Washington State Pesticide Management Strategy

Water Quality Protection

Developed as required by the US EPA under grants provided to State Lead Agencies for FIFRA implementation

Washington State Department of Agriculture
Pesticide Management Division

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Introduction

The Washington State Pesticide Management Strategy for Water Quality Protection was developed to outline the procedure, policy and existing legal authorities that allow the Washington State Department of Agriculture (WSDA) to meet its obligations under the USEPA grant to State Lead Agencies (SLA) for administrating FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act). Under the Fiscal Year 2008 – 2010 Joint EPA/OPP/ OECA State/Tribal Cooperative Agreement Guidance, Section 2.2. SLAs are required to assess the impact of pesticides that have the potential to occur in surface and ground water at concentrations approaching or exceeding a human health or ecological reference points in localized areas of the State. If upon review, it is determined that a pesticide(s) poses a significant risk to surface and/or ground water quality, management measures are required to be developed and implemented to address that risk.

The Strategy emphasizes prevention of water quality risks by managing pesticide use, when necessary, in a way that reduces or eliminates the leaching of pesticides to ground water in vulnerable areas and pesticide entry into surface waters through runoff or off target applications.

An additional goal of the guidance given under the EPA grant is to facilitate continuity of water quality protection under FIFRA and the Clean Water Act (CWA). Further, WSDA has a complimentary program that evaluates and assesses the impact of pesticides on salmonids listed for protection under the Endangered Species Act (ESA). Specific actions and requirements related to the CWA are addressed through the authorities of the Washington State Department of Ecology as the state delegated agency. Procedures specified in this document provide consideration of existing Clean Water Act activities carried out by the Department of Ecology into FIFRA registration decisions. WSDAs ESA activities are detailed in the State Initiated Plan (SIP) for Protection of Endangered Species.

In Washington State, water is vital for preservation of the quality of life all its citizens currently enjoy. The protection of the water resource from both a quality and quantity perspective is key to continued environmental protection and economic vitality. In recognition of the importance of protecting is water resources, the State has embarked on numerous initiatives that are designed to balance the needs of the environment with those of population and economic growth.

The strategy presented emphasizes prevention of water quality risks by managing pesticide use, when necessary, in a way that reduces or eliminates the leaching of pesticides to ground water in vulnerable areas and pesticide entry into surface waters through runoff or off target movement. Under current FIFRA guidance, EPA has required states to develop and implement strategies that would establish

processes for preventing and responding to pesticide detections in the State's water resources.

Under previous EPA water quality initiatives, WSDA created and implemented several critical elements of a pesticide management plan (PMP) that were designed to benefit the environment and assist the state's agricultural industry in the utilization of pesticides within the legal constraints of the appropriate labels. Additionally, WSDA began the development and implementation of its endangered species program that focused on the monitoring and assessment of surface waters designated as salmonid bearing. As a result of these two initiatives, WSDA has developed a pesticide assessment methodology consisting of:

- A surface and ground water pesticide detection database
- Decision support matrix for pesticide detection in surface and ground water
- A State Initiated Plan which identifies threats to salmonids listed for protection under the Endangered Species Act and proposes a consultation process with EPA and NOAA to remediate any pesticide threats detected in surface water

This document presents specifics of a pesticide management strategy that address:

- Legal Authorities
- Coordination of Authorities
- Data Management
- Response Procedures
- Management Measures
- Enforcement

These focus areas describe current WSDA activities and incorporate additional elements suggested by EPA's Office of Pesticide Programs. Each area of interest is described in detail as to current status, future areas of improvement, and historical context when appropriate.

I. Strategy Overview

The strategy outlines a cooperative approach to pesticide management with the agricultural community and local, state and federal agencies in an effort to emphasize and maximize existing resources, programs and funding in order to protect surface and ground water.

Washington State's Strategy stresses prevention of surface and ground water contamination through label compliance and, if necessary, implementation of voluntary use measures based on sound scientific principles over regulatory approaches. However, if pesticide occurrences begin to pose a threat to human health or aquatic life, the program includes a framework for the development and implementation of regulatory action(s) deemed necessary to protect water quality.

The core aspects of the Washington State Strategy are:

- Pesticide use evaluation;
- Water Quality assessment;
- Water quality monitoring and pesticide detection activities;
- Surface and ground water vulnerability assessment;
- Timely and measured response to confirmed water quality impacts from pesticide use;
- Cooperative development of label modifications to address environmental and human health pesticide concerns; and,
- Information and education to maximize proper use of pesticides according to label requirements.

The focus of the Strategy is to maintain the viability of the state's agricultural industry while protecting the human health and ecological designated uses for the surface and ground waters of the state.

The Strategy is intended to implement those provisions of FIFRA that require compliance with pesticide label restrictions pertaining to the protection of surface and ground water quality and human health. Implementation of these provisions will contribute to the overall state goal of protecting water quality to the highest beneficial use.

The Strategy is designed to be implemented by several agencies. If regulatory authorities are needed, WSDA authorities will be the primary means to control the use of pesticides. WSDA relies upon a cooperative effort by numerous agencies and organizations to implement this strategy and to educate users of pesticides as to the most effective and environmentally prudent application methods. It is envisioned that prior to selecting an educational or regulatory approach involving pesticide application or handling, coordination will occur

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between the Department of Agriculture and the other appropriate agencies (e.g., Washington State Department of Health or Department of Ecology).

II. Legal Authorities

Legal Authorities – WA Department of Agriculture

Legal authority for implementing pesticide management measures to protect surface and ground water from the potential adverse impact from pesticides is contained under two main statutes and three associated rules in Washington State. These statutes deal with the regulation of pesticide sale, distribution, and use to protect public health and welfare.

State Laws and Rules Governing Pesticides in Water

LEGAL AUTHORITY	*DEFINITION*
Chapter 15.58 RCW Washington Pesticide Control Act	WSDA has broad authority to regulate pesticide distribution and use in Washington State. WSDA can also prohibit the use of a product or active ingredient statewide.
Chapter 17.21 RCW Washington Pesticide Application Act	WSDA has the ability to control methods of applications and timing of applications, require permits for applications in certain areas, set maximum use rates, or prohibit the use of pesticides in geographical areas at certain times of the year.
WAC 16-228 General Pesticide Rules	Contains state restricted use pesticides posing a risk to ground water. These pesticides can only be purchased or used by certified applicators. Currently, the rule lists twelve active ingredients. The rules also contain requirements for pesticide application record keeping.
WAC 16-229 Secondary Containment Rules	Require facilities used for storage of large quantities of bulk pesticides and fertilizers be built and maintained to contain spills and prevent their release to the environment. Containment of pesticides at permanent mixing/loading sites is also required.
WAC 16-100 and 16-200 Chemigation and Fertigation rules	Establishes performance standards for the delivery of pesticides and fertilizers through irrigation systems.

WSDA is the state agency responsible for developing pesticide use regulations and managing pesticide use and distribution in Washington State. Some of this authority is derived from the US Environmental Protection Agency's delegation of FIFRA authority to WSDA. WSDA has primary responsibility for the pesticide misuse and applicator certification provisions of FIFRA as specified through a cooperative agreement with EPA.

WSDA has the authority to regulate pesticides and to prevent contamination of surface and ground water from pesticides statutorily through Washington's Pesticide Control and Pesticide Application Acts. Implementation of surface water and ground water quality protection is based on active involvement during the federal pesticide registration process and input during state supplemental registrations to ensure that adequate label restrictions protecting surface and ground water quality are developed.

WSDA has the authority to regulate pesticides and to prevent contamination of surface water and ground water from pesticides statutorily through Washington's Pesticide Control and Pesticide Application Acts.

In Washington State, compliance with label language is the cornerstone of achieving a fully functional water quality protection strategy. WSDA frequently provides advice and data to EPA during the federal pesticide registration process to help ensure that label language is protective of water quality. WSDA develops label language for "Special Local Needs" registrations under FIFRA §24(c) and emergency exemptions under FIFRA §18, which are submitted to EPA for approval. Compliance with current national and/or statewide label language will result in water quality protection in the vast majority of situations. However, that language may not be protective in every local situation.

A 1987 memorandum of understanding between the Washington State Departments of Agriculture, Ecology and Health (Contract Number 6500-64601) recognizes WSDA's authority and responsibility to control pesticide use and to adopt and administer pesticide regulations for protection of public health, welfare, and the environment.

Based upon the structure of the Pesticide Management Strategy currently implemented by WSDA, no additional measures specified under other state or federal statute or regulation are anticipated that would enhance surface and ground water quality beyond that called for under specific pesticide application and control statutes and regulations.

Legal Authorities – WA Department of Ecology

The Washington State Department of Ecology is the State's environmental protection agency. Under the Agency's authority exists ground water quality regulations (173-200 WAC) and surface water quality standards (173-201A WAC). These regulations are derived from statute Chapter 90.48 RCW – Water Pollution Control. Contained in these rules are both numeric and narrative criteria which maybe employed by other agencies to supplement their respective water quality protection activities. Using these criteria, the Department of Ecology may take enforcement action against both point and nonpoint sources of pollution that is regulated by the Department through permit or may otherwise cause harm to human health and/or the environment.

Development of the state's list of impaired waterbodies (CWA Section 303(d)), state water quality standards and the development and implementation of Total Daily Maximum Loads (TMDLs), and Special Protection Areas are conducted by the Department using their legal authorities.

Legal Authorities – WA Department of Health

The Washington State Department of Health does not have authority over the protection of surface or ground water quality. Rather the Department of Health's authority applies to the quality of water delivered to the consumer. The protection of source water has advantages to the operators of public water supply systems for which the Agency does have authority. As such the Department of Health serves as participant in assisting WSDA in activities that eliminate or reduce the likelihood that drinking water sources would become impacted by pesticides. WSDA has cooperative agreements and projects with the Department of Health that help to enhance source water assessments as they pertain to pesticide occurrence in both surface and ground water.

III. Coordination of Authorities

In Washington State, water quality protection is conducted by several agencies responsible for implementing environmental quality laws and regulations, protection of public drinking water supplies, and management of environmental activities and public health. Together, these programs constitute an integrated water quality protection program.

In Washington State, water quality protection is conducted by several agencies responsible for implementing environmental quality laws and regulations, protection of public drinking water supplies, and management of environmental activities and public health. Together, these programs constitute a holistic and integrated water quality protection program.

The mechanisms used by the state to insure that water quality is protected are found in the form of linked laws and regulations that employ the concept of antidegradation and protection of designated uses.

Coordination Mechanisms

In Washington State there are numerous state, federal, and local agencies that play a role in water quality protection as it relates to pesticide management. Some of these agencies have a direct implementation role, while others serve in a support capacity by providing technical assistance or data to those charged with implementation.

Several mechanisms exist through which coordination takes place between water quality protection agencies. These are:

Interagency Ground Water Committee

The Interagency Ground Water Committee (IGWC) is a state chartered organization that was formed in 1989 in response to the Environmental Protection Agency's "*Ground Water Protection Strategy*". The Committee is composed of core representatives from the Washington State Department's of Agriculture, Ecology, Health, and the state Conservation Commission. Other members include EPA, USGS, and various local governments. The function of the Committee is to provide a link between agencies engaged in ground water protection activities, and to provide support and review function for statewide ground water protection initiatives.

Member agencies have developed joint ground water protection projects and assist each other with feedback on agency specific tasks. The IGWC was responsible for the development of the Comprehensive State Ground Water Protection Program (CSGWPP), which was endorsed by EPA in 2002, and sets forth a strategy to implement and improve upon all the key elements cited in the Ground Water Protection Program.

Members of the IGWC meet quarterly, and discuss a wide range of issues related to ground water quality protection activities of which pesticide contamination is part. As requested by one or several agency Directors, the IGWC may accept assignments related to the research of multi-agency ground water concerns, and development of recommendation positions such as was the case in the development of the Columbia Basin Ground Water Management Area in response to elevated nitrate levels in ground water in Eastern Washington during the mid 1990's.

The *Interagency Ground Water Committee* has been inactive since the winter of 2007. Currently discussions are ongoing to reactivate the *Committee.*

Washington State Nonpoint Source Workgroup

In 2000, Washington State developed a statewide plan, titled *Washington's Water Quality Management Plan to Control Nonpoint Sources of Pollution*, to protect natural resources from nonpoint pollution. This plan can be viewed at http://www.ecy.wa.gov/programs/wq/nonpoint/nps_plan.html. The development of this plan was a collaborative effort headed by the Washington State Department of Ecology and involved numerous state agencies including Agriculture, Health, Fish and Wildlife, Parks and the state's two research universities. The nonpoint plan identified gaps in existing state programs, set a strategy for improving those programs, recommended timelines, and outlined methods for evaluating progress. The State Nonpoint Source Workgroup (which is comprised of representatives from the collaborative agencies) oversees the tracking of activities specified in the plan and provides funding to state agencies willing to address items identified in the plan. The "workgroup" also provides coordination of state agency actions cited in the strategic activities contained in the plan. Surface and ground water quality protection as it relates to agriculture is cited as within the strategic elements of the plan.

The Department of Ecology has recently elected to suspend elements of the workgroup related to project submittal and funding. The workgroup responsibilities in directing funding to key nonpoint projects is at this time undetermined.

Governor's Forum on Monitoring Salmon Recovery and Watershed Health

The Governor's Forum on Monitoring was created, in 2003 consistent with the Comprehensive Monitoring Strategy and Action Plan for Watershed Health and Salmon Recovery per Executive Order 04-03. The goals and objectives of the Forum are to:

- Provide a multi-agency venue for coordinating technical and policy issues and actions related to monitoring salmon recovery and watershed health;
- Make recommendations on biennial reporting of monitoring results and progress in watershed health and salmon recovery;
- Foster integrated analysis and reporting of monitoring information;
- Provide monitoring recommendations to the Salmon Recovery Funding Board, the Governor's Salmon Recovery Office and appropriate state agencies.
- Develop a broad set of measures that will convey results and progress on salmon recovery and watershed health in ways that are easily understood by the public, legislators and Congress.
- The Forum is also encouraged to develop such indicators with federal, tribal, regional and local partners working on salmon recovery and watershed health so that there is standardization of the measures used.
- Coordinate with local and regional watershed and salmon recovery groups, tribes, other states, the Northwest Power and Conservation Council, U.S. Environmental Protection Agency, NOAA Fisheries, U.S. Fish and Wildlife Service, and U.S. Forest Service.

Through the Forum, monitoring locations, parameters are coordinated and shared with other state local and federal agencies. Multi-agency agreements related to funding, and data sharing are included as part of the activities the Forum helps to foster between participants.

IV. Data Management

Data Collection

WSDA's analysis includes data collected to monitor normal pesticide use and application. As a result, data that has been collected, as part of a hazardous waste investigation or spill is not made part of the agency's water quality pesticide assessment.

Ground Water

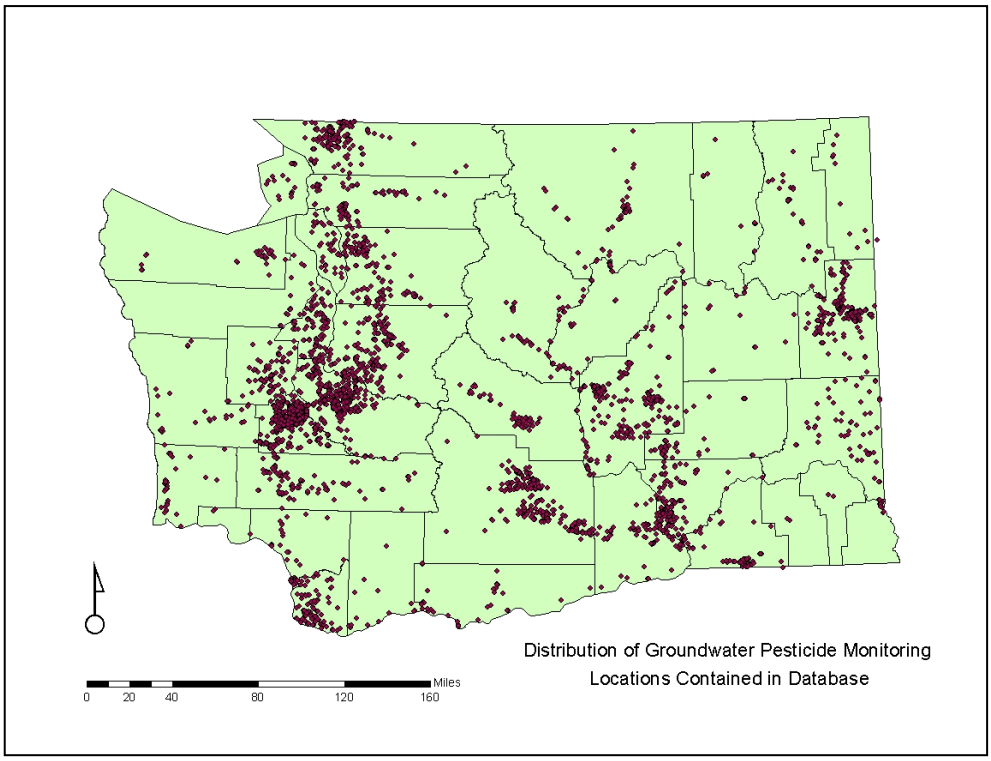
WSDA has limited monitoring and data resources available to adequately evaluate pesticide occurrences in ground water or explore (via monitoring) areas identified as vulnerable to pesticides of concern. Public water supply system (PWSS) sampling as required by the Washington State Department of Health is the only consistent, on-going, statewide ground water monitoring effort at this time. WSDA has elected to use ground water data collected by PWSS and supplement that data with that collected by other agencies and organizations, which employ strict quality control and quality assurance measures, as baseline information on which to base general assessments as to the presence of pesticides in ground water.

Ground Water Monitoring Data Collected by Agency

AGENCY	MONITORING DATA COLLECTED
US Geological Survey	Maintains ground water data collected as part of independent studies or as part of the Yakima and Columbia Basin NAWQA studies
Washington State Department of Ecology	Maintains environmental information management database (EIM). Most data in EIM is from the Clean-Up Program and Source Water Protection Program. Expect more data in the future from other agency programs.
Washington State Department of Health	Oversees a statewide drinking water well monitoring program for all public water supply systems.
Local Government (Cities/Counties/Districts)	Conducts ground water assessments and data collection in support of Ground Water Management Area, Critical Aquifer Recharge Areas, etc.
Washington State Department of Agriculture	Specialized studies conducted on an as needed basis.

In addition to the data collected by PWSS, WSDA relies on water monitoring data from other agencies and area wide assessment projects conducted by other government entities. These include the DOH, the USGS National Water Quality Assessment (NAWQA) monitoring data studies, and other related studies conducted or funded by the State, local governments, and Ground Water Management Areas (GWMA's).

Data that has been previously collected and has been made part of the WSDA database provides for adequate coverage of the major agricultural areas of the state. Additionally, this data also provides for coverage of urban areas of the state where homeowner use of pesticides is of concern. Currently, the WSDA database contains information from approximately 5000 sites within the state.



The currently available information provides the ability to assess general pesticide occurrence in the state's ground water resources. The majority of this data is collected in support of regulatory programs not directly focused on pesticides in ground water due to use or misuse. The data does provide an indication of the adequacy of current pesticide management practices in preventing ground water contamination. However, it should be noted that the current data source(s) may not provide the same level of "monitoring" that a dedicated ambient groundwater monitoring system would provide. In order to improve upon

the applicability of data collection efforts undertaken by other agencies and organizations WSDA will be working with entities collecting the data (e.g.,WDOH, WDOE, USGS, etc.) to tailor their sampling activities to better assess current pesticide management activities when appropriate.

Note: WSDA has entered into an agreement with WDOH to assess their current sampling structure and if possible accommodate some of the needs of WSDA in regards to parameters sampled and locations for sampling.

Surface Water

WSDA has an annual monitoring program for assessing pesticide concentrations in surface water. This program was implemented in 2003 with the specific intent of identifying potential contaminants of concern for salmonids listed as threatened of endangered under the Endangered Species Act. WSDA contracts with the Washington State Department of Ecology to collect weekly field samples in selected salmonid bearing streams from March through October. This activity is conducted through a Memorandum of Understanding which is evaluated on a two year cycle. Currently this program includes 16 monitoring locations distributed among four Water Resource Inventory Areas (WRIAs) throughout Washington.

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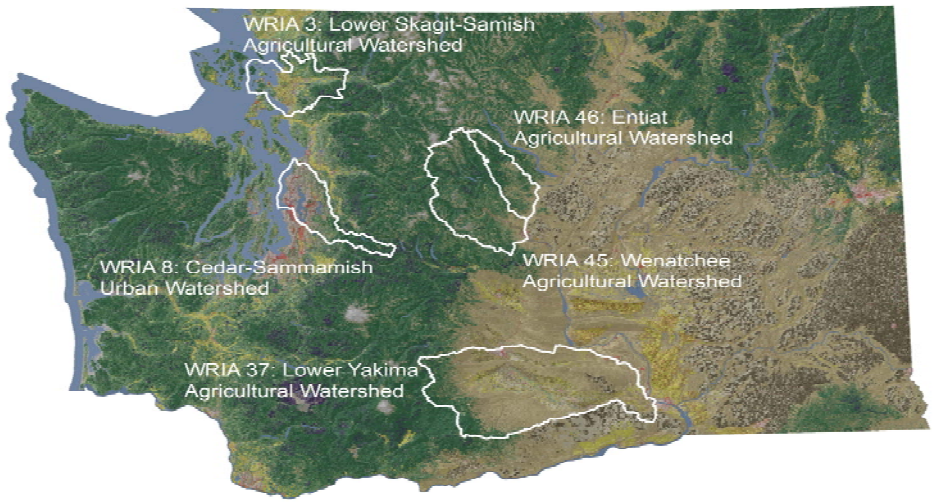

WRIAs monitored by WSDA for Pesticides in Surface Water

The WRIAs monitored are representative of different agricultural practices within Washington as well as one WRIA representing urban pesticide use. Monitoring locations are generally located on first or

second order drainages designated as salmon bearing near the confluence of the dominant drainage in the WRIA.

Sites are selected by delineating a watershed for each salmon bearing stream within a WRIA. Watersheds are then ranked based on the acreage of agricultural land use and typically the watersheds with highest acreage of agriculture are selected for monitoring. WSDA uses agricultural acreage within a watershed as an indicator of potential pesticide use. Thus the monitoring locations serve as integrator sites for sub-watersheds within a WRIA in which pesticides have the greatest potential for use based on agricultural land use. The exception to this is the urban watershed which was selected based upon historical sampling data. Samples are collected weekly at all locations except for two sites that are secondary locations in two drainages. This monitoring effort is done in collaboration with the Washington Department of Ecology.

This data also allows for a yearly assessment of water quality impacts to watersheds and specific streams from pesticide management practices in areas of intensive agricultural use. The data collected from this program is evaluated along with other surface water data collected from Ecology, the USGS and others (provided they meet Ecology's data acceptance criteria) to determine water body impairment and potential listing or removal from the Clean Water Act 303(d) list. At the conclusion of each years sampling, the two agencies collaborate in the production of data assessment report.

Data Sharing

Ground Water

Data that has been incorporated into the Department of Agriculture's database(s) is available to other agencies for use in their ground water or public health protection activities. This data and the analysis thereof is also made available to the US Environmental Protection Agency as part of the yearly grant agreement and as part of the pesticide registration and re-registration program.

Surface Water

Data collected as a result of the surface water pesticide monitoring program is made available to the general public following QA/QC evaluation and approval by WSDA. The general public can obtain the information using Ecology Environmental Information Management System (EIM) available at http://www.ecy.wa.gov/eim/.

Data Assessment

WSDA has the primary responsibility to evaluate relevant pesticide data collected from surface and ground water sources in order to verify use according to pesticide label restrictions and to determine if, based upon unique circumstances, a pesticide poses an elevated risk to the beneficial use of surface or ground water.

WSDA has developed a database(s) of historic and current surface and ground water samplings conducted by federal, state, and local agencies. This database(s) are used to identify pesticide occurrences in surface and ground water and to determine if pesticide vulnerable areas have emerged that may require additional attention.

As of December 2008, the WSDA ground water database contains over 270,000 separate sampling records collected from 1985 to December of 2008. The following table provides statistical information regarding pesticide occurrence in ground water for Washington State.

Ground water Monitoring Statistics

ELEMENT	STATISTICS
Total Sample Records	~270,000
Total Pesticide Detections	1715
Percent Detections	.60%
Percent detection of all cancelled pesticides and their metabolites and/or degradates and actively registered pesticides and their metabolites and/or degradates at or above an established regulatory limit	.049 % (139)
Percent detection of actively registered pesticides and their metabolites and/or degradates at or above an established regulatory limit	.000019% (6)
Percent detection of actively registered pesticides and their metabolites and/or degradates at or above 20% of an established regulatory limit.	.000074% (25)

Based on the records contained in the statewide database, there is little occurrence of currently used pesticides in ground water at levels that warrant concern from a human health perspective. There have been and continues to be detections of "legacy pesticides[1]" at levels that approach or exceed established regulatory limits. It should be noted that WSDA does recognize the limitations of using groundwater data primarily obtained from public water supply systems. To address the limitations of the current database, WSDA conducts additional analysis considering, the depth of the well, screened interval, and sampling location. Additionally, in the absence of data or as a compliment to it, WSDA always considers the potential vulnerability of underlying groundwater over areas were the potential chemical of concern maybe used. In order to accomplish this task, WSDA uses both its up to date land use data and pesticide use summaries.

Based on the records contained in the statewide database, there appears to be little occurrence of currently used pesticides in ground water at levels that warrant concern from a human health perspective. There has been and continues to be detections of "legacy pesticides" at levels that approach or exceed established regulatory limits.

Beginning with the establishment of the surface water monitoring program, WSDA created a database that summarizes surface water quality data for pesticides in Washington. This database is updated weekly with the Environmental Information Management (EIM) database which is the Washington Department of Ecology's repository of water quality data. WSDA also updates the database yearly with USGS NAWQA data.

Surface Water Monitoring Statistics For Monitored Pesticides

ELEMENT	STATISTIC	
Total Sample Records (includes parent and degradate compounds)	151,385	
Total Pesticide and Degradate Detections	14,014	Water, Sediment and Tissue Samples
Percent Detections	9%	66 Currently Registered Pesticides and Degradates
Currently Registered Pesticide Detections	7552	
Percent Detections of Currently Registered Pesticides and Degradates.	5%	
Current Use Pesticides Listed on Washington's 2004 303d List	5	Chlorpyrifos, Diazinon, Azinphos Methyl, Endosulfan, Pentachlorophenol

[1] Legacy pesticides are those that have been banned or cancelled or are otherwise no longer in use usually because of documented environmental or human health concerns and include but are not limited to EDB, Dinoseb, and DBCP.

WSDA uses the data contained in its databases and employs a three-tier approach to assess water quality conditions and measure the progress of protection efforts. These criteria were developed by states in coordination with EPA using national data on pesticide detections in surface and ground water. These steps are:

1) Pesticides of interest evaluated
2) Pesticides of concern managed
3) Demonstrated progress

The first measure will be to identify those pesticides that have a potential to occur in surface or ground water at concentrations approaching or exceeding a reference point[2]. These pesticides are defined as "pesticides of interest".

An EPA list of pesticides of interest appears in the following table. However, WSDA may add pesticides of a particular interest in Washington. An evaluation is then performed on the list of pesticides of interest to determine whether a human health or ecological reference point is likely to be approached or exceeded. Beginning in federal fiscal year 2008, WSDA and EPA will negotiate a schedule for evaluating pesticides of interest. That schedule will appear in future WSDA/EPA Pesticide Cooperative Agreements. The metric is:

$$\frac{\text{Evaluated pesticides of interest}}{\text{Number of pesticides of interest}} \textbf{ X 100\%}$$

The second measure will be the quantification of Washington State's efforts to manage pesticides that have been identified as posing a risk of contamination.

The state evaluation will determine whether pesticides of interest are likely to approach or exceed a human health or ecological reference point within localized areas, thus becoming pesticides of concern and in need of management measures. The metric for this evaluation is:

$$\frac{\text{Number of pesticides of concern managed}}{} \textbf{ X 100\%}$$

[2] WSDA first uses the state numeric ground water criteria as reference points, where no criteria exists a MCL or HAL is used. In the case where no reference points exists, WSDA consults with the Washington State Department of Health regarding the appropriate use of alternative reference levels to include US Geological Survey "benchmarks". In respect to surface water quality, WSDA uses a variety of reference points including state surface water quality criteria, EPA registration toxicological criteria for fish, aquatic invertebrates, and plants, and the EPA National Recommended Water Quality Criteria

Number of pesticides of concern identified

The third measure is aimed at quantifying the number of pesticide for which some form of management has demonstrated progress toward keeping (or returning) pesticide concentration in water below a reference point. This measure is:

Number of pesticides of concern managed for which there is Demonstrated progress toward reduction or maintenance of

$$\frac{\text{concentrations below the reference point}}{\text{Number of pesticides of concern managed}} \textbf{ X 100\%}$$

State Pesticides of Interest

2,4-D	Imidacloprid
Acetochlor (+ ESA, OXA	Isoxaflutole
Alachlor (+ ESA)	Lambda-cyhalothrin
Aldicarb (+ degradates)	Lindane
Atrazine (+ DEA, DIA, DACT, Hydroxy)	Malathion
Azinphos-methyl	Mesotrione
Bentazon	Metalaxyl
Bromacil	Metsulfuron Methyl
Carbaryl	Metolachlor (+ ESA, OXA, S-Metolachlor)
Carbofuran	Metribuzin (+ DA, DADK, DK)
Chlorothalonil	MSMA + other arsenical herbicides
Chlorpyrifos	Napropamide
Clopyralid	Norflurazone (+ degradates)
Copper Pesticides	Pendimethalin
Cyanazine	Phenoxy herbicide group
Dacthal	Phosment
DBCP	Picloram
Diazinon	Prometon
Dicamba	Prometryn
Dieldrin	Propazine
Dimethenamid	Propiconazole
Diuron	Simazine (+ DACT, DIA)
Endosulfan	Sulfometuron (et. al.)
Esfenvalerate	TCP
Ethoprop	Tebuthiuron
Ethylene Dibromide	Terbacil
Glyphosate (+ AMPA)	Thiamethoxam
Hexazinone (+ Metabolite B)	Tralkoxydim
Imazamethabenz	Triallate
Imazapyr	Triclopyr
	Trifluralin

"Pesticides of Concern" are those that Washington State identifies as *likely* to approach or exceed a human health or ecological reference

point in surface or ground water in localized areas. Designation as a pesticide of concern would prioritize that pesticide for management to ensure concentrations are maintained or reduced below the reference point. WSDA will consider any pesticide of interest that causes a waterbody to be classified as category 2 or 5 by the Department of Ecology under CWA 303d authority as a *Pesticide of Concern.*

V. Response Procedures

The Department's response to a pesticide occurrence is dictated by WSDA's statutory mandate to protect public health, welfare, and the environment. Once a pesticide has been designated as a "pesticide of concern" it will become subject to targeted activities designed to assess the extent of the occurrence, the degree to which it may impact human health, and the effectiveness of voluntary management measures that may be implemented in order to address the concern.

Ground Water

Response procedures used by WSDA will depend upon whether detections of pesticides in groundwater are confirmed by analytical means or are indicated based on potential vulnerability and land use. Response procedure base on vulnerability assessment and land use, will generally consist of increased educational efforts within the area of potential concern, and may lead to increased application inspections to verify that proper use criteria is being followed.

If the pesticide occurrence has been detected and verified in a private well, WSDA will work with the Washington State Department of Health to determine the degree to which the well user and public health may be impacted. WSDA and the Department of Health will determine if notification of either the well owner and/or the general public is required and WSDA will work with that agency to public notification through existing mechanisms. WSDA and the Department of Health will provide the private well owner/user with available health-related information along with the test results. Private well owners/users may be responsible for providing their own alternative sources of drinking water until a permanent solution is found to correct a problem.

In responding to detections found at public drinking water systems, the State Department of Health has the lead in regulating the water provider. If a pesticide is found by a community water system at or above the MCL[3], the purveyor is required to provide newspaper notice within 14 days and direct mail notice to consumers within 45 days of the violation. Other types of public water systems, such as "transient non-community systems" and "Group B water systems" have similar notification requirements (see WAC 246-290-495 and WAC 246-291-360). Community water systems are required to provide customers with an annual "consumer confidence report" that, among other things, lists contaminants detected in their water (see WAC 264-290-72001).

[3] WDOH uses the federal MCL as basis for action. In most cases the MCL will equate to the Ground Water Quality Standards criteria, except for compounds for which no criteria exists.

When contamination at or above an MCL is found, the purveyor must notify the Department of Health, determine the cause of the contamination, and take action as directed by DOH. For contaminants that do not have an MCL, DOH determines the follow-up action for the water system. Data received by DOH will be provided to WSDA and will be useful for the protection efforts.

For private wells, the Washington State Department of Ecology has provided drinking water, on a temporary basis, in cases where MCLs have been exceeded. This is not a uniform policy and water users may be responsible for providing their own alternative sources of drinking water until a permanent solution is found to correct a problem.

The time frame in which an action is implemented will depend on several factors. The risk to human health or sensitive ecosystems is a primary consideration and WSDA will consult with DOH or Ecology in that regard.

WSDA may implement a combination of actions depending on the pesticide detected, the concentration, and the source of contamination. At concentrations between 10 and 20% of a reference point, efforts will focus on better definition of the extent and magnitude of the contamination. Detections above 20% of the reference point will bring additional, more intensive effort to determine the source of the contamination and, if it is found to come from current legal use of the pesticide, to implement BMPs that meet standards of efficacy and economic practicality. Identification of the source of the contamination is key to identification of effective response actions but it can be a complex and expensive process.

WSDA will work with pesticide registrants, producers, and applicators to determine the source. Contamination between 50% to 75% of the reference point will result in even greater monitoring to closely track contamination trends and to evaluate the effectiveness of BMPs or other management measures. If monitoring shows that these actions are not effective in reducing contamination or if contamination is increasing, more stringent measures may be implemented, including mandatory measures developed through WSDA rule-making process. When contamination from current legal use meets or exceeds 75% of the reference point, WSDA may prohibit use in the area of contamination.

The time frame in which an action is implemented will depend on several factors. The risk to human is a primary consideration and WSDA will consult with DOH or Ecology in that regard. If contamination above 100% of the reference point is discovered, prioritization of investigational resources to determine the source of contamination and emergency rule-making may allow the Department to take action typically within 1-2 months. Emergency rule-making must be followed by permanent rule-making which typically takes six months to a year. For lower concentrations where human or

environmental health is not at immediate risk, identifying the source of contamination, then developing effective BMPs, and then having them voluntarily adopted by pesticide users may take two - five years depending on the physical conditions of the application area. Appendix One provides the general response matrix that will be used by WSDA when considering potential actions after pesticide have been detected in both surface and ground water.

The geographic area in which management actions may be taken will depend on vulnerability and monitoring results. When ground water within an area is found to be contaminated from current, legal use of a pesticide, in addition to that area, WSDA will consider which management actions should be implemented State-wide or in other areas of similar vulnerability to prevent other contamination problems. In areas where monitoring has detected no pesticide residues in ground water, WSDA will generally rely on education for prevention. Exceptions will be made if conditions in an area are similar to areas where detects have been confirmed and there is good evidence to suggest the area is highly vulnerable. In this case the agency will concentrate education in those areas and heavily promote voluntary implementation of BMPs. Increased monitoring priority will be given to these areas.

It should be noted that depending on the circumstance WSDA may elect to take action at any level if after consultation with the Department of Health it believes that a threat to public health exists. Each of the response levels presented is based upon the fact that confirmation of the pesticides existence has been made. This may include two or more consecutive detections in consecutive sampling quarters at the original level or above.

Surface Water

WSDA has focused on assessing the effects of pesticides found in surface water on threatened and endangered salmonids. The surface water criteria are based on the protection of aquatic organisms while the ground water criteria are based on human health protection. Aquatic organisms are more sensitive to contaminants thus the surface water criteria are more conservative. Three sets of criteria are used to assess these effects:

- EPA National Recommended Water Quality Criteria (NRWQC).
- Washington State water quality standards for the protection of aquatic life (WAC 173-201A).
- Pesticide registration toxicity and risk assessment criteria.

WSDA also consults the 303(d) list of impaired water bodies for Washington State compiled by the Washington Department of Ecology.

Water Quality Criterion and Standards

The National Recommended Water Quality Criteria (NRWQC) are established by the EPA Office of Water for the protection of aquatic life, as established under the federal Clean Water Act (33 United States Code 1251 et. seq.). The pesticide criteria established under the CWA are closely aligned with invertebrate acute and chronic toxicological criteria. States often adopt the NRWQC as their promulgated (legal) standards. The NRWQC were updated in 2006 and the Washington State water quality standards are established in the Washington Administrative Code (WAC), Chapter 173-201A.

Pesticide Registration Toxicity Criteria

The EPA uses risk quotients (RQ) to assess the potential risk of a pesticide to aquatic organisms. A RQ is calculated by dividing the environmental concentration by a toxicity value derived from data submitted during the pesticide registration process. The resulting RQ is a unit-less value that is compared to levels of concern (LOC). Comparing a measured concentration of a pesticide in water with a LOC provides an initial perspective on the relevance of the pesticide concentration to environmental health and can be used to identify and prioritize sites and pesticides that may require further investigation.

The endangered species LOC (0.05 for aquatic species) is used as a comparative value to assess potential risk to threatened or endangered species. The endangered species RQ can also be expressed as 1/20th of the acute LC50 for aquatic organisms. WSDA focuses on assessing the potential risk of a pesticide to salmonids and uses the LC50 for rainbow trout as a surrogate species when salmonid toxicity data is not available. In addition the concentrations of pesticides detected in surface water are compared to the aquatic invertebrate acute and chronic endpoints.

303(d) Listing – Impaired Water Bodies

All of the data collected from WSDAs surface water monitoring program as well as other monitoring projects conducted by Ecology are stored in the Environmental Information Management (EIM) system (http://www.ecy.wa.gov/eim) and available for determining 303d listing status under Ecology's Water Program policy (WQP Policy 1-11, revised September 2006) . WSDA will consult the 303(d) listing of impaired

waters for pesticides on an annual basis to determine if changes to water bodies due to pesticide impairment occur.

Assessment Approach and Response

There is typically a temporal duration of exposure criteria in addition to numeric criteria for a surface water quality standard. For example, the aquatic life criteria for diazinon reads "Freshwater aquatic life should not be affected if the one-hour average concentration of diazinon does not exceed 0.17 micrograms per liter more than once every three years on the average (acute criterion) and if the four-day average concentration of diazinon does not exceed 0.17 micrograms per liter more than once every three years on the average (chronic criterion)." (EPA, 2006).

Also, toxicity values such as those used for pesticide registration are determined from continuous exposure over time (e.g., LC50 freshwater fish acute toxicity tests are run for 96 hours at a constant concentration). Therefore, when comparing monitoring data to either the aquatic life criteria or directly to a toxicity criterion, the duration of exposure as well as the numeric toxicity value must be evaluated.

WSDA's uses a weight of evidence approach to assess the potential ecological effects of pesticides and relies mostly on its ongoing surface water monitoring program to do so. Current use pesticides detected above an assessment endpoint or are on the states 303(d) list will be included in Departmental outreach initiatives to inform applicators of water quality issues associated with pesticide use. These outreach activities may include presentations to watershed groups, irrigation districts and pesticide applicator license recertification courses.

If a pesticide is detected above an assessment endpoint during a consistent application period in two of three years[4] WSDA will work with pesticide registrants, producers, and applicators to determine the source and identify mitigation measures to reduce exposure. If mitigation measures cannot be identified or fail to reduce concentrations in surface water WSDA will take regulatory action to limit a pesticides use. This assessment paradigm places an emphasis on chronic surface water quality problems. WSDA will evaluate acute exposures on a case by case base. The response matrix for surface water is presented in Appendix 1.

[4] This is similar to the criteria used by the Washington Department of Ecology to list impaired water bodies under the Clean Water Act (Ecology Water Quality Policy 1-11, revised September 2006).

VI. Management Measures

This section describes the management measures that are currently in place or are available to WSDA to address pesticide detections, in water, that meet the criteria for a "*Pesticides of Concern*". The philosophy of water quality protection in Washington State focuses first on prevention of future water quality contamination and second on minimization and mitigation of existing pesticide water contamination. Regardless of whether pesticides are found to be present in surface or ground water, prevention has been and will be the foundation upon which water quality protection programs and efforts are based. WSDA's first choice is to use non-regulatory approaches to ensure the quality of the state's water through the Strategy. However, regulatory approaches such as state use restrictions and geographical bans may be used if it is determined that an agricultural chemical poses a serious threat to surface and/or ground water.

The Department will use vulnerability assessments to prioritize prevention activities in areas of high and moderate vulnerability (See Appendix Two). Activities that likely will be prioritized in these vulnerable areas include: chemigation and fertigation technical assistance, development of Best Management Practices, and pesticide applicator Certification and Training. Outreach to commodity, industry, and other interested groups will be a priority in vulnerable areas.

When a pesticide is detected, the initial response will focus on confirming the detection in water and determining the concentration level. WSDA will evaluate existing monitoring data and consult with the sampling entity to establish timelines for conformational monitoring.

Because of the nature of agricultural operations and pesticide application it is often impossible to identify the specific *source* of the contamination. Any monitoring that occurs following identification and confirmation of contamination will be structured in coordination with jurisdictional agencies, to determine the extent of an impacted area and definition of common characteristics occurring in that area that may have lead to pesticides entering ground or surface water. Generally, WSDA does not anticipate the need for additional sampling efforts beyond those normally conducted unless the contaminant concentration is at least 20 percent of a federally established Human Health Advisory Level (HAL), a Maximum Contaminant Level (MCL) a state Department of Health alternative level or a technically acceptable ecological effects level.

WSDA will respond to significant contamination with the pesticide management measure described Appendix One of this Strategy

according to the procedures and "response levels" described. The type of measure that is chosen and how it is implemented depends on the concentration of a pesticide relative to a "reference point". Once a pesticide management measure is in place, it is important to evaluate the effect that measure has on reducing the pesticide's concentration over the area of concern.

Voluntary Prevention Approaches

There are a variety of ongoing efforts in Washington State working towards preventing water quality contamination. WSDA recognizes prevention measures must be "do-able" from the pesticide user perspective. Ultimately, it is the acceptance and implementation by the users of pesticides (both commercial and residential) that will produce the desired end result. Additionally, increased cost and effort to use the pesticides should be supported by a significant reduction in risk to surface and ground water. Voluntary prevention approaches include education and training, community outreach, risk reduction measures, and compliance and technical assistance.

Education and Training

Education will be a major component of Washington's water quality protection strategy. It must include both a broad based approach to building awareness of water quality issues by all users of pesticides and target specific groups with more detailed and technical information. The education element should also address areas such as Integrated Pest Management and Sustainable Agriculture. Educational tools include the WSU Pesticide Education And Recertification Programs, Master Gardener Programs, industry and commodity group meetings.

WSDA Certification and Training

The Certification and Training section of WSDA's Pesticide Management Division is responsible for managing the pesticide licensing and recertification programs for individuals who apply, distribute or consult on the use of pesticides. WSDA's licensing program includes nine license types and more than twenty exam categories. Once licensed, an individual must either acquire the required number of recertification credits or retest in order to maintain his or her license.

WSDA works with Washington State University Cooperative Extension to produce study manuals for the various pesticide exams. Both the study manuals and exams address environmental concerns, including water quality. WSDA participates in the annual planning of the WSU sponsored programs and has input into the topics addressed. WSDA also provides speakers for the recertification courses. Since its

inception, the WSDA Water Quality Program has presented a course on water quality and pesticides at many of the recertification courses held around the state.

Water Quality Workshops

WSDA staff plans to develop and hold water quality protection workshops in addition to those conducted as part of a continuation education program. Additionally, WSDA staff will participate in workshops upon request to discuss the pesticide-specific issues of concerns that may arise. Workshops may target pesticide users in vulnerable geographic areas, particular pesticides or certain types of agriculture such as irrigated crops.

Commodity Group Meetings

There are many commodity groups in Washington State such as the Association of Washington Wheat Growers and the Washington Apple Commission. These groups are helpful to their members in many ways. Most have annual meetings and newsletters to keep their membership informed on different issues including new regulations. These commodity groups provide an excellent opportunity to work with and educate specific groups of growers about the pesticide and water quality related issues.

Industry Meetings

Many pesticide user groups hold annual meetings where speakers present a variety of topics of interest to their organization. Often these groups offer recertification credits for a portion of the talks relating to pesticides. WSDA and WSU Cooperative Extension often provide speakers for some of these meetings or for in-house training sessions for employees. WSDA staff will use these opportunities to discuss general water quality protection, and provide specific information about the status of pesticide and water quality related concerns or issues.

Newsletter

“Natural Resources Assessment News” is an electronic newsletter published by the WSDA Natural Resources Assessment Section. The newsletter disseminates information about surface and ground water issues, the Endangered Species Act, pesticide regulations, and Section activities focusing on the impacts of pesticides and fertilizers on Washington state’s natural resources.

The newsletter is delivered using an e-mail distribution list that includes agricultural organizations and advisory boards, commodity commissions, agricultural and environmental consultants, university cooperative extension offices, state and federal regulatory agencies, pesticide manufacturers, and other interested citizens and stakeholders. Currently, "Natural Resources Assessment News" has an electronic circulation of over 300 individuals and groups.

Community Outreach

Community outreach efforts such as the Master Gardener Program and presentations to interested groups and pesticide users will be directed to the public as well as the regulated community. Pesticide-specific management information, requirements, restrictions and updates will be disseminated to the general public and regulated community through industry newsletters, directed mass mailings, radio announcements, newspaper articles, and public meetings. Notification when a public water supply system is impacted will be accomplished as needed by the state Department of Health.

Master Gardener Program

The Master Garden Program administered by WSU Cooperative Extension offers a chance to educate the home and garden pesticide user. Master gardeners assist Cooperative Extension in educating and assisting homeowners and gardeners with questions concerning lawns, gardens and ornamental plants.

Presentations to Interested Groups

Presentations to the general public and interested groups will provide a basic introduction to the state's efforts to protect ground water from pesticides as well as the concept of pesticide-specific state management activities. Presentation length, content and style will be tailored for the different audiences as appropriate.

Residential Pesticide Users

In the past WSDA has developed educational materials on proper pesticide use, storage and disposal for the home and garden user. These materials consisted of fact sheets, plastic placards for pesticide storage areas and plastic measuring cups to be used for properly measuring pesticides when mixing. The materials have been distributed by master gardeners, at home and garden shows and by several organizations.

Risk Reduction Measures

Pesticide risks may be reduced when pesticides are applied properly and prescriptively. Evaluation of risk reduction measures will be accomplished through applicator surveys, evaluation of sales and use records and monitoring. Risk reduction measures include the application of best management practices, Home•A•Syst and the State Department of Health's Wellhead Protection Program.

Best Management Practices (BMPs)

BMPs are methods or practices used to control or reduce point and nonpoint source pollution. BMPs provide a framework for integrated nutrient and pesticide management. The proper combination of BMPs in agricultural production systems provides protection of both ground and surface water at a site-specific level. Technical assistance is available to growers through existing programs administered by WSU Cooperative Extension, the Natural Resources Conservation Service, Conservation Districts and others. WSDA will support these efforts as they relate to the pesticide-specific management plans.

BMPs have an important role in WSDA's prevention and response strategies. Although BMPs are generally viewed as voluntary measures, state regulation(s) acknowledge that BMPs can be mandatory. In certain contaminated areas, WSDA may make implementation of BMPs mandatory while they remain voluntary in other areas. WSDA along with partner agencies and institutions will be responsible for evaluating the effectiveness of BMPs and may require more stringent measures if the BMPs are not successful in demonstrating an improvement in water quality over a realistic timeframe.

The development of BMPs and recommendations for restrictions will be accomplished by WSDA and partner agencies and institutions. For a BMP or restriction to demonstrate progress (maintaining pesticide levels below a reference point or reducing level below a reference point) WSDA and partners will need to balance the effectiveness of the practice in reducing contamination with its economic practicality. Depending on the geographic scope for BMP development, WSDA will seek the input of all pertinent stakeholders including other local agencies and/or representative of agricultural, pesticide industry, and environmental organizations.

Source Water Protection Program

The Washington State Department of Health administers Washington's Wellhead Protection Program. Mandated by amendments to the Federal Safe Drinking Water Act in 1986, the program applies to all federally defined public water systems using both surface and ground water as their source. This is a pro-active program intended to prevent contamination of surface and ground water used for drinking water.

Regulatory Approaches

Compliance and technical assistance provides an opportunity for individuals to receive assistance from regulators in understanding and implementing regulatory requirements and potential pesticide-specific management plans. Compliance and technical assistance can help reduce violations by providing a better understanding of the requirements and specific actions required of the individual. Pesticide compliance and technical assistance is available through WSDA's Enforcement Program and the Chemigation and Fertigation Technical Assistance Program.

WSDA Chemigation and Fertigation Technical Assistance Program

The WSDA Chemigation and Fertigation Technical Assistance Program is administered from the Moses Lake office. The program was initiated in 1998 to protect surface and ground water and to update agency rules on chemigation and fertigation. Two chemigation and fertigation specialists staff the Moses Lake office and work with growers in the field to protect water resources from the potential hazard of pesticides and fertilizers. WSDA hopes to increase operator understanding of the potential impact irrigation activities have on surface and ground water, and convey the need for appropriate management practices through technical assistance.

Regulatory Actions

WSDA has the authority to impose regulations to prevent contamination and to respond to contamination. Regulatory approaches such as state use restrictions and geographical bans may be used if it is determined that an agricultural chemical poses a threat to water quality and those threats cannot be addressed through implementation of voluntary or mandatory BMPs or other management measures. Such actions would take place in the areas where

contamination is confirmed. In other areas of similar or higher vulnerability where water quality monitoring has not yet been implemented WSDA will conduct assessments designed to determine the need for regulatory action. The Department can classify a pesticide as State Restricted Use if it poses a serious threat to surface or ground water, even if water quality monitoring has not yet detected it in the State. Where contamination is not decreasing and voluntary approaches are not successful in protecting the state's water quality from agricultural chemicals, then regulatory approaches will be used. Several regulatory options are available to WSDA to further control the use of pesticides in Washington State including pesticide reclassification, pesticide use restrictions and permitting. Regulatory solutions may be used when monitoring data supports the need. Most regulatory activities involve rulemaking and a public process.

In areas where pesticides are not applied, impacts from pesticides to the environment should not occur. Where pesticides are applied according to the label and current state restrictions but those controls still fail to prevent contamination, implementation of additional restrictions may be considered.

Pesticide Reclassification

Pesticides posing a heightened risk to water resources may require intensive management and an adequate tracking mechanism if use is continued in Washington State. Classification of pesticide-specific management plan pesticides from general use to restricted use would provide a mechanism for tracking sales and use through record keeping requirements.

Under WAC 16-228-1230, WSDA may classify a pesticide as state restricted use for the protection of ground water. This classification ensures the pesticide can only be distributed by licensed pesticide dealers to certified applicators or their duly authorized representatives. Additionally, only certified applicators or persons under their direct supervision can apply state restricted use pesticides.

Pesticide Use Restrictions

In areas where pesticides are not applied, impacts from pesticides to the environment should not occur. Where pesticides are applied according to the label and current state restrictions but those controls still fail to prevent contamination, implementation of additional restrictions may be considered. These restrictions should reduce the amount of pesticides introduced into the environment and diminish the potential for pesticide leaching. Pesticide use restrictions include designating use prohibition areas, limiting pesticide use, limiting total amounts of pesticides applied, additional training requirements and setback areas

Use Prohibition Areas

Use prohibition areas will be defined as those areas where due to the extreme vulnerability of the aquifer, WSDA determines there are no best management practices sufficient to protect the ground water. Use prohibition areas related to surface waters will be defined based on the need for mitigation by the establishment of a TMDL as required for a Class 5 water body, other measures as outlined for a Class 4 water body under section 303(d) of the Clean Water Act, or measures as required under Chapter 90.48 RCW. These actions will be taken by the Department of Ecology if needed. WSDA will collaborate with Ecology as necessary.

Limited Use Areas

Limited use areas may include vulnerable aquifers where WSDA determines additional best management practices will be able to protect ground water resources, but where a "Use Prohibition" designation is not necessary. Limited use will also apply to areas having verified positive detections that have not responded to other voluntary preventive measures. Pesticide usage may be subject to the following limitations or restrictions:

- Restrict application method;
- Limit maximum application rates;
- Prohibit use on certain soil types;
- Prohibit use on certain crops;
- Limit timing of application; and
- Restrict type of formulation that can be used.

Setback and/or Buffer Areas

In consultation with DOH, WSDA may establish additional setback or buffer areas beyond the locally established wellhead protection zones. Buffer areas may also be designated around surface water features that are hydrogeologically connected to ground water recharge areas and identified as vulnerable or sensitive areas.

VII. Enforcement

A strong commitment to enforcement of regulations is essential for successful implementation of the pesticide management strategy.

Through a cooperative agreement with EPA Region 10, WSDA has the primary regulatory responsibility in Washington State for implementing FIFRA. WSDA has been working to enforce provisions of FIFRA for ground water quality protection through pesticide registration, certification and training, and enforcement. WSDA has field regulatory staff located in five offices in the state including Olympia, Moses Lake, Yakima, Wenatchee, and Spokane.

For implementation of the pesticide management strategy, the WSDA Water Quality Protection Program will use existing agency enforcement staff and processes in the enforcement investigations, case review and enforcement actions.

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Product Registration

WSDA is responsible for the registration of all pesticide products distributed in Washington State. All pesticide registrations in the state must be in accordance with FIFRA and Washington State Pesticide Laws and Rules. WSDA coordinates with EPA Headquarters and Region 10 offices as well as the WSU Cooperative Extension and industry to implement this program. WSDA registers pesticides under several different categories including general use, restricted use, FIFRA Section 24(c), and Section 18 registrations.

Compliance

The WSDA Enforcement Program inspects and investigates the production, distribution, and use of pesticides to assure proper registration, storage, sale and use of these chemicals. Enforcement investigations are conducted under the provisions of both state and federal laws. The department can take enforcement action for violations discovered during an inspection. These enforcement actions can serve to educate the pesticide user population and prevent further violations. Under the WSDA/EPA cooperative agreement, WSDA provides end of year reports to EPA on the progress of all FIFRA programs implemented by WSDA.

WSDA provides staff for training sessions in conjunction with the WSU Cooperative Extension Program and when requested, by grower or dealer groups. The field staff conducts test sessions throughout the state to evaluate and certify individuals who distribute and use

restricted pesticides and apply general use pesticides for commercial purposes within Washington State. Violations of the state and federal pesticide statutes can result in enforcement actions. These actions can range from warnings to civil penalties.

Case Review

WSDA conducts formal case review in compliance with FIFRA and Washington pesticide laws and rules. If necessary, cases impacting ground water quality will be blended into the enforcement and case review process.

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Penalty Provisions

WSDA has a variety of penalties it can impose for violations of laws and rules. The penalties range from verbal warnings to the imposition of civil penalties. The Department of Agriculture is currently authorized by statute to assess civil penalties of up to $7500.00 per violation. These will be assessed when it is determined that willful illegal use of a pesticide has occurred.

Additional penalty provisions exist with the Washington State Department of Ecology but WSDA envisions few circumstances where they would be a consideration. Ecology could take a penalty action if they determine that provisions within the Ground water Quality Standards have been violated and the agricultural exception no longer applies to the situation. The Ground water Quality Standards limit when an agency can assess a penalty. However, the guidance on the implementation of the Standards[5] (p. 79) says:

> Enforcement through a compliance order or permit modification shall precede any civil or criminal penalty [WAC 173-200-100(8)] if a permittee violates the Ground Water Quality Standards but is in compliance with the best management practices adopted by the following rules: ... RCW 15.58.150(2)(c), Pesticide Control Act -- Pesticides shall be used according to label directions or according to the Washington State Department of Agriculture regulations ... WAC 16-228-180(1), Pesticide regulations -- A pesticide license may be denied, revoked or suspended if the provisions are violated. ... WAC 16-228-185, Pesticide regulations -- Restrictions on the holding, handling, using, or disposing of pesticides and their containers.

[5] Washington State Department of Ecology Publication # 96-02, April 1996

WSDA recognizes the intent of this regulation but envisions few circumstances where it would be a consideration for non-point source contamination since agricultural application of a pesticide is not currently an action requiring a permit (excluding application of aquatic pesticides). If contamination is found to exceed a MCL or HAL, then WSDA will take steps to remove the pesticide load including the elimination or restriction of use in that area by a WSDA regulation. Non-compliance with that regulation will be enforced according to existing WSDA regulations and policies.

The State Departments of Agriculture, Ecology and Health, within their regulatory responsibilities, have provisions for levying penalties if necessary. These agencies write rules, develop policy, conduct routine inspections and complaint investigations, and take regulatory actions. They have the ability to assess civil penalties, and have trained enforcement staff available to implement the regulatory components of pesticide-specific state management plans. Investigations can be shared between agencies with joint jurisdiction or an investigation can be handed over to the agency with the strongest jurisdiction.

Chemigation

The enforcement component of the WSDA Chemigation and Fertigation Technical Assistance Program entails conducting audits of irrigation systems used to apply pesticides and fertilizer. These technical assistance audits evaluate the installation of pollution prevention equipment on the irrigation systems to prevent agrochemical contamination of surface and/or ground waters. The audits and subsequent follow-up inspections give growers a chance to fix any portion of the system that is found to be out of compliance. This program increases compliance with the laws and regulations while reducing potential agrochemical contamination of Washington waters.

VIII. Additional Information on the Implementation of this Strategy

This Strategy will be part of the continuing Pesticide Cooperative Agreement between WSDA and EPA. Under the agreement work plan, WSDA will be providing reports within 90 days of the end of the State fiscal year regarding the implementation of the Strategy. EPA plans to have an electronic reporting database for all states to provide information in a consistent format. Information in the database for Washington will likely include:

Which pesticides will be “Pesticides of Interest”?

Which pesticides will be “Pesticides of Concern”?

What management action(s) WSDA has implemented for each “pesticide of concern”, and;

Citations to any data that demonstrate that those management actions are effective.

The database is also likely to include the specific reference point that WSDA is using for a particular pesticide

Appendix One

Response Matrix

Response Matrix – Ground Water Quality

<table>
<tr><th colspan="2">Ground Water</th></tr>
<tr><td>Response Level</td><td>Detail</td></tr>
<tr><td>1</td><td>(Confirmed detection between 10 and 20% of a reference point or indication based on vulnerability of potential impacts)</td></tr>
<tr><td colspan="2">Evaluate data (water quality, land use, pesticide use) against known conditions of application and designated vulnerability assessments
Evaluate need for conformational data (do we really have an occurrence?)
Work with Department of Health to determine human health risk (necessary for pesticides without a MCL or HAL)
Evaluate data against historic occurrences of pesticide and cropping patterns to determine current or historic threat</td></tr>
<tr><td>2</td><td>(Confirmed detection between 20 and 50% of a reference point)</td></tr>
<tr><td colspan="2">Evaluate extent of pesticide occurrence, and inform State Department of Health that pesticide has been designated “pesticide of concern” using criteria on page 23
Work with registrant, producers, and applicators to determine source
Initiate voluntary BMP’s
Evaluate effectiveness of BMP’s</td></tr>
<tr><td>3</td><td>(Confirmed detection between 50 and 75% of a reference point)</td></tr>
<tr><td colspan="2">Consider implementing mandatory BMP’s or other regulatory restrictions
Monitor implementation of BMP’s/restrictions to determine effectiveness
Work with commodity groups and registrants to assess alternative pest control chemicals and/or measures</td></tr>
<tr><td>4</td><td>(Confirmed detection above 75% of a reference point)</td></tr>
<tr><td colspan="2">Implement use prohibition areas
Determine effectiveness of regulatory actions
Initiate enforcement action for cases of misuse or illegal disposal
Emergency rule-making possible if above 100%l</td></tr>
</table>

Response Matrix – Surface Water Quality

Surface Water	
Response Level	Detail
1	**Confirmed detection above a reference point**
1. Evaluate data against known conditions of use and application *2. Evaluate need for conformational data (do we really have an occurrence?)* *3. Evaluate data against historic occurrences of pesticide and cropping patterns to determine current or historic threat* *4. Include detected pesticide in outreach and educational efforts*	
2	**Confirmed detection in two of three years above a reference point**
1. Evaluate extent of pesticide occurrence *2. Work with registrant, producers, and applicators to determine source* *3. Initiate voluntary BMP's* *4. Evaluate effectiveness of BMP's*	
3	**Confirmed detection above a reference point after voluntary BMPs implemented**
1. Consider implementing mandatory BMP's or other regulatory restrictions *2. Monitor implementation of BMP's/restrictions to determine effectiveness* *3. Work with commodity groups and registrants to assess alternative pest control chemicals and/or measures*	
4	**Confirmed detection above a reference point after mandatory BMPs implemented**
1. Implement use prohibition areas *2. Determine effectiveness of regulatory actions* *3. Initiate enforcement action for cases of misuse or illegal disposal* *4. Emergency rule-making possible if above 100%l*	
The surface water matrix response levels differ from the ground water matrix as a result of the conservative nature of the assessment criteria used for surface water (see page 23)	

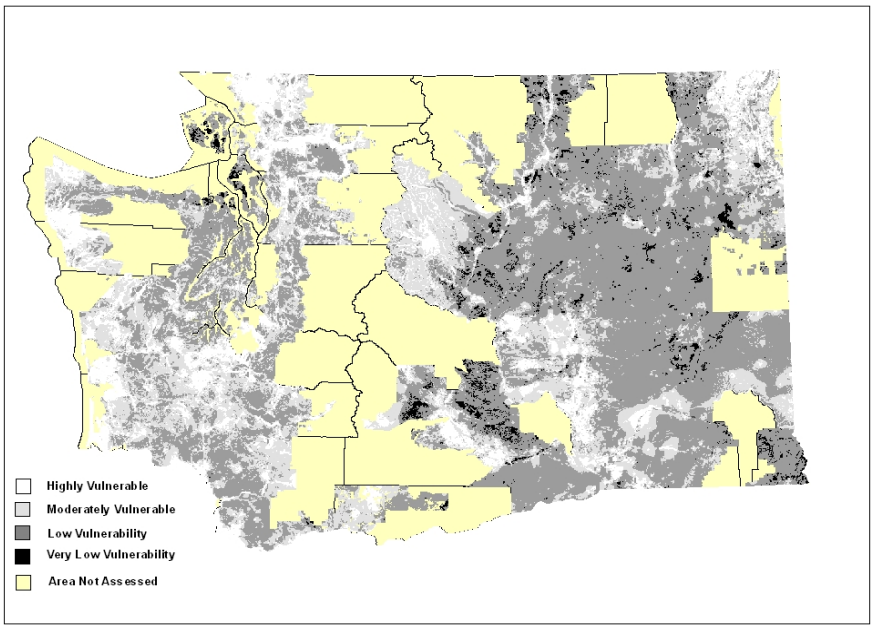
Appendix Two
Vulnerability Assessments

Aquifer Vulnerability Assessment

In March 2005, WSDA completed the latest in a series of aquifer assessments designed to assist the agency and users of pesticides in locating areas where an elevated potential for leachable pesticides to move to ground water exists. Vulnerability information, monitoring data, pesticide use data and information on the use of ground water are used to determine geographic areas with potentially the greatest risk for pesticide movement into the underlying aquifers.

Vulnerability assessments can be used as a cost effective method to direct resources to areas that require focused attention due to the physical that tend to increase the potential for pesticide occurrence in ground water. The various methods and/or tools available to WSDA are discussed below.

Pesticide Vulnerability Map of Washington Aquifers



Completion of the assessment has yielded a series of statewide maps that indicate where vulnerable areas exist. Future baseline monitoring will likely use the mapped results as a foundation to more effectively focus resources. A complete description of the methodology used to develop the vulnerability maps will be available on WSDA's web in late winter 2009.

Vulnerability is assessed using data from the following four areas:

1) Soil characteristics
2) Geologic characteristics
3) Depth to first encountered ground water

4) Availability of recharge for transport of contaminants

Additionally, cropping patterns and specific pesticide use are factored into the development of the final products.

Drinking Water Sources

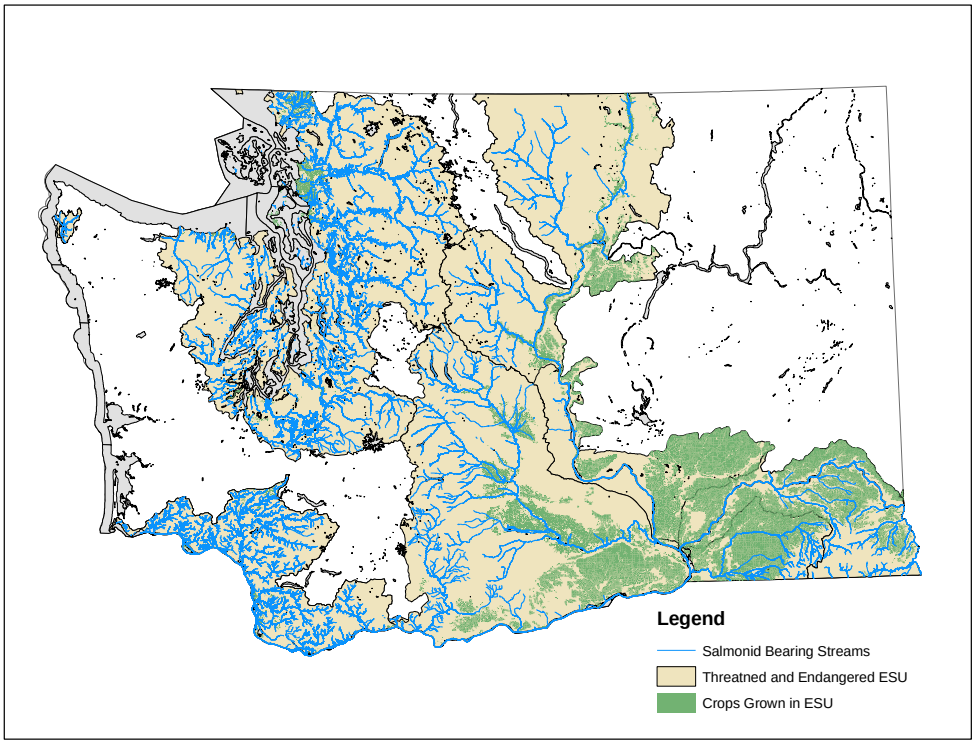
Although Washington State classifies all its ground water as a potential source of drinking water, areas that are current sources of drinking water receive greater attention under current programs. Areas covered by the wellhead protection program and source water protection program (WDOH) are the focus of more intense regulatory or non-regulatory management of contamination sources. Critical Aquifer Recharge Areas, Ground water Management Areas and Sole Source Aquifers are other areas where more attention is given to contamination sources. Even though all ground water is considered drinking water, these types of designated areas will likely continue to receive greater monitoring, protection, and enforcement effort for potential contaminants.

Surface Water Vulnerability Assessments

For the purpose of WSDAs current monitoring project vulnerability is assessed by determining the relationship of agriculture to salmonid habitat. Typically first order streams are selected for monitoring which are more susceptible to pesticide contamination than higher order streams. WSDA relies upon the Washington State Department of Fish and Wildlife to determine the stream segments that are inhabited by salmonids. This data is available on WDFWs website (http://wdfw.wa.gov/mapping/salmonscape/).

In areas targeted for monitoring WSDA will delineate watersheds of the salmonid habitat and utilizing the crop mapping[6] data calculate the acres and type of commodity grown within a drainage of salmonid habitat. WSDA uses crop acres as an indicator of potential pesticide use and ranks the various drainages utilized by salmonids within a WRIA from high to low based on crop acreage. The drainages with highest crop acreage are typically selected for monitoring unless there is a compelling reason to select an alternate drainage. This procedure is described in greater detail in Surface Water Monitoring Quality Assurance Project Plan. (http://agr.wa.gov/PestFert/EnvResources/docs/SWM/QAPP2003.pdf).

[6] **Since 2002 WSDA has been surveying the location of commodities grown in Washington State and storing this data in a geospatial database for GIS use.**



Additional Assessment Tools

Local jurisdictions also provide valuable information for pesticide-specific management plans as ground water vulnerability projects have been conducted in a number of Washington counties. Most of this activity is driven by requirements of the Growth Management Act. The Act requires counties and cities planning under the Act to classify and designate Critical Aquifer Recharge Areas (CARAs). Ecology guidelines recommend classifying CARAs according to aquifer vulnerability. It is anticipated that substantial amounts of useful information can be gained at the local level, and this information will be used for pesticide-specific management plan development. Ground water monitoring data from local, state or federal sources indicating a potential for concern will also be used to assess aquifer vulnerability and the need for specific pesticide management

Pesticide Use Data to Support Vulnerability Assessments

WSDA recognizes pesticide usage data is an important element to the success of the Ground water Protection Strategy and will use existing data sources. Existing data sources include pesticide use data collected by the Washington State Agricultural Statistics Service, USGS pesticide data published on Washington State, and the Pesticide Use Study conducted by WSDA in 1998 and the agency's crop profile data as it is created. These studies provide WSDA with information on usage patterns, formulation, rates and methods of application, and volume in pounds of active ingredient.

WSDA can require pesticide application data reporting if it is determined there is a potentially significant impact to the ground water resource. Pesticide application record call-ins and GIS mapping are useful tools for assessing pesticide use and surface and ground water vulnerability. However, application record call-ins are very expensive to acquire, screen and enter into a database. WSDA has a limited capability to use application record call-ins for state pesticide management planning and will reserve this tool for areas of significant concern. Existing surface and ground water quality data and known health affects information will be used to determine pesticides needing additional reporting requirements.

The evaluations to determine "pesticide(s) of interest" and "pesticide (s) of concern" will be based on the use of either the MCL, HAL, GWQS numeric criterion, the Surface Water Quality Standards. Use of alternative "reference points" such as USGS benchmarks will be considered pending review and recommendation from the Washington State Department of Health and/or the Department of Ecology. It is envisioned that as a result of continued assessment of pesticide occurrence in water, and a determination of known or potential impacts to human health, the list of "reference points" may expand over time.