Conclusions and recommendations

End material

Following are some guidelines for these parts.

ver/Title Page

mal reports are usually bound, often with a cover used for all reports in the writer's anization. Because the cover is the first item seen by the reader, it should be attractive l informative. It usually contains the same four pieces of information mentioned in the owing list with regard to the title page.

Inside the cover is the title page, which should include the following four pieces of in- mation:

Project title (exactly as it appears on the letter/memo of transmittal)

Your client's name ("Prepared for...")

Your name and/or the name of your organization ("Prepared by...")

Date of submission

To make your title page or cover distinctive, you might want to place a simple illustra- on it; however, do not clutter the page. Use a visual only if it reinforces a main point d if it can be done simply and tastefully, as in Figure 7–2.

etter/Memo of Transmittal

etters or memos of transmittal give the readers a taste of what is ahead. If your formal port is to readers outside your own organization, write a letter of transmittal. If it is to aders inside your organization, write a memo of transmittal.

> Transmittal Guideline 1: Place the Letter/Memo Immediately after the Title Page

his placement means that the letter/memo is bound with the document, to keep it from ecoming separated.

> Transmittal Guideline 2: Include a Major Point from Report

Readers are heavily influenced by what they read first in reports. Therefore, take advan- age of the position of this section by including a major finding, conclusion, or recommen- ation from the report—besides supplying necessary transmittal information.

>> Transmittal Guideline 3: Acknowledge Those Who Helped You

Recognizing those who have been particularly helpful with your project gives them ecognition and identifies you as a team player. It reflects well on you and on your organization.

>> Transmittal Guideline 4: Follow Letter and Memo Conventions

Like other letters and memos, letters and memos of transmittal should be easy to read, inviting readers into the rest of the report. Keep introductory and concluding paragraphs relatively short—no more than three to five lines each. Also, write in a conversational style, free of technical jargon.

Table of Contents

Your contents page acts as an outline. Many readers go there right away to grasp the structure of the report, and then return repeatedly to locate report sections of most interest to them. Guidelines follow for assembling this important component of your report; see p. 137 for an example in Figure 7–2.

>> Table of Contents Guideline 1: Make It Very Readable

The table of contents must be pleasing to the eye so that readers can find sections quickly and see their relationship to each other. Be sure to

- Space items well on the page
- Use indenting to draw attention to subheadings
- Include page numbers for every heading and subheading, unless there are many headings in a relatively short report, in which case you can delete page numbers for all of the lowest level headings listed in the table of contents

>> Table of Contents Guideline 2: Use the Contents Page to Reveal Report Emphases

Be specific yet concise so that each heading listed in the table of contents gives the reader a good indication of what the section contains. Readers associate the importance of report sections with the number of headings and subheadings listed in the table of contents.

>> Table of Contents Guideline 3: Consider Leaving Out Low-Level Headings

In very long reports, you may want to declutter the table of contents by removing lower-level headings. As always, the needs of the readers are the most important criterion to use in making this decision.

>> Table of Contents Guideline 4: List Appendices

Appendices include items, such as tables of data or descriptions of procedures that are inserted at the end of the report. Typically, they are listed at the end of the table of contents. Tabs on the edges of pages help the reader locate these sections.

Table of Contents Guideline 5: Use Parallel Form in All Entries

headings in one section, and sometimes even all headings and subheadings in the re-
t, have parallel grammatical form.

Table of Contents Guideline 6: Proofread Carefully

ong page numbers and incorrect headings are two common mistakes. Proofread this
ion carefully.

st of Illustrations

istrations within the body of the report are usually listed on a separate page right
er the table of contents. Another option is to list them at the bottom of the table of
ntents page rather than on a separate page. In either case, this list should include
number, title, and page number of every table and figure within the body of the
ort.

xecutive Summary

formal report would be complete without an executive summary. Consider it a stand-
ne section that provides a capsule version of the report and is free of technical jargon.
some cases, a copy of the executive summary may be circulated and filed separate from
e report.

Executive Summary Guideline 1: Put It on One Page

is comforting to most readers to know that somewhere within a long report there is one
ge to which they can turn for an overview. Moreover, a one-page length permits easy
stribution at meetings.

Some extremely long formal reports may require that you write an executive sum-
ary of several pages or longer. In this case, you can still provide the reader with a section
at summarizes the report in less than a page by including a brief *abstract*. The abstract is
condensed version of the executive summary directed to the highest-level decision mak-
s, that is placed right before the executive summary.

Executive Summary Guideline 2: Avoid Technical Jargon

nclude only that level of technical language the decision makers understand. Do not talk
ver the heads of the most important readers.

Executive Summary Guideline 3: Include Only the Important Conclusions and Recommendations

he executive summary mentions only the major points. An exhaustive list of findings,
onclusions, and recommendations can come later at the end of the report.

>> Executive Summary Guideline 4: Avoid References to the Report Body

Avoid the tendency to say that the report provides additional information. It is understood that the executive summary is only a generalized account of the report's contents.

An exception is those instances when you are discussing issues that involve danger or liability in which it may be necessary to add qualifiers in your summary—for example, "As noted in this report, further study will be necessary." Such statements protect you and the client in the event the executive summary is removed from the report and used as a separate stand-alone document.

>> Executive Summary Guideline 5: Use Paragraph Format

Whereas lists are often appropriate for body sections of a report, they can give executive summaries a fragmented effect. Instead, the best summaries create unity with a series of relatively short paragraphs that flow well together. Within a paragraph, there can be a short listing of a few points for emphasis, but the listing should not be the main structural element of the summary.

>> Executive Summary Guideline 6: Write the Executive Summary Last

Only after finishing the report do you have the perspective to write a summary. Sit back and review the report from beginning to end, asking yourself, "What would my readers really need to know if they had only a minute or two to read?" The answer to that question becomes the core of your executive summary.

Introduction

View this section as your chance to prepare both technical and nontechnical readers for the discussion ahead. Give information on the report's purpose, scope, and format, as well as a project description.

>> Introduction Guideline 1: State Your Purpose and Lead into Subsections

The purpose statement for the document should appear immediately after the main intro duction heading. Follow it with a sentence that mentions the introduction subdivisions t follow.

>> Introduction Guideline 2: Include a Project Description

Here you must be precise about the project. Depending on the type of project, you ma be describing a physical setting, a set of problems that prompted the report study, or som other data. When the project description is too long for the introduction, sometimes it placed in the body of the report.

Introduction Guideline 3: Include Scope Information

section outlines the precise objectives of the study. Your listing or description should llel the order of the information presented in the body of the report. Like the project ription, this subsection must be accurate in every detail.

Introduction Guideline 4: Consider Including Information on Report Format

en, the scope section lists information as it is presented in the report. If this is not case, end the introduction with a short subsection on the report format where you give readers a brief preview of the main sections that follow. In effect, the section as a condensed table of contents and may list the report's major sections and endices.

scussion Sections

cussion sections make up the longest part of formal reports and are written for the st technical members of your audience. You can focus on facts and opinions, demonting the technical expertise that the reader expects from you.

Discussion Guideline 1: Move from Facts to Opinions

you have learned, the ABC format requires that you start your formal report with a mmary of the most important information—that is, you skip to essential conclusions recommendations. Once into the discussion section, however, you back up and adopt rategy that parallels the stages of the technical project itself. You begin with data and ve toward conclusions and recommendations.

One way to view the discussion is that it should follow the order of a typical technical oject, which usually involves the following stages:

First, collect data (e.g., samples, interviews, records).

Second, subject these data to verification or testing (e.g., lab tests, computer analyses).

Third, analyze all the information, using your professional experience and skills to form conclusions (or convictions based on the data).

Fourth, develop recommendations that flow directly from the conclusions you have formed.

Thus, the body of your report gives technical readers the same movement from fact ward opinion that you experience during the project itself.

Discussion Guideline 2: Use Frequent Headings and Subheadings

eadings give readers handles by which to grasp the content of your report. Your readers ew headings, collectively, as a sort of outline by which they can make their way easily rough the report.

>> Discussion Guideline 3: Use Listings to Break Up Long Paragraphs

Long paragraphs full of technical details irritate readers. Use paragraphs for brief explanations, not for descriptions of processes or other details that could be listed.

>> Discussion Guideline 4: Place Excessive Detail in Appendices

Appendices give readers access to supporting information without cluttering the text of the report. Of course, you must refer to appendices in the body of the report and label appendices clearly so that readers can locate them easily.

Conclusions and Recommendations

This section gives readers a description—sometimes in the form of a listing—of all conclusions and recommendations. The points may or may not have been mentioned in the body of the report, depending on the length and complexity of the document. *Conclusions,* on the one hand, are convictions or beliefs based on the findings of your study. *Recommendations,* on the other hand, are actions you are suggesting based on your conclusions. For example, your conclusion may be that there is a dangerous level of toxic chemicals in a town's water supply, and your recommendation may be that the toxic site near the reservoir should be cleaned immediately.

The "Conclusions and Recommendations" section provides a complete list of conclusions and recommendations for technical and management readers, whereas the "Executive Summary" provides a selected list or description of the most important conclusions and recommendations for decision makers. In other words, view the "Conclusions and Recommendations" section as an expanded version of the "Executive Summary." It usually assumes one of these three headings, depending, of course, on the content:

1. Conclusions
2. Recommendations
3. Conclusions and Recommendations

Another option for reports that contain many conclusions and recommendations is to separate this last section into two sections: (1) "Conclusions" and (2) "Recommendations."

End Material

One kind of end material—appendices—is mentioned in the context of the discussion section. Note that formal reports may also contain works-cited pages or bibliographies, which should be included in the end materials. Finally, very long reports may include indices.

>>> Formal Report Example

Figure 7–2 provides a long and formal technical report. The report results from a study completed for the city of Winslow, Georgia. Members of the audience come from both technical and nontechnical backgrounds. Some are full-time professionals hired by the city, whereas others are part-time, unpaid citizens appointed by the mayor to explor

STUDY OF WILDWOOD CREEK

WINSLOW, GEORGIA

Prepared for:
The City of Winslow

Prepared by:
Christopher S. Rice, Hydro/Environmental Engineer
D-Lynn, Inc.

November 28, 2010

Uses graphic on title page to reinforce theme of environmental protection.

Figure 7–2 Formal report

12 Peachtree Street
Atlanta GA 30056
(404) 555-7524

D-Lynn Project #99-119
November 28, 2010

Adopt-a-Stream Program
City of Winslow
300 Lawrence Street
Winslow
Georgia 30000

Attention: Ms. Elaine Sykes, Director

Lists project title as it appears on title page.

STUDY OF WILDWOOD CREEK
WINSLOW, GEORGIA

Gives brief statement of project information.

We have completed our seven-month project on the pollution study of Wildwood Creek. This project was authorized on May 16, 2010. We performed the study in accordance with our original proposal No. 14-P72, dated April 24, 2010.

Provides major point from report.

This report mentions all completed tests and discusses the test results. Wildwood Creek scored well on many of the tests, but we are concerned about several problems—such as the level of phosphates in the stream. The few problems we observed during our study have led us to recommend that several additional tests should be completed.

Thank you for the opportunity to complete this project. We look forward to working with you on further tests for Wildwood Creek and other waterways in Winslow.

Sincerely,

Christopher S. Rice

Christopher S. Rice, P.E.
Hydro/Environmental Engineer

M-GLOBAL, INC.

M-Global Inc | 127 Rainbow Lane | Baltimore MD 21202 | 410.555.8175

Figure 7–2 continued

CONTENTS

APPENDICES

Uses white space, indenting, and bold to accent organization of report.

Figure 7–2 continued

Includes illustration titles as they appear in text.

ILLUSTRATIONS

PAGE

FIGURES

TABLES

Figure 7–2 continued

EXECUTIVE SUMMARY

The City of Winslow hired D-Lynn, Inc., to perform a pollution study of Wildwood Creek. The section of the creek that was studied is a one-mile-long area in Burns Nature Park, from Newell College to U.S. Highway 42. The study lasted seven months.

Summarizes purpose and scope of report.

D-Lynn completed 13 tests on four different test dates. Wildwood scored fairly well on many of the tests, but there were some problem areas—for example, high levels of phosphates were uncovered in the water. The phosphates were derived either from fertilizer or from animal and plant matter and waste. Also uncovered were small amounts of undesirable water organisms that are tolerant to pollutants and can survive in harsh environments.

Describes major findings and conclusions.

D-Lynn recommends that (1) the tests done in this study be conducted two more times, through spring 2011; (2) other environmental tests be conducted, as listed in the conclusions and recommendations section; and (3) a voluntary cleanup of the creek be scheduled. With these steps, we can better analyze the environmental integrity of Wildwood Creek.

Includes main recommendation from report text.

Figure 7-2 continued

3

INTRODUCTION

Gives lead-in to Introduction.

D-Lynn, Inc., has completed a follow-up to a study completed in 2002 by Ware County on the health of Wildwood Creek. This introduction describes the project site, scope of our study, and format for this report.

PROJECT DESCRIPTION

Briefly describes project.

By law, all states must clean up their waterways. The State of Georgia shares this responsibility with its counties. Ware County has certain waterways that are threatened and must be cleaned. Wildwood Creek is one of the more endangered waterways. The portion of the creek that was studied for this report is a one-mile stretch in the Burns Nature Park between Newell College and U.S. Highway 42.

SCOPE OF STUDY

The purpose of this project was to determine whether the health of the creek has changed since the previous study in 2002. Both physical and chemical tests were completed. The nine physical tests were as follows:

Uses bulleted list to emphasize scope of activities.

- Air temperature
- Water temperature
- Water flow
- Water appearance
- Habitat description
- Algae appearance
- Algae location
- Visible litter
- Bug count

The four chemical tests were as follows:

- pH
- Dissolved oxygen (DO)
- Turbidity
- Phosphate

REPORT FORMAT

Provides "map" of main sections in report.

This report includes three main sections:

1. Field Investigation: a complete discussion of all the tests that were performed for the project
2. Test Comparison: charts of the test results and comparisons
3. Conclusions and Recommendations

Figure 7–2 continued

FIELD INVESTIGATION

Wildwood Creek has been cited repeatedly for environmental violations in the pollution of its water. Many factors can generate pollution and affect the overall health of the creek. In 2002, the creek was studied in the context of a study of all water systems in Ware County. Wildwood Creek was determined to be one of the more threatened creeks in the county.

The city needed to learn if much has changed in the past nine years, so D-Lynn was hired to perform a variety of tests on the creek. Our effort involved a more in-depth study than that done in 2002. Tests were conducted four times over a seven-month period. The 2002 study lasted only one day.

The field investigation included two categories of tests: physical tests and chemical tests.

PHYSICAL TESTS

The physical tests covered a broad range of environmental features. This section discusses the importance of the tests and some major findings. The Test Comparison section on page 9 includes a table that lists results of the tests and the completion dates. The test types were as follows: air temperature, water temperature, water flow, water appearance, habitat description, algae appearance, algae location, visible litter, and bug count.

Amplifies information presented later in report.

Air Temperature

The temperature of the air surrounding the creek will affect life in the water. Unusual air temperature for the seasons will determine if life can grow in or out of the water.

Three of the four tests were performed in the warmer months. Only one was completed on a cool day. The difference in temperature from the warmest to coolest day was 10.5°C, an acceptable range.

Water Temperature

The temperature of the water determines which species will be present. Also affected are the feeding, reproduction, and metabolism of these species. If there are one or two weeks of high temperature, the stream is unsuitable for most species. If water temperature changes more than 1° to 2°C in 24 hours, thermal stress and shock can occur, killing much of the life in the creek.

During our study, the temperature of the water averaged 1°C cooler than the temperature of the air. The water temperature did not get above 23°C or below 13°C. These ranges are acceptable by law.

Figure 7–2 continued

5

Water Flow

The flow of the water influences the type of life in the stream. Periods of high flow can cause erosion to occur on the banks and sediment to cover the streambed. Low water flow can decrease the living space and deplete the oxygen supply.

The flow of water was at the correct level for the times of year the tests were done—except for June, which had a high rainfall. With continual rain and sudden flash floods, the creek was almost too dangerous for the study to be performed that month.

In fact, in June we witnessed the aftermath of one flash flood. Figure 1 shows the creek with an average flow of water, and Figure 2 shows the creek during the flood. The water's average depth is 10 inches. During the flash flood, the water level rose and fell 10 feet in about one hour. Much dirt and debris were washing into the creek, while some small fish were left on dry land as the water receded.

Incorporates graphic into page of text.

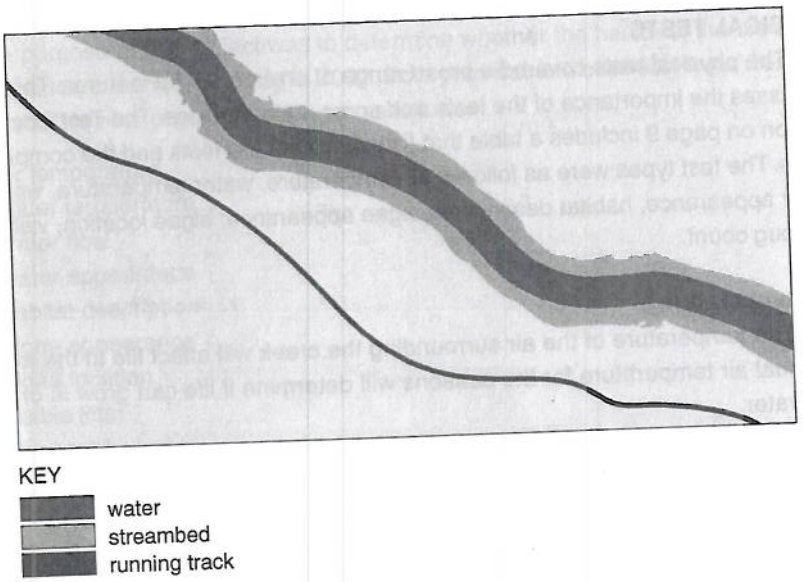

Figure 1 Wildwood Creek—Normal Water Level

Figure 7–2 continued

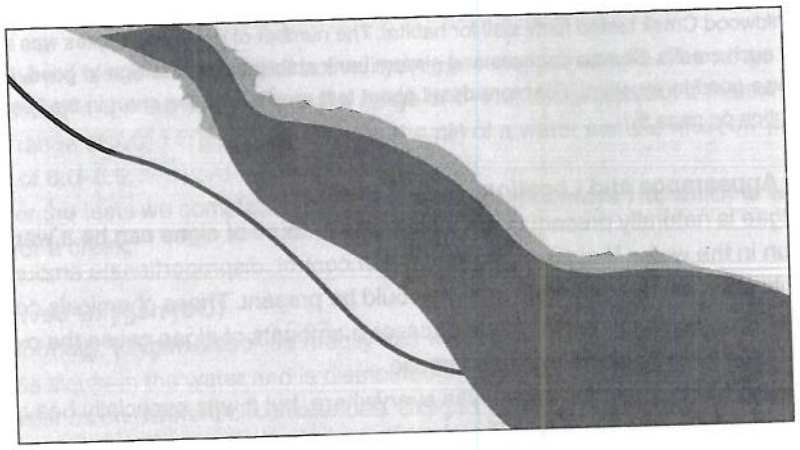

Figure 2 Wildwood Creek—Flash Flood Water Level

Water Appearance

The color of the water gives a quick but fairly accurate view of the health of the creek. If the water is brown or dirty, then silt or human waste may be present. Black areas of water may contain oil or other chemical products.

On each of the four test days, the water was always clear. Thus the appearance of the creek water was considered excellent.

Elaborates on importance of information shown in Table 1. Description parallels five items in table.

Habitat Description

The habitat description concerns the appearance of the stream and its surroundings. An important criterion is the number of pools and the number of ripples—that is, points where water flows quickly over a rocky area. Both pools and ripples provide good locations for fish and other stream creatures to live and breed.

In describing habitat, D-Lynn also evaluates the amount of sediment at the bottom of the stream. Too much sediment tends to cover up areas where aquatic life lays eggs and hides them from predators. We also evaluate the stability of the stream banks; a stable bank indicates that erosion has not damaged the habitat. Finally, we observe the amount of stream cover. Such vegetation helps keep soil in place on the banks.

Figure 7–2 continued

7

Wildwood Creek tested fairly well for habitat. The number of pools and ripples was about average for such creeks. Stream deposits and stream bank stability were average to good, and stream cover was good to excellent. For more detail about test results, see the chart in the Test Comparison section on page 9.

Algae Appearance and Location

Algae is naturally present in any creek. The amount of algae can be a warning of pollution in the water. If algae is growing out of control, disproportionate amounts of nutrients such as nitrogen or phosphate could be present. These chemicals could come from fertilizer washed into the creek. Excessive amounts of algae cause the oxygen level to drop when they die and decompose.

During the four studies, algae was everywhere, but it was especially heavy on the rocks in the ripples of the creek. The algae was always brown and sometimes hairy.

Visible Litter

Litter can affect the habitat of a creek. Although some litter has chemicals that can pollute the water, other litter can cover nesting areas and suffocate small animals. Whether the litter is harmful or not, it is always an eyesore.

Gives specific details that support the report's conclusions and recommendations, which come later.

On all four test dates, the litter we saw was heavy and ranged from tires to plastic bags. Some of the same trash that was at the site on the first visit was still there seven months later.

Bug Count

The bug count is a procedure that begins by washing dirt and water onto a screen. As water drains, the dirt with organisms is left on the screen. The bugs are removed and classified. Generally, the lower the bug count, the higher the pollution levels. Bug counts were considered low to average.

Two types of aquatic worms were discovered every time during our count, but in relatively small amounts. In addition, the worms we observed are very tolerant of pollution and can live in most conditions. Finally, we observed only two crayfish, animals that are somewhat sensitive to pollution.

CHEMICAL TESTS

Although physical tests cover areas seen with the naked eye, chemical tests can uncover pollutants that are not so recognizable. Certain chemicals can wipe out all life in a creek. Other chemicals can cause an overabundance of one life-form, which in turn could kill more sensitive animals.

A chart of results of chemical tests is included in the Test Comparison section on page 9. The chemical tests that D-Lynn performed were pH, dissolved oxygen (DO), turbidity, and phosphate.

Figure 7–2 continued

pH

The pH test is a measure of active hydrogen ions in a sample. The range of the pH test is 0–14. If the sample is in the range of 0–7.0, it is acidic; but if the sample is in the range of 7.0–14, it is basic. By law, the pH of a water sample must be within the range of 6.0–8.5.

For the tests we completed, the water sample was always 7.0, which is very good for a creek.

Dissolved Oxygen (DO)

Normally, oxygen dissolves readily into water from surface air. Once dissolved, it diffuses slowly in the water and is distributed throughout the creek. The amount of DO depends on different circumstances. Oxygen is always highest in choppy water, just after noon, and in cooler temperatures.

In many streams, the level of DO can become critically low during the summer months. When the temperature is warm, organisms are highly active and consume the oxygen supply. If the amount of DO drops below 3.0 ppm (parts per million), the area can become stressful for the organisms. An amount of oxygen that is 2.0 ppm or below will not support fish. DO that is 5.0 ppm to 6.0 ppm is usually required for growth and activity of organisms in the water.

According to the Water Quality Criteria for Georgia, average daily amounts of DO should be 5.0 ppm with a minimum of 4.0 ppm. Wildwood Creek scored well on this test. The average amount of DO in the water was 6.9 ppm, with the highest amount being 9.0 ppm on November 11, 2010.

Turbidity

Turbidity is the discoloration of water due to sediment, microscopic organisms, and other matter. One major factor of turbidity is the level of rainfall before a test.

Three of our tests were performed on clear days with little rainfall. On these dates, the turbidity of Wildwood Creek was always 1.0, the best that creek water can score on the test. The fourth test, which scored worse, occurred during a rainy period.

Phosphate

Phosphorus occurs naturally as phosphates—for example, orthophosphates and organically bound phosphates. Orthophosphates are phosphates that are formed in fertilizer, whereas organically bound phosphates can form in plant and animal matter and waste.

Phosphate levels higher than 0.03 ppm contribute to an increase in plant growth. If phosphate levels are above 0.1 ppm, plants may be stimulated to grow out of control. The phosphate level of Wildwood was always 0.5 ppm, considerably higher than is desirable.

Figure 7–2 continued

9

TEST COMPARISON

There was little change from each of the four test dates. The only tests that varied greatly from one test to another were air temperature, water temperature, water flow, and DO. On the basis of these results, it would appear that Wildwood Creek is a relatively stable environment.

Brings together test results for easy reference.

Table 1 Physical Tests

TEST DATES	*5/26/10*	*6/25/10*	*9/24/10*	*11/19/10*
Air Temperature in °C	21.5	23.0	24.0	13.5
Water Temperature in °C	20.0	22.0	23.0	13.0
Water Flow	Normal	High	Normal	Normal
Water Appearance	Clear	Clear	Clear	Clear
Habitat Description				
Number of Pools	2.0	3.0	2.0	5.0
Number of Ripples	1.0	2.0	2.0	2.0
Amount of Sediment Deposit	Average	Average	Good	Average
Stream Bank Stability	Average	Good	Good	Good
Stream Cover	Excellent	Good	Excellent	Good
Algae Appearance	Brown	Brown/hairy	Brown	Brown
Algae Location	Everywhere	Everywhere	Attached	Everywhere
Visible Litter	Heavy	Heavy	Heavy	Heavy
Bug Count	Low	Average	Low	Average

Table 2 Chemical Tests

Test	*5/26/10*	*6/25/10*	*9/24/10*	*11/19/10*
PH 7.0	7.0	7.0	7.0	
Dissolved Oxygen (DO)	6.8	6.0	5.6	9.0
Turbidity	1.0	3.0	1.0	1.0
Phosphate	0.50	0.50	0.50	0.50

Figure 7–2 continued

CONCLUSIONS AND RECOMMENDATIONS

This section includes the major conclusions and recommendations from our study of Wildwood Creek.

CONCLUSIONS

Generally, we were pleased with the health of the stream bank and its floodplain. The area studied has large amounts of vegetation along the stream, and the banks seem to be sturdy. The floodplain has been turned into a park, which handles floods in a natural way. Floodwater in this area comes in contact with vegetation and some dirt. Floodwater also drains quickly, which keeps sediment from building up in the creek.

Draws conclusions that flow from data in body of report.

Uses paragraph format instead of lists because of lengthy explanations needed.

However, we are concerned with the number and types of animals uncovered in our bug counts. Only two bug types were discovered, and these were types quite tolerant to pollutants. The time of year these tests were performed could affect the discovery of some animals. However, the low count still should be considered a possible warning sign about water quality. Phosphate levels were also high and probably are the cause of the large amount of algae.

We believe something in the water is keeping sensitive animals from developing. One factor that affects the number of animals discovered is the pollutant problems in the past (see Appendix A). The creek may still be in a redevelopment stage, thus explaining the small numbers of animals.

RECOMMENDATIONS

On the basis of these conclusions, we recommend the following actions for Wildwood Creek:

Gives numbered list of recommendations for easy reference.

1. Conduct the current tests two more times, through Spring 2011. Spring is the time of year that most aquatic insects are hatched. If sensitive organisms are found then, the health of the creek could be considered to have improved.
2. Add testing for nitrogen. With the phosphate level being so high, nitrogen might also be present. If it is, then fertilizer could be in the water.
3. Add testing for human waste. Some contamination may still be occurring.
4. Add testing for metals, such as mercury, that can pollute the water.
5. Add testing for runoff water from drainage pipes that flow into the creek.
6. Schedule a volunteer cleanup of the creek.

With a full year of study and additional tests, the problems of Wildwood Creek can be better understood.

Figure 7–2 continued

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APPENDIX A

Background on Wildwood Creek

Wildwood Creek begins from tributaries on the northeast side of the city of Winslow. From this point, the creek flows southwest to the Chattahoochee River. Winslow Wastewater Treatment Plant has severely polluted the creek in the past with discharge of wastewater directly into the creek. Wildwood became so contaminated that signs warning of excessive pollution were posted along the creek to alert the public.

Today, all known wastewater discharge has been removed. The stream's condition has dramatically improved, but nonpoint contamination sources continue to lower the creek's water quality. Nonpoint contamination includes sewer breaks, chemical dumping, and storm sewers.

Another problem for Wildwood Creek is siltration. Rainfall combines with bank erosion and habitat destruction to wash excess dirt into the creek. This harsh action destroys most of the macroinvertebrates. At the present time, Wildwood Creek may be one of the more threatened creeks in Ware County.

Figure 7-2 continued

APPENDIX B

Water Quality Criteria for Georgia

All waterways in Georgia are classified in one of the following categories: fishing, recreation, drinking, and wild and scenic. Different protection levels apply to the different uses. For example, the protection level for dissolved oxygen is stricter in drinking water than fishing water. All water is supposed to be free from all types of waste and sewage that can settle and form sludge deposits.

In Ware County, all waterways are classified as "fishing," according to Chapter 391-3-6.03 of "Water Use Classifications and Water Quality Standards" in the Georgia Department of Natural Resources *Rules and Regulations for Water Quality Control.* The only exception is the Chattahoochee River, which is classified as "drinking water supply" and "recreational."

Figure 7–2 continued

13

APPENDIX C

Map 6
Location of City of Winslow
Parks and Recreation Facilities

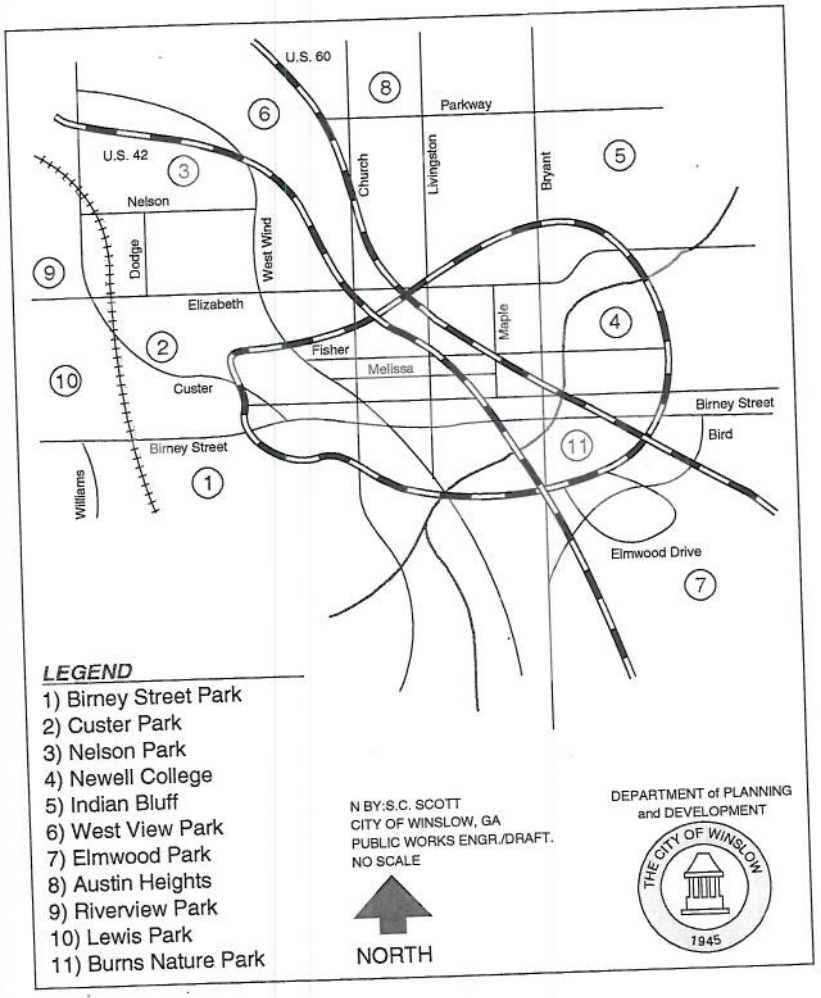

Figure 7–2 continued

environmental problems. The paid professionals include engineers, environmental specialists, accountants, city planners, managers, lawyers, real estate experts, and public relations specialists. The part-time appointees include citizens who work in a variety of blue-collar and white-collar professions or who are homemakers.

>>> Four Common Reports

Report types vary from company to company and can be produced in either informal or formal report format. The four types described here are only a sampling of what you will be asked to write on the job. If you master these, you can probably handle other types that come your way.

Equipment Evaluations

All organizations use some kind of equipment that someone has to buy, maintain, or replace. Because companies put so much money into this part of their business, evaluating equipment is an important activity. Equipment evaluations provide objective data about how machinery, tools, computer software, or other equipment has functioned. An equipment evaluation may focus only on problems; or it may go on to suggest a change in equipment. Whatever its focus, an equipment evaluation must provide a well-documented review of the exact manner in which equipment performed.

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Report 14: Research Report is an example of a formal equipment evaluation report.

Progress/Periodic Reports

Some reports are intended to cover activities that occurred during a specific period of time. They provide managers or clients with details about work on a specific project. A special type of progress report is the *project completion report*, which may be presented as a formal report when the project is completed. Progress and periodic reports contain mostly objective data. Yet both of them, especially progress reports, sometimes may be written in a persuasive manner. After all, you are trying to put forth the best case for the work you have completed. Figure 7–1 is an example of a progress report.

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Report 12: Final Report is an example of a formal project completion report.

Problem Analyses

Every organization faces both routine and complex problems. Routine problems are often handled without much paperwork; they are discussed and then solved. However, other problems must often be described in reports, particularly if they involve many people, are difficult to solve, or have been brewing for a long time. Problem analysis reports present readers with a detailed description of problems in areas, such as personnel, equipment, products, and services.

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Report 5: Research Report is an example of a problem analysis.