CHAPTER 1

KEY CONCEPTS

1. What is the Walnut Creek Watershed Management Authority?
   The Walnut Creek WMA is a collection of cities, counties and other jurisdictions coming together to focus on water quality and quality issues through collaboration and education. Currently, the Walnut Creek WMA includes the communities of Clive, Dallas Center, Des Moines, Grimes, Johnston, Urbandale, Waukee and West Des Moines. The WMA includes Polk County as well as the Dallas and Polk County Soil and Water Conservation Districts.

2. Public Interaction
   Interaction with stakeholders has been critical in the development of this plan. This included monthly meetings with WMA representatives, two open house events and two meetings with key agricultural landowners and producers.

3. Technical Analysis
   A variety of technical data has been used to inform this plan. This includes local climate records, past water quality monitoring data, geographic information systems (GIS) data and direct in-field assessments of stream and land use conditions.

4. How to Use this Plan
   This section outlines how the information in the plan is arranged and how it can be best used by a variety of audiences.

HOW DO THESE CONCEPTS INFLUENCE DEVELOPMENT OF THE PLAN?
The information gathered through stakeholder meetings, public events and technical analyses helps us to answer these key questions:

• What do we know about the watershed? (Assessment)
• What do we need to do to address identified issues? (Action)
• How do we carry out those actions? (Implementation)
  - Who, what, when, where and why?
Chapter 1 - Summary

Process Overview

Walnut Creek WMA:
- Board Meetings
- Executive Committee

Public Interaction:
- Open House Events
- Stakeholder Meetings
- Individual Discussions

Plan Development:
- Windshield Survey
- Stream Assessment Walks
- Quadcopter Video Collection
- Water Quality Monitoring

Boots on the Ground:
- GIS Analysis
- Computer Modeling & Simulation

Desktop Assessments
In 2010, the State of Iowa passed legislation to allow local governments to form Watershed Management Authorities (WMA). “Authority” here is a term the legislature often uses when referencing a convening body. In reality, AWMA has no actual authority. Instead, it is a collection of jurisdictions within a given watershed, coming together to focus on water quality and quantity issues through collaboration and education. By law, WMAs cannot be formed without inviting all of the Soil and Water Conservation Districts, communities and counties within the designated watershed to the table. It only takes two such jurisdictions, joining together by 28E agreement, to actually form the WMA.

The “authority,” however, continues to rest with the local governments. For all practical purposes, a WMA can only recommend that its member-governments take action—it cannot force that action.

The Walnut Creek WMA in Central Iowa formed in the context of this legislation, with the Metropolitan Planning Organization spearheading the formation of the WMA. In partnership with others, the MPO secured a grant from the Iowa Department of Natural Resources for the development of this plan. As of this writing, with the exception of Dallas County, all of the jurisdictions originally invited to join the WMA have done so.

In late 2014, the Walnut Creek WMA selected a consultant team led by RDG Planning & Design to complete analysis and develop content for the plan. Snyder & Associates (Ankeny, Iowa) was also a member of the consultant team completing flood modeling updates. The team included the Polk County Soil and Water District (SWCD) whose staff completed field assessments of stream conditions, mapped rural erosion factors and aided in communication and coordination with rural landowners and producers.

Process

Public Interaction

Public involvement and input from key stakeholders has been central to plan development. Each member organization was able to send representatives to the WMA Board which typically met monthly through 2015. An executive committee also met with the consultant team to discuss ongoing work and to prepare for material presentation to the larger board.

Two public open houses were held during the planning process. One was held at Colby Park in Windsor Heights in April 2015. That day started with a planning session in the morning at the community center at that location, followed by an open forum held near the outdoor amphitheater within the park. A brief presentation was made to the public, preceded and followed by times for open discussions and questions. Other activities included water quality sampling education, a build-your-own rain barrel workshop, canoe paddle art and short video presentations that showed conditions filmed along several key stream segments. Approximately 100 people attended the afternoon event.

The second open house was held at the meeting room at the Clive Aquatic Center in October 2015. This was held concurrently with an open house for the Clive Greenbelt Master Plan study. The Clive Greenbelt is a key feature and large area of publicly owned land along the main branch of Walnut Creek. Many of the issues related to improving conditions within the Walnut Creek Watershed have a direct bearing on the way the Clive Greenbelt is planned and managed. This pairing drew from a larger audience and provided a larger watershed context for those discussions.

The planning process also involved two separate meetings with local agricultural producers and landowners. These meetings, held at the Heartland Co-op in Dallas Center in May and December 2015, informed planners about some of the barriers to broader implementation of practices to improve water quality and slow runoff in the rural landscape. It also provided the opportunity to gauge the local interest in investing in improvements and gave a broader understanding of the challenges within the watershed and their potential solutions. Feedback from the December 2015 meeting was directly used to develop a 10-year plan to make improvements within a 6.5-square-mile area in the upper part of the Walnut Creek Watershed.
**Numeric Data Collection and Analysis**

To complete this plan, numeric data was collected and analyzed for several key factors:

- Climate data from the Des Moines Airport Natural Weather Service Station, including temperature, precipitation and length of growing season. This information was used to determine recent and historic trends for these factors.

- Stream gage flow data from a USGS station located along Walnut Creek, including daily average flow rates and gage height (measure of stream depth). This was used to look at seasonal and historic trends and patterns of runoff, stream flow and flood events.

- Water quality monitoring data from the USGS, Iowa Soybean Association / Agriculture’s Clean Water Alliance and IOWATER volunteer monitoring. This data included measured levels of various pollutants and stream conditions recorded over a long period of time. This information was important in identifying the key pollutants of concern, how their levels compare to state water quality standards and their potential sources within the watershed. This data was used in concert with the stream gage data (measured concentrations x measured flow volumes) to develop more accurate estimates of annual pollutant loads. This data was later used to calibrate mathematical water quality models to better reflect real-world observations.

**Desktop Analysis**

Geographic Information System (GIS) data was reviewed to identify important conditions throughout the watershed. Aerial photographs (past and present), topographic information, soils data and other available information was analyzed. Surface information was used to more precisely identify the overall boundary of the Walnut Creek Watershed and subdivide it into smaller subwatershed and microwatershed areas. The other data collected regarding soils, land uses, surface covers, buffer conditions and stream locations were categorized and sorted at these smaller scales.

**Field Assessments**

Conditions noted in desktop assessments were verified by observations in the field. These included:

- Windshield surveys—following along roadways and trails to photograph and note conditions across the watershed. These assessments are done rapidly, in less detail, in order to verify conditions across the entire watershed.

- Rural land use and crop rotation surveys—Polk County SWCD staff identified two-year crop rotation patterns (e.g., corn-soybeans, corn-corn, etc.), tillage practices and use of cover crops and other conservation practices.

- In-field stream assessments—two separate detailed assessments were included for data analysis:
  - Polk County SWCD completed field assessments of 28 miles of stream length using a handheld GPS collector and digital cameras to catalogue observed conditions along each stream corridor. These assessments were completed during the summer of 2015.
  - The City of Clive had their 2014 Stream Assessment Report completed by Nilles Associates. This project detailed conditions along 13 miles of streams within Clive’s city limits and used protocols similar to the Polk County SWCD work.

Other stream assessments, conducted across the watershed, were reviewed by the consultant team. These studies were used to develop a general awareness of stream conditions. However, some of these assessments were older or used different protocols which made it difficult to directly compare the results of the two studies listed above.
Detailing the Plan

Information gathered through public interaction and data analysis has been developed into this plan. The plan is generally divided into three key parts:

- **Assessment**—Chapters 2–6:
  - What did we learn about the watershed?
- **Action**—Chapters 7–10:
  - What strategies, projects and policies are necessary to address the key concerns identified in the assessment?
- **Implementation**—Chapters 11–15:
  - How do we educate key stakeholders on what actions are necessary?
  - What is the timetable to complete improvements, adopt policies and monitor results?
  - What resources are needed to carry out the plan?
  - How should the plan be evaluated and adjusted to stay on track to meet project goals?
  - What options are there for the specific practices to address key watershed issues?

How to Use this Plan

This Watershed Plan can be viewed as a comprehensive effort, addressing a wide variety of issues. The discoveries of this plan need to be relayed to a variety of stakeholders with very different levels of awareness. Some findings are larger concepts and more general ideas. Other parts of the plan have to be more technical and detailed, to provide decision-makers with the level of information they need to support the findings of this plan, propose new policies and dedicate or acquire the financial resources to carry them out.

For this reason, each chapter features headers that highlight the most important concepts, both in outline and graphical forms. The content that follows in each chapter features graphs and sidebar discussions which highlight these key ideas. Each chapter also includes a more detailed explanation of these concepts, which is valuable to all, but may be more useful to implementers of the plan. Words that are highlighted throughout the plan are included in a glossary at the end of the report, to help explain more detailed concepts to a broader audience.
# The Grand Overview

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Assessment</strong></td>
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<tr>
<td>2</td>
<td>Watershed Geography</td>
<td>Information about the overall character of the watershed, including soils, terrain, slopes and changes in land use.</td>
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<tr>
<td>3</td>
<td>Climate and Streamflow</td>
<td>Analysis of trends in temperature, precipitation, stream flow and flooding. These conditions have a direct impact on the challenges facing this watershed and the measures necessary to address them.</td>
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<td>4</td>
<td>Background</td>
<td>This plan isn’t the first study related to the Walnut Creek Watershed. A few past studies that influenced the development of this plan are reviewed here. These studies demonstrate what issues have already been identified within this watershed and how this area relates to other areas downstream.</td>
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<td>5</td>
<td>Character of Streams</td>
<td>Stream conditions such as stream stability, character and buffer conditions are discussed in detail.</td>
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<td>6</td>
<td>Key Pollutant and Sources</td>
<td>Available water quality monitoring information (pollutant levels) is reviewed and compared to water quality standards. The key pollutants of concern are identified. The results of computer water quality simulations are listed, including annual pollutant loads and identification of their sources (by location and land use).</td>
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<td><strong>Action</strong></td>
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<td>7</td>
<td>Strategic Framework</td>
<td>The vision, mission and goals of this plan are outlined here.</td>
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<td>8</td>
<td>Case Study: Subwatershed Strategic Plan</td>
<td>Three case study subwatersheds were selected that represent conditions of larger areas of the watershed. Each area is an example of a different land use: rural, urban and developing. These areas were studied in greater detail and unique plans developed for each. These plans are to be carried out over a ten-year period, focusing a greater amount of work in a smaller area. This allows water quality changes to be observed more quickly and the lessons learned can be implemented more broadly across the entire watershed.</td>
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<td>9</td>
<td>Policy Recommendations</td>
<td>Local policies and procedures have a direct effect on implementation. Some changes can be made with voluntary efforts with committed resources. In other cases, local regulations may need to be changed to effect desired outcomes.</td>
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<td>10</td>
<td>Projects and Priorities</td>
<td>This chapter lists projects recommended across the watershed, including those which are focused in the case study areas. A preliminary cost projection for each project is given.</td>
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<td><strong>Implementation</strong></td>
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<td>11</td>
<td>Education and Collaboration Plan</td>
<td>Educating the public, stakeholders and decision makers is essential to the success of this plan. This chapter reviews how to get these groups to understand this plan and how they can work together to carry it out.</td>
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</table>
| 12      | Measures and Milestones                    | This chapter addresses these questions:  
  • What is the proposed timeline to implement projects and policy changes? How is progress evaluated?  
  • How do we monitor for improvements in water quality and share data with other groups?  
  • How is progress to be reported back to the board and the public at large? |
| 13      | Resource Requirements                      | Resources are required to execute this plan. This chapter outlines the financial commitments required for coordination, project construction, maintenance and monitoring. It also details some potential methods to fund these needs. |
| 14      | Evaluation and Amendments                 | To be effective, this plan needs to be a “living document,” adapted based on lessons learned and changing conditions as the plan is implemented. These conditions need to be regularly evaluated so that regular corrections can be made to the plan to keep it on course. |
| 15      | Best Management Practices (BMP) Toolkit    | This chapter gives a brief review of the different types of practices that can be used in both the rural and urban environments. Each practice has a brief description and most have directions on where to find more detailed information. |
| **Glossary** |                                             | Over 150 key terms and abbreviations are defined here to make this document easier to understand by a broader audience.                                                                                     |
The Next Steps

Since watershed management authorities are “authorities without authority,” this plan is dependent on a variety of local communities, stakeholders and property owners to carry it out. Upon approval of the plan by the WMA Board, each community may take action to adopt the plan. Each city will need to review their ordinances and policies to determine what changes are needed to carry out the recommendations of this plan. Projects will need to be incorporated into city budgets or alternative sources of funding (grants, etc.) pursued. Ongoing resources and staff will need to be committed to carrying out water quality monitoring and the education and collaboration plan. Most of all, this plan needs champions—devoted local advocates that are committed to making sure that it is carried to its conclusion.

This plan outlines a ten-year process to initiate progress to improving water quality and watershed health. Land uses and other conditions within the watershed are rapidly changing. For this reason, it is difficult to accurately predict conditions that will need to be addressed for a longer period of time. At the end of a ten-year period, this planning effort should be recommissioned by the WMA Board in some fashion, to evaluate results, lessons learned and changed conditions. At that time the path forward for the next ten or twenty years should be set.

The conditions detailed in this plan have developed over a period of more than 150 years. It will certainly take several decades to make enough improvements to meet water quality goals for the entire watershed. The commitment of resources set forth in the plan may be daunting. However, a decision to not commit to these efforts will result in further deterioration in water quality, streambank instability and a potential for greater flood impacts in the future. Not addressing these issues will assuredly lead to greater costs in the future.