify a main person from the Technical Advisory Team who can easily be reached as a liaison for the Planning Council members to contact between meetings.

Examples

- Business and Industrial Groups
- Local Planning and Zoning Offices
- Soil and Water Conservation Districts
- Federal and State Natural Resource Agencies
- Universities and Cooperative Extension
- Public Works Department
- County Board Members

Pre-Planning Activity

❑ **Select an Educator for the Project and Develop a Public Education Action Plan**

The purpose of an education initiative encompasses many factors. The main goal is to inform the public of the watershed plan proceedings, so that interested individuals have a competent, and hopefully, convenient source of information. This will also curb any misunderstanding of how and why modifications of current conditions are under consideration. The educator should be someone who works well in public settings, someone who is available for the task, someone who has, at least, an intermediate understanding of the proceedings of the planning committee, and someone who can create user-friendly material for the public.

What to Do?

- ◆ Utilize contact information
- ◆ Public speaking, responsiveness, and knowledge of the subject are key capabilities of an educator.
- ◆ The educator will come up with an educational action plan designed to create public awareness and participation.

Examples:

- Professional teachers or scientists (working or retired) at universities
- extension agents/specialists
- Natural Resources Conservation Service
- County Conservationists
- Agencies (EPA, Sea Grant, DNR)
- National Wildlife Federation
- Sierra Club representatives
- State, County, and Town Officials
- Zoning Administrators
- Planners
- Environmental Health Officers

Pre-Planning Activity

❑ Gather Existing Data and Maps of the Area

Any of the examples are excellent sources for accurate maps and data. These maps will be used in further understanding the management area.

What to Do?

- ◆ Call local or regional organizations
- ◆ Explain that action is being taken to develop a management plan for a specified area
- ◆ Explain the need for data and maps of the specified area of focus
- ◆ Tell them the information needed
- ◆ They can mail or fax copies to you
- ◆ If you still have a question about whether or not you are getting the information necessary to continue the planning process, consider making an appointment with one of these individuals to look over the material they have provided.

Examples:

- Department of Environmental Quality
- Natural Resource Districts
(only in Nebraska)
- Game and Parks Commission
- Department of Natural Resources
- United States Geological Survey
- Internet keyword search- maps and regional area (e.g. Iowa maps)
- Scientific literature
- Dissertations and theses

Pre-Planning Activity

□ Brainstorm a List of Necessary Information and Data Needed for the Project

What to Do?

- ◆ Provide Worksheets
- ◆ There are some examples located in the preplanning Activities folder

Examples:

- habitat
- nutrient inputs
- Total Maximum Daily Load requirements
- type of water quality
- soil type (e.g., highly erodible)
- projected use of the watershed (recreation, fishing)
- current watershed activities and land uses
- threatened and endangered species
- nutrient and pesticide application within the watershed
- agricultural management practices

Pre-Planning Activity

□ Identify Types of Stakeholders in the Planning Area

These individuals will be residents and/or landowners, farm owners and operators, local municipal officials, business and industry representatives, environment and conservation groups, and other special interest representatives who are directly impacted by the impending plan. In most cases, the plan is somehow associated with or implemented on their property. Communication, consent, and cooperation in the development of the plan are crucial to the success of the plan. The Planning Committee is going to conduct this “identification” session.

What to do?

- ◆ Utilize a brainstorming session with the technical advisory team and others to identify as many different types of stakeholders in the project area as possible.
- ◆ Any group or person that lives in, or carries out any type of activity in the project area should be considered a stakeholder.
- ◆ Make a list of these for use in the next step.

Possible Stakeholders:

- Farmers
- Landowners
- School Teachers
- Fishing Associations
- Hunting Associations
- Boy Scouts
- Girl Scouts
- Construction Agencies
- Local Law Enforcement
- City Officials

Pre-Planning Activity

☐ Identify and Develop a List of Stakeholders to be Invited to First Public Meeting

Stakeholders are individuals who are affected or have an interest in the outcome of the plan. The individuals identified in this step will be notified of and invited to the first public meeting. Their inclusion and input will ensure a planning decision acceptable to many, resulting in less opposition and a smooth execution of the impending management alternative decision.

What to Do?

- ◆ Use the list of stakeholder groups to develop a mailing list of individuals that will be invited to Public meeting #1.
- ◆ The more inclusive the better the project support will be in the future.
- ◆ Be sure to identify any potential leadership positions or persons.

Examples:

- Farmers-
John J. Farmer
Jan Doe
Fred N. Forty
- Landowners-
John Doe
1st National Bank
Nebraska School Land
- School Teachers-
Mable Learnalot
Joe English
- Bass Anglers of America-
Chris Benthook
Audrey Gotaway
- Local Law Enforcement-
County Sheriff-Ross Escape
City Police-Matthew Dillon

STEPS for developing a watershed plan using a COMMUNITY BASED APPROACH

The outline below is a general overview of the fourteen planning steps that are about to take place now that the pre-planning activities have been completed. Hopefully, a solid understanding about your area and the components of this planning initiative are ready for discovery.

The following pages will guide you through the phases of community watershed planning; offering tips, suggestions, and things to look for to make this process easy and understandable.

- ❖ The Planning Team conducts [Public Meeting #1](#) for the presentation of resource information to develop public awareness of the resource problems in the area.
- ❖ A facilitated [Public Meeting #2](#) is held to develop a “Vision” for the area, define the objectives of the project, develop a list of prioritized stakeholders’ concerns, and to form the Steering Committee or Council.
- ❖ Inventory the natural resources in the area by identifying additional resource information and data needed, developing an action plan for collection of new data, and compiling all the necessary resource data.
- ❖ Analyze resource data with complete data assessment.
- ❖ Formulate alternatives to address resource problems and meet the goals and objectives of the process.
- ❖ Evaluate the ‘Alternatives’ and present alternatives to Subcommittees (if needed) at a facilitated session to develop recommendations to the Steering Committee or Council.
- ❖ Conduct [Public Meeting #3](#) to present recommended alternatives to the Steering Committee or Council and the stakeholders.
- ❖ The Project Sponsor makes final decisions on which alternatives to be included in the management plan.

- ❖ A Community Water Quality Conservation Management Plan draft that includes an information/education and outreach plan, structural and management practices that will be necessary, potential funding sources for the implementation phase, and assignment of actions or tasks.
- ❖ Conduct [Public Meeting #4](#) where the Community Based Water Quality Conservation Management Plan is presented to the stakeholders by the Project Sponsor for comment and the schedule for implementation is presented to the public.
- ❖ The management plan is approved by the Project Sponsor.
- ❖ Application of the Community Based Water Quality Management Plan is carried out as funding is obtained according to the implementation schedule.
- ❖ Steering Committee and Technical Advisory Team meets regularly to evaluate implementation and impacts based on benchmarks established. The sponsor may have to go back to step 4 (analyze resource data) if objectives are not being met.
- ❖ Celebrate when milestones in the Community Based Water Quality Management Plan are reached. Public functions would be very appropriate.

Putting on a Public Meeting



This section provides some useful tips and information on how to promote and initiate public meetings in your community. The content and instructions of the individual meetings are listed in the meeting section at the time they are to be instituted. This is a general overview outlining public interaction techniques.

Not everyone in the community will be at the public meetings or involved in the planning process for many reasons. However, they still have a stake in the way the area is used. To develop a Water Quality Watershed Management plan that will be embraced by the affected community it is necessary to understand the committee's purpose, the resource problems and issues, and the personal benefits of the final plan. Promotion and public relation roles are important part of community support and involvement. Use this section as a guideline for promoting all of the public meetings.

Promotion

There are many ways, in this technological age, to keep citizens informed and educated on the proceedings of the committee. The first, is with local television and radio media coverage. Using the local media as an educational medium will offer long-term benefits and understanding by the affected community. The educator of the group will probably assist with much of the communication between the media and the public, as well as assist with promotional material. However, someone else may also be utilized in this role. It is a good idea to designate one person as the liaison between the planning group and the media. This will ensure a consistent message from your group.

It is important to get the local television stations involved with the process early-on, so they can relay the entire story and, hopefully, continue reporting on the progression of the plan throughout the process. As the information becomes available provide media packets with factsheets or information about the Council members, resource problems, agency profiles of all project partners, descriptions of the community based watershed planning process. The television broadcasts can encourage the aspect of "group effort" from a community based planning process.

Many watershed groups have a motto or icon that is representative of their values or a goal. A symbol that, along with the name, gives easy recognition leading to greater popularity. Hopefully, promotion techniques motivate individuals to join and be heard on the concerns directly impacting their lives regarding the watershed.

What to Do?

(Make a brainstorming sheet and create lists identifying all options for the subsequent steps)

- ◆ Find out what the individuals of the community need to know in order to make a good decision
- ◆ Find out what resources are already available to the community
- ◆ Decide the most effective ways to reach a targeted audience
- ◆ Decide who the target audience is
- ◆ Send out invitations to individual stakeholders
- ◆ Post notices in public arenas and announcement areas (schools, grocery stores, post offices, church)
- ◆ Post internet, e-mail, and local television and radio announcements
- ◆ Arrange event coverage through local newspapers or television

Examples:

(that have helped promotion efforts)

- ◆ Publications and distributed educational materials
- ◆ Attending the meetings of other lake organizations
- ◆ One-on-one phone calls and letter writing to answer questions
- ◆ Developing and distributing slide and video collections to use in program development
- ◆ Developing special programs (e.g., “Adopt-A-Lake” program)
- ◆ “Welcome Wagon” packets (folders of information about lake-side living and local assistance for new owners)
- ◆ Posted information on computer bulletin boards
- ◆ Arrange visits from guest speakers
- ◆ Buying or acquiring local public television and radio station slots for an announcement

Adjust the promotion to fit your area

This manual can display different types of successful promotion techniques. However, there are several options for promotion that are area and community specific. So, be creative, and find a way to let the citizens of the area know about the proceedings taking place. Individualized methods will, most likely, be much more effective than a general promotion technique.

Public Meeting #1



The Purpose

The purpose of meeting #1 is to inform the public and stakeholders of the water quality problems and the effect it is having on the community and natural surrounding area. This meeting is intended to evoke public interest and participation. Get a feel for attitudes of the community regarding the watershed. It is particularly important to develop an agenda, so the first interaction with the public is organized. This meeting will be general descriptions of problems within the watershed.

Preparing for public meeting #1 is the first step to consider after the twelve pre-planning activities. This is the first time most members of the community will be together. Use this as an opportunity to create awareness and spark common interest in the watershed throughout your community.

Getting Ready

- The project manager, identified in the pre-planning activities, will play a large role in coordinating the public meetings. The Project Manager will delegate, with Council approval, the tasks required to execute a public meeting. The manager should split the activities among volunteers to make planning the meeting less taxing.
- The project manager will get in contact with the person identified earlier as the Technical Advisory Team liaison, who will also be able to help with planning meetings.
- Reserve a meeting room, try to rent a room that fits the number of people expected to attend. Rooms too large or too small tend to create an overwhelming feeling or a cramped feeling; both discourage conversation and comfort.
- Mail the agenda to the stakeholders at least two weeks in advance.
- Promote the meeting as much as possible (see putting on a public meeting above).

- Find out if any aspect of the presentations or speeches are going to require special equipment, paper or writing utensils.
- Bring suggestions for next meeting's agenda
- Bring copies of revised agenda to hand out to attendees
- Set up facility with chairs and equipment, seat Technical Advisors and visitors apart from the Planning Committee.
- Make sure the roles and times of speaking (during the meeting) are understood by the presenters and speakers.
- Appoint a meeting host to introduce speakers, open the meeting, and close the meeting. This involved host role will only be necessary for the first public meeting because the facilitator will guide subsequent public meetings.
- Someone also needs to make a record of the meeting so minutes can be made available. Record and save all the ideas from the group because these ideas will be used as a starting ground toward developing a problem statement at Public Meeting #2.

The Agenda

The Council will determine the agenda well before the meeting takes place. The Technical Advisory Team liaison will be there for consultation on forming the first program. After the first few meetings the Council will have a better grasp on the specifics of public meetings, and may not need to consult with the liaison to put agendas together. Remember, this is the first meeting, so include items in the agenda that encourage an open forum for all in attendance right away.

This meeting will be an introductory meeting designed to acquaint the group with each other and identify the general resource concerns in the area. This section contains an example of an agenda for the first meeting. Use it as a guideline for the topics on your agenda.

The Meeting

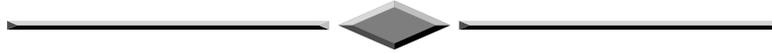
- Pass around an attendance sheet so new attendees can begin to receive information through phone calls or mail.
- Begin by discussing with the group the desired outcomes for the first public meeting. This includes meeting the other group members, identifying the resource concerns, developing a

statement to describe the problem, and asking questions; all of the activities that will be accomplished at the end of the meeting.

- ❑ Introduce participants to each other. It would be fun to create an interactive activity to help initiate acquaintance. For example, participants could be paired up to talk for a few minutes and then each pair could give a short introduction about their partner. There are some other fun activities on the getting acquainted worksheets provided on the next page. Appendix C has copies for removal.
- ❑ Following that, begin identifying resource concerns. Get someone to write all of the input on flipcharts or a chalkboard so everyone can refer to it throughout the discussion. Begin by asking, *What problems exist in the watershed and what needs to change?* An example of a resource concerns list from two separate watershed initiatives are given below the *getting acquainted worksheets*.
- ❑ A problem statement to describe the cumulative concerns in objective terms will be formed at Public Meeting #2. The statement should be short but adequately reflect the concerns.
- ❑ At the end of the meeting, be sure to review the place, date, and time of the next meeting so participants can clear that date on their schedule if they want to attend. **VERY IMPORTANT** ⇒ Also, offer time for questions and concerns.
- ❑ Prepare meeting minutes for handout at public meeting #2 to refresh memories of the returning group and new individuals.

Getting to Know You

(example activity)



Purpose: To learn more about what role in a group effort, such as watershed planning, might best suit your individual personality characteristics. Use one or all of these questions as a fun way to get the group acquainted with each other. These questions are, of course just for fun.

Directions: Answer the three questions. Afterward, the facilitator or host will hand out a key that specifies what each answer could say about your personality.

1. Which animal do you like most when you visit the Zoo?

- Monkey
- Tiger and Lion
- Snake
- Crocodile
- Bird
- Bear
- Hippopotamus
- Giraffe
- Elephant
- Zebra

2. What is your favorite ice cream flavor?

- Chocolate Chip
- Vanilla
- Strawberry
- Coffee
- Mixed Flavors
- Chocolate
- Peanut Butter
- You don't like ice cream

3. You are about to get on a bus for a trip. Which of the following seats will you choose to sit on ?

- A front seat on the drivers side
- A back seat on the drivers side
- A front seat on the entrance side

◆Q&A from-<http://quizbox.com/personality> These questions and views expressed herein are the views of the quizbox website, are for entertainment, and do not reflect the views of any of the representatives of the Stepping Toward Better Watershed Management Manual 3/08/01

- A back seat on the entrance side

KEY TO PERSONALITY QUESTIONS

#1

Monkey If the monkey cage is the first place you visit at the zoo, you are an active and energetic person. You like to be among lots of people and enjoy partying. You pay attention to every new thing that enters your life.

Tiger and Lion If these two are your favorite it indicates that you are brave. You are a leader and enjoy solving problems - both yours and others. You like to be away from chaotic places.

Snake You are a calm and relaxed person. Before making any decision, you have to have all of the relevant information at hand. You are trustworthy, honest, and fair. Sometime you tend to be over confident and you don't listen to others.

Crocodile Choosing to visit the Crocs shows that you like tranquillity. You are strong, tough, and loyal. You like to take your time thinking, especially on important matters. You are observant and have a good memory. If you are curious about something you will try to find an answer to it.

Bird Freedom and independence are the touchstones of your character. You enjoy meeting with people. In your spare time, you like to visit different places depending on how you feel at the time. The happiest moments in your life are when you are looking at the world from a birds eye view.

Bear You are a family person. You love your home and care for everyone in your family. You are kind and often sacrifice yourself to make others happy. You are proud of everything that belongs to you.

Hippopotamus Determination is your main quality. However you can occasionally be careless and often forget about the consequences that follow your actions.

Giraffe You are decisive and never give up. You have a plan for anything that you do and you will follow the plan until your goals are realized.

Elephant You are intelligent and have a good memory. You can remember your childhood distinctly and never forget about old friends. You have courage and determination.

Zebra Your feelings are kept hidden deep within you. You are not the sort to go around expressing yourself to others. You can behave in such a strange manner that sometimes people think you are weird. But who cares?

#2

Chocolate Chip You sincerely believe that everything around you is beautiful, even though other people may not notice. You are a determined person and set high goals for your life

Vanilla You are friendly and easy-going. People feel comfortable around you so it's not a surprise that many friends surround you. You have high self-esteem and will not let anyone get you down.

Strawberry You are affectionate, giving, and loving. You are very understanding of others which makes you a person others want to be with.

Coffee You have confidence in your ability to get things done. You are a leader among friends and a good one too. You are responsible and like to challenge yourself by taking on difficult tasks and you usually succeed.

Mixed Flavors You are a negotiator. You'll do anything you can to avoid open conflict so you never start quarrels. You will give in when you think it's appropriate - but you can be doggedly persistent when you know justice is on your side.

Chocolate You are a sensitive person and often find yourself day dreaming about your past and future. You are quite conservative and the values that your parents and teachers instilled in you still play an important role in your decision making.

Peanut Butter You like to be helpful and are generous with your time, so friends often come to you when they have problems. You are very patient and thoughtful and you give your friends useful advice every time.

You don't like ice cream A lot of people fall into this category. It means you are an independent, free-spirited person who won't let anything get in the way of their freedom.

#3 What might your position be in a group?

Front/Driver You are keen to know others matters. Besides you choose the front seat it means you are energetic and always lead the team. You will always tell your team where to go and you will be dissatisfied if you do not get to lead the team. That's why others leave this job to you.

Back/Driver You can take care of all members in the group very well. You make sure that everybody gets his or her plates during mealtime. You act like a caring mother all the time.

Front/Entrance You are more concerned with yourself rather than with others. As you choose to sit in the front. You are quick-witted and will always have gags to make people laugh or have questions for them to think. If you are absent all members will be bored.

Back/Entrance You are more concerned with yourself rather than with others. Superficially, you are a quiet and imaginative person. As you choose to sit at the back, you can converse with your friends although you do not talk a lot.

◆ Q&A from-<http://quizbox.com/personality> These questions and views expressed herein are the views of the quizbox website, are for entertainment, and do not reflect the views of any of the representatives of the Stepping Toward Better Watershed Management Manual 3/08/01



* The following examples are a general agenda for the First Public Meeting and two examples of concerns lists compiled from two different community based watershed initiatives in Nebraska. Use them as a model in creating your list.

EXAMPLE AGENDA:

**Community Based Watershed Planning Stakeholder's
Council
Finestate, USA
For Fishing, Swimming, and Boating
Public Meeting Notice and Meeting
Agenda
August 14th, 2001
6:00-8:00 pm
Hotel Fancy
9600 South Parkway**

- 7:00 - Welcome and opening remarks Project Manager
- 7:15 - Introduction activity for council and stakeholders Facilitator or Project Manager
- 7:45 - Review schedule for watershed management plan Theresa MacLake
- 8:00 - Begin discussion of resource concerns within the area Theresa MacLake
- 8:30 - Break
- 8:45 - Continue discussion of resource concerns within the area Project Manager
- 9:15 - Opportunity for questions concerning the process and plan Stakeholders
- 9:30 - Closing remarks Project Manager

1. From Kirkman's Cove Watershed: The concerns and opportunities were established during the first public meeting and then the watershed group members prioritized the concerns and opportunities through voting.

Concerns and Opportunities

(As Prioritized at Public meeting 3/15/01)

- #1) Rapid runoff - establish more underground tile outlets in the watershed (14 votes)
- #2) Soil erosion - reduce by establishing more CRP in the watershed* (10 votes)
- #3) Water Quality - reduce sediment flow and delivery to the lake (9 votes)
- #4) Soil erosion - age of terraces (6 votes)
- #5) Grade stabilization problems in the watershed (3 votes)
- #6) Stream bank erosion problems in the watershed (2 votes)
- #7) Gully erosion - (poor) condition of waterways in the watershed (2 votes)
- #8) Sedimentation - Establish more sediment ponds without restrictions (1 vote)
- #9) Sedimentation - easily suspended soil particles (1 vote)
- #10) Water Quality - erosion in upper parts of watershed depletes
- #11) Gully erosion - concentration of water (runoff)
- #12) Costs - cost of conservation practices

* Pawnee County has reached its 25% lid on acres allowed

Other non-resource related concerns:

Simpler procedures for cost sharing and construction (7 votes)

Park fees and electrical hookup fees (4 votes)

2. From Powder Creek Lake Watershed

POWDER CREEK RESOURCE CONCERNS

3/27/01

Erosion Control related issues to be addressed:

- ⊞ Technical and financial assistance in renovating and maintaining old existing dams within the watershed.
(Renovation of existing dams, maintenance, wave erosion) - 21 votes
- ⊞ Erosion Control on minimum maintenance roads and county road ditches
(County roads and ditches erosion control program) (Road Structures) - 15 votes
- ⊞ Need to build more dams to hold sediment
(Sediment dams) - 8 votes
- ⊞ Excessive erosion in road ditches are plugging the culverts under the road and causing flooding over the top of the road.
(Culvert build-up - silted up) - 4 votes
- ⊞ More dams and waterways need to be constructed in the watershed
(Dams and Waterways) - 3 votes
- ↓ Soil erosion should be addressed in the watershed
(Soil Erosion) - 0 votes

- ↓ Install more terraces to help control soil erosion
(More terraces) - 0 votes

Costs on related issues to be addressed:

- ↖ A higher cost-share incentive would increase conservation practices installed on the land.
(100% cost-share on conservation practices) - 11 votes
- ↖ Incentive payments should be given to producers who are already protecting natural resources.
(Green payments - get credit for doing things right) - 8 votes
- ↖ Provide incentive payments for utilizing no-till planting operations.
(No-till incentives) - 7 votes
- ↖ Install several dry structures instead of one structure with a pond area.
(Cost Effectiveness of Dry Structures vs. Wet Structures) - 7 votes
- ↖ Incentive payments for installing/maintaining grassed waterways.
(Waterway set aside) - 0 votes
- ↖ Need to provide additional cost-share assistance beyond what is currently available.
(Cost-share above and beyond what is there now) - 0 votes

Flooding related issues to be addressed:

- ↖ Concerned that water from lake will over top the county bridge during the storm events
(Potential inundation of county bridge) - 10 votes

Water Quality related issues to be addressed:

- ↖ Concern due to livestock runoff
(What about livestock runoff) - 6 votes
- ↓ Buffers strips can't be utilized where livestock water is along dams and streams.
Need access to water.
(Livestock Watering -- maintaining buffers) - 3 votes
- ↓ Can grazing be allowed on continuous CRP practices without a 25% reduction
(Grazing CRP--Filters/buffers/waterways) - 3 votes

Streambank erosion related issues to be addressed:

- ↓ Control erosion along streambanks
(Streambank Erosion) - 5 votes

Land use Conversion related issues to be addressed:

- ↓ Provide incentives to leave pastureland set idle like CRP acres
(Program for Pasture--CRP) - 4 votes
- ↓ Pastureland should remain in grass and not broke to crop
(Amount of pasture broken up) - 0 votes

Non-resource issues to be addressed:

- ↓ (Public access roads to lake) - 4 votes
- ↓ Who is responsible for the boundary fence around the lake
(Maintain fence where livestock is present - boundary of lake) - 2 votes
- ↓ Concern with police protection for lake and community
(Who polices recreation area for people living close to the lake) - 1 vote
- ↓ Is grazing allowed around existing dams in the watershed
(Can you graze around dams) - 0 votes
- ↓ (Will structure be maintained for mowing and trash pickup) - 0 votes
- ↓ Who is responsible for monitoring trash generated by a public recreation facility
(Trash) - 0 votes

Education related issues to be addressed:

- ↓ More direct planning assistance would help to address resource concerns.
(Planning assistance) - 2 votes
 - ↓ Difficult to establish waterways when fields are sprayed by commercial applicators.
(Spraying waterways by commercial applicators) - 1 vote
 - ↓ Need more public informational meetings on the CRP Continuous Sign-up Program.
(CRP/Buffer Strip Education) - 0 votes
 - ↓ Need more education programs to help control noxious weed problems
(County Weed Supervisor - Education on spraying) - 0 votes
 - ↓ Need to inform the public on current conservation programs available.
(Before lake - what is available for conservation assistance -- buffers, etc.) - 0 votes
-

Public Meeting #2



The Purpose

This meeting will take place about two to three months after Public Meeting #1. Awareness is heightened because more members of the community are exposed to promotion efforts and word-of-mouth and that means more people will be included. There are many reasons for Public Meeting #2. This meeting will be used for putting together a statement of purpose or a “Vision” for the area, define the objectives of the project, develop committees based on prioritized stakeholder concerns, and form the Steering Committee or Council.

Where to find a facilitator? Facilitators are trained for the position. They have skills to keep group communication and organization moving on the path to their goal. The Council and project manager will be responsible for the job of calling a facilitator for the project, arranging for their presence at this meeting, and making plans to incorporate the facilitator role.

Getting Ready

- The project manager needs to promote the meeting by posting notices at public arenas, and by running public television and radio announcements at least two weeks in advance. The manager can solicit volunteers from the group to help with promotion efforts. For additional promotion ideas refer to the section, *Promoting a Public Meeting*.
- The project manager will assign someone to acquire a facilitator for the project and let the facilitator know when and where the next public meeting will be. The facilitator will need to be made aware of the work done so far, the scope, and direction of the project.
- It is also necessary to mail out reminders of the meeting and agenda to previous attendees and stakeholders who filled out the mailing list information at the meeting. Do this at least two weeks in advance.

- As with the first public meeting, the manager should split the tasks for the second meeting among volunteers to make planning less taxing.
- The project manager will get in contact with the Technical Advisory Team liaison who will again be able to help with planning the events of the second meeting.
- If a room has not already been selected, reserve a meeting room. Try to rent a room that fits the number of people expected to attend. Try to reserve this same space for the rest of the public meetings right now because the number of participants at this meeting is a good indicator of the average number that can be expected at the rest of the gatherings.
- Find out if any aspect of the presentations/speeches is going to require special equipment (e.g., computer, Power Point), paper, overhead, or writing utensils.
- Bring suggestions for next meeting's agenda
- Bring copies of revised agenda to hand out to attendees if necessary.
- Set up facility with chairs and equipment, seat Technical Advisors and visitors apart from the Planning Committee.
- Make sure the roles and times of speaking (during the meeting) are understood by the presenters and speakers.
- The facilitator will guide the public meetings, however it may be necessary to appoint someone to introduce speakers, open the meeting, and close the meeting. This can be done by getting a volunteer and then taking a group consensus or vote.
- Someone needs to make a record of occurrences at the meeting so minutes can be made available afterward. Record and save all the ideas from the group because these ideas will be used as a starting point at Public Meeting #3.
- Gather the information from the last public meeting; include meeting minutes, flip charts, name tags, and brainstorming notes from the meeting to keep as history until the project is finished.

The Agenda

The main purpose of public meeting number two is to put together a vision for the area, develop committees based on common priorities, develop a Steering Council, develop objectives for the project, and introduce the facilitator for the public meetings. This meeting will be the beginning of addressing possible solutions by first defining the

problems and priorities. Also, take some time to introduce new attendees (if applicable). An example agenda is shown below.

Kirkman's Cove Watershed Stakeholder's Meeting

March 15, 2001
Humbolt, NE
7:00 pm

| | | |
|------|---|--------------|
| 7:00 | Welcome and Introductions | Jane |
| 7:05 | Recap of March 1, 2001 meeting | Jane |
| 7:15 | What We Hope to Accomplish this Evening | Paul Sweeney |
| 7:25 | Review of Vision for the Kirkman's Cove Watershed | Jane |
| 7:35 | Breakout Session - Brainstorming Resource Concerns and Issues | Facilitators |
| 8:00 | Prioritizing Resource Concerns and Issues | Facilitators |
| 8:15 | Development of Objectives/Goals for the Watershed | Facilitators |
| 8:45 | Discussion of the Role of the Stakeholders Council* | Paul Sweeney |
| 8:50 | Volunteers for the Stakeholders Council* | Jane |
| 9:00 | Where do we go from here??? | Paul Sweeney |
| 9:05 | Closing | Jane |

Questions and Comments with Technical Team Members

* Jane – Do you have a name for this group or do you want the group to develop a name for themselves? I would suggest they name themselves so they have ownership.

The Meeting

- Pass around an attendance sheet so attendees can receive information through phone calls or mail.
- Begin by discussing with the group the agenda for this public meeting. This includes introducing the facilitator, forming committees, setting objectives, and developing a vision statement.
- Review the list of concerns from Public Meeting #1 for comments and suggestions and introduce the facilitator.
- Following that, begin identifying common concerns and interests between individuals in the group. Get someone to write all of the input on flipcharts so everyone can refer to it throughout the discussion. Then form small committees within the larger group that will represent the priorities of that committee (e.g. “Agricultural Land Management Committee”, “Urban/Transition Committee”, etc.).
- Create a Vision Statement to describe the cumulative concerns in objective terms that indicate the cause of your watershed initiative. The statement should be short but adequately reflect the overall concerns within the watershed. An example *Vision Statement* is provided below.
- At the end of the meeting, be sure to review the place, date, and time of the next meeting so participants can clear that date on their schedule if they want to attend. *VERY IMPORTANT* ⇒ Also, allow time for questions and concerns.
- Prepare meeting minutes for handout at public meeting #3 to refresh memories of the returning group and inform new individuals.

A Sample Vision Statement

A Community Based Approach

Vision Statement

The Kirkman's Cove Watershed will be innovatively and economically managed and locally controlled to be beneficial to the needs of the landowners, agriculture, recreation, and water quality. This watershed will serve as a lasting example to improve the quality of life in our community.

Taking a Resource Inventory



A resource inventory is a compilation of information on natural and human resources in the area. Some of the resource inventory will already be done. The pre-planning activities folder will contain some accumulated data, like maps of the area, a brainstormed list of necessary information for the project, and a definition of the area. Gather the information on the resource acquired during pre-planning together to make the time spent on the resource inventory shorter. Much of the data, with a little bit of research is available. If the information is unavailable or not recent it may be necessary to include initial data collection costs as well as monitoring costs in the budget for the draft and final management plan. There are many reference materials that will also be helpful. Keep all the information you obtain from the resource inventory in a folder because it will also be reported in the final plan.

What to Do?

- ◆ Devise a **laundry list** of critical criteria with *all* possible factors necessary for the project; (check out the examples on the next page for a laundry list). It will be necessary to consult regularly with the Technical Advisory Team throughout the resource inventory stage of planning.
- ◆ Then create a **priority list** emphasizing the most *important* specific required data.
- ◆ Decide what data collection is necessary for your project; (the inventory should be thorough enough to analyze and interpret the natural and human conditions within the watershed, but your project may not require some data that another group's project may need, so don't waste time and effort trying to obtain that information).
- ◆ To efficiently gather data, categorize the data into groups of data that can be collected from one source.
- ◆ Decide how it can be collected and distribute collection responsibilities to volunteers based on who can help collect the information in the most efficient manner.
- ◆ Devise a list of all sources of pre-collected data (who, what, when) to aid in inventory recovery.
- ◆ Set due dates for data retrieval and coordinate reminder messages.
- ◆ Use the worksheet provided as a basis for your watershed inventory.

Examples:

Laundry list for a watershed description:

- historical, financial, and social aspects of the resource
- land use (include description of point sources)
- size, topography, geology, soils, and climate
- zoning in the area
- existing land treatment
- wetland resources
- appropriate maps (location, stream network, watershed layout, etc.)
- cultural resources
- threatened and endangered species list
- population distribution-(% rural/urban)

lake projects also require these:

- lake description
- legal name and location
- major and minor river basin
- NDEQ identifier (found in title 117)
- Hydrologic Unit Code (an 11 digit #)
- physical characteristics (e.g., retention time, storage capacity, morphology, hydrology, stratification) existing and anticipated uses (fishing, boating, swimming)

The rest of this section is aimed at providing references for the resource gatherers of the group. The inventory worksheet is provided so that you may have an organized idea of the types of information you will be seeking out. The table below provides you with the agencies who are usually responsible for specialized research areas or who would most likely carry specific information on soils, species, or other resource information specific to your region.

Where to look for information on your watershed

It can be very difficult to find information on your watershed. It may be helpful to know that different agencies and organizations are responsible for different areas of your watershed. For example, Nebraska's Department of Environmental Quality helps administer programs and regulations directed specifically toward water and air quality; so the NDEQ would probably be the best source for water and air resource information. One of the main focuses of the Natural Resources Conservation Service in Nebraska is soil. Different states will have variations in which organization or agency deals with which resource in your specific watershed. This list modified for Nebraska from a similar list compiled by Indiana is very helpful in showing you what information can be gathered and from whom. The *specifics* of this table may not be relevant in your state; however, it will give a general idea of who to contact to obtain the information you need for your watershed.

| Resource | Agency/Category | Type of Information |
|-------------------------------|--|---|
| Soil | Natural Resources Conservation Service (contact the state NRCS office) | Soil Surveys, published for each county, contain soil maps and detailed descriptions about the soil physical characteristics, uses, and hazards. |
| Land Use and Cover | NRCS: the National Resource inventory Conservation Service (contact the state NRCS office) | Land use, cover, crop, and other landscape characteristics have been recorded every five years since 1977. Reports detailing land use trends are published. |
| | Local Planning Departments | Numbers of building and subdivision permits; county master plans; transportation plans; county demographics. |
| | Agricultural Statistics | Crop, livestock and farm statistics. Contact University Cooperative Extension offices in your area. |
| Aquatic Life (including fish) | The Department of Health in your state. | Annually publishes Fish Consumption Advisories. |

| Resource | Agency/Category | Type of Information |
|-----------------------------|---|--|
| Aquatic Life (continued) | Department of Environmental Quality, Department of Natural Resources, or Game and Parks Commission in your state. | Contact the department for specific studies and reports. (Inquiries should mention Fish Population Studies or Fish Population, Fish Tissue and Macroinvertebrate Studies). |
| Water | Department of Natural Resources or Environmental Quality in your state. | Extensive water chemistry data, some showing trends over many years and some more recent, also for groundwater. Ask for assistance in interpreting the data. |
| | US Geological Survey | Water chemistry data on certain watersheds, and for groundwater. Contact the USGS state office. USGS also delineates watersheds for the Hydrological Unit Code maps, and publishes topographic maps. |
| | Army Corps of Engineers | If the reservoir is managed by ACOE, there will be water quality data taken each year; contact the dam manager for the specific lake. |
| | Local Water Utilities | Contact your drinking water suppliers for data on both upstream (pre-treatment) and post-treatment water. |
| | Streams/watersheds | USGS topographic maps, USGS watershed maps. |
| | Drainage: local drainage boards. Also stormwater management systems. | Condition and location of regulated drains; cost of cleaning and maintaining drainage systems. |

| Resource | Agency/Category | Type of Information |
|-----------------------------------|--|--|
| | Impaired Waters | Each state has a 305(b) report. They can be found in public libraries; or the annual 303(d) list of impaired water bodies prepared for EPA can be found on their website. |
| Water (continued) | Drinking water resources | EPA's <i>Surf Your Watershed</i> website. |
| | Wetlands | NRCS inventory maps, USFWS inventory maps. |
| | Protected and Designated Waters Point source outfalls (permitted facilities with something that comes out of a pipe). | Your state water quality department has a list of exceptional use waters. Your state department of environment permits branch (NPDES permits) and EPA's EnviroFacts website. |
| Geology | USGS | Call the state office or visit their website for map information. |
| Air Quality | Department of Environment in your state | Contact for information. |
| Endangered and Threatened Species | Game and Parks Commission or Fish and Wildlife Services in your watershed | Information on education and training and on the normal range of vegetation and wildlife. |
| Vegetation and Forestry | NRCS | Seeding specifications and plant suitability. |
| Livestock | Ag statistics and ag census data | Numbers of livestock. Contact co-op extension in your area (generally associated with universities). |
| | Animal Waste | NRCS: study on animal waste production by county; information on animal waste management. |
| Wildlife | US Fish and Wildlife Service | Technical assistance. Contact the state office. |

| Resource | Agency/Category | Type of Information |
|------------------------------|---------------------------------|---|
| Human Population Statistics | Census Data | Population density, trends, ect. Your local library or use the census internet information. |
| | Chambers of Commerce | Economic trends, employment trends. Contact local Chambers. |
| Pesticide and Fertilizer Use | State Department of Agriculture | Tracks purchases for the state by year. |

Resource Inventory Worksheet (example)

Land User's Name _____ Date: _____

Farm # _____ Tract # _____ Legal Description _____

Field Information:

| Field # | Land Use | Pred. Soil | Slope % | Irrigated | Irr. Scheduling |
|---------|----------|------------|---------|-----------|-----------------|
| (Y/N) | | | | | |

| | | | | | |
|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ |

Cropping System Information:

| Field # | Crop | %Residue* | Terrace/Grade | Contour | Ridge Ht. | UTO/Wways |
|---------|-------|-----------|---------------|---------|-----------|-----------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |

| | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |

*Approx. % Residue at Planting of this crop

Nutrient Use:

| Field # | N lbs applied | P lbs Applied | Pesticides Applied/ Rate | Soil Tests (Y/N) |
|---------|---------------|---------------|--------------------------|------------------|
| _____ | _____ | _____ | _____ | _____ |

| | | | | |
|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |

Pasture and Rangeland Information:

Water Facilities Cross 'N' lbs

Noxious Grass

| Field# | Acres | AUM's | Condition | Type/Location | Fencing Applied | Weeds Mixture |
|--------|-------|-------|-----------|---------------|-----------------|---------------|
|--------|-------|-------|-----------|---------------|-----------------|---------------|

| | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ |

Livestock Information:

Livestock Typ Number Waste Control Facilities Waste Application Nitrog./Phos. Tests

| | | | | |
|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ |

Water Resources Information:

Abandoned

| Well # | Type | Diameter | Use | Capacity | (Y/N) | Acres Irr. | Location |
|--------|------|----------|-----|----------|-------|------------|----------|
|--------|------|----------|-----|----------|-------|------------|----------|

| | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ | _____ | _____ | _____ | _____ |

Gully and Streambank Erosion (Identify and Number on Map):

| Reach | Length | Height | Approx. Yearly Width Increase |
|-------|--------|--------|-------------------------------|
|-------|--------|--------|-------------------------------|

| | | | |
|-------|-------|-------|-------|
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |
| _____ | _____ | _____ | _____ |

Other Resources (Locate on Map):

Wetlands – Type, Lineal, Ponds Cultural Resources – Present (Y/N)

Wildlife Present – Species, Numbers Riparian Areas – Type, Width

Windbreaks/Tree Plantings – Rows, Species, Condition

Wildlife Areas – Acres, Target Species

Comments:

Resource Analysis

The conclusions from analyzing the resource data will give information on the current state of the watershed. The best possible way to make informed natural resource decisions is to gain a complete picture of the elements that make up your specific area of focus. The resource analysis will tell the stakeholders what presents a problem, quantitatively, within their watershed. The resource analysis will help identify any pollutants or other problem areas that may be a cause for concern in the watershed.

Once all of the desired and relevant information within the watershed is obtained it will need to be analyzed. At this point, it will be necessary to contact the technical advisory team and utilize their knowledge. The technical advisory team will create a “summary of findings” document outlining the assessments of the current state of the resource. The team will then help the group identify alternative practices and management techniques that would bring about the desired in the priorities designated by the Steering Council and committees.

*Maintain all of the data, maps, and tables acquired during the resource inventory and summary because they will be inserted into a section of the final management plan.

Formulate Alternatives

Committee Meetings

Once the resource inventory has been completed, your group is now ready to formulate ways to reduce or eliminate negative impacts within the watershed. The Technical Advisory Team will be able to inform each of the committees on most or all of the possible alternatives to the current situation. The Technical Advisory Team also shares with the stakeholders the best alternatives from a technical standpoint. They will base their decision on the most current knowledge of the situation and cost-effectiveness of the alternatives and report their findings to the Steering Council at *Public Meeting #3*.

Each committee recorder or organizer will need to coordinate at least one committee meeting to allow the group time to explore all of the options and alternatives available that are aimed at meeting the goals designated by the group at the beginning of the community based planning process. Each committee should discuss concerns with the alternatives, evaluate the alternatives, and choose the best alternative(s) for their purposes. Be prepared to use part, all, or a combination of alternatives to reach the goals of the committee and ultimately the watershed group. Start by making a list of the alternatives. The concerns and evaluations as well as each committee's preferred alternative, should be recorded for Steering Council and other committee members reference.

Recommendations

Each individual committee is then ready to recommend an alternative to the Steering Council at *Public Meeting #3*. Hopefully, the input from committees, the Technical Advisory Team, and the Steering Council will offer an overall evaluation of the alternatives and preferences of the entire group so that the decision that is best for everyone will be chosen. Sometimes, however, more information or deliberation may be required before a firm decision can be made. In that case the steering council will assign concerns about the evaluations to a committee, to gather additional information.

Public Meeting #3



The Purpose

Public Meeting #3 will occur about five or six months after meeting two. The purpose of this meeting is to present the alternatives from the committees to the Steering Council, the stakeholders, and the public. Open the meeting to comments and questions regarding the alternatives to ensure that the choice is acceptable to a majority.

Getting Ready

- The project manager, with the help of volunteers, need to promote the meeting by posting notices at public arenas, and running public television and radio announcements at least two weeks in advance. For additional promotion ideas refer to the section, *Promoting a Public Meeting*
- It is also necessary to mail out reminders of the meeting and agenda to previous attendees and stakeholders who filled out the mailing list information at the first and second meetings. Do this at least two weeks in advance.
- As with all of the public meetings, the manager should split the tasks for the third meeting between volunteers to make planning less taxing.
- Call to confirm meeting room reservations for the appropriate number of people.
- Find out if any aspect of the presentations or speeches are going to require special equipment (e.g., computer, power point, paper, overhead, or writing utensils.)
- Bring copies of revised agenda to hand out to attendees if necessary.
- Set up facility with chairs and equipment.
- Make sure the roles and times of speaking (during the meeting) are understood by the participants.

- ❑ Appoint someone to introduce the speakers, open the meeting, and close the meeting. Other than the above listed intervals the facilitator will guide the public meetings.
- ❑ The recorder needs to make a record of occurrences at the meeting so minutes can be made available afterward.
- ❑ Gather the information from the last public meeting; include meeting minutes, flip charts, name tags, and notes from the meeting to keep as history until the project is finished.

The Agenda

Design your agenda to execute two tasks; explain to the public the alternatives and the selection process for the alternatives and, presentations by all of the committees on their alternative choice and a short explanation for the choice. Leave time for questions from the public, Stakeholder's Council, technical team, and committees in between each committee presentation.

The Meeting

- ❑ Pass around an attendance sheet so attendees can receive information regarding the plan through phone calls or mail.
- ❑ Begin by discussing with the group the desired outcomes or agenda from third public meeting. This includes an explanation of the alternatives and committee presentation of preferred alternatives and a description of all of the activities that will be accomplished by the end of the meeting.
- ❑ Then the facilitator will review the alternatives by explaining the components of each proposed action. Leave time for questions regarding each alternative.
- ❑ Each committee will then present the Stakeholders Council and the watershed group members with its choice of alternative(s) that would best represent its resource needs. Leave time for discussion after each presentation.
- ❑ At the end of the meeting, be sure to review the place, date, and time of the next meeting so participants can clear that date on their schedule if they want to attend. *VERY IMPORTANT* ⇒ Also, allow time for questions and concerns.
- ❑ Prepare meeting minutes for handout at public meeting four to refresh the memories of the returning group and update new individuals.

Project sponsor choice of Alternatives Included in Community Water Quality Plan

This portion of the planning process will be very simple. The information that has been gathered so far will need to be retrieved and given to the project sponsor for final approval. The person designated by the watershed group to hold and maintain the documents pertaining to the planning process (usually it is the project manager or the recorder) will be responsible for retrieving that information, organizing it, and giving it to the sponsor for evaluation.

As mentioned in the pre-planning activities the sponsor is an authority who is familiar with the rules and regulations that coincide with the watershed group's chosen alternatives. The sponsor's task will be specifically directed toward ensuring the alternative is sound and will not be held up due to unforeseen obstacles in the future plan implementation phase.

The project sponsor will consider each of the alternatives and will review the deliberation that brought the watershed group to their decision. The alternatives are reviewed to ensure that they abide by local and state regulations and that they will work effectively. The watershed group has had significant help throughout the community based process to ensure that the alternatives are sound. The sponsor, however, should always review it for anything that may have been missed during the planning process.

The sponsor will keep the lines of communication open and direct any questions to the technical team liaison or the Stakeholders Council. If alterations to the plan are necessary the Stakeholders Council will work with the sponsor and come to an agreement on changes. The sponsor will be aware of the watershed group's ideas and any glitches pertaining to plan implementation will most likely have already been addressed. There should be no surprises for the Stakeholders or the sponsor regarding the alternatives. The sponsor will take just about a month to look over the alternatives and then the Stakeholders Council will be able to continue to the next step in planning.

Draft Watershed Management Plan

Below is an example of an actual watershed management plan created using the community based approach. Take a look at it before you begin writing yours. It is first in this section because it can provide the best guidance for what elements a management plan should possess. This is a shorter plan than most, lacking the resource inventory information but it has all of the other elements necessary for a management plan. You will notice that most of this information was obtained throughout the planning process (public meetings, committee meetings, etc.) and was reproduced in this management plan for the purposes of communicating it to others.

EXAMPLE MANAGEMENT PLAN USING THE COMMUNITY BASED APPROACH

ISSUES and CONCERNS

“What watershed management issues should be addressed or questions answered now or in the near future as Walnut Creek Lake is developed?” From that point of discussion at the first Walnut Creek Lake Watershed meeting a list of priorities was identified; (this list is not in order of importance).

1. Immediate impact of lake on surrounding farmers.
2. Maintenance of horse trails.
3. Availability of additional cost share to farmers and commercial developers for development of erosion and sediment controls.
4. Regulation of population density as area becomes urbanized.
5. Creation of buffer zones around riparian habitat.
6. Extent of conservation restrictions placed on developers.
7. Extent of restrictions placed on livestock producers in the watershed.
8. Effect of the lake on existing conservation plans.
9. Zoning around the lake.
10. Erosion control.
11. Restrictions on-existing septic-systems.
12. Regulation of water usage.

Input was received from 49 community members representing the following interests: 20 watershed landowners, 13 Sarpy County landowners, 6 anglers, 3 horse club representatives, 3 agency representatives, 2 business owners, 1 farm operator, and 1 school teacher. The additional partnership meetings held throughout the planning process allowed public participation in the remaining planning activities including vision statement development, issue prioritization and qualitative goal setting.

Agricultural Land Management Task Force

Mission Statement

The Walnut Creek Lake Watershed provides lakeside living, recreation and natural open space with a network of farms preserved in the watershed through conservation easements. The lake has been protected as a convenient family-oriented oasis that is beautiful and healthy for people and wildlife.

Issues and concerns re-prioritized by the Agricultural task force included:

1. Provide incentives for Best Management Practices on the land.
2. Immediate impact of lake on surrounding farmers.
3. Extent of conservation restrictions placed on producers in the watershed.
4. Additional safeguards placed upstream to protect the lake from incoming sediments and nutrients.
5. Acceptable soil erosion amount.
6. Addressing ground water quality and pollution.
7. People pollution/dumping.

Urban Transition Task Forces

Mission Statement

The Walnut Creek Lake Watershed is an area that uses sound, comprehensive planning to create an environmentally sensitive, aesthetically pleasing haven while still offering the amenities necessary for a complete, progressive community.

Transition issues and concerns identified:

1. Regulation of population density and land use as area becomes urbanized.
2. Extent of conservation restrictions placed on producers in watershed.
3. Regulation of water usage.
4. Additional safeguards placed upstream to protect the lake from incoming sediments and nutrients.
5. Addressing ground water quality and pollution.
6. Protecting wildlife areas.
7. Restrictions/requirements placed on urban homeowners.
8. Restrictions on existing septic systems

Urban issues and concerns ranked by the Urban Transition Task Force:

1. Regulation of population density as the area becomes urbanized
2. Creation of buffer zones around riparian habitat

3. Extent of conservation restrictions placed on developers
4. Schools and educational activities
5. Erosion control
6. Balance the herbicide and pesticide use in the watershed
7. People pollution/dumping
8. Restrictions/requirements placed on urban homeowners
9. Sanitary and storm sewer connections
10. Changes in flood plain maps
11. Regulations of commercial development

Park Land issues and concerns:

1. Maintenance of horse trails
2. Erosion control
3. Prohibiting motor boating jet skis
4. Protecting wildlife areas.
5. People polluting dumping
6. Paying for maintenance
7. Traffic control access and security

Water Quality Management Goals

The Nebraska Department of Environmental Quality staff in turn developed quantitative goals and objectives based on the visioning, mission development and water quality issues prioritized by the Clean Lakes Council. The goals and objectives were reviewed by the Technical Advisory team and incorporated into the project.

Goal 1: Maintain water clarity to support desired recreational, aquatic, and aesthetic uses.

Objective 1. Maintain the “growing season” median water clarity at or above 28 inches.

Objective 2. Maintain the "growing season" median chlorophyll *a* measurement at or below 23 mg/m³.

Objective 3. Maintain the "growing season" total phosphorus concentration at or below 0.07mg/l.

Objective 4. Maintain the “growing season” total suspended solids concentration at or below 15mg/L.

Goal II: Maintain water quality in Walnut Creek Lake at a level protective of public health for persons pursuing a primary contact recreational use.

Objective 1. Meet state water quality criteria for the protection of recreational use in the lake. [Bacteria of the fecal coliform group shall not exceed a geometric mean of 200 colonies/100 ml, nor equal or exceed 400 colonies/100ml in more than 10 percent of the samples. These criteria are based on a minimum of five samples taken during a 30-day period and are applied to the recreational season of May 1 through September 30.]

Goal III: Maintain in-lake and near-shore aquatic habitat within Walnut Creek Lake that will enhance and fully support the desired in-lake fishery and a diverse wildlife population around the lake.

Objective 1 Maintain the average annual sedimentation rate at less than 0.3 percent of the initial lake volume.

Objective 2 Meet all state water quality criteria for the protection of *Warmwater Class A Aquatic Life*.

Objective 3 Control all significant areas of lake shoreline erosion.

Objective 4 Maintain dissolved oxygen concentration above the state water quality criteria in the upper 75 percent of the water column.

A Community - Based Watershed Management Plan for Walnut Creek Lake and Recreation Area

Sarpy County, Nebraska

Goals and Objectives. The strategy for managing stormwater and achieving the water quality conditions in Walnut Creek Lake will include measures that will at least maintain the present modeled conditions of the lake. The present modeled conditions for the lake indicate that the water quality should not be impaired at this time. The main goal of the management plan is to protect the lake as the land use transitions from agriculture to urban land uses. The strategies are structured to achieve this goal.

Construction (Transition) Sites

A. Management Alternative 1: Prevent construction site erosion and sedimentation.

1. *Action: Allow a maximum of 5 tons/acres-sediment yield from construction sites utilizing best management practices*

In 1998, construction sites comprised less than 1% of the watershed area. However, it is anticipated that in the future urban development will contribute the largest proportion of sediment and phosphorus to the lake of any of the land uses.

This plan allocates half of the allowable sediment load to the construction sites in the watershed and half to the agricultural land in the watershed, or approximately 1210 tons per year for each land use. Therefore, if 240 acres of land is under construction during a given year, 5 tons/acre would be allowed to reach the lake from construction sites. If a proposal would be presented to exceed the 240 acres this would have to be mitigated.

This goal would be achieved through the use of a combination of best management practices (BMPs) which would allow "credits" to the site, depending on the effectiveness of the BMPs in controlling sediment leaving the site. The following lists the percent effectiveness which would be credited to each BMP:

- | | |
|---|-----|
| ● Grass Cover (established) | 98% |
| ● Wet Basin - in place prior to stripping site | 80% |
| ● Basic Sediment Basin - in place prior to stripping site | 40% |
| ● Improved Basin (w/baffles, etc.) - in place prior to stripping site | 50% |
| ● Filter Basin (pipe is wrapped in stone or other filtering material) - in place prior to stripping | 60% |
| ● Filter Strip - 50' wide grass strip along the contour | 30% |

- *Level Terraces* - must be maintained and tied back when construction activities interrupt the terraces 25%
- *Silt Fence* - in place prior to stripping site 10%
- *Seed and Mulch* this credit assumes that: 75%
 - 1) seed and mulch *both* occur, 2) there is a sediment Basin - seed/mulch do not preclude the use of basins 3) the site is open 14 days, maximum and 4) seeding and mulching are accomplished within one week after completion of grading.

* See Appendix for Zorinsky Lake reference study

2. *Action: Implement a demonstration program where developers are provided funding assistance to implement the above construction site policy*

In addition the following two actions will be studied subsequent to completion of the watershed management plan to determine how to best achieve them.

3. *Action: Require grading permit/controls to reduce sediment from construction grading projects of less than 5 acres.* Currently permits are only required for grading areas over five acres. There are no erosion and sediment controls required for smaller grading and construction projects. As a result, sediment from individual home or small commercial projects are not required to install sediment and erosion control measures. In the Walnut Creek Lake watershed it is recommended that this policy be revised to incorporate the following requirements:

- Require grading permits for all grading projects over .5 acres in size.
- Require silt fencing and rock construction access route as a minimal control on grading and construction projects of less than .5 acres.

4. *Action: Provide inspection for construction and maintenance of erosion and sediment controls.* Although there is currently some self-inspection occurring, there is little agency regulation and enforcement being implemented. Policies should be reviewed and a strategy for implementing inspection and enforcement of erosion and sediment controls. Special funding should be sought to fund enforcement activities.

Stormwater Management of Large Storm Events and Agricultural Land Use Areas

B. *Management Alternative: Reduce sediment and phosphorus loading to Walnut Creek Lake resulting from large storm events.*

Construction site measures are not sufficient to protect the lake from sedimentation resulting from larger storm events (greater than 10-year storms). It is necessary to

construct larger scale structures to retain this stormwater long enough to allow sediments and pollutants to settle out before continuing downstream to the lake.

1. *Action: Construct a system of grade and sediment control structures.* This system of basins would be formed by construction of dams on the watershed's major tributaries. The basins would range in size from (20 to 40) surface acres, located on land which is currently in agricultural production. The land for the basins would be leased or utilized with the voluntary collaboration of affected landowners. The six recommended sediment control structures and basin sites are shown in Figure 8. Exact locations of the basins are preliminary and may be adjusted based on response of the affected landowners.

C. *Management Alternative: Implement additional erosion and sediment control treatments on agricultural land*

Although agricultural land uses are not yielding the pollutants per acre that can be produced by construction sites, they are still contributing significant amounts of sediments to the lake. It is therefore necessary to reduce these amounts in order to achieve the partnership's water quality goals for the lake.

1. *Action: Construct filter strips.* To preserve existing riparian corridors, this action consists of constructing or preserving 100 wide vegetative filter strips on either side of the streambeds. By installing this additional means of filtering water, the quality of the water entering the stream from adjacent agricultural fields would be improved and the volume and velocity of the water would be decreased. The result would be improved quality of the water which enters the tributary basins and less streambank erosion in the upper reaches of the watershed. Filter strips would be implemented on private property by willing landowners, potentially as part of an agricultural cost-share program.

2. *Action: Increase percentage of cropland that is treated with agricultural conservation practices.* Currently, approximately 85% of the cropland in the watershed is treated with erosion and sediment control measures, such as terraces, diversions, grassed channels, basins and grade stabilization structures. Though this is a relatively high percentage, agricultural producers in the watershed should strive to increase this percentage to 100% treated land. (See cost estimates for land treatments in Table M.)

3. *Action: Target Subwatershed 2 for reduction of sedimentation from agricultural lands.*

Table M. **AG. LAND MGT. TASK FORCE LAND
TREATMENT NEEDS**

| BEST MANAGEMENT PRACTICES | EXTENT NEEDED | COST/UNIT | TOTAL COST |
|---------------------------|---------------|-------------|------------|
| Conservation Tillage | 480 Acres | \$ 12/Ac | \$17,280* |
| Crop Residue Use | 80 Acres | \$ 5/Ac | \$1,200* |
| Filter Strips | 20 Acres | \$ 150/1/Ac | \$9,000* |
| Integrated Crop Mgmt | 1,200 Acres | \$ 7/Ac | \$25,200* |
| Livestock Exclusion | 20 Acres | \$ 7/Ac | \$420* |
| Terraces | 47,750 ft | \$.70/ft | \$33,425 |
| Grassed Waterways | 12,700 ft | \$.65/ft | \$8,255 |
| Underground Outlets | 6,800 ft | \$ 3.7/ft | \$25,160 |
| Tree Planting | 10 Acres | \$.60/ea | \$2,400 |

* Maximum 3 yr. Payment

/1/ = Amount Different than Task Force's recommendation

Stream and Lake Practices

D. *Management Alternative: Reduce erosion and sedimentation of major tributaries in the watershed.*

1. *Action: Preserve and maintain the existing riparian corridor.* This would consist of preserving a pre-determined width of land, or corridor, on either side of a stream tributary. Preserving and maintaining these corridors would provide a buffer between agricultural/urban land uses and the streams which would not only reduce streambank erosion, but would serve to filter pollutants and sediments from stormwater prior to its entering the stream. In addition to improving the water quality, benefits include preserving habitat for wildlife in the watershed and providing potential pedestrian connections between future development and the public use areas surrounding the lake. Preserving and maintaining the existing corridor could be accomplished through conservation easements, a conservation reserve program or by land acquisition by a public agency.

E. *Management Alternative: control shoreline erosion and encourage biodiversity in the lake and its surrounds.* This management alternative can incorporate a number of the actions already discussed which are not only beneficial from an improved water quality standpoint, but which have the added benefits of providing habitat for wildlife in the watershed. Preserving the riparian corridor, constructing tributary sediment basins and installing vegetative streambank practices.

Information, Education And Volunteer Activities

Ideas for information and education programs are grouped under management alternatives emphasizing specific goals.

F. *Management Alternative: Provide education and information programs which strive to protect and improve water quality.*

1. *Action: Sponsor program to educate lawn care services on the application of chemicals and pesticides to minimize impact on water quality; list those who go through training in neighborhood newsletters.*

2. *Action: Sponsor program to educate homeowners on the application of chemicals and pesticides to minimize impact on water quality*

3. *Action: Provide soil testing program to assist in making fertilizer application recommendations.*

4. *Actions: Conduct stenciling project on drain inlets to inform residents that anything they wash down the drain ends up in the lake.*

5. *Action: Sponsor landscape design program for homeowners to present landscaping ideas with plants that require low water and chemical usage; have demonstration landscape(s) at residence(s) in the watershed*

6. *Action: Organize a water festival to celebrate the watershed management plan and to involve and educate more people in the lake's water quality issues.*

7. *Action: Include inserts in area neighborhood association newsletters which keep the residents informed of the watershed management plan status, upcoming programs, projects which are implemented through the plan, and other lake water quality information and education topics.*

G. *Management Alternative: Provide ways for residents and other citizens to improve the recreational experience of the lake and its surrounds.*

- 1.** *Action: Sponsor lake clean-up days.*
- 2.** *Action: Provide program targeted to fishermen on responsible fishing habits.*
- 3.** *Action: Educate area homeowners association as to the governmental mechanisms available for protecting the lake's water quality*
- 4.** *Action: Review recreational uses and where they occur around the lake; changes in certain use patterns may reduce erosion and help minimize water quality impacts.*
- 5.** *Action: Provide trash receptacles in more strategic locations to reduce amount of trash that ends up in the lake.*
- 6.** *Action: Provide educational programs for developers and contractors regarding design and construction methods which will result in improved water quality.*

H. *Management Alternative: Implement water quality monitoring program*

- 1.** *Action: Involve interested residents and schools in the ongoing monitoring of the lake's water quality to educate them on lake water quality concerns and highlight successful watershed projects.*

Public Meeting #4



The Purpose

The purpose of the fourth public meeting is to present the Draft Management Plan to the agencies and to the sponsor with the public present. It will be the responsibility of the Stakeholders Council to invite the agencies pertaining to the plan. The technical team liaison should be contacted for help on specific agency names that should attend.

Getting Ready

- The project manager, with the help of other watershed group members, needs to promote the meeting by public notices and public television and radio announcements at least two weeks in advance.
- It is also necessary to mail out reminders of the meeting and agenda to previous attendees and stakeholders who filled out the mailing information at the previous meetings. Do this at least two weeks in advance.
- Don't forget to contact and invite, by mail or phone, the specific agency representatives and the project sponsor so they can attend.
- As with the other public meetings, the manager should split the tasks for the fourth meeting between volunteers to make planning less taxing.
- Call to confirm meeting room reservations for the appropriate number of people.
- Find out if any aspect of the presentations or speeches are going to require special equipment (e.g., computer, Power Point, paper, overhead, or writing utensils.)
- Set up facility with chairs and any necessary equipment for the presentations.
- Make sure the roles and times of speaking (during the meeting) are organized.
- The recorder needs to make a record of occurrences at the meeting so minutes can be made available afterward.

- ❑ The recorder should bring the information from the last public meeting; include meeting minutes, flip charts, name tags, and brainstorming notes from the meeting to keep as history until the project is finished.

The Agenda

This is a celebratory meeting because so much of the work has already been accomplished. Actual implementation of the plan will be rewarding by experiencing the improved condition and usability of your local watershed area, seeing the goals of your group initiative in action. Design the agenda to take care of business and then allow some time for fun. Make sure new attendees are introduced by the facilitator or project manager.

The Meeting

- ❑ Pass around an attendance sheet so attendees can receive information regarding the plan through phone calls or mail.
- ❑ Begin by discussing with the group the desired outcomes or agenda from the fourth public meeting and introduce the agency representatives and project sponsor in attendance.
- ❑ The Stakeholders Council will then present the Draft Watershed Management Plan to the attending agencies and project sponsor. Leave time for discussion, questions, and concerns after the presentations.
- ❑ The recorder should prepare meeting minutes for use in the Final Draft management plan.

Final Management Plan With Changes Accepted



This is the outline for the final management plan to be presented to your funding source for final approval. This plan is going to be written by the project sponsor. All of the accepted recommended changes, made by the stakeholders, the technical team, the project sponsor, the stakeholder's council, and anyone else involved will be included in the Final Draft, as well as the information gathered by your watershed group throughout the planning process. Below is an outline detailing the order of the information in the Final Draft. The specific order, shown below, of the Final Draft will help the environmental agency in your state or your funding source process the management plan in the most efficient way possible. Your watershed group should have all of this information from the planning process. The watershed group sponsor will follow this outline and compile the information into one uniform document.

Cover

Vision Statement:

Identifies the goals, objectives, and actions within the watershed.

A description of specific water quality problem(s) addressed in the plan.

The description should include both point and nonpoint sources of pollution, ground water's influence on stream hydrology and quality (nitrates, bacteria). Describe any ground water or wellhead protection area(s) within the watershed. Also, describe surface water quality (nitrates, bacteria).

Foreward:

The foreward should include an explanation of the sponsor, the initiation of the project, a short summary of the final plan, actions, and implementation. The foreward should also include a list of the Council and other contributors to the project and a paragraph summarizing the public input and outcome process. Include a summary of the community based planning process, the organizational structure of the community based planning process (the diagram on page 27 explains it well), the actions of committees and the meetings of the committees, and the operations leading up to the plan. Summarize the public meeting attendance and all public input as well. Summarize the role of the technical advisory committee and its members. Also, include a description of the partnerships and the roles of the agencies involved.

Introduction:

Provide a general description of the targeted watershed and lake (if applicable). Include maps and any other description that will be helpful in identifying or understanding the area. This section should be a written out resource inventory describing the different characteristics specific to your watershed.

Include all of these factors to describe the lake within the watershed (only do this portion if there is a lake in the area definition described in the *pre-planning activities*):

A lake description (if applicable), the legal name, the location, the major and minor river basin associated with the watershed, the NDEQ identifier (found in title 117 in Nebraska), the hydrologic Unit Code (an 11 digit # established by USGS found on their website), the physical characteristics (e.g., morphology, storage capacity, hydrology, retention time, stratification), the existing and anticipated uses (fishing, power boating, swimming, etc.), and the history of the lake.

Include all of these factors to describe the watershed:

Size of the watershed (not the size of the defined area), topographic characteristics, geology, soil types, climate, land uses (to include descriptions of point source discharges), existing land treatment, wetland resources, appropriate maps (location, stream network, watershed layout, etc.), cultural resources, history, threatened and endangered species list, population distribution and general population characteristics such as percentage rural and percentage urban

Resources Inventory Section

This section should include: data, maps, and tables to provide a quantitative explanation of the watershed.

Current Water Quality/Resource Conditions:

Discuss the monitoring and assessment activities that have been completed in the watershed including the process that was used to determine impairment or anticipated impairment. Include a description of completed monitoring and assessment activities (e.g. ambient monitoring, runoff monitoring, and modeling, and wildlife.) Provide a general description of the current and problematic water quality conditions and any other water quality concerns that may not be a focus of this plan, including current ground water, surface water, and ground water/surface water interaction (if applicable) conditions.

Pollutant Loading and Pollutant Source Quantification:

Pollutant loading information will only pertain to the pollutant(s) of concern or closely related pollutants such as sediment and phosphorus. Source quantification will only pertain to the source(s) of the pollutant(s) of concern. Source quantification will include all relevant point and nonpoint sources. Loads should be reported in the most appropriate timeframe(s). Include daily load by source, event based load by source annual or average annual load by source in the description.

Water Quality Goals:

Water quality goals will pertain to the pollutant(s) of concern or closely related pollutants such as sediment and phosphorus. The water quality goals will, at a minimum, be based on water quality standards and other applicable criteria. In some cases more aggressive goals may be established. Include desired endpoint and pollutant loading capacities and the margin of safety.

Pollutant Source Reduction Goals:

For each pollutant of concern, quantify the loading reduction needed to meet the desired water quality standards. Also provide a discussion of what sources should be targeted for reductions. Include the source reduction required to meet the water quality goals and sources targeted for the Watershed Management Action Strategy

Lake Management Strategy (optional):

Discuss the approach to be taken for managing the lake. Include all topics on which the management plan seeks to take action. For example, an action could be managing the fisheries, and the paragraph should also explain habitat development, stocking, access, funding sources, timeframe, and any other way to achieve management of the fisheries.

Another action may be maintaining water quality and the paragraph should include an explanation of the events aimed toward accomplishing that action such as periodic shoreline stabilization, water level manipulation, sediment basin dredging, funding sources, and timeframe.

Watershed Management Action Strategy:

Discuss the approach to be taken for implementing land treatment or other control measures. The discussion is to include a specific description of the targeted treatment areas or facilities, the type(s) of treatments or controls proposed, and the expected benefits of the treatments or controls in relation to the established water quality goals. The action plan should include a description of priority treatment areas/facilities and a treatment/control implementation approach. Include these factors when describing the implementation approach: Cost-share assistance, land owner contact(s), anticipated pollutant reduction/treatment benefits, funding needs, funding sources, and a time frame

Partnerships:

Discuss the entities that participated in the development of the WMP and the entities that will be responsible for implementing the Watershed management action strategy found in section I. Include parties/agencies responsible for monitoring and assessment, parties/agencies responsible for source reductions, agencies that administer applicable funding sources, and watershed stakeholders.

Management Effectiveness Evaluations:

Describe any monitoring and evaluation activities that are needed to refine the problem or assess the progress towards achieving water quality goals. Monitoring required to clarify/refine the water quality problems and sources should be done following a quality assurance monitoring project plan that contains concise goals and objectives, specific milestones, and a firm end date.

Also include future monitoring needs and goals, assessment methods, responsible parties, funding needs and sources, a time frame for completing evaluations and updating action strategies, and an implementation checklist with major activities and target dates.

Appendix-TMDL summary

This section should describe the pollutant of concern, the pollutant sources, pollutant load (quantitative), the water quality target, the necessary loading reduction, the margin of safety, and the implementation plan summary with the targeted treatment activities and estimated loading reduction.

Application of Plan

This section should outline how the watershed group plans to evaluate outcomes and success of the plan. The Council and technical team's responsibility in the application of the plan should also be outlined. Finally, this section should include methods of measurement that show if the management objectives are being reached.

**APPENDIX A. BEST MANAGEMENT PRACTICES (BMPs) TO
ADDRESS IDENTIFIED NONPOINT SOURCE WATER QUALITY
CONCERNS**

(As Identified in the State of Nebraska's Section 208 Water Quality Management Plan prepared
by the Nebraska Natural Resources Commission July, 1979)

**APPENDIX A.1 BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL
NONPOINT SOURCE POLLUTION ATTRIBUTED TO
AGRICULTURAL RUNOFF.**

DISCUSSION

Sediment is the primary NPS pollutant related to agricultural runoff. Through the physical process of water erosion, soil particles are dislodged and transported by water with a fraction of the particles reaching surface waters and being subsequently identified as sediment. Sediment also acts as a transporting medium for pesticides and fertilizer nutrients that become attached to the soil particles.

BMPs to control NPS pollution are the most practical and effective measure or combination of measures which, when applied to the agricultural management unit, will prevent or reduce the generation of pollutants to a level compatible with water quality goals. They often enhance the productivity of the soils as well as control pollution and add to the aesthetic value of the area. Because of the variability in production methods, crops and animals, soil types, topography, climate etc., the BMPs for any specific agricultural management unit may vary. The selection of BMPs for a particular agricultural management unit or area is a complex process. Any measure or combination of measures applied to an agricultural management unit or area that will achieve water quality goals is a potential BMP. However, the measures are generally the type that are incorporated into a soil and water conservation plan as developed by a landowner or land user with the assistance of a NRD and the NRCS. The principal emphasis should be placed on measures that will prevent or control the runoff or seepage of pollutants from crop or animal production management units. Preventive measures must be fully integrated into the total production management system of the farm or ranch unit. The soils, nutrients, and pesticides should be kept on the land where they perform their intended agricultural function.

The list of technical measures that may be the BMPs to control agricultural runoff is extensive and is shown below. In general, these measures act to prevent soil particles from being dislodged or to reduce the velocity of movement of the runoff. In addition to these benefits nonstructural measures also minimize the amount of agricultural chemicals available for transport.

BEST MANAGEMENT PRACTICES

Structural Measures

| | | |
|-------------------------------|---|-----------------------------|
| Access Road | Irrigation Pit | Streambank Protection |
| Dam, Floodwater Retarding | Irrigation Storage Reservoir | Structure for Water Control |
| Dam, Multiple-Purpose | Irrigation Water Conveyance, Ditch and Canal Lining | Terrace |
| Diversion | Irrigation Water Conveyance, Pipeline | Tree Planting |
| Fencing | Lined Waterway or Outlet | Waste Storage Pond |
| Floodwater Diversion | Open Channel | Waste Storage Structure |
| Grade Stabilization Structure | Pond | Waste Treatment Lagoon |
| Grassed Waterway or Outlet | Regulating Reservoir | Waterspreading |
| Irrigation Field Ditch | Sediment Basin | Well |
| Irrigation Land Leveling | Spring Development | |

Nonstructural Measures

| | | |
|------------------------------|---|-----------------------------|
| Brush Management | Grasses and Legumes in Rotation | Recreation Area Improvement |
| Conservation Cropping System | Grazing Land Mechanical Treatment | Stripcropping, Contour |
| Conservation Tillage System | Irrigation System, Drip | Stripcropping, Field |
| Contour Farming | Irrigation System, Sprinkler | Stripcropping, Wind |
| Cover and Green Manure Crop | Irrigation System, Surface and Subsurface | Stubble Mulching |
| Critical Area Planting | Irrigation System, Tailwater Recovery | Vegetated Filter Strip |
| Crop Residue Use | Irrigation Water Management | Waste Management System |
| Deferred Grazing | Livestock Exclusion | Waste Utilization |
| Emergency Tillage | Minimum Tillage | Wildlife Upland Habitat |
| Farmstead and Feedlot | Mulching | Management |
| Windbreak | Pasture and Hayland Management | Wildlife Wetland Habitat |
| Field Border | Pasture and Hayland Planting | Management |
| Field Windbreak | Planned Grazing Systems | Windbreak Renovation |
| Firebreak | Proper Grazing Use | |
| | Range Seeding | |

APPENDIX A.2. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO THE LEACHING OF NITRATES, PESTICIDES, AND OTHER CHEMICALS INTO GROUNDWATER.

DISCUSSION

As water moves through the soil profile, it dissolves water soluble chemicals. These chemicals, including salts, nutrients, and pesticides, can be carried to the ground water and cause contamination making it unsuitable for its intended uses. Of particular concern is the presence of nitrates in ground water utilized for drinking water.

The list of technical measures that individually or in combination may be the BMPs to control the leaching of chemicals into ground water is given below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. These measures are structural and nonstructural in nature. The structural measures include those designed to minimize the movement of chemicals below the surface by constructing an impervious layer on the surface. Nonstructural measures include those practices to manage and reduce the use of agricultural chemicals and irrigation water resulting in a minimum quantity of chemicals leaching to ground water.

BEST MANAGEMENT PRACTICES

Structural Measures

Irrigation Land Leveling
Irrigation Pit
Irrigation System, Tailwater Recovery
Irrigation Water Conveyance, Ditch or Canal Lining

Irrigation Water Conveyance, pipeline
Lined Waterway or Outlet
Pond Sealing or Lining
Regulating Reservoir
Subsurface Drain

Nonstructural Measures

Grasses and Legumes in Rotation
Irrigation Water Management (Includes Irrigation Scheduling)
Optimization of Chemicals Applied
Plowing Under Green Legume Crops

Use of Alternative Pest Control Methods
Fertilizer Management (Includes Use of Animal Wastes for Fertilizer)
Use of Chemical Release Inhibitors
Use of Winter Cover Crops

APPENDIX A.3. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO ROADSIDE EROSION.

DISCUSSION

The major pollutant stemming from roadside erosion is sediment. Through the physical process of water erosion, soil particles are dislodged and transported by water with some of the particles reaching bodies of water. Roadside erosion is accelerated by removing the ground cover for maintenance or construction or by cultivation. The list of technical measures that individually or in combination may be the best management practices to control roadside erosion is shown below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. In general, structural measures act to prevent soil particles from being dislodged, to reduce the velocity of runoff, or to trap sediment. Nonstructural measures primarily serve to establish and maintain vegetative growth which reduces erosion potential and filters sediment-laden runoff.

BEST MANAGEMENT PRACTICES

Structural Measures

Fencing
Grade Stabilization Structure
Structure Lined Waterway or Outlet

Sediment Basin
Water Control

Nonstructural Measures

Critical Area Planting (Roadside Seeding)
Field Border
Livestock Exclusion
Mulching

Proper Fertilization
Proper Pesticide Application
Proper Road Design

APPENDIX A.4. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO STREAMBANK EROSION.

DISCUSSION

Streambank erosion is a natural process which is often accelerated by clearing protective cover from banks or by channel straightening or realignment. Soil particles dislodged from the streambank become sediment in the stream. This sediment can cover the bottom of the stream interfering with feeding and reproduction of aquatic organisms. The sediment can cause a scouring effect which can damage aquatic organisms existing on the stream bottom. The sediment can also reduce light penetration into the stream, thereby disrupting the photosynthetic process reducing vegetative and oxygen production. Other impacts due to sedimentation include loss of reservoir capacity, reduced recreation demand, increased drainage maintenance costs, and reduced capacity of waterways.

The list of technical measures that individually or in combination may be the best management practices to control irrigation return flows is shown below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. Structural measures include those aimed at preventing the undermining of streambanks and sloughing of soil into the stream. Nonstructural measures act to stabilize the streambank by protecting the vegetation on the bank.

BEST MANAGEMENT PRACTICES

Structural Measures

Clearing and Snagging
Dam, Diversion, Dam, Multiple-Purpose
Floodwater Diversion
Grade Stabilization Structure
Grassed Waterway or Outlet
Open Channel

Stream Channel Stabilization
Streambank Protection
Structure For Water Control

Nonstructural Measures

Critical Area Planting
Mulching

Vegetative Filter Strip
Wildlife Upland Habitat Management

APPENDIX A.5. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO IRRIGATION RETURN FLOWS.

DISCUSSION

Irrigation return flows include water diverted from a stream to irrigate cropland that returns to a stream or seeps to the ground water aquifer and excess well irrigation water that flows to a stream or seeps into the ground water aquifer. Salts, nutrients, pesticides, sediment, bacteria, and floating debris may be contained in surface return flows in greater concentrations than the original water supply. These materials can affect surface water usage in many ways. Drainage water that moves through the soil profile may contain higher concentrations of salts and nutrients and pesticides than in the original water supply. It should be pointed out, however, that irrigation return flows have become an expected water source for some uses. The list of technical measures that individually or in combination may be the best management practices to control irrigation return flows is shown below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. These measures reduce the use of materials that may become pollutants or restrict the movement of the pollutants.

BEST MANAGEMENT PRACTICES

Structural Measures

| | |
|---|---|
| Diversions | Irrigation Water Conveyance, Ditch and Canal Lining |
| Irrigation Canal or Lateral | Irrigation Water Conveyance, Pipeline |
| Irrigation Field Ditch | Irrigation Water Management |
| Irrigation Land Leveling | Lined Waterway or Outlet |
| Irrigation Pit | Open Channel |
| Irrigation Storage Reservoir | Regulating Reservoir |
| Irrigation System, Drip | Sediment Basin |
| Irrigation System, Sprinkler | Structure for Water Control |
| Irrigation System, Surface and Subsurface | Terrace |
| Irrigation System, Tailwater Recovery | |

Nonstructural Measures

| | |
|------------------------------|--------------------------------|
| Conservation Cropping System | Minimum Tillage |
| Conservation Tillage System | Pasture and Hayland Management |
| Crop Residue Use | Proper Fertilization |
| Field Border | Proper Pesticide Application |

APPENDIX A.6. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO CONSTRUCTION SITE RUNOFF.

DISCUSSION

The major NPS pollutant stemming from construction site runoff is sediment. Through the physical process of water erosion, soil particles are dislodged and transported by water with a fraction of the particles reaching streams, lakes, and other surface waters and deposited as sediment. The list of technical measures that individually or in combination may be the BMPs to control construction site runoff are listed below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. In general, these measures act to prevent soil particles from being dislodged, transported, and deposited in surface waters. Structural measures are primarily designed to reduce the velocity of sediment particles and allow for them to settle out. Nonstructural measures serve to maintain vegetative growth which reduces erosion potential and filters sediment laden runoff.

BEST MANAGEMENT PRACTICES

Structural Measures

| | |
|--------------------|-----------------------------|
| Check Dam | Interceptor Dike |
| Chutes/Flumes | Level Spreader |
| Diversion Dike | Sandbag Sediment Barriers |
| Erosion Check | Sectional Downdrain |
| Filter Berm | Sediment Retention Basins |
| Flexible Downdrain | Straw Bale Sediment Barrier |
| Gabions | |

Nonstructural Measures

| | |
|------------------------------------|-------------------------|
| Chemical Mulch | Mulch Blankets |
| Chemical Mulch Tack | Netting |
| Chemical Temporary Soil Stabilizer | Seeding |
| Excelsior Blanket | Straw or Hay |
| Grassed Waterway or Outlet | Vegetative Filter Strip |
| Fiber Glass Matting | Woodchips |
| Jute Netting | Wood Fiber Mulch |
| Liquid Asphalt | |

APPENDIX A.7. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO URBAN RUNOFF.

DISCUSSION

Runoff leaving developed residential, commercial, and industrial areas carries with it, among other things, sediment, fertilizer nutrients, pesticides, heavy metals, and oils. The list of technical measures that individually or in combination may be the BMPs to control urban runoff is given below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. The measures reduce the amount of runoff reaching surface water or limit the pollutant load carried by urban runoff to surface waters. Structural measures are designed primarily to retain urban runoff and prevent urban runoff pollutants from reaching surface waters. Nonstructural measures include those that limit the amount of pollutants that come in contact with runoff.

BEST MANAGEMENT PRACTICES

Structural Measures

- | | |
|-------------------------------|-----------------------|
| Benches and Berms | Open Channel |
| Dam, Multiple-Purpose | Parking Lot Ponding |
| Diversion | Pond |
| Floodwater Diversion | Porous Pavement |
| Grade Stabilization Structure | Rooftop Ponding |
| Grassed Outlet | Sediment Basin |
| Infiltration System | Storm Sewer |
| Lined Waterway or Outlet | Streambank Protection |

Nonstructural Measures

- | | |
|--|---|
| Anti-Litter Practices | Optimizing the Use of Fertilizers and Pesticides in Urban Areas |
| Cleaning of Catch Basins | Proper Open Storage |
| Contour Development | Street Cleaning |
| Critical Area Planting Heavy Use Area Protection | Salt Substitution for Deicing Streets |
| Mulching | Vegetative Filter Strips |

APPENDIX A.8. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO RESIDUAL WASTE DISPOSAL SITE CONTAMINATION OF SURFACE AND GROUND WATER AND LAND APPLICATION OF WASTEWATER EFFLUENT AND SLUDGE.

DISCUSSION

Considerable quantities of sludge are produced by conventional wastewater treatment. The sludge is normally buried in landfills or spread on agricultural land or incinerated. Wastewater effluent is also land applied. Land application of sludge or effluent if done properly is not only an environmentally sound method of disposal, but also a method of resource recovery. Surface and ground water quality problems can result if the site is not carefully selected, if the rate of application is too great, or if the waste is not properly incorporated into the soil. The pollutants of concern include organic material, nutrients, bacteria, and heavy metals in sludge and suspended solids, bacteria, and biochemical oxygen demand in effluent. Another environmentally sound method for recovery of this resource is composting, which results in a stable material with qualities similar to black dirt. An excellent soil amendment, it is also used in reclaiming strip-mined areas, as landfill cover, and when simply disposed of in a landfill it does not create problems that sludge-slurries can.

The list of technical measures that individually or in combination may be the best management practices to control residual waste disposal site contamination of surface and ground water is shown below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. Measures applying to pollutant runoff are primarily structural in nature and are designed to reduce the velocity of movement of the sediment particles and attached pollutants. With velocity reduction, suspended particles will settle out. Measures to deal with leachate are primarily nonstructural in nature and are designed to prevent pollutants from leaving the surface and moving through the soil profile to the ground water.

BEST MANAGEMENT PRACTICES

Structural Measures

| | | |
|-------------------------------|--|-----------------------------|
| Access Road | Irrigation Pit | Sediment Basin |
| Dam, Floodwater Retarding | Irrigation Storage Reservoir | Streambank Protection |
| Dam, Multiple-Purpose | Irrigation Water Conveyance, Ditch/Canal | Structure For Water Control |
| Diversion | Irrigation Water Conveyance, Pipeline | Terrace |
| Fencing | Lined Waterway or Outlet | Tree Planting |
| Floodwater Diversion | Open Channel | Waste Storage Pond |
| Grade Stabilization Structure | Pond | Waste Storage Structure |
| Grassed Waterway or Outlet | Regulation Reservoir | Waste Treatment Lagoon |
| Irrigation Field Ditch | | |
| Irrigation Land Leveling | | |

Nonstructural Measures

| | | |
|------------------------------|---|-----------------------------------|
| Brush Management | Field Windbreak | Mulching |
| Composting | Firebreak | Pasture and Hayland Management |
| Conservation Cropping System | Grasses and Legumes In Rotation | Pasture and Hayland Planting |
| Conservation Tillage System | Grazing Land Mechanical Treatment | Proper Grazing Use |
| Contour Farming | Incorporation Into The Soil | Range Seeding |
| Cover and Green Manure Crop | Irrigation System, Drip | Reclamation Of Surface Mined Land |
| Critical Area Planting | Irrigation System, Sprinkler | Recreation Area Improvement |
| Crop Residue Use | Irrigation System, Surface and Subsurface | Residual Waste Application Mgmt. |
| Deferred Grazing | Irrigation System, Tailwater Recovery | Soil Tests |
| Emergency Tillage | Irrigation Water Management | Stripcropping, Contour |
| Farmstead and Feedlot | Lab Analysis Of Waste | Stripcropping, Field |
| Windbreak | Livestock Exclusion | Stripcropping, Wind |
| Field Border | Minimum Tillage | |

Stubble Mulching
Toxic Salt Reduction
Vegetated Filter Strip

Waste Management System
Waste Utilization
Wildlife Upland Habitat Management

Wildlife Wetland Habitat Mgmt.
Windbreak Renovation

APPENDIX A.9. BEST MANAGEMENT PRACTICES (BMPs) TO CONTROL NONPOINT SOURCE POLLUTION ATTRIBUTED TO FEEDLOT RUNOFF.

DISCUSSION

Manure produced by domestic animals in feedlots is characterized by large quantities of organic material, nitrogen compounds, phosphorus, and coliform bacteria. Uncontrolled, these pollutants can be carried with runoff from rain or snowmelt and reach surface waters. The list of technical measures that individually or in combination may be the BMPs to control feedlot runoff is given below. The proper combination of practices to solve a problem is not known until on-site planning is completed by a trained technician. These measures can be divided between structural and nonstructural measures. Structural measures are designed primarily to retain feedlot runoff and prevent pollutants from reaching surface waters. Nonstructural measures include those that limit the amount of pollutants that come in contact with runoff.

BEST MANAGEMENT PRACTICES

Structural Measures

Diversion
Fencing
Grade Stabilization Structure
Grassed Waterway or Outlet
Lined Waterway or Outlet
Open Channel

Sediment Basin
Subsurface Drain Terrace
Waste Storage Pond
Waste Storage Structure
Waste Treatment Lagoon

Nonstructural Measures

Critical Area Planting
Vegetated Filter Strip

Waste Management System
Waste Utilization

APPENDIX B

KEY TO ABBREVIATIONS

| | |
|-------|---|
| BMP | Best Management Practice |
| CBA | Community Based Approach |
| CE | Cooperative Extension |
| EPA | US Environmental Protection Agency |
| FWS | US Fish and Wildlife Service (USDI) |
| GWMA | Ground Water Management Area |
| GWMP | Ground Water Management Plan |
| NPDES | Nation Pollutant Discharge Elimination System |
| NPS | Nonpoint Source |
| NRD | Natural Resources District |
| USBR | US Bureau of Reclamation (USDI) |
| USDA | US Department of Agriculture |
| USDI | US Department of Interior |
| USFS | US Forest Service (USDA) |
| USGS | US Geological Survey (USDI) |
| WHP | Wellhead Protection |
| WHPA | Wellhead Protection Area |

References

Hammond, J., S., Keeney, L., R., and Raiffa, H. ©2000. Smart Choices: A Practical Guide to Making Better Decisions. Heldref Publications. Boston, Massachusetts.

Indiana Department of Environmental Management, Watershed Management. ©1998. Watershed Action Guide for Indiana. Indiana.

McLain and Magnuson. ©1998. Conservation of Aquatic Resources.

Miller Jr., G., Tyler. ©1998. Living In the Environment: Principles, Connections, and Solutions. Wadsworth Publishing Company, A Division of International Thomson Publishing Inc. United States.

Nebraska Department of Environmental Quality (NDEQ). ©2000. Nebraska Nonpoint Source Management Program. Nebraska.

Ruete, S., Edward. ©2000. Facilitation 101. Newton Lower Falls, Massachusetts.

Schueler, R., Thomas and Holland, K., Heather. ©2000. The Practice of Watershed Protection. Center for Watershed Protection. Ellicott City, Maryland.

The Groundwater Foundation. ©2000 (reprinted). Drinking Water Source Assessment and Protection. Lincoln, Nebraska.

United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS). ©1999. The Resource Planning Guidebook. Illinois.

UWEX-LAKES PROGRAM. ©1995. Lake Leaders Handbook. University of Wisconsin.

www.ctic.purdue.edu/KYW/Process/HowToStart.html. ©2000. Know Your Watershed. West Lafayette, Indiana.