

DRAFT

**AGRICULTURAL ACTIVITY ASSESSMENT
AND EVALUATION PLAN**

**for the
McKenzie River Watershed, Oregon**



**Karl A. Morgenstern
Eugene Water & Electric Board
February 2005
Revision 2**

Introduction

The McKenzie River is the sole source of drinking water for more than 200,000 people in Eugene and surrounding communities. In October 2000, EWEB developed a drinking water source protection plan, which included a risk assessment of all potential threats to this valuable source of drinking water. The high-risk threat categories included stormwater outfalls, urban runoff, hazardous materials spills, agricultural activities and forest management activities (EWEB, 2000).

The Agricultural Activities Assessment in the McKenzie watershed implements a portion of EWEB's drinking water source protection program (EWEB, 2000; EWEB, 2001a). The overall concept of drinking water source protection is to have the ability to measure the balance between watershed health and human use over time and implement actions that maintain a healthy balance for production of exceptional water quality. This requires not only being aware of all the different human activities going on within the watershed, but also requires understanding the limits of what the river can handle and still maintain a healthy watershed with good water quality. EWEB's source protection program consists of the following eight subprograms:

- ? Comprehensive Monitoring;
- ? Disaster Preparedness and Response;
- ? Education and Research Assistance;
- ? Point Source Evaluation and Mitigation;
- ? Nonpoint Source Evaluation and Mitigation;
- ? Land Acquisition;
- ? Public Outreach and Information Sharing; and,
- ? Watershed Land Use Tracking and Management.

EWEB received Oregon Department of Environmental Quality Section 319 grant funds to implement the nonpoint sources of pollution evaluation and mitigation subprogram. Specifically, implementation of this subprogram includes taking inventory, mapping and assessing the risk associated with forestry or silviculture activities, septic systems, agricultural activities, and building or construction activities in the McKenzie River watershed upstream of EWEB's intake at Hayden Bridge. Stormwater and urban runoff is not included in this effort because EWEB is already working with partner agencies to assess the potential impacts from this nonpoint source of pollution (NPS).

All work conducted under this grant will be accomplished using ArcGIS, a geographic information system (GIS) tool that allows for efficient data management and provides powerful data analysis and map production. The purpose of this report is to provide the various agencies, businesses, organizations, landowners, and other interested parties with basic information about the proposed project approach, objectives, scope, tasks, and outcomes as a starting point for discussing the best approach for this baseline assessment.

Potential Threats From Agricultural Activities

In the McKenzie watershed most agricultural land is located along the valley floor in close proximity to the river (Figure 1). Numerous studies have been conducted in the Willamette River Basin that looked at impacts of agricultural activities on streams, rivers and drinking water supplies (USGS 2001, USGS 1998, USGS 1997, USGS 1996). These studies show that pesticides and nutrients occurred more frequently and at higher concentrations at monitoring sites located in agricultural areas. Some widely used pesticides, such as atrazine, were found in over 90% of the 188 water samples collected in the Willamette basin (USGS, 1996; USGS, 1997). Drinking water sources degraded by agricultural nonpoint sources of pollutants increase raw water treatment costs and pose a risk to public health.

Contaminants of particular concern for EWEB's drinking water are dissolved organic chemicals including pesticides. EWEB's water-filtration plant is designed to continually treat the raw water from the McKenzie River for bacteria, metals, nutrients, sediment and organic matter. However, EWEB can only treat for dissolved organic chemicals using activated carbon if these contaminants are known to exist. Currently, activated carbon treatment is only used during times of known problems, such as spills or during periods of taste/odor problems.

EWEB has conducted storm event and monthly baseline monitoring of the lower McKenzie River watershed (between Hayden and Hendricks bridges) since October 2001 (EWEB, 2001b) (Figure 2). Preliminary results of this effort show that:

- 1) Runoff from storm events are responsible for the majority of pollution that reaches the river;
- 2) Pesticide levels detected in storm runoff from Cedar Creek, Camp Creek, and Keizer Slough were below standards set for aquatic and human health;
- 3) Some nutrient and metals detected in storm runoff from Cedar Creek, Camp Creek and Keizer Slough exceeded aquatic and human health-based standards; and,
- 4) Low levels of nutrients and trace amounts of one pesticide were detected in the McKenzie River (EWEB, 2004).

Purpose, Objectives and Scope

The purpose of this assessment is to collect baseline information about agricultural activities in the McKenzie watershed and, through GIS analysis and water quality monitoring, evaluate those areas that may impact the McKenzie River. This baseline data will be used to evaluate trends over time to identify impacts before they become a drinking water problem. The McKenzie River has excellent drinking water quality. The goal of EWEB's drinking water source protection program is to maintain this level of quality for future generations of customers.

The idea is to focus on specific areas in the watershed where the soil type, slope, crop type, proximity to surface water and other factors indicate a greater potential for storm runoff to contain agricultural chemicals. If potential problems exist, EWEB and partner organizations would work with interested landowners to voluntarily implement actions that would reduce risks to drinking water while maintaining healthy crops and increasing the grower's profit margin from those crops.

The objectives of the agricultural activities assessment project are to:

- ? Bring watershed stakeholders, agricultural agencies, Oregon State University, and growers/landowners together to share information and engage in meaningful discussions on current agricultural activities in the watershed and ways to assist growers while maintaining the exceptional water quality of the McKenzie River;
- ? Develop a baseline inventory of agricultural activities in the watershed and establish a procedure for periodic updates of this information;
- ? Evaluate agricultural activities to better understand potential threats and identify high priority areas for further study;
- ? Determine if high priority areas are currently impacting water quality in nearby streams and/or the McKenzie River;
- ? Work with interested landowners and/or growers to implement actions that would reduce potential risks in high priority areas; and
- ? Initiate and strengthen long-term relationships and cooperation among the agricultural community, EWEB, watershed stakeholders, academia, and others.

To achieve these objectives the following general tasks will be conducted:

1. Meet one-on-one with individual stakeholders, agricultural agencies, OSU extension agent and Department of Horticulture, and others to discuss the agricultural activities assessment project, gain a better understanding of current roles and responsibilities, and explore potential involvement and partnership opportunities with this project;
2. Collect watershed data on agricultural activities and import the information into a geographic information system (GIS);
3. Conduct GIS analyses of agricultural activities to identify specific areas susceptible to chemical runoff during storm events;
4. Meet and discuss the NPS assessment project with growers and landowners in these high priority areas to gain a better understanding of farming practices and to solicit participation in this project;
5. Conduct water quality monitoring during storm events upstream and downstream of these high priority areas. Water samples will be analyzed for pesticides, nutrients, metals and suspended sediment;
6. Share results with stakeholders, growers and landowners through various meetings and mailings;

7. Conduct brainstorming sessions with interested stakeholders and growers to create strategies for lower potential risks to water quality, maintaining healthy crops and increasing the farmer's profit margin from those crops;
8. Assist interested growers to implement voluntary actions; and,
9. Continue monitoring high priority areas to determine if voluntary actions are working.

Existing Agricultural Activity Data

The main data needs for this project are detailed crop types and chemical use. EWEB developed some general crop type data for the McKenzie watershed using 2004 high resolution color aerial photography (LCOG, 2004) (Map Sheets 1 thru 6). The U.S. Department of Agriculture (USDA) has GIS data on current crop types, but to date has not released this data for use in this project. EWEB will work with state and local agricultural agencies and growers to refine the crop type data in the McKenzie watershed.

As a starting point, EWEB will use data on chemical type, chemical application rates and typical seasonal schedule for applying chemicals that is contained in the USGS report titled *“Distribution of Dissolved Pesticides and Other Water Quality Constituents in Small Streams, and their Relation to Land Use, in the Willamette River Basin, Oregon (USGS, 1997) (See Attachment A). More accurate chemical use data will be developed as the project progresses.*

Existing Agricultural Practices and Laws

The main crops currently grown in the McKenzie watershed include grass for pasture, filberts, Christmas trees, corn, wheat, grass seed, blueberries, peppermint, row crops and nursery stock (EWEB, 2000; ODA, 2002). EWEB hopes to gain a better understanding of the practices used to grow these types of crops through discussions with growers and local agricultural agencies.

Rules governing agricultural activities that relate to water quality are contained in Oregon Administrative Rules (OAR) Chapter 603, Division 57 and Division 95. In OAR 603-057-0405 to 603-057-0425, pesticide users must report to the Oregon Department of Agriculture (ODA) the use of any pesticide product, except antimicrobial pesticide products. However, ODA was not provided funding to carry out this mandate, so this rule remains voluntary. EWEB would like to explore ways to work with pesticide users in the McKenzie watershed to voluntarily implement a portion of these rules ahead of mandatory reporting requirements.

In OAR 603-095-2100, ODA provides some basic requirements for landowners in the Southern Willamette Valley Agricultural Water Quality Management Area to prevent and control water pollution from agricultural activities and soil erosion. A Local Advisory Committee was formed to assist ODA and East Lane Soil & Water Conservation District in writing the Southern Willamette Valley Agricultural Water Quality Management Area Plan. The purpose of this plan is to identify strategies to reduce water pollution from agricultural lands through a combination of outreach programs, suggested land treatments, management activities and monitoring (ODA, 2002).

EWEB's agricultural activities assessment project implements many portions of the Southern Willamette Valley Agricultural Water Quality Management Area Plan by promoting partnerships, providing education and outreach opportunities to growers, working with growers to implement voluntary conservation projects and monitoring. Members of the Local Advisory Committee will be invited to provide feedback and participate in this assessment project.

The Agricultural Ecosystem - Food For Thought

EWEB has been involved in the McKenzie watershed since 1911 and will continue its reliance on the McKenzie for drinking water and hydroelectric power generation for the foreseeable future. This project provides an opportunity to develop long-term relationships with growers and local communities/institutions that would be beneficial to all parties involved. The following brief discussion is provided as food for thought.

It has been well documented that over time, growers have received an ever smaller portion of the food and fiber dollar, with more revenues going to the inputs (seed, stock, fuel, equipment, financing, labor, chemicals and management) and to the processors (Flora, 2001; Shiyomi and Koizumi, 2001). There is a need for communities and institutions to increase ties with local growers in ways that allow them to reach emerging markets and be more profitable, competitive, and environmentally sound. This could be viewed as a new type of cooperative that:

- ? Supports production of reliable, high-quality, healthy crops in ways that are profitable and environmentally sound;
- ? Works with growers to identify problem areas and design solutions to these problems;
- ? Finds necessary funding to implement actions at the farm level;
- ? Provides access to local markets;
- ? Assists with identification of local labor pools;
- ? Provides a marketing network for McKenzie Valley farm products regionally and possibly globally; and,
- ? Monitors watershed activities and provides a feedback loop to researchers and scientists at local universities that assist on solving local problems.

Development of on-farm and off-farm relationships among a diverse group of partners (growers, landowners, local agricultural agencies, watershed stakeholders, universities and local businesses) allows growers to make choices that ensure economic vitality, enhance environmental integrity, and meet quality of life goals with support from local communities and institutions (Flora, 2001; Giampietro, 2004). Local conditions, the complexities of farming, and market uncertainty requires a level of innovation that cannot be satisfied by simply implementing "best management practices" in a few areas. EWEB hopes that over the long-term we can forge new partnerships that make farm products grown in the McKenzie Valley a sought after commodity.

Agricultural Assessment Project Approach

It should be noted that this specific project is the initial effort associated with a long-term program to develop mutually beneficial relationships with the farming community, agricultural

agencies, universities, local businesses, and others. The agricultural activities assessment project is funded with Oregon DEQ grant funds and will be completed within one year. The results, lessons learned and partnerships developed from this initial effort will be used to shape future directions and projects with the agricultural community in the McKenzie watershed. The following is an overview of the conceptual approach to implementing the agricultural activities assessment project.

Phase 1: Meet, Listen, Learn, and Collect Information

- ? Contact and distribute this draft plan to the initial list of stakeholders and partners listed in Table 1 (add/remove stakeholders based on initial phone conversations).
- ? Meet with each stakeholder/partner to learn about their current involvement in the agricultural community, feedback on the draft plan, and discuss potential involvement in this project.
- ? Collect data and information on agricultural activities in the McKenzie watershed.

Phase 2: Share information and initial analysis

- ? Hold stakeholder/partner meeting(s) to share feedback received on draft plan, present the final plan, share information collected as part of the assessment, and discuss how information will be analyzed to identify high priority areas of potential pollution runoff.
- ? Conduct initial analysis and share results with agricultural community to get feedback, new information, identify errors, etc.
- ? Revise analysis based on feedback and share final analysis results with agricultural community that identifies high priority areas for further study.
- ? Meet and share results with specific landowners in high priority areas and learn about specific farm practices in these areas.

Phase 3: Monitor Storm Runoff in High Priority Areas

- ? Work with landowners and agricultural community to select monitoring sites and collect initial information on these sites.
- ? Conduct storm runoff monitoring upstream and downstream of high priority areas to collect water samples for pesticide, nutrients, metals, and suspended sediment analyses.
- ? Input storm runoff and analytical data into database.

Phase 4: Share Data and Brainstorm on Next Steps

- ? Share monitoring data results with landowners and agricultural community.
- ? Conduct multiple meetings to brainstorm on approaches to implement on-farm actions to reduce chemicals in runoff while providing support, funding, marketing, and other assistance to growers.
- ? Complete draft project report that discusses all aspects of the project and distribute to landowners and agricultural community for comments and feedback.
- ? Finalize project report and distribute to agricultural community and other interested parties.
- ? Develop new projects/approaches based on lessons learned and ideas from brainstorm sessions.

Project Timeline

Make Contacts & Distribute Plan	January to March 2005
Collect Data on Agricultural Activities	October 2004 to March 2005
Meeting to Share Data/Project Approach	March 2005
Hold One on One Stakeholder Meetings	March to April 2005
Revise GIS Analysis Based on Feedback	March to April 2005
Share GIS Analysis Results/Contact Landowners	April 2005
Meet with Landowners/Select Monitoring Sites	April to May 2005
Conduct Storm Monitoring	May to June 2005
Meet to Share Analytical Results	August 2005
Hold Brainstorm Sessions	August to September 2005
Draft & Final Project Reports	September to October 2005
Meet to Discuss New Approaches/Projects	October 2005

Summary of Potential Stakeholders and Partners

The following list of potential stakeholders and partners that may have an interest in participating in this project are summarized in Table 1. It is anticipated that this table will change after initial discussions with the various agencies, organizations, landowners, growers, and businesses listed in Table 1.

**TABLE 1
Summary of Agricultural Community Stakeholders**

Organization Name	Contact Information	Potential Role
McKenzie Watershed Council	Megan Finnessy	Data sharing, coordinate w/council partners, monitoring, assist w/landowners
Lane Council of Governments	Bob Denouden	Data sharing, GIS analysis support
U.S. Geological Survey	Chauncey Anderson	Pesticides monitoring, data analysis & interpretation

Oregon Department of Agriculture	Stephanie Page	Data sharing, coordinate w/ODA activities, tie-in w/WQ Mngt Plan
East Lane Soil and Water Conservation District	Dave Downing	Data sharing, advice on working w/Ag community, coordinate w/E. Lane activities, perspective on WQ Mngt Plan
Oregon Department of Environmental Quality	Rachel Burr	319 grant administrator, project coordination
Oregon State University	Ray Williams	Data sharing, data collection & interpretation, advice on working w/Ag community
OSU Extension Agent	Ross Penhallegon	Data sharing, data interpretation, advice on working w/Ag community
McKenzie River Trust	George Grier	Landowner information share, feedback on approach, potential land acquisition
Natural Resource Conservation Service	Gary Briggs	Conservation service program, project coordination and input
S. Willamette Valley Advisory Committee	Bob Kintigh	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
S. Willamette Valley Advisory Committee	Polly Kohl	Landowner, Mohawk watershed council, provide perspective on WQ Mngt Plan
S. Willamette Valley Advisory Committee	Artemio Paz	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
S. Willamette Valley Advisory Committee	Alan Petersen	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
S. Willamette Valley Advisory Committee	Carol Ach	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
S. Willamette Valley Advisory Committee	Garry Rodakowski	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
S. Willamette Valley Advisory Committee	Nancy Moreno	SUB drinking water concerns, provide perspective on WQ Mngt Plan

S. Willamette Valley Advisory Committee	Jim Goodpasture	Local grower, information share, perspective on WQ Mngt Plan, advice on working w/growers
Gossler Nursery Farm	Eric, Roger and Marj Gossler	Local nursery, information share, involved in riparian restoration projects
Blackberry Hill Nursery	Carol & Jessica Black	Local nursery, information share, advice on working w/growers
MWC/Blueberry Grower	Dana Burwell	Local grower, information share, advice on working w/growers
MWC/Blueberry Farmer	Douglas Moser	Local grower, member of MWC, information share, advice on working w/growers

References

Eugene Water & Electric Board (EWEB). 2000. *Drinking Water Source Protection Plan*.

EWEB, 2001a. *Proposal for Implementation of the Drinking Water Source Protection Program*. Prepared By Karl Morgenstern. November 2001.

EWEB, 2001b. *Lower McKenzie River Watershed, Stormwater and Urban Runoff Monitoring Plan, Drinking Water Source Protection Program*. Prepared By Karl Morgenstern. November 2001.

EWEB, 2004. *Water Quality Laboratory Analytical Data, 2001 to 2004*.

Flora, Cornelia. 2001. *Interactions Between Agroecosystems and Rural Communities*. New York: CRC Press.

Giampietro, Mario. 2004. *Multi-Scale Integrated Analysis of Agroecosystems*. New York: CRC Press.

Lane Council of Governments (LCOG). 2004. *Ortho-Corrected Color Aerial Photography of McKenzie Watershed, Lane County at 6-Inch Resolution*. Regional Information System.

Oregon Department of Agriculture (ODA). 2002. *Southern Willamette Valley Agricultural Water Quality Management Plan*. May 2002.

Shiyomi, Masae and Hiroshi Koizumi. 2001. *Structure and Function in Agroecosystem Design and Management*. New York: CRC Press.

U.S. Geological Survey (USGS). 1996. *Occurrence of Selected Trace Elements and Organic*

Compounds and Their Relation to Land Use in the Willamette River Basin, Oregon, 1992-94. Water-Resources Investigations Report 96-4234.

USGS. 1997. *Distribution of Dissolved Pesticides and Other Water Quality Constituents in Small Streams, and Their Relation to Land Use, in the Willamette River Basin, Oregon.* Water-Resources Investigations Report 97-4268.

USGS. 1998. *Seasonal and Spatial Variability of Nutrients and Pesticides in Streams of the Willamette Basin, Oregon, 1993-95.* Water-Resources Investigations Report 97-4082-C.

USGS. 2001. *Pesticides in Selected Water-Supply Reservoirs and Finished Drinking Water, 1999-2000: Summary of Results from a Pilot Monitoring Program.* Open-File Report 01-456.